



MDOT IntelliDriveSM Working Group Kick-off Meeting

June 28, 2010, 10 AM to noon

Meeting Hosts

Visteon Corporation
One Village Center Drive
Van Buren Township, Michigan 48111

Agenda

- Welcome and Introductions
- Goals and Objectives of Michigan IntelliDriveSM Working Groups
- Update on Michigan DOT IntelliDriveSM Program
- Existing Michigan IntelliDriveSM Capabilities & Resources
- Upcoming USDOT Initiatives
- Next Steps
- Q&A and Discussion
- Visteon Facility Tour

| Name | Company | |
|-----------------------------|---|------|
| <u>Kurt Oduti</u> | <u>MDOT-ITS Program Office</u> | . |
| <u>Stephanie Fredline</u> | <u>MDOT - ITS</u> | (1) |
| <u>Kim Zimmer</u> | <u>MDOT - Bay City TSC</u> | (1) |
| <u>Brian Daugherty</u> | <u>Visteon - Adv. Dev.</u> | (1) |
| <u>Debby Bezzina</u> | <u>Visteon - Adv Dev</u> | . |
| <u>Marc Start</u> | <u>URS Corporation</u> | . |
| <u>JEFFREY DALE</u> | <u>UMTRI-HOLM OF MICHIGAN</u> | . |
| <u>SCOTT SHOGAN</u> | <u>PARSONS BRINCKERHOFF</u> | ! |
| <u>Bill TANSIL</u> | <u>MICH DOT / Asset Mgmt</u> | ! |
| <u>Arthur Endsley</u> | <u>Michigan Tech Research Institut</u> | |
| <u>Suzanne Hueth</u> | <u>Kapsch Trafficom</u> | 2 |
| <u>STEVE KUCIEMBA</u> | <u>PARSONS BRINCKERHOFF</u> | 410 |
| <u>Giovette Yung</u> | <u>MDOT - Taylor TSC</u> | 3 |
| <u>Steve Stachowski</u> | <u>Visteon - Adv. Dev.</u> | (73) |
| <u>RALPH ROBINSON</u> | <u>UMTRI</u> | 6 |
| <u>Scott J. McCormick</u> | <u>Connected Vehicle Trade Assn</u> | 7 |
| <u>DAWN BIERLEIN</u> | <u>ROAD COMMISSION FOR OAKLAND COUNTY</u> | 8 |
| <u>Frank Perry</u> | <u>Booz Allen Hamilton</u> | . |
| <u>Michael Fobie</u> | <u>Booz Allen Hamilton</u> | . |
| <u>Lina Chapman</u> | <u>MDOT - Policy</u> | . |
| <u>NILES ANNELIN</u> | <u>MDOT - POLICY</u> | 2 |
| <u>Joshua Salazar</u> | <u>Florida DOT - Planning</u> | 4 |
| <u>Francis Szczublewski</u> | <u>Delphi</u> | E |

| Name | Company | F |
|--------------------------|------------------------------------|----|
| <u>GI. RAMANUJAN, PE</u> | <u>SOMAT ENGINEERING</u> | - |
| <u>MARK CRAWFORD</u> | <u>SOMAT ENGINEERING</u> | - |
| <u>Steve Crain</u> | <u>Motor City Electric Tech.</u> | - |
| <u>Steve Verkest</u> | <u>Motor City Electric Tech.</u> | - |
| <u>DICK BEAUBIEN</u> | <u>HUBBELL, ROTH & CLARK</u> | - |
| <u>PAUL MORRIS</u> | <u>VISTEON</u> | - |
| <u>Hongwei Zhang</u> | <u>Wayne State Univ.</u> | - |
| <u>DAN DIANNE</u> | <u>TRANSORE</u> | - |
| <u>DAN DU BOIS</u> | <u>MICHIGAN INT'L SPEEDWAY</u> | - |
| <u>KEVIN KELLY</u> | <u>MICHIGAN INT'L SPEEDWAY</u> | - |
| <u>TOM SMART</u> | <u>AUTOMOTIVE INSIGHT</u> | - |
| <u>Monroe Pendleton</u> | <u>STATE OF MICHIGAN - DTMB</u> | 2 |
| <u>Koji Mori</u> | <u>Denso International America</u> | 1 |
| <u>TOOP</u> | <u>UNIVERSITY OF MICHIGAN</u> | 1 |
| <u>ANUSKIEWICZ</u> | <u>TRANSPORTATION RESEARCH</u> | 1 |
| <u>Gary Piotrowicz</u> | <u>Road Comm. for Oakland City</u> | 21 |
| <u>Danielle Deneau</u> | <u>Road Comm. for Oakland City</u> | 21 |
| <u>MORRIE HOEVEL</u> | <u>Federal Highway Adm - MI</u> | 51 |
| <u>MIKE THOMAS</u> | <u>AUTOMOTIVE INSIGHT</u> | 31 |
| <u>Matt Kluwon</u> | <u>URS</u> | 24 |
| <u>Roger Safford</u> | <u>MDOT</u> | 6 |
| <u>CHRIS DOMIN</u> | <u>RICARDO</u> | 7 |
| <u>Tom Anderson</u> | <u>Automation Alley</u> | 24 |
| <u>Jim Barbaresso</u> | <u>HNTB</u> | 24 |

MDOT IntelliDriveSM Working Group Meeting

June 28, 2010

Visteon World Headquarters

Visteon graciously hosted the first MDOT IntelliDriveSM Working Group meeting of 2010. The meeting was well-attended, with more than 55 people present.

Kurt Coduti of MDOT welcomed the attendees, chaired the meeting, and introduced himself as the acting IntelliDriveSM coordinator for MDOT while Greg Krueger is on a one year fellowship with the USDOT. Kurt explained that one of the primary goals of the working group is for the state to be prepared for any USDOT procurements that are released. He also updated attendees to the next Working Group meeting, which is scheduled for September 27, 2010, at the Michigan International Speedway. Interested groups are requested to write a two-page description of their IntelliDriveSM activities, and several will be selected to speak at the next meeting about their work. He announced July 31 as the due date for these two-page papers.

Following Kurt's introduction, Debby Bezzina of Visteon provided an overview of Visteon's activities in the connected vehicle field. Visteon's road departure and crash warning system was the first IntelliDriveSM-related project mentioned, but she also described Visteon's involvement with the Integrated Vehicle-Based Safety System (IVBSS) project, which is now in the data analysis phase of that project. Her Visteon colleague (Mike Eichbrecht) gave a demonstration of their Connected Car project, which offers several infotainment applications with a touch-screen interface. It also supports diagnostics, mobility applications, and more.

Next, Steve Cook of MDOT discussed MDOT's broad IntelliDriveSM program. He mentioned that driver distraction and privacy concerns are two of the biggest issues that those in the industry need to be aware of as this program moves forward. He also discussed some non-safety applications of interest to MDOT, such as asset management and mobility, and emphasized that these should not be overlooked. Finally, he mentioned that MDOT, along with the Center for Automotive Research, is in the process of updating MDOT's IntelliDrive Strategic and Business Plan.

Richard Wallace of CAR followed and presented the depth of IntelliDriveSM capabilities and resources in Michigan beyond those of MDOT. These included Michigan-based vehicle manufacturers and suppliers as well as the many test facilities, industry consortia, programs, and research efforts both underway and already completed in the State. He also provided a short review of CAR's Tipping Points study, focusing on key obstacles (e.g., clear funding source) and enablers for deployment. Finally, he emphasized the potential payoff for Michigan (jobs, tax revenues) if Michigan leads the nation in IntelliDrive.

Finally, Scott Shogan of Parsons Brinkerhoff presented forthcoming USDOT IntelliDriveSM initiatives. The program has been in flux given the recent change in administration, but now has a more defined path forward. They expect a rulemaking on V2V policy by 2013, and have several tracks for both V2V and V2I safety plans. Before the rulemaking, they want to have a safety pilot to inform the 2013 decision, by demonstrating a V2V real world implementation for multiple vehicle types. Specifically, they wish to assess public acceptance of these devices in their cars. Also, the decision for the DTE management should be coming soon.

The meeting ended with an optional (and informative) tour of Visteon's facilities.

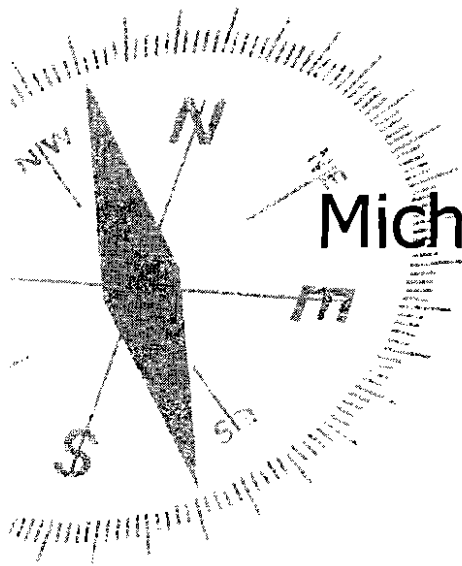


Working Group Kick-off Meeting

June 28, 2010

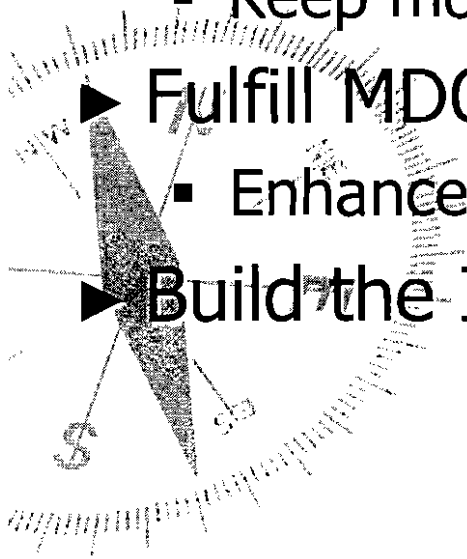
Kurt Coduti, P.E.

Michigan Department of Transportation
Statewide ITS Program Office

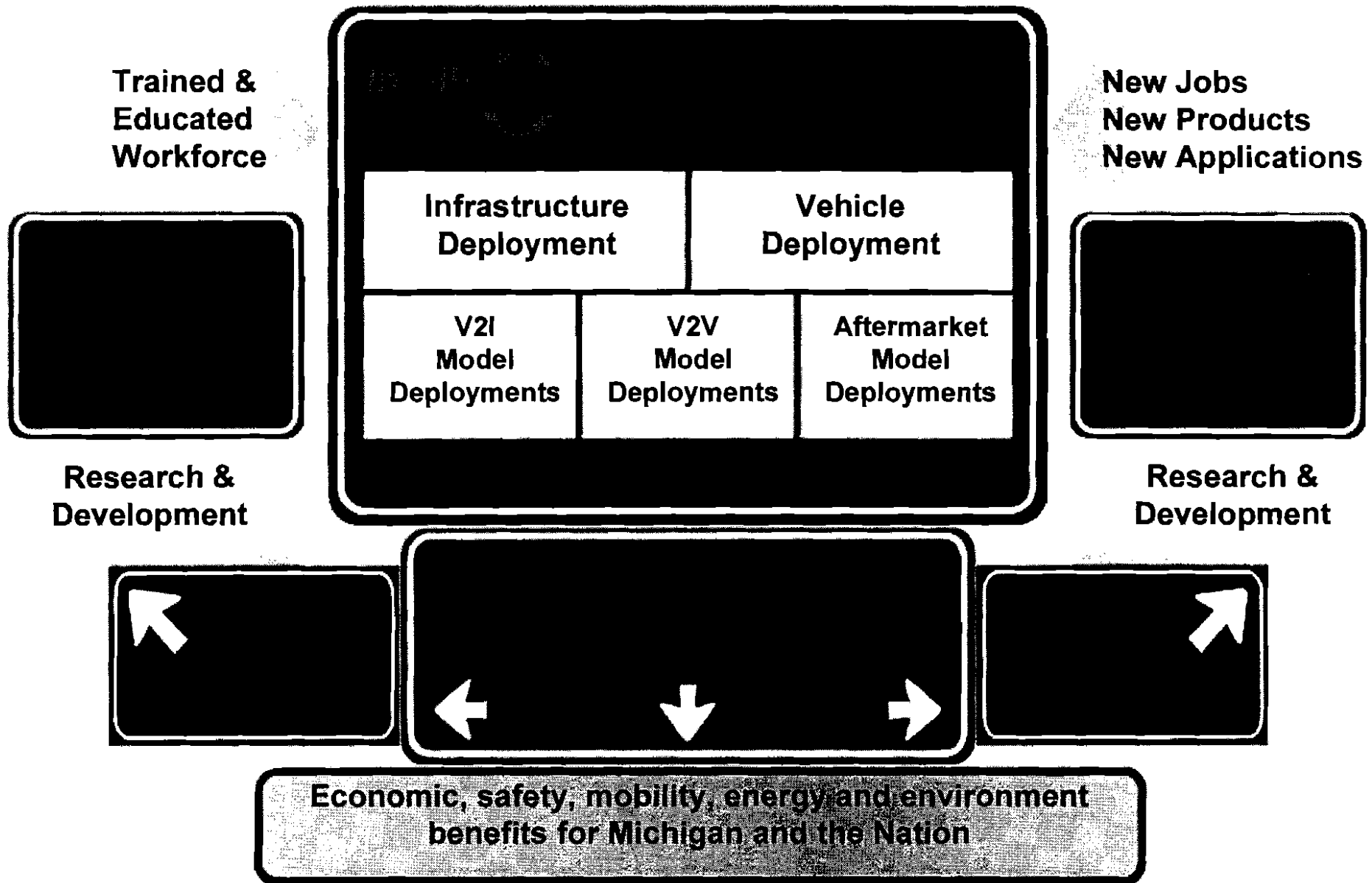


Primary Objectives & Goals

- ▶ Re-establish collaborative forum to help Michigan secure federal procurements and expedite deployment
 - Maintain alignment with future vision of US DOT
 - Keep moving forward together & on the same page
- ▶ Fulfill MDOT IntelliDriveSM Strategic Plan
 - Enhance public outreach and awareness
- ▶ Build the Incubator for IntelliDriveSM

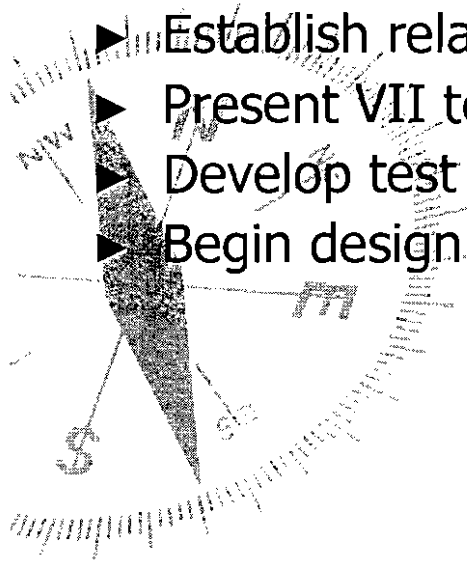


Michigan's IntelliDriveSM Incubator



A look back on next steps.....

- ▶ Complete and finalize ITS Strategic Plan
- ▶ Secure a consistent ITS funding source
- ▶ Create an ITS Programs Office
- ▶ Hire MDOT ITS Champion
- ▶ Communicate ITS initiatives to all ITS stakeholders
- ▶ Provide resources to accomplish established goals
- ▶ Establish relationships with external stakeholders
- ▶ Present VII test bed specifics to stakeholders
- ▶ Develop test bed agreements
- ▶ Begin design and construction of test bed communications infrastructure



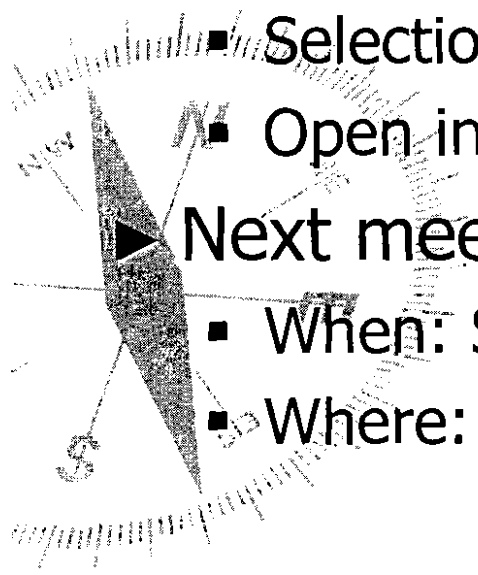
Moving Forward

▶ IntelliDriveSM Showcase Papers & Presentations

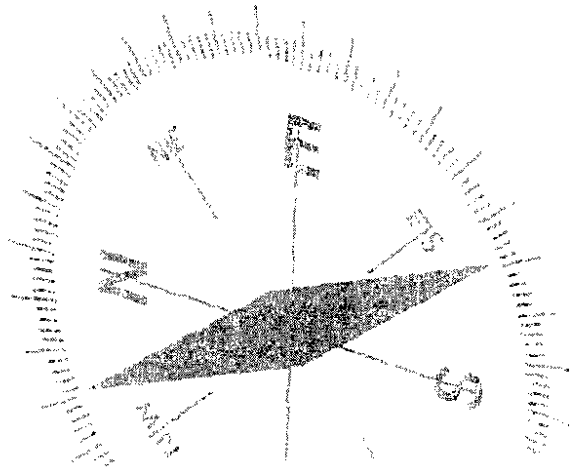
- 2 pages max. on IntelliDriveSM credentials, interests, and/or ideas
- If selected, opportunity to present at next meeting
- Due date for paper is July 30, 2010
- Selections made by August 27th.
- Open invitation via MDOT IntelliDriveSM listserv & ITS-MI

▶ Next meeting:

- When: September 27th, 2010 from 1 to 5 p.m.
- Where: Michigan International Speedway



Q&A and Discussion



Visteon Facility Tour →

MDOT IntelliDriveSM Initiatives

Michigan IntelliDriveSM 2010 Working Group Kick-off Meeting
Michigan Department of Transportation

Steve Cook, P.E.



MDOT's Strategic Plan for IntelliDrive(SM)

MDOT's IntelliDrive(SM) Mission

Partner with public agencies, the automotive and telecommunication industries, and other industries to lead the nation in IntelliDrive(SM) research and sustained IntelliDrive(SM) deployment, by providing the public foundation for Michigan's new automotive information technology industry and ensuring improvements in transportation systems safety and operational performance.

MDOT's IntelliDrive(SM) Vision

- The Michigan partnership is a recognized leader of and key reason for the success of IntelliDrive(SM).
- Michigan is partnering with other states to assure coordinated research, development and deployment across the United States
- IntelliDrive(SM) is an emerging industry with an entrepreneurial foundation that is central to Michigan's strong, new information technology sector
- Michigan is partnering with the automotive industry, including vehicle manufacturers and suppliers, the telecommunications industry, and other industries, and has demonstrated success in researching, developing, and deploying IntelliDrive(SM).
- IntelliDrive(SM) test results provide clear, measurable evidence that IntelliDrive(SM) increases transportation safety, mobility and security
- IntelliDrive(SM) promises to be one of the biggest advancements in passenger and commercial transportation since the inception of the Interstate Highway System
- IntelliDrive(SM) has been accepted enough to be programmed into the annual budgeting of Michigan's transportation needs

Customers and Partners

| | | | | | | | | |
|---|--------------------------|---------------------|--------------|---|------------------|---|-------------|--|
| <i>Vehicle Manufacturers and Automotive Suppliers</i> | <i>Service Providers</i> | <i>Universities</i> | <i>USDOT</i> | <i>State, Local, and Other Federal Agencies</i> | <i>Motorists</i> | <i>Commercial Fleets and Freight Operations</i> | <i>NGOs</i> | <i>Transit and Multi-Modal Organizations</i> |
|---|--------------------------|---------------------|--------------|---|------------------|---|-------------|--|

Customer and Partner Needs

| | | | | | | | | |
|---------------------------------------|---|-------------------------|---------------------------|---------------|-----------------------------|-------------------|--------------------------|---------------------------|
| Growing Sustainable Deployment | State-of-the-Art test Facilities | Asset Management | Traffic Management | Safety | Economic Development | Leadership | Financial Support | Cost-effectiveness |
|---------------------------------------|---|-------------------------|---------------------------|---------------|-----------------------------|-------------------|--------------------------|---------------------------|

IntelliDrive(SM) Strategic Goals

| | | | | | | | | |
|---|---|--|---|---|--|---|--|---|
| Partnership | Infostructure | Test Bed | Safety | Traffic | Asset Management | Outreach | Justification | Investment |
| Partner with vehicle manufacturers and other stakeholders to coordinate efforts | Lead the nation in designing, testing, and deploying an effective standard for IntelliDrive(SM) infostructure | Design, implement, maintain, and promote Michigan IntelliDrive(SM) test and development infrastructure | Advance Michigan-based IntelliDrive(SM) safety system research, development, and early deployment | Advance Michigan-based IntelliDrive(SM) traffic management system research, development, and early deployment | Advance Michigan-based IntelliDrive(SM) asset management system research, development and early deployment | Maintain high visibility of Michigan activities through outreach and public awareness | Justify planned deployment through analysis and research providing evidence of value-added results | Coordinate and leverage Michigan investment and attract federal and international support |



For more information about MDOT's IntelliDrive(SM) Strategic and Business Plan, go to www.michigan.gov/mdotvii

Michigan IntelliDriveSM Test Facility Descriptions

- **Chrysler Tech Center (Auburn Hills)**
 - Six roadside locations, three with DSRC capabilities
- **Farmington Hills**
 - Largely along 12 Mile Road; includes two radio towers and 17 roadside equipment locations

- **Rock Financial Showplace (Novi)**
 - Nine locations, using Motorola equipment
- **CVPC Intersection (Southfield)**
 - Two intersections equipped with WiFi and DSRC antennas
- **Michigan International Speedway**
 - Two 1.9 mile road courses and one two-mile oval can be used for testing
- **Telegraph Road Corridor**
 - Proposing to install 22 multiple intersections with DSRC to broadcast SPAT data
- **Owosso**
 - One intersection of seven proposed has been instrumented, and five vehicles have DGE in-vehicle units for SPAT
- **USDOT Developmental Test Environment**
 - Largest single deployment of IntelliDriveSM assets in Michigan with 55 RSE's
- **MDOT Region Access Points**

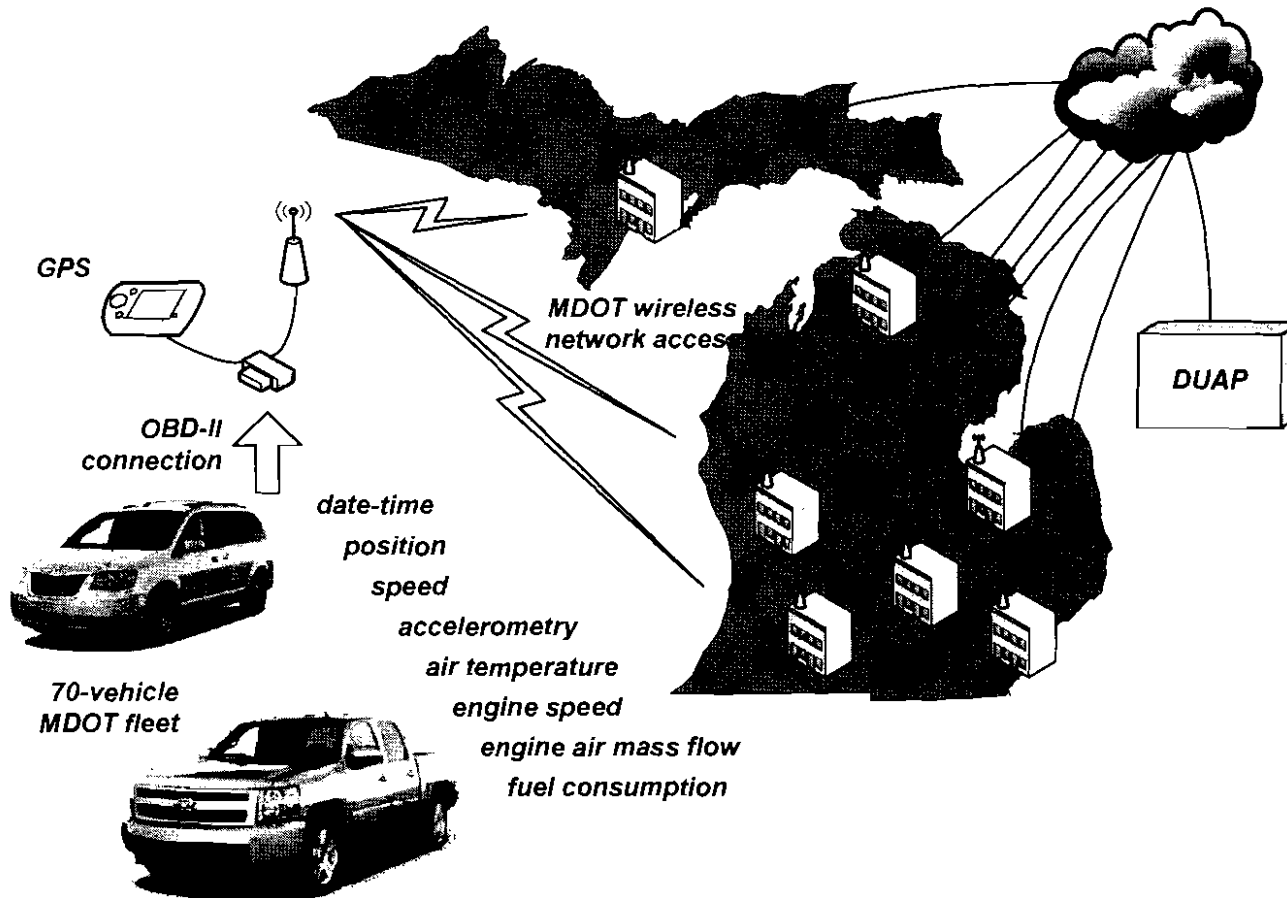
MDOT IntelliDriveSM Programs & Research

- **Data Use Analysis and Processing (DUAP) & DUAP 2**
 - Evaluates uses and benefits of IntelliDriveSM related data for transportation agency management and operations
 - Investigates how the availability of data from IntelliDriveSM equipped vehicles impact data uses and benefits for safety, managing traffic, and managing a DOT's transportation assets
- **MDOT 70 Fleet Vehicle Program**
 - Seven Regions, 10 vehicles in each Region: GPS, accelerometer, and diagnostics.
- **Slippery Roads**
 - Two vehicles collecting road surface weather related data.
- **Eliminating Slippery Conditions by Integrating Mobile Observations**
 - Determine accuracy and reliability of Roadway Weather Information Stations. Data collection of road surface quality IRI.

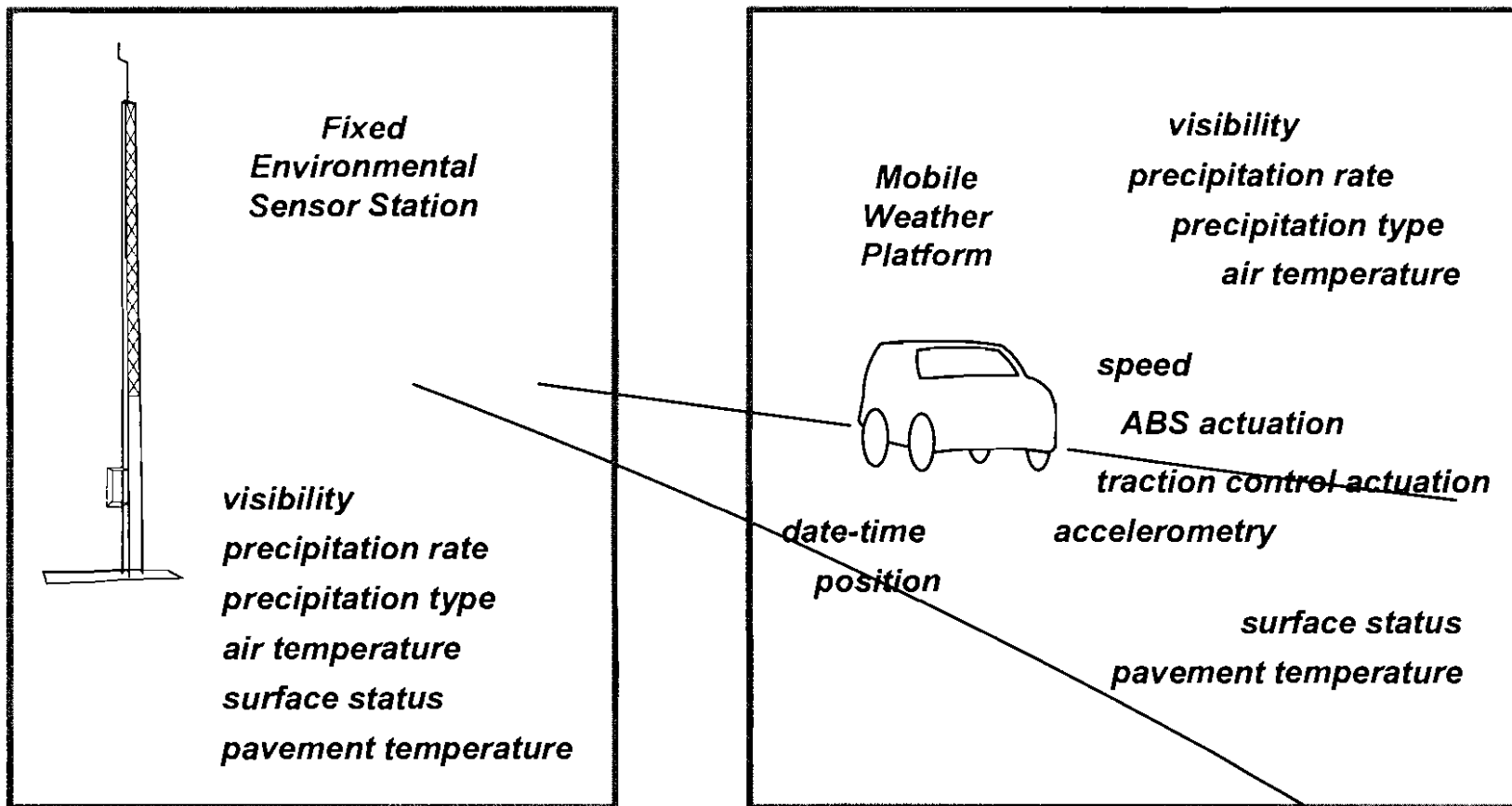
MDOT IntelliDriveSM Programs & Research

- **Critical Highway Infrastructure Monitoring Project**
 - Uses communication, sensor, and collection technology to monitor two bridges
 - Three Universities in Michigan awarded Infrastructure monitoring research and development projects
- **Multi-phase SPAT/GID Communication System**
 - Real time signal phase timing delivered to the driver
- **Pool Fund Research University of Virginia**
 - SPAT & California PATH, Pavement Management Support & Auburn University, Traffic Signal Algorithms & **University of Virginia**

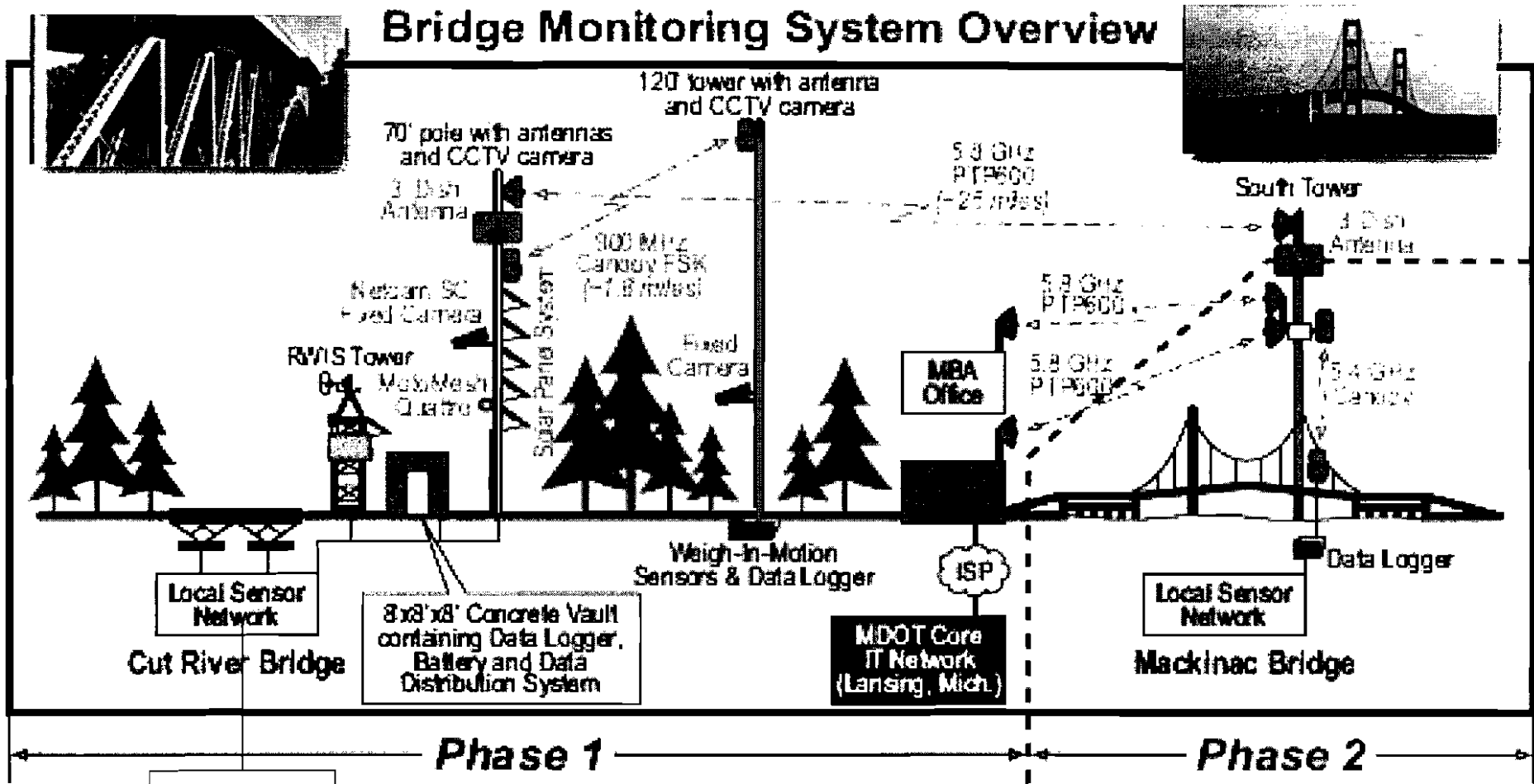
MDOT Fleet Data Collection



Eliminating Slippery Conditions by Integrating Mobile Observations

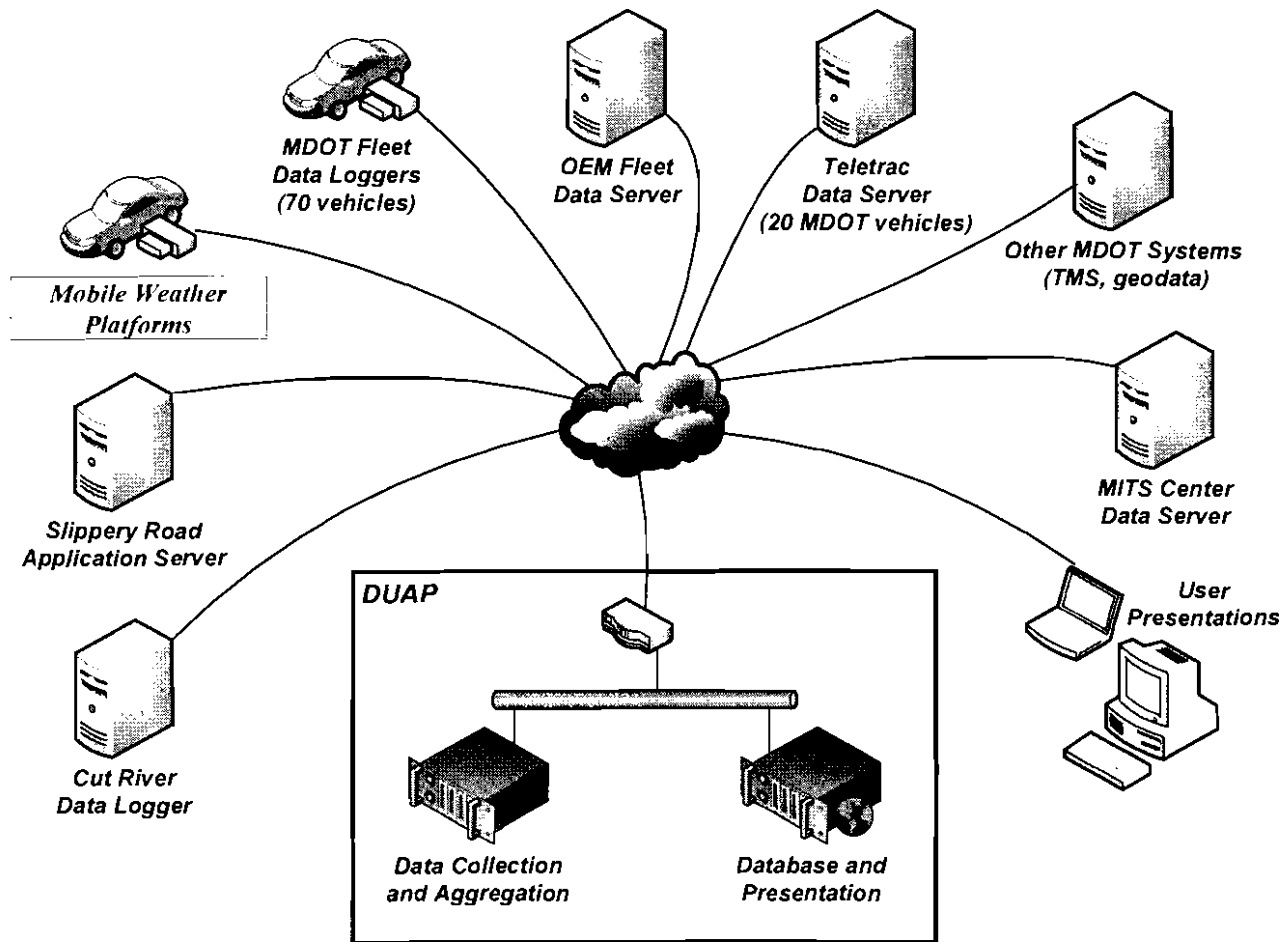


Bridge Monitoring System Overview



Includes fiber optics, concrete deck & traffic sensors

DUAP Data Collection





IntelliDriveSM Capabilities and Resources in Michigan

Richard Wallace, Center for Automotive Research

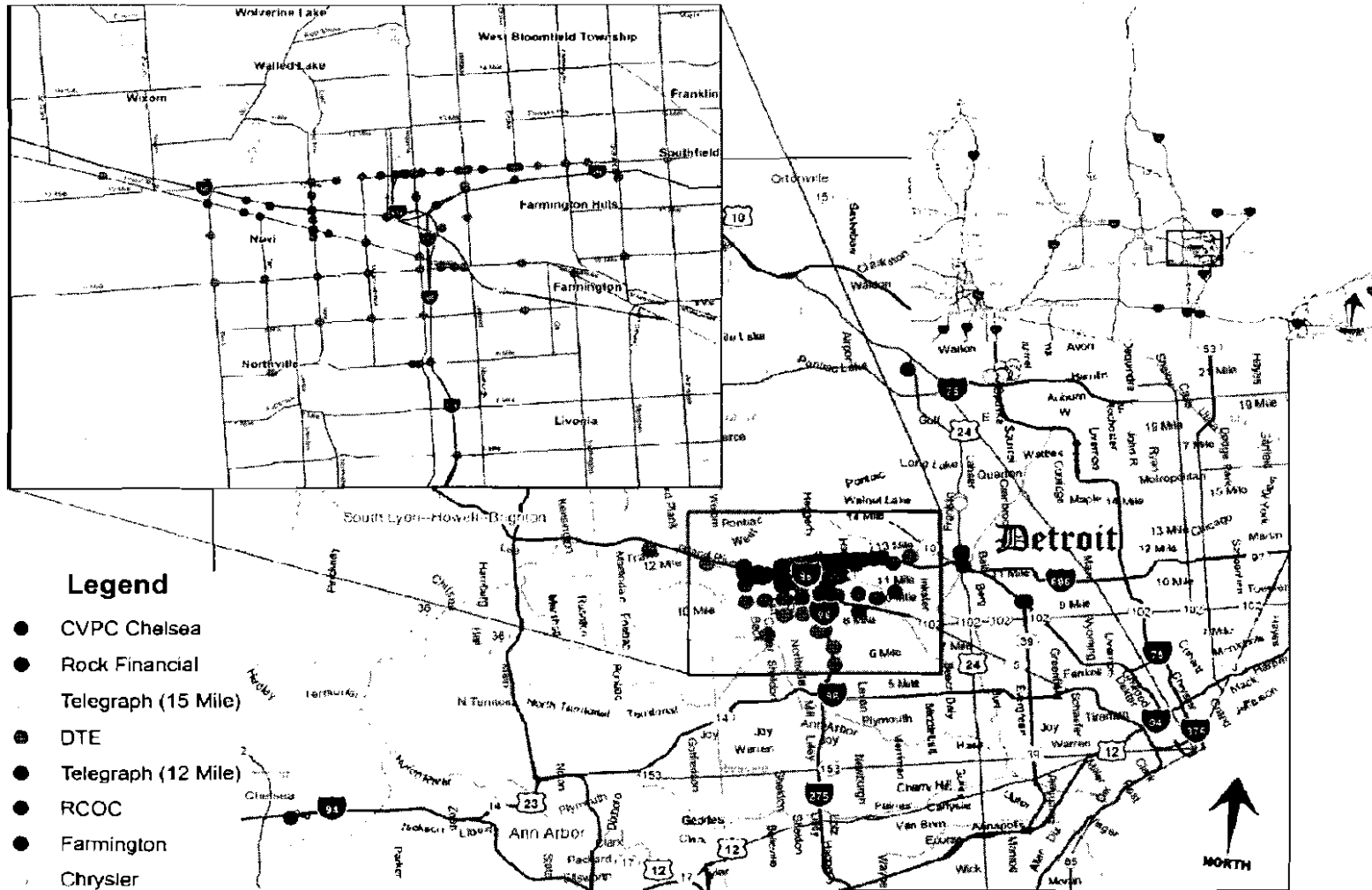
June 28, 2010



Michigan IntelliDriveSM Ecosystem

- IntelliDriveSM has great potential to save lives, reduce congestion, reduce individual travel time, reduce vehicle emissions, and provide location-specific information to travelers
- MDOT's IntelliDriveSM program has been around since the early 2000s, and many other organizations in Michigan are involved in IntelliDrive
 - Vehicle manufacturers
 - Vehicle suppliers
 - Other engineering companies
 - County and local government (road agencies)
 - Test facilities
 - Universities
 - Trade and other industry organizations
 - Not-for-profits...

Michigan IntelliDriveSM Test Facility Locations



Legend

- CVPC Chelsea
- Rock Financial
- Telegraph (15 Mile)
- DTE
- Telegraph (12 Mile)
- ROCO
- Farmington
- Chrysler
- CVPC Southfield

MDOT Asset Inventory



MDOT Michigan-Based IntelliDriveSM Consortia

- **Vehicle Infrastructure Integration Consortium (VII-C)**
 - Collection of representatives from nine light-duty vehicle manufacturers that conducted VII Proof of Concept testing using the USDOT Developmental Test Environment
- **Crash Avoidance Metrics Partnership (CAMP)**
 - Formed by Ford Motor Company and General Motors Corporation in 1995 to accelerate the implementation of crash avoidance countermeasures to improve traffic safety—involved with V2V and intersection V2I safety
- **ITS Michigan**
 - Award-winning Michigan chapter of ITS America, which seeks to improve the safety, security, and efficiency of the nation's transportation system through ITS
- **Connected Vehicle Trade Association (CVTA)**
 - Non-profit organization that advocates effective communication, collaboration, and consensus-building amongst companies, organizations, and governments involved in the use of vehicle communications
- **Specialty Equipment Manufacturers Association (SEMA)**
 - Aftermarket supplier trade association with a strong interest in IntelliDriveSM technology, especially for equipping existing vehicles with communication devices to speed up deployment
- **Michigan IntelliDriveSM Working Group—all of you!**



Other Michigan Programs and

Research Efforts Related to IntelliDriveSM

- **Southeastern Michigan Snow and Ice Management**
 - Improve winter road maintenance efficiency using vehicle communication technology
- **Integrated Vehicle-Based Safety Systems**
 - Four-year research program UMTRI has undertaken to develop and test an integrated crash-warning system
- **Cooperative Intersection Collision Avoidance System**
 - Program to design, test, and develop systems to prevent crashes at intersections using new wireless communications technologies
- **Connected Vehicle Proving Center (CVPC)**
 - MEDC-funded effort at UM Dearborn



Michigan Automotive Industry Investment

- Michigan is the home of the automotive industry, and our automakers and suppliers are critical to the long-term success of IntelliDriveSM in the state and nationally
- **Automakers**
 - General Motors (and OnStar)
 - Ford (and SYNC)
 - Other Vehicle Manufacturers
 - Chrysler, Toyota, Nissan, and Mercedes-Benz have research centers in Michigan that are engaged in IntelliDriveSM research
- **Suppliers**
 - Continental—Active Passive Integration, AutoLinQTM
 - Delphi—has partnered with others to demonstrate wireless access in vehicles
 - Bosch—has been researching ways to improve overall vehicle safety with communication technology
 - DENSO has supplied DSRC radios for several efforts
 - Other suppliers playing a role in Michigan include Visteon, Panasonic, Vector CANtech, Takata, and Kostal

IntelliDrive Technology Forecast

- Which communication technologies do you believe will be used for direct communication between vehicles and vehicle and the infrastructure for the following applications by 2015? (asked in late 2007/early 2008)

| Applications | 1st ranked | 2nd ranked | 3rd ranked |
|--|-------------------|-------------------|-------------------|
| In-vehicle warnings at intersections, traffic signs, and other road features | DSRC | Cellular/3G | WiMax |
| Vehicle-to-vehicle safety warnings, including approaching emergency vehicle warnings | DSRC | Wi-Fi | WiMax |
| Probe vehicles for traffic management, traveler information, and traffic planning | Cellular/3G | DSRC/WiMax | DSRC/WiMax |
| Tolls and electronic payments | DSRC | RFID | Cellular/3G |
| Commercial and public fleet management applications | Cellular/3G | WiMax/Satellite | |
| Commercial and private applications, such as remote diagnostics and media downloads | Cellular/3G | Wi-Fi | Wi-Fi |



MDOT Autonomous v. Cooperative (or Both)

- For the following safety features, please indicate whether each is most likely to be implemented cooperatively (i.e., vehicle-to-vehicle communication used) or autonomously (i.e., each vehicle uses only its own sensors) by the following dates.

| Safety Features | 2010 | 2015 | 2020 |
|--|--------|-------------|-------------|
| Road condition warning (vehicle-based); environmental sensing | Auton. | Both | Both |
| Vehicle-to-vehicle road feature notification | Auton. | Cooperative | Cooperative |
| Emergency electronic brake light (EEBL); early notification of lead vehicle braking hard | Auton. | Both | Both |
| Cooperative forward collision warning | Auton. | Both | Both |
| Pre-crash sensing and warning | Auton. | Both | Both |
| Emergency vehicle approaching (or ahead) warning | Auton. | Both | Both |

- The future appears likely to be both autonomous and connected!



IntelliDriveSM Tipping Points Study: Background and Methods

- ♦ IntelliDrive affected by larger issues, such as:
 - Change in presidential administration
 - Economic crisis, especially in the automotive sector
- ♦ Interested in what is needed for IntelliDrive to move from current state to broad deployment
- ♦ Conducted study of experts (45 in total)
 - 15 participated in detailed interviews on a range of related topics
 - 30 participated in two-round, web-based survey effort (questions derived largely from the interviews and open-ended results from first round)
 - Experts drawn from a broad cross-section of IntelliDrive sectors, including DOTs (federal, state, and local), vehicle manufacturers, telematics providers, automotive suppliers, tolling agencies, and others



IntelliDriveSM Tipping Points Study: Notable Results

- Strong consensus that IntelliDrive will be important for improving safety and mobility, but two main obstacles exist:
 - No clear plan for deploying both in cars and on infrastructure
 - No dedicated funding source for infrastructure deployment
- Source of funding for infrastructure emerged as greatest uncertainty hindering development and deployment
 - State of national economy and auto industry do not help and will lead to some delay in deployment (auto industry status leads to significant delay)
 - Dedicated federal funding is most clear solution
- Standards also are important, because they promote and ensure interoperability and provide clear direction to industry
- Public service campaign recommended to increase awareness of benefits among the public—led by USDOT, states, AASHTO
- Aftermarket is critical for retrofitting existing vehicles



IntelliDriveSM Tipping Points Study: Technology and Application Results

- DSRC is the only technology that can support very low latency, cooperative, active safety
 - Soft safety applications can be supported by other means (e.g., 3G, 4G)
- IntelliDrive will be important for environmental benefits
 - Fuel economy improvements, reduction in GHG emissions, etc., through improved situation awareness, optimized routing, etc.
 - Respondents split, though slightly against, IntelliDrive as part of a cap-and-trade program
- Interviewees see importance of tolling applications but are split on whether this is a leading (built-in funding source) or trailing application (too few tolling sites to support a market)

Economic Impact of IntelliDrive in Michigan

- Given Michigan leadership in IntelliDrive, it promises to have a substantial impact on the Michigan economy
 - Potential for 16,000 jobs IF Michigan is the home of IntelliDrive, as it has been the home of auto
 - Up to \$177 million annually in income tax revenues
 - Only small benefits (about \$0.27 per vehicle mile traveled) needed for net positive cost benefit
- The challenge:
 - To reap these benefits, Michigan must be the clear leader in IntelliDriveSM
 - This will require collaboration between government, industry, universities, not-for-profits, etc.
 - That is why we are here today



Scott Shogan

Parsons Brinckerhoff

Evolution of IntelliDrive

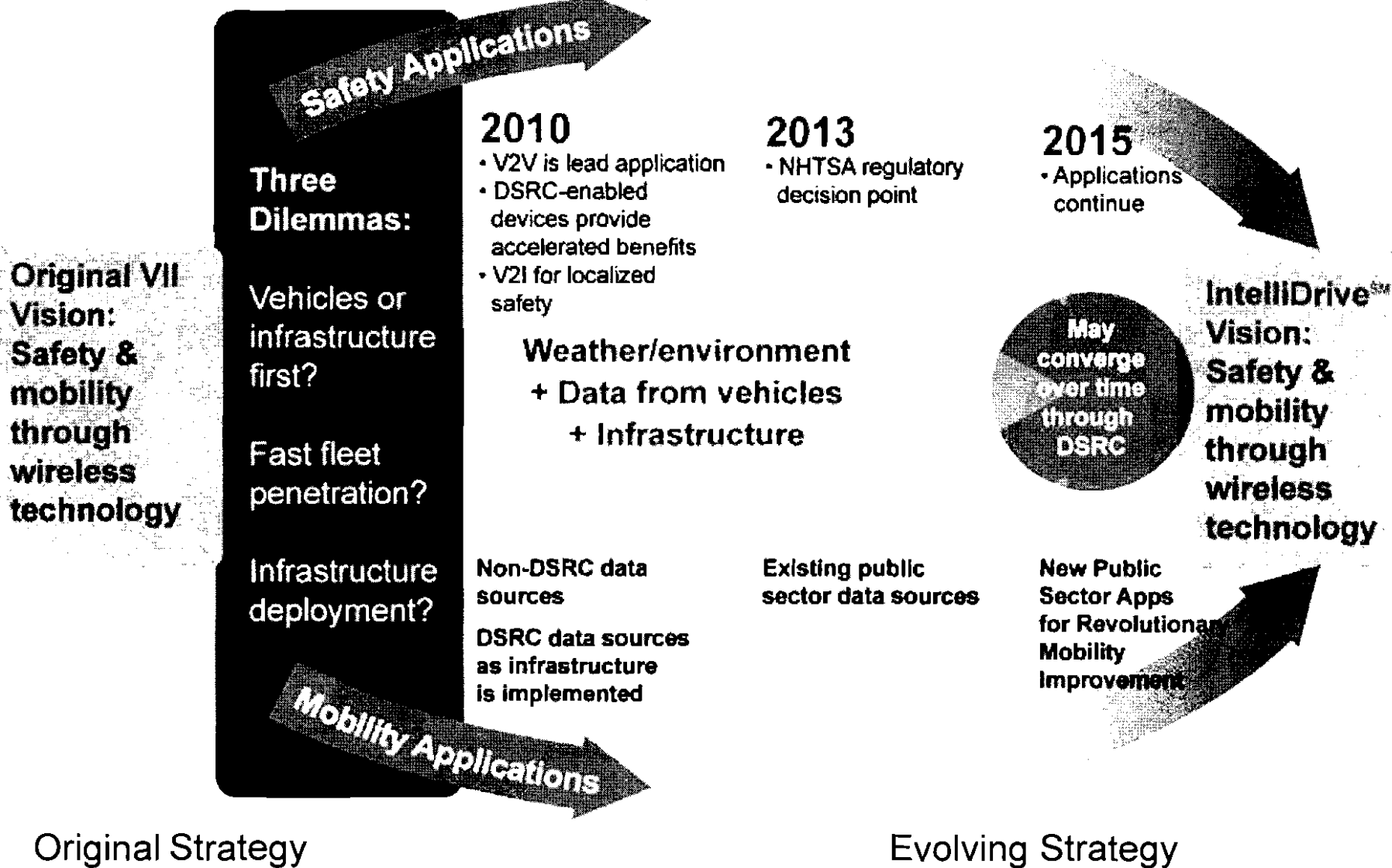
Original VII Deployment Model

- DSRC based for all applications
 - Infrastructure intensive using new DSRC technology
 - Vehicle turnover for embedded DSRC technology
- Start with V2I (for all application types) and evolve into V2V (safety)

US DOT's Current Perspective on IntelliDrive Deployment

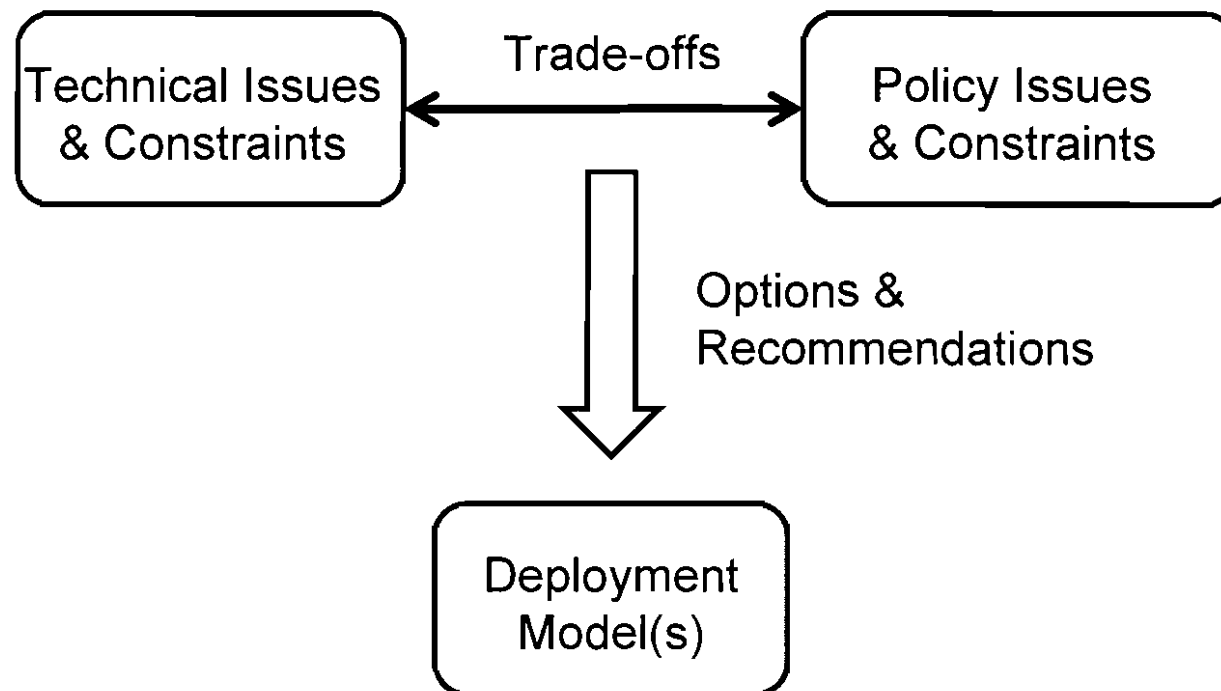
- Non-safety (mobility, environment)
 - Leverage existing data sources & communications; include DSRC as it becomes available
 - Support development of key applications for public agencies using current data sources
- Safety → DSRC
 - Aggressively pursue V2V; leverage vehicle capability for V2I spot safety
 - Can leveraging of nomadic devices & retrofitting accelerate benefits?
 - Infrastructure requirement is still a TBD (security)

IntelliDriveSM Strategy



Technical and Policy Interactions

(For Example: Security vs Privacy Trade-offs)

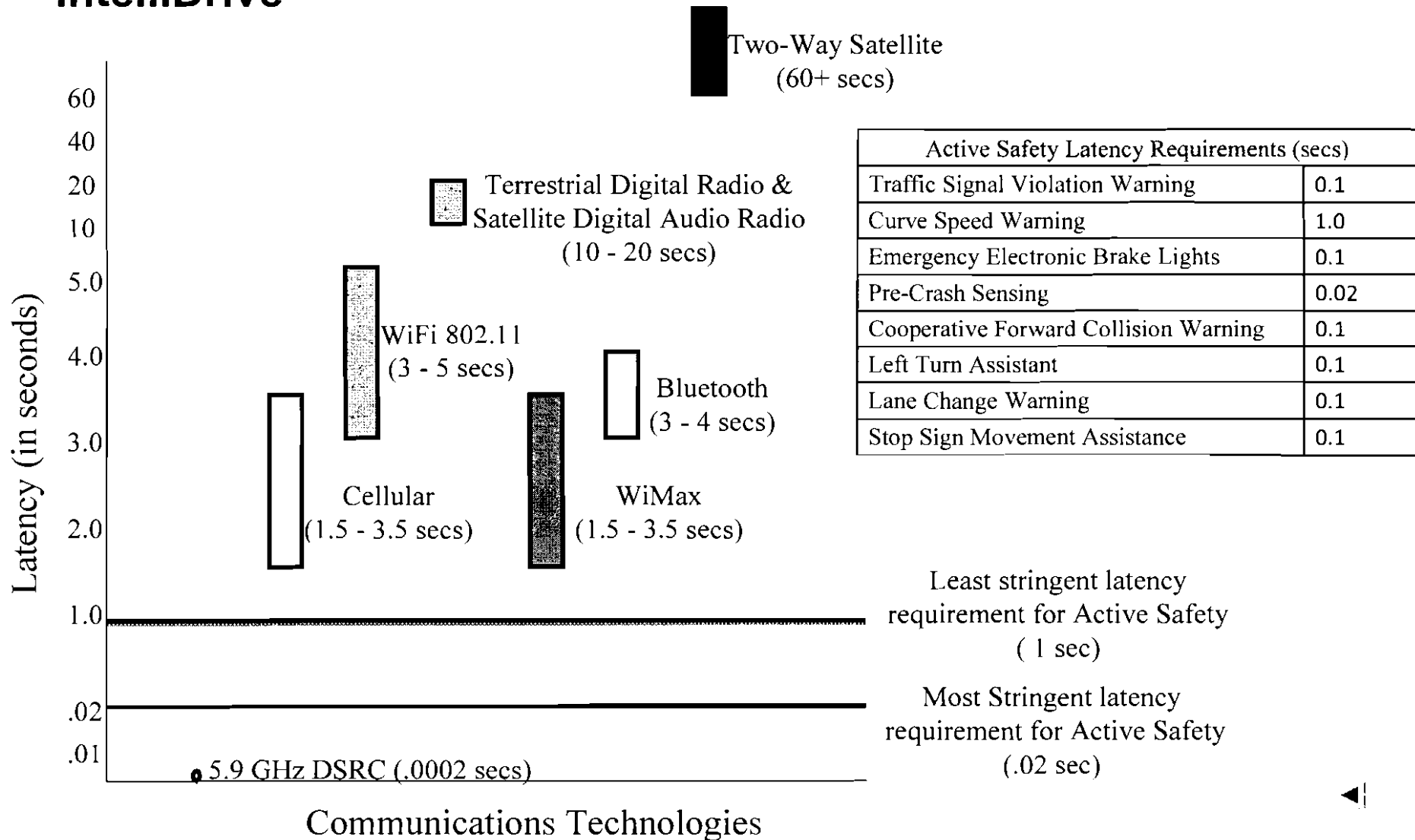


Policy trade-offs will require senior level decisions.

Technical Challenges

| Issue | Challenge | DOT Response |
|--|---|--|
| Range of available communications technologies | Desire to see a comparison to prove that DSRC is needed | DOT analysis (see chart) |
| Frequency issues | Capability in large scale situations Interference | Doing scalability testing under V2V program |
| Security Issues | Authentication, overhead, oversight, costs | <ul style="list-style-type: none"> • Work underway on technical side with security experts on authentication process • On policy side, developing a roadmap to identify and resolve issues |
| Interoperability | Need to explore problem | V2V Track 2 addresses technical interoperability issues |

Latency vs. Communications Technologies For IntelliDriveSM



Business Challenges

| Issue | Challenge | DOT Response |
|-------------------------|---|---|
| Business Case | Public will not buy safety | <ul style="list-style-type: none"> • DOT will conduct economic impact analysis as part of regulatory decision • DOT will work with industry to examine opportunities for accelerating deployment through aftermarket and retrofit – analysis will look at incentives and potential barriers |
| Production Timing | Internal company decisions to make major changes can be 2-5 year time frame | <ul style="list-style-type: none"> • Sources Sought Notification to move development along faster • Safety Pilot to demonstrate capability and determine what works most effectively |
| DSRC chip manufacturing | Limited market | <ul style="list-style-type: none"> • Need to explore problem |

Cultural Challenges

| Issue | Challenge | DOT Response |
|-----------------------------------|--|--|
| Negative experience with VII | Process felt closed, especially with Standards development | <ul style="list-style-type: none"> • Commitment to public working group meetings • Standards meetings are open to those interested in participating |
| Pace of deployment | Too slow | <ul style="list-style-type: none"> • Focus on V2V and clear goals within 4 year time frame • Engaging industry on steps to move forward with SSN and model deployment in near-term |
| Cultural disconnect among players | Data sharing Liability | <ul style="list-style-type: none"> • DOT would like to explore what data is desired from device manufacturers and apps developers • DOT will explore boundaries of data and liability • DOT will facilitate discussion with industry and OEMs |

Policy Research Goals

- Address policy and institutional issues that limit or challenge successful IntelliDrive deployment.
- Formulate recommendations and options.
- Identify how key partners and industry will contribute to move IntelliDrive research and deployment forward.

Intended Outcomes

1. Develop a set of alternative, viable *deployment approaches* for IntelliDriveSM
2. Produce a *range of options* that will include:
 - Policies, Legislation, and Regulatory options
 - Governance Structures
 - Investment Models and Market Incentives
 - Resolutions to Institutional Issues
3. Combine *deployment approaches* with *policy options* to produce a set of *richly detailed deployment scenarios*
4. Development of *concepts and recommendations*

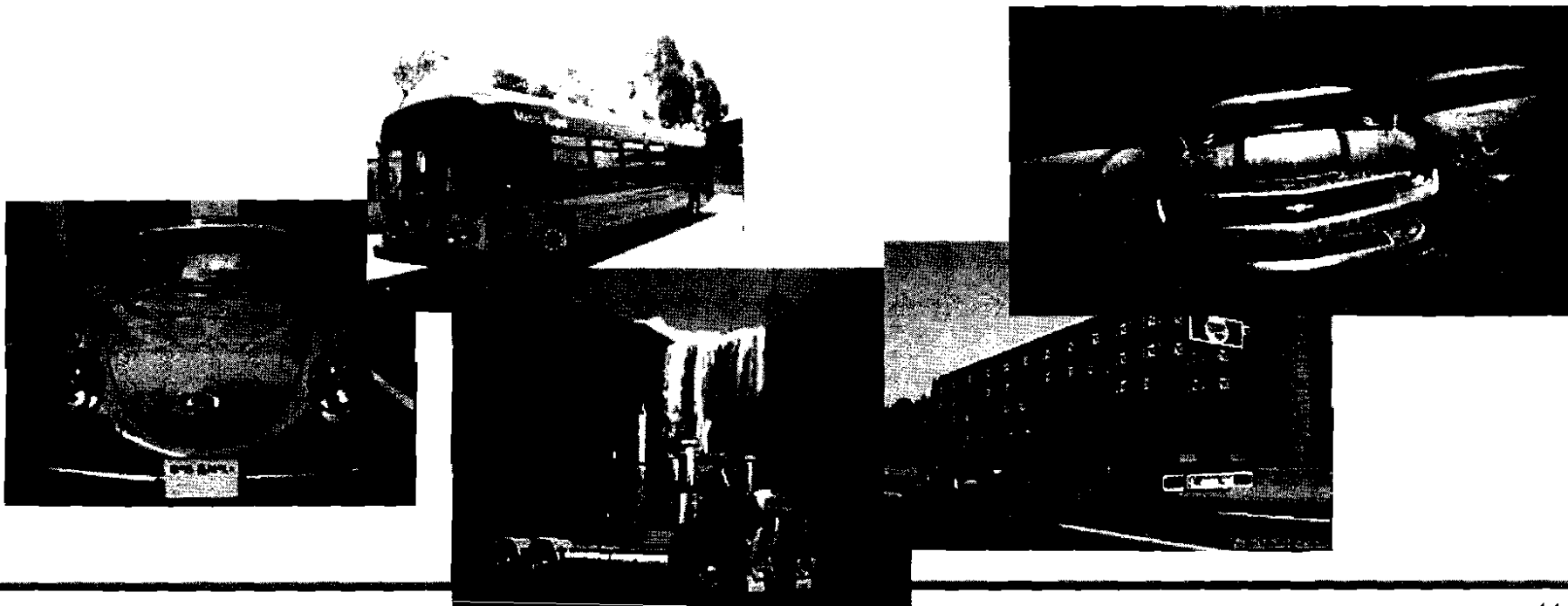
Research Areas and Key Questions

- Track 1: Deployment Scenarios and Implementation and Operations Strategies
 - Define key requirements, Identify alternative strategies
- Track 2: Financing and Investment Models
 - How will IntelliDrive be funded and by whom?
- Track 3: Governance Models
 - What elements of the IntelliDrive system need to be governed? What are options for doing so?
- Track 4: Institutional Issues
 - What are the major institutional, legal, and policy issues? How can they be resolved? How do we address privacy and ensure that applications do not cause driver distraction?

Program Scope

Program Milestone:

- Potential NHTSA rulemaking decision on V2V in 2013 – potentially covering passenger cars, trucks, busses.



V2V Policy Issues

- Assumptions:
 - 2013 Rulemaking decision is basis for timing of V2V policy research – critical issues and research that feeds into rulemaking takes priority
 - Focused on V2V, but not excluding V2I
 - V2V deployment concept assumes minimal or no infrastructure
 - V2V deployment concept potentially includes embedded, retrofit, and aftermarket devices

Safety Pilot

Goals:

- *Support the 2013 Regulatory V2V Decision with Field Data*
- *Public Awareness & Acceptance*

Primary Objectives

- Demonstrate V2V real world implementation
 - Multiple vehicle types (cars, trucks, buses, rail, etc)
 - Obtain substantial empirical data
- Assess driver acceptance of vehicle based safety systems
- Explore opportunities for accelerating safety benefits through aftermarket devices and retrofit systems

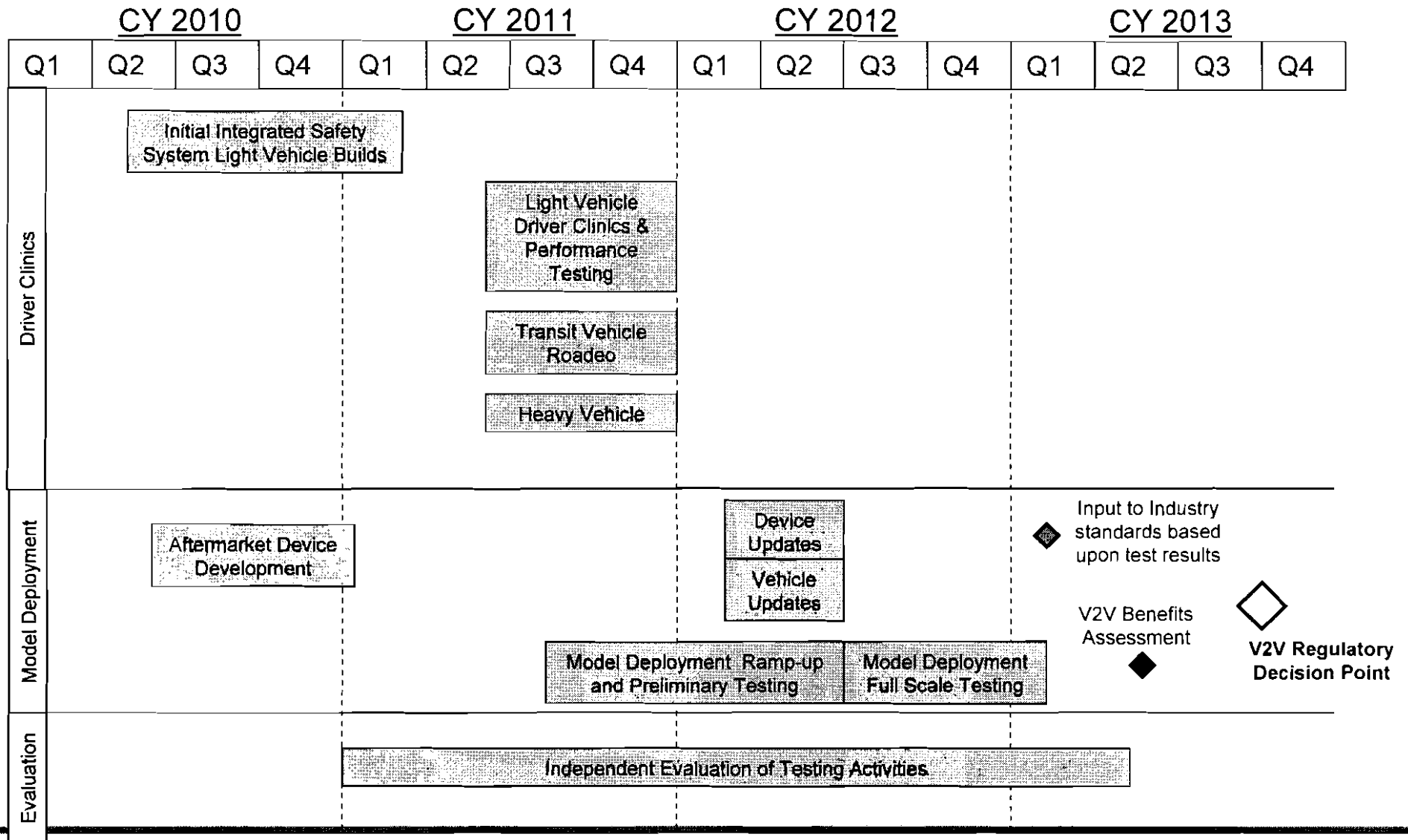
Secondary Objectives

- Enable vehicle-infrastructure (V2I) safety applications
- Leverage data for non-safety applications such as mobility, environment, and weather

Safety Pilot Activities

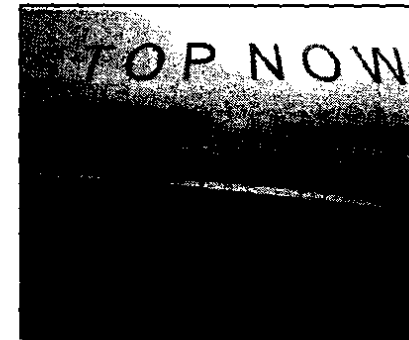
- Driver Clinics
 - Driver acceptance data from light vehicle driver clinics at various locations
 - Explore similar opportunities for other vehicle types
 - Performance testing in multiple geographic environments using small numbers of light vehicles and nomadic devices at same locations
- Model Deployment
 - Critical Mass/Exposure testing → large number of vehicles and devices creating a “highly saturated” operating environment
 - Mixture of integrated safety systems with nomadic devices
 - Cars, trucks, buses, fleets, rail crossings
 - Lots of vehicles, limited infrastructure

Safety Pilot Roadmap (rev 14)



V2I Safety Focus Areas

- Intersections
- Speed Management
- Run-off road and lane departure
- Enforcement and Operational Safety for Transit and Commercial Vehicles




V2I Safety Plan

- **Track 1 – Applications Analysis**
 - Selection of Safety Applications (Sept 2010)
- **Track 2 – Prototype Applications**
 - Field Operational Test (FOT) Go/No-Go decision (2Q 2012)
- **Track 3 – Communications and Mapping**
 - Test and evaluate SPaT, issue SPaT Policy Guidance (2Q 2013)
 - Test and evaluate Mapping solutions
 - Test and Evaluate Communication Requirements
- **Track 4 – Benefits Assessment**
 - Perform FOTs based on selected safety applications (2013-2014)
- **Track 5 – Deployment Planning (ongoing)**
 - Development of Toolbox for practitioners and Public Agency Guidelines

Safety Program Workshop

- Hilton Chicago Northbrook
- July 20-22, 2010
- Day 1: IntelliDriveSM Safety Program Roadmaps and Discussion (V2V, Safety Pilot, DSRC Device Certification, V2I Safety)
- Day 2: IntelliDriveSM Policy Roadmaps with a focus on reaching the V2V 2013 Regulatory decision milestone
- Day 3: Continuation of Policy Discussion
- Webinar available for those unable to attend
- Visit website for more details



Detroit Proof-of-Concept Test Bed

- USDOT has solicited bidders for ongoing operation and maintenance of the Michigan Development Test Environment (DTE)
- Initial goal is to make DTE an effective facility for continued research, testing and demonstration
- Announcement of selection of contractor is anticipated at any time

IntelliDrive.

For More Information...

<http://www.intelldriveusa.org/>

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News & Updates

Proof of Concept Test Results Released
March 11th, 2009 at 4:04pm

IntelliDrive SM Brand Replaces VII
February 23rd, 2009 at 10:12am

SAFETRIP-21 News
December 4th, 2008 at 3:12pm

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