Welcome

Unified Implementation of the Reference Architecture Orientation Session

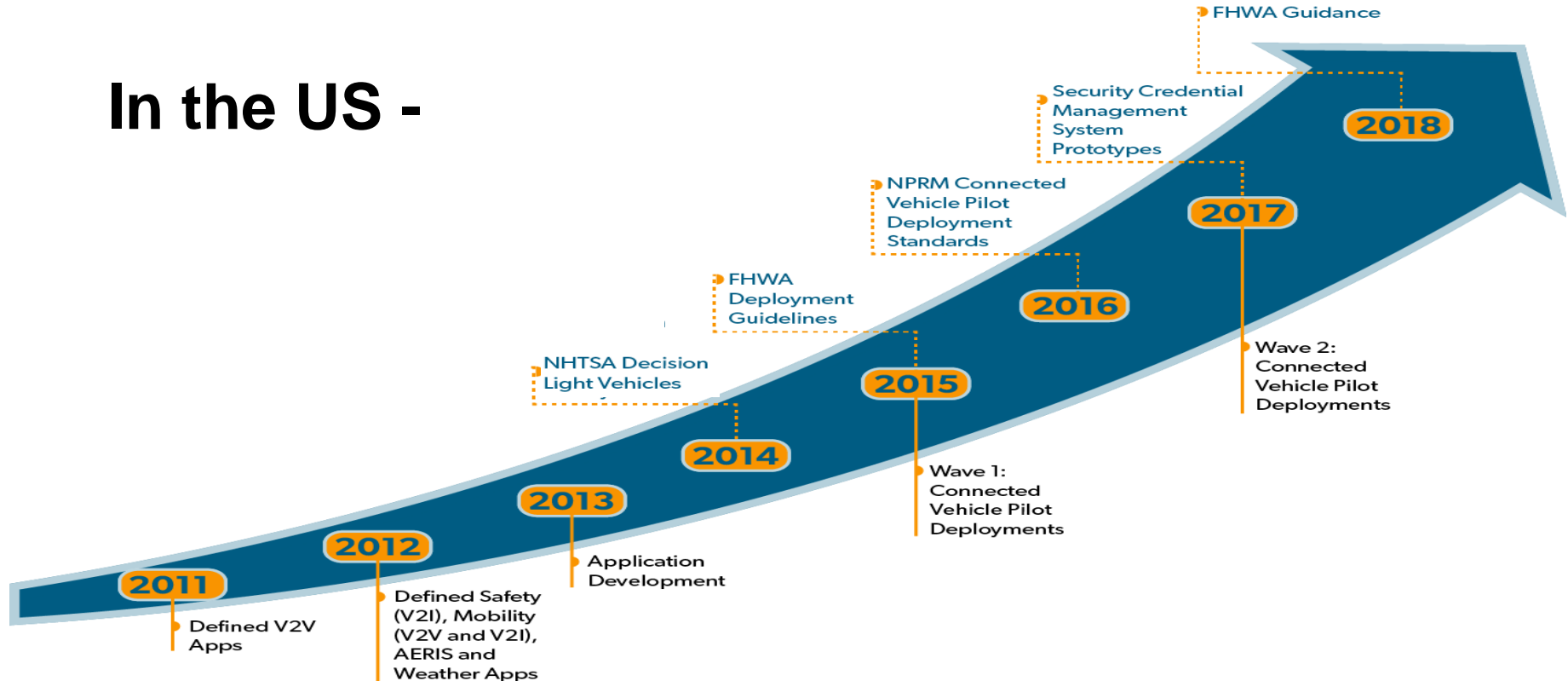**May, 2015**

Welcome

- Presenter –
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    - www.its.dot.gov

- Topics –
  - Overview
  - Communications and Data Movement
  - Complete System Architecture
  - Concept of Operation, Reference Implementation
  - Design Elements, Tools, and Support Services

Policy Decisions Timeline: Connected Vehicles

In the US -

FHWA Guidance

Security Credential Management System Prototypes

NPRM Connected Vehicle Pilot Deployment Standards

FHWA Deployment Guidelines

NHTSA Decision Light Vehicles

2018

2017

Wave 2: Connected Vehicle Pilot Deployments

2016

2015

Wave 1: Connected Vehicle Pilot Deployments

2014

2013

Application Development

2012

Defined Safety (V2I), Mobility (V2V and V2I), AERIS and Weather Apps

2011

Defined V2V Apps

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USDOT Concept Overview

- **Communication security**
  - Common process for all information flows
  - Preserving "Privacy by Design"

- **Data flow and evolution**
  - Common processes, two types of data

- **Multiple communication media**
  - DSRC on all 7 channels
  - Established wireless media
  - Other IP transport media

- *Tools*
  - *Consistent implementations*

"The opportunity for a common experience."

"The ability to do more."

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4

A Variety of Communication Media, Data Needs

Resources: wired and wireless, the Internet

- **3,000 miles, 3,000 meters, 300 meters, 3 meters.**

Continent-Wide

Wide Area Network

Mundelein

5.9GHz DSRC

Local Area Network

Requirements: Two types of data distribution:

- **To all, To one.**

Unified Implementation of the CVRIA All Data Flows
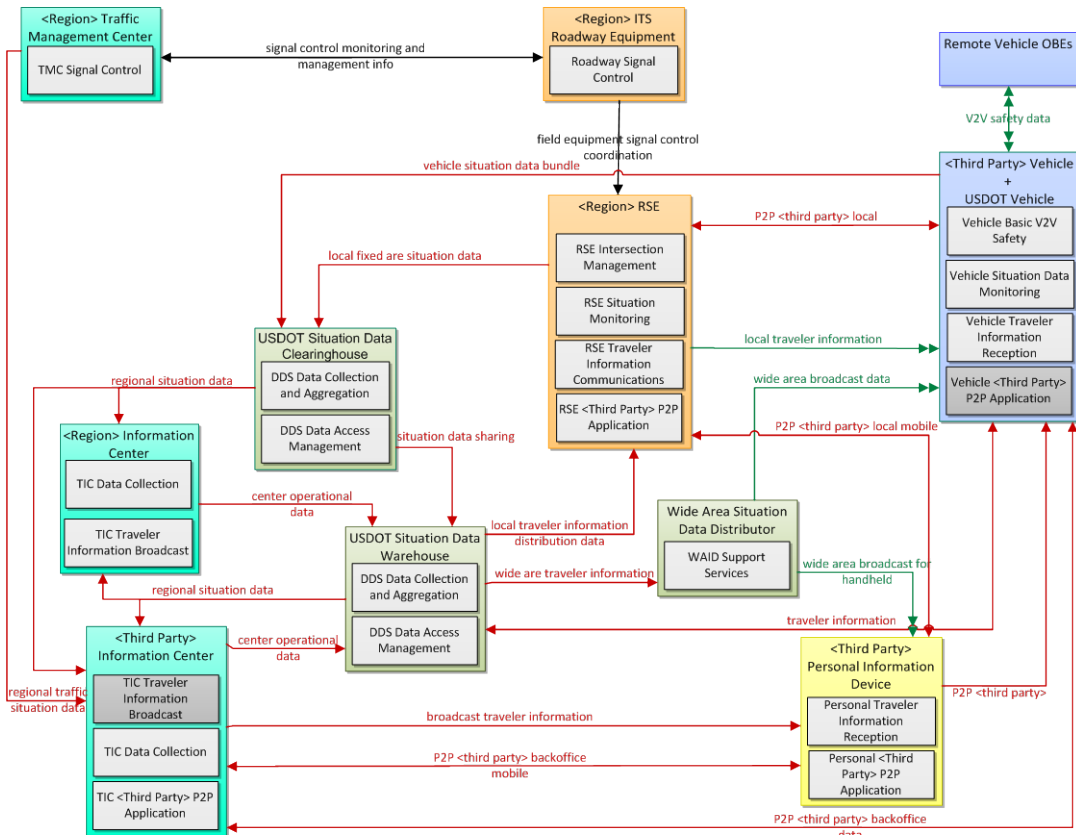
Connected Vehicle Reference Implementation Architecture

- Architecture site
  http://standards.its.dot.gov/DevelopmentActivities/CVReference

- SET-IT tool site
  - Version 1.1
  - Sample project
  http://www.iteris.com/cvria/html/resources/tools.html

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Upcoming Stakeholder Events

- Plug-Fests: http://www.its.dot.gov/testbed/plugfests.htm#calendar
  - Virtual: Ongoing, weekly at 11:00 EST
  - Data Movement Demonstrations: April, Detroit, MI

- Regional CV Pilot Workshops (TBD)
  - http://www.its.dot.gov/pilots/
  - http://www.its.dot.gov/pilots/cv_pilot_faq.htm

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Affiliation of Test Beds

The OST-R has entered into 73Memorandums of Agreement (MOA) with public, private, and academic organizations involved in the Affiliation of Test Beds. They include:

- Arada Systems
- Southwest Research Institute
- Detroit DPW
- Security Innovation
- Cohda Wireless
- Siemens Industry Inc.
- Dering & Estrada
- University of Michigan/UMTRI
- University of Arizona
- TIEMAC CORPORATION
- Tampa Hillsborough Expressway Authority
- DENSO Corporation
- Marben Products
- NextEnergy
- CETECOM
- Pioneer Advanced Solutions
- La Trobe University (Melbourne)
- OminiAir
- ITRI
- Autotalks LTD
- Connected Vehicle Trade Assc.
- Battelle Memorial Institute
- Rohde & Schwarz USA, Inc.
- MET Laboratories
- 7Layers Inc.
- Green Driver Inc.\ On Time Systems
- Virginia Tech Transportation Institute
- Illinois Tollway

- The Road Commission for Oakland County
- Contra Costa Transportation Authority
- Traffic Technology Solutions
- Savari Inc.
- Global Mobile Alert
- Case Western Reserve University
- University of Wisconsin Madison
- Unex Technology Corporation
- Sirius XM Radio Inc.
- Go-Light
- **Pravala Networks**
- The Regents of the University of California, Berkeley
- Renesas Electronics America, Inc.
- Vehicle Data Science Corporation
- UL, LLC
- Ericsson
- Commsignia LTD
- Aldis, Inc.
- eTrans2020
- Swiit Apps
- Azimuth Systems
- Paxgrid Telemetric Systems
- AutoTech Technology Development
- Danlaw
- Oakland County Connected Car Task Force
- ALPS Electric North America
- Alpine Electronics Research of America

- R Systems
- STA Group LLC
- iBiquity
- San Francisco Municipal Transportation Agency (SFMTA)
- Hyundai America Technical Center
- peiker acustic, Inc
- Carnegie Mellon University
- Hitachi Solutions, Ltd.
- Productivity Apex, Inc
- Hitachi Europe SAS
- Schagrin Consulting
- Leidos, Inc
- Intelligent Transportation Society of America

Latest
- Visteo Corporation
- **University of Windsor**
- The City University of New York
- Mobile Safety Accessories LLC
- Laird
- OZ Engineering
- **University of British Columbia***

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"Make no little plans. They have no magic to stir men's blood and probably themselves will not be realized. Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will never die, but long after we are gone will be a living thing, asserting itself with ever-growing insistency."
- Daniel Burnham

"I have always believed in planning big, and I have always discovered after the fact that, if anything, we didn't plan big enough.
- Alfred Sloan