# David Hilliard Williams

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## Expertise

- Location-Based Services (LBS)
- GPS Systems; Network-Based Location Determination Systems
- Wireless 911 (E911); NG911
- Internet of Things (IoT); Real-Time Location Systems (RTLS)
- Non-Cellular/Indoor/Sensor-based Location Systems, including: RFID, Wi-Fi/WPS, BLE/Bluetooth, Beacon-based RTLS; NFC/ DSRC; Wearable systems; Hybrids/Combinations
- Expert Witness Litigation Support, Patent/Intellectual Property Development and Protection Services
- GPS/Cellphone Criminal and Civil Matter Forensics, using CDRs, RTT, PCMD, NELOS, EVDO, Geotab, Paraben, CellHawk, and Cellebrite
- Internet of Things (IoT) Ecosystem (Sensors, Identity, Interfaces, Edge, Network, Cloud, Data Network Management, Data Management, Analytics, Privacy and Security)
- Location & IoT Data Privacy and Security
- Safety and Security Application and Architecture Design and Implementation
- Sensor Design, Architecture and Interfaces
- Mobile Resource Management (MRM) Tracking and Management; Vehicle, Fleet, Worker, and Freight & Asset Tracking/Mgmt.
- Telematics; Vehicle Monitoring Ecosystem
- Connected Car/Auto. Vehicle (AV) Ecosystem
- Navigation Systems; PNDs; Local Search
- Map Data, Digital Mapping, Digital Media Interfacing/Management, GIS, & IoT IT
- Mobile Social/Business Networking
- LBS and IoT Enterprise/Consumer Product & Technical Strategy, Design and Build
- Location/Context-Centric Enterprise Process Reengineering, Integration, & Interoperability
- SMART location, SMART Home, SMART Wearables, SMART Buildings, SMART Cities
- Context/Presence-Based LBS and IoT
- M2M, Smart Grid/Energy Systems
- Accident/Incident Reconstruction
- LBS Big Data and Cloud Computing

## Professional Summary

David Hilliard Williams is an internationally-known expert in the wireless/mobile location field and President and Founder of E911-LBS Consulting. He specializes in wireless location product and technology development and implementation, as well as Intellectual Property (IP)/patent and location forensics litigation services involving technologies such as Global Positioning Satellite (GPS) systems; Network-based location determination technologies such as TDOA, ECID, and AFLT; Wireless 911 (E911) and Next Generation 911; Real-Time Location Systems (RTLS) including Radio Frequency Identification (RFID) systems, Wi-Fi-based positioning systems (WPS), BLE/Beacon-based location systems, Bluetooth, Near Field Communications (NFC), and alternative RTLS (Ultrasound, Infrared); Wearable Tags/Sensor tracking systems; Zigbee/Mesh networks; and various hybrids and combinations.

Mr. Williams is expert in the full range of business and consumer location-based services (LBS) and IoT applications enabled by these location technologies, including safety, security, and intruder detection/monitoring, vehicle/fleet tracking/mgmt, telematics, local search, navigation systems, presence/context-aware apps, mobile resource management, asset and freight management, wearable tags/sensors, financial/mobile wallet, mobile hospitality/POS



GOOGLE EXHIBIT 1009
Google v. Geoscope

systems, supply chain management, family tracking, mobile social and business networking, proximity-based entertainment and leisure, gaming, and intelligent transportation systems.

Mr. Williams has extensive expertise in all aspects of LBS and IoT delivery across the mobile location ecosystem including enabling network communications, location technologies/sensors, geofencing design, map data, location data/database management, geospatial platform/Geographical Information Systems, GPS and other location chipsets, location data management, and device, infrastructure and integration providers. Mr. Williams has developed and implemented industry-leading product and technology solutions for numerous LBS applications and markets and provides consulting and research services to some of the leading carriers and enterprises in the U.S., Asia, and Europe. His client list includes Apple (2), AT&T, FedEx, GE, GM, Geotab, Google (6), Heil, the Houston Police Department, the L.A. County District Attorney's Office (2), Lyft (3), Macropoint, Nextel, NAVTEQ, Qualcomm, Peschke, Samsung, Sprint, Toyota, Twilio, Verizon Wireless, VIVINT, Volkswagen, and Zillow.

Mr. Williams has successfully represented both prosecutors and defendants in patent, ITC, and criminal litigation (including assisting State Public Defender entities), as well as both sides of civil trade secrets, product liability, and other litigation. He has been deposed 15 times and has testified 6 times, including successfully in The Eastern District Court of Texas, winning both infringement and invalidity matters. In total he has provided expertise in matters involving over 150 patents and over 35 criminal and civil matters.

Mr. Williams is expert in smart location technology issues in the Internet of Things (IoT) and connected/driverless car fields, particularly in their utilization of location and context information through the practical envisioning and design of: consumer/enterprise use matters and associated application design, sensor design and deployment strategies; process (re)engineering; IT integration; data aggregation, segmentation, analysis, and management; scalability; and security and privacy issues, requirements, collaboration structures, and ongoing management. He is expert on Big Data issues associated with location data.

With over thirty-five years in location, communications and information technology solutions design, selection, implementation and ongoing management, Mr. Williams has extensive experience in the activities and issues needed to get applications to market, including planning and design at the application, system, interface/integration, network, IT, operational and customer facing levels. He has been published and quoted by leading magazines and newspapers about location-related services, including The New York Times, CBS News.com, The Columbus (Ohio) Dispatch, The Boston Globe, Computerworld, Directions Magazine, Mission Critical Communications, Popular Mechanics, and RFID Journal.

Mr. Williams has authored five books on wireless location, including *The Definitive Guide to IoT Sensors (available December 2020), The Definitive Guide to GPS, RFID, Wi-Fi, and Other Wireless Location-Based Services (two versions, third in progress)*, *The Definitive Guide to Wireless E911*, and (co-authored) *The Definitive Guide to Mobile Positioning and Location Management*. Mr. Williams has authored dozens of research reports, and tracks and analyzes leading companies in the LBS, IoT, and public safety industries particularly with respect to their product and technology strategies, competitive capabilities and

implementation issues. He is expert on all public policy and technology issues related to emergency services/public safety, location data privacy and security, and LBS and IoT privacy protection policies, systems, and support infrastructure. He opines on location privacy issues in various forums.

## Employment History

From: 2002 **E911-LBS Consulting**
To: Present
Position: *President and Founder*
Provides services across the entire wireless value chain, particularly with respect to technology and business strategic planning and product design and development, plus specialized services such IP/Patent litigation associated with Location Based Services and applications, GPS, E911, IoT, RTLS, RFID, Wi-Fi, NFC, BLE/Bluetooth, beacons, & other location technologies and associated ecosystems. Projects include:

- Provided expert witness, technical consulting, and research analysis services with respect to location-based services-related intellectual property/patent protection, licensing, and litigation (details in separate litigation support section).

- Provide forensics expertise in examination of mobile location-related events and associated data for civil and criminal matters (both prosecutor/plaintiff and defense entities). Details under separate cover.

- Developed, implemented, managed, and marketed a portfolio of LBS applications and broader offers for leading North American wireless carrier. Responsible for all dimensions of product lifecycle and associated budgets. Work included the development and launch of several LBS applications including mobile social networking, family tracking, local search, 411 w/ location, and mobile worker, fleet, and asset management. Location technologies utilized include GPS, Wi-Fi positioning, RFID, Bluetooth, Cell ID (CID), ECID, and TDOA. Worked extensively with network engineering to troubleshoot/refine new location-determination infrastructure to address/improve location accuracy, privacy and security issues.

- Conducted geofencing accuracy compliance analysis for ride-sharing company auditing their driver airport compliance record. Involved extensive use of JSON/GeoJSON records.

- Conducted comprehensive technical and intellectual property analysis of Real-Time Location Systems (e.g. RFID, Wi-Fi

Positioning, Bluetooth, Infrared/Ultrasound, Others) market for European client looking to assert location-related patents.

- Provided strategic and technical guidance for mobile payments/wallet startup utilizing RFID, NFC and other technologies as key location enablers. Identified key issues and redeveloped successful patent application after initial USPTO rejection.

- Conducted technical and intellectual property analysis for Fleet Management/Telematics operator and service provider assessing potential infringement candidates.

- Conducted analysis of location aggregation market for client interested in acquisition in that industry space. Client acquired recommended aggregator.

- Provided E911 consulting expertise in support of new spectrum regulatory approval and technical implementation issues for nationwide carrier.

- Managed the design, collection, and analysis of E911 infrastructure deployment of western region of major wireless carrier. Data collected focused on technical issues associated with TDOA (Time Difference of Arrival) technology implementation, and collection and reporting of location accuracy data for FCC reporting purposes.

- Developed the site map and primary content for the NAVTEQ (now HERE) Network for Developers (N4D) LBS web ecosystem – http://developer.navteq.com. Responsible for designing and managing the site map and overall content, identifying key contributors and materials, and utilizing a variety of fragmented information to develop broad and deep technical, digital media and business content to assist various expertise levels of application developers and business management to become intimately familiar with map data, GIS platforms, and LBS applications and underlying technologies and to provide the information and guidance to successfully develop and launch their LBS applications.

- Managed the development of the Nextel (now Sprint) Location-Based Services strategy. Efforts included market and technical analysis of likely LBS offerings and integrating those findings with Nextel's broader wireless voice and data strategies. Work included prioritizing applications based on focus group findings, business matter attractiveness, ease of

implementation, impact on network infrastructure, and synchronization and integration with GPS terminal and E911 mandate rollout plans. Managed network engineering and consulting team to design network modifications to best support the additional demands of LBS applications and underlying bandwidth-consuming digital media content. Product strategy including researching and incorporating context-aware/presence concepts into product/device and network engineering plans.

- Developed navigation platform strategy for major international auto manufacturer. Assessed direction and technology requirements of in-car and portable navigation device (PND) technologies and developed technology strategy for future in-car navigation platforms.

- Developed numerous LBS company research reports using proprietary multi-point "report card" addressing numerous business and technology strategy dimensions and issues.

- Authored multiple books on wireless location, including *The Definitive Guide to IoT Sensors (available December 2020), The Definitive Guide to GPS, RFID, Wi-Fi, and Other Wireless Location-Based Services (2005 and 2009 versions)*, *The Definitive Guide to Wireless E911*, and (co-authored) *The Definitive Guide to Mobile Positioning and Location Management*.

- Advised numerous small companies and startups such as i360Hygiene, LOCAID, Finder Technologies, Orion GPS, and XYVerify on LBS-related issues to enhance value propositions on business, product and technology dimensions to enhance attractiveness to potential investors/acquisition candidates.

From: 2009 **AT&T Mobility**
To: 2010
Position: *Senior Product Manager – Enterprise LBS*
Led the development, implementation, and marketing of numerous enterprise location-based services across all sales, marketing and operational channels. Work included responsibility for all dimensions of product lifecycle and associated budgets. Products managed included telematics, fleet/vehicle management, asset/freight management, and mobile resource management GPS/LBS apps on a variety of platforms such as Telenav. Played key role in design of company-wide location services product and implementation roadmap.

From: 2007 **AT&T Mobility**
To: 2009

Position: *Consumer LBS Product Realization Manager (Consultant)*
Responsible for the design, development, implementation, and ongoing lifecycle management of several high-profile Consumer LBS applications and associated operational support. Overall application design and implementation responsibilities included AT&T FamilyMap, Loopt Mobile Social Networking, 411 with location, Slifter Local Search, and CaddyHawk Game systems. Work included design, troubleshooting, and implementation of AT&T location-related network, application, digital media and content, and privacy infrastructure and associated issues such as accuracy and privacy (efforts resulted in patent co-invention).

From: 1993 **Accenture**
To: 2002

Position: *Associate Partner - Communications & High-Technology Strategy*
Responsible for development of wireless location practice. Led development of business, technology, and product strategies for numerous communications and technology-centric companies looking to enter new markets. Specialized in new product design, development, and implementation, as well as network infrastructure design need to support next generation, high bandwidth-consuming digital media content and associated infrastructure. Efforts included assisting AT&T (re)enter local service, (then) Bell Atlantic launch long distance services, (then) GTE implement Intelligent Network services, Omnipoint (later part of T-Mobile) network integration strategy, as well as leading the design and implementation of voice and data communications networks and associated data management capabilities in a variety of industries including hospitality/retail, energy, agriculture, and banking/financial services.

From: 1991 **Booz Allen & Hamilton**
To: 1993

Position: *Senior Associate – Information Technology Practice*
Provided and led consulting services for communications industry and other Information Technology-intensive companies in developing technology strategies for addressing new marketing opportunities and internal operational issues.

From: 1987 **Deloitte Consulting (Originally Touche Ross)**
To: 1991

Position: *Senior Manager*
Provided consulting services for technology-intensive companies in developing business and product strategies for addressing new marketing opportunities and internal operational issues.

From: 1983 **Hughes Aircraft Company**
To: 1985

Position: *Electrical Engineer – Radar Development*
Microcomputer and digital system design engineer on the F-15 fighter radar system as part of analog to digital platform conversion.

## Litigation Support Experience

Date 2020 **Ropes & Gray LLP**
Matter: Target
Project: Providing expert consulting, support, and report for IPRs for several patents involving short-range communications technologies and associated identification and location determination methods and techniques including Bluetooth, RFID, and Wi-Fi. In progress.

Date: 2020 **Baker Botts**
Matter: Draft Kings
Project: Providing expert consulting, support, and report for IPRs for several patents involving validating gaming customers location in appropriate online gaming jurisdictions. In progress.

Date: 2020 **Baker Botts**
Matter: Lyft
Project: Providing expert consulting, support, and report for IPRs involving Intelligent Transportation systems, geofences, and associated location technologies including GPS, Bluetooth, Wi-Fi positioning, RFID, and road sensors/readers. In progress.

Date: 2020 **Finnegan & Henderson**
Matter: Google
Project: Providing expert consulting, support, and report for IPRs involving user experience sharing, software registration, and device/user tracking involving a variety of location technologies. In progress.

Date: 2020 **Latham & Watkins**
Matter: Garage Door Manufacturer
Project: Providing technical/engineering expertise in infringement and invalidity matter involving RF and Infrared sensors, Wi-Fi/WLAN/Bluetooth communications technologies, motion and barrier detection, and related technical issues. In progress.

Date: 2019-2020 **Lynch Thompson LLP**
Matter: Heil
Project: Providing technical/engineering expertise in trade secrets matter involving Internet of Things, RFID, Telematics, Vehicle Sensors, and Big Data for leading waste management vehicle manufacturer. In progress.

Date: 2018-2020 **Lawgivers (Trinidad and Tobago)**
Matter: A&V Oil and Gas
Project: Providing expert support and report in arbitration matter involving government of T&T. Focused on (in)accuracies of GPS-based vehicle tracking system relative to a variety of key events. Pending.

Date: 2019-2020 **Perkins Coie**
Matter: Zillow
Project: Provided expert support, report, and deposition for non-Infringement matter for major real estate services firm and associated subsidiaries involving a wide array of location determination technologies on smartphones. Won.

Date: 2019-2020 **Baker Botts**
Matter: Lyft
Project: Provided expert support, report, and deposition is support of Claim Construction brief associated with non-infringement matter. Won.

Date: 2016-2020 **Sterne Kessler Goldstein Fox**
Matters: Google (3 matters); Google (Nest, 2 matters)
Projects: Providing expert support, reports, and deposition for several IPRs of location/context-related patents on behalf of leading Internet services company utilizing a wide variety of communications and location technologies. 2 matters won; others ongoing.

Date: 2013, 2019/2020 **XYVerify (3)**
Patent Re-Submission and Approval; Patent Application Creation
Projects: (Re)wrote patent applications for LBS/financial verification system using multiple location determination methods including RFID, Bluetooth, WPS, and GPS. Efforts enabled patents to be approved after initial rejection by USPTO.

Date: 2013-2020 **Civil and Criminal Forensics**
Matters: Various
Project: Provided cellphone, vehicle, specialty device, and computer-based location forensics expertise in over 40 criminal and civil matters involving numerous location determination technologies and associated applications. Criminal matters include homicide, assault (multiple types), arson, armed robbery, breaking and entering, and property crime. Civil matters include trade secrets, ITC, product liability, accident liability, fraud, and employment matters.

Applications/Platforms for criminal and civil forensics analysis include cellular records, 911 records, Facebook/Instagram/ Messenger/social media apps, Google/search, Google tracking apps (e.g. Timeline, others), vehicle tracking systems, specialty GPS (e.g. GPS ankle bracelets, special devices) surveillance and safety

systems, smart home systems, aviation, and connected cars, Expert/knowledgeable in numerous forensic technologies, tools, and accident/incident reconstruction methods including CDR, NELOS, PCMD, RTT, EVDO, Cellebrite, Paraben, Google Earth/Timeline, and Hawk Analytics/CellHawk, as well as specialized knowledge on iOS and Android smartphone location determination techniques and data collection, analysis, and management of all types including KML/KMZ, (Geo)JSON, CSV, (E)WKT/WKB, Shapefile, ESRI, and other GIS vector/raster systems, technologies, formats, and models.

Date: 2019 **Sterne Kessler Goldstein Fox**
Matter: Volkswagen
Project: Provided expert support for IPR involving Location-Based Messaging in automotive related use matter/environments.

Date: 2017-2018 **Finnegan & Henderson**
Matter: Fed Ex
Project: Provided expert support, consulting, reports, deposition, and trial testifying for infringement and district court invalidity proceedings on behalf of leading transportation/shipping company. Matter won (in The Eastern District Court of Texas) on both infringement and invalidity counts on behalf of defendant Fed Ex.

Date: 2017-2018 **Polsinelli**
Matter: Uber
Project: Provided expert support and reports for Trade Secrets matter involving major shared transportation provider.

Date: 2017-2018 **Renner Otto**
Matters: Macropoint; Timekeeping Systems Inc.
Projects: Providing consulting, expert services, report and deposition in district court patent invalidity matters for transportation and employee tracking providers.

Date: 2016-2018 **Paul Hastings**
Matters: Samsung (3 matters)
Project: Provided expert services for Inter Partes Review (IPR) of multiple location, safety, and security patents on behalf of major telecommunications equipment and services provider.

Date: 2016-2017 **Baker Botts**
Matter: Twilio
Project: Provided location/E911-related expert services, report, and deposition for Inter Partes Review (IPR) of mobile registration patent on behalf of Voice & Video, Messaging, and Authentication APIs provider.

Date: 2016 **Los Angeles District Attorney's Office**
Matter: People v. Dawud Abdulwali
Project: Provided expert services on location technologies used to identify and trace accused arsonist. Defendant pled guilty.

Date: 2016-2017 **Fitzpatrick, Cella, Harper & Scinto**
Matter: Geotab
Project: Providing expert support, reports, and deposition for infringement defense of multiple asserted patents on behalf of fleet management/telematics provider. Settled.

Date: 2015-2016 **The Ogg Law Firm PLLC**
Matter: City of Houston Police Department
Project: Provided expert services/testimony regarding veracity of Automatic Vehicle Locator (AVL) systems in officer suspension matter.

Date: 2015-2016 **Sterne Kessler Goldstein Fox**
Matter: VIVINT
Project: Providing expert support, reports, and deposition for IPR involving several location-related patents for home security/energy company.

Date: 2015 **Hogan Lovells**
Matter: Apple
Project: Provided expert support for multiple location-related patent Inter Partes Review (IPR) and infringement proceedings for leading mobile platform, application and services provider.

Date: 2015 **Thompson Hine LLP**
Matters: Macropoint (2)
Project: Provided expert support for patent litigation efforts involving fleet management devices, software, and services.

Date: 2013-2014 **Williams & Connolly**
Matter: State of Maryland
Project: Provided expert services in assessing validity of GPS tracking bracelet/system in parole violation matter. Matter won.

Date: 2013-2014 **Cravath, Swaine & Moore**
Matter: Qualcomm
Project: Provided expert litigation support, technical consulting, and advisory services in Anti-Trust matter regarding location services technologies, platforms, and standards.

Date: 2014 **Patterson Thuente Pedersen, P.A.**
Matter: Kaspersky Internet Security
Project: Provided expert litigation support and technical consulting in patent countersuit involving internet security services.

Date: 2014 **Sullivan & Cromwell LLP, others**
Matter: Peschke
Project: Provided expert support and technical consulting in location services infringement patent dispute involving interactive mapping applications. Effort included providing deposition testimony.

Date: 2012-2013 **Covington & Burling**
Matter: Samsung
Project: Provided expert litigation support and technical consulting and advisory services in International Trade Commission (ITC) matter.

Date: 2011-2013 **Connolly Bove Lodge & Hutz**
Matter: Enovsys
Project: Provided expert litigation support and technical consulting and advisory services for pursuit of LBS patent royalties and infringement settlements.

Date: 2011-2013 **Voxson**
Matters: Various
Project: Provided expert litigation support and technical consulting and advisory services for pursuit of E911 and LBS patent infringement royalties and settlements.

Date: 2010-2012 **Morrison & Foerster LLP**
Matter: Cellco Partnership (dba Verizon Wireless)
Project: Provided expert advisory and report services in support of IPR re-examination process of E911 and LBS patents.

Date: 2011-2012 **Dovel & Luner**
Matter: TrackBeam
Project: Provided market/technical consulting, expertise and research analysis of LBS patents to identify potential licensing candidates.

Date: 2011 **SNR Denton**
Matter: Wavemarket
Project: Provided market and technical consulting and advisory services for defense of LBS patent lawsuits.

Date: 2010 **State of New Jersey**
Project: Provided wireless location consulting expertise in development of economic growth strategy for State of New Jersey.

Date: 2007-2008 **General Electric**
Project: Provided consulting research and guidance on LBS and E911 technology, GE-owned patents, prior artwork, and future technology direction.

## Education

| Year | College/University | Degree |
|---|---|---|
| 1987 | The University of Texas at Austin (1st in graduating class) | MBA, Information Systems Management |
| 1983 | Purdue University, West Lafayette, Indiana (Top honors; Tau Beta Pi, Eta Kappa Nu) | BSEE, Digital System Design emphasis |

## Patents

- "Method and apparatus for providing mobile social networking privacy." (U.S. Patent Number 8,613,109, issued on December 17, 2013).
- "Systems and methods of using wireless location, context, and/or one or more communication networks for monitoring for, preempting, and/or mitigating pre-identified behavior." (U.S. Patent Number 10,477,342, Issued November 12, 2019).
- "Systems and methods for monitoring for and preempting pre-identified restriction violation-related behavior(s) of persons under restriction" (U.S. Patent Number 10,497,242, Issued December 3, 2019).
- "Systems and methods for providing location-based security and/or privacy for restricting user access" (U.S. Patent Number 10,555,112, Issued February 4, 2020).

## Publications

**Books:**

1. The Definitive Guide to IoT Sensors (available December 2020)
2. The Practical Guide to The Internet of Things (IoT): Use Matters and Enabling Technologies (available December 2020)
3. The Definitive Guide to GPS, RFID, Wi-Fi, and Other Wireless Location-Based Services (2 versions, plus version in development)
4. The Definitive Guide to Wireless E911
5. The Definitive Guide to Mobile Positioning and Location Management (Co-authored)

**Articles/Quotations:**

1. Location Data Privacy posts/blog. Ongoing at www.E911-LBS.com.
2. Linked In. March 3, 2020. "Facial Recognition: Good, Bad, or Ugly?"
3. The Columbus Dispatch. February 17, 2017. "Experts: GPS monitors couldn't save OSU student's life"
4. E911-LBS.com. May 2012. "The Pacifier Generation – How Wireless is Impacting Our Society"
5. Nbizmag.com. Summer 2008. "How Will the Convergence of LBS Technologies Affect Business?"
6. Directions Magazine. November 30, 2005. "The Deadline for the E911 Mandate Approaches…Where Do Things Stand?"
7. Computerworld. May 23, 2005. "Beyond The Supply Chain: The Impact of RFID on Business Operations and IT Infrastructure"
8. RFID Journal. June 12, 2005. "IT's Impact on RFID"
9. Directions Magazine. July 29, 2004. "The Strategic Implications of the Wal-Mart RFID Mandate"

10. Directions Magazine. February 25, 2004. “RFID-Hot Technology with Wide-Ranging Applications”
11. WirelessDevNet.com. 1/30/2003. “It’s The (Location-Based) Applications – Stupid!”

## Languages/Tools

- C/C++, Java, Basic, Cobol, Fortran, Pascal, APL, Assembly
- CDR, NELOS, PCMD, RTT, EVDO, Cellebrite, Paraben, Google Earth/Timeline, Hawk Analytics/CellHawk, as well as specialized knowledge on iOS and Android smartphone location determination techniques.
- Data collection, analysis, and management of all types including KML/KMZ, (Geo)JSON, CSV, (E)WKT/WKB, Binary, Shapefile, ESRI, and other GIS vector/raster systems, technologies, formats, and models.

## Associations and Achievements

- NENA, APCO. Certified in Emergency Management Response (CERT)