



UNITED STATES
DEPARTMENT OF TRANSPORTATION

Technology Review

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Slide Title

- DSRC requirements/performance/robustness
- Positioning Technology requirements/performance/robustness
- FCC/NTIA Study
- Connected Vehicle Affiliated Test Bed Concept
- Open Discussion



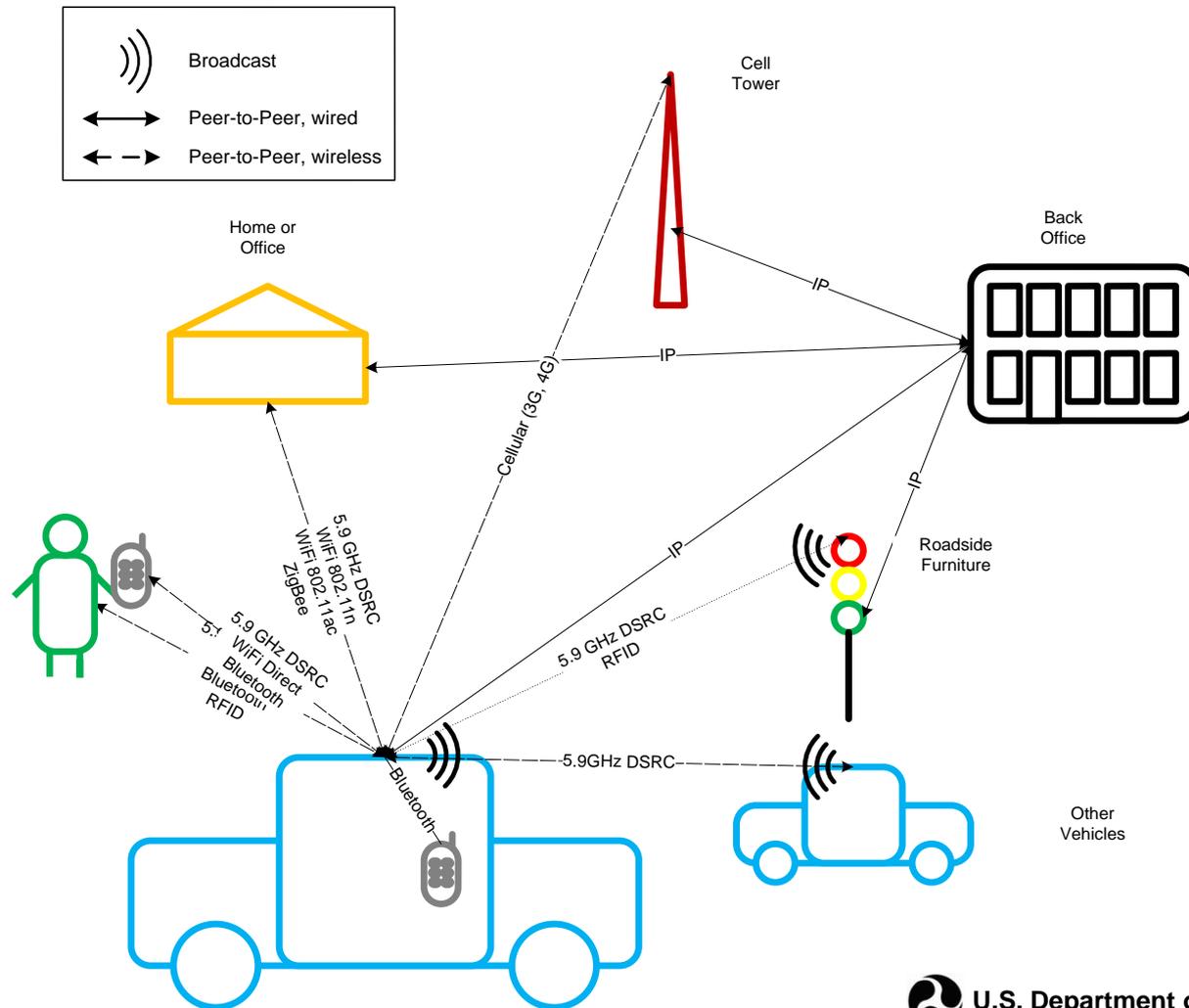
DSRC

requirements/performance/robustness



M2M Context, Where does 5.9GHz fit in?

Communication media options

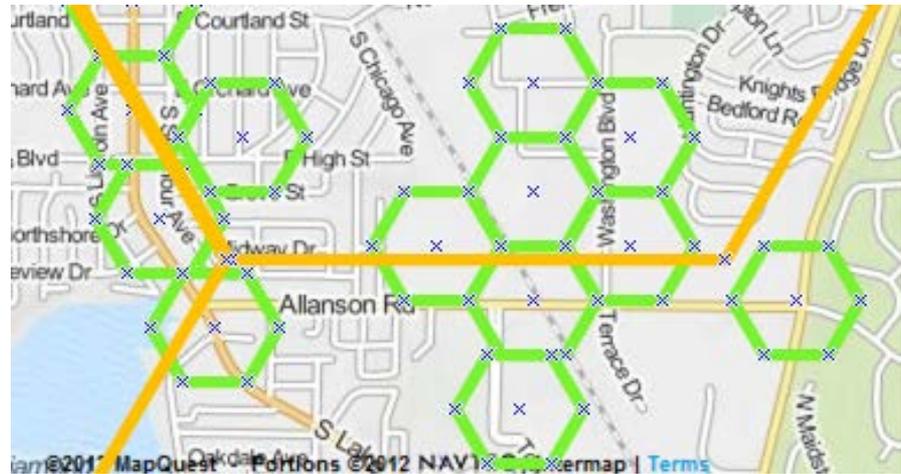
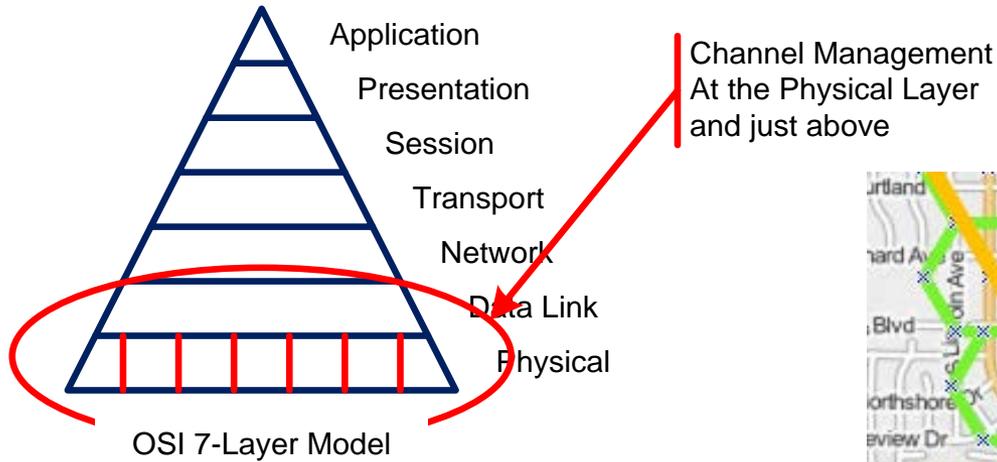


Characteristics of 5.9GHz DSRC

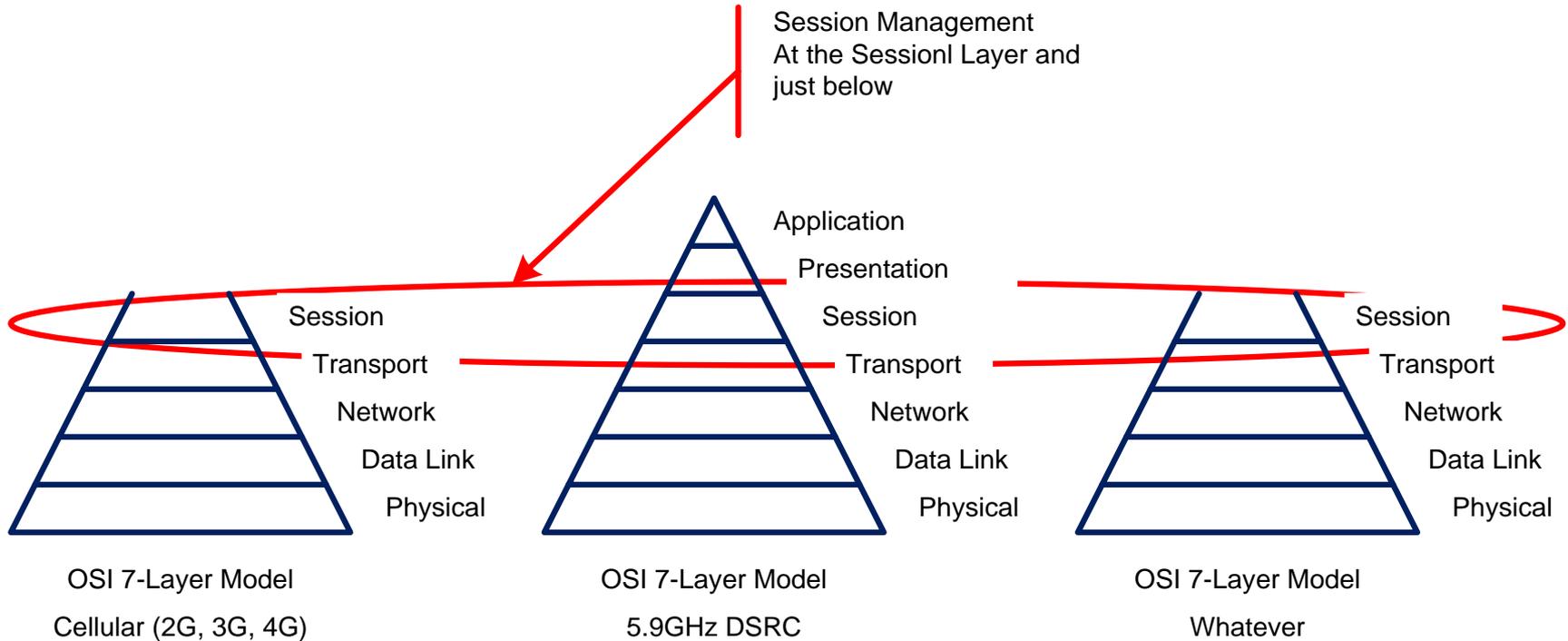
- What 5.9GHz DSRC is good for:
 - Small data exchanges (one frame with signature and if needed encryption).
 - Urgent data exchanges (broadcast mode for rapid situation information sharing).
 - Data exchanges from and among rapidly moving vehicles.
- What 5.9GHz DSRC is not good for:
 - Large file transfers while moving.
 - Voice data.
 - Streaming media.
- What 5.9GHz DSRC could be better:
 - Improvements to channel management.
 - Addition of session management to better coordinate with other wireless media.
- While keeping important aspects of the existing scheme:
 - All sessions are initiated by the mobile element.
 - No permanent ID is exposed.



Channel Management



Session Management



Positioning Technology

requirements/performance/robustness



Location Reporting Ability

- “Location at a specific time” is a key data element use by our applications.
- Performance requirements for this part of a BSM were established for the Safety Pilot Model Deployment.
 - The value shall be at least within 1.5 meters of the actual latitude at an HDOP smaller than 5 under open sky conditions within the 1 sigma absolute error.
 - The accuracy shall be within 1 milliseconds of the actual atomic time (or some other benchmark time) when the positioning data is determined.
- Device makers have made significant progress in meeting these requirements.

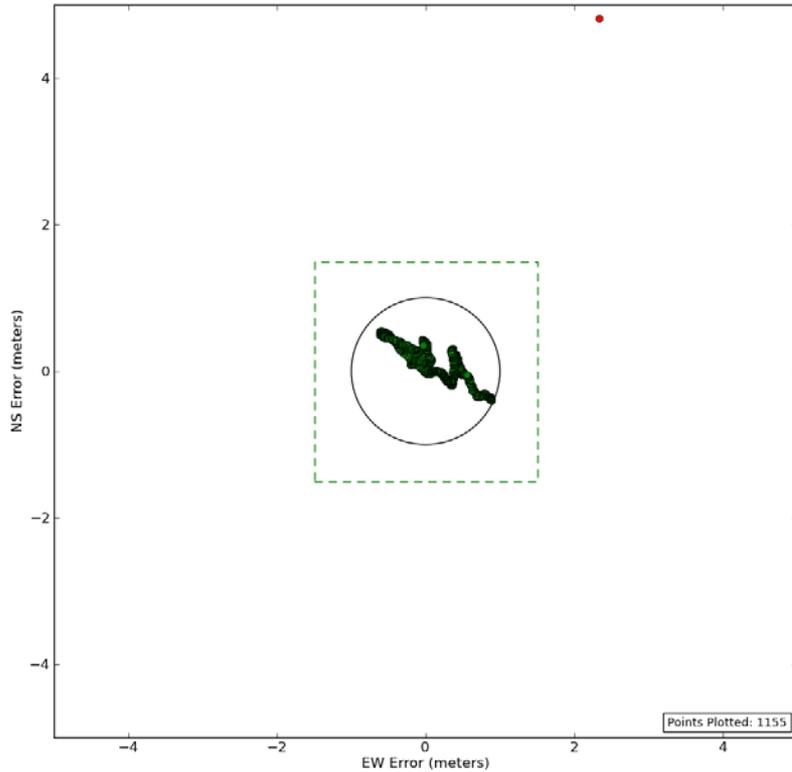
Model Deployment Safety Device DSRC BSM Communication Minimum Performance Requirements- VSC3 Internal Document, Revision 11, 1/24/2012



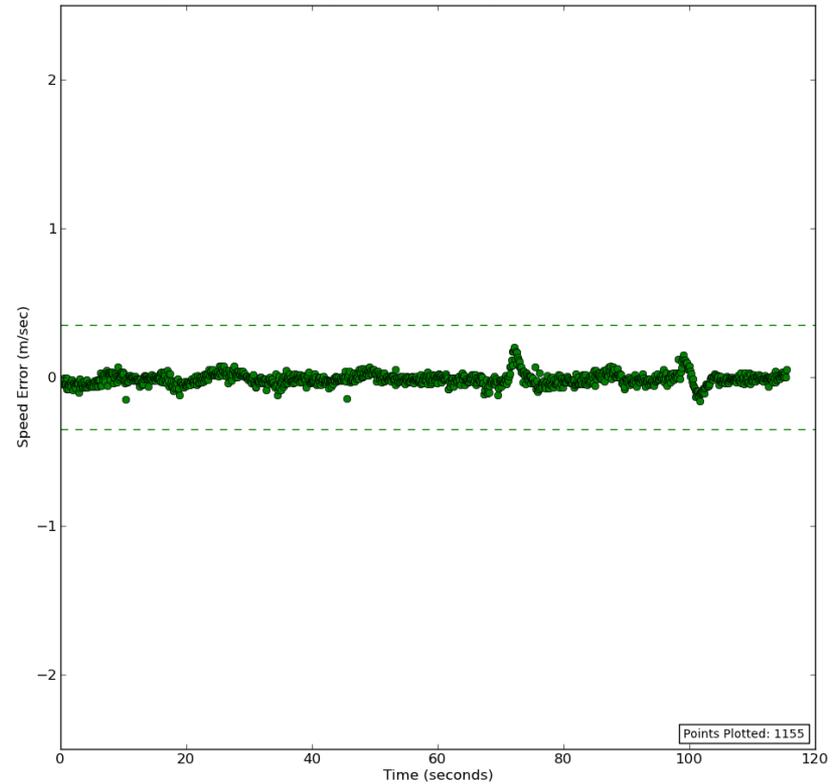
Results from Vehicle Awareness Devices

Good case

Lat Within 1.5m: **99.4%**
Lon Within 1.5m: **99.4%**

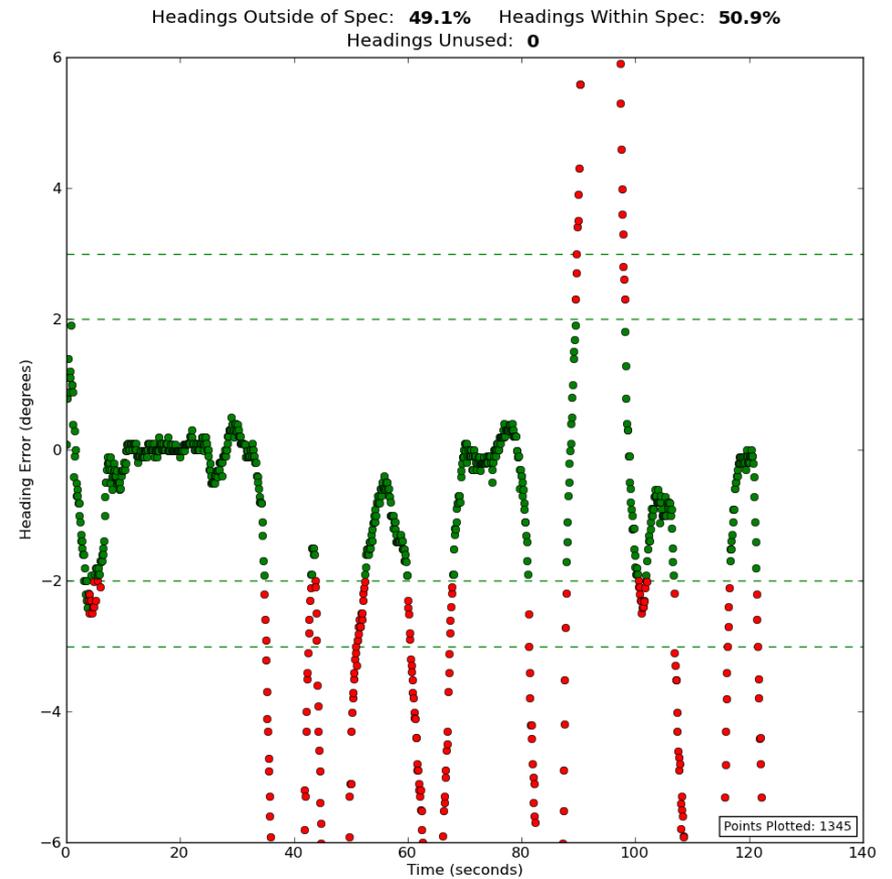
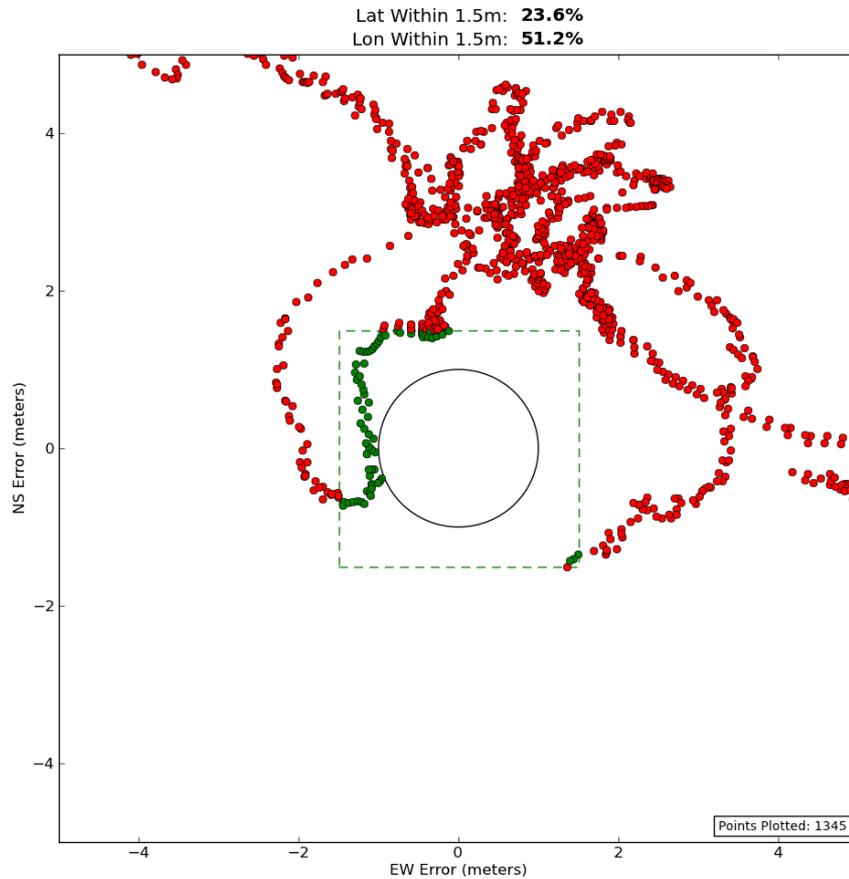


Speeds Outside of Spec: **0.0%** Speeds Within Spec: **100.0%**



Results from Vehicle Awareness Devices

Bad case



FCC/NTIA Study

Study Details and Timeline

The Middle Class Tax Relief and Job Creation Act of 2012 (P.L. 112-96, Section 6406) opens the possibility of spectrum sharing in the 5850-5925 MHz Band, subject to “a study evaluating known and proposed spectrum-sharing technologies and the risk to Federal users”, conducted by the National Telecommunications and Information Administration (NTIA).

- “In consultation with DOD and other affected agencies [DOT]”
- Likely candidates to share the spectrum are unlicensed U-NII devices.
- NTIA prepared a draft initial response in late August; agency comments provided in early September.
- Initial Report to Congress expected late October.
- The response identifies the need for extensive test and analysis starting in October.
- Results of testing are expected in early 2013.



Key Considerations for Coexistence

- Rules of channel use for each channel
- Respect for guard interval (time between packets)
- Limitations to packet size
- Limitations to packet transmission rates
- Limitations to data bit rate
- Limitations to power for non-transportation devices
- Regulation of modulation scheme

