

# **Michigan Connected Vehicle Working Group Meeting Packet**

**October 9, 2012**

- 1. Agenda**
- 2. Meeting Notes**
- 3. Attendance List**
- 4. Presentations**

## **MICHIGAN CONNECTED VEHICLE WORKING GROUP**

Tuesday, October 9, 2012

Michigan International Speedway  
12626 U.S. Highway 12  
Brooklyn, MI 49230

### **MEETING AGENDA**

1:00 PM Welcome and Introductions

1:15 PM Update on the Connected Vehicle Safety Pilot Model Deployment, Debra Bezzina, UMTRI

1:35 PM Update on Preparations for the 2014 ITS World Congress (to be held at Cobo Center in Detroit), Jim Barbaresso, HNTB

1:50 PM Autonomous Vehicle Activity at the University of Michigan, Dearborn, Mohammad Poorsartep, UMD

2:05 PM Demonstration of MDOT DUAP Phase 2, Collin Castle, MDOT

2:20 Networking Break and Coordination of Outdoor Demos

2:30 to 4 PM Outdoor Demonstrations

- Connected Vehicle Safety Pilot V2V application provided by Debra Bezzina and team, UMTRI (Pit Row location)
- Cadillac Cue demonstration provided by Andrew Gellatly, GM (Infield location)

## MICHIGAN CONNECTED VEHICLE WORKING GROUP

The October 2012 meeting of the Michigan Connected Vehicle Working Group was held at the Michigan International Speedway in Brooklyn, Michigan.

### Meeting Notes

After a brief welcome and introductions, Debra Bezzina from the University of Michigan Transportation Research Institute (UMTRI) gave a presentation on the \$25 million, 2.5 year safety pilot being conducted by UMTRI for U.S. DOT. She discussed the timeline for the pilot, scope, recruitment strategy, vehicles and devices to be deployed, applications being tested, and the current vehicle deployment status. She also discussed the potential for interested parties to use the deployment and access the data that is being collected. In her presentation, Debra presented maps displaying the locations of connected vehicle infrastructure in the Ann Arbor area and a video displaying some of the data being collected from the vehicles that have already been deployed.

Following Debra, Jim Barbaresso from HNTB gave an update on the 2014 ITS World Congress, which will be held in Detroit from September 7-11, 2014. Jim discussed the guiding principles for the event and presented a tentative timeline for the milestones leading up to the event. He also discussed the work being done by the organizing committee. The event will focus on technology demonstrations, and it will emphasize vehicle technologies, making for an environment in which attendees cannot help but experience these technologies. Jim also discussed the October 2<sup>nd</sup> Technology Showcase Workshop and the upcoming World Congress in Vienna. He mentioned that a “save-the-date” flyer has been created for the 2014 ITS World Congress, and it will be distributed at the Vienna World Congress, at which the 2014 ITS World Congress will have a booth.

Following Jim, Mohammad Poorsartep from the Connected Vehicle Proving Center at the University of Michigan, Dearborn, made a presentation emphasizing how important policy is to enabling connected, electric, and autonomous vehicle solutions. Mohammad mentioned how policy makers must understand the capabilities and limitations of the technology. He described a Policy and Technology Roadmap project to facilitate ties between stakeholders and decision-makers. He also presented on the *Automated Robotics for Installation and Base Operations* (ARIBO) initiative and three sub-projects, including autonomous vehicles for soldier transportation to medical appointments at Ford Bragg, autonomous driving to reduce the need for busing soldiers to the cafeteria at Ford Leonard Wood, and the *Autonomous Mobility Appliqué System* (AMAS) to create a common approach for integrating autonomous technology into existing military vehicles.

The presentation portion of the meeting concluded with Colin Castle of the Michigan Department of Transportation (MDOT) presenting on the *Data Use and Analysis Project Phase 2* (DUAP2) project. He discussed the current project status of the project and the project’s work so far with the U.S. DOT deployment in Ann Arbor. Colin showed several videos demonstrating scenarios that have been recorded from the deployed vehicles and infrastructure. He also discussed future activities relating to DUAP2, including finalizing system requirements, expanding data collection, and developing a searchable public database to improve data accessibility.

The meeting closed with demonstrations from UMTRI and General Motors (GM). Debra Bezzina and her team demonstrated forward collision and electronic brake light warnings in connected vehicles from the USDOT Safety Pilot deployment. Andrew Gellatly from GM demonstrated the Cadillac Cue system, focusing on the human-machine interface (HMI)

## MICHIGAN CONNECTED VEHICLE WORKING GROUP

### ATTENDANCE LIST

<b>First</b>	<b>Last</b>	<b>Organization</b>	<b>Email</b>
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Collin	Castle	MDOT	<a href="mailto:castlec@michigan.gov">castlec@michigan.gov</a>
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**MICHIGAN CONNECTED VEHICLE WORKING GROUP  
PRESENTATIONS**

# Michigan Connected Vehicle Working Group

Michigan International Speedway

Brooklyn, MI

*October 9, 2012*

# Agenda for This Afternoon

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- 1:15 PM Update on the Connected Vehicle Safety Pilot Model Deployment, Debra Bezzina, UMTRI
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# Working Group Mission

- Cooperatively pursue projects and other activities that are best accomplished through partnerships between multiple agencies, companies, universities, and other organizations and that ultimately advance Michigan's leadership position in connected vehicle research, deployment, and operations.
  - Benefit our state and our industry (automotive and more)
  - Enhance safety and mobility in Michigan and beyond

# Recent Connected Vehicle Events in Michigan

- USDOT Connected Vehicle Safety Pilot Field Test Kick-off
  - August 21 at UMTRI
  - Featured Governor Rick Snyder, Transportation Secretary Ray LaHood, Congressman John Dingell, and UMTRI Director Peter Sweatman
- 2014 ITS World Congress Planning Stakeholders Meeting
  - October 2 at SEMTOC
  - Led by Michele Mueller (MDOT), Steve Kuciemba (PB), and Jim Barbaresso (HNTB)
- NEXT MEETING OF THIS WORKING GROUP
  - Planned for January 2013, location TBD

# Other Business for the Group

- Washtenaw Community College is putting a together a proposal to NSF to develop an ITS Center
  - Looking for support and collaborators
  - Michelle Mueller is point of contact at WCC
- TRB (NCHRP, etc.) has released some relevant RFPs recently, and some are planned from other agencies, too
- Cooperative Transportation Systems Pooled Fund Study
- New scope for the working group



# Connected Vehicle Model Deployment

Debby Bezzina

Senior Program Manager

*University of Michigan Transportation Research Institute*

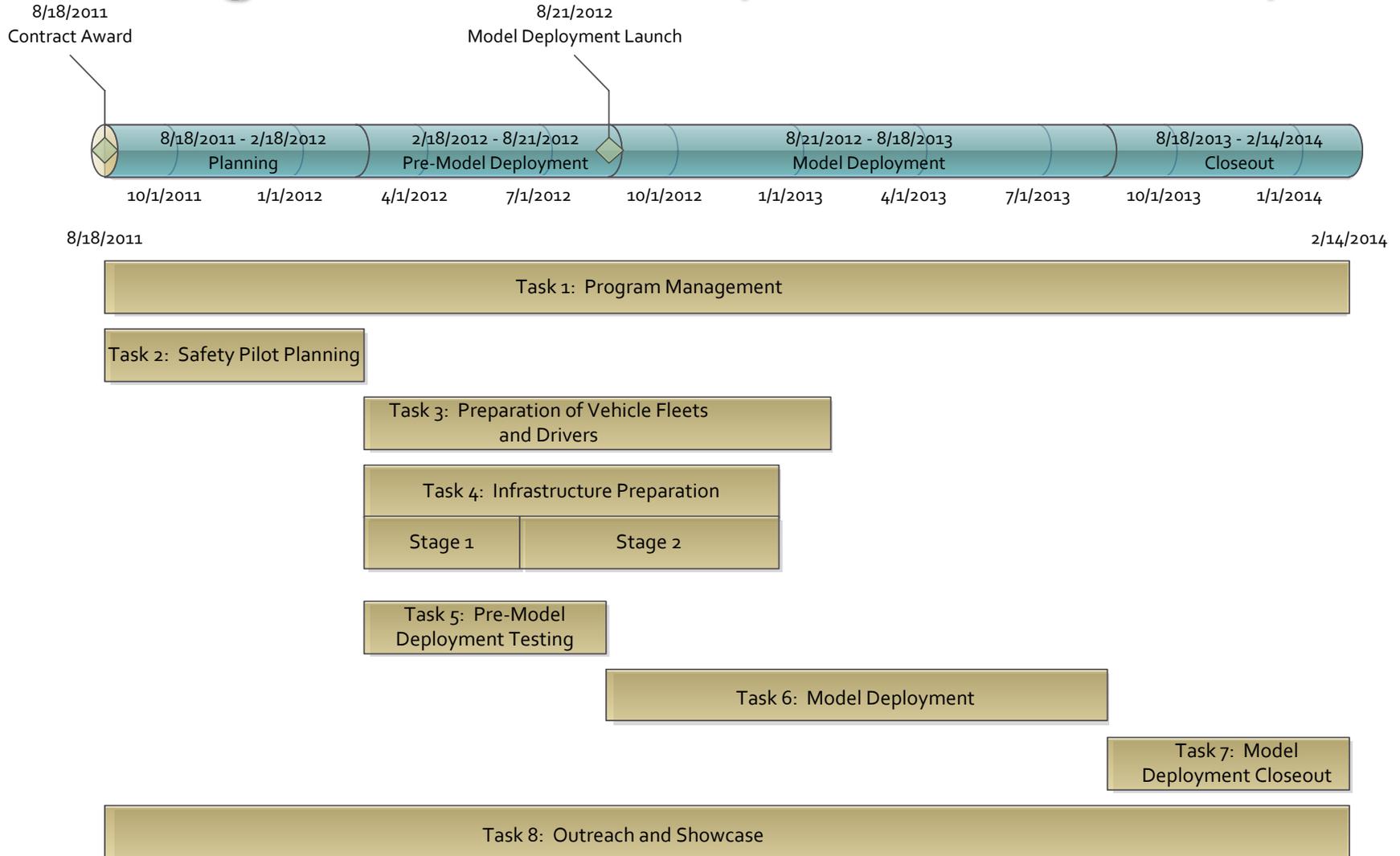
# Connected Vehicle Technology



# Safety Pilot Model Deployment

- Safety Pilot is:
  - Model for a national deployment of DSRC technology for both vehicle and infrastructure
  - Designed to determine the effectiveness of the safety applications at reducing crashes
  - Designed to determine the how real-world drivers will respond to the safety applications
- Safety Pilot will also tests mobility and sustainability applications
- \$25M, 2.5 year program
- 1-year deployment begins August 21, 2012

# Program Schedule (2012SEP26 ver7.1)



# Scope

- More than 2,836 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

# 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

# Recruitment Strategy

- Ann Arbor Public Schools
  - Targeted to specific schools
  - 3780 Students
    - Approximately 2835 households
    - Approximately 5000 vehicles
    - Excludes teachers and staff
- University of Michigan Medical Center
  - Targeted: based on zip codes that require travel through the model deployment area
  - Roughly 20,000 employees
- Approximately 3850 to date

# Devices Types

- **Vehicle Awareness Device (VAD)** – Only sends the basic safety message. Does not generate warnings.
  - Cohda
  - Savari
- **Aftermarket Safety Device (ASD)** – Sends and receives the safety messages. The device has a display, and issues audible or visual warnings to the driver
  - Cohda-Visteon
  - Cohad-Delphi
  - Denso

# Devices Types

- **Retrofit Safety Device (RSD)** – Like the ASD, but is connected to a vehicle data bus, can provide info from in-vehicle sensors
  - Battelle
  - SWRI
- **Integrated Safety System (ISD)** – Designed into vehicles by the vehicle manufacturer, and is connected to a vehicle data bus. Sends and receives the safety messages, and it issues warnings to the driver
  - CAMP
- **Roadside Equipment (RSE)** – Devices installed into the infrastructure that both send and receive safety messages, and can interface with traffic control systems
  - Arada
  - Savari

# 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

# Vehicle & Device Deployment Plan

	<b>Integrated Vehicles</b>	<b>Retrofit/ Aftermarket Devices</b>	<b>Vehicle Awareness Devices</b>	<b>Total</b>
Passenger Cars	64	300	2200	<b>2564</b>
Heavy Trucks	3	16	50	<b>69</b>
Transit		3	100	<b>103</b>
Medium Duty			100	<b>100</b>
	67	319	2450	<b>2836</b>

# Vehicle & Device Deployment Status

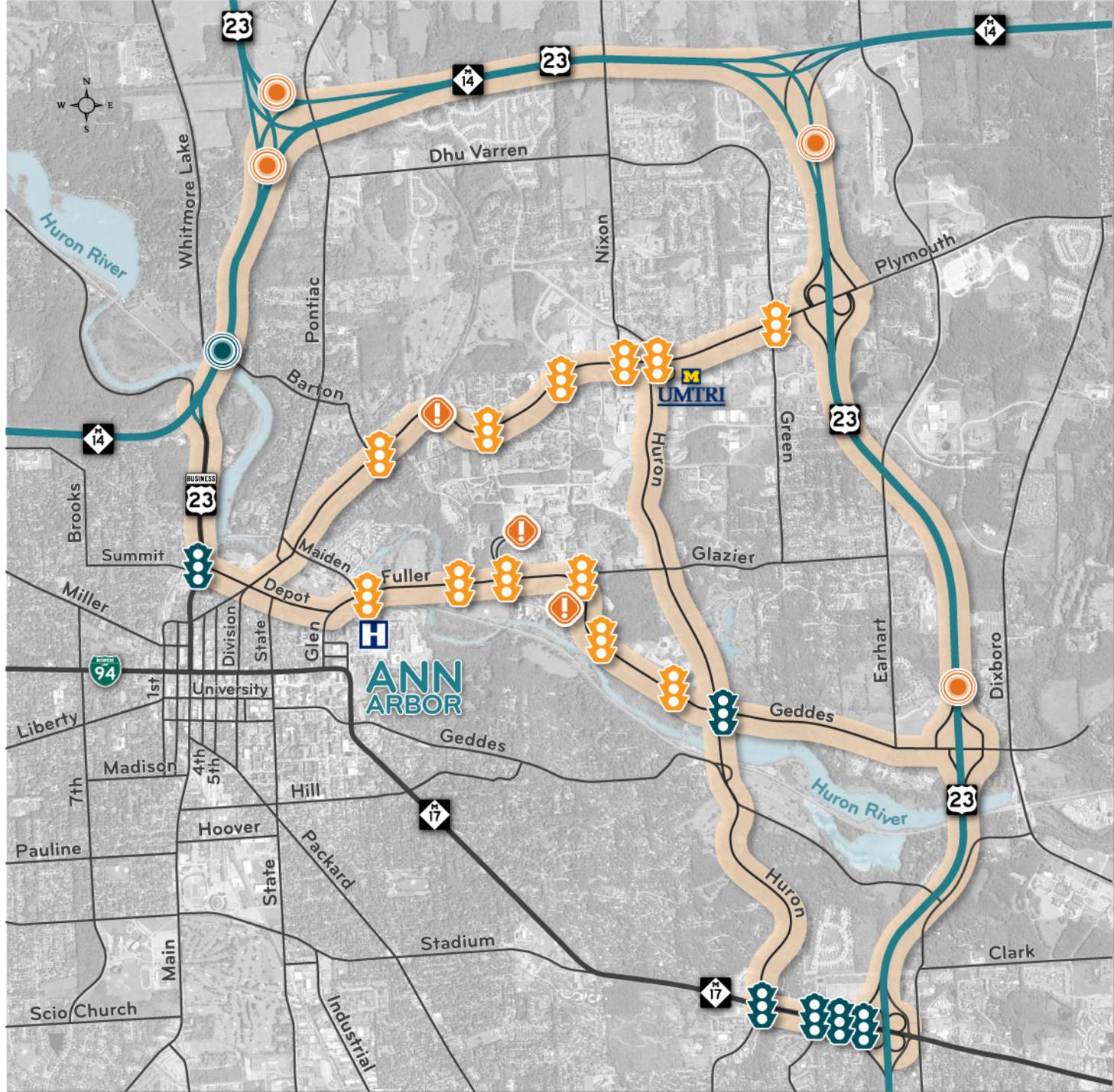
	<b>Integrated Vehicles</b>	<b>Retrofit/ Aftermarket Devices</b>	<b>Vehicle Awareness Devices</b>	<b>Total</b>
Passenger Cars	64	7	1245	<b>1316</b>
Heavy Trucks	0	0	10	<b>10</b>
Transit		3	3	<b>6</b>
Medium Duty			0	<b>0</b>
	64	10	1258	<b>1332</b>

# 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

# Infrastructure Installation Status

- 10 RSE units installed to date
- Stage 1 sites:
  - Plymouth and Green (Savari)
  - Fuller/Geddes and Huron Parkway (Savari)
  - Fuller and Glen Ave (Savari)
  - Washtenaw and Huron Parkway (Savari)
  - Main and Depot (Arada)
  - UMTRI (Arada)
- Stage 2 sites:
  - Plymouth Road & 700ft West of Pointe Lane (Arada)
  - Fuller Road & 500ft East of Glazier Way (Savari)
  - Plymouth Road & Barton Drive (Arada)
  - Fuller Road & Fuller Court(Savari)



# Program Outreach



# Program Outreach



# Stakeholder Utilization of the Site and Data Access

- Provide access to, and support for, use of the operating environment by other stakeholders
- Showcase facility to support stakeholder use of the site
  - Driver training facilities, demonstration areas, and a vehicle-based demonstration staging area
- Support wide-spread dissemination of the data for use by a variety of researchers
  - Some vehicle level, all of the infrastructure data

# Next Steps

- Complete VAD and ASD installations and deployment
- Deploy Integrated Heavy Vehicles
- Start the Retrofit installations and deploy the tractors
- Data collection and transfer



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**734-763-2498**

# 2014 World Congress Update

Connected Vehicle Working Group

October 9, 2012





# Reinventing Transportation in our Connected World



# 2014 ITS World Congress Update

- September 7 through 11, 2014
  - Good news:
    - No conflicts with other meetings
    - More predictable weather
    - More local events and sports
  - The Challenge: less time to plan

# 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

# The Organizing Committee

- Major Roles:
  - International Program Committee – Peter Sweatman, UMTRI
  - Technology Showcase Committee – Michele Mueller, MDOT
  - Exhibitor Advisory Committee – Carl Zabel, Eberle Design
  - Local Arrangements – Dan Carrier, Carrier & Gable
  - Government Relations – Link Hoewing, Verizon
  - International Affairs – Susan Spencer, Transport Canada
  - Marketing & Communications – Lisa Thompson, HNTB
  - Strategic Partnerships – John Peracchio, Peracchio & Co., LLC and Chris Thomas, Fontinalis
  - State Chapters Committee – Mel Evans, SMART
  - Finance Committee – Gerry Conover, PRC Associates
  - Operations Committee – Bill Russell, Eberle Design
  - Honorary Committee – Governor Snyder and Kirk Steudle, State of Michigan

# 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

***Promotion for Detroit begins this month!***

# Recent & Upcoming Activities

- **Technology Showcase Workshop**
- Vienna World Congress
- “Save the Date” flyer
- New Detroit video

# Technology Showcase Workshop

- October 2, 2012 at the SEMTOC
  - More than 60 attendees
  - Feedback on preliminary concepts will be captured in a concept document
- Electric Vehicles
  - Connected Vehicles
  - Autonomous Vehicles
  - Day In The Life
  - Goods Movement
  - TMC of the Future
  - Mileage Based User Fee

# Recent & Upcoming Activities

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# Smarter on the way



## 19th ITS World Congress 22 to 26 October 2012, Vienna | Austria

Messe Wien Exhibition and Congress Center  
<http://2012.itsworldcongress.com>



Organised by



Hosted by





**The 2014 World Congress will be highlighted in the America's Pavilion**

# Recent & Upcoming Activities

- Technology Showcase Workshop
- Vienna World Congress
- **“Save the Date” flyer**
- New Detroit video

Cobo Center Michigan

September 7-11, 2014

21ST WORLD CONGRESS  
DETROIT  
2014  
INTELLIGENT TRANSPORT SYSTEMS

Reinventing  
Transportation in  
Our Connected World

CO-HOSTED BY:

ITS AMERICA

ERTICO  
THE EUROPEAN

ITS



**A “Save the Date” flyer has been created for Vienna**

# Recent & Upcoming Activities

- Technology Showcase Workshop
- Vienna World Congress
- “Save the Date” flyer
- **New Detroit video**



# DETROIT

2014

INTELLIGENT TRANSPORT SYSTEMS

**Thank you!**





**M** UNIVERSITY OF MICHIGAN-DEARBORN

# Connected Vehicle Proving Center Projects and Updates

October 9, 2012  
Connected Vehicle Working Group  
MI International Speedway

Mohammad Poorsartep  
Project Manager  
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# Advancing Livable Communities through Sustainable Personal Mobility: An Integrated Assessment

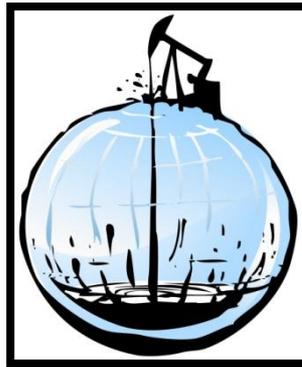


## Problem

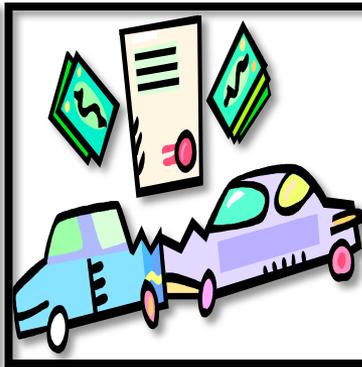
Road Transportation suffers from:



**Emissions**



**Oil Dependency**



**Accidents and  
Fatalities**



**Traffic Congestion**



**Underutilized  
Public Transit**



# Solutions

Emerging, disruptive technologies can help to mitigate or eliminate the problems.



**Connected Vehicles**



**Electric Vehicles**



**Self-Driving  
Vehicles**

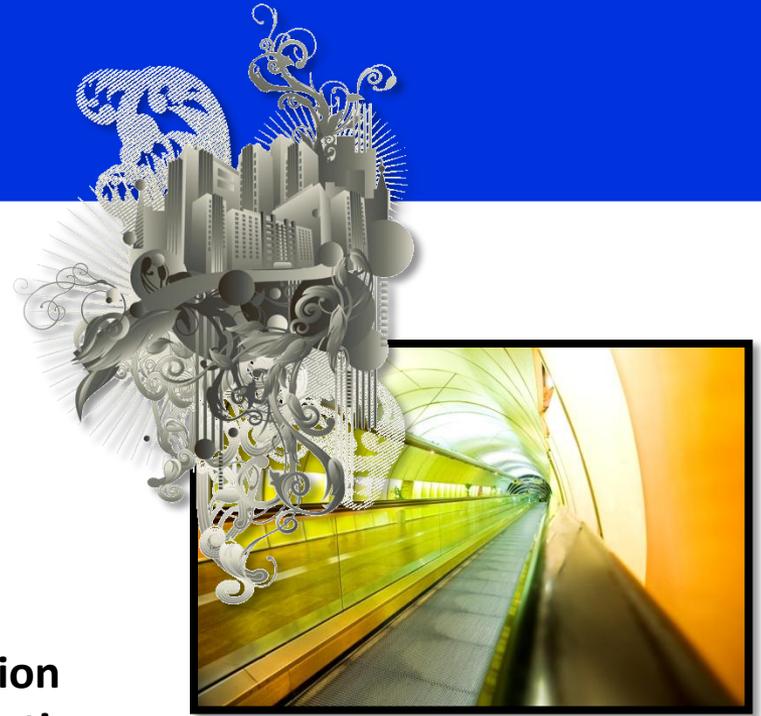
# Challenge

**How** can we get to the future where

cars are: **Self-Driving**  
**Connected**  
**Electric**

and our road transportation is free of:

**Pollution**  
**Congestion**  
**Accidents**  
**Oil Consumption**  
**Public Transport Inefficiency**



**CVPC**

# Response

We need a **Policy** and **Technology** roadmap to get us there



# Approach

1- With participation of **policy makers** and **technical experts**, describe a desirable, sustainable, and livable future communities that can be achieved through technology applications for personal mobility.



2- Initiate a **back-casting** process to learn the technology developments, industrial strategies, and public policies that are required to reach the desired future.



# Why

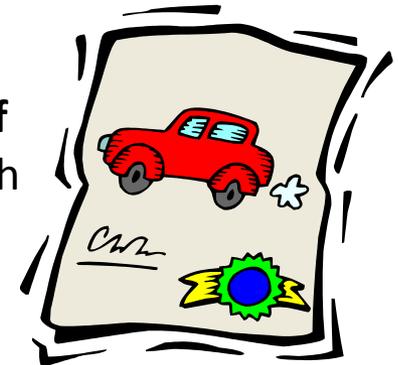
The forecast and back-casting processes helps to **bridge the gap** between public and private policy makers and the viewpoints of scientists, engineers, and other technical specialists.



Engaging these two communities will reveal **different needs** and **requirements** that would have been unknown otherwise

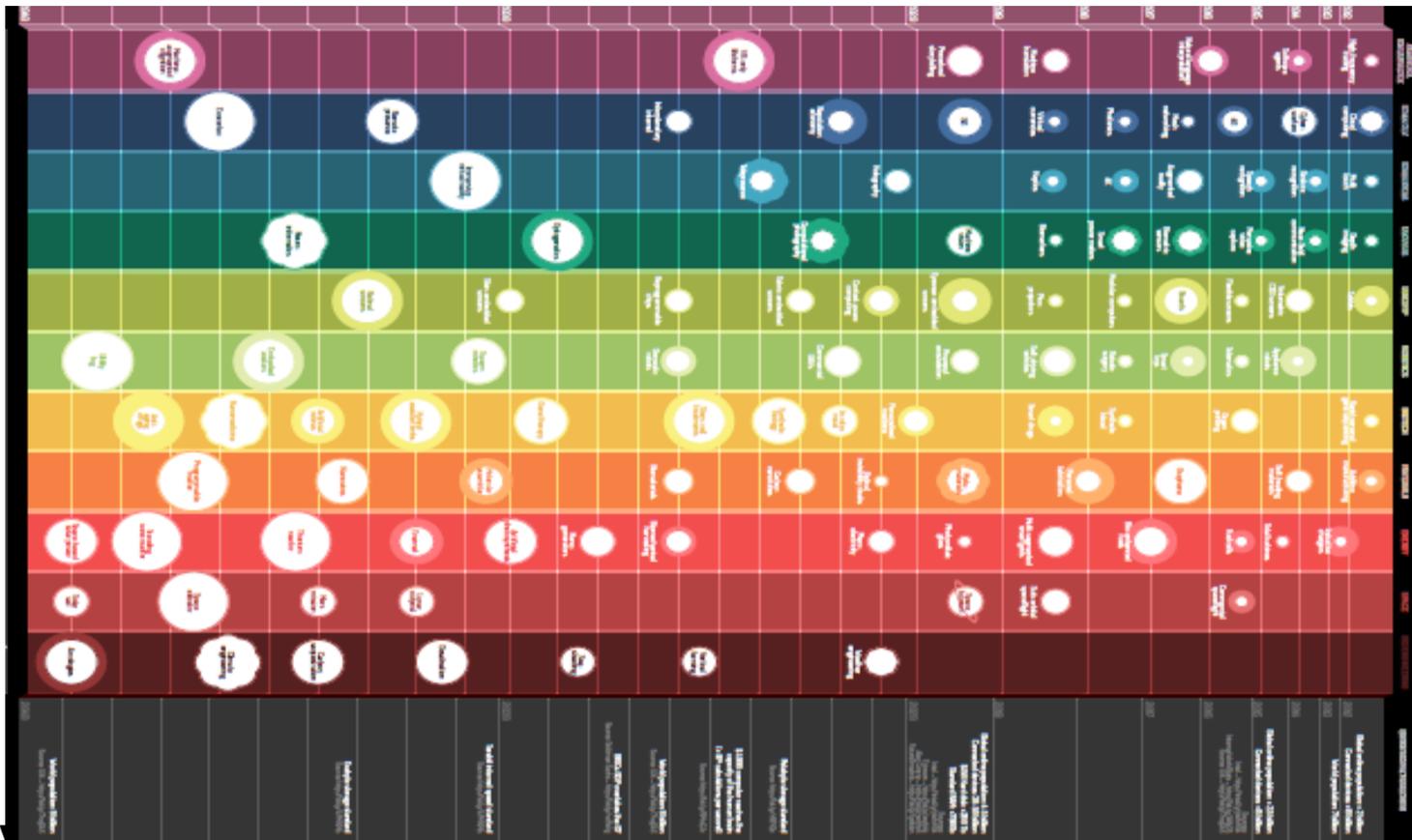
Policy makers will better understand the **technology capabilities** and **limitations** . Hence, they are more prepared to respond with effective policies

Scientists and engineers will better understand the **limitations of policy and regulation**. Hence, they are more able to respond with effective technical solutions.



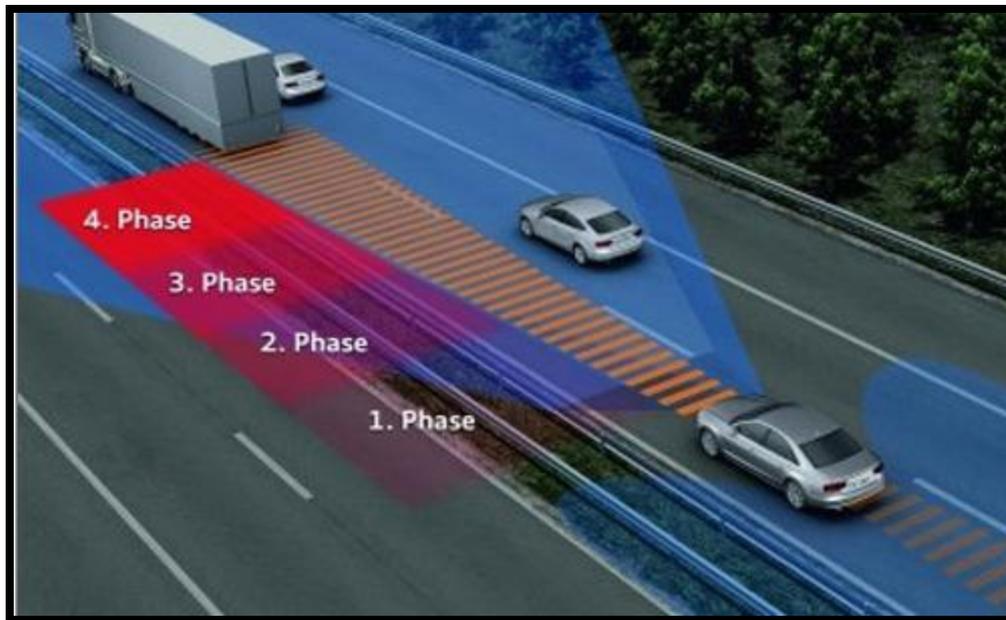
# Final Product

The final product of this project will be an **interactive graphical Policy & Technology Roadmap** put into the hands of stakeholders and decision makers.



# Strategic Research Roadmap for Advanced Driver Assistance Systems Technologies

To study **current** and **future** advanced driver assist systems (ADAS) applications in order to identify critical and **enabling research areas** pertinent to ADAS technologies.



Audi USA

# ARIBO

## Bridge from R&D to Transition = Living Lab

- Development
- Collaboration
- Tech Demo
- Pilot
- Test / Evaluation
- Safety Certification
- Socialization
- User Adoption
- Policy
- Transition
- Sustainability





# The Autonomous Mobility Appliqué System (AMAS)

- It is a proposed Program of Record for the US Army TARDEC to integrate robotic technology onto existing military vehicles in a **common, portable** and **scalable** approach for a variety of Military Operations.
- The CVPC at the University of Michigan-Dearborn is working with TARDEC to develop an **interoperability standard** to support the AMAS architecture.



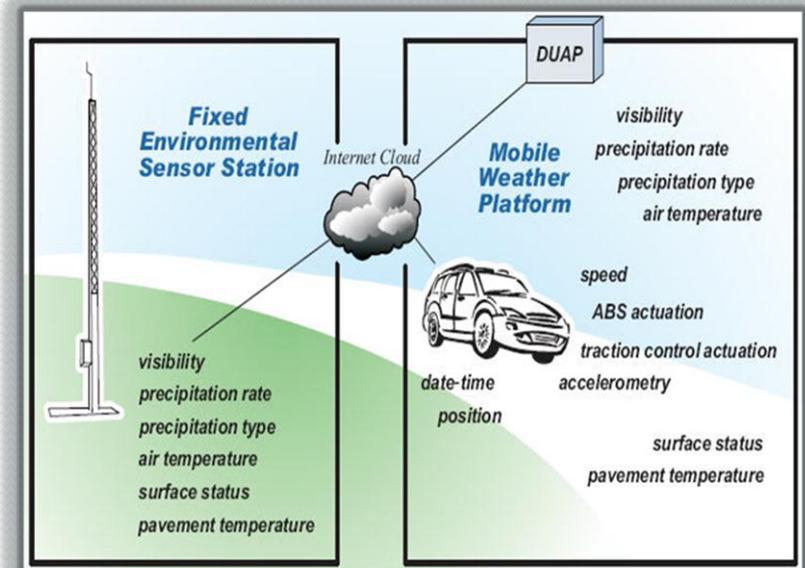
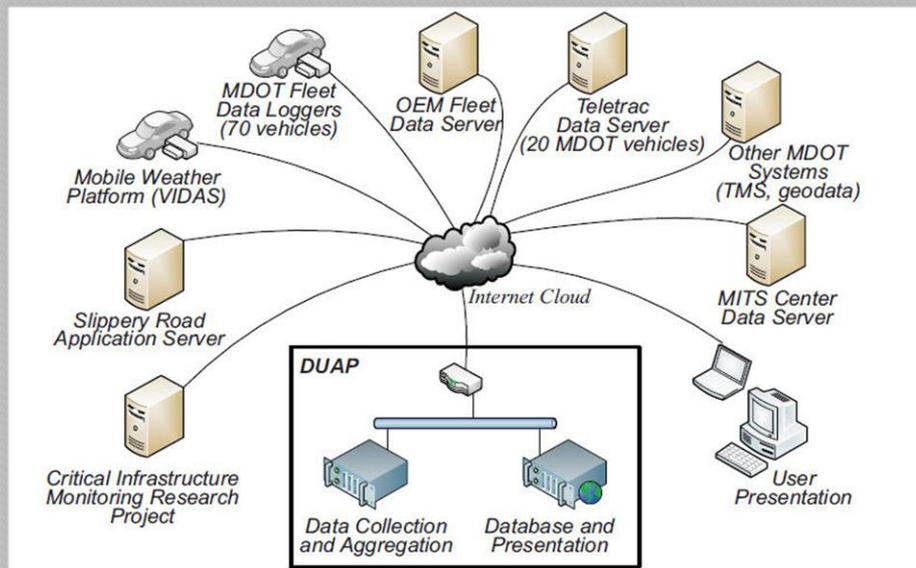


# Michigan DOT DUAP2 Project Update

Michigan Connected Vehicle  
Working Group Meeting  
October 9, 2012

# Connected Vehicle Projects

- DUAP (Data Use Analysis and Processing) - Phase 2
- VIDAS (Vehicle-based Information Data Acquisition System)



# DUAP2 – Current Project Status

- Concept of Operations Development
  - Collect subject matter experts data user needs
  - Define justification for change in current data use
- Application White Paper Development
  - Describes applications utilizing Connected Vehicle data
  - Potential applications include;
    - Road Weather Management
    - Asset Management
    - Real-time Traffic Operations
    - Traffic Signal Operations, etc.
- System Requirements Development
  - Hardware and Software requirements
  - Using Safety Pilot data as initial test of requirements

# DUAP2 - Safety Pilot Data Display

- Displays Safety Pilot data utilizing Basic Safety Message (BSM)
- Vehicle data is collected from a pool of opt-in pilot participants
- Data collected every 0.1 seconds, displayed every 1 second on map
- Approximately 1300 vehicles currently collecting data
- Approximately 700 vehicles used during display development
- Videos of Safety Pilot data display:
  - Video 1 – Roadside Equipment
  - Video 2 – Vehicle Stop and Go at Intersection
  - Video 3 – Vehicle Data w/ Trajectory
  - Video 4 - Vehicles Interaction
  - Video 5 - Vehicle Data w/ Trajectory
  - Video 6 – Vehicle Queue

# DUAP2 Future Activities

- Finalize con-ops, application white papers, and system requirements
- Develop searchable database that is accessible by all
- Select applications to maximize return
- Identify sources of future data collection
- Continue collecting Safety Pilot data
- Accept data from VIDAS acquisition platform on MDOT owned fleet
- Continue socialization of DUAP system within MDOT

# Questions

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