

Implementing New 9-1-1 Location Technologies

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Agenda

- Overview
- A-GPS/A-GNSS
- OTDOA
- Dispatchable Location
- Device Based Hybrid
- Upcoming Milestones



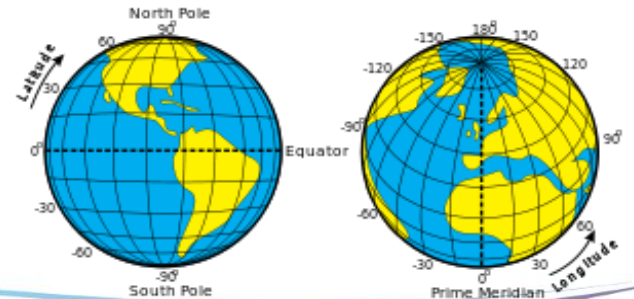
Overview

- Roadmap for Improving 911 Location Accuracy
- Location Accuracy Metrics
 - Year 2: 40% of 911 calls within 50 meters
 - Year 3: 50% of 911 calls within 50 meters
 - Year 5: 70% of 911 calls within 50 meters
 - Year 6: 80% of 911 calls within 50 meters
- Vertical Component at Year 6



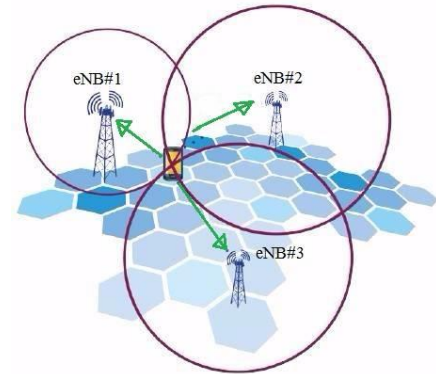
A-GPS/A-GNSS

- A-GPS in Use for 15 Years for E9-1-1
- Additional constellations
 - Improves availability indoors
 - Improves accuracy indoors and outdoors
- High Accuracy – 9-1-1 Location Test Bed Validated
- Handsets ready to go



Observed Time Difference On Arrival

- Handset measures downlink of surrounding base stations – Multilateration
 - Integrated into Voice over LTE (VoLTE) signaling
- Accurate network provisioning is fundamental to location accuracy
 - Network synchronization, antenna locations, cable delays, neighbor lists
- Carriers committed to implementing technology as part of Roadmap
- Functional improvements standardized, moving into production
 - Built into 3GPP standards unlike 2G and 3G.
- Already contributing to meeting the FCC accuracy standard



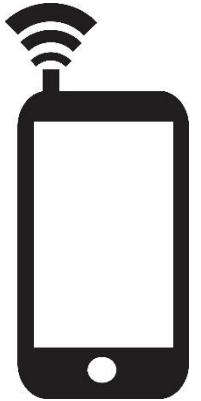
Dispatchable Location

- National Emergency Address Database
- Progress to Date
 - Standards
 - CTIA Working Groups
 - NEAD LLC
 - Network and Handset Changes

 NEAD

Device Based Hybrid

- Crowdsourced Wi-Fi based positioning paired with AGNSS
 - Combination of two very powerful positioning methods is complementary across morphologies
- Tested as highly accurate in 911 Location Test Bed.
- Already contributing to meeting the FCC accuracy standard
- High Accuracy, High Availability, Low Latency – even in very challenging indoor environments!
- Leveraging Successful Commercial Methods for E911!
- Device Based Position Calculation v. Network Based Position Calculation



Upcoming Milestones

- June 4 – 2nd Compliance Certification
- August 3
 - Uncompensated Barometric Pressure Data
 - Proposed Vertical Metric
 - 36 Month Progress Report

