Logical Architecture Volume III

Data Dictionary
Preface

Volume III of the Logical Architecture contract deliverable document documents the Data Dictionary. This formatted version of the Teamwork model data dictionary is mechanically produced from the Teamwork CDIF (Case Data Interchange Format) output file. It is an accurate reproduction of the actual model data, but reformatted for easier use. The following discussion describes the process steps and the resulting document structure.

Data Dictionary Generation

The Teamwork data dictionary is a formal, robust repository of all model definitions of data flows and data stores in the CASE process model of the ITS National Architecture. It also contains certain sizing assumptions as defined by the Joint Development Team during the analysis process. It is not however easily turned into a user friendly document. To produce the following documentation several steps are required, each modifying the form, but not the content, of the teamwork database.

Teamwork Export:

Data is extracted from the model using a Teamwork utility function (twk_get). This utility produces an ASCII flat file (ITS_cdif) in the Teamwork AIX environment. This file is very large (5.5 MB) and completely describes the CASE model, including the geometry of its graphical artifacts, the Data Flow diagrams (DFDs).

REXX Parse:

Next, a special program is used to automatically parse this large file into a set of smaller, more specific, ASCII files to facilitate importation into a relational database for analysis and documentation. The parsing program is written in REXX and runs in an OS/2 environment. In addition to finding, extracting and building the various ASCII files, this program performs some character substitution. Certain characters that are used in the Teamwork model cannot be directly carried over into Microsoft Excel models used in data loading analysis. For example, "*" in Teamwork is a comment delimiter while in Excel it is a multiplication operator. Also, some carriage return symbols are removed from the Teamwork data to eliminate "hard line breaks" and allow better text flow when reformatted in Access of Microsoft Word. With these exceptions, the data in the ASCII files is exactly the data in the Teamwork CDIF file and is an accurate representation of the CASE model.

Microsoft Access Import:

The ASCII flat files are then automatically imported into data tables in the Logical Architecture database (logical.mdb) using Access Visual Basic code and Macros.

Microsoft Access (Formatted) Report:

Finally, the data dictionary volume is generated using Access report utility and the data imported from Teamwork.

Data Dictionary Content

The top of each Data Dictionary page includes when the CASE model was last changed, when the CDIF was extracted, and when the database was updated. Each Data Dictionary Entry (DDE) is listed in alphabetical order and each entry consists of the following components.

DDE Name

The actual Teamwork flow or store name, in bold italicized type.

DDE Description

The textual description of the named flow or store as described in the CASE model. This description will identify the DDE as either a flow or a store. This textual description is not a formal definition and Teamwork neither checks nor enforces its content. This section may also contain comments regarding the assumptions that went into estimating the DDE size for data loading analysis.

DDE Definition

The list of component flows following the DDE description is the *formal* definition of the DDE in terms of other DDEs. If the DDE does not have components then it is a Primitive Element (PEL) and defines itself. This section the DDE is checked by Teamwork to ensure that all components are themselves defined and that the definition supports the use of the DDE in the model (e.g., information expected is actually present in definition).

Additional Sizing Assumption(s)

This is an "Extended Attribute" section of the Teamwork DDE. Extended attributes are not checked or maintained by Teamwork but are a convenient place to define and document certain assumptions about the DDEs. The Logical Architecture uses DDE extended attributes to define sizing assumptions (in bytes), primarily for data loading analysis.

Primitive Elements

DDEs that are not formally defined in terms of other DDEs are considered Primitive Elements (PELS). PELS, because they must define themselves, must include a size estimate. This estimate will appear in the form "SIZE - #". The size given may be either an integer number of bytes, or an Excel compatible expression. Excel expressions are evaluated (converted to numeric values) during data loading analysis. This size estimate is an assumption provided by the analyst. Where the assumption is not arbitrary, and is based on facts or other assumptions not obvious to an informed reader, further explanation may be found in the DDE Description section of the DDE. See *advisory_data_scope* on page 16 for an example of this type.

Non-Primitive Elements

Formally defined

PELS, because they must define themselves, must include a size estimate, but the sizes of DDEs that are not PELS can usually be derived from the sizes of their components in the formal

definition part of the DDE. The formal definition is converted to an Excel compatible expression during data extraction and is evaluated (i.e., converted to a numerical value) during data loading analysis. When this is the case, no "Additional Sizing Assumption(s) will be needed and this section of the DDE will not "None". See *actuator_commands* on page 1 for an example DDE of this type.

Informally defined

There are some cases where the formal definition cannot be used to directly estimate the size of a DDE, either because it cannot be converted to an Excel compatible expression (e.g., it contains "or" conditions) or it contains some deliberate ambiguity. A common example of the latter is the case where a flow is formally defined as a list and the list may contain a variable number of items. For the purposes of data loading, an additional assumption is required (i.e., the "typical" list size). In this instance the Additional Sizing Assumption(s) will be in the form of "SIZE =" followed by an Excel compatible expression. The expression will usually be similar to the formal definition, but slightly modified to incorporate the "*additional*" assumption (e.g., the anticipated list size). See *advanced_charges_payment_list* on page 2 for an example of DDE of this type. Also, note the use of a "Parameter" (described below) in this expression.

Parameters

Many of the Additional Sizing Assumption(s) are parameterized. Parameters are used to connect assumptions made independent of the CASE model (i.e., outside Teamwork) with CASE definitions within the model. They are evaluated during data loading analysis using an Excel spreadsheet model (pmodel.xls). Parameters appear in the data dictionary in ALL CAPITAL typeface. They are defined in the Logical Architecture database, not in the Data Dictionary. Teamwork does not check them. A complete list of Parameters used (and their definitions) is contained in Volume I of the Logical Architecture

ITS National Architecture

Document Control Information

CASE Model: 06/08/96 @ 12:34:24
Extracted: 06/08/96 @ 13:10:33
Logical Database: 06/09/96 @ 15:06:22

actuator_commands

This data flow is used within the Provide Driver and Traveler Services function. It contains data produced by the four servo control processes within the function. This data is used to provide automatic control of the vehicle. The data flow consists of the following data items each of which is defined in its own DDE:

steering_commands
+ lane_steering_commands
+ brake_commands
+ throttle_commands.

advanced_charge_transactions

This data flow is used within the Provide Electronic Payment Services function and contains data about advanced parking lot payment transactions as they take place for recording in the log of parking lot transactions. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ date
+ parking_lot_cost
+ stored_credit
+ time
+ vehicle_identity.

advanced_charges

This data flow is used within the provide Electronic Payment Services function and is also sent as part of a data flow from the Manage transit function. It contains data to enable an advanced parking lot charge to be calculated and billed, and can be input by either a driver from a vehicle, or a transit user from on-board a transit vehicle or at the roadside, i.e. a transit stop. The data flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ parking_lot_identity
+ parking_space_details
+ stored_credit
+ traveler_identity
+ vehicle_identity.

advanced_charges_billing_needed

This data flow is used within the Provide Electronic Payment Services function to indicate that advanced payment for a parking lot charge is needed. It consists of the following data item which is defined in its own DDE:

confirmation_flag.

advanced_charges_confirm

This data flow is used within the Provide Electronic Payment Services function to show that payment for advanced parking lot charges has been confirmed or not. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag

+ credit_identity
+ parking_lot_cost
+ stored_credit.

advanced_charges_needed

This data flow is used within the Provide Electronic Payment Services function to show that an advanced parking lot charge must be determined. It contains the following data items each of which is defined in its own DDE:

credit_identity
+ parking_space_details
+ stored_credit
+ vehicle_identity.

advanced_charges_payment_list

This store is used within the Provide Electronic Payment Services function to hold a list of drivers and travelers who have paid their parking lot charges in advance. It contains the following data items each of which is defined in its own DDE:

list_size
+ list_size{credit_identity
    + parking_lot_cost
    + parking_space_details
    + vehicle_identity}.

advanced_fare_billing

This data flow is used within the Provide Electronic Payment Services function and contains a traveler identity, the associated credit identity and the value of a transit fare that is being paid for in advance. The traveler identity is used to associate this charge with the traveler so that information on the success or failure of the transaction can be returned to the correct requester. The data flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ transit_fare
+ traveler_identity.

advanced_fare_billing_needed

This data flow is used within the Provide Electronic Payment Services function to indicate that advanced payment for a transit fare (or fares) is needed. It consists of the following data item which is defined in its own DDE:

confirmation_flag.

advanced_fare_details

This data flow is used within the Provide Electronic Payment Services function and contains details of the transit ride for which a driver wishes to make an advanced payment. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ transit_journey_date
+ transit_route_destination
+ transit_route_origin.

advanced_fare_payment_list

This store is used within the Provide Electronic Payment Services function to hold a list of those drivers, travelers and transit users who have paid their transit fares in advance, plus details of the fare and journey to which it applies. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{credit_identity
+ transit_route_origin
+ transit_route_destination
+ transit_journey_date
+ traveler_identity}.

advanced_fare_transactions

This data flow is used within the Provide Electronic Payment Services function and contains data about advanced transit fare payment transactions as they take place for recording in the log of transit fare transactions. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ date
+ stored_credit
+ time
+ transit_fare
+ traveler_identity.

advanced_fares_and_charges_request

This data flow is used within the Provide Electronic Payment Services function to transfer requests for advanced payments from the driver interface for subsequent processing. The size of the data flow has been set at less than the sum of the two constituent flows to allow for the fact that they will both not be present for every data transfer. It consists of the following data items each of which is defined in its own DDE:

advanced_fare_details
+ advanced_parking_lot_charges.

advanced_fares_and_charges_response

This data flow is used within the Provide Electronic Payment Services function and contains the result of the requested advanced transit fare and/or parking lot charge payment transaction from a driver. It consists of the following data item which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ parking_lot_cost
+ stored_credit
+ transit_fare.

advanced_fares_confirm

This data flow is used within the Provide Electronic Payment Services function to show that payment for advanced transit fares has been confirmed or not. It consists of the following data item which is defined in its own DDE:

confirmation_flag.

advanced_fares_needed

This data flow is used within the Provide Electronic Payment Services function to show that an advanced fare must be determined. It contains the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ transit_route_origin
+ transit_route_destination
+ transit_journey_date
+ traveler_identity.

advanced_other_charges_confirm

This data flow is used within the Provide Electronic Payment Services function and shows whether or not an advanced parking lot payment transaction has been confirmed or not. It consists of the following data item which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ stored_credit
+ parking_lot_cost
+ vehicle_identity.

advanced_other_charges_request

This data flow is used within the Provide Electronic Payment Services function to request that a parking lot charge be paid for in advance by either a driver who is paying a toll or a traveler (as a transit user) who is paying a transit fare. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ parking_lot_identity
+ parking_space_details
+ stored_credit
+ vehicle_identity.

advanced_other_fares_confirm

This data flow is used within the Provide Electronic Payment Services function to confirm the advanced payment of a transit fare by a transit user. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ stored_credit
+ transit_fare
+ traveler_identity.

advanced_other_fares_request

This data flow is used within the Provide Electronic Payment Services function to request that a transit fare be paid for in advance by a driver who is paying either a parking lot charge or a toll. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ transit_route_origin
+ transit_route_destination
+ transit_journey_date
+ traveler_identity.

advanced_other_tolls_confirm

This data flow is used within the Provide Electronic Payment Services function to confirm the advanced payment of tolls by a driver. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ stored_credit
+ toll_cost
+ vehicle_identity.

advanced_other_tolls_request

This data flow is used within the Provide Electronic Payment Services function to request that a toll be paid for in advance by either a driver who is paying a parking lot charge or a traveler (as a transit user) who is paying a transit fare. It consists

of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ toll_route_segments
+ vehicle_identity.

advanced_parking_lot_billing

This data flow is used within the Provide Electronic Payment Services function and contains the value of the advanced parking lot charge to be paid for a particular vehicle and driver through the credit identity. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ parking_lot_cost
+ stored_credit
+ vehicle_identity.

advanced_parking_lot_charges

This data flow is used within the Provide Electronic Payment Services function and contains data to enable an advanced parking lot charge to be calculated and billed. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ parking_lot_identity
+ parking_space_details
+ stored_credit
+ vehicle_identity.

advanced_parking_lot_charges_confirm

This data flow is used within the Provide Electronic Payment Services function to show that payment for an advanced parking lot charge has been confirmed or not. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ parking_lot_cost
+ stored_credit.

advanced_parking_lot_charges_request

This data flow is used within the Provide Electronic Payment Services function to request that a parking lot charge be paid for in advance by a driver who is already paying a charge for the immediate use of a parking lot space. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ parking_lot_identity
+ parking_space_details
+ stored_credit
+ vehicle_identity.

advanced_toll_billing

This data flow is used within the Provide Electronic Payment Services function and contains the value of the advanced toll to be charged for a particular vehicle and driver through the vehicle identity. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ toll_cost
+ toll_route_segments
+ vehicle_identity.

advanced_toll_billing_needed

This data flow is used within the Provide Electronic Payment Services function to indicate that advanced payment for a toll (or tolls) is needed. It consists of the following data item which is defined in its own DDE:

confirmation_flag.

advanced_toll_needed

This data flow is used within the Provide Electronic Payment Services function to show that an advanced toll cost must be determined. It contains the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ toll_route_segments
+ vehicle_identity.

advanced_toll_payment_list

This store is used within the Provide Electronic Payment Services function to hold a list of drivers and travelers who have paid their tolls in advance, the value of the payments, plus the toll segments and vehicles to which they apply. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{credit_identity
    + toll_cost
    + toll_route_segments
    + vehicle_identity}.

advanced_toll_transactions

This data flow is used within the Provide Electronic Payment Services function and contains data about advanced toll transactions as they take place for recording in the log of toll transactions. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ cv_carrier_number
+ cv_vehicle_number
+ date
+ stored_credit
+ time
+ toll_cost
+ toll_plaza_identity
+ toll_route_segments
+ vehicle_identity.

advanced_tolls

This data flow is used within the Provide Electronic Payment Services function and contains data to enable an advanced toll to be calculated and billed. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ toll_route_segments
+ vehicle_identity.

advanced_tolls_and_charges_roadside_confirm

This data flow is used within the Provide Electronic Payment Services function and contains the result of the requested advanced payment transaction from a traveler (as a transit user) at the roadside, i.e. a transit stop. It consists of the following data

items each of which is defined in its own DDE:

advanced_charges_confirm
+ advanced_tolls_confirm
+ confirmation_flag.

advanced_tolls_and_charges_roadside_request

This data flow is used by the Manage Transit function to transfer requests for advanced payments for toll and parking lot charges from the traveler (as a transit user) fare payment interface at the roadside, i.e. a transit stop, to the Provide Electronic Payment Services function for subsequent processing. The size of the data flow has been set at less than the sum of the two constituent flows to allow for the fact that they will both not be present for every data transfer. It consists of the following data items each of which is defined in its own DDE:

advanced_charges
+ advanced_tolls.

advanced_tolls_and_charges_vehicle_confirm

This data flow is used within the Provide Electronic Payment Services function and contains the result of the requested advanced payment transaction from a traveler (as a transit user) in a transit vehicle. It consists of the following data items each of which is defined in its own DDE:

advanced_charges_confirm
+ advanced_tolls_confirm
+ confirmation_flag.

advanced_tolls_and_charges_vehicle_request

This data flow is used by the Manage Transit function to transfer requests for advanced payments for toll and parking lot charges from the traveler (as a transit user) fare payment interface in a transit vehicle to the Provide Electronic Payment Services function for subsequent processing. The size of the data flow has been set at less than the sum of the two constituent flows to allow for the fact that they will both not be present for every data transfer. It consists of the following data items each of which is defined in its own DDE:

advanced_charges
+ advanced_tolls.

advanced_tolls_and_fares_request

This data flow is used within the Provide Electronic Payment Services function to transfer requests for advanced payments from the driver parking lot charge payment interface for subsequent processing. The size of the data flow has been set at less than the sum of the two constituent flows to allow for the fact that they will both not be present for every data transfer. It consists of the following data items each of which is defined in its own DDE:

advanced_fare_details
+ advanced_tolls.

advanced_tolls_and_fares_response

This data flow is used within the Provide Electronic Payment Services function and contains the result of the requested advanced toll and/or transit fare payment transaction from a driver. It consists of the following data item which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ stored_credit
+ toll_cost
+ transit_fare.

advanced_tolls_confirm

This data flow is used within the Provide Electronic Payment Services function to show that payment for an advanced toll has been confirmed or not. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ stored_credit
+ toll_cost.

advanced_traveler_charges_confirm

This data flow is used within the Provide Electronic Payment Services function It contains data about an advanced parking lot charge transaction requested by a traveler and consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ parking_lot_cost
+ stored_credit
+ traveler_identity.

advanced_traveler_charges_request

This data flow is used within the Provide Electronic Payment Services function to request that a parking lot charge be paid for in advance by a traveler who is planning a trip. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ parking_space_details
+ stored_credit
+ vehicle_identity.

advanced_traveler_fares_confirm

This data flow is used within the Provide Electronic Payment Services function to show whether advanced fare payment by a traveler planning a trip has been refused or cleared. The traveler will be using facilities in the Provide Driver and Traveler Services function to generate the trip request. The data flow consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ stored_credit
+ transit_fare
+ traveler_identity.

advanced_traveler_fares_request

This data flow is used within the Provide Electronic Payment Services function to request that a transit fare be paid for in advance by a traveler who is planning a trip using facilities in the Provide Driver and Traveler Services function. It consists of the following items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ transit_route_origin
+ transit_route_destination
+ transit_journey_date
+ traveler_identity.

advanced_traveler_tolls_confirm

This data flow is used within the Provide Electronic Payment Services function. It contains data about an advanced toll transaction requested by a traveler and consists of the following data items each of which is defined in its own DDE:

confirmation_flag

+ stored_credit
+ toll_cost
+ traveler_identity.

advanced_traveler_tolls_request

This data flow is used within the Provide Electronic Payment Services function to request that a toll be paid for in advance by a traveler who is planning a trip. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ toll_route_segments
+ vehicle_identity.

advisory_data

This data flow is used within the Provide Driver and Traveler Services function to provide traffic and travel advisory data to drivers and travelers in vehicles. It consists of the following data items each of which is defined in its own DDE:

traffic_data_for_advisories
+ predicted_incidents_for_advisories
+ prediction_data_for_advisories
+ transit_services_for_advisories
+ transit_running_data_for_advisories.

advisory_data_request

This data flow is used within the Provide Driver and Traveler Services function to request that advisory data be output to a driver or a traveler in a vehicle. The scope and transit route number data will be provided by the driver or transit user, whilst the vehicle location will be provided automatically. The data flow consists of the following data items each of which is defined in its own DDE:

advisory_data_scope
+ vehicle_location_for_advisories
+ transit_route_number
+ transit_vehicle_identity.

advisory_data_scope

This data flow is used within the Provide Driver and Traveler Services function to show the scope of the advisory data requested by the driver or transit user from a vehicle. The scope will define the type of data, e.g. traffic, transit, yellow pages, etc. It will use but not be limited to the following values:

0 - none
1 - current traffic data
2 - long term traffic data
100 - predictive model data
101 - predicted incidents
102 - prediction data
150 - transit schedules
151 - transit routes
152 - current transit running data
210 - yellow pages hotel data
211 - yellow pages restaurant data
212 - yellow pages theater data
213 - yellow pages services data

Additional code numbers will be needed to further subdivide the some of the data, e.g. current traffic data includes both traffic flows and pollution information. However the codes will be contained in the range 0 through 255, requiring a data flow size of one (1) byte. .

advisory_display_type

This data flow is used within the Provide Driver and Traveler Services function and contains the following definitions of the various types of driver and traveler displays that are available in the vehicle:

0 - no display,
1 - travel and traffic advisory display, updated with vehicle location changes,
2 - enable roadside information display,
3 - disable roadside information display,
4 - enable enhanced vision display,
5 - disable enhanced vision display,
6 - select front enhanced vision display,
7 - select rear enhanced vision display,
8 - transit information
9 - traffic information
10 - other (yellow pages) services information. .

agency_incident_response_procedures

This data flow is used within the Manage Traffic function and contains the actions required by agencies such as police, fire, ambulance, vehicle recovery, Environmental Protection, etc. to combat an incident. .

ahs_accel_decel_profile

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains a vehicle's acceleration and deceleration characteristics profile for use in the automatic control of the vehicle when operating on automatic highway system (ahs) lanes, whether or not it is part of a platoon. The data flow consists of the following data item which is defined in its own DDE:

vehicle_accel_decel_data.

ahs_check_identity

This data flow is used within the Provide Vehicle Monitoring and Control function and contains the identity and location of an automatic highway system (ahs) check-in facility. It consists of the following data items each of which is defined in its own DDE:

location_identity
+ unit_number.

ahs_check_parameters

This data flow is used within the Provide Vehicle Monitoring and Control function and contains the parameters against which a vehicle can be checked for suitability for operating on automatic highway system (ahs) lanes. These parameters will relate to vehicle conditions such as braking ability, maximum rate of acceleration, maximum sustainable speed, range with current fuel load, lane control accuracy, etc. .

ahs_check_response

This data flow is used within the Provide Vehicle Monitoring and Control function and contains the response to the checking of data from on-board a vehicle to see if it is suitable for operating on automatic highway system (ahs) lanes. The data flow consists of the following data items each of which is defined in its own DDE:

ahs_control_data_update
+ confirmation_flag.

ahs_checking_data

This data flow is used within the Provide Vehicle Monitoring and Control function and contains the results of a check of a vehicle's on-board data to see if it is suitable for operating on automatic highway system (ahs) lanes. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

ahs_checking_details

This data flow is used in the Provide Vehicle Monitoring and Control function and contains updates to the counts of successful and failed check-ins to the automatic highway system (ahs) lanes from roadside locations. It consists of the following data items each of which is defined in its own DDE:

ahs_failed_checks_count
+ ahs_successful_checks_count.

ahs_checking_records

This data flow is used within the Provide Vehicle Monitoring and Control function and contains records of all vehicles that tried to check in for operation on automatic highway system (ahs) lanes. The number of check-in successes and failures are stored for a series of time periods. The data is periodically passed to the Plan System Deployment function for analysis of ahs lane use. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{ahs_check_identity
    + ahs_failed_checks_count
    + ahs_successful_checks_count}.

ahs_control_data

This data flow is sent from the Manage Traffic function to the Provide Vehicle Monitoring and Control function. It contains data defining parameters to be used by vehicles participating in platoon following and running in automatic highway system (ahs) controlled lanes, which will override any already loaded into the vehicles. It consists of the following items of data each of which is defined in its own DDE:

ahs_demand_accel_decel_profile
+ ahs_demand_headway.

ahs_control_data_changes

This data flow is used within the Provide Vehicle Monitoring and Control function to send data from the management facility to the automatic highway system (ahs) check-in facilities. It contains data defining parameters to be used by vehicles participating in platoon following and running in ahs controlled lanes, which will override any already loaded into the vehicles. The data flow consists of the following items of data each of which is defined in its own DDE:

ahs_demand_accel_decel_profile
+ ahs_demand_headway.

ahs_control_data_update

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains data defining parameters to be used by vehicles participating in platoon following and running in automatic highway system (ahs) controlled lanes. This data is provided by the Manage Demand facility in the Manage Traffic function and will override any already loaded into the vehicles. The data flow consists of the following items of data each of which is defined in its own DDE:

ahs_demand_accel_decel_profile
+ ahs_demand_headway.

ahs_control_information

This data flow is used within the Provide Vehicle Monitoring and Control function and contains the parameters against which a vehicle can be checked for suitability for operating on automatic highway system (ahs) lanes, plus control data for operating in that type of lane. The data flow consists of the following items each of which is defined in its own DDE:

ahs_check_parameters
+ ahs_control_data.

ahs_data_input

This data flow is used within the Provide Vehicle Control and Monitoring function and contains data obtained from on-board vehicle sensors that identifies the type of automatic highway system (ahs) lane in which the vehicle is traveling, together with the lane identity. There are five types of ahs lane which are as follows:

1 - entry lane,
2 - running lane,
3 - exit lane,
4 - exit lane ahead,
5 - transfer lane,
6 - transfer lane ahead.

Items 1 and 2 will be accompanied by the lane identity, whilst items 4 and 6 will be accompanied by the identity of the ahs lane to which the exit lane leads, plus the direction (left or right). Item 5 is used for a particular type of exit lane and will be accompanied by the identity of the ahs lane being joined. Item 3 is used for a lane taking vehicles to a lane on which ahs operation is not supported. .

ahs_demand_accel_decel_profile

This data flow is used within the Manage Traffic and Provide Vehicle Monitoring and Control functions. It contains the acceleration and deceleration characteristics profile to be used by all vehicles over their entire speed range whilst traveling along automatic highway system (ahs) lanes in automatic control mode. This data is provided by the Manage Demand facility in the Manage Traffic function and is used to override the set of data loaded into the vehicle during its manufacture. The data flow consists of the following data item which is defined in its own DDE:

vehicle_accel_decel_profile.

ahs_demand_headway

This data flow is used within the Manage Traffic and Provide Vehicle Monitoring and Control functions. It contains the headway to be used by a vehicle over its entire speed range whilst in automatic control mode and traveling on automatic highway system (ahs) lanes. The data flow value is set by the Manage Demand facility in the Manage Traffic function and is used to override any on-board vehicle data. The data flow consists of the following data item which is defined in its own DDE:

vehicle_headway_data.

ahs_failed_checks_count

This data flow is used within the Provide Vehicle Monitoring and Control function and contains a count of the number of vehicles that failed to pass through the automatic highway system (ahs) check-in procedure at a particular point. It is sized at two (2) bytes to give a maximum value of 32767 vehicles, as the time period is expected to be one hour. .

ahs_headway

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains the headway to be used by a vehicle over its entire speed range whilst in automatic control mode and traveling along sutomatic highway system (ahs) lanes, whether or not it is part of a platoon. This data is loaded into the vehicle during its manufacture and can be overridden by data from other sources. The data flow consists of the following data item which is defined in its own DDE:

vehicle_headway_data.

ahs_lane_use_data

This data flow is used within the Provide Vehicle Monitoring and Control function and

contains records of the use of all ahs lanes. This is to enable a picture to be complied of the ahs lane use starting from the check-in point. The data is passed periodically to the Plan System Deployment function for analysis of ahs lane use. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_identity
    + ahs_vehicle_count}.

ahs_operational_data

This data flow is sent from the Provide Vehicle Monitoring and Control function to the Plan System Deployment function. It contains details of the number of vehicles that have been checked into the automatic highway system (ahs), plus details about the use of ahs lanes during the previous time period, e.g. one (1) hour. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{ahs_checking_records
    + ahs_lane_use_data
    + date
    + time}.

ahs_route

This data flow is sent by the Provide Driver and Traveler Services function to the Provide Vehicle Control and Monitoring function. It is a special form of route for vehicles only using automatic highway system (ahs) lanes and contains a list of the route segments containing these lanes that will form the route. This means that the modes data in the route selection criteria sent to the Provide Driver and Traveler Services function was set to ahs lanes only. The data flow consists of the following items each of which is defined in its own DDE:

route_segment_number{route_segment}.

ahs_route_data

This data flow is used within the Provide Vehicle Monitoring and Control function and contains a list of the route segments that will be used by a vehicle. These route segments will be those that contain automatic highway system (ahs) lanes, and will be used by the vehicle on its ahs controlled route. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_identity}.

ahs_route_request

This data flow is sent from the Provide Vehicle Control and Monitoring function to the Provide Driver and Traveler Services function to request a vehicle route that can only be used by vehicles equipped for automatic highway system (ahs) operation. It consists of the following data item which is defined in its own DDE, other data such as vehicle location and vehicle identity being added by the receiving process. Data items such as constraints and preferences that are within the data item shown below will be set up for ahs lane operation only.

origin
+ destination
+ departure_time
+ desired_arrival_time
+ modes
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments

+ preferred_weather_conditions
+ constraint_on_acceptable_travel_time
+ constraint_on_eta_change
+ constraint_on_special_needs
+ constraint_on_load_classification
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type.

ahs_status

This data flow is used within the Provide Vehicle Control and Monitoring function and contains the status of the vehicle in its operation on automatic highway system (ahs) lanes. It is made up of a single (1) byte, which make have any one of the following values :

0 - not in ahs,
1 - trying to join,
2 - running,
3 - leaving at next exit,
4 - leaving,
5 - ahs access denied,
6 - transferring lanes.

The actual warning messages, e.g. please take control of vehicle, when the vehicle is leaving ahs lane operation, output to the driver will be generated according to the state of this data flow.

ahs_successful_checks_count

This data flow is used within the Provide Vehicle Monitoring and Control function and contains a count of the number of vehicles that successfully passed through the automatic highway system (ahs) check-in procedure at a particular point. It is sized at two (2) bytes to give a maximum value of 32767 vehicles, as the time period is expected to be one hour. .

ahs_usage_data

This data store is used within the Provide Vehicle Monitoring and Control function and contains records of all vehicles that tried to check in for operation on automatic highway system (ahs) lanes. The number of check-in successes and failures are stored for a series of time periods. For successful check-ins, the resulting route data is also stored so that a picture can be complied of the ahs lane use starting from the check-in point. The data is periodically passed to the Plan System Deployment function for analysis of ahs lane use. The data flow consists of the following data items each of which is defined in its own DDE:

ahs_checking_records
+ ahs_lane_use_data.

ahs_vehicle_checking_paramters

This data store is used within the Provide Vehicle Monitoring and Control function. It contains parameters against which a vehicle's condition can be checked to see if it is suitable for operating on automatic highway system (ahs) lanes, plus the vehicle control parameters (speed, headway, etc.) used by vehicles in those lanes. The data flow consists of the following items each of which is defined in its own DDE:

ahs_check_parameters
+ ahs_control_data.

ahs_vehicle_condition

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains data processed from on-board vehicle sensors that show the vehicle's current operating condition. This data is used to determine its suitability for

operating on automatic highway system (ahs) lanes. .

ahs_vehicle_count

This data flow is used within the Provide Vehicle Monitoring and Control function and contains a count of the number of vehicles that have used an automatic highway system (ahs) lane based route segment during the previous time period. It is sized at two (2) bytes to give a maximum value of 32767 vehicles, as the time period is expected to be one hour. .

ahs_vehicle_data

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains data input by a vehicle that wishes to participate in automatic highway system (ahs) lane operation. The data consists of the following items each of which is defined in its own DDE:

ahs_data_input
+ ahs_vehicle_condition.

air_services_costs

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the costs for a traveler's use of the services operated by airlines that may be suitable for inclusion in the response to a traveler's trip request. The data flow is sized to enable the costs of up to six (6) different services to be included. These may be all on the same route, or on up to three different routes. The data flow consists of the following data item which is defined in its own DDE:

6{cost}.

air_services_destination

This data flow is used within the Provide Driver and Traveler Services function. It contains the destination of the airline service(s) that are the closest fit with a traveler's proposed trip plan. This destination may be different to that provided in the intermodal services request as it will be a commercial airfield, rather than a town, or other geographic point. It may also not be the destination of the service operated by the airline as the traveler may be leaving at some intermediate point. The data flow consists of the following data item which is defined in its own DDE:

route_point.

air_services_destination_arrival_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a flight arrives the destination point for airline services in a traveler's trip plan. This destination may not be the actual final destination of the flight operated by the airline, because the traveler may be leaving at some intermediate point along its route. The service will be a close fit with a traveler's proposed trip plan. The data flow consists of the following data item which is defined in its own DDE:

time.

air_services_details

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the airline service(s) that have been found to be suitable for use by a traveler as part of a proposed trip. It consists of the following data items each of which is defined in its own DDE:

air_services_costs
+ air_services_routes
+ air_services_schedules.

air_services_intermediate_arrival_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a flight arrives at an intermediate point on the part of a

traveler's route to be provided by an airline. Up to four (4) of these intermediate points are allowed as part of a particular airline flight. These four points are those at which the traveler has to change flights, or has a significant stop over time. There may be other intermediate points on the airline route, but they are ignored because the traveler is expected to do nothing other than remain on-board the flight. The airline route will be that which provides a service that is a close fit to the requirements of the traveler's proposed trip. The data flow consists of the following data item which is defined in its own DDE:

time.

air_services_intermediate_depart_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which an airline service departs from an intermediate point on the part of a traveler's route to be provided by an airline. Up to four (4) of these intermediate points are allowed as part of a particular airline flight. These four points are those at which the traveler has to change flights, or has a significant stop over time. There may be other intermediate points on the airline route, but they are ignored because the traveler is expected to do nothing other than remain on-board the flight. The airline route will be that which provides the service that is a close fit to the requirements of the traveler's proposed trip. The data flow consists of the following data item which is defined in its own DDE:

time.

air_services_intermediate_point

This data flow is used within the Provide Driver and Traveler Services function. It contains the location of an intermediate point on a route operated by an airline. Up to four (4) of these intermediate points are allowed as part of a particular service and they will all be the locations of commercial airfields. They will be airfields at which the traveler will have to change flights, or where the flight schedule has a significant stop over time. All other stops on the flight schedule will ignored. The airline route will be that which provides the service that is a close fit to the requirements of the traveler's proposed trip. The data flow consists of the following data item which is defined in its own DDE:

route_point.

air_services_origin

This data flow is used within the Provide Driver and Traveler Services function. It contains the origin of the airline service(s) that are the closest fit with a traveler's proposed trip plan. This origin may be different to that provided in the intermodal services request as it will be a commercial airfield, rather than a town, or other geographic point. It may also not be the origin of the service operated by the airline as the traveler may be joining it at some intermediate point. The data flow consists of the following data item which is defined in its own DDE:

route_point.

air_services_origin_depart_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a flight leaves the origin point for airline services in a traveler's trip plan. This origin may not be the actual origin of the flight operated by the airline, because the traveler may be joining at some intermediate point along its route. The service will be a close fit with a traveler's proposed trip plan. The data flow consists of the following data item which is defined in its own DDE:

time.

air_services_route_details

This data flow is used within the Provide Driver and Traveler Services function. It contains details of an airline route that will suit a traveler's proposed trip and is

associated with a cost and a schedule. The route may have up to four (4) intermediate points at which the services calls, and at which the traveler may have to change from one flight to another. There may be other intermediate points on the flight but these are of no concern to the traveler. The data flow consists of the following data items each of which is defined in its own DDE:

air_services_origin
+ 4{air_services_intermediate_point}
+ air_services_destination.

air_services_routes

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the routes served by airlines. These may be suitable for use by a traveler as part of a proposed trip. The data flow is sized to enable up to three (3) different routes to be provided. It consists of the following data item which is defined in its own DDE:

3{air_services_route_details}.

air_services_schedule_details

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the departure and arrival times at places along an airline route that will suit a traveler's proposed trip and is associated with a cost and a route. The route may have up to four of these places at which the services calls, and at which the traveler may have to change from one flight to another There may be other places at which the flight calls, but the traveler is expected to remain on-board the aircraft and therefore they are ignored. The data flow consists of the following data items each of which is defined in its own DDE:

air_services_origin_depart_time
+ 4{air_services_intermediate_arrival_time
  + air_services_intermediate_depart_time}
+ air_services_destination_arrival_time.

air_services_schedules

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the schedules of services on the routes operated by airlines which may be suitable for use by a traveler as part of a proposed trip. The data flow is sized to enable up to six (6) different routes to be provided. It consists of the following data item which is defined in its own DDE:

6{air_services_schedule_details}.

approved_corrective_plan

This data flow is used within the Manage Transit function and represents a plan of action to respond to a (relatively) long term transit schedule disruption. It consists of the following data items each of which is defined in its own DDE:

transit_route_corrections
+ transit_changes_in_stops
+ transit_changes_in_speed.

authorization_code

This data flow is used to show the result of a financial transaction involving payment using credit facilities. The code is provided if it was successful, otherwise the value is zero. .

Additional sizing assumptions:

SIZE=2;

autonomous_traveler_guidance_accepted

This data flow is used within the Provide Driver and Traveler Services function and contains the acceptance by the traveler of the previously provided route for autonomous guidance. Acceptance must be provided before guidance can begin. .

autonomous_traveler_guidance_data

This data flow is used within the Provide Driver and Traveler Services function and contains the data for providing autonomous guidance to a traveler using a personal portable device. It consists of the following data items each of which is defined in its own DDE:

route
+ route_cost.

autonomous_traveler_guidance_data_request

This data flow is used within the Provide Driver and Traveler Services function and requests autonomous guidance for a traveler using a personal portable device. The data flow consists of the following data items each of which is defined in its own DDE:

origin
+ destination
+ desired_arrival_time
+ modes
+ preferred_routes
+ preferred_alternate_routes
+ preferred_ridesharing_options
+ preferred_route_segments
+ preferred_transit_options
+ constraint_on_acceptable_travel_time
+ constraint_on_number_of_mode_changes
+ constraint_on_number_of_transfers
+ constraint_on_eta_change
+ constraint_on_special_needs.

autonomous_vehicle_guidance_accepted

This data flow is used within the Provide Driver and Traveler Services function and contains the acceptance by the driver of the previously provided route for autonomous guidance. Acceptance must be provided before guidance can begin. .

autonomous_vehicle_guidance_data

This data flow is used within the Provide Driver and Traveler Services function and contains the data for providing autonomous guidance to a driver in a vehicle. It consists of the following data items each of which is defined in its own DDE:

route
+ route_cost.

autonomous_vehicle_guidance_data_request

This data flow is used within the Provide Driver and Traveler Services function and requests on-line dynamic or autonomous guidance for the vehicle in which the driver is traveling.

origin
+ destination
+ desired_arrival_time
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ constraint_on_acceptable_travel_time
+ constraint_on_eta_change
+ constraint_on_special_needs
+ constraint_on_load_classification
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type.

background_strategy

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. This data comprises information about the traffic control strategies to be used if no overrides are in effect, i.e. there are no incidents, emergency vehicle routes, and no changes due to demand management or traffic system operator activity. Any of these may cause a special control strategy to be introduced and supersede the background strategy. The background strategy is specified for different times of the day, days of the week, and days of the year. Those for which a day of the year is specified will take preference over those for which a day of the week is specified, which in turn will take preference over those for which no date or day is specified. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{strategy_start_time
+ strategy_end_time
+ strategy_day
+ strategy_date
+ selected_strategy_type
+ selected_strategy_data}.

bad_charge_payment_list

This store is used within the Provide Electronic Payment Services function. It contains a list of credit identities that have been provided by the financial institution because they have been involved in one or more bad (failed) parking lot charge payment transactions.

list_size
+ list_size{credit_identity}.

bad_fare_payment_list

This store is used within the Provide Electronic Payment Services function. It contains a list of credit identities that have been provided by the financial institution because they have been involved in one or more bad (failed) transit fare payment transactions.

list_size
+ list_size{credit_identity}.

bad_tag_list_request

This data flow is sent from the Manage Transit fare billing on vehicle facility to the Provide Electronic Payment Services function. It requests that a new copy of the list of bad transit tags be provided for use in fare transitaction processing on-board a transit vehicle. The data flow consists of the following data item which is defined in its own DDE:

transit_vehicle_identity.

bad_tag_list_update

This data flow is sent from the Provide Electronic Payment Services function to the Manage transit function. It contains a list of current transit userr tags that have been found to be bad. This means that a afre payment transaction in which they were involved has failed, or the tag has been invalidated by the financial institution to which it belongs. The data flow consists of the following data items each of which is defined in its own DDE:

transit_vehicle_identity
+ list_size
+ list_size{credit_identity}.

bad_toll_payment_list

This store is used within the Provide Electronic Payment Services function and

contains a list of credit identities that have been provided by the financial institution because they have been involved in one or more bad (failed) toll transactions. The store consists of the following data items each of which is defined in its own DDE. Note that the carrier data will be set to zero (0) for credit identities that do not relate to commercial vehicle operations.

list_size
+ list_size{credit_identity + cv_carrier_number}.

bad_transit_tag_data

This data store is used within the Manage Transit function in the processing of transit fare payments on-baord a transit vehicle. It contains details of bad transit user tags that have been detected as a result of fare processing as transit users have been using the transit network. The data is provided by processes in the Provide Electronic Payment Services function on request from the transit vehicle. The data store consists of the following items each of which is defined in its own DDE:

list_size
+ list_size{credit_identity}.

bad_transit_tag_store_check_request

This data flow is used within the Manage Transit function. It contains details of transit user tag that must be checked against the list of bad tags. The data flow consists of the following item which is defined in its own DDE:

credit_identity.

bad_transit_tag_store_data

This data flow is used within the Manage Transit function. It contains a response to a request for a match of a transit user's tag data with the list of bad tags. No match is indicated by a zero (0) value, and means that the tag is good. A non-zero value will be the credit identity of the tag that has been found to be bad. The data flow consists of the following data item which is defined in its own DDE:

credit_identity.

bad_transit_tag_store_updates

This data flow is used within the Manage Transit function. It contains details of bad transit user tags that have been detected as a result of fare processing as transit users have been using the transit network. The data is provided by processes in the Provide Electronic Payment Services function on request from the transit vehicle and is used to update a data store. It consists of the following items each of which is defined in its own DDE:

list_size
+ list_size{credit_identity}.

billing_for_charges_needed

This data flow is used within the Provide Electronic Payment Services function to indicate that billing for a parking lot charge is required if its contents are set to a non-zero value. An advanced parking lot charge payment request is indicated by a non-zero value in the advanced charges billing needed data item. The data flow contains the following data items each of which is defined in its own DDE:

advanced_charges_billing_needed
+ parking_lot_tag_data
+ parking_lot_cost
+ vehicle_identity.

billing_for_fares_needed

This data flow is used within the Provide Electronic Payment Services function to indicate that billing for a transit fare is required. This will be true if the transit

fare data it contains is set to a non-zero value. An advanced toll payment request is indicated by a non-zero value in the advanced toll billing needed data item. The data flow consists of the following data items each of which is defined in its own DDE:

advanced_fare_billing_needed
+ credit_identity
+ stored_credit
+ transit_fare
+ transit_route_number
+ transit_route_segment_number
+ transit_route_use_time
+ transit_user_category
+ traveler_identity.

billing_for_tolls_needed

This data flow is used within the Provide Electronic Payment Services function to indicate that billing for a toll is required if its contents are set to a non-zero values. An advanced toll payment request is indicated by a non-zero value in the advanced toll billing needed data item. The data flow contains the following data items each of which is defined in its own DDE:

advanced_toll_billing_needed
+ cv_carrier_number
+ cv_vehicle_number
+ toll_cost
+ toll_route_segments
+ toll_tag_data
+ vehicle_identity.

border_crossing_request

This request contains necessary enrollment information for commercial vehicle international border crossings.

This flow will typically provide information about the carrier or freight forwarder, the vehicle, the driver and
the current trip including a cargo declaration. .

brake_commands

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains data showing any changes required to the current brake setting in order to increase or decrease the headway between the vehicle and the one it is following. A value of (999) means fully apply the brakes. .

broadcast_data

This data flow is used within the Provide Driver and Traveler Services function to provide traffic and travel advisory data via a wide area broadcast message to drivers and travelers in vehicles. It consists of the following data items each of which is defined in its own DDE:

traffic_data_for_broadcast
+ predicted_incidents_for_broadcast
+ prediction_data_for_broadcast
+ transit_services_for_broadcast
+ transit_running_data_for_broadcast.

broadcast_parameters_data

This data store is used within the Provide Driver and Traveler Services function to hold parameters used to filter traffic and transit data for the wide area broadcast of traffic and transit data. These parameters can be viewed ISP Operator and updated if required. .

broadcast_parameters_data_output

This data flow is used within the Provide Driver and Traveler Services function and

contains the contents of the store of parameters used to filter traffic and transit information for wide area broadcasting. The data is being sent to a process for output to the ISP operator. The data flow consists of the following data item which is defined in its own DDE:

broadcast_parameters_data.

broadcast_parameters_data_update

This data flow is used within the Provide Driver and Traveler Services function and contains the contents of the store of parameters used to filter traffic and transit information for wide area broadcasting. The data is being sent to a process for loading into its store, following input by the ISP operator. The data flow consists of the following data item which is defined in its own DDE:

broadcast_parameters_data.

cargo_data_request

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains a request for data about a vehicle's cargo including any damage report to be sent back in reply. .

carrier_identity

This data flow is used within the Manage Commercial Vehicles function. It contains the identity of the carrier to whom the commercial vehicle belongs (40 characters). Where the vehicle is operated by the driver, it will be the same as the driver's identity. .

cf_driver_instructions

This data store is used within the Manage Commercial Vehicle function. It stores details of driver routes and the cargo that is to be picked up and dropped off at the origin, destination, and any intermediate points. The store consists of the following data items each of which is defined in its own DDE:

cv_driver_number
+ cf_driver_load_details
+ cf_driver_route.

cf_driver_instructions_request

This data flow is used within the Manage Commercial Vehicles function and contains a request from the commercial vehicle manager for output of the driver route instructions for a particular route and driver combination. It consists of the following data items each of which is defined in its own DDE:

cv_driver_number
+ cv_route_number.

cf_driver_load_data

This data flow is used within the Manage Commercial Vehicles function and contains the cargo to be dropped off and/or picked up on a particular route by a particular driver. It consists of the following data items each of which is defined in its own DDE:

cf_driver_load_details
+ cv_driver_number
+ cv_route_number.

cf_driver_load_details

This data flow is used within the Manage Commercial Vehicle function and contains details of the cargo to be picked up and/or dropped off along a commercial vehicle route with which this data is associated. The information about the cargo is for use by the commercial vehicle driver and is provided through input from the Commercial Fleet Manager. .

cf_driver_route

This data flow is used within the Manage Commercial Vehicle function and contains

details of the route to be followed by a commercial vehicle driver. The route has been prepared by processes within the function as a result of input from the Commercial Vehicle Manager. The data flow consists of the following data items each of which is defined in its own DDE:

cv_route_number
+ cv_route_data.

cf_driver_route_instructions

This data flow is used within the Manage Commercial Vehicles function and contains the driver route and loading instructions related to a particular route and driver for output to the commercial vehicle driver. It consists of the following data items each of which is defined in its own DDE:

cf_driver_route
+ cf_driver_load_details.

cf_driver_route_instructions_output

This data flow is used within the Manage Commercial Vehicles function and contains the current contents of the store of driver route and loading instructions for output to the commercial vehicle manager. It consists of the following data items each of which is defined in its own DDE:

cv_driver_number
+ cf_driver_load_details
+ cv_route_number
+ route.

cf_driver_route_instructions_request

This data flow is used within the Manage Commercial Vehicles function and contains a request from the commercial vehicle driver for output of the driver route instructions. It consists of the following data items each of which is defined in its own DDE:

cv_driver_number
+ cv_route_number.

cf_enrollment_information

This data flow is used within the Manage Commercial Vehicles function and contains the data for enrollment on a particular route produced from data supplied by the commercial fleet manager. It contains the following data items each of which is defined in its own DDE:

cv_route_number
+ cv_taxes_and_duties
+ route
+ route_type
+ cv_border_enrollments.

cf_enrollment_payment_confirmation

This data flow is used within the Manage Commercial Vehicles function to confirm that a payment of the taxes and duties for the enrollment of a particular commercial vehicle cargo, weight and type on a particular route from the commercial fleet manager has been accepted. It consists of the following data items each of which is defined in its own DDE:

cv_route_number
+ cv_account_number
+ cv_amount_billed.

cf_enrollment_payment_request

This data flow is used within the Manage Commercial Vehicles function to request payment for the enrollment of a particular commercial vehicle cargo, weight and type on

a particular route by the commercial fleet manager. The number of sets of taxes and duties has been set at fourteen (14) for the definition, but has been set to one and a half (1.5) for the size expression as this is a more typical value. The data flow consists of the following items each of which is defined in its own DDE:

cf_manager_credit_identity
+ cv_account_number
+ cv_route_number
+ 1{cv_taxes_and_duties}14.

cf_enrollment_request

This data flow is used within the Manage Commercial Vehicles function and contains the data needed to obtain enrollment information for a particular commercial vehicle cargo, type and weight on a particular route as provided by the commercial fleet manager. It consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_route_data
+ cv_route_number
+ cv_trip_classification_data
+ cv_trip_identity
+ route_type
+ border_crossing_request.

cf_hazmat_request

This data flow is sent from the Manage Emergency Services function to the Manage Commercial Vehicles function and contains a request for information about hazardous materials that are being or about to be carried by commercial vehicles. .

cf_hazmat_route_information

This data flow is sent from the Manage Commercial Vehicles function to the Manage Emergency Services function and contains information about the route about to be used or planned for a commercial vehicle that will carry hazardous materials. This information may cause the Emergency Services to raise an incident for all or part of the vehicle's route. The data flow consists of the following data items each of which is define in its own DDE:

cv_route_number
+ route.

cf_hazmat_vehicle_information

This data flow is sent from the Manage Commercial Vehicles function to the Manage Emergency Services function and contains information about hazardous materials that are on-board the vehicle and details of the vehicle itself. The data flow consists of the following data items each of which is defined in its own DDE:

hazmat_load_data
+ hazmat_vehicle_data.

cf_manager_activity_report

This data flow is used within the Manage Commercial Vehicle Fleet function. It contains a commercial vehicle activity report that has been previously requested by the commercial vehicle manager. The data flow consists of the following data item which is defined in its own DDE:

cf_retained_activity_report_data.

cf_manager_activity_report_request

This data flow is used within the Manage Commercial Vehicle Fleet function. It contains a request for the output of a commercial vehicle activity report from the store of retained data. This report will be for a particular combination of carrier,

driver and vehicle, and for all (or a particular) set of commercial vehicle roadside checkstation facilities. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_roadside_activity_report_frequency
+ list_size
+ list_size{cv_roadside_facility_identity}.

cf_manager_credit_identity

This data flow is sent from the Provide Electronic Payments Services function to the Manage Commercial Vehicles function and contains the credit identity or the amount of stored credit currently stored on the payment instrument being used by a commercial vehicle manager. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit.

cf_manager_enrollment_cost

This data flow is sent from the Manage Commercial Vehicles function to the Provide Electronic Payment Services function. It contains the cost of the electronic credential filing and taxes, payment of which was previously requested by the commercial vehicle manager, and is only sent when the cost is to be deducted from the credit stored on the payment instrument being used by the driver. The data flow consists of the following data items each of which is defined in its own DDE:

cv_amount_billed
+ stored_credit.

cf_manager_enrollment_information

This data flow is used within the Manage Commercial Vehicles function and contains data about the taxes and duties required for a commercial vehicle to be enrolled for a particular route as provided by the commercial vehicle manager. It consists of the following data items each of which is defined in its own DDE:

cv_route_number
+ cv_taxes_and_duties.

cf_manager_enrollment_payment_confirmation

This data flow is used within the Manage Commercial Vehicles function and contains the confirmation that the payment for the enrollment of a particular commercial vehicle cargo, weight and type on a particular route has been made. It consists of the following data items each of which is defined in its own DDE:

cf_manager_credit_identity
+ confirmation_flag
+ cv_route_number
+ cv_account_number
+ cv_amount_billed.

cf_manager_enrollment_payment_request

This data flow is used within the Manage Commercial Vehicles function and contains data required to enable payment for enrollment of a commercial vehicle for the use of a particular route as provided by the commercial vehicle manager. It consists of the following data items each of which is defined in its own DDE:

cf_manager_credit_identity
+ cv_route_number.

cf_manager_enrollment_request

This data flow is used within the Manage Commercial Vehicles function. It contains

data required for the enrollment of a commercial vehicle on a particular route as provided by a commercial vehicle manager. The data flow consists of the following data items each of which is defined in its own DDE:

cv_cargo_class
+ cv_route_number
+ cv_trip_identity
+ cv_vehicle_class
+ cv_weight_class.

cf_manager_route_data

This data flow is used within the Manage Commercial Vehicle function and contains data about a vehicle route requested by a commercial vehicle manager. It consists of the following data items each of which is defined in its own DDE:

cv_route_data
+ route_type
+ cv_route_number.

cf_manager_route_request

This data flow is used within the Manage Commercial Vehicles function by the commercial vehicle manager to request a commercial vehicle route. It consists of the following data items each of which is defined in its own DDE:

origin
+ destination
+ departure_time
+ desired_arrival_time
+ modes
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ preferred_weather_conditions
+ constraint_on_acceptable_travel_time
+ constraint_on_load_classification
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type
+ route_type.

cf_manager_storage_request

This data flow is used within the Manage Commercial Vehicles function to manage the store of routes used by the commercial vehicle manager. It consists of the following data items each of which is defined in its own DDE:

cv_storage_action_flag
+ cv_route_number.

cf_on_board_vehicle_data

This data flow is used within the Manage Commercial Vehicle function and contains data collected on-board a commercial vehicle output of which has been requested by the commercial vehicle manager. It consists of the following data items each of which is defined in its own DDE:

cv_on_board_data
+ cv_general_output_message
+ vehicle_location_for_cv.

cf_periodic_activity_report

This data flow is used within the Manage Commercial Vehicles function. It consists of the data from the commercial vehicle roadside checkstation facility logs from which a

report on activities will be issued. This data flow will have been produced as a result of a request from a commercial vehicle manager for periodic reports. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_roadside_facility_identity
+ cv_roadside_periodic_activity_data}.

cf_reports

This flow consists of reports of roadside fleet activity and safety compliance, generated by commercial vehicle administration for commercial fleet managers. It consists of the following data flows, each of which is defined in its own DDE.

cf_roadside_activity_report
+ cf_periodic_activity_report.

cf_request_activity_report

This data flow is used within the Manage Commercial Vehicles function and contains a request from the commercial vehicle manager for one of two types of activity report to be provided. This may be either a specific one time report of clearance safety activity at roadside facilities, or a request that periodic summary reports to be sent on a regular basis. The reports will only relate to the carrier, driver, vehicle combination specified in the request, although it will be possible for all the vehicles and drivers related to a specific carrier to be requested. The data flow contains the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_roadside_activity_report_frequency
+ date
+ list_size
+ list_size{cv_roadside_facility_identity}.

cf_request_on_board_vehicle_data

This data flow is used within the Manage Commercial Vehicles function. It contains a request from the commercial vehicle manager for the commercial vehicle to output the on-board data it has collected, plus any general message data from the driver. The data flow consists of the following data items each of which is defined in its own DDE:

cv_on_board_data_required
+ cv_general_input_message.

cf_request_vehicle_data

This data flow is used within the Manage Commercial Vehicles function. It contains a request for output of the data that has been collected from on-board a commercial vehicle for output to the commercial vehicle manager. .

cf_retained_activity_report_data

This data flow is used within the Manage Commercial Vehicles function. It contains reports from the commercial vehicle roadside checkstation and border crossing facilities about the activities of vehicles in the fleet.

list_size
+ list_size{cv_roadside_facility_identity
+ cv_retained_roadside_activity_data}.

cf_retained_data

This data store is used within the Manage Commercial Vehicle Fleet function. It contains details of the tag data used by vehicles in the fleet, and reports from the commercial vehicle roadside checkstation facilities about their activities. The data store consists of the following data items each of which is defined in its own DDE:

cf_retained_activity_report_data
+ cf_retained_tag_initialization_data.

cf_retained_tag_initialization_data

This data flow is used within the Manage Commercial Vehicles function. It contains details of the tag data used by vehicles in the fleet and is for use in future manager activities such as enrollment. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cf_tag_initialization_data}.

cf_retrieved_vehicle_data

This data store is used within the Manage Commercial Vehicles function. It contains the data that has been collected from on-board a commercial vehicle and is available for subsequent output to the commercial vehicle manager. The data consists of the following data items each of which is defined in its own DDE:

cv_on_board_data
+ cv_general_input_message
+ vehicle_identity
+ vehicle_location_for_cv.

cf_roadside_activity_report

This data flow is used within the Manage Commercial Vehicles function. It contains data from the commercial vehicle roadside checkstation facility logs from which a report on activities will be issued. This data flow will have been produced as a result of a specific request from a commercial vehicle manager and consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_roadside_facility_identity
    + cv_roadside_single_activity_data}.

cf_route

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Commercial Vehicles function . It contains details of a dynamic route provided for a commercial vehicle the request for which originated with the commercial vehicle fleet manager. The data flow consists of the following data items each of which is defined in its own DDE:

cv_route_data
+ cv_route_number.

cf_route_details

This data store is used within the Manage Commercial Vehicle function to hold data about commercial vehicle routes used by the commercial fleet manager. It consists of the following data items each of which is stored in its own DDE:

cv_route_number
+ cv_taxes_and_duties
+ route
+ route_type.

cf_route_request

This data flow is sent from the Manage Commercial Vehicles function to the Provide Driver and Traveler Services function. It is used to request the preparation of a dynamic route for a commercial vehicle and originates with the commercial vehicle fleet manager. The data flow consists of the following items each of which is defined in its own DDE:

constraint_on_acceptable_travel_time

+ constraint_on_eta_change
+ constraint_on_load_classification
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type
+ cv_route_number
+ destination
+ departure_time
+ desired_arrival_time
+ modes
+ origin
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ preferred_weather_conditions.

cf_static_route_data

This data flow is used within the Manage Commercial Vehicles function. It contains the data for a static based route provided as a result of data provided by the commercial vehicle fleet manager. .

cf_static_route_request

This data flow is used within the Manage Commercial Vehicles function. It contains the data from which a static route can be determined for a commercial vehicle and is supplied by the commercial fleet manager. It contains the following data items each of which is defined in its own DDE:

constraint_on_acceptable_travel_time
+ constraint_on_ahs_lanes
+ constraint_on_eta_change
+ constraint_on_interstate
+ constraint_on_load_classification
+ constraint_on_urban
+ constraint_on_vehicle_type
+ destination
+ departure_time
+ desired_arrival_time
+ modes
+ origin
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ preferred_weather_conditions.

cf_tag_data

This data flow is used within the Manage Commercial Vehicles function. It contains the output of the data currently being held by a commercial vehicle tag. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_trip_identity.

cf_tag_data_store_output

This data flow is used within the Manage Commercial Vehicles function. It contains the output of the data currently being held by a type two commercial vehicle tag as previously requested by the commercial vehicle manager. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_trip_identity.

cf_tag_data_store_request

This data flow is used within the Manage Commercial Vehicles function. It contains a request for the current on-board commercial vehicle tag data to be sent to the process that provides the interface with the commercial vehicle manager. This data flow is sent in response to a request by the manager for the output of the current tag data. .

cf_tag_data_store_write

This data flow is used within the Manage Commercial Vehicles function. It contains on-board commercial vehicle tag data that is loaded by the commercial vehicle manager and is used by other processes in the function. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_trip_identity
+ tag_identity.

cf_tag_initialization_data

This data flow is used within the Manage Commercial Vehicle function. It contains a request for the initialization of the specified commercial vehicle tag with its on-board data. The data flow consists of the following data items each of which is defined in its own DDE:

tag_identity
+ cv_credentials_details
+ cv_trip_identity.

cf_tax_audit_data

This data flow is used within the Manage Commercial Vehicles function. It contains tax data and audit filings not related to specific credentials application and is generated as a result of input from the commercial vehicle manager. .

cf_vehicle_data

This data flow is used within the Manage Commercial Vehicles function. It contains the data that has been collected from on-board a commercial vehicle for output to the commercial vehicle manager. The data consists of the following data items each of which is defined in its own DDE:

cv_on_board_data
+ cv_general_input_message
+ vehicle_identity
+ vehicle_location_for_cv.

charge_payment_violator_data

This data flow is used within the Provide Electronic Payment Services function and contains data about a parking lot payment transaction that was attempted but did not work. It consists of the data items shown below, each of which is defined in its own DDE. For each particular set of data some of the data items may be blank depending on the reason(s) for which the transaction did not work.

credit_identity
+ vehicle_identity
+ parking_lot_cost.

collision_data

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains information about a vehicle's state with reference to itself and any objects (other vehicles) that may be near by. The data flow consists of the following data items each of which is defined in its own DDE:

vehicle_motion_data
+ vehicle_attitude_data
+ vehicle_proximity_data.

confirm_advanced_charges_payment

This data flow is used within the Provide Electronic Payment Services function to confirm that advanced payment for parking lot charges have been made. This may have originated as a request from a traveler making pre-trip planning, as an advanced charges payment from a driver at a toll plaza or parking lot, or from a transit user in the transit network, i.e. on a transit vehicle or at a transit stop. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ parking_lot_cost
+ stored_credit
+ traveler_identity.

confirm_advanced_fares_payment

This data flow is used within the Provide Electronic Payment Services function to confirm that advanced payment for a transit fare has been made. This may have originated as a request from a traveler making pre-trip planning, or as an advanced fare payment from a driver at a toll plaza or parking lot. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ stored_credit
+ transit_fare
+ traveler_identity.

confirm_advanced_tolls_payment

This data flow is used within the Provide Electronic Payment Services function to confirm that advanced payment for a toll has been made. This may have originated as a request from a traveler making pre-trip planning, as an advanced toll payment from a driver at a toll plaza or parking lot, or from a transit user in the transit network, i.e. on a transit vehicle or at a transit stop. The data flow consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ stored_credit
+ toll_cost
+ traveler_identity.

confirm_incident_data_output

This data flow is used within the Manage Traffic function to confirm output of previously requested incident data by the Media System. .

Additional sizing assumptions:

SIZE=1;

confirm_roadside_fare_payment

This data flow is sent from the Provide Electronic Payment Services function to the Manage transit function to confirm that transaction processing of the payment of a transit fare from the roadside, i.e. a transit stop, has been completed. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ transit_roadside_fare_collection_identity.

confirm_traffic_data_output

This data flow is used within the Manage Traffic function and contains confirmation of the output of a previously requested set of traffic data by the Media System. It contains the following data item which is defined in its own DDE:

confirmation_flag.

confirm_vehicle_fare_payment

This data flow is sent from the Provide Electronic Payment Services function to the Manage transit function to confirm that transaction processing of the payment of a single transit fare (interactive operation) or of a group of fares (batch mode) from on-board the vehicle has been completed. If the transaction processing was in batch mode, the transit user's tag identity will be set to zero (0), otherwiseit will be set to the identity provided in the transaction request. The data flow consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ transit_user_vehicle_tag_identity
+ transit_vehicle_identity.

confirmation_flag

This data flow is used within various ITS functions. It is a flag which is set to one (1) to indicate the success of a request or transaction, and zero (0) to indicate failure. .

constraint_on_acceptable_travel_time

This data flow is used within the Provide Driver and Traveler Services function and contains the maximum total travel time which the traveler or driver will allow for the selected route. This is an integer value of the time in minutes and is sized at two (2) bytes to enable a route to be selected that takes several days. .

constraint_on_ahs_lanes

This data flow is used within the Provide Driver and Traveler Services function and contains a flag which if set to one (1) means that where possible use route segments that are automatic highway system (ahs) lanes. The default is set to false, i.e. do not use ahs lanes. .

constraint_on_eta_change

This data flow is used within the Provide Driver and Traveler Services function. It contains the value by which the estimated time of arrival (eta) at the destination must change for a new route to be automatically sent to the vehicle, or used for autonomous guidance with long journey and queue times being obtained from a central source. .

constraint_on_interstate

This data flow is used within the Provide Driver and Traveler Services function and contains a flag which if set to one (1) means where possible use interstate freeways except for when access is required to particular places, e.g. origin, destination, way points along a route. The default is set to true. .

constraint_on_load_classification

This data flow is used within the Provide Driver and Traveler Services function and contains a three character code that specifies the load type. This is principally aimed at hazardous material (HAZMAT) type loads that may require special routing restrictions. The load type is specified using a three character code, the most hazardous type being used if more than one is being carried on a single vehicle. .

constraint_on_number_of_mode_changes

This data flow is used within the Provide Driver and Traveler Services function and contains the maximum number of changes between different modes of transport which the traveler or driver wishes to see used in the planned trip (1 byte) .

constraint_on_number_of_transfers

This data flow is used within the Provide Driver and Traveler Services function and contains the maximum number of mode changes that a traveler or driver will allow when a multimodal route is being specified. .

constraint_on_special_needs

This data flow is used within the Provide Driver and Traveler Services function and contains a three character code that covers physical and/or mental disabilities which may affect the choice of mode, route, etc., e.g. blind and will be accompanied, blind with a guide dog, deaf, dumb, uses crutches, wheelchair bound, etc. .

constraint_on_urban

This data flow is used within the Provide Driver and Traveler Services function and contains a flag which if set to one (1) means avoid all urban roads except for when they are needed for access. The default is set to true. .

constraint_on_vehicle_type

This data flow is used within the Provide Driver and Traveler Services function and contains a three character code that specifies that the route must be suitable for a particular type or types of vehicle. If left blank then routes suitable for all types of vehicle will be chosen so that for example, routes prohibiting commercial vehicles will be avoided. When vehicle types are specified, then the route will be suitable for that type and will if possible use segments from which other types are prohibited. The type is specified using a three (3) character code and the data flow has been sized to enable up to six different types to be specified. .

constraints

This data flow is used within the Provide Driver and Traveler Services function and is also sent to that function by the Provide Vehicle Monitoring and Control function as part of the data to enable a route involving automatic highway system (ahs) lanes to be selected. It contains the constraints being placed on the choice of route and which will override any preferences that are also specified. Unless a default value is specifically defined, a value giving the least severe requirement will be used. Some parameters will have to be supplied by the traveler or driver (or provided by a process as a default value) before the route selection process can proceed. The data flow consists of the following items each of which is defined in its own DDE:

constraint_on_acceptable_travel_time
+ constraint_on_number_of_mode_changes
+ constraint_on_number_of_transfers
+ constraint_on_eta_change
+ constraint_on_special_needs
+ constraint_on_load_classification
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type.

control_parameters

This data flow is used within the Manage Traffic function to pass data between the Provide Traffic Surveillance and Provide Device Control facilities. It consists of the following data items each of which is defined in its own DDE:

existing_sensor_static_data
+ local_sensor_data
+ other_TMC_cv_incidents
+ other_TMC_emergency_data
+ other_TMC_strategy_data
+ parking_lot_input_data
+ prediction_data
+ ramp_data
+ strategy_data
+ traffic_data_for_signage
+ vehicle_smart_probe_data_indication.

control_status

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains details of the vehicle's current control status, which may be manual (0), automatic control, platoon following (4), failed to take control (5), sensor failure (6), manual input detected (7), Built In Self Test (BIST) failure (8), driver and/or vehicle unsafe (9), inputs disabled (10), or input unknown (11). The second one (automatic control) may itself be split up into various forms, e.g. automatic control

may be speed control (1), headway control (2), lane control (3), or any combination of these. .

coordination_data_freeways_to_roads

This data flow is used within the Manage Traffic function and contains data that can be used to coordinate the traffic management strategy on road (surface street) network with that being implemented on freeway network served by the function. The data it contains will only apply to those indicators located on the freeway network whose operation has an impact on the road network, e.g. those that are immediately upstream of freeway exit ramps. The data flow consists of the following data items each of which is defined in its own DDE:

coordination_rule_highway_data_number
+ coordination_rule_highway_data_description
+ coordination_rule_data_for_highways.

coordination_data_ramps_to_roads

This data flow is used within the Manage Traffic function and contains data that can be used to coordinate the traffic management strategy on road (surface street) network with that being implemented on freeway entry ramps served by the function. The data it contains will show the current state of the ramps and will enable the road management process to react accordingly. The data flow consists of the following data items each of which is defined in its own DDE:

ramp_signal_state.

coordination_data_roads_to_freeways

This data flow is used within the Manage Traffic function and contains data that can be used to coordinate the traffic management strategy on freeway network with that being implemented on the road (surface streets) network served by the function. The data it contains will only apply to those indicators located on the roads whose operation has an impact on the freeway network, e.g. those that are control roads which give access to freeway entry ramps. The data flow consists of the following data items each of which is defined in its own DDE:

coordination_rule_road_data_number
+ coordination_rule_road_data_description
+ coordination_rule_data_for_roads.

coordination_data_roads_to_ramps

This data flow is used within the Manage Traffic function and contains data that can be used to coordinate the traffic management strategy on freeway entrance ramps with that being implemented on the road (surface streets) network served by the function. The data it contains will provide information about traffic conditions on links that feed traffic to the ramps entry ramps. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_identity
    + link_journey_time
    + link_queue_time}.

coordination_rule_data_for_highways

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises data that defines the action to be taken by the road system when a particular highway sign plan is used on the highway network. The action is expressed as a series of up to four (4) adaptive and fixed time plan numbers which are to be implemented. The data flow consists of the following data items each of which is defined in its own DDE:

highway_sign_plan_number
+ 1{indicator_road_adaptive_plan_number

+ indicator_road_fixed_plan_number}4.

coordination_rule_data_for_roads

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises data that defines the action to be taken by the highway system when a particular adaptive or fixed time plan is used on the road network. The action is expressed as a series of up to eight (8) highway sign plan numbers which are to be implemented. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_road_adaptive_plan_number
+ indicator_road_fixed_plan_number
+ 1{highway_sign_plan_number}8.

coordination_rule_highway_data_description

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises a description of the coordination rule defining a particular set of data used to coordinate the actions of the road system with those of the highway system. It is sized at twenty (20) bytes to enable a meaningful description to be supported for each set of rules. .

coordination_rule_highway_data_number

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises the coordination rule number that identifies a particular set of data used to coordinate the actions of the road system with those of the highway system. It is sized at three (3) bytes to enable a three alphanumeric character code to be used to identify each set of rules. .

coordination_rule_road_data_description

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises a description of the coordination rule defining a particular set of data used to coordinate the actions of the highway system with those of the road system. It is sized at twenty (20) bytes to enable a meaningful description to be supported for each set of rules. .

coordination_rule_road_data_number

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises the coordination rule number that identifies a particular set of data used to coordinate the actions of the highway system with those of the road system. It is sized at three (3) bytes to enable a three alphanumeric character code to be used to identify each set of rules. .

coordination_rules_for_highways

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises data that defines the rules for the coordination of the highway and road control strategies. These rules will set out what action the road system is expected to take because a particular strategy has been implemented on the highway network. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{coordination_rule_data_for_highways
    + coordination_rule_highway_data_number
    + coordination_rule_highway_data_description}.

coordination_rules_for_roads

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises data that defines the rules for the coordination of the road and highway control strategies. These rules will set out what action the highway system is expected to take because a particular strategy has been implemented on the road network. The data flow consists of the following data items each of which is defined in its own DDE:

list_size

+ list_size{coordination_rule_data_for_roads
+ coordination_rule_road_data_number
+ coordination_rule_road_data_description}.

cost

This data flow is used by several functions within ITS and contains the cost of a service. This may something provided by a yellow pages service provider, the cost of a display map or navigable map database update, the cost of a transit fare, a paratransit service etc. The cost is shown in cents (US) and is sized as a two (2) byte number. .

credit_identity

This data flow is principally used within the Provide Electronic Payment Services function, although it also appears in the Manage Commercial Vehicles, Manage Transit and Provide Driver and Traveler Services functions. It contains the identity number of a credit card (13 digits) which is to be used to secure preclearance from paying dues, taxes, and other commercial vehicles charges, or by a traveler or driver for payment of current or advanced tolls, fares, parking lot charges, or for yellow pages services. The value is obtained from the relevant credit identity data flow provided from the payment instrument terminator and consists of the credit identity (using the standard 16 character credit card identity field) plus the expiration data (4 characters). .

crossing_adaptive_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about adaptive control data used by indicators that are multimodal crossing controllers to enable them to control traffic. The format of the data will depend upon the type of adaptive control being used but should be no more than fifty (30) bytes per controller. .

crossing_close_duration

This data flow is used within the Manage Traffic function. It contains the time duration for which a Multimodal Crossing must close to vehicular (roads and highway) traffic to permit the passage of the alternate flow, e.g. railroad, river traffic, aircraft, etc. and is used to influence the control of signalized traffic intersections provided by the Provide Device Control facility. .

crossing_close_time

This data flow is used within the Manage Traffic function. It contains the time period before a Multimodal Crossing must close to vehicular (road and highway) traffic to permit the passage of the alternate flow, e.g. railroad, river traffic, aircraft, etc. and is used to influence the control of signalized traffic intersections provided by the Provide Device Control facility. .

crossing_control_commands

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the actual control commands that make the multimodal crossing controller change the traffic stop/go outputs shown by its phases to traffic. The actual format of the control commands will depend on national standards being developed for controller fixed time plans, e.g. NTCIP. However the data flow has been sized at 20 bytes to enable it to handle all projected type of controller and control commands formats. .

crossing_cycle_time

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the time taken to complete all the control commands in an multimodal crossing fixed time plan once only. It is sized at two (2) bytes to give a maximum value of 32767 seconds. .

crossing_data_for_highways

This data flow is used within the Manage Traffic function. It contains data received from a multimodal crossings on highways about when they are going to close and for how long. The data flow consists of the following data items each of which is defined in its own DDE:

crossing_list
+ 1{crossing_close_time
  + crossing_close_duration}list_size.

crossing_data_for_roads

This data flow is used within the Manage Traffic function. It contains data received from a multimodal crossings on roads about when they are going to close and for how long the closure will last. The data flow consists of the following data items each of which is defined in its own DDE:

crossing_list
+ 1{crossing_close_time
  + crossing_close_duration}list_size.

crossing_equipment_data_for_highways

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides information about each multimodal crossing so that closure of the crossing to highway traffic can be properly implemented when needed. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{crossing_identity
    + crossing_phase_data}.

crossing_equipment_data_for_roads

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides information about each multimodal crossing so that closure of the crossing to road traffic can be properly implemented when needed. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{crossing_identity
    + crossing_phase_data}.

crossing_fixed_time_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about fixed time control data used by indicators that are multimodal crossing controllers to enable them to control traffic. The data will be made up of the following items:

crossing_cycle_time
+ crossing_offset_time
+ crossing_control_commands.

crossing_identity

This data flow is used within the Manage Traffic function and contains the identity of a multimodal crossing. It consists of the following data items each of which is defined in its own DDE:

unit_number
+ location_identity.

crossing_list

This data flow is used within the Manage Traffic function and contains a list of multimodal crossings to which the accompanying data applies. It consists of the following data items each of which is defined in its own DDE:

list_size
+ 1{crossing_identity}list_size.

crossing_offset_time

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the relative start time of the cycle of multimodal crossing control commands and is set at a value that will achieve synchronization between adjacent controllers, regardless of their type. It is sized at two (2) bytes to give a maximum value of 32767 seconds. .

crossing_phase_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides information about the way in which each multimodal crossing operates, i.e. the minimum and maximum phase timings, phase change timings, etc. The data will be in integer format with the phase timings having a maximum value of 255 seconds (1 byte) and the change timings having a maximum value of 15 seconds (1/2 byte), which for a two phase crossing gives a total data size of five (5) bytes. .

current_carbon_monoxide_pollution

This data flow is used within the Manage Traffic function and contains the average level of carbon monoxide pollution as measured by sensors. These sensors may provide general coverage of the geographic area served by the function, or located at the roadside, or measure data for particular vehicle types. The unit of measurement will be in parts per million (ppm). .

current_charge_transactions

This data flow is used within the Provide Electronic Payment Services function and contains data about current parking lot charge payment transactions as they take place for recording in the log of parking lot transactions. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ date
+ parking_lot_cost
+ time
+ vehicle_identity.

current_conditions

This data flow is used within the Provide Driver and Traveler Services function and contains data from the store of tourist information. It consists of the following data items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_type
+ fws-current_weather
+ fws-predicted_weather.

current_data

This data store is used within the Manage Traffic function to hold data about the current state of traffic on the road (surface street) and freeway network served by the function. It is a sample of the traffic at a single instant in time and is updated periodically from data collected by other processes within both this and other ITS functions. The data flow contains the following data items each of which is defined in its own DDE:

current_stored_incident_data
+ current_other_routes_use
+ parking_lot_storage_data
+ processed_data
+ traffic_flow_state
+ traffic_management_storage_data
+ traffic_video_image_data
+ vehicle_smart_probe_stored_data

+ wide_area_pollution_data.

current_data_for_media

This data flow is used within the Manage Traffic function. It contains a subset of the current data stored by the function which will be used as the basis for traffic data that is sent to other functions. The data flow consists of the following data items each of which is defined in its own DDE:

current_incident_data
+ current_other_routes_use
+ parking_lot_storage_data
+ traffic_flow_state
+ vehicle_smart_probe_stored_data
+ wide_area_pollution_data.

current_fare_transactions

This data flow is used within the Provide Electronic Payment Services function and contains data about current transit fare payment transactions as they take place for recording in the log of transit fare transactions. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ date
+ time
+ transit_fare
+ traveler_identity.

current_highway_network_data

This data flow is used within the Manage Traffic function and contains data about traffic conditions on links in the highway network served by the function. This data is used for determining traffic management strategies and is also sent for storage in both the long term and current data stores. It consists of the following data items each of which is defined in its own DDE:

link_list_for_highways
+ list_size{link_journey_time
    + link_delay}.

current_highway_network_state

This data flow is sent by the Manage Traffic function to the Provide Driver and Traveler Services function and contains data about traffic conditions on links in the road network served by the function. The data is used by the route selection and guidance processes in determining the best vehicle routes. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_identity
    + link_journey_time
    + link_delay}.

current_hydrocarbon_pollution

This data flow is used within the Manage Traffic function and contains the current level of hydrocarbon pollution as measured sensors. These sensors may provide general coverage of the geographic area served by the function, or located at the roadside, or measure data for particular vehicle types. The unit of measurement will be in parts per million (ppm). .

current_incident_data

This data flow is used within the Manage Traffic function to transfer data about current incidents from the Incident Management facility to the Provide Traffic Surveillance facility for storage. It contains the following data items each of which is defined in its own DDE:

list_size
+ list_size{current_incident_details}.

current_incident_data_for_vehicle_signage

This data flow is used within the Manage Traffic function. It contains data about current incidents for output as part of in-vehicle signage data. The data flow consists of the following data item which is defined in its own DDE:

current_incident_details.

current_incident_details

This data flow is used within the Manage Traffic function and contains the details of a current incident. It consists of the following data items each of which is defined in its own DDE:

incident_description
+ incident_duration
+ incident_location
+ incident_number
+ incident_severity
+ incident_start_time
+ incident_traffic_impact
+ incident_type.

current_incident_static_data

This data flow is sent from the Manage Traffic function to the Plan System Deployment function and contains of some or all of the current static data used for the management of incidents. It therefore contains the contents of the following data store, which is defined in its own DDE:

static_data_for_incident_management.

current_incidents

This data flow is used within the Manage Traffic function. It contains the current contents of all or part of the store of current incidents maintained by the Manage Incidents facility. It consists of the following data item which is defined in its own DDE:

current_incidents_data.

current_incidents_data

This data flow is used within the Manage Traffic function and contains data about current incidents. It consists if the following items each of which is defined in its own DDE:

incident_duration
+ incident_location
+ incident_number
+ incident_severity
+ incident_start_time
+ incident_traffic_impact
+ incident_type.

current_incidents_data_output

This data flow is used within the Manage Traffic function. It contains data about a incident which has just become current and for which a response is needed. The data flow is sent to another process in the Manage Incidents facility for that response to be generated. It consists if the following items each of which is defined in its own DDE:

incident_duration
+ incident_location
+ incident_number

+ incident_severity
+ incident_start_time
+ incident_traffic_impact
+ incident_type.

current_incidents_data_request

This data flow is used within the Manage Traffic function to request output of data on current incidents to traffic operations personnel. The output can be tailored to cover some types of incidents in some locations. The data flow consists of the following data items each of which is defined in its own DDE:

incident_location
+ incident_type.

current_incidents_data_update

This data flow is used within the Manage Traffic function and contains data about a new current incident (formerly a predicted incident) which must be added to the store of current incidents. It consists if the following items each of which is defined in its own DDE:

incident_duration
+ incident_location
+ incident_number
+ incident_severity
+ incident_start_time
+ incident_traffic_impact
+ incident_type.

current_incidents_local_data

This data flow is used within the Manage Traffic function and contains a copy of the contents of the store of current incidents. This has been requested by the same function in another traffic management center (TMC) to which it will be sent by another process. The data flow consists of the following data items each of which is defined in its own DDE:

tmc_identity
+ list_size
+ list_size{current_incidents_data}.

current_incidents_new_data

This data flow is used within the Manage Traffic function and contains data about a new current incident (formerly a possible incident) which must be added to the store of predicted incidents. It consists if the following items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_type
+ incident_severity
+ incident_traffic_impact.

current_incidents_request

This data flow is used within the Manage Traffic function. It contains a request for output of some or all of the contents of the store of current incidents data hled by the Manage Incidents facility. It consists of either of both of the following data items, each of which is defined in its own DDE:

incident_type
+ incident_oldest_time.

current_incidents_store

This data store is used within the Manage Traffic function and holds data about

incidents that are currently in progress. The data consists if the following items each of which is defined in its own DDE:

list_size
+ list_size{current_incident_details}.

current_nitrous_oxide_pollution

This data flow is used within the Manage Traffic function and contains the average level of nitrous oxide pollution as measured sensors. These sensors may provide general coverage of the geographic area served by the function, or located at the roadside, or measure data for particular vehicle types. The unit of measurement will be in parts per million (ppm). .

current_other_routes_use

This data flow is used within the Provide Driver and Traveler Services function and contains data about the non-vehicle portion(s) of routes that have been requested by travelers. These route portions will involve the use of modes such as cycling, walking, etc. The data will be stored in ascending route segment number order (i.e. from 1 to the maximum number of route segments),r and consists of the following data items each of which is defined in its own DDE:

route_segment_total_number
+ route_segment_total_number{route_segment_identity
+ time_period{route_segment_guided_travelers}
+ route_segment_journey_time}.

current_ozone_pollution

This data flow is used within the Manage Traffic function and contains the average level of ozone pollution as measured sensors. These sensors may provide general coverage of the geographic area served by the function, or located at the roadside, or measure data for particular vehicle types. The unit of measurement will be in parts per million (ppm). .

current_particulate_pollution

This data flow is used within the Manage Traffic function and contains the average level of pollution from particulates as measured sensors. These sensors may provide general coverage of the geographic area served by the function, or located at the roadside, or measure data for particular vehicle types. The unit of measurement will be in parts per million (ppm). .

current_pollution_location

This data flow is used within the Manage Traffic function and gives the location coordinates from which a set of current pollution levels have been obtained. The location may be one at which the pollution for the geographic area served by the function is measured, or one at which roadside pollution levels are measured, or one at which pollution data for particular vehicle types is measured. These pollution levels will be defined in an associated set of data flows. This data flow consists of the following data item which is defined in its own DDE:

location_identity.

current_ramp_state

This data flow is used within the Manage Traffic function to transfer the current ramp state from the Provide Device Control facility to the Provide Traffic Surveillance facility for storage. It will have two states, either open (allow traffic to flow down the ramp) or closed. .

current_road_network_data

This data flow is used within the Manage Traffic function and contains data about traffic conditions on links in the road network served by the function. This data is used for determining traffic management strategies and is also sent for storage in both the long term and current data stores. It consists of the following data items each of which is defined in its own DDE:

link_list_for_roads
+ list_size{link_journey_time
+ link_delay}.

current_road_network_state

This data flow is sent by the Manage Traffic function to the Provide Driver and Traveler Services function and contains data about traffic conditions on links in the highway network served by the function. The data is used by the route selection and guidance processes in determining the best vehicle routes. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_identity
+ link_journey_time
+ link_delay}.

current_road_network_use

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Traffic function. It contains information about how many vehicles are being guided down each route segment and the average journey time for each route segment provided by guided vehicles. The data will be stored in ascending route segment number order (i.e. from 1 to the maximum number of route segments), and consists of the following data items each of which is defined in its own DDE:

route_segment_total_number
+ route_segment_total_number{route_segment_identity
+ route_segment_use_prediction
+ route_segment_journey_time}.

current_roadside_pollution_location

This data flow is used within the Manage Traffic function and contains the location at which an associated set of current roadside atmospheric pollution values have been obtained from sensors. It consists of the following data item which is defined in its own DDE:

location_identity.

current_roadway_network_data

This data flow is used within the Manage Traffic function and contains data about traffic conditions on links in the road (surface street) and highway network served by the function. The data is used for determining traffic management strategy and is also sent for in both the long term and current data stores. It consists of the following data items each of which is defined in its own DDE:

current_highway_network_data
+ current_road_network_data.

current_roadway_network_state

This data flow is sent by the Manage Traffic function to the Provide Driver and Traveler Services function and contains data about traffic conditions on links in the road (surface street) and highway network served by the function. The data is used by the route selection and guidance processes in determining the best vehicle routes. It consists of the following data items each of which is defined in its own DDE:

current_highway_network_state
+ current_road_network_state.

current_stored_incident_data

This data flow is used within the Manage Traffic function. It contains the current and predicted incidents at a single point in time. The data flow consists of the following data items each of which is defined in its own DDE:

current_incident_data
+ predicted_incident_data.

current_sulfur_dioxide_pollution

This data flow is used within the Manage Traffic function and contains the average level of sulfur dioxide pollution as measured by sensors. These sensors may provide general coverage of the geographic area served by the function, or located at the roadside, or measure data for particular vehicle types. The unit of measurement will be in parts per million (ppm). .

current_toll_transactions

This data flow is used within the Provide Electronic Payment Services function and contains data about current toll transactions as they take place for recording in the log of toll transactions. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ cv_carrier_number
+ cv_vehicle_number
+ date
+ stored_credit
+ time
+ toll_cost
+ toll_plaza_identity
+ toll_route_segments
+ vehicle_identity.

current_traffic_static_data

This data flow is sent from the Manage Traffic function to the Plan System Deployment function and contains of some or all of the current static data consisting of signal data (timings, permitted phase changes, etc.), VMS data, which items of traffic data are used by certain processes, etc. It therefore contains the contents of the following data stores, each of which is defined in its own DDE:

static_data_for_traffic_control
+ static_data_for_sensor_processing.

current_transit_routes_use

This data flow is used within the Provide Driver and Traveler Services and Manage Traffic functions. It contains data showing the numbers of travelers using all or part of the available transit routes, either for personal guidance or as part of trip requests. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_number
    + transit_route_current_use}.

current_weather

This data flow is used within the Manage Traffic function and the Provide Driver and Traveler Services functions. It contains details of the current weather conditions, e.g. temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc. .

cv_account_number

This data flow is used within the Manage Commercial Vehicle function and contains the account number from which payment is to be made for the taxes and duties required for a commercial vehicle to use a particular route. .

cv_admin_data_for_roadside

This data flow is used within the Manage Commercial Vehicle function. It contains data that is being sent from the commercial vehicle trips and clearances administration facility to the commercial vehicle roadside checkstation facility. The data flow

consists of the following data items each of which is defined in its own DDE:

cv_border_database_update
+ cv_credentials_database_update
+ cv_credentials_information_response
+ cv_safety_database_update
+ cv_safety_information_response.

cv_amount_billed

This data flow is used within the Manage Commercial Vehicles function to show the amount (cents) billed to a particular account for the enrollment of a commercial vehicle cargo, weight and type on a particular route. If set to zero (0) the payment request failed. .

cv_archived_inspection_data

This data flow is used within the Manage Commercial Vehicles function and contains archived commercial vehicle inspection data collected at the commercial vehicle roadside checkstation facility. It consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_driver_details
+ cv_inspection_data
+ cv_inspector_safety_data_input
+ cv_not_pulled_in
+ cv_roadside_report
+ cv_safety_status_code
+ cv_vehicle_details
+ time.

cv_archived_safety_data

This data flow is used within the Manage Commercial Vehicles function. It contains information that is collected at a roadside checkstation facility as the result of the safety checking of an approaching commercial vehicle. This data is stored in the log of roadside facility data. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_safety_pull_in_output
+ cv_safety_override
+ time.

cv_border_daily_log

This data flow is used within the Manage Commercial Vehicles functio. It contains a copy of the daily log of activities that have taken place at a commercial vehicle border crossing facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_roadside_facility_identity
+ cv_border_record
+ date.

cv_border_data

This data flow is used within the Manage Commercial Vehicles function. It contains commercial vehicle identification, vehicle characteristics and lock tag data for initiating border clearance checks at a commercial vehicle roadside border crossing facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_lock_tag_data
+ cv_trip_identity

+ cv_vehicle_characteristics.

cv_border_database_update

This data flow is used within the Manage Commercial Vehicles function. It contains the list of enrolled commercial vehicle credentials maintained by the commercial vehicle administrative processes and is used to periodically update the database at the roadside border crossing facilities served by the function. The databases provide the facilities with an up to date list of which vehicles have been cleared (enrolled) to potentially pass through without stopping. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_trip_identity.

cv_border_decision

This data flow is used within the Manage Commercial Vehicle function. It contains the results of an automatic border crossing check that has been made by a process in the commercial vehicle roadside checkstation facility. This data is sent for output to the roadside inspector interface process, to give the inspector the opportunity to override the automatic decision. The data flow consists of the following data item which is defined in its own DDE:

cv_border_pull_in_output.

cv_border_enrollments

This data flow is used within the Manage Commercial Vehicles function. It contains necessary enrollment information for commercial vehicles at roadside facilities that are international border crossings. This flow will typically provide information about the carrier or freight forwarder, the vehicle, the driver and the current trip including a cargo declaration. .

cv_border_override

This data flow is used within the Manage Commercial Vehicles function. It contains the decision made by an inspector at a commercial vehicle roadside checkstation facility to override (or not) the automated pass or pull-in decision made by the process responsible for border crossing checking. The data flow contains the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_border_override_code
+ time.

cv_border_override_code

This data flow is used within the Manage Commercial Vehicles function. It contains a code which gives the results of the decision made by an inspector at a commercial vehicle roadside checkstation facility to override (or not) the automated pass or pull-in decision made by the process responsible for border crossings checking. The data flow consists of the following data item which is defined in its own DDE:

cv_operator_override.

cv_border_problem

This data flow is used within the Manage Commercial Vehicles function and contains a two byte character code used to identify the nature of a problem with a commercial vehicle's data at a border crossing. .

cv_border_pull_in_output

This data flow is used in the Manage Commercial Vehicles function and contains the output of the result of an analysis of the data from a commercial vehicle that is approaching a roadside checkstation facility, by the process responsible for commercial vehicle border crossing checking. The result is expressed in terms of a pull-in or pass decision for the vehicle. The data flow consists of the following data items, each of which is defined in its own DDE:

cv_credentials_details
+ cv_border_problem
+ time.

cv_border_record

This data flow is used within the Manage Commercial Vehicles function. It contains information that is collected at a roadside checkstation facility as the result of the border crossing checks on an approaching commercial vehicle. This data is stored in the log of roadside facility data. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_border_pull_in_output
+ cv_border_override}.

cv_cargo_class

This data flow is used within the Manage Commercial Vehicles function and contains the cargo classification (three character code) for a particular use of a commercial vehicle route. .

cv_cargo_discharged

This data flow is used within the Manage Commercial Vehicles function. It contains an identification code for cargo that was discharged from a commercial vehicle. The time, date, loaction, vehicle mileage, etc. when this activity took place are recorded in separate data flows. This data flow consists of a three byte (3) code which is used to identify the type of cargo. Examples of these codes are as follows:

NPT - news print
CLG - clothing
TFD - tinned food
DPD - dairy products, cheese, butter, etc.
FNT - furnishings.

The activity may in some cases only apply to part of the vehicle's cargo. However for every on of these discharge activities there should be a similar loading activity which is defined in a separate data flow. This data other flow also contains further examples of the codes that can be used. .

cv_cargo_loaded

This data flow is used within the Manage Commercial Vehicles function. It contains an identification code for cargo that was loaded onto a commercial vehicle. The time, date, loaction, vehicle mileage, etc. when this activity took place are recorded in separate data flows. This data flow consists of a three byte (3) code which is used to identify the type of cargo. Examples of these codes are as follows:

EWG - electrical %034white%034 goods, e.g. washing machines, freezers, etc.
SND - sand (in bulk)
SSD - sacks of sand
MBF - beaf meat (frozen)
LSB - beef livestock.

The activity may in some cases only apply to part of the vehicle's cargo. However for every on of these loading activities there should be a similar discharge activity which is defined in a separate data flow. This data other flow also contains further examples of the codes that can be used. .

cv_cargo_status

This data flow is used within the Manage Commercial Vehicles function. It contains the status of a commercial vehicle's cargo in terms of its commodity code and its HAZMAT placard. The data flow is sized at one (1) byte which gives three (3) bits for the commodity code and five (5) bits for the placard. .

cv_carrier_number

This data flow is used within the Manage Commercial Vehicle function and contains a sixteen character code that is the carrier identification number. .

Additional sizing assumptions:

SIZE=16;

cv_check_credentials_request

This data flow is used within the Manage Commercial Vehicles function and contains a request to check the commercial vehicle credentials. The check will produce credentials data stored against the carrier, driver and vehicle number and show whether or not any problem(s) is (are) flagged. The data flow consists of the following data item which is defined in its own DDE:

cv_credentials_details.

cv_check_credentials_response

This data flow is used within the Manage Commercial Vehicles function and contains the result of a previous request to check the commercial vehicle credentials. The check shows credentials data stored against the carrier, driver and vehicle number and indicates whether or not any problem(s) is (are) flagged. The data flow consists of the following data item which is defined in its own DDE:

cv_credentials_details
+ cv_credentials_status_code.

cv_commit_local_enrollment

This data flow is used within the Manage Commercial Vehicles function. It contains a request from a remote commercial vehicle administration function to update the credentials for a particular commercial vehicle at the roadside checkstation facilities (enroll the vehicle) that are served by the local function. The data flow consists of the following data items each of which is defined in its own DDE:

cv_route_details
+ cv_credentials_details
+ cv_trip_classification_data
+ cv_trip_identity.

cv_commit_remote_enrollment

This data flow is used within the Manage Commercial Vehicles function. It contains a request to update the credentials for a particular commercial vehicle at the roadside checkstation and border crossing facilities along its route (enroll the vehicle) that are not served by the local commercial vehicle administration function. The data flow consists of the following data items each of which is defined in its own DDE:

cv_route_details
+ cv_credentials_details
+ cv_trip_classification_data
+ cv_trip_identity.

cv_confirmed_enrollment

This data flow is used within the Manage Commercial Vehicles function and contains confirmation that a previous request for enrollment payment has been accepted by the financial institution. It consists of the following data items each of which is defined is its own DDE:

cv_account_number
+ cv_payment_confirmed.

cv_credentials

This data flow is used within the Manage Commercial Vehicles function and contains details about a commercial vehicle, e.g. make, model, type, special features, etc. (32 characters). It is set up at manufacture when the on-board vehicle system is installed and cannot be changed by the driver. .

cv_credentials_data_output

This data flow is used within the Manage Commercial Vehicles function and contains the data produced by a previous request by a commercial vehicle inspector for the output of the credentials for a particular commercial vehicle.. The data to be output will have been specified by the inspector in terms of a carrier, driver and/or vehicle number. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_credentials_status_code
+ cv_credentials_information.

cv_credentials_data_request

This data flow is used within the Manage Commercial Vehicles function and contains the request by the commercial vehicle roadside checkstation inspector for output of some credentials of a particular commercial vehicle. The data to be output is specified by the inspector in terms of a carrier, driver and/or vehicle number. The data flow consists of the following data item which is defined in its own DDE:

cv_credentials_details.

cv_credentials_database_update

This data flow is used within the Manage Commercial Vehicles function. It contains the list of enrolled commercial vehicle credentials maintained by the commercial vehicle administrative processes and is used to periodically update the credentials database at the roadside checkstation facilities served by the function. The databases provide the facilities with an up to date list of which vehicles have been cleared (enrolled) to potentially pass through without stopping. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_credentials_status_code
+ cv_trip_classification_data.

cv_credentials_details

This data flow is used within the Manage Commercial Vehicles function and contains details about the carrier, driver and vehicle numbers that are used as the key identifiers for commercial vehicles credentials data. The data flow consists of the following items each of which is defined in its own DDE:

cv_vehicle_number
+ cv_carrier_number
+ cv_driver_number.

cv_credentials_information

This data flow is used within the Manage Commercial Vehicles function and contains some commercial vehicle credentials data which has been previously requested by the commercial vehicle roadside checkstation inspector. This data will be used by the inspector for checking vehicles as they pass. The data flow consists of the following item of data which is defined in its own DDE:

information_datapage.

cv_credentials_information_request

This data flow is used within the Manage Commercial Vehicles function and contains the request for some commercial vehicle credentials data to be down loaded to the database maintained by the commercial vehicles roadside checkstation facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_credentials_request_type

+ cv_credentials_request_identity
+ cv_roadside_facility_identity.

cv_credentials_information_response

This data flow is used within the Manage Commercial Vehicles function and contains the data resulting from a request for some commercial vehicle credentials data to be down loaded to the database maintained by the commercial vehicles roadside checkstation facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_credentials_status_code.

cv_credentials_problem

This data flow is used within the Manage Commercial Vehicles function and contains a two byte character code used to identify the nature of a problem with a commercial vehicle's credentials. .

cv_credentials_request_identity

This data flow is used within the Manage Commercial Vehicles function and contains the identity number of the commercial vehicle credentials data request. This number is used as a mechanism for tracking successive data requests from the same commercial vehicle roadside checkstation facility. It is sized at two bytes to enable a unique identifying code to be used for each request. .

cv_credentials_request_type

This data flow is used within the Manage Commercial Vehicles function and contains the type of credentials for which data is being requested. The type will relate to such things as the carrier, driver or vehicle number. .

cv_credentials_status_code

This data flow is used within the Manage Commercial Vehicles function and contains the status of an associated set of commercial vehicle credentials. This status may be clear, or set to indicate that there is a problem. .

cv_critical_safety_problem

This data flow is used within the Manage Commercial Vehicles function. It contains data about potential critical safety problem(s) that have been identified from an analysis of the vehicle's on-board data. .

cv_customs_inspector_identity

This data flow is used within the Manage Commercial Vehicles function and contains the identity of the customs inspector who sealed cargo that is crossing a border. The sealing process will have resulted in this data as well as the time and date being loaded into the lock tag. This data will be checked at each border crossing point to make sure that the cargo has not been touched since in was sealed. The data flow is sized at six (6) bytes to provide a unique identification code for each inspector. .

cv_data_for_payments

This data flow is sent from the Manage Commercial Vehicles function to the Provide Electronic Payment Services function. It contains data that will be used to transact financial payments for commercial vehicles, inclduing the payment of tolls. The data flow consists of the following items each of which is defined in its own DDE:

financial_request.

cv_database

This data store is used within the Manage Commercial Vehicles function and contains a list of carriers, vehicles and driver numbers that have been enrolled, together with flags to identify any for which there are safety and tax payment problems. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_credentials_details
+ cv_trip_classification_data

+ cv_credentials_status_code
+ cv_trip_identity}.

cv_driver_credentials

This data item is used within the Manage Commercial Vehicles function and contains details of the commercial vehicle driver's licence (24 character code). .

Additional sizing assumptions:

SIZE=24;

cv_driver_credit_identity

This data flow is sent from the Provide Electronic Payments Services function to the Manage Commercial Vehicles function. It contains the credit identity of a commercial vehicle driver or the amount of stored credit obtained from the payment instrument terminator and consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit.

cv_driver_data_input

This data flow is used within the Manage Commercial Vehicle function. It contains data that has been input by a commercial vehicle driver for loading into the vehicle's log. The data flow consists of the following data items each of which is defined in its own DDE:

cv_repairs_and_service_records
+ cv_fuel_purchase_data
+ cv_driver_number
+ cv_driver_credentials
+ cv_driver_license_citations.

cv_driver_data_output

This data flow is used within the Manage Commercial Vehicle function and contains the ouput from the commercial vehicle's data store requested by the driver. .

Additional sizing assumptions:

SIZE=1024000;

cv_driver_details

This data flow is used within the Manage Commercial Vehicles function and contains details about a particular commercial vehicle driver. The driver identity is held in an associated data flow. The data flow consists of the following data items each of which is defined in its own DDE:

cv_driver_credentials
+ cv_driver_license_citations.

cv_driver_enrollment_cost

This data flow is sent from the Manage Commercial Vehicles function to the Provide Electronic Pyement Services function. It contains the cost of the electronic credential filing and taxes, payment of which was previously requested by the commercial vehicle driver acting in the role of fleet manager, and is only sent when the cost is to be deducted from the credit stored on the payement instrument being used by the driver. The data flow consists of the following data items each of which is defined in its own DDE:

cv_amount_billed
+ stored_credit.

cv_driver_enrollment_information

This data flow is used within the Manage Commercial Vehicles function and contains data about the taxes and duties required for a commercial vehicle to be enrolled for a particular route as provided by the commercial vehicle driver. It consists of the following data items each of which is defined in its own DDE:

cv_route_number
+ cv_taxes_and_duties.

cv_driver_enrollment_payment_confirmation

This data flow is usedw within the Manage Commercial Vehicles function to confirm that a payment of the taxes and duties for the enrollment of a particular commercial vehicle cargo, weight and type on a particular route from the commercial vehicle driver has been accepted. It consists of the following data items each of which is defined in its own DDE:

cv_account_number
+ cv_amount_billed
+ cv_driver_credit_identity
+ cv_route_number.

cv_driver_enrollment_payment_request

This data flow is used within the Manage Commercial Vehicles function and contains data required to enable payment for enrollment of a commercial vehicle for the use of a particular route as provided by the commercial vehicle driver. It consists of the following data items each of which is defined in its own DDE:

cv_account_number
+ cv_driver_credit_identity
+ cv_route_number.

cv_driver_enrollment_request

This data flow is used within the Manage Commercial Vehicles functiona and contains data required for the enrollment of a commercial vehicle on a particular route as provided by a commercial vehicle driver. It consists of the following data items each of which is defined in its own DDE:

cv_cargo_class
+ cv_route_number
+ cv_trip_identity
+ cv_vehicle_class
+ cv_weight_class.

cv_driver_license_citations

This data items is used within the Manage Commercial Vehicles function and contains details of any citations, etc. recorded against the driver's licence (32 characters). .

Additional sizing assumptions:

SIZE=32;

cv_driver_number

This data flow is used within the Manage Commercial Vehicle function and contains a sixteen character (16) alphanumeric code that is the commercial vehicle driver identification number. .

cv_driver_route_data

This data flow is used within the Manage Commercial Vehicle function and contains data about a vehicle route requested by a commercial vehicle driver. It consists of the following data items each of which is defined in its own DDE:

cv_route_data
+ route_type
+ cv_route_number.

cv_driver_route_request

This data flow is used within the Manage Commercial Vehicles function by the commercial vehicle driver to request a commercial vehicle route. It contains the following data items each of which is defined in its own DDE:

trip_request

+ route_type.

cv_driver_storage_request

This data flow is used within the Manage Commercial Vehicles function to manage the store of routes used by the commercial vehicle driver. It consists of the following data items each of which is defined in its own DDE:

cv_storage_action_flag
+ cv_route_number.

cv_electronic_clearance_data

This data flow is used within the Manage Commercial Vehicles and Provide Electronic Payment Services functions. It contains data that has been stored on a commercial vehicle tag to enable its identification at commercial vehicle roadside checkstation facilities for the purposes of electronic clearance, and/or safety inspection, and/or border clearance, as well as at toll plazas for toll payment collection. The data flow consists of the following data items each of which is defined in its own DDE:

cv_on_board_tag_data
+ cv_lock_tag_data.

cv_emergency_data

This data flow is sent by the Manage Commercial Vehicles function to the Manage Emergency Services function and contains information on hazardous load(s) being carried by comercial vehicles. It consists of the following two data items each of which is contained in its own DDE:

cf_hazmat_vehicle_information
+ cf_hazmat_route_information
+ cv_violation_data.

cv_enrollment_information

This data flow is used within the Manage Commercial Vehicles function and contains the data for enrollment on a particular route produced from data supplied by the commercial vehicle driver. It contains the following data items each of which is defined in its own DDE:

cv_route_number
+ cv_taxes_and_duties
+ route
+ route_type
+ cv_border_enrollments.

cv_enrollment_list

This data flow is used within the Manage Commercial Vehicles function and contains a list of taxes and duties that are to be paid from an account number to enable a comercial vehicle to be enrolled for a particular route. It consists of the following data items each of which is defined in its own DDE:

cv_account_number
+ cf_manager_credit_identity
+ cv_taxes_and_duties.

cv_enrollment_payment_confirmation

This data flow is used within the Manage Commercial Vehicles function to confirm that a payment of the taxes and duties for the enrollment of a particular commercial vehicle cargo, weight and type on a particular route from the commercial vehicle driver has been accepted. It consists of the following data items each of which is defined in its own DDE:

cv_account_number
+ cv_amount_billed

+ cv_driver_credit_identity
+ cv_route_number.

cv_enrollment_payment_request

This data flow is used within the Manage Commercial Vehicles function to request payment for the enrollment of a particular commercial vehicle cargo, weight and type on a particular route by the commercial vehicle driver acting in the role of the commercial fleet manager. The number of sets of taxes and duties has been set at fourteen (14) for the definition, but has been set to one and a half (1.5) for the size expression as this is a more typical value. The data flow consists of the following items each of which is defined in its own DDE:

cv_account_number
+ cv_driver_credit_identity
+ cv_route_number
+ 1{cv_taxes_and_duties}14.

cv_enrollment_request

This data flow is used within the Manage Commercial Vehicles function and contains the data needed to obtain enrollment information for a particular commercial vehicle cargo, type and weight on a particular route as provided by the commercial vehicle driver. It consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_route_data
+ cv_route_number
+ cv_trip_classification_data
+ cv_trip_identity
+ route_type
+ border_crossing_request.

cv_facility_log

This data store is used within the Manage Commercial Vehicles function. It contains the contents of the daily logs of activities at commercial vehicle roadside and border checkstation facilities. The data store has been sized two enable a maximum of two border crossings to be accommodated within the ITS area under study, and for the data covering one hundred (100) days to be stored. It consists of the following data items, each of which is defined in its own DDE.

list_size
+ list_size{cv_roadside_daily_log}
+ 2{cv_border_daily_log}.

cv_fuel_purchase_cost

This data flow is used within the Manage Commercial Vehicles function. It contains the cost of a quantity of fuel purchased for a commercial vehicle. The quantity of fuel purchased together with the time and date are stored in separate data flows. This data flow consists of the following data item which is defined in its own DDE:

cost.

cv_fuel_purchase_data

This data flow is used within the Manage Commercial Vehicles function. It contains details of the quantity and cost of fuel purchased for a commercial vehicle. The number of miles recorded by the vehicle, the time and the date are stored in separate data flows. This data flow consists of the following data items each of which is defined in its own DDE:

cv_fuel_purchase_cost
+ cv_fuel_purchase_quantity.

cv_fuel_purchase_quantity

This data flow is used within the Manage Commercial Vehicles function. It contains the quantity of fuel purchased for a commercial vehicle. The cost of this quantity of fuel together with the time and date are stored in separate data flows. This data flow has been sized at one (1) byte to enable quantities of up to 255 gallons (US) to be supported. .

cv_general_decision

This data flow is used to indicate that a commercial vehicle is to be pulled in regardless of whether or not it has precleared its permits and duties or has passed a safety check. It contains the following data item which is defined in its own DDE:

cv_general_pull-in.

cv_general_input_message

This data flow is used within the Manage Commercial Vehicle function and contains a string of alphanumeric data which can be set up by the commercial vehicle driver, sent from the vehicle and output directly by the commercial vehicle manager. The data is used to convey general information and may be used instead of a voice link. .

cv_general_output_message

This data flow is used within the Manage Commercial Vehicle function and contains a string of alphanumeric data which can be set up by the commercial fleet manager, sent to the vehicle and output directly by the commercial vehicle driver. The data is used to convey general information and may be used instead of a voice link. .

cv_general_override

This data flow is used within the Manage Commercial Vehicle function. It indicates that the commercial vehicle roadside facility operator has placed an override on any pull-in/pass decisions. It contains the following data items each of which is defined in its own DDE:

cv_general_pull-in.

cv_general_pull_in

This data flow is used within the Manage Commercial Vehicles function. If it is set to one (1) a commercial vehicle is to be pulled in because it cannot be identified, otherwise a zero (0) setting means the pull-in decision can be taken by other processes. .

cv_general_pull_in_output

This data flow is used wihin the Manage Commercial Vehicles function to indicate a general pull-in request for all commercial vehicles, or a pull-in request for one particular vehicle because of a problem with reading some or all of its on-board tag data. It contains the following data items, each of which is defined in its own DDE:

cv_vehicle_number
+ cv_general_pull-in.

cv_get_on_board_data

This is a request for on-board data carried by a commercial vehicle, from the roadside inspection process. This could be an electronic message, manual activation, etc. .

Additional sizing assumptions:

SIZE=1;

cv_identity_details

This data flow is used within the Manage Commercial Vehicles function and contains data on carrier, driver, and vehicle identities which is used by many processes. It consists of the following data items each of which is defined in its own DDE:

carrier_identity
+ driver_identity
+ vehicle_identity.

cv_incident_override

This data flow is used within the Manage Traffic function to transfer data about

changes in traffic control strategy to accommodate the passage of a commercial vehicle with a special load. A special load is one whihc either contains hazardous material (HAZMAT load) or has some other special characterisitcs, e.g. over size, over weight, etc. The data flow consists of the following data items each of which is defined in its own DDE:

permit_type
+ permit_route_plan
+ permit_traffic_controls.

cv_incidents_for_other_TMC

This data flow is used within the Manage Traffic function and contains data about the route for a commercial vehicle that is carrying an abnormal load where that route goes outside the road and highway network covered by the local TMC. An abnormal load is defined as being one for which some kind of movement permit is needed. It may be that it is either over dimensioned (width, height, weight, etc.) or contains hazardous material (HAZMAT). The data will be sent to the TMC('s) serving the links that are not controlled by the local TMC to enable it(them) to set up any special traffic control strategies to minimize the disruption to traffic as the load passes through the network. The data flow consists of the following data items each of which is defined in its own DDE:

permit_type
+ permit_route_plan
+ permit_traffic_controls.

cv_inspection_activities_data

This data flow is used within the Manage Commercial Vehicles function. It contains a record of the inspection activities that have been carried out on the commercial vehicle. The data flow is sized to enable thirty two (32) characters in each record of data. .

cv_inspection_data

This data flow is used within the Manage Commercial Vehicles function and contains the results of a roadside vehicle check which are to be down loaded for storage on-board the vehicle. The data may be eventually retrieved by the driver, the commercial vehicle manager, or at a subsequent roadside inspection. .

cv_inspection_data_output

This data flow is used within the Manage Commercial Vehicle function and contains the results of the commercial vehicle roadside inspection. These are down loaded for storage on-board the vehicle. .

cv_inspection_data_update

This data flow is used within the Manage Commercial Vehicle function and contains the results of an inspection either at the commercial vehicle roadside cehckstation facility or elsewhere by an inspector using a hand held terminal. This data is loaded into the vehicle's on-board store for later retrieval by the commercial fleet manager, commercial vehicle driver, or by an inspector at another commercial vehicle roadside checkstation facility. The data flow is sized at eight hundered (800) bytes to enable the inspector to provide a concise summary of the results of the inspection in ten lines of up to eighty columns each. .

cv_inspection_results

This data flow is used to indicate the results of any commercial vehicle roadside inspections. It consists of the following data items each of whichis defined in its own DDE:

vehicle_identity
+ cv_roadside_report.

cv_inspector_safety_data_input

This data flow is used within the Manage Commercial Vehicles function and contains data that is input by an inspector using a hand held terminal. This data will be associated with the roadside inspection of a commercial vehicle and may include extra

comments on things not found by the inspection process, or recommendations for remedial action, where problems have been found. .

cv_lock_tag_data

This data flow is used within the Manage Commercial Vehicles function and contains the current contents of a lock tag output in response to a previous request from a commercial vehicle roadside checkstation facility. This tag is used to control access to the cargo being carried across a border by a commercial vehicle. The data flow consists of the following data items each of which is defined in its own DDE:

cv_customs_inspector_identity
+ date
+ time.

cv_log_data

This data flow is used within the Manage Commercial Vehicles function. It contains identification data for each entry in the vehicle details section of the data archived at a roadside checkstation facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_driver_number
+ cv_log_entry_date
+ cv_log_entry_location
+ cv_log_entry_mileage
+ cv_log_entry_time.

cv_log_entry_date

This data flow is used within the Manage Commercial Vehicles function. It contains the date on which an entry was made into the store of vehicle activity. The data flow consists of the following data item which is defined in its own DDE:

date.

cv_log_entry_location

This data flow is used within the Manage Commercial Vehicles function. It contains the location of the commercial vehicle when data was loaded into the store of its activities. The data flow consists of the following data item which is defined in its own DDE:

vehicle_location_for_cv.

cv_log_entry_mileage

This data flow is used within the Manage Commercial Vehicles function. It contains the vehicle mileage at which an entry was made into the store of vehicle activity. The data flow is sized at three (3) bytes to enable mileages of several million to be used, as this is typical of many commercial vehicles. .

cv_log_entry_time

This data flow is used within the Manage Commercial Vehicles function. It contains the time at which an entry was made into the store of vehicle activity. The data flow consists of the following data item which is defined in its own DDE:

time.

cv_manual_pull_in

This data flow is to show that a manual pull-in os required. If set to one (1) it means that the commercial vehicle roadside facility operator has invoked a manual pull-in, and all commercial vehicles
are to be pulled in, otherwise zero (0) means only pull in when requested be the preclearance or safety
processes or an operator override. .

cv_not_pulled_in

This data item contains a flag which if set to one (1) shows that a potentially there will be the

need to pull in a commercial vehicle because of a problem. It is otherwise set to zero (0). .

Additional sizing assumptions:

SIZE=1;

cv_on_board_border_data

This data flow is used within the Manage Commercial Vehicles function. It contains the results of screening of a commercial vehicle's credentials at the commercial vehicle roadside border crossing facilities that it has passed by along its route. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_on_board_border_details}.

cv_on_board_border_details

This data flow is used within the Manage Commercial Vehicles function. It contains the details of the results of the screening of a commercial vehicle at a commercial vehicle roadside border crossing facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_roadside_facility_identity
+ cv_border_pull_in_output
+ cv_vehicle_weight
+ time.

cv_on_board_border_record

This data flow is used within the Manage Commercial Vehicles function. It contains the results of the of the border clearance checks at a commercial vehicle roadside border crossing facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_on_board_border_details.

cv_on_board_data

This data flow is used within the Manage Commercial Vehicles function to send on-board commercial vehicle data from the vehicle to a commercial vehicle roadside facility. It contains the following data items each of which is defined in its own DDE:

cv_identity_details
+ cv_credentials
+ cv_driver_credentials
+ cv_driver_license_citations
+ cv_repairs_and_service_records
+ cv_inspection_data
+ cv_inspection_activities_data
+ cv_fuel_purchase_data
+ cv_safety_systems_diagnostics_results
+ cv_vehicle_log
+ cv_log_data
+ cv_not_pulled_in.

cv_on_board_data_current_copy

This data flow is used within the Manage Commercial Vehicle function and contains a copy of the data currently loaded in the on-board commercial vehicle data store. It is for output to the inspector who made the request for output of the data. The data flow consists of the following data item which is defined in its own DDE:

cv_on_board_data.

cv_on_board_data_needed

This data flow is used within the Manage Commercial Vehicle function and contains a request from an inspector either at a commercial vehicle roadside checkstation facility or elsewhere using a hand held terminal for output of the data currently loaded into a

commercial vehicle's on-board data store. The data will be used as input to the safety inspection process. .

cv_on_board_data_output

This data flow is used within the Manage Commercial Vehicle function and contains a copy of the data currently loaded in the on-board commercial vehicle data store. It is for output to the commercial vehicle manager or driver who made the request for output of the data. The data flow consists of the following data item which is defined in its own DDE:

cv_on_board_data.

cv_on_board_data_required

This data flow is used within the Manage Commercial Vehicle function and contains a request from a commercial vehicle manager or driver for output of the data currently loaded into a commercial vehicle's on-board data store. The data will be sent to the requesing manager or driver when it has been retrieved. .

cv_on_board_data_update

This data flow is used within the Manage Commercial Vehicle function and contains updates to the data held in the on-board commercial vehicle data store. These updates are provided by the process that analyzes the data obtained from inputs on-board the vehicle. The data flow consists of the following data items each of which is defined in its own DDE:

cv_fuel_purchase_data
+ cv_inspection_data
+ cv_inspection_activities_data
+ cv_log_data
+ cv_repairs_and_service_records
+ cv_safety_systems_diagnostics_results
+ cv_vehicle_log.

cv_on_board_pull_in_output

This data flow is used in the Manage Commercial Vehicles function and contains the output result of the commercial vehicle safety or screening processes, in terms of a pull-in or pass decision for the vehicle, or a general pull-in pass decision for all vehicles, or a pull-in decision based on a problem with reading the vehicle's tag. It consists of the following data items, each of which is defined in its own DDE:

[cv_general_pull-in
| cv_screening_pull_in_output
| cv_safety_pull_in_output
| cv_border_pull_in_output].

cv_on_board_screening_data

This data flow is used within the Manage Commercial Vehicles function. It contains the results of screening of a commercial vehicle's credentials at the commercial vehicle roadside checkstation facilities that it has passed by along its route. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_on_board_screening_details}.

cv_on_board_screening_details

This data flow is used within the Manage Commercial Vehicles function. It contains the details of the results of the screening of a commercial vehicle's credentials at a commercial vehicle roadside checkstation facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_cargo_status
+ cv_out_of_service_status

+ cv_roadside_facility_identity
+ cv_screening_pull_in_output
+ cv_screening_override
+ cv_vehicle_axle_weight_data
+ cv_vehicle_weight
+ time.

cv_on_board_screening_record

This data flow is used within the Manage Commercial Vehicles function and contains the results of the screening of a commercial vehicle at a particular commercial vehicle roadside checking facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_on_board_screening_details.

cv_on_board_stored_data

This data store is used within the Manage Commecial Vehicles function and contains data colleted and/or stpred on-board a commercial vehicle. The data store consists of the following data items of data each of which is defined in its own DDE:

cv_credentials
+ cv_credentials_details
+ cv_driver_credentials
+ cv_driver_license_citations
+ cv_fuel_purchase_data
+ cv_identity_details
+ cv_inspection_activities_data
+ cv_inspection_data
+ cv_log_data
+ cv_not_pulled_in
+ cv_repairs_and_service_records
+ cv_safety_systems_diagnostics_results
+ cv_vehicle_log.

cv_on_board_stored_sensor_data

This data store is used within the Manage Commercial Vehicles function to store data obtained from sensors on-board the coomercial vehicle. This will be a digital version of the analog data provided to the sensors and is used by another process for data analysis. .

cv_on_board_tag_data

This data flow is used within the Manage Commercial Vehicles function. It contains on-board commercial vehicle data that is loaded into a tag. The credentials data is loaded by either the commercial fleet manager or the commercial vehicle driver. The screening data is loaded by each commercial vehicle roadside checkstation facility that the vehicle passes on its route. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_on_board_border_data
+ cv_on_board_screening_data
+ cv_trip_identity
+ tag_identity.

cv_on_board_vehicle_data

This data flow is used within the Manage Commercial Vehicle function and contains data collected on-board a commercial vehicle output of which has been requested by the commercial vehicle driver. It consists of the following data items each of which is defined in its own DDE:

cv_on_board_data

+ vehicle_location_for_cv.

cv_operational_data

This data is sent from the Manage Commercial Vehicle function to the Plan System Deployment function. It contains data about the number of commercial vehicles passing each roadside checking facility and how many are passing or failing their checks. The data is obtained from the roadside facility log, with details of vehicle identities is removed by the Manage Commercial Vehicles function before the data is sent. .

cv_operator_override

This data flow is used within the Manage Commercial Vehicles function. It contains the roadside facility operator override action. This is a one (1) byte field, which may be either 'L' for allow to pass, or 'P' for pull-in. .

cv_out_of_service_status

This data flow is used within the Manage Commercial Vehicles function. It contains the out of service status of the driver and the vehicle. The data flow is sized at one (1) byte to permit the use of four (4) bits for each of the status items. .

cv_output_on_board_vehicle_data

This data flow is used within the Manage Commercial Vehicle function and contains a request from the copmmercial vehicle driver for the data collected on-board a commercial vehicle to be output to the commercial vehicle manager. This request will only apply to data in the commercial vehicle from which the request was made, i.e. a driver cannot remotely request input of data from another vehicle. .

cv_payment_confirmed

This data flow is used within the Manage Commercial Vehicles function and contains the confirmation that payment for enrollment by the financial institution has been accepted. .

Additional sizing assumptions:

SIZE=1;

cv_payments_results_data

This data flow is sent from the Provide Electronic Payment Services function to the Manage Commercial Vehicles function. It contains data that provides the results of financial payments for commercial vehicles. The data flow consists of the following item which is defined in its own DDE:

financial_response.

cv_payments_transactions

This data flow is used within the Provide Payment Electronic Services function and contains records of all payment transactions for commercial vehicle administration, i.e. electronic credentials and tax filing. .

cv_provide_credentials_data_for_inspections

This data flow is used within the Manage Commercial Vehicles function and contains the commercial vehicle's credentials data. This data flow makes that data available for downloading to the roadside as part of the on-board vheicle safety data requested by an inspector using a hand held terminal. This data flow consists of the following data item which is defined in its own DDE:

cv_credentials_details.

cv_provide_enrollment_data

This data flow is used within the Manage Commercial Vehicles function and is a request for a remote commercial vehicle administration system (Other CVAS) to provide data needed for the enrollment of a commercial vehicle, its driver and the carrier. .

cv_received_vehicle_data

This data store is used within the Manage Commercial Vehicles function. It contains the data that has been collected from on-board a commercial vehicle and is availble for subsequent output to the commercial vehicle driver who is acting in the role of commercial vehicle fleet manager. The data will only relate to the vehicle from which the request to up-load the data was made. It consists of the following data items each of which is defined in its own DDE:

cv_on_board_data
+ cv_general_input_message.

cv_remote_enrollment_confirmation

This data flow is used within the Manage Commercial Vehicles function and provides confirmation that a commercial vehicle, its driver and carrier have been enrolled by a remote commercial vehicle administration system (Other CVAS). .

cv_remote_enrollment_request

This data flow is used within the Manage Commercial Vehicles function and contains a request for a commercial vehicle, its driver and carrier to be enrolled by a remote commercial vehicle administration system (Other CVAS). .

cv_repairs_and_service_records

This data item is used within the Manage Commercial Vehicles function and contains a record of the repair and service work carried out on a commercial vehicle. The data flow is sized at thirty two (32) bytes to enable the record to contain up to that number of characters. .

cv_request_electronic_clearance_data

This data flow is used within the Manage Commercial Vehicles function. It contains a request from a commercial vehicle roadside checkstation or border crossing facility for the output of the current contents of a commercial vehicle's tag, plus the cargo lock tag, if one is being carried by the vehicle. .

cv_request_enrollment_data

This data flow is used within the Manage Commercial Vehicles function and contains a request for data to enable a commercial vehicle, its driver and carrier to be enrolled by a remote commercial vehicle administration system (Other CVAS). .

cv_request_lock_tag_data

This data flow is used within the Manage Commercial Vehicles function and contains a request for the current contents of a lock tag issued as part of the request for electronic tag data from a commercial vehicle roadside checkstation facility. This tag is used to control access to the cargo being carried across a border by a commercial vehicle. .

cv_request_on_board_data

This data flow is used within the Manage Commercial Vehicles function by the commercial vehicle roadside processing to request on-board data from a commercial vehicle. It contains the following data items each of which is defined in its own DDE:

cv_roadside_facility_identity
+ cv_roadside_facility_address.

cv_request_on_board_vehicle_data

This data flow is used within the Manage Commercial Vehicle function and contains a request from the commercial vehicle driver for the commercial vehicle to output the on-board data it has collected, plus any general message data from the driver. This data is sent to the commercial vehicle driver who is acting in the role of commercial vehicle manager, i.e. is an owner driver. The data flow consists of the following data item which is defined in its own DDE:

cv_on_board_data_required.

cv_request_permits_and_duties_update

This data flow is used within the Manage Commercial Vehicles function. It contains a request that an updated list of taxes and credential fees be obtained from the government administrators. .

cv_request_vehicle_data

This data flow is used within the Manage Commercial Vehicles function. It contains a request for output of the data that has been collected from on-board a commercial vehicle for output to the commercial vehicle driver who is acting in the role of commercial vehicle fleet manager. .

cv_retained_roadside_activity_data

This data flow is used within the Manage Commercial Vehicles function. It contains data from the commercial vehicle roadside checkstation and border crossing facilities about the activities of vehicles in the fleet. The data flow is sized at one thousand entries to enable the storage of dat for up to one hundred (100) days with no more than ten (10) visits per day. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_roadside_activity_details}.

cv_roadside_activity_details

This data flow is used within the Manage Commercial Vehicles function. It contains activity data from the commercial vehicle roadside checkstation facility for a particular carrier, driver and vehicle combination. The data flow consists of the following data items each of which is defined in its own DDE:

cv_archived_safety_data
+ cv_archived_inspection_data
+ cv_border_record
+ cv_screening_record
+ date.

cv_roadside_activity_report_frequency

This data flow is used within the Manage Commercial Vehicles function and contains the frequency at which reports of the activities of a particular combination of carrier, driver, and vehicle at all (or some) roadside facilities are to be output to the manage commercial fleet processes. The data flow is sized at one (1) byte so that the period may be either none, or a number of days. The period may not be less than one day as the reports are generated by the roadside facilities daily. If the period is set to zero, then only one report shall be produced using the current data. .

cv_roadside_border_database

This data store is used within the Manage Commercial Vehicles function and contains the %034real-time%034 list of commercial vehicle credentials that is used by commercial vehicle roadside checkstation facility to screen passing commercial vehicles. It is updated periodically with data from a commercial vehicle administration process from its master list of credentials for enrolled vehicles.

list_size
+ list_size{cv_credentials_details
    + cv_trip_identity}.

cv_roadside_collected_data

This data store is used within the Manage Commercial Vehicles function and contains the data collected from a commercial vehicle. It consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_driver_details
+ cv_safety_status_code
+ cv_vehicle_details
+ cv_not_pulled_in.

cv_roadside_credentials_database

This data store is used within the Manage Commercial Vehicles function and contains the %034real-time%034 list of commercial vehicle credentials that is used by commercial vehicle roadside checkstation facility to screen passing commercial vehicles. It is updated periodically with data from a commercial vehicle administration process from its master list of credentials for enrolled vehicles.

list_size

+ list_size{cv_credentials_details
+ cv_credentials_status_code
+ cv_trip_classification_data}.

cv_roadside_daily_log

This data flow is used within the Manage Commercial Vehicles function. It contains a copy of the daily log of all the activities that have taken place at a commercial vehicle roadside checkstation facility. This data is analyzed to determine problem vehicles, drivers and carriers for future pull-in requests and reports to the government administrators. The data flow consists of the following data items each of which is defined in its own DDE:

cv_roadside_facility_identity
+ cv_roadside_record
+ date.

cv_roadside_data_for_admin

This data flow is used within the Manage Commercial Vehicle function. It contains data that is being sent from the commercial vehicle roadside checkstation facility to the commercial vehicle trips and clearances administration facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_information_request
+ cv_roadside_daily_log
+ cv_border_daily_log
+ cv_safety_information_request
+ cv_update_safety_problems_list.

cv_roadside_data_for_vehicle

This data flow is used within the Manage Commercial Vehicle function. It contains data that is being sent from a commercial vehicle roadside checkstation or border crossing facility to the commercial vehicle. The data flow consists of the following data items each of which is defined in its own DDE:

cv_on_board_border_record
+ cv_request_electronic_clearance_data
+ cv_on_board_screening_record.

cv_roadside_facility_address

This data item contains the address (16 digits) at which the roadside facility can be contacted, e.g. wide area network address. .

Additional sizing assumptions:

SIZE=16;

cv_roadside_facility_identity

This data item is used within the Manage Commercial Vehicles function and contains the identity of the commercial vehicle roadside checking facility. This has been sized at sixteen (16) bytes to enable a unique set of alphanumeric characters to be used, but still provide the option of grouping identities by State and/or area(s) within a State. .

cv_roadside_facility_location

This data flow is used within the Manage Commercial Vehicles functions and contains a the location of a commercial vehicle roadside checkstation facility at which a commercial vehicle is to be enrolled. It consists of the following data items each of which is defined in its own DDE:

cv_roadside_facility_identity
+ route_segment_identity.

cv_roadside_facility_locations

This data store is used within the Manage Commercial Vehicles functions and contains the commercial vehicle roadside checkstation facilities location data. It consists of

the following data item which is defined in its own DDE:

cv_roadside_facility_locations_data.

cv_roadside_facility_locations_data

This data flow is used within the Manage Commercial Vehicles functions and contains a the location of each commercial vehicle roadside checkstation facility. The location is stored as the route segment identity on which the facility is located. The data is used by the vehicle enrollment process. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_roadside_facility_identity
    + route_segment_identity}.

cv_roadside_facility_locations_update

This data flow is used within the Manage Commercial Vehicles functions and contains a new set of commercial vehicle roadside checkstation facilities location data. This data will be loaded into the store of this data for use as part of the vehicle enrollment process. The data flow consists of the following data item which is defined in its own DDE:

cv_roadside_facility_locations_data.

cv_roadside_facility_log

This data store is used within the Manage Commercial Vehicles function and contains a log of all the activities that may be taking place at an individual commercial vehicle roadside checkstation facility. It consists of the following items of data each of which is defined in its own DDE:

list_size
+ list_size{date
    + cv_archived_safety_data
    + cv_archived_inspection_data
    + cv_screening_record
    + cv_border_record
    + time}.

cv_roadside_operator_data_request

This data flow is used within the Manage Commercial Vehicles function and contains a request for output of data from the commercial vehicle roadside facility log to the commercial vehicle inspector. .

cv_roadside_operator_output

This data flow is used within the Manage Commercial Vehicles function and contains the output requested from the commercial vehicle roadside facility log by the commercial vehicle inspector. It consists of the following data item which is defined in its own DDE:

cv_roadside_facility_log.

cv_roadside_periodic_activity_data

This data flow is used within the Manage Commercial Vehicles function. It contains activity data from the commercial vehicle roadside checkstation facility for a particular carrier, driver and vehicle combination. It is sized to enable the activities (up to ten (10) visits) for up to ten (10) days to be provided and will form part of the periodic report. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_roadside_activity_details}.

cv_roadside_record

This data flow is used within the Manage Commercial Vehicles function. It contains a copy of the details of the activities that have been logged at a commercial vehicle roadside checkstation facility. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_archived_safety_data
+ cv_archived_inspection_data
+ cv_screening_record}.

cv_roadside_report

This data flow is used within the Manage Commercial Vehicles function and contains the results data from a commercial vehicle roadside inspection. If set to null there was no data available from which to carry-out the inspection. .

cv_roadside_safety_data

This data store is used within the Manage Commercial Vehicles function and contains the data collected from commercial vehicles at a commercial vehicle roadside checking facility. It consists of the following data items each of which is defined in its own DDE:

cv_driver_details
+ cv_safety_status_code
+ cv_vehicle_details.

cv_roadside_safety_database

This data store is used within the Manage Commercial Vehicles function and contains the vehicle safety database for a commercial vehicle roadside checking facility. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_roadside_safety_data}.

cv_roadside_safety_database_output

This data flow is used within the Manage Commercial Vehicles function and contains an output of data currently held in the safety database held by the commercial vehicle roadside checkstation facility. It consists of the following data item which is defined in its own DDE:

cv_roadside_safety_data.

cv_roadside_safety_database_read

This data flow is used within the Manage Commercial Vehicles function and contains a read of the data currently in the safety database held by the commercial vehicle roadside checkstation facility. It consists of the following data item which is defined in its own DDE:

cv_roadside_safety_data.

cv_roadside_safety_database_update

This data flow is used within the Manage Commercial Vehicles function and contains the update to data in the safety database held by the commercial vehicle roadside checkstation facility. It consists of the following data item which is defined in its own DDE:

cv_roadside_safety_data.

cv_roadside_safety_database_write

This data flow is used within the Manage Commercial Vehicles function and contains a write of data to the safety database held by the commercial vehicle roadside checkstation facility. It consists of the following data item which is defined in its own DDE:

cv_roadside_safety_data.

cv_roadside_single_activity_data

This data flow is used within the Manage Commercial Vehicles function. It contains activity data from the commercial vehicle roadside checkstation facility for a particular carrier, driver and vehicle combination. It is sized to enable one thousand (1000) sets of data to be provided, which will cover ten (10) visits a day to a roadside facility for up to one hundred (100) days. The data flow will be used in the report that is output once at the specific request of a commercial vehicle manager. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_roadside_activity_details}.

cv_route

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Commercial Vehicles function . It contains details of a dynamic route provided for a commercial vehicle the request for which originated with the commercial vehicle driver acting in the role of fleet manager. The data flow consists of the following data items each of which is defined in its own DDE:

cv_route_data
+ vehicle_identity.

cv_route_data

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Commercial Vehicles function. It contains data for routes that have been selected for a commercial vehicle based on the data provided in the request from the Manage Commercial Vehicles function. The data flow consists of the following items each of which is defined in its own DDE:

route_cost
+ route_list
+ route_start_time
+ route_statistics
+ route_segment_number{route_segment_commercial_details}.

cv_route_details

This data store is used within the Manage Commercial Vehicle function to hold data about commercial vehicle routes used by the commercial vehicle driver. It consists of the following data items each of which is stored in its own DDE:

cv_route_number
+ cv_taxes_and_duties
+ cv_route_data
+ route_type.

cv_route_input

This data flow is sent from the Manage Commercial Vehicle function to the Provide Driver and Traveler Services function and contains route and vehicle location data. It consists of the following data items each of which is defined in its own DDE:

cf_route_request
+ cv_route_request.

cv_route_number

This data flow is used within the Manage Commercial Vehicle function and contains the number of the commercial vehicle route. It is used to associate other items of data such as taxes and duties, route details, classes, etc. .

cv_route_outputs

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Commercial Vehicle function and contains route and vehicle location data. It

consists of the following data items each of which is defined in its own DDE:

cf_route
+ cv_route
+ vehicle_location_for_cv.

cv_route_request

This data flow is sent from the Manage Commercial Vehicles function to the Provide Driver and Traveler Services function. It is used to request the preparation of a dynamic route for a commercial vehicle and originates with the commercial vehicle driver acting in the role of fleet manager. The data flow consists of the following items each of which is defined in its own DDE:

constraint_on_acceptable_travel_time
+ constraint_on_eta_change
+ constraint_on_load_classification
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type
+ destination
+ departure_time
+ desired_arrival_time
+ modes
+ origin
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ preferred_weather_conditions
+ vehicle_identity.

cv_safety_data

This data flow is used within the Manage Commercial Vehicles function and contains commercial vehicle identification and characteristics data for initiating safety checking at the commercial vehicle roadside check facility. It consists of the following data items each of which is defined in its own DDE:

cv_electronic_clearance_data
+ cv_vehicle_characteristics.

cv_safety_data_request

This data flow is used within the Manage Commercial Vehicles function and contains a request from the commercial vehicle roadside checkstation inspector for output of data held in the facility safety database. The data to be output is specified in terms of a carrier, driver and/or vehicle number. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_safety_information_request_type.

cv_safety_data_response

This data flow is used within the Manage Commercial Vehicles function and contains the output resulting from a request by the commercial vehicle roadside checkstation inspector for output of some data from the facility safety database. The data to be output will have been specified by the inspector in terms of a carrier, driver and/or vehicle number. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_safety_information.

cv_safety_database_update

This data flow is used within the Manage Commercial Vehicles function and contains data to update the data store containing the safety problem list on a periodic basis (i.e. daily). It contains the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_roadside_safety_data.

cv_safety_decision

This data flow is used within the Manage Commercial Vehicle function. It contains the results of an automatic safety check that has been made by a process in the commercial vehicle roadside checkstation facility. This data is sent for output to the roadside inspector interface process, to give the inspector the opportunity to override the automatic decision. The data flow consists of the following data item which is defined in its own DDE:

cv_safety_pull_in_output.

cv_safety_history

This data store is used within the Manage Commercial Vehicles function and contains a list of those carriers and vehicles that have been found to have safety problems during an inspection at the roadside commercial vehicle fixed facility. It consists of the following data items each of which is defined in its own DDE:

cv_safety_history_data.

cv_safety_history_data

This data flow is used within the Manage Commercial Vehicles function and contains a list of those carriers and vehicles that have been found to have safety problems during an inspection at the roadside commercial vehicle fixed facility. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_credentials_details
+ cv_roadside_facility_identity
+ cv_roadside_safety_data}.

cv_safety_history_read

This data flow is used within the Manage Commercial Vehicles function and contains the data currently in the store which contains a list of those commercial vehicles and carriers that have been found to have safety problems. The data flow consists of the following data item which is defined in its own DDE:

cv_safety_history_data.

cv_safety_history_update

This data flow is used within the Manage Commercial Vehicles function and contains a write to the store which contains a list of those commercial vehicles and carriers that have been found to have safety problems. This data originates from the government administrators terminator. The data flow consists of the following data item which is defined in its own DDE:

cv_safety_history_data.

cv_safety_history_write

This data flow is used within the Manage Commercial Vehicles function and contains an update to the store which contains a list of those commercial vehicles and carriers that have been found to have safety problems. This data originates from the commercial vehicle roadside check facility and is a result of problems with vehicle inspections that it has carried out. The data flow consists of the following data item which is defined in its own DDE:

cv_safety_history_data.

cv_safety_information

This data flow is used within the Manage Commercial Vehicles function and contains some commercial vehicle safety data which has been previously requested by the commercial vehicle roadside checkstation inspector. This data will be used by the inspector for checking vehicles as they pass. The data flow consists of the following item of data which is defined in its own DDE:

information_datapage.

cv_safety_information_request

This data flow is used within the Manage Commercial Vehicles function and contains a request from the commercial vehicle roadside checkstation inspector for output of data held in the facility safety database. The data to be output is specified in terms of a carrier, driver and/or vehicle number. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_safety_information_request_identity
+ cv_safety_information_request_type
+ cv_roadside_facility_identity.

cv_safety_information_request_identity

This data flow is used within the Manage Commercial Vehicles function and contains the identity number of the commercial vehicle safety information request. This number is used as a mechanism for tracking successive data requests from the same commercial vehicle roadside checkstation facility. It is sized at two bytes to enable a unique identifying code to be used for each request. .

cv_safety_information_request_type

This data flow is used within the Manage Commercial Vehicles function and contains the type of safety data for which output is requested. This will be able to include such things as driver's health, driver's safety record (citations, etc.), vehicle's safety record, etc. .

cv_safety_information_response

This data flow is used within the Manage Commercial Vehicles function and contains the output resulting from a request by the commercial vehicle roadside checkstation inspector for output of some data from the facility safety database. The data to be output will have been specified by the inspector in terms of a carrier, driver and/or vehicle number. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_roadside_safety_data.

cv_safety_override

This data flow is used within the Manage Commercial Vehicles function. It contains the decision made by an inspector at a commercial vehicle roadside checkstation facility to overide (or not) the automated pass or pull-in decision made by the process responsible for safety checking. The data flow contains the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_safety_override_code.

cv_safety_override_code

This data flow is used within the Manage Commercial Vehicles function. It contains a code which gives the results of the decision made by an inspector at a commercial vehicle roadside checkstation facility to override (or not) the automated pass or pull-in decision made by the process responsible for safety checking. The data flow consists of the following data item which is defined in its own DDE:

cv_operator_override.

cv_safety_problem

This data flow is used within the Manage Commercial Vehicles function and contains a two byte character code used to identify the nature of a problem with the safety of a commercial vehicle, its driver, or the carrier in general. .

cv_safety_pull_in_output

This data flow is used in the Manage Commercial Vehicles function and contains the output of the result of an analysis of the data from a commercial vehicle that is approaching a roadside checkstation facility, by the process responsible for commercial vehicle safety checking. The result is expressed in terms of a pull-in or pass decision for the vehicle. The data flow consists of the following data items, each of which is defined in its own DDE:

cv_credentials_details
+ cv_safety_problem.

cv_safety_status_code

This data flow is used within the Manage Commercial Vehicles function and contains the status of an associated set of commercial vehicle safety data. This status may be clear, or set to indicate that there is a problem. .

cv_safety_systems_diagnostics_results

This data item contains flags set to show the results of diagnostic checks run by a commercial vehicle's on-board safety system. For no failures the data item will be blank (all zero), with ones (1's) being used to indicate failure. (16 digits). .

cv_screening_data

This data flow is used within the Manage Commercial Vehicles function and contains commercial vehicle identification and characteristics data for initiating screening checks at the commercial vehicle roadside check facility. It consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_on_board_screening_data
+ cv_vehicle_characteristics.

cv_screening_decision

This data flow is used within the Manage Commercial Vehicle function. It contains the results of an automatic credentials screening check that has been made by a process in the commercial vehicle roadside checkstation facility. This data is sent for output to the roadside inspector interface process, to give the inspector the opportunity to override the automatic decision. The data flow consists of the following data item which is defined in its own DDE:

cv_screening_pull_in_output.

cv_screening_override

This data flow is used within the Manage Commercial Vehicles function. It contains the decision made by an inspector at a commercial vehicle roadside checkstation facility to override (or not) the automated pass or pull-in decision made by the process responsible for credentials checking. The data flow contains the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_screening_override_code.

cv_screening_override_code

This data flow is used within the Manage Commercial Vehicles function. It contains a code which gives the results of the decision made by an inspector at a commercial vehicle roadside checkstation facility to override (or not) the automated pass or pull-in decision made by the process responsible for credentials checking. The data flow consists of the following data item which is defined in its own DDE:

cv_operator_override.

cv_screening_pull_in_output

This data flow is used in the Manage Commercial Vehicles function and contains the output of the result of an analysis of the data from a commercial vehicle that is approaching a roadside checkstation facility, by the process responsible for commercial vehicle credentials checking. The result is expressed in terms of a pull-in or pass decision for the vehicle. The data flow consists of the following data items, each of which is defined in its own DDE:

cv_credentials_details
+ cv_credentials_problem.

cv_screening_record

This data flow is used within the Manage Commercial Vehicles function. It contains information that is collected at a roadside checkstation facility as the result of the credentials checks on an approaching commercial vehicle. This data is stored in the log of roadside facility data. The data flow consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_screening_pull_in_output
+ cv_screening_override
+ time.

cv_start_inspection

This data flow is used within the Manage Commercial Vehicles function to indicate that a roadside commercial vehicle inspection should be started on a particular commercial vehicle. It contains the following data item which is defined in its own DDE:

cv_credentials_details.

cv_static_route_data

This data flow is used within the Manage Commercial Vehicles function. It contains the data for a static based route provided as a result of data provided by the commercial vehicle driver acting as a fleet manager. .

cv_static_route_request

This data flow is used within the Manage Commercial Vehicles function. It contains the data from which a static route can be determined for a commercial vehicle and is supplied by the commercial vehicle driver acting as a fleet manager. The data flow consists of the following data items each of which is defined in its own DDE:

constraint_on_acceptable_travel_time
+ constraint_on_ahs_lanes
+ constraint_on_eta_change
+ constraint_on_interstate
+ constraint_on_load_classification
+ constraint_on_urban
+ constraint_on_vehicle_type
+ destination
+ departure_time
+ desired_arrival_time
+ modes
+ origin
+ preferred_alternate_routes
+ preferred_route_segments
+ preferred_routes
+ preferred_weather_conditions.

cv_storage_action_flag

This data flow is used within the Manage Commercial Vehicles function and contains a storage action flag. This may be set to 'S' for store and 'D' for delete and is used for the management of the stores of route data used by the commercial vehicle manager and driver. It is sized at one (1) byte to accommodate the above characters. .

cv_tag_data

This data flow is used within the Manage Commercial Vehicles and Provide Electronic Payment Services functions and contains the data read from a commercial vehicle's on-board tag. It consists of the following data items each of which is defined in its own DDE:

cv_carrier_number
+ cv_driver_number
+ cv_vehicle_number.

cv_tag_data_store

This data store is used within the Manage Commercial Vehicles funtion. It contains the on-board vehicle type two tag data that is interrogated by each and every commercial vehicle roadside checkstation facility. The data flow consists of the following data item which is defined in its own DDE:

cv_on_board_tag_data.

cv_tag_data_store_needed

This data flow is used within the Manage Commercial Vehicles funtion and contains a request for the current on-board commercial vehicle tag data to be sent to the process that provides the communications interface with the commercial vehicle roadside checkstation or border crossing facilities. This data flow is sent in response to a request by the facility for the output of the current tag data. .

cv_tag_data_store_output

This data flow is used within the Manage Commercial Vehicles funtion. It contains the output of the data currently being held by a type two commercial vehicle tag as previously requested by the commercial vehicle driver (possibly acting in the role of a commercial vehicle manager). The data flow consists of the following data item which is defined in its own DDE:

cv_credentials_details
+ cv_trip_identity.

cv_tag_data_store_read

This data flow is used within the Manage Commercial Vehicles funtion. It contains data that is being read from an on-board commercial vehicle type tag in response to a request for data from a commercial vehicle roadside checkstation or border crossing facility. The data flow consists of the following data item which is defined in its own DDE:

cv_on_board_tag_data.

cv_tag_data_store_request

This data flow is used within the Manage Commercial Vehicles funtion and contains a request for the current on-board commercial vehicle tag data to be sent to the process that provides the interface with the commercial vehicle driver. This data flow is sent in response to a request by the driver for the output of the current tag data. .

cv_tag_data_store_update

This data flow is used within the Manage Commercial Vehicles funtion. It contains data that is being updated on an on-board commercial vehicle type tag as a result of data being sent from a commercial vehicle roadside checkstation or border crossing facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_on_board_border_details

+ cv_on_board_screening_details.

cv_tag_data_store_write

This data flow is used within the Manage Commercial Vehicles funtion and contains on-board commercial vehicle tag data that is being loaded by either the commercial vehicle driver acting in the role of a commercial vehicle manager and is used by other processes in the function. The data flow consists of the following data item which is defined in its own DDE:

cv_credentials_details
+ cv_trip_identity
+ tag_identity.

cv_tax_and_credential_fees

This data store is used within the Manage Commercial Vehicles function and contains information about the taxes and credential fees required by commercial vehicles to pass through States and cross borders, the account number to which payments should be made, plus a historical record of payments made by carriers (and owner drivers) where problems have occured, e.g. late or incorrect payment. .

cv_taxes_and_duties

This data flow is used within the Manage Commercial Vehicle function and contains a list of the taxes and duties required for the use of a particular commercial vehicle route using a particular class of vehicle, cargo and weight. This data flow has been sized at seven (7) bytes to enable a two character state identifier and associated costs (5 bytes) to be accommodated. .

cv_trip_classification_data

This data flow is used within the Manage Commercial Vehicles function and contains the classification data for which a particular commercial vehicle has been enrolled at commercial vehicle roadside checkstation locations for a particular route. The data flow consists of the following data items each of which is defined in its own DDE:

cv_cargo_class
+ cv_vehicle_class
+ cv_weight_class.

cv_trip_identity

This data flow is used within the Manage Commercial Vehicles function. It contains a trip identity number that is set up by the commercial vehicle manager (or the driver acting in that capacity) for use in checking the commercial vehicle through a border crossing. The data flow is sized at four (4) bytes to permit a unique number to be used for each trip. .

cv_update_new_credentials_request

This data flow is used within the Manage Commercial Vehicles function and contains a request to update the credentials for a particular commercial vehicle at the roadside checkstation and border crossing facilities along its route, i.e. to enroll the vehicle, that are served by the local commercial vehicle administration function. The data flow consists of the following data items each of which is defined in its own DDE:

cv_route_details
+ cv_credentials_details
+ cv_trip_classification_data
+ cv_trip_identity.

cv_update_new_credentials_response

This data flow is used within the Manage Commercial Vehicles function and contains the response to a previous request for a commercial vehicle's credentials and trip classification to be enrolled at all the roadside checkstation facilities along its route.

confirmation_flag
+ cv_route_number.

cv_update_safety_problems_list

This data flow is used within the Manage Commercial Vehicles function and contains details of the carrier, driver and vehicle for which safety problems have been found during a inspection at the commercial vehicle roadside checkstation facility. It consists of the following data items each of which is defined in its own DDE:

cv_credentials_details
+ cv_roadside_facility_identity
+ cv_roadside_safety_data.

cv_vehicle_axle_weight_data

This data flow is used within the Manage Commercial Vehicles function. It contains the details of the number of axles the vehicle has, the weight per axle and the spacing between the axles. The data flow is sized at fifteen (15) bytes to enable this data to be accommodated for vehicles of up to ten (10) axles. .

cv_vehicle_characteristics

This data flow is used within the Manage Commercial Vehicles and Provide Electronic Payment Services functions and contains the characteristics of a commercial vehicle as determined from data provided by roadside sensors. It consists of the following data items each of which is defined in its own DDE:

cv_vehicle_weight
+ cv_vehicle_size
+ cv_vehicle_configuration.

cv_vehicle_class

This data flow is used within the Manage Commercial Vehicles function and contains the vehicle classification (three character code) for a particular use of a commercial vehicle route. .

cv_vehicle_configuration

This data flow is used within the Manage Commercial Vehicles and Provide Electronic Payment Services functions and contains a three character code that defines the commercial vehicle configuration. Examples of the character codes that will be used are:

1TV - tractor unit plus articulated trailer (van type),
TCR - tractor unit only,
VTV - vehicle plus trailer, i.e. the motive power unit may carry payload (van type),
2TV - tractor unit plus articulated trailer plus trailer (van type),
1TK - tractor unit plus articulated trailer (tanker type),
VTK - vehicle plus trailer, i.e. the motive power unit may carry payload (tanker type),
2TK - tractor unit plus articulated trailer plus trailer (tanker type).

Other codes will be needed to accommodate different types of commercial vehicles. .

cv_vehicle_data

This data flow is used within the Manage Commercial Vehicles function. It contains the data that has been collected from on-board a commercial vehicle for output to the commercial vehicle driver who is acting in the role of commercial vehicle fleet manager. The data will only relate to the vehicle from which the request to up-load the data was made. It consists of the following data items each of which is defined in its own DDE:

cv_on_board_data
+ cv_general_input_message.

cv_vehicle_data_for_roadside

This data flow is used within the Manage Commercial Vehicle function. It contains data that is being sent from the commercial vehicle to the commercial vehicle roadside checkstation facility. The data flow consists of the following data items each of which is defined in its own DDE:

cv_electronic_clearance_data.

cv_vehicle_details

This data flow is used within the Manage Commercial Vehicles function. It contains details about the activities involving a particular commercial vehicle over a period of time. This period of time has been set at one hundred (100) days. The vehicle identity for this data is held in an associated data flow. The data flow itself consists of the following data items each of which is defined in its own DDE:

cv_credentials
+ 100{cv_fuel_purchase_data
+ cv_inspection_activities_data
+ cv_log_data
+ cv_repairs_and_service_records
+ cv_safety_systems_diagnostics_results
+ cv_vehicle_log}.

cv_vehicle_log

This data flow is used within the Manage Commercial Vehicles function. It contains a log of the commercial vehicle's cargo loading and unloading activities. Data about other activities is stored in separate data flows, as is the date, time, place, driver identity and vehicle mileage when the activity took place. This data flow consists of the following data items each of which is defined in its own DDE:

cv_cargo_loaded
+ cv_cargo_discharged.

cv_vehicle_number

This data flow is used within the Manage Commercial Vehicle function and contains a sixteen character (16) alphanumeric code that is the commercial vehicle identification number. .

Additional sizing assumptions:

SIZE=16;

cv_vehicle_size

This data flow is used within the Manage Commercial Vehicles and Provide Electronic Payment Services functions and contains the commercial vehicle size as measured by roadside sensors. The data will include details such as the length, width and height of the vehicle. It will be stored as a four (4) byte integer comprising two bytes for the length and one byte each for the width and height. All sizes will be measured in inches. .

cv_vehicle_weight

This data flow is used within the Manage Commercial Vehicles and Provide Electronic Payment Services functions and contains the commercial vehicle weight as measured by roadside sensors, such as weigh-in-motion detectors. The data will be stored as a three (1) byte integer to enable commercial vehicle weights of up to 255000 lbs to be accommodated, the weight being shown in thousands of pounds. .

cv_violation_data

This data flow is sent from the Manage Commercial Vehicles function to the Manage Emergency Services function. It contains details of commercial vehicles that have committed violations at roadside checking facilities. These may be caused by failure to stop ,or by failure to provide on-board data, the on-board data itself being in error, or failure of a roadside check. .

cv_weight_class

This data flow is used within the Manage Commercial Vehicles function and contains the weight classification (three character code) for a particular use of a commercial vehicle route. .

data_from_front_vehicle

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains data from the next vehicle to the front in a platoon. This data provides

information about the status of the sending vehicle that will assist the receiving vehicle in both maintaining the current platoon formation and making changes because (for example) the sending vehicle is leaving the platoon. The data flow consists of the following data items each of which is defined in its own DDE:

platoon_ahead_vehicle_status
+ platoon_accel_decel_profile
+ platoon_headway.

data_from_rear_vehicle

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains data from the vehicle to the rear in a platoon. This data provides information about the status of the vehicle to the rear that will assist the receiving vehicle in both maintaining the current platoon formation and making changes because (for example) the vehicle to the rear is leaving the platoon. The data flow consists of the following data items each of which is defined in its own DDE:

platoon_accel_decel_profile
+ platoon_rear_vehicle_status
+ platoon_headway.

data_to_front_vehicle

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains data for the next vehicle ahead in a platoon. The data provides vehicle status information to assist it in both maintaining the current formation and reacting to any changes, e.g. a vehicle leaving the platoon. The data flow consists of the following data items each of which is defined in its own DDE:

platoon_accel_decel_profile
+ platoon_rear_vehicle_status
+ platoon_headway.

data_to_rear_vehicle

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains data for the vehicle to the rear in a platoon. This data provides information about the status of the sending vehicle that will assist the receiving vehicle in both maintaining the current platoon formation and making changes because (for example) the sending vehicle is leaving the platoon. The data flow consists of the following data items each of which is defined in its own DDE:

platoon_accel_decel_profile
+ platoon_ahead_vehicle_status
+ platoon_headway.

date

This data flow is used within many ITS function and contains the calendar date data normally used to indicate currency or effectivity of other data flows. The codification of the data is MMDDYY or equivalent and the size estimate is based on 4 bit month, 5 bit day, 7 bit year code. .

defined_incident_response_changes

This data flow is used within the Manage Traffic function. It contains the updates to the data currently held in the store of defined incident responses as provided by the process responsible for reviewing possible new defined responses based on those that have been made to incidents in the past. The data flow consists of either of the following data items, each of which is defined in its own DDE:

planned_incident_response
+ incident_info_template.

defined_incident_response_data

This data flow is used within the Manage Traffic function. It contains the data currently

held in the store of defined incident responses and consists of the following data items, each of which is defined in its own DDE:

planned_incident_response
+ incident_info_template.

defined_incident_response_data_request

This data flow is used within the Manage Traffic function. It contains a request for the data currently held in the store of defined incident responses. .

Additional sizing assumptions:

SIZE=1;

defined_incident_response_update_request

This data flow is used within the Manage Traffic function and contains a request that possible defined incident responses are transfered from their data store to the store of live responses for use when incidents actually occur. It includes the following data item which is defined in its own DDE:

possible_defined_response_identity.

defined_incident_response_updates

This data flow is used within the Manage Traffic function. It contains the updates to the data currently held in the store of defined incident responses as provided by the Traffic Operations Personnel. The data flow consists of either of the following data items, each of which is defined in its own DDE:

planned_incident_response
+ incident_info_template.

defined_responses_data

This data store is used within the Manage Traffic function and contains data about defined incident responses. It consists of the following data items each of which is defined in its own DDE:

incident_type
+ planned_incident_response
+ incident_info_template
+ traffic_impact_criteria.

demand_data_update_request

This data flow is used within the Manage Traffic function to activate the process which collects data from other parts of ITS for use in traffic and travel demand forecasting. .

Additional sizing assumptions:

SIZE=2;

demand_forecast_data

This store is used within the Manage Traffic function to hold data which predicts traffic and travel demand over the geographic area covered by ITS. It is based on input data provided by other parts of ITS and is used as the basis for the implementation of new demand mamagement actions. .

demand_forecast_request

This data flow is used within the Manage Traffic function to activate the process which produces a forecast of the future traffic and travel demand in the geographic area covered by ITS. .

demand_forecast_result

This data flow is used within the Manage Traffic function to provide the results from the process that produces the forecast of the future traffic and travel demand in the geographic area covered by ITS. .

demand_input_data

This store is used within the Manage Traffic function to hold data collected from other facilities within the function and from other parts of ITS that can be used as input to the traffic and travel demand forecasting process. This data will show the current and

historical patterns of traffic and travel in the geographic area controlled by ITS, as well as (where available) predictions of future traffic based on trip planning requests. .

demand_management_activate

This data flow is used within the Manage Traffic function to activate the process which acts on the results of the demand forecasting process to implement new demand mangement strategies, using demand management policy data. .

demand_management_result

This data flow is used within the Manage Traffic function and provides the results of the requested activation of the demand management process. These results are designed to show whether or not the policies have been accepted by other parts of ITS. .

demand_overrides

This data flow is used within the Manage Traffic function. It contains changes to the current traffic management strategy that will help to alter the split of travel demand between the various modes of travel. These changes will affect things such as the traffic control strategy at intersections and highway ramps and the status of parking lots. They may also give priority to certain types of vehicle such as those in carpools and vanpools.

demand_policy_data

This store is used within the Manage Traffic function to hold data which defines the policies that are to be applied to the implementation of the results of traffic and travel demand forecasting. They can be used to influence such things as traffic control strategies including HOV lane states, parking lot states and charges, route choice parameters, transit fares, etc. .

departure_time

This data flow is used within the Provide Driver and Traveler Services function and defines the time at which a driver or traveler's planned or requested trip is to start. It consists of the following data item which is defined in its own DDE:

time.

desired_arrival_time

This data flow is used within the Provide Driver and Traveler Services function and specifies the target time for arrival at the end of a driver or traveler's planned or requested trip. It consists of the following data item which is defined in its own DDE:

time.

destination

This data flow is used within the Provide Driver and Traveler Services function. It defines the destination point for a trip request or a route to be used by a traveler or a vehicle. In some instances it will be used as the origin for the use of a particular mode within a trip, e.g. the part of the route for the trip that is to be provided by walking, or ridesharing, or an intermodal service provider. It consists of the following data item which is defined in its own DDE:

route_point.

detailed_emergency_status

This data flow is used within the Manage Emergency Services function and provides the detailed status for an emergency response that is in progress. It will include a detailed view of the assets which are deployed for the emergency, the current emergency status and any hazmat information not already sent.

incident_number
+ incident_severity
+ incident_vehicle_status
+ cf_hazmat_vehicle_information.

direction_commands

This data flow is used within the Provide Vehicle Control and Monitoring function. It is

used to select forward motion (+1), rearwards motion (-1) or neutral (999). A zero value means ignore, i.e. do not change the direction of motion. .

display_map_traveler_update_cost

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function and contains the cost (cents) of an update to the digitized map data used as the background to displays of traffic and travel information on a traveler's personal portable device. The data flow is sized at two bytes to give a maximum cost of 32767 cents for each update. .

documentation_output

This data flow is used within the Plan System Deployment function. It contains the data from the data stores, output in a format from which a document can be produced, together with any relevant digitzed map data. .

documentation_request

This dat a flow contains a list of the data (if any) to be retrieved from the historical, static and planning data stores within the Plan System Deployment function and output as system documentation. .

Additional sizing assumptions:

SIZE=1024;

driver_advanced_payment_at_lot

This data flow is used within the Provide Electronic Payment Services function and contains details of the previously notified credit stored on the driver's payment instrument and the advanced parking lot charge, and/or toll cost, and/or transit fare which has to be deducted. It consists of the following data items each of which is defiend in its own DDE:

stored_credit
+ parking_lot_cost
+ toll_cost
+ transit_fare.

driver_advanced_payment_at_toll

This data flow is used within the Provide Electronic Payment Services function and contains details of the previously notified credit stored on the driver's payment instrument and the advanced parking lot charge, and/or toll cost, and/or transit fare which has to be deducted. It consists of the following data items each of which is defiend in its own DDE:

stored_credit
+ parking_lot_cost
+ toll_cost
+ transit_fare.

driver_advanced_payment_for_map

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function. It contains the cost of the update to the in-vehicle map database that must be deducted from the credit currently stored on the payment instrument. The data flow consists of the folllowing data items each of which is defined in its own DDE:

navigable_map_vehicle_update_cost
+ stored_credit.

driver_advisory_information

This data flow is used within the Provide Driver and Traveler Services function and contains traffic, transit advisory information, or yellow pages information, plus vehicle control messages, for a driver in a vehicle. It consists of the following data items each of which is defined in its own DDE:

advisory_data

+ emergency_message_auto_output
+ emergency_message_driver_output
+ safety_warnings
+ position_warnings
+ vehicle_control_status
+ vehicle_signage_data
+ vision_data
+ vehicle_status_details.

driver_advisory_information_request

This data flow is used within the Provide Driver and Traveler Services function and contains analyzed requests for the various types of driver display. It contains the folowing data items each of which is defined in its own DDE:

advisory_display_type
+ advisory_data_scope.

driver_ahs_input

This data flow is used to indicate that AHS mode has been selected (999) by the driver. If set to zero it means that either manual or some other mode of automatic vehicle operation has been selected by the driver. .

driver_broadcast_information

This data flow is used within the Provide Driver and Traveler Services function and contains traffic and transit advisory wide area broadcast information, plus vehicle control messages, for a driver in a vehicle. It consists of the following data items each of which is defined in its own DDE:

broadcast_data
+ emergency_message_auto_output
+ emergency_message_driver_output
+ safety_warnings
+ position_warnings
+ vehicle_control_status
+ vehicle_signage_data
+ vehicle_smart_probe_data_output
+ vehicle_status_details
+ vision_data.

driver_commands

This data flow is used within the Provide Vehicle Control and Monitoring function and is a combination of all the commands produced as a result of driver inputs. It contains the following data items each of which is defined in its own DDE:

select_speed
+ select_headway
+ select_lane_hold.

driver_credit_identity

This data flow is sent from the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function. It contains the credit identity of a driver or the amount of stored credit obtained from the payment instrument terminator and is used for purchasing updates to the in-vehicle navigable map database. The data flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit.

driver_guidance_accepted

This data flow is used within the Provide Driver and Traveler Services function and contains the acceptance by the driver of the previously provided route for autonomous or on-line guidance. Acceptance must be provided before guidance can begin. .

driver_guidance_data

This data flow is used within the Provide Driver and Traveler Services function and contains data to be used in a vehicle guidance request. It consists of some or all of the following data items each of which is defined in its own DDE:

origin
+ destination
+ desired_arrival_time
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ constraint_on_acceptable_travel_time
+ constraint_on_eta_change
+ constraint_on_special_needs
+ constraint_on_load_classification
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type.

driver_guidance_request

This data flow is used within the Provide Driver and Traveler Services function and requests on-line dynamic or autonomous guidance for the vehicle in which the driver is traveling. The choice of the type of guidance made by the driver is shown by the character used in the data flow and will be 'D' for infrastructure based dynamic, 'L' for autonomous but using link journey and queue times provided from the infrastructure and 'A' for totally autonomous, i.e. no contact with anything outside the vehicle, except for broadcast data used to determine location. .

driver_identity

This data item contains the identity of the commercial vehicle driver (40 characters). .

Additional sizing assumptions:

SIZE=40;

driver_input

This data flow is used within the Provide Driver Monitoring and Control function. It contains the vehicle control mode selected by the driver. The choice of modes is limited to manual (indicated by a zero), automatic control, or platoon following. The last two may be split up into various forms, e.g. automatic control may be speed control, headway control lane control, or any combination of these. .

driver_input_request

This data flow is used within the Provide Driver and Traveler Services function to request the driver to input data for a route over which guidance has been requested, but for which data has not previously been entered and stored locally. .

driver_manual_input

This data flow contains an indication (zero) that the driver has selected manual mode for the vehicle control or that automatic control is to be disabled. A non-zero value (1) means that some form of automatic control has been selected by the driver. .

driver_map_update_payment_request

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function and contains a request that payment be made for an update of the navigable map database used for on-line vehicle guidance. The payment will be made by debiting the credit identity with the cost through the financial institution terminator. It consists of the following data items each of which is defined in its own DDE:

vehicle_identity
+ credit_identity
+ navigable_map_vehicle_update_cost.

driver_map_update_payment_response

This data flow is sent from the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function and contains the response to a previous request from the driver that payment be made for an update of the navigable map database used for on-line vehicle guidance. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ vehicle_identity.

driver_map_update_payments_transactions

This data flow is used within the Provide Payment Electronic Services function and contains records of all payment transactions for driver in-vehicle guidnace map updates. .

Additional sizing assumptions:

SIZE=128;

driver_map_update_request

This data flow is used within the Provide Driver and Traveler Services function and contains a request for an update of the digitized map used data used for on-line vehicle guidance. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ vehicle_identity.

driver_map_update_response

This data flow is used within the Provide Driver and Traveler Services function and contains the response to a previous request from the driver for an update of the navigable map used database used for on-line vehicle guidance. If payment is to be made by reducing the credit stored on-board the payment instrument in the vehicle then the update cost and stored credit data items will have non-zero values. If these values are set to zero then the payment transaction will have been made through the financial institution using the previously supplied credit identity. The success of this transaction will be indicated by the confirmation flag data item. The data flow consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ navigable_map_vehicle_update_cost
+ stored_credit
+ vehicle_identity.

driver_parking_payment_credit_identity

This data flow is used within the Provide Electronic Payment Services function. It contains the credit identity or the amount of stored credit obtained from the payment instrument terminator on-board a vehicle at a parking lot. This data is used for payment of parking lot charges and if required, advanced payment for tolls, and/or parking lot charges, and/or transit fares. The data flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit.

driver_personal_emergency_request

This data flow is used within the Provide Driver and Traveler Services function to carry data about an emergency situation that applies to a driver and his vehicle. It contains the following data items each of which is defined in its own DDE:

vehicle_identity
+ vehicle_location_for_emergencies
+ vehicle_status_details.

driver_selection

This data flow is used within the Provide Vehicle Control and Monitoring function and contains parameters about the mode of autoamtic vehicle control selected by the driver. If set to zero (0) it means that the driver has selected manual, or some other form of automatic mode for the vehicle control. A value of one (1) means that the driver has selected platoon following mode for the vehicle and a value of (999) means that there has been a failure in some other part of the control process and platoon following must be disabled immediately. .

driver_toll_payment_credit_identity

This data flow is used within the Provide Electronic Payment Services function. It contains the credit identity or the amount of stored credit obtained from the payment instrument terminator on-board a vehicle as it passes through a toll plaza. This data is used for payment of tolls and if required, advanced payments for tolls, and/or parking lot charges, and/or transit fares. The data flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit.

driving_guidance_instructions

This data flow is used to provide the driver with actual details of the next route segment to be followed by the vehicle in the form turnings to make, details of the carriageway, etc. .

Additional sizing assumptions:

SIZE=1024;

duration

This data flow is used within many ITS function. It contains the expected duration of a particular activity. Although 17 bits would be required to provide 1 second granularity, a 16 bit data element supports time accurate to within a few seconds and will be sufficient for all ITS applications. .

duty_cost

This data flow is used within the Manage Commercial Vehicle function. It contains the cost of commercial vehicle duties and consists of the following data item which is defined in its own DDE:.

cost.

dynamic_traveler_guidance_data

This data flow is used within the Provide Driver and Traveler Services function and contains the data for providing dynamic guidance to a traveler using a personnal portable device. It consists of the following data items each of which is defined in its own DDE:

route
+ route_cost.

dynamic_traveler_guidance_data_request

This data flow is used within the Provide Driver and Traveler Services function and requests on-line dynamic guidance for a traveler who is using a personal portable device. The data flow consists of the following data items each of which is defined in its own DDE:

origin
+ destination
+ desired_arrival_time
+ modes
+ preferred_routes
+ preferred_alternate_routes
+ preferred_ridesharing_options
+ preferred_route_segments
+ preferred_transit_options

+ constraint_on_acceptable_travel_time
+ constraint_on_number_of_mode_changes
+ constraint_on_number_of_transfers
+ constraint_on_eta_change
+ constraint_on_special_needs.

dynamic_vehicle_guidance_data

This data flow is used within the Provide Driver and Traveler Services function and contains the data for providing dynamic guidance to a driver in a vehicle. It consists of the following data items each of which is defined in its own DDE:

route
+ route_cost.

dynamic_vehicle_guidance_data_request

This data flow is used within the Provide Driver and Traveler Services function. It contains data for use as the request for on-line dynamic guidance of the vehicle in which the driver is traveling. The data flow consists of the following data items each of which is defined in its own DDE:

origin
+ destination
+ desired_arrival_time
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ constraint_on_acceptable_travel_time
+ constraint_on_eta_change
+ constraint_on_special_needs
+ constraint_on_load_classification
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type.

emergency_data_for_other_TMC

This data flow is used within the Manage Traffic function and contains the portion of a strategy that gives priority to emergency vehicles that relates to roads (surface streets) and highways that are outside the area served by the local TMC. This data will be sent to the appropriate other TMC's so that they can implement the requested priority measures to give the emergency vehicles priority throughout their route. The data flow consists of the following data items each of which is defined in its own DDE:

emergency_vehicle_green_wave
+ selected_emergency_vehicle_strategy.

emergency_driver_status_update

This data flow is used within the Manage Emergency Services function and contains an update from the emergency vehicle driver to the current emergency vehicle status in its requested response to an incident. The data flow consists of the following data items each of which is defined in its own DDE:

date
+ emergency_vehicle_identity
+ emergency_vehicle_status_code
+ incident_number
+ time.

emergency_message_auto_output

This data flow is sent from the Provide Vehicle Monitoring and Control function to the Provide Driver and Traveler Services function. It provides data for the display of the

response from the Emergency Management System to a previously submitted emergency request. .

emergency_message_driver_output

This data flow is used within the Provide Driver and Traveler Services function. It provides data for the display of the response from the Emergency Management System to an emergency request previously submitted by the driver. .

emergency_message_traveler_output

This data flow is used within the Provide Driver and Traveler Services function. It provides data for the display of the response from the Emergency Management System to an emergency request previously submitted by the traveler. .

emergency_request

This data defines the type of emergency to which a response is being made, e.g. road accident with no casualties, road accident with casualties, road accident with fatalities, off road/highway fire, vehicle fire, off road/highway explosion, vehicle explosion, Public Transport vehicle(s) involved, etc. .

emergency_request_driver_acknowledge

This data flow is used by the Manage Emergency Services function to acknowledge that the request for emergency services previously sent by the driver has been received and is therefore sent to the Provide Driver and Traveler Services function for output. .

emergency_request_driver_details

This data flow is used by the Provide Driver and Traveler Services function to send data about an emergency declared by a driver to the Manage Emergency Services function. It contains the following data items each of which is defined in its own DDE:

date
+ driver_personal_emergency_request
+ time.

emergency_request_kiosk_traveler_acknowledge

This data flow is used by the Manage Emergency Services function to confirm that the request for emergency services previously sent by the traveler has been received from a kiosk and is therefore sent to the Provide Driver and Traveler Services function for output. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

emergency_request_kiosk_traveler_details

This data flow is used by the Provide Driver and Traveler Services function to send data about an emergency declared by a traveler using a kiosk to the Manage Emergency Services function. It contains the following data items each of which is defined in its own DDE:

date
+ time
+ traveler_personal_emergency_request.

emergency_request_personal_traveler_acknowledge

This data flow is used by the Manage Emergency Services function to confirm that the request for emergency services previously sent by the traveler has been received from a personal portable device and is therefore sent to the Provide Driver and Traveler Services function for output. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

emergency_request_personal_traveler_details

This data flow is used by the Provide Driver and Traveler Services function to send data about an emergency declared by a traveler using a personal portable device to the Manage Emergency Services function. It contains the following data items each of which is defined in its own DDE:

date
+ time
+ traveler_personal_emergency_request.

emergency_request_vehicle_acknowledge

This data flow is used by the Manage Emergency Services function to acknowledge that the request for emergency services previously sent automatically by the vehicle through processes in the Provide Vehicle Control and Monitoring function has been received. It is sent to the Provide Driver and Traveler Services function for output. .

emergency_request_vehicle_details

This data flow is used by the Provide Vehicle Control and Monitoring function to send data about an emergency automatically declared by a vehicle to the Manage Emergency Services function. It contains the following data items each of which is defined in its own DDE:

date
+ time
+ vehicle_emergency_request.

emergency_response_data_for_communications

This data flow is used within the Manage Emergency Services function. It contains details of a reported emergency and the response plan for use by the process that communicates with drivers, travelers, the Manage Transit function, and the emergency telephone service or E911 operator, when they have reported emergencies. The data flow consists of the following data items each of which is defined in its own DDE:

emergency_response_plan_data
+ identified_emergency_details.

emergency_response_data_for_management

This data flow is used within the Manage Emergency Services function. It contains details of a reported emergency and the response plan for use by the process that manages emergency responses. The data flow consists of the following data items each of which is defined in its own DDE:

emergency_response_plan_data
+ identified_emergency_details.

emergency_response_plan_data

This data flow is used within the Manage Emergency Services function and contains a pre-planned set of procedures directing an appropriate response to an emergency. The data supports various levels of plans including overall regional plans documenting coordinated multi-agency reponse to major incidents. This data flow is used to provide a source of information on emergency responses to other ITS functions, and to the emergency services dispatch facility. .

emergency_service_action_details

This data flow is used within the Manage Emergency Services function. It contains details of the responses to each emergency that are store in the log of emergency service actions. The data flow consists the following items, each of which is defined in its own DDE:

emergency_service_allocations
+ emergency_service_type_requested
+ emergency_service_type_override
+ emergency_vehicle_route
+ emergency_vehicle_arrival_time
+ identified_emergency_details.

emergency_service_action_log

This data store is used within the Manage Emergency Services function. It contains the log of actions for each incident processed within the Manage Emergency Services

area of ITS. The data store consists the following items, each of which is defined in its own DDE:

list_size
+ list_size{emergency_service_action_details
+ incident_action_time}.

emergency_service_allocation_criteria

This store is used within the Mnaage Emergency Services function and contains the default allocations of emergency services type (or types) for each type of incident. It contains the following data items each of which is defined in its own DDE:

incident_type
+ emergency_service_allocations
+ enforcement_agency_allocations
+ violation_type.

emergency_service_allocation_data

This data flow is used within the Mnaage Emergency Services function and contains a pre-planned set of procedures directing an appropriate emergency services response to an incident. It consists of the following data item which is defined in its own DDE:

emergency_service_allocations.

emergency_service_allocation_data_output

This data flow is used within the Manage Emergency Services function. It contains the output from the store management process of the contents of the store that holds the data defining the allocation of emergency services to each type of incident. .

emergency_service_allocation_data_output_request

This data flow is used within the Manage Emergency Services function and contains the request for the store management process to output the contents of the store that holds the data defining the allocation of emergency services to each type of incident. It consists of the following data item which is defined in its own DDE :

violation_type.

emergency_service_allocation_data_request

This data flow is used within the Mnaage Emergency Services function and contains a request for the pre-planned set of procedures directing an appropriate response to an emergency. It consists of the following data item which is defined in its own DDE :

incident_type.

emergency_service_allocation_data_updates

This data flow is used within the Manage Emergency Services function and contains an update to the pre-planned set of procedures directing an appropriate response to an emergency. It consists of the following data items each of which is defined in its own DDE:

incident_type
+ emergency_service_allocations.

emergency_service_allocation_override

This data flow contains details of an override of the automatic allocation of emergency services to an incident. It contains the following data items each of which is defined in its own DDE:

incident_number
+ emergency_service_type_override.

emergency_service_allocations

This data item is used within the Manage Emergency Services function and defines the type (or types) or emergency service required for a particular emergency incident. The types may be any of the following:

0 - none, cancel previous request
1 - police,
2 - fire,
3 - ambulance,
4 - towing
5 - paramedics,
6 - wrecking crew,
7 - aircraft fire service,
8 - rail breakdown crew,
9 - SWAT. .

emergency_service_log_output

This data flow is used within the Manage Emergency Services function and contains the output of the emergency services action log. It is output following a request from the emergency services operator and contains all the data up to the current time, shonw by incident number. The data flow consists of the following data item which is defined in its own DDE:

emergency_service_action_log.

emergency_service_log_output_request

This data flow is used within the Manage Emergency Services function and contains the request from the emergency services operator for the output of the current contents of the emergency services action log. .

emergency_service_type_override

This data flow is used within the Manage Emergency Service function. It defines the type (or types) or emergency service allocated by the Emergency Services operator for a particular emergency incident. It has the same range of values as the data for emergency service allocations, but as this is an operator override of the standard allocation, it will not have the same value for each incident. .

emergency_service_type_requested

This data item defines the type (or types) or emergency service requested for a particular emergency incident. It has the same range as the %034emergency_service_type%034 data item but may not
have the same value for each incident. .

emergency_telephone_service_identity

This data flow is used within the Manage Emergency Services function and contains the identity of an emergency center that is either sending data about incidents in its own local area or is receiving data about incidents in the area served by the local function. It is sized as a string of up to sixteen (16) alphanumeric characters to enable a wide choice of names to be accommodated. .

emergency_vehicle_acknowledge

This data flow is used within the Manage Emergency Services function. It contains the acknowledgement of data received by the emergency vehicle. The data flow consists of the following data items each of which is defined in its own DDE:

emergency_vehicle_route
+ emergency_vehicle_arrival_time.

emergency_vehicle_arrival_time

This data flow is used within the Manage Emergency Servies function. It contains the time at which it is predicted that the emergency vehicle will arrive at the incident. The data flow consists of the following data item which is defined in its own DDE:

time.

emergency_vehicle_dispatch_data

This data flow is used within the Manage Emergency Services function. It contains data required to dispatch an emrgency vehicle to the scene of an incident. The data

flow consists of the following data items each of which is defined in its own DDE:

emergency_vehicle_identity
+ emergency_vehicle_type
+ incident_location
+ incident_type.

emergency_vehicle_dispatch_failure

This data flow is used within the Manage Emergency Services function and contains the indication that the dispatch of emergency vehicles in response to an incident has failed because insufficient vehicles of the right type could be found. The data flow only shows the type(s) for which the dispatch failed and/or the numbers of each type that it was not possible to dispatch. It consists of the following data items each of which is defined in its own DDE:

incident_number
+ 8{emergency_vehicle_type
  + emergency_vehicle_number}.

emergency_vehicle_dispatch_request

This data flow is used within the Manage Emergency Services function and contains data for the request for an emergency vehicle dispatch. The data flow specifies the type(s) of vehicle(s) needed to respond to a particlur incident and the number of vehicles of each type. It consists of the following data item which is defined in its own DDE. Up to eight (8) may be used to enable up to eight different types of emergency vehicle to be specified for a single incident.

8{emergency_vehicle_type
 + emergency_vehicle_number}.

emergency_vehicle_dispatch_status

This data flow is used within the Manage Emergency function and shows whether or not the requested emergency vehicle dispatch was successful or not. The confirmation flag data flow is use for this purpose. The data flow consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ 8{emergency_vehicle_type
  + emergency_vehicle_number}
+ incident_number.

emergency_vehicle_driver_inputs

This data flow is used within the Manage Emergency Services function and contains processed inputs from the emergency vehicle driver for use within the function. .

Additional sizing assumptions:

SIZE=64;

emergency_vehicle_driver_outputs

This data flow is used within the Manage Emergency Services function and contains data from other parts of the function for output to the emergency vehicle driver. .

Additional sizing assumptions:

SIZE=128;

emergency_vehicle_green_wave

This data flow is sent from the Manage Emergency Services function to the Manage Traffic function. It contains a list of the route segments that have been provided for use by an emergency vehicle, together with the arrival time at each segment. The data will be used by the Manage Traffic function to generate changes to the current traffic management strategy to give the emergency vehicle priority. The data data flow consists of the following data items each of which is defined in its own DDE:

date
+ list_size

+ list_size{route_segment_identity + route_segment_estimated_arrival_time}
+ time.

emergency_vehicle_identity

This data flow is used within the Manage Emergency Services function. It contains the identity of an individual emergency vehicle. This data is used by processes within the function to identify the source and/or ownership of other data. .

emergency_vehicle_incident_details

This data flow is used within the Manage Emergency Services function and contains details of an incident to which a response is required. It consists of the following items of data each of which is defined in its own DDE:

incident_duration
+ incident_location
+ incident_number
+ incident_severity
+ incident_start_time
+ incident_type.

emergency_vehicle_junction_preemption

This data flow is sent from the Manage Emergency Services function to the Manage Traffic function and contains data necessary for an emergency services vehicle to be given preemption (priority) at an indicator that is particular set of junction control signals. The data flow is sent directly from the emergency vehicle to the junction controller, which is assumed to be capable of giving priority to the correct phase(s) for any received preemption request. The data flow is sized at one (1) byte to enable the preemption request to be sent. .

emergency_vehicle_number

This data flow is used within the Manage Emergency Services function and contains the number of vehicles of a particular type that are needed to respond to a particular incident. The data flow is sized at one (1) byte to enable a maximum of 255 vehicles to be requested for a particular emergency incident. .

emergency_vehicle_operational_data

This data flow is sent from the manage Emergency Services function to the Plan System Deployment function. It contains information about the movements of emergency vehicles whilst attending incidents, and therefore shows the usage of green wave routes, the times at which the vehicles passed various points in the road and highway network etc. .

emergency_vehicle_pedestrian_preemption

This data flow is sent from the Manage Emergency Services function to the Manage Traffic function and contains data necessary for an emergency services vehicle to be given preemption (priority) at an indicator that is particular set of pedestrian signals. The data flow is sent directly from the emergency vehicle to the pedestrian controller, which is assumed to be capable of giving priority to the correct phase. The data flow is sized at one (1) byte to enable the preemption request to be sent. .

emergency_vehicle_preemptions

This data flow is sent by the Manage Emergency Services function to the Manage Traffic function. It contains the data necessary for an individual emergency services vehicle and the stream of traffic in which the vehicle is traveling to be given preemption (priority) at an indicator controller. This will be at the controller for a particular road junction, pedestrian crossing, or highway entrance ramp. The data is sent directly from the emergency vehicle to the next controller along its route and therefore is not subject to any centralized coordination. Local coordination may be provided if there are links between adjacent controllers. The data flow consists of the following data items each of which is defined in its own DDE:

emergency_vehicle_junction_preemption
+ emergency_vehicle_pedestrian_preemption
+ emergency_vehicle_ramp_preemption

+ emergency_vehicle_sign_preemption.

emergency_vehicle_ramp_preemption

This data flow is sent by the Manage Emergency Services function to the Manage Traffic function. It contains the data necessary for a emergency services vehicle to be given preemption (priority) at an indicator that is particular set of highway entry ramp control signals. The data flow is sent directly from the emergency vehicle to the ramp controller, which is assumed to be capable of giving priority to the correct ramp or lane if multiple ramps or lanes are involved. .

emergency_vehicle_route

This data flow is sent from the Manage Emergency Services function to the Manage Traffic function. It contains details of the emergency vehicle's route and is used to trigger a special green wave route for the emergency vehicle. The data flow consists of the following items each of which is described in its own DDE:

route
+ emergency_request
+ vehicle_identity.

emergency_vehicle_route_request

This data flow is used by the Manage Emergency Services function to request a dynamic route for an
emergency vehicle. It contains the following data items each of which is defined in its own DDE:

trip_request
+ vehicle_identity
+ emergency_request.

emergency_vehicle_sign_preemption

This data flow is sent from the Manage Emergency Services function to the Manage Traffic function and contains data necessary for an emergency services vehicle to have a message output giving it preemption (priority) at an indicator that is a particular variable message sign (vms) or fixed message sign that has a transit priority message that can be displayed. The data flow is sent directly from the emergency vehicle to the sign controller and may consist of either a single alphanumeric character that will enable the sign controller to output the correct message from its list of known messages, or a string of up to twenty (20) alphanumeric characters for a controller driving a vms. .

emergency_vehicle_status_code

This data flow is used within the Manage Emergency Services function to report the status of an emergency vehicle. This status will reflect its current operating condition and will determine such things as its availability to repond to emergencies, and its current activity in response to an emergency. A two (2) byte code has been assumed in the sizing estimate to enable reportable
situations such as the following to be accommodated:

AE - at emergency
DI - disabled (poosibly due to its own involvement in an incident)
GE - going to emergency
NA - not available
RA - requires assistance (additional resource needed)
RE - returning from emergency
RS - requires servicing (maintenance)
SH - at station house. .

emergency_vehicle_status_data

This data store is used within the Manage Emergency Services function. It contains details of the status reports for emergency vehicles consisting of a predefined status code, the vehicle location and a time and date stamp. The sizing estimate below is based on the assumed number of emergency vehicles (ERMS_VEHS). The data flow consists of the

following data items each of which is defined in its own DDE:

list_size
+ list_size{emergency_vehicle_status_details}.

emergency_vehicle_status_data_change

This data flow is used within the Manage Emergency function and contains a status report for a single emergency vehicle. This will have been changed as a result of the vehicle having been selected for dispatch. The data flow consists of the following data item which is defined in its own DDE:

emergency_vehicle_status_details.

emergency_vehicle_status_data_for_assessment

This data flow is used within the Manage Emergency Services function and represents a a status report for a single emergency vehicle. The data will be used to analyze the response status based on new input from the emergency vehicle driver. It consists of the following data item which is defined in its own DDE.

emergency_vehicle_status_details.

emergency_vehicle_status_data_for_dispatch

This data is used within the Manage Emergency function and contains a status report for a single emergency vehicle. It is used as further information about the vehicle by the process responsible for vehicle dispatch. The data flow consists of the following data item which is defined in its own DDE:

emergency_vehicle_status_details.

emergency_vehicle_status_data_for_priority

This data is used within the Manage Emergency function and contains a status report for a single emergency vehicle. It is used to enable the vehicle to gain priority at traffic intersections, ramps, etc. when on its way to an emergency incident. The data flow consists of the following data item which is defined in its own DDE:

emergency_vehicle_status_details.

emergency_vehicle_status_data_for_responses

This data is used within the Manage Emergency Services function and represents a current status report for a single emergency vehicle. The data will be used to determine which vehicles are available and can be allocated to respond to a particular emergency. The data flow consists of the following data item which is defined in its own DDE:

emergency_vehicle_status_details.

emergency_vehicle_status_data_needed

This data flow is used within the Manage Emergency function and contains a request for the current status of a specified emergency vehicle. This data will be updated using data provided by the vehicle's driver. The data flow consists of the following data item which is defined in its own DDE:

emergency_vehicle_identity.

emergency_vehicle_status_data_request

This data flow is used within the Manage Emergency function and contains a request for the current status of an emergency vehicle of a specified type. This data will be used to select the appropriate vehicle(s) to respond to an emergency. The data flow consists of the following data item which is defined in its own DDE:

emergency_vehicle_type.

emergency_vehicle_status_data_update

This data flow is used within the Manage Emergency function and contains a status report for a single emergency vehicle. This will have been updated as a result of a

status report having been received from the emergency vehicle driver. The data flow consists of the following data item which is defined in its own DDE:

emergency_vehicle_status_details.

emergency_vehicle_status_details

This data flow is used within the Manage Emergency Services function. It contains emergency vehicle status details comprising a predefined status code, the vehicle's tracking data and a time and date stamp. Note that the time and date stamp applies to the last time that the status code was updated, and not the vehicle tacking data, which carries its own time and date stamp showing when the location was last reported. The data flow consists of the following data items each of which is defined in its own DDE:

date
+ emergency_vehicle_identity
+ emergency_vehicle_status_code
+ emergency_vehicle_tracking_data
+ emergency_vehicle_type
+ incident_number
+ time.

emergency_vehicle_tracking_data

This data flow is within the Manage Emergency function and contains the current location of an emergency vehicle, together with the time and date to which the location applies. The data flow consists of the following data items each of which is defined in its own DDE:

date
+ time
+ vehicle_location_for_emergency_services.

emergency_vehicle_type

This data flow is used within the Manage Emergency Services function and contains the type code for an emergency vehicle. This is sized at three (3) bytes to enable a unique code to be applied to each type of vehicle. Examples of the types of vehicle that could be supported by the code are:

ABL - ambulance with no special equipment
APM - ambulance with paramedics and their equipment
ASS - ambulance for special services, e.g. mining disaster
FEP - a fire engine with its own pump
FWT - a fire engine which is a water tanker
FLT - a fire engine which is a ladder truck
PPC - police patrol car
PPV - police patrol van
TVH - tow vehicle, i.e. one that can tow another that will run on its own wheels
WRT - wrecking truck. .

enforcement_agency_address

This data flow is used within the Manage Emergency Services function and contains the full postal address (including zip code) of an enforcement agency. This is one of the agency details that is used in the processing of violations reported by other processes in the ITS function. It is stored as a string of up to 50 characters. .

enforcement_agency_allocations

This data item is used within the Manage Emergency Services function and defines the type (or types) or enforcement service required for a particular emergency incident. These may be as follows:

0 - none, cancel previous request
1 - police,
2 - SWAT,

3 - special police (transit authority, port authority, etc.). .

enforcement_agency_computer

This data flow is used within the Manage Emergency Services function and contains the computer telephone number of an enforcement agency. This number provides direct but password and encrypted access to a computer within an enforcement agency, and is one of the agency details that is used in the processing of violations reported by other processes in the ITS function. It is stored as a string of up to 10 characters. .

enforcement_agency_contact

This data flow is used within the Manage Emergency Services function and contains a character string that defines the method by which an enforcement agency shall be contacted with details of a violation. The character string is three (3) bytes long and may have one of the following entries to define the method:

eml - e-mail message
pst - postal service
tpn - voice based telephone call
tfx - fax

Only one method should be specified for each agency, the processes responsible for passing the data being able to report failure to communicate. .

enforcement_agency_details

This data flow is used within the Manage Emergency Services function and contains the details of the access points for an enforcement agency. These access points comprise addresses, telephone numbers, etc. through which the agency may be sent information on violations that have been detected elsewhere within the ITS function. Not all entries may be present, and as a minimum only one is needed. The details are contained in the following data items each of which is defined in its own DDE:

enforcement_agency_address
+ enforcement_agency_computer
+ enforcement_agency_email
+ enforcement_agency_fax
+ enforcement_agency_name
+ enforcement_agency_phone
+ enforcement_agency_responsibility.

enforcement_agency_email

This data flow is used within the Manage Emergency Services function and contains the e-mail address of an enforcement agency. This is one of the agency details that is used in the processing of violations reported by other processes in the ITS function. It is stored as a string of up to 30 characters. .

enforcement_agency_fax

This data flow is used within the Manage Emergency Services function and contains the telephone number of the fax line for an enforcement agency. This is one of the agency details that is used in the processing of violations reported by other processes in the ITS function. It is stored as a string of up to 10 characters. .

enforcement_agency_name

This data flow is used within the Manage Emergency Services function and contains the name of an enforcement agency. This is one of the agency details that is used in the processing of violations reported by other processes in the ITS function. It is stored as a string of up to 30 characters. .

enforcement_agency_phone

This data flow is used within the Manage Emergency Services function and contains the voice line telephone number of an enforcement agency. This is one of the agency details that is used in the processing of violations reported by other processes in the ITS function. It is stored as a string of up to 10 characters. .

enforcement_agency_responsibility

This data flow is used within the Manage Emergency Services function and contains the area for which a paarticular enforcement agency has responsibility. This is defined as a three character string, the characters signifying the area of responsibility in the following ways:

cv - commercial vehicles
tf - traffic (general, not tolls)
tfp - traffic tolls and parking
trp - transit fares (collection and payment).

Other character strings can be added to expand the areas of responsibility. .

enforcement_data_for_cv

This data store is used within the Manage Emergency Services function and contains details about the enforcement agency to which commercial vehicle violation data must be sent when it is received from processes in the Manage Commercial Vehicles function, and/or the State Department of Motor Vehicles (DMV) office from which vehicle registration data may be obtained. The details comprise the contacts (addresses, telephone numbers, fax numbers, e-mail addresses, etc.) for the enforcement agency and the DMV office, plus the method by which they should be contacted. The contact details will be stored in such a way that the actual violation data can be easily added to them before being sent to the enforcement agency. The data store contains the following data items each of which is defined in its own DDE:

enforcement_agency_contact
+ enforcement_agency_details
+ 1{state_contact_data}50.

enforcement_data_for_fare_payment

This data store is used within the Manage Emergency Services function and contains details about the contacts (addresses, telephone numbers, fax numbers, e-mail addresses, etc.) for an enforcement agency and the method by which it should be contacted. This is the agency to which data should be sent about each transit fare payment violation when it is received from the Provide Electronic Payment Services function. The contact details will be stored in such a way that the actual violation data can be easily added to them before being sent to the enforcement agency. The data store contains the following data items each of which is defined in its own DDE:

enforcement_agency_contact
+ enforcement_agency_details.

enforcement_data_for_parking

This data store is used within the Manage Emergency Services function and contains details about the enforcement agency to which parking lot violation data must be sent when it is received from processes in the Provide Electronic Payment Services function, and/or the State Department of Motor Vehicles (DMV) office from which vehicle registration data may be obtained. The details comprise the contacts (addresses, telephone numbers, fax numbers, e-mail addresses, etc.) for the enforcement agency and the DMV office, plus the method by which they should be contacted The contact details will be stored in such a way that the actual violation data can be easily added to them before being sent to the enforcement agency. The data store contains the following data items each of which is defined in its own DDE:

enforcement_agency_contact
+ enforcement_agency_details
+ 1{state_contact_data}50.

enforcement_data_for_roadside_fare_collection

This data store is used within the Manage Emergency Services function and contains details about the contacts (addresses, telephone numbers, fax numbers, e-mail addresses, etc.) for an enforcement agency and the method by which it should be contacted. This is the agency to which data should be sent about each transit fare violation that takes

place at the roadside, i.e. a transit stop, when it is received from the Manage Transit function. The contact details will be stored in such a way that the actual violation data can be easily added to them before being sent to the enforcement agency. The data store contains the following data items each of which is defined in its own DDE:

enforcement_agency_contact
+ enforcement_agency_details.

enforcement_data_for_TM

This data store is used within the Manage Emergency Services function and contains details about the contacts (addresses, telephone numbers, fax numbers, e-mail addresses, etc.) for up to two enforcement agencies and the method by which they should be contacted, plus details of the contacts at the state Department of Motor Vehicles offices (DMV's) from which vehicle registration data can be obtained. The enforcement agencies are those to which about each high occupancy vehicle (hov) lane and pollution violations should be sent when they are received from the Manage Traffic function. The contact details will be stored in such a way that the actual violation or vehicle license data can be easily added to them before being sent to the enforcement agency or the appropriate DMV. The data store contains the following data items each of which is defined in its own DDE:

1{enforcement_agency_contact
+ enforcement_agency_details}2
+ 1{state_contact_data}50.

enforcement_data_for_tolls

This data store is used within the Manage Emergency Services function and contains details about the enforcement agency(ies) to which toll violation data must be sent when it is received from processes in the Provide Electronic Payment Services function, and/or the State Department of Motor Vehicles (DMV) office from which vehicle registration data may be obtained. The details comprise the contacts (addresses, telephone numbers, fax numbers, e-mail addresses, etc.) for the enforcement agency and the DMV office and the method by which they should be contacted. The contact details will be stored in such a way that the actual violation data can be easily added to them before being sent to the enforcement agency. The data store contains the following data items each of which is defined in its own DDE:

enforcement_agency_contact
+ enforcement_agency_details
+ 1{state_contact_data}50.

enforcement_data_for_vehicle_fare_collection

This data store is used within the Manage Emergency Services function and contains details about the contacts (addresses, telephone numbers, fax numbers, e-mail addresses, etc.) for an enforcement agency and the method by which it should be contacted. This is the agency to which data should be sent about each transit fare collection violation that takes place on-board a transit vehicle, when it is received from the Manage Transit function. The contact details will be stored in such a way that the actual violation data can be easily added to them before being sent to the enforcement agency. The data store contains the following data items each of which is defined in its own DDE:

enforcement_agency_contact
+ enforcement_agency_details.

erms_incidents

This data flow is sent from the Manage Emergency Services function to the Manage Traffic function. It contains data about incidents and the priority requests needed by emergency vehicles. The data flow consists of the following data items each of which is defined in its own DDE:

emergency_vehicle_green_wave

+ emergency_vehicle_preemptions
+ incident_details
+ incident_response_status.

evaluation_request

This data flow is used within the Plan System Deployment fuction. It contains a request to run the evaluation process plus additional parameters. .

Additional sizing assumptions:

SIZE=48;

event_attendance_expected

This data flow is used within the Manage Traffic function to define the number of people expected to attend an event that has been registered as a possible incident by an Event Promoter. .

event_duration

This data flow is used within the Manage Traffic function to define the duration of an event that has been registered as a possible incident by an Event Promoter. .

Additional sizing assumptions:

SIZE=4;

event_location

This data flow is used within the Manage Traffic function to define the location of an event that has been registered as a possible incident by an Event Promoter.

location_identity.

event_name

This data flow is used within the Manage Traffic function to define the name of an event that has been registered as a possible incident by an Event Promoter. .

Additional sizing assumptions:

SIZE=64;

event_start_time

This data flow is used within the Manage Traffic function to define the start time of an event that has been registered as a possible incident by an Event Promoter. .

Additional sizing assumptions:

SIZE=4;

existing_sensor_static_data

This data flow is used within the Manage Traffic fucntion. It contains a copy of the current contents of the store of static data used in the processing of data received from traffic sensors. It consists of the following data item which is defined in its own DDE:

static_data_for_sensor_processing.

fare_collection_roadside_violation_information

This data is used by the Manage Transit function to send data about a violator of the transit fare collection processes at the roadside, i.e. a transit stop to the Manage Emergency Services function. This data flow will contain a digitized video image of the transit user who is trying to violate the fare collection process at the roadside. It is assumed that this digitized data will include other data such as date and time, plus camera identity from which the roadside (transit stop) location can be determined. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ transit_route_segment_number
+ transit_user_roadside_image
+ transit_user_roadside_tag_identity.

fare_collection_vehicle_violation_information

This data is used by the Manage Transit function to send data about a violator of the transit fare collection processes on-board the vehicle to the Manage Emergency Services function. This data flow will contain a digitized video image of the transit user who is trying to violate the fare collection process on-board a vehicle. It is assumed that

this digitized data will include other data such as date and time, plus camera identity from which the transit vehicle identity can be determined. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ transit_route_segment_number
+ transit_user_vehicle_image
+ transit_user_vehicle_tag_identity.

fare_payment_violator_data

This data flow is used within the Provide Electronic Payment Services function and contains data about a transit fare payment transaction that was attempted but did not work. It consists of the data items shown below, each of which is defined in its own DDE. For each particular set of data some of the data items may be blank depending on the reason(s) for which the transaction did not work.

credit_identity
+ transit_fare.

fare_violation_information

This data is used by the Provide Electronic Payment Services functions to send data about a violator of the transit fare collection processes to the Manage Emergency Services function. This data will contain a digitized video image of the traveler trying to violate the toll collection process, plus information about the transit fare and the vehicle or roadside location from which payment was being attempted. The data flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ transit_fare
+ transit_route_number
+ transit_route_segment_number
+ transit_route_use_time
+ transit_user_category
+ transit_user_roadside_image
+ transit_user_vehicle_image
+ traveler_identity.

fbv_brake_servo_response

This data flow is sent from the basic vehicle to the Provide Vehicle Monitoring and Control function. It contains analog input which indicates that the vehicle's brake has been moved. .

fbv_crash_sensor_data

This data flow is sent from the basic vehicle to the Provide Vehicle Control and Monitoring function. It contains analog data from on-board vehicle sensors and consists of information which shows whether the vehicle has been involved in a collision producing a front impact, a left side impact, a right side impact, or a rear impact, plus details of the collision extent and passenger injuries. Size is 4 bytes per sensor with 8 sensors. .

fbv_diagnostics_data

This data flow is sent from the basic vehicle to the Provide Vehicle Control and Monitoring function and contains data from on-board vehicle diagnostics functions from which the vehicle's operational status can be determined. Size is 4 bytes per function with 8 functions. .

fbv_driver_safety_status

This data flow is sent from the basic vehicle to the Provide Vehicle Control and Monitoring function and contains sensor data from which the following can be determined:

driver_state - the ability of the driver to control the vehicle, negative factors being such things as alcohol on the breath, too many mistakes, etc.

injuries - any detectable problems with the vehicle occupants, e.g. sudden change in heart rate, pulse,
breathing, etc.
Size is 4 bytes per sensor with 8 sensors. .

fbv_steering_servo_response

This data flow is sent from the basic vehicle to the Provide Vehicle Monitoring and Control function. It contains analog input which indicates that the vehicle's steering has been moved. .

fbv_throttle_servo_response

This data flow is sent from the basic vehicle to the Provide Vehicle Monitoring and Control function. It contains analog input which indicates that the contains analgue input which indicates that the throttle has been moved. .

fbv_vehicle_attitude_data

This data flow is sent from the basic vehicle to the Provide Vehicle Monitoring and Control function and contains data obtained from on-vehicle sensors indicating the vehicle's attitude, i.e. right-way up (normal), upside-down, on its side, etc. Size is 4 bytes per sensor. .

fbv_vehicle_characteristics

This data flow is sent from the basic vehicle to the Provide Electronic Payment Services function. It is an analog flow that is processed by sensors and used to identify a particular vehicle and its characteristics, such as the number of wheels, size, etc., for toll payment and parking lot charging purposes. The size assumption stated below is based on an equivalent digital size for loading estimation purposes. .

fbv_vehicle_condition

This data flow is sent from the basic vehicle to the Provide Vehicle Monitoring and Control function and contains analog data about the vehicle's current condition from which its suitability for operation on automatic highway system (ahs) lanes can be determined. This flow would be made up of the following components:
brake_condition
+ drive_train_condition
+ forward_sensors_condition
+ rear sensors_condition
+ side_sensors_condition
+ steering_condition
+ vehicle_procoessor_condition
+ fuel_level_condition
+ tire_wear_and_pressure_condition
+ vehicle_external_communication_condition
+ vehicle_internal_communication_condition.
Size is 4 bytes per element times 11 elements. .

fbv_vehicle_headway

This data flow is sent from the basic vehicle to the Provide Vehicle Control and Monitoring function. It contains on-board vehicle sensor input from which the distance between the vehicle and the one in front (headway) can be computed. .

fbv_vehicle_identity

This data flow is sent from the basic vehicle to the Manage Traffic and the Provide Vehicle Monitoring and Control functions. It contains the identity of the vehicle from which other data such as ownership, vehicle type, plus data from the Department of Motor Vehicles (DMV) can be obtained. .

fbv_vehicle_lane_position

This data flow is sent from the basic vehicle to the Provide Vehicle Control and Monitoring function. It contains analog data from on-board vehicle sensors input from which the vehicle's position within a lane can be computed. Size is 4 bytes per sensor times 4 sensors. .

fbv_vehicle_motion_data

This data flow is sent from the basic vehicle to the Provide Vehicle Monitoring and Conrol function and contains analog data obtained from on-vehicle sensors indicating whether the vehicle is moving in a forward, sideways, or backwards, or in any combined direction. Size is 4 bytes per sensor times 4 sensors. .

fbv_vehicle_on_ahs_lane

This data flow is sent from the basic vehicle to the Provide Vehicle Control and Monitoring function. It contains analog sensor input from which the the type of automatic highway system (ahs) lane (if any) in which the vehicle is traveling can be computed. Size is 4 bytes per sensor times three sensors. .

fbv_vehicle_proximity_data

This data flow is sent from the basic vehicle to the Provide Vehicle Monitoring and Control function and contains analog data obtained from on-vehicle sensors including but not limited to those covering headway, i.e. distance between vehicle and the next vehicle in front, lateral distance, i.e. the distance between the vehicle and any objects on either side, and rear distance. Size is 4 bytes per sensor times 4 sensors. .

fbv_vehicle_safety_status

This data flow is sent from the basic vehicle to the Provide Vehicle Control and Monitoring function and contains analog data from on-board vehicle sensors from which the extent of a vehicles collision damage can be determined. Size is 4 bytes per sensor times 8 sensors. .

fbv_vehicle_speed

This data flow is sent from the basic vehicle to the Provide Vehicle Control and Monitoring function. It contains analog data from on-board vehicle sensors from which the vehicle's speed can be computed. .

fci_credentials_data_request

This data flow is sent from the commercial vehicle roadside facility inspector to the Manage Commercial Vehicles function. It contains a request for the output of the credentials data for a particular combination of carrier, vehicle and driver. .

fci_inspection_data_input

This data flow is sent from the commercial vehicle roadside facility inspector to the Manage Commercial Vehicles function. It contains data about a commercial vehicle inspection that can only be supplied by the inspector. .

fci_pull_in_action

This data flow is sent from the commercial vehicle roadside facility inspector to the Manage Commercial Vehicles function. It contains an override of the pull-in or pass decision made as a result of the safety or preclearance processing for a commercial vehicle. .

fci_request_log_report

This data flow is sent from the commercial vehicle roadside facility inspector to the Manage Commercial Vehicles function. Itcontains a request for a part of the commercial vehicle roadside facility log to be output to its operator. .

fci_safety_data_request

This data flow is sent from the commercial vehicle roadside facility inspector to the Manage Commercial Vehicles function. It contains a request for output of the safety data for a particular carrier, driver and vehicle being held in the commercial vehicle roadside facility safety database. .

fci_start_inspection

This data flow is sent from the commercial vehicle inspector to the Manage Commercial Vehicles function and represents the roadside commercial vehicle inspectors' initiation of a vehicle inspection. The size assumption is based on some form of electronic signature of an authorized inspector. .

fcm_fault_clearance

This data flow is sent from the construction and maintenance terminator to the Manage Traffic function. It contains a report showing that a particular fault in an indicator has been cleared and that it has been restored to normal operation. .

fcm_incident_information

This data flow is sent from the construction and maintenance terminator to the Manage Traffic function. It contains information about an incident that is about to be created by the proposed start of road maintenance activity which will affect the flow of traffic on one or more lanes of a road or highway. Information contained is location, number of lanes closed, and duration of closure. .

fcv_brake_condition

This data flow is used within the Manage Commercial Vehicle function. It contains analog data from on-board commercial vehicle sensors from which the current condition of the vehicle's brakes can be determined. .

fcv_cargo_data

This data flow is sent from the basic vehicle to the Providde Vehicle Monitoring and Control function. It contains sensor input from which the following can be determined:

cargo_type - solid, liquid, powder, flammable liquid, livestock, etc.,

cargo_hazmat - details of the HAZMAT designation (if any) for the cargo,

cargo_weight - the actual weight of the cargo including its packaging, i.e. what weight the vehicle is actually carrying,

cargo_packaging - the type of container in which the cargo is held, e.g. closed ISO container, tank, open container, refrigerated container, etc.

Size is 4 bytes per cargo element. .

fcv_cargo_safety_status

This data flow is used within the Manage Commercial Vehicle function. It contains analog data from on-board commercial vehicle sensors from which the current condition of the vehicle's cargo can be determined. The data flow has been sized at 4 bytes per sensor with 4 sensors, giving a total of sixteen (16) bytes. .

fcv_distance_travelled

This data flow is used within the Manage Commercial Vehicle function. It contains data from on-board commercial vehicle sensors from which the total distance travelled by the vehicle (miles) can be determined. .

fcv_driver_safety_status

This data flow is used within the Manage Commercial Vehicle function. It contains data which on-board commercial vehicle sensors can use to determine the following:

driver_state - the ability of the driver to control the vehicle, negative factors being such things as alcohol on the breath, too many mistakes, etc.

injuries - any detectable problems with the vehicle occupants, e.g. sudden change in heart rate, pulse, breathing, etc.

The data flow has been sized at 4 bytes per sensor with 8 sensors, giving a total of thrity two (32) bytes. .

fcv_driver_status

This data flow is used within the Manage Commercial Vehicle function. It contains analog data from on-board commercial vehicle sensors from which the current driver status can be determined. .

fcv_lock_tag_data

This data flow is sent from a commercial vehicle to the Manage Commercial Vehicles function. It contains the current status of the lock tag that is used to control access to commercial vehicle cargos that are being taken across borders, and is sent in response to an earlier request. .

fcv_vehicle_characteristics

This data flow is used within the Manage Commercial Vehicles function and represents

vehicle characteristics that are sensed at a commercial vehicle roadside checking facility. This data may be acquired by sensors from the vehicle either electronically, optically, or manually and will include data such as weight, size, number of axles, use of trailor, etc. The size assumption stated below is based on an equivalent digital size for loading estimation purposes. .

fcv_vehicle_safety_status

This data flow is used within the Manage Commercial Vehicle function. It contains analog data from on-board commercial vehicle sensors from which the extent of a vehicle's collision damage can be determined. .

fcv_weight

This data flow is used within the Manage Commercial Vehicle function. It contains analog data from on-board commercial vehicle sensors from which the vehicle's gross weight can be determined in tons (US). Size is 4 bytes per sensor, with two sensors. .

fcvd_activity_request

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains an activity number which may be one of the following:

1 - request route,
2 - request preclearance,
3 - store route,
4 - provide list of stored routes
5 - display route details
6 - delete route.

Values of three (3) and four (4) must be accompanied by a route number. .

fcvd_carrier_number

This data flow is sent from the commercial vehicle driver to the Manage Commecial Vehicles function and contains the commercial vehicle carrier identification number to be entered into the commercial vehicle's tag data store. .

fcvd_driver_data_input

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and includes the driver's log data as required by state and federal agencies as well as requested data for the previously input data type. This data is to be used by the on-board vehicle data collection system. .

fcvd_driver_general_message

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains a general message for output to the commercial vehicle fleet manager as part of the on-board vehicle data. Its size will be restricted in a way that will depend upon the mechanism by which the data is input, e.g. time (1 minute?) for voice input, number of characters (512?) for typed input. .

fcvd_driver_input_type

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains an indication of the type of data that the driver wants to input to the on-board vehicle data collection system. This type may be one of the following:

1 - cargo_data,
2 - repairs and service records,
3 - inpsection and maintenance data,
4 - fuel purchase data,
5 - driver identity,
6 - driver_credentials,
7 - driver_license_citations,
8 - carrier_identity,
9 - data_store_contents. .

fcvd_driver_number

This data flow is sent from the commercial vehicle driver to the Manage Commecial Vehicles function and contains the commercial vehicle driver identification number to be entered into the commercial vehicle's tag data store. .

fcvd_enrollment_payment_request

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains a request for payment of the taxes and duties needed to cover the enrollment of a particular class of vehicle and cargo at a particular weight on a particular route. The data will include the account number from which the costs are to be deducted (12 bytes) and the route number (4 bytes) to which they apply. Drivers will make this request because they are acting on the role of their own fleet managers, i.e. they will be owner drivers. .

fcvd_enrollment_request

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains a request for the enrollment of a particular class of vehicle (1 byte) and cargo (2 bytes) at a particular weight (6 bytes) on a particular route (4 bytes). Drivers will make this request because they are acting on the role of their own fleet managers, i.e. they will be owner/operators. .

fcvd_other_data_input

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains the response to an earlier request for input of other data. Drivers will make this request because they are acting on the role of their own fleet managers, i.e. they will be owner drivers. .

fcvd_request_routing_instructions

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains a request for instructions on which route to take and any cargo that must be picked up or dropped off at the origin, destination and/or intermediate points along the route. This data does not include any route guidance instructions as the driver will be able to obtain this data through the Provide Driver and Traveler Services function when the route origin, destination and intermadiate points are known. .

fcvd_request_tag_data_output

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function. It contains a request for the output of the current data that is stored on a commercial vehicle's two tag. Only the data that can be written by the manager is output. .

fcvd_route_data

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains data input in response to a previous request for the input of route data. Drivers will make this request because they are acting on the role of their own fleet managers, i.e. they will be owner drivers. .

fcvd_route_request

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains a request for a route to be provided. Drivers will make this request because they are acting on the role of their own fleet managers, i.e. they will be owner drivers. .

fcvd_trip_identity

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains the commercial vehicle trip identification number to be entered into the vehicle's tag data store. .

fcvd_vehicle_number

This data flow is sent from the commercial vehicle driver to the Manage Commecial Vehicles function and contains the commercial vehicle identification number to be entered into the commercial vehicle's tag data store. .

fcvm_carrier_number

This data flow is sent from the commercial vehicle manager to the Manage Commecial Vehicles function and contains the commercial vehicle carrier identification number to

be entered into the vehicle's tag data store. .

fcvm_driver_number

This data flow is sent from the commercial vehicle manager to the Manage Commecial Vehicles function and contains the commercial vehicle driver identification number to be entered into the vehicle's tag data store. .

fcvm_enrollment_payment_request

This data flow is sent from the commercial vehicle manager to the Manage Commercial Vehicles function and contains a request for payment of the taxes and duties needed to cover the enrollment of a particular class of vehicle and cargo at a particular weight on a particular route. The data will include the account number (12 bytes) from which the cost of the taxes and duties are to be deducted and the route number (4 bytes) to which they apply. Commercial vehicle drivers will make this request because they are acting on the role of their own fleet managers, i.e. they will be owner drivers. .

fcvm_enrollment_request

This data flow is sent from the commercial vehicle manager to the Manage Commercial Vehicles function and contains a request for the enrollment of a particular class of vehicle and cargo at a particular weight on a particular route. .

fcvm_other_data_input

This data flow is sent from the commercial vehicle manager to the Manage Commecial Vehicles function and contains the response to a previous request for other data to be input for use within the function. Commercial vehicle drivers will make this request because they are acting in the role of their own fleet managers, i.e. they will be owner drivers. .

fcvm_preclearance_data

This data flow is sent from the commercial vehicle manager to the Manage Commecial Vehicles function and contains input data defining the route (4 bytes) and vehicle identity (16 bytes) for which preclearance is required. .

fcvm_request_driver_route_instructions

This data flow is sent from the commercial vehicle manager to the Manage Commecial Vehicles function and contains a request for the data that defines the route that the commercial vehicle driver is to follow and/or details of cargo to be picked up and/or dropped at the origin, destination or intermediate points. .

fcvm_request_on_board_vehicle_data

This data flow is sent from the commercial vehicle manager to the Manage Commecial Vehicles function. It contains a request for the data that has been obtained from the store of safety and trip related data on-board a commercial vehicle. .

fcvm_request_tag_data_output

This data flow is sent from the commercial vehicle mamager to the Manage Commercial Vehicles function. It contains a request for the output of the current data that is stored on a commercial vehicle's tag. Only the data that can be written by the manager is output. .

fcvm_roadside_activity_report_request

This data flow is sent from the commercial vehicle manager to the Manage Commecial Vehicles function. It contains a request for output of the commercial vehicle roadside checkstation facility logs, showing the activities of a particular carrier, driver and vehicle combination. The request may be for a one time report or for the report to be produced periodically. .

fcvm_route_data

This data flow is sent from the commercial vehicle manager to the Manage Commecial Vehicles function and contains input defining the requested commercial vehicle route data, e.g. origin, destination, preferences, constraints, etc. .

fcvm_route_function_request

This data flow is sent from the commercial vehicle manager to the Manage Commecial Vehicles function. It contains an acitivity number for facilities within the function, which may be one of the following:

1 - request route,
2 - request preclearance,
3 - store route,
4 - provide list of stored routes
5 - display route details
6 - delete route.

Values of three (3) and four (4) must be accompanied by a route number. .

fcvm_trip_identity

This data flow is sent from the commercial vehicle manager to the Manage Commercial Vehicles function and contains the commercial vehicle trip identification number to be entered into the vehicle's tag data store. .

fcvm_update_driver_route_instructions

This data flow is sent from the commercial vehicle manager to the Manage Commecial Vehicles function and contains changes or additions to the data defining the route that the driver is to follow and/or details of cargo to be picked up and/or dropped at the origin, destination or intermediate points. .

fcvm_vehicle_number

This data flow is sent from the commercial vehicle manager to the Manage Commercial Vehicles function and contains the commercial vehicle's identification number to be entered into the vehicle's tag data store. .

fcvoir_request_for_information

This data flow is sent from the commercial vehicle information requester to the Manage Commercial Vehicles function. It contains a request for commercial vehicle operations information such as carrier or vehicle information for use by an organization such as an insurance underwriter. The size estimate below is based on a coded request to execute a standardized query. .

fd_activate_vehicle_control

This data flow is sent from the driver to the Provide Driver and Traveler Services function and is used by a vehicle driver to activate automatic control of the vehicle. The size assumption below allows for some form of electronic signature to be automatically included. .

fd_emergency_request

This data flow is sent from the driver and to the Provide Driver and Traveler Services function. It consists of the following items :

medical_services_required - please send medical assistance;

other_vehicle_damage_crash - a crash has occurred involving other vehicles;

minor_property_damage_only_crash - a crash has occurred which only involves minor property damage;

breakdown - the vehicle has broken down;

security_alarm - driver in danger, please send emergency services;

cancel - cancel any previous emergency request.

Several items may be sent simultaneously with the exception of the last one which will be sent on its own. The size assumption below is intended to allow for some form of electronic signature. .

fd_guidance_data

This data flow is input by a driver to the Provide Driver and Traveler Services function and contains data requested so that a vehicle route can be determined for which

on-line guidance can be provided. .

fd_guidance_map_update_request

This data flow is sent from the driver to the Provide Driver and Traveler Services function and contains a request for an update of the digitized map data used to provide on-line vehicle guidance. .

fd_guidance_request

This data flow is sent from the driver to the Provide Driver and Traveler Services function. It contains a request to provide on-line guidance of the driver's vehicle and specifies a choice of the type of prefered guidance, i.e. infrastructure based dynamic, autonomous with link journey and queue times provided from the infrastructure, and totally autonomous. The driver will be prompted for further data in order that the guidance can begin. .

fd_guidance_route_accepted

This data flow is sent from the driver to the Provide Driver and Traveler Services function. It contains acceptance of the route that has been generated in response to a previous request from the driver for on-line guidance. Guidance will not begin until the acceptance has been received. .

fd_other_services_parking_request

This data flow is input from a driver to the Provide Driver and Traveler Services function and contains a request for additional services other than simple parking lot charge collection. These may comprise advanced payment of fares, parking lot charges, or toll charges. .

fd_other_services_toll_request

This data flow is input from a driver to the Provide Driver and Traveler Services function and contains a request for additional services other than simple toll collection. These services may comprise advanced payment of fares, parking lot charges, or toll charges. The information provided by the driver must include sufficient information for the parking lot charge and/or transit fare to be determined. .

fd_request_advisory_information

This data flow is sent from the driver to the Provide Driver and Traveler Services function and contains input from the driver specifying the type of advisory display required or to be disabled. .

fdmv_cv_violation_state_identity

This data flow is sent from the department of motor vehicles to the Manage Emergency Services function and contains the identity of the state that is supplying the requested vehicle registration data to enable a commercial vehicle credential filing or tax payment violation to be processed. .

fdmv_cv_violation_vehicle_registration

This data flow is sent from the department of motor vehicles to the Manage Emergency Services function and contains the requested vehicle registration data to enable a commercial vehicle credential filing or tax payment violation to be processed. .

fdmv_parking_lot_violation_state_identity

This data flow is sent from the department of motor vehicles to the Manage Emergency Services function and contains the identity of the state that is supplying the requested vehicle registration data to enable a parking lot payment violation to be processed. .

fdmv_parking_lot_violation_vehicle_registration

This data flow is sent from the department of motor vehicles to the Manage Emergency Services function and contains the requested vehicle registration data to enable a parking lot payment violation to be processed. .

fdmv_toll_violation_state_identity

This data flow is sent from the department of motor vehicles to the Manage Emergency Services function and contains the identity of the state that is supplying the requested vehicle registration data to enable a toll payment violation to be

processed. .

fdmv_toll_violation_vehicle_registration

This data flow is sent from the department of motor vehicles to the Manage Emergency Services function and contains the requested vehicle registration data to enable a toll payment violation to be processed. .

fdmv_traffic_violation_state_identity

This data flow is sent from the department of motor vehicles to the Manage Emergency Services function and contains the identity of the state that is supplying the requested vehicle registration data to enable a high occupancy vehicle (hov) lane or pollution violation to be processed. .

fdmv_traffic_violation_vehicle_registration

This data flow is sent from the department of motor vehicles to the Manage Emergency Services function and contains the requested vehicle registration data to enable a high occupancy vehicle (hov) lane or pollution violation to be processed. .

fe_area_pollutant_levels

This data flow is used within the Manage Traffic function. It contains analog data from which sensors within ITS can determine the actual levels of various atmospheric pollutants, such as nitrous oxide, sulphur dioxide, hydrocarbons, carbon monoxide and ozone, that are generally present within a particular geographic area. They are therefore really background levels of pollutants that are not due to any particular sources such as road traffic. The sizing assumption below is based on an estimate of the digitized equivalent information. .

fe_roadside_pollutant_levels

This data flow is used within the Manage Traffic function. It contains analog data from which sensors can determine the actual levels of various atmospheric pollutants, such as nitrous oxide, sulphur dioxide, hydrocarbons, carbon monoxide and ozone, that are generally present at the roadside. The sizing assumption below is based on an estimate of the digitized equivalent information. .

fea_cv_enforcement_agency_response

This data flow is sent from the enforcement agency to the Manage Commercial Vehicles function. It contains the response from an enforcement agency to the previous request for data from the commercial vehicle administration facility. The size estimate below is based on a coded response to a standardized query.

feedback_actuator_response

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains feedback of the response from various on-board vehicle actuators and consists of the following data itens each of which is defined in its own DDE:

manual_brake_input_detected
+ manual_steering_input_detected
+ manual_throttle_input_detected.

feedback_actuator_status

This data flow is used withhin the Provide Vehicle Monitoring and Control function and contains the current status of and the result of the Built In Self Test (BIST) processing. The status is set to zero for manual input detected and one (1) for normal operation. The BIST result is set to zero (0) for a pass or (999) for a failure. .

feedback_change_lane_servo_status

This data flow is used within the Provide Driver Monitoring and Control function. It contains the current status of and the result of the Built In Self Test (BIST) processing. The BIST result is set to zero (0) for a pass and (999) for a failure. .

feedback_headway_servo_status

This data flow is used within the Provide Driver Monitoring and Control function. It contains the current status of and the result of the Built In Self Test (BIST) processing. The BIST result is set to zero (0) for a pass and (999) for a failure. .

feedback_lane_servo_status

This data flow is used within the Provide Driver Monitoring and Control function. It

contains the current status of and the result of the Built In Self Test (BIST) processing. The status is set to zero for manual input detected and one (1) for normal operation. The BIST result is set to zero (0) for a pass and (999) for a failure. .

feedback_platoon_status

This data flow is used within the Provide Driver Monitoring and Control function. It contains the current status of, and the result of the Built In Self Test (BIST) processing. The status is set to zero for manual input detected, one (1) for normal operation and (999) if the vehicle or driver is unsafe. The BIST result is set to zero (0) for a pass or (999) for a failure. .

feedback_sensor_status

This data flow is used within the Provide Driver Monitoring and Control function. It contains the current status of and the result of the Built In Self Test (BIST) processing The status is set to zero for manual input detected and one (1) for normal operation. The BIST result is set to zero (0) for a pass or (999) for a failure. .

feedback_servo_status

This data flow is used within the Provide Driver Monitoring and Control function. It is a combination of all the status and Built In Self Test (BIST) result flows from the four servo control processes. It consists of the following data items each of which is defined in its own DDE:

feedback_speed_servo_status
+ feedback_headway_servo_status
+ feedback_lane_servo_status
+ feedback_change_lane_servo_status.

feedback_speed_servo_status

This data flow is used within the Provide Driver Monitoring and Control function. It contains the current status of and the result of the Built In Self Test (BIST) processing. The status is set to zero for manual input detected and one (1) for normal operation. The BIST result is set to zero (0) for a pass and (999) for a failure. .

fep_event_information

This data flow is sent from the event promoters terminator to the Manage Traffic function and contains details of a special event that way become a possible incident due to its impact on the traffic flowing on one or more lanes of a road or highway. .

ferry_services_costs

This data flow is used within the Provide Driver and Traveler Services function and contains details of the costs for a traveler's use of the services provided by ferry operators that may be suitable for use by a traveler as part of a proposed trip. The data flow is sized to enable the costs of up to eight (8) different services to be included, all on the same route. The data flow consists of the following data item which is defined in its own DDE:

8{cost}.

ferry_services_destination

This data flow is used within the Provide Driver and Traveler Services function. It contains the destination of the ferry service(s) that are the closest fit with a traveler's proposed trip plan. This destination may be different to that provided in the intermodal services request as it will be a ferry port, rather than a town, or other geographic point. It may also not be the destination of the service operated by the ferry company as the traveler may be leaving at some intermediate point. The data flow consists of the following data item which is defined in its own DDE:

route_point.

ferry_services_destination_arrival_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a ferry arrives the destination point for ferry services in a traveler's trip plan. This destination may not be the actual final destination of the

service operated by the ferry, because the traveler may be leaving at some intermediate point along its route. The service will be a close fit with a traveler's proposed trip plan. The data flow consists of the following data item which is defined in its own DDE:

time.

ferry_services_details

This data flow is used within the Provide Driver and Traveler Services function and contains details of the services provided by ferry operators that may be suitable for use by a traveler as part of a proposed trip. It consists of the following data items each of which is defined in its own DDE:

ferry_services_costs
+ ferry_services_routes
+ ferry_services_schedules.

ferry_services_intermediate_arrival_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a ferry arrives at an intermediate point on the part of a traveler's route to be provided by this type of service. Up to two (2) of these intermediate points are allowed as part of a particular ferry service. These two points are those at which the traveler has to change from one ferry to another, or has a significant stop over time. There may be other intermediate points on the route operated by the ferry service, but they are ignored because the traveler is expected to do nothing other than remain on-board the ferry. The route will be that which provides a service that is a close fit to the requirements of the traveler's proposed trip. The data flow consists of the following data item which is defined in its own DDE:

time.

ferry_services_intermediate_depart_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a ferry departs from an intermediate point on the part of a traveler's route to be provided by this type of service. Up to two (2) of these intermediate points are allowed as part of a particular ferry service. These two points are those at which the traveler has to change from one ferry to another, or has a significant stop over time. There may be other intermediate points on the route operated by the ferry service, but they are ignored because the traveler is expected to do nothing other than remain on-board the ferry. The route will be that which provides a service that is a close fit to the requirements of the traveler's proposed trip. The data flow consists of the following data item which is defined in its own DDE:

time.

ferry_services_intermediate_point

This data flow is used within the Provide Driver and Traveler Services function. It contains the location of an intermediate point on a route operated by a ferry company. Up to two (2) of these intermediate points are allowed as part of a particular service and they will all be the locations of ferry ports. They will be places at which the traveler will have to change from one ferry to another, or where the ferry schedule has a significant stop over time. All other stops on the ferry service will ignored. The ferry's route will be that which provides the service that is a close fit to the requirements of the traveler's proposed trip. The data flow consists of the following data item which is defined in its own DDE:

route_point.

ferry_services_origin

This data flow is used within the Provide Driver and Traveler Services function. It contains the origin of the ferry service(s) that are the closest fit with a traveler's proposed trip plan. This origin may be different to that provided in the intermodal

services request as it will be a ferry port, rather than a town, or other geographic point. It may also not be the origin of the service operated by the ferry company as the traveler may be joining it at some intermediate point. The data flow consists of the following data item which is defined in its own DDE:

route_point.

ferry_services_origin_depart_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a ferry leaves the origin point for ferry services in a traveler's trip plan. This origin may not be the actual origin of the ferry service because the traveler may be joining at some intermediate point along its route. The service will be a close fit with a traveler's proposed trip plan. The data flow consists of the following data item which is defined in its own DDE:

time.

ferry_services_route_details

This data flow is used within the Provide Driver and Traveler Services function. It contains details of a ferry route that will suit a traveler's proposed trip and is associated with a cost and a schedule. The route may have up to two (2) intermediate points at which the services calls, and at which the traveler may have to change from one ferry to another. There may be other intermediate points on the flight but these are of no concern to the traveler. The data flow consists of the following data items each of which is defined in its own DDE:

ferry_services_origin
+ 2{ferry_services_intermediate_point}
+ ferry_services_destination.

ferry_services_routes

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the routes served by ferry operators. These may be suitable for use by a traveler as part of a proposed trip. The data flow is sized to enable one route to be provided. It consists of the following data item which is defined in its own DDE:

ferry_services_route_details.

ferry_services_schedule_details

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the departure and arrival times at places along a ferry route that will suit a traveler's proposed trip and is associated with a cost and a route. The route may have up to four of these places at which the services calls, and at which the traveler may have to change from one flight to another There may be other places at which the flight calls, but the traveler is expected to remain on-board the ferrycraft and therefore they are ignored. The data flow consists of the following data items each of which is defined in its own DDE:

ferry_services_origin_depart_time
+ 2{ferry_services_intermediate_arrival_time
  + ferry_services_intermediate_depart_time}
+ ferry_services_destination_arrival_time.

ferry_services_schedules

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the schedules of services on the routes served by ferry operators which may be suitable for use by a traveler as part of a proposed trip. The data flow is sized to enable up to eight (8) different routes to be provided. It consists of the following data item which is defined in its own DDE:

8{ferry_services_schedule_details}.

feso_emergency_action_log_request

This data flow is sent by the emergency system operator to the Manage Emergency Services function. It contains a request for output of the emergency services action log. This records responses to all incidents that have been reported through this function from the other Emergency Management Centers, the E911 or Emergency Telephone Services, or by other ITS functions. .

feso_emergency_allocation_override

This data flow is sent by the emergency system operator to the Manage Emergency Services function. It contains an override of the current pre-defined allocation of emergency services to respond to a particular current incident. .

feso_emergency_data_input

This data flow is sent by the emergency system operator to the Manage Emergency Services function. It contains the operator's request for one of the following:

0 - no action,
1 - override the emergency services allocation for an incident (requires the number and type),
2 - data for the allocation criteria store,
3 - a request for output from the log,
4 - a request for output of the criteria store. .

feso_emergency_data_output_request

This data flow is sent by the emergency system operator to the Manage Emergency Services function. It contains a request for output of the data that defines the emergency services that must be allocated for all the different types of incident that can be detected by processes within ITS functions. .

feso_emergency_display_update_request

This data flow is sent by the emergency system operator to the Manage Emergency Services function. It contains the operator's request for an update to be obtained of the digitzed map data that is used as the background for the output of incident and emergency data to the operator. .

fets_emergency_telephone_service_identity

This data flow is sent from the emergency telephone service to the Manage Emergency Services function and contains the identity of the emergency telephone service that has reported an incident. The details of this incident are contained in a parallel data flow. The emergency telephone service identity is sized as a string of up to sixteen (16) alphanumeric characters to enable a wide choice of names. .

fets_incident_data_FB

This data flow is sent from the emergency telephone service to the Manage Emergency Services function and contains incident data and the identity of the originating emergency telephone service. It consists of the following data items each of which is defined in its own DDE:

fets-emergency_telephone_service_identity
+ fets-incident_details.

fets_incident_details

This data flow is sent from the emergency telephone service to the Manage Emergency Services function and contains data about an incident that has been reported to one of the services through mechanisms that are outside ITS. It consists of the following data items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_severity
+ incident_type.

fevd_emergency_dispatch_acknowledge

This data flow is sent from the emergency vehicle driver to the Manage Emergency Services function to acknowledge that the emergency vehicle has been dispatched and is on its way to the

incident identified in the dispatch request. .

fevd_incident_status

This data flow is sent from the emergency vehicle driver to report the current status of an incident, e.g. length of time to clear site, length of time involved in work at site. .

Additional sizing assumptions:

SIZE=16;

ffi_bad_charges_payment_updates

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains data about a toll transaction that was either attempted but did not work, or for which the subsequent payment transaction by the Financial Institution failed. The data is to be used within the function for checking against future toll transaction data. .

ffi_bad_fare_payment_updates

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains data about a transit fare transaction that was either attempted but did not work, or for which the subsequent payment transaction by the Financial Institution failed. The data is to be used within the function for checking aqgainst future fare transaction data. .

ffi_bad_toll_payment_updates

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains data about a parking lot charge transaction that was either attempted but did not work, or for which the subsequent payment transaction by the Financial Institution failed. The data is to be used within the function for checking against future parking lot charge transaction data. .

ffi_confirm_charges_payment

This data flow is sent from the Financial Institution to the Provide Electronic Payment Services function and is set to either zero (0) for a parking lot charge payment transaction not completed, or one (1) for a valid completion. .

ffi_confirm_fare_payment

This data flow is sent from the Financial Institution to the Provide Electronic Payment Services function. It is used to confirm that a previous request for toll payments is being processed by the Financial Institution. .

ffi_confirm_toll_payment

This data flow is sent from the Financial Institution to the Provide Electronic Payment Services function. It is used to confirm that a previous request for toll payments is being processed by the Financial Institution. .

ffi_cv_payment_confirm

This data flow is sent from the financial institution to the Provide Electronic Payment Services function. It contains confirmation that a previously submitted request from a commercial fleet manager or commercial vehicle driver (acting in the role of fleet manager) for payment of electronic credentials and tax filing has been accepted and made. .

ffi_driver_map_payment_confirm

This data flow is sent from the financial institution to the Provide Electronic Payment Services function. It contains confirmation that a previously submitted request from a driver for payment for the update of the digitized map data used for on-line vehicle guidance has been accepted and made. .

ffi_other_services_payment_confirm

This data flow is sent from the financial institution to the Provide Electronic Payment Services function. It contains confirmation that a previously submitted request from a transit user for payment for other (yellow pages) services has been accepted and made. .

ffi_registration_payment_confirm

This data flow is sent from the financial institution to the Provide Electronic Payment Services function. It contains confirmation that a previously submitted request from a yellow services provider for payment to register as a supplier of these services and have details of them made available to travelers and transit users has been accepted and made. .

ffi_traveler_display_payment_confirm

This data flow is sent from the financial institution to the Provide Electronic Payment Services function. It contains confirmation that a previously submitted request from a traveler for payment for the update of the digitized map data used as the background for displays of traffic and travel information on a traveler's personal portable device has been accepted and made. .

ffi_traveler_map_payment_confirm

This data flow is sent from the financial institution to the Provide Electronic Payment Services function. It contains confirmation that a previously submitted request from a traveler for payment for the update of the naviagable map database used for on-line personal guidance has been accepted and made. .

ffi_traveler_other_services_payments_confirm

This data flow is sent from the financial institution to the Provide Electronic Payment Services function. It contains confirmation that a previously submitted request from a traveler for payment for other (yellow pages) services has been accepted and made. .

ffi_traveler_rideshare_payment_confirm

This data flow is sent from the financial institution to the Provide Electronic Payment Services function. It contains confirmation that a previously submitted request from a traveler for payment for the provision of rideshare services has been accepted and made. .

fga_carrier_safety_ratings

This data flow is sent by the government administrator to the Manage Commercial Vehicles function. It contains the current safety rating for a carrier determined as a result of previous roadside safety inspections. .

fga_roadside_facility_locations

This data flow is sent by the government administrator to the Manage Commercial Vehicles function. It contains the location of a commercial vehicle roadside checkstation facility.

roadside_facility_list_FB.

fga_tax_and_credential_fees

This data flow is sent from the government agencies to the Manage Commercial Vehicles function and contains data about the taxes and fees payable by commercial vehicle operators for the movement of vehicles through states and across borders. .

financial_data_for_system_development

This data flow is sent from the Provide Electronic Payment Services function to the Plan System Deployment function. It contains data about toll and other payment transactions that may be useful to transportation planners developing the travel network served by the ITS functions. The data flow consists of the following data items each of which is defined in its own DDE:

payment_transaction_reports
+ toll_operational_data.

financial_request

This data flow is sent by the Manage Commercial Vehicles function to the Provide Electronic Payment Services function to request payment of permits and duties required for a commercial vehicle to complete its planned journey. It contains the following items each of which is defined in its own DDE:

cf_manager_enrollment_cost
+ cv_driver_enrollment_cost
+ duty_cost
+ permit_cost.

financial_response

This data flow is sent by the Provide Electronic Payments Services function to the Manage Commercial Vehicles function and contains the response to the request for

payment of permits and duties made by either the commercial fleet manager or the commercial vehicle driver acting in the role of fleet manager. It consists of the following items each of which is defined in its own DDE:

cf_manager_credit_identity
+ cv_driver_credit_identity
+ authorization_code.

fispo_broadcast_data_parameters_request

This data flow is sent from the ISP operator to the Provide Driver and Traveler Services function. It contains a request for the output of the parameters used in the output of wide area information broadcasts. .

fispo_broadcast_data_parameters_update

This data flow is sent from the ISP operator to the Provide Driver and Traveler Services function. It contains updates of parameters used in wide area information broadcast to drivers and transit users in vehicle. These parameters are used to %034filter%034 the available data to pick out that which is unusual or which is useful if broadcast. .

fispo_request_other_routes_selection_map_data_update

This data flow is sent from the ISP operator to the Provide Driver and Traveler Services function. It contains a request for an update of the digitized map data used by the process that selects non-vehicle or transit based routes for use in traveler's trip plans. The request will go to the process that manages the store of this data and provides the interface with the map data supplier. .

fispo_request_route_selection_map_data_update

This data flow is sent from the ISP operator to the Provide Driver and Traveler Services function. It contains a request for an update of the digitized map data used by the process that selects vehicle based routes for use in traveler's trip plans and on-line drover guidance. The request will go to the process that manages the store of this data and provides the interface with the map data supplier. .

fispo_route_selection_parameters_request

This data flow is sent from the ISP operator to the Provide Driver and Traveler Services function and contains a request for output of the parameters currently being used to govern the selection of routes by the trip planning processes. .

fispo_route_selection_parameters_update

This data flow is sent from the ISP operator to the Provide Driver and Traveler Services function and contains an update of the parameters used to govern the selection of routes by the route selection process that provide both vehicle routes to travelers and on-line guidance to drivers. .

fispo_trip_planning_parameters_request

This data flow is sent from the ISP operator to the Provide Driver and Traveler Services function and contains a request for output of the parameters used to govern the selection of routes by the trip planning process. .

fispo_trip_planning_parameters_update

This data flow is sent from the ISP operator to the Provide Driver and Traveler Services function and contains an update of the parameters used to govern the selection of routes by the trip planning processes. .

fitsp_air_services

This data flow is sent from the intermodal transportation service provider to the Provide Driver and Traveler Services function and contains details of the regular and charter air services available to move travelers. .

fitsp_ferry_services

This data flow is sent from the intermodal transportation service provider to the Provide Driver and Traveler Services function and contains details of the sea and river ferry services available to move travelers. .

fitsp_intermodal_service_confirmation

This data flow is sent from the intermodal transportation service provider to the Provide Driver and Traveler Services function and contains confirmation that a previous request from a traveler for an alternate mode service has been accepted. .

fitsp_rail_services

This data flow is sent from the intermodal transportation service provider to the Provide Driver and Traveler Services function and contains details of the heavy rail services (i.e. those which do not form part of a transit operation) available to move travelers. .

fitsp_transit_service_data

This data flow is sent from the intermodal transportation service provider to the Manage Transit function and contains details of the services provided by the intermodal transportation service providers. The data is intended for use by other processes in the calculation of new routes and services for the local regular transit operation and will enable the two groups of services to be coordinated for the benefit of the traveler. .

fm_traveler_information

This data flow is sent from the media to the Provide Driver and Traveler Services function and contains information that the media has that might be of interest to travelers planning trips. This may include but not be limited to such things as special events. sports fixtures, etc. .

fmmc_crossing_close_duration

This data flow is sent to the Provide Traffic Surveillance facility within the Manage Traffic function from multimodal crossings. It contains the time duration for which a crossing must close to vehicular traffic to permit the passage of the alternate flow, e.g. railroad, river traffic, aircraft, etc. .

fmmc_crossing_close_time

This data flow is sent to the Provide Traffic Surveillance facility within the Manage Traffic function from multimodal crossings. It contains the time period before a crossing must close to vehicular traffic to permit the passage of the alternate flow, e.g. railroad, river traffic, aircraft, etc. .

fmo_incident_data_FB

This data flow is sent to the Manage Traffic function from the media operator and contains data for an incident and the identity of the media operator. It consists of the following items of data each of which is defined in its own DDE:

fmo-media_operator_identity
+ fmo-incident_details.

fmo_incident_details

This data flow is sent to the Manage Traffic function from the media operator. It contains data about an incident that has been reported by a member of the traveling public to the media operator by mechanisms that are outside of ITS, e.g. car phone. The data flow consists of the following items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_severity
+ incident_type.

fmo_incident_information_output_request

This data flow is sent to the Manage Traffic function and contains a request for data on incidents to be sent to the Media System. The request must specify the data on which particular incident is to be sent, there being a limit of one per request, and the particular Media System to which the data must be output. .

fmo_incident_information_request

This data flow is sent to the Manage Traffic function and contains a request for data on incidents to be sent to the Media Operator. The request must specify whether all, current or predicted incidents are required, in the latter case state the time period by date and hour

range, and the geographic area(s) to which it should relate. .

fmo_media_operator_identity

This data flow is sent to the Manage Traffic function from the media operator and contains the identity of the media operator who has reported an incident. The details of this incident are contained in a parallel data flow. The media operator identity is sized as a string of up to thirty two (32) alphanumeric characters to enable a wide choice of names to be accommodated. .

fmo_traffic_information_output_request

This data flow is sent to the Manage Traffic function and contains a request for data on traffic conditions to be sent to the Media System. The request must specify the data on which particular set of traffic conditions is to be sent, there being a limit of one per request, and the particular Media System to which the data must be output. .

fmo_traffic_information_request

This data flow is sent to the Manage Traffic function. It contains a request from the Media Operator for traffic information. The request must specify the type of information required (flow/congestion) and the geographic area(s) to which it should relate. .

fmup_demand_display_update

This data flow is sent from the map update provider to the Manage Demand facility within the Manage Traffic function. It contains the digitized map data for displays that can be used as background for the output of data on traffic and travel demand levels. .

fmup_deployment_map_update

This data flow is sent from the map update provider to the Plan System Deployment function and contains a new set of digitized map data. This will be used in the simulation and evaluation of the road and highway network served by the ITS, so that any changes to improve its efficiency can be determined. .

fmup_emergency_display_update

This data flow is sent from the map update provider to the Manage Emergency Services function. It contains the digitized map data for displays that can be used as the background for the output of data on incidents and emergencies to the emergency system operator. .

fmup_incident_display_update

This data flow is sent from the map update provider to the Display and Update Incident Data facility within the Manage Traffic function. It contains the digitized map data for displays that can be used as background for the output of data on current or predicted incidents. .

fmup_other_routes_map_data

This data flow is sent by the map update provider to the Provide Driver and Traveler Services function and contains a new copy of the digitized map data used by the process that selects other, i.e. non-vehicle and non-transit, routes. .

fmup_pollution_display_update

This data flow is sent from the map update provider to the Manage Emissions facility within the Manage Traffic function. It contains the digitized map data for displays that can be used as background for the output of data on the levels of various atmospheric pollutants. .

fmup_route_selection_map_data

This data flow is sent by the map update provider to the Provide Driver and Traveler Services function. It contains an update of the digitized map data used by the route selection facility to produce vehicle based routes for trip planning and on-line guidance purposes. .

fmup_traffic_display_update

This data flow is sent from the map update provider to the Display and Output Traffic Data facility within the Manage Traffic function. It contains the digitized map data for displays that can be used as background for the output of data on current or predicted traffic levels. .

fmup_transit_map_update

This data flow is sent from the map update provider to the Manage Transit function and contains digitized map to be used for route generation and as a background to displays of services requested by the transit fleet manager. .

fmup_traveler_display_update

This data flow is sent from the map update provider to the Provide Driver and Traveler Services function. It contains the digitized map data that can be used as background to displays of traffic, trip and travel information that are output to a kiosk for use by travelers. The data will be different to that sent for output of similar displays at a personal portable device since the type of display is likely to be different (larger) in this case. .

fmup_traveler_map_update

This data flow is sent from the map update provider to the Provide Driver and Traveler Services function and contains data for a new guidance map to be used by the on-line traveler guidance facility. .

fmup_traveler_map_update_cost

This data flow is sent from the map update provider to the Provide Driver and Traveler Services function and contains the cost for a new navigable map database to be used by the traveler personal on-line guidance facility. .

fmup_traveler_personal_display_update

This data flow is sent from the map update provider to the Provide Driver and Traveler Services function. It contains the digitized map data that can be used as background to displays of traffic, trip and travel information that are output to a personal portable device for use by travelers. The data will be different to that sent for output of similar displays at a kiosk since the type of display is likely to be different (smaller) in this case. .

fmup_traveler_personal_display_update_cost

This data flow is sent from the map update provider to the Provide Driver and Traveler Services function and contains the cost for a new set of digitized map data to be used as the background to displays of traffic and travel information being output by a traveler's personal personal portable device. .

fmup_vehicle_map_update

This data flow is sent from the map update provider to the Provide Driver and Traveler Services function and contains data for a new navigable map database to be used by the on-line vehicle guidance facility. .

fmup_vehicle_map_update_cost

This data flow is sent from the map update provider to the Provide Driver and Traveler Services function and contains the cost for a new navigable map database to be used by the on-line vehicle guidance facility. .

focvas_commit_local_enrollment

This data flow is sent from the other commercial vehicle administration system to the Manage Commercial Vehicles function and contains a request for the commitment of the enrollment of the carrier, vehicle and driver that has been previously enrolled. This means that the other remote enrollment transactions were successful. .

focvas_data_table

This data flow is sent from the other commercial vehicle administration system to the Manage Commercial Vehicles function and contains data about required taxes and credential fees. .

focvas_enrollment_confirmation

This data flow is sent from the other commercial vehicle administration system to the Manage Commercial Vehicles function and contains confirmation that enrollment of the carrier, vehicle and driver has been accepted. .

focvas_enrollment_request

This data flow is sent from the other commercial vehicle administration system to the Manage Commercial Vehicles function and contains a request for enrollment of the carrier, vehicle and driver. .

focvas_provide_data

This data flow is sent from the other commercial vehicle administration system to the

Manage Commercial Vehicles function and contains a request for data about required taxes and credential fees to be provided. .

foec_emergency_telephone_service_identity

This data flow is sent from the other emergency centers to the Manage Emergency Services function and contains the identity of an emergency center that has reported an incident. The details of this incident are contained in a parallel data flow. This data flow consists of the following data item which is defined in its own DDE:

emergency_telephone_service_identity.

foec_incident_data_FB

This data flow is sent from the other emergency centers to the Manage Emergency Services function and contains data about an incident that has been reported in an area outside that served by the local function. It consists of the following data items each of which is defined in its own DDE:

foec-emergency_telephone_service_identity
+ foec-incident_details.

foec_incident_details

This data flow is sent by the other emergency centers to the Manage Emergency Services function and contains data about an incident that is taking place outside the area of operation serviced by the local function. It consists of the following data items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_severity
+ incident_type.

foisp_data_supply

This data flow is sent to the Provide Driver and Traveler Services function and contains a set of road data covering the local geographic area for use by the similar function in an ISP covering another geographic area. It consists of the following data item which is defined in its own DDE:

road_data.

foisp_request_data

This data flow is sent to the Provide Driver and Traveler Services function and contains a request for a set of road data covering another geographic area outside that covered by the ISP supporting the local function. .

fotc_data_request

This data flow is sent to from other traffic centers to the Manage Traffic function and contains a request for data to be sent to another Traffic Management Center (TMC) from the local TMC. It consists of the following data item which is defined in its own DDE:

other_TMC_data_request
+ local_TMC_incidents_request.

fotc_identity

This data flow is sent from the other traffic centers to the Manage Traffic function and contains the identity of the remote (originating) Traffic Management Center - TMC for the accompanying data that covers geographic or jurisdictional area(s) outside that served by the local TMC. It consists of the following data item which is defined in its own DDE:

tmc_identity.

fotc_request_local_TMC_data_FB

This data flow is sent from the other traffic centers (TM) to the Manage Traffic function and contains a request for data to be sent from one Traffic Management Center (TMC), in this case the local TMC, to another (remote) TMC. It consists of the following data items each of which is defined in its own DDE:

fotc-data_request
+ fotc-identity.

fotc_transfer_data

This data flow is sent from the other traffic centers to the Manage Traffic function and contains the data which is being transferred from one (remote) Traffic Management Center (TMC) to another, in this case the local TMC. It consists of the following data items each of which is defined in its own DDE:

other_current_incidents
+ other_long_term_data
+ other_predicted_incidents
+ other_TMC_cv_incidents
+ permit_coordination
+ other_TMC_emergency_data.

fotc_transfer_other_TMC_data_FB

This data flow is sent from the other traffic centers (TM) to the Manage Traffic function and contains the data which is being transferred from one (remote) Traffic Management Center (TMC) to another, in this case the local TMC. It consists of the following data items each of which is defined in its own DDE:

fotc-identity
+ fotc-transfer_data.

fotrm_transit_services

This data flow is sent by the other TRM (other transit center) to the Manage Transit function and contains data from the other transit center about services which have an interface into the area covered by services from the local center. .

fp_pedestrian_data

This data flow is used within the Manage Traffic function. It contains analog data about the presense of pedestrians waiting to cross, or approaching the crossing points of roads and highways from which pedestrian surveillance data such as pedestrian demand, numbers of pedestrians, etc. can be obtained by sensors within ITS. .

fp_pedestrian_images

This data flow is used within the Manage Traffic function. It contains visual information (analog data) about pedestrians waiting to cross, or approaching the crossing points of roads and highways from which pedestrian surveillance data can be obtained by image processors within ITS. The size estimate is representative of a digitization of this analog data. .

fpi_commercial_manager_input_credit_identity

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It contains the data necessary to allow automatic billing of the user of the payment instrument when they are the commercial vehicle fleet manager, working in an office environment. A payment instrument is a device that can be used to make payments, e.g. a debit card, a credit card. It will belong to the financial institution responsible for its issue and not to the user. .

fpi_confirm_fare_payment_at_roadside

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It contains confirmation that the requested payment of the current transit fare, plus if required the cost of advanced tolls, and/or parking lot charges, and/or transit fares, has been successfully deducted from the total credit previously stored by the payment instrument. This data flow will only apply to those types of payment instrument that can carry stored credit and will not be set by those that only contain a credit identity. .

fpi_confirm_fare_payment_on_transit_vehicle

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It contains confirmation that the requested payment of the current transit fare, plus if required the cost of advanced tolls, and/or parking lot charges, and/or transit fares, has been successfully deducted from the total credit previously stored by the payment instrument. This data flow will only apply to those types of payment instrument that can carry stored credit and will not be set by those that only contain a credit identity. .

fpi_confirm_payment_at_parking_lot

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It contains confirmation that the requested parking lot charge has been successfully deducted from the total credit previously stored by the payment instrument. This data flow will only apply to those types of payment instrument that can carry stored credit and will not be set by those that only contain a credit identity. .

fpi_confirm_payment_at_toll_plaza

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It contains confirmation that the requested payment of the current toll, plus if required the cost of advanced tolls, and/or parking lot charges, and/or transit fares, has been successfully deducted from the total credit previously stored by the payment instrument. This data flow will only apply to those types of payment instrument that can carry stored credit and will not be set by those that only contain a credit identity. .

fpi_driver_vehicle_input_credit_identity

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It contains the data necessary to allow automatic billing of the user of the payment instrument for the update of the navigable map database used within a vehicle for on-line driver guidance, or the cost of commercial vehicle electronic credential filing and tax payments. For the database update, the vehicle may be a private car, a transit vehicle, or a commercial vehicle. A payment instrument is a device that can be used to make payments, e.g. a debit card, a credit card. It will belong to the financial institution responsible for its issue and not to the driver. .

fpi_parking_tag_data

This data flow is sent from the Payment Instrument to the Provide Electronic Payment Services function and is used to either identify a particular payment instrument or the amount of credit that it currently has stored, when the instrument is being used on-board a vehicle at a parking lot. In either case the data will be used to enable automatic billing for the current parking lot charge, plus if required, advanced payments for tolls, and/or parking lot charges and/or transit fares. The vehicle may be a private car or van, or a transit vehicle, or a commercial vehicle. In the case of a transit vehicle, the payments will be for the vehicle itself and not for its passengers, i.e. transit users. A payment instrument is a device that can be used to make payments, e.g. a debit card, or a device that contains stored credit that can be used for actual payments. It will belong to the financial institution responsible for its issue and not to the user, who in this instance is the vehicle driver. .

fpi_toll_tag_data

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function and is used to either identify a particular payment instrument or the amount of credit that it currently has stored, when the instrument is being used on-board a vehicle passing through a toll plaza. In either case the data will be used to enable automatic billing for the current toll, plus if required, advanced payments for tolls, and/or parking lot charges and/or transit fares. The vehicle may be a private car or van, a transit vehicle, or a commercial vehicle. In the case of a transit vehicle, the payments will be for the vehicle itself and not for its passengers, i.e. transit users. A payment instrument is a device that can be used to make payments, e.g. a debit card, or a device that contains stored credit that can be used for actual payments. It will belong to the financial institution responsible for its issue and

not to the user, who in this instance is the vehicle driver. .

fpi_transit_roadside_tag_data

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function and is used to either identify a particular payment instrument or the amount of credit that it currently has stored, when the instrument is being used at the roadside, i.e. a transit stop. In either case the data will be used to enable automatic billing for the current transit fare, plus if required, advanced payments for tolls, and/or parking lot charges and/or transit fares. A payment instrument is a device that can be used to make payments, e.g. a debit card, or a device that contains stored credit that can be used for actual payments. It will belong to the financial institution responsible for its issue and not to the user, who in this instance is the transit user. .

fpi_transit_user_roadside_input_credit_identity

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It contains the data necessary to allow automatic billing of the transit user for advanced tolls, and/or parking lot charges, and/or transit fares, when the user is at the roadside, i.e. a transit stop. A payment instrument is a device that can be used to make payments, e.g. a debit card, or a stored value card. It will belong to the financial institution responsible for its issue and not to the user. .

fpi_transit_user_vehicle_input_credit_identity

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It contains the data necessary to allow automatic billing of the transit user for advanced tolls, and/or parking lot charges, and/or transit fares, when the user is on-board a transit vehicle. A payment instrument is a device that can be used to make payments, e.g. a debit card, or a stored value card. It will belong to the financial institution responsible for its issue and not to the user. .

fpi_transit_vehicle_tag_data

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function and is used to either identify a particular payment instrument or the amount of credit that it currently has stored, when the instrument is being used on-board a transit vehicle. In either case the data will be used to enable automatic billing for the current transit fare, plus if required, advanced payments for tolls, and/or parking lot charges and/or transit fares. The payments will be for the transit vehicle passengers, i.e. transit users and not for the vehicle itself. A payment instrument is a device that can be used to make payments, e.g. a debit card, or a device that contains stored credit that can be used for actual payments. It will belong to the financial institution responsible for its issue and not to the user, who in this instance is the transit user. .

fpi_traveler_personal_input_credit_identity

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It contains the data necessary to allow automatic billing of the user of the payment instrument when they are using a personal portable device, such as a Personal Digital Assistant (PDA) or similar type of unit, that can be used by the traveler to provide travel information, trip planning, or on-line guidance during a intermodal trip. A payment instrument is a device that can be used to make payments, e.g. a debit card, or a stored value card which itself contains credit that can be used to make payments. It will belong to the financial institution responsible for its issue and not to the user. .

fpi_traveler_roadside_input_credit_identity

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It contains the data necessary to allow automatic billing of the user of the payment instrument when they are at a kiosk that provides facilities for traveler information and trip planning. A payment instrument is a device that can be used to make payments, e.g. a debit card, or a stored value card which itself contains credit that can be used to make payments. It will belong to the financial institution responsible for its issue and not to the user. .

fpo_current_lot_state

This data flow is sent from a parking lot system to the Manage Traffic function and contains the current parking lot state as provided by the operator. This state may be defined as closed, almost full, full, or spaces. .

fpo_lot_occupancy

This data flow is sent from a parking lot operator to the Manage Traffic function and contains the current parking lot occupancy in terms of the number of vehicles present as provided by the operator. .

fpsp_confirm_advanced_parking_payment

This data flow is sent from the parking service provider to the Provide Electronic Payment Services function to confirm that an advanced payment of a parking lot charge will be accepted. .

Additional sizing assumptions:

SIZE=confirmation_flag;

fpsp_current_lot_state

This data flow is sent from a parking lot service provider to the Manage Traffic function and contains the current parking lot state. This state may be defined as closed, almost full, full, or spaces. .

fpsp_lot_occupancy

This data flow is sent from a parking lot service provider to the Manage Traffic function and contains the current parking lot occupancy in terms of the number of vehicles present. .

Additional sizing assumptions:

SIZE=4;

fpsp_parking_lot_charge_change_response

This data flow is sent to the Provide Electronic Payment Services function by the parking services provider. It contains the response to a previous request for a change to the current parking lot charging structure so that travelers my be encouraged to change the modal split in their journeys. .

fpsp_parking_lot_data

This data flow is sent from the parking service provider to the Provide Electronic Payment Services function. It contains input of parking lot price and capacity data. .

Additional sizing assumptions:

SIZE=16;

fpsp_transaction_reports_request

This data flow is sent form the parking service provider to the Provide Electronic Payment Services function and is a request for the report on parking lot transactions. The request must include the time period and identity of the lots which the report must cover. .

fre_physical_conditions

This data flow is sent from the roadside environment to the Manage Traffic function and contains analog data. This data is used by sensors within the function to determine the physical conditions such as fog, ice, snow, rain, etc. that are affecting the road and highway network served by the function. .

fre_roadside_data

This data flow is sent by the roadway environment to the Provide Vehicle Monitoring and Control function. It contains analog data from which sensors on-board the vehicle can determine the physical conditions such as fog, ice, snow, rain, etc. at the road or highway. .

fre_tunnel_conditions

This data flow is sent from the roadside environment to the Manage Traffic function and contains analog and digital data. This data is used by sensors within the function to determine the physical conditions in tunnels that are part of the road and highway network served by the function. The most important 'extra' condition that is only relevant to tunnels is the detection of fire. This may be through heat sensors or through detection of the use for fire extinguishing equipment. .

From_Basic_Vehicle

This data flow is sent to the Provide Vehicle Control and Monitoring functions. It contains analog data that can be monitored by on-board vehicle sensors to provide a number of digital data readings for use elsewhere within ITS. The data applies to any type of vehicle, i.e. it is not particular to one type such as commercial vehicles, transit vehicles, etc. It consists of the following data items each of which is defined in its own DDE:

fbv-brake_servo_response
+ fbv-crash_sensor_data
+ fbv-diagnostics_data
+ fbv-driver_safety_status
+ fbv-steering_servo_response
+ fbv-throttle_servo_response
+ fbv-vehicle_attitude_data
+ fbv-vehicle_characteristics
+ fbv-vehicle_condition
+ fbv-vehicle_headway
+ fbv-vehicle_identity
+ fbv-vehicle_lane_position
+ fbv-vehicle_motion_data
+ fbv-vehicle_on_ahs_lane
+ fbv-vehicle_proximity_data
+ fbv-vehicle_safety_status
+ fbv-vehicle_speed.

From_C_and_M

This data flow is sent to the Manage Traffic function. It contains either information about road and highway repairs from the Construction and Maintenance organization or indicator fault clearance data. It consists of the following data items each of which is defined in its own DDE:

fcm-fault_clearance
+ fcm-incident_information.

From_Commercial_Vehicle

This data flow is sent from a commercial vehicle to the Manage Commercial Vehicles and Provide Vehicle Monitoring and Control functions. It contains data that has been collected on-board a commercial vehicle for processing by sensors before being used within the functions. The data flow consists of the following items each of which is defined in its own DDE:

fcv-brake_condition
+ fcv-cargo_data
+ fcv-cargo_safety_status
+ fcv-distance_travelled
+ fcv-driver_safety_status
+ fcv-driver_status
+ fcv-lock_tag_data
+ fcv-vehicle_safety_status
+ fcv-weight
+ fcv-vehicle_characteristics.

From_Commercial_Vehicle_Driver

This data flow is sent from the commercial vehicle driver to the Manage Commercial Vehicles function and contains data that has been input by a driver acting either as a driver, or acting as a commercial vehicle manager. It consists of the following data items each of which is defined in its own DDE:

fcvd-activity_request
+ fcvd-carrier_number
+ fcvd-driver_data_input

+ fcvd-driver_general_message
+ fcvd-driver_input_type
+ fcvd-enrollment_payment_request
+ fcvd-enrollment_request
+ fcvd-driver_number
+ fcvd-other_data_input
+ fcvd-request_routing_instructions
+ fcvd-request_tag_data_output
+ fcvd-route_data
+ fcvd-route_request
+ fcvd-trip_identity
+ fcvd-vehicle_number.

From_Commercial_Vehicle_Manager

This data flow is sent from the commercial vehicle mamager to the Manage Commercial Vehicles function and contains data that has been input by a commercial vehicle fleet manager. It consists of the following items each of which is defined in its own DDE:

fcvm-carrier_number
+ fcvm-driver_number
+ fcvm-enrollment_payment_request
+ fcvm-enrollment_request
+ fcvm-other_data_input
+ fcvm-preclearance_data
+ fcvm-request_driver_route_instructions
+ fcvm-request_on_board_vehicle_data
+ fcvm-request_tag_data_output
+ fcvm-roadside_activity_report_request
+ fcvm-route_data
+ fcvm-route_function_request
+ fcvm-trip_identity
+ fcvm-update_driver_route_instructions
+ fcvm-vehicle_number.

From_CVO_Information_Requestor

This data flow is sent to the commercial vehicle information requestor from the Manage Commercial Vehicle function. It contains a request for commercial vehicle operations information. The data flow consists of the following item which is defined in its own DDE:

fcvoir-request_for_information.

From_CVO_Inspector

This data flow is sent from the commercail vehicle roadside facility inspector to the Manage Commercial Vehicles function. It consists of the following data items each of which is defined in its own DDE:

fci-credentials_data_request
+ fci-inspection_data_input
+ fci-pull-in_action
+ fci-request_log_report
+ fci-safety_data_request
+ fci-start_inspection.

From_DMV

This data flow is sent from the department of motor vehicles to the Manage Traffic function in response to a request from a valid ITS operation for vehicle registration data to be used in calculating tolls, verification of emissions compoiance, etc.

fdmv-cv_violation_state_identity
+ fdmv-cv_violation_vehicle_registration

+ fdmv-parking_lot_violation_state_identity
+ fdmv-parking_lot_violation_vehicle_registration
+ fdmv-toll_violation_state_identity
+ fdmv-toll_violation_vehicle_registration
+ fdmv-traffic_violation_state_identity
+ fdmv-traffic_violation_vehicle_registration.

From_Driver

This data flow is sent from the driver to both the Provide Electronic Payment Services and the Provide Driver and Traveler Services functions. It contains data input by a driver for in-vehicle services such as guidance, travel advisory and automatic vehicle control. It consists of the following data items each of which is defined in its own DDE:

fd-emergency_request
+ fd-guidance_data
+ fd-guidance_map_update_request
+ fd-guidance_request
+ fd-guidance_route_accepted
+ fd-other_services_parking_request
+ fd-other_services_toll_request
+ fd-request_advisory_information
+ fd-activate_vehicle_control.

From_E911_or_ETS

This data flow originates is sent by the emergency telephone service to the Manage Emergency Services function. The terminator includes specialized systems and services that exist to provide an immediate response to emergencies that are reported by travelers, drivers and the general public, e.g. 911, E911, the new RESCUE service, etc. The data flow includes the following item which is defined in its own DDE:

fets-incident_data_FB.

From_Emergency_System_Operator

This data flow is sent by the emergency system operator to the Manage Emergency Services function and contains emergency services allocation data input by an emergency services operator, or an override to the current automatic allocation of emergency services to an incident. It consists of the following data items each of which is defined in its own DDE:

feso-emergency_action_log_request
+ feso-emergency_allocation_override
+ feso-emergency_data_input
+ feso-emergency_data_output_request
+ feso-emergency_display_update_request.

From_Emergency_Vehicle_Driver

This data flow is sent from the emergency vehicle driver to the Manage Emergency Services function. It consists of the following data items each of which is defined in its own DDE:

fevd-emergency_dispatch_acknowledge
+ fevd-incident_status.

From_Enforcement_Agency

This data flow is a response from an enforcement agency to a request for data from commercial vehicle
administration.

fea-cv_enforcement_agency_response.

From_Environment

This data flow is sent from the environment to the Manage Traffic function. It provides information about the environmental conditions both generally in the area

served by ITS and at the roadside. It is mostly analog data that must be converted by sensors to provide data for use by other processes. The data flow consists of the following data items each of which is defined in its own DDE:

fe-area_pollutant_levels
+ fe-roadside_pollutant_levels.

From_Event_Promoters

This data flow is sent from the Event Promoters terminator to the Provide Driver and Traveler Services and Manage Traffic functions. It contains the following data items each of which is defined in its own DDE:

fep-event_information.

From_Financial_Institution

This data flow is sent from the Financial Institution to the Provide Electronic Payment Services function and contains data about requests for payments that have been successfully made or otherwise. It consists of the following items each of which is defined in its own DDE:

ffi-bad_charges_payment_updates
+ ffi-bad_fare_payment_updates
+ ffi-bad_toll_payment_updates
+ ffi-confirm_charges_payment
+ ffi-confirm_fare_payment
+ ffi-confirm_toll_payment
+ ffi-cv_payment_confirm
+ ffi-driver_map_payment_confirm
+ ffi-other_services_payment_confirm
+ ffi-registration_payment_confirm
+ ffi-traveler_display_payment_confirm
+ ffi-traveler_map_payment_confirm
+ ffi-traveler_other_services_payments_confirm
+ ffi-traveler_rideshare_payment_confirm.

From_Govt_Admin

This data flow is sent from the government administrator to the Manage Commercial Vehicles function. It contains data about vehicles and the carriers that operate them, details of the taxes and fees payable by commercial vehicle operators for the movement of vehicles through states and across borders, plus the location of commercial vehicle roadside checkstation facilities. The data flow consists of the following data items each of which is defined in its own DDE:

fga-tax_and_credential_fees
+ fga-carrier_safety_ratings
+ fga-roadside_facility_locations.

From_Intermodal_Freight_Depot

This data flow is used within the Manage Commercial Vehicles function and contains data about the movement of freight by means that may include methods other than commercial vehicles, e.g. heavy rail, air, sea, river, etc. .

From_Intermodal_Freight_Shipper

This data flow is used within the Manage Commercial Vehicles function and contains data about the services available to ship freight by means other than commercial vehicles, e.g. heavy rail, air, sea, river, etc. .

From_Intermodal_Transportation_Service_Provider

This data flow is sent from the intermodal transportation service provider to the Provide Driver and Traveler Services function and contains details of the services available to move travlers by means other than road vehicles, e.g. heavy rail, air, sea, river, etc. It consists of the following data items each of which is defined in its own DDE:

fitsp-air_services
+ fitsp-intermodal_service_confirmation
+ fitsp-ferry_services
+ fitsp-rail_services
+ fitsp-transit_service_data.

From_ISP_Operator

This data flow is sent from the ISP operator to the Provide Driver and Traveler Services function. It may contain updates of parameters used in wide area information broadcast, trip planning and route selection, or requests for the output of these parameters, or requests for updates of the actual digitized map data used by the route selection processes. The data flow consists of the following items each of which is defined in its own DDE:

fispo-broadcast_data_parameters_request
+ fispo-broadcast_data_parameters_update
+ fispo-request_route_selection_map_data_update
+ fispo-request_other_routes_selection_map_data_update
+ fispo-route_selection_parameters_request
+ fispo-route_selection_parameters_update
+ fispo-trip_planning_parameters_request
+ fispo-trip_planning_parameters_update.

From_Location_Data_Source

This data is sent to a number of processes in the Provide Driver and Traveler Services function. It contains the current state of such things as GPS signals, magnetic flux and other location data sources. The data is sent to sensor processes for conversion into an actual vehicle location. The size estimate below is based on an equivalent digitized form (e.g. location_identity) even though it may actually be an entirely form .

From_Map_Update_Provider

This data flow is sent to several ITS functions by the map update provider. It contains new digitzed map data for displays, on-line vehicle and traveler guidance plus system evaluation, transit route generation and static data preparation. The map update provider is a specialist supplier of this type of data serving some or all of the country. The display data is used as the background to outputs of traffic, incident, transit routes and pollution data, whilst the guidance data is ueed by the on-line vehicle and traveler guidance facilities. The data flow contains the following data items each of which is defined in its own DDE:

fmup-demand_display_update
+ fmup-deployment_map_update
+ fmup-emergency_display_update
+ fmup-incident_display_update
+ fmup-other_routes_map_data
+ fmup-pollution_display_update
+ fmup-route_selection_map_data
+ fmup-traffic_display_update
+ fmup-transit_map_update
+ fmup-traveler_display_update
+ fmup-traveler_map_update
+ fmup-traveler_map_update_cost
+ fmup-traveler_personal_display_update
+ fmup-traveler_personal_display_update_cost
+ fmup-vehicle_map_update
+ fmup-vehicle_map_update_cost.

From_Media

This data flow is sent from the media to the Provide Driver and Traveler Services function. It provides input of traveler information and consists of the following data items each of which is defined in its own DDE:

fm-traveler_information.

From_Media_Operator

This data flow is sent to processes within the Manage Traffic function from the Media Operator and contains requests for information on traffic flow conditions or incidents, incident data, or a request for the output of traffic or incident data to the media system. It consists of the following data items each of which is defined in its own DDE:

fmo-incident_data_FB
+ fmo-incident_information_request
+ fmo-traffic_information_request
+ fmo-incident_information_output_request
+ fmo-traffic_information_output_request.

From_Multimodal_Crossings

This data flow is sent from multimodal crossings to the Manage Traffic function. It contains data about the need for a Mutli-modal Crossing to close prohibiting the passage of vehicular traffic. This data flow consists of the following data items each of which is defiend in its own DDE:

fmmc-crossing_close_time
+ fmmc-crossing_close_duration.

From_Other_CVAS

This data flow is sent from the other commercial vehicle administration system from the Manage Commercial Vehicles function and contains requests for data from and data provided against previous requests. It consists of the following data items each of which is defined in its own DDE:

focvas-commit_local_enrollment
+ focvas-data_table
+ focvas-enrollment_request
+ focvas-enrollment_confirmation
+ focvas-provide_data.

From_Other_EM

This data flow is sent by the other emergency centers to the Manage Emergency Services function and contains information about incidents that are taking place outside the area of operation servced by the local function. It consists of the following data item which is defined in its own DDE:

foec-incident_data_FB.

From_Other_ISP

This data flow is received from an information and service provider outside the area of opertions of the local providers by the Provide Driver and Traveler Services function. It contains the following data items each of which is defined in its own DDE:

foisp-data_supply
+ foisp-request_data.

From_Other_TM

This data flow is sent by other traffic centers (TM) to the Manage Traffic function and contains traffic data about geographic areas of operation are outside those of the local center. It consists of the following data items each of which is defined in its own DDE:

fotc-request_local_TMC_data_FB
+ fotc-transfer_other_TMC_data_FB.

From_Other_TRM

This data flow is sent by the other TRM (other transit center) to the Manage Transit

function and contains data from the other transit centers. It consists of the following data item which is defined in its own DDE:

fotrm-transit_services.

From_Other_Vehicle

This data flow is used within the Provide Vehicle Monitoring and Control function to receive data from other vehicles in a platoon when in platoon following mode of vehicle operation. .

Additional sizing assumptions:

SIZE=512;

From_Parking_Operator

This data flow is sent from a parking lot operator to the Manage Traffic function and contains data about the paring lot state and occupancy as supplied by a parking lot operator. It consists of the following data items each of which is defined in its own DDE:

fpo-current_lot_state
+ fpo-lot_occupancy.

From_Parking_Service_Provider

This data flow is sent from the parking lot services provider to the Provide Electronic Payment Services function and contains data on the use of parking lots or requests for transaction information. It consists of the following data items each of which is defined in its own DDE:

fpsp-confirm_advanced_parking_payment
+ fpsp-current_lot_state
+ fpsp-lot_occupancy
+ fpsp-parking_lot_charge_change_response
+ fpsp-parking_lot_data
+ fpsp-transaction_reports_request.

From_Payment_Instrument

This data flow is sent from the payment instrument to the Provide Electronic Payment Services function. It consists of the following data items each of which is defined in its own DDE:

fpi-commercial_manager_input_credit_identity
+ fpi-confirm_payment_at_parking_lot
+ fpi-confirm_fare_payment_at_roadside
+ fpi-confirm_fare_payment_on_transit_vehicle
+ fpi-confirm_payment_at_toll_plaza
+ fpi-driver_vehicle_input_credit_identity
+ fpi-parking_tag_data
+ fpi-toll_tag_data
+ fpi-transit_roadside_tag_data
+ fpi-transit_user_roadside_input_credit_identity
+ fpi-transit_user_vehicle_input_credit_identity
+ fpi-transit_vehicle_tag_data
+ fpi-traveler_personal_input_credit_identity
+ fpi-traveler_roadside_input_credit_identity.

From_Pedestrians

This data flow contains data from pedestrians that indicates their need to have the road or freeway closed to traffic as a temporary measure whilst the cross. This data is sent to the Provide Traffic Surveillance facility of the Manage Traffic function and contains the following data items each of which is defined in its own DDE:

fp-pedestrian_images
+ fp-pedestrian_data.

From_Potential_Obstacles

This data flow is sent from potential obstacles to the Provide Vehicle Monitoring and Control function. It contains analog data that provides information on potential obstacles that can be encountered by a vehicle. .

From_Roadway

This data flow contains analog information about the roadway. It is sent to the Provide Vehicle Monitoring and Control function. .

Additional sizing assumptions:

SIZE=16;

From_Roadway_Environment

This data flow is sent from the roadway environment to the Provide Vehicle Monitoring and Control and Manage Traffic functions. It contains analog data about the environment actually around the roadway itself covering such things as emissions, fog, ice, snow, etc. It contains the following data items each of which is defined in its own DDE:

fre-physical_conditions
+ fre-roadside_data
+ fre-tunnel_conditions.

From_Secure_Area_Environment

This data flow is sent from the secure area environment to the Manage Transit function and represents information about conditions in a secure area environment such as that found in a transit network. This information is sensed/detected by sensors contained in the Manage Transit function, and is most probably image data, but switches such as a %034panic button%034 are also represented by this flow. This data flow consists of the following data items each of which is defined in its own DDE:

fsa-transit_video_image
+ fsa-transit_panic_button.

From_Toll_Operator

This data flow is sent to the Provide Electronic Payment Services function and contains input from a local operator at a toll plaza. It consists of the following data items each of which is defined in its own DDE:

fto-local_toll_price_variations.

From_Toll_Service_Provider

This data flow is sent to the provide Electronic Payment Services function by the toll service provider. It contains the response to requests for changes in toll prices, and advanced tolls, plus new toll price data. It consists of the folowing data items each of which is defined in its own DDE:

ftsp-confirm_advanced_toll
+ ftsp-toll_price_changes_response
+ ftsp-toll_price_data.

From_Traffic

This data flow is sent to the Manage Traffic function. It contains analog data from traffic on roads and highways that can be read by sensors within ITS. It consists of the following items each of which is defined in its own DDE:

ft-traffic_images
+ ft-traffic_data
+ ft-vehicle_pollutant_levels.

From_Traffic_Operations_Personnel

This data flow is input by traffic operations personnel to various processes in the Manage Traffic function. It is used to request the output of traffic, incident, traffic and travel demand, or pollution data, or to control closed circuit television (cctv) systems, or to provide new parameters for use by processes in the Traffic Incident,

Demand and Emissions Management facilities. It consists of the following data items each of which is defined in its own DDE, and some of which are groups of input flows belonging to the same facility:

ftop-demand_management_inputs_FB
+ ftop-incident_management_inputs_FB
+ ftop-indicator_fault_data_input
+ ftop-indicator_fault_data_request
+ ftop-indicator_fault_data_update
+ ftop-pollution_data_information_request
+ ftop-pollution_parameter_updates
+ ftop-strategy_override
+ ftop-traffic_information_requests
+ ftop-traffic_data_parameter_updates
+ ftop-video_camera_action_request.

From_Transit_Driver

This data flow is sent to the Manage Transit function. It contains input from a transit vehicle driver. The data flow consists of the following data items each of which is defined in its own DDE:

ftd-emergency_request
+ ftd-information_updates
+ ftd-request_batch_mode_data_transfer
+ ftd-fare_transaction_mode_set_up.

From_Transit_Fleet_Manager

Tis data flow is sent from the transit fleet manager to the Manage Transit function and contains various inputs. Some are initiated by the manager, whilst others result from prompts to input data which is additional to that already received by processes within the function. The data flow consists of the following data items each of which is defined in its own DDE:

ftfm-approved_corrections
+ ftfm-coordination_data
+ ftfm-initiate_service_updates
+ ftfm-passenger_loading_updates
+ ftfm-planning_parameters
+ ftfm-planning_parameters_update_request
+ ftfm-response_parameters
+ ftfm-request_response_parameter_output
+ ftfm-request_transit_vehicle_data
+ ftfm-technician_information_request
+ ftfm-technician_information_updates
+ ftfm-transit_display_update_request
+ ftfm-transit_driver_information_request
+ ftfm-transit_driver_information_updates
+ ftfm-transit_driver_route_preferences
+ ftfm-transit_services_output_request
+ ftfm-transit_vehicle_maintenance_information_request
+ ftfm-transit_vehicle_maintenance_specs.

From_Transit_Maintenance_Personnel

This data flow is sent from transit vehicle maintenance personnel to the Manage Transit function. It contains the following item of data which is defined in its own DDE:

ftmp-transit_vehicle_maintenance_updates.

From_Transit_System_Operators

This data flow is sent by the transit system operator to the Manage Transit function. It contains acknowledgement of potential incidents, security actions, a request for output of transit fare transaction data, control inputs for video cameras and fare data

updates. The data flow consists of the following data items each of which is defined in its own DDE:

ftso-emergency_request_acknowledge
+ ftso-fare_updates
+ ftso-media_parameter_request
+ ftso-media_parameter_updates
+ ftso-security_action
+ ftso-request_fare_output
+ ftso-video_camera_action_request.

From_Transit_User

This data flow is sent to the Manage Transit function and contains inputs from the traveler who is at the moment a transit user. It consists of the following data items each of which is defined in its own DDE:

ftu-destination_at_roadside
+ ftu-destination_on_vehicle
+ ftu-emergency_request
+ ftu-other_services_roadside_request
+ ftu-other_services_vehicle_request
+ ftu-request_advisory_information
+ ftu-transit_information_request
+ ftu-transit_user_roadside_image
+ ftu-transit_user_vehicle_image.

From_Transit_Vehicle

This data flow is sent from the transit vehicle to the Manage Transit function and contains data that has been collected on-board the vheicle. It consists of the following data items each of which is defined in its own DDE:

ftv-availability
+ ftv-vehicle_maintenance_data
+ ftv-vehicle_trip_data.

From_Transportation_Planners

This data flow is sent from the transportation planner terminator and contains input to initiate processes within the Plan System Deployment function and/or data for use by those processes. It consists of the following data items each of which is defined in its own DDE:

ftp-evaluation_request
+ ftp-export_request
+ ftp-generation_request
+ ftp-import_request
+ ftp-output_request
+ ftp-parameters
+ ftp-request_documentation
+ ftp-request_link_data
+ ftp-simulation_request
+ ftp-static_data
+ ftp-traffic_data_request
+ ftp-update_link_data.

From_Traveler

This data flow is sent from the traveler to the Provide Driver and Traveler Services function and contains requests for information or guidance from a traveler, either at a kiosk or using a personal portable device. It consists of the following data items each of which is defined in its own DDE:

ft-extra_trip_data

+ ft-guidance_data
+ ft-guidance_map_update_request
+ ft-guidance_request
+ ft-guidance_route_accepted
+ ft-kiosk_emergency_request
+ ft-personal_emergency_request
+ ft-personal_extra_trip_data
+ ft-personal_map_display_update_request
+ ft-personal_trip_planning_requests
+ ft-trip_planning_requests.

From_Vehicle_Characteristics

This data flow is sent from the vehicle characteristics terminator to the Provide Electronic Payment Services function. It contains analog data from which the visible characteristics of a vehicle can be determined and is used to obtain information about toll and parking lot charge violators. .

From_Weather_Service

This data flow consists of data that is provided by the Weather Service terminator and is sent to the Provide Driver and Traveler Services and Manage Traffic functions. It contains the following items that will be organized by geographic area to allow for local variations and each of which is defined in its own DDE:

fws-current_weather
+ fws-predicted_weather.

From_Yellow_Pages_Service_Providers

This data is sent from the Information and Service Providers to the Provide Driver and Traveler Services function. It contains the following data items each of which is defined in its own DDE:

fypsp-request_provider_registration
+ fypsp-transaction_confirmation
+ fypsp-yellow_pages_data.

fsa_transit_panic_button

This data flow is sent from the secure area environment to the Manage Transit function and contains input from a panic button. This can be used by the transit user to alert the transit system operator to an emergency situation or incident within the transit operational network, i.e. not on-board a transit vehicle, or at a transit stop, but in such things as a modal interchange facility, transit depot, etc. .

fsa_transit_video_image

This data flow is sent from the secure area environment to the Manage Transit function and contains a video image. This will have been obtained from closed circuit television (cctv) systems that are monitoring activity in the transit operational network, i.e. not on-board a transit vehicle, but at a transit stop, or in such things as a modal interchange facility, transit depot, etc. The data can be used for incident detection, etc. using automatic analysis techniques. .

ft_extra_trip_data

This data flow is sent from the traveler to the Provide Driver and Traveler Services function and contains analog data from which sensors can determine extra trip request data to supplement that already input by a traveler at a kiosk. Examples of these inputs are speech, signals from relays driven by switches, buttons, etc., or input from touch screens. .

ft_guidance_data

This data flow is sent from the traveler to the Provide Driver and Traveler Services function and contains data to be used in preparing the request for a traveler route. .

Additional sizing assumptions:

SIZE=64;

ft_guidance_map_update_request

This data flow is sent from the traveler to the Provide Driver and Traveler Services function and contains a request for an update of the digitized map data used to provide

on-line traveler guidance. .

ft_guidance_request

This data flow is sent from the traveler to the Provide Driver and Traveler Services function. It contains the a request to provide on-line traveler guidance and specifies a choice of the type of prefered guidance, i.e. infrastructure based dynamic, or totally autonomous. The traveler will be prompted for further data in order that the guidance can begin. . .

ft_guidance_route_accepted

This data flow is sent from the driver to the Provide Driver and Traveler Services function. It contains acceptance of the route that has been generated in response to a previous request from the traveler for on-line guidance. Guidance will not begin until the acceptance has been received. .

ft_kiosk_emergency_request

This data flow is sent from the traveler to the Provide Driver and Traveler Services function. It contains image data from which sensors can determine that a traveler has an emergency situation that has given rise to an input from a kiosk. This data is provided in abstract form and is used by a process at the kiosk to determine the nature of the ememergency. .

ft_personal_emergency_request

This data flow is sent from the traveler to the Provide Driver and Traveler Services function. It contains analog data from which sensors can determine that a traveler has an emergency situation that has given rise to an input from the traveler's personal portable device. This data must be forwarded to the Emergency Services function. .

ft_personal_extra_trip_data

This data flow is sent from the traveler to the Provide Driver and Traveler Services function and contains analog data from which sensors can determine extra trip request data to supplement that already input by a traveler using a personal portable device. Examples of these inputs are speech, signals from relays driven by switches, buttons, etc., or input from touch screens. .

ft_personal_map_display_update_request

This data flow is sent from the traveler to the Provide Driver and Traveler Services function and contains analog input from which may be determined a traveler's request for the update of the digitized map data used as the background to traffic, trip amd travel information displays in a personal portable device. Examples of these inputs are speech, signals from relays driven by switches, buttons, etc., or input from touch screens. .

ft_personal_trip_planning_requests

This data flow is sent from the traveler to the Provide Driver and Traveler Services function and contains analog inputs from which a traveler's trip request to a personal portable device may be determined. Examples of these inputs are speech, signals from relays driven by switches, buttons, etc., or input from touch screens. .

ft_traffic_data

This data flow is used within the Manage Traffic function. It contains analog data about the presense of traffic flowing on roads and highways from which traffic surveillance data such as vehicle speed, occupancy, flow volume, headway, etc. can be obtained by sensors within ITS. .

ft_traffic_images

This data flow is used within the Manage Traffic function. It contains visual information (analog data) about the traffic flowing on roads and highways from which traffic surveillance data can be obtained by image processors within ITS. The size shown below is representative of a digitized equivalent of this analog information. .

ft_trip_planning_requests

This data flow is sent from the traveler to the Provide Driver and Traveler Services function and contains analog inputs from which a traveler's trip request to a kiosk may be determined. Examples of these inputs are speech, signals from relays driven by

switches, buttons, etc., or input from touch screens. .

ft_vehicle_pollutant_levels

This data flow is used within the Manage Traffic function. It contains analog data from which sensors within ITS can determine the actual levels of various atmospheric pollutants, such as nitrous oxide, sulphur dioxide, hydrocarbons, carbon monoxide and ozone, that are being produced by particular passing vehicles. .

ftd_emergency_request

This data flow is sent by the transit driver to the Manage Transit function. It contains notification that the driver needs help because an emergency has occurred on-board or near a transit vehicle. .

ftd_fare_transaction_mode_set_up

This data flow is sent from the transit driver to the Manage Transit function. It contains the mode in which the transit fare transaction processing on-baord the transit vehicle is to operate. This may be either batch mode (part processing of each fare transaction carried out and the details of a large number of transactions transferred to the central function for further processing) or interactive mode (complete processing of each transaction carried out without stopping). .

ftd_information_updates

This data flow is sent from the transit driver to the Manage Transit function. It contains information from individual transit drivers about their previous work hours and vacations, etc. It is used to assess a driver's eligibility for future work assignments. .

ftd_request_batch_mode_data_transfer

This data flow is sent from the transit driver to the Manage Transit function. It contains a request that the current contents of the store of transit fare transactions be transferred to processes in the Provide Electronic Payment Services function for further processing. .

ftfm_approved_corrections

This data flow is sent from the transit fleet manager to the Manage Transit function and contains the transit fleet manager's approval for changes to transit schedules that will bring one or more transit vehicles back to their schedules. .

ftfm_coordination_data

This data flow is sent from the transit fleet managert to the Manage transit function and contains an acknowledgement of the previous request for action plus incident coordination and response information. .

ftfm_initiate_service_updates

This data flow is sent from the transit fleet manager to the Manage Transit function and indicates that the transit fleet manager wants the transit services to be re-processed because changes have occurred to the parameters which govern their calculation. .

ftfm_passenger_loading_updates

This data flow is sent from the transit fleet manager to the Manage Transit function and contains an update to the passenger (transit user) loading data as a result of a miss-match being found in the collected data. .

ftfm_planning_parameters

This data flow is sent from the transit fleet manager to the Manage Transit function and contains planning parameters used to calculate new transit schedules. .

Additional sizing assumptions:

SIZE=32;

ftfm_planning_parameters_update_request

This data flow is sent from the transit fleet manager to the Manage Transit function and contains a request for the current planning transit service planning parameters to be output to the transit fleet manager. .

ftfm_request_response_parameter_output

This data flow is sent from the transit fleet manager to the Manage Transit function and is used to output of the preplanned responses to incidents by and within the transit operations area. .

ftfm_request_transit_vehicle_data

This data flow is sent from the transit fleet manager to the Manage Transit function and contains a request for output of the current contents of the store of transit vehicle operational data. .

ftfm_response_parameters

This data flow is sent from the transit fleet manager to the Manage Transit function and is used to provide data about planned responses to incidents by and within the transit operations area. .

ftfm_technician_information_request

This data flow is sent from the transit fleet manager to the Manage Transit function and is used to request information about transit maintenance technicians. .

Additional sizing assumptions:

SIZE=8;

ftfm_technician_information_updates

This data flow is sent from the transit fleet manage and is used to provide updates to the information held within the Manage Transit function about transit technicians. .

Additional sizing assumptions:

SIZE=32;

ftfm_transit_display_update_request

This data flow is sent from the transit fleet manager to the Manage Transit function and is used to request an update of the digitized map database. This is used as a source of data for route generation and for the background to displays of transit services data requested by the transit fleet manager. .

ftfm_transit_driver_information_request

This data flow is sent from the transit fleet manager to the Manage Transit function and contains a request for the output of the consideration data about one or more transit drivers. .

ftfm_transit_driver_information_updates

This data flow is sent from the transit fleet manager to the Manage Transit function and contains an update of the consideration data for a particular transit driver. .

Additional sizing assumptions:

SIZE=64;

ftfm_transit_driver_route_preferences

This data flow is sent from the transit fleet manager to the Manage Transit function and is used to provide information about the preferences that transit drivers have about working over certain transit routes. .

ftfm_transit_services_output_request

This data flow is sent from the transit fleet manager to the Manage Transit function and is used to request output of the current transit services. This data is that produced by the transit route and schedule generation processes in the function. .

ftfm_transit_vehicle_maintenance_information_request

This data flow is sent from the transit fleet manager to the Manage transit function and contains a request for information about the maintenance status of an individual transit vehicle. .

ftfm_transit_vehicle_maintenance_specs

This data flow is sent from the transit fleet manager to the Manage transit function and contains a new or revised transit vehicle maintenance specification. This will be loaded into the store of transit vehicle operations data. .

ftmp_transit_vehicle_maintenance_updates

This data flow is sent from transit maintenance personnel to the Manage Transit function and is used to provide updates to the maintenance information being held within the function about individual transit vehicles. .

fto_local_toll_price_variations

This data flow is sent from the toll operator to the Provide Electronic Payment Services function and defines changes to the toll prices that are provided locally by the toll operator. .

ftop_defined_incident_response_data_request

This data flow is sent to the Manage Traffic function and enables Traffic Operations Personnel to request the data currently held by the store of defined incident responses held by the Manage Incidents facility. .

ftop_defined_incident_response_data_update

This data flow is sent to the Manage Traffic function and enables Traffic Operations Personnel to amend data currently held by the store of defined incident responses held by the Manage Incidents facility. .

ftop_demand_data_request

This data flow is sent to the Manage Traffic function from the traffic operations personnel and is a request for output of the current contents of the store of input data to be used in demand forecasting. .

ftop_demand_data_update_request

This data flow is sent to the Manage Traffic function from the traffic operations personnel and is a request for a new set of data to be collected and loaded into the store of input data to be used in demand forecasting. This request will override any automatic or unsolicitied data updates. .

ftop_demand_forecast_request

This data flow is sent to the Manage Traffic function from the traffic operations personnel and is a request for a calculation of a new demand forecast based on the data currently available in the store of input data to be used in demand forecasting. .

ftop_demand_management_inputs_FB

This data flow is sent from the traffic operations personnel to the Manage Traffic function and contains all the input flows for the Manage Demand facility. It consists of the following data items each of which is defined in its own DDE:

ftop-demand_data_request
+ ftop-demand_data_update_request
+ ftop-demand_forecast_request
+ ftop-demand_policy_information_request
+ ftop-demand_policy_activation
+ ftop-demand_policy_updates.

ftop_demand_policy_activation

This data flow is sent to the Manage Traffic function from the traffic operations personnel and is a request for the activation of the demand policies dictated by the data in the demand forecast data store. .

ftop_demand_policy_information_request

This data flow is sent to the Manage Traffic function and is a request from the traffic operations personnel for the data currently held in the demand policy data store. .

ftop_demand_policy_updates

This data flow is sent to the Manage Traffic function from the traffic operations personnel and contains permanent changes to the data held in the store of demand policy data. .

ftop_incident_camera_action_request

This data flow is sent to the Manage Traffic function from the traffic operations personnel. It contains a request for a change to the operating parameters of a closed circuit television (cctv) system used to provide incident management data. These parameters may cover things such as camera pan, tilt, and zoom, plus other picture controls. .

ftop_incident_data_amendment

This data flow is sent to the Manage Traffic function and enables traffic operations personnel to amend data currently held by the stores of current and predicted incidents held by the Manage Incidents facility. .

ftop_incident_information_requests

This data flow is sent to the Manage Traffic function and contains requests for output of the data held in the stores of current or predicted incidents maintained by the Manage Incidents facility. .

ftop_incident_management_inputs_FB

This data flow is sent from the traffic operations personnel to the Manage Traffic function and contains all the input flows for the Manage Incidents facility. It consists of the following data items each of which is defined in its own DDE:

ftop-defined_incident_response_data_request
+ ftop-defined_incident_response_data_update
+ ftop-incident_camera_action_request
+ ftop-incident_data_amendment
+ ftop-incident_information_requests
+ ftop-output_possible_defined_reponses
+ ftop-request_possible_incidents_data
+ ftop-update_defined_incident_responses.

ftop_indicator_fault_data_input

This data flow is sent to the Manage Traffic function from the traffic operations personnel and contains new data for loading into the store store of current indicator faults. .

ftop_indicator_fault_data_request

This data flow is sent to the Manage Traffic function from the traffic operations personnel and is a request for output of the contents of the store store of current indicator faults. .

ftop_indicator_fault_data_update

This data flow is sent to the Manage Traffic function from the traffic operations personnel and is an update data in the store store of current indicator faults. .

Additional sizing assumptions:

SIZE=32;

ftop_output_possible_defined_reponses

This data flow is sent from the traffic operations personnel to the Manage Traffic function and contains a request for output of the current contents of the store of possible defined incident responses to enable traffic operations personnel to review them to see if any should be made available for on-line use as and when incidents occur. .

ftop_pollution_data_information_request

This data flow is sent from the traffic operations personnel to the Manage Traffic function and contains a request for a display of pollution reference or current pollution state data. .

ftop_pollution_parameter_updates

This data flow is sent from the traffic operations personnel to the Manage Traffic function and contains a request for specified pollution reference data values to be updated to those provided. .

ftop_request_possible_incidents_data

This data flow is sent from the traffic operations personnel to the Manage Traffic function and contains requests for the output of some or all of the data currently held in the store of possible incidents maintained by the Manage Incidents facility. .

ftop_strategy_override

This data flow is sent from the traffic operations personnel to the Manage Traffic function and contains an override for some aspect of the current method of traffic control currently being implemented. .

ftop_traffic_data_parameter_updates

This data flow is sent from the traffic operations personnel to the Manage Traffic function and contains updatess to the parameters used to define the traffic data that is retrieved in response to information requests from the media and from other functions within ITS that are outside of the Manage Trqffic function. .

ftop_traffic_information_requests

This data flow is sent from the traffic operations personnel to the Manage Traffic function and contains requests for traffic information to enable the personnel to review and seek clarification of the way the current traffic situation is being managed, or something which is taking place on the road or highway, etc. .

ftop_update_defined_incident_responses

This data flow is sent from the traffic operations personnel to the Manage Traffic function and contains a request for possible defined incident responses to be transfered from their store to that of the actual defined responses that willbe used as and when incidents occur. .

ftop_video_camera_action_request

This data flow is sent to the Manage Traffic function from the traffic operations personnel. It contains a request for a change to the operating parameters of a closed circuit television (cctv) system used to provide traffic surveillance data. These parameters may cover things such as camera pan, tilt, and zoom, plus other picture controls. .

ftp_evaluation_request

This data flowis sent from the transportation planner to the Plan System Deployment function contains a request to start the evaluation process plus (optionally) additional parameters. .

ftp_export_request

This data flow is sent from the transportation planner to the Plan System Deployment function and specifies what and which kind of data is to be exported to other functions within ITS. .

ftp_generation_request

This data flow is sent from the transportation planner to the Plan System Deployment function and contains parameters used to create a new set of static data for use by other functions within ITS. .

ftp_import_request

This data flow is sent from the transportation planner to the Plan System Deployment function and contains details of what and which kind of data is to be imported from other functions within ITS. This will only cover data that is not automatically sent to the function by other functions within ITS. .

ftp_output_request

This data flow is sent from the transportation planner to the Plan System Deployment function and contains details of which part(s) of the historic, static or planning data stores are to be output. .

ftp_parameters

This data flow is sent from the transportation planner to the Plan System Deployment function and contains parameters use by the simulation, evaluation and static data generation processes within the function. .

ftp_request_documentation

This data flow is sent from the transportation planner to the Plan System Deployment function and contains details of the planner's choice of the planning-data or simulation data which is to be documented. .

ftp_request_link_data

This data flow is sent from the transportation planner to the Plan System Deployment function and contains a request for output of the store containing the link database. .

Additional sizing assumptions:

SIZE=4;

ftp_simulation_request

This data flow is sent from the transportation planner to the Plan System Deployment function and contains a request plus (optionally) additional parameters needed to start the simulation process. .

ftp_static_data

This data flow is sent from the transportation planner to the Plan System Deployment function and contains items of new or amended data for the static data store which the transportation planner wishes to add to that store. .

ftp_traffic_data_request

This data flow is sent from the transportation planner to the Plan System Deployment function and contains a request for a new set of traffic data to be obtained from the Manage Traffic function. .

ftp_update_link_data

This data flow is sent from the transportation planner to the Plan System Deployment function and contains a updates to the contents of the store containing the link database. .

ftso_emergency_request_acknowledge

This data flow is sent by the transit operator to the Manage Transit function and is used to acknowledge the receipt of an emergency request previously sent by the Manage Transit function. .

ftso_fare_updates

This data flow is sent from the transit system operator to the Provide Electronic Payment Services function. It contains data identifying the transit route number, the fares for some or all or the segments on that route and the time(s)/day(s) that they apply, which are to be updated in the store of transit fares. .

ftso_media_parameter_request

This data flow is sent by the transit system operator to the Manage Transit function and contains a request for output of the current parameters used to control the style and content of information about incidents affecting the transit network that is automatically sent to the media. .

ftso_media_parameter_updates

This data flow is sent by the transit system operator to the Manage Transit function and contains update to the parameters used to control the style and content of information about incidents affecting the transit network that is automatically sent to the media. .

ftso_request_fare_output

This data flow is sent from the transit system operator to the Provide Electronic Payment Services function. It contains a request for output of the current transit fares held in the local data store. .

ftso_security_action

This data flow is sent by the transit system operator to the Manage Transit function and contains details of the action needed in response to a previously identified security problem. .

ftso_video_camera_action_request

This data flow is sent by the transit system operator to the Manage Transit function and contains a request for the change of operating parameters for a closed circuit television (cctv) system located in the secure area environment. These parameters may cover things such as camera pan, tilt, and zoom, plus other picture controls. .

ftsp_confirm_advanced_toll

This data flow is sent from the toll service provider to the Provide Electronic Payment Servcies function and confirms the acceptance of payment of an advanced toll. .

Additional sizing assumptions:

SIZE=2;

ftsp_toll_price_changes_response

This data flow is sent to the Provide Electronic Payment Services function by the

toll services provider. It contains the response to a previous request for a change to the current toll pricing structure so that travelers my be encouraged to change the modal split in their journeys. .

ftsp_toll_price_data

This data flow is sent from the toll service provider to the Provide Electronic Payment Services function and contains updates to the current toll prices. .

Additional sizing assumptions:

SIZE=32;

ftu_destination_at_roadside

This data flow is sent by the transit user to the Manage Transit function and is used to specify the detination of a desired service for which a fare has to be paid at the roadside, i.e. a transit stop. .

ftu_destination_on_vehicle

This data flow is sent by the transit user to the Manage Transit function and is used to specify the detination of a desired service for which a fare has to be paid on-board the transit vehicle. .

ftu_emergency_request

This data flow is sent from the transit user to the Manage transit function and is used to identify that an emergency of some type has been seen, and may involve the transit user personally. .

ftu_other_services_roadside_request

This data flow is sent by the transit user to the Manage Transit function to specify other non-transit services that are needed by a transit user at the roadside, i.e. a transit stop. .

ftu_other_services_vehicle_request

This data flow is sent by the transit user to the Manage Transit function to specify other non-transit services that are needed by a transit user on-board a transit vehicle. .

ftu_request_advisory_information

This data flow is sent from the traveler to the Provide Driver and Traveler Services function and conatins data that enables a display on-board a transit vehicle that will be capable of showing transit, yellow pages information and other traffic and travel advisory information. .

ftu_transit_information_request

This data flow is sent by the transit user to the Manage Transit functions to request information on transit services from a kiosk or other information point. .

Additional sizing assumptions:

SIZE=4;

ftu_transit_user_roadside_image

This data flow is used within the Manage Transit function and contains analog information from which sensors can produce an image of the transit user when a fare transaction violation has been detected at the roadside. The size estimate represents a digitized equivalent of the analog image .

ftu_transit_user_vehicle_image

This data flow is used within the Manage Transit function and contains analog information from which sensors can produce an image of the transit user when a fare transaction violation has been detected on-board the vehicle. The size estimate represents a digitized equivalent of the analog image .

ftv_availability

This data flow is sent from the transit vehicle to the Manage Transit function. It defines the avaialability of a transit vehicle in terms of its identity, type and passenger capacity. .

ftv_vehicle_maintenance_data

This data flow is sent from the transit vehicle to the Manage Transit function. It

contains analog data from which various aspects of the transit vehicle operation can be determined for future maintenance purposes. .

ftv_vehicle_trip_data

This data flow is sent from the transit vehicle to the Manage Transit function. It contains analog data from which various aspects of the transit vehicle operation can be determined so that its performance on the current trip can be analyzed. .

fws_current_weather

This data flow is sent to the Manage Traffic function and the Provide Driver and Traveler Services functions. It contains details of the current weather conditions, e.g. temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc. .

fws_predicted_weather

This data flow is sent to the Manage Traffic and Provide Driver and Traveler Services functions. It contains details of the predicted weather conditions, e.g. temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc. .

fypsp_request_provider_registration

This data flow is sent to the Provide Driver and Traveler Services function from the information and service provider to request registration as a provider of yellow pages data for another process within this function. The data flow includes details of the provider, credit identity of the provider, geographic area for which data can be provided and available yellow pages services. .

fypsp_transaction_confirmation

This data flow is sent by the information and service provider to the Provide Driver and Traveler Services function and contains confirmation that a transaction requested by a traveler has (or has not) successfully taken place. .

fypsp_yellow_pages_data

This data flow is sent from the information and services provider to the Provide Driver and Traveler Services function. It provides information on yellow pages services in three forms comprising that of general interest, more specific items and transaction information. .

generation_request

This data flow is used within the Plan System Deployment function. It contains parameters to define which parts of the planning and historical data stores are to be used to produce a new version of the static data store for use by other ITS functions. .

get_charge_payment_violator_image

This data flow is used within the Provide Electronic Payment Services function and contains data fields which if set non-zero act as a request that the image of the vehicle currently trying to pay a parking lot charge be obtained as the payment transaction has been found to be illegal. It consists of the following data items each of which is defined in its own DDE :

credit_identity
+ vehicle_identity
+ parking_lot_cost.

get_fare_violator_payment_image

This data flow is used within the Provide Electronic Payment Services function and contains a data fields which if set non-zero act as request that the image of the transit user currently trying to pay a transit fare be obtained as the payment transaction has been found to be illegal. If the transaction is at the roadside the identity of the transit vehicle will be set to zero, and if on a vehicle the fare collection identity will be set to zero. For vehicle collection, the collection method data will show whether a batch or interactive method is being used for processing the fare collection data. The data flow consists of the following data items each of which is defined in its own DDE :

credit_identity
+ transit_fare
+ transit_roadside_fare_collection_identity
+ transit_route_number
+ transit_route_segment_number
+ transit_route_use_time
+ transit_user_category
+ transit_vehicle_fare_collection_method
+ transit_vehicle_identity
+ traveler_identity.

get_other_route

This data flow is used within the Provide Driver and Traveler Services function to enable the selection of routes that only involve modes other than those using vehicles or transit services. It consists of the following data items each of which is defined in its own DDE:

origin
+ destination
+ departure_time
+ desired_arrival_time
+ modes
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ preferred_weather_conditions
+ constraint_on_acceptable_travel_time
+ constraint_on_eta_change
+ constraint_on_special_needs.

get_parking_lot_tag_violator_image

This data flow is used within the Provide Electronic Payment Services function and contains a flag which if set to one (1) requests that the image of the vehicle currently entering a parking lot be obtained as its tag cannot be correctly read. .

get_toll_payment_violator_image

This data flow is used within the Provide Electronic Payment Services function and contains data fields which if set non-zero acts as a request for the image of the vehicle currently trying to pay a toll be obtained as the payment transaction has been found to be illegal. It consists of the following data items each of which is defined in its own DDE :

credit_identity
+ vehicle_identity
+ toll_cost.

get_toll_tag_violator_image

This data flow is used within the Provide Electronic Payment Services function and contains a flag which if set to one (1) requests that the image of the vehicle currently entering a toll plaza be obtained as its tag cannot be correctly read. .

get_transit_route

This data flow is used within the Provide Driver and Traveler Services function. It contains data that enables the selection of a route using only transit services, as part of a traveler's trip request. The data flow consists of the following data items each of which is defined in its own DDE:

origin
+ destination
+ departure_time
+ desired_arrival_time
+ preferred_routes
+ preferred_alternate_routes

+ preferred_route_segments
+ preferred_weather_conditions
+ preferred_transit_options
+ constraint_on_acceptable_travel_time
+ constraint_on_number_of_mode_changes
+ constraint_on_number_of_transfers
+ constraint_on_eta_change
+ constraint_on_special_needs.

get_vehicle_route

This data flow is used within the Provide Driver and Traveler Services function to enable a route to be selected that only involve the use of vehicles, excluding transit vehicles, i.e. private cars, vans, commercial vehicles, emergency vehicles, etc. It consists of the following data items each of which is defined in its own DDE:

constraint_on_acceptable_travel_time
+ constraint_on_eta_change
+ constraint_on_special_needs
+ constraint_on_load_classification
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type
+ destination
+ departure_time
+ desired_arrival_time
+ origin
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ preferred_weather_conditions.

guidance_data

This data flow is used within the Provide Driver and Traveler Services function to transfer data between the Manage Trip Planning and Ridesharing facility and the Provide Guidance and Trip Planning Services facility. It consists of the following data items each of which is defined in its own DDE:

paratransit_route_response
+ trip_request.

hazmat_load_data

This data flow is used within the Manage Commercial Vehicles, Manage Emergency Services, Manage Traffic and Provide Driver and Traveler Services functions. It contains the manifest data plus the chemical characteristics of a hazmat load being carried by a commercial vehicle. This data is used by the emergency services to plan their responses if the vehicle on which the load is traveling is involved in an incident. The data flow is sized at ten (10) bytes to use of the standard safety codes for hazardous materials. .

hazmat_vehicle_data

This data flow is used within the Manage Commercial Vehicles, Manage Emergency Services and Provide Driver and Traveler Services functions. It contains details such as make, type, towing points, etc. of a vehicle that is carrying a hazardous load. This is used by the emergency services to plan their responses if the vehicle is involved in an incident. The data flow is sized at eighteen (18) bytes to enable up to six items of vehicle data to be stored as three character codes. .

headway

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains the distance beteen the vehicle and the vehicle in front in a platoon (headway, measured in inches up to 255) as computed from on-board sensors. .

highway_control_devices

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. This data includes information about each device used to output traffic management commands to vehicle drivers on highways. Data for devices at highway entry ramps is provided separately. This data flow consists of the following data items each of which is defined in its own DDE:

crossing_equipment_data_for_highways
+ highway_equipment_data.

highway_equipment_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides information about each highway indicator that is used to provide traffic management commands to drivers. The data flow consists of the following items each of which is defined in its own DDE:

list_size
+ list_size{vms_upstream_identity
    + vms_downstream_identity}
+ vms_highway_allocation.

highway_network

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises data about each segment in the highway network and the way in which they fit together, i.e. which segment is joined to which, both upstream and downstream, plus identification of those links that interface to the road (surface street) network. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_downstream_identity
    + route_segment_end_point
    + route_segment_identity
    + route_segment_start_point
    + route_segment_upstream_identity}.

highway_sign_plan_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about the highway indicator sequence(s) needed to implement a specific traffic management control strategy in part of the highway in the geographic and jurisdictional area(s) served by the Manage Traffic function. A strategy can be anything from setting a speed restriction, to closing a single lane, to closing the whole highway. It may be either designed to suit specific locations on the highway network (lane closures), or for general application (speed restrictions) and can consist of up to fifteen (15) highway sign sequences. The data flow consists of the following data items each of which is defined in its own DDE:

highway_sign_plan_purpose
+ 1{highway_sign_sequence_data}15
+ highway_sign_plan_priority.

highway_sign_plan_number

This data flow is used within the Manage Traffic function and contains the number of an adaptive plan for the road network controlled by the function. A plan is a set of data that enables a set of sign sequences to be applied to highway indicators to achieve a desired traffic control strategy. The data flow is defined as a three character code to enable a wide range of alphanumeric character sequences to be used for plan numbers. .

highway_sign_plan_priority

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about the relative

priority of each highway sign plan. The data flow is sized at one (1) byte to enable a single numeric value (range 1 to 255) or an alphanumeric character to be used to indicate each priority value. .

highway_sign_plan_purpose

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes a fifteen alphanumeric character code which defines the purpose of highway sign plan. These codes shall include but not be limited to the following:

CH695J147N - close highway I695 at junction 157 northbound
S40LH475S - set 40 mph speed limit on highway I475 southbound (may apply anywhere)
CR2LH895J133E - close the right two lanes on highway I895 from junction 133 eastbound .

highway_sign_sequence_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about the sequence in which a set of highway indicators must be set in order to implement a specific action, e.g. close one lane, set a speed restriction, etc. The sequences are designed to enable the action to implemented safely, e.g. a speed restriction of 40 mph could be preceded by warnings that it starts 'x' feet farther along the highway, where 'x' is the distance from the indicator to the start of the speed restriction. Sequences are not location specific and are standard for a particular action. The data flow consists of the following data items each of which is defined in its own DDE:

highway_sign_sequence_purpose
+ indicator_list.

highway_sign_sequence_purpose

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes a three alphanumberic character code which defines the purpose of a highway sign sequence. These codes shall include but not be limited to the following:

C1L - close one lane
CRL - close right-hand (nearside) lane
CCL - close center lane
CLL - close left-hand (offside) lane
C2L - close two lanes
C3L - close three lanes
CAL - close all lanes, i.e. close the highway in one direction
S4L - set 40 mph speed limit (from higher limit)
S5L - set 50 mph speed limit (from higher limit)
S4N - set 40 mph speed limit (from no limit) .

highway_sign_setting_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes sets of sequences for setting indicators on a highway to implement specific functions, e.g. close one lane, set a speed restriction, etc. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{highway_sign_sequence_data}.

highway_sign_setting_plans

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about highway indicator plans that are used to implement specific actions. These are designed to enable the management of a variety of situations on the highway(s) in the geographic and jurisdiction area(s) served by the Manage Traffic function. The data flow consists of the following data items each of which is defiend in its own DDE:

list_size
+ list_size{highway_sign_plan_data
+ highway_sign_plan_number}.

hov_lane_data

This data flow is used within the Manage Traffic function and contains the data obtained from processing the inputs from traffic sensors located on High Occupancy Vehicle (HOV) lanes around the road network. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{hov_lane_vehicle_count
+ hov_lane_violation_count}.

hov_lane_data_input

THis data is used within the Manage Traffic function and contains data from which the use of High Occupancy Vehicle (HOV) lanes can be monitored. It consists of the following data items each of which is defined in its own DDE:

private_vehicle_occupants
+ traffic_video_image
+ vehicle_count.

hov_lane_identity

This data flow is used within the Manage Traffic function to identify individual high occupancy vehicle (hov) lanes used for the control of traffic on roads (surface streets) and highways. The data flow consists of the following data items each of which is defined in its own DDE:

unit_number
+ location_identity.

hov_lane_list

This data flow is used within the Manage Traffic function and contains a list of high occupancy vehicle (hov) lanes to which the accompanying data applies. It consists of the following data items each of which is defined by its own DDE:

list_size
+ 1{hov_lane_identity}list_size.

hov_lane_vehicle_count

This data flow is used within the Manage Traffic function and contains the a count of the number of vehicle legitimately using High Occupancy Vehicle (HOV) lanes in the road and highway network served by the function. The count shows the actual number of vehicles in a lane, which is not the same as the vehicle flow rate, although this can be calculated as an average from successive values of this data flow. The data flow is updated every second and is fixed at one (1) byte for a maximum value of 255. .

hov_lane_violation

This data flow is sent by the Manage Traffic function to the Manage Emergency Services function and contains data about vehicles that do not have the required number of occupants to legitimately use a High Occupancy Vehicle (HOV) lane. It consists of the following data items each of which is defined in its own DDE:

vehicle_identity
+ vehicle_license
+ private_vehicle_occupants.

hov_lane_violation_count

This data flow is used within the Manage Traffic function and contains the a count of the number of vehicle illegally using High Occupancy Vehicle (HOV) lanes in the road and highway network. The count shows the actual number of illegal vehicles in a lane,

which is not the same as the illegal vehicle flow rate, although this can be calculated as an average from successive values of this data flow. The data flow is updated every second and is fixed at one (1) byte for a maximum value of 255. .

hov_priority

This data flow is used within the Manage Traffic function and contains data about the number of vehicles using high occupancy vehicle (hov) lanes. Data is included about vehicles that are both legal and illegal users. The data flow consists of the following items each of which is defined in its own DDE:

hov_lane_list
+ 1{hov_lane_data}list_size.

identified_emergency

This data flow is used within the Manage Emergency Servies function. It contains information about an emergency that has been identified from the inputs received within the function. The data flow consists of some or all or the following data item which is defined in its own DDE:

identified_emergency_details.

identified_emergency_details

This data flow is used within the Manage Emergency Servies function. It contains details of an emergency that has been identified by inputs to a process within the function. The data flow consists of some or all or the following data items each of which is defined in its own DDE:

incident_confidence_level
+ incident_description
+ incident_duration
+ incident_location
+ incident_number
+ incident_report_source
+ incident_reported_time
+ incident_severity
+ incident_start_time
+ incident_traffic_impact
+ incident_type.

import_request

This data flow is used to define details about the data which is to be requested from other parts of ITS. .

Additional sizing assumptions:

SIZE=96;

imported_map_data

This data flow is used within the Plan System Deployment function and contains a new set of digitized map data for uae in ITS simulation and evaluation. It will have been obtained from the map update provider through a terminator and consists of the following data item which is defined in its own DDE:

map_data_store_contents.

incident_action_time

This data flow is used within the Manage Emergency Servies function. It contains the time at which the incident data in the emergency services action log was updated by processes in the Manage Emergency Services function. The data flow contains the following data item which is defined in its own DDE:

time.

incident_alert

This data flow is used to send details of an incident from the Manage Traffic function to the

Manage Emergency Services function. It contains the following data items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_severity
+ incident_type
+ incident_traffic_impact.

incident_analysis_data

This data flow is used within the Manage Traffic function and contains processed traffic sensor data that can be analyzed for the possible presence of incidents. The data is provided directly from the local traffic sensor process rather than from some regional/area based process and so must originate in sensors that are within a small geographic area. .

incident_confidence_level

This data flow is used within the Manage Traffic function and defines the level of confidence that can be associated with a particular set of incident data. This level will depend on a number of factors such as the source of the incident data (police, media, driver, traveler, etc.), the type of incident (this may affect how easy it is to detect), and the time at which the incident was detected. The value of this data flow can be in the range 1 to 255 and can be assigned by processes within the function and/or the traffic operations personnel. .

incident_data

This data flow is used within the Manage Traffic function to send incident data from the Manage Incidents facility to the Provide Traffic Surveillance facility for use by the predictive model process and for transfer to a similar function at another traffic management center (TMC . It consists of the following data items each of which is defined in its own DDE:

current_incident_data
+ current_incidents_local_data
+ predicted_incident_data
+ predicted_incidents
+ predicted_incidents_local_data
+ request_other_current_incidents_data
+ request_other_predicted_incidents_data.

incident_data_flow

This data flow is used to transfer data between the Manage Emergency Services function and the Provide Driver and Traveler Services function. It contains the following items of data each of which is defined in its own DDE:

emergency_request_driver_acknowledge
+ emergency_request_kiosk_traveler_acknowledge
+ emergency_request_personal_traveler_acknowledge
+ emergency_vehicle_route_request
+ incident_information.

incident_data_for_vehicle_signage

This data flow is used within the Manage Traffic function. It contains data about current and predicted incidents for output as part of in-vehicle signage data. The data flow consists of the following data items each of which is defined in its own DDE:

current_incident_data_for_vehicle_signage
+ predicted_incident_data_for_vehicle_signage.

incident_data_input

This data flow is used within the Manage Traffic function to send processed traffic sensor data and data received from other traffic management centers (TMC's) from the Provide Traffic Surveillance facility to the Manage Incidents facility. It consists of

the following data items each of which is defined in its own DDE:

incident_analysis_data
+ other_current_incidents
+ other_predicted_incidents
+ request_local_current_incidents_data
+ request_local_predicted_incidents_data
+ unusual_data.

incident_data_output

This data flow is used within the Manage Traffic function and contains incident data that is to be output by the Media System. This data will cover a particular current or predicted incident, rather than the output of more general incident information, as the Media System is expected to be something similar to the current Highway Advisory Radio (HAR) systems. The data must also specify the part(s) of the Media System that are to output the data so that it can be directed to the appropriate areas. .

incident_data_request

This data flow is used to transfer data between the Provide Driver and Traveler Services function and the Manage Emergency Services function. It contains the following data items each of which is defined in its own DDE:

emergency_vehicle_route
+ emergency_request_driver_details
+ emergency_request_kiosk_traveler_details
+ emergency_request_personal_traveler_details
+ incident_information_request
+ vehicle_location_for_emergency_services.

incident_data_update

This data flow is used within the Manage Traffic function to request that the process responsible for re-classifying predicted incidents runs because new data has been loaded into the store of either predicted incidents or current incidents. This process will check the stores for new incidents and may re-classify a predicted incident as a current incident. When doing this, the details of the incident will be sent to another process for the generation of the appropriate incident response. The data flow contains a single character that is set to 'P' for a new predicted incident and 'C' for a new current incident. .

incident_description

This data flow is used within the Manage Traffic function and contains the description of an incident using a predefined dictionary of three character codes. .

Additional sizing assumptions:

SIZE=3;

incident_details

This data flow is sent from the Manage Emergency Services function to the Manage Traffic function and provides information about current incidents. It contains the following data items each of which is defined in its own DDE:

incident_number
+ incident_location
+ incident_start_time
+ incident_duration
+ incident_type
+ incident_severity.

incident_details_request

This data flow is used by the Manage Traffic function to request details of incidents from the Manage Emergency Services function. It contains the following data items each of which is defined in its own DDE:

incident_type
+ incident_oldest_time.

incident_duration

This data flow is used within the Manage Traffic function and gives the expected duration of an incident from its start time until the time at which it is expected that it will have no further effect on traffic conditions. The data flow consists of the following data item which is defined in its own DDE:

duration.

incident_info_template

This data is used within the Manage Traffic function and contains a templates showing what data will be available for a particular type of incident. .

Additional sizing assumptions:

SIZE=64;

incident_info_type

This data defines whether amended incident or defined responses data is being provided or is to be sent to the traffic operations personnel. .

Additional sizing assumptions:

SIZE=1;

incident_information

This data flow is sent from the Manage Emergency Services function to the Provide Driver and Traveler Services function and contains information that has been requested about incidents. It consists of the following items each of which is defined in its own DDE:

incident_number
+ incident_location
+ incident_start_time
+ incident_duration
+ incident_type
+ incident_severity
+ incident_traffic_impact.

incident_information_request

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Emergency Services function and is a request for information about incidents It contains the following data items each of which is defined in its own DDE:

incident_type
+ incident_oldest_time.

incident_location

This data flow is used within the Manage Traffic function and contains the location at which an incident will take place (for predicted incidents) or is taking place (for current incidents). The location will be defined in terms of map coordinates to enable it to be referenced spatially within the geographic area served by the local TMC. The data flow consists of the following data item which is defined in its own DDE:

location_identity.

incident_number

This data item is used by processes in the Manage Emergency Services and Manage Traffic functions and identifies each incident that has been or is active. The data flow is seized at two (2) bytes to enable up to 32767 incidents to be accommodated before old data is overwritten. Note that each function will have its own copy of this data so that an incident in one function does not have the same number in the other function, i.e. the numbering of incidents is independent in each function. .

incident_oldest_time

This data flow is used within the Manage Emergency Services functions. It contains the time from which details of current incidents known to the function are to be

reported to other functions, i.e. the time of the oldest, longest outstanding incident to be reported. The data flow consists of the following data item which is defined in its own DDE:

time.

incident_overrides

This data flow is used within the Manange Traffic function to transfer changes in traffic control strategy and incident details from the Manage Incidents facility to the Provide Device Control facility for implementation. The changes in strategy are of two types, one covering changes to road, and/or highway, and/or entry ramp control strategy and the other covering advisory message texts for output using variable message signs (vms). The incident details will be for both current and predicted incidents. The data flow consists of the following data items each of which is defined in its own DDE:

cv_incident_override
+ incident_data_for_vehicle_signage
+ incident_strategy_override
+ vms_updates.

incident_report_source

This data flow is used within the Manage Emergency Servies function. It contains information about the source of an emergency that has been identified from the inputs received within the function. It is sized at three (3) bytes to enable the use of a three character code for the indentification of sources. Examples of these codes are; 'ETS' for emergency telephone service, 'E91' for the E911 service operator, 'VEH' for an in-vehicle emergency declared by a driver, 'TST' for a transit emergency, etc. .

incident_reported_time

This data flow is used within the Manage Emergency Servies function. It contains the time at which an incident was first reported and is used for record purposes. The data flow consists of the following data item which is defined in its own DDE:

time.

incident_response_clear

This data flow is sent from the Manage Traffic function to the Manage Emergency Services function and is an indication that the Manage Traffic function has data indicating that an incident has been cleared. It consists of the following items of data each of which is defined in its own DDE:

incident_location
+ incident_type.

incident_response_log

This data store is used within the Manage Traffic function. It contains a record of all the incidents that have taken place for which some form of defined response data has been output to other parts of ITS. It consists of the following data items each of which is defined in its own DDE:

incident_location
+ incident_type
+ incident_severity
+ incident_description
+ incident_traffic_impact
+ planned_incident_response.

incident_response_status

This data flow is sent from the Manage Emergency Services function to the Manage Traffic function and contains data on the current status of an incident as provided by feedback from the Emergency Services. It consists of the following data items each of which is defined in its own DDE:

incident_number
+ incident_location
+ incident_severity
+ incident_traffic_impact
+ incident_type.

incident_severity

This data flow is used within the Manage Traffic and Manage Emergency Services functions and defines the severity of an incident held as a three character code. .

Additional sizing assumptions:

SIZE=3;

incident_start_time

This data flow is used within the Manage Traffic function and shows the time at which an incident will start. The point at which it starts to have an effect on traffic conditions will be later than this time which is used as the trigger for any corrective or mitigating action, e.g. change in traffic control strategy. Thus in the case of incidents that are some form of special event, the start time may not be the actual event start time. An example would be a baseball game, which could create an incident as spectators arrive for the start of the game. The time at which this happens will be different (before) the actual start of the game but after the time at which the gates open. The data flow consists of the following data item which is defined in its own DDE:

time.

incident_strategy_override

This data flow is used within the Manage Traffic function to request a change of current traffic control strategy as applied to intersections and lane control to take account of the effects on traffic flow of a current incident. The data flow consists of the following data items each of which is defined in its own DDE:

selected_roadway_control_strategy
+ selected_ramp_control_strategy.

incident_traffic_impact

This data flow is used within the Manage Traffic function and contains details of the impact that a particular incident will have on traffic flows. .

Additional sizing assumptions:

SIZE=80;

incident_type

This data flow is used within both the Manage Traffic and Manage Emergency Services functions and defines an incident type using a three character code. This will use a standard set of character codes to uniquely define the type of incident. .

incident_vehicle_status

This data flow is used within the Manage Emergency Services function and contains details of the status of the emergency vehicles that are responding to an incident. The status is stored as a three character code. .

incident_video_image

This data flow is used within the Manage Traffic function and contains a high resolution digitized image of a potential or current incident at a particular point on the road or freeway network. The size expression below assumes that the image is compressed. .

incident_video_image_control

This data flow is used within the Manage Traffic function and contains control parameters for closed circuit television (cctv) systems located used to provide incident management information. These parameters may cover things such as camera pan, tilt, and zoom, plus other picture controls. .

indicator_control_data

This data flow is used within the Manage Traffic function and contains the actual data from which instructions to the driver and traveler can be produced by indicators at the roadside on roads and highways served by the function. It consists of the following data items each of which is defined in its own DDE:

indicator_control_data_for_highways
+ indicator_control_data_for_roads.

indicator_control_data_for_highways

This data flow is used within the Manage Traffic function and contains the actual data from which instructions to the driver and traveler can be produced by indicators at the roadside on freeways in the geographic and/or jurisdictional area(s) served by the function. It consists of the following data items each of which is defined in its own DDE:

indicator_crossing_control_data_for_highways
+ indicator_ramp_control_data
+ indicator_sign_control_data_for_highways.

indicator_control_data_for_roads

This data flow is used within the Manage Traffic function and contains the actual data from which instructions to the driver and traveler can be produced by indicators at the roadside on roads (surface streets) in the geographic and/or jurisdictional area(s) served by the function. It consists of the following data items each of which is defined in its own DDE:

indicator_crossing_control_data_for_roads
+ indicator_junction_control_data
+ indicator_pedestrian_control_data
+ indicator_sign_control_data_for_roads.

indicator_control_monitoring_data

This data flow is used within the Manage Traffic function. It contains the actual data from which instructions to the driver and traveler can be produced by indicators at the roadside although in this case the data is used to monitor the operation of the indicators rather than actual message output. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_control_monitoring_data_for_highways
+ indicator_control_monitoring_data_for_roads.

indicator_control_monitoring_data_for_highways

This data flow is used within the Manage Traffic function. It contains the actual data from which instructions to the driver and traveler can be produced by indicators on the freeways in the geographic and/or jurisdictional area(s) served by the function. In this case the data is used by a process to monitor the operation of the indicators rather than actual message output. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_control_data_for_highways.

indicator_control_monitoring_data_for_roads

This data flow is used within the Manage Traffic function. It contains the actual data from which instructions to the driver and traveler can be produced by indicators on the roads (surface streets) in the geographic and/or jurisdictional area(s) served by the function. In this case the data is used by a process to monitor the operation of the indicators rather than actual message output. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_control_data_for_roads.

indicator_control_storage_data

This data flow is used within the Manage Traffic function to transfer indicator control data from the Provide Device Control facility to Provide Traffic Surveillance facility for loading into the current and long term data stores. It contains the data currently being output to the indicators that are used to control traffic on the roads and highways served by the TMC. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_control_storage_data_for_highways
+ indicator_control_storage_data_for_roads.

indicator_control_storage_data_for_highways

This data flow is used within the Manage Traffic function and contains the data currently being output to the indicators that are used to control traffic on the freeways in the geographic and/or jurisdictional area(s) served by the function. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_control_data_for_highways.

indicator_control_storage_data_for_roads

This data flow is used within the Manage Traffic function and contains the data currently being output to the indicators that are used to control traffic on the roads (surface streets) in the geographic and/or jurisdictional area(s) served by the function. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_control_data_for_roads.

indicator_crossing_control_data_for_highways

This data flow is used within the Manage Traffic function and contains the actual data from which instructions to the driver and traveler can be produced by indicators at multimodal crossings on freeways served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
    + indicator_crossing_controls}.

indicator_crossing_control_data_for_roads

This data flow is used within the Manage Traffic function and contains the actual data from which instructions to the driver and traveler can be produced by indicators at multimodal crossings on roads (surface streets) served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
    + indicator_crossing_controls}.

indicator_crossing_controls

This data flow is used within the Manage Traffic function and contains the actual control data to be passed to an indicator that is a multimodal crossing. This will be either the actual indication to be seen by the driver, e.g. red to stop vehicle or green to proceed, or a set of these instructions with duration times put together to form a fixed time signal plan, or an instruction to run using the controller's local intelligence. It is sized at twenty (20) bytes to enable the transfer of the fixed time plan data for use within the controller. .

indicator_current_fault_data

This data flow is used within the Manage Traffic function and contains details of all indicator faults that have been reported and are in the process of being cleared by the construction and maintenance organization for output to the traffic operations persoonel. It consists of the following data items each of which is defined in its own DDE:

indicator_type

+ indicator_fault
+ indicator_fault_number.

indicator_current_fault_update

This data flow is used within the Manage Traffic function and contains details of the updates that the traffic operations personnel have provided for current indicator fault data stored locally. It consists of the following data items each of which is defined in its own DDE:

indicator_type
+ indicator_fault
+ indicator_fault_number.

indicator_current_faults_list

This data flow is used within the Manage Traffic function and contains details of all indicator faults that have been reported and are in the process of being cleared by the construction and maintenance organization. It consists of the following data items each of which is defined in its own DDE:

indicator_type
+ indicator_fault
+ indicator_fault_number.

indicator_data

This data flow is used within the Manage Traffic function and contains the data from which a roadside indicator can create the message for output to drivers and travelers. .

Additional sizing assumptions:

SIZE=6;

indicator_data_fault

This data flow is used within the Manage Traffic function to show that an indicator has developed a fault that means it is not operating correctly. The fault will have been found by a process that is not local to the indicator itself, and may be located anywhere in the geographic area covered by the function. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_data_fault_for_highways
+ indicator_data_fault_for_roads.

indicator_data_fault_for_highways

This data flow is used within the Manage Traffic function

list_size
+ list_size{indicator_type
+ indicator_fault}.

indicator_data_fault_for_roads

This data flow is used within the Manage Traffic function

list_size
+ list_size{indicator_type
+ indicator_fault}.

indicator_fault

This data flow is used within the Manage Traffic function to define the type of fault that has been found in an indicator as it is not operating correctly. .

Additional sizing assumptions:

SIZE=2;

indicator_fault_clearance_update

This data flow is used within the Manage Traffic function and contains details of an indicator fault that has been cleared by the construction and maintenance organization. It consists of the following data items each of which is defined in its own DDE:

indicator_fault_number.

indicator_fault_data

This data flow is used within the Manage Traffic function to show that an indicator has developed a fault that means it is not operating correctly. The fault will have been found by a process that is local to the indicator itself. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_type
+ indicator_fault.

indicator_fault_number

This data flow is used within the Manage Traffic function and contains the number of an indicator fault. This number is used to reference the details of the fault that are stored within the Manage Traffic function. .

indicator_fault_state

This data flow is used within the Manage Traffic function to indicate the fault state of an indicator. It contains the indicator type (which includes its identity) and a fault code which is set to zero (0) means that any previously reported fault has been cleared. It consists of the following data items each of which is defined in its own DDE:

indicator_type
+ indicator_fault.

indicator_highway_control_static_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about the control data which may be used by indicators, either locally or as a series of commands from a central source, to provide traffic management on the highway network controlled by the Manage Traffic function. The data flow consists of the following data items each of which is defined in its own DDE:

highway_sign_setting_data
+ highway_sign_setting_plans.

indicator_highway_requested_state

This data flow is used within the Manage Traffic function and contains the actual state of operation of an indicator used to pass instructions to drivers and travelers on the highway network served by the function. The form of indication shown to drivers will depend on the type of indicator. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_control_data_for_highways}.

indicator_identity

This data flow is used within the Manage Traffic function to identify individual indicators used for the control of traffic on roads (surface streets) and highways. The indicators can be either intersection signal controllers, pedestrian signal controllers or variable message signs (vms). The data flow consists of the following data items each of which is defined in its own DDE:

indicator_type
+ unit_number
+ location_identity.

indicator_input_data

This data flow is used within the Manage Traffic function and contains the actual state of operation of the roadside indicators used to pass instructions to drivers and travelers on roads and highways. It consists of the following data items each of which is defined in its own DDE:

indicator_input_data_from_highways
+ indicator_input_data_from_roads.

indicator_input_data_from_highways

This data flow is used within the Manage Traffic function and contains the actual state of operation of the roadside indicators used to pass instructions to drivers and travelers on freeways within the geographic and/or jurisdictional area(s) served by the function. It is used for centralized monitoring the operation of the indicators and consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
+ indicator_response_state}.

indicator_input_data_from_roads

This data flow is used within the Manage Traffic function and contains the actual state of operation of the roadside indicators used to pass instructions to drivers and travelers on roads (surface streets) within the geographic and/or jurisdictional area(s) served by the function. It is used for centralized monitoring the operation of the indicators and consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
+ indicator_response_state}.

indicator_input_state_for_highways

This data flow is used within the Manage Traffic function and contains the state of response to control data of indicators on the roads (surface streets) in the geographic and/or jurisductional area(s) served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_data
+ indicator_type}.

indicator_input_state_for_roads

This data flow is used within the Manage Traffic function and contains the state of response to control data of indicators on the freeways in the geographic and/or jurisductional area(s) served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_data
+ indicator_type}.

indicator_input_storage_data

This data flow is used within the Manage Traffic function to transfer indicator response data from the Provide Device Control facility to the Provide Traffic Surveillance facility. The latter facility will load the data into the current and long term data stores. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_input_storage_data_for_highways
+ indicator_input_storage_data_for_roads.

indicator_input_storage_data_for_highways

This data flow is used within the Manage Traffic function and contains the response to control data that has been made by indicators on the freeways in the geographic and/or jurisdictional area(s) served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size

+ list_size{indicator_type
+ indicator_response_state}.

indicator_input_storage_data_for_roads

This data flow is used within the Manage Traffic function and contains the response to control data that has been made by indicators on the roads (surface streets) in the geographic and/or jurisdictional area(s) served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_type
+ indicator_response_state}.

indicator_junction_control_data

This data flow is used within the Manage Traffic function and contains the actual data from which instructions to the driver and traveler can be produced by indicators at junctions on roads served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
+ indicator_juntion_controls}.

indicator_juntion_controls

This data flow is used within the Manage Traffic function and contains the actual control data to be passed to an indicator at a road junction. This will be either the actual indication to be seen by the driver, e.g. red for stop vehicle or green for proceed, or a set of these instructions with duration times put together to form a fixed time signal plan, or an instruction to run using the controller's local intelligence. It is sized at forty (40) bytes to enable the transfer of the fixed time plan data for use within the controller. .

indicator_list

This data flow is used within the Manage Traffic function and contains a list of indicators to which a particular traffic control strategy is to be applied. The indicators may be intersection traffic signal controllers, pedestrian signal controllers and/or variable message signs (vms), the latter being used for lane control or advisory message output purposes. The data flow consists of the following data items each of which is defined by its own DDE:

list_size
+ 1{indicator_identity}list_size.

indicator_monitoring_suspend

This data flow is used within the Manage Traffic function and contains an instruction to suspend local monitoring of the operation of an indicator. It is used to prevent a fault being reported because the indicator is not obeying the control data it is receiving due to the input of a priority request for a transit or emergency vehicle. .

indicator_new_fault

This data flow is used within the Manage Traffic function and contains details of a new indicator fault that is to be reported to the construction and maintenance organization. It consists of the following data items each of which is defined in its own DDE:

indicator_type
+ indicator_fault
+ indicator_fault_number.

indicator_new_fault_data

This data flow is used within the Manage Traffic function and contains details of the new indicator fault data that the traffic operations personnel have provided for local storage. These faults are assumed to be undetectable by any of the other facilities within the Manage Traffic function. It consists of the following data items each of which is

defined in its own DDE:

indicator_type
+ indicator_fault.

indicator_new_fault_update

This data flow is used within the Manage Traffic function and contains details of an indicator fault. It consists of the following data items each of which is defined in its own DDE:

indicator_type
+ indicator_fault.

indicator_operating_condition

This data flow is used within the Manage Traffic function and contains the operating condition of an indicator that is an intersection controller. The condition will show which phases are indicating green (proceed) and which are showing red (stop) to vehicles and pedestrians. This data is for use in providing intersection collision avoidance data to approaching vehicles. The data flow is sized at four (4) bytes to enable intersection controllers of up to thrity two (32) phases to be accommodated. .

indicator_pedestrian_control_data

This data flow is used within the Manage Traffic function and contains the actual data from which instructions to the driver and traveler can be produced by indicators at pedestrian crossings on roads served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
+ indicator_pedestrian_controls}.

indicator_pedestrian_controls

This data flow is used within the Manage Traffic function and contains the actual control data to be passed to an indicator at a pedestrian crossing. This will be either the actual indication to be seen by the driver and the traveler, e.g. red for stop vehicle or cross now indication, or a set of these instructions with duration times put together to form a fixed time signal plan, or an instruction to run using the controller's local intelligence. It is sized at twenty (20) bytes to enable the transfer of the fixed time plan data for use within the controller. .

indicator_preemption_override_for_highways

This data flow is used within the Manage Traffic function. It contains an instruction to suspend the current operation of an indicator on the freeway network served by the function and give priority to the stream of traffic in which a transit or emergency vehicle is traveling. This data flow is generated by a process that has reveived a priority request from either the Manage Transit or Manage Emergency Services functions. .

indicator_preemption_override_for_roads

This data flow is used within the Manage Traffic function. It contains an instruction to suspend the current operation of an indicator on the road (surface streets) network served by the function and give priority to the stream of traffic in which a transit or emergency vehicle is traveling. This data flow is generated by a process that has reveived a priority request from either the Manage Transit or Manage Emergency Services functions. .

indicator_ramp_control_data

This data flow is used within the Manage Traffic function and contains the actual data from which instructions to the driver and traveler can be produced by indicators at entry ramps to highways served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity

+ ramp_controls}.

indicator_requested_state

This data flow is used within the Manage Traffic function and contains the actual state of operation of a roadside indicator used to pass instructions to drivers and travelers. The state will show some type of indication to drivers depending on the type of indicator. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_road_requested_state
+ indicator_highway_requested_state.

indicator_response_data_for_highways

This data flow is used within the Manage Traffic function. It contains the actual state of operation of the roadside indicators used to pass instructions to drivers and travelers on the highways in the geographic and/or jurisdictional area(s) served by the function. The data is used for local monitoring the operation of the indicators. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_type
+ indicator_response_state}.

indicator_response_data_for_roads

This data flow is used within the Manage Traffic function. It contains the actual state of operation of the roadside indicators used to pass instructions to drivers and travelers on the roads (surface streets) in the geographic and/or jurisdictional area(s) served by the function. The data is used for local monitoring the operation of the indicators. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_type
+ indicator_response_state}.

indicator_response_state

This data flow is used within the Manage Traffic function and contains the current state of an indicator that is being used to control traffic on the roads (surface streets) and highways in the geographic area served by the TMC. It is used to check that the indicator is performing as requested and may form the basis for a fault report if it is not. The data is sized at three bytes to enable a three character code to be used with which to identify the indicator state. Examples of typical states are:

cop - correct operation,
nrp - not responding,
sop - stuck on phase,
pnr - phase will not respond. .

indicator_road_adaptive_plan_number

This data flow is used within the Manage Traffic function and contains the number of an adaptive plan for the road network controlled by the function. A plan is a set of data that enables adaptive control to be applied to some or all of the indicators in a particular way. For example at one or more intersections, certain phases may be added or omitted, etc. The data flow is defined as a three character code to enable a wide range of alphanumberic character sequences to be used for plan numbers.

indicator_road_adaptive_plans

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about the adaptive control data which may be used by indicators, either locally or as a series of commands from a central source, to provide traffic management on the road network controlled by the Manage Traffic function. The data flow consists of the following data items each

of which is defined in its own DDE:

list_size
+ list_size{indicator_road_adaptive_plan_number
    + crossing_adaptive_data
    + intersection_adaptive_data
    + pedestrian_adaptive_data}.

indicator_road_control_static_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about the control data which may be used by indicators, either locally or as a series of commands from a central source, to provide traffic management on the road network controlled by the Manage Traffic function. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_road_adaptive_plans
+ indicator_road_fixed_plans.

indicator_road_fixed_plan_number

This data flow is used within the Manage Traffic function and contains the number of an adaptive plan for the road network controlled by the function. A plan is a set of data that enables fixed time control to be applied to some or all of the indicators in a particular way. Thus each set of plan data will specify particular cycle times, off-sets and phase timings for indicators. There may also be special instructions which may require certain phases may be added or omitted, demand responsive operation may be prohibited, local operation may be enabled, etc. The data flow is defined as a three character code to enable a wide range of alphanumberic character sequences to be used for plan numbers. .

indicator_road_fixed_plans

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about the fixed time control data which may be used by indicators, either locally or as a series of commands from a central source, to provide traffic management on the road network controlled by the Manage Traffic function. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_road_fixed_plan_number
    + crossing_fixed_time_data
    + intersection_fixed_time_data
    + pedestrian_fixed_time_data}.

indicator_road_requested_state

This data flow is used within the Manage Traffic function and contains the actual state of operation of an indicator used to pass instructions to drivers and travelers on the road network served by the function. The form of indication shown to drivers will depend on the type of indicator. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_control_data_for_roads}.

indicator_sign_control_data

This data flow is used within the Manage Traffic function and contains the actual data for use by indicators that are variable message (vms) and other types of signs on roads and freeways served by the function. The data flow has been sized to include the \ largest of its possible constituent data items, which are shown below and are each defined in their own DDE's:

[lane_vms_controls

| parking_lot_vms_controls
| pollution_output_message
| vms_advisory_text].

indicator_sign_control_data_for_highways

This data flow is used within the Manage Traffic function and contains the actual data from which instructions to the driver and traveler can be produced by indicators at variable message (vms) and other types of signs on the freeways in the geographic and/or jurisdictional area(s) served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
+ indicator_sign_control_data}.

indicator_sign_control_data_for_roads

This data flow is used within the Manage Traffic function and contains the actual data from which instructions to the driver and traveler can be produced by indicators at variable message (vms) and other types of signs on the roads (surface streets) in the geographic and/or jurisdictional area(s) served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
+ indicator_sign_control_data}.

indicator_type

This data flow is used within the Manage Traffic function and contains the type of indicator to which the accompanying output or input data applies. The type may be either intersection signal controller, pedestrian signal controller, variable message sign (vms) or mutlimodal crossing. .

information_datapage

This data flow is used within some ITS functions and represents the quantity of data that would be contained on a page (US letter, 50 lines by 80 columns). The data will be provided as a string of characters (4000) and will be formated as required by the receiving process. .

intermodal_service_arrival_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which an intermodal service must arrive at the destination for this type of service within a traveler's proposed trip plan. The destination may not be the final destination of the trip, or of the intermodal service. The time may also have to fit in with other modes of travel being used by the trip plan. The data flow consists of the following data item which is defined in its own DDE:

time.

intermodal_service_confirm

This data flow is used within the Provide Driver and Traveler Services function to confirm that a traveler wishes to make use of alternate mode services as part of a proposed trip. It consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ intermodal_services_details.

intermodal_service_confirmation

This data flow is used within the Provide Driver and Traveler Services function to confirm that a traveler's request for an alternate mode service booking has been accepted. It consists of the following data item which is defined in its own DDE:

reservation_status

+ traveler_identity.

intermodal_service_data_read

This data flow is used within the Provide Driver and Traveler Services function. It contains data previously obtained from the intermodal transportation service providers for use in a traveler's trip request. The data is being read from a data store for use in a current traveler trip request. The data flow contains the following data items each of which is defined in its own DDE:

[air_services_details | ferry_services_details | rail_services_details].

intermodal_service_data_request

This data flow is used within the Provide Driver and Traveler Services function. It contains a request for data about intermodal (non roadway) services that are available for use as part of a traveler's trip plan. The request specifies the origin and destination of the intermodal service, which may not be the same as those for the trip plan as a whole, plus the modes that can be considered, and the arrival and departure times. The data flow consists of the following data items each of which is defined in its own DDE:

intermodal_service_arrival_time
+ intermodal_service_departure_time
+ intermodal_service_destination
+ intermodal_service_origin
+ intermodal_service_possible_modes.

intermodal_service_data_response

This data flow is used within the Provide Driver and Traveler Services function. It contains the response to the request for data about the intermodal (non roadway) service available that will suit a traveler's proposed trip plan. The data flow consists of the following data items each of which is defined in its own DDE:

air_services_details
+ ferry_services_details
+ rail_services_details.

intermodal_service_data_write

This data flow is used within the Provide Driver and Traveler Services function. It contains data obtained from the intermodal transportation service providers for use in a traveler's trip request. The data is being loaded into a data store for use in future traveler trip requests. The data flow contains the following data items each of which is defined in its own DDE:

[air_services_details | ferry_services_details | rail_services_details].

intermodal_service_departure_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which an intermodal service must depart from the origin for this type of service within a traveler's proposed trip plan. The origin may not be the start point of the trip, or of the intermodal service. The time may also have to fit in with other modes of travel being used by the trip plan. The data flow consists of the following data item which is defined in its own DDE:

time.

intermodal_service_destination

This data flow is used within the Provide Driver and Traveler Services function. It contains the destination of an intermodal service within a traveler's proposed trip plan. It may not be the final destination of the trip, or of the intermodal service and may have to fit in with other modes of travel being used by the trip plan. The data flow consists of the following data item which is defined in its own DDE:

route_point.

intermodal_service_details

This data store is used within the Provide Driver and Traveler Services function. It contains data about air, heavy rail and ferry services that has been supplied by the intermodal transportation service providers. This data has been obtained in response to the requirements of traveler's trip plan requests and are retained to reduce the number of times the providers have to be accessed to provide the data. This store contains the following data items each of which is defined in its own DDE:

20{air_services_details}
+ 5{ferry_services_details}
+ 10{rail_services_details}.

intermodal_service_origin

This data flow is used within the Provide Driver and Traveler Services function. It contains the origin of an intermodal service within a traveler's proposed trip plan. It may not be the start point of the trip, or of the intermodal service and may have to fit in with other modes of travel being used by the trip plan. The data flow consists of the following data item which is defined in its own DDE:

route_point.

intermodal_service_possible_modes

This data flow is used within the Provide Driver and Traveler Services function. It contains the types of intermodal service that can be used as part of a traveler's proposed trip plan. These are stored as single bytes making up a three (3) byte code using the following characters:

'A' - airlines
'F' - ferry services
'R' - heavy rail operations.

Only those characters corresponding to the modes to be used will be included in the data flow, the non-used ones will be left blank. .

intermodal_services_details

This data flow is used within the Provide Driver and Traveler Services function. It contains details of services provided by non-road based transportation service providers such as heavy rail companies, ferry operators and airlines that are best suited to a traveler's trip plan. The data flow consists of the following data items each of which is defined in its own DDE:

air_services_details
+ ferry_services_details
+ rail_services_details.

intersection_adaptive_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about adaptive control data used by indicators that are intersection controllers to enable them to control traffic. The format of the data will depend upon the type of adaptive control being used but should be no more than fifty (50) bytes per controller. .

intersection_collision_avoidance_data

This data flow is sent from the Manage Traffic function to the Provide Vehicle Monitoring and Control function. It contains data for a vehicle that shows that it is likely to be involved in a collision at an intersection, unless it takes some avoiding action. The data flow is sized at two (2) bytes so that it can show the direction from which the other vehicle(s) is (are) approaching. This will help the vehicle to decide which is the most appropriate avoiding action to take. .

intersection_control_commands

This data flow is used within the Manage Traffic function and contains data provided

by the Plan System Deployment function. It is the actual control commands that make the intersection controller change the traffic %034stop/go%034 outputs shown by its phases to traffic. The actual format of the control commands will depend on national standards being developed for controller fixed time plans, e.g. NTCIP. However the data flow has been sized at 40 bytes to enable it to handle all projected type of controller and control commands formats. .

intersection_cycle_time

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the time taken to complete all the control commands in an intersection fixed time plan once only. It is sized at one (1) byte to give a maximum value of 255 seconds. .

intersection_equipment_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides information about each road traffic intersection so that its control using adaptive, fixed time or local techniques can be properly implemented when needed. Note that the indicator type data in data that forms part of the indicator identity will be set to that for intersection controllers. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
    + intersection_phase_number
    + intersection_phase_data}.

intersection_fixed_time_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about fixed time control data used by indicators that are intersection controllers to enable them to control traffic. The data will be made up of the following items each of which is defined in its own DDE:

intersection_cycle_time
+ intersection_offset_time
+ intersection_control_commands.

intersection_offset_time

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the relative start time of the cycle of intersection control commands and is set at a value that will achieve synchronization between adjacent controllers of any type. It is sized at one (1) byte to give a maximum value of 255 seconds. .

intersection_phase_data

This data flow is used within the Manage Traffic function and comprises data provided by the Plan System Deployment function. It contains information about the way in which each road traffic intersection controller operates, i.e. the minimum and maximum phase timings, phase change timings, etc. The data will be in integer format with the phase timings having a maximum value of 255 seconds (1 byte) and the change timings having a maximum value of 15 seconds (1/2 byte). The maximum number of controlled phases at an intersection has been assumed to be 16, including %034WALK%034 phases, which gives a total data size of forty (40) bytes. .

intersection_phase_number

This data flow is used within the Manage Traffic function and comprises data provided by the Plan System Deployment function. It contains the number of control phases that can be driven either through centrally supplied and implemented control data or by down loading data for local implementation. The phases may themselves be used to control vehicles, bicycles, transit vehicles, pedestrians, emergency vehicles, or other specialist uses. The data flow has been sized at one (1) byte to give a maximum of

255 phases. .

intersection_state_data

This data flow is used within the Manage Traffic function and contains the operating state of an indicator that is an intersection controller. This data is for use in providing intersection collision avoidance data to approaching vehicles. It consists of the following data items each of which is defined in its own DDE:

indicator_operating_condition
+ indicator_response_state.

kiosk_identity

This data flow is used by the Provide Driver and Traveler Services function to identify a particular kiosk. This enables the kiosk that was the source of a data request to be identified so that the requested data can be sent back to the correct kiosk. In order that a rich selection of kiosk identities can be supported, this data item will consist of up to five (5) alphanumeric characters and is therefore five (5) bytes in size. .

lane_deviation

This data flow is used within the Provide Vehicle Control and Monitoring function and contains details of the position of the vehicle within a highway lane as computed from on-board sensors. The data is either zero for centre or positive when to the right of center or negative when to the left of center. Both non-zero values are measured in inches up 127. .

lane_steering_commands

This data flow is used within the Provide Vehicle Control and Monitoring function and contains data showing any changes required to the vehicle's steering so that it can continue to stay in the current lane. The commands are of the form turn left (negative value), turn right (positive value), or center the steering (zero value) and will be of a much smaller order of magnitude than the similar commands for changing lane. .

lane_vms_controls

This data flow is used within the Manage Traffic function and contains the actual control data to be passed to an indicator that is a lane control sign. This will be the actual indication that the lane is or is not to be used. The data flow sized at two (2) bytes to enable the transfer of lane closed or open indications. .

link_and_queue_data

This data is used within the Provide Driver and Traveler Services function and contains the average link journey times and queue times for each link, computed from traffic data and (if available) vehicle probe data.

list_size
+ list_size{link_identity
    + link_journey_time
    + link_queue_time}.

link_attributes

This data flow is used within the Provide Driver and Traveler Services function and contains details of the type of road data stored for the link by a TMC or ISP. .

Additional sizing assumptions:

SIZE=16;

link_conditions

This data flow is used within the Manage Traffic function and contains information about local conditions, i.e. snow, ice, rain, fog, other forms of precipitation (earth, sand, petroleum, chemicals, etc.), flooding on each link of the road and highway network served by the function. Where the link is in a tunnel, high temperature and optionally the use of fire extinguishers is monitored. One bit is used to show the presence of each of the above conditions. If set to one (1) the bit indicates that the condition is present of the link, and if set to zero (0) that it is not. A total of 16 bits are available to cover all the different conditions which may be applied to each of the links in the road and highway network. .

link_data

This data flow is sent by the Plan System Deployment function to the Manage Traffic function. It contains a new version of the store of link data used to determine which other TMC to contact to obtain traffic data relating to another geographic area. The data flow consists of the following data items each of which is defined in its own DDE:

link_attributes
+ link_identity
+ link_TMC_identity.

link_data_for_guidance

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function. It contains data for use in detemining which other ISP('s) must be contacted to obtain data about roads and highways in geographic area(s) outside that served by the local function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_attributes
    + link_identity
    + link_ISP_identity}.

link_data_from_tags

This data flow is used within the Manage Traffic function. It contains the link journey and queue times calculated by processing the times at which tag data was collected from vehicles on the road (surface street) and highway network served by the function. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_queue_time
    + link_journey_time}.

link_data_store

This data store is used within the Provide Driver and Traveler Services function and contains data for use in detemining which other ISP must be contacted to obtain road data relating to another geographic area. It consists of the following data item which is defined in its own DDE:

link_data_for_guidance.

link_data_update

This data flow is used within the Manage Traffic function and contains updates to the data held in the store of link data used to determine which other TMC to contact to obtain traffic data relating to another geographic area. It consists of the following data items each of which is defined in its own DDE:

link_attributes
+ link_identity
+ link_TMC_identity.

link_database

This data store is generated within the Plan System Deployment function and contains data about which links of the road network are covered by different TMC's and/or ISP's. The data is sent to the local Manage Trafffic and Provide Driver and Traveler Services functions for use in detemining which other TMC or ISP must be contacted to obtain traffic or road data relating to another geographic area. It consists of the following data items each of which is defined in its own DDE:

link_attributes
+ link_identity

+ link_TMC_identity
+ link_ISP_identity.

link_delay

This data flow is used within the Manage Traffic function and contains the calculated delay for vehicles driving along a particular link in the road and highway network served by the function. This delay is the additional time it will take above that recorded during free flow conditions to travel from one end of the link to the other and will either be calculated from sensor and/or probe data, or produced by the predictive model process within the function. .

link_details

This data store is used within the Manage Traffic function and contains data about which links of the road network are covered by different TMC's. It consists of the following data items each of which is defined in its own DDE:

link_attributes
+ link_identity
+ link_TMC_identity.

link_identity

This data flow is used within the Manage Traffic, Provide Driver and Traveler Services and Plan System Deployment functions. It contains the unique identity of each link, data for which is stored by a particular TMC or ISP. A link is a short segment typically less than one mile, e.g. a segment of freeway between off-ramps or a street segment between two intersections. The utilization of this data in a variety of other data flows necessitates fairly comprehensive coverage to include all route segments along which such services as route guidance are offered. For some link attributes such as link times, a link pair may be required since travel times will differ per link pair (e.g. link time for a vehicle turning left may be different from the link time for a vehicle proceeding through an intersection). The data flow consists of the following data items each of which is defined in its own DDE:

unit_number
+ link_type
+ location_identity.

link_identity_list

THis data flow is used within the Manage Transit function. It contains a list of the links in the road and freeway network that are covered by a transit route segment. The data flow has been sized to enable up to four (4) links to be part of a segment in all three scenarios (urban, inter-urban and rural). It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_identity}.

link_ISP_identity

This data flow is used within the Provide Driver and Traveler Services function and contains the indentity of other ISP's with which road links outide the local ITS geographic area are associated. .

link_journey_time

This data flow is used within the Manage Traffic function and contains the current journey time for vehicles on a particular link. This will have been determined using sensor data that measures traffic on the road and highway network served by the function or produced by the predictive model process. .

link_list

This data flow is used within the Manage Traffic function and contains a list of links for which data is being provided. These links will comprise all of those on both the road (surface street) and highway network served by the function. The data flow consists of the following data items each of which is defined by its own DDE:

list_size
+ 1{link_identity}list_size.

link_list_for_highways

This data flow is used within the Manage Traffic function and contains a list of links for which data is being provided. These links will comprise all of those on the the highway network served by the function. The data flow consists of the following data items each of which is defined by its own DDE:

list_size
+ 1{link_identity}list_size.

link_list_for_roads

This data flow is used within the Manage Traffic function and contains a list of links for which data is being provided. These links will comprise all of those on the road (surface street) network served by the function. The data flow consists of the following data items each of which is defined by its own DDE:

list_size
+ 1{link_identity}list_size.

link_queue_time

This data flow is used within the Manage Traffic function and contains the current queuing time for vehicles on a particular link. This will have been determined using sensor data that measures traffic on the road and highway network served by the function or produced by the predictive model process. .

link_state_data

This data flow is used within the Manage Traffic function and contains data about traffic conditions on each link within the road (surface street) and highway network in the geographic area served by the TMC. The data will apply to all links regardless of whether it is used for other purposes such as strategy selection, parking lot management, etc. The data flow consists of the following items each of which is defined in its own DDE:

link_list
+ 1{vehicle_count
  + vehicle_queue_length
  + vehicle_speed
  + vehicle_headway
  + vehicle_occupancy}list_size.

link_strategy_data

This data flow is used within the Manage Traffic function and contains processes data from sensors on a link that forms part of the road and highway network served by the TMC. The data is used as one of the inputs for the selection of the most appropriate traffic control strategy by the Provide Device Control facility. The data flow consists of the following data itmes each of which is defined in its own DDE:

link_list
+ 1{vehicle_count
  + vehicle_queue_length
  + vehicle_occupancy}list_size.

link_time_calculation_data

This data flow is used within the Manage Traffic function and contains the tag data read from readers within the road (surface street) and freeway network served by the function. This data can be used with that read from vehicles in the future to calculate link journey and queue times. The data flow contains the following data item which is defined in its own DDE:

list_size
+ list_size{date
+ time
+ vehicle_tag_data}.

link_time_calculation_read

This data flow is used within the Manage Traffic function and contains tag data read from the store. This store holds tag data previously read from vehicles which can be used with the current data to calculate link journey and queue times. The data flow contains the following data item which is defined in its own DDE:

link_time_calculation_data.

link_time_calculation_store

This data store is used within the Manage Traffic function and contains tag data that has previously been read from vehicles. This store holds tag data previously read from vehicles which can be used with the data read from vehicles in the future to calculate link journey and queue times. The data flow contains the following data item which is defined in its own DDE:

link_time_calculation_data.

link_time_calculation_write

This data flow is used within the Manage Traffic function and contains tag data being written to the store. This store holds tag data previously read from vehicles which can be used with the data read from vehicles in the future to calculate link journey and queue times. The data flow contains the following data item which is defined in its own DDE:

link_time_calculation_data.

link_TMC_identity

This data flow is used within the Provide Driver and Traveler Services function and contains the indentity of the TMC with which each road link is associated. .

Additional sizing assumptions:

SIZE=32;

link_type

This data flow is used within the Manage Traffic function and contains an identifier to show the type of link to which associated data applies. The link type varies according to how it fits into the road and highway network. It can be all or part of a surface street, a lane of a surface street, a lane on a highway, or all of a highway, and can have other characteristics such as high occupancy vehicles (hov) use only,etc. .

list_size

This data flow is a general parameter used throughout ITS functions to specify the number of data items included in a data flow. For example is can be the number of indicators in a strategy selection message, or the number of data items that have been collected in a particular time period. .

load_description

This data flow is used within the Manage Traffic function and summarizes the contents and size of the load to be conveyed by a commercial vehicle along its permitted route plan. This data may include special load characteristics (dimensions, weight, hazardous material designation etc.) to ensure that the links in the road (surface street) and highway network on the planned route can accommodate its passage. The data flow is sized at three (3) bytes to enable a three character code to be used to define the load. .

local_sensor_data

This data flow is used within the Manage Traffic function as a means of transfering sensor data for use in traffic management from the Provide Traffic Surveillance facility to the Provide Device Control facility. It is intended to be used in circumstances where traffic management cannot be implemented by anything other than local (roadside) means. The data flow consists of the following data items each of

which is defined in its own DDE:

local_sensor_data_for_highways
+ local_sensor_data_for_roads.

local_sensor_data_for_highways

This data flow is used within the Manage Traffic function It contains sensor data for use in traffic management when traffic management cannot be implemented by anything other than local roadside (freeway) means. The data flow consists of the following data items each of which is defined in its own DDE:

crossing_close_time
+ crossing_close_duration
+ hov_priority
+ roadside_conditions
+ traffic_video_image
+ vehicle_detection_data.

local_sensor_data_for_roads

This data flow is used within the Manage Traffic function. It contains sensor data for use in traffic management when traffic management cannot be implemented by anything other than local roadside means. The data flow consists of the following data items each of which is defined in its own DDE:

crossing_close_time
+ crossing_close_duration
+ hov_priority
+ pedestrian_demand
+ roadside_conditions
+ traffic_video_image
+ vehicle_detection_data.

local_TMC_incidents_request

This data flow is exchanged with the other traffic centers (TMC's) terminator by the Manage Traffic function. It is used to request data about both current and predicted incidents from the local TMC. They will be entered into the other TMC's store of predicted and current incidents for use in determining reponses to incidents that although outside its geographic or jurisdictional area(s) may affect its local traffic conditions. To enable either or both predicted and current incidents to be requested, the data flow consists of the following data items each of which is defined in its own DDE:

request_local_predicted_incidents_data
+ request_local_current_incidents_data.

location_identity

This data flow is used within many of the ITS functions and is an identifier for the position of a subsystem or component such as a variable message sign (vms), parking lot, ramp, etc., or for the start, end and way points along a route segment. The position may then be used to orient the equipment or route segment within a spatial database. The data flow is sized at thirteen (13) bytes to enable it to include the georeferenced point ISP-location reference standard LRMP format, as described in the White Paper on location referencing dated 11/8/95. .

logged_hazmat_route

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Traffic function. It contains details about an route that has been requested by a commercial vehicle that is carrying cargo which could be viewed as being liable to cause a potential incident. Loads falling into this category are those containing hazardous (HAZMAT) material, or those which are outsize, e.g. wide, heavy, or fragile and hence slow moving. The data flow is derived from the route that has been produced for the commercial vehicle and consists the following items each of which is defined in

its own DDE:

hazmat_load_data
+ list_size
+ list_size{route_segment_end_point
+ route_segment_estimated_arrival_time
+ route_segment_estimated_travel_time
+ route_segment_identity
+ route_segment_start_point}.

long_term_data

This data store is used within the Manage Traffic function to contain data about the previous (historical) state of traffic on the road (surface street) and highway network served by the function. The data is accumulated in real time at periodic time intervals from other processes within both this and other ITS functions. The traffic flow, other routes use, o-d matrix, parking lot, processed and wide area pollution data is stored in hourly time intervals for each day over a rolling two week period (336 entries), after which it is consolidated into a single smoothed or average set of data for normal weekday flows (24 entries). This gives a total of 360 entries or sets of data flows in the store. The traffic management data is stored in fifteen minute intervals daily for a long period of time as a record of the indicator state. The store consists of the following items of data each of which is defined in its own DDE:

1{current_stored_incident_data
+ current_other_routes_use
+ o_d_matrix
+ parking_lot_storage_data
+ processed_data
+ traffic_flow_state
+ vehicle_smart_probe_stored_data
+ wide_area_pollution_data}360
+ 1{traffic_management_storage_data}18720.

long_term_data_for_media

This data flow is used within the Manage Traffic function. It contains a subset of the long data stored by the function which will be used as the basis for traffic data that is sent to other functions. This subset shows the traffic conditions for the last six hours plus the smoothed or average flow over a weekday, giving a total of 31 entries or sets of data. The data flow consists of the following data items each of which is defined in its own DDE:

1{current_incident_data
+ current_other_routes_use
+ parking_lot_storage_data
+ traffic_flow_state
+ vehicle_smart_probe_stored_data
+ wide_area_pollution_data}31.

low_traffic_route

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Traffic functoin. It is a special form of route similar to an emergency vehicle route, but for use by other vehicles when traffic volumes are low, e.g. in the early hours of the morning and is used to trigger a special green wave route for the vehicle. The traffic volume in the road network which will allow this type of route to be used is set in the static data. This flow contains the items shown below each of which is defined in its own DDE:

route
+ vehicle_identity.

manual_brake_input_detected

This data flow is used within the Provide Vehicle Control and Monitoring function to provide feedback that the driver has activated the vehicle brakes manually. If set to a no-zero value then the actuator is functioning, but if set to zero manual input has been detected. .

manual_input_received

This data flow is used within the Provide Vehicle Control and Monitoring function It contains an indication (zero) that manual driver input has been detected. A non-zero value (1) means that some form of automatic control has been selected by the driver. .

manual_steering_input_detected

This data flow is used within the Provide Vehicle Control and Monitoring function to provide feedback that the driver has activated the vehicle steering manually. If set to a no-zero value then the actuator is functioning, but if set to zero manual input has been detected. .

manual_throttle_input_detected

This data flow is used within the Provide Vehicle Control and Monitoring function to provide feedback that the driver has activated the vehicle throttle manually. If set to a no-zero value then the actuator is functioning, but if set to zero manual input has been detected. .

map_data

This data store is used within the Manage Commercial Vehicles function. It contains digitized map data that is provided with and used as part of a static route selection package to determine routes for commercial vehicles. The whole package including the data will have been obtained from a specialist supplier, and will be capable of providing routes that are the shortest, quickest, etc. without taking any account of current or predicted traffic conditions along the route. .

map_data_for_cv_drivers

This data store is used within the Manage Commercial Vehicles function and contains digitized map data which will be used by the commercial vehicle driver's static route selection process. It consists of the following data item which is defined in its own DDE:

map_data.

map_data_for_demand_display

This data store is used within the Manage Traffic function and contains digitized map data. This data is for use as background to displays of data about current and predicted traffic and travel demand produced within the facility. The map data will enable the demand data to be shown in its location context to improve its understanding by traffic operations personnel. The data store consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_documentation

This data store is used in the Plan System Deployment function and contains digitized map data. This data is for use as background to documentation of the results of evaluations and simulations of the operation of the transportation network served by the ITS functions, plus historical and other data relating to the operation of the network. The map data will enable this data to be printed (either in hardcopy or electronically) in its location context and thus improve its understanding by Transportation Planners and others to whom the documentation may be sent. The data flow consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_emergency_display

This data store is used within the Manage Emergency Services function and contains digitized map data. This data is for use as background to displays of data about incidents and emergencies. The map data will enable incidents and emergencies to be shown in their location context thus improve the understanding of their impact and the possible responses by the emergency system operator. The data store consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_fleet_managers

This data store is used within the Manage Commercial Vehicles function and contains digitized map data which will be used by the commercial fleet manager's static route selection process. It consists of the following data item which is defined in its own DDE:

map_data.

map_data_for_general_use

This data store is used by processes in the Plan System Deployment and Provide Driver and Traveler Services functions as a source of digitized data on the physical layout of the road and highway network. This is provided by the map update provider which is a specialist supplier of this type of data that is outside of ITS. The store consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_incident_display

This data store is used in the Display and Update Incident Data facility within the Manage Traffic function. It contains digitized map data for use as background to displays of incident data obtained from the stores of either current or predicted incident data. The map data will enable the incident data to be shown in its location context to improve its understanding by Traffic Operations Personnel. It consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_pollution_display

This data store is used in the Manage Emissions facility within the Manage Traffic function. It contains digitized map data for use as background to displays of pollution data obtained from the stores of either pollution state or reference data. The map data will enable the pollution data to be shown in its location context to improve its understanding by traffic operations personnel. It consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_route_selection

This data store is used by processes in the Provide Driver and Traveler Services function as a source of digitized data on the physical layout of the road and highway network. This is provided by the map update provider which is a specialist supplier of this type of data that is outside of ITS. The store consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_tp_displays

This data store is used in the Plan System Deployment function and contains digitized map data. This data is for use as background to displays of the results of evaluations and simulations of the operation of the transportation network served by the ITS functions. The map data will enable this data to be shown in its location context and thus improve its understanding by Transportation Planners. It consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_traffic_display

This data store is used in the Display and Output Traffic Data facility within the Manage Traffic function. It contains digitized map data for use as background to displays of traffic data obtained from the stores of either current or long term data. The map data will enable the traffic data to be shown in its location context to improve its understanding by traffic operations personnel. It consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_transit

This data store is used within the Manage transit function and contains digitized map data. This data is for use in generating transit routes and as the background to displays of data about transit services requested by the transit fleet manager. The map data will enable the services to be shown in their location context thus improve the understanding by the transit fleet manager. The data store consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_traveler_displays

This data store is used in the Manage Traveler Information facility within the Provide Driver and Traveler Services function. It contains digitized map data for use as background to displays of trip information requested by the traveler from a kiosk. The map data will enable the trip information to be output to be shown at the kiosk against a bakground that includes its location context to enable travelers to understand it more easily. It consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_for_traveler_personal_displays

This data store is used in the Manage Traveler Information facility within the Provide Driver and Traveler Services function. It contains digitized map data for use as background to displays of trip information requested by the traveler from a perosnal portable device. The map data will enable the trip information to be output to be shown on the device against a bakground that includes its location context to enable travelers to understand it more easily. It consists of the following data item which is defined in its own DDE:

map_data_store_contents.

map_data_store_contents

This data store is used by many processes within ITS functions as a source of digitized data on the physical layout of the road and highway network. It will include three types of data, the digitized map data, the details of each link and the gazetteer that details all road and freeway names. This data will be obtained from a specialist supplier and will be accessed in such a way that the choice of supplier will be left open and up to the individual system operators. The link identity data will be updated on a regular basis. The data store consists of the following data items each of which is defined in its own DDE:

map_digitized_data
+ map_link_identity_data
+ map_gazetteer_data
+ map_transit_data.

map_digitized_data

This data flow is used by many processes within ITS functions and forms part of the store of digitized map data. It contains data which enables computer generated drawings of the physical road network to be produced in a variety of scales and sizes. These will be produced to suit the geometry of the actual display unit on which the data will be shown in either visual or hardcopy format. .

map_gazetteer_data

This data flow is used by many processes within ITS functions and forms part of the store of digitized map data. It contains a list of the names of every road and freeway covered by the digitized data, together with positioning information which enables the name to be placed on a computer generated drawing of the road and freeway network. .

map_link_identity_data

This data flow is used by many processes within ITS functions and forms part of the

store of digitized map data. It contains data about the physical characteristics of each link in the road network that enables navigation, e.g. low bridges, sharp bends, one-way streets, physical and administrative turning restrictions, tolls (including schedules), and the required permits and duties for commercial vehicles. .

map_transit_data

This data flow is used by many processes within ITS functions and forms part of the store of digitized map data. It contains data which enables maps of the transit route network to be produced. These will be produced to suit the geometry of the actual display unit on which the data will be shown in either visual or hardcopy format. .

media_incident_data_updates

This data flow is used within the Manage Traffic function. It contains changes to the data about incidents in the current or predicted incidents data stores, which have been input by the Media Operator. It consistis of one of the following data items each of which is defined in its own DDE:

current_incidents_data
+ predicted_incidents_data.

modes

This data flow is used within many functions and forms part of the data used for route requests and trip plans. It defines the mode(s) of transport to be used on a requested route or proposed trip. The following different modes are supported using the associated three character code and up to six (6) may be used in any trip request:

CAR - own private car
BUS - part of public transit services
RLY - part of public transit services
AIR - scheduled air service
SHP - sea borne transport other than ferry, see below
FRY - passenger or vehicle ferry
CYL - pedal or motor powered bicycle
WLK - walking
VPL - van pool
CPL - car pool
EBS - express bus service
SPS - specialized_service, e.g. a private bus service from airport to hotel
EMV - emergency vehicle .

navigable_map_traveler_update_cost

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function and contains the cost (cents) of an update to the navigable map database used for on-line traveler guidance. The data flow consists of the following data item which is defined in its own DDE:

cost.

navigable_map_vehicle_update_cost

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function and contains the cost (cents) of an update to the digitized map data used for on-line vehicle guidance. It consists of the following data item which is defined in its own DDE:

cost.

network_data

This data flow is sent from the Manage Traffic function to the Plan System Deployment function and contains the current static data being used for managing traffic, the log of parking lot data and pollution data, plus a snap-shot of the current and historic state of traffic within the road and highway network. It contains the following data

items each of which is defined in its own DDE:

current_traffic_static_data
+ current_incident_static_data
+ parking_lot_operational_data
+ pollution_operational_data
+ traffic_data_for_deployment.

network_evaluation_parameters

This data flow is used within the Plan System Deployment function and provides parameters input by the transportation engineer for the evaluation of a model of the ITS network. .

network_evaluation_results

This data flow is produced within the Plan System Deployment function and contains the results of an evaluation of the model of the ITS network using the simulation parameters together with other data captured from its operation. .

network_generation_parameters

This data flow is used within the Plan System Deployment function and provides parameters input by the transportation engineer for the generation of a new set of static data. .

network_historical_data

This data store is used within the Plan System Deployment function and contains the following data items each of which is defined in its own DDE:

ahs_operational_data
+ current_other_routes_use
+ current_road_network_use
+ cv_operational_data
+ emergency_vehicle_operational_data
+ payment_transaction_reports
+ parking_lot_operational_data
+ pollution_operational_data
+ toll_operational_data
+ traffic_data_for_deployment
+ transit_passenger_operational_data
+ transit_services_for_deployment.

network_parameters

This data flow is used within the Provide System Deployment function to transfer data from the transportation planner interface into a store. It contains the following data items each of which is stored in its own DDE:

network_generation_parameters
+ network_simulation_parameters
+ network_evaluation_parameters.

network_planning_data

This store is used within the Plan System Deployment function and contains the following data items each of which is defined in its own DDE:

network_evaluation_results
+ network_parameters.

network_simulation_data

This data flow is produced within the Plan System Deployment function and contains data used to simulate the ITS network and its traffic and traveler movements to analyze where improvements can be made. .

network_simulation_parameters

This data flow is used within the Plan System Deployment function and provides

parameters input by the transportation engineer for the simulation of the traffic in the network as part of the process of evaluating any changes that are being proposed. .

network_static_data

This data flow is used within the Plan System Deployment function and contains new static data to be sent to the Manage Traffic function.

current_incident_static_data
+ current_traffic_static_data
+ road_data.

network_static_data_store

This store is used within the Plan System Deployment function and contains data about the network of road, highways and transit services available in the geographic area covered by ITS. It consists of the following data items each of which is defined in its own DDE:

current_incident_static_data
+ current_traffic_static_data
+ imported_map_data.

network_store_data_output

This data item contains part(s) of either the historical, static, or planning data stores which are to be output to the transportation planner. .

Additional sizing assumptions:

SIZE=1024000;

network_updates

This data flow is sent from the Plan System Deployment function to the Manage Traffic function and contains the either new static data to be used for managing traffic or requests for traffic data and/or a copy of the current static data. It contains the following data items each of which is defined in its own DDE:

link_data
+ static_data_request
+ supply_incident_static_data
+ supply_traffic_static_data
+ traffic_data_deployment_request.

new_sensor_static_data

This data flow is used within the Manage Transit function. It contains data that is loaded into the store of static data used in the processing of data received from traffic sensors. It consists of the following data item which is defined in its own DDE:

static_data_for_sensor_processing.

o_d_matrix

This data flow is used within the Manage Traffic function and contains an origin-destination (o-d) matrix that has been derived from the other traffic data, such as that obtained from video images of traffic. It will apply to the road (surface street) and highway network in the geographic area served by the function. The data will comprise a list of o-d pairs and the traffic flow between them, where the pairs will be identified by link identities. Thus the data flow has been sized at half the maximum number of links multiplied by two (2) bytes for the vehicle flow rate. .

operations_incident_data_updates

This data flow is used within the Manage Traffic function. It contains changes to the data about incidents in the current or predicted incidents data stores or data in the defined incident responses data store, which have been input by Traffic Operations Personnel. It consistis of one of the following data items each of which is defined in its own DDE:

incident_info_type
+ incident_location

+ incident_start_time
+ incident_duration
+ incident_type
+ incident_severity
+ incident_traffic_impact
+ traffic_impact_criteria.

origin

This data flow is used within the Provide Driver and Traveler Services function. It defines the origin point for a trip request or a route to be used by a traveler or a vehicle. In some instances it will be used as the origin for the use of a particular mode within a trip, e.g. the part of the route for the trip that is to be provided by walking, or ridesharing, or an intermodal service provider. It consists of the following data item which is defined in its own DDE:

route_point.

other_current_incidents

This data flow is used within the Manage Traffic function and contains information about incidents which are currently taking place on links in areas served by adjacent traffic management centers (TMC's). The data flow consists of the following data items each of which is defined in its own DDE:

tmc_identity
+ list_size
+ list_size{current_incidents_data}.

other_long_term_data

This data flow is used within the Manage Traffic function and contains historic traffic data for links in the road (surface street) and highway network which are served by other traffic management centers (TMC's). The size estimate is based on data being accumulated at periodic time intervals. The traffic flow, other routes use, o-d matrix, parking lot, processed and wide area pollution data is stored in hourly time intervals for each day over a rolling two week period (336 entries), after which it is consolidated into a single smoothed or average set of data for normal weekday flows (24 entries). This gives a total of 360 entries or sets of data flows in the store. The traffic management data is stored in fifteen minute intervals daily for a long period of time as a record of the indicator state. This flow consists of the following items each of which is defined in its own DDE:

1{current_stored_incident_data
+ current_other_routes_use
+ o_d_matrix
+ parking_lot_storage_data
+ processed_data
+ traffic_flow_state
+ wide_area_pollution_data}360
+ 1{traffic_management_storage_data}18720.

other_modes_routes

This data store is used within the Provide Driver and Traveler Services function and contains details of all non-vehicle and non-transit routes which are currently in use by travelers. .

Additional sizing assumptions:

SIZE=32768;

other_predicted_incidents

This data flow is used within the Manage Traffic function and contains information about incidents which are predicted to take place on links in areas served by adjacent traffic management centers (TMC's). The data flow consists of the following data items each of which is defined in its own DDE:

tmc_identity

+ list_size
+ list_size{predicted_incidents_data}.

other_route

This data flow is used within the Provide Driver and Traveler Services function. It is a special form of %034route%034 which uses modes of transport other than vehicles or transit and contains the following items each of which is defined in its own DDE:

route_cost
+ route_segment_number{route_segment_end_point
+ route_segment_estimated_travel_time
+ route_segment_mode
+ route_segment_report_position_points
+ route_segment_start_point}.

other_route_segment_data

This data flow is used within the Provide Driver and Traveler Services function. It contains route segment data obtained from a similar function in another ITS Center covering a separate geographic area. It consists of the following data item which ss defined in its own DDE:

route_segment_details.

other_serivces_payment_confirm

This data flow is used within the Provide Electronic Payment Services and Provide Driver and Traveler Services functions. It is a flag which if set to one (1) indicates that payment for a traveler's confirmed use of other (yellow pages) services has been completed successfully, but if set to zero (0) indicates that the payment transaction failed. .

other_services_data

This data flow is used within the Manage Transit and Provide Driver and Traveler Services function and contains details of the other (yellow pages) services requested by a traveler or transit user.

other_services_roadside_request

This data flow is sent from the Manage Transit function to the Provide Electronic Payment Services function and contains the transit user's request from the roadside, i.e. a transit stop, for other (yellow pages) services. It consists of the following data items each of which is defined in its own DDE :

traveler_identity
+ credit_identity
+ other_services_data.

other_services_roadside_response

This data flow is sent from the Provide Electronic Payment Services function to the Manage Transit function and contains the response to the transit user's request from the roadside, i.e. a transit stop, for other (yellow pages) services. It consists of the following data items each of which is defined in its own DDE :

traveler_identity
+ credit_identity
+ other_services_data.

other_services_vehicle_request

This data flow is sent from the Manage Transit function to the Provide Electronic Payment Services function and contains the transit user's request from a transit vehicle for other (yellow pages) services. It consists of the following data items each of which is defined in its own DDE :

traveler_identity
+ credit_identity
+ other_services_data.

other_services_vehicle_response

This data flow is sent from the Provide Electronic Payment Services function to the Manage Transit function and contains the response to the transit user's request from a transit vehicle for other (yellow pages) services. It consists of the following data items each of which is defined in its own DDE :

traveler_identity
+ credit_identity
+ other_services_data.

other_TMC_cv_incidents

This data flow is used within the Manage Traffic function and contains data about the route for a commercial vehicle that is carrying an abnormal load where that route originates outside the road and highway network covered by the local TMC. An abnormal load is defined as being one for which some kind of movement permit is neeed. It may be that it is either over dimensioned (width, height, weight, etc.) or contains hazardous material (HAZMAT). The data has been received from another TMC (not necessarily that serving the area from which the route originated) and will enable the local TMC to set up any special traffic control strategies to minimze the disruption to traffic as the load passes through the network. The data flow consists of the following data items each of which is defined in its own DDE:

permit_type
+ permit_route_plan
+ permit_traffic_controls.

other_TMC_data_request

This data flow is exchanged with the other traffic centers (TMC's) terminator by the Manage Traffic function. It is used to request traffic data from another TMC for use by the local TMC is determining its traffic control strategies. .

other_TMC_emergency_data

This data flow is used within the Manage Traffic function and contains the portion of a strategy that gives priority to emergency vehicles that relates to roads (surface streets) and highways that are outside the area served by the local TMC. This data has been received from other TMC's so the local TMC can implement the requested priority measures to give the emergency vehicles priority throughout their route. The data flow consists of the following data items each of which is defined in its own DDE:

emergency_vehicle_green_wave
+ selected_emergency_vehicle_strategy.

other_TMC_incidents_request

This data flow is exchanged with the other traffic centers (TMC's) terminator by the Manage Traffic function. It is used to request data about both current and predicted incidents from another TMC. They will be entered into the local TMC's store of predicted and current incidents for use in determining reponses to incidents that although outside its geographic or jurisdictional area(s) may affect local traffic conditions. To enable either or both predicted and current incidents to be requested, the data flow consists of the following data items each of which is defined in its own DDE:

request_other_predicted_incidents_data
+ request_other_current_incidents_data.

other_TMC_strategy_data

This data flow is used within the Manage Traffic function and contains the strategy data that has been obtained from another TMC. This data can be use by the local TMC for determining its own traffic management strategy taking account of what is happening in the road and highway network controlled by another TMC. The data flow consists of the following items each of which is defined in its own DDE:

strategy_data.

other_traffic_center_data

This store is used within the Manage Traffic function and contains data that has been obtained from other Traffic Management Centers (TMC's) that serve different geographic or jurisdictional areas outside that served by the local TMC. The data flow consists of the following items of data each of which is defined in its own DDE:

tmc_list
+ 1{other_long_term_data}list_size.

other_TRM_service_data

This data flow is used within the Manage Transit function and contains the raw transit schedule and route data received from an adjacent transit operation.. The data will be used in future service calculations by the local operation to enable there to be coordination between the two services for the benefit of the traveler. .

override_lane_hold

This data flow is used within the Provide Vehicle Control and Monitoring function and indicates that lane holding must be suspended whilst the vehicle changes lanes. This lane change is due to the driver requesting that the vehicle change lanes. .

override_throttle

This data flow is used within the Provide Vehicle Control and Monitoring function and indicates that the current throttle setting must be changed because the driver has requested that the vehicle changes speed. .

paratransit_arrival_time

This data flow is used within the Manage Transit function and contains the time at which the requested paratransit service will get the traveler to the requested destination. The location of the destination is provided in a separate data flow. The data flow consists of the following data item which is defined in its own DDE:

time.

paratransit_availability_time

This data flow is used within the Manage Transit function and contains time window of availability of the requested paratransit service. If the traveler does not confirm the use of the within this time frame, the details will no longer be valid, and the traveler will have to re-request the service. This is to allow for the fluctuating nature of demand for paratransit services and to enable the best possible service to be provided at any time. .

paratransit_available_vehicles

This data store is used within the Manage Transit function and contains information on vehicles that are available for paratransit services.

transit_vehicle_type
+ transit_vehicle_identity
+ transit_vehicle_passenger_capacity
+ transit_vehicle_location.

paratransit_destination

This data flow is used within the Manage Transit function and contains destination of the requested paratransit service, which may not be the traveler's final destination, since the remainder of the trip may be completed by other means, e.g. regular public transit. .

paratransit_personal_schedule

This data flow is sent from the Manage Transit function to the Provide Driver and Traveler Services function. It consists of the following data items each of which is defined in its own DDE:

paratransit_service_details
+ paratransit_service_cost
+ traveler_identity.

paratransit_pickup_location

This data flow is used within the Manage Transit function and contains the location at which the requested paratransit service will pick up the traveler. The time at which the traveler will be picked up is contained in a separate data flow. The data flow consists of the following data item which is defined in its own DDE:

location_identity.

paratransit_pickup_time

This data flow is used within the Manage Transit function and contains the time at which the requested paratransit service will pick up the traveler. The location of the pick-up point is provided in a separate data flow. .

paratransit_request

This data flow is used within the Provide Driver and Traveler Services function as a means of specifying the parameters needed for a paratransit based trip (or paratransit portion of a multi-modal trip) to be generated. It contains the following data items each of which is defined in its own DDE:

origin
+ destination
+ departure_time
+ desired_arrival_time.

paratransit_requested_services

This data flow is used within the Manage transit function and contains detasils of the traveler's request for paratransit services. It consists of the following data items each of which is defined in its own DDE:

paratransit_personal_schedule
+ traveler_identity.

paratransit_route_confirm

This data flow is used within the Provide Driver and Traveler Services function and is the confirmation that the response to a previous request from a travelers seeking on-line guidance to be given access to paratransit services is acceptable to the traveler.

paratransit_service_details
+ traveler_identity.

paratransit_route_request

This data flow is used within the Provide Driver and Traveler Services function to enable travelers using on-line guidance to be given access to paratransit services. It consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ trip_request.

paratransit_route_response

This data flow is used within the Provide Driver and Traveler Services function and is the response to the request from a travelers using on-line guidance to be given access to paratransit services. It consists of the following data items each of which is defined in its own DDE:

paratransit_service_details
+ traveler_identity.

paratransit_schedule

This data flow is used within the Manage Transit function and contains details of a paratransit service that has been generated in response to a previously submitted traveler request. It consists of the following data items each of which is defined in its own DDE:

paratransit_service_details

+ transit_stop_locations
+ transit_schedules
+ transit_route.

paratransit_service_confirmation

This data flow is sent by the Provide Driver and Traveler Services function to the Manage Transit function to confirm that the traveler wants to use the previously identifies paratransit service. It contains the following data items each of which is defined in its own DDE:

paratransit_service_identity
+ transit_confirmation_flag
+ traveler_identity.

paratransit_service_cost

This data flow is used within the Manage Transit function and contains the cost of the requested paratransit service. It consists of the following data item which is defined in its own DDE:

cost.

paratransit_service_data

This data store is used within the Manage Trasit function and to hold data about paratransit services that have been requested but not confirmed by travelers. It consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ paratransit_personal_schedule.

paratransit_service_details

This data flow is used within the Manage Transit function to provide details of the response to a requested paratransit service. It consists of the following data items each of which is defined in its own DDE:

paratransit_arrival_time
+ paratransit_availability_time
+ paratransit_destination
+ paratransit_pickup_time
+ paratransit_pickup_location
+ paratransit_service_identity.

paratransit_service_identity

This data flow is used within the Manage Transit function to provide a unique identity number for a requested paratransit service. It is sized at three (3) bytes to enable this number to be unique over a long time period. .

paratransit_service_output

This data flow is used within the Manage Transit function to hold data about paratransit services for output to the store used as the interface to the regular transit route and schedule generation processes. It contains the following data item which is defined in its own DDE:

paratransit_service_details.

paratransit_service_stored_data

This data flow is used within the Manage Transit function. It contains details of the one hundred most used demand responsive transit (paratransit) services and is for use by the processes that generate regular transit service routes and schedules. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{paratransit_service_details}.

paratransit_services

This store is used within the Manage Transit function to hold data about paratransit services as they are different from normal transit services. It contains the following data items each of which is defined in its own DDE:

paratransit_service_details
+ transit_vehicle_identity
+ transit_stop_locations
+ transit_schedules
+ transit_route
+ traveler_identity.

paratransit_services_for_transit_drivers

This data flow is used within the Manage Transit function to provide data about a confirmed paratransit service to a transit driver.

transit_schedules
+ transit_route
+ transit_stop_locations.

paratransit_transit_driver_instructions

This data flow is used within the Manage Transit function and contains the instructions for the transit driver to follow in order that a paratransit service can be executed. The instructions will contain such things as pick-up points, traveler identities, drop off points, etc. The driver can obtain actual route guidance through the on-line vehicle guidance facility available from the Provide Driver and Traveler Services function. .

paratransit_transit_vehicle_availability

This data flow is used within the Manage Transit function and contains the current availability of a transit vehicle for paratransit services. This availability has been computed from processing the inputs from on-board sensors within the transit vehicle. .

paratransit_trip_request

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Transit function to action a trip request using the paratransit operation. It contains the following data items each of which is defined in its own DDE:

traveler_identity
+ trip_request.

parking_guidance_for_vms

This data flow is used within the Manage Traffic function. It contains the variable message sign (vms) states that will be used to implement the desired traffic control strategy at the parking lots served by the function. This data may be used to guide vehicles towards those parking lots where spaces are currently available or to show which lots have been closed, i.e. are not currently in use. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_list
+ 1{parking_lot_vms_controls}list_size.

parking_lot_availability

This data flow is sent from the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function. It contains details of the number of spaces available in the lot in response to a previous request for this data. The data flow consists of the following items each of which is defined in its own DDE:

parking_lot_identity
+ parking_lot_spaces
+ traveler_identity.

parking_lot_bookings_confirm

This data flow is used within the Provide Electronic Payment Services function and contains result of a previous request for the advanced booking of space(s) in a parking lot.

It consists of the following data items each of which is defined in its own DDE:

vehicle_identity
+ reservation_status.

parking_lot_bookings_request

This data flow is used within the Provide Electronic Payment Services function and contains details of the advanced booking being requested for space(s) in a parking lot. It consists of the following data items each of which is defined in its own DDE:

vehicle_identity
+ parking_lot_identity
+ parking_space_details.

parking_lot_calculated_occupancy

This data flow is used within the Manage Traffic function and contains the current occupancy of a parking lot, i.e. the number of vehicles present, calculated from traffic sensors located at its entrance(s) and exit(s). It is sized at two (2) bytes to enable a parking lot with up to 32767 spaces to be served by the Manage Traffic function. .

parking_lot_capacity_update

This data flow is used within the Provide Electronic Payments function and contains an update to the current capacity of a parking lot managed by a particular Parking Service Provider. It consists of the following data items each of which is defined in its own DDE:

parking_lot_identity
+ parking_lot_spaces.

parking_lot_capacity_update_confirm

This data flow is used within the Provide Electronic Payments function and contains the result of an update to the current capacity of a parking lot managed by a particular Parking Service Provider. It consists of the data items shown below each of which is defined in its own DDE. If the capacity is set to 99999, then the update failed.

parking_lot_identity
+ parking_lot_spaces.

parking_lot_charge

This data flow is used within the Provide Electronic Payment Services function and contains a vehicle identity, credit identity, stored credit and the chrage for the use of a space in a parking lot. The first three data items are used to enable the cost to be directed at the owner of the vehicle or the vehicle driver. The data flow consists of the following data items each of which is defined in its own DDE:

parking_lot_tag_data
+ parking_lot_cost
+ vehicle_identity.

parking_lot_charge_application_time

This data flow is used within the Provide Electronic Payment Services function and contains the time at which a parking lot charge applies for a particular toll segment. The time is held as the number of seconds since a fixed reference point, from which the actual time and date can be easily computed. .

parking_lot_charge_change_request

This data flow is sent from the Manage Traffic function to the Provide Electronic Payment Services function and contains a request for a change to the current parking lot charging structure that will help to influence a change in modal split of journeys currently being undertaken by travelers of all types, i.e. including drivers and transit users, by encouraging then to use certain parking lots, e.g. those near park and ride sites on the edge of an urban area. It consists of the following data items each of which is defined in its own DDE:

parking_lot_identity
+ parking_lot_price
+ parking_lot_charge_application_time
+ vehicle_type_for_charges.

parking_lot_charge_change_response

This data flow is sent from the Provide Electronic Payment Services function to the Manage Traffic function. It contains the response to a previous request for the current parking lot charges to be changed to help produce a change in the current modal split of trips being undertaken by all types of travelers. If sent to one (1) the change was accepted and if set to zero (0), the change was rejected. .

parking_lot_charge_details

This data flow is sent from the Provide Electronic Payment Services function to the Manage Traffic function and contains the prices being charged by each parking lot for each of its spaces, together with the time and date for which they apply.

parking_lot_identity
+ parking_lot_price
+ parking_lot_charge_application_time
+ vehicle_type_for_charges.

parking_lot_charge_request

This data flow is sent from the Manage Traffic function to the Provide Electronic Payment Services function and contains a request for the current prices being charged for parking lot spaces. .

parking_lot_cost

This data flow is used within the Provide Electronic Payment Services function. It defines the cost of particular vehicle using a space in a parking lot for a particular time period. The data flow consists of the following data item which is defined in its own DDE:

cost.

parking_lot_current_occupancy

This data flow is used within the Manage Traffic function and contains the parking lot identity and current occupancy. It consists of the following data items each of which is defined in its own DDE:

parking_lot_identity
+ parking_lot_calculated_occupancy.

parking_lot_current_state

This data flow is used within the Manage Traffic function and contains the identity of the parking lot plus its current status and occupancy. It consists of the following data items each of which is defined in its own DDE:

parking_lot_identity
+ parking_lot_state
+ parking_lot_current_occupancy.

parking_lot_data

This data store is used within the Provide Electronic Payment Services function and contains data covering the capacity of the parking lot, i.e. the total number of spaces for vehicles, abd any advanced booking that have been made. It consists of the following data items each of which is defined in its own DDE:

parking_lot_bookings_request
+ parking_lot_spaces
+ parking_lot_identity.

parking_lot_data_request

This data flow is sent from the Provide Driver and Traveler Services function to the

Provide Electronic Payment Services function and contains a request for data about the number of spaces that are available in a particular parking lot at the specified data and time. This data is requested as part of the process of putting together a proposed trip in response to a traveler's trip request This data flow contains the following items each of which is defined in its own DDE:

date
+ parking_lot_identity
+ time
+ traveler_identity.

parking_lot_decreasing_threshold

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It contains the threshold at which the parking lot state will change, e.g. from 'spaces' to 'almost full', etc., as the number of vehicles in the parking lot decreases. The threshold is sized at two (2) bytes, as occupancies will typically be greater than 255, the maximum value that can be accommodated within one byte. .

parking_lot_entry_lane_number

This data flow is used within the Provide Electronic Payment Services function and contains the number of the lane through which the vehicle entered the parking lot. .

Additional sizing assumptions:

SIZE=1;

parking_lot_identity

This data flow is used within the Provide Electronic Payment Services and Manage Traffic function. It contains the identity of an individual parking lot so that its charges can be defined and a control strategy applied to its use. The data flow consists of the following data items each of which is defined in its own DDE:

unit_number
+ location_identity.

parking_lot_increasing_threshold

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It contains the threshold at which the parking lot state will change, e.g. from 'spaces' to 'almost full', etc., as the number of vehicles in the parking lot increases. The threshold is sized at two (2) bytes, as occupancies will typically be greater than 255, the maximum value that can be accommodated within one byte. .

parking_lot_input_data

This data flow is used within the Manage Traffic function and contains data that is used to calculate the occupancy of parking lots. It consists of the following items each of which is defined in its own DDE:

parking_lot_list
+ 1{vehicle_count
  + vehicle_queue_length}list_size.

parking_lot_list

This data flow is used within the Manage Traffic function and contains a list of parking lots to which a particular strategy is to be applied. The strategy will either promote or discourage the use of the parking lots to generally improve traffic flow conditions in the geographic area controlled by the TMC. The data flow consists of the following data items each of which is defined by its own DDE:

list_size
+ 1{parking_lot_identity}list_size.

parking_lot_occupancy

This data flow is used within the Manage Traffic function and contains the current

occupancy of a parking lot, i.e. the number of vehicles present. .

Additional sizing assumptions:

SIZE=2;

parking_lot_operational_data

This data flow is sent from the Manage Traffic function to the Provide System Deployment function. It contains counts of the number of spaces used in the parking lot and the parking lot state during the previous time period, i.e. since the data was last sent. Regardless of the actual value of the time period, the data is provided in five (5) minute steps, i.e. the number of spaces used and state are recorded every five minutes. The data flow consists of the following data items each of which is defined in its own DDE:

date
+ list_size
+ list_size{parking_lot_current_state}
+ parking_lot_identity
+ time.

parking_lot_operator_input_data

This data flow is used within the Manage Transit function to provide data from the parking lot operator. This data may take the form of the current parking lot occupancy or its state, e.g. full, spaces, closed, etc. .

parking_lot_operator_output_data

This data flow is used within the Manage Transit function to provide data to the parking lot operator. This data may take the form of a request to change the state of the parking lot, or the parking lot state, where this is not available locally from other equipment. .

parking_lot_operator_transit_update

This data flow is used within the Manage Transit function to provide data to the parking lot operator about the response recevied to a request for new or additional park and ride (P+R) transit services from the parking lot. .

parking_lot_payment_confirmation

This data flow is used within the Provide Electronic Payment Services function and contains confirmation that the previous request for the cost of the current parking lot charge to be deducted from the credit currently stored by the payment instrument has been completed successfully. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

parking_lot_payment_debited

This data flow is used within the Provide Electronic Payment Services function and contains confirmation that the cost of the current parking lot charge will be deducted by the financial institution from the credit identity previously provided by the payment instrument. It is only sent when a credit identity has been previously received from the payment instrument. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

parking_lot_payment_pull_in_message

This data flow is used within the Provide Electronic Payment Services function to indicate that a driver must pull in because the parking lot payment transaction has failed. It contains the following data item which is defined in its own DDE:

vehicle_identity.

parking_lot_payment_request

This data flow is used within the Provide Electronic Payment Services function and contains the request for the cost of the current parking lot charge to be deducted from the credit currently stored by the payment instrument. It is only sent when a value of

stored credit has been previously received from the payment instrument. The data flow consists of the following data item which is defined in its own DDE:

parking_lot_cost.

parking_lot_price

This store is used within the Provide Electronic Payment Service function to hold data about the prices to be charged for parking lot spaces(cents). .

Additional sizing assumptions:

SIZE=2;

parking_lot_price_data

This data flow is used within the Provide Electronic Payment Services function and contains the prices being charged by each parking lot for each of its spaces, together with the time and date for which they apply. It consists of the following data items each of which is defined in its own DDE:

parking_lot_identity
+ parking_lot_price
+ parking_lot_charge_application_time
+ vehicle_type_for_charges.

parking_lot_price_data_request

This data flow is used within the Provide Electronic Payment Services function. It contains a request for the current parking lot price data to be provided from the store that is being used to calculate parking lot charges. .

parking_lot_price_details

This data flow is used within the Provide Electronic Payment Services function and contains details of the prices charged by each parking lot for use of its spaces. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{parking_lot_price_data}.

parking_lot_prices

This store is used within the Provide Electronic Payment Service function to hold data about the prices to be charged for parking lot spaces, by time of day, day of week and vehicle type.

list_size
+ parking_lot_identity
+ 1{parking_lot_price
  + parking_lot_charge_application_time
  + vehicle_type_for_charges}list_size.

parking_lot_pull_in_message

This data flow is used within the Provide Electronic Payment Services function to indicate that a driver must pull in because the parking lot payment transaction through the payment clearinghouse has failed. It contains the following data items which is defined in its own DDE:

vehicle_identity.

parking_lot_reservation_confirm

This data flow is sent from the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function. It contains the confirmation that a previously requested reservation of a space at a parking lot has been confirmed and can be included in a traveler's confirmed trip plan. This data flow consists of the following items each of which is defined in its own DDE:

parking_lot_identity
+ reservation_status

+ traveler_identity.

parking_lot_reservation_request

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function and contains a request for an advance reservation to be made at a parking lot. This reservation is the result of a traveler confirming a proposed trip. This data flow contains the following items each of which is defined in its own DDE:

date
+ parking_lot_identity
+ time
+ traveler_identity.

parking_lot_sensor_allocation

This data flow is used within the Manage Traffic function and is provided by the Plan System Deployment function. It contains the identity(ies) of the traffic sensors that are used to determine the number of spaces in the parking lot that are currently occuppied. There are two types of sensor, those measuring input flow (vehicles entering the lot) and those measuring output flow (vehicles leaving the lot). The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{unit_number + parking_lot_sensor_type}.

parking_lot_sensor_type

This data flow is used within the Manage Traffic function and is provided by the Plan System Deployment function. It contains a character that indicates the type of parking lot lane to which which a traffic sensor has been applied to count the number of vehicles that pass. The following two types are provided:

N - for sensors on entry lanes,
X - for sensors on exit lanes. .

parking_lot_spaces

This data flow is used within the Provide Driver and Traveler Services function and contains the number of spaces available in a parking lot. This may be either currently or at some point in the future depending on accompanying data. The data flow is sized at two bytes to enable parking lots with up to 32767 spaces to be accommodated. .

parking_lot_state

This data flow is used within the Manage Traffic function and contains the current state of a parking lot, e.g. %034spaces%034, %034almost full%034, %034full%034, %034closed%034, etc. It will have been determined from data provided by either the parking lot operator, the parking service provider, or a comparison of the actual occupancy of the parking lot determined from vehicle detectors sited at the lot entrance(s) and exit(s) with threshold values for each status condition. The state is stored as a two character code, which could typically be as follows:

SP - spaces
AF - almost full
F - full
C - closed. .

parking_lot_state_thresholds

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It contains the thresholds at which the parking lot states will change, e.g. from 'spaces' to 'almost full', etc. There are two sets of three thresholds, one set for use when the parking lot occupancy is increasing and the other set for use when the occupancy is decreasing. The data flow consists of the following data items each of which is defined in its own DDE:

3{parking_lot_increasing_threshold}
+ 3{parking_lot_decreasing_threshold}.

parking_lot_static_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about the allocation of vehicle counting sensors, and signs to parking lots, plus details of the thresholds used to decide the parking lot state, i.e. the occupancies at which the 'almost full' and 'full' states will apply. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{parking_lot_identity
    + parking_lot_sensor_allocation
    + parking_lot_state_thresholds
    + parking_lot_vms_allocation}.

parking_lot_storage_data

This data flow is used within the Manage Traffic function and contains occupancy and state data for all the parking lots in the geographic area served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{parking_lot_current_occupancy
    + parking_lot_identity
    + parking_lot_state}.

parking_lot_tag_data

This data flow is used within the Provide Electronic Payment Services function and contains the data that has been provided by the payment instrument being used by the driver at a parking lot. This may be either a credit identity, or the value of the credit currently stored by the payment instrument, to which parking lot charges may be charged. The data flow consists of the following items each of which is defined in its own DDE:

credit_identity
+ date
+ parking_lot_entry_lane_number
+ stored_credit
+ time.

parking_lot_tag_data_clear

This data flow is used within the Provide Electronic Payment Services function and contains the parking lot tag data from which any arrival time has been cleared. The data will have been used to charge for use of the parking lot, and is being cleared to enable its use for future charging. The data flow consists of the following data item which is defined in its own DDE:

parking_lot_tag_data.

parking_lot_tag_data_collect

This data flow is used within the Provide Electronic Payment Services function and contains the parking lot tag data that is being collected from on-board the vehicle. This data will be used as the means by which the vehicle will be charged for its use of the parking lot and will consist of the following data item which is defined in its own DDE:

parking_lot_tag_data.

parking_lot_tag_data_input

This data flow is sent from the Provide Electronic Payment Services function to the Manage Traffic function. It contains the data from parking lot and toll tags on-board

vehicles which will be used to calculate vehicle journey times for links in the road (surface street) and freeway network served by the Manage Traffic function. The data consists of a unique identity number which is assigned to each tag as it is read

parking_lot_tag_data.

parking_lot_tag_data_needed

This data flow is used within the Manage Traffic and Provide Electronic Payment Services functions to request the output of the data from a toll tag that may be on-board a vehicle. This data will be used to calculate vehicle journey times for links in the road (surface street) and freeway network served by the Manage Traffic function. .

parking_lot_tag_data_read

This data flow is used within the Provide Electronic Payment Services function and contains the parking lot tag data that is being read from a store on-board the vehicle. In addition to the credit identity or stored credit value which will be unchanged, this data will contain the time at which the vehicle entered the parking lot and is for use in charging for the vehicle's use of the lot. The data flow consists of the following data item which is defined in its own DDE:

parking_lot_tag_data.

parking_lot_tag_data_request

This data flow is used within the Provide Electronic Payment Services function and contains a request for the parking lot tag data to be read from the store that is held on-board the vehicle. .

parking_lot_tag_data_store

This data store is used within the Provide Electronic Payment Services function and contains the parking lot tag data that is being currently used by the vehicle. The time portion of this data may show the time at which the vehicle entered the parking lot and will be used as the basis for calculating the parking lot use charge. The data flow consists of the following data item which is defined in its own DDE:

parking_lot_tag_data.

parking_lot_tag_data_update

This data flow is used within the Provide Electronic Payment Services function and contains the parking lot tag data that has been updated. The updated will have loaded the time at which the vehicle entered the parking lot and is for use in charging for the vehicle's use of the lot. The data flow consists of the following data item which is defined in its own DDE:

parking_lot_tag_data.

parking_lot_tag_data_write

This data flow is used within the Provide Electronic Payment Services function and contains the parking lot tag data that has been updated and is being written into a store on-board the vehicle. In addition to the credit identity or stored credit value which will be unchanged, this updated data will contain the time at which the vehicle entered the parking lot and is for use in charging for the vehicle's use of the lot. The data flow consists of the following data item which is defined in its own DDE:

parking_lot_tag_data.

parking_lot_tag_pull_in_message

This data flow is used within the Provide Electronic Payment Services function to indicate that a driver must pull in because the vehicle's tage cannot be read at a parking lot. .

parking_lot_transaction_records

This data store is used by processes in the Provide Electronic Payment Services function and contains records of parking lot payment transactions. It consists of the

following data items each of which is defined in its own DDE:

list_size
+ list_size{advanced_charge_transactions
+ current_charge_transactions}.

parking_lot_transit_request

This data flow is sent by the Manage Traffic function to the Manage Transit function and contains a request for new or additional park and ride (P+R) transit services to be provided from the parking lot. .

parking_lot_transit_response

This data flow is sent by the Manage Transit function to the Manage Traffic function and contains the response to a request for new or additional park and ride (P+R) transit services to be provided from the parking lot. .

parking_lot_violation_information

This data is used by the Provide Electronic Payment Services functions to send data about a violator of the parking lot charge collection processes to the Manage Emergency Services function. This data will contain a digitized video image of the vehicle trying to violate the parking lot charge collection process. .

parking_lot_vms_allocation

This data flow is used within the Manage Traffic function and is provided by the Plan System Deployment function. It contains the identity(ies) of variable message signs that are allocated to parkinglots to show the state of the parking lot, and (poosibly) give alternate parking information.

list_size
+ list_size{unit_number}.

parking_lot_vms_controls

This data flow is used within the Manage Traffic function and contains data about the text strings of information about parking lot states that are to be output to drivers using a form of indicators called variable message signs (vms). The output data may be a direction indication towards a parking lot where spaces exist, a state indication (open/closed), or a number of spaces currently available depending on the type of indicator and the selected strategy. .

parking_service_provider_input_data

This data flow is used within the Manage Transit function to provide data from the parking lot system. This data may take the form of the current parking lot occupancy or its state, e.g. full, spaces, closed, etc. .

parking_service_provider_output_data

This data flow is used within the Manage Transit function to provide data to the parking lot system. This data may take the form of a request to change the state of the parking lot, or the parking lot state, where this is not available locally from other equipment. .

parking_service_provider_transit_update

This data flow is used within the Manage Transit function to provide data to the parking lot system about the response recevied to a request for new or additional park and ride (P+R) transit services from the parking lot. .

parking_space_details

This data flow is used within the Provide Electronic Payment Services function and contains details of the parking lot space requirements for a particular user. It consists of the following data items each of which is defined in its own DDE:

date
+ duration
+ time.

payment_request

This data flow is sent from the Provide Driver and Traveler Services function to the

Provide Electronic Payment Services function and contains requests for payments to be made by travelers or requests for price information. It consists of the following data items each of which is defined in its own DDE:

driver_advanced_payment_for_map
+ driver_map_update_payment_request
+ parking_lot_data_request
+ parking_lot_reservation_request
+ request_prices
+ rideshare_payment_request
+ traveler_map_update_payment_request
+ traveler_other_services_payment_request
+ traveler_payment_request
+ traveler_personal_display_update_cost
+ traveler_personal_display_update_payment_request
+ traveler_personal_map_update_cost
+ traveler_personal_trip_costs
+ traveler_roadside_trip_costs
+ yellow_pages_service_provider_registration_request.

payment_result

This data flow is sent by the Provide Electronic Payment Services function to the Provide Driver and Traveler Service function and contains responses to requests for payment by travelers, prices, probe data from vehicles paying tolls, or responses from parking lots. The data flow consists of the following data items each of which is defined in its own DDE:

driver_credit_identity
+ driver_map_update_payment_response
+ parking_lot_availability
+ parking_lot_reservation_confirm
+ prices
+ rideshare_payment_confirmation
+ traveler_map_update_payment_response
+ traveler_payment_response
+ traveler_personal_display_update_payment_response
+ traveler_other_services_payment_result
+ traveler_personal_credit_identity
+ traveler_roadside_credit_identity
+ vehicle_toll_probe_data
+ yellow_pages_service_provider_registration_response.

payment_transaction_records

This data flow is used within the Provide Electronic Services function and contains records of all payment transactions for services such as driver and traveler map updates, provision of other (yellow pages) services, registration of suppliers of these services and commercial vehicle administration. It consists of the following data items each of which is defined in its own DDE:

cv_payments_transactions
+ driver_map_update_payments_transactions
+ transit_user_payments_transactions
+ traveler_map_update_payments_transactions
+ traveler_trip_payments_transactions
+ yellow_pages_provder_payments_transactions.

payment_transaction_reports

This data flow is used within the Provide Electronic Payment Services function and contains a report on all map update, other (yellow pages) services and commercial administration payment transactions that have been carried out by the relevant processes over the last period. .

pedestrian_adaptive_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about adaptive control data used by indicators that are pedestrian controllers to enable them to control traffic. The format of the data will depend upon the type of adaptive control being used but should be no more than fifty (20) bytes per controller. .

pedestrian_control_commands

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the actual control commands that make the pedestrian controller change the traffic %034stop/go%034 and pedestrian %034walk/don't walk%034
outputs shown by its phases. The actual format of the control commands will depend on national standards being developed for controller fixed time plans, e.g. NTCIP. However the data flow has been sized at 16 bytes to enable it to handle all projected type of controller and control commands formats. .

pedestrian_cycle_time

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the time taken to complete all the control commands in an pedestrian fixed time plan once only. It is sized at one (1) byte to give a maximum value of 255 seconds. .

pedestrian_data

This data flow is used within the Manage Traffic function and contains a list of indicators for which pedestrian demands have been found to be present. These indicators are in fact traffic signal controllers that are capable of servicing the pedestrian demand and enabling pedestrians to cross the road or highway is a safe and coordinated manner. This data is used to determine the traffic control strategy for signalized traffic intersections. The data flow consists of the following items each of which is defined in its own DDE:

indicator_list
+ 1{pedestrian_demand}list_size.

pedestrian_demand

This data flow is used within the Manage Traffic function. It contains processed pedestrian surveillance data obtained from sensors within the road (surface street) and highway network served by the TMC. The data is used to determine the traffic control strategy for signalized traffic intersections. .

pedestrian_equipment_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides information about each pedestrian intersection, i.e. an interface between pedestrians and road vehicles that enables one or the other to have controlled roght of way. The information is required so that its control using adaptive, fixed time or local techniques can be properly implemented when needed. Note that the indicator type data in data that forms part of the indicator identity will be set to that for pedestrian controllers. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity + pedestrian_phase_data}.

pedestrian_fixed_time_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes information about fixed time control data used by indicators that are pedestrian controllers to enable them to control traffic. The data will be made up of the following items:

pedestrian_cycle_time
+ pedestrian_offset_time

+ pedestrian_control_commands.

pedestrian_offset_time

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the relative start time of the cycle of pedestrian control commands and is set at a value that will achieve synchronization between adjacent controllers. It is sized at one (1) byte to give a maximum value of 255 seconds. .

pedestrian_phase_data

This data flow is used within the Manage Traffic function and comprises data provided by the Plan System Deployment function. It contains information about the way in which each pedestrian controller operates, i.e. the minimum and maximum phase timings, phase change timings, etc. The data will be in integer format with the phase timings having a maximum value of 255 seconds (1 byte) and the change timings having a maximum value of 15 seconds (1/2 byte). The maximum number of controlled phases at a pedestrian controller has been assumed to be 2, which gives a total data size of five (5) bytes. .

permit_coordination

This data flow is used within the Manage Traffic function and contains information used in the coordination of permits for special travel requirements which involve different agencies and jurisdictions. This information provides the Manage Traffic function with schedule and route information to prepare special travel and traffic controls for the transport of non-typical loads or roadway activities that require permits. The data flow consists of the following data items each of which is defined in its own DDE:

date
+ time
+ permit_type
+ permit_route_plan
+ permit_traffic_controls.

permit_cost

This data flow is used within the Manage Commercial Vehicles function and contains the cost of a commercial vehicle permit. It consists of the following data item which is defined in its own DDE:

cost.

permit_route_plan

This data flow is used within the Manage Traffic function and defines the links in the road (surface street) and highway network to be traversed by a commercial vehicle carrying a special load. It is derived from the route produced for the commercial vehicle carrying the load and requires special traffic control strategies to enable the vehicle to pass through the network with the minimum of interruption to other traffic. This may involve coordination between multiple agencies due to inter-jurisdiction travel or travel outside the geographic area served by the local TMC and so may require that the data be sent to other TMC's. The data flow consists of the following data items each of which is defined in its own DDE:

link_list
+ load_description.

permit_traffic_controls

This data flow is used within the Manage Traffic function and defines the special traffic control strategy needed to enable the passage of a commercial vehicle containing a special permitted load through the road (surface street) and highway network included in the vehicle's route. The control strategy may affect both intersection signal controllers and/or variable message signs (vms) used for lane control, and/or ramp metering controllers used to regulate the entry of vehicles onto highways. The data flow consists of the following data items each of which is defined

in its own DDE:

selected_roadway_control_strategy
+ selected_ramp_control_strategy.

permit_type

This data flow is used within the Manage Traffic function and defines the type of transport permit associated with major transport of special loads. A special load is defined as being one that either contains hazardous material (HAZMAT load) and/or is over size or over weight. The data flow is sized at three (3) bytes to enable the use of a three character code to identify each permit type. .

planned_incident_response

This data flow is used within Manage Traffic and contains details of what should be done as a response for each type of incident. It contains the following data items each of which is defined in its own DDE:

agency_incident_response_procedures
+ traffic_control_strategy_alterations
+ vms_displays.

platoon_accel_decel_profile

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains the profile for acceleration and deceleration profile for use by a vehicle when operating as part of a platoon. This data is that which the sending vehicle is using currently and is for use by the receiving vehicle so that it will accelerate and decelerate at the same rate as the vehicle in front. The data flow consists of the following data item which is defined in its own DDE:

vehicle_accel_decel_data.

platoon_action

This data flow is used within the Provide Vehicle Control and Monitoring function and indicates the type of action to be taken in respect of platoon following. This may have one of the following values:

0 - null (manual or other non-AHS control mode),
1 - join platoon, i.e. join AHS platoon,
2 - leave AHS,
3 - exit (emergency and means steer left),
4 - steer left,
5 - steer right,
6 - center steering. .

platoon_ahead_vehicle_status

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains the status of the vehicle in front of the receiving vehicle in the platoon and consists of the following data item which is defined in its own DDE:

vehicle_status_details.

platoon_change_lane_servo_override

This data flow is used within the Provide Vehicle Control and Monitoring function and contains data which will cause the vehicle's steering to be altered so that the vehicle changes lane and continue to follow the next vehicle in front which is part of the platoon. .

platoon_following_commands

This data flow is used within the Provide Vehicle Control and Monitoring function and is a combination of all the servo commands generated by the varius processes. It consists of the following data items each of which is defined in its own DDE:

platoon_speed_servo_override
+ platoon_headway_servo_override
+ platoon_lane_servo_override

+ platoon_change_lane_servo_override.

platoon_headway

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains the headway to be used by a vehicle over its entire speed range whilst in automatic control mode and traveling as part of a platoon. This data is that which the sending vehicle is using currently and is for use by the receiving vehicle so that it will maintain the correct distance from the vehicle in front. The data flow consists of the following data item which is defined in its own DDE:

vehicle_headway_data.

platoon_headway_servo_override

This data flow is used within the Provide Vehicle Control and Monitoring function and contains data showing any changes required to the current brake setting in order to increase or decrease the headway between the vehicle and the one it is following in a platoon. .

platoon_lane_servo_override

This data flow is used within the Provide Vehicle Control and Monitoring function and contains data showing any changes required to the vehicle's steering in order that the vehicle can continue to follow the next vehicle in front which is part of the platoon. In this instance the value 999 is used to indicate that the stering must be centered, i.e. the vehicle is to proceed in a straight line. .

platoon_rear_vehicle_status

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains the status of the vehicle behind the receiving vehicle in the platoon and consists of the following data item which is defined in its own DDE:

vehicle_status_details.

platoon_speed_servo_override

This data flow is used within the Provide Vehicle Control and Monitoring function and contains data showing the speed the vehicle is to maintain now that it is part of a platoon. .

Additional sizing assumptions:

SIZE=2;

platoon_status

This data flow is used within the Provide Vehicle Control and Monitoring function and indicates the current platoon status and may take one of the following four values:

0 - no vehicles front or rear, i.e. a platoon of one,
1 - searching for platoon,
2 - joining platoon,
3 - running in platoon,
4 - leaving AHS lane,
5 - control failure
6 - manual input received
7 - vehicle and/or driver unsafe. .

platooning_selected

This data flow is used within the Provide Vehicle Control and Monitoring function and contains an indication (zero) that vehicle platooning has not been selected by the driver or that the existing platooning must be cancelled. A non-zero value (1) means that the driver has selected vehicle platooning. .

pollution_area_acceptance_data

This data flow is used within the Manage Traffic function and contains the levels of atmospheric pollutants which are acceptable, i.e. the presence of pollutants within the geographic area served by the function at or below these levels will not create an out of specification condition that may ultimately lead to a pollution incident being reported. A pollution incident will only be reported if the value for the particular pollutant is exceeded for the length of time specified in the area acceptance time data flow. These levels will be set at lower values than those defined in the area

tolerance levels data flow. There are currently six (6) different pollutants being detected by sensors which means that six levels each sized at two (2) bytes (maximum values 32767 part per million) will be needed, giving a total data flow size of twelve (12) bytes. .

pollution_area_acceptance_times

This data flow is used within the Manage Traffic function and contains the times for which the levels of atmospheric pollution defined in the area acceptance data flow may exist before they create an out of specification condition that may ultimately result in a pollution incident being reported. These times will be longer than those for the levels defined in the area tolerance data flow. There are currently six (6) different pollutants being detected by sensors which means that six times each sized at two (2) bytes (maximum value 32767 seconds) will be needed, giving a total data flow size of twelve (12) bytes. .

pollution_area_tolerance_data

This data flow is used within the Manage Traffic function and contains the levels of atmospheric pollutants which are tolerable, i.e. the presence of pollutants within the geographic area served by the function at or below this level will not create an out of specification condition that may result in a pollution incident being reported. A pollution incident will only be reported if the value for the particular pollutant is exceeded for the length of time specified in the area tolerance time data flow. These levels will be set at higher values than those defined in the area acceptance levels data flow. There are currently six (6) different pollutants being detected by sensors which means that six levels each sized at two (2) bytes (maximum values 32767 part per million) will be needed, giving a total data flow size of twelve (12) bytes. .

pollution_area_tolerance_times

This data flow is used within the Manage Traffic function and contains the times for which the levels of atmospheric pollution defined in the area tolerance data flow may exist before they create an out of specification condition that may ultimately result in a pollution incident being reported. These times will be shorter than those for the levels defined in the area acceptance data flow. There are currently six (6) different pollutants being detected by sensors which means that six times each sized at two (2) bytes (maximum vakue 32767 seconds) will be needed, giving a total data flow size of twelve (12) bytes. .

pollution_data_log

This data store is used within the Manage Traffic function and contains a record of all the pollution states determined by processes within the Manage Emissions facility from sensor inputs. This data is periodically read from the store and sent to the Plan System Deployment functoin for use in ITS simulation and performance analysis. The store consists of the following data items each of which is defined in its own DDE:

pollution_state_area_collection
+ list_size
+ list_size{pollution_state_roadside_collection + pollution_state_vehicle_collection}.

pollution_data_violation

This data flow is used within the Manage Traffic and Manage Emergency Services functions to hold data on the actual atmospheric pollutant(s) that are outside the safe standards for air quality and their actual level(s). The latter will be held in units of parts per million (ppm) except for particulate sizes which will be a digital value. .

pollution_incident

This data flow is used within the Manage Traffic function and contains details of a current or predicted pollution incident. The incident type will be set to the three character code for a pollution incident and will depend on the type of pollutant that is involved. The data flow consists of the following data items each of which is defined in its own DDE:

incident_start_time

+ incident_duration
+ incident_location
+ incident_severity
+ incident_type.

pollution_operational_data

This data flow is sent from the Manage Traffic function to the Plan System Deployment function. It contains data about the levels of pollution detected by roadside, wide area and individual vehicle sensors located in the geographic area served by the function. The data will be that which has been collected since the last set of data was sent and will therefore have a time stamp record. The data flow consists of the following data items each of which is defined in its own DDE:

date
+ list_size
+ list_size{pollution_state_roadside_collection + pollution_state_vehicle_collection}
+ pollution_state_area_collection
+ time.

pollution_output_message

This data flow is used within the Manage Traffic function and contains the data which the Manage Emissions facility wants output to alert a driver to the fact that the vehicle is generating pollution outside of the standard limits. It consists of the following data items each of which is defined in its own DDE:

vehicle_identity
+ vms_pollution_message.

pollution_reference_data

This store is used by processes within the Manage Traffic function and contains data about acceptable and tollerable pollution levels. It consists of the following data items each of which is defined in its own DDE:

pollution_area_acceptance_data
+ pollution_area_acceptance_times
+ pollution_area_tolerance_data
+ pollution_area_tolerance_times
+ pollution_roadside_acceptance_data
+ pollution_roadside_acceptance_times
+ pollution_roadside_tolerance_data
+ pollution_roadside_tolerance_times
+ pollution_vehicle_acceptance_data
+ pollution_vehicle_acceptance_conditions.

pollution_reference_data_output

This data flow is used within the Manage Traffic function and contains the current contents of the store of pollution reference data for output to the traffic operations personnel via the interface process. It consists of the following data items each of which is defined in its own DDE:

pollution_area_acceptance_data
+ pollution_area_acceptance_times
+ pollution_area_tolerance_data
+ pollution_area_tolerance_times
+ pollution_roadside_acceptance_data
+ pollution_roadside_acceptance_times
+ pollution_roadside_tolerance_data
+ pollution_roadside_tolerance_times
+ pollution_vehicle_acceptance_conditions
+ pollution_vehicle_acceptance_data
+ state_contact_data.

pollution_reference_data_request

This data flow is used within the Manage Traffic function and is a request for the output of the current contents of the store of pollution reference data to be sent to the traffic operations personnel interface process. .

pollution_reference_data_update

This data flow is used within the Manage Traffic function and contains updates to the contents of the store of pollution reference data. It may consist of any of the data items that form part of the data store. .

pollution_roadside_acceptance_data

This data flow is used within the Manage Traffic function and contains the levels of atmospheric pollutants which are acceptable, i.e. the presence of pollutants at the roadside in the geographic area served by the function at or below these levels will not create an out of specification condition that may ultimately lead to a pollution incident being reported. A pollution incident will only be reported if the value for the particular pollutant is exceeded for the length of time specified in the roadside acceptance time data flow. These levels will be set at higher values than those defined in the roadside tolerance levels data flow. There are currently six (6) different pollutants being detected by sensors which means that six levels each sized at two (2) bytes (maximum values 32767 part per million) will be needed, giving a total data flow size of twelve (12) bytes. .

pollution_roadside_acceptance_times

This data flow is used within the Manage Traffic function and contains the times for which the levels of atmospheric pollution defined in the roadside acceptance data flow may exist before they create an out of specification condition that may ultimately result in a pollution incident being reported. These times will be longer than those for the levels defined in the roadside tolerance data flow. There are currently six (6) different pollutants being detected by sensors which means that six times each sized at two (2) bytes (maximum value 32767 seconds) will be needed, giving a total data flow size of twelve (12) bytes. .

pollution_roadside_tolerance_data

This data flow is used within the Manage Traffic function and contains the levels of atmospheric pollutants which are tolerable, i.e. the presence of pollutants at the roadside in the geographic area served by the function at or below these levels will not create an out of specification condition that may ultimately lead to a pollution incident being reported. A pollution incident will only be reported if the value for the particular pollutant is exceeded for the length of time specified in the roadside tolerance time data flow. These levels will be set at lower values than those defined in the area acceptance levels data flow. There are currently six (6) different pollutants being detected by sensors which means that six levels each sized at two (2) bytes (maximum values 32767 part per million) will be needed, giving a total data flow size of twelve (12) bytes. .

pollution_roadside_tolerance_times

This data flow is used within the Manage Traffic function and contains the times for which the levels of atmospheric pollution defined in the roadside tolerance data flow may exist before they create an out of specification condition that may ultimately result in a pollution incident being reported. These times will be shorter than those for the levels defined in the roadside acceptance data flow. There are currently six (6) different pollutants being detected by sensors which means that six times each sized at two (2) bytes (maximum value 32767 seconds) will be needed, giving a total data flow size of twelve (12) bytes. .

pollution_state

This store is used within the Manage Traffic function to hold the current levels of pollutants in the different parts of the geographic area covered by the function, as well as collected at the roadside and from particular vehicle types. It consists of the following data items that provide the actual levels of various pollutants, each of which is defined in their own DDE:

pollution_state_area_collection
+ list_size
+ list_size{pollution_state_roadside_collection + pollution_state_vehicle_collection}.

pollution_state_area_collection

This data flow is used within the Manage Traffic function and contains the current states of the various types of pollution within the atmosphere in the geographic area served by the function. It consists of the following data items each of which is defined in its own DDE:

current_ozone_pollution
+ current_nitrous_oxide_pollution
+ current_sulfur_dioxide_pollution
+ current_hydrocarbon_pollution
+ current_carbon_monoxide_pollution
+ current_particulate_pollution
+ current_pollution_location.

pollution_state_data

This data flow is used within the Manage Traffic function as a means of transferring current pollution data from the Manage Emissions facility to the Manage Demand facility. It contains data about the current levels of pollution obtained from the store of pollution data and consists of the following data items each of which is defined in its own DDE:

current_ozone_pollution
+ current_nitrous_oxide_pollution
+ current_sulfur_dioxide_pollution
+ current_hydrocarbon_pollution
+ current_carbon_monoxide_pollution
+ current_particulate_pollution
+ current_pollution_location
+ vehicle_type.

pollution_state_data_output

This data flow is used within the Manage Traffic function and contains the current contents of the store of pollution state data for output to the traffic operations personnel via the interface process. It consists of the following data items each of which is defined in its own DDE:

current_ozone_pollution
+ current_nitrous_oxide_pollution
+ current_sulfur_dioxide_pollution
+ current_hydrocarbon_pollution
+ current_carbon_monoxide_pollution
+ current_particulate_pollution
+ current_pollution_location
+ vehicle_type.

pollution_state_data_output_request

This data flow is used within the Manage Traffic function and is a request for the output of the current contents of the store of pollution reference data to be sent to the traffic operations personnel interface process. .

pollution_state_data_request

This data flow is used within the Manage Traffic function as a means of requesting current pollution data to be sent from the Manage Emissions facility to the Manage Demand facility. It contains request for data about current levels of pollution. This data can be requested for a roadside or wide area location. .

pollution_state_roadside_collection

This data flow is used within the Manage Traffic function and contains the digitized

values of pollution levels obtained from roadside sensors in the geographic area served by the function. It consists of the following data items each of which is defined in its own DDE:

current_ozone_pollution
+ current_nitrous_oxide_pollution
+ current_sulfur_dioxide_pollution
+ current_hydrocarbon_pollution
+ current_carbon_monoxide_pollution
+ current_particulate_pollution
+ current_roadside_pollution_location.

pollution_state_static_acceptance_criteria

This data flow is used within the Manage Traffic function and contains data about acceptable and tollerable levels of atmospheric pollution, at both a general level within the geographic area served by the function, and at the roadside. It consists of the following items of data each of which is defined in its own DDE:

pollution_area_acceptance_data
+ pollution_area_acceptance_times
+ pollution_area_tolerance_data
+ pollution_area_tolerance_times
+ pollution_roadside_acceptance_data
+ pollution_roadside_acceptance_times
+ pollution_roadside_tolerance_data
+ pollution_roadside_tolerance_times.

pollution_state_static_collection

This data flow is used within the Manage Traffic function and contains the current states of the various types of pollution present in the atmosphere and at the roadside within the geographic area served by the function, i.e. static pollution data. It consists of the following data items each of which is defined in its own DDE:

pollution_state_area_collection
+ pollution_state_roadside_collection.

pollution_state_static_log_data

This data flow is used within the Manage Traffic function and contains a periodic average of the pollution data collected from both the general area served by the function and from specific roadside locations, i.e. static pollution data. It consists of the following data items each of which is defined in its own DDE:

pollution_state_area_collection
+ pollution_state_roadside_collection.

pollution_state_vehicle_acceptance_criteria

This data flow is used within the Manage Traffic function and contains data on the pollution levels produced by different types of vehicle under various operating conditions. It consists of the following items of data each of which is defined in its own DDE:

pollution_vehicle_acceptance_data
+ pollution_vehicle_acceptance_conditions.

pollution_state_vehicle_collection

This data flow is used within the Manage Traffic function and contains the average levels of the various types of pollution that were being output by a particular type of violating vehicle. It consists of the following data items each of which is defined in its own DDE:

current_ozone_pollution
+ current_nitrous_oxide_pollution

+ current_sulfur_dioxide_pollution
+ current_hydrocarbon_pollution
+ current_carbon_monoxide_pollution
+ current_particulate_pollution
+ vehicle_type.

pollution_state_vehicle_log_data

This data flow is used within the Manage Traffic function and contains a periodic average of the pollution data measured by sensors from actual vehicles. It consists of the following data item which is defined in its own DDE:

pollution_state_vehicle_collection.

pollution_vehicle_acceptance_conditions

This data flow is used within the Manage Traffic function and contains the vehicle operating conditions at which the associated levels of atmospheric pollutants must not be exceeded. If they are then a pollution incident will be generated for the vehicle leading the details being passed to the enforcement agency terminator, which may result in eventual prosecution of the vehicle's owner. Up to six (6) operating conditions are expected to be used and each will be defined by an engine loading and operating temperature values. Each of these values is expected to be sized at one (1) byte, which gives a total data flow size of six (6) bytes. .

pollution_vehicle_acceptance_data

This data flow is used within the Manage Traffic function and contains the levels of atmospheric pollutants which are acceptable, i.e. the presence of pollutants from vehicles at or below these levels will not create an out of specification condition that may ultimately lead to a pollution incident being reported. A pollution incident will only be reported if the value for the particular pollutant is exceeded at the vehicle operating condition to which it applies. These operating conditions are specified in an associated data flow. There are currently six (6) different pollutants being detected by sensors which means that six levels each sized at two (2) bytes (maximum values 32767 part per million) will be needed for each vehicle operating condition. For the six operating conditions specified, this gives a total data flow size of twelve (72) bytes. .

position_advisory_message

This data flow is used within the Provide Vehicle Monitoring and Control function and the Provide Driver and Traveler Services function. It contains a short description of the action that the driver should take to avoid the object that is near to the vehicle, and with which the vehicle will come into contact if no avoidance action os taken. The data flow is sized at twenty four (24) bytes to enable a short concise waring message to be provided for output to the driver. .

position_critical_state

This data flow is used within the Provide Vehicle Monitoring and Control function and the Provide Driver and Traveler Services function. It contains an indication that an object is too close to the vehicle. This object may be stationary or itself moving, and will come into contact with the vehicle of no action is taken by the driver. The data item is sized at one (1) byte so that it can hold any value up to and including 255. The actual value used will depend on how far away from the vehicle the object is located. The nearer the number is to 255 the closer is the object, and the higher the priority that the message should be given over any other messages being output to the driver. .

position_warning_to_front

This data flow is used within the Provide Vehicle Monitoring and Control function and the Provide Driver and Traveler Services function. It contains a warning that there is something immediately to the front of the vehicle that is a hazard to the vehicle if it starts (or continues) to move in that direction, plus a short description of the action that the driver should take to avoid the object. The data flow consists of the following data items each of which is defined in its own DDE:

position_critical_state
+ position_advisory_message.

position_warning_to_rear

This data flow is used within the Provide Vehicle Monitoring and Control function and the Provide Driver and Traveler Services function. It contains a warning that there is something behind the vehicle that is a hazard to the vehicle if it starts (or continues) to move in that direction, plus a short description of the action that the driver should take to avoid the object. The data flow consists of the following data items each of which is defined in its own DDE:

position_critical_state
+ position_advisory_message.

position_warning_to_side

This data flow is used within the Provide Vehicle Monitoring and Control function and the Provide Driver and Traveler Services function. It contains a warning that there is something to one side or the other of the vehicle that is a hazard to the vehicle if it starts (or continues) to move in that direction, plus a short description of the action that the driver should take to avoid the object. The data flow consists of the following data items each of which is defined in its own DDE:

position_critical_state
+ position_advisory_message.

position_warnings

This data flow is sent from the Provide Vehicle Monitoring and Control function to the Provide Driver and Traveler Services function. It contains posistion warnings for a driver, each of which is generated when an object gets close enough to the vehicle to become a hazard if no action is taken by the driver. The data flow consists of the following data items each of which is defined in its own DDE:

position_warning_to_front
+ position_warning_to_side
+ position_warning_to_rear.

possible_defined_response_identity

This data flow is used within the Manage Traffic function and is the indetity of each possible incident defined response that has been produced from an analysis of past responses and store for possible future use. .

possible_defined_responses

This data store is used within the Manage Traffic function and contains all the possible defined incident responses that have been found from an analysis of past responses. It consists of the following data items each of which is defined in its own DDE:

agency_incident_response_procedures
+ incident_duration
+ incident_severity
+ incident_traffic_impact
+ incident_type
+ possible_defined_response_identity
+ traffic_control_strategy_alterations
+ vms_displays.

possible_defined_responses_data

This data flow is used within Manage Traffic and contains details of possible defined incident responses that have been produced from an analysis of past responses. It contains the following data items each of which is defined in its own DDE:

agency_incident_response_procedures

+ incident_duration
+ incident_severity
+ incident_traffic_impact
+ incident_type
+ traffic_control_strategy_alterations
+ vms_displays.

possible_defined_responses_output

This data flow is used within Manage Traffic and contains details of possible defined incident responses that have been produced from an analysis of past responses and are to be output to traffic operations personnel. It contains the following data items each of which is defined in its own DDE:

agency_incident_response_procedures
+ incident_duration
+ incident_severity
+ incident_traffic_impact
+ incident_type
+ possible_defined_response_identity
+ traffic_control_strategy_alterations
+ vms_displays.

possible_defined_responses_output_request

This data flow is used within the Manage Traffic function and contains a request that possible defined incident responses are output to the traffic operations personnel. It includes the following data item which is defined in its own DDE:

possible_defined_response_identity.

possible_detected_incidents

This data flow is used within the Manage Traffic function. It contains details of a suspected traffic incident which has been detected from an analysis of detector data. The incident type would be set to %034unknown%034 since the traffic data would not yield sufficient information on its own to define the type. The data consists of the following items each of which is defined in its own DDE:

incident_location
+ incident_type.

possible_incident_data_update

This data flow is used within the Manage Traffic function to request that the process responsible for re-classifying possible incidents runs because new data has been loaded into the store of possible incidents. .

possible_incidents

This data store is used within the Manage Traffic function to store details of possible incidents that have been reported from a variety of sources, but which have not yet been classified as predicted or current incidents. It contains the following data items each of which is defined in its own DDE:

current_weather
+ event_name
+ event_start_time
+ event_duration
+ event_location
+ event_attendance_expected
+ incident_start_time
+ incident_duration
+ incident_location
+ incident_severity
+ incident_type
+ incident_confidence_level

+ predicted_weather.

possible_incidents_data_output

This data flow is used within the Manage Traffic function and contains data about possible incidents for output to traffic operations personnel. It consists if the following items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_confidence_level
+ incident_duration
+ incident_type
+ incident_severity.

predicted_highway_network_data

This data flow is used within the Manage Traffic function and contains data about predicted traffic conditions on links in the highway network served by the function. This data is produced by the predictive model process. It consists of the following data items each of which is defined in its own DDE:

link_list_for_highways
+ list_size{link_journey_time
    + link_delay}.

predicted_hov_lane_data

This data flow is used within the Manage Traffic function and contains prediction of the numbers of both legal and illegal vehicles using High Occupancy Vehicle (HOV) lanes in the road and highway network served by the function. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{hov_lane_vehicle_count
    + hov_lane_violation_count}.

predicted_incident_data

This data flow is used within the Manage Traffic function to transfer data about predicted incidents from the Incident Management facility to the Provide Traffic Surveillance facility for storage. It contains the following data items each of which is defined in its own DDE:

list_size
+ list_size{predicted_incident_details}.

predicted_incident_data_for_vehicle_signage

This data flow is used within the Manage Traffic function. It contains data about predicted incidents for output as part of in-vehicle signage data. The data flow consists of the following data item which is defined in its own DDE:

predicted_incident_details.

predicted_incident_details

This data flow is used within the Manage Traffic function and contains the details of a predicted incident. It consists of the following data items each of which is defined in its own DDE:

incident_duration
+ incident_location
+ incident_number
+ incident_severity
+ incident_start_time
+ incident_type
+ incident_traffic_impact.

predicted_incidents

This data flow is used within the Manage Traffic function and contains details of known incidents due to take place in the future. It contains the following data items each of which is defined in its own DDE:

list_size
+ list_size{incident_location
+ incident_type
+ incident_severity
+ incident_description
+ incident_traffic_impact}.

predicted_incidents_data

This data flow is used within the Manage Traffic function and contains data about predicted incidents. The data consists if the following items each of which is defined in its own DDE:

list_size
+ list_size{predicted_incident_details}.

predicted_incidents_data_output

This data flow is used within the Manage Traffic function and contains data about predicted incidents for output to traffic operations personnel. It consists if the following items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_type
+ incident_severity
+ incident_traffic_impact.

predicted_incidents_for_advisories

This data flow is used within the Provide Driver and Traveler Services function and contains data about predicted incidents for use in advisory messages that are requested by and output to drivers and transit users in vehicles. The data will be restricted to that which is in the area local to the vehicle's current location and in the road and highway network served by the Manage Traffic function. The data flow consists of the following data items each of which is defined in its own DDE

list_size
+ list_size{incident_location
+ incident_type
+ incident_severity
+ incident_description
+ incident_traffic_impact}.

predicted_incidents_for_broadcast

This data flow is used within the Provide Driver and Traveler Services function and contains data about predicted incidents for use in wide area broadcast messages that are automatically output to drivers and travelers in vehicles. The data will be restricted to that which is unusual using parameters set up by the ISP operator and will only relate to the road and highway network served by the Manage Traffic function. The data flow consists of the following items each of which is defined in its own DDE

list_size
+ list_size{incident_location
+ incident_type
+ incident_severity
+ incident_description
+ incident_traffic_impact}.

predicted_incidents_local_data

This data flow is used within the Manage Traffic function and contains a copy of the contents of the store of predicted incidents. This has been requested by the same function in another traffic management center (TMC) to which it will be sent by another process. The data flow consists of the following data items each of which is defined in its own DDE:

tmc_identity
+ list_size
+ list_size{predicted_incidents_data}.

predicted_incidents_new_data

This data flow is used within the Manage Traffic function and contains data about a new predicted incident (formerly a possible incident) which must be added to the store of predicted incidents. It consists if the following items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_type
+ incident_severity
+ incident_traffic_impact.

predicted_incidents_store

This data store is used within the Manage Traffic function and holds data about incidents that are predicted to occur. This means that their occurance is certain but that it will be at some time in the future. The data store consists if the following items each of which is defined in its own DDE:

list_size
+ list_size{predicted_incident_details}.

predicted_o_d_matrix

This data flow is used within the Manage Traffic function and contains an origin-destination (o-d) matrix that has been produced by the predictive model within the function. It will apply to the road (surface street) and highway network in the geographic area served by the function. The data will comprise a list of o-d pairs and the traffic flow between them, where the pairs will be identified by link identities. Thus the data flow has been sized at half the maximum number of links multiplied by two (2) bytes for the vehicle flow rate. .

predicted_other_routes_use

This data flow is used within the Manage Traffic function. It is produced by the predictive model process and contains information about how many travelers it is predicted will be guided down each non-vehicle and non-transit route segment and the average journey time for each route segment. The data will be stored in ascending route segment number order (i.e. from 1 to the maximum number of route segments), and consists of the following data items each of which is defined in its own DDE:

route_segment_total_number
+ route_segment_total_number{route_segment_identity
+ time_period{route_segment_guided_travelers}
+ route_segment_journey_time}.

predicted_parking_lot_data

This data flow is used within the Manage Traffic function and contains predicted parking lot states produced by the predictive model process. It will apply to all the parking lots in the geographic area served by the function, and consists of the following data items each of which is defined in its own DDE:

list_size

+ list_size{parking_lot_identity
+ parking_lot_state
+ parking_lot_occupancy}.

predicted_road_network_data

This data flow is used within the Manage Traffic function and contains data about predicted traffic conditions on links in the road network served by the function. This data is produced by the predictive model process. It consists of the following data items each of which is defined in its own DDE:

link_list_for_roads
+ list_size{link_journey_time
+ link_delay}.

predicted_road_network_use

This data flow is used within the Manage Traffic function. It is produced by the predictive model process and contains information about how many vehicles it is predicted will be guided down each route segment and the average journey time for each route segment. The data will only apply to those route segments that are related to links in the road and highway network served by the Manage Traffic function. It will be stored in ascending route segment number order (i.e. from 1 to the maximum number of route segments), and consists of the following data items each of which is defined in its own DDE:

route_segment_total_number
+ route_segment_total_number{route_segment_identity
+ time_period{route_segment_guided_vehicles}
+ route_segment_journey_time}.

predicted_weather

This data flow is used within the Manage Traffic and Provide Driver and Traveler Services functions. It contains details of the predicted weather conditions, e.g. temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc. .

prediction_data

This data flow is used within the Manage Traffic function and is also sent by that function to the Manage Transit and Provide Driver and Traveler Services function. It contains output from the predictive model process showing predictions of traffic data for route segments on the road and highway network served by the Manage Traffic function. The data flow consists of the following items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_identity
+ route_segment_volume_delay_predictions
+ route_segment_queue_delay_predictions
+ route_segment_occupancy_predictions}.

prediction_data_for_advisories

This data flow is used within the Provide Driver and Traveler Services function. It is used to provide advisory messages to drivers and transit users in vehicles showing predictions of traffic data for route segments on the road and highway network served by the Manage Traffic function. Data will only be provided where it is relevant to the current location of the vehicle from which the request originated. The data flow consists of the following items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_identity
+ route_segment_volume_delay_predictions
+ route_segment_queue_delay_predictions
+ route_segment_occupancy_predictions}.

prediction_data_for_broadcast

This data flow is used within the Provide Driver and Traveler Services function. It is used to provide wide area broadcast messages to drivers and transit users in vehicles showing predictions of traffic data for route segments on the road and highway network served by the Manage Traffic function. The data will be restricted to that which is unusual using parameters set up by the ISP operator. The data flow consists of the following items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_identity
    + route_segment_volume_delay_predictions
    + route_segment_queue_delay_predictions
    + route_segment_occupancy_predictions}.

predictive_model_data

This data store is used within the Manage Traffic function and contains the model of the predicted traffic conditions on the road network served by the function. This data is produced by the predictive model generation process and is used for determining traffic management strategies. It consists of the following data items each of which is defined in its own DDE:

predicted_highway_network_data
+ predicted_hov_lane_data
+ predicted_o_d_matrix
+ predicted_other_routes_use
+ predicted_parking_lot_data
+ predicted_road_network_data
+ predicted_road_network_use.

predictive_model_data_for_media

This data flow is used within the Manage Traffic function. It contains a subset of the predictive model data stored by the function which will be used as the basis for traffic data that is sent to other functions. The data flow consists of the following data items each of which is defined in its own DDE:

predicted_highway_network_data
+ predicted_hov_lane_data
+ predicted_other_routes_use
+ predicted_parking_lot_data
+ predicted_road_network_data
+ predicted_road_network_use.

preferences

This data flow is used within the Provide Driver and Traveler Services function and is also sent to that function by the Provide Vehicle Monitoring and Control function as part of the data needed to request a route involving automatic highway system (ahs) lanes. It contains the preferences being placed on the choice of a route being requested by a driver or traveler and consists of the following data items each of which is defined in its own DDE:

modes
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ preferred_weather_conditions
+ preferred_ridesharing_options
+ preferred_transit_options.

preferred_alternate_routes

This data flow is used within the Provide Driver and Traveler Services function and contains the number of alternate routes that are to be provided to the driver or

traveler making the route request. These alternate routes will be in addition to the primary route, which will be the one that most nearly meets the specified preferences and constraints. This data flow is sized at one (1) byte to give 255 as the maximum number of alternate routes. .

preferred_ridesharing_options

This data flow is used within the Provide Driver and Traveler Services function and contains .

Additional sizing assumptions:

SIZE=12;

preferred_route_segments

This data flow is used within the Provide Driver and Traveler Services function and contains a list of preferred route segments. This is actually a list of preferred types of route segment, e.g. those containing automatic highway system (ahs) lanes. If no preference is identified, the route selection process will assume that it is free to choose any type of segment, although this will not include those with ahs lanes unless this is specifically identified. This data flow has been sized at twelve (12) bytes to enable a reasonable type selection to be made. .

preferred_routes

This data flow is used within the Provide Driver and Traveler Services function and contains a list of preferred route choices, e.g. a route must go via a particular place or avoid another place. The list will comprise a list of place names and has been sized at 40 bytes to enable a reasonable choice to be made. .

preferred_transit_options

This data flow is used within the Provide Driver and Traveler Services function and contains .

Additional sizing assumptions:

SIZE=12;

preferred_weather_conditions

This data flow is used within the Provide Driver and Traveler Services function and contains . .

Additional sizing assumptions:

SIZE=12;

price_data

This data flow is sent from the Provide Electronic Payment Services function to the Manage Traffic function and contains data on the current prices being charged for tolls, parking lots and transit fares, plus the response to a request from the Manage Demand facility for changes in the current prices . It consists the following data items each of which is defined in its own DDE:

parking_lot_charge_details
+ parking_lot_charge_change_response
+ probe_data_for_traffic
+ tag_data_inputs
+ transit_fare_details
+ toll_price_changes_response
+ toll_price_details.

price_data_for_services

This data store is used within the Provide Electronic Payments Services function to store data about prices being charged for tolls, parking lot spaces and regular transit fares. It consists of the following data items each of which is defined in its own DDE:

parking_lot_price_details
+ toll_price_values
+ transit_fare_data.

price_request

This data flow is sent from the Manage Traffic function to the Provide Electronic

Payment Service function. It is used to request the current prices for tolls, parking lot spaces and transit fares, to request changes to their current prices in order that the modal split of trips being undertaken by travelers can be changed, and to request parking lot and toll tag data for traffic journey time measurement. The data flow consists of the following data items each of which is defined in its own DDE:

parking_lot_charge_change_request
+ parking_lot_charge_request
+ transit_fare_request
+ tag_data_requests
+ toll_price_changes_request
+ toll_price_request.

prices

This data flow is sent from the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function and contains data on the current prices being charged for tolls, parking lots and transit fares. It consists the following data items each of which is defined in its own DDE:

toll_price_data
+ parking_lot_price_data
+ transit_fare_data.

private_vehicle_occupants

This data item is used within the Manage Traffic function and contains a count of the number of occupants in a vehicle as measured by a detector located on, or near to the highway, as the vehicles pass by its sensor. .

probe_data_for_traffic

This data flow is sent from the Provide Electronic Payment Services function to the Manage Traffic function and contains journey times between toll collection points for those vehicles equipped for electronic toll collection. It is used to calculate link journey times for use in adaptive traffic control techniques and route selection and guidance. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_identity
    + route_segment_journey_time_from_tolls}.

processed_cargo_data

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains data obtained from the processing by sensors of analog data received on-board the vehicle about the composition and state of its cargo. .

processed_data

This data flow is used within the Manage Traffic function and contains traffic sensor data that has been processed ready for storage in both the current and long term data stores. It consists of the following items each of which is defined in it own DDE:

parking_lot_input_data
+ o_d_matrix
+ private_vehicle_occupants
+ ramp_data
+ roadside_conditions
+ strategy_data
+ link_state_data.

rail_services_costs

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the costs for a traveler's use of heavy rail services that may be suitable for inclusion in the response to a traveler's trip request. The data flow is

sized to enable the costs of up to four (4) different services to be included. These may be all on the same route, or on up to two different routes. The data flow consists of the following data item which is defined in its own DDE:

4{cost}.

rail_services_destination

This data flow is used within the Provide Driver and Traveler Services function. It contains the destination of the heavy rail service(s) that are the closest fit with a traveler's proposed trip plan. This destination may be different to that provided in the intermodal services request as it will be a railroad station, rather than a town, or other geographic point. It may also not be the destination of the service operated by the railroad as the traveler may be leaving at some intermediate point. The data flow consists of the following data item which is defined in its own DDE:

route_point.

rail_services_destination_arrival_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a railroad service arrives the destination point for heavy rail services in a traveler's trip plan. This destination may not be the actual final destination of the railroad service, because the traveler may be leaving at some intermediate point along its route. The service will be a close fit with a traveler's proposed trip plan. The data flow consists of the following data item which is defined in its own DDE:

time.

rail_services_details

This data flow is used within the Provide Driver and Traveler Services function and contains details of the heavy rail services that may be suitable for use by a traveler as part of a proposed trip. It consists of the following data items each of which is defined in its own DDE:

rail_services_costs
+ rail_services_routes
+ rail_services_schedules.

rail_services_intermediate_arrival_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a railroad service arrives at an intermediate point on the part of a traveler's route to be provided by a railroad. Up to four (4) of these intermediate points may be specified. These four points are those at which the traveler has to change trains, or has a significant stop over time. There may be other intermediate points along the railroad route, but they are ignored because the traveler is expected to do nothing other than remain on-board the train. The railroad route will be that which provides the service that is a close fit to the requirements of the traveler's proposed trip. The data flow consists of the following data item which is defined in its own DDE:

time.

rail_services_intermediate_depart_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a railroad service departs from an intermediate point on the part of a traveler's route to be provided by a railroad Up to four (4) of these intermediate points are allowed as part of a particular railroad route. These four points are those at which the traveler has to change trains, or has a significant stop over time. There may be other intermediate points on the airline route, but they are ignored because the traveler is expected to do nothing other than remain on-board the train. The railroad route will be that which provides the service that is a close fit to the requirements of the traveler's proposed trip. The data flow consists of the

following data item which is defined in its own DDE:

time.

rail_services_intermediate_point

This data flow is used within the Provide Driver and Traveler Services function. It contains the location of an intermediate point on a route operated by a railroad. Up to two (2) of these intermediate points are allowed as part of a particular service and they will both be the locations of railroad stations. They will be stations at which the traveler will have to change trains, or where the service has a significant stop over time. All other stops on the railroad route will ignored. The route will be that which provides the service that is a close fit to the requirements of the traveler's proposed trip. The data flow consists of the following data item which is defined in its own DDE:

route_point.

rail_services_origin

This data flow is used within the Provide Driver and Traveler Services function. It contains the origin of the heavy rail service(s) that are the closest fit with a traveler's proposed trip plan. This origin may be different to that provided in the intermodal services request as it will be a railroad station, rather than a town, or other geographic point. It may also not be the origin of the service operated by the railroad as the traveler may be joining it at some intermediate point. The data flow consists of the following data item which is defined in its own DDE:

route_point.

rail_services_origin_depart_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the time at which a railroad service leaves the origin point for heavy rail services in a traveler's trip plan. This origin may not be the actual origin of the particular railroad service, because the traveler may be joining at some intermediate point along its route. The service will be a close fit with a traveler's proposed trip plan. The data flow consists of the following data item which is defined in its own DDE:

time.

rail_services_route_details

This data flow is used within the Provide Driver and Traveler Services function. It contains details of a heavy rail route that will suit a traveler's proposed trip and is associated with a cost and a schedule. The route may have up to two intermediate points at which the services calls, and at which the traveler may have to change from one train to another There may be other intermediate points on the flight but these are of no concern to the traveler.. The data flow consists of the following data items each of which is defined in its own DDE:

rail_services_origin
+ 2{rail_services_intermediate_point}
+ rail_services_destination.

rail_services_routes

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the routes served by heavy rail services. These may be suitable for use by a traveler as part of a proposed trip. The data flow is sized to enable up to two (2) different routes to be provided. It consists of the following data item which is defined in its own DDE:

2{rail_services_route_details}.

rail_services_schedule_details

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the departure and arrival times at stations along a railroad route that will suit a traveler's proposed trip and are associated with a cost and a route. The route may have up to four of these intermediate stations at which the services stops, and at which the traveler may have to change from one train to another. There may be other stations at which the train stops, but the traveler is expected to remain on-board and therefore they are ignored. The data flow consists of the following data items each of which is defined in its own DDE:

rail_services_origin_depart_time
+ 4{rail_services_intermediate_arrival_time
  + rail_services_intermediate_depart_time}
+ rail_services_destination_arrival_time.

rail_services_schedules

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the schedules of services on the routes operated by heavy rail services, and may be suitable for use by a traveler as part of a proposed trip. The data flow is sized to enable up to four (4) different routes to be provided. It consists of the following data item which is defined in its own DDE:

4{rail_services_schedule_details}.

ramp_controls

This data flow is used within the Manage Traffic function and contains the actual control data to be passed to a ramp meter controller. The state will show either a proceed (green) or stop (red) state dependent on what has been determined as the best strategy for traffic entering the highway via the ramp. .

ramp_data

This data flow is used within the Manage Traffic function and contains data which is used to control access to freeways etc. from ramps. It consists of the following items each of which is defined in its own DDE:

ramp_list
+ 1{vehicle_speed
  + vehicle_headway
  + vehicle_occupancy
  + private_vehicle_occupants}list_size.

ramp_devices

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. This data includes information about each device used to output traffic management commands to vehicle drivers at highway entrance ramps. These devices are used as a means of controlling access to highways particularly during periods of peak traffic flow. This data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{ramp_identity + ramp_phase_data}.

ramp_identity

This data flow is used within the Manage Traffic function to indentify individual ramp metering equipment used for the control of traffic entering highways. The data flow consists of the following data items each of which is defined in its own DDE:

unit_number
+ location_identity
+ indicator_identity.

ramp_list

This data flow is used within the Manage Traffic function and contains a list of the ramps to which a particular traffic control strategy is to be applied. The ramps are

served by ramp metering equipment which has the ability to control vehicle access to the highway. The data flow consists of the following data items each of which is defined by its own DDE:

list_size
+ 1{ramp_identity}list_size.

ramp_phase_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides information about the way in which each highway ramp entry lane controller operates, i.e. the minimum and maximum phase timings, phase change timings, etc. plus the criteria which cause access to the highway to be restricted. The data will be in integer format with the phase timings having a maximum value of 255 seconds (1 byte) and the change timings having a maximum value of 15 seconds (1/2 byte), whilst the restriction criteria will comprise up to twelve (12) integers detailing such things as individual highway lane speeds and vehicle headways. As a ramp controller is only a two phase device, this gives a total data size of seventeen (17) bytes. .

ramp_signal_state

This data flow is used witin the Manage Traffic function to indicate the required state of the ramp meter contollers at the entrance to the highway ramps controlled by the TMC. The data flow consists of the following data items each of which is defined in its own DDE:

ramp_list
+ 1{ramp_controls}list_size.

reclassify_incidents

This data flow is used within the Manage Traffic function to request that the process to re-cpassify incidents is run. .

Additional sizing assumptions:

SIZE=1;

request_current_traffic_media_data

This data flow is used within the Manage Traffic function to request traffic details for output by the media operator. The traffic details will comprise link journey times, traffic flows, equipment faults and the text(s) currently being sent to variable message signs specified in the request, as stored in the store of current data. The data flow consists of the following data items each of which is defined in its own DDE:

request_traffic_flow
+ request_link_journey_time
+ request_equipment_faults
+ request_vms_outputs.

request_demand_display_update

This data flow is used within the Manage Traffic function to request an update of the current digitized map data used as a background for traffic operations personnel data displays. It is generated as a result of a specific request for an update from the traffic operations personnel. The map data prodiced as a result of this request will be provided by a specialist supplier. .

request_emergency_display_update

This data flow is used within the Manage Emergency Services function to request an update of the current digitized map data used as a background for emergency system operator data displays. It is generated as a result of a specific request for an update from the emergency system operator. The map data prodiced as a result of this request will be provided by a specialist supplier. .

request_equipment_faults

This data flow is used within the Manage Traffic function to request details of the faults currently outstanding on indicators. The identity of the indicators for which

this data is required will be specified in the request. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity}.

request_erms

This data flow is sent from the Manage Traffic function to the Manage Emergency Services function. It contains the following data item which is defined in its own DDE:

hov_lane_violation
+ incident_alert
+ incident_details_request
+ incident_response_clear
+ vehicle_pollution_alert.

request_erms_acknowledge

This data flow is used to transfer data between the Manage Emergency Services function and the Provide Vehicle Monitoring and Control function. It contains the following data item which is defined in its own DDE:

emergency_request_vehicle_acknowledge.

request_erms_message

This data flow is used to transfer data (through an automated process) between the Provide Vehicle Monitoring and Control function and the Manage Emergency Services function. It contains the following data item which is defined in its own DDE:

emergency_request_vehicle_details.

request_incident_map_display_update

This data flow is used within the Manage Traffic function to request an update of the current digitized map data used as a background for incident data displays. The map data will be provided by a specialist supplier. .

request_incident_media_data

This data flow is used within the Manage Traffic function to request incident data for output to the Media Operator, or to the Media System. The request must specify whether the data to be output to the Media Operator should include current or predicted incident data, or any combination of the two, or data about a particular incident in the case of output to the Media System. The request for output must also include the geographic area(s) to be covered. .

request_incident_operations_data

This data flow is used within the Manage Traffic function to request incident data for output to the Traffic Operations Personnel. The request must specify whether the data to be output must include current or predicted incident data, any combination of the two, or defined incident response data. .

request_link_journey_time

This data flow is used within the Manage Traffic function to request link journey times for output by the media operator. The journey times will be for those links specified in the request. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_identity}.

request_local_current_incidents_data

This data flow is used within the Manage Traffic function to request data about current incidents for use by another TMC. They will be entered into the local TMC's store of current incidents for use in determining reponses. Only details of those incidents that are likely to have an impact outside the local TMC's geographic or

jurisdictional area(s) will be sent to the other TMC. .

request_local_predicted_incidents_data

This data flow is used within the Manage Traffic function to request data about predicted incidents for use by another TMC. They will be entered into the other TMC's store of predicted incidents for use in determining reponses. Only details of those incidents that are likely to have an impact outside the local TMC's geographic or jurisdictional area(s) will be sent to the other TMC. .

request_long_term_traffic_media_data

This data flow is used within the Manage Traffic function to request traffic details for output by the media operator. The traffic details will comprise link journey times, traffic flows, equipment faults and the text(s) currently being sent to variable message signs specified in the request, as stored in the store of data from the predictive model. The data flow consists of the following data items each of which is defined in its own DDE:

request_traffic_flow
+ request_link_journey_time.

request_map_data_import

This data flow is used within the Plan System Deployment function and contains the request for a new set of digitized map data to be uaed in ITS simulation and evaluation. .

Additional sizing assumptions:

SIZE=2;

request_other_current_incidents_data

This data flow is used within the Manage Traffic function to request data about current incidents from another TMC. They will be entered into the local TMC's store of current incidents for use in determining reponses. Although the location of these incidents is outside the TMC's geographic or jurisdictional area(s) they may affect local traffic conditions. .

request_other_predicted_incidents_data

This data flow is used within the Manage Traffic function to request data about predicted incidents from another TMC. They will be entered into the local TMC's store of predicted incidents for use in determining reponses. Although the location of these incidents is outside the TMC's geographic or jurisdictional area(s) they may affect local traffic conditions. .

request_other_route_segment_data

This data flow is used within the Provide Driver and Traveler Services function to request route segment data for the geographic area(s) not covered by the local route segment data store. .

request_other_routes_map_update

This data flow is used within the Provide Driver and Traveler Services function and contains a request which has originated from the ISP operator for an update to the store of digitized map data used by the other routes selection process to be requested from the map provider. .

request_other_TMC_data

This data flow is used within the Manage Traffic function to request data from Traffic Management Centers (TMC's) that cover other geographic and/or jurisdictional areas outside that served by the local TMC. .

request_pollution_map_display_update

This data flow is used by the Manage Emissions facility within the Manage Traffic function to request an update of the current digitized map data used as a background for data displays. The map data will be provided by a specialist supplier. .

request_possible_incidents_data

This data flow is used within the Manage Traffic function to request data currently held in the store of possible incidents. It consists of the following data items each of which is defined in its own DDE :

incident_type
+ incident_oldest_time.

request_predicted_incidents_data

This data flow is used within the Manage Traffic function to request output of data on predicted incidents to traffic operations personnel. The output can be tailored to cover some types of incidents in some locations. The data flow consists of the following data items each of which is defined in its own DDE:

incident_location
+ incident_type.

request_predictive_traffic_media_data

This data flow is used within the Manage Traffic function to request traffic details for output by the media operator. The traffic details will comprise link journey times and traffic flows specified in the request, as stored in the store of long term data. The data flow consists of the following data items each of which is defined in its own DDE:

request_traffic_flow
+ request_link_journey_time
+ request_equipment_faults
+ request_vms_outputs.

request_prices

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Service function to rerquest the current prices for tolls, parking lot spaces and transit fares. .

request_roadside_fare_payment

This data flow is sent from the Manage Transit function to the Provide Electronic Payment Services function to request payment of a transit fare from the roadside, i.e. a transit stop. It consists of the following data items each of which is defined in its own DDE:

transit_fare
+ transit_roadside_fare_collection_identity
+ transit_user_roadside_tag_identity.

request_route_segment_data

This data flow is used within the Provide Driver and Traveler Services function. It contains the following data items:

action_flag - set to one (1) for find data or zero (0) for delete data,

link_list - a list of links for which data must either be found or deleted. .

request_route_selection_map_update

This data flow is used within the Provide Driver and Traveler Services function and contains a request which has originated from the ISP operator for an update to the store of digitized map data used by the vehicle routes selection process to be requested from the map provider. .

request_sensor_static_data

This data flow is used within the Manage Traffic function and contains a request for the contents of the data store of static data used in the processing of data received from traffic sensors. It consists of a single alphanumeric character which will be set to 's' if the data is to be retrieved and returned to the coordinating process. .

request_traffic_flow

This data flow is used within the Manage Traffic function to request traffic flow data for output by the media operator. The data will be for those links specified in the request. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_identity}.

request_traffic_map_display_update

This data flow is used within the Manage Traffic function to request an update of the current digitized map data used as a background for traffic data displays. The map data will be provided by a specialist supplier. .

request_traffic_media_data

This data flow is used within the Manage Traffic function to request traffic data for output to the Media Operator, or to the Media System. The request must specify whether the data to be output to the Media Operator must include current, long term or predicted data, or any combination of the three, or the particular traffic conditions in the case of output to the Media System. The data flow consists of the following data items each of which is defined in its own DDE:

request_current_traffic_media_data
+ request_long_term_traffic_media_data
+ request_predictive_traffic_media_data
+ request_unusual_traffic_data_output.

request_traffic_operations_data

This data flow is used within the Manage Traffic function to request traffic data for output to the Traffic Operations Personnel. The request must specify whether the data to be output must include current, long term or predicted data, or any combination of the three. .

request_transit_map_update

This data flow is used within the Manage Transit function to request an update of the current digitized map data. This data may be used as input to the transit route generation process, or as a background for displays of transit services requested by the transit fleet manager. It is generated as a result of a specific request for an update from the transit fleet manager. The map data prodiced as a result of this request will be provided by a specialist supplier. .

request_transit_service_external_data

This data flow is used within the Manage Transit function and is the request for the output of the current transit services (routes and schedules) for internal used by processes outside of the Manage Transit function. .

request_transit_service_internal_data

This data flow is used within the Manage Transit function and is the request for the output of the current transit services (routes and schedules) for internal used by processes within the function. .

request_transit_services_data_for_output

This data flow is used within the Manage Transit function and is the request for the current transit services (routes and schedules). The request is generates as a result of input from the transit fleet manager, to whom the data will be sent via the interface process. .

request_transit_user_roadside_image

This data flow is sent from the Provide Electronic Payment Services function to the Manage Transit function. It contains a request for the supply of the image of a transit user who has violated the transit fare payment process at a roadside fare collection point. .

request_transit_user_vehicle_image

This data flow is sent from the Provide Electronic Payment Services function to the Manage Transit function. It contains a request for the supply of the image of a transit user who has violated the transit fare payment process at an on-board vehicle fare collection point. .

request_unusual_traffic_data_output

This data flow is used within the Manage Traffic function to details of any unusual

congestion for output by the media operator. The data will be for those links specified in the request. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_identity}.

request_vehicle_fare_payment

This data flow is sent from the Manage Transit fare billing on vehicle facility to the Provide Electronic Payment Services function. It requests payment processing of one or more transit fare transactions from on-board a transit vehicle. This flow provides for both batch (low value/high usage) fare transactions (e.g. city bus routes) and for high value/low volume, interactive, near real-time transactions (e.g. individualized flexible transit). The size assumption below is appropriate for the interactive mode of operation (one transaction per message) which can be assumed to present the greater stress on the transit vehicle communications process due to the higher frequency of operation. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ transit_vehicle_identity
+ transit_vehicle_fare_collection_method
+ list_size{transit_fare
    + transit_user_vehicle_tag_identity}.

request_vms_outputs

This data flow is used within the Manage Traffic function to request detials of the texts being output to variable message signs (vms) for output by the media operator. The vms texts will only be for those signs specified in the request. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity}.

reservation_status

This data flow is used within the ITS functions to show the status of a reservation that is being or has been requested. If the flag is set to true the reservation was accepted, but if set to false, then the reservation was denied. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

retained_traveler_guidance_data

This data store is used within the Provide Driver and Traveler Services function and is used to hold data previously input as part of a traveler route request. It is retained to prevent the traveler having to re-input often used data. .

retained_vehicle_guidance_data

This data store is used within the Provide Driver and Traveler Services function and is used to hold data previously input as part of a driver route request. It is retained to prevent the driver having to re-input often used data. .

retrieved_incident_media_data

This data flow is used within the Manage Traffic function and contains incident data for output to the Media Operator. It contains one or more of the following data items each of which is defined in its own DDE:

current_incidents_data
+ defined_responses_data
+ predicted_incidents_data.

retrieved_incident_operations_data

This data flow is used within the Manage Traffic function and contains data for output to

either the Traffic Operations Personnel. It contains one or more of the following data items each of which is defined in its own DDE:

current_incidents_data
+ defined_responses_data
+ predicted_incidents_data.

retrieved_traffic_media_data

This data flow is used within the Manage Traffic function. It contains traffic data for output to the Media Operator. The data flow consists the following data item which is defined in its own DDE:

traffic_data_for_media.

retrieved_traffic_operations_data

This data flow is used within the Manage Traffic function and contains data for output to either the Traffic Operations Personnel. It contains one or more of the following data items each of which is defined in its own DDE:

long_term_data
+ current_data
+ predictive_model_data.

ride_segments

This data flow is used within the Manage Transit function and defines the transit route segment(s) for which payment is being or has been provided or for which prices have been requested or supplied. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_segment_number}.

rideshare_confirmation

This data flow is used within the Provide Driver and Traveler Services function to show that a traveler requested rideshare has been confirmed of not. It consists of the following data items each of which is defined in its own DDE:

reservation_status
+ traveler_identity.

rideshare_confirmation_data

This data flow is used within the Provide Driver and Traveler Services function and contains data about confirmed rideshare requests. It consists of the following data items each of which is defined in its own DDE:

reservation_status
+ rideshare_selection_number.

rideshare_cost

This data flow defines the cost of a single use of the ridesharing services (cents) .

Additional sizing assumptions:

SIZE=2;

rideshare_data

This store is used within the Provide Driver and Traveler Services function to hold data about available rideshare routes and travelers. It consists of the following data items each of which is defined in its own DDE:

rideshare_eligibility_data
+ rideshare_confirmation_data
+ rideshare_details.

rideshare_details

This data flow is used within the Provide Driver and Traveler Services function and

contains a list of potential ridesharing matches for output to the traveler. This data will provide information on the other participants in the proposed rideshare, pick-up and drop-off points, etc. .

rideshare_eligibility_data

This data flow is used within the Provide Driver and Traveler Services function to identify potential rideshare participants and to determine their eligibility. .

Additional sizing assumptions:

SIZE=32;

rideshare_ineligible_status_notification

This data flow is used within the Provide Driver and Traveler Services function and is used to indicate that a traveler who wishes to participate in a rideshare has been found to be ineligible. .

rideshare_information

This data flow is used within the Provide Driver and Traveler Services function to transfer information about rideshare requests. It contains the following data items each of which is defined in its own DDE:

rideshare_confirmation
+ rideshare_response.

rideshare_payment_confirmation

This data flow is used by the Provide Electronic Payment Services function to confirm to the Provide Driver and Traveler Services function that payment for a traveler's request and confirmation of a successful rideshare match has been made. .

rideshare_payment_request

This data flow is used by the Provide Driver and Traveler Services function to request that the Provide Electronic Payment Services function carries out the transactions needed for payment of charges necessary for a traveler to make use of ridesharing services. It consists of the following data items each of which is define in its own DDE:

credit_identity
+ rideshare_cost.

rideshare_request_and_confirmation

This data flow is used within the Provide Driver and Traveler Services function to transfer information about rideshare requests. It contains the following data items each of which is defined in its own DDE:

traveler_rideshare_confirmation
+ traveler_rideshare_request.

rideshare_request_from_eligible_traveler

This data flow is used within the Provide Driver and Traveler Services function. It contains data about a ride request that has been screened to ensure the traveler's eligibility for use of the service. The data flow consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ traveler_rideshare_data
+ traveler_rideshare_preferences
+ traveler_rideshare_constraints.

rideshare_response

This data flow is used within the Provide Driver and Traveler Services function to provide the response to a traveler's rideshare request. It contains the following data items each of which is defined in its own DDE:

rideshare_details
+ rideshare_selection_number
+ traveler_identity.

rideshare_selection

This data flow is used within the Provide Driver and Traveler Services function and contains details of the rideshare that has been prepared in response to a traveler's rideshare request. It consists the following data items each of which is defined in its own DDE:

rideshare_details
+ rideshare_selection_number
+ traveler_identity.

rideshare_selection_number

This data flow is used within the Provide Driver and Traveler Services function to provide the identification number for a rideshare selection that has been made in response to a traveler's request. This number consists of up to eight (8) alphanumeric characters and is used to identify a rideshare selection in all subsequent transactions. .

road_control_devices

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. This data includes information about each device used to output traffic management commands to vehicle drivers at road junctions, inclding those that control vehicles at multimodal crossings. Data for devices at highway entry ramps is provided separately. This data flow consists of the following data items each of which is defined in its own DDE:

crossing_equipment_data_for_roads
+ intersection_equipment_data
+ pedestrian_equipment_data
+ vms_road_allocation.

road_data

This data flow is sent from the Provide System Deployment function to the Provide Driver and Traveler Services function. It contains definitions of the road network in the geographic area covered by the particular ITS to which the functions belong, that can be used as a source of route guidance data. .

road_network

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises data about each segment in the road (surface street) network and the way in which they fit together, i.e. which segment is joined to which, both upstream and downstream, plus identification of those links that interface to the highway network. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_downstream_identity
    + route_segment_end_point
    + route_segment_identity
    + route_segment_start_point
    + route_segment_upstream_identity}.

road_segment_location

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function and contains the geographic location of the start and end points of the road segement(s) to which an indicator displays its information. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_end_point
    + route_segment_identity
    + route_segment_start_point}.

roadside_conditions

This data flow is used within the Manage Traffic function and contains information about local road and highway conditions, i.e. snow, ice, rain, fog, other forms of precipitation (earth, sand, petroleum, chemicals, etc.), flooding. The data flow consists of the following data items each of which is defined in its own DDE:

link_list
+ 1{link_conditions}list_size.

roadside_facility_list_FB

This data flow is sent by the government administrator to the Manage Commercial Vehicles function. It consists of a list of the locations of commercial vehicle roadside checkstation facilities. The size assumption for the data flow is related to the assumed number of CVO facilities (CVO_FAC). The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{cv_roadside_facility_identity
+ location_identity}.

roadside_fault_data

This data flow is used within the Manage Traffic function to show any faults that have been found in roadside equipment. This may be in an indicator or the equipment which outputs in-vehicle signage data. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_fault_data
+ vehicle_sign_data_output_fault
+ vehicle_smart_probe_data_output_fault.

route

This data flow is used within the Provide Driver and Traveler Services function and contains details of a route. This will have been produced to fit the origin, destination, preferences and constraints requirements provided by a traveler through the trip request data. The route segment(s) will be in sets, one for a primary route (the nearest fit to the traveler's requirements), plus one or more alternates that may give a better modal split, or improved journey time, etc. There may be one or many route segments depending on the length of the route. The data flow consists of the following items each of which is defined in its own DDE:

route_start_time
+ route_statistics
+ route_cost
+ route_list
+ route_segment_number{route_segment}.

route_cost

This data item is used within the Provide Driver and Traveler Services function and contains the cost of using a particular route. This is made up of some or all of such things as tolls, fares, port charges, plus the cost of commercial vehicle credential filing and tax payments. The cost is shown in cents. .

route_data

This data flow is used to transfer data between the Provide Driver and Traveler Services function and the Manage Traffic function. It contains a wide variety of data covering road network use by guided vehicles and requests for current traffic data which can be presented to travelers. The data flow consists of the following data items each of which is defined in its own DDE:

current_other_routes_use
+ current_road_network_use
+ current_transit_routes_use
+ logged_hazmat_route

+ low_traffic_route
+ traffic_data_advisory_request
+ traffic_data_guidance_request
+ traffic_data_kiosk_request
+ traffic_data_portables_request
+ traffic_data_ridesharing_request.

route_identity

This data flow is used within the Provide Driver and Traveler Services function and contains the identity of a route that is to be used for either on-line vehicle or traveler guidance. The data is for internal use within the function and identifies the route when the driver or traveler subsequently accepts it for use. The data flow is sized at two (2) bytes to give the ISP a wide range of numbers. .

route_list

This data flow is used within the Provide Driver and Traveler Services function and contains a list of the number of route segments in each route that is being provided to a traveler. The data flow is sized at four (4) bytes to enable a primary route plus up to three alternates to be offered. The primary route will be that which most closely fits the traveler's requirements, whilst the others will be alternates that may give such things as improved journey time, shorter distance, lower cost, different modal split, etc. The byte entries will be filled from the lowest with a zero entry denoting that there is no further alternate routes. The data flow therefore consists of the following data item which is defined in its own DDE:

1{route_segment_number}4.

route_point

This data flow is used within the Provide Driver and Traveler Services function. It defines a point that may be on the route that is provided in response to a trip request, or it may be part of the trip specification produced by the traveler as the trip request. In either case it may be the origin, destination, or an intermediate point which the traveler wishes to pass through, or where the trip planning facility has decided that it is necessary to change modes. .

route_reports

This data flow is sent from the Provide Driver and Traveler Services function to the Plan System Deployment function and contains a snap shot of the current usage travelers are making of roads and other (non-transit) methods of transport. It contains the following data items each of which is define in its own DDE:

current_other_routes_use
+ current_road_network_use.

route_segment

This data flow is used within the Provide Driver and Traveler Services function and forms the basic building block for a route. It consists of the following items of data each of which is defined in its own DDE:

route_segment_data
+ route_segment_identity
+ route_segment_mode.

route_segment_commercial_details

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Commercial Vehicles function. It contains data about each of the route segments that have been included in a commercial vehicle route. The data flow consists of the following data items each of which is defined in its own DDE:

route_segment_estimated_condition
+ route_segment_predicted_weather
+ route_segment_end_point
+ route_segment_estimated_travel_time

+ route_segment_start_point.

route_segment_data

This data flow is used within the Provide Driver and Traveler Services function and contains information about a route segment. It consists of the following items of data each of which is defined in its own DDE:

route_segment_estimated_condition
+ route_segment_predicted_weather
+ route_segment_end_point
+ route_segment_start_point
+ route_segment_description
+ route_segment_estimated_arrival_time
+ route_segment_estimated_travel_time
+ route_segment_report_position_points.

route_segment_description

This data flow is used within the Provide Driver and Traveler Services function and contains a description of the physical details for the entire route segment. This data is used to provide information from which guidance can be produced in a form which is understandable by the driver, e.g. lane selection, right/left turns, etc. .

route_segment_details

This data store is used within the Provide Driver and Traveler Services function. It contains data about the route segments both within and outside the control of the local TMC, with which regular contact is maintained. The store is therefore sized at one and a half times the number of route segments in the road and freeway network controlled by the local ITS function to enable data from other areas to be stored. The store consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_stored_details}.

route_segment_details_updated

this data flow is used within the Provide Driver and Traveler Services function to indicate that the store of route segment details has been updated. .

Additional sizing assumptions:

SIZE=1;

route_segment_downstream_identity

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides the identity of the route segment that is immediately downstream of the route segment with which the data flow is associated. This may be another route segment of the same type (highway or road), or of the alternative type (road or highway) where there is an interface to the other network. The data flow consists of the following data item which is defined in its own DDE:

route_segment_identity.

route_segment_end_point

This data flow is used within the Provide Driver and Traveler Services function and the Manage Traffic function. It contains the location of the end of a route segment and consists of the following data item which is defined in its own DDE:

location_identity.

route_segment_estimated_arrival_time

This data flow is used within the Provide Driver and Traveler Services function and contains the estimated time at which the route segment end point will be reached. The data flow is sized at five (5) bytes to enable the use of the twenty four hour clock system, plus an indicator for whether the time applies to the current or next day. .

route_segment_estimated_condition

This data flow is used within the Provide Driver and Traveler Services function and contains the traffic conditions expected on the route segment at the time at which it will be used. It is sized at three (3) bytes to enable the use of a three character code to define the actual conditions. .

route_segment_estimated_travel_time

This data flow is used within the Provide Driver and Traveler Services function and contains the estimated time it will take a vehicle to travel the route segment taking account of the expected conditions defined in other data. It is sized at two (2) bytes to enable the time to be in excess of 255 seconds (the maximum value for one byte), but with a maximum value of 32767 seconds. .

route_segment_guided_travelers

This data flow is used within the Provide Driver and Traveler Services function and contains the number of travelers being guided along a route segment in one minute of real time. This data only applies to non-vehicle route segments and those not provided by transit services. The travelers may not actually be on the segment at the time the data is used, but will have it included in their current personal guidance data. The data flow is sized at two bytes to give a maximum of 32767 travelers per route segment per minute. .

route_segment_guided_vehicles

This data flow is used within the Provide Driver and Traveler Services function and contains the number of vehicles being guided along a route segment in one minute of real time. The vehicles may not actually be on the segment at the time the data is used, but will have it included in their current route guidance data. The data flow is sized at two bytes to give a maximum of 32767 vehicles per route segment per minute and will only apply to those route segments that are used by road vehicles other than transit vehicles. .

route_segment_identity

This data flow is used within the Provide Driver and Traveler Services function and contains the identity number of a route segment. A link may not be the same physical entity as a surface street or highway link (defined elsewhere), but in some cases they could be the same. The data flow consists of the following data items each of which is defined in its own DDE:

unit_number
+ route_segment_type
+ location_identity.

route_segment_incident_data

This data flow is used within the Provide Driver and Traveler Services function. It contains data about a predicted incident on a route segment. The data is provided by the Manage Incidents facility in the Manage Traffic function. The data flow consists of the following data items each of which is defined in its own DDE:

incident_type
+ incident_severity
+ incident_description
+ incident_traffic_impact.

route_segment_journey_time

This data flow is used within the Provide Driver and Traveler Services function and contains the average route segment journey time calculated from data being provided by guided vehicles. These vehicle are acting as probes in the road network by reporting their position to request fresh (updated) guidance at the beginning of each new route segment on their current route. The data is stored in seconds (secs) so that with a size of two bytes the maximum journey time for a route segment is 32767 seconds. .

route_segment_journey_time_from_tolls

This data flow is sent from the Provide Electronic Payment Services function to the Provide Driver and traveler Services function. It contains the smoothed average

vehicle journey times for the route segment between two toll collection points, obtained from the passing times of those vehicles equipped for electronic toll collection. .

route_segment_mode

This data flow is used within the Provide Driver and Traveler Services function and contains the mode that has been selected for use within the route segment. The choice of mode is made as part of the trip planning process using one of those listed in the %034modes%034 data flow. Only one mode can be used in any single route segment. This gives a size of three (3) bytes to accommodate the three character code used to define the mode. .

route_segment_number

This data flow is used within the Provide Driver and Traveler Services function and contains the number of segments in a route that is being provided in response to a trip request from a traveler. The maximum number of route segments allowed in a route is two hundred and fifty five (255). .

route_segment_occupancy_predictions

This data flow is used within the Manage Traffic function and is also sent by that function to the Manage Transit and Provide Driver and Traveler Services function. It contains output from the predictive model process showing predictions of the occupancy for route segments on the road and highway network served by the Manage Traffic function. This occupancy is shown as a percentage (%) value with zero (0) meaning that there are no vehicles present and one hundred (100) meaning that the vehicles are not moving. The data flow is sized at one (1) byte as its value can never be greater than 100, i.e. 100%. .

route_segment_pollution_data

This data flow is used within the Provide Driver and Traveler Services function. It contains data about the pollution levels that are present in the geographic area which is occupied by the route segment. This data will have been obtained from sensors that are deployed and monitored by the Manage Emissions facility within the Manage Traffic function. The data flow consists of the following data items each of which is defined in its own DDE:

current_ozone_pollution
+ current_nitrous_oxide_pollution
+ current_sulfur_dioxide_pollution
+ current_hydrocarbon_pollution
+ current_carbon_monoxide_pollution
+ current_particulate_pollution
+ current_roadside_pollution_location.

route_segment_predicted_weather

This data flow is used within the Provide Driver and Traveler Services function and contains the weather conditions expected on the road segment at the time at which it will be used. It is sized at three (3) bytes to enable the use of a three character code to define the actual conditions. .

route_segment_queue_delay_predictions

This data flow is used within the Manage Traffic function and is also sent by that function to the Manage Transit and Provide Driver and Traveler Services function. It contains output from the predictive model process showing predictions of the delay(s) due to traffic queues for route segments on the road and highway network served by the Manage Traffic function. This delay is the additional time that a vehicle will take to move from the start of a route segment to its end, above that which it would need in totally free flow conditions. The queues may be caused by very high traffic flows such that the traffic cannot all physically fit into certain part(s) of the roads and highways. The data flow is sized at two (2) bytes to take account of the long segments that may be present on highways and in rural areas. .

route_segment_report_position_points

This data flow is used within the Provide Driver and Traveler Services function and contains a list of any points other than those at the route segment start and end where the vehicle's position is to be reported. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_way_point}.

route_segment_start_point

This data flow is used within the Provide Driver and Traveler Services function and the Manage Traffic function. It contains the location of the start of a route segment and consists of the following data item which is defined in its own DDE:

location_identity.

route_segment_stored_details

This data flow is used within the Provide Driver and Traveler Services function. It contains data for each %034route_segment%034 such as the current journey time, either obtained from position reports input by probe vehicles, i.e. those which are reporting their current position regardless of whether they are guided or not, or calculated from data produced as part of the adaptive control strategy process, data from the predictive model, and pollution data. The data flow consists of the following data items each of which is defined in its own DDE:

route_segment_identity
+ route_segment_incident_data
+ route_segment_journey_time
+ route_segment_occupancy_predictions
+ route_segment_pollution_data
+ route_segment_queue_delay_predictions
+ route_segment_use_prediction
+ route_segment_volume_delay_predictions.

route_segment_total_number

This data flow is used within the Manage Traffic and Provide Driver and Traveler Services function to define the total number of route segments in the road (surface street) and highway network served by the Manage Traffic function. This may be different from that served by the Provide Driver and Traveler Services function, and in this instance is used to define the number of route segments for which probe vehicle data is being provided to the Manage Traffic function, or the total number of route segments used by non-vehicle modes (walking, cycling, etc.) for which journey times are available. The data flow is sized at two bytes to enable the maximum number of route segments to be up to 32767. .

route_segment_type

This data flow is used within the Manage Traffic, Provide Driver and Traveler Services and Plan System Deployment functions. It contains the definition of the type of route segment which will depend on the types of use it will support. The data flow is sized as a three (3) character string which is used to defined the supported types in the following way:

ATV - any type of vehicle
OCV - commercial vehicles only
OTR - transit vehicles only
OCT - commercial and transit vehicles
OPC - private cars and vans only
OBC - bicycles only
PNV - all pedestrians, no vehicles
DPO - disabled pedestrians only, no vehicles
RRS - road route segment
HRS - highway route segment. .

route_segment_upstream_identity

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides the identity of the route segment that is immediately upstream of the route segment with which the data flow is associated. This may be another route segment of the same type (road or highway), or of the alternative type (highway or road) where there is an interface to the other network. The data flow consists of the following data item which is defined in its own DDE:

route_segment_identity.

route_segment_use_prediction

This data flow is used within the Provide Driver and Traveler Services function. It contains data about the number of guided vehicles that will be using a route segment over a set of time periods. Typically these time periods will cover five (5) minutes as so far as traffic management is concerned there is no advantage in providing a greater resolution. The data flow consists of the following data items each of which is defined in its own DDE:

time_period{route_segment_guided_vehicles}.

route_segment_volume_delay_predictions

This data flow is used within the Manage Traffic function and is also sent by that function to the Manage Transit and Provide Driver and Traveler Services function. It contains output from the predictive model process showing predictions of the delay(s) due to traffic volume for route segments on the road and highway network served by the Manage Traffic function. This delay is the additional time that a vehicle will take to move from the start of a route segment to its end, above that which it would need in totally free flow conditions. The data flow is sized at two (2) bytes to take account of the long segments that may be present on highways and in rural areas. .

route_segment_way_point

This data flow is used within the Provide Driver and Traveler Services function and contains the location of a point part way along a route segment at which a vehicle's position is to be reported. It consists of the following data item which is defined in its own DDE:

location_identity.

route_selection_parameters

This data store is used within the Provide Driver and traveler Services function and contains parameters used to determine the way in which route are selected for both traveler trip plans and for on-line vehicle guidance. The parameters govern the weighting that is to be given to the preferences and constraints provided as part of the input from the traveler or driver, and any particular streets, highways, bridges, etc. that are to be avoided. .

route_start_time

This data flow is used within the Provide Driver and Traveler Services function. It contains the date and time at which a route will start taken from the time specified in the request for the route. The data flow consists of the following data items each of which is defined in its own DDE:

date
+ time.

route_statistics

This data flow is used within the Provide Driver and Traveler Services function and contains the overall predicted statistics associated with a route which may assist the traveler in making a final route selection. The statistics will include such things as itinerary, estimated net travel time, time of arrival, total distance, anticipated delays/congestion, etc. .

route_type

This data flow is used within the Manage Commercial Vehicles function and contains an indication of the type of route requested, or that for which data is available. It is stored as a single (1) byte and has the following values:

no data - blank,
dynamic route - D,
static route - S. .

routes_for_vehicles_data

This data store is used within the Provide Driver and Traveler Services function. It contains details of all the vehicle routes which are currently being used by vehicles using dynamic guidance. The data store consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{vehicle_guidance_stored_data}.

safety_advisory_message

This data flow is used within the Provide Vehicle Monitoring and Control function and the Provide Driver and Traveler Services function. It contains a short description of a safety problem that has been detected on-board the vehicle, with some advice as to what action the driver should take. The problem may be related to the driver, the vehicle or the road ahead of the vehicle. The data flow is sized at thirty two (32) bytes to enable a short concise message about the safety problem to be provided for output to the driver. .

safety_data

This data flow is used within the Provide Vehicle Monitoring and Control function and contains the following data about vehicle safety:

driver_safety_status - the status of the driver in terms of their ability to control the vehicle,

vehicle_safety_status - the status of the vehicle in terms of its continued ability to operate in a safe manner,

roadside_data - data about the road conditions, e.g. ice, fog, rain, snow, etc.

plus similar information in the following data items each of which is defined in its own DDE:

vehicle_motion_data
+ vehicle_attitude_data.

safety_state_for_driver

This data flow is used within the Provide Vehicle Monitoring and Control function and the Provide Driver and Traveler Services function. It contains an indication of the level of importance that must be attached to an associated safety warning. The warning may be related to the condition of the driver, the vehicle, or the road ahead of the vehicle. The data item is sized at one (1) byte so that it can a character that can be used to define the seriousness of the safety condition, The character may be one of the following:

A - advisory, e.g windshield washer fluid level low
F - faily serious, e.g. road ahead has severe bends
V - very serious, e.g. alternator not working, vehiclc running on battery
C - critical, e.g. engine temperature too high, engine about to stop.

The character is for use by the message output processes in determining the level of priority that the message should have over other messages that are being output to the driver. .

safety_warning_for_driver_condition

This data flow is used within the Provide Vehicle Monitoring and Control function and the Provide Driver and Traveler Services function. It contains a warning to the driver that current hehaviour patterns indicate to systems on-board the vehicle that he/she is incapable of maintaining proper control of the vehicle. The data flow consists of the following data items each of which is defined in its own DDE:

safety_state_for_driver
+ safety_advisory_message.

safety_warning_for_road_condition

This data flow is used within the Provide Vehicle Monitoring and Control function and the Provide Driver and Traveler Services function. It contains a warning to the driver that the road conditions ahead of the vehicle are unsafe, i.e. the vehicle may be in danger of suffering damage if it continues. The data flow consists of the following data items each of which is defined in its own DDE:

safety_state_for_driver
+ safety_advisory_message.

safety_warning_for_vehicle_condition

This data flow is used within the Provide Vehicle Monitoring and Control function and the Provide Driver and Traveler Services function. It contains a warning to the driver that there is something wrong the vehicle, the nature of which is given in the accompanying text string. The data flow consists of the following data items each of which is defined in its own DDE:

safety_state_for_driver
+ safety_advisory_message.

safety_warnings

This data flow is sent from the Provide Vehicle Monitoring and Control function to the Provide Driver and Traveler Services function. It contains safety warnings for drivers about the current operation of the vehicle. The data flow consists of the following data items each of which is defined in its own DDE:

safety_warning_for_driver_condition
+ safety_warning_for_vehicle_condition
+ safety_warning_for_road_condition.

select_headway

This data flow is used within the Provide Vehicle Control and Monitoring function and contains details of the distance between the vehicle and the next vehicle in front (headway) selected by the driver or zero if headway control is to be disabled. .

select_lane_hold

This data flow is used within the Provide Vehicle Control and Monitoring function and contains an indication that the driver has (1) or has not (0) selected lane holding. .

Additional sizing assumptions:

SIZE=2;

select_speed

This data flow is used within the Provide Vehicle Control and Monitoring function and contains details of the vehicle speed selected by the driver or zero if speed control is to be disabled. .

selected_emergency_strategy

This data flow is used within the Manage Traffic function to specify the type of traffic control strategy to be applied to some or all of the road (surface strteets) and highway traffic control units controlled by a TMC. The strategy will be based on the emergency vehicle route provided by the route selection facility in the Provide Driver and Traveler Services function. It will give priority to the emergecny vehicle(s) by ensuring that they are given the proceed indication (green signal) as they approach each individual intersection, pedestrian and ramp meter control unit

along the emergency vehicle route. Another feature of the strategy may be the direction of other vehicles to use particular lanes on a surface street or highway so that the emergency vehicle(s) have a lane for the sole use. .

selected_emergency_vehicle_strategy

This data flow is used within the Manage Traffic function and contains the strategy which has been selected to enable priority to be given to emergency vehicles through the road (surface street) and highway network controlled by the TMC. It will cover intersection controllers, pedestrain controllers, variable message signs (vms) that control lane use and ramp metering controllers. The strategies for each of these individual types of unit will be sent out as the strategies to their individual control processes. The strategy may be applied to some or all of the units on the roads and highways in the geographic area served by the TMC. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_list
+ ramp_list
+ selected_emergency_strategy.

selected_highway_control_strategy

This data flow is used within the Manage Traffic function and contains the strategy which has been selected for implementation at some or all of the indicators on the highways in the geographic and jurisdictional area(s) served by the function. The strategy may be one of several depending on that which is best suited to control of traffic on the highways. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ 1{indicator_identity}list_size
+ selected_strategy_type
+ highway_sign_plan_number.

selected_parking_lot_control_strategy

This data flow is used within the Manage Traffic function and contains the strategy which has been selected for implementation at parking lots to control their use. The strategy will be designed to promote or discourage the use of a parking lot by directing vehicles to or away from it through the use of variable message signs (vms). The decision on which stretegy to employ will depend upon such things as the overall traffic management strategy, the need to restrict vehicle use because of a number of factors e.g. congestion, pollution, and the desire to encourage travelers to make use of alternative modes of transport by using park and ride (P+R) facilities. The strategy may be applied to sime or all of the parking lots in the geographic area served by the TMC. The data flow consists of the following data items each of which is defined in its own DDE: the may be one of 'open' or 'close'
the lot and may be applied to some or all of the lots in the geographic area served by the function.

parking_lot_list
+ selected_parking_lot_strategy_type.

selected_parking_lot_strategy_type

This data flow is used within the Manage Traffic function to specify the type of strategy to be applied to some or all of the parking lots controlled by a TMC. The strategy type will be designed to promote or discourage the use of a particular parking lot and thus may either 'open' or 'close' the lot, indicate the state of the lot, i.e. the number of spaces remaining, or give priority to vehicles that are part of car or van pools. .

selected_ramp_control_strategy

This data flow is used within the Manage Traffic function and contains the strategy which has been selected for implementation at highway entry ramps by the local ramp metering equipment. The strategy may be either 'open', 'closed' or 'admit vehicles when not congested' and may be applied to some or all of the ramps in the geographic area served by the TMC. The data flow consists of the following data items each of which is defined in its own DDE:

ramp_list
+ selected_ramp_strategy_type.

selected_ramp_strategy_type

This data flow is used within the Manage Traffic function and contains the strategy which has been selected for implementation by ramp mtering equipment. The strategy may typically be one which either permanently opens or closes the ramp, or enables traffic to join the highway under certain conditions. These would be things such as low congestion on the highway, or situations where additonal traffic entering the highway will not increase the level of congestion such that free flow conditions break down. An override will be provided to enable the ramp to be opened if closing it will cause unacceptable congestion to the surrounding surface streets. .

selected_road_control_strategy

This data flow is used within the Manage Traffic function and contains the strategy which has been selected for implementation at some or all of the indicators on the roads in the geographic and jurisdictional area(s) served by the function. The s trategy may be one of several depending on that which is best suited to control of traffic on the roads. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ 1{indicator_identity}list_size
+ selected_strategy_type
+ indicator_road_adaptive_plan_number
+ indicator_road_fixed_plan_number.

selected_roadway_control_strategy

This data flow is used within the Manage Traffic function and contains the strategy which has been selected for implementation at traffic signal and lane use control devices on the roads in the geographic and jurisdictional area(s) served by the function. In this context, roadway means roads (surface streets) and highways. The data flow consists of the following data items each of which is defined in its own DDE:

selected_road_control_strategy
+ selected_highway_control_strategy.

selected_strategy

This data flow is used within the Manage Traffic function to transfer the current traffic control strategies being implemented on highways and roads (surface streets) from the Provide Device Control facility to the Provide Traffic Surveillance facility for loading into the store of long term data. It contains the following data items each of which is defined in its own DDE:

selected_roadway_control_strategy
+ selected_ramp_control_strategy
+ selected_parking_lot_control_strategy
+ selected_emergency_vehicle_strategy.

selected_strategy_data

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It specifies supplementary data that goes with the strategy type data. Thus it may be anything from a simple fixed time traffic signal control plan number, to a set of adaptive control parameters. It has been sized as a thirty two byte string to cover all possibilities. .

selected_strategy_type

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It specifies the type of traffic control strategy to be applied to some or all of the road (surface street) and highway indicators controlled by a TMC. The strategy type is defined as a three character

string using one of the following codes:

CA - centralized adaptive control,
DA - distributed adaptive control,
AL - adaptive control with some local autonomy,
APS - automatic plan selection (APS) using fixed time or adaptive control data,
CFT - centralized fixed time control,
DFT - distributed fixed time control using local controller intelligence,
LC - local control using only the controller's intelligence. .

sensor_allocation

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It contains details of the way in which sensors are allocated to the various types of road and highway control and output devices, detection devices, and other units capable of collected data from traffic within the geographic area controlled by the function. The data flow consists of the following data items each of which is defined in its own DDE:

sensor_allocation_for_controllers
+ sensor_allocation_for_hov_lanes
+ sensor_allocation_for_tags
+ sensor_allocation_for_probes.

sensor_allocation_for_controllers

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It contains details of the way in which vehicle and pedestrian sensors are allocated to the various types of road and highway control and output devices within the geographic area controlled by ITS. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
    + sensor_list}.

sensor_allocation_for_hov_lanes

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It contains details of the way in which vehicle sensors are allocated for the detection of vehicles in high occupancy vehicle (hov) lanes. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{hov_lane_identity
    + sensor_list}.

sensor_allocation_for_probes

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It contains details of the way in which vehicle smart probe data collection units are located and allocated to links in the road and freeway network served by the function. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_identity
    + vehicle_smart_probe_data_source_identity
    + vehicle_smart_probe_data_source_location}.

sensor_allocation_for_tags

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It contains details of the way in which vehicle probide data receiveing equipment is located within the road and freeway network served by the function. If no equipment is allocated to a link then the entries for the

indentity and location of the equipment will be left blank. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_identity
+ vehicle_tag_data_source_identity
+ vehicle_tag_data_source_location}.

sensor_data

This data flow is used within the Provide Vehicle Monitoring and Control function and contains data about a vehicle's position and spped obtains from on-board sensors. It consists of the following data items each of which is defined in its own DDE:

headway
+ lane_deviation
+ speed.

sensor_identity

This data flow is used within the Manage Traffic function to indentify individual sensors used to provide data for the control of traffic on roads (surface streets) and highways. The sensors can be of any type and may detect vehicles of all types, and/or cycles, and/or pedestrians. The data flow consists of the following data items each of which is defined in its own DDE:

sensor_type
+ unit_number
+ location_identity.

sensor_list

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. This data includes a list of the identity(ies) of the traffic and pedestrian sensors that are associated with a particular indicator, which may be an intersection, pedestrian or highway entry ramp controller. The sensors are used to provide details of traffic and pedestrian movements and are used in the management of conditions on the road and highway network controlled by the Manage Traffic function. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{sensor_identity}.

sensor_parameters

This data flow is used within the Manage Traffic function to send data between the Provide Device Control and Provide Traffic Surveillance facilities. It contains the following items of data each of which is defined in its own DDE:

current_ramp_state
+ current_roadway_network_data
+ cv_incidents_for_other_TMC
+ emergency_data_for_other_TMC
+ indicator_control_storage_data
+ indicator_input_storage_data
+ link_data_update
+ new_sensor_static_data
+ parking_lot_current_state
+ request_other_TMC_data
+ request_sensor_static_data
+ selected_strategy
+ traffic_video_camera_control.

sensor_type

This data flow is used within the Manage Traffic function and contains the type for a

particular sensor. The type defines both what the sensor will detect and the type of unit that it is, and is represented by the following three character codes:

GVG - ground based sensor for all types of vehicles,
EVG - ground based sensor for emergency vehicles,
TVG - ground based sensor for transit vehicles,
GVU - above ground based sensor for all types of vehicles,
EVU - above ground based sensor for emergency vehicles,
TVU - above ground based sensor for transit vehicles,
CG - ground based sensor for cycles,
CU - above ground based sensor for cycles,
PG - ground based sensor for pedestrians,
PU - above ground based sensor for pedestrians. .

simulation_request

This data flow is used within the Plan System Deployment fuction. It contains a request and (optionally) extra

parameters necessary to start the simulation of a certain part of the ITS network. .

speed

This data flow is used within the Provide Vehicle Control and Monitoring function and contains the vehicle's speed (measured in mph up to 100) as computed from on-board sensors. .

Additional sizing assumptions:

SIZE=2;

state_contact_address

This data flow is used within the Manage Emergency Services function and contains the full postal address (including zip code) of a state Department of Motor Vehicle (DMV) office. This is one of the details that is used to obtain vehicle registration data from a vehicle license. It is stored as a string of up to 50 characters. .

state_contact_computer

This data flow is used within the Manage Emergency Services function and contains the computer telephone number of a state Department of Motor Vehicle (DMV) office. This number provides direct but password and encrypted access to a computer within the DMV office, and is one of the details that is used to obtain vehicle registration data from a vehicle license. It is stored as a string of up to 10 characters. .

state_contact_data

This data flow is used within the Manage Traffic function and contains the contact information for all state Department of Motor Vehicle (DMV) offices from which a match between vehicle license and vehicle registration number can be obtained. It consists of the following data items each of which is defined in its own DDE:

state_contact_method
+ state_contact_details
+ state_contact_identity.

state_contact_details

This data flow is used within the Manage Emergency Services function and contains the details of all the available access points for a state Department of Motor Vehicle (DMV) office. These access points comprise addresses, telephone numbers, etc. through which the DMV office may be sent vehicle license data from which it is expected that vehicle registration information will be provided. Not all entries may be present, and as a minimum only one is needed. The details are contained in the following data items each of which is defined in its own DDE:

state_contact_address
+ state_contact_computer
+ state_contact_email
+ state_contact_fax

+ state_contact_name
+ state_contact_phone.

state_contact_email

This data flow is used within the Manage Emergency Services function and contains the e-mail address of a state Department of Motor Vehicle (DMV) office. This is one of the details that is used to obtain vehicle registration data from a vehicle license. It is stored as a string of up to 30 characters. .

state_contact_fax

This data flow is used within the Manage Emergency Services function and contains the telephone number of the fax line for a state Department of Motor Vehicle (DMV) office. This is one of the details that is used to obtain vehicle registration data from a vehicle license. It is stored as a string of up to 10 characters. .

state_contact_identity

This data flow is used within the Manage Traffic function and contains an identity code for a particular State Department of Motor Vehicle (DMV) office from which a match between vehicle license and vehicle registration number can be obtained. There is one of these codes for every State and each uses the standard two character abbreviation for each State, e.g. MD for Maryland, CA for California, etc. .

state_contact_method

This data flow is used within the Manage Emergency Services function and contains a character string that defines the method by which a state Department of Motor Vehicle (DMV) office shall be contacted with details of a vehicle license for which the corresponding registration data is required. The character string is three (3) bytes long and may have one of the following entries to define the method:

eml - e-mail message
pst - postal service
tpn - voice based telephone call
tfx - fax

Only one method should be specified for each agency, the processes responsible for passing the data being able to report failure to communicate. .

state_contact_name

This data flow is used within the Manage Emergency Services function and contains the name of a state Department of Motor Vehicle (DMV) office. This is one of the details that is used to obtain vehicle registration data from a vehicle license. It is stored as a string of up to 30 characters. .

state_contact_phone

This data flow is used within the Manage Emergency Services function and contains the voice line telephone number of a state Department of Motor Vehicle (DMV) office. This is one of the details that is used to obtain vehicle registration data from a vehicle license. It is stored as a string of up to 10 characters. .

static_data_for_control

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes data that is used by the processes that output control data to roadside equipment on roads and highways. The data flow consists of the following items each of which is defined in its own DDE:

static_data_for_highway_control
+ static_data_for_road_control
+ static_data_for_vehicle_signage.

static_data_for_highway_control

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes data that is used by the process that outputs control data to roadside equipment on freeways and monitors its subsequent operation. The data flow consists of the following items each of which is defined in

its own DDE:

highway_control_devices
+ highway_network
+ ramp_devices
+ vms_allocation.

static_data_for_highways

This data flow is used by processes within the Manage Traffic function. It contains data that defines the way in which each highway indicator (vehicle outputs only) operates plus the way in which each segement of the highway network fits together. It consists of the following data items each of which is defined in its own DDE:

highway_network
+ highway_control_devices
+ indicator_highway_control_static_data
+ sensor_allocation
+ coordination_rules_for_highways.

static_data_for_incident_management

This data store is used by processes in the Manage Traffic function and contains data provided by the Plan System Deployment function. This data is used in the processing of raw incident data provided from a variety of sources. It consists of the following data items each of which is defined in its own DDE:

highway_network
+ road_network
+ road_segment_location.

static_data_for_maps

This data flow is used within the Plan System Deployment function and contains data about the road and highway network. This data encompasses such things as the number of lanes in each segment of the network, direction of travel, lane restrictions, speed limits, lane geometry, traffic signal locations, etc. It is sent to the map provider for use in preparing the digitized map data that is used by both this and other functions in the ITS. .

static_data_for_parking_lots

This data flow is used within the Manage Traffic function and is provided by the Plan System Deployment function. It contains data that relates vehicle sensors, queue counting sensors and signs to individual parking lots, and the lot occupancy(ies) at which states such as 'almost full' and 'full' will apply. The data is sent to each parking lot for its own use. The data flow consists of the following data items each of which is defined in its own DDE:

parking_lot_identity
+ parking_lot_sensor_allocation
+ parking_lot_state_thresholds
+ parking_lot_vms_allocation.

static_data_for_ramps

This data flow is used by processes within the Manage Traffic function. It contains data that defines the way in which each highway ramp operates plus the way in which each segement highway network fits together. It consists of the following data items each of which is defined in its own DDE:

highway_network
+ ramp_devices.

static_data_for_road_control

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes data that is used by the process that outputs control data to roadside equipment on roads (surface streets) and monitors

its subsequent operation. The data flow consists of the following items each of which is defined in its own DDE:

road_control_devices
+ road_network
+ vms_allocation.

static_data_for_roads

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It comprises data that defines the way in which each road indicator (vehicle outputs, pedestrian outputs and multimodal crossing outputs) operates, plus rules for the coordination of the road and highway control strategies, and the way in which each segement of the road network fits together. It consists of the following data items each of which is defined in its own DDE:

road_network
+ indicator_road_control_static_data
+ road_control_devices
+ sensor_allocation
+ coordination_rules_for_roads.

static_data_for_roadways

This data flow is used by processes within the Manage Traffic function. It contains data that defines the static data for both highways and roads. It consists of the following data items each of which is defined in its own DDE:

static_data_for_highways
+ static_data_for_roads.

static_data_for_sensor_processing

This data store is used by the processed in the Manage Traffic function. It contains data that shows which data items obtained by processes in the Provide Traffic Surveillance facility apply to other processes in the Traffic Surveillance and Control facility. It consists of the following data items each of which is defined in its own DDE:

highway_control_devices
+ highway_network
+ ramp_devices
+ road_control_devices
+ road_network
+ sensor_allocation.

static_data_for_strategy

This data flow is used by processes within the Manage Traffic function. It contains data that defines the way in which all junction, pedestrian and ramp controllers and signs operate, the default (background) control strategy, plus the way in which each segement of the road and highway network fits together. It consists of the following data items each of which is defined in its own DDE:

background_strategy
+ highway_control_devices
+ highway_network
+ ramp_devices
+ road_control_devices
+ road_network.

static_data_for_traffic_control

This data store is used by processes in the Manage Traffic function and contains data provided by the Plan System Deployment function. This data is used in the processing of data provided by traffic sensors and in the control of indicators (intersection signals, pedestrian crossing signals, etc) that manage traffic flow. It consists of

the following data items each of which is defined in its own DDE:

background_strategy
+ coordination_rules_for_highways
+ coordination_rules_for_roads
+ highway_control_devices
+ highway_network
+ indicator_highway_control_static_data
+ indicator_road_control_static_data
+ parking_lot_static_data
+ ramp_devices
+ road_control_devices
+ road_network
+ sensor_allocation
+ vehicle_signage_output_identity
+ vms_allocation.

static_data_for_traffic_control_copy

This data flow is used within the Manage Traffic function and contains a copy of the data originally provided by the Plan System Deployment function. This data is held in a store and is sent to other processes within the function when it is updated. The data flow consists of the following data item which is defined in its own DDE:

static_data_for_traffic_control.

static_data_for_traffic_control_output

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. This data is a copy of that loaded into a store and is for use by other processes within the function. The data flow consists of the following data item which is defined in its own DDE:

static_data_for_traffic_control.

static_data_for_traffic_control_update

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. This data is for loading into a store and is then sent to other processes within the function by another process. The data flow consists of the following data item which is defined in its own DDE:

static_data_for_traffic_control.

static_data_for_vehicle_signage

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It includes data that is used by the process that outputs control data to roadside equipment responsible for broadcasting data for use by in-vehicle signage systems. This data consists of the identity of the roadside equipment and the indentity of up to six indicators whose data may be output by the roadside equipment. The data flow consists of the following items each of which is defined in its own DDE:

list_size
+ list_size{vehicle_signage_output_identity
    + 6{indicator_identity}}.

static_data_request

This data flow is sent from the Provide System Deployment function to the Manage Traffic function to request a copy of some or all of the current static data being used by the traffic control, sensor processing and incident management facilities. The data flow is sized at three bytes to enable the use of three alphanumeric characters, one for each type of data, i.e. 'i' for incident, 's' for sensor and 't' for traffic. The receiving process will check that the alphanumeric character for its data is present before retrieving and returning it to the Plan System Deployment function. .

static_data_store_updated

This data flow is used within the Manage Trsffic function and signals that new data has been loaded into the store of static data for traffic control. This flow is used enable the update of the static data used by other processes within the fucntion. .

steering_commands

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains data showing any changes required to the vehicle's steering so that it will change from the current lane to an adjacent lane on either side (left or right). The commands are of the form turn left (negative value), turn right (positive value), or center the steering (zero value) and may be of a larger order of magnitude than the similar commands for lane following control. .

stored_credit

This data flow is used within the Provide Electronic Payment Services function and contains the value of the credit currently stored by the payment instrument. This value is stored in cents (US) and has a maximum value of 32767. .

strategy_data

This data flow is used within the Manage Traffic function. It contains processed surveillance data which is used to determine the traffic control strategy for the road and highway network served by the function. It consists of the following data items each of which is defined in its own DDE:

strategy_data_for_roads
+ strategy_data_for_highways.

strategy_data_for_highways

This data flow is used within the Manage Traffic function. It contains processed traffic data, plus data about the closure of multimodal crossings, which is used to determine the traffic control strategy for the highway network served by the function. It consists of the following data items each of which is defined in its own DDE:

crossing_data_for_highways
+ hov_priority
+ link_strategy_data
+ tunnel_conditions.

strategy_data_for_roads

This data flow is used within the Manage Traffic function. It contains processed traffic and pedestrian surveillance data, plus data about the closure of multimodal crossings, which is used to determine the traffic control strategy for the road network served by the function. It consists of the following data items each of which is defined in its own DDE:

crossing_data_for_roads
+ hov_priority
+ pedestrian_data
+ link_strategy_data.

strategy_date

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the date of the year on which a traffic control strategy is to be implemented on the road and highway network (including parking lots) served by the Manage Traffic function. The strategy implemented on this date will be the background strategy, i.e. that which is used when no overrides due to incidents, emergency vehicle routes, traffic systems operator intervention, or demand management changes are in force. The date is stored as a eight character string in the order %034mmddyy%034, where %034mm%034 is the month of the year, e.g. %03404%034, %034dd%034 is the day of the month, e.g. %03427%034, and %034yy%034 is the year, e.g. 92. .

strategy_day

This data flow is used within the Manage Traffic function and contains data provided

by the Plan System Deployment function. It is the day of the week on which a traffic control strategy is to be implemented on the road and highway network (including parking lots) served by the Manage Traffic function. The strategy implemented on this day will be the background strategy, i.e. that which is used when no overrides due to incidents, emergency vehicle routes, traffic systems operator intervention, or demand management changes are in force. The day is stored as a two character string using the first to characters of the day name. .

strategy_end_time

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the end time for a traffic control strategy to be implemented on the road and highway network (including parking lots) served by the Manage Traffic function. The strategy that is removed at this time will be the background strategy, i.e. that which is used when no overrides due to incidents, emergency vehicle routes, traffic systems operator intervention, or demand management changes are in force. The data flow consists of the following data item which is defined in its own DDE:

time.

strategy_start_time

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It is the start time for a traffic control strategy to be implemented on the road and highway network (including parking lots) served by the Manage Traffic function. The strategy implemented at this time will be the background strategy, i.e. that which is used when no overrides due to incidents, emergency vehicle routes, traffic systems operator intervention, or demand management changes are in force. The data flow cosists of the following data item which is defined in its own DDE:

time.

supplied_route

This data flow is used within the Provide Driver and Traveler Services function to provide details of a route selected by the traveler. It contains the following data items each of which is defined in its own DDE:

route
+ route_cost
+ traveler_identity.

supply_incident_static_data

This data flow is sent by the Provide System Deployment function to the Manage Traffic function and includes new and/or amended static data for use in incident management. This data consists of details of the road network plus the location and relationship between links in the network. It therefore contains the contents of the following data store which is defined in its own DDE:

static_data_for_incident_management.

supply_traffic_static_data

This data flow is sent by the Provide System Deployment function to the Manage Traffic function and includes new and/or amended static data for use in trafic control and sensor processing. This data consists of traffic signal data (timings, permitted phase changes, etc.), which items of traffic data are used by certain processes, VMS data, etc. It therefore contains the contents of the following data stores, each of which is defined in its own DDE:

static_data_for_traffic_control
+ static_data_for_sensor_processing.

tag_data_inputs

This data flow is sent from the Manage Traffic function to the Provide Electronic Payment Service function and contains a request for parking and toll tag data. This data will be provided from units on-board vehicles and is used for traffic journey time calculations. The data flow consists of the following items each of which is defined in its own DDE:

parking_lot_tag_data_input
+ toll_tag_data_input.

tag_data_requests

This data flow is sent from the Manage Traffic function to the Provide Electronic Payment Service function and contains a request for parking and toll tag data. This data will be provided from units on-board vehicles and is used for traffic journey time calculations. The data flow consists of the following items each of which is defined in its own DDE:

parking_lot_tag_data_needed
+ toll_tag_data_needed.

tag_identity

This data flow is used by various ITS functions. It represents the identity number of a vehicle tag (16 digits) which can be used to various purposes, including preclearance from paying dues,taxes, and other commercial vehicles charges, or by a traveler or driver for payment of current or advanced tolls, fares, or parking lot charges, etc. .

tbv_change_brake_setting

This data flow is sent to the basic vehicle from the Provide Vehicle Monitoring and Control function and contains analog output which alters the vehicle's wheel brake setting. A zero value will completely release the brake and any positive value will apply the brake by the set amount. .

tbv_change_direction

This data flow is sent to the basic vehicle from the Provide Vehicle Monitoring and Control function and contains analog output which changes the vehicle's direction of motion between forward, reverse and neutral. .

tbv_change_throttle_setting

This data flow is sent to the basic vehicle from the Provide Vehicle Monitoring and Control function and contains analog output which alters the vehicle's throttle setting. A zero output will cloe the throttle and any positive value will cause the throttle to be opened to the set value. .

tbv_deploy_crash_restraints

This data flow is sent to the basic vehicle from the Provide Vehicle Monitoring and Control function and contains analog output which initiates the deployment of the vehicle's crash restraint devices. .

tbv_steer_left

This data flow is sent to the basic vehicle from the Provide Vehicle Monitoring and Control function and is used to provide analog output which steers the vehicle to the left. .

tbv_steer_right

This data flow is sent to the basic vehicle from the Provide Vehicle Monitoring and Control function and is used to provide analog output that will steer a vehicle to the right. .

tbv_steer_straight

This data flow is sent to the basic vehicle from the Provide Vehicle Monitoring and Control function and is used to provide analog output which centralizes the vehicle's steering from a steer left or steer right position. .

tci_credentials_data_output

This data flow is sent to the commercial vehicle inspector from the Manage Commercial Vehicles function and conatins the formatted output of the previously requested

credentials for a particular combination of carrier, driver and vehicle. .

tci_inspection_report

This data flow is sent to the commercial vehicle inspector from the Manage Commercial Vehicles function and conatins the formatted output of the results of the commercial vehicle roadside inspection previosuly initiated by the inspector. .

tci_output_log_report

This dat flow is sent to the commercial vehicle inspector from the Manage Commercial Vehicles function and contains the commercial vehicle roadside checking facility log showing which vehicles have been stopped, passed, or pulled-in by the inspectors. .

tci_pull_in_information

This data flow is sent to the commercial vehicle inspector from the Manage Commercial Vehicles function and contains details of the pull-in or pass decision made as a result of the safety or preclearance processing for a commercial vehicle. The inspector can override this decision if needed. .

tci_safety_data_output

This data flow is sent to the commercial vehicle inspector from the Manage Commercial Vehicles function and conatins the formatted output of the safety data for a particular carrier, driver or vehicle. This data will have been previously requested by the commercial vehicle roadside inspector. .

tcm_fault_data

This data flow is sent to the construction and maintenance terminator from the Manage Traffic function. It contains a report showing that a particular fault has been found in an indicator be either a local or a roadside process. This report acts as a request for the construction and maintenance terminator to effect repairs to restore the indicator to normal operation as soon as possible. .

tcm_incident_confirmation

This data flow is sent to the construction and maintenance terminator from the Manage Traffic function to provide confirmation that work by the Construction and Maintenance terminator which has been recorded as a possible incident can take place at the requested time. .

tcm_request_incident_change

This data flow is sent to the construction and maintenance terminator from the Manage Traffic function to request changes to the timing of work requested by the construction and maintenance terminator. This will have been provided as input to the function and been recorded as a possible incident. .

tcv_lock_tag_data_request

This data flow is sent to a commercial vehicle from the Manage Commercial Vehicles function. It contains a request for the provision of the current status of the lock tag that is used to control access to commercial vehicle cargos that are being taken across borders. .

tcvd_border_pull_in_output

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicle function and represents the actual messaage to be conveyed to the driver of a commercial vehicle that is being pulled in to a roadside facility for border clearance (permits, duties, trip number, etc.) reasons. .

tcvd_clearance_pull_in_output

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicle function and represents the actual messaage to be conveyed to the driver of a commercial vehicle that is being pulled in to a roadside facility for clearance (permits duties, etc.) reasons. .

tcvd_confirm_data_stored

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function and contains confirmation that the previously entered data has been stored in the on-board vehicle unit. .

tcvd_critical_safety_problem

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicle function and contains details of any commercial vehicle on-board safety problems which have been detected by processes within the function. .

tcvd_data_input_request

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function and contains the request for the driver to input data for the type of data previously requested. It is part of a data input dialogue that the driver has with the vehicle's on-board data collection system. .

tcvd_data_request

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function and contains a request for the input of additional data to allow a previously requested action to be implemented. Drivers will receive this data in response to previous data input because they are acting on the role of their own fleet managers, i.e. they will be owner drivers. .

tcvd_enrollment_confirmation

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function and contains confirmation that a request for the enrollment of a particular class of vehicle and cargo at a particular weight on a particular route has been acccepted and includes a list of the required taxes and duties together with their costs. Drivers will receive this data in response to previous data input because they are acting on the role of their own fleet managers, i.e. they will be owner drivers. .

tcvd_enrollment_payment_confirmation

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function and contains confirmation that a payment for the enrollment of a particular class of vehicle and cargo at a particular weight on a particular route has been acccepted. Drivers will receive this data in response to previous data input because they are acting on the role of their own fleet managers, i.e. they will be owner drivers. .

tcvd_general_pull_in_output

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicle function. It represents the actual messaage to be conveyed to the driver of a vehicle that is being pulled in to a commercial vehicle roadside checking facility for general reasons using roadside displays, e.g. variable message signs (vms), etc. .

tcvd_inspection_results

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function and represents a message to the driver of a commercial vehicle that provides the results of an inspection at a commercial vehicle roadside cehcking facility. .

tcvd_on_board_pull_in_output

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicle function. It represents the messaage to be sent to the driver of a vehicle that is being pulled in to a commercial vehicle roadside checking facility. This may be because problems with credentials, safety, or reading data from the tag of a particluar vehicle, or a general pull-in request for all vehicles. It may also be output by a commercial vehicle roadside border crossing facility due to a problem with clearing a vehicle through a border crossing check point. The data will be output directly to the driver in the vehicle cab and not using any mechanism external to the vehicle. .

tcvd_other_data_request

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function and contains the identities of data items needed to complete all the data needed for a route to be stored in the data store, of commercial vehicle routes, but which have yet to be provided by the driver. Drivers will receive this data in response to previous data input because they are acting on the role of their own fleet managers, i.e. they will be owner drivers. .

tcvd_output_data

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicle function and contains the data output previously requested by a commercial vehicle driver. .

tcvd_output_tag_data

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function. It contains the output of the current contents of a commercial vehicle's type two tag, produced in response to a previous request from the driver. .

tcvd_route_data

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function and and contains details of a route for a commercial vehicle, together with the location and type of each roadside facility along the route. Drivers will receive this data in response to previous data input because they are acting on the role of their own fleet managers, i.e. they will be owner drivers. .

tcvd_routing_instructions

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function and and contains details of a route for a commercial vehicle, together with instructions about cargo that is to be picked up and/or dropped off at the origin, destination and/or intermediate points along the route. .

tcvd_safety_pull_in_output

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicles function and represents the actual messaage to be conveyed to the driver of a commercial vehicle that is being pulled in to a roadside facility for safety reasons. .

tcvd_type_input_request

This data flow is sent to the conmmercial vehicle driver from the Manage Commercial Vehicle function and contains the request for the type of data to be input to be provided by the driver. .

tcvm_confirm_enrollment_data_stored

This data flow is sent to the commercial vehicle manager from the Manage Commercial Vehicles function and contains confirmation that the previously entered enrollment data has been stored in the on-board vehicle unit. .

tcvm_data_input_request

This data flow is sent to the commercial vehicle manager from the Manage Commercial Vehicles function and contains the identities of data items needed for a route request to be made, but which have not been provided by the manager. .

tcvm_driver_route_instructions

This data flow is sent to the commercial vehicle manager from the Manage Commecial Vehicles function. It contains the output of the current instructions that have been loaded into a store for use by a commercial vehicle driver. They will enable the driver to follow a specified route picking up and dropping off cargo along the way. .

tcvm_enrollment_confirmation

This data flow is sent to the commercial vehicle manager from the Manage Commercial Vehicles function and contains confirmation that a request for the enrollment of a particular class of vehicle and cargo at a particular weight on a particular route has been acccepted and includes a list of the required taxes and duties together with their costs. .

tcvm_enrollment_payment_confirmation

This data flow is sent to the commercial vehicle manager from the Manage Commercial Vehicles function and contains confirmation that a payment for the enrollment of a particular class of vehicle and cargo at a particular weight on a particular route has been acccepted. .

tcvm_other_data_request

This data flow is sent to the commercial vehicle manager from the Manage Commercial Vehicles function and contains the identities of data items needed to complete all the data needed for a route to be stored in the data store of commercial fleet routes, but

which have yet to be provided by the manager. .

tcvm_output_tag_data

This data flow is sent to the commercial vehicle manager from the Manage Commercial Vehicles function It contains the output of the current contents of a commercial vehicle's type two tag, produced in response to a previous request from the manager. .

tcvm_preclearance_results

This data flow is sent to the commercial vehicle manager from the Manage Commercial Vehicles function and contains the route number, route details and a list of roadside facilities for which preclearance has been obtained. .

tcvm_roadside_activity_report

This data flow is sent to the commercial vehicle manager from the Manage Commecial Vehicles function. It contains the output of the commercial vehicle roadside checkstation facility logs showing the activities of a particular carrier, driver and vehicle combination. .

tcvm_route_data

This data flow is sent to the commercial vehicle manager from the Manage Commecial Vehicles function and contains details of a route for a commercial vehicle, together with the location and type of each roadside facility along the route. .

tcvoir_carrier_or_vehicle_information

This data flow is sent to the commercial vehicle information requester from the Manage Commercial Vehicles function. It contains information about a commercial vehicle or carrier and is based on data generated within the function in response to a previous request. The size estimate below is based on a coded response to a standardized query. .

td_advisory_information

This data flow is sent to the driver from the Provide Driver and Traveler Services function. It contains displays of the various types of traffic and travel information messages available to the driver. This information will only be output following a specific request from the driver and will be filtered to only include that which is relevant to the vehicle's current location. .

td_broadcast_information

This data flow is sent to the driver from the Provide Driver and Traveler Services function. It contains displays of the various types of broadcast information which can be output to the driver. This information will comprise but not be limited to such things as safety warnings, position warnings, enhanced vision, vehicle status, data from smart vehicle probes, etc. .

td_driving_guidance

This data flow is sent to the driver from the Provide Driver and Traveler Services function and contains output (displays - text and/or graphics, and/or audio based information) which gives the driver instructions on how to steer the vehicle, e.g. turn left at the next intersection, take the middle lane, fork right at the next intersection, etc. .

td_guidance_input_request

This data flow is sent to the driver from the Provide Driver and Traveler Services function and contains a request for the input a specific item of data needed to determine the vehicle route for on-line guidance. The data may comprise such things as the destination, prefered arrival time, plus route choice preferences and constraints. .

td_guidance_map_update_response

This data flow is sent to the driver from the Provide Driver and Traveler Services function and contains a the response to a previous request for the update of the digitized map data used to provide on-line vehicle guidance. .

td_guidance_route_details

This data flow is sent to the driver from the Provide Driver and Traveler Services function and contains details of the route that has been selected in response to the driver's request for on-line guidance. The route and choice of guidance method will have been based on previous input from the driver. Guidance will not begin until the

driver has positively accepted this data. .

td_information_for_drivers_in_traffic_FB

This data flow is used by the Manage Traffic function to send data to vehicles on the roads (surface streets) and highways. This data provides both instructions (traffic signal outputs and mandatory messages) and advisory information (incident warnings) to vehicle drivers produced by the traffic management facilities within the Manage Traffic function. It consists of the following data items each of which is defined in its own DDE:

td-signal_indication
+ td-lane_use_indication_for_highways
+ td-lane_use_indication_for_roads
+ td-ramp_state_indication
+ td-vms_indication_for_highways
+ td-vms_indication_for_roads.

td_lane_use_indication_for_highways

This data flow is sent to the driver by the Manage Traffic function and contains an indication that a particular vehicle lane on a freeway served by the function is available for use (green) or closed to vehicle use (red). .

td_lane_use_indication_for_roads

This data flow is sent to the driver by the Manage Traffic function and contains an indication that a particular vehicle lane on a road (surface street) served by the function is available for use (green) or closed to vehicle use (red). .

td_other_services_parking_response

This data flow is sent to the driver from the Provide Driver and Traveler Services function and contains the response to the traveler's previously input request for addtional services other than simple parking lot charge collection. .

td_other_services_toll_response

This data flow is sent to the driver from the Provide Driver and Traveler Services function and contains the response to the traveler's previously input request for addtional services other than simple toll collection. .

td_parking_lot_payment_confirmed

This data flow is sent to the driver from the Provide Driver and Traveler Services function to confirm that the parking lot payment transaction has been successfully comlpeted. .

td_parking_lot_payment_invalid

This data flow is sent to the driver from the Provide Driver and Traveler Services function to indicate that the parking lot payment tranaction is invalid. .

Additional sizing assumptions:

SIZE=2;

td_ramp_state_indication

This data flow is sent to the driver by the Manage Traffic function and contains an indication that a particular highway entrance ramp is available for use (green) or closed to vehicle use (red). .

td_signal_indication

This data flow is sent to the driver by the Manage Traffic function and contains instructions for drivers to stop their vehicles (red), prepare to stop their vehicles (amber), or that they have permission to proceed (green) along the road or highway. .

td_toll_payment_confirmed

This data flow is sent to the driver from the Provide Driver and Traveler Services function to confirm that the toll payment transaction has been successfully comlpeted. .

Additional sizing assumptions:

SIZE=2;

td_toll_payment_invalid

This data flow is sent to the driver from the Provide Driver and Traveler Services

function to indicate that the toll payment tranaction is invalid. .

Additional sizing assumptions:

SIZE=2;

td_vms_indication_for_highways

This data flow is sent to the driver by the Manage Traffic function and contains a textual message either warning drivers of a potential hazard, or providing mandatory instructions as to the avaialability of all or part of a freeway served by the function. .

td_vms_indication_for_roads

This data flow is sent to the driver by the Manage Traffic function and contains a textual message either warning drivers of a potential hazard, or providing mandatory instructions as to the avaialability of all or part of a road (surface street) served by the function. .

tdmv_cv_violation_identity_code

This data flow is sent to the department of motor vehicles from the Manage Emergency Services function and contains the identity code of the ITS that is requesting the vehicle registration data so that a commercial vehicle credential filing or tax payment violation can be processed. .

tdmv_cv_violation_vehicle_license

This data flow is sent to the department of motor vehicles from the Manage Emergency Services function and contains the vehicle license for which the corresponding registration data is required so that a commercial vehicle credential filing or tax payment violation can be processed. .

tdmv_parking_lot_violation_identity_code

This data flow is sent to the department of motor vehicles from the Manage Emergency Services function and contains the identity code of the ITS that is requesting the vehicle registration data so that a parking lot payment violation can be processed. .

tdmv_parking_lot_violation_vehicle_license

This data flow is sent to the department of motor vehicles from the Manage Emergency Services function and contains the vehicle license for which the corresponding registration data is required so that a parking lot payment violation can be processed. .

tdmv_toll_violation_identity_code

This data flow is sent to the department of motor vehicles from the Manage Emergency Services function and contains the identity code of the ITS that is requesting the vehicle registration data so that a toll payment violation can be processed. .

tdmv_toll_violation_vehicle_license

This data flow is sent to the department of motor vehicles from the Manage Emergency Services function and contains the vehicle license for which the corresponding registration data is required so that a toll payment violation can be processed. .

tdmv_traffic_violation_identity_code

This data flow is sent to the department of motor vehicles from the Manage Emergency Services function and contains the identity code of the ITS that is requesting the vehicle registration data so that a high occupancy vehicle (hov) lane or pollution violation can be processed. .

tdmv_traffic_violation_vehicle_license

This data flow is sent to the department of motor vehicles from the Manage Emergency Services function and contains the vehicle license for which the corresponding registration data is required so that a high occupancy vehicle (hov) lane or pollution violation can be processed. .

tea_cv_request_for_information

This data flow is sent to the enforcement agency from the Manage Commercial Vehicles function. It contains a request for information from an enforcement agency about a commercial carrier, vehicle or driver that may be the subject of prosecution for previous violations. The size estimate is based on a coded request (16 bytes) and one subject identity. .

tea_cv_violation_data

This data flow is sent from the Manage Emergency Services function to the enforcement agency and contains information about violations of commercial vehicle electronic credential and tax filing payment procedures etc. that have been detected by the Manage Commercial Vehicles function. The data in the flow will enable the notified enforcement agency to take the appropriate action against those committing the violation. .

tea_fare_collection_roadside_violation_data

This data flow is sent from the Manage Emergency Services function to the enforcement agency responsible for dealing with transit fare collection violations. It contains information about a collection violation that has been detected by the Manage Transit function at the roadside, i.e. the transit stop. The data in the flow will enable the notified enforcement agency to take the appropriate action against those who have committed the violation. .

tea_fare_collection_vehicle_violation_data

This data flow is sent from the Manage Emergency Services function to the enforcement agency responsible for dealing with transit fare collection violations. It contains information about a collection violation that has been detected by the Manage Transit function on-board the transit vehicle. The data in the flow will enable the notified enforcement agency to take the appropriate action against those who have committed the violation. .

tea_fare_payment_violation_data

This data flow is sent from the Manage Emergency Services function to the enforcement agency and contains information about fare payment violations that have been detected by the Manage Transit and/or Provide Electronic Payment Services functions. The data in the flow will enable the notified enforcement agency to take the appropriate action against those committing the violation. .

tea_parking_violation_data

This data flow is sent from the Manage Emergency Services function to the enforcement agency and contains information about parking lot charge payment violations that have been detected by the Provide Electronic Payment Services function. The data in the flow will enable the notified enforcement agency to take the appropriate action against those committing the violation. .

tea_toll_violation_data

This data flow is sent from the Manage Emergency Services function to the enforcement agency and contains information about toll violations that have been detected by processes in the Provide Electronic Payment Services function. The data in the flow will enable the notified enforcement agency to take the appropriate action against those committing the violation. .

tea_traffic_violation_data

This data flow is sent from the Manage Emergency Services function to the enforcement agency and contains information about high occupancy vehicle (hov) lane use and pollution violations that have been detected by processes within the Manage Traffic function. The data in this flow will enable the notified enforcement agency to take the appropriate action against those committing the violations. .

tep_event_confirmation

This data flow is sent from the Manage Traffic function to event promoters and is the confirmation that the previously submitted details of an event have been accepted as a possible incident. .

teso_emergency_action_log_output

This data flow is sent to the emergency system operator by the Manage Emergency Services function and contains the response to an operator command for output of the contenst of the emergency services action log. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

teso_emergency_data_output

This data flow is sent to the emergency system operator by the Manage Emergency

Services function and contains the response to an operator command for output of data about emergency service allocations. The data that is output may be details of a recently completed emergency services allocation, or the contents of the allocation criteria store. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

teso_emergency_vehicle_dispatch_failure

This data flow is sent to the emergency system operator by the Manage Emergency Services function and contains details of an emergency services vehicle dispatch that has failed. Details of the type(s) of vehicle requested and the number that has been dispatched (if any) are provided. The output may be in audio and visual forms, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

tets_incident_acknowledge

This data flow is sent to the emergency telephone service from the Manage Emergency Services function and contains acknowledgement of the receipt by the function of data about an incident that has been reported to one of the services through mechanisms that are outside ITS. .

tevd_emergency_dispatch_order

This data flow is sent to the emergency vehicle driver from the Manage Emergency Services function and is the order for the emergency vehicle driver to proceed. It includes data on the emergency vehicle identity, the incident type and its location. .

tfi_cv_payment_request

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains a request from a commercial fleet manager or commercial vehicle driver (acting in the role of fleet manager) for payment of electronic credentials and tax filing. .

tfi_driver_map_payment_request

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains a request from a driver for payment for the update of the digitized map data used for on-line vehicle guidance. .

tfi_fare_payment_violator_data

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains data about a transit fare payment transaction that was attempted but did not work and is to be used by the Financial Institution. .

tfi_other_services_payment_request

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains a request from a transit user for payment for other (yellow pages) services. .

tfi_parking_lot_payment_violator_data

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains data about a toll payment transaction that was attempted but did not work and is to be used by the Financial Institution. .

tfi_registration_payment_request

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains a request from a yellow services provider for payment to register as a supplier of these services and have details of them made available to travelers and transit users. .

tfi_request_charges_payment

This data flow is sent to the Financial Institution by the Provide Electronic Payment Services function and requests payment of a parking lot charge. It is sent periodically, e.g. once per day, and requests payment of the parking lot charge transactions since the previous request. The data flow will include the parking lot charge and credit identity for each transaction. .

tfi_request_fare_payment

This data flow is sent to the Financial Institution by the Provide Electronic Payment

Services function and requests payment of a transit fare. It is sent periodically, e.g. once per day, and requests payment of the transit fare transactions since the previous request. The data flow will include the transit fare cost and credit identity for each transaction. .

tfi_request_toll_payment

This data flow is sent to the Financial Institution by the Provide Electronic Payment Services function. It is sent periodically, e.g. once per day, and requests payment of the toll transactions since the previous request. The data flow will include the toll cost and credit identity for each transaction. .

tfi_toll_payment_violator_data

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains data about a parking lot payment transaction that was attempted but did not work and is to be used by the Financial Institution. .

tfi_traveler_display_payment_request

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains a request from a traveler for payment for the update of the digitized map data used as the background for displays of traffic and travel information on a traveler's personal portable device. .

tfi_traveler_map_payment_request

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains a request from a traveler for payment for the update of the navigable map database used for on-line personal guidance. .

tfi_traveler_other_services_payments_request

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It a request from a traveler for payment for other (yellow pages) services. .

tfi_traveler_rideshare_payment_request

This data flow is sent to the financial institution from the Provide Electronic Payment Services function. It contains a request from a traveler for payment for the provision of rideshare services as part of a confirmed trip. .

tga_quarterly_reports

This data flow is sent to the government agencies from the Manage Commercial Vehicles function and contains the quarterly reports of the data in the commercial vehicle roadside facility log. .

tga_request_fees_updates

This data flow is sent to the government agencies from the Manage Commercial Vehicles function and contains a request for an update to the store of taxes and credential fees payable for operating commercial vehicles across states and through borders. .

throttle_commands

This data flow is used within the Provide Vehicle Monitoring and Control function and contains data showing any changes required to the current vehicle throttle setting in order to increase or decrease the headway between the vehicle and the one it is following, or to maintain a set vehicle speed. It is sized as a single (1) byte to enable the use of the following characters:

B - keep at present level (default value),
I - increase throttle (go faster or maintain speed up hill),
D - decrease throttle (slow down or maintain speed down hill). .

time

This data flow is used within many ITS functions. It contains the current time of day and will be associated with other data flows and (possibly) a date. Although 17 bits would be required to provide 1 second granularity, a 16 bit data element supports time accurate to within a few seconds and will be sufficient for all ITS applications. .

time_period

This data flow is used within the Provide Driver and Traveler Services function to

define the time period over which data about the use of a route segement is being provided. It is set to sixty (60) to enable data to be provided for the next sixty minutes (one hour). .

tispo_broadcast_data_parameters_output

This data flow is sent to the ISP operator by the Provide Driver and Traveler Swervices function. It contains output of the parameters used in wide area information broadcast and is a result of an output request from the operator. .

tispo_route_selection_parameters

This data is sent to the ISP Operator from the Provide Driver and Traveler Services function. It contains output of the parameters used by the route selection processes to best determine the routes used for travelers proposed trips and for on-line vehicle guidance. The output may be in audible, visual or hradcopy form and will require no further processing to be understood by the operator. .

tispo_trip_planning_parameters

This data is sent to the ISP Operator from the Provide Driver and Traveler Services function. It contains output of the parameters used by the trip planning processes to best determine the routes for travelers. The output may be in audible, visual or hardcopy form and will require no further processing to be understood by the operator. .

titsp_air_services_request

This data flow is sent to the intermodal transportation service provider from the Provide Driver and Traveler Services function and contains a request for details of the regular and charter air services available to move travelers. .

titsp_confirm_intermodal_service

This data flow is sent to the intermodal transportation service provider from the Provide Driver and Traveler Services function and contains a request for provision of an alternate mode service as part of a traveler's proposed trip. .

titsp_ferry_services_request

This data flow is sent to the intermodal transportation service provider from the Provide Driver and Traveler Services function and contains a request for details of the sea and river ferry services available to move travelers. .

titsp_rail_services_request

This data flow is sent to the intermodal transportation service provider from the Provide Driver and Traveler Services function and contains a request for details of the heavy rail services (i.e. those which do not form part of a transit operation) available to move travelers. .

titsp_transit_arrival_changes

This data flow is sent to the intermodal transportation service provider from the Manage Transit function and contains details of the changes that are currently expected to the arrival time of a transit vehicle at the next modal interchange point. The data is intended for enable the coordintaion of services between the intermaodal and regular transit operations. .

titsp_transit_arrival_deviations

This data flow is sent to the intermodal transportation service provider from the Manage Transit function and contains details of the changes that are currently expected to the arrival time of transit vehicles at the modal interchange point(s). The data is intended for enable the coordintaion of services between the intermaodal and regular transit operations. .

titsp_transit_service_data

This data flow is sent to the intermodal transportation service provider from the Manage Transit function and contains details of the regular transit services provided by the local transit operation. The data is intended for use in hte coordintaion of services between the intermaodal and regular transit operations. .

tm_incident_information

This data flow is output by the Display and Update Incident Data facility within the Manage Traffic function. It contains data on current incidents in a form which will be

readily understood by Media Systems such as the current HAR system. It is sent as an unsolicited message and requires no response. .

tm_traffic_information

This data flow is output by the Manage Traffic function. It gives information on a particular current traffic situation in a form which will be readily understood by Media Systems such as HAR. It is as an unsolicited message and does not require a response from the Media System. .

tm_transit_emergency_information

This data flow is sent to the media from the Manage Transit function and provides information to the media that an emergency has occurred within a transit vehicle. The location of the transit vehicle and details of the emergency will be included in the information, subject to any constraints applied by the transit media information parameters. These parameters will also control the style and format of the way in which the information is presented to the media. The data flow has been sized to enable two pages of text at 65 lines/page and 80 characters/line to be accommodated. .

tm_transit_incident_information

This data flow is sent to the media from the Manage Transit function and contains information about an incident that has occurred within part of the transit operations network, e.g. transit stop or mode interchange point. The location and details of the incident will be included in the information, subject to any constraints applied by the transit media information parameters. These parameters will also control the style and format of the way in which the information is presented to the media. The data flow has been sized to enable two pages of text at 65 lines/page and 80 characters/line to be accommodated. .

tm_transit_schedule_variations

This data flow is sent to the media from the Manage Transit function and contains details of deviations from schedule of regular transit services. The information will enable the media to broadcast the details to travelers via such things as local radio, bulletin boards, etc. .

tm_traveler_information_request

This data flow is sent to the media from the Provide Driver and Traveler Services function and contains a request for any information that the media has that might be of interest to travelers planning trips. This may include but not be limited to such things as special events. sports fixtures, etc. .

tmc_identity

This data item is used within the Manage Traffic function and defines the logical identifier of an interfacing peer Traffic Management Center (TMC) to share traffic data and system status. Other centers may be on-line to coordinate wide area traffic operations to promote traffic mobility and coordination. Security safeguards are employed to ensure unauthorized entities cannot masquerade as a valid TMC. .

tmc_list

This data flow is used within the Manage Traffic function and contains a list of Traffic Management Centers (TMC's) from which the accompanying traffic data has been obtained for use by the local TMC. The data flow consists of the following data items each of which is defined by its own DDE:

list_size
+ 1{tmc_identity}list_size.

tmmc_crossing_clear_at_highways

This data flow is sent to the multimodal crossings from the Manage Traffic function to indicate that freeway traffic has been stopped and the crossing may be used by the other (non-road or highway) transportation system. .

tmmc_crossing_clear_at_roads

This data flow is sent to the multimodal crossings from the Manage Traffic function to indicate that road (surface street) traffic has been stopped and the crossing may be used by the other (non-road or highway) transportation system. .

tmmc_stop_alternate_mode_at_highways

This data flow is sent to the multimodal crossings from the Manage Traffic function to indicate that the alternate mode traffic must if possible be stopped, to enable the crossing to be used by emergency vehicles. Output of this data does not guarantee that the emergency vehicle(s) will have priority, since in some cases it may be too late to stop the alternate mode traffic. .

tmmc_stop_alternate_mode_at_roads

This data flow is sent to the multimodal crossings from the Manage Traffic function to indicate that the alternate mode traffic must if possible be stopped, to enable the crossing to be used by emergency vehicles. Output of this data does not guarantee that the emergency vehicle(s) will have priority, since in some cases it may be too late to stop the alternate mode traffic. .

tmmc_stop_traffic_at_highways

This data flow is sent to the multimodal crossings from the Manage Traffic function to indicate that road (surface street) must be stopped to enable the crossing to be used by the other (non-road or highway) transportation system. .

tmmc_stop_traffic_at_roads

This data flow is sent to the multimodal crossings from the Manage Traffic function to indicate that highway traffic must be stopped to enable the crossing to be used by the other (non-road or highway) transportation system. .

tmo_incident_information

This data flow is sent to the media operator from the Manage Traffic function. It contains data on current and/or predicted incidents in a form which will be readily understood by the Media OPerator. The data is sent in response to a request for information from the media operator. .

tmo_traffic_information

This data flow is sen to the media operator from the Manage Traffic function. It gives information on the current traffic situation in a form which will be readily understood by the Media Operator. The data is sent in response to a request for information from the media operator. .

tmup_deployment_map_update_request

This data flow is sent to the map update provider from the Plan System Deployment function and contains a request for an update of the digitized map data. This data is used in the simulation and evaluation of the road and highway network served by the ITS so that changes to improve its efficiency can be designed and implemented. .

tmup_map_static_data

This data flow is sent to the map update provider from the Plan System Deployment function and contains a new set of static data or a set of transit route data. This will be used by the map provider in the preparation of a new set of digitized map data which can then be used by this and other functions within ITS. .

tmup_request_demand_display_update

This data flow is sent to the map update provider from the Manage Demand facility within the Manage Traffic function. It contains a request for an update to the digitized map data for displays that can be used as background for the output of data on traffic and travel demand levels. .

tmup_request_emergency_display_update

This data flow is sent to the map update provider from the Manage Emergency Services function. It contains a request for an update to the digitized map data for displays that can be used as the background for the output of data incidents and emergencies to the emergency system operator. .

tmup_request_incident_display_update

This data flow is sent to the map update provider from the Display and Update Incident Data facility within the Manage Traffic function. It contains a request for an update to the digitized map data for displays that can be used as background for the output of data on current and predicted incidents. .

tmup_request_other_routes_map_update

This data flow is sent to the map update provider by the Provide Driver and Traveler Services function and contains a request for a new copy of the digitized map data used by the process that selects other, i.e. non-vehicle and non-transit, routes for travelers. .

tmup_request_pollution_display_update

This data flow is sent to the map update provider from the Manage Emissions facility within the Manage Traffic function. It contains a request for an update to the digitized map data for displays that can be used as background for the output of data on the levels of various atmospheric pollutants. .

tmup_request_route_selection_map_update

This data flow is sent to the map update provider by the Provide Driver and Traveler Services function and contains a request for a new copy of the digitized map data used by the process that selects vehicle based routes for travelers and drivers. .

tmup_request_traffic_display_update

This data flow is sent to the map update provider from the Display and Output Traffic Data facility within the Manage Traffic function. It contains a request for an update to the digitized map data for displays that can be used as background for the output of data on current and predicted traffic levels. .

tmup_request_traveler_display_update

This data flow is sent to the map update provider from the Provide Driver and Traveler Services function. It contains a request for an update to the digitized map data used for displays that can be output as background for traffic, trip and travel information for use by travelers at kiosks. It must include the identity of the kiosk from which the request has originated so that the map update provider can determine the map data to supply that will be relevant to the area in which the kiosk is located. .

tmup_request_traveler_display_updates_FB

This data flow is sent to the map upadate provder from the Provide Driver and Traveler Services function and contains a request for an update to the digitized map data used for displays that are output to the traveler at a traveler's personal portable device. It consists of the following data items each of which is defined in its own DDE:

tmup-request_traveler_personal_display_update
+ tmup-request_traveler_personal_display_update_cost
+ tmup-traveler_map_update_cost_request
+ tmup-traveler_map_update_request.

tmup_request_traveler_personal_display_update

This data flow is sent to the map update provider from the Provide Driver and Traveler Services function. It contains a request for an update to the digitized map data used for displays that can be output as background for traffic, trip and travel information for use by a traveler at a personal portable device. It consists of the following data items each of which is defined in its own DDE. The map update provider is expected to use them as a means of obtaining payment for providing the map data, but not for %034tuning%034 the data so that it will be relevant to the area in which the kiosk is located since there is no knowledge of where the device may be used.

credit_identity
+ traveler_identity.

tmup_request_traveler_personal_display_update_cost

This data flow is sent to the map update provider from the Provide Driver and Traveler Services function and contains a request for the cost of an update to the digitized map data used for providing the background to displays of traffic and travel information on a traveler personal portable device. .

tmup_transit_map_update_request

This data flow is sent to the map update provider from the Manage Transit function and

contains a request for an update of the map database used for generating new transit routes and as a background to displays of transit services requested by the transit fleet manager. .

tmup_traveler_map_update_cost_request

This data flow is sent to the map update provider from the Provide Driver and Traveler Services function and contains a request for the cost of an update to the navigable map database used for providing traveler personal on-line guidance. .

tmup_traveler_map_update_request

This data flow is sent to the map update provider from the Provide Driver and Traveler Services function and contains a request for an update of the digitized map database used for guiding travelers on their selected routes. .

tmup_vehicle_map_update_cost_request

This data flow is sent to the map update provider from the Provide Driver and Traveler Services function and contains a request for the cost of an update to the navigable map database used for providing in-vehicle on-line guidance. .

tmup_vehicle_map_update_request

This data flow is sent to the map update provider from the Provide Driver and Traveler Services function and contains a request for an update of the navigable map database used for providing in-vehicle on-line guidance. .

To_Basic_Vehicle

This data flow is sent to the basic vehicle from the Provide Vehicle Monitoring and Control function and contains commands to on-board vehicle actuators that control vehicle operation in terms of speed, direction and crash restraints. It consists of the following data items each of which is defined in its own DDE:

tbv-change_brake_setting
+ tbv-change_direction
+ tbv-change_throttle_setting
+ tbv-deploy_crash_restraints
+ tbv-steer_left
+ tbv-steer_right
+ tbv-steer_straight.

To_C_and_M

This data flow is sent to the construction and maintenance terminator from the Manage Traffic function. It either confirms that the request for maintenance work sent in as a planned incident from the terminator has been accepted, or requests changes to the timing to minimize the impact on traffic flows, or contains reports about indicators that are faulty. It consists of the following data items each of which is defined in its own DDE:

tcm-fault_data
+ tcm-incident_confirmation
+ tcm-request_incident_change.

To_Commercial_Vehicle

This data flow is sent to a commercial vehicle from the Manage Commercial Vehicles function. It contains a request for data to be provided by the commercial vehicle for use within the function. The data flow consists of the following items each of which is defined in its own DDE:

tcv-lock_tag_data_request.

To_Commercial_Vehicle_Driver

This data flow is sent to the commercial vehicle driver from the Manage Commercial Vehicle function and contains responses to requests for information or requests for further data to be input. It consists of the following data items each of which is defined in its own DDE:

tcvd-border_pull_in_output
+ tcvd-confirm_data_stored
+ tcvd-critical_safety_problem
+ tcvd-data_input_request
+ tcvd-data_request
+ tcvd-enrollment_confirmation
+ tcvd-enrollment_payment_confirmation
+ tcvd-general_pull_in_output
+ tcvd-inspection_results
+ tcvd-on_board_pull_in_output
+ tcvd-other_data_request
+ tcvd-output_data
+ tcvd-output_tag_data
+ tcvd-clearance_pull_in_output
+ tcvd-route_data
+ tcvd-routing_instructions
+ tcvd-safety_pull_in_output
+ tcvd-type_input_request.

To_Commercial_Vehicle_Manager

This data flow is sent to the commercial fleet manager from the Manage Commercial Vehicles function and contains data to be output to the manager. It consists of the following data items each of which is defined in its own DDE:

tcvm-confirm_enrollment_data_stored
+ tcvm-data_input_request
+ tcvm-driver_route_instructions
+ tcvm-enrollment_confirmation
+ tcvm-enrollment_payment_confirmation
+ tcvm-other_data_request
+ tcvm-output_tag_data
+ tcvm-preclearance_results
+ tcvm-roadside_activity_report
+ tcvm-route_data.

To_CVO_Information_Requestor

This data flow is sent from the commercial vehicle information requestor to the Manage Commercial Vehicles function. It contains information produced in response to a previous data request. The data flow consists of the following item which is defined in its own DDE:

tcvoir-carrier_or_vehicle_information.

To_CVO_Inspector

This data flow is sent from the Manage Commercial Vehicles function to the commercial vehicle roadside facility inspector and contains data on commercial vehicle inspections and safety checks bcarried out at the roadside facility where the inspector works. It consists of the following data items each of which is defined in its own DDE:

tci-credentials_data_output
+ tci-inspection_report
+ tci-output_log_report
+ tci-pull-in_information
+ tci-safety_data_output.

To_DMV

This data flow is sent to the department of motor vehicles from several processes within the ITS functions and provides a path to request vehicle registration data. It consists of the following data items each of which is defined in its own DDE:

tdmv-cv_violation_identity_code
+ tdmv-cv_violation_vehicle_license

+ tdmv-parking_lot_violation_identity_code
+ tdmv-parking_lot_violation_vehicle_license
+ tdmv-toll_violation_identity_code
+ tdmv-toll_violation_vehicle_license
+ tdmv-traffic_violation_identity_code
+ tdmv-traffic_violation_vehicle_license.

To_Driver

This data flow is sent to the driver from the Provide Driver and Traveler Services, Manage Traffic and Provide Electronic Payment Services functions. It contains output from traffic indicators (intersection and pedestrian controllers, signs, etc.), the results of payment transactions and on-line vehicle guidance data that has been requested by the driver. The data flow consists of the following data items each of which is defined in its own DDE:

td-advisory_information
+ td-broadcast_information
+ td-driving_guidance
+ td-guidance_input_request
+ td-guidance_map_update_response
+ td-guidance_route_details
+ td-information_for_drivers_in_traffic_FB
+ td-other_services_parking_response
+ td-other_services_toll_response
+ td-parking_lot_payment_confirmed
+ td-parking_lot_payment_invalid
+ td-toll_payment_confirmed
+ td-toll_payment_invalid.

To_E911_or_ETS

This data flow is sent to the emergency telephone service by the Manage Emergency Services function.. The terminator includes specialized systems and services that exist to provide an immediate response to emergencies that are reported by travelers, drivers and the general public, e.g. 911, E911, the new RESCUE service, etc. It consists of the following data item which is defined in its own DDE:

tets-incident_acknowledge.

To_Emergency_System_Operator

This data flow is sent from the Manage Emergency Services function and contains output requested by the emergency services opertaor. It consists of the following data items each of which is defined in its own DDE:

teso-emergency_action_log_output
+ teso-emergency_data_output
+ teso-emergency_vehicle_dispatch_failure.

To_Emergency_Vehicle_Driver

This data flow is sent to the emergency vehicle driver from the Manage Emergency Services function. It consists of the following data item which is defined in its own DDE:

tevd-emergency_dispatch_order.

To_Enforcement_Agency

This data flow is sent from the Manage Emergency Services or Commercial Vehicle Operations functions
to the enforcement agency and contains information about violations that have been detected by many of
the other functions within ITS and requests for information from the enforecment agency. The data contained in each of these flows will enable the enforcement agency to carry out a prosecution of the offender if required and to provide access to its repository of information. The data flow consists of the following data item which is defined in its own DDE:

tea-cv_violation_data
+ tea-fare_collection_roadside_violation_data
+ tea-fare_collection_vehicle_violation_data
+ tea-fare_payment_violation_data
+ tea-parking_violation_data
+ tea-toll_violation_data
+ tea-traffic_violation_data
+ tea-cv_request_for_information.

To_Event_Promoters

This data flow is sent from the Manage Traffic function to the event promoters terminator and contains the folowing data item which is defined in its own DDE:

tep-event_confirmation.

To_Financial_Institution

This data flow is sent to the Financial Institution from the Provide Electronic Payment Services function and contains requests for payment to be made for services being requested by travelers or drivers, or details of those involved in bad transaction data. It consists of the following data items each of which is defined in its own DDE:

tfi-cv_payment_request
+ tfi-fare_payment_violator_data
+ tfi-parking_lot_payment_violator_data
+ tfi-request_charges_payment
+ tfi-request_fare_payment
+ tfi-request_toll_payment
+ tfi-toll_payment_violator_data
+ tfi-driver_map_payment_request
+ tfi-other_services_payment_request
+ tfi-registration_payment_request
+ tfi-traveler_display_payment_request
+ tfi-traveler_map_payment_request
+ tfi-traveler_other_services_payments_request
+ tfi-traveler_rideshare_payment_request.

To_Govt_Admin

This data flow is sent to the government agencies from the Manage Commercial Vehicles function and contains requests for data and quarterly reports on activities at commercial vehicle roadside facilities. It consists of the following data items each of which is defined in its own DDE:

tga-quarterly_reports
+ tga-request_fees_updates.

To_Intermodal_Freight_Depot

This data flow is a request for details of the movement of freight by means that may include methods other than commercial vehicles, e.g. heavy rail, air, sea, river, etc. .

Additional sizing assumptions:

SIZE=64;

To_Intermodal_Freight_Shipper

This data flow is a request for data about the services available to ship freight by means other than commercial vehicles, e.g. heavy rail, air, sea, river, etc. .

Additional sizing assumptions:

SIZE=64;

To_Intermodal_Transportation_Service_Provider

This data flow is sent to the intermodal transportation service provider from the Provide Driver and Traveler Services function. It contains either a request for details of the

services available to move travlers by means other than road vehicles, e.g. heavy rail, air, sea, river, etc., or changes to the arrival time(s) of transit services caused by schedule deviations The data flow consists of the following data items each of which is defined in its own DDE:

titsp-air_services_request
+ titsp-confirm_intermodal_service
+ titsp-ferry_services_request
+ titsp-rail_services_request
+ titsp-transit_arrival_changes
+ titsp-transit_arrival_deviations
+ titsp-transit_service_data.

To_ISP_Operator

This data flow is sent to the ISP operator by the Provide Driver and Traveler Swervices function. It contains output of the parameters used in wide area information broadcast, trip planning and route selection as requested by the operator. The data flow consists of the following items each of which is defined in its own DDE:

tispo-broadcast_data_parameters_output
+ tispo-route_selection_parameters
+ tispo-trip_planning_parameters.

To_Map_Update_Provider

This data flow is sent to the map update provider to serveral ITS functions. It contains requests for updates of the digitized map data used for display maps, as a navigable map database for on-vehicle or personal traveler guidance, and as a source of data for trip planning and transit route generation. The display map data is used as the background for the output of traffic, incident, transit services and pollution data, the guidance data is used for the guidance of drivers and travelers on their selected routes, whilst the trip planning data is used for routes produced in response to traveler's trip requests. Static data is sent from the Plan System Deployment function to the map update provider for use in preparing the actaul digitized map data. The data flow consists the following data items each of which is defined in its own DDE:

tmup-deployment_map_update_request
+ tmup-map_static_data
+ tmup-request_demand_display_update
+ tmup-request_emergency_display_update
+ tmup-request_incident_display_update
+ tmup-request_other_routes_map_update
+ tmup-request_pollution_display_update
+ tmup-request_route_selection_map_update
+ tmup-request_traffic_display_update
+ tmup-request_traveler_display_update
+ tmup-request_traveler_display_updates_FB
+ tmup-transit_map_update_request
+ tmup-vehicle_map_update_cost_request
+ tmup-vehicle_map_update_request.

To_Media

This data flow is sent by processes within the Manage Traffic and Manage Transit functions to the Media System. It provides output of information on traffic flow conditions, traffic incidents and transit incidents, depending on the content of the output request, plus a request for traveler information. It consists of the following data items each of which is defined in its own DDE:

tm-incident_information
+ tm-traffic_information
+ tm-transit_emergency_information
+ tm-transit_incident_information

+ tm-transit_schedule_variations
+ tm-traveler_information_request.

To_Media_Operator

This data flow is sent by processes within the Manage Traffic function to the media operator and provides information on both traffic flow conditions and incidents, depending on the content of the information request. It consists of the following data items each of which is defined in its own DDE:

tmo-incident_information
+ tmo-traffic_information.

To_Multimodal_Crossings

This data flow is sent to the multi-modal crossings from the Manage Traffic function to acknowledge that a previous request for its closure to road vehicles has been received and is being actioned.

tmmc-crossing_clear_at_highways
+ tmmc-stop_alternate_mode_at_highways
+ tmmc-stop_traffic_at_highways
+ tmmc-crossing_clear_at_roads
+ tmmc-stop_alternate_mode_at_roads
+ tmmc-stop_traffic_at_roads.

To_Other_CVAS

This data flow is sent to the other commercial vehicle administration system from the Manage Commercial Vehicles function and contains requests for data from and data provided against previous requests. It consists of the following data items each of which is defined in its own DDE:

tocvas-commit_remote_enrollment
+ tocvas-data_table
+ tocvas-enrollment_confirmation
+ tocvas-enrollment_request
+ tocvas-provide_data.

To_Other_EM

This data flow is sent to the other emergency centers by the Manage Emergency Services function to advise then of incidents that are taking place in locations that are in the area served by the local function and hence outside their area of operations. It consists the following data items each of which is defined in its own DDE:

toec-incident_data_FB.

To_Other_ISP

This data flow is sent from the Provide Driver and Traveler Services function to an information and service provider (ISP) located outside the geographic area of operation of the local ISP supporting the function. It contains the following data items each of which is defined in its own DDE:

toisp-data_supply
+ toisp-request_data.

To_Other_TM

This data flow is used by the Manage Traffic function to send data to other traffic centers (TM) whose areas of operation are outside those of the local center. It consists of the following data items each of which is defined in its own DDE:

totc-request_other_TMC_data_FB
+ totc-transfer_local_TMC_data_FB.

To_Other_TRM

This data flow is sent to the other TRM (other transit center) by the Manage Transit function and contains data for the other transit centers. It consists of the following data item which is defined in its own DDE:

totrm-transit_services.

To_Other_Vehicle

This data flow is used by the provide Vehicle Monitoring and Control function to send data to other vehicles in a platoon when in platoon following mode of vehicle operation. .

Additional sizing assumptions:

SIZE=512;

To_Parking_Operator

This data flow is used by the Manage Traffic function to send data to a parking lot operator with instructions to change the operational state of the parking lot, e.g. close the lot. It consists of the following data item which is defined in its own DDE:

tpo-change_lot_state.

To_Parking_Service_Provider

This data flow is sent from the Manage Traffic function and contains reports of the transactions that have taken place at a parking lot or a request for a space reservation for which advanced payment is being made. It consists of the following data items each of which is defined in its own DDE:

tpsp-change_lot_state
+ tpsp-parking_lot_charge_change_request
+ tpsp-request_advanced_parking_payment
+ tpsp-transaction_reports.

To_Payment_Instrument

This data flow is sent to the payment instrument by the Provide Electronic Payment Services function. It consists of two types of data, that which requests payment for a service from the credit stored by the instrument itself, and that which gives notice that payment for the service will charged to the credit identity provided by the instrument. The data flow consists of the following data items each of which is defined in its own DDE:

tpi-debited_fare_payment_at_roadside
+ tpi-debited_commercial_manager_payment
+ tpi-debited_payment_at_parking_lot
+ tpi-debited_payment_at_personal_device
+ tpi-debited_transit_user_payment_at_roadside
+ tpi-debited_transit_user_payment_at_vehicle
+ tpi-debited_traveler_payment_at_roadside
+ tpi-debited_payment_at_toll_plaza
+ tpi-debited_driver_payment_at_vehicle
+ tpi-debited_payment_on_transit_vehicle
+ tpi-request_fare_payment_at_roadside
+ tpi-request_fare_payment_on_transit_vehicle
+ tpi-request_payment_at_parking_lot
+ tpi-request_payment_at_toll_plaza.

To_Pedestrians

This data flow is sent by the Manage Traffic function to pedestrian crossings to acknowledge that a previous request to enable pedestrians to cross the road or highway has been received, to action that request, and to provide textual messages. It consists of the following data items each of which is defined in its own DDE:

tp-cross_road
+ tp-cross_request_received
+ tp-vms_indication.

To_Secure_Area_Environment

This data flow is sent to the secure area environment by the Manage Transit fuction and contains information for transit users information when they are in part of the transit operations network, or control data for video cameras. This data flow consists of the following data items each of which is defined in its own DDE:

tsa-broadcast_message
+ tsa-panic_button_acknowledge
+ tsa-video_camera_control.

To_Toll_Operator

This data flow is sent from the Provide Electronic Payment function to the operator at a toll plaza and contains previously requested transaction reports. It consists of the following data items each of which is defined in its own DDE:

tto-transaction_reports.

To_Toll_Service_Provider

This data flow is sent from the Provide Electronic Payment Services function to the toll service provider. It contains the requests for changes in toll prices, and advanced tolls, plus new toll price data. The data flow consists of the following data items each of which is defined in its own DDE:

ttsp-credit_identity
+ ttsp-toll_price_changes_request
+ ttsp-toll_segments
+ ttsp-transaction_reports
+ ttsp-vehicle_identity.

To_Traffic_Operations_Personnel

This data flow is used by various processes within the Manage Traffic function to send data on traffic conditions, incidents, incident responses, traffic and travel demand and pollution data to traffic operations personnel. It consists of the following data items each of which is defined in its own DDE, and some of which are groups of output flows belonging to the same facility:

ttop-current_indicator_faults
+ ttop-demand_management_outputs_FB
+ ttop-incident_management_outputs_FB
+ ttop-pollution_data_display
+ ttop-traffic_control_information_display
+ ttop-video_image_output.

To_Transit_Driver

This data flow is sent by the Manage Transit function to the transit driver. It contains information for the transit driver. This information is particular to this type of driver and is not relevant to drivers of other types of vehicle(s). The data flow consists of the following data items each of which is defined in its own DDE:

ttd-batch_mode_data_transfer_status
+ ttd-corrective_instructions
+ ttd-emergency_information
+ ttd-paratransit_information
+ ttd-request_fare_transaction_mode_set_up
+ ttd-route_assignements
+ ttd-transit_vehicle_schedule_deviations.

To_Transit_Fleet_Manager

This data flow is sent from the Manage Transit function and contains output to a transit fleet manager. It consists of the following data items each of which is defined in its own DDE:

ttfm-coordination_request
+ ttfm-parameters
+ ttfm-paratransit_service
+ ttfm-passenger_loading_error
+ ttfm-proposed_corrections
+ ttfm-response_parameter_output
+ ttfm-transaction_reports
+ ttfm-transit_driver_information
+ ttfm-transit_services_output
+ ttfm-transit_vehicle_data
+ ttfm-transit_vehicle_maintenance_information
+ ttfm-technician_information.

To_Transit_Maintenance_Personnel

This data flow is sent from the Manage Transit function and contains the work schedule for a transit maintenance engineer. It consists of the following data item which is defined in its own DDE:

ttmp-work_schedule.

To_Transit_System_Operators

This data flow is sent from the Manage Transit function to the transit system operators. It contains information on potential incidents, video images and transit fare collection data. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. The data flow consists of the following data items each of which is defined in its own DDE:

ttso-emergency_request
+ ttso-media_parameters
+ ttso-potential_incidents_alarm
+ ttso-potential_security_problem
+ ttso-transaction_reports
+ ttso-transit_fare_output
+ ttso-video_image_data.

To_Transit_User

This data flow is sent from the Manage Transit function and contains information for a traveler who is at the moment a transit user. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, in-vehicle signage, or hardcopy (paper) output. It consists of the following data items each of which is defined in its own DDE:

ttu-advisory_information
+ ttu-vehicle_access_message
+ ttu-other_services_vehicle_confirmed
+ ttu-other_services_roadside_confirmed
+ ttu-roadside_access_message
+ ttu-roadside_payment_confirmed
+ ttu-transit_information
+ ttu-transit_vehicle_information
+ ttu-vehicle_payment_confirmed.

To_Transportation_Planners

This data flow is sent to the transportation planner terminator and contains output from processes within the Plan System Deployment function.. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, or hardcopy (paper) output. The data flow consists of the following data items each of which is defined in its own DDE:

ttp-evaluation_results
+ ttp-output_data_store
+ ttp-output_documentation

+ ttp-output_link_data
+ ttp-simulation_data.

To_Traveler

This data flow is sent from the Provide Driver and Traveler Services function and contains information and guidance data requested by the traveler. The output may be in audio or visual form, with the latter being available in a variety of formats depending onthe device being used by the traveler, e.g. personal portable device, kiosk, home computer, etc. It is therefore possible for the visual output to appear on a variety of different types of displays, or hardcopy (paper) output. The data flow consists of the following data items each of which is defined in its own DDE:

tt-emergency_message
+ tt-extra_trip_data_request
+ tt-guidance
+ tt-guidance_input_request
+ tt-guidance_map_update_response
+ tt-guidance_route_details
+ tt-kiosk_emergency_response
+ tt-personal_extra_trip_data_request
+ tt-personal_trip_planning_responses
+ tt-trip_planning_responses.

To_Yellow_Pages_Service_Providers

This data flow is sent from the Provide Driver and Traveler Services function and contains requests for information needed by a traveler. It consists of the following data items each of which is defined in its own DDE:

typsp-provider_registration_confirm
+ typsp-transaction_request
+ typsp-yellow_pages_info_request.

tocvas_commit_remote_enrollment

This data flow is sent from to other commercial vehicle administration system by the Manage Commercial Vehicles function and contains a request for the commitment of the enrollment of the carrier, vehicle and driver that has been previously enrolled. This means that the local and any remote enrollment transactions were successful. .

tocvas_data_table

This data flow is sent to the other commercial vehicle administration system from the Manage Commercial Vehicles function and contains data about required taxes and credential fees. .

tocvas_enrollment_confirmation

This data flow is sent to the other commercial vehicle administration system from the Manage Commercial Vehicles function and contains confirmation that enrollment of the carrier, vehicle and driver has been accepted. .

tocvas_enrollment_request

This data flow is sent to the other commercial vehicle administration system from the Manage Commercial Vehicles function and contains a request for enrollment of the carrier, vehicle and driver. .

tocvas_provide_data

This data flow is sent to the other commercial vehicle administration system from the Manage Commercial Vehicles function and contains a request for data about required taxes and credential fees to be provided. .

toec_emergency_telephone_service_identity

This data flow is sent to the other emergency centers from the Manage Emergency Services function and contains the identity of the center that is providing the local function. The details of this incident are contained in a parallel data flow. This data flow consists of the following data item which is defined in its own DDE:

emergency_telephone_service_identity.

toec_incident_data_FB

This data flow is sent to the other emergency centers from the Manage Emergency Services function and contains data about an incident that has been reported in the area served by the local function and therefore outside their area of operation, plus the identity of the local function. It consists of the following data items each of which is defined in its own DDE:

toec-emergency_telephone_service_identity
+ toec-incident_details.

toec_incident_details

This data flow is sent to the other emergency centers from the Manage Emergency Services function and contains data about an incident that has been reported in the area served by the local function and therefore outside their area of operation. It consists of the following data items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_severity
+ incident_type.

toisp_data_supply

This data flow is sent by the Plan System Deployment and Implementation function and contains a road data covering the local geographic area for use by the similar function in an ITS covering another geographic or jurisdictional area. It consists of the following data item which is defined in its own DDE:

road_data.

toisp_request_data

This data flow is sent by the Plan System Deployment and Implementation function and contains a request for road data covering another geographic area outside that covered by the local function. .

toll_bad_payment_check_request

This data flow is used within the Provide Electronic Payment Services function and contains a request for a check that a driver requesting toll payment is not on the list of bad payers. In the case of commercial vehicles it will be the carrier that is used for the check. The data flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ cv_carrier_number.

toll_bad_payment_check_response

This data flow is used within the Provide Electronic Payment Services function and contains the response to a request for a check that a driver requesting toll payment is not on the list of bad payers. In the case of commercial vehicles it will be the carrier that is used for the check. The data flow consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ cv_carrier_number.

toll_charge

This data flow is used within the Provide Electronic Payment Services function and contains a vehicle identity, credit identity, stored credit and a toll cost. The credit identity and stored credit data items are used to enable the cost to be directed at the owner of the vehicle or the vehicle driver. The data flow consists of the

following data items each of which is defined in its own DDE:

cv_carrier_number
+ cv_vehicle_number
+ toll_cost
+ toll_route_segments
+ toll_tag_data
+ vehicle_identity
+ vehicle_type.

toll_cost

This data flow is used within the Provide Electronic Payment Services function and defines the cost of the toll for a particular vehicle through a toll plaza (cents), thus giving it the ability to use the toll segment governed by the toll plaza. .

toll_operational_data

This data flow is sent from the Provide Electronic Payment Services function to the Plan System Deployment function. It contains data about the cost of toll segments and the number of users of those segements during the time period since the data was last sent. The data flow consists of the following data items each of which is defined in its own DDE:

date
+ list_size
+ list_size{toll_cost + toll_segment_identity + toll_segment_users}
+ time.

toll_payment_confirmation

This data flow is used within the Provide Electronic Payment Services function and contains confirmation that the previous request for the cost of the current toll to be deducted from the credit currently stored by the driver's payment instrument has been completed successfully. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

toll_payment_debited

This data flow is used within the Provide Electronic Payment Services function and contains confirmation that the cost of the current toll will be deducted by the financial institution from the credit identity previously provided by the payment instrument being used by the driver. It is only sent when a credit identity has been previously received from the payment instrument. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

toll_payment_pull_in_message

This data flow is used within the Provide Electronic Payment Services function to indicate that a driver must pull in because the toll payment transaction has failed. It contains the following data item which is defined in its own DDE:

vehicle_identity.

toll_payment_request

This data flow is used within the Provide Electronic Payment Services function and contains the request for the cost of the current toll to be deducted from the credit currently stored by the payment instrument. It is only sent when a value of stored credit has been previously received from the payment instrument. The data flow consists of the following data item which is defined in its own DDE:

toll_cost.

toll_payment_violator_data

This data flow is used within the Provide Electronic Payment Services function and contains data about a toll transaction that was attempted but did not work. It consists of the data items shown below, each of which is defined in its own DDE. For each particular set of data some of the data items may be blank depending on the reason(s) for which the transaction did not work.

credit_identity
+ vehicle_identity
+ toll_cost.

toll_plaza_identity

This data flow is used within the Provide Electronic Payment Services function. It contains the identity of a toll plaza. This is used in the calcualtion of average journey times between toll plazas. It comprises an eight (8) alphanumeric character string enabling a unique identity to be provided for each toll plaza. .

toll_price

This data flow is used within the Provide Electronic Payment Services function and contains the price (cents) for each road segment to which a toll can be applied. .

Additional sizing assumptions:

SIZE=2;

toll_price_application_time

This data flow is used within the Provide Electronic Payment Services function and contains the time at which a toll price applies for a particular toll segment. The time is held as the number of seconds since a fixed reference point, from which the actual time and date can be easily computed. .

toll_price_changes_request

This data flow is sent from the Manage Traffic function to the Provide Electronic Payment Services function and contains a request for a change to the current toll pricing structure that will help to influence a change in modal split of journeys currently being undertaken by travelers of all types, i.e. including drivers and transit users. It consists of the following data items each of which is defined in its own DDE:

toll_segments
+ toll_price
+ toll_price_application_time
+ vehicle_type_for_tolls.

toll_price_changes_response

This data flow is sent from the Provide Electronic Payment Services function to the Manage Traffic function. It contains the response to a previous request for the current toll prices to be changed to help produce a change in the current modal split of trips being undertaken by all types of travelers. If sent to one (1) the change was accepted and if set to zero (0), the change was rejected. .

toll_price_data

This data flow is used within the Provide Electronic Payment Services function. It contains the price for each road segment to which a toll applies, with the time and date for when it applies. The data flow consists of the following data items each of which is defined in its own DDE:

toll_segment_identity
+ toll_price
+ toll_price_application_time
+ vehicle_type_for_tolls.

toll_price_data_request

This data flow is used within the Provide Electronic Payment Services function. It contains a request for the current toll price data to be provided from the store that is being used to calculate toll costs. .

toll_price_details

This data flow is sent from the Provide Electronic Payment Services function to the Manage Traffic function and contains the price for each road segment to which a toll applies, with the time and date for when it applies. This data will be used by the Manage Travel Demand facility in its efforts to re-distribute travel demand to the more efficient providers. The data flow consists of the following data items each of which is defined in its own DDE:

toll_segments
+ toll_price
+ toll_price_application_time
+ vehicle_type_for_tolls.

toll_price_request

This data flow is sent from the Manage Traffic function to the Provide Electronic Payment Services function and contains a request for the current prices being charged for toll segments on the road and highway network. .

toll_price_values

This data flow is used within the Provide Electronic Payment Services function. It contains the values of the prices for each road segment to which a toll applies, with the time and date for when it applies. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{toll_price_data}.

toll_prices

This data store is used within the Provide Electronic Payment Services function to hold data on the price for the use of each toll segment by time of day, day of week, special days, and vehicle type.

list_size
+ 1{toll_price
  + toll_price_application_time
  + toll_segment_identity
  + vehicle_type_for_tolls}list_size.

toll_route_segments

This data flow is used within the Provide Electronic Payment Services function and contains the identity of toll segments for which toll payment is being provided or requested. It consists of the following data for a specific route. The size definition below is based on the assumption that toll segments occur in about the same frequency as the percentage of toll road miles to total freeway miles. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{toll_segment_identity}.

toll_segment_identity

This data flow is used within the Provide Electronic Payment Services function and the Provide Driver and Traveler Services function. It contains the identity number of a toll segment, which may not be the same physical entity as a route segment or a link as used by traffic management processes. The data flow consists of the following data items each of which is defined in its own DDE:

unit_number.

toll_segment_users

This data flow is sent from the Provide Electronic Payment Services function to the Plan System Deployment function. It contains a calculation of the number of users of a toll segment and is sized at two (2) bytes to give a maximum value of 32767. .

toll_segments

This data flow is used within the Provide Electronic Payment Serivces function and

contains the identity of the toll segment for which toll payment is being provided or requested, or for which toll price data is stored. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{toll_segment_identity}.

toll_tag_data

This data flow is used within the Provide Electronic Payment Services function and contains the data that has been provided by the payment instrument being used by the driver at a toll plaza. This may be either a credit identity, or the value of the credit currently stored by the payment instrument, to which tolls may be charged. The data flow consists of the following items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ toll_segment_identity.

toll_tag_data_clear

This data flow is used within the Provide Electronic Payment Services function and contains the toll tag data from which any toll segment identity has been cleared. The data will have been used to charge for use of the toll road, and is being cleared to enable its use for future charging. The data flow consists of the following data item which is defined in its own DDE:

toll_tag_data.

toll_tag_data_collect

This data flow is used within the Provide Electronic Payment Services function and contains the toll tag data that is being collected from on-board the vehicle. This data will be used as the means by which the vehicle will be charged for its use of the toll road and will consist of the following data item which is defined in its own DDE:

toll_tag_data.

toll_tag_data_input

This data flow is sent from the Provide Electronic Payment Services function to the Manage Traffic function. It contains the data from a toll tag on-board a vehicle which will be used to calculate vehicle journey times for links in the road (surface street) and freeway network served by the Manage Traffic function. The data flow consists of the following data item which is defined in its own DDE:

toll_tag_data.

toll_tag_data_needed

This data flow is used within the Manage Traffic and Provide Electronic Payment Services functions to request the output of the data from a parking lot tag that may be on-board a vehicle. This data will be used to calculate vehicle journey times for links in the road (surface street) and freeway network served by the Manage Traffic function. .

toll_tag_data_read

This data flow is used within the Provide Electronic Payment Services function and contains the toll tag data that is being read from a store on-board the vehicle. In addition to the credit identity or stored credit value which will be unchanged, this data may contain the identity of the toll segment at which the vehicle entered the toll road and is for use in charging for the vehicle's use of the toll road. The data flow consists of the following data item which is defined in its own DDE:

toll_tag_data.

toll_tag_data_request

This data flow is used within the Provide Electronic Payment Services function and

contains a request for the toll tag data to be read from the store that is held on-board the vehicle. .

toll_tag_data_store

This data store is used within the Provide Electronic Payment Services function and contains the toll tag data that is being currently used by the vehicle. The toll segment identity portion of this data may show the segment at the entry point to the toll road if that is to be used as the basis for toll charging. The data flow consists of the following data item which is defined in its own DDE:

toll_tag_data.

toll_tag_data_update

This data flow is used within the Provide Electronic Payment Services function and contains the toll tag data that has been updated. The updated will have loaded the identity of the toll segment at which the vehicle entered the toll road and is for use in charging for the vehicle's use of the toll road. The data flow consists of the following data item which is defined in its own DDE:

toll_tag_data.

toll_tag_data_write

This data flow is used within the Provide Electronic Payment Services function and contains the toll tag data that has been updated and is being written into a store on-board the vehicle. In addition to the credit identity or stored credit value which will be unchanged, this updated data will contain the identity of the toll segment at which the vehicle entered the toll road and is for use in charging for the vehicle's use of the toll road. The data flow consists of the following data item which is defined in its own DDE:

toll_tag_data.

toll_tag_pull_in_message

This data flow is used within the Provide Electronic Payment Services function to indicate that a driver must pull in because the vehicle's tage cannot be read at a toll plaza. .

toll_transaction_records

This data store is used by processes in the Provide Electronic Payment Services function and contains records of the toll transactions. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{advanced_toll_transactions
    + current_toll_transactions}.

toll_transactions_for_probe_data

This data flow is used within the Provide Electronic Payment Services function. It contains 'sanitized' toll transaction data from which average journey times between toll plazas can be calculated. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{date
    + time
    + toll_plaza_identity
    + toll_route_segments
    + vehicle_identity}.

toll_transactions_for_probe_data_request

This data flow is used within the Provide Electronic Payment Services function. It contains a request for a 'sanitized' set of toll transaction data from which average journey times between toll plazas can be calculated. .

toll_violation_information

This data is used by the Provide Electronic Payment Services functions to send data about a violator of the toll collection processes to the Manage Emergency Services function. This data will contain a digitized video image of the vehicle trying to violate the toll collection process. .

totc_data_request

This data flow is sent to the other traffic centers by the Manage Traffic function and contains a request for data to be sent from another Traffic Management Center (TMC) to the local TMC. It consists of the following data item which is defined in its own DDE:

other_TMC_data_request
+ other_TMC_incidents_request.

totc_identity

This data flow is sent to the other traffic centers by the Manage Traffic function and contains the identity of the local Traffic Management Center - TMC which is sending the accompanying data about traffic conditions in the geographic or jurisdictional area which is serves. The data flow consists of the following data item which is defined in its own DDE:

tmc_identity.

totc_request_other_TMC_data_FB

This data flow is sent to the other traffic centers (TM) from the Manage Traffic function and contains a request for data to be sent from one Traffic Management Center (TMC), in this case a remote TMC, to another (the local) TMC. It consists of the following data items each of which is defined in its own DDE:

totc-data_request
+ totc-identity.

totc_transfer_data

This data flow is sent to the other traffic centers by the Manage Traffic function and contains the data which is being transferred from one Traffic Management Center (TMC) to one or more others. It consists of the following data items each of which is defined in its own DDE:

current_incidents_local_data
+ cv_incidents_for_other_TMC
+ emergency_data_for_other_TMC
+ long_term_data
+ permit_coordination
+ predicted_incidents_local_data.

totc_transfer_local_TMC_data_FB

This data flow is sent to the other traffic centers (TM) from the Manage Traffic function and contains the data which is being transferred from the local Traffic Management Center (TMC) to another, in this case a remote TMC. It consists of the following data items each of which is defined in its own DDE:

totc-identity
+ totc-transfer_data.

totrm_transit_services

This data flow is sent to the other TRM (other transit center) by the Manage Transit function and contains data for the other transit center about services provided by the local center which have an interface into the area(s) covered by services from the other center. .

tourist_information

This data store is used within the Provide Driver and Traveler Services function to contains data for use by travelers when requesting tourist type information. It

consists of the following data items each of which is defined in its own DDE:

yellow_pages_general_information
+ yellow_pages_specific_information
+ yellow_pages_transaction_information
+ incident_information.

tp_cross_request_received

This data flow is sent to pedestrians by the Manage Traffic function and is an indication that a request by a pedestrian to cross the road or highway has been received and will be actioned in the future. When no requests have been received the indication must be blank or not visible to pedestrians. .

tp_cross_road

This data flow is sent to pedestrians by the Manage Traffic function and is an indication that a pedestrian may cross the road or highway (green) or wait until instructed to cross (red). .

tp_vms_indication

This data flow is sent to pedestrians by the Manage Traffic function and contains a textual message either warning them of a potential hazard, or providing mandatory instructions as to the avaialability of pedestrian access. .

tpi_debited_commercial_manager_payment

This data flow is sent to the payment instrument from the Provide Electronic Payment Services function. It is a request to deduct the cost of payment for commercial vehicle electronic credential filing and tax payment from the value of credit currently stored on the payment instrument being used by the commercial fleet manager. .

tpi_debited_driver_payment_at_vehicle

This data flow is sent to the payment instrument from the Provide Electronic Payment Services function. It is a request to deduct the cost of the update to the navigable map database used within a vehicle for on-line driver guidance, or the cost of commercial vehicle electronic credential filing and tax payments, from the value of credit currently stored on the payment instrument being used by the driver. .

tpi_debited_fare_payment_at_roadside

This data flow is sent to the payment instrument by the Provide Electronic Payment Services function and contains confirmation that the cost of the current transit fare incurred at the roadside, i.e. a transit stop, plus if required the cost of advanced tolls, and/or parking lot charges, and/or transit fares, will be debited to the credit identity provided by the payment instrument. The debit transaction will be carried out throught the financial institution through other processes within the function. .

tpi_debited_payment_at_parking_lot

This data flow is sent to the payment instrument by the Provide Electronic Payment Services function and contains confirmation that the cost of the current parking lot charge, plus if required the cost of advanced tolls, and/or parking lot charges, and/or transit fares, will be debited to the credit identity provided by the payment instrument. The debit transaction will be carried out throught the financial institution through other processes within the function. .

tpi_debited_payment_at_personal_device

This data flow is sent to the payment instrument from the Provide Electronic Payment Services function. It is a request to deduct either the cost of the update to the navigable map database used by the traveler for on-line personal guidance, or the cost of a traveler's confirmed trip from the value of credit currently stored by the payment instrument. .

tpi_debited_payment_at_toll_plaza

This data flow is sent to the payment instrument by the Provide Electronic Payment Services function and contains confirmation that the cost of the current toll, plus if required the cost of advanced tolls, and/or parking lot charges, and/or transit fares, will be debited to the credit identity provided by the payment instrument. The debit transaction will be carried out throught the financial institution through other

processes within the function. .

tpi_debited_payment_on_transit_vehicle

This data flow is sent to the payment instrument by the Provide Electronic Payment Services function and contains confirmation that the cost of the current transit fare incurred on-board a transit vehicle, plus if required the cost of advanced tolls, and/or parking lot charges, and/or transit fares, will be debited to the credit identity provided by the payment instrument. The debit transaction will be carried out throught the financial institution through other processes within the function. .

tpi_debited_transit_user_payment_at_roadside

This data flow is sent to the payment instrument from the Provide Electronic Payment Services function. It is a request to deduct the cost of advanced payments from the value of credit currently stored by the payment instrument belonging being used by a transit user at the roadside, i.e. a transit stop. The advanced payments may cover tolls, and/or parking lot charges, and/or transit fares. .

tpi_debited_transit_user_payment_at_vehicle

This data flow is sent to the payment instrument from the Provide Electronic Payment Services function. It is a request to deduct the cost of advanced payments from the value of credit currently stored by the payment instrument belonging being used by a transit user on-board a transit vehicle. The advanced payments may cover tolls, and/or parking lot charges, and/or transit fares. .

tpi_debited_traveler_payment_at_roadside

This data flow is sent to the payment instrument from the Provide Electronic Payment Services function. It is a request to deduct the cost of a traveler's confirmed trip from the value of credit currently stored by the payment instrument being used by the traveler. .

tpi_request_fare_payment_at_roadside

This data flow is sent to the payment instrument from the Provide Electronic Payment Services function. It is a request to deduct the total cost of the current transit fare, or if required, that for advanced tolls, and/or parking lot charges and/or transit fares from the credit currently stored by the payment instrument when used at the roadside, i.e. a transit stop. .

tpi_request_fare_payment_on_transit_vehicle

This data flow is sent to the payment instrument from the Provide Electronic Payment Services function. It is a request to deduct the total cost of the current transit fare, or if required, that for advanced tolls, and/or parking lot charges and/or transit fares from the credit currently stored by the payment instrument when used on-board a transit vehicle. .

tpi_request_payment_at_parking_lot

This data flow is sent to the payment instrument from the Provide Electronic Payment Services function. It is a request to deduct the total cost of the current parking lot charge, or if required, that for advanced tolls, and/or parking lot charges and/or transit fares from the credit currently stored by the payment instrument when used on-board a vehicle at a parking lot. .

tpi_request_payment_at_toll_plaza

This data flow is sent to the payment instrument from the Provide Electronic Payment Services function. It is a request to deduct the total cost of the current toll, or if required, that for advanced tolls, and/or parking lot charges and/or transit fares from the credit currently stored by the payment instrument when used on-board a vehicle at a toll plaza. .

tpo_change_lot_state

This data flow is sent to a parking lot operator by the Manage Traffic function and is a request for the operator to change the apparent parking lot state. This is the state that is apparaent to users and may be closed, open, or in some cases almost full, although this may not be the true state according to its occupancy. .

tpsp_change_lot_state

This data flow is sent to a parking lot service provider by the Manage Traffic function and is a request for the provider to change the apparent state of the parking lot. This is the state that is seen by users and may be 'CLOSED', 'OPEN', or in some cases 'ALMOST FULL', although this may not be the true state according to its current occupancy. .

tpsp_parking_lot_charge_change_request

This data flow is sent from the Provide Electronic Payment Services function to the parking services provider. It contains data requesting a change to the current parking lot charging structure so that travelers my be encouraged to change the modal split in their journeys. .

tpsp_request_advanced_parking_payment

This data flow is used by the Provide Electronic Payment Services function to send a request the parking service provider to enable a particular advanced parking lot payment and includes information on the payee's credit identity, the vehicle identity and the location of the required parking lot space. .

tpsp_transaction_reports

This data flow is sentto the parking service provider from the Provide Electronic Payment Services function to the parking service provider and contains the output of the log of toll transaction reports. .

traffic_control_strategy_alterations

This data flow is used within the Manage Traffic function and contains the traffic control actions necessary to minimise the impact of an incident. .

Additional sizing assumptions:

SIZE=1024;

traffic_data

This data flow is used by the Manage Traffic function to send data to many other ITS functions as part of another data flow. It is used to provide data on the traffic flowing in the road network, plus that which is predicted to flow in the network and consists of the following items each of which is defined in its own DDE:

current_data
+ long_term_data
+ predictive_model_data.

traffic_data_advisory_request

This data flow is used by the Provide Driver and Traveler Interface facility within the Provide Driver and Traveler Services function to request the Manage Traffic function to provide it with traffic data. It must contain a processor source identity so that the Manage Traffic function knows where to send the retrieved traffic data. .

traffic_data_demand_request

This data flow is used within the Manage Traffic function to provide the Manage Demand facility with current, historic and predictive traffic data. It consists of the following data items each of which is defined in its own DDE:

tmc_identity
+ traffic_data_request.

traffic_data_deployment_request

This data flow is used by the Plan System Deployment and Improvement function to request the Manage Traffic function to provide it with traffic data. It must contain a processor source identity so that the Manage Traffic function knows where to send the retrieved traffic data. .

traffic_data_flow

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function. It contains traffic data either to be provided direct to travelers or for use by the route guidance and route selection processes. The data flow consists of the following data items each of which is defined in its own DDE:

current_roadway_network_state
+ link_data_for_guidance
+ traffic_data_for_advisory_output
+ traffic_data_for_guidance
+ traffic_data_for_kiosks
+ traffic_data_for_portables
+ traffic_data_for_ridesharing
+ prediction_data
+ predicted_incidents
+ vehicle_signage_data
+ vehicle_smart_probe_data_output.

traffic_data_for_advisories

This data flow is used within the Provide Driver and Traveler Services function. It is used to provide advisory messages on both the current and predicted traffic flowing in the road and highway network served by the Manage Traffic function. Only data about those parts of the network that are relevant to the current location of the vehicle is included. This may involve several data items, e.g. data about route segments, of one value, e.g. data from the nearest roadside pollution measurement point. The data flow consists of the following items each of which is defined in its own DDE:

tmc_identity
+ pollution_state_area_collection
+ pollution_state_roadside_collection
+ list_size
+ list_size{route_segment_identity
+ route_segment_journey_time
+ link_identity
+ hov_lane_vehicle_count
+ parking_lot_identity
+ parking_lot_state}.

traffic_data_for_advisory_output

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function. It is used to provide data on the traffic flowing in the road network, plus that which is predicted to flow in the network and consists the following items each of which is defined in its own DDE:

tmc_identity
+ current_data_for_media
+ long_term_data_for_media
+ predictive_model_data_for_media.

traffic_data_for_broadcast

This data flow is used within the Provide Driver and Traveler Services function. It is used to provide wide area broadcast messages on both the current and predicted traffic flowing in the road and highway network served by the Manage Traffic function. Only data that provides exceptional information, e.g. congestion, parking lot closed, etc. will be included. The data flow consists of the following items each of which is defined in its own DDE:

tmc_identity
+ pollution_state_area_collection
+ pollution_state_roadside_collection
+ list_size
+ list_size{route_segment_identity
+ route_segment_journey_time
+ link_identity
+ hov_lane_vehicle_count
+ parking_lot_identity
+ parking_lot_state}.

traffic_data_for_demand

This data flow is used within the Manage Traffic function to send data from the Display and Output Traffic Data facility to the Manage Demand facility. It is used to provide data on the traffic flowing in the road network, plus that which is predicted to flow in the network and consists the following items each of which is defined in its own DDE:

tmc_identity
+ long_term_data
+ predictive_model_data.

traffic_data_for_deployment

This data flow is sent from the Manage Traffic function to the Plan System Deployment and Implementation function. It is used to provide data on the traffic flowing in the road network, plus that which is predicted to flow in the network and consists the following items each of which is defined in its own DDE:

long_term_data
+ predictive_model_data.

traffic_data_for_guidance

This data flow is sent from the Manage Traffic function to the Provide Guidance and Trip Planning facility within the Provide Driver and Traveler Services function. It is used to provide data on the traffic flowing in the road network, plus that which is predicted to flow in the network. The data flow has been sized to enable data for all route segments to be provided. It consists the following items each of which is defined in its own DDE:

tmc_identity
+ current_data_for_media
+ long_term_data_for_media.

traffic_data_for_kiosks

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function. It is used to provide data on the traffic flowing in the road network, plus that which is predicted to flow in the network for output at a kiosk. The flow consists of the following items each of which is defined in its own DDE:

kiosk_identity
+ tmc_identity
+ traffic_data_for_media.

traffic_data_for_media

This data flow is used within the Manage Traffic function. It contains the response to a request for particular data to be retrieved from the stores of current, long term and predictive model data. This data will be used as the basis for traffic information data that is provided to other ITS functions. The data flow consists of the following data items each of which is defined in its own DDE:

current_data_for_media
+ long_term_data_for_media
+ predictive_model_data_for_media.

traffic_data_for_portables

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function. It is used to provide data on the traffic flowing in the road network, plus that which is predicted to flow in the network for output to a traveler's personal portable device. The data flow has been sized to take account of the need to only supply a subset of the full traffic data to the portable device. This subset will depend on the route segment list included in the request, which for sizing

purposes has been assumed to have a maximum value of 25. Thus, the size expression below is based on sampling a percentage of the data equivalent to an N route segment square area (i.e. N/total number of segments). The flow consists of the following items each of which is defined in its own DDE:

tmc_identity
+ traffic_data_for_media
+ traveler_identity.

traffic_data_for_ridesharing

This data flow is sent from the Manage Traffic function to the Ridesharing facility within the Provide Driver and Traveler Services function. It is used to provide data on the traffic flowing in the road network, plus that which is predicted to flow in the network and consists the following items each of which is defined in its own DDE:

tmc_identity
+ traffic_data_for_media.

traffic_data_for_signage

This data flow is used within the Manage Traffic function. It contains traffic flow, occupancy, speed and other data some of which can be used as part of the data that is broadcast by roadside processes for use by in-vehicle signage equipment. The data flow consists of the following data items each of which is defined in its own DDE:

link_state_data.

traffic_data_guidance_request

This data flow is used by the Provide Guidance and Trip Planning facility within the Provide Driver and Traveler Services function to request the Manage Traffic function to provide it with traffic data. It must contain a processor source identity so that the Manage Traffic function knows where to send the retrieved traffic data. .

traffic_data_kiosk_request

This data flow is sent by the Provide Driver and Traveler Services function to the Manage Traffic function and contains the request for the provision of traffic data for output at a kiosk. It consists of the following data items each of which is defined in its own DDE:

kiosk_identity
+ traffic_data_request.

traffic_data_media_parameters

This data flow is used within the Manage Traffic function and contains parameters used to define the actual data elements that are required for each request for output data by the media. This data flow is the result of input of new parameters and/or updates to the current set of parameters by the traffic operations personnel. .

traffic_data_media_request

This data flow is used within the Manage Traffic function and contains a request for particular data to be retieved from the stores of long term and current traffic data. This data will be used by the media as the basis for output that it generates. .

traffic_data_portables_request

This data flow is sent by the Provide Driver and Traveler Services function to the Manage Traffic function and contains the request for the provision of traffic data for output at a traveler's personal portable device. It consists of the following data items each of which is defined in its own DDE:

traffic_data_request
+ traveler_identity.

traffic_data_request

This data flow is used by several ITS functions to request the Manage Traffic function to provide current, long term and predictive traffic data. It will be accompanied by

other data flows to provide the origin and hence the return destination for the retrieved traffic data. The data flow has been sized at five (5) bytes to enable some type of alphanumeric convention to be used for road and/or highway network area or region identification. .

traffic_data_retrieval_parameters

This data store is used within the Manage Traffic function and contains parameters used to define the actual data elements that are required for each request for output data by the media. The data in this store is set up by the traffic operations personnel. .

traffic_data_ridesharing_request

This data flow is used by the Ridesharing facility within the Provide Driver and Traveler Services function to request the Manage Traffic function to provide it with traffic data. It must contain a processor source identity so that the Manage Traffic function knows where to send the retrieved traffic data. .

traffic_flow_state

This data flow is used within the Manage Traffic function. It contains data showing the current traffic flow conditions on roads (surface streets), freeways and ramps served by the function. It also includes flows in high occupancy vehicle (hov) lanes from the same area. The data is a subset of that in the current and long term data stores and is used as a means of %034packaging%034 the data for distribution to users such as ISP's. The data flow consists of the following data items each of which is defined in its own DDE:

ramp_signal_state
+ current_roadway_network_data
+ current_road_network_use
+ hov_lane_data
+ link_data_from_tags.

traffic_image_data

This data flow is used within the Manage Traffic function and contains the data produced by processing image data obtained from visual detection systems. This data is therefore that which can be obtained from systems such as traffic surveillance closed circuit television (cctv). It is analyzed and used to detect traffic conditions such as flow, occupancy, possible incidents, etc. The size expression below assumes that the image is compressed. .

traffic_impact_criteria

This data contains the criteria for calculating the impact an incident will have on traffic flows. .

Additional sizing assumptions:

SIZE=256;

traffic_management_storage_data

This data flow is used within the Manage Traffic function. It contains the indicator control and response states plus the selected traffic control strategy(ies) for the road (surface street) and highway network served by the function. The data is a subset of that in the current and long term data stores. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_control_storage_data
+ indicator_input_storage_data
+ selected_strategy.

traffic_sensor_data

This data flow is used within the Manage Traffic function and contains the data obtained from processing the inputs from sensors around the road network. It consists of the following data items each of which is defined in its own DDE:

crossing_close_time
+ crossing_close_duration
+ hov_priority

+ pedestrian_demand
+ private_vehicle_occupants
+ roadside_conditions
+ traffic_video_image
+ tunnel_conditions
+ vehicle_count
+ vehicle_queue_length
+ vehicle_speed
+ vehicle_headway
+ vehicle_occupancy.

traffic_video_camera_control

This data flow is used within the Manage Traffic function and contains control parameters for closed circuit television (cctv) systems located used to provide traffic surveillance data. These parameters may cover things such as camera pan, tilt, and zoom, plus other picture controls. .

traffic_video_camera_number

This data flow is used within the Manage Traffic function. It contains the identiy of a high resolution video camera used for traffic surveillance. The data flow consists of the following items each of which is defined in its own DDE:

unit_number
+ location_identity.

traffic_video_image

This data flow is used within the Manage Traffic function and contains a high resolution digitized image of the traffic flowing at a particular point on the road or freeway network. This data can be used to provide either traffic data (count, occupancy, etc.) similar to that produced by other forms of detection, or vehicle identity using number plates. The latter may also be used to provide data for origin-destination (o-d) matrix calculations. The size expression below assumes that the image is compressed. .

traffic_video_image_data

This data flow is used within the Manage Traffic function. It contains a number of high resolution digitized images of the traffic flowing at particular points on the road and freeway network served by the function. The data flow consists of the following items each of which is defined in its own DDE:

list_size
+ list_size{traffic_video_camera_number
    + traffic_video_image}.

transaction_number

This data is used by ITS functions as the identifier for a particular financial transaction usually with the Information and Service Providers Brokers or Financial Institutions, etc. by the traveler. .

transfer_charges_to_fares

This data flow is used within the Provide Electronic Payment Services function. It is sent from the parking lot charge payment facility to the fare payment facility and contains the following items of data each of which is defined in its own DDE:

advanced_fare_details
+ advanced_charges_confirm.

transfer_charges_to_tolls

This data flow is used within the Provide Electronic Payment Services function. It is sent from the parking lot charge payment facility to the toll payment facility and contains the following data items each of which is define in its own DDE:

advanced_tolls
+ advanced_charges_confirm.

transfer_fares_to_charges

This data flow is used within the Provide Electronic Payment Services function. It is sent from the transit fare payment facility to the parking lot charge payment facility and contains the following data items each of which is defined in its own DDE:

advanced_charges
+ advanced_fares_confirm.

transfer_fares_to_tolls

This data flow is used within the Provide Electronic Payment Services function. It is sent from the fare payment facility to the toll payment facility and contains the following data items each of which is define in its own DDE:

advanced_tolls
+ advanced_fares_confirm.

transfer_tolls_to_charges

This data flow is used within the Provide Electronic Payment Services function. It is sent from the toll payment facility to the parking lot charge payment facility an contains the following items of data each of which is defined in its own DDE:

advanced_charges
+ advanced_tolls_confirm.

transfer_tolls_to_fares

This data flow is used within the Provide Electronic Payment Services function. It is sent from the toll payment facility to the transit fare payment facility and contains the following data items each of which is defined in its own DDE:

advanced_fare_details
+ advanced_tolls_confirm.

transit_changes_in_speed

This data flow is used within the Manage Transit function and contains corrections to the desired average speed for each segment in the current regular transit route. This speed value is that which the transit driver must achieve between successive transit stops in order to be compliant with the revised transit schedule. These corrections are intended to enable the transit vehicles on a particular route to return to their scheduled service for that route. .

transit_changes_in_stops

This data flow is used within the Manage Transit function and contains corrections to the stops on the current regular transit route. These corrections may be to delete stops because the route has also been changed (see separate data flow), or to add stops so that transit users can use such things as alternative mode transfer facilities. The corrections are intended to enable the transit vehicles on a particular route to return to their scheduled service for that route. .

transit_conditions_advisories_request

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Transit function. It is used to request details of the current state of transit vehicle operations for use in the preparation of data for driver and traveler advisories. .

transit_conditions_demand_request

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Traffic function. It is used to request details of the current state of transit vehicle operations for use in demand forecasting calculations carried out by the Manage Demand facility. .

transit_conditions_guidance_request

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Transit function. It is used to request details of the current state of transit

vehicle operations for use in the preparation of data for on-line driver and traveler guidance. .

transit_confirmation_flag

This data flow is used within the Manage Transit function to indicate that a paratransit service is to be used (set to 1) or not set to (999). .

Additional sizing assumptions:

SIZE=1;

transit_coordination_data

This data flow is sent from the Manage Transit function to the Manage Emergency Services function. It is used to provide data on the way in which the response to a transit incident should be coordinated. The data flow consists of the following data items each of which is defined in its own DDE:

transit_coordination_information
+ transit_fleet_operation_acknowledge
+ transit_response_to_incident.

transit_coordination_information

This data flow is used within the Manage Transit function and contains incident response co-ordination information for use by processes in that function. .

Additional sizing assumptions:

SIZE=1024;

transit_data

This data flow is sent from the Manage Transit function to the Provide Driver and Traveler Services function and contains information that is being provided in response to requests from drivers or travelers. It consists of the following data items each of which is defined in its own DDE:

paratransit_personal_schedule
+ transit_running_data_for_advisory_output
+ transit_running_data_for_guidance
+ transit_services_for_advisory_data
+ transit_services_for_guidance
+ transit_services_for_kiosks
+ transit_services_for_portables
+ transit_deviations_for_kiosks
+ transit_deviations_for_portables.

transit_data_transfer

This data flow is sent from the Manage Transit function to the Provide System Deployment function and contains data on the current state of transit operations. It consists of the following data items each of which is defined in its own DDE:

transit_passenger_operational_data
+ transit_services_for_deployment.

transit_deviation_data_received

This data flow is used within the Manage Transit function and contains an indication that new data about transit service deviations has been received and is now in the local store of this data. The process(es) receiving this data is(are) expected to take action automatically to output the new data to other functions that are outside the scope of the ITS. .

transit_deviation_kiosk_request

This data flow is sent by the Provide Driver and Traveler Services function to the Manage Transit function and is a request for data on current transit service deviations for output to a kiosk. It consists of the following data items each of which is defined in its own DDE:

kiosk_identity
+ transit_vehicle_deviation_request.

transit_deviations_for_kiosks

This data flow is sent by the Manage Transit function to the Provide Driver and Traveler Services function and contains current transit service deviations for output to a kiosk. It consists of the following data items each of which is defined in its own DDE:

kiosk_identity
+ transit_vehicle_schedule_deviations.

transit_deviations_for_portables

This data flow is sent by the Provide Driver and Traveler Services function to the Manage Transit function and contains current transit service deviations for a particular route. This data will be output to a traveler's personal portable device. It consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ list_size
+ list_size{transit_vehicle_identity
+ transit_vehicle_achieved_time
+ transit_route_segment_number}.

transit_deviations_portables_request

This data flow is sent by the Provide Driver and Traveler Services function to the Manage Transit function and is a request for data on current transit service deviations for output to a traveler's personal portable device. The request is modified so that only the data for a transit route specified by the traveler from the portable device is requested. The data flow consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ transit_vehicle_deviation_request
+ transit_route_number.

transit_driver_availability

This data flow is used within the Manage Transit function and contains information that represents the transit driver's current, future hourly, daily weekly and monthly calendar availability. The data will be stored for future access by the transit fleet manager. .

transit_driver_availability_considerations

This data flow is used within the Manage Transit function and contains information that is used in assessing the transit driver's availability for work. It will comprise details of such things as the driver's vacation status, health status, accumulated work hours, and any laws and policies that will affect the driver. The data is used in assessing the driver's eligibility for future work assignments. .

transit_driver_availability_data

This data flow is used within the Manage Transit function and contains information that represents the transit driver's current, future hourly, daily weekly and monthly calendar availability. The data will be used in the assessment of the driver's eligibility for future work assignements. .

transit_driver_consideration_inputs

This data flow is used within the Manage Transit function and contains updates to the consideration data, plus previous route assignments, used to assess a driver's availability for future work, that have been provided by the driver. The data flow consists of the following data items each of which is defined in its own DDE:

transit_driver_identity
+ transit_driver_availability_considerations
+ transit_driver_route_details.

transit_driver_consideration_updates

This data flow is used within the Manage Transit function and contains updates to the

consideration data used to assess a driver's availability for future work, that have been provided by the transit fleet manager. The data flow consists of the following data items each of which is defined in its own DDE:

transit_driver_identity
+ transit_driver_cost_effectiveness_considerations
+ transit_driver_eligibility_considerations
+ transit_driver_performance_considerations
+ transit_driver_route_assignment_considerations.

transit_driver_cost_effectiveness

This data flow is used within the Manage Transit function and contains the transit driver's cost effectiveness and is used primarily to reduce overtime pay and to assign higher paid drivers to the more demanding route assignments. The data will be stored for future access by the transit fleet manager. .

transit_driver_cost_effectiveness_considerations

This data flow is used within the Manage Transit function and contains information that is used in assessing the transit driver's cost effectiveness. It will contain such things as the driver's accumulated work hours, and hourly wage. The data is used in assessing the driver's eligibility for future work assignments. .

transit_driver_cost_effectiveness_data

This data flow is used within the Manage Transit function and contains the transit driver's cost effectiveness and is used primarily to reduce overtime pay and to assign higher paid drivers to the more demanding route assignments. The data will be used in the assessment of the driver's eligibility for future work assignements. .

transit_driver_details

This data flow is used within the Manage Transit function and contains data about an individual transit driver. The data is used to assess the driver's eligibility for future work assignments and as a source of data about drivers for the transit fleet manager. It consists of the following data items each of which is defined in its own DDE:

transit_driver_identity
+ transit_driver_availability_considerations
+ transit_driver_availability
+ transit_driver_cost_effectiveness_considerations
+ transit_driver_cost_effectiveness
+ transit_driver_eligibility_considerations
+ transit_driver_eligibility
+ transit_driver_performance_considerations
+ transit_driver_performance
+ transit_driver_route_details
+ transit_driver_route_assignment_considerations.

transit_driver_eligibility

This data flow is used within the Manage Transit function and contains the transit driver's eligibility to perform a route assignments. The data will be stored for future access by the transit fleet manager. .

transit_driver_eligibility_considerations

This data flow is used within the Manage Transit function and contains information that is used in assessing the transit driver's eligibility. It will contain such things as a list of driver certifications, experience, and education. The data is used in assessing the driver's eligibility for future work assignments. .

transit_driver_eligibility_data

This data flow is used within the Manage Transit function and contains the transit driver's eligibility to perform a route assignment. The data will be used in the allocation of future work assignements for the driver. .

transit_driver_emergency_acknowledge

This data flow is used within the Manage Transit function and contains an acknowledgement that the previous driver emergency request has been received and is being processed. .

Additional sizing assumptions:

SIZE=16;

transit_driver_emergency_request

This data flow is used within the Manage Transit function and contains a request for action because a transit driver has identified an emergency situation on-board or close to a transit vehicle. Details of the transit vehicle identity and location are provided through accompanying data flows. .

transit_driver_identity

This data flow is used within the Manage Transit function and contains the identity of an individual transit driver. It is used by processes in the Manage Transit function that allocate work assignments to drivers. .

transit_driver_information

This data store is used within the Manage Transit function and contains data about the transit drivers. The data is used to allocate future work assignments to drivers. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_driver_details}.

transit_driver_information_output

This data flow is used within the Manage Transit function. It contains data from the store of transit driver information that has been previously requested by the transit fleet manager and may relate to one or more of the transit drivers. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_driver_details}.

transit_driver_information_output_request

This data flow is used within the Manage Transit function to request output of the information currently stored about one or more transit drivers. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_driver_identity}.

transit_driver_performance

This data flow is used within the Manage Transit function and contains a transit driver's past and current route assignment performance. The data will be stored for future access by the transit fleet manager. .

transit_driver_performance_considerations

This data flow is used within the Manage Transit function and contains information that is used in assessing a transit driver's performance in carrying out previously assigned work. It will contain such things as details of any moving violations and accidents in which the driver has been involved, plus comments from supervisors on the driver's performance. The data will be used in deciding the allocation of future work to the driver. .

transit_driver_performance_data

This data flow is used within the Manage Transit function and contains a transit driver's past and current route assignment performance. The data will be used in the assessment of the driver's eligibility for future work assignements. .

transit_driver_route_assignment_considerations

This data flow is used within the Manage Transit function and contains information that is used in making driver route assignments. It will contain such things as details of any driver route preferences and the driver's seniority. The data will be used in deciding the allocation of future work to the driver.. .

transit_driver_route_data

This data store is used within the Manage Transit function to store data that is used in the assignment of new routes to transit drivers. The data is provided by other processes within the function. The store consists of the following data items each of which is defined in its own DDE:

paratransit_services_for_transit_drivers
+ transit_services_for_transit_drivers
+ list_size
+ list_size{transit_vehicle_identity
+ transit_vehicle_availability}.

transit_driver_route_details

This data flow is used within the Manage Transit function and contains the assignment of the transit driver to a previous transit route and schedule. This data will be used to provide the driver with new work assignments. .

transit_emergency

This data flow is sent from the Manage Transit function to the Manage Emergency Services funtion and contains data about incidents within the transit network and fare payment violators. It consists of the following data items each of which is defined in its own DDE:

transit_coordination_data
+ transit_emergency_data
+ transit_incident_details
+ fare_collection_roadside_violation_information
+ fare_collection_vehicle_violation_information.

transit_emergency_coordination_data

This data flow is sent from the Manage Emergency Services function to the Manage Transit function. It contains the following data item which is defined in its own DDE:

transit_incident_coordination_data.

transit_emergency_data

This data flow is sent from the Manage Transit function to the Manage Emergency Services function and contains details of an emergency on-board a transit vehicle. It consists of the following data items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_severity.

transit_emergency_details

This data flow is used within the Manage Transit function and contains details of emergency requests that have been input on-board a transit vehicle. It consists of the following data items each of which is defined in its own DDE:

transit_driver_emergency_request
+ transit_user_emergency_request
+ transit_vehicle_location.

transit_emergency_information

This data flow is used within the Manage Transit function and contains details of emergency requests that have been input on-board a transit vehicle. It consists of the following data items each of which is defined in its own DDE:

transit_driver_emergency_request
+ transit_user_emergency_request

+ transit_vehicle_location.

transit_fare

This data flow is used within the Manage Transit function and contains the actual cost (cents) for the transit user to travel over a route in the transit network, i.e. the cost of going from a particular origin on a transit route to a particular destination on (possibly another) transit route. .

transit_fare_collection_data

This data item is used within the Manage Transit function. It contains data about the transit services that have been used and the fares that have been collected for their use. The data flow consists of the following data items each of which is defined in its own DDE:

transit_fare
+ transit_route_use_time
+ transit_user_category
+ transit_user_journey_end
+ transit_user_journey_start.

transit_fare_data

This data flow is used within the Provide Electronic Payment Services function and contains details of the fares being currently charged for transit services. It consists of the following item which is defined in its own DDE:

list_size
+ list_size{transit_fares}.

transit_fare_data_request

This data flow is used within the Provide Electronic Payment Services function. It contains a request for the current transit fare price data to be provided from the store that is being used to calculate transit fares. .

transit_fare_details

This data flow is sent from the Provide Electronic Payment Services function to the Manage Traffic function and contains details of the fares being currently charged for transit services. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_number
    + transit_route_segment_list
    + transit_user_category
    + transit_route_use_time}.

transit_fare_request

This data flow is sent from the Manage Traffic function to the Provide Electronic Payment Services function and contains a request for the current prices being charged for transit fares. .

transit_fare_transaction_records

This data store is used by processes in the Provide Electronic Payment Services function and contains records of transit fare payment transactions. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{advanced_fare_transactions
    + current_fare_transactions}.

transit_fares

This data item is used within the Manage Transit function. It contains the current fare for each segment of a transit route in the network. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ transit_route_segment_list
+ transit_user_category
+ transit_route_use_time.

transit_fares_for_advanced_payments

This data store is used within the Provide Electronic Payments Services function and contains details of the current regular transit fares for use in calculating advanced fare payments. It consists of the following data item which is defined in its own DDE:

transit_fare_data.

transit_fares_for_roadside

This data store is used within the Manage Transit function and contains the current transit fares for use in fare processing on-board the transit vehicle. It consists of the following data item which is defined in its own DDE:

transit_fares.

transit_fares_for_vehicle

This data store is used within the Manage Transit function and contains the current transit fares for use in fare processing on-board the transit vehicle. It consists of the following data item which is defined in its own DDE:

transit_fares.

transit_fleet_operation_acknowledge

This data flow is used within the Manage Transit function and contains the acknowledgement of the request for the transit fleet manager to take specified actions in response to an incident .

transit_fleet_operation_request

This data flow is used within the Manage Transit function and contains a request for the transit system operator to take specified actions in response to an incident. .

Additional sizing assumptions:

SIZE=16;

transit_highway_overall_priority

This data flow is sent from the Manage Transit function to the Manage Traffic function. It contains requests and information about the overall priority which should be given to one or more transit vehicles at all points in the freeway network served by the function, as opposed to priority requests from individual vehicles at specific locations. This priority will apply at an idividual junction, or along a selected transit route if that is specified. The data flow size assumption below is based on an assumed percentage of transit vehicles running late (TRANSIT_VEH_DEVS) and the percentage of freeway miles to total miles (HIGHWAY_MILES/MILES). .

transit_highway_priority_given

This data flow is sent from the Manage Traffic function to the Manage Transit function. It contains confirmation that the requested priority has been given to transit vehicles throughout the freeway network served by the function. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

transit_incident_coordination_data

This data flow is sent from the Manage Emergency Services function to the Manage Transit function and contains information needed to deal with a transit related incident. It contains the following data items each of which is defined in its own DDE:

transit_coordination_information
+ transit_fleet_operation_request
+ transit_response_to_incident.

transit_incident_details

This data flow is sent from the Manage Transit function to the Manage Emergency Services function and contains details of an incident in the transit operations network. It consists of the following data items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_severity.

transit_incident_extra_data

This data flow is used within the Manage Transit function and contains details of any additional data relevant to a transit incident which the transit system operator requires to be output. This data is in addition to that specified in the accompanying transit incident required action data flow. .

transit_incident_information

This data flow is used within the Manage Transit function and contains information about an incident in the transit operations network. It consists of the following data items each of which is defined in its own DDE:

incident_location
+ incident_start_time
+ incident_duration
+ incident_severity.

transit_incident_location

This data flow is used within the Manage Transit function and contains the location of an incident that has occurred in the transit operations network. The location will be something other than a transit vehicle and so will be at a fixed point. The data flow consists of the following data item which is defined in its own DDE:

location_identity.

transit_incident_required_action

This data flow is used within the Manage Transit function and contains details of the action(s) required concerning the security problem previously identified to the transit system operator. The action(s) is(are) to be taken by the receiving process. .

transit_information_for_transit_users

This data flow is used within the Manage Transit function. It contains information about transit services (routes and schedules) for output to transit users at transit stops and details of the arrival time of the next transit vehicle(s) if the service(s) is(are) not running to their expected timings. The data flow contains the following data items both of which is defined in its own DDE:

transit_services_for_travelers
+ transit_vehicle_arrival_time.

transit_information_request

This data flow is used within the Manage Transit function and requests details details of the current state of transit vehicle operations. .

Additional sizing assumptions:

SIZE=2;

transit_information_transit_user_request

This data flow is used within the Manage Transit function and contains a request from the transit user at a transit stop for output of data about transit services available at that stop. .

transit_inputs

This data flow is sent from the Manage Transit function to the Manage Traffic function and contains information about the operation of tranit vehicles, requests for preemption at signalized intersections and the response to requests for changes in

transit services that have been made to help redistribute traveler demand. It consists of the following data items each of which is defined in its own DDE:

parking_lot_transit_response
+ transit_roadway_overall_priority
+ transit_vehicle_roadway_preemptions
+ transit_ramp_overall_priority
+ transit_services_for_demand
+ transit_services_changes_response
+ transit_running_data_for_demand.

transit_journey_date

This data flow is used within the Provide Electronic Payment Services and Manage transit functions. It gives the date and time at which a transit journey is to be made by a traveler as a transit user and is used for trip planning purposes only. The data flow consists of the following data items each of which is defined in its own DDE:

date
+ time.

transit_media_emergency_information

This data flow is used within the Manage Transit function and contains information about an emergency that has been detected on board a transit vehicle following input from a transit user or transit vehicle driver. The data is in its raw form and requires processing before it can be output to the media. It consists of the following data items each of which is defined in its own DDE:

transit_driver_emergency_request
+ transit_media_emergency_interface_parameters
+ transit_user_emergency_request
+ transit_vehicle_location.

transit_media_emergency_interface_parameters

This data flow is used within the Manage Transit function and contains parameters used to define the content and form of data that is automatically output to the media following an emergency in the transit operations network. It covers incidents to both transit users and vehicles and is principally concerned with emergencies that have taken place on-board transit vehicles. The data in the flow is set up by the transit system operator and enables some control to be exercised of the information being output, e.g. the suppression of some details where such things as acts of terrorism may be involved. .

transit_media_incident_information

This data flow is used within the Manage Transit function and contains information about an incident that has been automatically detected at a transit facility. The data is in its raw form and requires processing before it can be output to the media. It consists of the following data items each of which is defined in its own DDE:

transit_incident_details
+ transit_incident_extra_data
+ transit_incident_location
+ transit_media_incident_interface_parameters.

transit_media_incident_interface_parameters

This data flow is used within the Manage Transit function and contains parameters used to define the content and form of data that is automatically output to the media following an incident in any part of the transit facilities. It covers incidents to transit users, and may have taken place at a transit stop or in some other transit operating facility. The data in the flow is set up by the transit system operator and enables some control to be exercised of the information being output, e.g. the suppression of some details where such things as acts of terrorism may be involved. .

transit_media_interface_parameters

This data store is used within the Manage Transit function and contains paramters used to define the content and form of data that is automatically output to the media following an incident or emergency in the transit operations network. The data store consists of the following data items each of which is defined in its own DDE:

transit_media_emergency_interface_parameters
+ transit_media_incident_interface_parameters.

transit_mode_routes

This store is used within the Provide Driver and Traveler Services fuction and is used to store details of all transit routes which are currently in use by travelers. .

Additional sizing assumptions:

SIZE=4096;

transit_operational_data

This data store is used within the Manage Transit function and contains operational data which can be used to generate transit routes and schedules. It consists of the following data items each of which is defined in its own DDE

list_size
+ list_size{date + time
+ transit_roadside_operational_data
+ transit_vehicle_operational_data}.

transit_operator_emergency_request

This data flow is used within the Manage Transit function and contains information about an incident that has been detected on board a transit vehicle or at a transit facility following input from a transit user or transit vehicle driver. The data is for output to the transit system operator so that responsive action can be carried initiated. .

transit_operator_incident_information

This data flow is used within the Manage Transit function and contains information about an incident that has been automatically detected within the transit operations area. This incident may be a potential security problem, but it is up to the transit system operator to decide what responsive action can be initiated. The data flow consists of the following data items each of which is defined in its own DDE:

transit_incident_location
+ transit_user_incident_input
+ transit_video_camera_image.

transit_operator_request_acknowledge

This data flow is used within the Manage Transit function and contains an acknowledgement that the previous notification of an emergency to the transit system operator has been received and is being considered for action. .

transit_operator_security_action

This data flow is used within the Manage Transit function and contains details of security action(s) that the transit system operator has requested having being presented with details of an incident within the transit operations network. The data flow consists of the following data items each of which is defined in its own DDE:

transit_incident_required_action
+ transit_incident_extra_data
+ transit_video_camera_command.

transit_passenger_capacities

This data flow is used within the Manage Transit function and provides the capacity of each transit vehicle as a number of passengers. .

Additional sizing assumptions:

SIZE=2;

transit_passenger_numbers

This data flow is used within the Manage Transit function and contains the number of

passengers (transit users) carried by a transit vehicle on each of its transit route segments. This data is measured by counting the numbers of passengers that pass the transit fare collection point on a transit vehicle, and is determined independently of any passenger counting process. The size has been set at two bytes to enable the number of passengers on a transit vehicle to reach a maximum of 37267, which may be possible with multi-carriage units of the type employed on some metro and mass-transit systems. .

transit_passenger_operational_data

This data flow is sent from the Manage Transit function to the Plan System Deployment function. It contains data about the number of passengers (transit users) that have used transit stops and vehicles being operated by the Manage transit function. There are therefore two sets of data, one showing the numbers of passengers using each transit stop and the other showing the number of passengers on-board transit vehicles on each route segment. The data is recorded as the average values over short time intervals, e.g. five (5) minutes, for a whole day. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{date + time
+ transit_roadside_operational_data
+ transit_route_operational_data}.

transit_payment_data

This data flow is sent from the Manage Transit function to the Provide Electronic Payment Services function and contains data used in payment transactions. It consists of the following data items each of which is defined in its own DDE:

advanced_tolls_and_charges_roadside_request
+ advanced_tolls_and_charges_vehicle_request
+ bad_tag_list_request
+ other_services_roadside_request
+ other_services_vehicle_request
+ request_roadside_fare_payment
+ request_vehicle_fare_payment
+ transit_services_for_advanced_fares
+ transit_user_advanced_payment_at_roadside
+ transit_user_advanced_payment_on_vehicle
+ transit_user_roadside_image
+ transit_user_vehicle_image.

transit_payment_results

This data flow is sent from the Provide Electronic Payment Services function to the Manage Transit function and contains the results of payment transactions. It consists of the following data items each of which is defined in its own DDE:

advanced_tolls_and_charges_roadside_confirm
+ advanced_tolls_and_charges_vehicle_confirm
+ bad_tag_list_update
+ confirm_roadside_fare_payment
+ confirm_vehicle_fare_payment
+ other_services_roadside_response
+ other_services_vehicle_response
+ request_transit_user_roadside_image
+ request_transit_user_vehicle_image
+ transit_roadside_fare_data
+ transit_vehicle_fare_data
+ transit_user_roadside_credit_identity
+ transit_user_roadside_tag_data
+ transit_user_vehicle_credit_identity
+ transit_user_vehicle_tag_data.

transit_plans

This data store is used within the Manage Transit function to hold data about both regular and paratransit services. This data is used as input to the regular transit schedule generation processes, as it provides details of the current services and the most popular paratransit services. The data store contains the following data items each of which is defined in its own DDE:

paratransit_service_stored_data
+ transit_routes
+ transit_schedules.

transit_preplanned_responses_for_incidents

This store is generated and used by processes within the Manage Transit function and contains the following items each of which is defined in its own DDE:

transit_coordination_information
+ transit_response_to_incident.

transit_ramp_overall_priority

This data flow is sent from the Manage Transit function to the Manage Traffic function. It contains requests and information on the overall priority which should be given to one or more transit vehicles over a wide area as opposed to priority requests from individual vehicles at a particular set of ramp signals. .

transit_ramp_priority_given

This data flow is sent from the Manage Transit function to the Manage Traffic function. It contains confirmation that the overall priority request for one or more transit vehicles over the ramp signals in a wide area as opposed to priority requests from individual vehicles at a particular set of ramp signals has been given. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

transit_raw_map_data

This data flow is used within the Plan System Deployment function. It contains details of the transit route segements and the links in the road and freeway network with which they are associated. The data flow consists of the following data item which is defined in its own DDE:

transit_routes_data.

transit_requests

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Transit function and contains requests for information about transit services or a request for a paratransit service, plus vehicle location data and transit user tag data. It consists of the following data items each of which is defined in its own DDE:

paratransit_service_confirmation
+ paratransit_trip_request
+ transit_conditions_advisories_request
+ transit_conditions_guidance_request
+ transit_deviation_kiosk_request
+ transit_deviations_portables_request
+ transit_services_advisories_request
+ transit_services_guidance_request
+ transit_services_kiosk_request
+ transit_services_portables_request
+ vehicle_location_for_transit.

transit_response_to_incident

This data flow is used within the Manage Transit function and contains details of what

transit action is required in response to an incident. It is used by processes within that function. .

transit_road_overall_priority

This data flow is sent from the Manage Transit function to the Manage Traffic function. It contains requests and information about the overall priority which should be given to one or more transit vehicles at all junctions and/or pedestrain crossings in the road network served by the function, as opposed to priority requests for individual vehicles at specific locations. As this is a 'blanket' application of of priority, no list of indicators is needed. The size assumption is based on an assumed percentage of transit vehicles running late (TRANSIT_VEH_DEVS) and the percentage of street miles to total miles (ROAD_MILES/MILES). .

transit_road_priority_given

This data flow is sent from the Manage Traffic function to the Manage Transit function. It contains confirmation that the requested priority has been given to transit vehicles throughout the road network served by the function. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

transit_roadside_fare_collection_data

This data store is used within the Manage Transit function. It contains details of the transit fare transactions that have been processed at a roadside location, i.e. a transit stop, as a result of transit users passing through the location to board transit vehicles. The data flow is sized to accommodate data from the maximum number of transit users that are expected to use a transit stop in a twenty four hour period. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_fare_collection_data}.

transit_roadside_fare_collection_identity

This data flow is used within the Manage Transit and Provide Electronic Payment Services function. It contains the identity of each transit fare roadside collection point. This is usually a transit stop, although by using a separate identity definition the fare collection points can be in other places such as shopping malls, tourist attractions, travel agencies, etc. The data flow has been sized at five (5) bytes to permit the use of alphanumeric characters to aid identification of each collection point. .

transit_roadside_fare_data

This data flow is sent by the Provide Electronic Payment Services function to the Manage Transit function and contains details of the fares being currently charged for regular transit services. It is for use in calculating fares that are to be paid by transit users at the roadside, i.e. a transit stop, and consists of the following data item which is defined in its own DDE:

transit_fare_data.

transit_roadside_fare_payment_confirmation

This data flow is used within the Provide Electronic Payment Services function and contains confirmation that the previous request for the cost of the current transit fare has been deducted from the credit currently stored by the transit user's payment instrument has been completed successfully. The data flow is used when the transit user is paying for the transit fare at the roadside and consists of the following data item which is defined in its own DDE:

confirmation_flag.

transit_roadside_fare_payment_debited

This data flow is used within the Provide Electronic Payment Services function and contains confirmation that the cost of the current transit fare will be deducted by the

financial institution from the credit identity previously provided by the payment instrument being used by the transit user on-board a transit vehicle. It is only sent when a credit identity has been previously received from the payment instrument. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

transit_roadside_fare_payment_request

This data flow is used within the Provide Electronic Payment Services function and contains the request for the cost of the current transit fare to be deducted from the credit currently stored by the transit user's payment instrument, when it is being used at the roadside, i.e. a transit stop. It is only sent when a value of stored credit has been previously received from the payment instrument. The data flow consists of the following data item which is defined in its own DDE:

transit_fare.

transit_roadside_operational_data

This data flow is used within the Manage Transit functiona and contains operational data collected from the roadside, i.e. from transit stops. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_roadside_passenger_data}.

transit_roadside_passenger_data

This data flow is used within the Manage Transit function. It contains the number of transit users (passengers) who in a twenty four hour period, have passed through a transit stop plus data about the ride which they purchased. The data is derived from roadside fare collection data and is for use in the determinatiion of future transit services. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_stop_number
+ transit_user_journey_start
+ 24{list_size
  + list_size{transit_passenger_numbers
    + transit_user_journey_end
    + transit_route_use_time
    + transit_user_category}}.

transit_roadway_overall_priority

This data flow is sent from the Manage Transit function to the Manage Traffic function. It contains requests and information on the overall priority which should be given to one or more transit vehicles throughout the road and freeway network served by the function and is different from priority requests from individual vehicles at particular locations. The data flow consists of the following data items each of which is defined in its own DDE:

transit_highway_overall_priority
+ transit_road_overall_priority.

transit_roadway_priority_given

This data flow is sent from the Manage Traffic function to the Manage Transit function. It contains confirmation that the overall priority requested for one or more transit vehicles throughout the road and freeway network served by the function has been given . The data flow consists of the following data items each of which is defined in its own DDE:

transit_highway_priority_given
+ transit_road_priority_given.

transit_route

This data flow is used within the Provide Driver and Traveler Services function and contains data for a special form of %034route%034 which only uses transit servies. It consists the following data items each of which is defined in its own DDE:

route_cost
+ route_segment_number{route_segment_end_point
+ route_segment_estimated_travel_time
+ route_segment_report_position_points
+ route_segment_start_point}.

transit_route_corrections

This data flow is used within the Manage Transit function and contains corrections to the current regular transit route. These corrections are intended to enable the transit vehicles on a particular route to return to their scheduled service for that route. .

transit_route_current_use

This data flow is used within the Provide Driver and Traveler Services functions. It contains a count of the number of travelers who have selected a particular route as part of their on-line guidance or through trip planning requests. The data flow is sized at two (2) bytes to enable a realistic number of travelers to be accommodated. .

transit_route_destination

This data flow is used within the Manage Transit and Provide Electronic Payment Services functions. It contains the destination of a transit route to be used by a traveler (advanced fares) or transit user. The destination will be defined as the name of a transit stop and provided as a string of up to twenty (20) alphanumeric characters. This should enable each destination to be uniquely identified allowing for the use of a common town or city name. .

transit_route_details

This store is used and maintained within the Provide Driver and Traveler Services function and contains the following data items each of which is defined in its own DDE:

transit_vehicle_passenger_loading
+ transit_passenger_capacities
+ transit_vehicle_running_times
+ transit_vehicle_schedule_deviations
+ transit_vehicle_eta
+ transit_route
+ transit_stop_locations
+ transit_schedules.

transit_route_fare_data

This data flow is used within the Manage Transit function. It contains details of the transit user fares for all the transit routes operated by the transit fleet from which the request was made. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_number
+ transit_route_segment_list}
+ map_transit_data.

transit_route_number

This data flow is used within the Manage Transit function and contains the number of a regular transit route. This is stored as a four (4) character string to enable the use of alphanumeric characters so that the route number may be the same as that seen by transit users, e.g. 141A, or N177, etc. .

transit_route_operational_data

This data flow is used within the Manage Transit function and contains operational data about the number of passengers using each transit route. This data is the average

value over short time periods, e.g. five (5) minutes, for a whole day and shows the number of passngers present on transit vehicles for each transit route segment. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_number + transit_vehicle_passenger_operational_data}.

transit_route_origin

This data flow is used within the Manage Transit and Provide Electronic Payment Services functions. It contains the origin of a transit route to be used by a traveler (advanced fares) or transit user.. The origin will be defined as the name of a transit stop and provided as a string of up to twenty (20) alphanumeric characters. This should enable each destination to be uniquely identified allowing for the use of a common town or city name. .

transit_route_schedule_number

This data flow is used within the Mange Transit function and contains the number of the transit service that is operating on a particular route. This number may be in the range 1 to 255 and hence is sized at one (1) byte. .

transit_route_segment_cost

This data flow is used within the Manage Transit function and contains the cost (cents) of the use of a particular transit route segment. It can only be used in association with the segment number, the category of the transit user and the time at which the route is used. .

transit_route_segment_indentity

This data flow is used within the Manage Transit function. It contains the identity of a transit route segment. The identity is on two parts, the route number on which the segment lies, and the number of the segment along the route. A transit route segment is defined as the link between two successive transit stops, either of which may also be points of interchange with other routes. It is possible for the segments on two or more routes to apply to the same physical link between to stops. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ transit_route_segment_number.

transit_route_segment_list

This data flow is used within the Manage Transit function. It contains a list of the transit route segments that make up a particular transit route, plus the cost to a transit user for using each segment and the identity of the road or freeway link(s) over which the route segment runs. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{link_identity_list
    + transit_route_segment_number
    + transit_route_segment_cost}.

transit_route_segment_number

This data flow is used within the Manage Transit function. It contains the number of a transit route segment within the transit route on which it lies. The data flow is sized at two (2) bytes to enable the numbering system to accommodate a large number of stops, which may be required for long routes. .

transit_route_stop_data

This data flow is used within the Manage Transit function and contains data for each of the transit stops that make up a particular transit route. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_schedule_number
    + transit_stop_scheduled_time}.

transit_route_stop_list

This data flow is used within the Manage Transit function and is a list of the transit stops that make up a particular transit route and the time at which services on the route will arrive at each stop. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_stop_number
+ transit_route_stop_data}.

transit_route_stop_number

This data flow is used within the Manage Transit function and contains the identity number of a transit stop on a transit route. It is sized at one (1) byte to enable a maximum of 255 stops to be specified on one route. The identity of the route number that goes with the stop is carried in an accompanying data flow. .

transit_route_use_time

This data flow is used within the Manage Transit function and contains the time at which the associated transit fare will apply, e.g. weekday morning peak, Sunday, public holiday, etc. .

transit_routes

This data flow is used within the Manage Transit function. It contains details of the routes being provided by the regular transit operation. The data flow consists of the following data items each of which is defined in its own DDE:

transit_routes_data.

transit_routes_current_data

This data flow is used within the Manage Transit function. It contains details of a previously generated transit vehicle route and the routes of the most popular demand responsive transit services. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{paratransit_destination
+ paratransit_pickup_location}
+ transit_passenger_capacities
+ transit_route
+ transit_stop_locations.

transit_routes_data

This data flow is used within the Manage Transit function. It contains details of the routes being provided by the transit operation. The list of route segments contains the identity of each link in the road and freeway network associated with the segment to enable them to be output on top of a display of digitized map data. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_number
+ transit_route_segment_list
+ transit_route_stop_number}.

transit_routes_request

This data flow is used within the Manage Transit function to request a copy of the current transit routes. .

Additional sizing assumptions:

SIZE=1;

transit_routes_updates

This data flow is used within the Manage Transit function and contains details of each transit vehicle route calculated at the request of the transit fleet manager using

previously defined parameters and current transit operational datae. It consists of the following data items each of which is defined in its own DDE:

transit_passenger_capacities
+ transit_route
+ transit_stop_locations.

transit_running_data_for_advisories

This data flow is used within the Provide Driver and Traveler Services function. It contains data on the current state of transit operations for use in driver and transit user advisory output messages. The messages will only contain data that is relevant to the vehicle's current location. The data flow consists of the following items each of which is defined in its own DDE:

transit_route_number
+ transit_vehicle_identity
+ list_size
+ list_size{transit_route_segment_number
    + transit_stop_scheduled_time
    + transit_vehicle_achieved_time
    + transit_vehicle_time}.

transit_running_data_for_advisory_output

This data flow is sent from the Manage Transit function to the Provide Driver and Traveler Services function. It is used to provide data on the current state of transit operation for use in driver and traveler advisories and consists of the following items each of which is defined in its own DDE:

list_size
+ list_size{transit_vehicle_passenger_loading
    + transit_vehicle_running_times
    + transit_vehicle_schedule_deviations
    + transit_vehicle_eta}.

transit_running_data_for_broadcast

This data flow is used within the Provide Driver and Traveler Services function. It contains data on the current state of transit operations for use in driver and transit user wide area broadcast messages. The messages will only contain data that is unusual, e.g. service suspension, temporary revised timings, etc.. The data flow consists of the following items each of which is defined in its own DDE:

transit_route_number
+ transit_vehicle_identity
+ list_size
+ list_size{transit_route_segment_number
    + transit_stop_scheduled_time
    + transit_vehicle_achieved_time
    + transit_vehicle_time}.

transit_running_data_for_demand

This data flow is sent from the Manage Transit function to the Manage Traffic function. It is used to provide data on the current state of transit operation for use in demand forecasting calculations carried out by the Manage Demand facility and consists of the following items each of which is defined in its own DDE:

transit_vehicle_passenger_loading
+ transit_vehicle_deviation_update
+ transit_vehicle_running_times
+ transit_vehicle_schedule_deviations
+ transit_vehicle_eta.

transit_running_data_for_guidance

This data flow is sent from the Manage Transit function to the Provide Driver and Traveler Services function. It is used to provide data on the current state of transit operation for use in preparing driver and traveler on-line guidance data and consists of the following items each of which is defined in its own DDE:

transit_vehicle_passenger_loading
+ transit_vehicle_running_times
+ transit_vehicle_schedule_deviations
+ transit_vehicle_eta.

transit_schedule_current_data

This data flow is used within the Manage Transit function. It contains details of a previously generated schedule of services on each regular transit vehicle route, plus the timings for the most popular demand responsive transit services. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{paratransit_arrival_time
    + paratransit_destination
    + paratransit_pickup_time
    + paratransit_pickup_location}
+ transit_schedule_data.

transit_schedule_data

This data flow is used within the Manage Transit function and contains the schedule of services on each transit vehicle route and the cost to the transit user of the use of each route segment. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_number
    + transit_route_segment_list
    + transit_route_stop_list
    + transit_schedule_identity}.

transit_schedule_identity

This data flow is used within the Manage Transit function and contains the identity of a particular set of transit schedules. This identity is sized at sixteen (16) bytes to enable the identity to include a short description of when (day and/or period) the schedule is expected to apply. .

transit_schedule_request

This data flow is used within the Manage Transit function to request a copy of the current schedules of transit services on the transit routes. .

Additional sizing assumptions:

SIZE=1;

transit_schedule_updates

This data flow is used within the Manage Transit function. It contains the schedule of services on a transit vehicle route calculated at the request of the transit fleet manager using previously defined parameters and current transit operational data. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ transit_route_segment_list
+ transit_route_stop_list
+ transit_schedule_identity.

transit_schedules

This data flow is used within the Manage Transit function. It contains the schedule of the timings of services on each regular transit route. The data flow consists of

the following data item which is defined in its own DDE:

transit_schedule_data.

transit_service_external_data

This data flow is used within the Manage Transit function. It contains transit services (routes and schedules) in their raw form for distribution to and use by processes in other ITS functions. the map data of transit routes is included to enable output of displaysd showing transit routes by processes that do not ahve access to a digitized map database. Those that do can use the link identity in the transit routes data to map out the transit route. The data flow consists of the following items of data both of which are defined in their own DDE's:

transit_routes_data
+ transit_schedule_data
+ map_transit_data.

transit_service_internal_data

This data flow is used within the Manage Transit function and contains data about the current transit services (routes and schedules) in their raw form. It is used for distribution to and use by other processes within the local function. The map data is included to enable the transit route(s) and any data provided with them by a local process to be output as a map type display. The data flow consists of the following items of data both of which are defined in their own DDE's:

transit_routes_data
+ transit_schedule_data
+ map_transit_data.

transit_service_planning_parameters

This data store is used within the Manage Transit function and contains parameters collected from actual transit operations that are used to generate transit routes and schedules. .

Additional sizing assumptions:

SIZE=1024000;

transit_service_raw_data

This data store is used within the Manage Transit function and contains the raw output from the transit service generation processes, i.e. raw routes and schedules. The term raw indicates that the data is not in a form that would be readily understandable by transit system operators, users, and fleet managers without some subsequent processing. It is therefore intended for use by other processes and consists of the following data items each of which is defined in its own DDE:

transit_routes_data
+ transit_schedule_data.

transit_services

This data flow is sent by the Manage Transit function to other ITS functions. It contains a complete set of all the transit routes and the services that run upon them, including timings, etc. that are currently being provided by the transit fleet. This data is a processed version of the raw data to enable it to be easily understood by the recipients such as drivers and travelers. The data flow consists of the following items of data both of which are defined in their own DDE:

transit_routes_data
+ transit_schedule_data
+ map_transit_data.

transit_services_advisories_request

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Transit function. It is a request for supply of details of the services being currently provided by the transit fleet and will be used in the preparation of on-line

driver and traveler advisory data for output to vehicles. .

transit_services_changes_request

This data flow is sent by the Manage Traffic function to the Manage Transit function and is a request to change the current transit services in response to changes in demand, or a desire to change the modal split currently being used by travelers. .

transit_services_changes_response

This data flow is sent by the Manage Transit function to the Manage Traffic function and is the response to the previous request for changes in the transit services. .

Additional sizing assumptions:

SIZE=2;

transit_services_data_for_output

This data flow is used within the Manage Transit function and contains data about the current transit services (routes and schedules) in their raw form. It is used to produce output for the transit fleet manager when requested. The data flow consists of the following items of data both of which are defined in their own DDE's:

transit_routes_data
+ transit_schedule_data.

transit_services_demand_request

This data flow is sent from the Manage Traffic function to the Manage Transit function. It is a request for supply of details of the transit services and will be used in the preparation demand forecasts by the Manage Demand facility. The data flow consists of the following data items each of which is defined in its own DDE:

tmc_identity
+ transit_services_request.

transit_services_demand_response_request

This data flow is used within the Manage Transit function. It is sent from the Demand Responsive Transit facility to request details of the regular transit services being currently provided by the transit fleet. It consists of the following data item which is defined in its own DDE:

transit_services_request.

transit_services_for_advanced_fares

This data flow is sent from the Manage Transit function to the Provide Electronic Payment Services function. It contains datails of the transit user fares for all the transit routes operated by the transit fleet from which the request was made. This data is for use in processing advanced transit fare payments initiated by drivers at toll plazas or parking lots. The data flow consists of the following data item which is defined in its own DDE:

transit_route_fare_data.

transit_services_for_advisories

This data flow is used within the Provide Driver and Traveler Services function to provide details of transit services that are relevant to a driver or transit user who is requesting advisory information from a vehicle. .

transit_services_for_advisory_data

This data flow is sent from the Manage Transit function to the Provide Driver and Traveler Services function. It contains a complete set of all the transit routes and the services that run upon them, including timings, etc. that are provided by the transit fleet from which the data was requested, for use in the preparation of driver and traveler advisory information for output on-board vehicles. It consists of the following data item which is defined in its own DDE:

transit_services.

transit_services_for_broadcast

This data flow is used within the Provide Driver and Traveler Services function to

provide details of transit services to a driver or transit user as part of a wide area broadcast message. This message will only contain data that is unusual such as a new service, new route, closure of an existing service, etc. .

transit_services_for_corrections

This data flow is used within the Manage Transit function. It is sent to the Operate Transit Vehicles facility for use in the calculation of corrections to transit vehicle routes and schedules to restore a service to normal operation. It contains a complete set of all the transit routes and the services that run upon them, including timings, etc. that are provided by the transit fleet from which the data was requested.

list_size
+ list_size{transit_services}.

transit_services_for_demand

This data flow is sent from the Manage Transit function to the Manage Traffic function. It contains a complete set of all the transit routes and the services that run upon them, including timings, etc. that are provided by the transit fleet from which the data was requested, for use in the calculation of demand forecasts by the Manage Demand facility. The data flow consists of the following data items each of which is defined in its own DDE:

transit_services.

transit_services_for_demand_response

This data flow is used within the Manage Transit function. It contains details of the services being currently provided by the regular transit fleet and consists of the following data item which is defined in its own DDE:

transit_services.

transit_services_for_deployment

This data flow is sent from the Manage Transit function to the Plan System Deployment function. It contains details of the current transit services for use in the analysis of ITS operating performance and consists of the following data item which is defined in its own DDE:

transit_services.

transit_services_for_eta

This data flow is used within the Manage Transit function. It is sent to the Operate Transit Vehicles facility for use in the calculation of transit vehicle estimated times of arrival (eta) at transit stops. It only contains details of the schedule for the transit route that is currently being operated by the vehicle. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ transit_route_segment_list
+ transit_route_stop_list.

transit_services_for_eta_request

This data flow is used within the Manage Transit function to request the details of the current transit service so that a transit vehicle can calculate its current deviation relative to that schedule. It consists of the following data items each of which is defined in its own DDE:

transit_vehicle_identity
+ transit_route_number
+ transit_route_schedule_number.

transit_services_for_guidance

This data flow is sent from the Manage Transit function to the Provide Driver and Traveler Services function. It contains a complete set of all the transit routes and

the services that run upon them, including timings, etc. that are provided by the transit fleet from which the data was requested, for use in the preparation of data for output as on-line driver and traveler guidance data. The data flow consists of the following data items each of which is defined in its own DDE:

1{transit_services_for_output}2
+ traveler_identity.

transit_services_for_kiosks

This data flow is sent from the Manage Transit function to the Provide Driver and Traveler Services function. It contains details of the transit services that satisfy a traveler's request and are for output to a kiosk. The data flow consists of the following data items each of which is defined in its own DDE:

kiosk_identity
+ 1{transit_services_for_output}2.

transit_services_for_other_TRM

This data flow is used within the Manage Transit function and contains details of the local transit services (routes and schedules) for use by other adjacent transit centers so that coordination of services can be achieved to the benefit of transit users. It consists of the following items of data both of which are defined in their own DDE's:

transit_routes_data
+ transit_schedule_data.

transit_services_for_output

This data flow is used within the Manage Transit function and contains details of the transit route(s) that fulfil the origin-destination requirements of a particular transit user or traveler's request. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ list_size
+ list_size{transit_route_segment_number
    + transit_route_segment_cost
    + transit_stop_scheduled_time}.

transit_services_for_portables

This data flow is sent from the Manage Transit function to the Provide Driver and Traveler Services function. It contains details of the current transit services for output to a traveler's personal portable device and consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ 1{transit_services_for_output}2.

transit_services_for_roadside_fares

This data flow is used within the Manage Transit function. It contains details of the transit user fares for all the transit routes operated by the transit fleet from which the request was made. This data is for use in processing transit fare payments initiated by transit users at the roadside (a transit stop). The data flow consists of the following data item which is defined in its own DDE:

transit_route_fare_data.

transit_services_for_scenarios

This data flow is used within the Manage Transit function. It is sent to the Operate Transit Vehicles facility for use in the calculation of the scenarios for the return of transit vehicles to their published schedules and routes. It contains a complete set of all the transit routes and the services that run upon them, including timings, etc. that are provided by the transit fleet from which the data was requested.

list_size
+ list_size{transit_services}
+ map_transit_data.

transit_services_for_transit_drivers

This data flow is used within the Manage Transit function. It is sent to the Generate Transit Driver Schedules facility and contains a complete set of all the transit routes and the services that run upon them, including timings, etc. that are provided by the transit fleet from which the data was requested.

list_size
+ list_size{transit_services}.

transit_services_for_travelers

This data flow is used within the Manage Transit function. It is sent to the Provide Traveler Transit Interface facility and contains a complete set of all the transit routes and the services that run upon them, including timings, etc. that are provided by the transit fleet from which the data was requested. The data flow consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ 1{transit_services_for_output}2.

transit_services_for_vehicle_fares

This data flow is used within the Manage Transit function. It contains details of the transit user fares for all the transit routes operated by the transit fleet from which the request was made. This data is for use in processing transit fare payments initiated by transit users on-board a transit vehicle. The data flow consists of the following data item which is defined in its own DDE:

transit_route_fare_data.

transit_services_guidance_request

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Transit function. It is a request for supply of details of the services being currently provided by the transit fleet and will be used in the preparation of on-line traveler guidance data. The process(es) that are providing the interface through which the traveler is obtaining the on-line guidance will have to provide the origin and destination so that the receiving process in the Manage Transit function can work out for which transit route(s) data will be provided. The data flow consists of the following data items each of which is defined in its own DDE:

destination
+ origin
+ traveler_identity.

transit_services_kiosk_request

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Transit function. It is a request for supply of details of transit services for output to a kiosk. The traveler will have to provide the origin and destination so that the receiving process can work out for which transit route(s) data will have to be provided. The data flow consists of the following data items each of which is defined in its own DDE:

destination
+ kiosk_identity
+ origin.

transit_services_portables_request

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Transit function. It is a request for supply of details of transit services for

output to a traveler's personal portable device. The tranveler will have to provide the origin and destination so that the receiving process can work out for which transit route(s) data will be provided. The data flow consists of the following data items each of which is defined in its own DDE:

destination
+ origin
+ traveler_identity.

transit_services_request

This data flow is sent by ITS functions to the Manage Transit facility. It contains a request for details of the regular transit services being currently provided by the transit fleet. The size of sixty four (64) bytes enables a bit to be set to identify each actual service for which data is required. .

transit_services_roadside_data

This data store is used within the Manage Transit function and contains all the data that has been output to the transit user at a transit stop. The data is held local to the stop and is used as a source of data if communications with the transit management center (TRM), or local transit vehicle is not available. The data is replaced when new updates are obtained, or in the case of transit vehicles when the vehicle leaves the transit stop. This data store consists of the following items of data, each of which is defined in its own DDE:

transit_services_for_travelers
+ transit_vehicle_arrival_time
+ transit_vehicle_user_data.

transit_services_travelers_request

This data flow is used within the Manage Transit function to request the details of the current transit services for a transit user at the roadside. The transit user will have to provide the origin and destination so that the receiving process can work out for which transit route(s) data will be provided. The data flow consists of the following data items each of which is defined in its own DDE:

destination
+ origin
+ traveler_identity.

transit_stop_locations

The data flow is used within the Manage Transit function and provides the location of stops on transit routes. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_stop_number
    + transit_route_number
    + location_identity}.

transit_stop_scheduled_time

This data flow is used within the Manage Transit function and contains the time at which a transit vehicle is scheduled to reach each stop on a transit route. This will thus be the scheduled time of arrival at the end of a transit route segment. The identity of the transit route segment to which this data applies is carried in an accompanying data flow. The data flow consists of the following data item which is defined in its own DDE:

time.

transit_technician_data

This data store is used within the Manage Transit function and contains data about all the transit technicians available to carry out maintenance work on the vehicles in a transit fleet. It consists of the following data items each of which is defined in

its own DDE:

list_size
+ list_size{transit_technician_detail}.

transit_technician_detail

This data flow is used within the Manage Transit function and contains data about transit technicians. It consists of the following data items each of which is defined in its own DDE:

transit_technician_identity
+ transit_technician_seniority
+ transit_technician_work_assignment
+ transit_technician_work_hours
+ transit_technician_work_log
+ transit_technician_work_preferences
+ transit_technician_work_skills.

transit_technician_identity

This data flow is used within the Manage Transit function and contains the identity of an individual transit technician. It is used to identify other data about the technician, which will be found in associated data flows. .

transit_technician_seniority

This data flow is used within the Manage Transit function and contains the seniority of an individual transit technician. This is sized as a single (1) byte to enable a character or numberic code to be used. .

transit_technician_work_assignment

This data flow is used within the Manage Transit function and contains information on the work assignment that has been given to the transit technician to carry out. It will involve some transit vehicle maintenance work. The data flow consists of the following data items each of which is defined in its own DDE:

transit_technician_identity
+ transit_vehicle_identity
+ transit_vehicle_maintenance_work.

transit_technician_work_hours

This data flow is used within the Manage Transit function and contains the number of hours per week, per month and per year that an individual transit technician is able to work. The identity of the technician is contained in a separate data flow. The data is sized at three (3) bytes to enable three indivdual values to be stored. .

transit_technician_work_log

This data flow is used within the Manage Transit function and contains the log of maintenance work carried out by an individual transit technician. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{date
+ time
+ transit_vehicle_identity
+ transit_vehicle_maintenance_work}.

transit_technician_work_preferences

This data flow is used within the Manage Transit function and contains the work preferences of an individual transit technician. They are defined as a series of up to eight (8) three character codes, which include but are not limited to the following:

DWO - day time working only
NWO - night time working only
WDO - weekday working only, i.e. no weekend working

LDH - limited day time hours
NWC - no working constraints, i.e. can work any hours on any days
LNH - limited night time hours
WOF - can work outside of the maintenance facility, e.g. on the road. .

transit_technician_work_skills

This data flow is used within the Manage Transit function and contains the skills that are possessed by an individual transit technician. These skills are defined as three (3) character codes as follows:

GMT - general maintenance technician (no specialities)
VES - vehicle engine specialist
VTS - vehicle transmission specialist
VRS - vehicle running gear specialist
VBS - vehicle body work specialist
TDL - has a transit vehicle driving license. .

transit_updates

This data flow is sent from the Manage Traffic function to the Manage Transit function and contains traffic data for use in transit operations, requsts for informations on transit services, or requests for changes to transit services to try and re-distribute traveler demand. It consists of the following data items each of which is defined in its own DDE:

parking_lot_transit_request
+ prediction_data
+ transit_conditions_demand_request
+ transit_ramp_priority_given
+ transit_roadway_priority_given
+ transit_services_demand_request
+ transit_services_changes_request.

transit_user_advanced_payment_at_roadside

This data flow is sent from the Manage Transit function to the Provide Electronic Payment Services function. It contains the cost of advanced payments that must be deducted from the credit currently stored on the payment instrument, being used by a transit user at the roadside, i.e. a transit stop. These advanced payments may cover tolls, and/or parking lot charges, and/or transit fares. The data flow consists of the following data items each of which is defined in its own DDE:

stored_credit
+ parking_lot_cost
+ toll_cost
+ transit_fare.

transit_user_advanced_payment_on_vehicle

This data flow is sent from the Manage Transit function to the Provide Electronic Payment Services function. It contains the cost of advanced payments that must be deducted from the credit currently stored on the payment instrument, being used by a transit user on-board a transit vehicle. These advanced payments may cover tolls, and/or parking lot charges, and/or transit fares. The data flow consists of the following data items each of which is defined in its own DDE:

stored_credit
+ parking_lot_cost
+ toll_cost
+ transit_fare.

transit_user_advisory_information

This data flow is used within the Provide Driver and Traveler Services function. It contains data to be converted into output displays for the transit user and includes the following data item which is defined in its own DDE:

advisory_data.

transit_user_advisory_information_request

This data flow is used within the Provide Driver and Traveler Services function and contains analyzed requests for the various types of transit user display. It contains the folowing data items each of which is defined in its own DDE:

advisory_display_type
+ advisory_data_scope.

transit_user_category

This data flow is used within the Manage Transit function and contains the category of transit user to which the associated transit fare applies, e.g. adult, child, senior citizen, disabled, etc. .

transit_user_emergency_request

This data flow is used within the Manage Transit function and contains a request for action because a transit user has identified an emergency situation on-board or close to a transit vehicle. Details of the transit vehicle identity and location are provided through accompanying data flows. .

transit_user_incident_input

This data flow is used within the Manage Transit function and contains the digitized input from the secure area environment in the transit operations network. This data will have been converted from its raw input form by sensors within the Manage Transit function. It is sized at sixteen (16) bytes to enable different classes and types of incident to be accommodated bearing in mind the wide range of facilities within a transit operations network. .

transit_user_journey_end

This data flow is used within the Manage Transit function. It contains the identity of the route segment at the end of a transit user's journey. The identity will be that at which the transit user will leave the transit vehicle at the end of the ride. The data flow consists of the following data item which is defined in its own DDE:

transit_route_segment_indentity.

transit_user_journey_start

This data flow is used within the Manage Transit function. It contains the identity of the route segment at the start of a transit user's journey. The identity will either be that of the transit stop at which the transit user purchases a ride, or the segment at which the transit vehicle was located when the transit user purchased a ride from on-board the vehicle. The data flow consists of the following data item which is defined in its own DDE:

transit_route_segment_indentity.

transit_user_payments_transactions

This data flow is used within the Provide Electronic Payment Services function and contains records of all payment transactions for the provision of other (yellow pages) services to transit users. .

transit_user_reservation_confirmation

This data flow is used within the Provide Driver and Traveler Services function to confirm any reservations made by the transit usler. It contains the following data items, each of which is defined in its own DDE:

transaction_number
+ traveler_identity
+ yellow_pages_cost
+ yellow_pages_dining_reservation_confirmation
+ yellow_pages_lodging_reservation_confirmation
+ yellow_pages_ticket_purchase_confirmation.

transit_user_reservation_request

This data flow is used within the Provide Driver and Traveler Services function by the transit user to make reservations for other (yellow pages) services. It contains the following data items, each of which is defined in its own DDE:

yellow_pages_dining_reservation
+ yellow_pages_lodging_reservation
+ yellow_pages_ticket_purchase.

transit_user_roadside_credit_identity

This data flow is sent from the Provide Electronic Payments Services function to the Manage Transit function and contains the credit identity of a transit user at the roadside, i.e. a transit stop. It is obtained as data input from the payment instrument terminator and consists of the following data item which is defined in its own DDE:

credit_identity.

transit_user_roadside_fare

This data flow is used within the Manage Transit function and contains details of the transit service that the transit user at the roadside, i.e. at a transit stop, is going to use and the required fare for using this sevice. It consists of the following data items each of which is defined in its own DDE:

transit_fare
+ transit_user_roadside_tag_identity.

transit_user_roadside_image

This data flow is sent from the Manage Transit function to the Provide Electronic Payment Services function. It contains an JPEG compressed image of the transit user who has violated the transit fare collection process at the roadside, i.e. at a transit stop. The data will be used in subsequent transit fare violation processing. .

transit_user_roadside_information

This data flow is used within the Manage Transit function. It contains the transit user's destination for the ride that is being requested. The destination will be provided as a character string of up to forty (40) bytes, from which the identity of the transit route segment that is at that point can be determined. .

transit_user_roadside_payment_response

This data flow is used within the Manage Transit function to provide an indication for output to the transit user at the roadside, i.e. a transit stop, that the previously submitted fare payment has been accepted (set to 1) or not (set to 999). .

transit_user_roadside_processed_fare_data

This data flow is used within the Manage Transit function and contains details of the transit service that the transit user at the roadside, i.e. a transit stop, is going to use and the required fare for using this sevice. It consists of the following data items each of which is defined in its own DDE:

transit_fare
+ transit_route_number
+ transit_route_segment_number
+ transit_route_use_time
+ transit_user_category.

transit_user_roadside_ride

This data flow is used within the Manage Transit function and contains details of the transit service that the transit user at the roadside, i.e. at a transit stop, is going to use so that the fare for this sevice can be calculated. It consists of the following data items each of which is defined in its own DDE:

transit_user_journey_end
+ transit_user_journey_start

+ transit_route_use_time
+ transit_user_category
+ transit_user_roadside_tag_identity.

transit_user_roadside_ride_data

This data flow is used within the Manage Transit function and contains details of the transit service that the transit user at the roadside, i.e. a transit stop, is going to use. It consists of the following data items each of which is defined in its own DDE:

transit_user_journey_end
+ transit_user_journey_start
+ transit_route_use_time
+ transit_user_category
+ transit_user_roadside_tag_identity.

transit_user_roadside_tag_data

This data flow is used within the Provide Electronic Payment Services function and contains the data that has been provided by the payment instrument being used by the transit user at the roadside. This may be either a credit identity, or the value of the credit currently stored by the payment instrument, to which transit fares may be charged. The data flow consists of the following items each of which is defined in its own DDE:

credit_identity
+ stored_credit.

transit_user_roadside_tag_identity

This data is used within the Manage Transit function. It provides the identity of a transit user, at the roadside, i.e. at a transit stop, for fare payment. The data flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ traveler_identity.

transit_user_transaction_buffer

This data store is used within the Manage Traffic function and contains batched records of on-vehicle fare transactions. These records are transmitted from the transit vehicle to the infrastructure for %034back-end%034 processing at a convenient time. The store contains approximately one operating shift's volume of tranaction_records and consists of the following data items each of which is defined in its own DDE:

list_size{transit_user_transaction_record}.

transit_user_transaction_queue

This data flow is used within the Manage Traffic function. It contains data retrieved from the transaction buffer for batch transmission to the Provide Electronic Payment Services function to request payment processing of one or more transit fare transactions from on-board a transit vehicle. This flow provides for both batch (low value/high usage) fare transactions (e.g. city bus routes). The size assumption below is based on assumptions about the number of transactions a single transit vehicle might accumulate in a single shift of operation. The flow consists of the following data items each of which is defined in its own DDE:

list_size{transit_user_transaction_record}.

transit_user_transaction_record

This data flow is used within the Manage Transit function. It is sent from the on-vehicle fare billing facility to the tranaction buffer to record a request for payment processing of a transit fare transaction from on-board a transit vehicle. This flow provides for batch (low value/high usage) fare transaction (e.g. city bus routes) processing. The flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ transit_fare
+ transit_route_number
+ transit_route_segment_number
+ transit_route_use_time
+ transit_user_category
+ traveler_identity.

transit_user_vehicle_credit_identity

This data flow is sent from the Provide Electronic Payments Services function to the Manage Transit function and contains the credit identity of a transit user on-board a transit vehicle, or a stored credit value. Either data items is obtained by a process within the Provide Electronic Payment Services fiunction as data input from the payment instrument terminator and consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit.

transit_user_vehicle_fare

This data flow is used within the Manage Transit function and contains details of the transit service that the transit user on a transit vehicle is going to use and the required fare for using this sevice. It consists of the following data items each of which is defined in its own DDE:

transit_fare
+ transit_user_vehicle_tag_identity.

transit_user_vehicle_image

This data flow is sent from the Manage Transit function to the Provide Electronic Payment Services function. It contains a compressed image of the transit user who has violated the transit fare collection process on-board a transit vehicle. The data will be used in subsequent transit fare violation processing. .

transit_user_vehicle_information

This data flow is used within the Manage Transit function and contains information\ about other services requested by a transit user on-board a transit vehicle. These other services will be for what are called %034yellow pages%034 services, e.g. hotels, restaurants, theaters, etc. .

transit_user_vehicle_payment_response

This data flow is used within the Manage Transit function to provide an indication for output to the transit user on-board a transit vehicle that the previously submitted fare payment has been accepted (set to 1) or not (set to 999). .

transit_user_vehicle_processed_fare_data

This data flow is used within the Manage Transit function and contains details of the transit service that the transit user on-board a transit vehicle is going to use and the required fare for using this sevice. It consists of the following data items each of which is defined in its own DDE:

transit_fare
+ transit_user_vehicle_tag_identity.

transit_user_vehicle_ride

This data flow is used within the Manage Transit function and contains details of the transit service that the transit user on a transit vehicle is going to use so that the fare for this sevice can be calculated. It consists of the following data items each of which is defined in its own DDE:

transit_user_journey_end
+ transit_user_journey_start

+ transit_route_use_time
+ transit_user_category
+ transit_user_vehicle_tag_identity.

transit_user_vehicle_ride_data

This data flow is used within the Manage Transit function. It contains details of the transit service that the transit user on a transit vehicle is going to use. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_use_time
+ transit_user_category
+ transit_user_journey_end
+ transit_user_journey_start
+ transit_user_vehicle_tag_identity.

transit_user_vehicle_tag_data

This data flow is used within the Provide Electronic Payment Services function and contains the data that has been provided by the payment instrument being used by the transit user on-board a transit vehicle. This may be either a credit identity, or the value of the credit currently stored by the payment instrument, to which transit fares may be charged. The data flow consists of the following items each of which is defined in its own DDE:

credit_identity
+ stored_credit.

transit_user_vehicle_tag_identity

This data is used within the Manage Transit function and provides the identity of a transit user on a transit vehicle for fare payment. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ traveler_identity.

transit_user_yellow_pages_information_data

This data store is used within the Provide Driver and Traveler Services function to hold data about yellow pages information that may be requested by drivers or transit users from on-board vehicles. It consists of the following data item which is defined in its own DDE:

yellow_pages_data.

transit_user_yellow_pages_output

This data flow is used within the Provide Driver and Traveler Services function and is used to provide the process that updates the store of transit user yellow pages data with the current set of data to which new data can be added or updated. It consists of the following data item which is defined in its own DDE:

transit_user_yellow_pages_information_data.

transit_user_yellow_pages_update

This data flow is used within the Provide Driver and Traveler Services function and is a new copy of transit user yellow pages data from the process that updates the store of that data. It consists of the following data item which is defined in its own DDE:

transit_user_yellow_pages_information_data.

transit_vehicle_achieved_time

This data flow is used within the Manage Transit function and contains the time at which a transit vehicle actually reached the end of a transit route segment. This point is usually a transit stop and the data is thus the arrival time of a transit vehicle at each of the transit stop(s) along the transit route. The identity of the

transit route segment to which this data applies is carried in an accompanying data flow. The data flow consists of the following data item which is defined in its own DDE:

time.

transit_vehicle_advanced_payment_request

THis data flow is used within the Manage Transit function and contains data about advanced fares and tolls requested by travelers (as transit users) from on-board transit vehicles. It consists of the following data items each of which is defined in its own DDE:

advanced_charges
+ advanced_tolls
+ transit_vehicle_location.

transit_vehicle_advanced_payment_response

This data flow is used within the Manage Transit function and contains contains the result of the requested advanced payment transaction from a traveler (as a transit user) in a transit vehicle. It consists of the following data items each of which is defined in its own DDE:

advanced_charges_confirm
+ advanced_tolls_confirm
+ confirmation_flag
+ transit_vehicle_identity.

transit_vehicle_arrival_conditions

This data flow is used within the Manage Transit function and contains the deviations from the published data of a transit service. This data is for output to the intermodal transportation service providers so that adjustments can be made to their services to enable transit users to make their connections at modal interchange points. .

transit_vehicle_arrival_deviations

This data flow is used within the Manage Transit function and contains the deviation from the published service of a transit vehicle. This data is for output to the intermodal transportation service providers so that their services may be adjusted to enable transit users on the vehicle to make their connections at modal interchange points. .

transit_vehicle_arrival_time

This data flow is used within the Manage Transit function. It contains the estimated time of arrival of a transit vehicle at a stop plus the route and service number on which it is operating. .

transit_vehicle_arrival_times

This data flow is used within the Manage transit function. It contains the time at which it is expected that a transit vehicle will reach defined the end of transit_route segments on its route and is used to determine any schedule deviations. The end of a transit route segment is usually a transit stop and the data is thus the expected arrival time of a transit vehicle at each of the transit stop(s) along the transit route. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ list_size
+ list_size{transit_route_segment_number
    + transit_stop_scheduled_time}.

transit_vehicle_availability

This data flow is used within the Manage Transit function and contains details of a transit vehicle's availability for work. .

Additional sizing assumptions:

SIZE=2;

transit_vehicle_collected_maintenance_data

This data flow is used by processes within the Manage Transit function and contains data collected from the transit vehicle. The data is produced by sensors analyzing conditions on-board the vehicle during the course of its operation. The data flow consists of the following data items each of which is defined in its own DDE:

transit_vehicle_mileage_accumulated
+ transit_vehicle_operating_condition.

transit_vehicle_collected_maintenance_data_request

This data flow is used by processes within the Manage Transit function and contains a request for data collected on-board the transit vehicle. The data is produced by sensors analyzing conditions on-board the vehicle during the course of its operation. .

transit_vehicle_collected_trip_data

This data flow is used by processes within the Manage Transit function and contains data collected from the transit vehicle. The data is produced by sensors analyzing conditions on-board the vehicle during the course of its operation. The data flow consists of the following data items each of which is defined in its own DDE:

transit_vehicle_passenger_loading
+ transit_vehicle_running_times.

transit_vehicle_corrective_instructions

This data flow is used within the Manage Transit function and contains instructions for a transit vehicle driver that will enable the service being currently operatoed by the vehicle to be brought back to its planned and published schedule. The instructions will be output to the driver by an interface process. .

transit_vehicle_data

This data flow is used by processes within the Manage Transit function and contains data about transit vehicles in the fleet operated by the function. This data is used in the planning of routes and schedules for regular transit services. It will have been obtained from processing the input to sensors on-board each transit vehicle during the course of their operation. The data flow consists of the following items each of which is defined in its own DDE:

list_size
+ list_size{transit_vehicle_identity + transit_vehicle_passenger_loading}.

transit_vehicle_deviation_data

This data flow is used within the Manage Transit function and contains data showing to what extent a transit vehicle has departed from its published service, i.e. by how much it is running early of late, or any departure from the published route. This data is for output to the transit vehicle driver. .

transit_vehicle_deviation_request

This data flow is sent by the Provide Driver and Traveler Services function to the Manage Transit function. It contains a request for the provision of data on the current transit service deviations for output to a traveler at a kiosk. .

transit_vehicle_deviation_update

This data flow is used within the Manage Transit function. It contains the estimated time of arrival of several transit vehicles at stop(s) along their route(s) plus the route and service number on which they are operating. It is used for multiple transit vehicle deviations where one or more routes are affected and consists of the following data items each of which is defined in its own DDE:

list_size
+ 1{transit_vehicle_identity
  + transit_vehicle_time
  + transit_route_number
  + transit_route_segment_number}list_size.

transit_vehicle_deviations

This data flow is used within the Manage Transit function and contains the deviations of a transit vehicle from its published schedule. It is used in calculating the return to the published schedule where the deviation is minor and applies to a single vehicle. .

transit_vehicle_deviations_details

This data flow is used within the Manage Transit function. It contains details of the deviations of transit vehicles from their published routes and schedules and is used as a source of data to be sent to processes in other functions. The data flow consists of the following data items each of which is defined in is own DDE:

transit_vehicle_eta
+ transit_vehicle_collected_trip_data
+ transit_vehicle_deviation_update
+ transit_vehicle_location
+ transit_vehicle_schedule_deviations.

transit_vehicle_deviations_details_request

This data flow is used within the Manage Transit function. It contains a request for output of the details of the deviations of transit vehicles from their published routes and schedules for use as a source of data to be sent to processes in other functions. .

transit_vehicle_deviations_from_schedule

This data flow is used within the Manage Transit function and contains the deviations of a transit vehicle from its published schedule. It is used in calculating the return to the published schedule where the deviation is major and/or it applies to several vehicles on a particular route. .

transit_vehicle_eta

This data flow is used within the Manage Transit function. It contains the estimated time of arrival of a transit vehicle at the end of a transit route segment, which is usually a stop, plus the route and service number on which it is operating. It is used for individual transit vehicle deviations and contains the following data items each of which is defined in its own DDE:

transit_vehicle_identity
+ transit_vehicle_time
+ transit_route_number.

transit_vehicle_fare_collection_data

This data store is used within the Manage Transit function. It contains details of the transit fare transactions that have been processed on the vehicle as a result of transit users coming on-board and requesting rides that they have not paid for at the roadside, i.e. a tramsit stop. The data flow is sized to accommodate data from the maximum number of transit users that are expected to use a transit on one run along its route. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_fare_collection_data}.

transit_vehicle_fare_collection_method

This data flow is used within the Manage Transit function and the Provide Electronic Payment Services function. It contains an indication of which a batch or interactive method is being used for processing the fare collection data. The data flow is sized at a single (1) byte so that a character can be used to identify the method. The characters that will be used are 'I' for interactive and 'B' for batch. .

transit_vehicle_fare_data

This data flow is sent by the Provide Electronic Payment Services function to the Manage Transit function and contains details of the fares being currently charged for regular transit services. It is for use in calculating fares that are to be paid by transit users on-board a transit vehicle and consists of the following data

item which is defined in its own DDE:

transit_fares.

transit_vehicle_fare_payment_confirmation

This data flow is used within the Provide Electronic Payment Services function and contains confirmation that the previous request for the cost of the current transit fare has been deducted from the credit currently stored by the transit user's payment instrument has been completed successfully. The data flow is used when the transit user is paying for the transit fare on-board a transit vehicle and consists of the following data item which is defined in its own DDE:

confirmation_flag.

transit_vehicle_fare_payment_debited

This data flow is used within the Provide Electronic Payment Services function and contains confirmation that the cost of the current transit fare will be deducted by the financial institution from the credit identity previously provided by the payment instrument being used by the transit user at the roadside. It is only sent when a credit identity has been previously received from the payment instrument. The data flow consists of the following data item which is defined in its own DDE:

confirmation_flag.

transit_vehicle_fare_payment_request

This data flow is used within the Provide Electronic Payment Services function and contains the request for the cost of the current transit fare to be deducted from the credit currently stored by the transit user's payment instrument, when it is being used on-board a transit vehicle. It is only sent when a value of stored credit has been previously received from the payment instrument. The data flow consists of the following data item which is defined in its own DDE:

transit_fare.

transit_vehicle_identity

This data flow is used within the Manage Transit function and contains the identity of an individual transit vehicle. This data is used by processes within the function to identify the source and/or ownership of other data. .

transit_vehicle_information

This data flow is used by processes within the Manage Transit function and contains data about an individual transit vehicle. It consists of the following data items each of which is defined in its own DDE:

transit_vehicle_collected_trip_data
+ transit_vehicle_collected_maintenance_data
+ transit_vehicle_eta
+ transit_vehicle_deviation_update
+ transit_vehicle_identity
+ transit_vehicle_location
+ transit_vehicle_schedule_deviations.

transit_vehicle_junction_preemption

This data flow is sent from the Manage Transit function to the Manage Traffic function and contains data necessary for a transit vehicle to be given preemption (priority) at an indicator that is particular set of junction control signals. The data flow is sent directly from the transit vehicle to the junction controller, which is assumed to be capable of giving priority to the correct phase(s) for any received preemption request. The data flow is sized at one (1) byte to enable the preemption request to be sent. .

transit_vehicle_location

This data flow is used within the Manage Transit function to provide the exact

location of the transit vehicle. It contains the transit vehicle location plus the its identity and consists the following items each of which is defined in its own DDE:

transit_vehicle_identity
+ transit_vehicle_location_data.

transit_vehicle_location_data

This data flow is used within the Manage Transit function to provide the exact location of the transit vehicle. It is based on the standard vehicle location data supplemented with additional data that is only relevant to transit vehicles. The data flow consists of the following data item which is defined in its own DDE:

location_identity.

transit_vehicle_location_for_deviation

This data flow is used within the Manage Transit function to provide the exact location of the transit vehicle for the calculation of any return to schedule scenarios. It contains the transit vehicle location plus the its identity and consists the following items each of which is defined in its own DDE:

transit_vehicle_identity
+ transit_vehicle_location_data.

transit_vehicle_location_for_eta

This data flow is used within the Manage Transit function to provide the exact location of the transit vehicle for calculation of its estaimated time of arrival (eta). It contains the transit vehicle location plus the its identity and consists the following items each of which is defined in its own DDE:

transit_vehicle_identity
+ transit_vehicle_location_data.

transit_vehicle_location_for_store

This data flow is used within the Manage Transit function to provide the exact location of the transit vehicle for storage so that it can be used by other facilities and functions within ITS. It contains the transit vehicle location plus the its identity and consists the following items each of which is defined in its own DDE:

transit_vehicle_identity
+ transit_vehicle_location_data.

transit_vehicle_maintenace_date

This data flow is used within the Manage Transit function. It contains the date on which unscheduled maintenance activity on a particular transit vehicle must take place and is used as one of the identifiers of data within the vehicle's maintenance log. The vehicle's identity is stored in a separate data flow. The data flow consists of the following data item which is defined in its own DDE:

date.

transit_vehicle_maintenance

This data flow is used within the Manage Transit function. It contains data on the need for maintenance of an individual transit vehicle based on its current condition. This maintenance work will be in addition to the maintenance that is scheduled to take place because the vehicle has covered a proscribed number of miles, or has achieved a certain age. The data flow is sized to accommodate one hundred and twenty entries enabling it to cover up to ten (10) years of the vehicle's life. It consists of the following data items each of which is defined in its own DDE:

120{transit_vehicle_maintenace_date
+ transit_vehicle_maintenance_mileage
+ transit_vehicle_maintenance_required}.

transit_vehicle_maintenance_data

This data flow is used within the Manage Transit function and contains maintenance data for a transit vehicle. This is for output to the transit fleet manager and is sent in response to a request for data received from the manager. The data flow consists of the following data items each of which is defined in its own DDE:

transit_vehicle_identity
+ transit_vehicle_maintenance.

transit_vehicle_maintenance_data_request

This data flow is used within the Manage Transit function. It contains a request for the output of transit vehicle maintenance data to the transit fleet manager from the store of this data. The data flow consists of the following data item which is defined in its own DDE:

transit_vehicle_identity.

transit_vehicle_maintenance_data_update

This data flow is used within the Manage Transit function. It contains updates for the transit vehicle maintenance data, provided by the transit maintenance personnel. .

Additional sizing assumptions:

SIZE=64;

transit_vehicle_maintenance_details

This data flow is used within the Manage Transit function and contains information about the maintenance required by an individual transit vehicle of a particular type. .

Additional sizing assumptions:

SIZE=4096;

transit_vehicle_maintenance_information

This data flow is used within the Manage Transit function and contains data on the need for maintenance of an individual transit vehicle based on its current condition. .

Additional sizing assumptions:

SIZE=1024000;

transit_vehicle_maintenance_log

This data flow is used within the Manage Transit function. It contains a log of the maintenance carried out on an individual transit vehicle, the identity of which is stored in a separate data flow. The data flow is sized to enable the data for ten (10) years to be stored, assuming that maintenance activity of one type or another takes place every day. It consists of the following data items each of which is defined in its own DDE:

3650{transit_vehicle_maintenance_log_time
+ transit_vehicle_maintenance_log_date
+ transit_vehicle_maintenance_log_activity
+ transit_vehicle_maintenance_log_mileage}.

transit_vehicle_maintenance_log_activity

This data flow is used within the Manage Transit function. It contains a brief description of the maintenance activity that has taken place on a particular transit vehicle took place. The vehicle's identity, plus the date, time and mileage at which the activity tokk place are stored in separate data flows. The data flow is sized at thrity two (32) bytes to accommodate a simple brief description of the activity. .

transit_vehicle_maintenance_log_data

This data flow is used within the Manage Transit function. It contains data for recording in the transit vehicle maintenance log that is held in the store of transit vehicle operations data. .

transit_vehicle_maintenance_log_date

This data flow is used within the Manage Transit function. It contains the date at which maintenance activity on a particular transit vehicle took place and is used as one of the identifiers of data within the vehicle's maintenance log. The vehicle's

identity is stored in a separate data flow. The data flow consists of the following data item which is defined in its own DDE:

date.

transit_vehicle_maintenance_log_mileage

This data flow is used within the Manage Transit function. It contains the vehicle mileage at which maintenance activity on a particular transit vehicle took place and is used as one of the identifiers of data within the vehicle's maintenance log. The vehicle's identity is stored in a separate data flow. The data flow is sized at three (3) bytes to enable mileage figures in excess of one million to be accommodated, as this is not unusual for this type of vehicle. .

transit_vehicle_maintenance_log_time

This data flow is used within the Manage Transit function. It contains the time at which maintenance activity on a particular transit vehicle took place and is used as one of the identifiers of data within the vehicle's maintenance log. The vehicle's identity is stored in a separate data flow. The data flow consists of the following data item which is defined in its own DDE:

time.

transit_vehicle_maintenance_mileage

This data flow is used within the Manage Transit function. It contains the mileage at which unscheduled maintenance activity on a particular transit vehicle must take place and is used as one of the identifiers of data within the vehicle's maintenance log. The vehicle's identity is stored in a separate data flow. The data flow is sized at three (3) bytes to enable mileage figures in excess of one million to be accommodated, as this is not unusual for this type of vehicle. .

transit_vehicle_maintenance_required

This data flow is used within the Manage Transit function. It contains a brief description of the unscheduled maintenance activity that must take place on a particular transit vehicle. The vehicle's identity, plus the date and mileage at which the activity must take place are stored in separate data flows. The data flow is sized at thrity two (32) bytes to accommodate a simple brief description of the activity. .

transit_vehicle_maintenance_schedule

This data flow is used within the Manage Transit function. It contains the schedule for the maintenance of an individual transit vehicle. The identity of the vehicle is stored in a separate data flow. The data flow is sized so that a maximum of one hundred and twenty (120) data based entries plus two hundred (200) mileage based entries can be accommodated. This should enable the schedule to last for ten (10) years. It consists of the following data items each of which is defined in its own DDE:

320{transit_vehicle_maintenance_schedule_date
+ transit_vehicle_maintenance_schedule_mileage
+ transit_vehicle_maintenance_schedule_activity}.

transit_vehicle_maintenance_schedule_activity

This data flow is used within the Manage Transit function. It contains a brief description of the maintenance activity that is to be carried out on a transit vehicle, either when it achieves a particular mileage, or an a particular date. Both mileage and date will be measured from the date of the vehicle's manufacture and are stored in separate data flows within the store of the maintenance schedules. The data flow is sized at thrity two (32) bytes to enable a brief description of the required maintenance activity to be accommodated. .

transit_vehicle_maintenance_schedule_data

This data flow is used within the Manage Transit function and contains the schedule for the maintenance of an individual transit vehicle. .

Additional sizing assumptions:

SIZE=2048000;

transit_vehicle_maintenance_schedule_date

This data flow is used within the Manage Transit function. It contains the date on which maintenance activity must take place on a transit vehicle. This date will be related to the date of manufacture of the vehicle and will ensure that if the vehicle covers no more than the expected number of miles it will be serviced on particular dates. Vehicles exceeding the expected mileage will be serviced on a miles covered basis, which is stored in a separate data flow within the store of the maintenance schedules. The data flow consists of the following data item which is defined in its own DDE:

date.

transit_vehicle_maintenance_schedule_mileage

This data flow is used within the Manage Transit function. It contains the mileage at which maintenance activity must take place on a transit vehicle. This will be the number of miles that the vehicle has covered since manufacture and will ensure that if is regularly maintained if its mileage exceeds that which is expected. Those vehicles covering no more than the expected mileage will be serviced on particular dates, which are defined in a separate data flow within the store of maintenance schedules. The data flow is sized at three (3) bytes to accommodate mileage figures in the millions as this is not uncommon for this type of vehicle. .

transit_vehicle_maintenance_specs

This data flow is used within the Manage Transit function and contains the mantenance specifications for individual transit vehicles by type and identity. It is used by processes within the Manage Transit function and contains the following data items each of which is defined in its own DDE:

transit_vehicle_identity
+ transit_vehicle_type
+ transit_vehicle_maintenance_details.

transit_vehicle_maintenance_specs_update

This data flow is used within the Manage Transit function. It contains updated transit vehicle maintenance specifications. The data flow consists of the following data items each of which is defined in its own DDE:

transit_vehicle_identity
+ transit_vehicle_maintenance_specs.

transit_vehicle_maintenance_verification_results

This data flow is used within the Manage Transit function and contains vefification that maintenance of a transit vehicle has been successfully completed. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ transit_technician_identity
+ transit_technician_work_assignment
+ transit_vehicle_identity.

transit_vehicle_maintenance_work

This data flow is used within the Manage Transit function and contains information on the maintenance work to be carried out an a transit vehicle. It is sized at thirty (30) bytes to enable up to ten (10) three character codes to be used to define a range of maintenance activities. These will include but no tbe limited to the following:

CEO - change engine oil
CEW - change engine cooling water
AAW - add anti-freeze to engine colling water
CSW - check driver's windshield washer system and top up if necessary
CEF - check engine fluid levels and top up if necessary
CBL - check vehicle battery levels and top up if necessary

CBS - check vehicle brakes and replace pads and/or top up fluid levels if necessary
CMM - carry out maintenance based on vehicle mileage
CEV - clean external of vehicle
CIV - clean interior of vehicle
CTS - check transmission state and top up fluid levels if necessary
CRG - check vehicle running equipment (springs, dampers, muffler, etc.) .

transit_vehicle_mileage_accumulated

This data flow is used by processes within the Manage Transit function and contains the total mileage accumulated by a transit vehicle. It is sized at three (3) bytes to enable a realistic total mileage value to be accommodated, e.g. over one million miles is probably not unreasonable for a transit vehicle during its operating life. .

transit_vehicle_on_board_data

This data flow is used within the Manage Transit function and contains data that is used to supplement other data giving the transit vehicle's location to locate the vehicle to a very high degree of accuracy. An example of the type of data provided is passenger doors open or closed. .

transit_vehicle_operating_condition

This data flow is used by processes within the Manage Transit function and contains the status of transit vehicle's drive-line, e.g. high temperature, low oil pressure, etc., plus other operating conditions such as brake wear, internal lighting failures, incorrect operation of the environmental control unit, etc. .

transit_vehicle_operating_data

This data store is used within the Manage Transit function and contains information collected from each transit vehicle in the fleet operated by the function about the way in which it is operating. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_vehicle_eta
    + transit_vehicle_collected_maintenance_data
    + transit_vehicle_collected_trip_data
    + transit_vehicle_deviation_update
    + transit_vehicle_location
    + transit_vehicle_schedule_deviations}.

transit_vehicle_operational_data

This data flow is used within the Manage Transit functiona and contains operational data collected from transit vehicles whislt in service. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_vehicle_availability
    + transit_vehicle_data
    + transit_vehicle_passenger_data}.

transit_vehicle_operations_data

This data store is used within the Manage Transit function. It contains maintenance and other information about transit vehicles for use by processes within the schedule transit vehicle maintenance facility. The data store consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_vehicle_identity
    + transit_vehicle_operations_details}.

transit_vehicle_operations_details

This data flow is used within the Manage Transit function. It contains information about the maintenance of a transit vehicle. The data flow consists of the following data items each of which is defined in its own DDE:

transit_vehicle_maintenance_specs
+ transit_vehicle_maintenance_log
+ transit_vehicle_maintenance_schedule
+ transit_vehicle_maintenance.

transit_vehicle_passenger_capacity

This data flow is used within the Manage Transit function and defines the number of passengers that can be carried by a particular transit vehicle. .

Additional sizing assumptions:

SIZE=1;

transit_vehicle_passenger_data

This data flow is used within the Manage Transit function and contains the number of passengers carried by a transit vehicle whilst in service. It is derived from on-board vehicle fare collection data and may be used for calculating future transit schedules. It consists of the following data items each of which is defined in its own DDE:

transit_passenger_numbers
+ transit_route_number
+ transit_route_segment_number
+ transit_route_use_time
+ transit_user_category
+ transit_vehicle_identity.

transit_vehicle_passenger_loading

This data flow is used by processes within the Manage Transit function and contains the number of passengers (transit users) carried by a transit vehicle on each part of its route, i.e. each transit route segment. The data flow consists of the following data items each of which is defined in its own DDE:

transit_vehicle_identity
+ transit_route_number
+ list_size
+ list_size{transit_route_segment_number + transit_vehicle_passengers}.

transit_vehicle_passenger_operational_data

This data flow is used within the Manage Transit function and contains the number of passengers carried by a transit vehicle whilst in service. It is derived from the numbers of passengers on the vehicle for eacht transit route segment as counted by on-board vehicle sensors. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_route_segment_number + transit_vehicle_passengers}.

transit_vehicle_passengers

This data flow is used within the Manage Transit function and contains a count of the number of passengers (transit users) that were on-board a transit vehicle on a particular transit route segment. This data is measured by counting the numbers of transit users that enter and leave the vehicle at each transit stop, and is determined independently of any transit fare collection process. The size has been set at two bytes to enable the number of passengers on a transit vehicle to reach a maximum of 37267, which may be possible with multi-carriage units of the type employed on some metro and mass-transit systems. .

transit_vehicle_pedestrian_preemption

This data flow is sent from the Manage Transit function to the Manage Traffic function and contains data necessary for a transit vehicle to be given preemption (priority) at an indicator that is particular set of pedestrian signals. The data flow is sent directly from the transit vehicle to the pedestrian controller, which is

assumed to be capable of giving priority to the correct phase. The data flow is sized at one (1) byte to enable the preemption request to be sent. .

transit_vehicle_preemption_request

This data flow is used within the Manage Transit function. It contains a request for the output of the preemption signal from a transit vehicle to traffic management equipment at the roadside. .

transit_vehicle_ramp_preemption

This data flow is sent from the Manage Transit function to the Manage Traffic function and contains the data necessary for a transit vehicle to be given preemption (priority) at an indicator that is particular set of highway entry ramp control signals. The data flow is sent directly from the transit vehicle to the ramp controller, which is assumed to be capable of giving priority to the correct ramp or lane if multiple ramps or lanes are involved. .

transit_vehicle_roadway_preemptions

This data flow is sent from the Manage Transit function to the Manage Traffic function and contains data necessary for an individual transit vehicle to be given preemption (priority) at indicator controllers. This will be at the controller for a particular road junction, pedestrian crossing, or highway entrance ramp. The data is sent directly from the transit vehicle to the next controller along its route and therefore is not subject to any centralized coordination. Local coordination may be provided if there are links between adjacent controllers. The data flow consists of the following data items each of which is defined in its own DDE:

transit_vehicle_junction_preemption
+ transit_vehicle_pedestrian_preemption
+ transit_vehicle_ramp_preemption
+ transit_vehicle_sign_preemption.

transit_vehicle_running_times

This data flow is used within the Manage transit function. It contains the time at which it is expected that a transit vehicle will reach the end of each transit route segment on its route and is used to determine any schedule deviations. The end of a transit route segment is usually a transit stop and the data is thus the expected arrival time of a transit vehicle at each of the transit stop(s) along the transit route. The data flow consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ list_size
+ list_size{transit_route_segment_number
    + transit_stop_scheduled_time}.

transit_vehicle_schedule_deviation

This data flow is used within the Manage Transit function and contains the deviation of a transit vehicle from its published schedule. .

Additional sizing assumptions:

SIZE=32;

transit_vehicle_schedule_deviations

This data flow is sent from the Manage Transit function to processes in the Provide Driver and Traveler Services function. It contains the deviations of transit vehicles from their published routes and schedules at transit route segments that have already been completed, i.e. at transit stops that have been passed by the vehicle. The data is used to provide information about the current state of the transit service operation to a traveler, and consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{transit_vehicle_identity
    + transit_vehicle_achieved_time

+ transit_route_number
+ transit_route_segment_number}.

transit_vehicle_sign_preemption

This data flow is sent from the Manage Transit function to the Manage Traffic function and contains data necessary for a transit vehicle to have a message output giving it preemption (priority) at an indicator that is a particular variable message sign (vms) or fixed message sign that has a transit priority message that can be displayed. The data flow is sent directly from the transit vehicle to the sign controller and may consist of either a single alphanumeric character that will enable the sign controller to output the correct message from its list of known messages, or a string of up to twenty (20) alphanumeric characters for a controller driving a vms. .

transit_vehicle_status

This data flow is used to pass information about the transit vehicle to the maintenance facility and contains data that has been collected and processed by sensors on-board the vehicle. If consists of the following data items each of which is defined in its own DDE:

transit_vehicle_collected_maintenance_data
+ transit_vehicle_identity
+ transit_vehicle_location.

transit_vehicle_time

This data flow is used within the Manage Transit function. It contains the estimated time of arrival of a transit vehicle at the end of the next transit route segment not so far reached during its journey along the transit route. The end of a transit route segment is usually a transit stop and the data is thus the estimated arrival time of a transit vehicle at each of the remaining transit stop(s) along the transit route. The identity of the transit route segment to which this data applies is carried in an accompanying data flow. The time is stored as a seven (7) character string in the format 'hhmmssd'. The first six characters show the time using the 24-hour clock system, whilst the last character is an indicator to show whether the time applies to the day on which the schedule started, or the next day.. .

transit_vehicle_type

This data flow identifies transit vehicles by their type and is used by processes within the Manage Transit function. .

Additional sizing assumptions:

SIZE=2;

transit_vehicle_user_data

This data flow is used within the Manage Transit function and contains data about a transit vehicle for automatic output to transit users at transit stops. The data is output at the transit stop as the vehicle approaches and contains information about the vehicle such as the route number. It therefore consists of the following data items each of which is defined in its own DDE:

transit_route_number
+ transit_vehicle_time.

transit_video_camera_command

This data flow is used within the Manage Transit function and contains control parameters for closed circuit television (cctv) systems located in the secure area environment. These parameters may cover things such as camera pan, tilt, and zoom, plus other picture controls. .

transit_video_camera_image

This data flow is used within the Manage Transit function and contains video image data. This will have been received by closed circuit television (cctv) systems located in the secure area environment and may contain images of incidents. .

transportation_planner_inputs

This data flow is used to pass on the transportation engineer's requests for actin by processes

in the Plan System Deployment function. It contains the following data items, which may not be used
all at once, each of which is defined in its own DDE:

generation_request
+ evaluation_request
+ simulation_request
+ documentation_request.

transportation_planner_outputs

This data flow is used within the Plan System Deployment function to direct output from the various processes to the transportation engineer. It contains the following data items each of which is defined in its own DDE:

network_store_data_output
+ network_simulation_data
+ network_evaluation_results
+ documentation_output.

traveler_advanced_payments_confirm

This data flow is used within the Provide Electronic Payment Services function and contains confirmation that a request for the advanced payment of the tolls, and/or parking lot charges, and/or transit fares, for a trip plan which has been accepted bt the traveler. It consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ advanced_tolls_confirm
+ advanced_fares_confirm
+ advanced_parking_lot_charges_confirm.

traveler_advanced_payments_request

This data flow is used within the Provide Electronic Payment Services function and contains a request for advanced payment of the tolls, and/or parking lot charges, and/or transit fares for a trip which a traveler has confirmed. It consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ credit_identity
+ toll_route_segments
+ ride_segments
+ parking_space_details.

traveler_current_condition_request

This data flow is used within the Provide Driver and Traveler Services function and contains a request for details of the current conditions, e.g. weather, events, incidents, etc. The request includes the identity of the kiosk from which the request was input by the traveler so that the response can be correctly returned. The data flow consists of the following item which is defined in its own DDE:

kiosk_identity.

traveler_guidance_accepted

This data flow is used within the Provide Driver and Traveler Services function and contains the acceptance by the traveler of the previously provided route for autonomous or on-line guidance. Acceptance must be provided before guidance can begin. The data flow consists of the following data item which is defined in its own DDE:

route_identity.

traveler_guidance_data

This data flow is used within the Provide Driver and Traveler Services function and

contains data input by the traveler to a personal portable device that is to be used in a guidance request. It consists of some or all of the following data items each of which is defined in its own DDE:

origin
+ destination
+ desired_arrival_time
+ modes
+ preferred_routes
+ preferred_alternate_routes
+ preferred_ridesharing_options
+ preferred_route_segments
+ preferred_transit_options
+ constraint_on_acceptable_travel_time
+ constraint_on_number_of_mode_changes
+ constraint_on_number_of_transfers
+ constraint_on_eta_change
+ constraint_on_special_needs.

traveler_guidance_instructions

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the next route segment to be followed by the traveler in the form of which side of the road to walk, which cycle track to use, which transit service to take, etc. .

traveler_guidance_request

This data flow is used within the Provide Driver and Traveler Services function and is used to request on-line dynamic or autonomous guidance for the traveler using a personal portable device. The choice of the type of guidance made by the traveler is shown by the character used in the data flow and will be 'D' for infrastructure based dynamic, and 'A' for totally autonomous, i.e. no contact with anything outside the personal portable device, except for broadcast data used to determine location. .

traveler_guidance_route

This data flow is used within the Provide Driver and Traveler Services function and contains the data for a traveler's route which has been produced following a route request from the traveler. It consists of the following data items each of which is defined in its own DDE:

route_identity
+ traveler_route
+ traveler_identity.

traveler_identity

This data flow is used within the Provide Driver and Traveler Services function and contains the identity of the traveler who is making a request for information or guidance, so that the results of the request can be sent back to the originating traveler. It may be passed to processes in functions outside the Provide Driver and Traveler Services function for the same purpose. The identity can be up to twenty four (24) alphanumeric characters so that (for example) the traveler's family name and initials can be used. .

traveler_identity_store

This store is used within the Provide Driver and Traveler Services function and holds the identity of the traveler's Personal Portable Device (PPD). This will be pre-loaded into the PPD during its manufacture and can be associated with its owner. .

traveler_input_request

This data flow is used within the Provide Driver and Traveler Services function to request the input of data needed for a route request and which is not already present in the function's internal data stores. .

traveler_location

This data flow is used within the Provide Driver and Traveler Services function and contains the traveler's location as computed from sensor data.

location_identity.

traveler_location_for_autonomous_guidance

This data flow is used within the Provide Driver and Traveler Services function and contains the traveler's location as computed from sensor data. This is a high precission data flow that enables the location of the traveler to be pin-pointed to a high degree of accuracy and is used for traveler autonomous guidance purposes.

location_identity.

traveler_location_for_dynamic_guidance

This data flow is used within the Provide Driver and Traveler Services function and contains the traveler's location as computed from sensor data. This is a high precission data flow that enables the location of the traveler to be pin-pointed to a high degree of accuracy and is used for traveler dynamic guidance purposes.

location_identity.

traveler_location_for_emergencies

This data flow is used within the Provide Driver and Traveler Services function and contains the traveler's location as computed from sensor data. This is a high precision data flow that enables the location of the traveler to be pin-pointed to a high degree of accuracy and is used to provide the destination for the emergency services to the emergency call-out message.

location_identity.

traveler_location_for_information

This data flow is used within the Provide Driver and Traveler Services function and contains the traveler's location as computed from sensor data. This is a high precision data flow that enables the location of the traveler to be pin-pointed to a high degree of accuracy and is used to filter personal information data output.

location_identity.

traveler_location_for_planning

This data flow is used within the Provide Driver and Traveler Services function and contains the traveler's location as computed from sensor data. This is a high precission data flow that enables the location of the traveler to be pin-pointed to determine the orogin for trip planning requests and to act as a filter for traffic and travel information.

location_identity.

traveler_map_database

This data flow is used by the Provide Driver and Traveler Services function. It contains details of the physical geometry of each segment of roads, transit routes, pathways, cycleways, etc. which may be used by a traveler. This data includes the location of such things as signs, bends, junctions, traffic lanes, transit stops, and their use, etc. For each segment, where available it also contains the historical average link journey time and queing time computed from data recorded over the last several months, and available for different time of the day/days of the week, to take account of peak travel times, weekend travel etc. .

traveler_map_update_payment_request

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function and contains a request that payment be made for an update of the navigable map database used by the traveler for on-line personal guidance. The payment will be made by debiting the credit identity with the cost through the financial institution terminator. It consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ credit_identity
+ navigable_map_traveler_update_cost.

traveler_map_update_payment_response

This data flow is sent from the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function and contains the response to a previous request from the traveler that payment be made for an update of the navigable map database used for on-line traveler guidance. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ traveler_identity.

traveler_map_update_payments_transactions

This data flow is used within the Provide Payment Electronic Services function and contains records of all payment transactions for driver map updates. .

Additional sizing assumptions:

SIZE=128;

traveler_map_update_request

This data flow is used within the Provide Driver and Traveler Services function and contains a request for an update of the navigable map database used for on-line traveler personal guidance. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ traveler_identity.

traveler_map_update_response

This data flow is used within the Provide Driver and Traveler Services function and contains the response to a previous request from the traveler for an update of the navigable map database used for on-line traveler guidance. If payment is to be made by reducing the credit stored on-board the payment instrument in the vehicle then the update cost and stored credit data items will have non-zero values. If these values are set to zero then the payment transaction will have been made through the financial institution using the previously supplied credit identity. The success of this transaction will be indicated by the confirmation flag data item. The data flow consists of the following data items and others each of which is defined in its own DDE:

confirmation_flag
+ navigable_map_traveler_update_cost
+ stored_credit
+ traveler_identity.

traveler_other_services_payment_request

This data flow is used to send traveler payment information for the confirmed use of other (yellow pages) services that my (or may not) be part of a confirmed trip from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function. It contains the following data items each of which is defined in its own DDE:

traveler_identity
+ credit_identity
+ yellow_pages_dining_reservation
+ yellow_pages_lodging_reservation
+ yellow_pages_ticket_purchase.

traveler_other_services_payment_result

This data flow is sent by the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function to indicate the payment for a confirmed trip has been

successfully completed. It consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ other_serivces_payment_confirm.

traveler_payment_confirmation

This data flow is used within the Provide Driver and Traveler Services function to indicate the payment for a confirmed trip has been successfully completed., or that the total cost can now be deducted from the credit stored on the traveler's payment instrument The request for payment will have been initiated by input from the traveler to a kiosk. The data flow consists of the following data items each of which is defined in its own DDE:

advanced_tolls_confirm
+ advanced_fares_confirm
+ advanced_parking_lot_charges_confirm
+ credit_identity
+ kiosk_identity
+ stored_credit
+ traveler_total_trip_cost.

traveler_payment_information

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the components of a trip which a traveler has obtained from the input of data to a kiosk and for which advanced payment is needed following trip confirmation. The traveler's identity and credit identity or stored credit from the payment instrument are therefore also included to enable payment to be made. The data flow consists of the following items each of which is defined in its own DDE:

credit_identity
+ kiosk_identity
+ parking_space_details
+ ride_segments
+ stored_credit
+ toll_route_segments.

traveler_payment_request

This data flow is used to send traveler payment information for a confirmed trip from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function. The payment will have been initiated by input from the traveler to a kiosk or a personal portable device. The data flow consists the following data items each of which is defined in its own DDE:

credit_identity
+ ride_segments
+ parking_space_details
+ stored_credit
+ toll_route_segments
+ transaction_number
+ traveler_identity.

traveler_payment_response

This data flow is sent by the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function to indicate the payment for a confirmed trip has been successfully completed. The payment will have been initiated by input from the traveler to a kiosk or a personal portable device. The data flow consists of the following data items each of which is defined in its own DDE:

transaction_number
+ advanced_tolls_confirm

+ advanced_fares_confirm
+ advanced_parking_lot_charges_confirm.

traveler_personal_credit_identity

This data flow is sent from the Provide Electronic Payments Services function to the Provide Driver and Traveler Services function and contains the credit identity of a traveler using a personal portable device, e.g. PDA. It is obtained as data input from the payment instrument terminator and consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit.

traveler_personal_current_condition_request

This data flow is used within the Provide Driver and Traveler Services function and contains a request for details of the current conditions, e.g. weather, events, incidents, etc. The request includes the identity of the personal portable device from which the request was input by the traveler so that the response can be correctly returned. The data flow consists of the following item which is defined in its own DDE:

traveler_identity.

traveler_personal_display_map_update_request

This data flow is used within the Provide Driver and Traveler Services function and contains the request for the update of the data for the digitized map displays used as the background to the output of traffic, trip and travel information in a traveler's personal portable device. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ stored_credit
+ traveler_identity.

traveler_personal_display_map_update_response

This data flow is used within the Provide Driver and Traveler Services function and contains the response to the previous request for the update of the data for the digitized map displays used as the background to the output of traffic, trip and travel information on a traveler's personal portable device. If payment is to be made by reducing the credit stored on-board the payment instrument in the vehicle then the update cost and stored credit data items will have non-zero values. If these values are set to zero then the payment transaction will have been made through the financial institution using the previously supplied credit identity. The success of this transaction will be indicated by the confirmation flag data item. The data flow consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ display_map_traveler_update_cost
+ stored_credit
+ traveler_identity.

traveler_personal_display_update_cost

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function. It contains the cost of the update to the digitized map displays used as the background to the output of traffic, trip and travel information on a traveler's personal portable device. This cost is to be deducted from the credit currently stored on the traveler's payment instrument. The data flow includes the following data items each of which is defined in its own DDE:

display_map_traveler_update_cost
+ stored_credit
+ traveler_identity.

traveler_personal_display_update_payment_request

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function and contains a request that payment be made for an update of the digitized map data used as background to the displays of traffic and travel information on a traveler's personal portable device. The payment will be made by debiting the credit identity with the cost through the financial institution terminator. It consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ credit_identity
+ display_map_traveler_update_cost.

traveler_personal_display_update_payment_response

This data flow is sent from the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function and contains the response to a previous request from the traveler that payment be made for an update of the digitized map data used as background to the displays of traffic and travel information on a traveler's personal portable device. It consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ credit_identity
+ traveler_identity.

traveler_personal_emergency_request

This data flow is used within the Provide Driver and Traveler Services function to carry data about an emergency situation that applies to a traveler. It contains the following data items each of which is defined in its own DDE:

traveler_identity
+ traveler_location_for_emergencies.

traveler_personal_map_update_cost

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function and contains the cost of an update to the navigable map database used within the traveler's personal portable device. This cost is to be deducted from the credit currently stored by the traveler's payment instrument and will not be used when the instrument only contains a credit identity. The data flow consists of the following data items each of which is defined in its own DDE:

stored_credit
+ traveler_identity
+ navigable_map_traveler_update_cost.

traveler_personal_payment_confirmation

This data flow is used within the Provide Driver and Traveler Services function to indicate the payment for a confirmed trip has been successfully completed, or that the total cost can now be deducted from the credit stored on the traveler's payment instrument. The request for payment will have been initiated by input from the traveler to a personal portable device. The data flow consists of the following data items each of which is defined in its own DDE:

advanced_tolls_confirm
+ advanced_fares_confirm
+ advanced_parking_lot_charges_confirm
+ credit_identity
+ stored_credit
+ traveler_identity
+ traveler_total_trip_cost.

traveler_personal_payment_information

This data flow is used within the Provide Driver and Traveler Services function. It contains details of the components of a trip which a traveler has obtained from the input of data to a personal portable device and for which advanced payment is needed following a trip confirmation. The traveler's identity and credit identity or stored credit from the payment instrument are therefore also included to enable payment to be made. The data flow consists of the following items each of which is defined in its own DDE:

credit_identity
+ parking_space_details
+ ride_segments
+ stored_credit
+ toll_route_segments
+ traveler_identity.

traveler_personal_regular_data

This data store is used within the Provide Driver and Traveler Services function to hold items of data which are regularly used as part of traveler inputs to a kiosk. Example of this type of data are the home location of the traveler which may act as the origin for trip requests, traveler identity which is used to identify data requests within the function and the traveler's credit identity which enables payment for advanced charges and other services. .

traveler_personal_requests_and_confirmation

This data flow is used within the Provide Driver and Traveler Services function and contains requests for traffic, trip planning and travel information or confirmation that the previously requested information is acceptable to the traveler. The data will have been input by the traveler to a personal portable device. The data flow consists of the following data items each of which is defined in its own DDE:

traveler_personal_current_condition_request
+ traveler_personal_payment_information
+ traveler_personal_trip_confirmation
+ traveler_personal_trip_request.

traveler_personal_traffic_condition_request

This data flow is used within the Provide Driver and Traveler Services function and contains details of the type of traffic information requested by a traveler from a personal portable device. It consists of the following items each of which is defined in its own DDE:

traveler_identity
+ traveler_traffic_data_type_request.

traveler_personal_transaction_confirmation

This data flow is used within the Provide Driver and Traveler Services function to confirm any reservations made by the traveler from a personal portable device. These reservations will be based on information obtained by the traveler from previous data input and output through the device. The data flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ traveler_identity
+ transaction_number
+ yellow_pages_cost
+ yellow_pages_lodging_reservation_confirmation
+ yellow_pages_dining_reservation_confirmation
+ yellow_pages_ticket_purchase_confirmation.

traveler_personal_transaction_request

This data flow is used within the Provide Driver and Traveler Services function and contains data input by the traveler at a personal portable device to make reservations for various other (yellow pages) services. It contains the following data items, each of which is defined in its

own DDE:

yellow_pages_dining_reservation
+ yellow_pages_lodging_reservation
+ yellow_pages_ticket_purchase.

traveler_personal_transit_condition_request

This data flow is used within the Provide Driver and Traveler Services function and contains details of the type of transit information requested by the traveler from a personal portable device. It consists of the following items each of which is defined in its own DDE:

traveler_identity
+ traveler_transit_data_type_request.

traveler_personal_trip_confirmation

This data flow is used within the Provide Driver and Traveler Services function to confirm the trip details provided as the result of a traveler's previous trip request input from a personal portable device. It contains the following data item which is defined in its own DDE:

paratransit_service_confirmation
+ traveler_identity
+ traveler_rideshare_confirmation.

traveler_personal_trip_confirmation_information

This data flow is used within the Provide Driver and Traveler Services function and contains data confirming various aspects of a traveler's trip. It is sent as a result of a traveler previously requesting confirmation of a trip, the details of which were provided in response to data inputs from the traveler to a personal portable device. The data flow consists of the following data items each of which is defined in its own DDE:

traveler_personal_payment_confirmation
+ traveler_personal_transaction_confirmation
+ traveler_personal_trip_information.

traveler_personal_trip_costs

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function. It contains the cost of a traveler's trip based on a previous trip request and confirmmation input by the traveler from a personal portable device such as a PDA. This cost is to be deducted from the credit currently stored on the traveler's payment instrument. The data flow includes the following data items each of which is defined in its own DDE:

stored_credit
+ traveler_identity
+ traveler_total_trip_cost.

traveler_personal_trip_information

This data flow is used within the Provide Driver and Traveler Services function and contains information about a proposed trip that the traveler has requested earlier from the personal portable device. It consists of the following data items each of which is defined in its own DDE:

current_conditions
+ [paratransit_personal_schedule | route | rideshare_response]
+ traveler_identity
+ traveler_total_trip_cost.

traveler_personal_trip_planning_requests

This data flow is used within the Provide Driver and Traveler Services function and contains data that the traveler has provided through a personal portable device so that a trip can be plannned or general travel information provided. It consists of the folloiwng data items each

of which is defined in its own DDE, all of which may not be present in any one data flow:

transit_deviations_portables_request
+ traveler_identity
+ traveler_personal_trip_request
+ traveler_personal_trip_confirmation
+ traveler_personal_payment_information
+ traveler_personal_transit_condition_request
+ traveler_personal_transaction_request
+ traveler_personal_traffic_condition_request
+ traveler_yellow_pages_information_request.

traveler_personal_trip_planning_responses

This data flow is used within the Provide Driver and Traveler Services function and contains the responses to various requests for information and trip planning services previously input by a traveler from a personal portable device. The data will only cover those services needed to fulfil the traveler's trip or information request. If the previous input from the traveler was a trip confirmation, the data will include either the credit identity or stored credit value originally supplied by the traveler's payment instrument. The data flow consists of the following data items each of which is defined in its own DDE:

traffic_data_for_portables
+ transit_services_for_portables
+ transit_deviations_for_portables
+ traveler_identity
+ traveler_personal_trip_information
+ traveler_personal_payment_confirmation
+ traveler_personal_yellow_pages_data
+ traveler_transaction_confirmation.

traveler_personal_trip_request

This data flow is used within the Provide Driver and Traveler Services function and contains data about a traveler's trip request which has been input from a personal portable device. It consists of the following data items each of which is defined in its own DDE:

trip_request
+ traveler_identity
+ traveler_rideshare_request.

traveler_personal_yellow_pages_data

This data flow is used within the Provide Driver and Traveler Services function and contains details of other (yellow pages) services which is to be sent to the traveler interface facility for output using a kiosk. The size of the data flow has been set to take account of the need to provide only a small percentage of the total yellow pages data that is available. The data flow consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ yellow_pages_general_information
+ yellow_pages_specific_information
+ yellow_pages_transaction_information.

traveler_personal_yellow_pages_information_request

This data flow is used within the Provide Driver and Traveler Services function and contains a request for data on other (yellow pages) services to be provided to a traveler using a personal portable device. The traveler identity is used as the means of ensuring that the data produced in response to the request is returned to the correct traveler. As no filtering components are included, all the data currently available will be provided. The data flow consists of the following data item which is defined in its own DDE:

traveler_identity.

traveler_personal_yellow_pages_requests

This data flow is used within the Provide Driver and Traveler Services function to transfer requests for other services (yellow pages) information from the traveler interface facility in a personal portable device to the yellow pages data collection facility. It consists of the following data items each of which is defined in its own DDE:

traveler_personal_payment_information
+ traveler_personal_transaction_request
+ traveler_personal_yellow_pages_information_request.

traveler_regular_data

This data store is used within the Provide Driver and Traveler Services function to hold items of data which are regularly used as part of traveler inputs to a kiosk. Examples of this type of data are location (of the kiosk) which may act as the origin for trip requests and the identity of the kiosk which is used to track data through the processes in the function. .

traveler_requests_and_confirmation

This data flow is used within the Provide Driver and Traveler Services function and contains requests for traffic, trip planning and travel information or confirmation that the previously requested information is acceptable to the traveler. The data will have been input by the traveler to a kiosk. The data flow consists of the following data items each of which is defined in its own DDE:

traveler_current_condition_request
+ traveler_payment_information
+ traveler_trip_confirmation
+ traveler_trip_request.

traveler_rideshare_confirmation

This data flow is used within the Provide Driver and Traveler Services function and contains a traveler's request to confirm a rideshare based trip. It consists of the following data items each of which is defined in its own DDE:

credit_identity
+ reservation_status
+ rideshare_selection_number
+ traveler_identity.

traveler_rideshare_constraints

This data flow is used within the Provide Driver and Traveler Services function to provide details of the constraints for a rideshare being requested as part of a traveler's proposed trip. It consists of the following data items each of which is defined in its own DDE:

constraint_on_acceptable_travel_time
+ constraint_on_eta_change
+ constraint_on_special_needs
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type.

traveler_rideshare_data

This data flow is used within the Provide Driver and Traveler Services function to provide details about a rideshare requested as part of a traveler's proposed trip. It consists of the following data items each of which is defined in its own DDE:

origin
+ destination
+ departure_time

+ desired_arrival_time.

traveler_rideshare_payments_transactions

This data flow is used within the Provide Payment Electronic Services function and contains records of all payment transactions for traveler ridesharing provision. .

Additional sizing assumptions:

SIZE=128;

traveler_rideshare_preferences

This data flow is used within the Provide Driver and Traveler Services function to provide details of the preferences for a rideshare being requested as part of a traveler's proposed trip. It consists of the following data items each of which is defined in its own DDE:

preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ preferred_ridesharing_options.

traveler_rideshare_request

This data flow is used within the Provide Driver and Traveler Services function to request a rideshare as part of a traveler's proposed trip request. It consists of the following data items each of which is defined in its own DDE:

traveler_identity
+ traveler_rideshare_data
+ traveler_rideshare_preferences
+ traveler_rideshare_constraints.

traveler_roadside_credit_identity

This data flow is sent from the Provide Electronic Payments Services function to the Provide Driver and Traveler Services function and contains the credit identity of a traveler using a roadside facility such as a kiosk. It is obtained as data input from the payment instrument terminator and consists of the following data item which is defined in its own DDE:

credit_identity.

traveler_roadside_trip_costs

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function. It contains the cost of a traveler's trip based on a previous trip request and confirmmation input by the traveler from a roadside unit such as a kiosk. This cost is to be deducted from the credit currently stored on the traveler's payment instrument. The data flow includes the following data items each of which is defined in its own DDE:

kiosk_identity
+ stored_credit
+ traveler_total_trip_cost.

traveler_route

This data flow is used within the Provide Driver and Traveler Services function and is a special form of %034route%034 for traveler guidance only. It contains a subset of the data items included in the %034route%034 data flow to meet the requirements of pn-line traveler guidance as opposed to the more general requirements for a route need as part of a trip planning activity. The data flow consists of the following data items each of which is defined in its own DDE:

route_segment_number{route_segment_description
+ route_segment_end_point
+ route_segment_estimated_travel_time
+ route_segment_mode
+ route_segment_report_position_points

+ route_segment_start_point}.

traveler_route_accepted

This data flow is used within the Provide Driver and Traveler Services function and contains the acceptance by the traveler of the previously provided route for on-line infrastructure based guidance. Acceptance must be provided before guidance can begin. The data flow consists of the following data item which is defined in its own DDE:

route_identity.

traveler_route_request

This data flow is used within the Provide Driver and Traveler Services function and contains data from which the route requested by a traveler can be determined, or that the previously provided data has been accepted. It consists of the following data items each of which is defined in its own DDE:

origin
+ destination
+ desired_arrival_time
+ modes
+ preferred_routes
+ preferred_alternate_routes
+ preferred_ridesharing_options
+ preferred_route_segments
+ preferred_transit_options
+ constraint_on_acceptable_travel_time
+ constraint_on_number_of_mode_changes
+ constraint_on_number_of_transfers
+ constraint_on_eta_change
+ constraint_on_special_needs
+ traveler_route_accepted
+ traveler_identity
+ traveler_location.

traveler_total_trip_cost

This data flow is used within the Provide Driver and Traveler Services function and contains the total cost of a traveler's trip. This will be a trip that has been previously confirmed by the traveler from either a personal portable device or a kiosk, and for which where necessary, reservations have been made. The cost is stored in cents (US) in a three (3) bytes to give a sensible value bearing in mind that it could include the cost of number of services, not least of which may be intermodal transport, such as those provided by airlines. It will be deducted from the credit currently stored on the traveler's payment instrument. .

traveler_traffic_condition_request

This data flow is used within the Provide Driver and Traveler Services function and contains details of the type of traffic information requested by a traveler from a kiosk. It consists of the following items each of which is defined in its own DDE:

kiosk_identity
+ traveler_traffic_data_type_request.

traveler_traffic_data_type_request

This data flow is used within the Provide Driver and Traveler Services function and contains details of the type of traffic data that the traveler has requested for output to a kiosk or personal portable device. This data is used to set up the actual traffic data request that is sent to the Manage Traffic function. The size is set at three characters to enable one to be set for each of the types of traffic data, current (c), long term (l) and predicted (p). .

traveler_traffic_information_data

This data store is used within the Provide Driver and Traveler Services function to hold data about traffic that may be requested by drivers or transit users from within a

vehicle as advisoiry information. It contains the following data items each of which is defined in its own DDE:

predicted_incidents
+ prediction_data
+ traffic_data_for_advisory_output.

traveler_traffic_information_data_output

This data flow is used within the Provide Driver and Traveler Services function and contains the contents of the store of traffic data used to profvide input for both local and wide area broadcast information output. The data is being sent from the store to a process for amalgamation with new data that has been obtained from the Manage Traffic function. The data flow consists of the following data item which is defined in its own DDE:

traveler_traffic_information_data.

traveler_traffic_information_data_update

This data flow is used within the Provide Driver and Traveler Services function and contains the contents of the store of traffic data used to profvide input for both local and wide area broadcast information output. The data is being sent from a process to the store following its update with new data that has been obtained from the Manage Traffic function. The data flow consists of the following data item which is defined in its own DDE:

traveler_traffic_information_data.

traveler_transaction_confirmation

This data flow is used within the Provide Driver and Traveler Services function to confirm any reservations made by the traveler from a kiosk. These reservations will be based on information obtained by the traveler from previous data input and output through the kiosk. The data flow consists of the following data items each of which is defined in its own DDE:

credit_identity
+ kiosk_identity
+ transaction_number
+ yellow_pages_cost
+ yellow_pages_lodging_reservation_confirmation
+ yellow_pages_dining_reservation_confirmation
+ yellow_pages_ticket_purchase_confirmation.

traveler_transaction_request

This data flow is used within the Provide Driver and Traveler Services function and contains data input by the traveler at a kiosk to make reservations for various other (yellow pages) services. It contains the following data items, each of which is defined in its own DDE:

yellow_pages_dining_reservation
+ yellow_pages_lodging_reservation
+ yellow_pages_ticket_purchase.

traveler_transit_condition_request

This data flow is used within the Provide Driver and Traveler Services function and contains details of the type of transit information requested by the traveler from a kiosk. It consists of the following items each of which is defined in its own DDE:

kiosk_identity
+ traveler_transit_data_type_request.

traveler_transit_data_type_request

This data flow is used within the Provide Driver and Traveler Services function and contains details of the type of transit data that the traveler has requested for output to a kiosk or personal portable device. This data is used to set up the actual transit services data request

that is sent to the Manage Transit function. The size is set at two characters to enable one to be set for each of the types of transit data, routes (r) and schedules (s). .

traveler_transit_information_data

This store is used within the Provide Driver and Traveler Services function to hold data about transit that may be requested by drivers or transit users from within a vehicle as advisoiry information. It contains the following data items each of which is defined in its own DDE:

transit_services_for_advisory_data
+ transit_running_data_for_advisory_output.

traveler_transit_information_data_output

This data flow is used within the Provide Driver and Traveler Services function and contains the contents of the store of transit data used to profvide input for both local and wide area broadcast information output. The data is being sent from the store to a process for amalgamation with new data that has been obtained from the Manage Transit function. The data flow consists of the following data item which is defined in its own DDE:

traveler_transit_information_data.

traveler_transit_information_data_update

This data flow is used within the Provide Driver and Traveler Services function and contains the contents of the store of transit data used to profvide input for both local and wide area broadcast information output. The data is being sent from a process to the store following its update with new data that has been obtained from the Manage Transit function. The data flow consists of the following data item which is defined in its own DDE:

traveler_transit_information_data.

traveler_trip_confirmation

This data flow is used within the Provide Driver and Traveler Services function to confirm the trip details provided as the result of a traveler's previous trip request input from a kiosk. It contains the following data item which is defined in its own DDE:

paratransit_service_confirmation
+ traveler_identity
+ traveler_rideshare_confirmation.

traveler_trip_confirmation_information

This data flow is used within the Provide Driver and Traveler Services function and contains data confirming various aspects of a traveler's trip. It is sent as a result of a traveler previously requesting confirmation of a trip, the details of which were provided in response to data inputs from the traveler to the kiosk. The data flow consists of the following data items each of which is defined in its own DDE:

traveler_payment_confirmation
+ traveler_transaction_confirmation
+ traveler_trip_information.

traveler_trip_information

This data flow is used within the Provide Driver and Traveler Services function and contains information about a proposed trip that the traveler has requested earlier from the kiosk. It consists of the following data items each of which is defined in its own DDE:

current_conditions
+ kiosk_identity
+ paratransit_personal_schedule
+ rideshare_response

+ 1{route
  + route_cost}4.

traveler_trip_payments_transactions

This data flow is used within the Provide Payment Electronic Services function and contains records of all payment transactions for the provision of other (yellow pages) services and advnace toll, parking lot charges, or transit fares as part of travelers' confirmed trips. .

traveler_trip_planning_requests

This data flow is used within the Provide Driver and Traveler Services function and contains data that the traveler has provided through a kiosk so that a trip can be plannned or general travel information provided. It consists of the folloiwng data items each of which is defined in its own DDE, all of which may not be present in any one data flow:

kiosk_identity
+ traveler_trip_request
+ transit_vehicle_deviation_request
+ traveler_trip_confirmation
+ traveler_payment_information
+ traveler_yellow_pages_information_request
+ traveler_transaction_request
+ traveler_traffic_condition_request
+ traveler_transit_condition_request.

traveler_trip_planning_responses

This data flow is used within the Provide Driver and Traveler Services function and contains the responses to various requests for information and trip planning services previously input by a traveler from a kiosk. The data will only cover those services needed to fulfil the traveler's trip or information request. If the previous input from the traveler was a trip confirmation, the data will include either the credit identity or stored credit value originally supplied by the traveler's payment instrument. The data flow consists of the following data items each of which is defined in its own DDE:

kiosk_identity
+ transit_services_for_kiosks
+ transit_vehicle_schedule_deviations
+ traffic_data_for_kiosks
+ traveler_trip_information
+ traveler_payment_confirmation
+ traveler_yellow_pages_data
+ traveler_transaction_confirmation.

traveler_trip_request

This data flow is used within the Provide Driver and Traveler Services function and contains data about a traveler's trip request which has been input from a kiosk. It consists of the following data items each of which is defined in its own DDE:

trip_request
+ traveler_identity
+ traveler_rideshare_request.

traveler_yellow_pages_data

This data flow is used within the Provide Driver and Traveler Services function and contains details of other (yellow pages) services which is to be sent to the traveler interface facility for output using a kiosk. The size of the data flow has been set to take account of the need to provide only a small percentage of the total yellow pages data that is available. The data flow consists of the following data items each of which is defined in its own DDE:

kiosk_identity
+ yellow_pages_general_information
+ yellow_pages_specific_information
+ yellow_pages_transaction_information.

traveler_yellow_pages_information_request

This data flow is used within the Provide Driver and Traveler Services function and contains a request for data on other (yellow pages) services to be provided to a traveler at the identified kiosk. As no filtering components are included, all the data currently available will be provided. The data flow consists of the following data item which is defined in its own DDE:

kiosk_identity.

traveler_yellow_pages_requests

This data flow is used within the Provide Driver and Traveler Services function to transfer requests for yellow pages information from the traveler kiosk interface facility to the yellow pages data collection facility. It consists of the following data items each of which is defined in its own DDE:

traveler_payment_information
+ traveler_transaction_request
+ traveler_yellow_pages_information_request.

trip_information

This data store is maintained within the Provide Driver and Traveler Services function and contains information about travelers' trip requests for use if and when they are confirmed. It consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{current_conditions
+ intermodal_services_details
+ paratransit_personal_schedule
+ rideshare_response
+ route
+ route_cost
+ traveler_identity
+ trip_request}.

trip_planning_data

This data flow is used within the Provide Driver and Traveler Services function to transfer data between the Provide Guidance and Trip Planning Services facility and the Manage Trip Planning and Ridesharing facility. It consists of the following data items each of which is defined in its own DDE:

paratransit_route_request
+ paratransit_route_confirm
+ supplied_route.

trip_planning_parameters

This data flow is used within the Provide Driver and Traveler Services function and contains parameters used for trip planning. .

Additional sizing assumptions:

SIZE=32;

trip_request

This data flow is used within the Provide Driver and Traveler Services function as a means of specifying the parameters needed for a trip or route to be provided to a driver or traveler. It consists of the following data items each of which is defined in its own DDE:

origin
+ destination
+ departure_time
+ desired_arrival_time
+ preferences
+ constraints.

tsa_broadcast_message

This data flow is sent to the secure area environment by the Manage Transit fuction and contains textual information for transit users in part of the transit operational network, i.e. not on-board a transit vehicle, or at a transit stop, but in such things as a modal interchange facility, transit depot, etc. The information will be sent out as part of the response to an emergency or incident being detected within the network. .

tsa_panic_button_acknowledge

This data flow is sent to the secure area environment by the Manage Transit fuction and contains the response to input from a panic button that has been activated by a transit suer in part of the transit operational network, i.e. not on-board a transit vehicle, or at a transit stop, but in such things as a modal interchange facility, transit depot, etc. The information will be sent out as part of the response to an emergency or incident being detected within the network. .

tsa_video_camera_control

This data flow is sent to the secure area environment by the Manage Transit fuction and contains control data for a closed circuit television (cctv) systems located in the secure area environment. This data may change the pan, tilt, zoom, or other camera operating parameters and may be generated automatically or as a result of input from the transit system operator. .

tt_emergency_message

This data flow is used as part of the interface to the traveler by the Provide Driver and Traveler Services function. It contains the achnowledgement of a request for action by the Emergency Services previously submitted by the traveler. .

tt_extra_trip_data_request

This data flow is used as part of the interface to the traveler by the Provide Driver and Traveler Services function. It contains outputs about the trip that the traveler has previously requested from a kisk, or messages about the previous confirmation of this trip. .

tt_guidance

This data flow is used as part of the interface to the traveler by the Provide Driver and Traveler Services function. It conains output (displays - text and/or graphics, and/or audio based information) which gives the traveler instructions on how to follow the route, e.g. cross the road, take a particular transit service, use the lift for wheelchairs, etc. .

tt_guidance_input_request

This data flow is sent to the traveler by the Provide Driver and Traveler Services function. It contains a request for the traveler to input a specific item of data needed to determine the best route for on-line guidance. The data may comprise such things as the destination, prefered arrival time, plus route choice preferences and constraints. The latter will include limitations on the choice of mode(s) for all or part of the route. .

tt_guidance_map_update_response

This data flow is sent to the traveler by the Provide Driver and Traveler Services function and contains the response to a previous request from the driver for an update to the digitized map data used to provide on-line traveler guidance. .

tt_guidance_route_details

This data flow is sent to the traveler from the Provide Driver and Traveler Services function and contains details of the route that has been selected in response to the traveler's request for on-line guidance. The route and choice of guidance method will have been based on previous input from the traveler. Guidance will not begin until the

traveler has positively accepted this data. .

tt_kiosk_emergency_response

This data flow is used as part of the interface to the traveler by the Provide Driver and Traveler Services function. It contains ackowledgement of an emergency previously declared by a traveler from a kiosk. .

tt_personal_extra_trip_data_request

This data flow is used as part of the interface to the traveler by the Provide Driver and Traveler Services function. It contains outputs about the trip that the traveler has previously requested from a personal portable device, or messages about the previous confirmation of this trip. .

tt_personal_trip_planning_responses

This data flow is used as part of the interface to the traveler by the Provide Driver and Traveler Services function. It contains the result of requests for more data about the trip on which the traveler is requesting information from a personal portable device. .

tt_trip_planning_responses

This data flow is used as part of the interface to the traveler by the Provide Driver and Traveler Services function. It contains the result of requests for more data about the trip on which the traveler is requesting information from a kiosk. .

ttd_batch_mode_data_transfer_status

This data flow is sent to the transit vehicle driver by the Manage Transit function. It contains details of the result of the previous request for a transfer of transit fare transaction data to the Provide Electronic Payment Services function for further processing. If the transfer or processing failed the driver may request it to be repeated. .

ttd_corrective_instructions

This data flow is sent to the transit vehicle driver by the Manage Transit function. It contains items of data which are designed to help the driver restore the transit vehicle to its correct schedule. These will comprise such things as corrections to the current route, changes to the sequence plus inclusion or deletion of stops and changes in the proscribed vehicle speed between stops. .

ttd_emergency_information

This data flow is sent to the transit vehicle driver by the Manage Transit function. It contains an acknowledgement that the emergency request previously input by the driver has been received. .

ttd_paratransit_information

This data flow is sent to the transit vehicle driver by the Manage Transit function. It contains information about the paratransit schedule that the transit driver is being requested to perform. This information comprises data such as the route, pcik-up time, drop of point, and route. It may involve picking up one or more travelers at different locations along the route. .

ttd_request_fare_transaction_mode_set_up

This data flow is sent from the transit driver to the Manage Transit function. It contains a request that the driver inputs the mode of transit fare transaction processing that is to be used on-board the vehicle. Either one of the following two modes is possible: batch mode (part processing of each fare transaction carried out and the details of a large number of transactions transferred to the central function for further processing) or interactive mode (complete processing of each transaction carried out without stopping). .

ttd_route_assignements

This data flow is sent to the transit vehicle driver by the Manage Transit function. It contains information for the driver about route assignments from the regular driver work assignment facility. .

ttd_transit_vehicle_schedule_deviations

This data flow is sent to the transit vehicle driver by the Manage Transit function.

It contains information for the driver on deviations from the transit route and/or schedule in order that normal service operation can be provided. .

ttfm_coordination_request

This data flow is sent to the transit fleet manager by the Manage Transit function. It contains requests for input on the responses to be made to a particular emergency situation or incident. .

ttfm_parameters

This data flow is sent to the transit fleet manager by the Manage Transit function and contains a list of the currently available planning parameters that can be used to prepare transit schedules. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttfm_paratransit_service

This data flow is sent to the transit fleet manager by the Manage Transit function. It contains details of paratransit services as and when they are provided to travelers. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttfm_passenger_loading_error

This data flow is sent to the transit fleet manager by the Manage Transit function and contains details of a miss-match in the passenger (transit user) data collected from the fare collection and data collection processes on-board a transit vehicle. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttfm_proposed_corrections

This data flow is sent to the transit fleet manager by the Manage Transit function. It contains details of the proposed corrective action to return a transit vehicle to the schedule from which it has deviated. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttfm_response_parameter_output

This data flow is sent to the transit fleet manager by the Manage Transit function. It contains the output of the preplanned responses to incidents by and within the transit operations area. .

ttfm_technician_information

This data flow is sent to the transit fleet manager by the Manage Transit function. It contains information about transit maintenance technician work assignements. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttfm_transaction_reports

This data flow is sent to the transit fleet manager by the Provide Electronic Payments Services function. It contains details of the transit fare payment transactions that have taken place. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttfm_transit_driver_information

This data flow is sent to the transit fleet manager by the Manage Transit function. It contains information about a transit driver that is being used to generate work assignments etc. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttfm_transit_services_output

This data flow is sent to the transit fleet manager by the Manage Transit function and contains output of the current transit routes and schedules. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttfm_transit_vehicle_data

This data flow is sent to the transit fleet manager by the Manage Transit function. It contains data about transit vehicle(s). The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttfm_transit_vehicle_maintenance_information

This data flow is sent to the transit fleet manager by the Manage Transit function. It contains a report on the maintenance state of transit vehicle(s). The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttmp_work_schedule

This data flow is sent to the transit maintenance personnel by the Manage Transit function. It contains the schedule of work to be carried out to maintain the transit vehicle(s). The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

tto_transaction_reports

This data flow is sent to the toll operator by the Provide Electronic Payments Services function. It contains details of the toll transactions that have taken place in the last day. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttop_current_indicator_faults

This data flow is sent by the Manage Traffic function to the traffic operations personnel. It contains details of the data currently held in the store of current indicator faults and shows which indicators are faulty and the nature of the fault. .

ttop_defined_incident_responses_data

This data flow is used by the Manage Traffic function to send the traffic operations personnel details of the data currently held in the store or defined incident reponses used by the Manage Incidents facility. .

ttop_demand_data

This data flow is sent to the traffic operations personnel by the Manage Traffic function and contains input data to be used in the calculation of demand forecasts. .

Additional sizing assumptions:

SIZE=1024000;

ttop_demand_forecast_data

This data flow is used by the Manage Traffic function to send the Traffic Operations Personnel details of the predicted trends in traffic and travel demand and its effects on the overall transportation service. .

ttop_demand_forecast_result

This data flow is used by the Manage Traffic function to send the traffic operations personnel results of progress in producing new data on traffic and travel demand and its effects on the overall transportation service. .

ttop_demand_management_outputs_FB

This data flow is sent to the traffic operations personnel from the Manage Traffic function and contains all the output flows for the Manage Demand facility. It consists of the following data items each of which is defined in its own DDE:

ttop-demand_data
+ ttop-demand_forecast_data
+ ttop-demand_forecast_result
+ ttop-demand_policy_activation_result
+ ttop-demand_policy_information.

ttop_demand_policy_activation_result

This data flow is sent to the traffic operations personnel from the Manage Traffic function and provides confirmation of the result of the implementation of the current demand management policy data. .

ttop_demand_policy_information

This data flow is used by the Manage Traffic function to send traffic operations personnel details of the current travel demand controlling parameters being used to generate demand forecsts. It is sent in response to an operator request. .

ttop_incident_information_display

This data flow is used by the Manage Traffic function to send requested information on either current or predicted incidents, plus defined incident response data to traffic operations personnel. .

ttop_incident_management_outputs_FB

This data flow is sent to the traffic operations personnel from the Manage Traffic function and contains all the output flows for the Manage Incidents facility. It consists of the following data items each of which is defined in its own DDE:

ttop-defined_incident_responses_data
+ ttop-incident_information_display
+ ttop-incident_video_image_output
+ ttop-possible_defined_response_output
+ ttop-possible_incidents_data
+ ttop-undefined_response_details.

ttop_incident_video_image_output

This data flow is sent by the Manage Traffic function to the traffic operations personnel. It contains a video imagefrom a closed circuit television (cctv) system which shows incident conditions at a point in the road and freeway network served by the function. .

ttop_pollution_data_display

This data flow is sent by the Manage Traffic function to the traffic operations personnel. It contains details of both the pollution reference data and the current pollution state in the geographic area served by the ITS functions. .

ttop_possible_defined_response_output

This data flow is sent from the Manage Traffic function to traffic operations personnel and contains the current contents of the store of possible defined incident responeses. .

ttop_possible_incidents_data

This data flow is sent from the Manage Traffic function and provides traffic operations personnel with details of incidents that are currently held in the store of possible incidents. .

ttop_traffic_control_information_display

This data flow is sent by the Manage Traffic function to the traffic operations personnel. It contains information on traffic conditions. The information may concern current, long term, or predicted traffic data, or a combination of some or all of these three. .

ttop_undefined_response_details

This data flow is sent from the Manage Traffic function and provides traffic operations personnel with details of incidents for which no predefined response is available. The Manage Incidents facility will take no action concerning this type of incident until the traffic operations personnel have provided a defined response. .

ttop_video_image_output

This data flow is sent by the Manage Traffic function to the traffic operations personnel. It contains a video image from a closed circuit television (cctv) system which shows traffic conditions at a point in the road and freeway network served by the function. .

ttp_evaluation_results

This data flow is sent to the transportation planner by the Plan System Deployment function. It contains the formatted output of the results from the evaluation process. .

ttp_output_data_store

This data flow is sent to the transportation planner by the Plan System Deployment function. It contains the formatted output of either the hostoric, static or planning data stores .

ttp_output_documentation

This data flow is sent to the transportation planner by the Plan System Deployment function. It contains output formatted as a document covering ome or all of the data stored for the ITS network in the historic, static or planning data stores. .

ttp_output_link_data

This data flow is sent to the transportation planner by the Plan System Deployment function. It contains the formatted output of the contents of the store containing the link database .

ttp_simulation_data

This data flow is sent to the transportation planner by the Plan System Deployment function. It contains the formatted output of the results from the simulation process. .

ttso_emergency_request

This data flow is sent to the transit system operator by the Manage Transit function and contains the emergency requests that have been input from either the transit vehicle driver or the transit user. .

ttso_media_parameters

This data flow is sent to the transit system operator by the Manage Transit function and contains the current set of parameters used to control the style and content of information about incidents affecting the transit network that is automatically sent to the media. .

ttso_potential_incidents_alarm

This data flow is sent to the transit system operator by the Manage Transit function and contains information about a potential incident on board a transit vehicle. .

Additional sizing assumptions:

SIZE=64;

ttso_potential_security_problem

This data flow is sent to the transit system operator by the Manage Transit function and contains informationabout a potential security problem that has been detected within the transit system operating facilities, e.g. transit stops, travel interchanges, kiosks, etc. .

ttso_transaction_reports

This data flow is sent to the transit system operator by the Provide Electronic Payments Services function. It contains details of the transit fare payment transactions that have taken place. .

ttso_transit_fare_output

This data flow is sent from the transit system operator to the Provide Electronic Payment Services function. It contains the output of the current transit fares held in the local data store. .

ttso_video_image_data

This data flow is sent to the transit system operator by the Manage Transit function and contains video image data. This will have been received by closed circuit television (cctv) systems located in the secure area environment and may contain images of incidents. .

ttsp_credit_identity

This data flow is sent to the toll service provider by the Provide Electronic Payment Services function and contains the identity number of a payment instrument which is to be used to pay advanced tolls. .

ttsp_toll_price_changes_request

This data flow is sent from the Provide Electronic Payment Services function to the toll services provider. It contains data requesting a change to the current toll

pricing structure so that travelers my be encouraged to change the modal split in their journeys. .

ttsp_toll_segments

This data flow is sent to the toll service provider by the Provide Electronic Payment Serivces function and provides information on the route segment(s) for which advanced toll payment is being requested. .

ttsp_transaction_reports

This data flow is sent to the toll service provider by the Provide Electronic Payment Services function. It contains details of the toll transactions that have taken place in the last period. The output may be in audio or visual form, with the latter being available in a variety of formats, e.g. displays, vms, or hardcopy (paper) output. .

ttsp_vehicle_identity

This data item is sent to the toll service provider by the Provide Electronic Payment Services function and contains the identity of a vehicle which is to be associated with an advanced toll payment. .

ttu_advisory_information

This data flow is used as part of the interface to the traveler by the Provide Driver and Traveler Services function. It contains displays of the traffic, travel and other services (yellow pages) information produced in response to a previous traveler request. .

ttu_other_services_roadside_confirmed

This data flow is sent to the transit user by the Manage Transit function. It contains a message giving the transit user at the roadside, i.e. the transit stop, details of the success or failure of the request for other (yellow pages) services. .

ttu_other_services_vehicle_confirmed

This data flow is sent to the transit user by the Manage Transit function. It contains a message giving the transit user on-board the vehicle details of the success or failure of the request for other (yellow pages) services. .

ttu_roadside_access_message

This data flow is sent to the transit user by the Manage Transit function. It contains a message giving the transit user details of the success or failure of the fare transaction previously initiated from at the roadside, i.e. the transit stop. .

ttu_roadside_payment_confirmed

This data flow is sent to the transit user by the Manage Transit function. It contains a message giving the transit user at the roadside, i.e. the transit stop, details of the success or failure of the payment transaction.. .

ttu_transit_information

This data flow is sent to the transit user by the Manage Transit function. It contains a message giving the transit user details of transit services that are currently available. .

ttu_transit_vehicle_information

This data flow is sent to the transit user from the Manage transit function and contains information such as route number, service number, etc. about a transit vehicle that has just arrived at a transit stop. .

ttu_vehicle_access_message

This data flow is sent to the transit user by the Manage Transit function. It contains a message giving the transit user details of the success or failure of the fare transaction previously initiated from on-board the vehicle. .

ttu_vehicle_payment_confirmed

This data flow is sent to the transit user by the Manage Transit function. It contains a message giving the transit user on-board the vehicle details of the success or failure of the payment transaction. .

tunnel_conditions

This data flow is used within the Manage Traffic function and contains information about conditions in tunnels. This will have been provided by sensors that are

processing data from the tunnels and will be principally concerned with the detection of high temperatures indicating possible fire in a tunnel. The data flow consists of the following data items each of which is defined in its own DDE:

link_list
+ 1{link_conditions}list_size.

typsp_provider_registration_confirm

This data flow is sent from the Provide Driver and Traveler Services function to the information and service provider to confirm that a request for registration has been successfully completed. The provider can now expect to receive requests for yellow pages data from another process within this function. .

typsp_transaction_request

This data flow is sent to the information and service provider from the Provide Driver and Traveler Services function and contains a request that payment for the associated yellow pages services is transacted. .

typsp_yellow_pages_info_request

This data flow is used by the Provide Driver and Traveler Services function to obtain data from the information and service providers. It contains requests for information of a general nature, or specific information, or information an available transactions. .

undefined_incident_response

This data flow is used within the Manage Traffic function and contains details of an incident for which no defined response can be determined. It consists of the following data items each of which is defined in its own DDE:

incident_confidence_level
+ incident_location
+ incident_severity
+ incident_start_time
+ incident_type.

unit_number

This data flow is used within the Manage Traffic function to provide an identification number of a particular piece of equipment, e.g. intersection signal controller, pedestrian signal controller, variable message sign (vms), ramp meter, parking lot, road/highway link, toll segment, traffic sensor, etc. The actual form of the number is defined as a five (5) byte character string, enabling a flexible alphanumeric based numbering system to be used rather than a more rigid entirely numeric based system. .

unusual_congestion

This data flow is used within the Manage Traffic function and identifies places in the road network at which unusual congestion has been detected. It consists of the following data item which is defined in its own DDE:

location_identity.

unusual_data

This data flow is used within the Manage Traffic function and contains information obtained from data analyzed by traffic sensors that shows the possible presence of congestion. It is sent to the Manage Incidents facility for further analysis and contains the following items each of which is defined in its own DDE:

vehicle_count
+ vehicle_queue_length
+ vehicle_speed
+ vehicle_headway
+ vehicle_occupancy.

unusual_traffic_data

This data flow is used within the Manage Traffic function and contains traffic data that is to be output by the Media System. This data will cover a particular traffic condition, e.g.

congestion at a particular point, rather than the output of more general traffic conditions, as the Media System is expected to be something similar to the current Highway Advisory Radio (HAR) systems. The data must also specify the part(s) of the Media System that are to output the data so that it can be directed to the appropriate areas. .

update_historic_data_store

This data flow is used within the Plan System Deployment function and contains data from the other ITS functions that must be loaded into the store of historical data. It contains the following data items each of which is defined in its own DDE:

ahs_operational_data
+ current_other_routes_use
+ current_road_network_use
+ cv_operational_data
+ emergency_vehicle_operational_data
+ payment_transaction_reports
+ parking_lot_operational_data
+ pollution_operational_data
+ toll_operational_data
+ traffic_data_for_deployment
+ transit_passenger_operational_data
+ transit_services_for_deployment.

update_routes

This data flow is used within the Manage Transit function to indicate that the transit routes should be re-calculated based on the current planning parameters provided by the transit fleet manager, the current operational data, plus the current transit routes, and using digitized map data for road and freeway layout, etc. .

update_schedules

This data flow is used within the Manage Transit function to indicate that the transit schedules should be re-calculated based on the currently planning parameters. .

Additional sizing assumptions:

SIZE=2;

update_static_data_store

This data flow is used within the Plan System Deployment function and contains data from the Manage Traffic function that must be loaded into the store of static data. It consists of the following data items each of which is defined in its own DDE:

current_incident_static_data
+ current_traffic_static_data
+ imported_map_data.

vehicle_accel_decel_data

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains the acceleration and deceleration characteristics profile for a vehicle over its entire speed range. The data consists of acceleration and deceleration rates for the whole range of vehicle speeds. The vaules at intermediate speeds must be calculated by interpolation. When this data is provided during the vehicle's manufacture, it will be a guaranteed maximum. When provided by other vehicles, or by the Manage Demand facility within the Manage Traffic function, it will override the maximum values. The data flow has been sized at five hundred (500) bytes. This will give the acceleration and deceleration values (one byte each) in increments of 5 miles per hour (5 mph) from zero to one hundred miles per hour (100 mph) inclusive, plus eight bytes for use as an indentification text, for up to ten sets of operating conditions. .

vehicle_accel_decel_profile

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains the acceleration and deceleration characteristics profile for a vehicle over its entire speed range. This will be used in the automatic control of the vehicle when it is operating as part of a platoon or on its own. It is loaded into the vehicle

during its manufacture and cannot be changed. However the Manage Demand facility in the Manage Traffic fuction, or other vehicles in a platoon can provide a different set of data to be used in preference to this set. The data flow consists of the following data item which is defined in its own DDE:

vehicle_accel_decel_data.

vehicle_action_requests

This data flow is used within the Provide Vehicle Control and Monitoring function to initiate action to avoid potential vehicle collisions. It contains the following data items, each of which is defined in its own DDE:

vehicle_and_driver_safety_status
+ vehicle_change_position_requests
+ vehicle_crash_restraint_commands.

vehicle_and_driver_safety_status

This data flow is used within the Provide Vehicle Monitoring and Control function and contains an indication of whether the vehicle and/or driver have been found to be safe (0) or unsafe (1). .

vehicle_attitude_data

This data flow is used within the Provide Vehicle Monitoring and Control function and contains data about a vehicle's attitude, e.g. upright, rolled to the left, right, nose down, etc. .

vehicle_change_position_requests

This data flow is used within the Provide Vehicle Monitoring and Control function and contains commands which will provide automatic control of the vehicle. It consists of the following items each of which is defined in its own DDE. Items 1 and 2 below may be sent together, as may item 2 plus item 4. Item 4 will not be actioned without item 3.

throttle_commands
+ steering_commands
+ brake_commands
+ direction_commands.

vehicle_characteristics

This data flow is used within the Provide Electronic Payment Services function and contains a digitized representation of the characteristics of a vehicle. These will have been obtained from the processing of analog data by sensors at either a toll or parking lot payment point. .

vehicle_control_data

This data flow is used within the Provide Vehicle Monitoring and Control function. It provides data for use in the automatic control of the vehicle. The data flow consists of the following items of data each of which is defined in its own DDE:

ahs_accel_decel_profile
+ ahs_headway
+ vehicle_accel_decel_profile
+ vehicle_standard_headway.

vehicle_control_data_store

This data store is used by processes within the Provide Vehicle Monitoring and Control function and provides data for use in the automatic control of the vehicle. The contents of this data store are loaded by the vehicle manufacturer, or the vehicle control system manufacturer. The data store cannot be changed or examined by the driver. It consists of the following items of data each of which is defined in its own DDE:

ahs_accel_decel_profile
+ ahs_headway
+ vehicle_accel_decel_profile

+ vehicle_standard_headway.

vehicle_control_request

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Automatic Vehicle Monitoring and Control function. It contains the request from the driver for the vehicle to be put under automatic control. The value of the data will decide the form of control to be provided. Values may comprise but not be limited to the following:

0 - manual control,
1 - platooning,
2 - speed control,
3 - headway control,
4 - lane control,
5 - automatic highway system (ahs) lane use. .

vehicle_control_status

This data flow is used to provide data on the status of the automatic control of the vehicle for output to the driver. .

Additional sizing assumptions:

SIZE=128;

vehicle_count

This data item is used within the Manage Traffic function and contains a count of the number of vehicles which have been detected by a detector located on the highway or at a parking lot entrance or exit, as the vehicles flow over its sensor. The units are vehicles-per-hour (veh/hr) and the data item is sized to give a maximum value of 32767 veh/hr. .

vehicle_crash_restraint_commands

This data flow is used within the Provide Vehicle Monnitoring and Control function to activate the vehicle's crash restraint mechanisms. .

Additional sizing assumptions:

SIZE=4;

vehicle_crash_sensor_data

This data flow is used within the Provide Vehicle Monitoring and Control function and contains data obtained from the processing by sensors of analog data received on-board the vehicle. This data provides information about the effects of a crash in which the vehicle has been involved. .

vehicle_data

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Vehicle Monitoring and Control function and contains data for use by the latter, details of a route that involves AHS lanes and a request from the driver for the vehicle to be automatically controlled. It consists of the following data items each of which is defined in its own DDE:

ahs_route
+ vehicle_control_request
+ vehicle_location_for_incidents.

vehicle_data_for_traffic_management

This data flow is sent from the Provide Vehicle Monitoring and Control function to the Manage Traffic function. It contains vehicle status and other data for use in the management of vehicle traffic. The data flow consists of the following data items each of which is defined in its own DDE:

vehicle_smart_probe_data
+ vehicle_status_details_for_emissions.

vehicle_detection_data

This data flow is used within the Manage Traffic function and contains vehicle detection data, i.e. data that provides information about vehicles moving on the road

and highway network served by the function. It consists of the following data items each of which is defined in its own DDE:

vehicle_count
+ vehicle_queue_length
+ vehicle_speed
+ vehicle_headway
+ vehicle_occupancy.

vehicle_display_definitions_data

This data sore is used within the Provide Driver and Traveler Services function. It contains information about each type of roadsign and the templates for messages which can be output to the driver via an in-vehicle display. .

vehicle_emergency_request

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains information about an in-vehicle emergency and includes the following items each defined in its own DDE:

vehicle_crash_sensor_data
+ vehicle_location_for_incidents
+ vehicle_identity
+ processed_cargo_data
+ vehicle_status_details.

vehicle_guidance_probe_data

This data flow is used within the Provide Driver and Traveler Services function and contains the time at which a vehicle was at a route segment end point. This data will be used to calculate the actual vehicle journey time for the route segment which may supplement or replace data gathered from other sources. This data will be used for in-vehicle guidance purposes. The data flow consists of the following data items each of which is defined in its own DDE

route_segment_identity
+ vehicle_identity.

vehicle_guidance_route

This data flow is used within the Provide Driver and Traveler Services function and is a special form of %034route%034 for vehicle guidance only. It contains a subset of the data items included in the %034route%034 data flow to meet the requirements of in-vehicle infrastructure based guidance as opposed to the more general requirements for a route need as part of a trip planning activity. The data flow consists of the following data items each of which is defined in its own DDE:

route_identity
+ route_segment_number{route_segment_description
+ route_segment_end_point
+ route_segment_estimated_travel_time
+ route_segment_report_position_points
+ route_segment_start_point}
+ vehicle_identity.

vehicle_guidance_route_accepted

This data flow is used within the Provide Driver and Traveler Services function and contains the acceptance by the driver of the previously provided route for on-line guidance. Acceptance must be provided before guidance can begin. The data flow consists of the following data item which is defined in its own DDE:

route_identity.

vehicle_guidance_stored_data

This data flow is used within the Provide Driver and Traveler Services function and

contains the route provided to a vehicle that is using dynamic guidance. This data is loaded into a store and provides information about which routes are being used. The identity of the vehicle is removed for privacy reasons. The data flow consists of the following data items each of which is defined in its own DDE:

route_identity
+ route_segment_number{route_segment_description
+ route_segment_end_point
+ route_segment_estimated_travel_time
+ route_segment_report_position_points
+ route_segment_start_point}.

vehicle_headway

This data item is used within the Manage Traffic function and contains a measure of the distance between two successive vehicles traveling in the same direction in the same lane, as detected by a detector located on the highway, as the vehicles flowed over its sensor. The units are in inches (ins) and the data item is sized at two (2) bytes to give a maximum value of 32767 ins (or 2730 feet). .

vehicle_headway_control_data

This data store is used within the Provide Vehicle Monitoring and Control function. It contains the vehicle headway adata for use in the automatic control of the vehicle when it is operating as part of a platoon, or on automatic highway system (ahs) lanes. It consists of the following items of data each of which is defined in its own DDE:

ahs_headway
+ vehicle_standard_headway.

vehicle_headway_data

This data flow is used within the Manage Traffic and Provide Vehicle Monitoring and Control functions. It contains the headway to be used by a vehicle over its entire speed range. The data flow value may be set up during the vehicle's manufacture, or by the Manage Demand facility in the Manage Traffic function. This second set of values will override the first set when received by a vehicle. The data flow is sized at two hundred and ninety (290) bytes. This enables values in the range zero to 255 inches to be provided for speeds in the range of zero to one hundred miles per hour (100 mph) inclusive, plus nine bytes of decriptive text, for up to ten sets of vehicle operating conditions. .

vehicle_identity

This data flow is used within the Manage Commercial Vehicles function and contains the identity of a vehicle (16 characters). .

Additional sizing assumptions:

SIZE=16;

vehicle_identity_for_collision_notification_store

This data store is used for vehicle identification in the event of a collision.
It is built into the vehicle during the course ofits manufacture.
It contains the vehicle's identity number (16 digits).

vehicle_identity.

vehicle_identity_for_driver_security_store

This data store is provides the vehicel identity for personal driver security messages and is built into the vehicle during the course of its manufacture.
It contains the vehicle's identity number.

vehicle_identity.

vehicle_information

This data flow is sent from the Provide Vehicle Monitoring and Control function to the Provide Driver and Traveler Services function and contains data for output to the driver, automatic inclusion in driver messages (e.g. mayday), or a request for a route involving

AHS lanes. It consists of the following data items each of which is defined in its own DDE:

ahs_route_request
+ emergency_message_auto_output
+ position_warnings
+ safety_warnings
+ vehicle_control_status
+ vision_data
+ vehicle_status_details_for_broadcast
+ vehicle_status_details_for_driver_security.

vehicle_input_data

This data is used within the Provide Driver and Traveler Services function and contains a vehicle route for guidance purposes and data about link journey times that is generated by and sent from centralized functions to the vehicle for use by the autonomous guidance process. It consists of the following data items each of which is defined in its own DDE:

link_and_queue_data
+ vehicle_guidance_route.

vehicle_license

This data flow is used within the Manage Traffic function and contains the vehicle license number read from a vehicle that is violating the pollution standards. .

Additional sizing assumptions:

SIZE=8;

vehicle_location_for_advisories

This data flow is used within the Provide Driver and Traveler Services function and contains the vehicle's location as computed from data input to sensors controlled by the processes that determines vehicle location. This is a low precision data flow that has sufficient accuracy for filtering traveler and driver in-vehicle advisory data to make it relevant to the current geographic area where the vehicle is located. It consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_location_for_autonomous_guidance

This data flow is used within the Provide Driver and Traveler Services function and contains the vehicle's location as computed from sensor data. This is a high precission data flow that enables the location of the vehicle to be pin-pointed to a high degree of accuracy and is used for in-vehicle autonomous guidance purposes. It consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_location_for_cv

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Commercial Vehicles function. It contains the vehicle location data for use in reporting on-board data to the commercial fleet manager, or the driver acting in this role. The data is computed from data input to sensors controlled by the processes that determines vehicle location. The data flow consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_location_for_dynamic_guidance

This data flow is used within the Provide Driver and Traveler Services function and contains the vehicle's location as computed from sensor data. This is a high precision data flow that enables the location of the vehicle to be pin-pointed to a high degree of accuracy and is used for in-vehicle dynamic guidance purposes. It consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_location_for_emergencies

This data flow is used within the Provide Driver and Traveler Services function. It contains the vehicle's location as computed from data input to sensors controlled by the processes that determines vehicle location. This is a high precision data flow that enables the location of the vehicle to be pin-pointed to a high degree of accuracy and is used to provide the destination for the emergency services when they respond to an emergency call-out message generated on-board a vehicle by its driver. It consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_location_for_emergency_services

This data flow is sent from the Provide Driver and Traveler Services function to the Manage Emergency Services function and contains a vehicle's location as computed from data input to sensors controlled by the processes that determines vehicle location. This is a high precision data flow that enables the location of an emergency vehicle to be pin-pointed to a high degree of accuracy by the Manage Emergency Services function. It consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_location_for_incidents

This data flow is used within the Provide Driver and Traveler Services function. It contains the vehicle's location as computed from data input to sensors controlled by the processes that determines vehicle location. This is a high precision data flow that enables the location of the vehicle to be pin-pointed to a high degree of accuracy and is used to provide the destination for the emergency services when they respond to an emergency call-out message automatically generated by the vehicle due to a crash or problem with the status of its cargo. It consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_location_for_transit

This data flow is sent from the Provide Driver and Traveler Services function to the Manage transit function. It contains the vehicle's location as computed from data input to sensors controlled by the processes that determines vehicle location. This is a low precission data flow that will be refined using data obtained from on-board the transit vehicle. It consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_map_database

This data flow is used by the Provide Driver and Traveler Services function. It contains details of the physical geometry of each road segment, including the location of such things as roadsigns, bends, junctions, traffic lanes and thier use, etc. For each route segment, it also contains the historical average link journey time and queing time computed from data recorded over the last several months, and available for different time of the day/days of the week, to take account of peak travel times, weekend travel etc. .

vehicle_motion_data

This data flow is used within the Provide Vehicle Monitoring and Control function and contains data about the motion of a vehicle, e.g. forwards, to the left, etc. .

Additional sizing assumptions:

SIZE=1;

vehicle_occupancy

This data item is used within the Manage Traffic function and contains a count of the time for which a vehicle occupied the point in the surface street or highway at which a detector is located. The data is measured in seconds and may subsequently be converted to give a percentage value, the the percentage of time for which the detector was

occupied by a vehicle. The data item is sized at two (2) bytes to enable the time period over which the occupancy is measured to be anything up to an hour (3600 seconds). .

vehicle_output_data

This data is flow used within the Provide Driver and Traveler Services function and contains a request for on-line guidance and probe data which is sent from the vehicle to a centralized point for porcessing. It consists of the following data items each of which is defined in its own DDE:

vehicle_guidance_probe_data
+ vehicle_guidance_route_accepted
+ vehicle_route_request.

vehicle_parking_lot_characteristic_data

This data flow is used within the Provide Electronic Payment Services function and contains data obtaine from a vehicle at a parking lot charge payment point. It consists of the following data items each of which is defined in its own DDE:

vehicle_identity
+ vehicle_characteristics.

vehicle_pollution_alert

This data flow is used by the Manage Traffic function as a means of transferring current vehicle pollution data from the Manage Emissions facility to the Manage Emergency Services function to enable enforcement of air quality standards. It contains data about the current levels of pollution being output by a vehicle. This data is held in the following data items each of which is defined in its own DDE:

vehicle_identity
+ vehicle_license
+ pollution_data_violation.

vehicle_pollution_message

This data flow is used within the Manage Traffic function as a means of transfering current vehicle pollution data from the Manage Emissions facility to the Provide Device Control facility. It contains data about the current levels of pollution being output by a vehicle and is for output to vehicle drivers. The data flow consists of the following data items each of which is defined in its own DDE:

vehicle_pollution_message_for_highways
+ vehicle_pollution_message_for_roads.

vehicle_pollution_message_for_highways

This data flow is used within the Manage Traffic function and contains data about the current levels of pollution being output by a vehicle. It is for output to the vehicle driver who is on a freeway in the geographic and/or jurisdictional area(s) served by the function. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_identity
+ pollution_output_message.

vehicle_pollution_message_for_roads

This data flow is used within the Manage Traffic function and contains data about the current levels of pollution being output by a vehicle. It is for output to the vehicle driver who is on a road (surface street) in the geographic and/or jurisdictional area(s) served by the function. The data flow consists of the following data items each of which is defined in its own DDE:

indicator_identity
+ pollution_output_message.

vehicle_probe_data_amalgamation

This data flow is used within the Provide Driver and Traveler Services function and contains vehicle journey times for route segments. These journey times have been calculated from an amalgamation of the journey times provided from a variety of sources such as toll collection points and guided vehicles. This data will be used for in-vehicle guidance purposes. The data flow consists of the following data items each of which is defined in its own DDE

list_size
+ list_size{route_segment_identity
+ route_segment_journey_time}.

vehicle_proximity_data

This data flow is used within the Provide Vehicle Control and Montoring function and contains information on the closeness of any other vehicle or object to the vehicle in any direction. .

Additional sizing assumptions:

SIZE=64;

vehicle_queue_length

This data item is used within the Manage Traffic function and contains a measure of the length of queue as measured by a traffic sensor. This may be on the roadway (surface street or highway), or at specific locations such as the entrance to a parking lot. The data contains the approximate number of vehicles, based on the average vehicle length and the position of the detector relative to a fixed point from which the queue needs to be measured. The item is sized at one byte to give a maximum value of 255 vehicles. .

vehicle_route

This data flow is used within the Provide Driver and Traveler Services function and is a special form of %034route%034 for vehicles only. It may also have special forms and ultimate destinations depending on the type of vehicle and type of route (see %034modes%034) and contains the following items each which is defined in its own DDE:

route.

vehicle_route_request

This data is flow used within the Provide Driver and Traveler Services function and contains a request for on-line guidance of the vehicle. This will have been generated by the driver and will include the necessary source and destination data from which a route can be computed. It consists of the following data items each of which is defined in its own DDE:

constraint_on_acceptable_travel_time
+ constraint_on_eta_change
+ constraint_on_special_needs
+ constraint_on_load_classification
+ constraint_on_ahs_lanes
+ constraint_on_interstate
+ constraint_on_urban
+ constraint_on_vehicle_type
+ destination
+ departure_time
+ desired_arrival_time
+ origin
+ preferred_routes
+ preferred_alternate_routes
+ preferred_route_segments
+ vehicle_location_for_dynamic_guidance
+ vehicle_identity.

vehicle_sign_data

This data flow is used within the Manage Traffic function and contains data for use in producing in-vehicle signage displays. The information sent can fall into two categories - sign data and situation data. Sign data includes permanent fixed signs (eg. STOP, YIELD, etc), temporary signs (eg. detours), and variable message signs. Situation data provides information about traffic conditions, e.g. congestion and speed, on up to eight (8) links. Up to six (6) sets of indicator data may be contained within the data flow and they may be for the same or different types of indicator, or for incidents. All data is filtered so that the receiving processes only get that which is relevant to their local geographic area. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{vehicle_signage_output_identity
+ 6{vehicle_signage_output_data}
+ 8{vehicle_signage_traffic_data}}.

vehicle_sign_data_for_highways

This data flow is used within the Manage Traffic function. It contains the actual data from which in-vehicle signage data can be produced for output by transmission units located at the roadside on freeways in the geographic and/or jurisdictional area(s) served by the function. The data flow consists of the following items each of which is defined in its own DDE:

indicator_control_data_for_highways.

vehicle_sign_data_for_roads

This data flow is used within the Manage Traffic function. It contains the actual data from which in-vehicle signage data can be produced for output by transmission units located at the roadside on roads (surface streets) in the geographic and/or jurisdictional area(s) served by the function. The data flow consists of the following items each of which is defined in its own DDE:

indicator_control_data_for_roads.

vehicle_sign_data_output_fault

This data flow is used within the Manage Traffic function and contains an indication that a fault has been found with the processing of in-vehicle sign data by the process at the roadside. The data flow is sized at one (1) byte to enable a character to be used to indicate that the fault is either that there is no output, or the output does not match the input. .

vehicle_sign_data_output_location

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function and contains the location of the equipment that is outputing in-vehicle signage data. The data flow consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_signage_current_data

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function and contains data that represents the actual roadside traffic indicator outputs, i.e. those from intersection traffic controllers, pedestrian controllers, etc. The indicator outputs will be replicated as in-vehicle signage displays, and will relate to the signs that are covered by each of the roadside broadcast processes. The data is presented as a three (3) character code which shows the state of the indicator, e.g. stop, about to show stop (leaving amber), go, or not operating (proceed with caution). .

vehicle_signage_current_incident_data

This data flow is used within the Manage Traffic function. It contains data about current incidents for output as part of in-vehicle signage data. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{current_incident_details}.

vehicle_signage_data

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function. It contains data for use in producing in-vehicle signage displays. The data flow consists of the following data items each of which is defined in its own DDE:

vehicle_sign_data_output_location
+ 6{vehicle_signage_output_data}
+ 8{vehicle_signage_traffic_data}.

vehicle_signage_fixed_data

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function and contains data that represents the actual roadside traffic fixed signs, i.e. those for STOP, YIELD and other types of sign. The sign outputs will be replicated as in-vehicle signage displays, and will relate to the signs that are covered by each of the roadside broadcast processes. The data is presented as a three (3) character code which represents the sign display, e.g. STOP, YIELD, etc. .

vehicle_signage_incident_data

This data store is used within the Manage Traffic function. It contains data about current and predicted incidents for output as part of in-vehicle signage data. The data in the store consists of the following data items each of which is defined in its own DDE:

vehicle_signage_current_incident_data
+ vehicle_signage_predicted_incident_data.

vehicle_signage_incident_details

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function and contains data that describes an incident in the area around the location of each of the roadside broadcast processes. The data is presented as a three (3) character code which represents the type (and possibly) extent of the incident. .

vehicle_signage_output_data

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function and contains data that represents the actual roadside traffic indicator outputs and incident details. The indicator outputs will be replicated as in-vehicle signage displays, and will relate to the signs that are covered by each of the roadside broadcast processes. The incident details will be for those incidents that are local to the roadside broadcast processes and will be used to provide driver and traveler information messages in the vehicle. The data flow consists of one of the following data items each of which is defined in its own DDE:

[vehicle_signage_current_data | vehicle_signage_fixed_data
| vehicle_signage_incident_details | vehicle_signage_vms_data].

vehicle_signage_output_identity

This data flow is used within the Manage Traffic function to identify individual indicators used for the control of traffic on roads (surface streets) and highways. The indicators can be either intersection signal controllers, pedestrian signal controllers or variable message signs (vms). The data flow consists of the following data items each of which is defined in its own DDE:

unit_number
+ location_identity.

vehicle_signage_predicted_incident_data

This data flow is used within the Manage Traffic function. It contains data about

predicted incidents for output as part of in-vehicle signage data. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{predicted_incident_details}.

vehicle_signage_traffic_data

THis data flow is used withhin the Manage Traffic and Provide Driver and Traveler Services functions. It contains vehicle speed and occupancy data for a link that is in the area local to a process that outputs data for use by in-vehicle signage units. The data flow consists of the following data items each of which is defined in its own DDE:

link_identity
+ vehicle_occupancy
+ vehicle_speed.

vehicle_signage_vms_data

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function and contains data that represents the output from actual roadside variable message signs (vms). The vms outputs will be replicated as in-vehicle signage displays, and will relate to the signs that are covered by each of the roadside broadcast processes. The data is presented as a three (3) character code which represents the sign display. .

vehicle_smart_probe_data

This data flow is sent from the Provide Vehicle Monitoring and Control function to the Manage Traffic function. It contains one (1) byte of data that is coded to give an indication of a hazard on the road or freeway that has been detected by sensors on-board a passing vehicle. The type of hazard to be enacoded will comprise but not be limited to such things as, fog, ice, snow, earth (mud) slides, liquid spill (oil), floods, road subsidance, bridges broken, etc. .

vehicle_smart_probe_data_for_storage

This data flow is used within the Manage Traffic function. It contains the processed vehicle smart probe data collected from a roadside unit, which in turn have received data output by suitably equipped vehicles as they pass by. The data flow consists of the following data items each of which is defined in its own DDE:

vehicle_smart_probe_data_source
+ vehicle_smart_probe_data_indication.

vehicle_smart_probe_data_indication

This data flow is used within the Manage Traffic function. It contains the data from a vehicle mart probe, processed to provide an indication of the type of hazard that the vehicle found on the road or freeway. The indication will be shown as a three (3) byte character code, comprising but not limited to the following:

BDN - bridge down, i.e. broken, or in some way hazardous to traffic;
ESD - earth or mud slide;
FOG - fog, smoke or mist reducing visibility;
ICE - the road surface is icy;
LOR - road covered by a liquid, e.g. oil, which makes it hazardous to traffic;
OOR - obsticle on road, e.g. fallen treee, telegraph pole, etc.;
RSS - road subsidance, i.e part of the road surface has fallen away. .

vehicle_smart_probe_data_output

This data flow is sent from the Manage Traffic function to the Provide Driver and Traveler Services function. It contains the data obtained from vehicle smart probes, processsed and formatted for output to vehicles as they pass by. The data flow is sized at one (1) byte and will contain a compressed version of the internally used character codes for the various types of hazard that may be found on roads and freeways. .

vehicle_smart_probe_data_output_fault

This data flow is used within the Manage Traffic function. It contains an indication that the output of vehicle smart probe data is faulty. This may be due to data not being received for output, or that the output process itself is at fault. The data flow is sized at one (1) byte and will use a single character to show the type of fault or be blank is no fault is present. .

vehicle_smart_probe_data_source

This data flow is used within the Manage Traffic function. It contains the identity and location of the roadside unit that has collected a particular vehicle smart probe data. The data flow consists of the following data items each of which is defined in its own DDE:

vehicle_smart_probe_data_source_identity
+ vehicle_smart_probe_data_source_location.

vehicle_smart_probe_data_source_identity

This data flow is used within the Manage Traffic function. It contains the identity of the roadside unit that has collected a particular vehicle smart probe data. The data flow consists of the following data item which is defined in its own DDE:

unit_number.

vehicle_smart_probe_data_source_location

This data flow is used within the Manage Traffic function. It contains the location of the roadside unit that has collected a particular vehicle smart probe data. The data flow consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_smart_probe_input_data

This data flow is used within the Manage Traffic function. It contains the raw data obtained from vehicle smart probes, with the identity of the roadside unit that received the data. The data flow consists of the followingg data items each of which is defined in its own DDE:

vehicle_smart_probe_data_source_identity
+ vehicle_smart_probe_data.

vehicle_smart_probe_stored_data

This data flow is used within the Manage Traffic function. It contains the processed vehicle smart probe data collected from roadside units. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{vehicle_smart_probe_data_for_storage}.

vehicle_speed

This data item is used within the Manage Traffic function and contains the speed of a vehicle which has been detected by a detector located on the highway, as the vehicle flowed over its sensor. The units are in miles-per-hour (mph), and the data flow is sized at one (1) byte to give a maximum value of 127 mph. .

vehicle_speed_control_data

This data flow is used within the Provide Vehicle Monitoring and Control function. It contains data for use in the automatic control of the vehicle. The data flow consists of the following items of data each of which is defined in its own DDE:

[ahs_accel_decel_profile | vehicle_accel_decel_profile | ahs_demand_accel_decel_profile].

vehicle_standard_headway

This data flow is used within the Provide Vehicle Monitoring and Control function. It provides the vehicle headway that is to be used when it it operating as part of a platoon. The data is loaded into the vehicle during its manufacture and cannot be changed. It can however by overridden by data from the Manage Demand facility in the manage Traffic function, or by data from another vehicle in the platoon. The data flow

consists of the following data item which is defined in its own DDE:

vehicle_headway_data.

vehicle_status_details

This data flow is generated in the Provide Vehicle Control and Monitoring function for use in a number of other messages. It contains the coded operational status of the vehicle as determined from on-board sensors. This will comprise but no be limited to any of the following:

VNT - engine not at operating temperature
VDC - driver in control of the vehicle
VAC - vehicle under automatic control
VAM - vehicle in acceleration mode, i.e. speed increasing
VDM - vehicle in deceleration mode, i.e. speed decreasing
VBM - vehicle in braking mode, i.e. brakes on
VPF - potential vehicle fault, i.e. there is a fault but it doesn't affect operations
VSF - vehicle safety fault, i.e. the vehicle has a fault affecting its safety

Only some of the above will be used for each of the types of data identified above. .

vehicle_status_details_for_broadcast

This data flow is sent from the Provide Vehicle Control and Monitoring function to the Provide Driver and Traveler Services function. It contains the operational status of the vehicle for output to the driver. The data flow consists of the following data item which is defined in its own DDE:

vehicle_status_details.

vehicle_status_details_for_driver_security

This data flow is sent from the Provide Vehicle Control and Monitoring function to the Provide Driver and Traveler Services function. It contains the operational status of the vehicle for use in driver initiated emergency message output to the Manage Emergency Services function. The data flow consists of the following data item which is defined in its own DDE:

vehicle_status_details.

vehicle_status_details_for_emergencies

This data flow is used within the Provide Vehicle Control and Monitoring function. It contains the vehicle's current status for use as part of the data output when it is involved in an emergency. The data flow consists of the following data item which is defined in its own DDE:

vehicle_status_details.

vehicle_status_details_for_emissions

This data flow is sent from the Provide Vehicle Control and Monitoring function to the Manage Traffic function. It contains the operational status of the vehicle which is important because the levels of pollution vary according to how long the vehicle has been running, i.e. how warm is the engine, and what it is actually doing, e.g. is it stationary, or pulling away from a stop. The data flow consists of the following data item which is defined in its own DDE:

vehicle_status_details.

vehicle_status_traffic_inputs

This data flow is used to transfer data from the Manage Traffic function to the Provide Vehicle Monitoring and Control function. It contains data for use by processes involved in automatic highway system (ahs) lane management and vehicle control. The data flow consists of the following data items each of which is defined in its own DDE:

ahs_control_data
+ intersection_collision_avoidance_data.

vehicle_tag_data

This data flow is used within the Manage Traffic function. It contains the data from parking lot and toll tags on-board vehicles plus the identity of the unit which received the data. The data flow consists of the following data items each of which is defined in its own DDE:

vehicle_tag_data_source_identity
+ vehicle_tag_input_data.

vehicle_tag_data_source_identity

This data flow is used within the Manage Traffic function. It contains the identity of the roadside unit that has collected a particular vehicle tag data. The data flow consists of the following data item which is defined in its own DDE:

unit_number.

vehicle_tag_data_source_location

This data flow is used within the Manage Traffic function. It contains the location of the roadside unit that has collected a particular vehicle tag data. The data flow consists of the following data item which is defined in its own DDE:

location_identity.

vehicle_tag_for_charges

This data flow is used within the Provide Electronic Payment Services function and provides the user identity for parking lot payment. It consists of the following data items each of which is defined in its own DDE:

parking_lot_tag_data
+ vehicle_identity.

vehicle_tag_for_tolls

This data flow is used within the Provide Electronic Payment Services function and provides the user identity for toll payment. It consists of the following data items each of which is defined in its own DDE:

toll_tag_data
+ vehicle_identity.

vehicle_tag_input_data

This data flow is used within the Manage Traffic function. It contains the data from parking lot and toll tags on-board vehicles which will be used to calculate vehicle journey times for links in the road (surface street) and freeway network served by the function. The data consists of a uniquely encoded form of the original tag data (using a large integer number) which will identify a particular tag, but not with its actual tag number. This is necessary to protect the identity of the tag while it is being used to calculate vehicle journey times. .

vehicle_toll_characteristic_data

This data flow is used within the Provide Electronic Payment Services function and contains data obtaine from a vehicle at a toll payment point. It consists of the following data items each of which is defined in its own DDE:

vehicle_identity
+ vehicle_characteristics
+ cv_vehicle_characteristics.

vehicle_toll_probe_data

This data flow is sent from the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function. It contains the smoothed average vehicle journey times for the route segment between two toll collection points, and the

identity of the route segment. The data is used to calculate link journey times for in-vehicle guidance purposes. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{route_segment_identity
+ route_segment_journey_time_from_tolls}.

vehicle_type

This data flow is used within the Manage Traffic function and contains an identifier for the type of vehicle for which pollution violations have been detected. The data is stored as up to eight alphanumeric characters. .

vehicle_type_for_charges

This data flow is used within the Provide Electronic Payment Services function and contains the vehicle type as determined from processing of the vehicle's characteristics for the purpose of paying for parking lot charges. .

vehicle_type_for_tolls

This data flow is used within the Provide Electronic Payment Services function and contains the vehicle type and identity as determined from processing of the vehicle's characteristics for the purpose of charging for tolls. It consists of the following data items each of which is defined in its own DDE:

cv_tag_data
+ cv_vehicle_characteristics
+ vehicle_identity
+ vehicle_type.

violation_information

This data is used by the Manage Transit and Provide Electronic Payment Services functions to send data about a violator of the toll, parking lot or fare collection processes to the Manage Emergency Services functin. It consists of the following data items each of which is defined it its own DDE:

fare_violation_information
+ parking_lot_violation_information
+ toll_violation_information.

violation_type

This data flow is used within the Manage Emergency Services function and defines a violation type using a three character code. .

Additional sizing assumptions:

SIZE=3;

vision_data

This data flow is used within the Provide Vehicle Monitoring and Control function and contains data for an enhanced version of the picture obtained from other sensor(s) in the vehicle. This picture will show the driver's field of view, and will be enhanced to increase clarity under conditions such as poor visibility, darkness, etc. .

vms_advisory_text

This data flow is used within the Manage Traffic function and contains details of the actual advisory text strings that are to be output to drivers and pedestrians using indicators that are variable message signs (vms). The advisory text string may be one of three types depending on the type of incident about which advice is being provided. The data flow will consist of one of the following data items each of which is defined in its own DDE:

[vms_highway_open_close | vms_incident_warning | vms_weather_warning].

vms_allocation

This data flow is used within the Manage Traffic function and is provided by the Plan System Deployment function. It contains details of the way in which variable message signs (vms) are allocated to the road and highway network within the geographic area

controlled by ITS. The data flow consists of the following data items each of which is defined in its own DDE:

vms_highway_allocation
+ vms_road_allocation.

vms_displays

This data flow is used within the Manage Traffic function and contains th actual texts for use in variable message sign (vms) displays that are to be used to provide forwarning of the full range of incidents. .

vms_downstream_identity

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides the identity of the variable message sign (vms) that is downstream of the vms to which the data relates. The data flow consists of the following data item which is defined in its own DDE:

indicator_identity.

vms_highway_allocation

This data flow is used within the Manage Traffic function and is provided by the Plan System Deployment function. It contains details of the way in which variable message signs (vms) are allocated to the highway network within the geographic area controlled by ITS. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
+ route_segment_end_point
+ route_segment_identity
+ route_segment_start_point}.

vms_highway_open_close

This data flow is used within the Manage Traffic function. It is a VMS state which advises drivers that some or all of the highway(s) ahead is(are) closed. If the highway(s) are open no indication will be given as this is the normal state .

vms_incident_warning

This data flow is used within the Manage Traffic function and is the VMS state which gives warning
of an incident to travelers .

Additional sizing assumptions:

SIZE=8;

vms_pollution_message

This data flow is used within the Manage Traffic function. It is a VMS state which advises drivers that a particular vehicle is producing abnormal pollution, or that the general pollution levels are too high. If the pollution levels are not out of the ordinary, i.e. within limits, no indication will be given as this is the normal state .

vms_road_allocation

This data flow is used within the Manage Traffic function and is provided by the Plan System Deployment function. It contains details of the way in which variable message signs (vms) are allocated to the road network within the geographic area controlled by ITS. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
+ route_segment_end_point
+ route_segment_identity
+ route_segment_start_point}.

vms_updates

This data flow is used within the Manage Traffic function and contains data about the text strings of information concerning incidents that are to be output to drivers and pedestrians. This output will be achieved using a form of indicators called variable message signs (vms). The indicator type specified for the data output must be a vms otherwise no output can be made, and only one of the data items defining the type of data to be output will be present. The data flow consists of the following data items each of which is defined in its own DDE:

vms_updates_for_highways
+ vms_updates_for_roads.

vms_updates_for_highways

This data flow is used within the Manage Traffic function and contains data about the text strings of information concerning incidents that are to be output to drivers on freeways in the geographic and/or jurisdictional area(s) served by the function. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
+ vms_advisory_text}.

vms_updates_for_roads

This data flow is used within the Manage Traffic function and contains data about the text strings of information concerning incidents that are to be output to drivers and pedestrians on roads (surface streets) in the geographic and/or jurisdictional area(s) served by the function. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{indicator_identity
+ vms_advisory_text}.

vms_upstream_identity

This data flow is used within the Manage Traffic function and contains data provided by the Plan System Deployment function. It provides the identity of the variable message sign (vms) that is upstream of the vms to which the data relates. The data flow consists of the following data item which is defined in its own DDE

indicator_identity.

vms_weather_warning

This data flow is used within the Manage Traffic function and is the VMS state which gives warning
of weather conditions which are likely to be hazardous to driving. .

Additional sizing assumptions:

SIZE=8;

wide_area_pollution_data

This data flow is used within the Manage Traffic function as a means of transferring current pollution data from the Manage Emissions facility to the Provide Traffic Surveillance facility. It contains data about the current levels of pollution obtained from the store of pollution data in the area covered by the Traffic Management Center (TMC) and consists of the following data items each of which is defined in its own DDE:

pollution_state_area_collection
+ list_size
+ list_size{pollution_state_roadside_collection}.

yellow_pages_advisory_data

This data flow is used within the Provide Driver and Traveler Services function to provide yellow pages data to drivers and transit users in vehicles and/or confirmation of a previously requested reservation. It consists of the following data items each of

which is defined in its own DDE:

yellow_pages_data_for_advisories
+ yellow_pages_cost
+ yellow_pages_dining_reservation_confirmation
+ yellow_pages_lodging_reservation_confirmation
+ yellow_pages_ticket_purchase_confirmation.

yellow_pages_advisory_requests

This data flow is used within the Provide Driver and Traveler Services function to request that data about yellow pages services be output to a driver or a transit user in a vehicle or that a yellow pages services reservation b made. The scope and transit route number data will be provided by the driver or transit user, whilst the vehicle location will be provided automatically. The data flow consists of the following data items each of which is defined in its own DDE:

advisory_data_scope
+ vehicle_location_for_advisories
+ transit_route_number
+ transit_vehicle_identity
+ yellow_pages_dining_reservation
+ yellow_pages_lodging_reservation
+ yellow_pages_ticket_purchase.

yellow_pages_cost

This data flow is used within the Provide Driver and Traveler Services and Provide Electronic Payments Services functions. It contains the cost of other (yellow pages) services such as hotels, restaurants, theaters, etc. that have been requested and/or confirmed by the traveler. The data flow consists of the following data item which is defined in its own DDE:

cost.

yellow_pages_data

This data flow is used within the Provide Driver and Traveler Services function to provide information on yellow pages (other) services that are currently available to the traveler. It consists of the following data items each of which is defined in its own DDE:

yellow_pages_general_information
+ yellow_pages_specific_information
+ yellow_pages_transaction_information.

yellow_pages_data_for_advisories

This data flow is used within the Provide Driver and Traveler Services function to provide yellow pages (other services) advisory data to drivers and travelers in vehicles. It only includes those services of whatever type that are relevant to the vehicles current location. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_detail}.

yellow_pages_data_request

This data flow is used within the Provide Driver and Traveler Services function and is used to request the Manage Yellow pages Services facility to provide data on yellow pages (other) services. .

yellow_pages_dining_information

This data flow is used within the Provide Driver and Traveler Services function and contains details of those restaurants, diners, etc. in the area served by the function, with dates and prices of available seats. The type character code will define the type

of restaurant, diner, etc. and the description will define the name of the chain (if applicable) and the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_detail}.

yellow_pages_dining_reservation

This data flow is used within the Provide Driver and Traveler Services function and contains a request for the information and service providers to make a dining reservation at a restaurant, hotel, etc. The reservation will be based on the data already provided to the traveler through a previous request. .

yellow_pages_dining_reservation_confirmation

This data flow is used within the Provide Driver and Traveler Services function. It contains a massage to say that a dining reservation is confirmed and includes a confirmation number. The data flow consists of the following items each of which is defined in its own DDE:

confirmation_flag
+ yellow_pages_service_reservation_number.

yellow_pages_food

This data flow is used within the Provide Driver and Traveler Services function and contains details of restaurants, fast food outlets, etc. in the area served by the function. The type character code will define the type of food and the description will define the chain (if applicable) and the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
    + yellow_pages_service_contact
    + yellow_pages_service_description
    + yellow_pages_service_location}.

yellow_pages_gas_stations

This data flow is used within the Provide Driver and Traveler Services function and contains details of gas stations in the area served by the function. The type character code will define the facilities available at the gas station, e.g. toilets, shop, food, the type(s) of fuel supplied, etc. and the description will define the gas supplier chain(s) and the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
    + yellow_pages_service_contact
    + yellow_pages_service_description
    + yellow_pages_service_location}.

yellow_pages_general_information

This data flow is sent from the information and service providers terminator to the Provide Driver and Traveler Services function. It contains the following items the contents of which will be specific to the area covered by the function and which will include contact telephone numbers, etc. Each of them is defined in its own DDE:

yellow_pages_history
+ yellow_pages_local_customs
+ yellow_pages_people.

yellow_pages_history

This data flow is used within the Provide Driver and Traveler Services function and contains details of any sites of historic interest, etc. in the area served by the

function. The type character code will define the type of site, e.g. Civil War battle site and the description will define the address of the site. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
+ yellow_pages_service_contact
+ yellow_pages_service_description
+ yellow_pages_service_location
+ yellow_pages_service_time}.

yellow_pages_hospitals

This data flow is used within the Provide Driver and Traveler Services function and contains details of location(s), available facilities and visiting hours of hospitals by type, e.g. general human, human speciality (eye, skin, maternity, etc.), veterinary, etc. in the area served by the function. The type character code will define the type of hospital and the description will define opening times and visiting hours plus the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
+ yellow_pages_service_contact
+ yellow_pages_service_description
+ yellow_pages_service_location}.

yellow_pages_local_customs

This data flow is used within the Provide Driver and Traveler Services function and contains details of local customs, etc. in the area served by the function. The description will define the customs themselves, e.g. the days on which shops close early, etc., whilst the location enables the data to apply to selected part(s) of the served area. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
+ yellow_pages_service_description
+ yellow_pages_service_location}.

yellow_pages_lodging

This data flow is used within the Provide Driver and Traveler Services function and contains details of hotels, motels, etc. in the area served by the function. The type character code will define the type of hotel and the description will define the hotel chain (if applicable) and the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
+ yellow_pages_service_contact
+ yellow_pages_service_description
+ yellow_pages_service_location}.

yellow_pages_lodging_reservation

This data flow is used within the Provide Driver and Traveler Services function and contains a request for the information and service providers to make a lodging reservation at a hotel or motel etc. from the information already provided to the traveler through a previous request. .

yellow_pages_lodging_reservation_confirmation

This data flow is used within the Provide Driver and Traveler Services function. It contains a massage to say that a lodging reservation is confirmed and includes a confirmation number. The data flow consists of the following items each of which is

defined in its own DDE:

confirmation_flag
+ yellow_pages_service_reservation_number.

yellow_pages_lodging_reservations

This data flow is used within the Provide Driver and Traveler Services function and contains details of those hotels, motels, etc. in the area served by the function, with dates and prices of available rooms. The type character code will define the type of hotel and the description will define the hotel chain (if applicable) and the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_detail}.

yellow_pages_new_data_request

This data flow is used within the Provide Driver and Traveler Services function and shows that a new information and service provider, or other information and service provider has been successfully registered and can be used as a source of yellow pages data. It incldudes the following data item which is defined in its own DDE:

yellow_pages_service_provider_identity.

yellow_pages_parking

This data flow is used within the Provide Driver and Traveler Services function and contains details of parking lots, on-street parking arrangements, etc. in the area served by the function. The type character code will define the type parking, e.g. privately managed lot, municipally owned lot, free parking, on-street parking, etc. and the description will define the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
    + yellow_pages_service_contact
    + yellow_pages_service_description
    + yellow_pages_service_location}.

yellow_pages_people

This data flow is used within the Provide Driver and Traveler Services function and contains details of important local people, e.g. mayor, chief of police, etc. in the area served by the function. The type character code will define the type of person and the description will define the part(s) of the area served and the address of the person's office. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
    + yellow_pages_service_contact
    + yellow_pages_service_description
    + yellow_pages_service_location}.

yellow_pages_private_vehicle_parts_shops

This data flow is used within the Provide Driver and Traveler Services function and contains details of vehicle parts shops in the area served by the function. The type character code will define the type of vehicle parts available, e.g. engines, brakes, tyres, mufflers, etc. and the description will define the repair shop chain (if applicable) and the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type

+ yellow_pages_service_contact
+ yellow_pages_service_description
+ yellow_pages_service_location}.

yellow_pages_private_vehicle_repair_shops

This data flow is used within the Provide Driver and Traveler Services function and contains details of repair shops in the area served by the function. The type character code will define the type of repair shop, the type(s) of repair facilities that are available, e.g. general servicing, engines, brakes, tyres, mufflers, etc. and the description will define the repair shop chain (if applicable) and the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
+ yellow_pages_service_contact
+ yellow_pages_service_description
+ yellow_pages_service_location}.

yellow_pages_provder_payments_transactions

This data flow is used within the Provide Payment Electronic Services function and contains records of all payment transactions for the provision of other (yellow pages) services and registration of suppliers of these services. .

yellow_pages_rest_areas

This data flow is used within the Provide Driver and Traveler Services function and contains details of test areas adjacent to roads and highways in the area served by the function. The type character code will define the facilities available at the rest area, e.g. toilets, food, etc. and the description will define any private operators that provide on-site services and the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
+ yellow_pages_service_contact
+ yellow_pages_service_description
+ yellow_pages_service_location}.

yellow_pages_service_availability

This data flow is used within the Provide Driver and Traveler Services function and contains a sixteen (16) character code that is used to define what is actually available from the yellow pages service that is being provided. This may be a number of rooms at a hotel, the number of seats at a theater or restaurant, or none of they are all sold, a range of services provided by a garage, a list of codes for attractions at a tourist site or special event, etc. .

yellow_pages_service_contact

This data flow is used within the Provide Driver and Traveler Services function and contains a twenty (20) character code that is used to define the telephone, fax or e-mail contact number for the yellow pages service that is being provided. The actual number will be proceeded a character in parenthesis to show its type, i.e. (T) for telephone, (F) for facsimile, (E) for e-mail, etc. .

yellow_pages_service_cost

This data flow is used within the Provide Driver and Traveler Services function and contains the cost of an associated yellow pages service which is currently available. It consists of the following data item which is defined in its own DDE:

cost.

yellow_pages_service_date

This data flow is used within the Provide Driver and Traveler Services function and contains the date on which an associated yellow pages service will be available. It consists of the following data item which is defined in its own DDE:

date.

yellow_pages_service_description

This data flow is used within the Provide Driver and Traveler Services function and contains a thirty character string that describes the yellow pages service that is being provided. This may be the name of a hotel, theater or concert hall, the address of a sports stadium, the address of a garage, etc. .

yellow_pages_service_detail

This data flow is used within the Provide Driver and traveler Services function. It contains details of the providers of those services of whatever type that are relevant to a vehicle's current location. The data flow consists of the following data items each of which is defined in its own DDE

yellow_pages_service_type
+ yellow_pages_service_contact
+ yellow_pages_service_cost
+ yellow_pages_service_date
+ yellow_pages_service_description
+ yellow_pages_service_location
+ yellow_pages_service_time
+ yellow_pages_service_availability.

yellow_pages_service_location

This data flow is used within the Provide Driver and Traveler Services function and contains the geographic location at which an associated yellow pages service will be available. It consists of the following data item which is defined in its own DDE:

location_identity.

yellow_pages_service_provider_area

This data flow is used within the Provide Driver and Traveler Services function and contains a list of the geographic area(s) served by an individual yellow pages service provider. The data flow is sized at fifty (50) bytes to enable state and county identities to be stored using the standard two character codes, e.g. MD, CA, Fl, etc. .

yellow_pages_service_provider_attributes

This data flow is used within the Provide Driver and Traveler Services function and contains the details of the services that are provided by an individual yellow pages service provider. The data flow is sized at thirty (30) bytes to enable up to ten services to be identified as a series of three (3) byte character codes. Eamples of the codes that could be used comprise but are not limited to the following:

THR - theaters
CTS - concerts
RST - restaurants
CGS - car (pertrol) gas stations
DGS - truck/van (diesel) gas stations
CRS - car repair shops
VRS - truck repair shops
HPT - hospitals
DPV - vetenary services specializing in domestic animals
FAV - vetenary services specializing in farm type animals. .

yellow_pages_service_provider_contact

This data flow is used within the Provide Driver and Traveler Services function and contains the details of how to contact (send data to, obtain information from) an individual yellow pages service provider. The data flow is sized at fifty (50) bytes to enable information such as address, plus telephone and fax numbers, e-mail address, and world wide web page address to be included. .

yellow_pages_service_provider_data

This data store is used within the Provide Driver and Traveler Services function and contains data about individual yellow pages service providers. It is sized to enable details of up to one hundered (100) providers to be stored. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_provider_details
+ yellow_pages_service_provider_identity}.

yellow_pages_service_provider_details

This data flow is used within the Provide Driver and Traveler Services function and contains data about individual yellow pages service providers. This data includes the provider name, contact details, scope of the geographic area for which it can provide data and the actual services that it can provide. The data flow consits of the following data items each of which is defined in its own DDE:

yellow_pages_service_provider_name
+ yellow_pages_service_provider_contact
+ yellow_pages_service_provider_attributes
+ yellow_pages_service_provider_area.

yellow_pages_service_provider_identity

This data flow is used within the Provide Driver and Traveler Services function and contains the identity of an yellow pages service provider. It is sized at sixteen (16) bytes to enable a unique identifier to be applied, as for other identities used for such things as vehicles, drivers, travelers, etc. .

yellow_pages_service_provider_name

This data flow is used within the Provide Driver and Traveler Services function and contains the name of an individual yellow pages service provider. The data flow is sized at thirty (30) bytes to enable the name to be accommmodated without any abbreviations. .

yellow_pages_service_provider_registration_request

This data flow is sent from the Provide Driver and Traveler Services function to the Provide Electronic Payment Services function and contains the request for payment of the registration fee for an information and service provider, or other information and service provider, to supply yellow pages data to another process in the Provide Driver and Traveler Services function. The data flow contains the following data item which is defined in its own DDE:

credit_identity
+ yellow_pages_service_provider_identity.

yellow_pages_service_provider_registration_response

This data flow is sent from the Provide Electronic Payment Services function to the Provide Driver and Traveler Services function and contains the response to a previous request for payment of the registration fee for a yellow pages service provider to supply yellow pages data to another process in the Provide Driver and Traveler Services function. The data flow consists of the following data items each of which is defined in its own DDE:

confirmation_flag
+ yellow_pages_service_provider_identity.

yellow_pages_service_reservation_number

This data flow is used within the Provide Driver and Traveler Services function and contains the confirmation number for a yellow pages service reservation. The data flow is sized at three (3) bytes to enable a unique number to be given to each and every reservation. bearing in mind the possibility that some time (months) may elapse before it expires. .

yellow_pages_service_time

This data flow is used within the Provide Driver and Traveler Services function and contains the time at which an associated yellow pages service will be available. It consists of the following data item which is defined in its own DDE:

time.

yellow_pages_service_type

This data flow is used within the Provide Driver and Traveler Services function and contains a three character code that is used to define the type of yellow pages service that is being provided. The three character code will use alphanumeric characters and comprise but not be limited to the following:

HTL - hotel
MTL - motel
TVL - travel lodge
RST - restaurant
TAW - take away
DNR - diner
THR - theater
CCT - concert
SHW - stage show
NFL - national football league game
NHL - national hockey league game .

yellow_pages_special_events

This data flow is used within the Provide Driver and Traveler Services function and contains details of special events such as parades, fairs, exhibitions, conventions, etc. in the area served by the function. The type character code will define the type of event and the description will define the organizer(s) and address at which the event will take place. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
+ yellow_pages_service_contact
+ yellow_pages_service_description
+ yellow_pages_service_location}.

yellow_pages_specific_information

This data flow is sent from the information and service providers terminator to the Provide Driver and Traveler Services function. It contains information which will be specific to the area covered by the function and which will include details of what facilities are currently available for purchase, etc. The data flow consists of the following items each of which is defined in its own DDE:

yellow_pages_food
+ yellow_pages_gas_stations
+ yellow_pages_hospitals
+ yellow_pages_lodging
+ yellow_pages_private_vehicle_repair_shops
+ yellow_pages_private_vehicle_parts_shops
+ yellow_pages_parking
+ yellow_pages_rest_areas
+ yellow_pages_special_events
+ yellow_pages_tourist_activities
+ yellow_pages_tourist_services.

yellow_pages_ticket_information

This data flow is used within the Provide Driver and Traveler Services function and contains details of those activities, services etc. for which tickets are required in the area served by the function, with dates and prices. The type character code will

define the type of activity or service and the description will define the address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_detail}.

yellow_pages_ticket_purchase

This data flow is used within the Provide Driver and Traveler Services function and contains a request for the information and service providers to make a ticket purchase for a special event, theater, tourist attraction, etc. from the information already provided to the traveler through a previous request. .

yellow_pages_ticket_purchase_confirmation

This data flow is used within the Provide Driver and Traveler Services function. It contains a massage to say that a ticket purchase is confirmed and includes a confirmation number. The data flow consists of the following items each of which is defined in its own DDE:

confirmation_flag
+ yellow_pages_service_reservation_number.

yellow_pages_tourist_activities

This data flow is used within the Provide Driver and Traveler Services function and contains details of tourist specific activities in the area served by the function. The type character code will define the type of activity and the description will define the address at which thew activity will take place. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
    + yellow_pages_service_contact
    + yellow_pages_service_description
    + yellow_pages_service_location
    + yellow_pages_service_time}.

yellow_pages_tourist_services

This data flow is used within the Provide Driver and Traveler Services function and contains details of travel agents in the area served by the function. The type character code will define the service(s) provided by the agent and the description will define the agent's address. The data flow consists of the following data items each of which is defined in its own DDE:

list_size
+ list_size{yellow_pages_service_type
    + yellow_pages_service_contact
    + yellow_pages_service_description
    + yellow_pages_service_location}.

yellow_pages_transaction_information

This data flow is sent from the information and service providers terminator to the Provide Driver and Traveler Services function. It contains information which will be specific to the area covered by the function and which will include details of what facilities are currently available for purchase, etc. The data flow consists of the following items each of which is defined in its own DDE:

yellow_pages_lodging_reservations
+ yellow_pages_dining_information
+ yellow_pages_ticket_information.

yellow_pages_update_request

This data flow is used withi the Provide Driver and Traveler Services function to request

an update of the yellow pages data currently available to travelers. The source of the data request may be specified as either the local suppliers (the information and service provider terminator) or suppliers outside the immediate ITS geographic area of operation (the other information and service provider terminator). .