Incident Management and Access for Managed Lanes

- **Audio:**
  - Via Computer - No action needed
  - Via Telephone – Mute computer speakers, call 1-866-863-9293 passcode 93130562

- **Presentations by:**
  - Paul Jodoin, Federal Highway Administration Traffic Incident Management Program, paul.jodoin@dot.gov
  - Javier Rodriguez, Florida Department of Transportation, javier.rodriguez2@dot.state.fl.us
  - Todd Merkens, Washington State Department of Transportation, merketo@wsdot.wa.gov
  - Brian Kary, Minnesota Department of Transportation, brian.kary@state.mn.us

- **Audience Q&A –** addressed after each presentation, please type your questions into the chat area on the right side of the screen

- **Closed captioning is available at:** http://www.fedrcc.us//Enter.aspx?EventID=1980150&CustomerID=321
- **Upcoming Webinars:**
  - Visit http://www.ops.fhwa.dot.gov/tolling_pricing/webinars/index.htm
- **Recordings and Materials from Previous Webinars:**
  - http://www.fhwa.dot.gov/ipd/revenue/road_pricing/resources/webinars/congestion_pricing_2011.htm

U.S. Department of Transportation
Federal Highway Administration

Traffic Incident Management

Enhancing TIM for all Operations Strategies

Congestion Pricing Webinar

July 17, 2012

Average annual number of responders <u>struck and killed</u> nationally while working in or near moving traffic:

Fire/Rescue and EMS: 6 to 8/year

Law Enforcement: 10 to 12/year

Tow/Recovery: 50/year

Highway: 100/year + 20,000 injured

Source: Emergency Responder Safety Institute

Example of a 1998 "Struck-By" incident that killed one firefighter and injured nine additional responders

Vehicle on PA Turnpike lost control and slid into a drainage ditch...911 is called

Courtesy Lionville (PA) Fire Co.

47a2


KCHLAN

- Estimated 20-25% of all Incidents are secondary
- Estimated that the likelihood of a secondary incident raises 2.8% for every minute
- Often more severe than the primary incident

Quantifying the Problem- Congestion vs. Crashes

- **Annual cost of traffic crashes:**

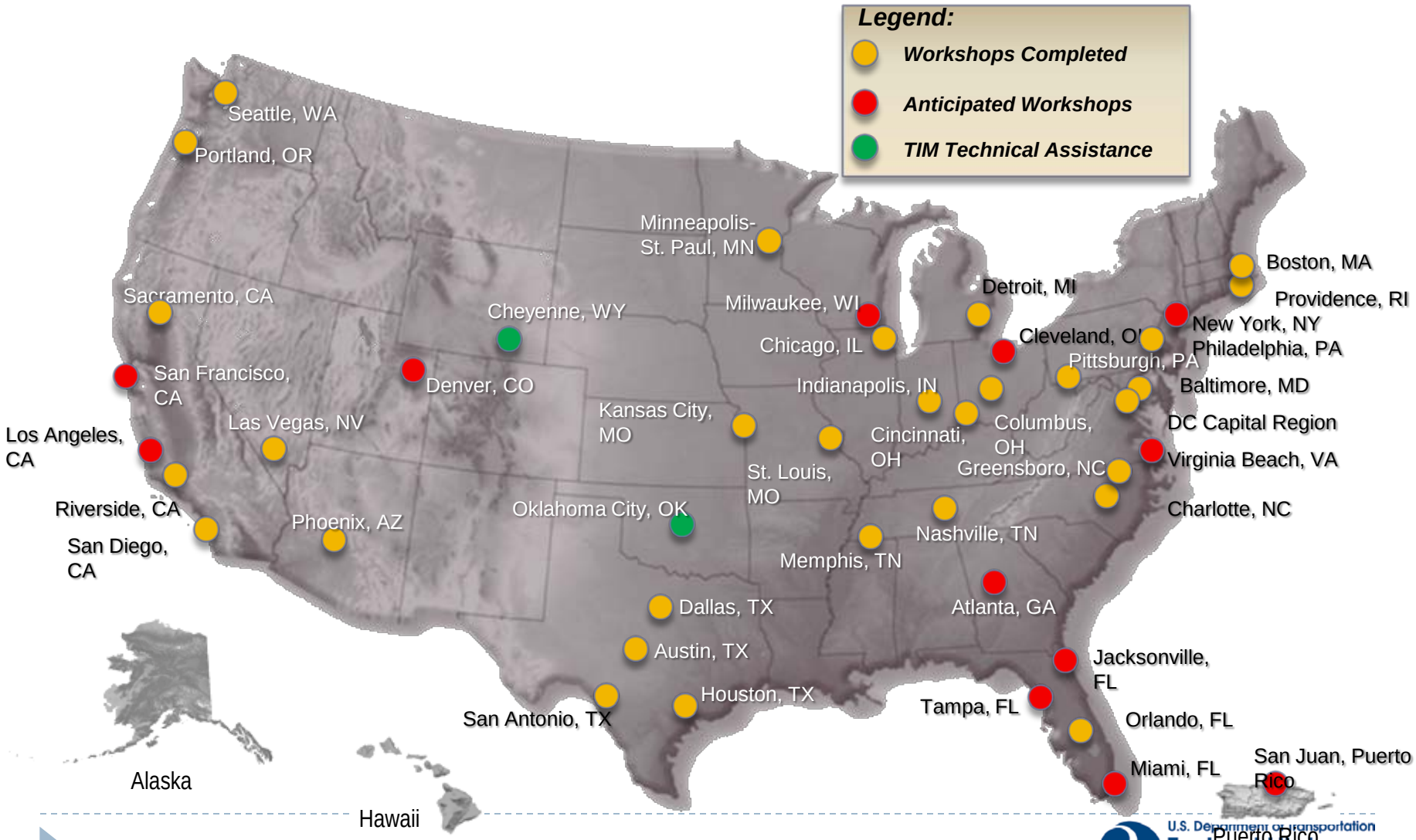
  $299.5 billion (+ 83% from 2008)

  Average cost per person ≈ $1,522

2011 Major TIM Initiatives

- Advanced Workshops and Executive Briefings
- Self Assessment (Big move nationally in 2011)
- National TIM Framework
- Training Standardization
- Public Outreach Toolkit
- Performance Metrics
- P2P Program
- IACP Agenda and National Executive Meeting
- Training for Traffic Incident Responders (SHRP 2 L12)

Advanced TIM Workshops: 40 Completed



U.S. Department of Transportation
Federal Highway Administration

Common Critical Needs

- Develop/enhance TIM Program
- Develop/implement multi-discipline TIM training
- Enhance responder notification/communication
- Measure performance
- Public Outreach and Awareness

National TIM Program Vision…

Through continuous and enhanced planning and training of all TIM personnel:

1. Reduce or eliminate responder and motorist injuries and fatalities
2. Promote rapid incident clearance thereby reducing traffic congestion
3. Develop or enhance local TIM Programs that ultimately benefit corridors, regions and states
4. Emphasize TIM as a system operations "core mission" for all responders
5. Measure performance that demonstrates improved TIM responses and programs over time

The NASCAR Pit Stop - TIM Analogy

- NASCAR: Quicker pit stops = the difference between winning and losing
  - 1960: 45 seconds (4-prong lug wrench)
  - 1963: 25 seconds (air/impact wrench)

Training – Practice – Technology

  - 1990s/Today: 12 seconds

"I feel that we've gotten stuck at 25 seconds…"

Brian Kary, Mn/DOT RTMC TIM Engineer

Operations Overview

Moving from Building a System

Using and Operating the System

At the core…
Traffic Incident Management (TIM)

- TIM consists of a planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible

- Effective TIM reduces the duration and impacts of traffic incidents and improves the safety of motorists, crash victims and emergency responders

National Unified Goal for TIM

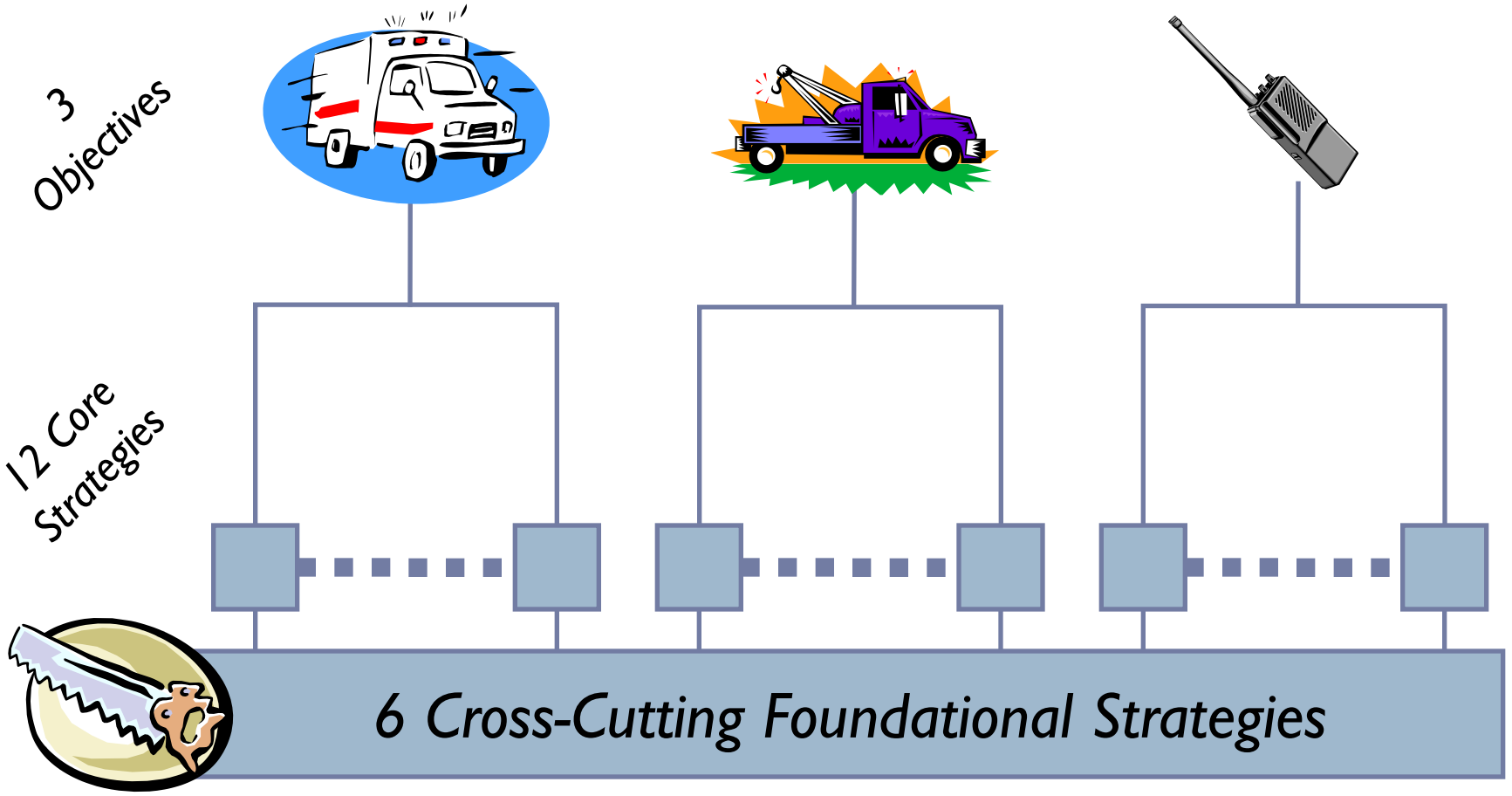
The NUG for TIM is:

Responder Safety

Safe, Quick Clearance

Prompt, Reliable, Interoperable Communications

NUG Framework



TIM Program Components

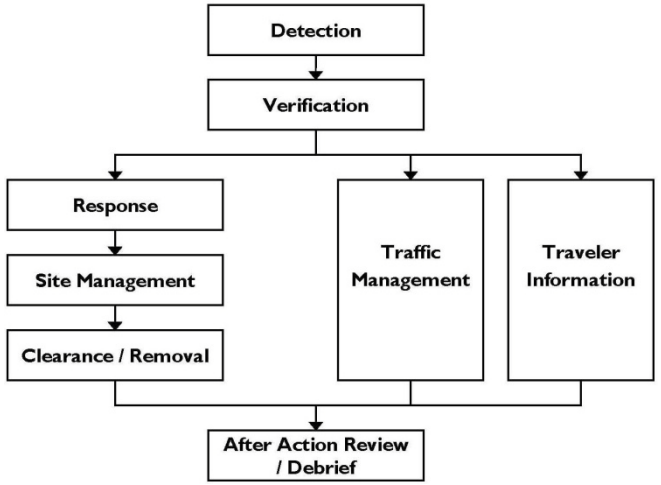
TIM Components

Program (Committee/Task Force)

- Relationships
- Needs Assessment
- Training
- Performance Evaluation
- Asset Management
- Contracting
- Administration & Staffing
- *Finance/Budget*

Response

- TIM Process



U.S. Department of Transportation
Federal Highway Administration

TIM Performance Measures - Good Practices and Enhancement Discussion

Measuring Success

What Gets Measured Gets Performed...

- Quantifying TIM benefits will advance program continuity:
  - Builds critical mass for program support from managers and elected officials:
    - Supporting what works
  - Ensures buy-in from diverse stakeholders:
    - Multiple agencies, coordinated response
  - Supports allocation of technical and budget resources

TIM Performance Measures

"Roadway" Clearance Time

- The time between first recordable awareness of an incident (detection/ notification/verification) by a responsible agency and first confirmation that all lanes are available for traffic flow.

"Incident" Clearance Time

- The time between the first recordable awareness and the time at which the last responder has left the scene.

Secondary Crashes

- The number of secondary crashes beginning with the time of detection of the primary incident where a collision occurs either a) within the incident scene or b) within the queue, including the opposite direction, resulting from the original incident.

High-Level TIM Training Framework and Tiered TIM Focus Areas

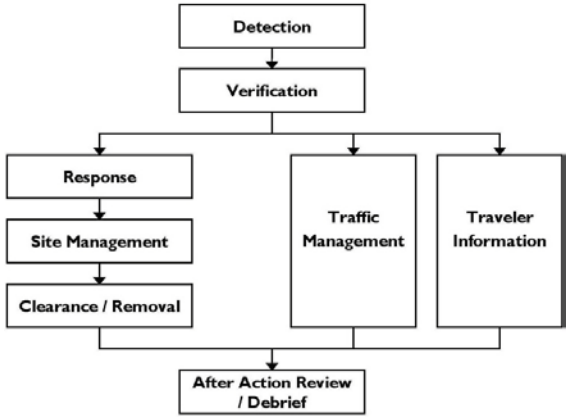
Tier 1: Training for Traffic Incident Responders (SHRP 2 L12)

Tier 2: Advanced TIM Workshop (for Mid-Level Managers)

Tier 3: Executive Level Briefings (for Decision Makers)

Response Focus

- TIM Process



Program Focus (Committee/Task Force)

- Relationships
- Needs Assessment
- Training
- Performance Evaluation
- Asset Management
- Contracting
- Administration & Staffing
- *Finance/Budget*

Strategic Highway Research Program (SHRP2)

- Authorized by Congress to address some of the most pressing needs related to the nation's highway system
- Research areas: Safety, Renewal, Reliability, Capacity
- Administered by Transportation Research Board (TRB) :
  - Federal Highway Administration (FHWA)
  - America Association of State Highway and Trans Officials (AASHTO)

- FHWA expected lead on implementation

U.S. Department of Transportation
Federal Highway Administration

SHRP2 : National Traffic Incident Management Responder Course

- **Objectives:**
  - Improved responder safety
  - Improved reliability (reduced incident duration)
  - Improved motorist safety (reduced secondary crashes)
- **Approach:**
  - Researched core competencies
  - All disciplines participated every step
  - Development of multi-disciplinary training program for all responder stakeholders
  - Cross-training in TIM core competencies

U.S. Department of Transportation
Federal Highway Administration

SHRP2–L12: Training Course Elements

- **Course Design:**
  - Final course is developed so entire course can be taught by Experienced Trainers from All Disciplines
  - Presented in its entirety or through selected modules
  - Four Hour Version will be available
- **Course Delivery Mechanisms:**
  - Provide course to existing entities already conducting training – central body sets course
  - Flexible approach – delivery provided at local level
  - Instructors from different disciplines

Under Development

- **E-Learning Course** An eTools version of the training will be developed to facilitate wide scale deployment of the training

- **Evaluation:** assess the degree to which the training accomplishes the L12 objectives of improving TIM core competencies and coordination among multidisciplinary response teams.

First Round

TRB Pilots - Tennessee, Virginia, Montana

Transition workshop - Fort Lauderdale, FL

FHWA Implementation –

Starts late August – Aggressive schedule

Delivery

- **Train the Trainer:** Multi- discipline full curriculum developed in SHRP2 L12 project. After completing the TtT course participants will be equipped to provide the training to a larger audience of incident responders in their discipline.

- **Classroom Training**: Multi-discipline trainers trained through the TtT courses will conduct classroom-based training for a broader audience of incident responders across that state and/or region.

National TIM Responder Classroom Training

To the extent possible:

- Conduct multi-discipline sessions
- 2 instructors (police, fire, DOT) per session
- 4 hours curriculum will be available

Other training options:

- Per module
- Police only
- Academy curriculums

U.S. Department of Transportation
Federal Highway Administration

SHRP2-L32: Implementation Goals

- **By August 2012:**
  - Conduct 4 TtT pilot workshops (TRB)
- **By August 2014:**
  - Conduct 40-60 additional TtT sessions
  - Train 1000-1500 State/local responders to deliver classroom training
  - Deliver Classroom Training to 30K-70K responders
- **Within 10 Years:**
  - Train 4500 State/local responders to deliver classroom training
  - Deliver Classroom Training to 425K-900K responders
  - Deliver E-Learning to 1.2M responders

High Level Support

- International Association of Chiefs of Police

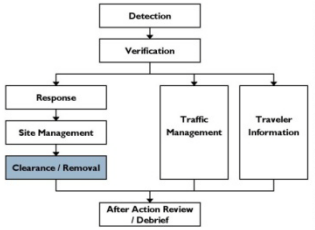
  State and Providential Division

  Expected to formally endorse in September

- International Association of Fire Chiefs

  Formally Endorsed

- American Association of State Highway and Transportation Officials (AASHTO) - Priority project
- National Volunteer Fire Council- endorsement
- Public Safety/Transportation Summit -

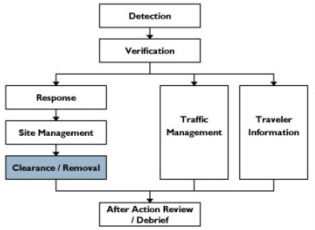


Towing and Recovery

Georgia TIME Program

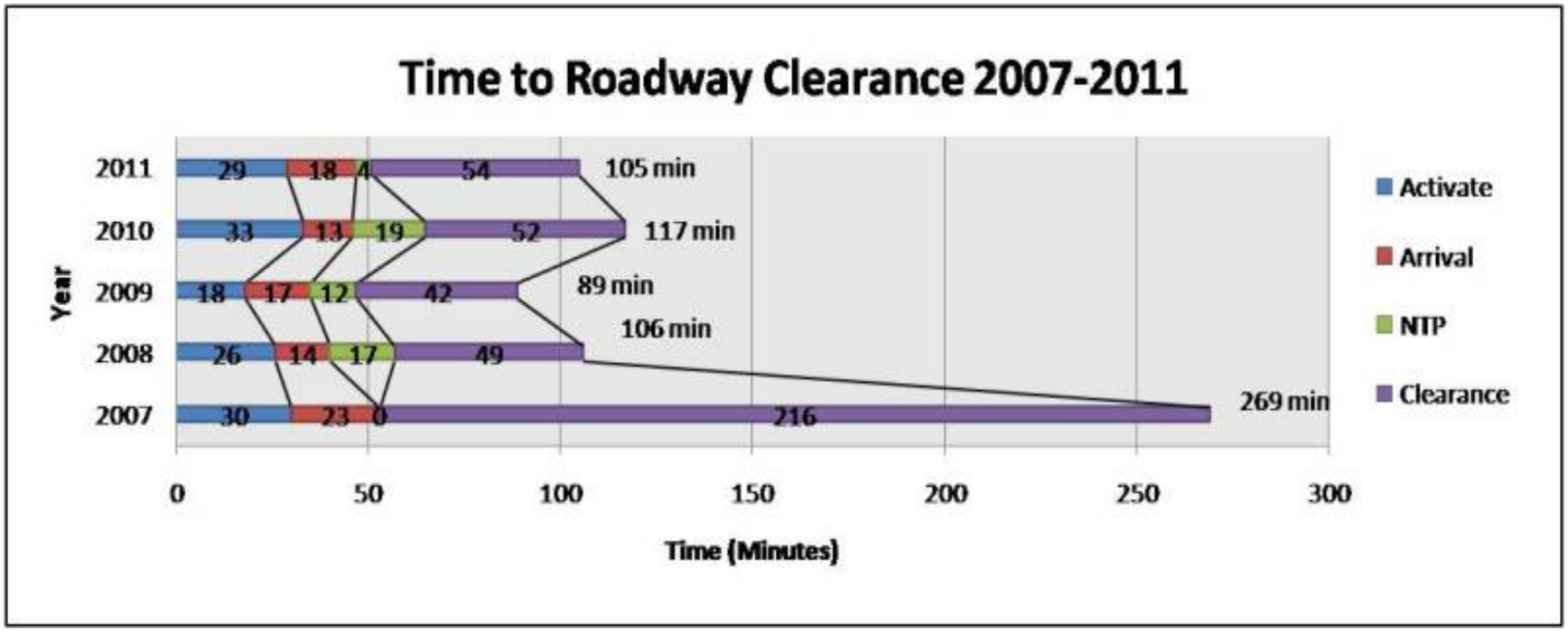
Towing and Recovery Incentive Program (TRIP)

- Implemented to pay heavy-duty recovery companies a monetary bonus for clearing commercial vehicles wrecks within 90 minutes



Towing and Recovery

Towing and Recovery Incentive Program (TRIP)



- **Reference:** http://www.timetaskforce.com/trip.html

Do incentive based programs work?

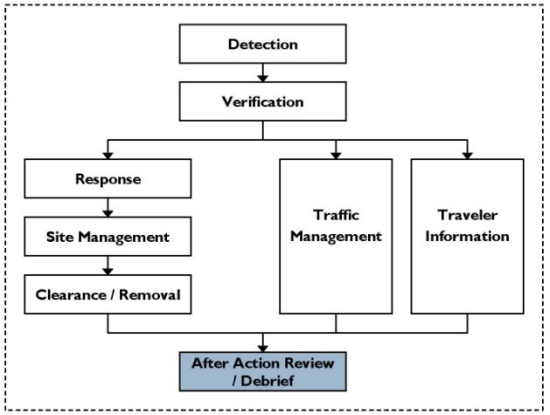
- Evaluation completed by Atkins in 2011
- Cost savings PER INCIDENT = $456,396
- Percentage of Savings = 71%
- Financial benefit of TRIP for 2008 & 2009= $9,154,431
- Benefit / Cost of 11:1

Other Towing Programs

- Rapid Incident Scene Clearance Program- FL
- WSTOT- Blockbuster Tow Program
- WSDOT – Instant Tow Program

After-Action Review (AAR) / Debrief

- Typically a function of an on-going TIM Program (i.e. should NOT be done at the incident scene)
- Absolutely critical for success
- Facilitates inter-agency relationship building
- Evaluation
  - What went well?
  - What went not so well?
  - How can we do better?



Safety Service Patrols

Full-Function Service Patrols

- Provide all of the services provided by baseline and mid-level Safety Service Patrols, PLUS:
  - Clearance and recovery services
  - Emergency traffic control and management
  - Assistance with emergency services
- Example:
  Tennessee HELP Program

Safety Service Patrols

- Today's Safety Service Patrols:
  - Are a new generation of first responders
  - Provide valuable public safety and protection services
  - Help keep incident scenes safe
  - Clear incidents more quickly
  - Assist other emergency responders at incident scenes
- FHWA supports the expanded role of full-function service patrols and encourages metropolitan jurisdictions and their states to establish or upgrade Safety Service Patrols to full-function standards

Questions?

Paul. Jodoin@dot.gov

95 EXPRESS

95 Express Phase 1
Miami, Florida

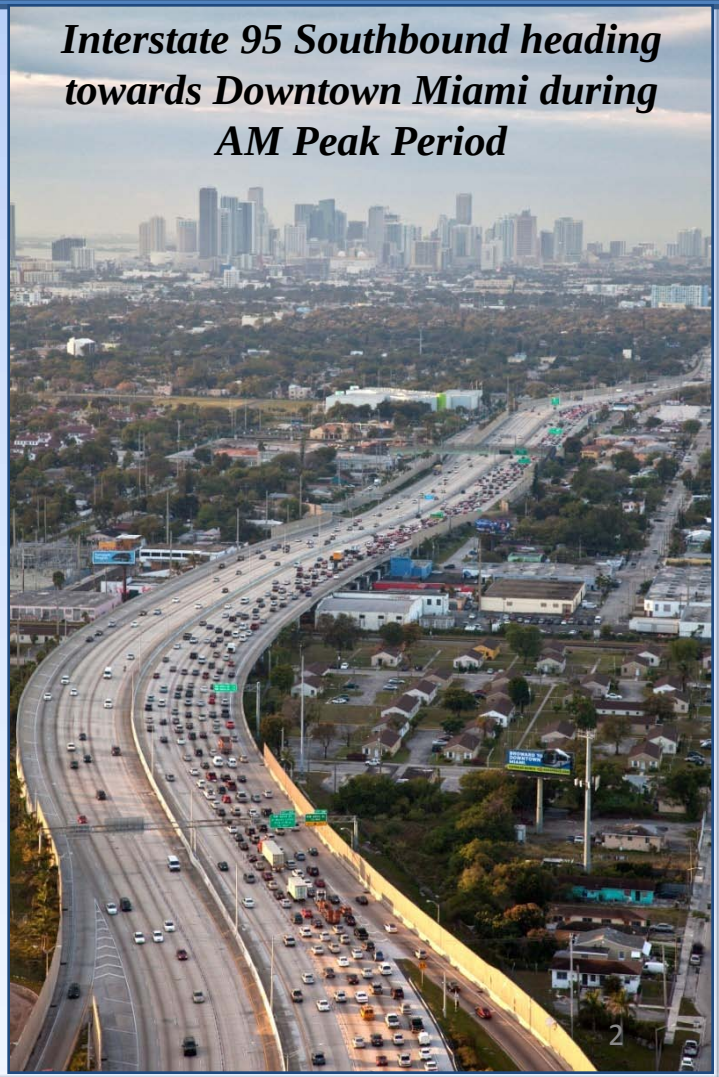
Federal Highway Administration Webinar
Incident Management for Managed Lanes, July 17, 2012

Javier Rodriguez, P.E., ITS Operations Engineer
FDOT District Six

Agenda

- FDOT District Six TMC
- Project Overview
- Incident Management Plan
  - Development
  - Resources
  - Procedures
- Results
- Questions

95 EXPRESS



Interstate 95 Southbound heading towards Downtown Miami during AM Peak Period

FDOT District Six TMC

Overview

- **Miami-Dade County**
  - 580.7 centerline miles
- **Monroe County**
  - 119.3 centerline miles
- **Miami is 7th Most Congested City in U.S.***
  - 2.5 million residents**
  - 9.9 million visitors in 2011***
- **Limited Access Facilities (ITS)**
  - I-75, I-95, I-195, I-395 & S.R. 826
- **Other Roadways (ITS)**
  - U.S.-1, Card Sound Road

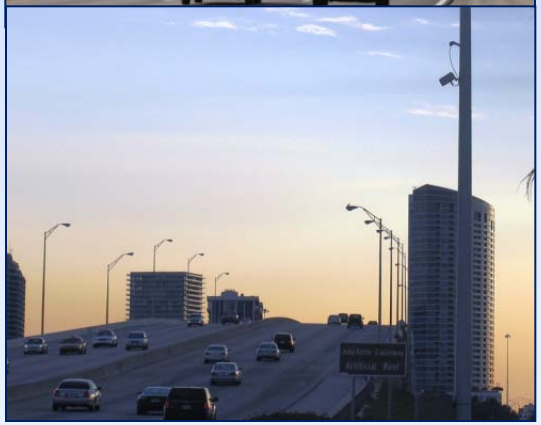
95 EXPRESS

* Texas Transportation Institute , Annual Urban Mobility Report (Rank in Total Annual Delay)
** 2010 U.S. Census Bureau
*** Greater Miami Convention & Visitors Bureau (to September 2011)

FDOT District Six TMC

Overview

- **Incident Management**
- **Traffic Management**
- **Traveler Information**
- **Miles Managed**
  - Limited Access: 53.5 centerline miles
  - Other Roadways: 212 centerline miles
- **Closed Circuit TV (CCTV) Cameras - 226**
- **Dynamic Message Signs - 99**
- **Detector Stations - 301**
- **Ramp Meters -** 22



District Six is fully ITS instrumented.

Project Overview

Scope

- **Phase 1 Complete**
  - Northbound Tolling – Dec. 2008
  - Southbound Tolling – Jan. 2010
- **HOV to HOT Conversion**
  - 1 HOV Lane ➡ 2 Express Lanes
- **Congestion-Priced Tolling**
- **Ramp Signaling**
- **Bus-Rapid Transit Service / HOV Enhancements**

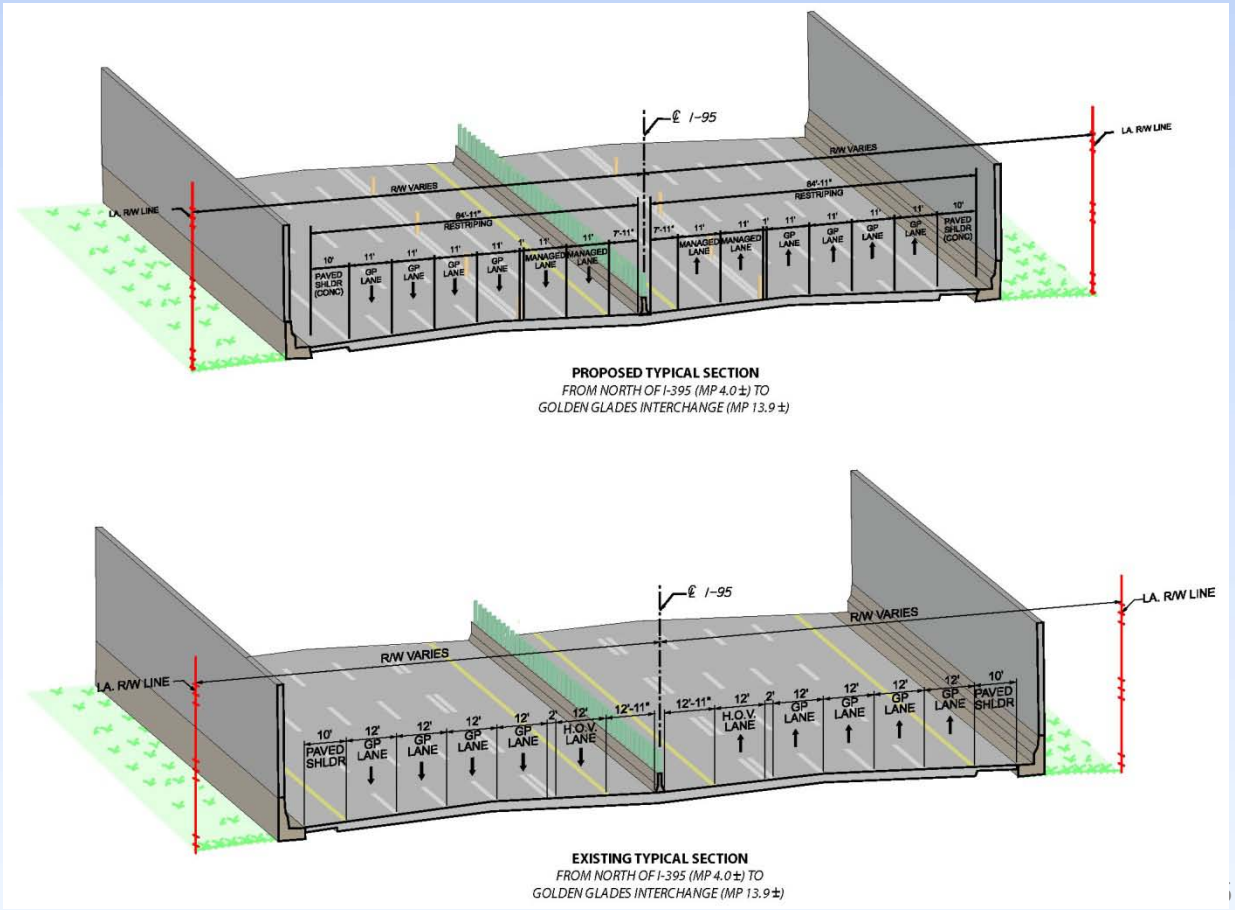
95 EXPRESS

Phase 1 is complete and Phase 2 will be completed during the next 2-3 years.

Project Overview

Design

- SIGNING AND MARKING CONCEPT



95 EXPRESS

Project Overview
Operations

- **Integrated with TMC Operations**
- **Expanded Procedures**
  - More Staff Responsibility = More Training
- **Higher Expectations for EL Operators**
  - Dedicated EL Operators = TMC Supervisors, Daily Report

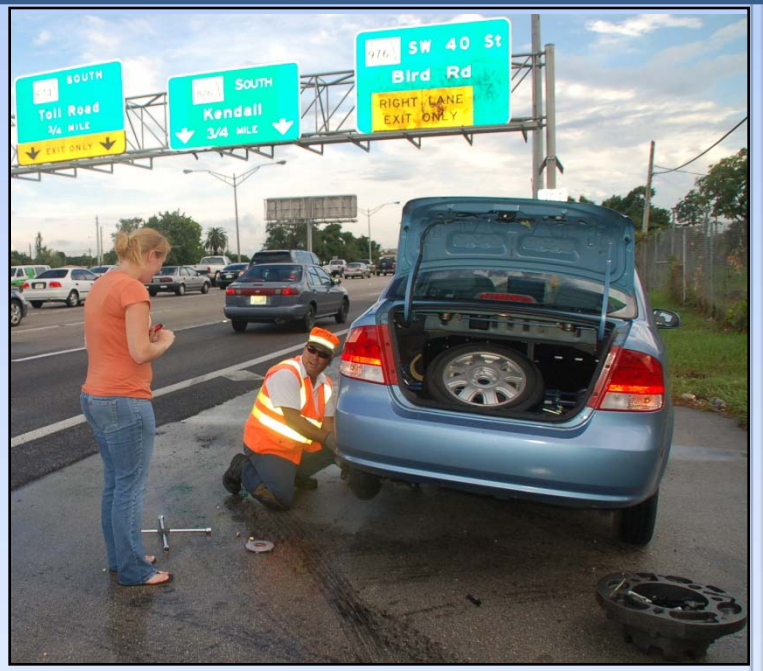
FDOT District Six TMC staff oversees all Incident Management efforts for 95 Express.

95 EXPRESS

Project Overview

Incident Management (Prior to 95 Express)

- **Road Rangers – 24/7 Service Patrols**
  - Tow Trucks and Pick Ups
- **Asset Maintenance Contractor**
- **TMC Manager Responsible for TIM**
  - Improved Internal/External Coordination with Partner Agencies



Prior to 95 Express, Road Rangers were the primary incident management services.

95 EXPRESS

Project Overview

Operational Performance – FY 10/11

- **EL Average Weekday Trips**
  - 60,000
- **EL Average Peak Period Speeds**
  - Northbound: 56 MPH
  - Southbound: 63 MPH
- **Events Managed**
  - EL: 1,496
  - LL: 13,277

Express Lanes serviced approximately 19.2 million vehicle trips last Fiscal Year.

95 EXPRESS

Incident Management Plan

Development

- Operational Risk Assessment
- Incident Management Workshops
- Follow-up Meetings with Agency Partners
  - Developed protocols/agreements
  - Developed quick clearance procedures
  - Video sharing opportunities
- Updated for Phase 1B (SB) Opening

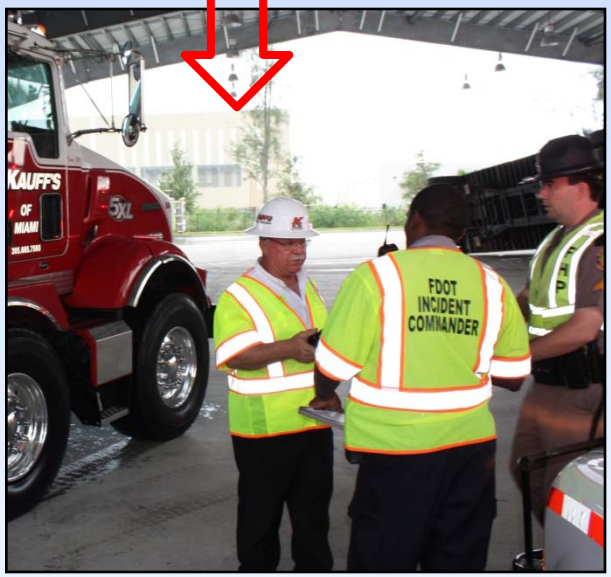
FDOT District Six Team held numerous workshops in preparation for project launch.

95 EXPRESS

Incident Management Plan

Resources

- TMC 95 Express Lane (EL) Operators
- Road Ranger Services
- Additional Incident Responders
- Outreach/Training



Incident management procedures developed at the TMC are executed on the field.

95 EXPRESS

Incident Management Plan

Resources

- **TMC 95 Express Lane Operators**
  - Specially Trained EL procedures
  - Central Contact Point for Agency Coordination & Dispatchers for Incident Response Operators
  - Dedicated radio channel on the existing 470 MHz radio system

Express Lanes Operators needed to evolve from traffic managers to travel demand managers.

95 EXPRESS

Incident Management Plan

Resources

- **Additional Incident Response**
  - Additional FHP Trooper (6am – 10pm, M-F)
  - Incident Response Operators (5:30am to 9:30pm, M-F)
    - Coordinates FDOT resources
    - Specially Trained
  - Incident Response Vehicles
    - Specially Equipped IRV Truck
    - Flatbed Tow Truck

Incident Managers work together to clear event along northbound I-95.

95 EXPRESS

Incident Management Plan

Resources

- Outreach & Training
  - One-on-One Meetings
  - Post Incident Analysis
  - Multi-Agency Training; MOT, Procedures
  - Recurring Effort

95 EXPRESS

Incident Management Plan

Procedures

- **Road Rangers**
  - FHP support for Road Rangers to cross double white lines and delineators for incidents
- **Disabled Vehicles**
  - Quickly/safely relocated to designated area
- **Abandoned Vehicles**
  - Expedite logging the initial discovery
  - FHP Trooper “sweeps” the 95 EL daily

Procedures were developed to ensure efficiency and safety on the field.

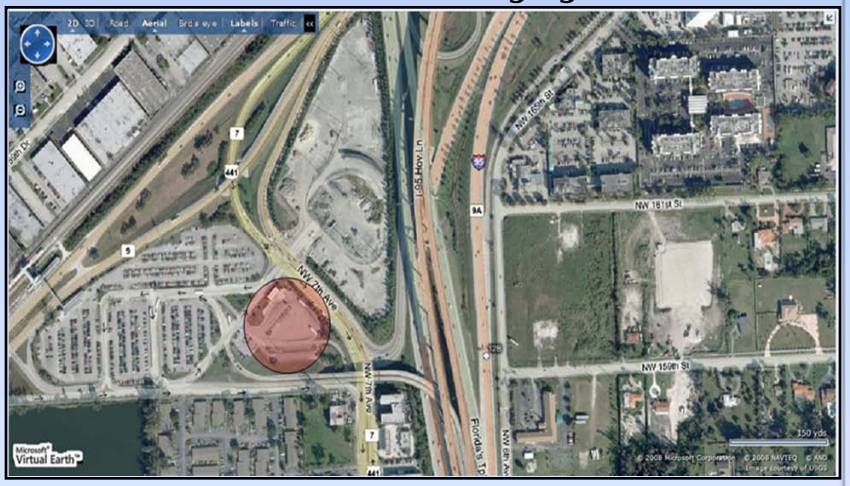
95 EXPRESS

Incident Management Plan

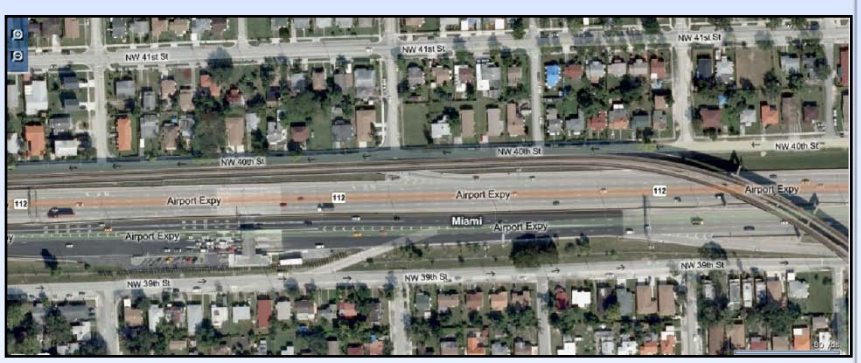
Procedures

- **Staging**
  - Crash Investigations
  - Relocated to strategic staging locations
    - 5AM – 1 PM: Park & Ride Lot, 95 Street SB On-Ramp
    - 1PM – 9PM: Park & Ride Lot, SR 112 Toll Plaza
    - 9PM – 5AM: Park & Ride Lot

Park & Ride Lot Staging Area



SR 112 Toll Plaza Staging Area

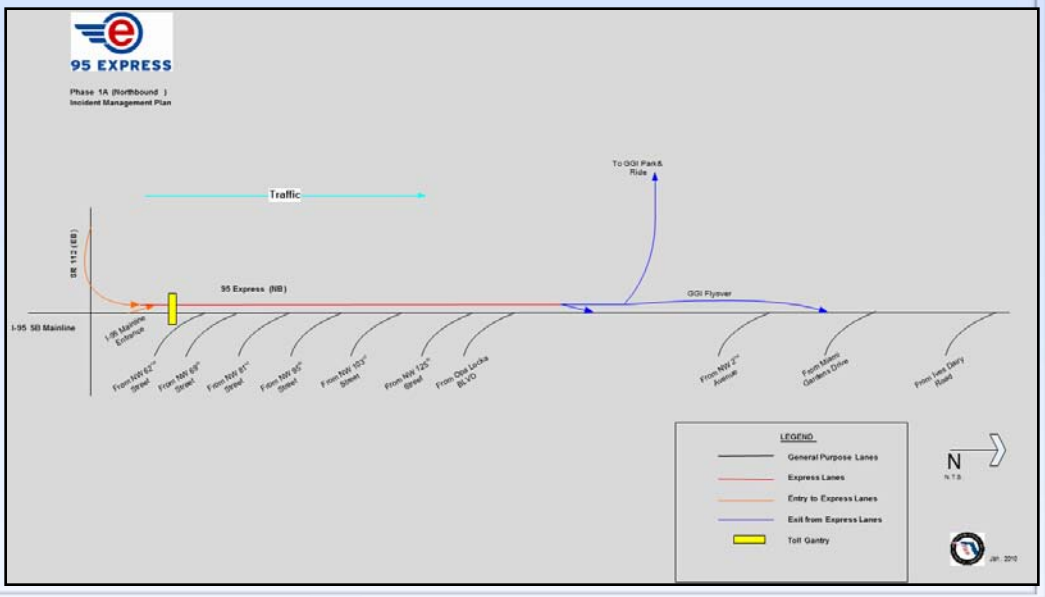


95 EXPRESS

Incident Management Plan

Procedures

- **Closure Procedures**
  - Less than 30 minutes – Post “Closed”
  - 30 to 60 minutes – Road Rangers
  - 60 minutes plus – Asset Maintenance Contractor
  - DMS Strategies
  - MOT Resources

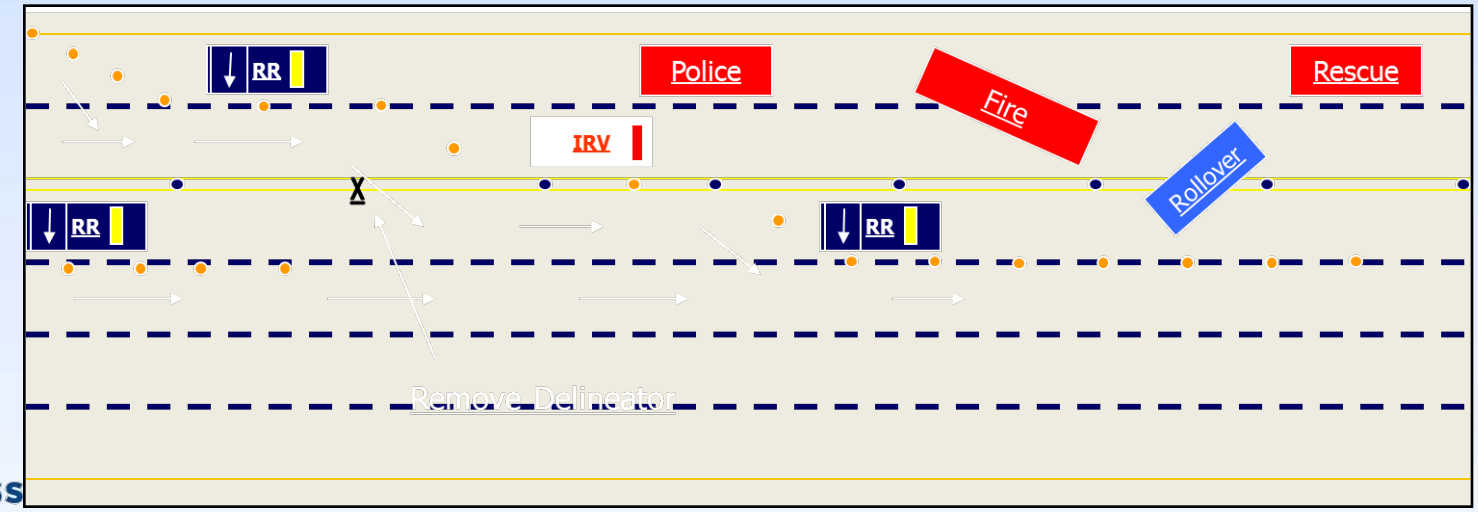


95 EXPRESS

Incident Management Plan

Procedures

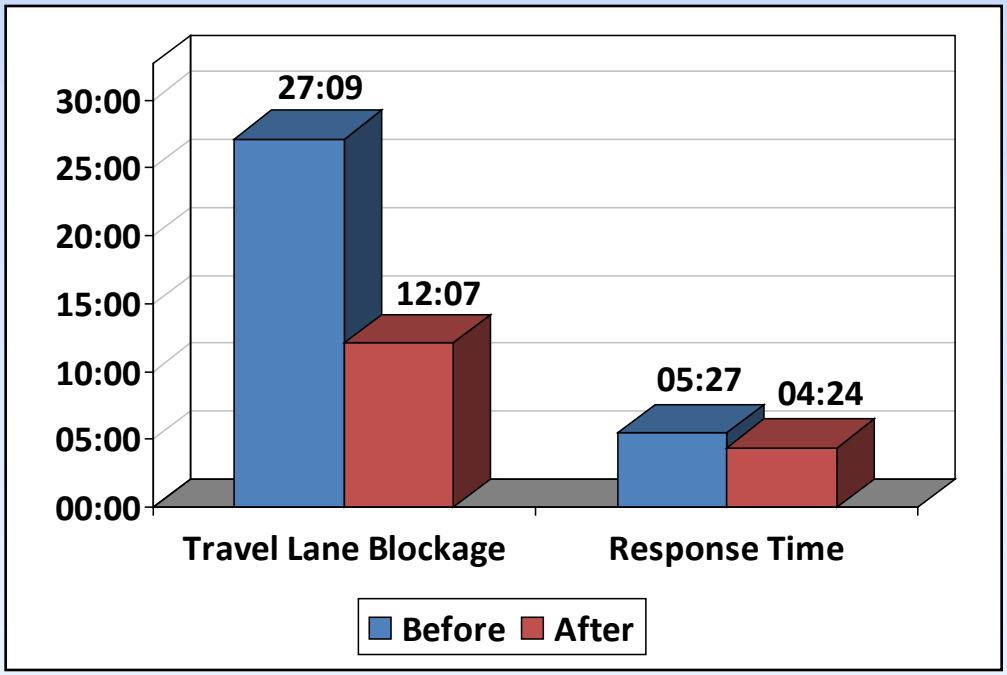
- Developed New MOT Plans
  - Within EL
  - Redirection
  - Buses



95 EXPRESS

Results

- *Initial Impacts
  - Travel Lane Blockage ↓55%
  - Response Times ↓19%



* Data from 11/24/2008 → June 30th 2009

95 EXPRESS

Results – *FY 10/11*

- **95 Express Closed due to Incidents 1.3% of time**
- **Travel Lanes Blockage Duration**
  - Express Lanes: 19 minutes
  - District wide: 30 minutes

The Incident Management Plan has contributed to the overall success of 95 Express.

95 EXPRESS

Questions

"Motorists and Motorcycles Share the Road"

Thank you,

Javier Rodriguez, PE
Intelligent Transportation Systems Operations Engineer
Florida Department of Transportation District Six
javier.rodriguez2@dot.state.fl.us
(305) 470-5757

www.95express.com

95 EXPRESS

SR 167 HOT Lanes

Paula J. Hammond, P.E.
Secretary

Steve Reinmuth
Chief of Staff

Todd S. Merkens
Toll Development Engineer

Tyler Patterson
Toll Operations Engineer

FHWA Webinar: Incident Management for Managed Lanes
July 17, 2012

Introduction

HOT lanes …

- are carpool lanes that also are open to other users who pay a toll
- use toll rates that adjust automatically according to traffic volumes to keep HOT lane traffic flowing at 45 mph or faster

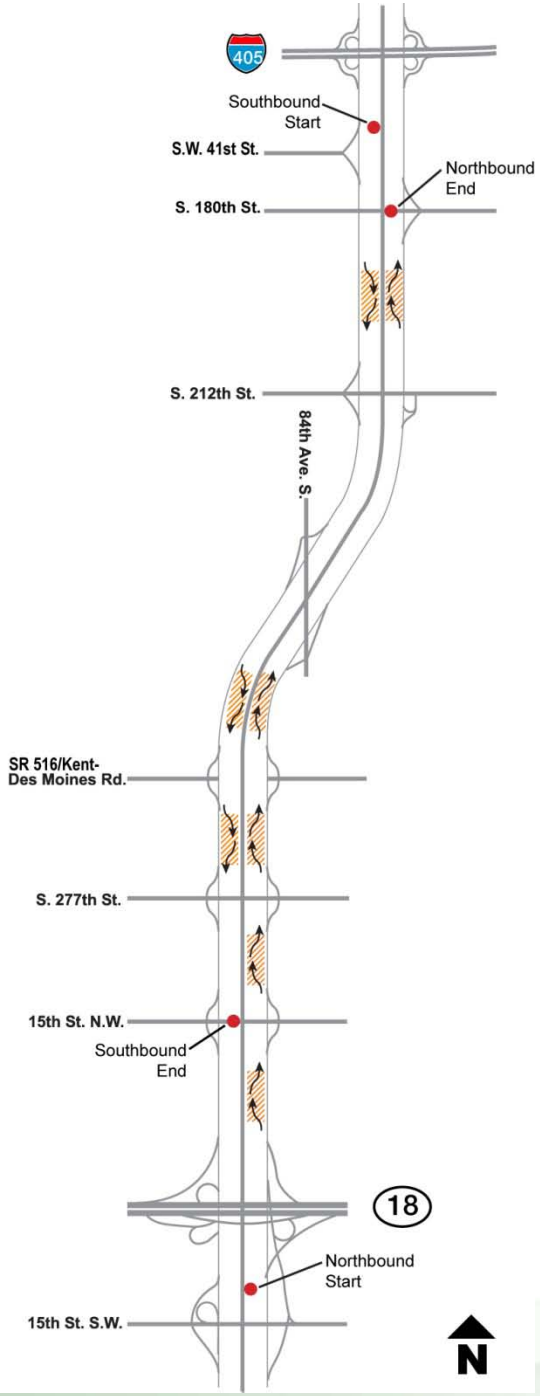
Why HOT lanes on SR 167?

- Highly congested route
- Underutilized HOV lanes
- Ability to provide drivers a new choice

Opened: May 3, 2008

SR 167 HOT Lanes

- Lanes operate between 5 AM and 7 PM
- Lanes open to all, including solo drivers 7 PM– 5AM
- Revenue helps pay for operations and maintenance, increased enforcement, and added incident response.
- State Patrol enforces HOT lane rules



Washington State Department of Transportation

SR 167 HOT Lane Features

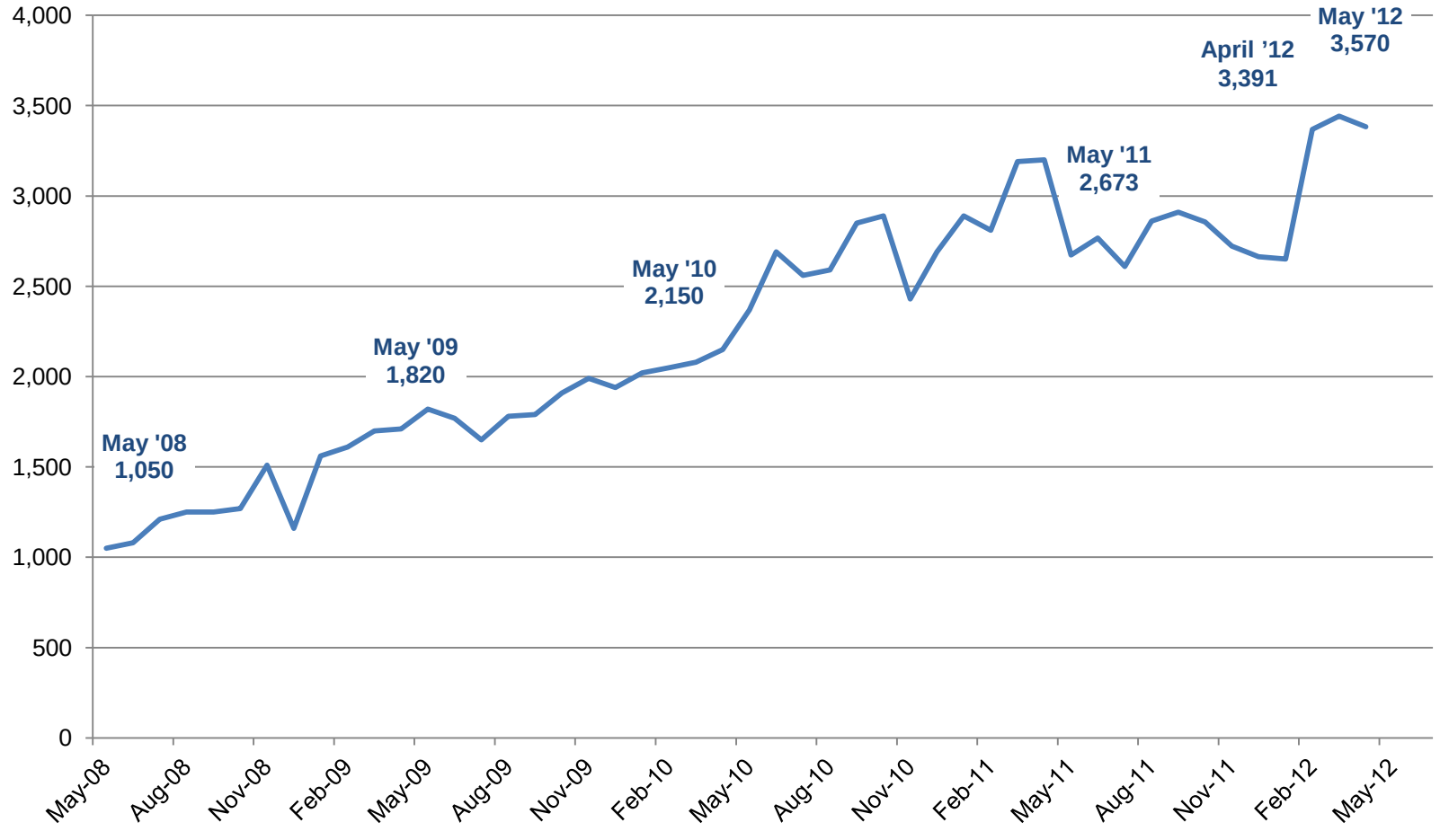
- Free to buses, 2+ carpools and motorcycles
- Solo drivers pay a single toll to travel any distance on 10-mile route
    - AVI/Tag payment only
- Single HOT lane in each direction
- HOT lane separated from GP lanes by double-white line, which is illegal to cross
- Electronic signs indicate the toll rate before each entry point
- 10 access points

Pre-HOT lanes:

SR 167 had two general purpose lanes and one HOV lane.

Post HOT lanes: *HOV lanes were converted to a single HOT lane in each direction.*

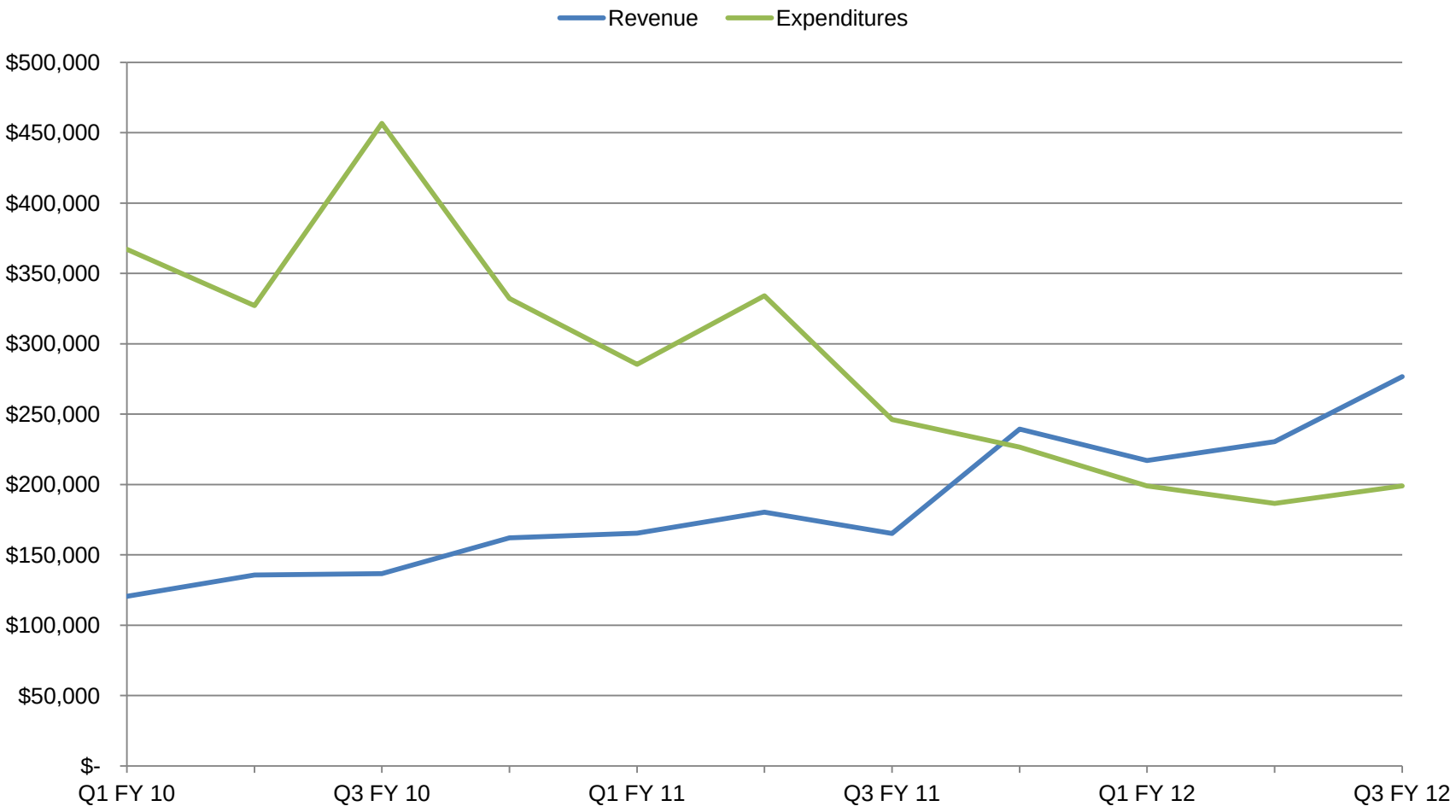
HOT Lanes Usage Continues to Grow



Average Toll Trips Per Weekday (Tuesday – Thursday)

Washington State Department of Transportation

Quarterly Revenue & Expenditures



Traffic Management Center

- Monitors live traffic conditions via cameras
- Identifies incidents and blockages
- Coordinates IRT and WSP response efforts
- Continue to fund 1 FTE from toll revenue

Incident Response Teams

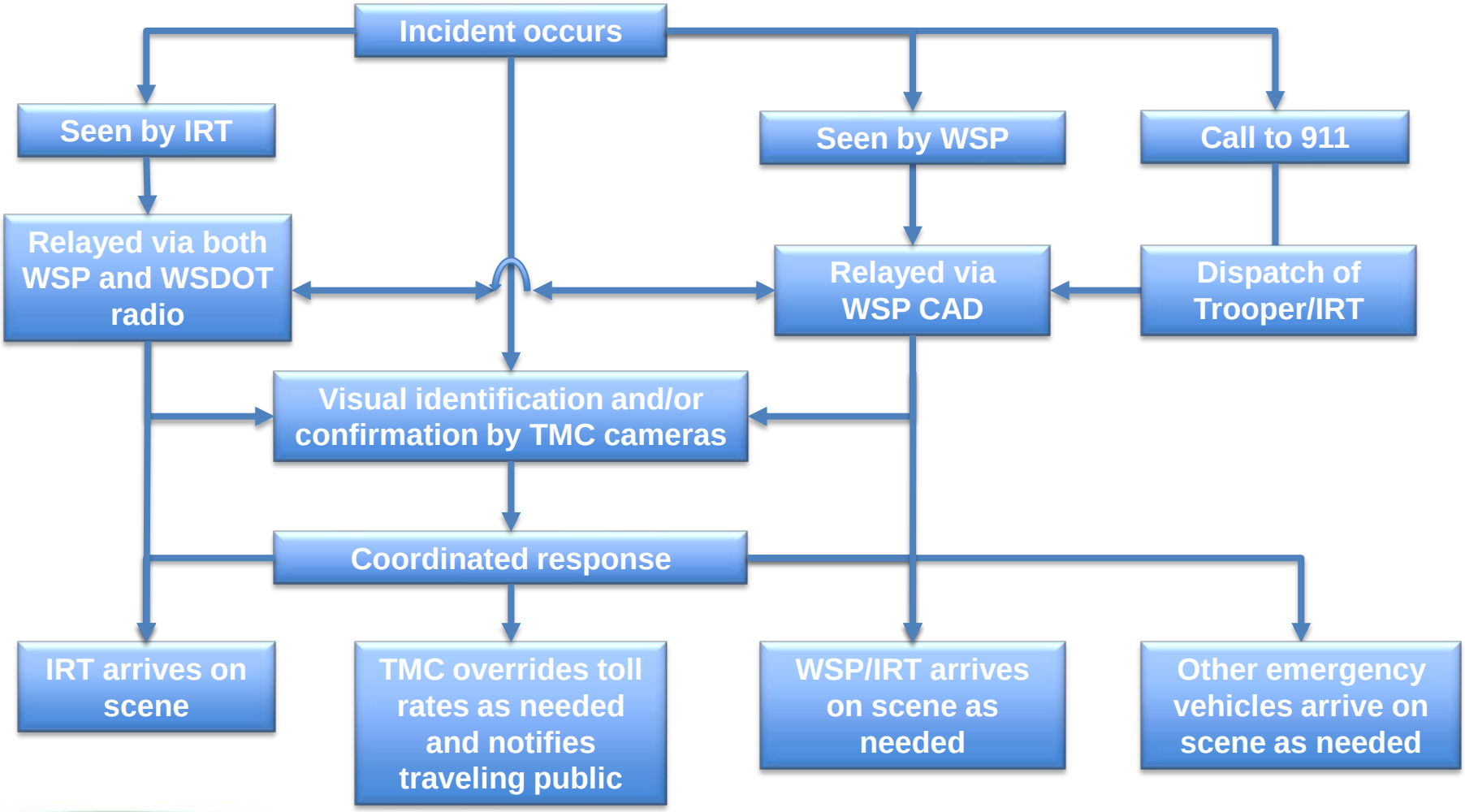
- Additional teams added to keep traffic clear and to response times low, for vehicles in all lanes
- Use of smaller trucks and split shifts for cost savings
  - Opened with 2 FTE for IRT operations on SR 167
  - Currently funding 1 FTE for SR 167 IRT operations

	2008	2009	2010	2011
Monthly Incidents Responded To	130	195	180	180
Average response time (in minutes)	10.3	9.3	9.9	8.9

Washington State Patrol

- Extra patrols in place for HOT lane enforcement
- Visual enforcement
- Reduced from initial all day extra enforcement to peak-hour only for cost savings
  - First six weeks: 540 hours/month
  - Through September 2010: 240 hours/month
  - Currently: 130 hours/month

Incident Response Flow Diagram



Questions?

For more information regarding the SR 167 HOT Lanes, please contact:

Tyler Patterson
Toll Operations
206-716-1134 or PatterT@wsdot.wa.gov

Todd S. Merkens
Toll Development
20-716-1151 or MerkeTo@wsdot.wa.gov

Incident Management and Managed Lanes

Brian Kary
Minnesota Department of Transportation
Freeway Operations Engineer

Regional Transportation Management Center

- Shared Operations Center
  - MnDOT Traffic Operations
  - MnDOT Maintenance Dispatch
  - State Patrol Dispatch
- 400 miles of freeway management system
- Backbone for Managed Lanes system

Freeway Incident Response Safety Team

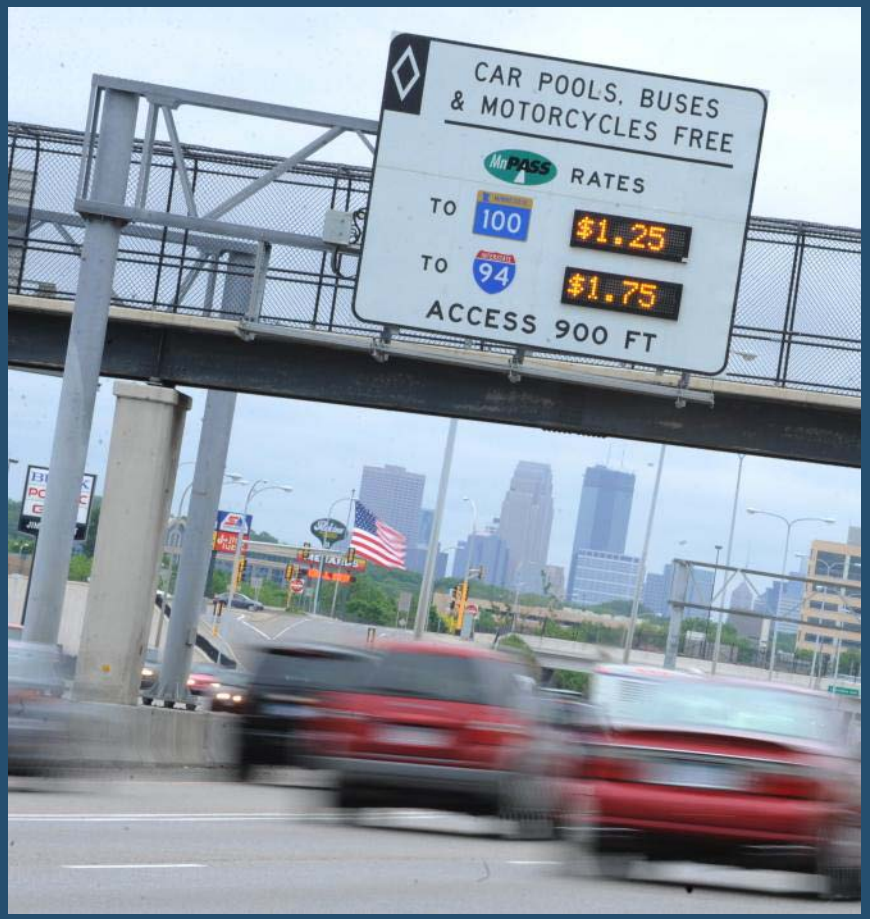
- Monday – Friday
- 5:30 AM to 7:30 PM
- Limited weekend coverage
- 20 Drivers, 2 Shifts
- 12 Trucks
- 250 freeway miles

- "Open Roads" – A statewide policy between MNDOT and State Patrol to make re-opening roads & lanes a priority.
- "Quick Clearance" – A change in state law 169.041, applies to Metro district only, gives MSP & MNDOT additional legal force to clear obstructions promptly.

I-94 Truck Rollover

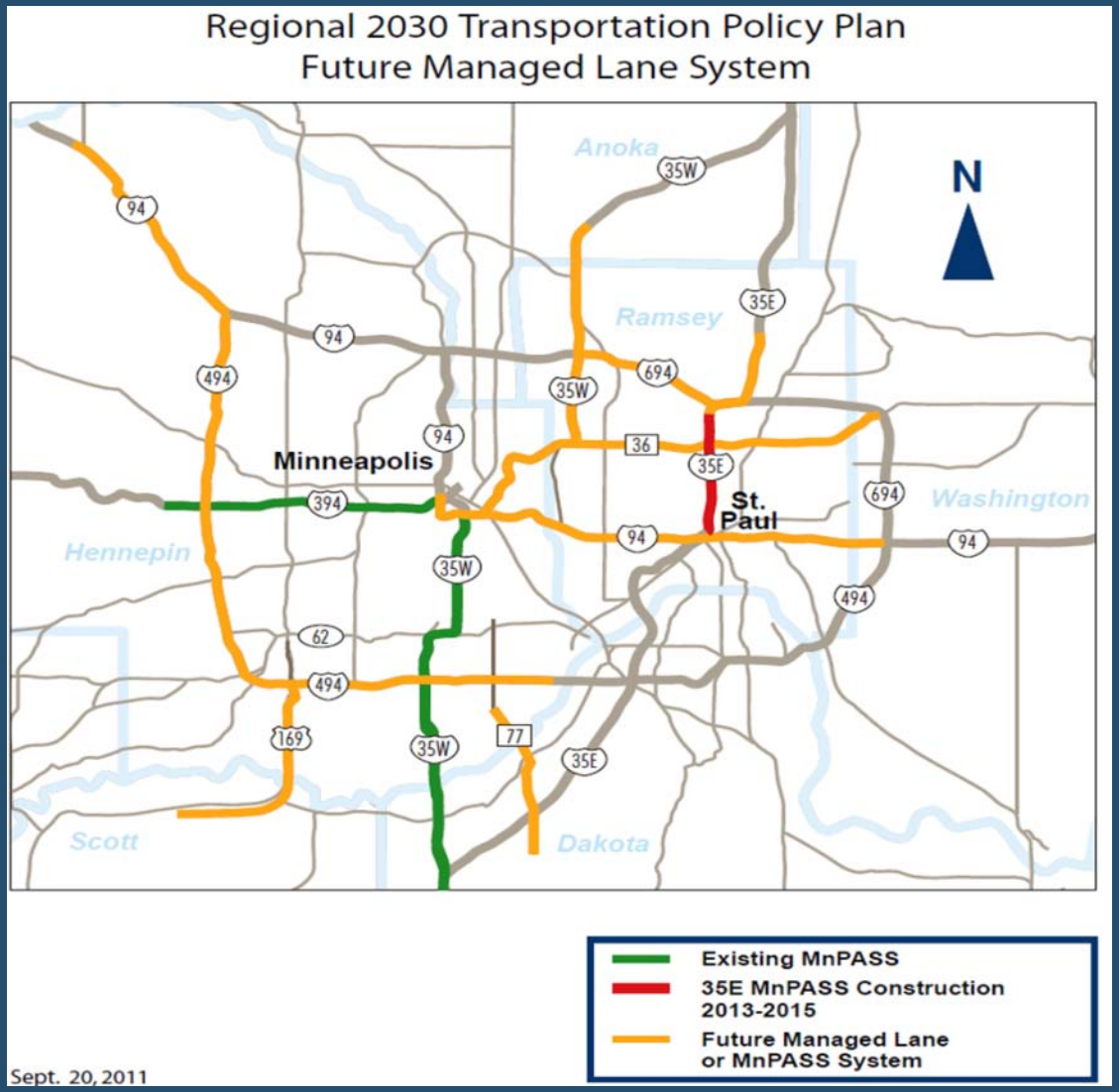
Congestion Pricing in Minnesota

- High Occupancy Toll Lanes
- Provide for faster, safer and more reliable travel options
- Travel benefits for transit, carpoolers, motorcycles and MnPASS customers



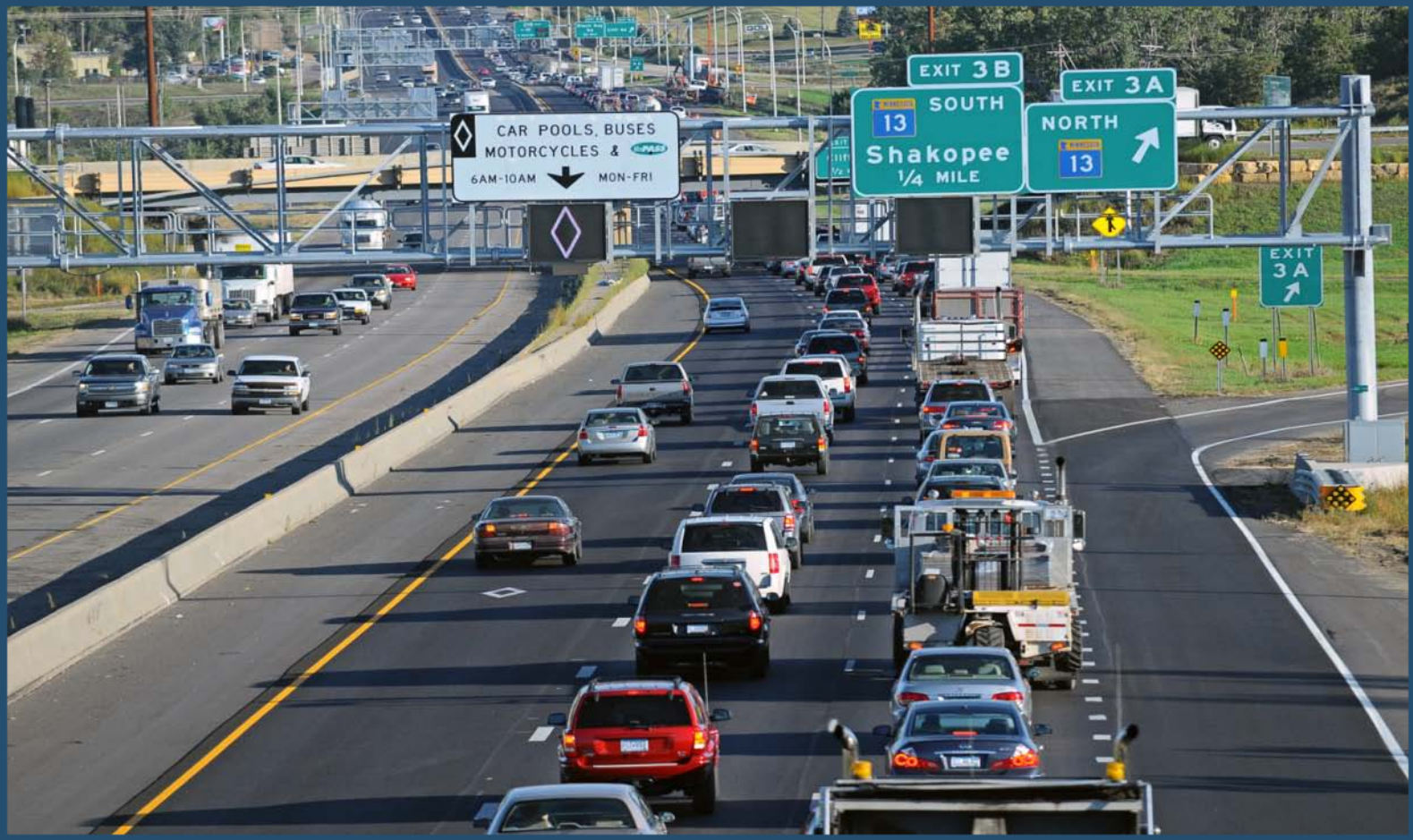
MnPASS System

- Opened 11 miles HOT lane on I-394 in 2005
- Opened 16 mile HOT lane on I-35W in 2009/2010
- Planned 4 mile HOT lane on I-35E in 2015



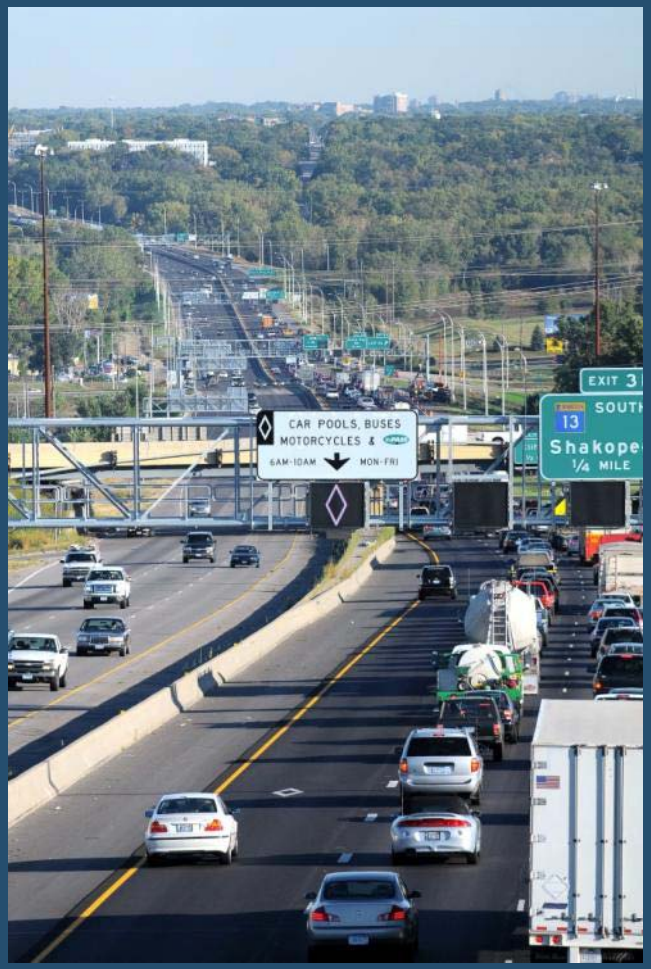
MnPASS Enforcement

I-35W Smart Lanes



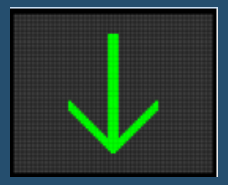
I-35W Smart Lanes

- Intelligent Lane Control Signals (ILCS) located every ½ mile over every lane.
- A total of 187 ILCS.
- ILCS are a 4ft x 5ft full color matrix signs.
- Use of the ILCS is for incident management , speed harmonization and priced dynamic shoulder lane.



ILCS Sign Options

Blank – default



Green – Lane Open

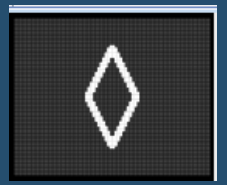
Flashing Yellow – Caution

Red X – Closed

Yellow X – Closed Ahead

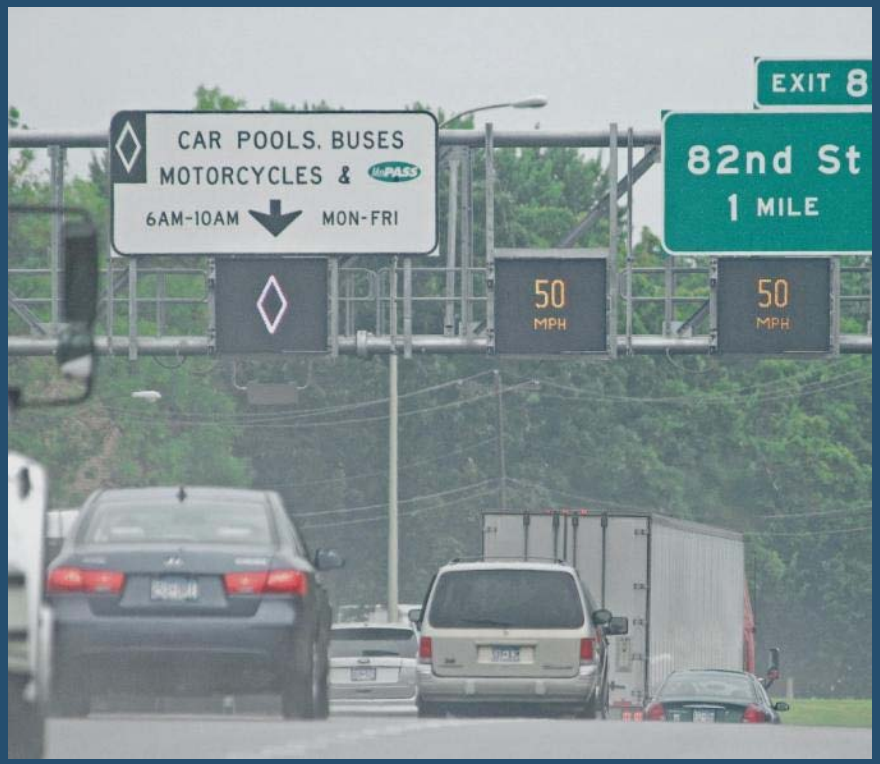
Merge

Speed Limit



White Diamond

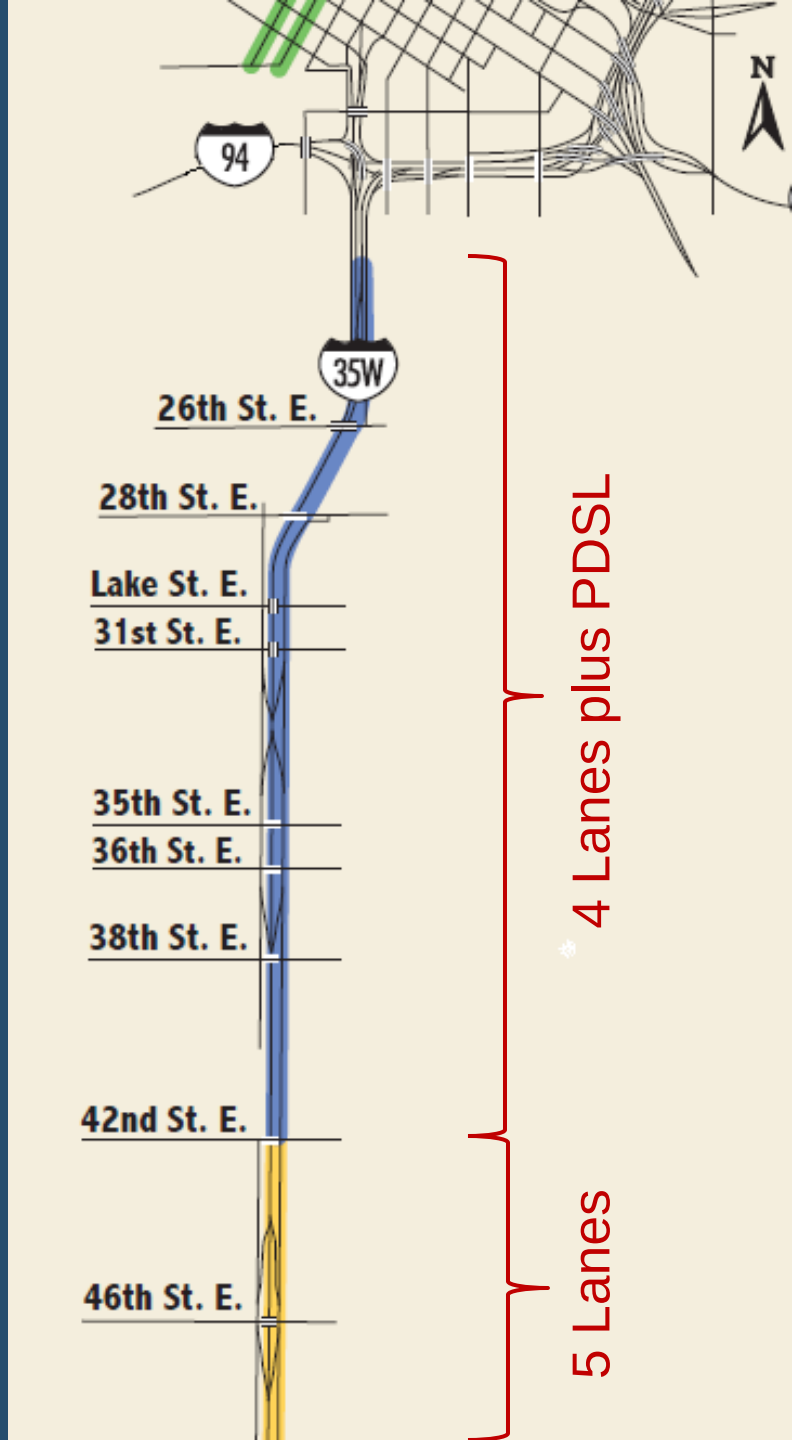
Variable Speed Limits



- Advisory Only
- Detection measures traffic speeds downstream
- Speeds are posted up to 1 ½ miles upstream

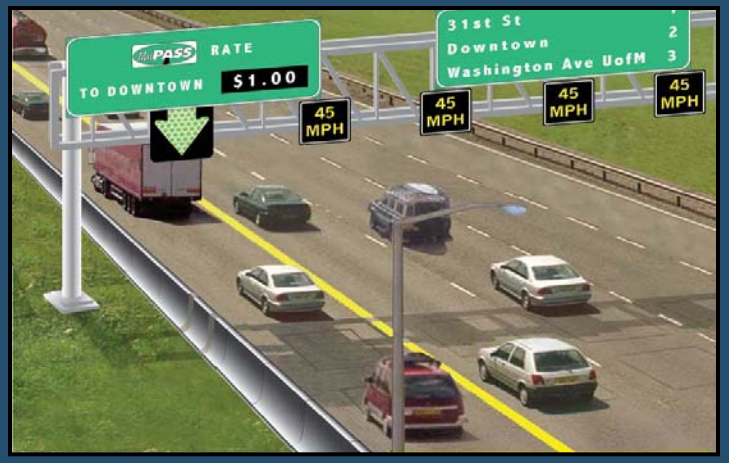
Priced Dynamic Shoulder Lane (PDSL)

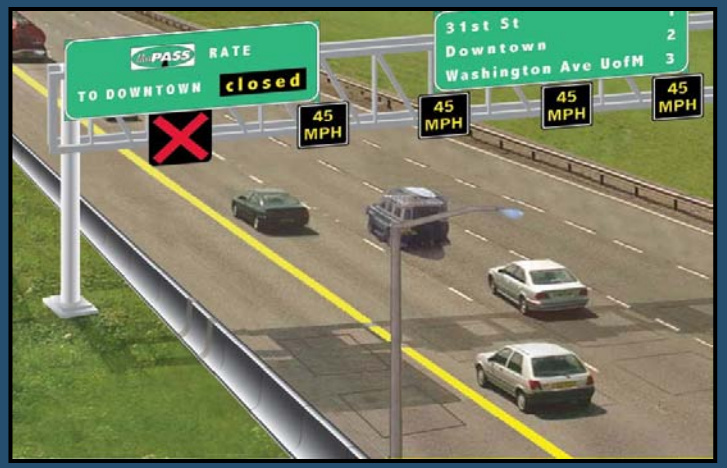
- 3 Mile Segment on NB 35W
- Maintains existing 4 lanes with an added PDSL Lane
- Effectively extends the MnPASS lane to downtown Minneapolis using existing road space



I-35W PDSL Operations

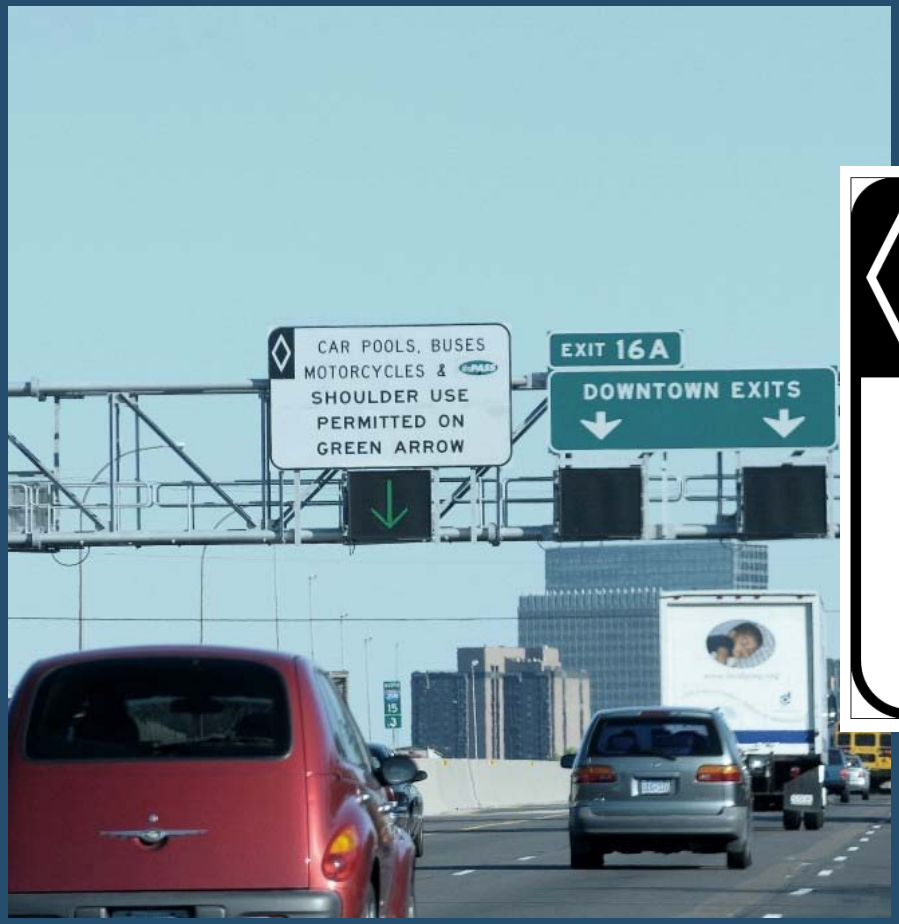
- Monday – Friday
  - 6:00 AM to 7:00 PM
- Can be open on weekends or evenings for special events, weather or incidents.





I-35W PDSL Cross Section

I-35W MnPASS: Regulatory Signing



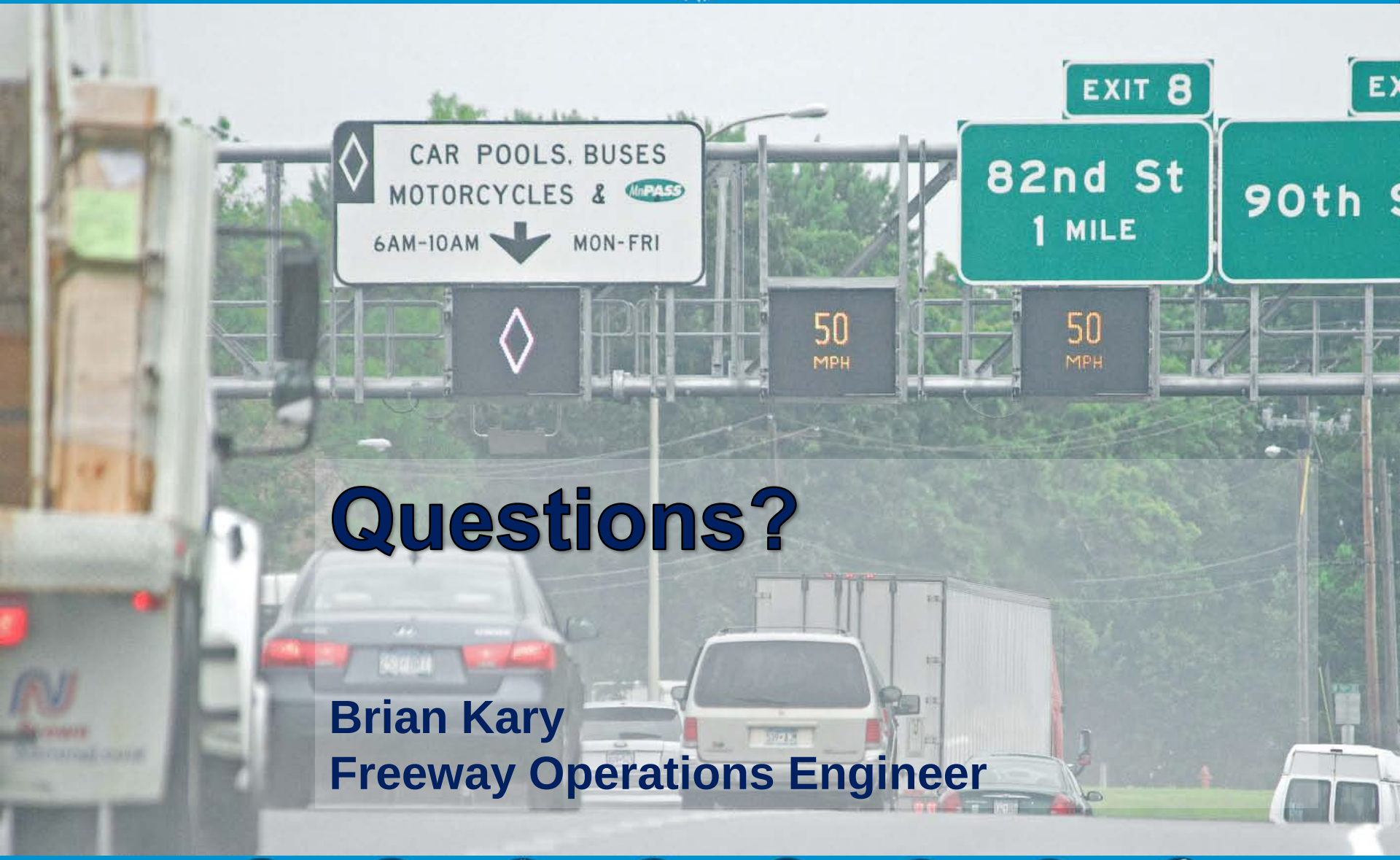
Emergency Pull-Offs

Why we have them:

- Refuge for disabled vehicles and crashes
- Enforcement areas
- Co-located with Maintenance pull-offs

Design considerations:

- Goal to locate every ½ mile
- 14 ft width, min 200 ft long



Questions?

Brian Kary
Freeway Operations Engineer