# Smarter Work Zones Webinar Series

## Webinar #5: Smarter Work Zones – Program-Based Project Coordination

Martha Kapitanov, Clarence Dickerson, and Stan Suchan

November 2, 2015
1:00-2:30pm EST

*Efficiency through technology and collaboration*


innovation ingenuity imagination invention
Every Day Counts

U.S. Department of Transportation
Federal Highway Administration

# Smarter Work Zones

## Introduction and Today's Speakers

# Today's Speakers

**Martha C. Kapitanov**
Transportation Specialist
FHWA Office of Operations

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District Department of Transportation

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Project Development & Evaluation Manager
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# Smarter Work Zones Webinar Series

- This is the fifth in a series of bi-weekly SWZ webinars
- Topics based on **what matters most to you!**
- Webinars include:
  - Previously Recorded:
    - Webinar #1: A Comprehensive Overview of the SWZ Initiative (9/9/2015)
      - https://www.workzonesafety.org/swz/project_coordination/training
    - Webinar #2: Implementing Technology Application Solutions (9/29/2015)
      - https://www.workzonesafety.org/swz/technology_application/training
    - Webinar #3: SWZ Corridor-Based Project Coordination (10/15/15)
      - https://www.workzonesafety.org/swz/project_coordination/training
    - Webinar #4: SWZ Technology Showcase – Queue Warning Systems (10/26/15)
      - https://www.workzonesafety.org/swz/technology_application/training
  - Coming Up:

| | | |
|---|---|---|
| **November** | 11/12 | Webinar #6: TA Case Studies: Variable Speed Limit and Dynamic Merge |
| **December** | 12/2 | Webinar #7: Work Zone Project Coordination Guide and Examples |
| | 12/15 | Webinar #8: TA/PC Showcase: Corridor Traffic Management |

**For additional information go to:**
**https://www.workzonesafety.org/SWZ/main**

# Purpose of Today's Webinar

***Provide a comprehensive overview of program-based project coordination and discuss real-world examples of successful program-based SWZ project coordination strategies.***

**Topics include:**

1. SWZ Project Coordination Initiative
   - Show how the SWZ Project Coordination initiative can be used by agencies to enhance their current work zone management practices
2. Program-Based Project Coordination Examples
   - Provide real-world examples of successful program-based SWZ project coordination strategies which resulted in:
     - Minimized travel delays
     - Enhanced safety for all road users and workers
     - Maintenance of business and resident access

# Smarter Work Zones

## Project Coordination Initiative

# What are Smarter Work Zones (SWZ)?

*Innovative strategies designed to optimize work zone safety and mobility*

- Policies and practices used to incrementally and continuously improve WZ operations
- Tools to reduce WZ crashes and delays
- Tools to enhance WZ management strategies

# Two Identified SWZ Initiatives:

## Project Coordination

Coordination within a single project and/or among multiple projects within a corridor, network, or region, and possibly across agency jurisdictions

*Today's Focus of Discussion*

## Technology Application

Deployment of Intelligent Transportation Systems (ITS) for dynamic management of work zone traffic impacts, such as queue and speed management

# Project Coordination – What is it?

Coordination within a single project and/or among multiple projects within a corridor, network, or region, and possibly across agency jurisdictions to minimize work zone traffic impacts.

Benefits:

- *For transportation agencies include*:
  - Ability to reduce and manage traffic disruptions from road work
  - Earlier identification of project impacts
  - Dynamic adjustments to schedule
  - Improved communications within and cross agencies
  - Cost savings
- *From the driver's perspective*:
  - Fewer numbers of work zones and street cuts
  - Better quality road surfaces
  - Increased customer satisfaction

Source: FHWA

# SWZ Project Coordination Goals:

## Goal 1

By December 2016, 25 State DOTs have incorporated work zone project coordination strategies into agency documentation and business processes.

**What does this mean?**

- Review of:
  - Existing PC-related policies/practices to identify strengths and weaknesses
  - Other agencies' PC-related best practices
- Identify and implement of SWZ PC strategies
- Develop agency documentation and business processes

# SWZ Project Coordination Goals:

## Goal 2

By December 2016, 5 State DOTs have volunteered to pilot the Work Zone Implementation Strategies Estimator (WISE) software.

**What does this mean?**

- Use WISE tool to optimize project schedules and analyze mitigation strategies to minimize work zone traffic impacts
- Pilot, evaluate, suggest enhancements, and demonstrate WISE's value for work zone management

# Smarter Work Zones

## Program-Based Project Coordination Examples

1. DDOT's District-wide Project Coordination Tool
2. WSDOT's Regional Project Coordination

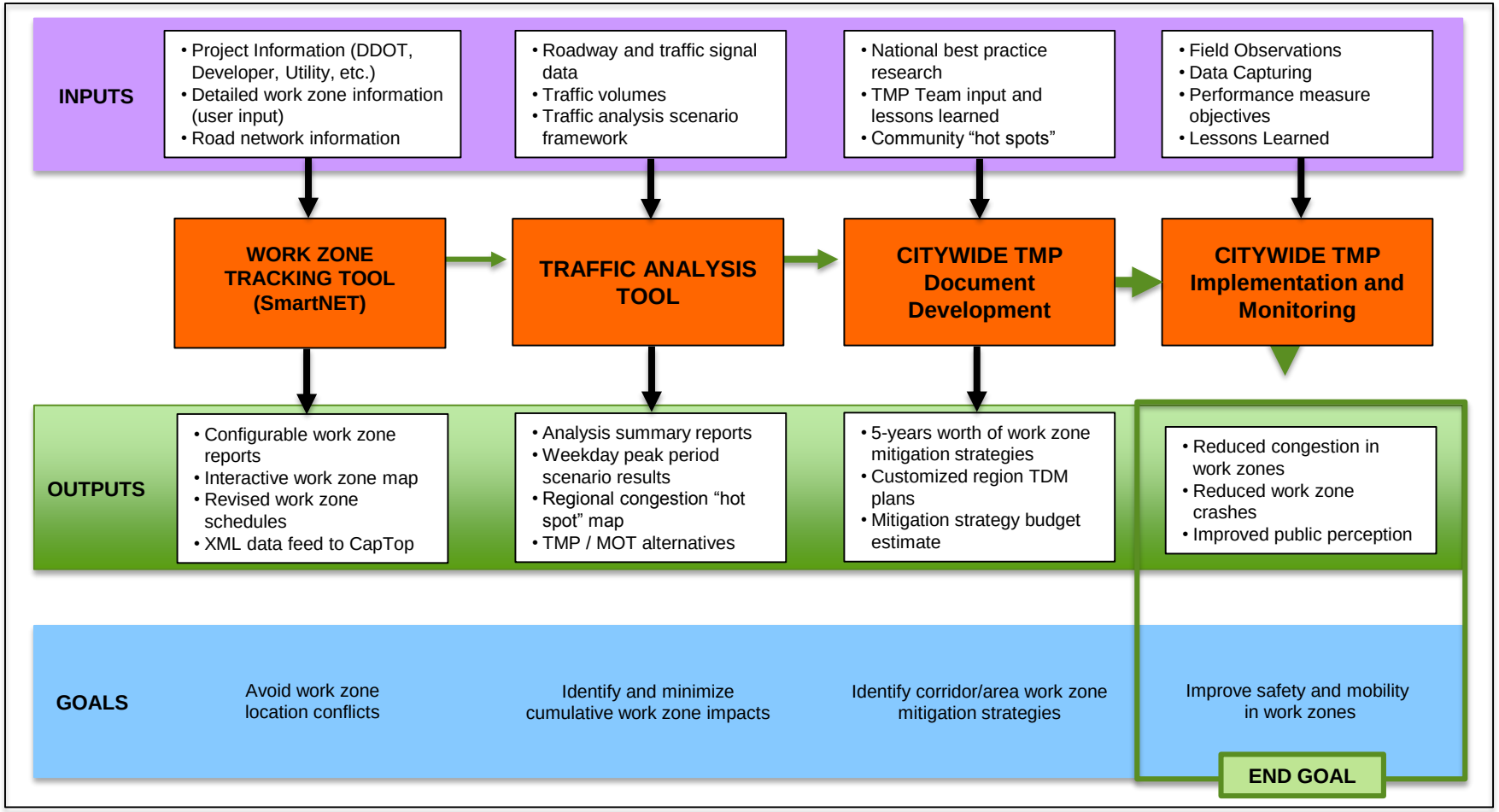
# Example #1: District-wide Project Coordination Tool

- Complex transportation network
- Multiple projects along New York Avenue, the Nationals Park area, and the convention center were causing impacts for travelers
- Coordination efforts to determine cumulative traffic impacts of these activities and identification of conflicts
- A tool could help streamline and enhance the project coordination process by integrating resources into a single system
- Led to the development of the Work Zone Project Management System (WZPMS)

# Work Zone Project Management System (WZPMS) (1 of 2)

- Made up of the following components:
  - Work Zone Tracking tool
  - Traffic Analysis tool
  - Cumulative Transportation Management Planning (TMP) reporting
  - Implementation and Monitoring program
  - Database for roadway, developer, and utility construction projects
- Iterative process is used to identify conflicts

# Work Zone Project Management System (WZPMS) (2 of 2)




Source: DDOT

# Work Zone Tracking Tool (1 of 2)

- All DDOT road construction projects within public right-of-way are entered
- Scheduled to begin within 3 months and 5 years in the future
- Special events are also entered (i.e., annual marathons or presidential inaugurations)
- Input analyzed as soon as entered to identify conflicts
- Can email project engineers to alert to potential conflicts between projects

Source: DDOT

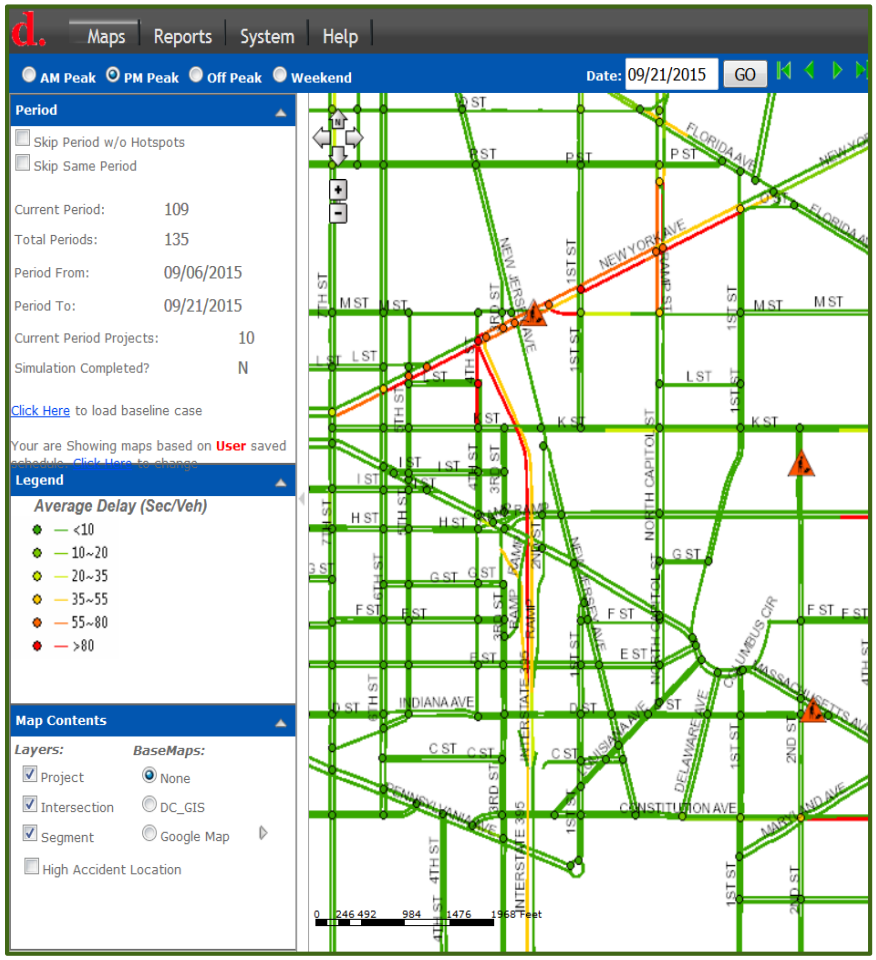
# Work Zone Tracking Tool (2 of 2)

- All utility and developer construction projects are permitted, which are placed in the DDOT Transportation Online Permitting System (TOPS) which are drawn into the database


Source: DDOT

# Traffic Analysis Tool (1 of 2)

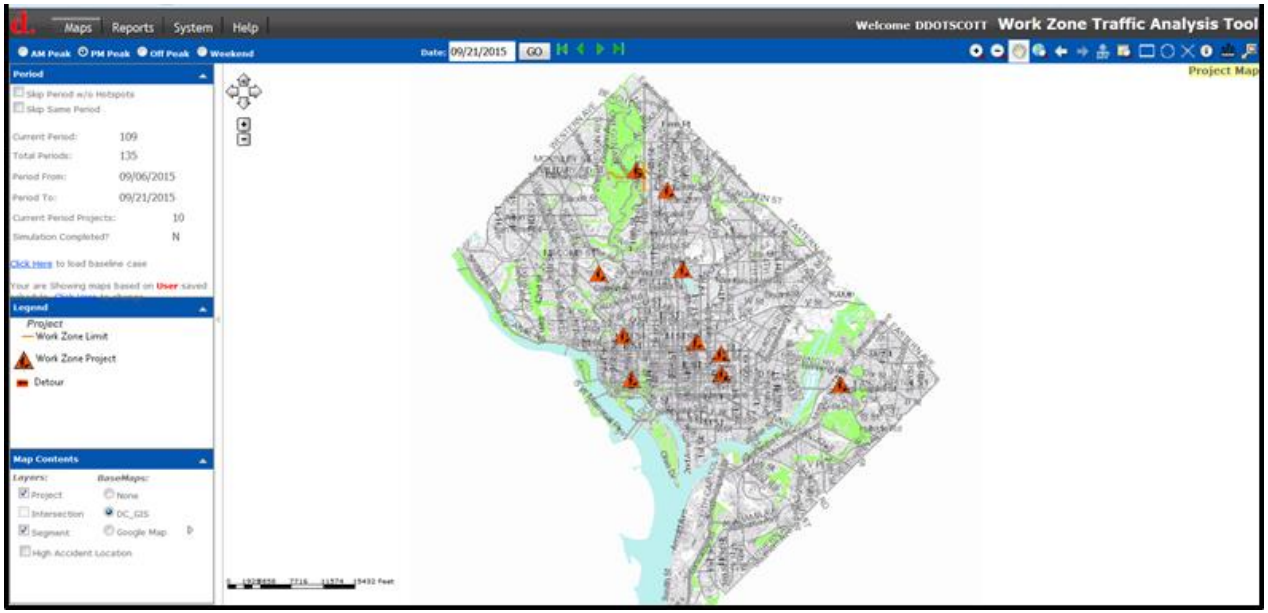
- Conflicts identified in Work Zone Tracking Tool are examined to quantify traffic impacts related to closures and trip diversions
- Cumulative traffic impacts are analyzed daily to generate outputs, including a series of level of service maps
- Can generate maps to look at any day and time period within the next 5 years
  - Weekdays or weekends
  - Average delay for an individual work zone
  - Hot spot areas where multiple work zones severely increase delay and congestion levels




Source: DDOT

# Traffic Analysis Tool (2 of 2)

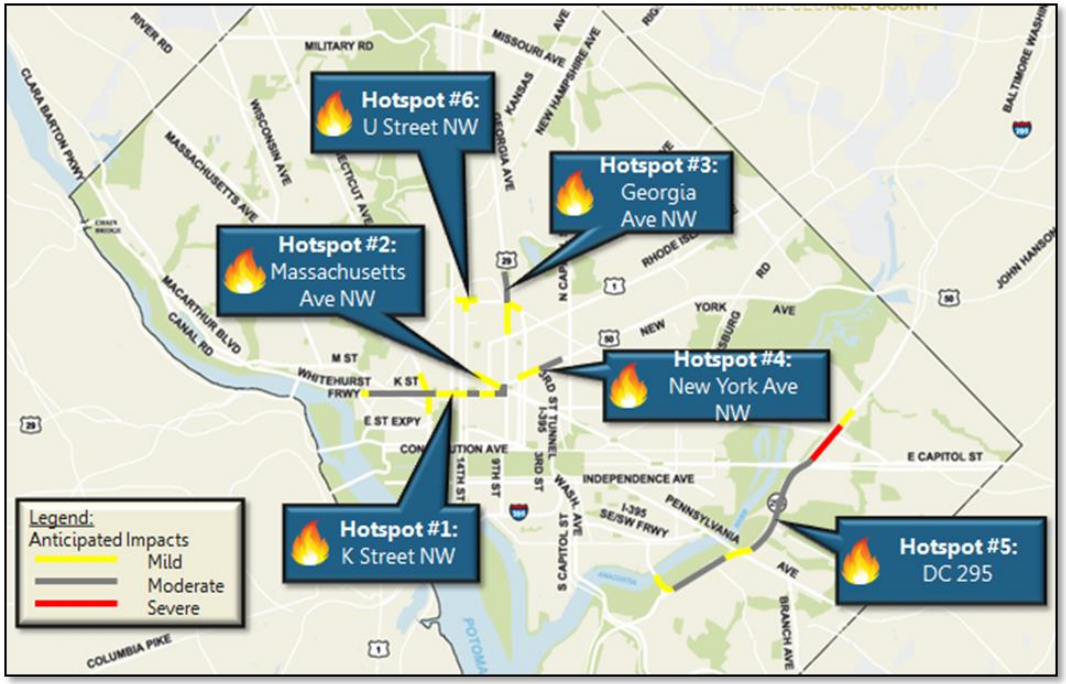
- Maps are used to help identify mitigation strategies
- After conflicts are identified, DDOT meets with project engineers to find an appropriate solution
- Solutions can include:
  - Schedule adjustments
  - Maintenance of traffic changes




Source: DDOT

# Example – Anticipated Hotspots and Impacts

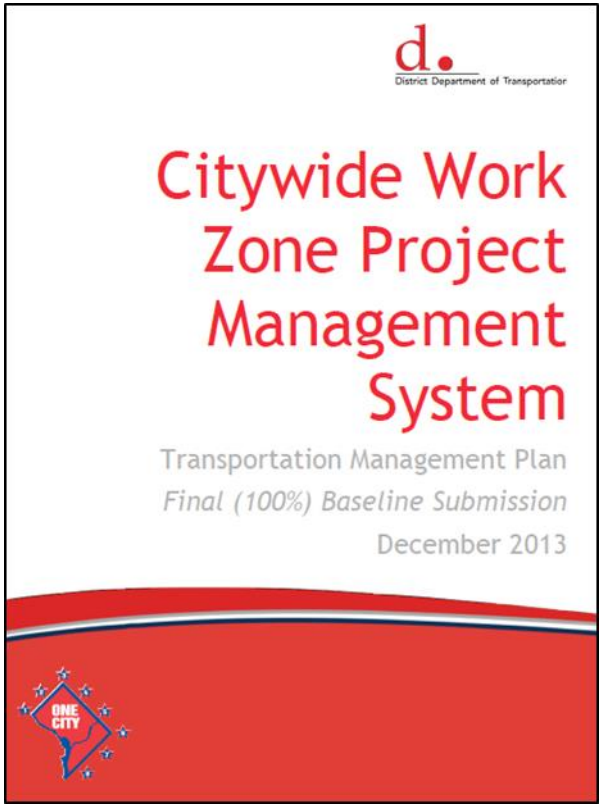
- Examine hotspot maps to determine what makes it a hotspot
  - Result of cumulative impacts of 5 projects or a single, major project
- Modify inputs to WSPMS to apply alternate mitigation strategies and see if impacts are reduced from these modifications




Source: DDOT

# Citywide Transportation Management Plan

- Based on tools used to track and analyze cumulative impacts of all construction projects
- Examines appropriate work zone mitigation strategies for the next 5 years
- Informs an estimated budget for work zone mitigation strategies
- Mitigation strategies include:
  - Launching a Citywide Work Zone Project Management website
  - Considering schedule changes for overlapping projects
  - Implementing transit incentive programs
  - And more




Source: DDOT

# Institutionalizing Project Coordination

- WZPMS continues to evolve since its development:
  - Expansion from impacts on arterials only to include collector roads with planned efforts to incorporate local roadways
  - Inclusion of special events and other activities
  - Ability to generate outputs relevant to Metro transit, as needed
  - Planned efforts to incorporate automated examination of alternate routes for roadway closures, including truck alternate routes
  - And more

# WZPMS Development Challenges (1 of 2)

- Originally envisioned as an open system for all stakeholders to view all planned and ongoing construction activities and conflicts
  - Public
  - DC agencies like fire and police departments
- Concern that outputs or purpose may be misunderstood by some stakeholders
- Only used in-house

# WZPMS Development Challenges (2 of 2)

- What traffic control plans should be entered into the system and by whom?
  - Initially, have individual project engineers perform this task
  - Structure of DDOT and workload did not allow for this to be the most efficient method
  - Settled on DDOT Project Development & Environment Division
    - Other division databases also incorporated
      - Permitting information

# Lessons Learned

- Leadership support was helpful for securing funding to develop the WZPMS
- Understanding your area and stakeholders is important
- Using existing databases to automatically populate the WZPMS made it more robust and efficient
- Challenging to keep up with latest information as tool include more inputs
- Conflicts are recognized and proactively addressed instead of not knowing until receiving complaints
- Mitigation strategies and future budgetary needs are known in advanced by understanding the cumulative, citywide impacts for 5 years into the future

# For more information:

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# Example #2: WSDOT's Regional Project Coordination

- Puget Sound region of Washington encompasses Seattle, Tacoma, Olympia, and Everett
- Northwest and Olympic WSDOT regions
- Many regional and local projects taking place


Source: WSDOT

# WSDOT Regional Project Coordination

- Legislature approves funding and defines when it will be available for individual projects
- Many factors are considered when prioritizing project
- Traffic impacts may not be known or considered
- Difficult to prevent conflicting lane or road closures on parallel routes
- Need for better coordination of planned construction activities

# Support from Leadership

- Agency leadership recognized the need to better coordinate planned construction activities
- Support and funding to internally develop a software program to coordinate projects was received
- Important because it includes a culture shift
- Help encourage internal and external stakeholders to participate

# Project Goals

- Include transit stakeholders and establish relationship with transit agencies
- Collaboration between regions and jurisdictions to provide a neutral assessment of projects with cross-regional or cross-jurisdictional impacts
  - Internal marketing helped garner and maintain support

# Construction Impact Analysis (CIA) Tool

- Two components
  - Mapping tool
  - Database
- Identify conflicts between projects
- Helped to formalize and facilitate mid- to long-term activities
- Also helps coordinate maintenance or utilities activities or special events
- WSDOT developed tool

# CIA Inputs

- Updated on a quarterly basis
- Inputs are solicited via an email to project teams in 8 counties within Olympic and Northwest regions and local jurisdictions
- Longer-term projects are planned for up to 2 years into the future
- Maintenance and utility projects
- Example Input:
  - **Location:** I-5 from NE 117th St to SR 104 (Milepost 173.14 to 177.75) – Pavement Repair
  - **Date:** 8/1/2014 – 10/5/2014
  - **Impacts:** Planned partial closure, nighttime, Sun-Thu; Possible partial closure daytime Sun.

# CIA Outputs (1 of 2)

- Distributed on a quarterly basis to approximately 400 stakeholders
- Outputs include detailed maps of scheduled projects and Gantt charts detailing the specifics of upcoming projects


Source: WSDOT


Source: WSDOT

# CIA Outputs (2 of 2)

- Hot spot and watch list areas are identified prior to the summer construction season
  - Based on number of projects in close proximity and other types of impacts that could cause traffic impacts
- Example: Redmond Hotspot
  - Multiple projects affecting every major roadway into city
  - Only 1 WSDOT project, but many local projects
  - Minimize impacts to local community


Source: WSDOT

WSDOT Hotspot Website: http://www.wsdot.wa.gov/Construction/planning/2015.htm

# Coordination Meetings

- Annual meetings are held to discuss upcoming projects for next couple of construction seasons
  - Attendees include WSDOT, local road and transit agencies, private freight representatives and port representatives
- More frequent meetings are held for local agencies
  - Impacted agencies for downtown Seattle hotspot meet every 2 months
  - Weekly meetings are conducted to coordinate maintenance activities like cleaning out storm drains or inspecting bridges

# Institutionalizing Project Coordination

- Stakeholders see the value of using the CIA tool
- No requirements to submit project inputs, but understand the benefits of coordinating projects to minimize congestion impacts on local jurisdictions
- CIA outputs are routinely used for a variety of purposes:
  - Approval of state road closures by WSDOT regions
  - Revision of bus routes and schedules by transit agencies
  - Development of schedules by project teams
- Many special provisions in contracts lists projects that must be coordinated with from the CIA tool.

# Lessons Learned

- Multi-agency communications and culture change to collaboratively shift the focus from individual projects to network performance is important
- Internal marketing helps demonstrate the value of project coordination and encourages stakeholder involvement
- Buy-in from management to support the potential need for additional staff and resources is important
- Project coordination can help plan future work zone impacts with all affected regions

# For more information:

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# Smarter Work Zones

## FHWA Resources

# SWZ Interactive Toolkit Available!

https://www.workzonesafety.org/SWZ/main

# Other Resources

| Project Coordination Resources | |
|---|---|
| FHWA | • FHWA Work Zone Mobility and Safety Program – Project Coordination http://www.ops.fhwa.dot.gov/wz/construction/crp/index.htm<br>• FHWA Work Zone Mobility and Safety Program – Peer-to-Peer Program http://www.ops.fhwa.dot.gov/wz/p2p/index.htm |
| TRB SHRP2 | • WISE Software Users Guide http://onlinepubs.trb.org/onlinepubs/shrp2/SHRP2_S2-R11-RW-2.pdf |
| NCHRP | • NCHRP Synthesis 413: Techniques for Effective Highway Construction Projects in Congested Urban Areas http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_41.pdf |
| Others | • Highway Construction Coordination to Minimize Traffic Impacts http://planning.transportation.org/Documents/8-36/NCHRP8-36(56)FinalReport.pdf |

# Thanks for joining us!

- **Upcoming Events**
  - Webinar #6: Technology Application Case Studies: Variable Speed Limit and Dynamic Lane Merge
    - Thursday, November 12, 2015, 1:00-2:30pm EST
  - Webinar #7: Work Zone Project Coordination Guide and Examples
    - Wednesday, December 2, 2015, 2:00-3:30pm EST
  - Regional Peer Exchanges

| FHWA DFS Region | Location | Dates |
|---|---|---|
| Mid-America | Des Moines, Iowa | October 22-23 |
| North | Springfield, Massachusetts | October 28-29 |
| **South** | **Raleigh, North Carolina** | **November 5-6** |
| **West** | **Denver, Colorado** | **November 17-18** |

  - Check The National Work Zone Safety Information Clearinghouse website for updates https://www.workzonesafety.org/SWZ/main
  - **Questions or Comments?**
    - Jawad Paracha (FHWA Operations, WZ Team) Jawad.Paracha@dot.gov