

**Work Zone Project Coordination
Webinar Transcript
September 24, 2012**

Jennifer Symoun

Good afternoon or good morning to those of you to the West. Welcome to today's webinar on Work Zone Project Coordination. My name is Jennifer Symoun and I will moderate today's webinar.

Before I go any further, I do want to let those of you who are calling into the teleconference for the audio know that you need to mute your computer speakers or else you will be hearing your audio over the computer as well. For those of you calling into the phone line, please note that your phone lines are listen-only.

Today's webinar is scheduled to last 90 minutes. We will start with an introduction given by Tracy Scriba of the Federal Highway Administration (FHWA) Work Zone Mobility and Safety Program. She will then be followed by presentations from the Great Lakes Regional Transportation Operations Coalition, given by Peter Rafferty of the University of Wisconsin and Bobbi Welke of the Michigan Department of Transportation; John Speroni of the New York City Department of Transportation; and Tony Coleman of the Oregon Department of Transportation.

If during the presentations you think of a question, please type it into the chat area. Please make sure you send your question to "Everyone". Presenters will be unable to answer your questions during their presentations, but we'll take about 5 minutes following each presentation for questions. If we run out of time and there are unanswered questions, we will attempt to get written responses from the presenters that will be emailed to all attendees.

The PowerPoint presentations used during the webinar are available for download from the file download box in the lower right corner of your screen. The presentations will also be available online within the next few weeks, along with a recording and a transcript of today's webinar. I will notify all attendees once these materials are posted online.

We're now going to go ahead and get started with our first presentation, given by Tracy Scriba of the FHWA Work Zone Mobility and Safety Program.

As a reminder, if you have questions during the presentations please type them into the chat box and they will be addressed following each presentation. I'm now going to turn it over to Tracy Scriba to get started.

Tracy Scriba

Thank you, Jennifer. Welcome, everyone, to today's webinar. Thank you for your participation. I hope you have some good questions for our presenters. I wanted to provide a few comments leading into our topic. I think when we all put our motorist hats on and drive around in our cars, we sometimes find that we go through road project after road project. I know that's true in my area, the DC/Northern Virginia area. In going 10 to 12 miles to work, I can go through five work zones. Sometimes it can seem from the motorist's perspective like there are a lot of projects going on, and we think, doesn't anyone coordinate these? Doesn't anyone think maybe we shouldn't do them all at the same time? I can say that I heard that comment from friends and neighbors several times just this weekend. That is one perspective, but coming from the

transportation community and the construction side of things, we all know it is not so simple. There are a lot of complicating factors as to why projects are done at the same time. Obviously, there is emergency work in certain situations. There are budgeting issues that come up that mean if we don't do the project now, we won't do it at all. There are always political reasons that enter into decision-making at the high level in some of these situations. So, there are a lot of factors as to why projects may occur at the same time.

That said, I throw out the challenge that I think we could do more than we have done to try to better coordinate projects. At the early project planning level, we could look at the sequencing of projects and look at impacts across the corridor or at the regional level. We could look at the letting schedule and see what we could do there. We could coordinate between different agencies. Sometimes it's not just the transportation agency; there's utility work, which can be extensive, particularly in urban areas, and can result in numerous projects along parallel routes at the same time. Things like that will allow us to see what we can do to improve coordination. There are benefits that come through that. We and a number of cities and States have seen that in terms of reduced impacts; better public perception of the management of work that goes on; higher quality road surfaces because we aren't seeing multiple projects coming in just after we've repaired the road; and cost savings. We have seen better coordination in a number of places around the country that have made an effort in that area and have found that it can be a win-win for public agencies, road users, and citizens. This can reduce the need for additional work zones.

We have great speakers today who will share what they have been doing in their areas. We've tried to get different types of approaches to doing additional project coordination so that we can get these ideas shared in more places around the country. Maybe the speakers today will put something in your mind about how to overcome a hurdle you may have experienced in your area in trying to have additional coordination across multiple projects. Thank you, and back to you, Jennifer.

Jennifer Symoun

Thank you, Tracy. We are now going to move onto the presentations. The first presentation will be given by Peter Rafferty of the University of Wisconsin and Bobbi Welke of the Michigan Department of Transportation, who will be speaking about the Great Lakes Regional Transportation Operations Coalition.

Bobbi Welke

My name is Bobbi Welke. I'm Michigan DOT's (MDOT) Southwest Region Engineer, based in Kalamazoo. I am responsible for MDOT work in the nine southwest Michigan counties. In my part of the presentation I will cover MDOT's collaborative operational partnerships, with a focus on coordinating work zones with the three MDOT regions responsible for Michigan's I-94 corridor.

Peter Rafferty

I am Peter Rafferty with the Wisconsin Traffic Operations and Safety (TOPS) laboratory based at University of Wisconsin-Madison. I lead research and development in the areas of traffic operations, traveler information, and multi-state transportation operations.

Today, Bobbi will begin with a discussion about work zone collaboration within Michigan. Then, I will share the Great Lakes Regional Transportation Operational Coalition's (GLRTOC) experience, including background on our partners and mission, geographic area, and current and upcoming work zone coordination efforts. Right now, I will turn it back over to Bobbi.

Bobbi Welke

Thank you, Peter. Three MDOT regions are responsible for the southern portion of Michigan, including the I-94 corridor. We use eight transportation service centers (TSC) to provide our customers with the department's primary transportation services, which include design, construction, maintenance, permits, and operations for this area, including the I-94 route. These TSCs are noted by the triangles on the map.

We were fairly comfortable with setting up each project's work zone and each region's set of projects in conformance with FHWA's *Work Zone Safety and Mobility Rule*, but less so when we were grouping the projects along the entire I-94 corridor.

To address your work zones with an eye on corridor safety and mobility on behalf of travelers, we established an I-94 corridor operations partnership with the mission to improve traffic operations and system reliability, optimizing the Department's effectiveness and producing results that satisfy our customers' needs.

One of our strategies was to establish what we believed to be a tolerable travel time delay for work zones along the entire corridor, with three segments separated at major I-94 entry or departure points. We set a 40-minute delay allowance for these 275 miles of I-94. The segment limits were purposely set to cover two of the three regions so that collaboration was purposefully required. In this case, we were setting our limits at the influence of where I-69 crosses I-94 and where I-75 in downtown Detroit crosses I-94.

Each year, we map our projects onto this map with predictions of the travel time delay for both the peak and non-peak periods noted for each of the three segments. To demonstrate the value of these mapping efforts, in 2009, two projects in the Detroit metro region were modified prior to letting because the calculated travel time delays exceeded the allowable prediction.

Some of our actions and results have included having our construction engineers participate in bi-weekly conference calls to discuss the status of and coordination issues with their projects, which has resulted in sharing better ideas in regard to progress clause requirements and other better construction practices. We worked through standardizing construction signs and traffic control. Our major accomplishment was establishing a left lane closure plan for nearly all work zones – no matter which lane is being worked – thereby allowing the motorists to consistently know when they approach a Michigan work zone that the left lane is closed.

Our performance team worked to predict delays and measure the project delays to check against our predictions and seek assistance if work zone delays were substantially exceeding the predicted delay. This graph shows our measured monthly work zone delays, sorted by the three segments.

Within the southwest region, we were able to measure traffic speeds for each of our three TSC areas, and then plotted the region-wide results, presuming the travelers were traveling all four counties of I-94. These measurements were known and discussed weekly, thereby allowing timely understanding in regard to the causes and discussion of what can be done to improve travel speeds. By the end of this year, we will have new a data collection reporting tool in place that will automate this collection and report the system conditions for the entire I-94 corridor.

As I wrap up this Michigan report, I want to pass this discussion to Peter. Michigan is proud to be a founding member of the GLRTOC. We know that by working together we will provide travelers between Minneapolis and Toronto with a better work zone travel experience.

Peter Rafferty

Thank you, Bobbi. First, zooming out from Southern Michigan to a view of North America, I want to illustrate what I mean by the Great Lakes megaregion. On the map it is shown in gold. It centers around the Chicago region, but encompasses several states and has a population of about 60 million. More so than other megaregions touching national borders, it encompasses a large portion of Canada's population and includes major border crossings between Michigan and Ontario.

The GLRTOC was founded in 2009 with the mission to improve cross-regional transportation operations in support of regional economic competitiveness and improved quality of life. The member agencies extend from Minnesota through Wisconsin, Illinois, Indiana, Michigan, and Ontario. To date, this has been a volunteer effort with only donated resources. We are especially grateful for the Wisconsin DOT Bureau of Traffic Operations and its Director John Corbin for providing ongoing financial support to the GLRTOC.

Early in the coalition's efforts, two demonstration corridors were identified, representing the approximately 1,000-mile trip between Minneapolis, Minnesota on the West and Toronto, Ontario. To the south, I-94, Highway 401, and associated routes emphasize work zone coordination and metropolitan issues, and US 2, Highway 17-400, and associated routes to the north emphasize winter operations and rural issues.

The three strategic areas defined by the coalition are efficient freight operations, reliable mobility, and traffic incident management (TIM)/emergency transportation operations (ETO). Work zone impacts are especially relevant to those first two areas, and early in its formation, the GLRTOC identified work zone collaboration as a priority area.

The focus of these work zone efforts is the annual work zone preview, but that event's history predated the GLRTOC. In 2006, the Lake Michigan Interstate Gateway Alliance (LMIGA) evolved from the Gary-Chicago-Milwaukee (GCM) ITS Priority Corridor as the focus grew beyond just traffic congestion toward broader interstate operations, and the boundaries were expanded around the south end of Lake Michigan to include southwest Michigan and more of southern Wisconsin. For several years, LMIGA and GCM, with the Chicago Metropolitan Agency for Planning, have been hosting an annual work zone preview giving agencies in the Chicago metro region an opportunity to update each other on construction activity in the

upcoming season. Since 2011, the GLRTOC has joined with this event and expanded it to cover the key demonstration corridors. Limiting the scope to those corridors and to only higher impact work zones allowed us to focus our efforts during the formative years. The objective of this is to increase awareness of neighboring work zones and to identify opportunities for adjustments or remediation: for example, improved traveler information and ostensibly reducing overall delay across corridors.

Embarking on this annual effort has led to related efforts on work zone collaboration. There are a couple of examples. One is the comparison of how agencies estimate work zone impacts, or in terms of the FHWA's Work Zone Safety and Mobility Rule, how agencies define "significant." For those of you familiar with this issue, it entails many variables and enormous variation among agencies, and is really a challenge. The table on the screen is an excerpt of the basic type of information that we seek to share, and you may notice that we limit our assessment of work zone impacts to broad and sometimes subjective levels of low, medium, and high, as provided by each agency.

The second example is the immediately apparent need for a map on which we can place all of these work zones. Given the objective is to improve coordination across agencies, we needed to be able to visually see where conflicts or opportunities existed. For the 2011 review, we quickly put together this online map using more manual processes and the ArcGIS server. It served our purposes then, but this was the first attempt, and several immediate improvements were pursued. What you see here is a screenshot from the 2012 prototype work zone mapping application, which included a lot of improvements over the first. This one was developed by someone at the Wisconsin TOPS lab. Work zones are overlaid on an interactive Google map and color coded by impact estimates with information provided in pop-ups, like the one you see in the upper right. On the left are toggle controls to show the key demonstration routes. These can also be adjusted to show work zones outside of these routes, if available. To show map ID labels, below the toggles are two sliders that limit the display to certain impact levels and dates. The portion of the table you see at the bottom of the screenshot automatically updates as you pan and zoom around to list only those work zones in the current map view. It is a good interactive tool that way. Work zones can be imported from a variety of formats. There is also an upload utility provided. It also allows users functionality to zoom directly to a work zone ID and generate a printer friendly view. This has been a good tool for us, and we are using it this coming February for the next annual preview.

Just last month, we learned we were one of six recipients of funds through the USDOT Multi-State Corridor Operations and Management (MCOM) program. This award funds two projects. The first is to improve center-to-center communications and expand traveler information services across the megaregion. The map on the left shows the locations of the operations centers. The second project is for improved additional work zone collaboration, coordination, and monitoring, including the use of Bluetooth detectors like those shown in the pictures on the right. The second project entails three tasks: 1) resource support for the annual work zone preview; 2) major changes to the work zone mapping application; and 3) multiagency smart work zone performance monitoring.

The first task is relatively straightforward, so I'll skip to the second one, which is providing funding to take the work zone mapping application to a whole new level. This is a draft mockup as we are just starting development. A recent update of the ArcGIS server included major improvements, so we are returning to that platform. In addition, flexible database use, map services, and other backend and data enhancements to the new application will provide for versioned, multi-user, authenticated editing. That means users who are logged in across any agency are enabled to modify, add, or remove work zones throughout the year. There's obviously some preparation leading up to the annual preview, but this is something that will be available year-round and for special events. It is also going to include a date picker so that you can add work zones as you learn about them in the hopes of becoming increasingly proactive in coordination. Directly through the online map interface, users will also have an opportunity to search or query or extract work zone information for other purposes. The final product will have a similar interface to the Google map shown earlier, including the same user controls, tabular views, and interactive navigation. This mapping application is also being adopted by the Northwest Passage Coalition, which includes Wisconsin and extends to the West all the way out to the State of Washington.

There are a couple of questions that come up regularly on this application. First, aren't you asking agencies to provide the same work zone information in multiple platforms (i.e., the dual entry burden)? The answer is no; we take their internal work zone information in whatever formats they already have – for example, the Michigan DOT maps that you saw earlier in the presentation. Agencies can also point us to an online map or other service that they have from which we can pull the information we want. There are a lot of opportunities for reducing the burden. That said, as a partner coalition, we do ask agencies to assist us with getting that information, but with the new transactional interface, agencies will be able to make updates themselves throughout the year. We also limit this effort by focusing only on key interstates and the State and national border crossing corridors, and only on the higher impact work zones – again, taking the broader view and focusing on collaboration over large, lengthy expanses.

A second common question is how do you keep this up-to-date and accurate, as work zones are always a moving target? This is intended as a planning and coordination tool, not as a universal platform for all work zone information. We know how complex that information gets within an agency. Though it is publicly viewable, travelers are also directed to other resources for the most up-to-date work zone information.

The third task is to improve multi-agency work zone performance monitoring. The pilot test segment we've identified for this effort is the I-39/90 segment between Madison, Wisconsin and Rockford, Illinois. This 65-mile segment is mostly rural. It has little or no traffic detection, but is a key recreational and freight corridor. In the summer, we see huge directional splits in recreational traffic, and the percent heavy vehicles gets as high as 20-30%. This section of interstate is maintained by three different agencies: Wisconsin DOT, Illinois DOT, and Illinois Tollway. Each has major work zones within a 4-year span, primarily as it expands from a four-lane interstate to a six-lane interstate, and sometimes these work zones happen simultaneously across borders.

The task entails additional traffic detection, primarily with Bluetooth, but also potentially microwave, video, etc. More important is the integration into the Regional Gateway Traveler Information System and potentially different operations centers. The hope is that the information will be seamlessly available to operators across these borders. The information – travel times, for example – is also available to the public via Web, phone, and dynamic messages, and is archived for researchers.

With that, thank you very much for the opportunity to share.

Jennifer Symoun

Thank you, Peter and Bobbi. We have five minutes for questions. The first question is how do you collect travel time data and determine delay for the I- 94 corridor?

Bobbi Welke

We have a contract with NAVTEQ to collect traffic on our freeway systems, especially within and adjacent to the greater metro Detroit area. If you go to Michigan.gov/drive and click on the speed limit control, you can see the speed of traffic throughout our freeway network. We use a manual process in which we take a snapshot about every 10 minutes, 24 hours, 7 days a week, and then we have someone look at that and pull out anything we call red, which is 0 to 20 mph. For the I-94 corridor only, the 0 to 20 mph sections are sent to each of the six offices to review what caused it and what could be done to prevent it next time. We have a new contract in place with Atkins North America through Maryland's Center for Advanced Transportation Technology (CATT) lab. We will soon have an automated measuring system in place, and we can share more information at a later date on how we will go from our manual system to an automated system to tell us what the speeds are for traffic and what the delay times are.

Jennifer Symoun

Do you use a vendor for your smart work zone monitoring program? If so, which ones?

Bobbi Welke

I think that is in regards to Peter's discussion about I-80 corridor and the smart zone that's being developed. Many of us were in Chicago two weeks ago to learn about what is going on in that area and we are now getting on board with various factors. In Michigan, our vendor has become Atkins North America, who collaborates with the CATT lab. For the other smart corridor, Peter, do you want to respond?

Peter Rafferty

Let me preface this by saying that the Wisconsin TOPS lab has been actively evaluating multiple Bluetooth traffic detector devices and vendors. As many of you know, these have really only been active for traffic detection for four years. We have been active in testing three different products. Two of them are very good. One of these is the TrafX Blue Facts Unit, and the one that is part of the team that won the MCOM award is the TrafficCast BlueTOAD unit. TrafficCast is part of our team for monitoring, and we'll be deploying standard BlueTOAD devices, which include real-time cellular communications.

Jennifer Symoun

How many people are involved in directly taking the information from coalition members and mapping this information?

Peter Rafferty

We've only done it twice so far, leading up to the annual work zone preview. We have one staff person, and it is a portion of their job to get the information collected. To give you a better sense of the scale of this, for each agency, the number of work zones that we're putting together for the upcoming year ranges from two to twenty, so we aren't looking at that many, especially if we narrow it down to the higher impact projects. The expanding interest in the work zone application is a large part of why we are going back to the ArcGIS platform that allows users to edit and modify and add/delete their own work zones to distribute the workload and make it a more versatile and up-to-date tool.

Jennifer Symoun

Thank you, Peter and Bobbi. The next presentation will be given by John Speroni of the New York City DOT.

John Speroni

Hello, everybody. I am with the New York City DOT. I am the director of performance management and accountability. A lot of our performance metrics and project management tools are handled by my unit. I will start with a brief summary of New York City DOT. I think we are different from the other participants – we're more of a local operation. We do cover highways, but we also cover all of the local streets in the five boroughs of New York City. We have 20,000 lane miles. We also handle bridges and we operate the Staten Island Ferry. Annually, we issue approximately 325,000 permits by contractors or other city agencies that want to do street work. We inspect most permits one or two times, depending on the type of permit. We may go in and inspect them while the street is open and again after the street is closed to make sure that they are complying with our work rules.

The types of projects that we handle include capital reconstruction, where we start from the base, sometimes including water mains, sewers, and all sub-surface utilities. Then there is street resurfacing. We resurface approximately 1,000 lane-miles per year, and that's the typical milling and resurfacing of the asphalt only – we do not touch the concrete beneath the asphalt. We also do bridge maintenance, which is handled by a separate division within DOT due to the unique characteristics of bridges. We also do plazas, parks, and other public spaces. We are also involved with a variety of other projects done by other stakeholders that impact the sidewalks and streets.

In terms of our goals for improved project coordination within New York City, we are trying to coordinate all of the work that needs to be done at one location. We don't want one permittee to come in and cut into the street, disrupt traffic, and damage the road surface, and then two weeks later have someone else come in and do a different type of work at the same location. We would like to open the street once, have all of the sub-surface work done, and then patch the street once.

In a perfect situation, if we know that DOT is working at a location, we want permittees to do all of their planned work before we resurface the streets so there are no more cuts into our brand new street surface.

For our general coordination process, we have advanced coordination and planning where all of the stakeholders meet and exchange data about work locations for the next few years. This is so we can adjust our individual project schedules. Then, just before work begins, a permit is issued. This is the step where we can catch things that were not detected during the advanced coordination and planning. If we know we are working at a location six months from now, and somebody applies for a permit today, we may look for opportunities there and suggest that they wait five months to do their work and do their work just before resurfacing. They will save money because they don't have to do street restoration. They will do their work and as soon as they are done, we will resurface. The final step of coordination is the actual work. This is where we perform an oversight role to make sure that the contractors are working safely.

In our coordination toolbox, we have a combination of work rules. The most important concept here is probably our protected streets. After new asphalt or concrete goes down, for the next five years, any work at that location has extra stringent restoration requirements. If we just paved the street and a year after that someone wants to do a street cut, we can require them to repave the entire roadway so there is no seam around their cut. Other tools we have include our permit process, which I've covered, inspections, and construction embargos. There are certain times of the year when we do not allow any work in certain zones to minimize disruptions. If a road is going to have a parade or other special event, for roughly a one month around these events we say no street work is allowed, other than in emergencies. We have a variety of coordination meetings. We have monthly meetings in each of the five boroughs (counties). We meet with other city agencies and high-volume permittees. There are annual look-ahead meetings, which are done on a citywide basis. For large projects, we have project-specific meetings as needed. We have a variety of permit and project management software that we use. Additionally, we have been publishing more of our information online for the benefit of stakeholders.

One of the new software projects is what we call DOTMap (<http://www.nyc.gov/DOTMap/>). This is a site that brings together data from multiple locations. This sample map shows in purple streets affected by a holiday embargo. This is the period from Thanksgiving to New Year's Eve. There is an annual recurring embargo where we do not want any work being done during the busy holiday season. The map also shows in green our 10 year capital plan. We can click on these locations and see more information. When I click on one intersection, it brings up a screen that shows that this intersection happens to have holiday embargos on both cross streets and it also has a capital project at the location. Other information we are looking to add to this map includes publishing our high-volume permittees' work locations. We are working with them to get their long-term plans submitted to us in a map-able format.

The Street Works Manual is a policy document that we released just under one year ago. It announces some of our new policies for improved coordination. It explains to the permittees how they benefit from coordinating with us. It also documents the details of the permit process. If a hotel wants to put a canopy in front of their entrance, it might interfere with the sidewalk, poles, utilities underneath the sidewalks, etc., depending on where they are located. The Street Works

Manual is intended more for the lower-volume permittees and the public than for the high-volume utilities, as they are already well familiar with our processes. The Manual is available in three forms: at the website listed here, as a downloadable PDF (also at the website), and as a hardcopy that we sell via the city store, where all city agencies can purchase documents for sale to the public.

In terms of the internal stakeholders we have for project coordination within DOT, we have the capital program management group. They initiate our capital reconstruction projects. The roadway repair and maintenance group handles resurfacing, pothole repair, and the more routine work that we do. The traffic and planning group is responsible for traffic signals, public plazas, bike lanes, and a variety of other projects. We have offices that are responsible for issuing permits, doing street inspections, issuing permits, etc. This is the scope of internal stakeholders that have input into our coordination process.

In terms of external stakeholders, in a lot of other municipalities there is a Department of Public Works that deals with roads, sewers, water, and other public works. In New York City, a few decades ago those operations were separated out, and the Department of Design and Construction (DDC) now oversees all capital reconstruction. If DOT and the Department of Environmental Protection (DEP), which oversees sewer and water operations, are doing work in the same area, DDC will do that construction. Only one bid for construction will be issued through DDC. Rather than having two separate contractors at the site, DDC coordinates all of the city's capital construction. For a lot of skyscrapers in the New York City, cranes, refuse containers, etc. are placed on the street. The Department of Buildings (DOB) is responsible for the building construction, but for anything that interferes with the use of the street or sidewalk, DOT issues a permit. We have inspectors who can issue violations, but the Police Department has a much larger workforce in the field than we do, so they augment our inspections. In terms of safety issues, they often observe the safety issue before we're scheduled to be at the site to inspect the work. There are State and Federal agencies that in many cases provide us with grant money or coordinate other work. We have utilities that do work under the streets. The construction contractors may be working for DOT, utilities, or a private homeowner. If a homeowner needs plumbing work, the water main is the property of DEP, but the line that goes from the street to the house is the property owner's responsibility. If there is a leak, a contractor may need to dig up the street.

This picture shows an example of what we have under our streets. There is a variety of different utilities at this reconstruction site, and we have sewer and water beneath the street. There are six different rail systems operating in different or sometimes shared tunnels. There is the New York City Subway, four commuter rail systems – two of them cover New Jersey, one covers Long Island, and one covers upstate New York and Connecticut – and Amtrak comes into Penn Station. In some cases, utilities are interested in coordinating work with one another, and in other cases (which I will cover later if I have time), there are some issues that limit the utilities' ability to coordinate work. A street cut is when there is a leak under the street and a small patch needs to be taken out of the roadway. Roughly 55% of all street cuts is done by four utilities.

The impacts of a street cut are that the roadway deteriorates quicker because there is water infiltration at the edges of even a properly restored cut; the road users are inconvenienced while

the work is being done; there is construction that impacts local businesses; and there are permit fees associated with the street cuts themselves. Our high-volume permittees spend millions of dollars each year on street permits.

The benefits of having fewer cuts include helping city residents avoid inconvenience and save money through reduced utility rates. Utility customers are taxpayers, so when we help the utilities save money, we help our constituents.

In terms of results, we have recently gone to a web permits computer system and we are now issuing 80% of our permits online. There is no need for the customer to come to the office to apply for, pay, or receive their permit; they can print their permit at home. We have improved street quality, increasing from 66% of the streets rated as good in FY08 to 73% in FY12. We also do ongoing process improvements.

Some of our challenges with coordination are that some utilities are competitors. For example, the local telephone company and the cable system are both providing Internet access to their customers. They are understandably wary of releasing data that their competition can use to assess their marketing strategy. If one utility were to announce that they were doing work in a certain neighborhood six months from now, you could guess that they are doing a push for an increased customer base in that area.

Additionally, there is a legislative challenge that provides a disincentive for utilities to do work. It is a complex situation in that every year the utilities apply to the State Public Service Commission to set their rates. They are allowed to factor in certain costs to their rate structure. Proactive work, unfortunately, is not one of those things that they can include in their rate structure. While we have a street open for construction, if we see a new building going up and we see the structure of the building but there is no electrical service to the building yet, we note that the building will need electricity. If the utility does their connections now while we are doing our construction, they have to eat that cost. If they wait until the building owner calls them to request electrical service, then even though we have finished our construction, they'll have to do a street cut, but they will be able to include those costs in their rate structure. To deal with that challenge, there is currently a research project underway in partnership with a local law school looking into the details of the laws governing that situation.

With that, I think my time is about up.

Jennifer Symoun

Thank you, John. We will move onto questions. How many permit inspectors do you have to perform the inspections?

John Speroni

I don't know the answer to that. I'm sorry.

Jennifer Symoun

Regarding the construction area on Second Avenue, I understand it is a very complicated situation to deal with. Who came up with that maintenance of traffic design?

John Speroni

I'm going to assume that this is uptown around 68th or so. There is a new subway line being constructed. It's the first phase of that project. That project is being managed by the Metropolitan Transportation Authority. The subway system is one of their operations. They have been coordinating with New York City DOT and other stakeholders. In terms of the maintenance of traffic design that shows how traffic flow is being maintained, DOT's Office of Construction Mitigation and Control (OCMC) is the internal stakeholder who manages that process with the external stakeholders.

Jennifer Symoun

If you rebuild a road, do you require the homeowner (who owns the line in the city street) to move their line? How do you manage that?

John Speroni

When we are rebuilding a road, in general we try to coordinate with all of the utilities. We typically don't relocate the water mains. The electrical line is fully the responsibility of the utilities. This is an unusual situation in that the utility feed to the property is the responsibility of the utilities, but the water feed off of the main is the homeowner's responsibility. It is very unusual for us to come up with a project that actually relocates the water main. If this were necessary, the DEP would coordinate that work. I don't know what their policies are. If a connection had to be moved as a result of them moving their pipe, I presume that they would eat the cost of that. They wouldn't have 10 different homeowners hire 10 different contractors to independently connect. If their work was somehow impacting the local connections, I think that would be under their scope of work.

Jennifer Symoun

How much interaction do you have with the agencies operating the bridges and tunnels, and what is a typical problem you might experience when all are involved?

John Speroni

I personally do not interact much with them, but the OCMC and the Capital Construction groups interact with them on a regular basis because our property and their property adjoin. Their bridge starts where our roadway ends, so we have regular communications with them to coordinate any work done being done. If they are doing major work on their bridges, they notify us; when we are doing work on the roads that lead to the bridges, we notify them. The goal is to provide the most efficient construction sequencing. We don't want them close a roadway for their work and then we close the feeder to the roadway after they finish their work, because then the construction will last twice as long. We try to work together on those things.

Jennifer Symoun

Are you tracking how these efforts are affecting costs? If so, what have you seen so far?

John Speroni

One of the challenges that we have internally is which performance metrics should be used to measure coordination. We have several metrics that suggest coordination. For example, if we see

fewer street cuts, that suggests coordination is having a positive effect. But street cuts also fluctuate due to other conditions such as real estate and construction. If building supply costs increase, construction might temporarily decrease, and we would therefore see fewer permits. We are looking at how to track these. Regarding costs, one additional legislative challenge that we're looking into is a process called joint bidding. When we are doing work beneath the roadway, the city-owned portion of the roadway is bid out by the city. The utilities hire the contractors separately. That process is in place for legal reasons. We would like to be able to put things out as one bid for the construction with the utilities funding their portion of the work, but we would actually hire and select the contractor to do all of the work. In areas where we have tested this, we have seen significant cost savings on projects.

Jennifer Symoun

We have a few more questions but we do need to move on in the interest of time. Feel free to type in your responses, John. If we have time at the end we will go back to these or I can e-mail them to you.

The final presentation will be given by Tony Coleman of the Oregon DOT (ODOT).

Tony Coleman

Good morning, everyone. I am the Region 1 Freight Mobility/Construction Liaison here at ODOT. We are split into five unique regions throughout the state. With me is Simon Eng. He is one of our Region 1 traffic engineers and he is here to help me answer questions.

This presentation is going to focus on the background of the Region 1 Construction Coordination Team and its purpose. I will tell you about ODOT's mobility program, which is unique from some of our neighboring States. I don't think there are any neighboring States – Washington, Idaho, or California – with a mobility program like ours. We do have the Port of Portland, which is huge to the economy of our State. The ability to move material import-export by marine and the connectivity between rail and train is huge. We continue to be a major player here on the west coast.

Again, our presentation will include background on the Region 1 Coordination Team and its purpose. I will show you a slide of the ODOT regions breakdown and we will talk about the critical route pairs that are important to us. We will show an example of the region mobility schedule and we will have a brief example of how Region 1 and Region 2 have recommended delay thresholds for our coastal highways. We will give an example of Region 1 and 2 Coastal Corridor Coordination team, and then we will answer questions.

In regards to the mobility program, in 2005 the original Highway Mobility Operations Manual was created. It was in response to the unprecedented increase in road and bridge work, largely due to the Oregon Transportation Investment Act III (OTIA III). Keeping traffic and freight moving during this time was one of the top priorities of the Governor, the Legislature, and the Director. The budget note to House Bill 2041, which was the OTIA III legislation, directed ODOT to develop a strategy that maximized the increase of traffic and freight movement throughout the state. This strategy was developed in collaboration with key stakeholders, including AAA, Oregon Bridge delivery partners, and the Oregon Trucking Association.

What's at stake? Why did we do that? Oregon's economic health and well-being depend on the ability to communicate and coordinate. We know that by the issuance of our Oregon Freight Plan that trucking will continue to be the dominant role of freight transport, reflecting the shift towards high value products, greater time sensitivity, product movements, and the ability of trucks to reach all parts of the state. This will create increasing demand on the State highways and local roads. Metropolitan congestion will become an increasing concern for key industries.

Effectively managing our work zone impacts is essential to meeting the Department's mobility goals. ODOT supports the efforts of FHWA and complies with the provisions of the Rule on Work Zone Safety and Mobility.

Who is working on work zone coordination/mobility? Region 1 has a Construction Coordination Team that consists of my boss, the region construction engineer; myself; two area managers; two District maintenance managers; community affairs manager and staff; traffic management operations center manager and staff; four construction project managers; traffic manager and staff; and the project delivery manager. Again, the regions are committed to the free movement of traffic during each construction season. We recognize the economic vitality of our State depends on how much it costs and how much time it takes to deliver products to market and move supplies to manufacturers and finished goods to buyers.

Work zone coordination and mobility also affects our quality of life here in Oregon. There are many beautiful travel destinations throughout the state. This is why we are tasked with making sure that traveling is pleasurable. The goal is to keep all traffic moving. Work zone management is being applied to all highway and bridge construction projects, including local agency projects receiving Federal funds. Short-term work zones for maintenance activities will also be managed and coordinated.

This map depicts the five regions that ODOT has. Region 2 and 4 are our neighboring partners. Regions 3, 4, and 5 border northern California, and Regions 1, 2, 4 and 5 border Washington.

Region 1 consists of five metropolitan counties. Washington, Clackamas, and Multnomah are three of our huge metropolitan counties. We also cover Hood River, and we most recently gave away Columbia County, which is one of our coastal counties.

As mentioned, work zone coordination is applied statewide to ensure that we provide guidance in maintaining corridors and moving people and goods and services. It is of primary importance to keep at least one of our major north-south and east-west corridors unrestricted for freight industry and the traveling public. Corridor plans provide specific objectives and targets for managing mobility.

This slide illustrates a critical route pair. We coordinate work affecting critical route pairs to maintain unrestricted freight routes on the I-5 corridor. As you can see here, I-5 goes north-south through the Western Cascades. I-5 has critical route pairs with I-205, which loops around the east side of Portland, and OR212, US 26, and US 97, which go north-south through the central part of the state and help us get to the eastern part of the state as well.

The State highway network has been divided into north-south and east-west corridors and major arteries. Each of these corridors has been further divided into segments. The segmentation is associated with breakpoints at major crossing roads or cities. This is similar to what you saw with Michigan and Wisconsin in the previous presentation. Each segment has been assigned mobility objectives and targets to optimize traffic movement. How these objectives and targets are achieved is determined by features of each project. This could mean changing project milestones to reduce the number of combined effects of multiple work zones. It could also mean that project designs would need to be revised to use detours, diversions, or closing lanes if free-flowing traffic could be maintained. Nighttime and off-peak work might also be considered to help ease traffic congestion. The desired result is to have few, if any, but planned peak time delays. However, there will be some.

This happens to be the cover of the corridor-level traffic management plan (which is now called transportation management plan) (TMP) that was developed by the Oregon State Bridge Delivery Partners. This was made to make sure that we were managing and designing corridor-level delays. This happens to be a cover of the I-5 North and the OR 58 corridor from the Washington State Line to US 97.

This is another critical route pair we have, which shows our east-west corridor. I-84, the corridor from Portland extending east all the way to the Idaho border, is huge in terms of freight routing. Right now we have a lot of windmill farms growing in eastern Oregon. It is critical to keep I-84 open to get these windmill components through. When we have project programs on the I-84 corridor, we have to ensure and we have committed to our freight partners that we will keep I-205, OR 212, US 26, US 97, US 20, US 78 and US 95 open for the east-west movement of freight. To do that, the Oregon Bridge Delivery Partners developed a corridor-level TMP for I-84 and I-5 from Portland, Oregon to the Idaho State line. The US 26/US 97 corridor along with I-205 was a unique corridor-level plan that should be considered in a critical route pair, so it was developed separately.

We also have critical route pairs east-west for the coastal network. The critical route pair for that network from Portland to the coast is US26, which is the Sunset Highway, and US30. As with the other corridors, the Oregon Bridge Delivery Partners developed a corridor-level TMP for the coastal network.

What do we do at the regional level? Work zone coordination is being actively managed in the planning, design, and construction phases of work. Project development teams evaluate early on how a project may be structured and put together a construction plan in the primary stages of the process that will minimize traveler delay. The document you see is created using MS Project, with the input from the Region 1 project delivery management team. We track projects from our statewide Transportation Improvement Plan. We use this document to see where we have conflicts between pre-discussed critical route pairs and the regional network. The start dates represent the project bid-lets, and the finish dates represent the project completion dates. The corridor-level TMP and the work zone traffic analysis tool are key components to help determine corridor segment delay threshold and work zone lane closure periods.

Currently, as you see, we only have two projects on the I-5 corridor. We have approximately six projects on the I-84 corridor, six projects on the US 26 east corridor, seven on the coastal corridor (US 26 West), and a couple of projects on I-205, US 30, and so on. This schedule is approximately three pages long. We also list other corridors that we need to manage.

Traffic patterns are different in the Region 1 than the rest of the state. The levels of existing congestion in the Portland metropolitan area are unmatched anywhere else in the state. The high commuter influence on traffic patterns within the Portland metro area of Region 1 makes it prudent to re-segment portions of the primary OTIA III corridors to allow the sections that are heavily influenced by Portland commuter traffic to become their own segments. Separating these segments from the rest of the corridors allows these segments to be managed in a different way that accounts for the characteristics that make them unique within the state. The concept of delay thresholds that is being applied to the primary OTIA III corridors in the state is not appropriate for Region 1, because the delay thresholds are too restrictive to allow necessary work to be completed.

Using travel time as a threshold for the purposes of mobility management is restrictive enough to prohibit lane closures during peak hours while allowing additional flexibility during off-peak hours. This will not change the current practice of the region to limit work to overnight hours under almost all circumstances. The peak travel time will be travel time thresholds during these hours. The bottom line here is that Region 1 is different from the rest of the regions. We are in an urbanized environment. Because of the traffic volume in Regions 4 and 5, it is easy for them to program and schedule project during the day as opposed to the night. For the most part, in Region 1, I would say that 90-95% of our projects occur at night because of the traffic volume.

Here is an example spreadsheet from the 2010-2014 construction season. ODOT had approximately \$140 million worth of planned construction work, including 15 projects on US 26/Sunset Highway alone and several others along other coastal critical route pairs. It was imperative for these projects to be managed and coordinated to minimize disruption to the freight industry, the traveling public, and others. We also had to recognize concerns about the fragile economies of the coastal communities. Their economies are dependent on tourism, which accounts for most of their income. US 26 and US 30 are also critical lifelines in the event of tsunamis. This spreadsheet shows projects on which we coordinated between 2009 and 2011. We are still tracking a few of these projects. This spreadsheet shows the projects that we had on each of the networks, their mile point ranges, who was in charge of the project, the bid-let date and the construction completion date, the lane restrictions that we had on each one of the corridors per project, and the delay thresholds that were calculated. We also had the delay threshold for the entire corridor. We continued to update and manage this spreadsheet as projects were completed and added.

This map gives you a good indicator of what the coastal corridors look like. From Portland, US30 is huge for getting to the coastal network on the north boundaries of our state. US 26 gets us up over the coastal range and heads over to 101, which is the coastal route north-south.

What did we learn through all of this? Protecting the safety of the traveling public and construction workers is our highest priority. Safety measures to protect workers and motorists in

the work zone and to prevent work zone accidents are always being added. It is important for the traveling public to also recognize this fact and to be more careful and more patient as they travel through these numerous work zones. Avoiding incidents within the work zone is not only important from a safety perspective, but it also helps to minimize traveler delay. Significant delays experienced in the work zones will most likely be the result of an accident within the work zone. Minimizing delay and inconvenience, keeping people and commerce moving, and optimizing traffic movement are really huge to ODOT.

We are winding down from the OTIA III, but we are also starting to pick up the 2009 Jobs and Transportation Act. We also have the 2009 American Recovery and Reinvestment Act. These are causing us to have more projects, but we need to continue to focus so that as these projects go out the door we address mobility. In the past, we used to address mobility through planning and design, and then we focused on mobility before we got to construction. Today, mobility issues are coordinated during planning. We continue to coordinate through the design process, and by the time we get to construction, we have good plans to minimize these impacts.

To finish, these are referenced documents that you may have seen in some of my slides. These include the three corridor-level TMPs. I also talked about the Work Zone Traffic Analysis Tool developed by the Oregon Bridge Delivery Partners. I have listed the website where that tool can be found. Here is my contact information.

Jennifer Symoun

Thank you, Tony. We have one question typed in. What tools or computer programs are you using to get the predicted work zone delays?

Simon Eng

ODOT has a web-based tool to estimate travel delay due to construction. This tool has integrated with some of the functions of a traffic microsimulation software called CORSIM (short for corridor simulation). It is available online, and you can find out more about how this tool works and how we are applying it to coordination and lane restriction.

Jennifer Symoun

What is the update time on these maps, and how often does each of the presenters update these tools?

Tony Coleman

Usually our heavy construction begins after April. ODOT is not good at getting good weather, so our construction season mainly goes from May to the end of September. In September we have a paving specification where our top lift paving has to be completed by September 30 every year. The construction season is heavy in the summertime, so we begin our coordination of the projects usually in March and April.

John Speroni

As far as our capital plan, when re-issue that on an annual basis. Our resurfacing schedule is published every week, as is our protected streets. If we paved a street last week, when someone downloads the data this week, they'll see which streets are protected on the map.

Peter Rafferty

For the Great Lakes megarion map, that effort is done in December and January of each year in preparation for the annual work zone preview. With the new application, we're expecting it to be more of a year-round tool available for special events and major traffic generator events. Bobbi had to go, but Michigan updates their annual outlook map I believe in the December timeframe. From the Wisconsin perspective, too, we have a successful lane closure system that powers maps that are available and updated monthly, and it also powers the real-time work zone mapping that comes through our 511 system.

Jennifer Symoun

Going back to Tony and Simon, the threshold times in the spreadsheet that you mentioned it – how are they calculated?

Simon Eng

The delay threshold is based on the difference between the travel times during peak hours and non-peak hours without construction. Our goal is to make sure that the travel time through a work zone or multiple work zones on a highway does not exceed the travel time in the peak period when there is no construction.

Jennifer Symoun

Do you have a tool that forecasts queue lengths associated with each work zone delay time on major corridors (for example, a 27 minute delay equates to X miles of queuing)?

Simon Eng

The Work Zone Traffic Analysis Tool does have a function for determining queue length. It depends on how many lanes we close for a project.

Jennifer Symoun

There are no additional questions typed in. We are about out of time so we will go ahead and close out for the day. I want to thank all of the presenters and everyone in attendance as well. The presentations and recording from today's webinar will be available online on the FHWA Work Zone Safety and Mobility website in a few weeks. I will send an e-mail to everyone who registered once everything is available online. If anyone has additional questions, feel free to type them in or send them to me and I'll get them to the presenters.

Thank you, everybody, and enjoy the rest of your day.