



SAFETYPILOT

**Connected Vehicle Large-Scale Field
Operational Testing:
The US “Safety Pilot”**

Gerald D. Conover

Chairman, International Affairs

The Intelligent Transportation Society of America

Connected Vehicle Technology



Connected Vehicle Technology Applications

- **Vehicle to Vehicle Communication (V2V)**
 - Forward crash warning
 - Electronic emergency brake lamps, several ahead
 - Intersection movement assist
- **Vehicle to Infrastructure Communication (V2I)**
 - Emergency vehicle signal preemption
 - Dynamic signal phase adjustments
 - Road surface condition
- **Vehicle to Everything Else (V2X)**
 - Pedestrians, cyclists, trains at grade crossings

Safety Pilot Model Deployment

- The **Safety Pilot** is:
 - Model for a national deployment of DSRC technology for both vehicles and infrastructure
 - Designed to determine the effectiveness of the safety applications at reducing crashes
 - Determine how real-world drivers will respond to the safety applications
- Safety Pilot will also test mobility and sustainability applications
- \$22 Million, 2½-year program
- Launched on 21 August 2012

Safety Pilot Test Conductor Team



USDOT Safety Pilot Vehicle Integrators

Video and animation developed and provided by the Crash Avoidance Metrics Partnership (CAMP)

CAMP

Vehicle Safety Communications 3

Mercedes-Benz
Research & Development North America, Inc.



TOYOTA

HONDA
Honda R&D Americas



NISSAN



HYUNDAI · KIA MOTORS
Hyundai · Kia America Technical Center, Inc.

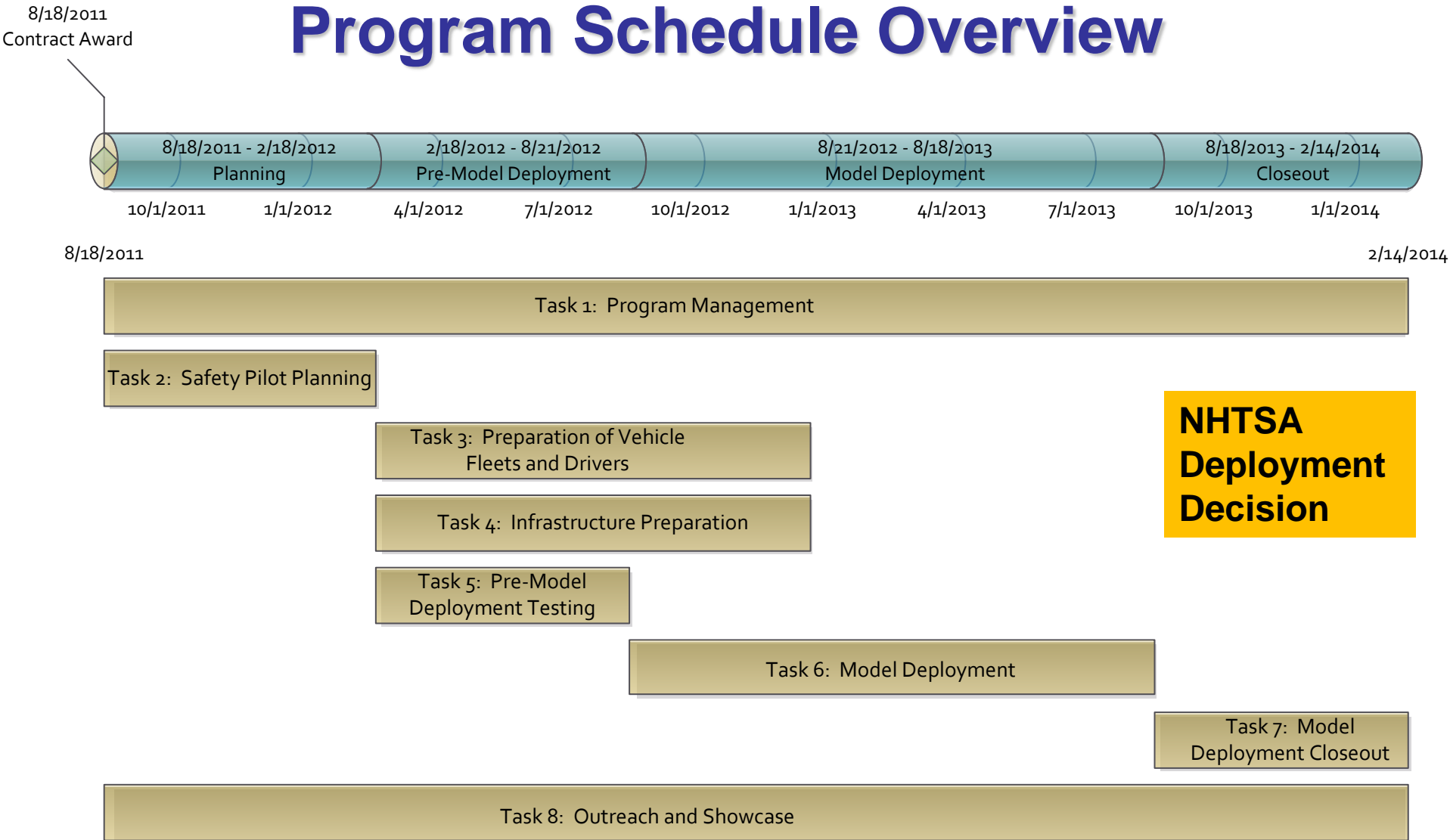
VOLKSWAGEN
GROUP OF AMERICA

Intelligent Transportation Systems



Battelle
The Business of Innovation

Program Schedule Overview



Scope

- 2,450 cars, commercial trucks, and transit vehicles
- 73 lane-miles of roadway instrumented with 29 roadside-equipment installations
- A variety of different devices
 - Vehicle Awareness Devices
 - Aftermarket Safety Devices
 - Integrated Safety Systems
 - Retrofit Safety Devices
 - Roadside Equipment

Devices Types

Vehicle Awareness Devices (VAD)

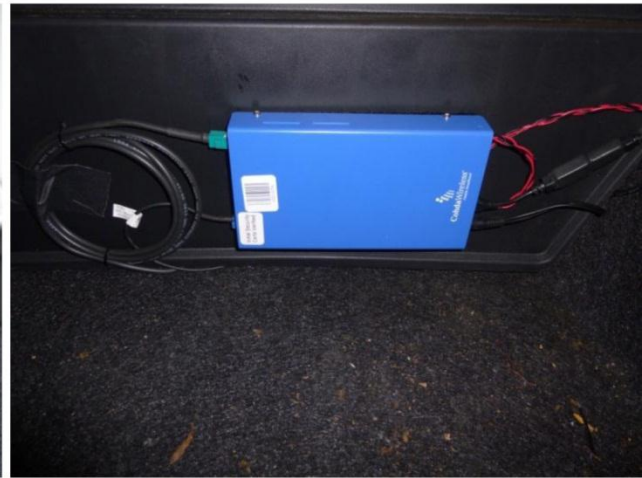
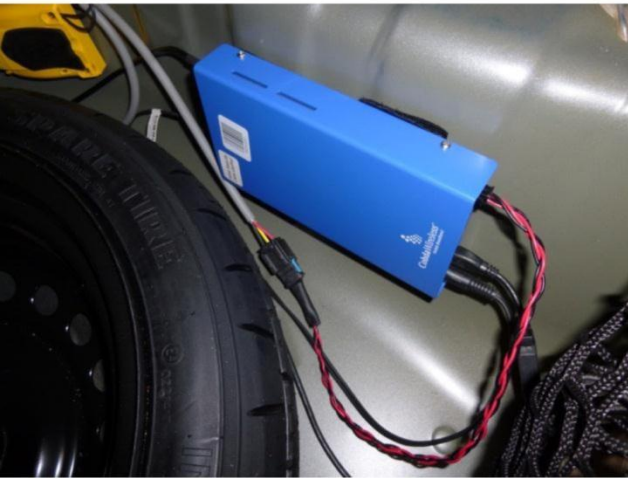
- Only sends the basic safety message.
- Does not generate warnings.

Devices Types

Aftermarket Safety Device (ASD)

- Sends and receives the safety messages.
- Has a display.
- Issues audible or visual warnings to the driver.

Example ASD Unit Installations



Devices Types

Retrofit Safety Devices (RSD)

- Similar to the Aftermarket Safety Device
- But is connected to a vehicle data bus
- Can provide information from in-vehicle sensors

Devices Types

Integrated Safety Systems (ISD)

- Designed into vehicles by the vehicle manufacturer
- Connected to a vehicle data bus.
- Sends and receives the safety messages
- Issues warnings to the driver

Devices Types

Roadside Equipment (RSE)

- Devices installed into the infrastructure
- Both send and receive safety messages
- Can interface with traffic control systems

Infrastructure Installations




Applications

- Forward Collision Warning (FCW)
- Emergency Electronic Brake Light (EEBL)
- Intersection Movement Assist (IMA)
- Blind Spot Warning (BSW)
- Do-Not-Pass Warning (DNPW)
- Left Turn Across Path (LTAP)
- Right Turn in Front Warning
- Curve Speed Warning (CSW)
- Pedestrian Detection

Vehicles Deployed

	Integrated Vehicles	Retrofit/ Aftermarket Devices	Retrofit/ Aftermarket Devices	Vehicle Awareness Devices
Passenger Cars	64	100	200	2215
Heavy Trucks	3	8	8	50
Transit		3		85
Medium Duty				100
	67	111	208	2450

 Data Acquisition System (Video, CAN, Warnings, Messages)

 Basic Messages Only

 All Messages and Warnings

Ann Arbor as the Deployment Site

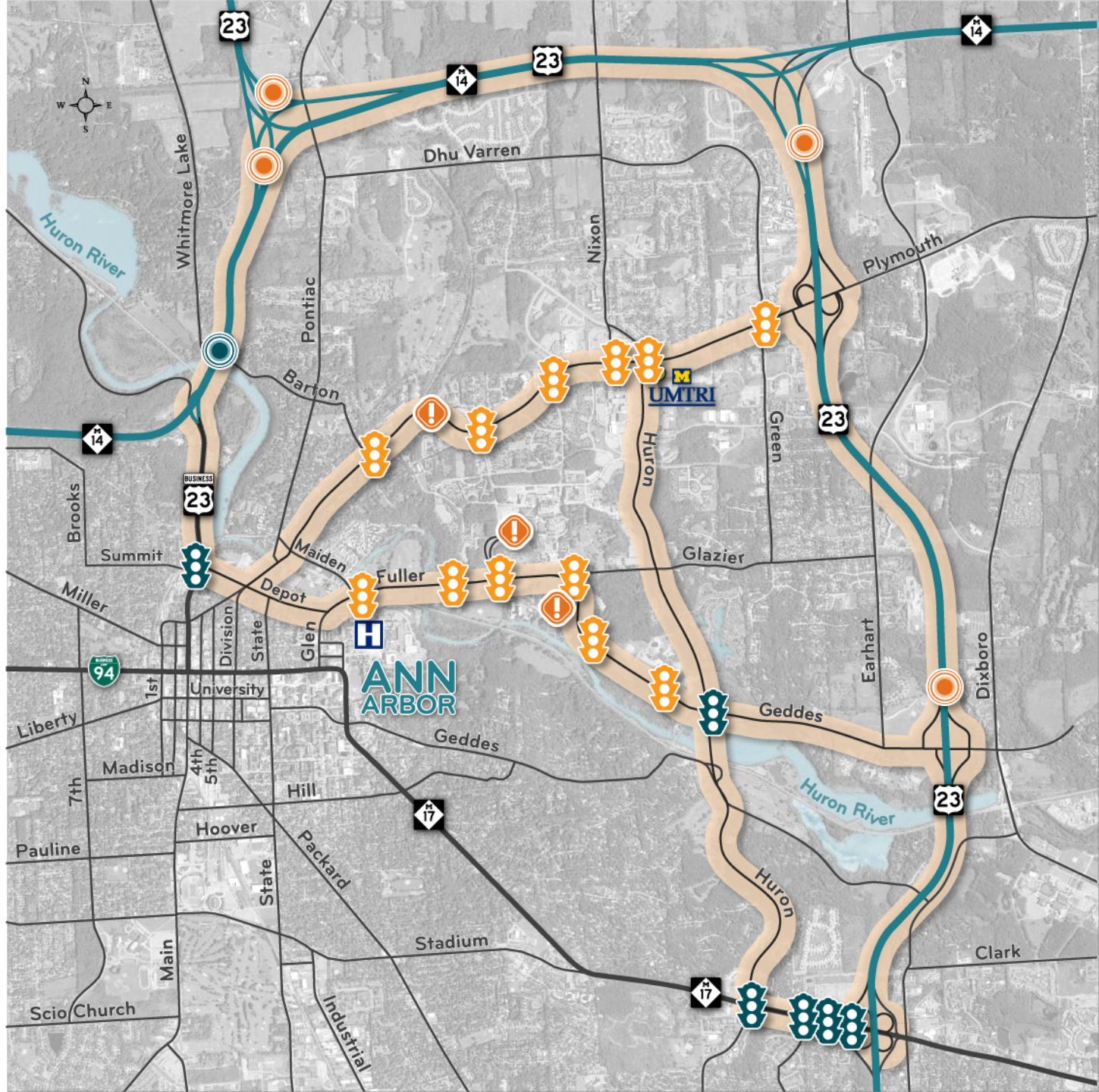
- A good mix of high-volume, multi-modal traffic
- Urban, suburban and rural roads
- A variety of roadway characteristics
- Weather variation to examine events, applications, and equipment durability
- Proximity to vehicle manufacturers and suppliers

Driver Recruitment in Ann Arbor

- Maximize vehicle exposure to the site/other vehicles
- Large potential recruitment population
 - 114,000 city population
 - 40,000 UM employees, VA Hospital, EPA, etc.
 - Community-based recruitment via public schools to increase exposure and probability of vehicle interaction
- Two trucking firms
 - Con-way Freight and Sysco Foods
- Two transit agencies
 - Ann Arbor Transit Authority and UM Transit
- Other organizations

Infrastructure Installations

- Strategy for site location
 - Capture all traffic operating in Northeast Ann Arbor, with focus on local commuters, and all other trips
- Roadside Equipment at:
 - 21 signalized intersections
 - 3 curves
 - 5 freeway sites
- 2 SPaT enabled corridors
 - 12 intersections, 6 per corridor



Model Deployment Launch



- Over 250 guests
- 40+ members of the media
- Examples of all of the technologies
- Each of the platforms
- UMTRI's partners and community representatives





Before We Take Questions...

Detroit ITS World Congress

7-11 September 2014



Cobo Center Michigan

September 7-11, 2014



Reinventing
Transportation in
Our Connected World

CO-HOSTED BY:

ITS AMERICA



2014 World Congress Update

- Date and Theme
- Vision for 2014
- Tentative Timeline
- The Organizing Committee
- Where to Stay – What to Do
- Event Venues
- ITS Infrastructure and Plans in Detroit

Reinventing Transportation in Our Connected World

- Guiding Principles
 - Immersive experience
 - Greater integration of program, exhibits and demonstrations
 - More emphasis on personal, vehicle and infrastructure connectivity
 - More emphasis on consumers and youth
 - Leverage the presence of the auto industry

The Story of Reinvention

Technology Showcase

People

- Drivers
- Riders
- Pedestrians
- Operators
- Containers

Vehicles

- Cars
- Commercial Vehicles
- Transit Vehicles

Program

Exhibits

Infrastructure

- TMCs
- Traditional ITS

Mobile Devices

- Affordable
- Mode-agnostic

Other Events

Tentative Timeline

Website
Opens –
April 2013

Exhibit Sales
Launch –
October
2013

Papers Due
– January
2014

IPC
Meetings –
January and
March 2014

Registration
Open –
Spring 2014

Headquarters Hotel

- Detroit Marriott at the Renaissance Center



Other Detroit Hotels



Baseball, Golf and More



Our Gems

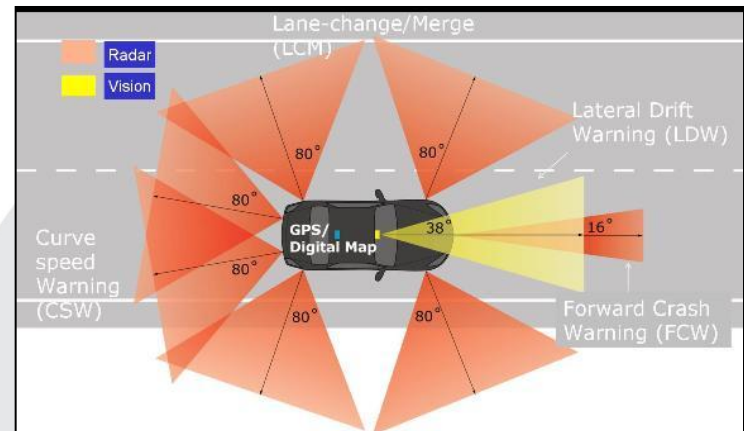


Our Heritage

Automotive Innovation



Worldwide Center for Automotive R&D



Our Venue – The New Cobo Center



VIP Dinner Venue



Gala Venue



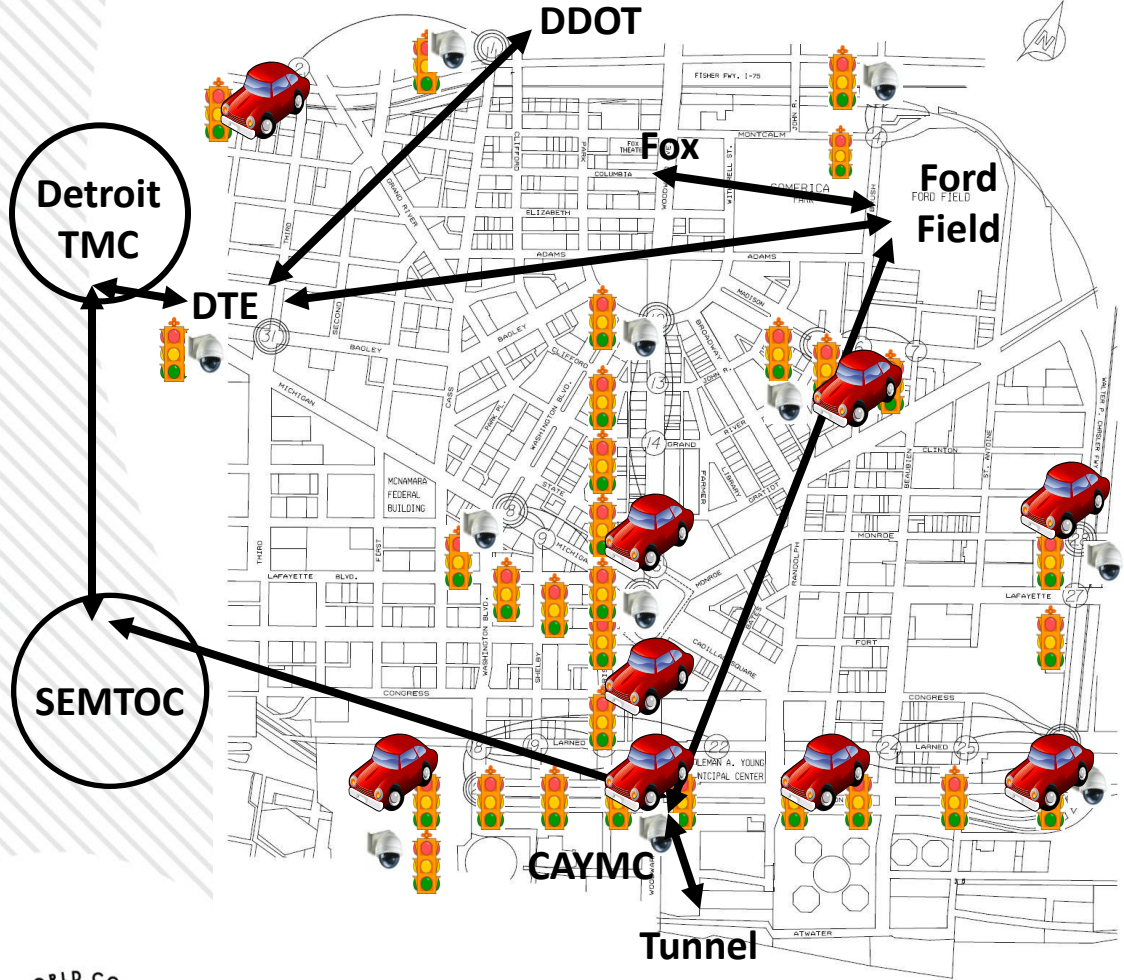
ITS in Greater Detroit

- More than 200 miles of freeway instrumentation
- Adaptive traffic control
- Smart border crossings with Canada
- Traffic Management Centers (TMCs)
 - Road Commission for Oakland County TOC
 - Macomb County Roads TMC
 - City of Detroit TMC
 - Southeast Michigan Transportation Operations Center (SEMTOC)

Southeast Michigan Transportation Operations Center



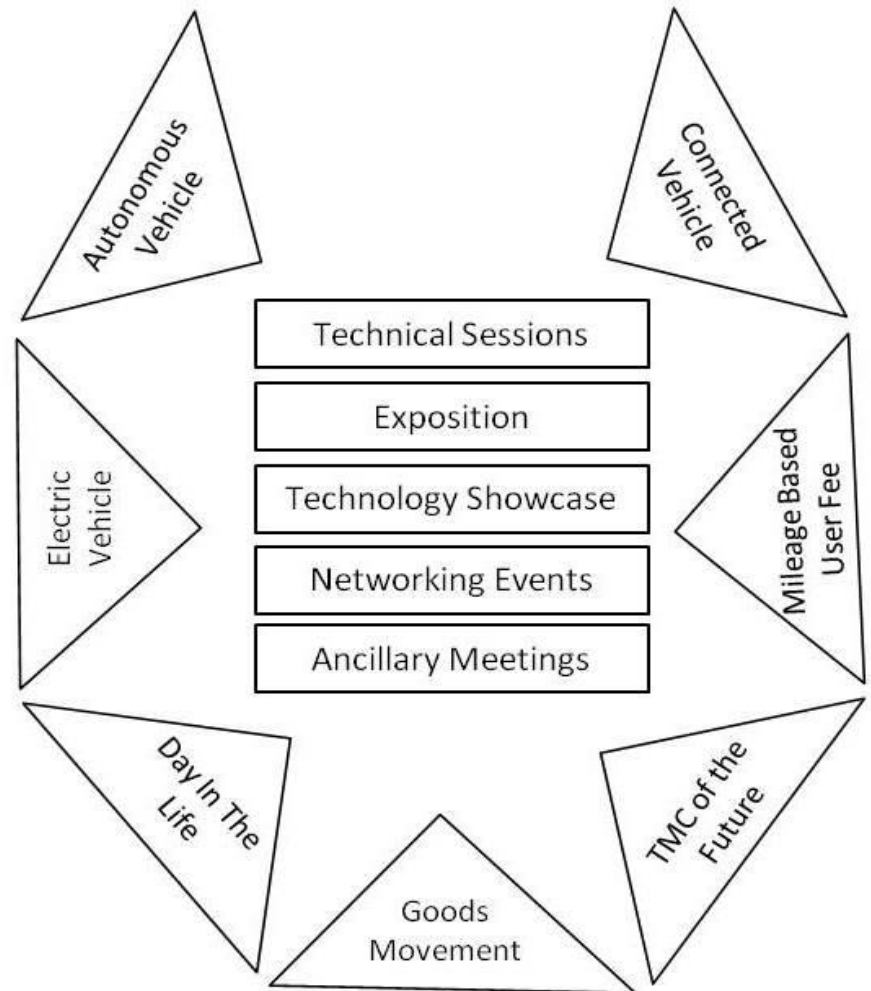
ITS in the Motor City



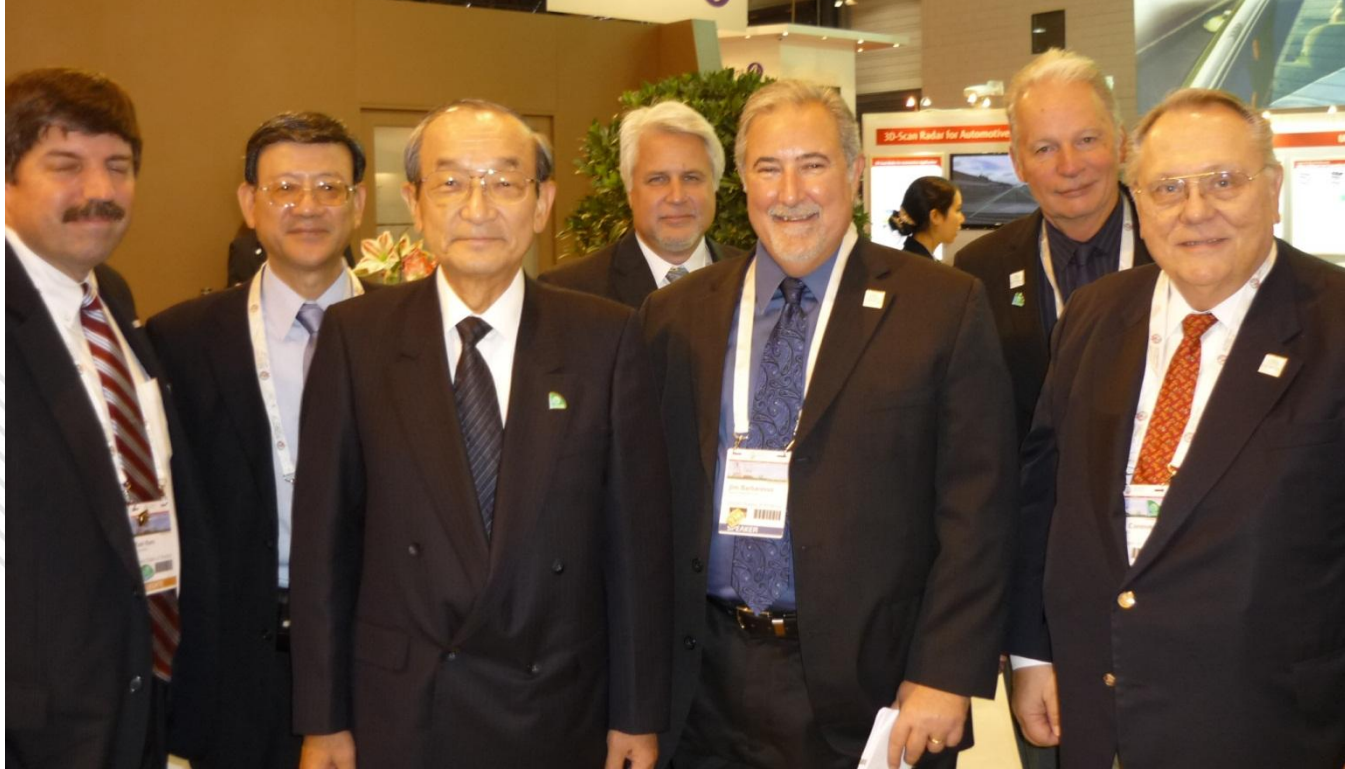
- 30 Downtown Intersections on Centralized Control
- 11 CCTV Cameras
- 9 System Detection Cameras
- Redundant Hybrid Communications Backbone
- Two TMCs
- New DSRC Deployment Underway

Technology Showcase

- Seven working themes
- Integrated with other elements of the World Congress
- Stakeholder workshop held on October 2nd
- Concepts being refined



Tokyo-Detroit World Congress Partnership





**Thank you from
Your Detroit World Congress
Hosts!**





SAFETYPILOT

or Detroit ITS World Congress

Questions?

gconover@iname.com