

New Mobility Ecosystems

Advancing Integrated and Innovative Mobility Management

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Bus & Paratransit Conference

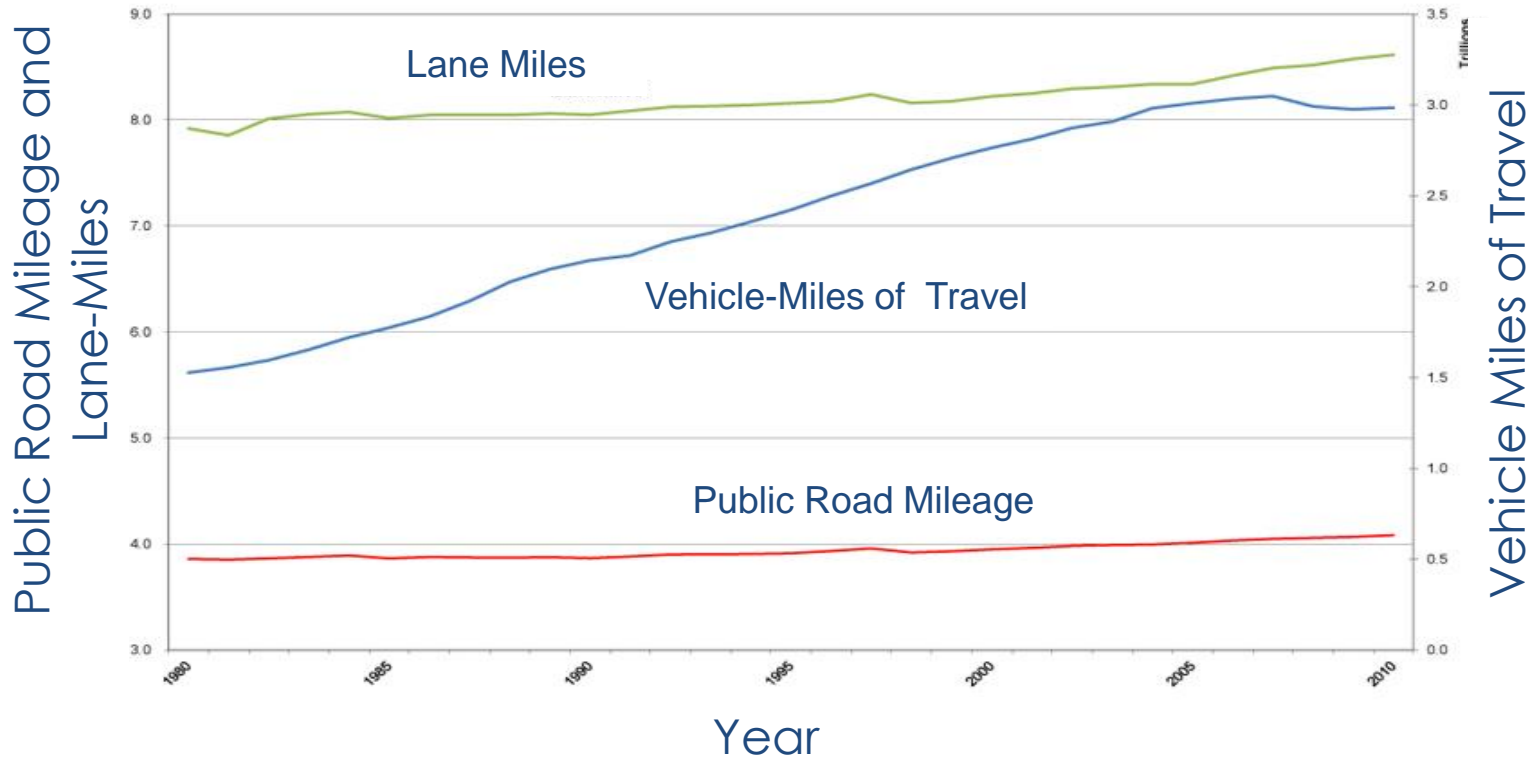


Agenda

- **Brief Background**
- **Trends**
- **Current Landscape, Developments**
- **Connected Automated Vehicles / Test Beds**
- **One Example; Smart Cities and MOD/MaaS**

Demand is Greater than Supply

Public Road Mileage, Lane Miles, and VMT
1980 - 2010

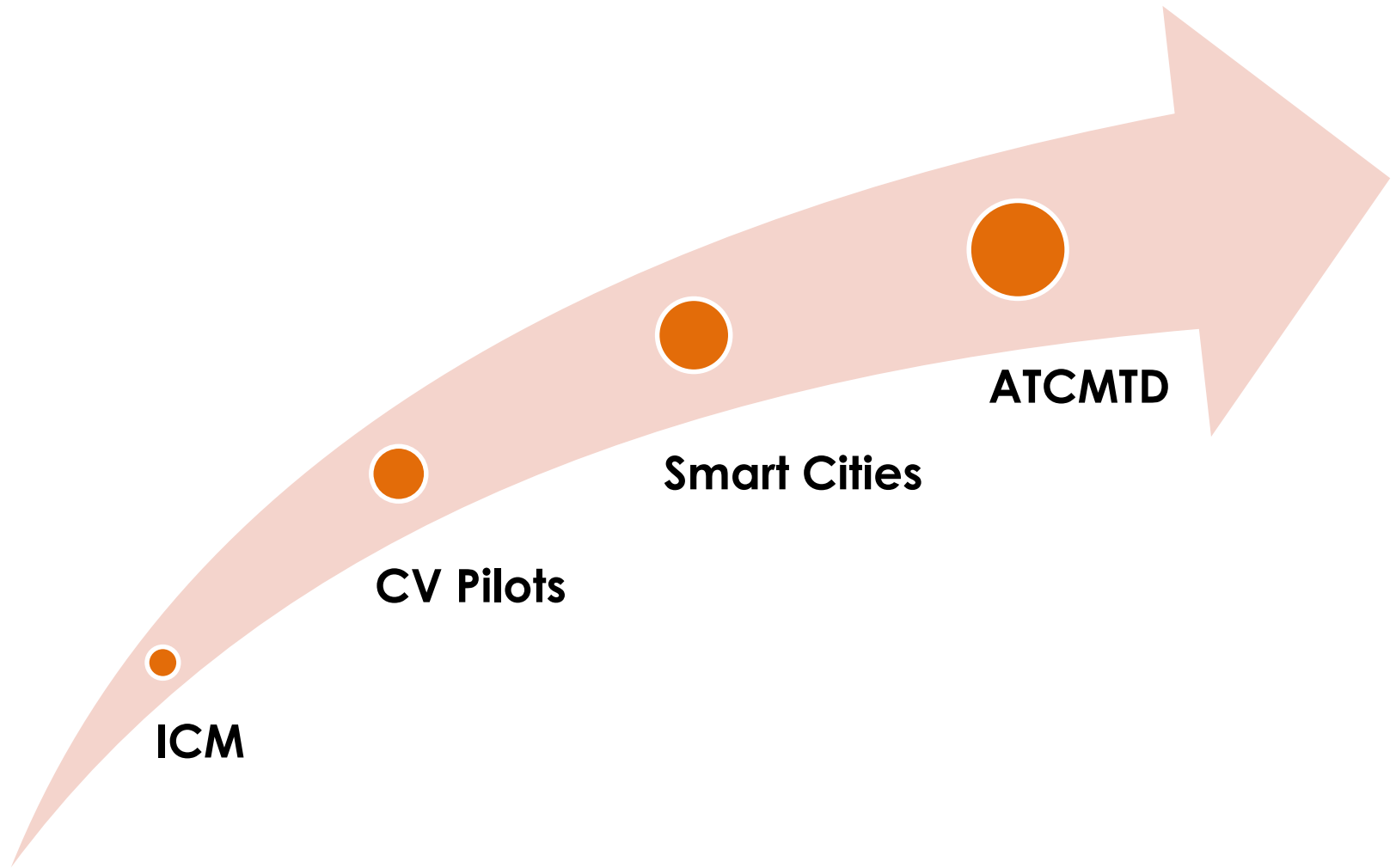


Federal Gas Tax

**40%
Decrease**



Indications from the Last Decade



Destination



Federal Automated Vehicle Policy

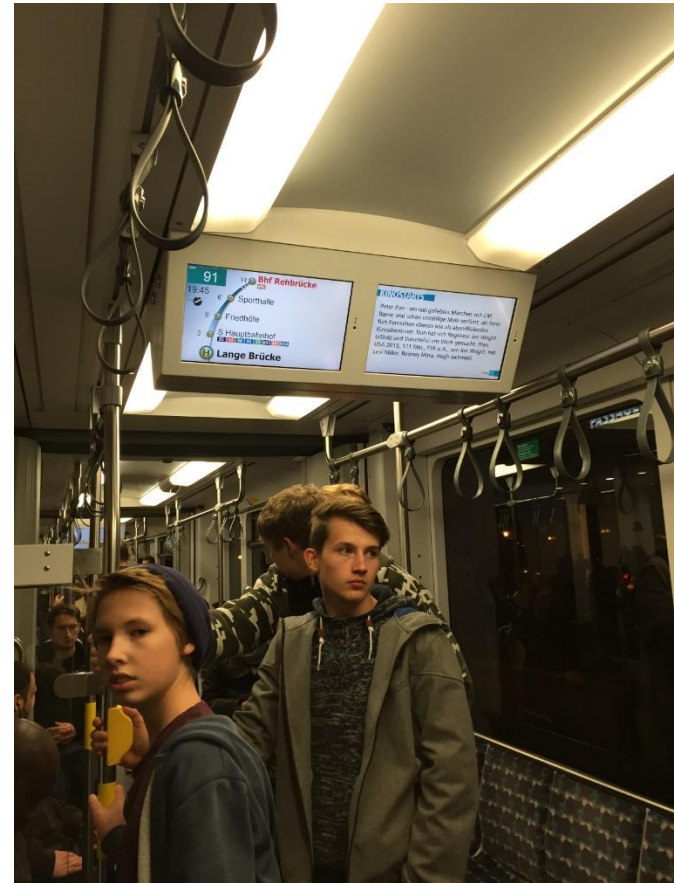
- **Vehicle Performance Guidance for AV, HAV**
- **Model State Policy**
- **Current Regulatory Tools**
- **Modern Regulatory Tools**

V2I Deployment Guidance

- **USDOT Sponsored; ITS America, AASHTO and ITE**
- **Final Draft released, dated December 30, 2016**

Primary Outstanding Issues

- Who Own the data (Big Data)
- Spectrum Sharing (FCC)



Who is at Fault ?



Enforcement & Driverless Vehicles



"Speeding, officer? You'll have to ask the self-driving car."

Connected Vehicle (CV) Applications

V2I Safety

Red Light Violation Warning
Curve Speed Warning
Stop Sign Gap Assist
Spot Weather Impact Warning
Reduced Speed/Work Zone Warning
Pedestrian in Signalized Crosswalk Warning (Transit)

V2V Safety

Emergency Electronic Brake Lights (EEBL)
Forward Collision Warning (FCW)
Intersection Movement Assist (IMA)
Left Turn Assist (LTA)
Blind Spot/Lane Change Warning (BSW/LCW)
Do Not Pass Warning (DNPW)
Vehicle Turning Right in Front of Bus Warning (Transit)

Agency Data

Probe-based Pavement Maintenance
Probe-enabled Traffic Monitoring
Vehicle Classification-based Traffic Studies
CV-enabled Turning Movement &

Environment

Eco-Approach and Departure at Signalized Intersections
Eco-Traffic Signal Timing
Eco-Traffic Signal Priority
Connected Eco-Driving
Wireless Inductive/Resonance Charging
Eco-Lanes Management
Eco-Speed Harmonization
Eco-Cooperative Adaptive Cruise Control
Eco-Traveler Information
Eco-Ramp Metering
Low Emissions Zone Management
AFV Charging / Fueling Information
Eco-Smart Parking
Dynamic Eco-Routing (light vehicle, transit, freight)
Eco-ICM Decision Support System

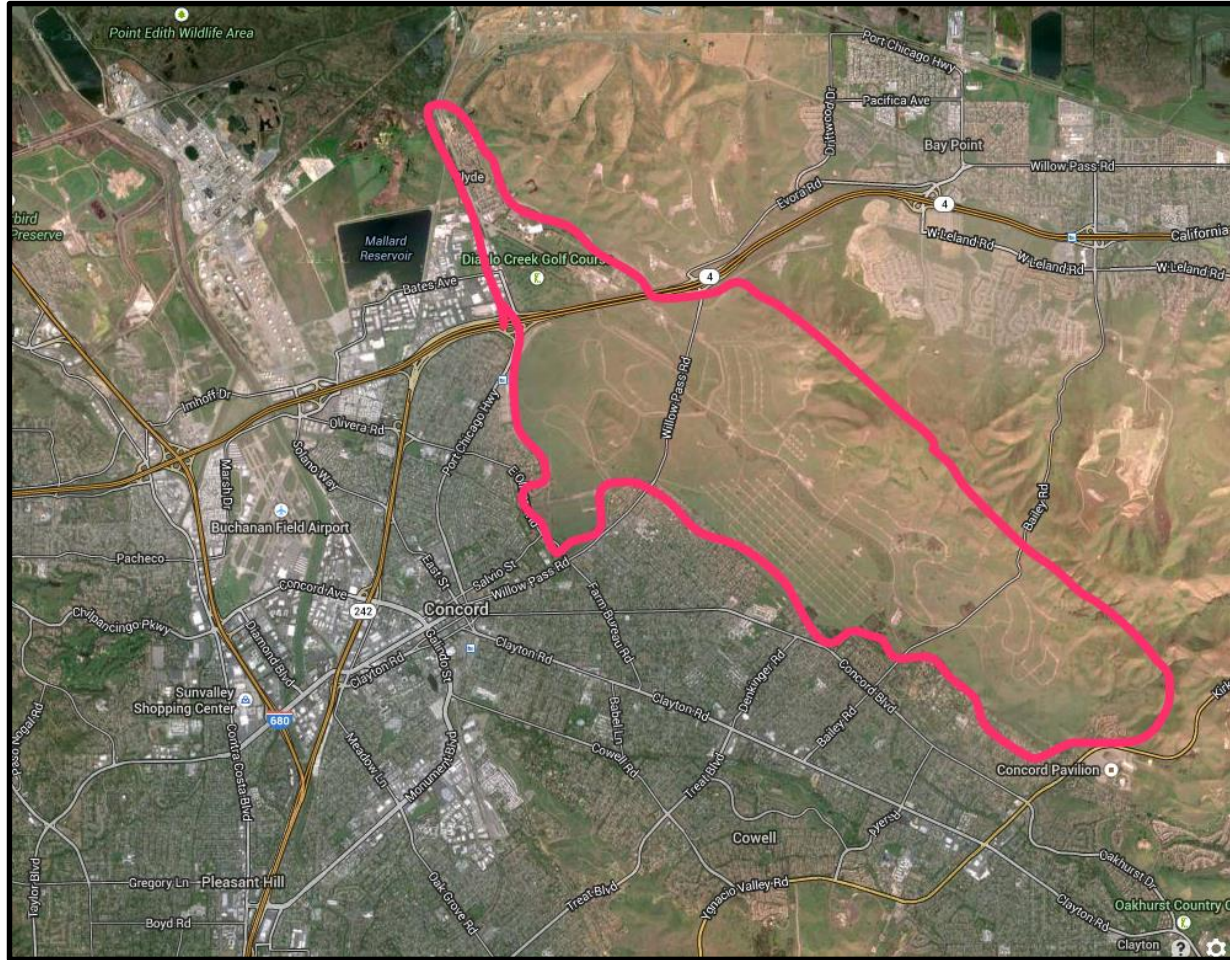
Road Weather

Motorist Advisories and Warnings (MAW)
Enhanced MDSS
Vehicle Data Translator (VDT)
Weather Response Traffic Information (WxTINFO)

Mobility

Advanced Traveler Information System
Intelligent Traffic Signal System (I-SIG)
Signal Priority (transit, freight)
Mobile Accessible Pedestrian Signal System (PED-SIG)
Emergency Vehicle Preemption (PREEMPT)
Dynamic Speed Harmonization (SPD-HARM)
Queue Warning (Q-WARN)
Cooperative Adaptive Cruise Control (CACC)
Incident Scene Pre-Arrival Staging Guidance for Emergency Responders (RESP-STG)
Incident Scene Work Zone Alerts for Drivers and Workers (INC-ZONE)
Emergency Communications and Evacuation (EVAC)
Connection Protection (T-CONNECT)
Dynamic Transit Operations (T-DISP)
Dynamic Ridesharing (D-RIDE)
Freight-Specific Dynamic Travel Planning and Performance
Drayage Optimization

GoMentum Station



GoMentum Station

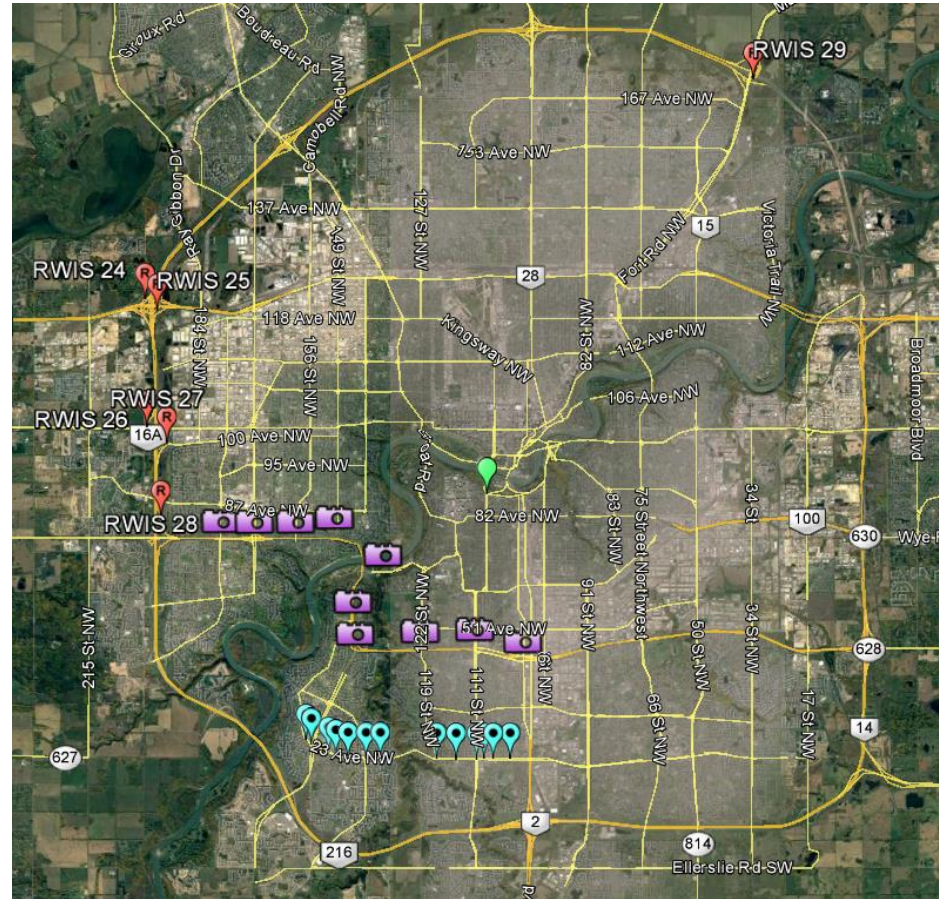


Active-Aurora

- Collaborative
- Cold Winter Climate – cold, snow, salt
- Mixed Traffic
- V2I, V2X, DSRC
- Rural & Urban Freeways and Urban Arterials
- UAV
- Continental Interoperability

Active-Aurora

- Current RSE
- Rural Frwy
- Urban Expwy
- Urban Arterial
- City Fleet



- Future phases expand network

Navya



Olli



EasyMile



World Bus



Transit Benefits

- **First Mile / Last Mile**
- **Eliminates Wait Time**
- **Provides for Seamless Transfers**
- **Improves Transit reliability**
- **Customer satisfaction**
- **Increases Transit Ridership**
- **Reduces Operating Costs**
- **Increased total system throughput**
- **Decreases in primary & secondary incidents**
- **Stimulates economic vitality**
- **Short project development, implementation timeframe**
- **Electric Vehicles, Zero Emissions**
- **MOD, MaaS**

Thank you