Beyond Traffic: US DOT's 30 Year Framework for the Future

ITS Program Advisory Committee
Crystal City, VA

February 4, 2015

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One Year in Development

- Significant background work on trends, data, research and issues
  - Over a thousand documents in resource library
  - Multiple modal and policy expert teams
- Outreach via webinars, focus groups
  - Charts shared previously with ITSPAC
  - Analysis/multiple revisions at the highest levels
- Draft Framework released Monday, February 2

Secretary's Goals for the Framework

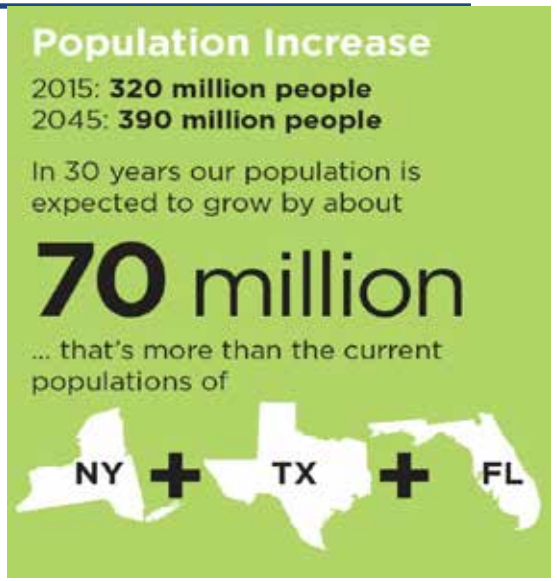
- An "intellectual reset" of transportation issues in context of:
  - Infrastructure deficit
  - Where trends will take us if not addressed
  - Possibilities of technology impacts
- A common basis of fact to support discussions
- Not advocate for specific policy solutions
- Underscore critical decision points facing the country

Beyond Traffic 2045

- http://www.dot.gov//beyondtraffic
- Comments requested on:
  - Additional trends/policy options/other ideas
  - Section-specific comments

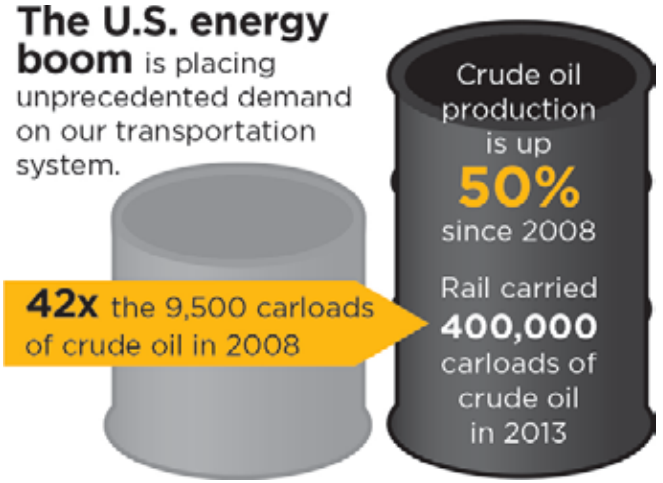
Five Key Questions Being Addressed

- **How will we move?**
  - How will we build a transportation system to accommodate a growing population?
  - Growth of megaregions
  - Population growth in South and West
  - Changes in transportation choices by generations (Boomers v. Millennials)
  - Twice as many older Americans in 2045



Five Key Questions Being Addressed (2)

- **How will we move freight?**
  - How to reduce freight chokepoints that drive up the cost of owning a business?
  - By 2045, freight volume will increase 45 percent
  - Increasing of online shopping
  - Impact of airline mergers and hub consolidation
  - Changing international trade balances
  - Increasing domestic energy production

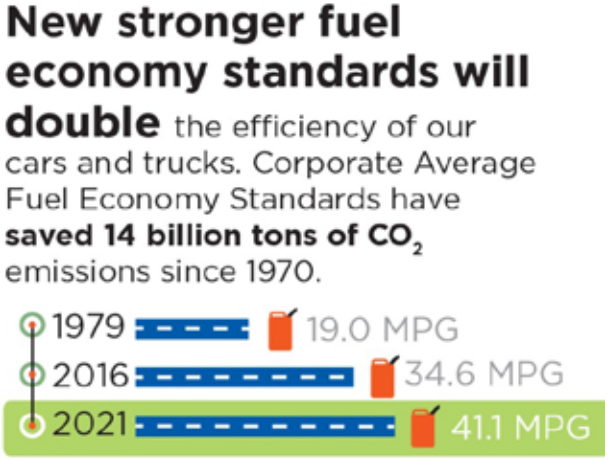


Five Key Questions Being Addressed (3)

- **How will we move better?**
  - How to knock down barriers to new technologies to make travel safer?
  - Technological changes and innovation to transform vehicles, infrastructure, logistics, services
  - New sources of travel data to travel, management and investment decisions
  - Automation and robotics affect all modes, improving maintenance and safety, and enabling the mainstream use of autonomous vehicles

Five Key Questions Being Addressed (4)

- **How will we adapt?**
  - How to make our infrastructure resilient to events like Hurricane Sandy?
  - The effects of climate change will include global mean sea level rise, temperature increases, and more frequent and intense storm events, all of which will impact highways, bridges, public transportation, coastal ports and waterways.

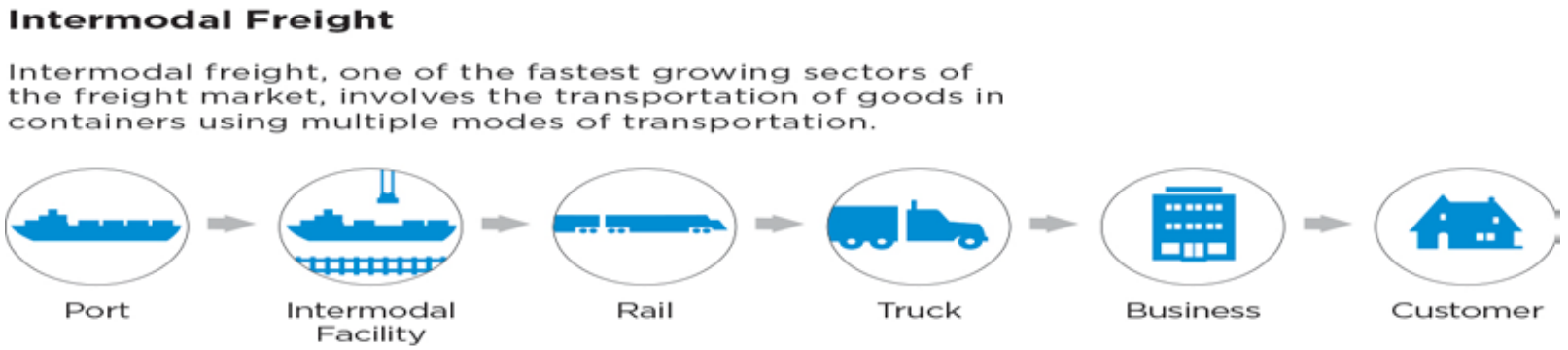


Five Key Questions Being Addressed (5)

- **How will we align decisions and dollars?**
  - Public revenues to support transportation are not keeping up with needs
  - 65 percent of roads are in less than good condition
  - 25 percent of bridges need significant repair
  - 45 percent of Americans lack access to transit
  - Overall financing uncertainty, shortfalls in the Highway Trust Fund, and the absence of reliable federal funding for rail, marine highways, and ports have created a need for new financing mechanisms

Report Structure

1. Major trends (internal and external to transportation systems)
2. Trend implications for each mode
3. Description of baseline future scenario/ policy options



Scenario 2045: Drifting Toward Gridlock

- Defined by:
  - Lack of decisions
  - Lack of action
  - Lack of funding
  - Loss of national leadership

Policy Options: “A Better Path”

- **How We Move**
  - Increase infrastructure capacity
  - Reduce congestion
  - Promote public transit, biking and walking
- **How We Move Things**
  - Improve freight planning
  - Target policies to resolve congestion
  - Encourage innovative strategies

Policy Options: “A Better Path” (2)

- **How We Move Better**
  - Address regulatory barriers to deployment of new technologies
  - Collect and manage data, while protecting privacy
  - Support research and deployments
  - Maintain paramount focus on safety
- **How We Adapt**
  - Reduce transportation emissions
  - Design and build resilient infrastructure
  - Align costs and incentives

Policy Options: “A Better Path” (3)

- **How We Align Decisions and Dollars**
  - Ensure adequate revenues
  - Reduce spending to match revenues
  - Prioritize investments based on performance
  - Ensure clear roles of public and private sectors

Discussion and Questions

OCIO Office of the DOT Chief Information Officer

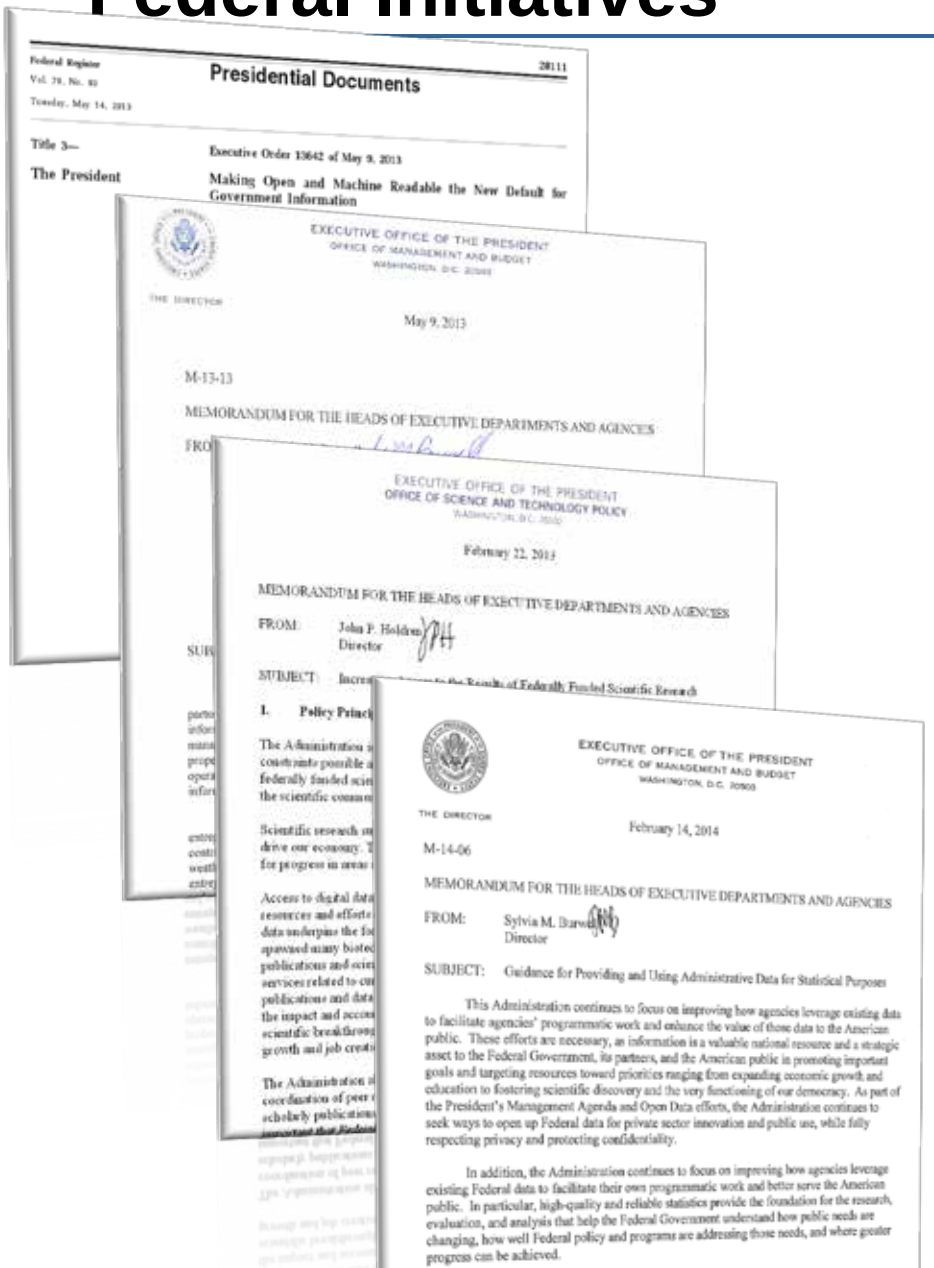
Trends in Open Data

Presentation for the ITS Policy Advisory Committee

D. Morgan

04 February 2015

Federal Initiatives



- Several open data policies now in place
  - Emphasis on managing data as an asset
  - Presumption of openness, subject to appropriate controls
  - Apply to *all* government information – mission, administrative, and research
- Focus on benefits and applications
  - Expanding economic growth and education
  - Fostering scientific discovery
  - Enabling functioning democracy
- Engage and support many potential use cases
  - Within and across levels of government
  - Private sector innovation
  - General public use

State and Local Initiatives

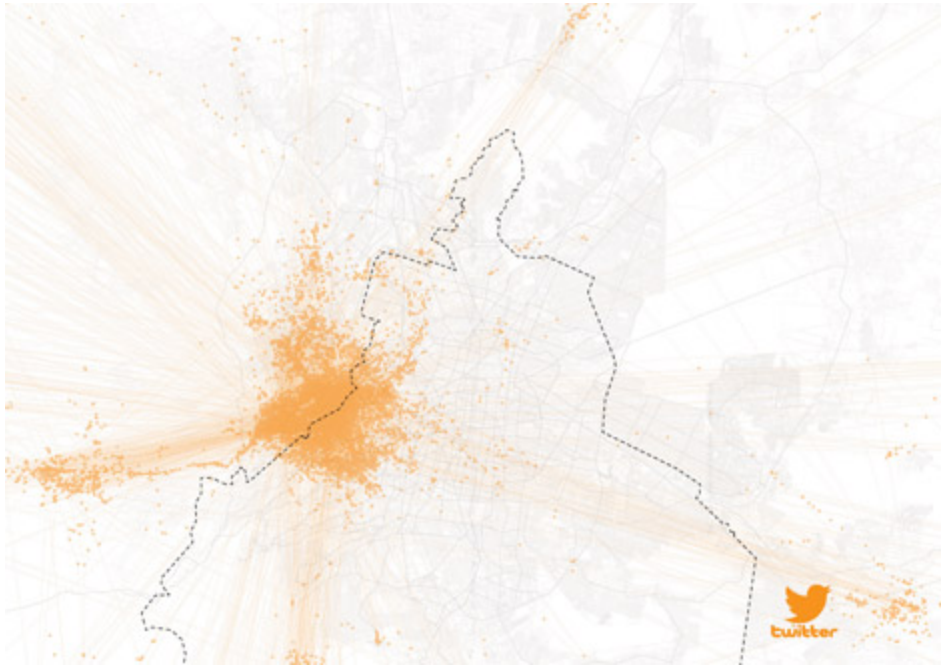
•Source: Sunlight Foundation; http://sunlightfoundation.com/policy/local/

- 50 state and local open data policies tracked since 2009
- Mix of legislative and executive initiatives
- Open Data Portals focus on local issues
  - Fiscal transparency
  - Crime/Public safety (including transportation)
  - Zoning
  - Education
  - Social services
  - Permits

Trend: Collecting & Sharing

- Provides patients with ways to collect & analyze data about their asthma and inhaler use
- Patients chooses what to share:
  - Clinical data
  - Personal data
  - Sensor data
  - Aggregated, anonymized location data
- Patients choose who gets to see their data
  - Family and friends
  - Healthcare provider
  - Health care researchers, clinical trials

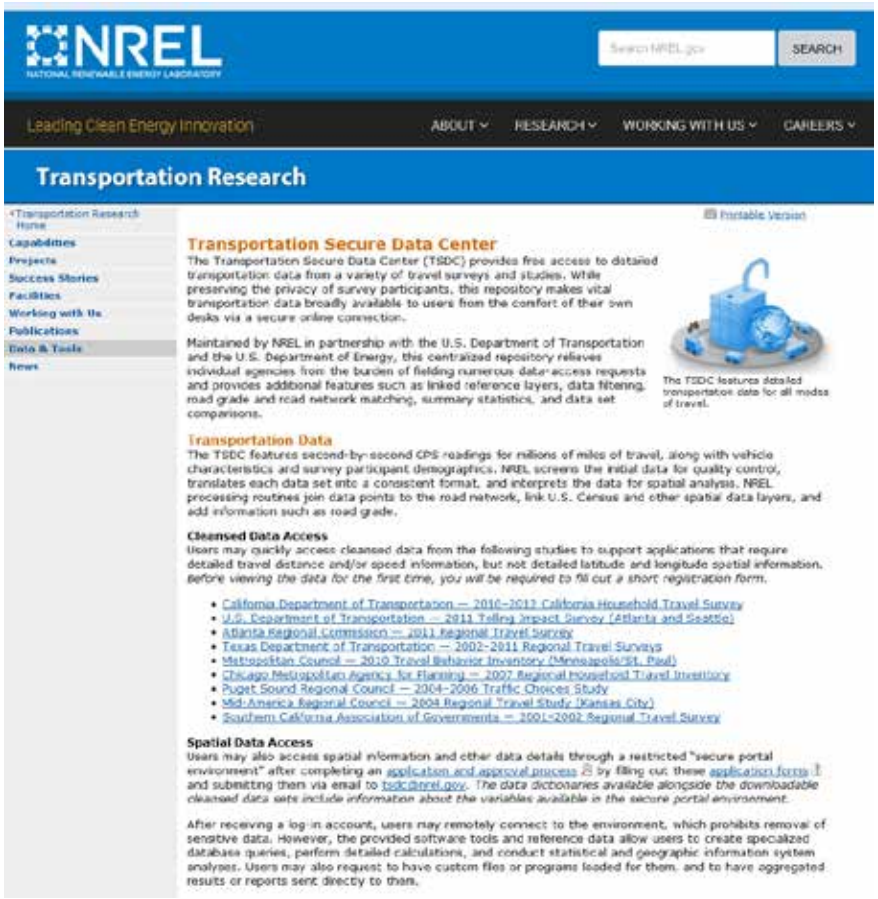
Trend: Donate My Data



- Audi Urban Future Award
  - Mexico City proposed a system where drivers anonymously donate data about location and movement
  - Data are shared via Web site and app in real-time
  - Data are archived for urban and transportation planners

- “In Mexico we see that people make sensitive mobility data available to the whole community if their individual benefit (less congestion, more leisure time) is greater than their concerns about protecting data”

Trend: Study & Preserve



- A repository for travel survey and study data
  - GPS tracks
  - Survey participant demographics
- Varying access levels
  - Public-use cleansed files
  - Detailed and spatial-enabled files
- Modeled after Census data enclaves


Questions?

Contra Costa Transportation Authority

Presentation to the ITS Program Advisory Committee
Multimodal Transportation Projects

Jack Hall, P.E.
ITS/CV Program Manager

CONTRA COSTA transportation authority






Washington D.C.
February 4, 2015

WHO WE ARE

- The Contra Costa Transportation Authority (CCTA) is a public agency formed by Contra Costa voters in 1988 to manage the county's transportation sales tax program and to lead the county's transportation planning efforts.

- CCTA is responsible for maintaining and improving the county's transportation system by planning, funding, and delivering critical transportation infrastructure projects and programs that connect our communities, foster a strong economy, increase sustainability, and safely and efficiently get people where they need to go.

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transportation
authority

WHAT WE DO

- **BUSES** Invest in a reliable, comfortable and convenient bus network
- **LOCAL STREETS** Smooth traffic flow on major roads and invest in neighborhood improvements such as repairing potholes and road surfaces
- **PEDESTRIAN** Make improvements to sidewalks, crosswalks, trails, and paths
- **SAFE ROUTES TO SCHOOLS** Focus on programs and projects aimed at bicycle and pedestrian safety for K-12 students
- **FERRIES** Expand the Bay Area ferry system by looking to ferries as an alternate commute method between West County and San Francisco
- **BICYCLE** Invest in safe routes and infrastructure improvements for bicyclists
- **BART** Make improvements to BART service and stations, such as extensions to new routes and parking at stations
- **HIGHWAYS** Complete Contra Costa's highway system, and improve air quality and noise protection along these corridors
- **CARPOOL/RIDESHARE** Implement programs aimed at reducing traffic congestion by encouraging carpooling and ridesharing
- **PROGRAMS FOR SENIORS AND PEOPLE WITH DISABILITIES** Enhance transit options to improve mobility for seniors and people with disabilities

MEASURE C

- Passed in 1988, Measure C provided for a 1/2-cent sales tax for 20 years to pay for an ambitious list of transportation projects and programs. It was estimated to generate $1 billion over 20 years for:
  - BART extension,
  - Freeway improvements,
  - Better bus service,
  - Enhanced bicycle facilities, and
  - More transportation options

MEASURE J

- In November 2004, 71% of Contra Costa voters approved Measure J. The measure provided for the continuation of our county's 1/2-cent transportation sales tax until 2034, and will provide approximately $2.7 billion for countywide and local transportation projects and programs for the life of the measure.

Intermodal Transit Centers

Pacheco Transit Hub
Parker App – Streetline

STREETLINE
Connecting the Real World

MARTINEZ

MONTHLY REPORT NOV. 30, 2014 – JAN. 3, 2015

KEY FACTS

No. of Sensors: 102 General / 6 EV / 6 ADA /
Area(s): Pacheco Lot

60%	Avg. Occupancy
7.5	Avg. Duration *(hrs.)*
Mon.	Peak Occupancy Day *(71%)*
9am	Peak Occupancy Hour *(62%)*
8am	Peak Arrival Hour *(24 cars/day)*
1,389	Parking Sessions

Note(s): Metrics are calculated Monday-Friday, between 6am-2pm for General spaces only.

DEPLOYMENT MAP

CONTRA COSTA transportation authority

Carsharing Program

- Locations near BART Stations
- AccessMobile
- Electric Vehicles

Carma Carpooling

Connected Commuting Platform
GPS Verified Vehicle Occupancy
Real-time Ridesharing and HOV/HOT Enforcement
APIs for App and connected vehicle integration

Legal Ridesharing
Not a Transportation Network Company (Uber, Lyft)
No impact on driver insurance or licensing

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Integrated Dynamic Transit Operations System

- Dynamic Dispatch
- Connection Protection
- Dynamic Ridesharing

Richmond Ferry Terminal Project

WETA

WETA

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I-80 Integrated Corridor Management

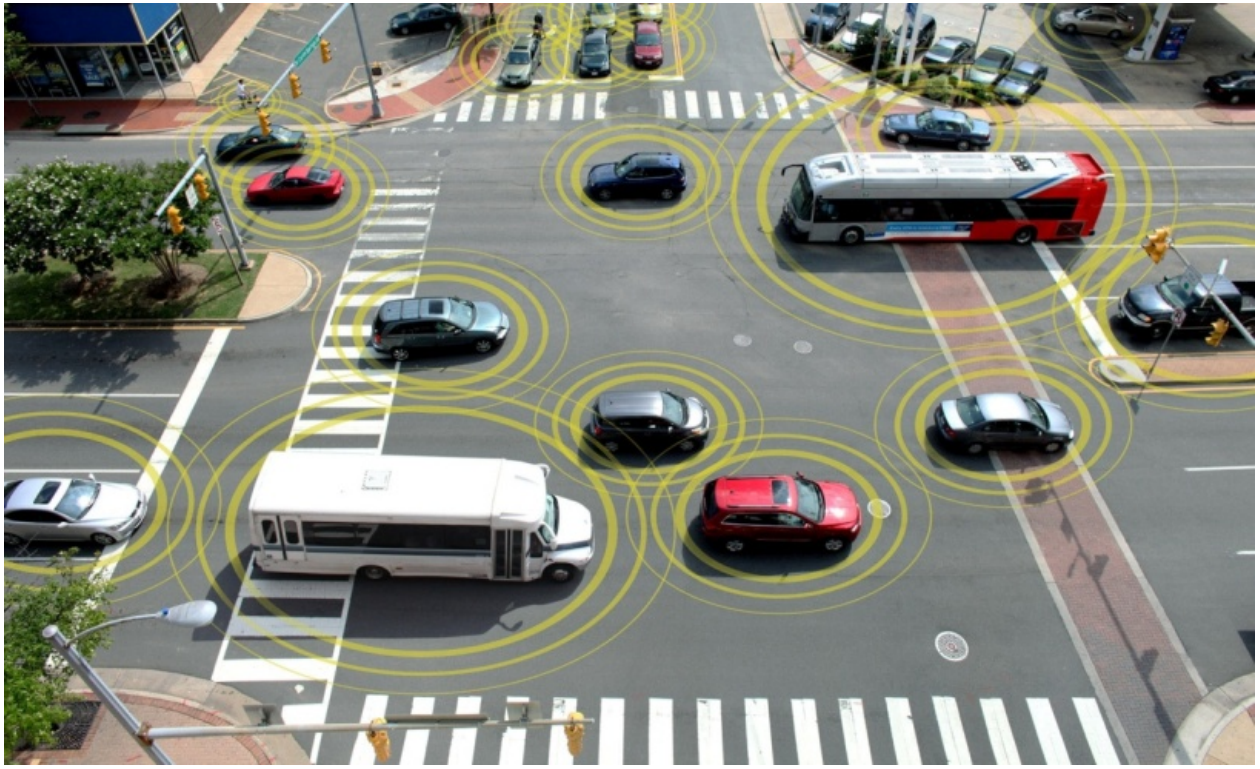
- Active Traffic Management (ATM)
- Integrated Corridor Management (ICM)
- Freeway Management System (FMS)
- Arterial Management System
- Advanced Traveler Information System (ATIS)

Traffic Light Synchronization/Information

Connected Signals

EnLighten Application

Today's technology in action
building smarter transportation networks



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Innovative Technologies in Transportation
What might the future bring?

Connected Vehicle Program

Major initiative by the US Department of Transportation

- Addresses Safety, Mobility, and Environmental concerns
- Major support by U.S. DOT
- Supported by Vehicle Manufacturers worldwide
- Supported by leading state and local-level departments of transportation

Introducing

GoMentum Station

Connected Vehicle and Autonomous Vehicle (CV/AV) Program and Test Facility

CONTRA COSTA transportation authority

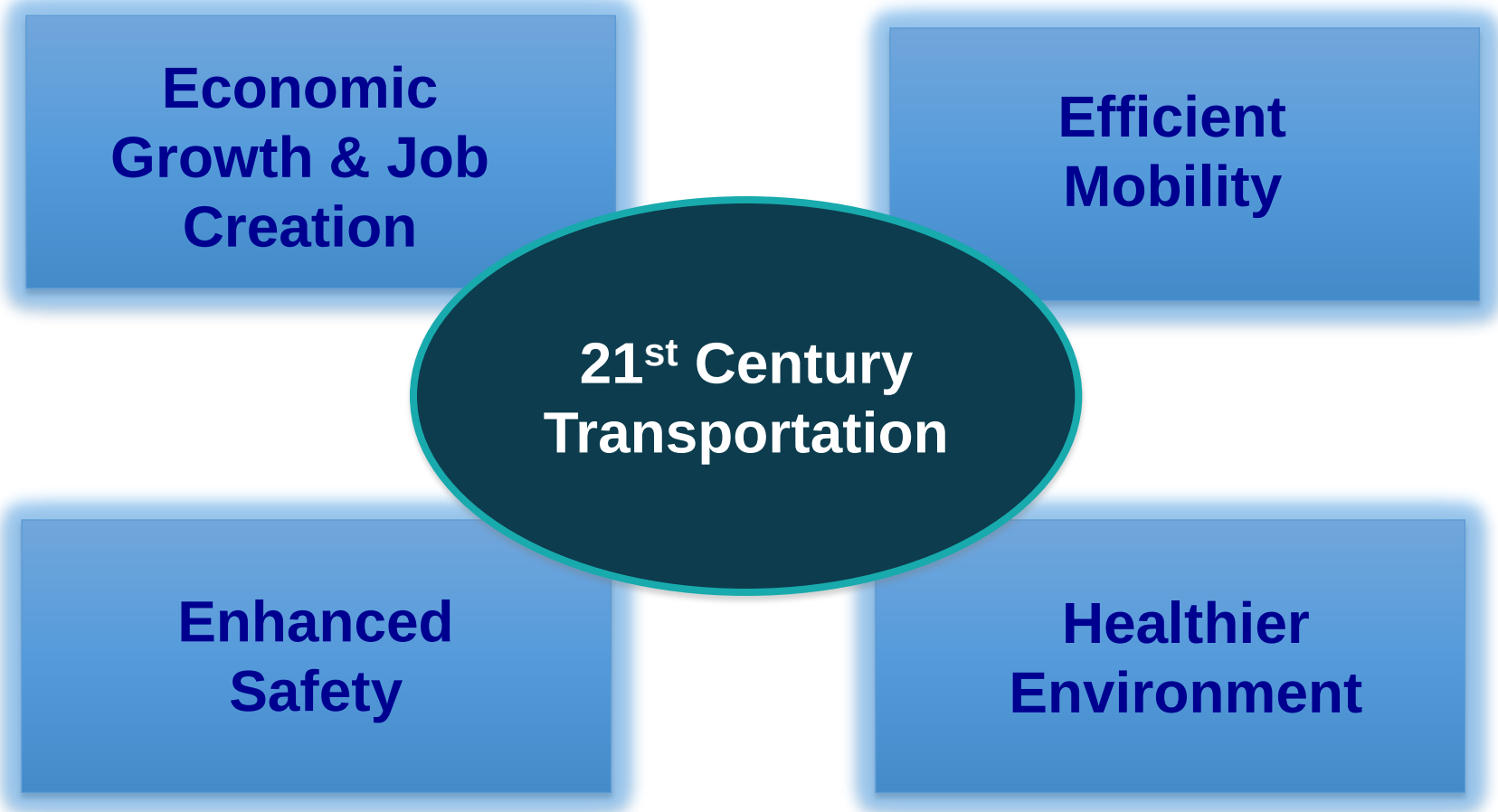
CCTA CV/AV Program

Vision

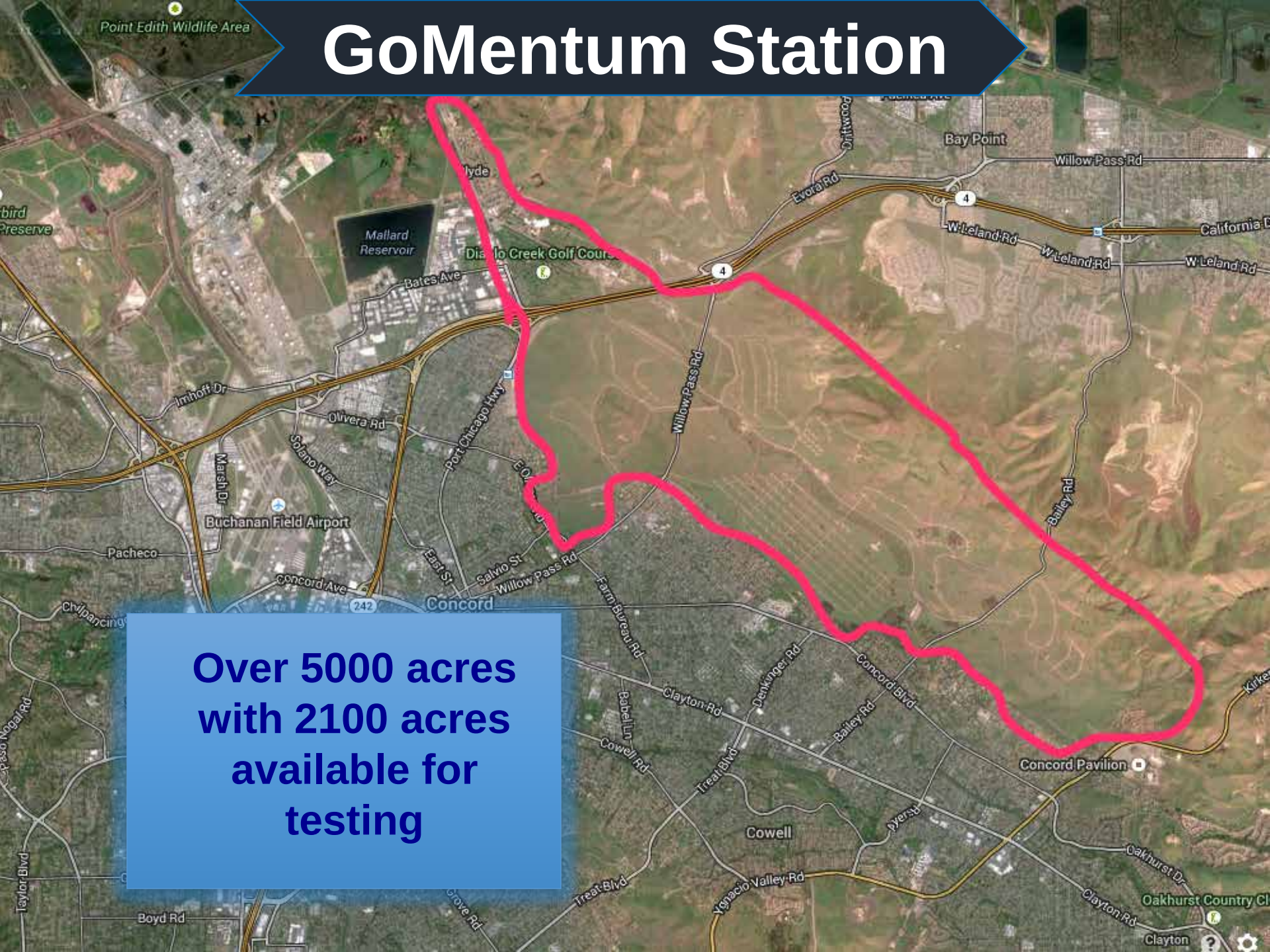
Build a CV/AV center at GoMentum Station where convergence, innovation and commercialization of CV applications and AV technologies take place in the largest testbed in the world

CCTA CV/AV Program

Overarching Goals



GoMentum Station



Over 5000 acres with 2100 acres available for testing

GoMentum Station

Over 20 miles of paved roadways including a 7-mile long spine road for high speed testing

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GoMentum Station

Two 1400-ft. long tunnels ideal for testing guidance, sensors & communications technologies

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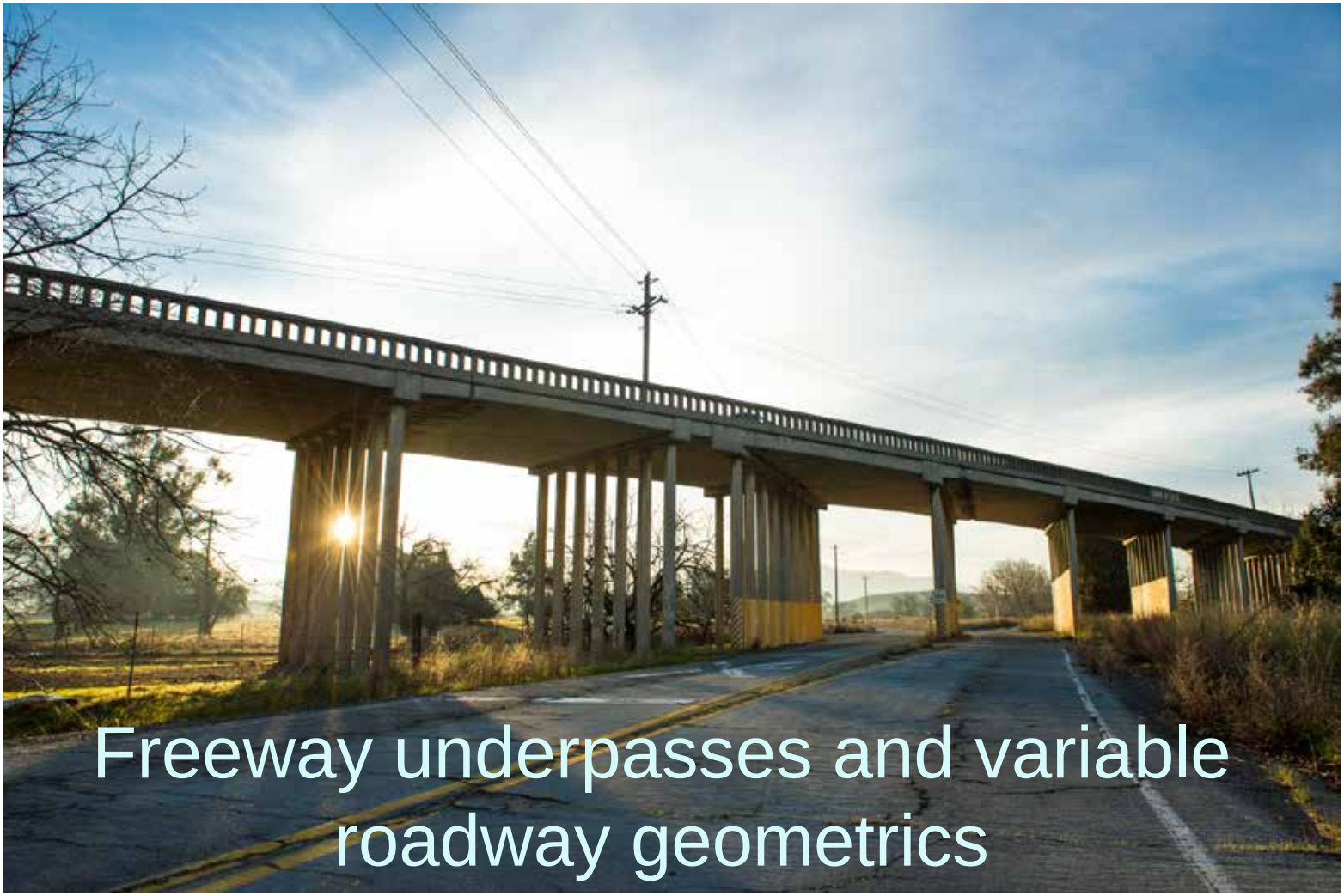
GoMentum Station



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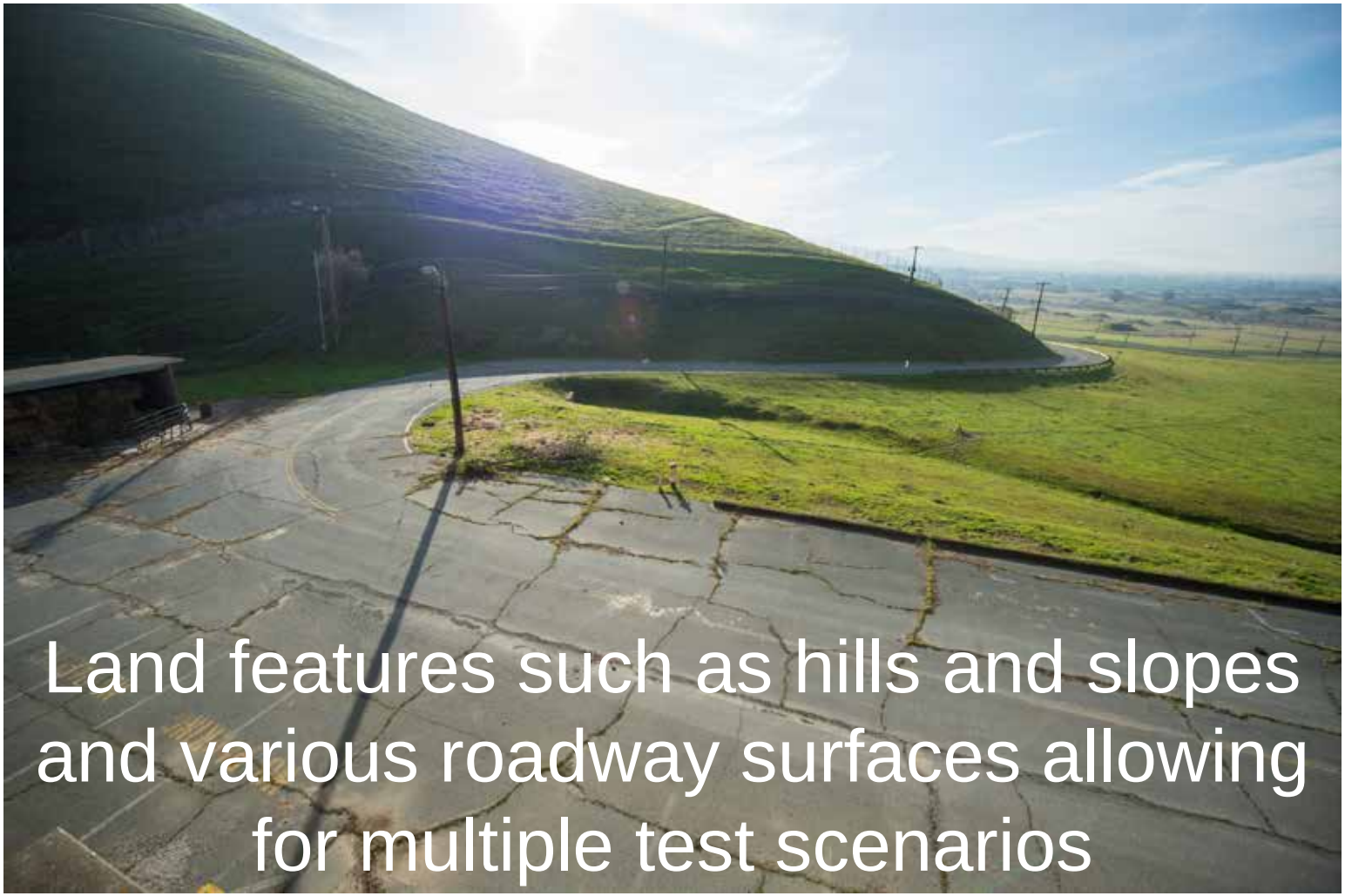
GoMentum Station



GoMentum Station

Railroad crossings and tracks to enable
real-world testing

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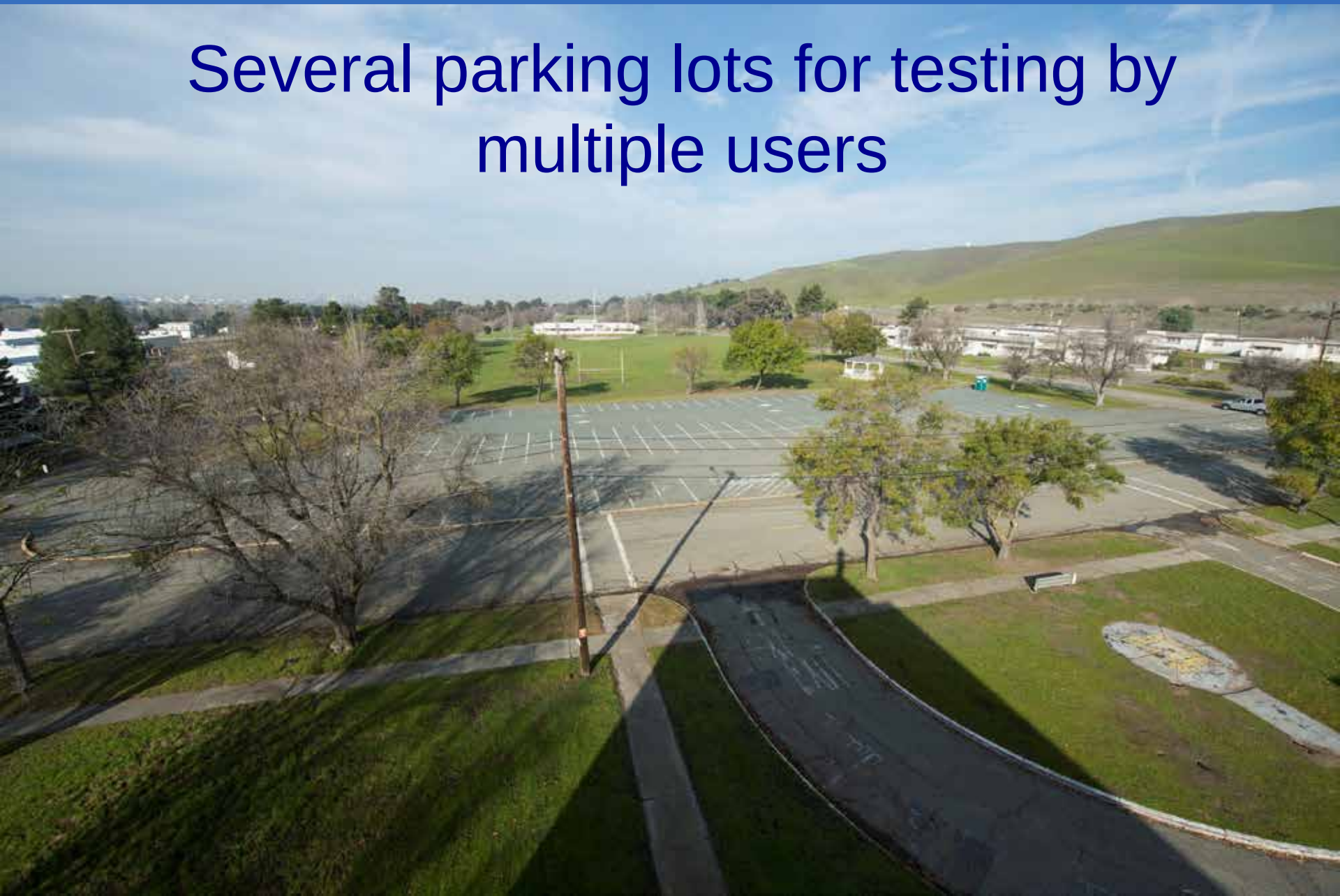
GoMentum Station

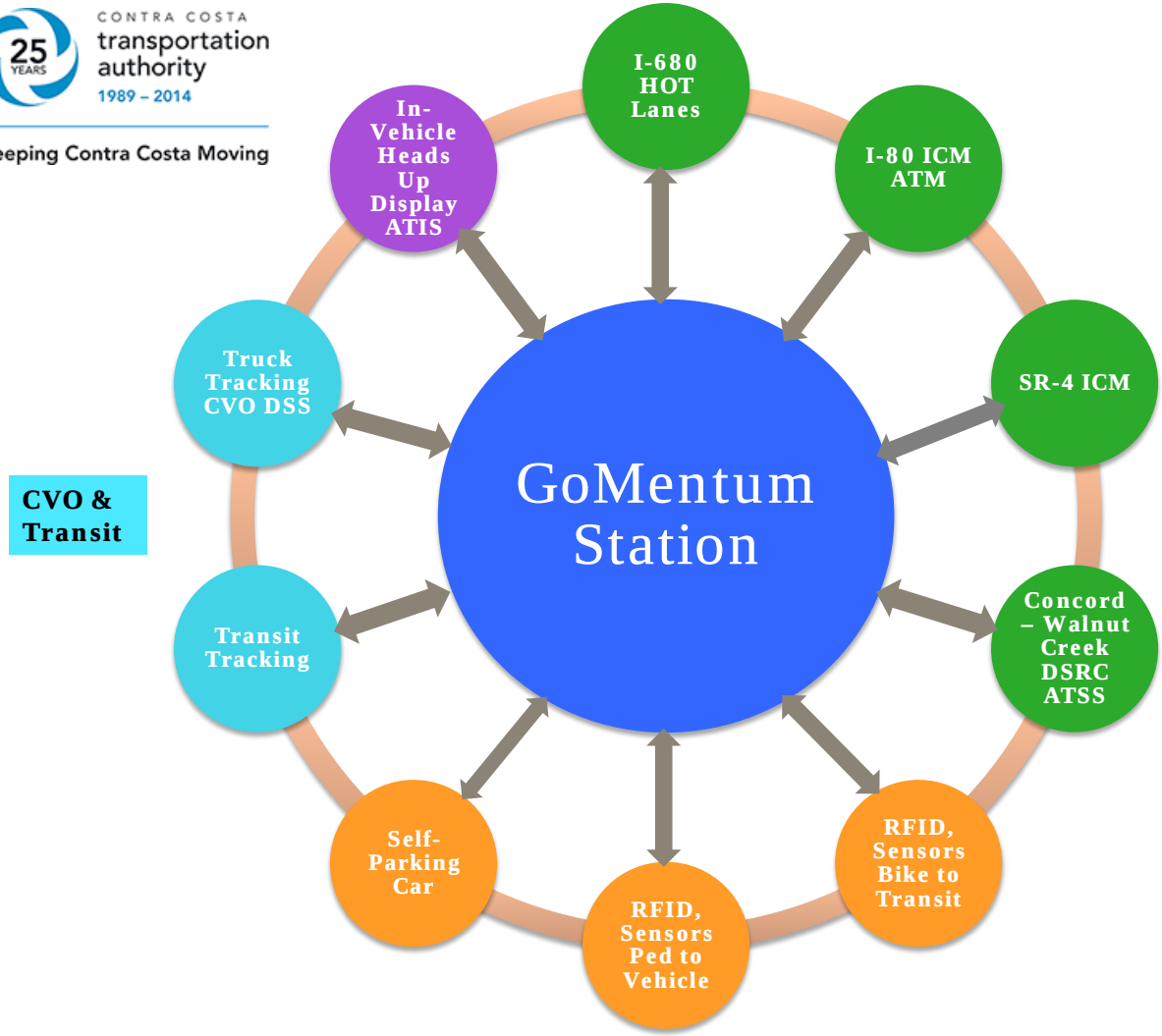
Several parking lots for testing by multiple users



Integrated CV/AV Program

CONTRA COSTA transportation authority 1989 – 2014

Keeping Contra Costa Moving



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City 5.0

UBx
Insurance
CarShare

Multimodal
Mobility

Smart City

Personalization

Service Integration

Big Data

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Invitation to attend

March 31st Summit

In Concord, California

For more details please contact:

Jack Hall, P.E.
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Office: (925) 354-0685

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CONTRA COSTA transportation authority

Comments / Questions

Jack Hall
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U.S. Department of Transportation
Federal Highway Administration

ITS Advisory Committee Operations and the Connected Vehicle

The Objectives of the Office of Operations

- Influencing travel demand (how much, when, where) and effectively managing the traffic that results
- Anticipating and responding to planned and unplanned events (traffic incidents, work zones, bad weather, special events)
- Providing travelers with high quality traffic and weather information
- Ensuring that the unique needs of the freight community are considered and included in all of the above

Why Focus On Improving Operations?

- ü To keep people and commerce moving – a healthy economy needs a reliable transportation system
- ü To reduce / manage impacts of congestion
- ü To improve the safety and sustainability of the highway system
- ü To make more cost effective investment of limited resources
- ü To promote a more proactive approach

Proactive Operations of Transportations Systems

- ü Real-time and forecasted information
- ü Measuring / monitoring performance
- ü Good analytical foundation/tools
- ü State of the art technologies and strategies
- ü Integration across system elements, jurisdictions, and modes
- ü An organization and workforce capable of managing all of the above

Office of Operations Theme/Program Areas

- Building a Strong Foundation for Proactive Operations
  - Accelerating Implementation of Operations & ITS Technologies and Strategies
  - Operations and Freight Performance Measurement and Management
  - Organizing and Planning for Operations
  - Traffic Analysis Tools
  - Traffic Control (MUTCD)

Office of Operations Theme/Program Areas (cont.)

- Managing Congestion by Improving Reliability and Operating the System at Peak Performance
  - Active Transportation and Demand Management
  - Arterial Management / Traffic Signal Operations
  - Congestion Pricing
  - Real-Time Transportation Information
  - Road Weather Management
  - Traffic Incident and Events Management
  - Work Zone Mobility and Safety

Office of Operations Theme/Program Areas (cont.)

Improving Reliability Through Efficient Movement of Freight

- Commercial Vehicle Size and Weight
- Freight Data and Analysis
- Freight Operations and Technology
- Freight Professional Development

Office of Operations Theme/Program Areas (cont.)

- Supporting Connected Vehicle Deployment
  - Applications Development
  - Connected Vehicle Pilots
  - Connected Vehicle Deployment Planning / Guidance / Tools
  - V2I Deployment Coalition
- Integrated Corridor Management
- Active Traffic Management
- Adaptive Signal Control
- Smarter Work Zones
- Real-Time Information

Goal Under Connected Vehicle Activities

- Our goal in Connected Vehicle activities is to:
  - Provide national leadership in infrastructure initiatives;
  - Facilitate a smooth and effective deployment path for transportation owners/operators interested in implementing infrastructure enabled connected vehicle applications.

Purpose of the V2I Guidance/Products-Tools

- ü Help FHWA achieve national leadership in the area of infrastructure guidance
- ü The guidance is intended to assist FHWA staff and transportation system owner/operators deploy V2I technology; not only in terms of the Federal-aid Highway program requirements but also practices to help assure interoperability and efficient planning/procurement/operations.

V2I Guidance/Products-Tools Timeline

- ü **Spring 2013 -** Work was started on an *initial draft* V2I guidance document with a group of FHWA-HQ program staff and a selection of Division Administrators, NHTSA, OST Policy/Research, and other USDOT modes.
- ü **Summer 2014 -** The *initial draft* document was circulated among USDOT's Associate Administrators for concurrence as well as FHWA Council (HCC), Office of Secretary (OST), Office of Management & Budget (OMB), and the Federal Communications Commission (FCC).

V2I Guidance/Products-Tools Timeline (cont.)

- ü **Fall 2014 –** Under Federal Register Doc. 2014–19460, the *initial draft* document was released for public, internal, and external comments
- ü **Fall 2014 –** The *initial draft* document was presented at the 2014 World Congress as an outreach to State DOTs, MPOs, and the public (~100 in attendance & ~110+ via web conference).
- ü **Winter 2014 –** The comment period for the *initial draft* document was closed on November 27th. There were approximately 450 comments among 26 individuals, organizations, State DOTs, and USDOT staff. <u>There were not comments that would hinder the release of a V2I guidance/products-tools.</u>

V2I Guidance/Products-Tools Timeline (cont.)

ü List of Products-Tools w/ Delivery Dates

Ø System Engineering Process for Vehicle to Infrastructure [Awarded 8/14 w/ Deliverables by 8/15]	Ø Tools for Estimating Economic Development Benefits of V2I [Awarded 9/14 w/ Deliverables by 10/15]
Ø Incorporating CV into the Transportation Planning Process [Awarded 8/14 w/ Deliverables by 8/15]	Ø Guide to V2I Cyber-Security [Awarded 9/14 w/ Deliverables by 3/16]
Ø Guide to Licensing DSRC Roadside Units [Awarded 8/14 w/ Deliverables by 5/15]	Ø Near Term V2I Transition & Phasing Analysis [Awarded 9/14 w/ Deliverables by 9/15]
Ø V2I Message Lexicon [Deliverables by mid-summer 2016]	Ø Guide to V2I Communication Technology Selection* [SOW and timeline under development]
Ø CV Planning Guidance Criteria* [SOW and timeline under development]	Ø V2I Benefit Cost Analysis Tool* [Seek to leverage Safety/CV Pilot data in 2016/2017]

Next Steps in the V2I Guidance/Products-Tools

- **Spring 2015 -** The *initial* document will be circulated among USDOT's Associate Administrators for concurrence as well as FHWA Council (HCC), Office of Secretary (OST), Office of Management & Budget (OMB), and the Federal Communications Commission (FCC).
- **Mid-Summer 2015 -** The *initial* document & products-tools will be available in electronic format via the web for download.
- **Winter 2017 -** The *initial* document will be revised based on the CV Pilot's lessons learned

Questions/ Comments

Contact us

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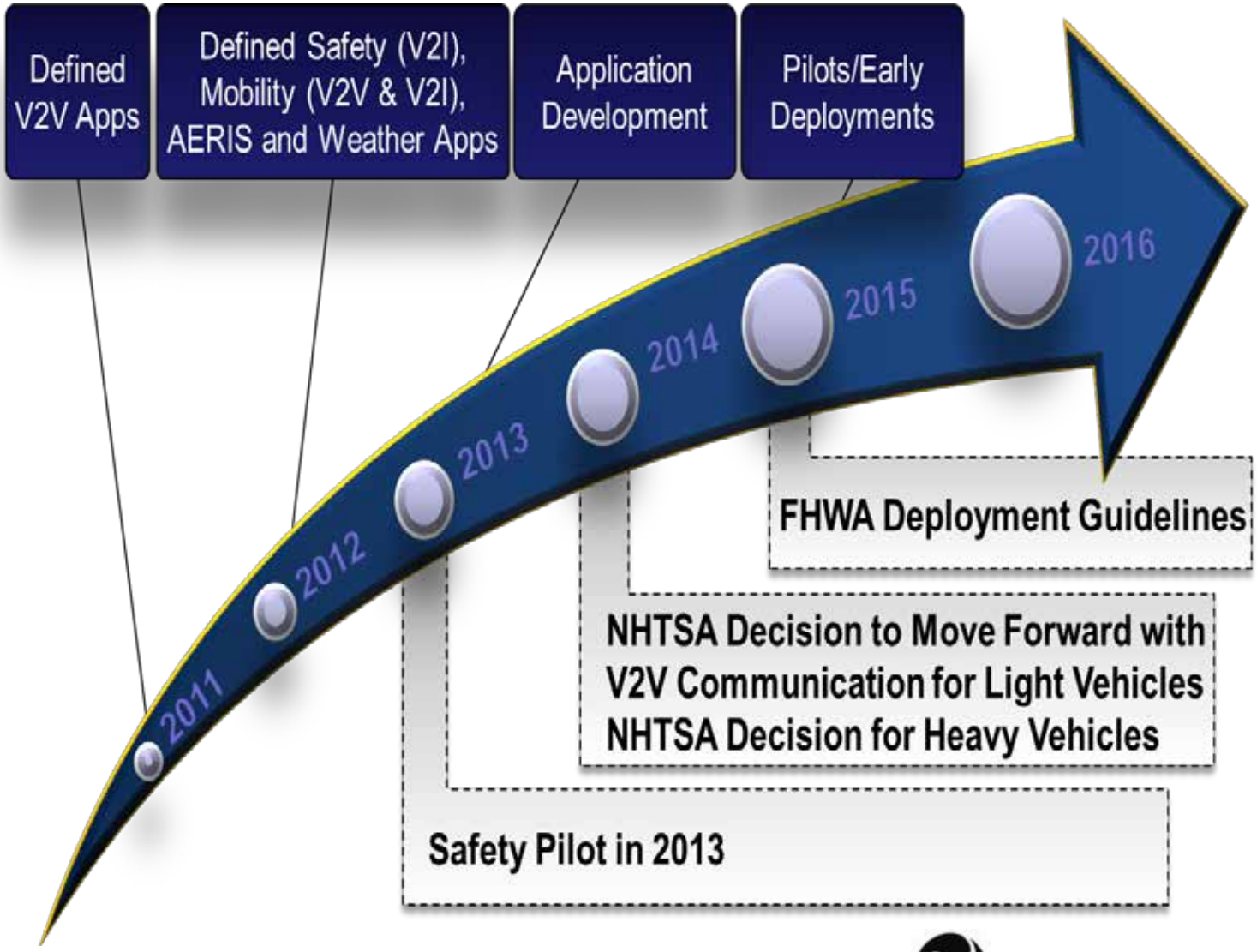
ITS Program Advisory Committee

Connected Intelligent Transportation System Complete View

February 4, 2015

Path to Deployment



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
  - Full round trip
- **Multiple communication media**
  - DSRC on all 7 channels
  - Other IP transport media
- ***Tools***
  - *Consistent implementations*

•“The opportunity for a common experience.”

A Variety of Communication Media, Data Needs

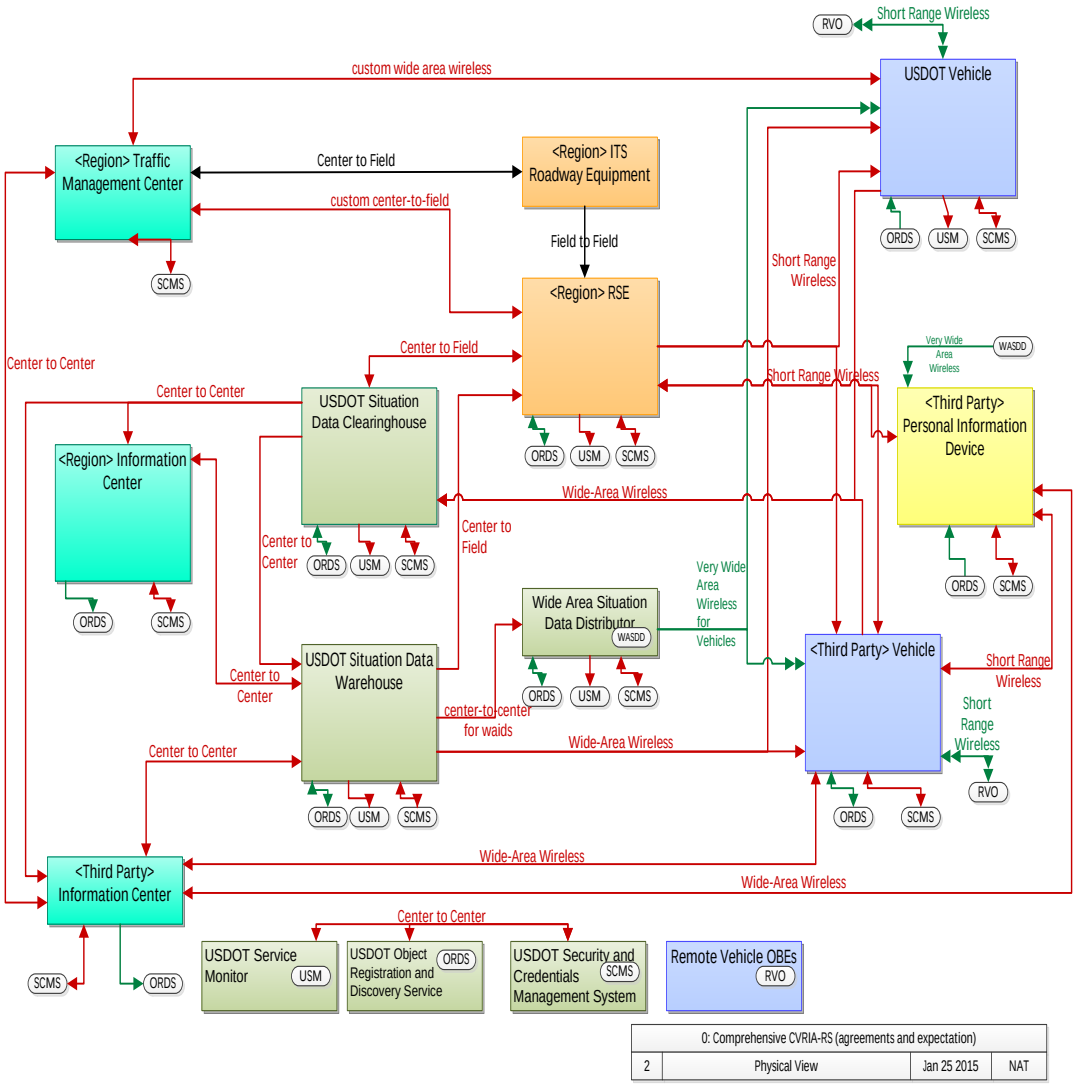
Resources: wired and wireless, the Internet

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

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
  - http://www.iteris.com/cvria/html/resources/tools.html

Affiliation of Test Beds

The OST-R has entered into 62 Memorandums 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

Latest

- Carnegie Mellon University

Upcoming Stakeholder Events

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

- Regional CV Pilot
  - http://www.its.dot.gov/pilots/
  - http://www.its.dot.gov/pilots/cv_pilot_faq.htm

Twitter: @ITSJPODirector

Facebook: https://www.facebook.com/DOTRITA

Website: http://www.its.dot.gov

•"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