

Please stand by for real time captions. >> Ladies and gentlemen, this is the operator. Today's conference is scheduled to begin momentarily. Until that time, will be placed on musical. Thank you for your patience. >> Good afternoon, my name is Chris and I will be are conference operator. At this time, but like to welcome everyone to the smarter works owner quarter based conference call. Only to be placed on mute prevent any background we. After the speakers works, it will be a question-and-answer session. If you would like to ask a question simply press star in the number one Mac. If you would like to try your question, press the pound key. Nicole Coene you may begin your conference.

Good afternoon, or good morning. Welcome to the third webinar in the smarter work center -- works of webinar series. My name is Nicole Coene and I will moderate the webinar. Before I go any further, I want to let those of you know who are calling in let you know that you need to mute your computer speakers. Today we will have three presenters. Martha Kapitanov. John Habermann, and Steve brink with the region.

Martha is a transportation specialist under the work zone management team and is a member of the everyday count works owner of limitation team. As a transportation specialist she provides leadership and guidance to the development and implementation of effective works own practices and innovation on a national level. She hold a doctor's degree in civil engineering. John Habermann is the lead coordinator in research engineer of the Texas A&M Institute on the I-35 expansion in a Texas Department of Transportation district. -- In coordination with multiple contractors and assistance to the district with traffic mobility concerns plans in support of the wake-up public information officer is a registered professional engineer in a state of Texas in Indiana. He is a member of the Texas Institute. John has a bachelor's of science in civil engineering from Texas trend 21 -- A&M University. Steve brink is the region engineer for the transportation Southwest region in Kalamazoo Michigan. The coordinates and administers the region's business processes for traffic safety systems operations, and works on safety inability. Has a project manager trainer, and overseas the over -- measurements big. Illinois, and received his Bachelor of Science and engineering for Michigan Tech. Today seminar will ask 90 minute -- will last 90 minutes. After the presentation you think of a question, you can type it into the chat area. Is make sure that you send your questions to everyone. Presenters will be unable to answer your questions during the presentation. It will pause the presentation to answer questions. We will answer again at the end of the presentations. In addition, if time allows we will open up the phone lines for questions and comments. The PowerPoint presentation is available for download in the lower right corner of your screen. It will also be available online in the next few weeks. I will notify all attendees when the materials are posted online. Federal highway does not satisfy -- certifying these for continuing education credits so it still may be claimed for developed hours. Please contact her professional certification board for the requirements registration confirmation is the only proof of attendance will be able to provide. I'm not going to turn over to Martha Kapitanov of federal highway.

Thank you Nicole. In thank you everyone for joining us. This is a third in a series of biweekly smarter works owns -- zones. A series of biweekly smarter works owns webinars. They will help implement project information strategies. The previous two webinars have been recorded and information have been posted on the national works on safety information website. We have five more webinars coming up in for more information about these please visit the safety work zone clearance.

The purpose of today's webinar is to provide a comprehensive over new -- overview of -- and discuss real-world examples of successful quarter based smarter works owns, strategies that can help you minimize travel delay and enhance safety for all road users and workers while improving customer satisfaction.

The goal is to raise the bar on how they rate -- works on operations. So what are smarter works owns? They provide innovative strategies cop practices and tools to enhance the state of the practice for work zone safety and mobility. Under the smarter works owns an initiative we had to strategies. Project

coordination which is the focus of today's session. In today's -- technology applications. To ensure good implementation of a project coordination strategy we need to understand the transportation system is a network and roadwork at one location affects other locations. Also, agent infrastructure can increase highway construction -- congestion utilities in greater works on impacts. The lack of coordination can mean many road projects close together, recently paved roads, resulting in reduced quality and agencies and users cost. Under the smarter works own project coordination, with two roles. One, by December by December 2016 to have 25 using works own coordination strategies. We want the goal to use the software-based system to coordinate the construction activities using quarter level traffic management plans to address traffic related impacts of construction projects using construction traffic management, using the project coordination strategies to pinpoint that they are included in this agency manuals. And can't driver time in road capacity law savings. We also have a second law -- goal, it is to have at least five DOT to pilot the estimators also known as the WISE software.

I will share with you to court or based PC examples that will help you reduce and save money. Now our next speaker is John Habermann Thank you Martha. Good morning to all of the participants. And I would like to say a special good morning to those friends that are logged on from a previous work at the program I was involved with. What we have here, is I-35 in the wake of district. >> For those of you not familiar with Texas, the Waco district is a section that is South of the Dallas area in North Austin area what we call the heart of Texas central Texas. / Or central Texas. This is some of the statistics regarding our court or on Tran -- I-35. There is a big plan to up graded to six lanes. That means that three Lane South in three lanes North. And we have been charged to handle the area in the Waco district. There is a traffic statistic, there's a truck staff -- traffic statistic. And we would like to point out, we will come to this later that our truck traffic percentages get upwards between 70% and 75% in the evening hours. Patch becomes important when we have our link closures. The maximum was 64 miles that was under construction at one time. We are now at a state where we are approximately 44 miles. We have our 14 ROTA segments and 17 projects. And multiple contractors. For those of you that are familiar with different delivery methods of projects, I want to point out that all of our projects in Waco are your traditional design the beta build. We have none of the more recent ways of doing in the Waco district. It was done in a traditional way that we know how to build road projects. So this is what it looks like today. The blacks are your completed, and then you have your active, injuring nearly completed sections. We hope to be done by early 2019. If coordination continues to go well, our conversations continue to go well, and if the contractor that had the last few projects can organize resources, we hope to bump up that completion date. And what I am going to start out as, I'm going to start out at the beginning from how we started the planning and design to how we got to this particular map. And then, what happens once a snap got developed and how we coordinate everything up and down. And I would like to point out, that this project covers everything that Martha pointed out. We are going to talk about coordination with in the project, between projects, coordination along the whole corridor, coordination with local agencies that are part of the court or. You can see on the map, all the way from Hillsboro to Abbott will be different local governments that are included in this coordination effort. >> And also, in the previous slide, I want to point out to you and other states please do not let the \$2.1 billion of the construction effort be a deterrent to you in understanding some of these coordination efforts in some of the strategies that we are helping federal highway with. Many of these can still be used depending on the size of your project but they can also be scaled it down to. We will show you in a little while the data collection equipment that you may not need as much equipment as we do, because you are quarter or maybe shorter, or your project might not be as long. But also, your coordination efforts might have to be greater because coordination not only depends on the number of projects in length of projects. It also includes the variable of what is adjacent to your project. Depending on your business that you have to deal with, the size of the city, the ability to detour your traffic if you have to. I really want to encourage you to take note of the spirit of what we're trying to teach you today and not be intimidated by the dollar values or the size of what we are doing here in Texas. >> We started this out by creating a special project office. The district wanted to quickly complete the plan, design, and funding, right away the

environmental and get all of that done as quickly as possible. So they physically relocated specific staff members to a different location outside of the district office, and they appointed a project engineer. They had up a staff of engineers and technicians to hit this hard and very thoroughly. Communications during this time also included the tax division down in Austin, of bridges and designs of environmental. Our federal highway partners will -- were also included. All of the local agencies who might be impacted. They took the core door and divided it into six sections and they each talk to segments.

When it comes to good to me -- communication one of the stars that they should receive for the effort is they had more meetings than what were required by law. They started their meetings as soon as what was practical they went to local government they cast of the vision for the whole core door and was the message got out and they had more details they went into the public and they went into each segment and they started asking about historical areas, cemeteries, some unmarked cemeteries, historical lands, the non-negotiable's were pulled out. Long before some very detailed drawings were made, the parameters of where the expansion can and could go were determined before too much drawing was accomplished into much of the quantities calculated, and those details going to the plan. Then they had a set of meetings where they laid out>>'s. You can also imagine, the district engineers pulling staff and moving them to special project offices what happens to the other work that the district is doing. Every district, and I think every office whether you are public or private, give a certain number of resources and individuals give a certain number of hours per week so you know what your total hours of effort in your office is. And, what TxDOT Waco did, was they contacted other districts and asked if any of the staff was falling short and if they could help with work hours. In those that said that they could help some of them took right away some of them took design one of them took construction inspection for us. The Austin district has helped up to step -- stepped up to help us. As you know, there are other state owned facilities and some of the districts help with those efforts as well what we would call every day district business. Once those hours were maxed out we also included consultants on this in the consulting world -- the consulting world was brought in. Also the construction engineering inspection we have a couple of consultants helping us on the inspection as well. Here are some of the things that -- that was design and planning. Today we are in constructions. These are some of the things that we are pay attention to in terms of construction coordination. That go into what I do on a weekly basis, with the Waco district staff. And all of the things that we included, you can see at the second to the last bullet point shippers. One of our cities has a large industrial Park, and we have reached out to the shippers and that industrial Park, we have received their contact information, we send out regular notices to them. And call when you need to be, we get together live with them and get an updated construction schedule of their area and also, where certain roads are closed and when they might need to come into their industrial Park as a different angle. So we recognize that the shippers were an important customer in all of this. We actively engaged in time as well. A milestone is what we consider when a certain exit ramp, a certain intersection, a certain port -- part of the quarter is heavily used by local traffic. In order to be sensitive to stakeholder concerns we have generated milestones. That means, inside of the contract it tells the contractor when he bid the document that when you start, at this intersection, the clock starts ticking and you have to be done in 22 calendar days or 22 workdays or how ever be milestone is set up. And, if that's milestone is not met, there are penalties -- financial penalties assessed to the contractor. So milestones are so sensitive, that there is double encouragement that if they finish early they get bonus money as well. Not all of our contractors have -- I believe all of them do have early incentives for total completion of associated with them as well. To helping courage minimal disruption. -- To help encourage minimal disruption.

Nicole Reddick, that I am a mobility coordinator. These are the highlights of what a mobility coordinator is. And what I do on a day in and day out basis here in Waco essentially, I try to be the point person. For those of you who are use -- used to writing a subway, this is Grand Central Station where everybody comes in, and they need to go somewhere else. All of the information comes in and I try to collect it, and then I send it out to the appropriate stakeholder who need the information. In of this

communication, we want to point out that our communication along the corridor does not stop once we had our last designed public meeting. Our communication is ongoing and well-established systems that we have to help us along the corridor here. That includes but not limited to businesses cities and towns and internally, what we work out between the field and the public information officers of the Waco district. >> This slide here, in order to facilitate communication it helps to have data. I recently Reddick quote by Sean, he is the head of the financial web services and he says, data creates a lot of clarity around decision-making data is incredibly liberating. If we needed to know about Q predictions, Q development, travel times, amount of traffic, classification of traffic, then we need to be measuring it on a routine basis. Because, not all traffic volumes are the same in every part of our core door and in every part of our projects. So we have set up the big picture on your left, at the top of it you'll see a hemisphere, those are cameras that we have and of those re located throughout critical parts of the corridor to give those a traffic operations the ability to look up and down the court or. So bright rectangle instrument that is our traffic data collector and traffic data classifier and then all of that goes down into a box, into that box has on top of it a Bluetooth meter that's picks up addresses at .8, and again at point B in their time stamped -- and they are time stamped. We know the difference between the cabinet, and we know the time that it took for a vehicle to travel between the two points. You know what the speed is in the travel time. On the very top you can see a thin panel above the camera that is our solar panel. Solar panels have really revolutionized our ability to track traffic move the boxes, and be reestablished within a few days. That's another thing that they consider collecting traffic as using a solar panel. You have to make sure they stay clean. For those of you that live up north, you may have sometimes in the winter where the gray days of old man winter does not allow you to get enough sunshine. So you have to make sure batteries are changed frequently. If he the one on the right is attached to a bridge column. We made sure that it was attached in such a way that it received the sun. If you attach it to bridges make sure it is not under the bridge all the time. This one, has a gray antenna for the Bluetooth. And, the message board there is how we communicate travel times to the public in real time. Both are updated every five minutes.

We collected a, based on the volume of traffic we can do delayed predictions, or construction, and we can send out travel information through the web or other social media. >> A lot of this we want you to know was pulled off of separate -- public surveys we did. We sent out a survey that asked the public if we were going to tear up all of 35 what would help them navigate the court or under construction. These are the things that came back on the public surveys. This is how we based our task when it came to developing a program ended traveler information program.

And there are several slides on how this came to be and it could be its own presentation. I wanted to highlight that we did a public survey on heavy public wanted to be fed information in regards to the construction and delays. Any current operations of the highway. >> With that, I want to give you a quick example of what coordination looks like between projects on a weekly basis. What you see here is an internal website I look at every day. And has north on the top, southbound on the bottom, and across the columns every column is a different project name or different project number. And going down horizontally is time of day. Review the 7 PM to 7 AM because that's when they are closing down. What happens, is on his southbound direction that is occurring they both put in for lane closures up for the following week, my screen turned yellow. That means, that are delayed for traveler going through the core door exceeded 30 minutes. The 30 minute threshold was a self-imposed value that we said, if someone is traveling from the South end of the district to the North end, we do not want them to be delayed Oregon 30 minutes on their trip. And, the reason why we did this, is when we did our traffic data analysis, we found that two thirds of our traffic pass through the Waco district. So we want to make sure that that pass through traffic does not have unnecessary delays or longer delays the unnecessary, if we know that they are going to happen.

So, when we know that they are going to happen we have a report like this. >> It is a system that was established for contractors to submit advanced notification of plans to close one or more freeway lanes.

It is a construction traveler information system and it was designed and implemented for this construction effort. It includes a subsystem and we call it the plan closure notification system. It allows TxDOT, mobility coordinators or others to enter information into the database. Contractors are required to send advanced notice of at least seven days before they plan to close the interstate. Link closures due to construction is not permitted and it's only from 7 PM to 7 AM. Our database stores all these details and then, the entries can be flagged for immediate publication to the public or they can be held private until we view certain traffic analyses tested do certain traffic analysis that can happen on each night. And for each closure that is submitted, our system developed a report like you see here. This is called the lane closure assessment tool. And, they lane closure applies of expected hourly traffic demands to be estimated works on capacity of each requested lane closure. When demands exceed capacity, a key was predicted. The language is estimated -- the lane is estimated to be stored in the queue each hour. The estimate that caused by the queue. >> As you see, the lane closure output includes expected queue lanes and expected delays for individual lane closures. In this case, we have shown that the queue is expected to get up to 1.3 miles at the 9 PM hour. This helps us then go back and to discuss what the -- with the contractors about what are they doing that particular night, and is there something that we can do to either shift there were three different evening, or shift the time that it would start. So what we did in this case, they are saying work activity would it be okay if you started that's 9 PM. So the contractor said yes, I can start at 9 PM because the work will not take me 12 hours. And, as expected by shifting the time, two 9 PM are expected billing for this particular project went down. Now, but I want to show you is the next graph. Which covers what we expect the delay to be when everybody started at 7 PM. That's the blue line. The red line, was 11 contractor began to start at 9 PM. And the green line is when we looked at the date of the next morning as to what actually happened out in the field the night before.

We were able to lower the queue, and when we lowered the queue, we lower the delay, and when we lowered the delay we actually pushed the peak delays later into the evening as traffic volumes were coming down. And also, there is another discussion in there, the less queue there is, in the last time there is a queue on the highway, the safer we can make the highway by decreasing the potential of rear end crashes. And at that will be discussed in a later webinar.

Also, as I wrap up here, I want you to know that we do performance measures monthly, and weekly to see how the core door is operating because of the construction. And here, on the bottom of the graph, it gives you time date, and it lets us know which was the delay -- what the delay was of the traveler due to construction closures. And if so, over half of our closures had a five minutes or less delay all the way down to our greater than 30 minute delays. And that is the one that we go back and we will drill deeper into. If our average has been 4% since 2004 team -- 13 what happened in the month of artist that made a jump to 11%. So that gives us a little tip to go look into some things. So we get out our graph for August, and all the projects are on the left. And across the tops are all of the time frames that you so. And when we looked on the greater than 30 minutes, we cannot necessarily attribute any particular project to be longer than 30 minute delays. This one ended up just being the fact that, projects were doing certain activities all at the same time that generated longer queues and a some of the queue development has two also do with when the traffic exits the interstate they go on the frontage road through an intersection and they get back on and we have noticed some time that we have to remember our flaggers and are off-duty officers to get out of their vehicles and actually flagged be traffic through the intersection that will help flow.

So lessons learned is what Martha and her team hope that you get out of some of this. This is a very high level quick flying type of presentation that we do. In dating, federal highway, and the smart work some committee is open to creating. To peer discussions if any of this needs to be bedded in further detail. Here are some of the things that we have learned and continue to learn. Construction coordination, early in continued conversations with decision-makers and the public is important and very helpful. During

the play design of the construction going well because of such product office. And then, when the documents contain language that is consistent across all projects that help sustain good coordination. Advanced Lane notifications are very helpful. Because, that gives us time to look at the predicted delays, and have conversations with the contractors as to what solutions we can develop. >> Traffic data collection equipment is important. As we said, over a long time period, if we have been doing this five or six years are traffic patterns or volumes could change. And also traffic volumes in traffic patterns change based on the time of the year. To have that real-time traffic data it really helps with our delay predictions and other decision-making ideas that we implement when we are able to look at real-time traffic. Mobility coordination creates space to advance conversation and minimize late -- delays. Feedback from road users helps improve feedback. TxDOT has developed a traffic incident management plan. This is how I want to end, with one long hopefully good statement. And then also, feeding back to the beginning of the public surveys. They took -- contributed significantly to the work task and how we delivered the information to the public. And we have conducted public surveys since then to ask the public how we are doing and continue to improve our processes. But, our strongest thing -- what of the strongest thing that we have done in Waco as we have had monthly meetings through the leadership. And that, we have been able to establish a coordination culture with any district. By this, immune we have established advance notification of construction activities. Have established advance notice location of maintenance activities.

Of utility activities, and even the Texas State Police Department notifies the district when they would like to shut down I-35 for forensic investigations. And for those unexpected -- unexpected closures the district has developed an incident management plan complete with detours and traffic control plans so when I-35 has been closed off, we know what to do with the traffic in the core door.

With that, I give it back to you Nicole, and we will do our questions if we need to.

Rank you John. We do have a couple of questions.

Mike would like to know how is the delay calculated or estimated. >> And its simple form, will first is, this is a plug for your next webinar on October 26, I believe that Jerry will go into more detail about that. But, and its simplistic way, we calculate delay and we know the capacity of our interstate is. And then, when we close one Lane down we know that we decrease the capacity and because we have real-time traffic volume we have a volume and capacity with those that's how we come up with our estimate. Now, the actual algorithm and how all of those factors are put together, that was designed by Jerry -- Jerry Allman and he can speak to that more on his webinar. You can contact me and I can introduce you to my email.

Thank you John. Next question, are the traffic delays referred to in the presentation based on actual times or theoretical based on speed reduction and or increased demands? >> When I showed you the pictures of the PC MS that shows the miles to the next town in the minutes to the next town that was lively and active. If you driving, you would not -- you would encounter that incident, and you can expect to take that long to get to that next town. If there was no delay then they would've said 15 miles 15 minutes. So to answer your second question, is when it's in a free flow conditioning, we go ahead and a truncate our program at 60 miles per hour because the public traveling the core door realizes that 15 miles to 15 minutes to the next town is essentially free flow even though our speed limits may be 65 miles per hour or 70 miles per hour, but when it's about 1 mi./m, for the travel time the public knows that we are in a free flow condition. We do not decrease the minutes if things are flowing faster. But, if things are flowing slower, that is real-time travel. That's the amount that you are being delayed. >> Thank you John.

Mike would like to know, what sort of traffic volumes are along this core door. >> While the first slide, depending on where you are and depending on the time of day we could have a two 55,000 vehicles a

day or over 100,000 vehicles per day. So like I said, it depends on the day of the week, but are traffic volumes kind of go in the high 50s all the way up to the low 100s.

Thank you. Christie would like to know, what other operational performance goals were part of this project. Decides 30 minutes will delay. >> -- Besides 30 minute total delay.

That's a good question. We look at crashes on a routine basis. With of those crashes, we look at severity of crashes, and we try to determine if those crashes are associated with a particular section of a project, if our transitions are be traffic shifts that we set up. If they are creating clashes that were not happening before. And calm -- and, it's not -- well one of them -- it's not an engineering metric. But, if a public information officer in Waco has a day or a week of minimal complaints due to I-35, we consider that a win as well. But, we can't put an instrument in her office in measure that. But we know, that that is part of what we try to do on the soft side. To keep the emotional energy from construction by giving good communication to those, so that they understand what is going on and are not surprised by what we are doing. If there is a specific performance goal, you are thinking of, ask about that. We may be doing it in a might not be thinking about it. But we have -- every month we have a report and I can send you that report of all the different things that we look at.

Thank you John. Is a copy of the traffic incident management plan available?

Sure. With an email address I can send you the PDF. >> And Donald Smith like to know what software was used to evaluate the traffic data. >>

From what I understand, the software we are using it was an in-house development software. And, that was all developed and designed before came on board. So, I would need to follow up with you Donald on exactly -- unless you're talking about how we can use Bluetooth data, or how we breathe the traffic data, there are a couple of different things in there. A lot of this was handwritten -- not handwritten -- but designed in-house. I could get with you off-line and talk more about that. >> Thank you John. At this time I will turn it over to Steve the department presentation. >> Thanks. I am Steve. I will be talking about some of the efforts that they are taking. Performance management to provide all -- provide along I-94 just a brief description of what that is like for those unfamiliar it is the primary connection between Detroit and Chicago. It also serves as being core door is that travel from Canada --. >> The can of higher commuter values. Depending on where you are. It covers 271 miles across the southern part of the state includes connections to three border crossings with Ontario. >> I 94 stands three regions and a branch offices what we call transportation services. And varies from three lanes to two lanes and lower rule areas. Are some tour coordination began in 2010. After numerous works phone, our staff was challenged to provide better service and try to limit pounding delays. >> Staffing from three other regions other workshops and teams to develop ideas to move them along a better faster operation. It was titled the I-94 coordination of partnership. The overall mission of the I-94 partnership was to improve travel and reliability. The overall goal was established. It defined the six months. . Is also important us a little. The target was set to limits will delays to 40 minutes. 40 minutes is about a 15% increase in total travel time compared to the speed around that entire stretch. >> There were a few teams established as part of the partnership to come up with ways to provide better travel. One was involved in working with performance measures, singles, and Project coordination. Another was involved with improving management of active works owns along the corridor. >> The performance team had the task of developing goals to set up performance standards actions in try to achieve them in more the planning and design stages of the project. The team divided up I-94 on three sections. Not a region boundaries. This coordination across the region boundaries. The Western infection -- segments were a total delay a 15 minutes in the Eastern section from Detroit at 10 minutes. It set the tone for our actions staff that they would take. To fix the three segments along I-94 any colors on the map represent works owns that were active. The green, were no laying closures, yellow were awfully enclosures and red were the ones that were going to happen during troubled times. A list of each worked on was

compiled the calculated delays during peak and off-peak times the delays for some to see we could meet our delay goals for the year. This is an example of a term used. Is project is basically charted to provide a week by week summary of which projects are active on the court or. The roads on the bottom estimated delays to provide a snapshot to meet our goal are not. This data can then be used to just projects or and dates if possible. While some project may take -- others kinship Tourette -- shift around.

Or four coordination across our regions were district, MDOT also shares it with her neighboring agencies. We assist each other with messaging in major incidents and -- when projects occur. Several states in the upper Middle America are part of the Great Lakes regional transportation coalition and we, and only share our upcoming works on projects for the year. So in addition to the project scheduling and coordination some best practices were gathered in higher quarter standards were implemented. The intent was to provide a more consistent works on across the various offices during the design and construction.

Their benefit was being thought to improve works owns and ultimately reduce driver confusion and frustration with works owns. >> In order to help maintain capacity some of these standards included shoulder width of 2 feet, improve driver expectations works owns and left-wing close -- left lanes closed first.

In the works owns when practical. >> The active quarter management team was staffed with improving during construction. The goals of the steamer to better manage active works owns and message coordination. The team decided that the delayed measurements were necessary to validate the estimates, calculate design, as well as to find out how well or poorly the works on this operating.

The teams established a works on meeting and participated to limit delay. While travel time worked as a performance measure, it was an easier number for people to relate to and in easier to put and -- perspective with costs. They were are the estimating a delay cost for each project in addition to estimating delays in the metric became a basis of our alchemy base performance. The cost is simply just taking the delay time for traffic and multiplying it by an individual cost for vehicles. To the different number for passionate caught -- passenger cars and commercial vehicles. Sitting in traffic, or services not arriving on time.

We also investigated the possibility of other metrics like travel time index, we found, is better suited for long-term performance and so the day to day activities. Is also more difficult to relate to the public if you ever tried posting your performance metrics. >> For the cost established, efforts were expanded to cover other congestion besides works owns, the targeted response with the number of winter impacts and roadways back. But these other outcome goals determined various measurable actions were developed, the hope of moving the needle towards the desired outcomes. These and other efforts were part of a whole business process that MDOT undertook for performance management.

With as much effort as we were spending our results were -- or tools were fairly rudimentary we. Spending dollars on software that can provide quick and easy calculations and graphics was important. So just a recap of our history. 2010, we measured by taking snapshots of our information up -- map and associating specific delays every time the map shows speeds of less than 20 miles per hour. We continue that in 2011 in 2012 we measured the entire quarter. We also continue the 30 minute delay measure. This provided data for the performance measure measuring it on the map but it was not very accurate and it was time-consuming. By the end of 2012, the software to help us about and we went with the cat lab and the University of Maryland program which is the regional system so, adding that, we can spend more time looking at the data as opposed to gathering the data. The traffic speeds from a combination of probe vehicle data, we've been able to estimate on the system in a routine continual basis thereby reflecting changes in our system of operations triggered by works owns in weather. As I said originally they were fairly rudimentary we acquired that it maintains a database of that data. Allows us

to compare current speeds and cost data with what we have experienced over the last five years. There several modules that you can see from the screenshot. Offered to tables and charts to please her enter engineer are available at your fingertips. I've been pretty happy with that software.

Some of the various efforts to meet the goals for works owns include the items that you can see here. It's different -- funny estimates of impact, and minimizing the impact of works owns. Have evolved over the years by coming part of the everyday activities or sometimes being discontinued because it did not result in a desired outcome. To validate our delay works on quality. So, what we're up to these days, my region has shown success in limiting air packs -- impact in works owns. We like to think we do a great job at mitigating those work -- impacts. We haven't had as many pressures to deal with. Unfortunately, and led to a little bit less focus. But we felt a renewed -- and we're working on the coordination. We continue to track easily clock -- as we delays. This is to suck the number of the they experience a delay over 10 minutes. Everyday work is on his active discounted and it's by the direction impacts. Soever project working in a freeway that could be 14 works own days in a week. And if one of those days you have a delay over 10 minutes your percentage of success will go down to 93%. We think that they good measure. I think our goal of 90% is low. That's an example of how we may need to adjust our goals. It's kind of a process with a measures. While this percentage looks pretty good. We have encountered about 1600 works own days in our region. That means that we've had 76 days. So, we have room for improvement as there always is.

When it's working in networking. Helps us prepare. As a side note, some delays have thresholds for completing transportation management plans when designing a project. We do have a purity process managed by ours health -- peer-reviewed process. So, or other action item we're doing which we plan to continue. Works on calling meetings. We do those weekly, and we basically discuss what projects are coming up over the next week as well as what our messaging plans it should be for IT us devices.

So, the other image that you see here on the screen is our overall mobility goal for the region. It is the bar trade -- it is the bar on the right. Compared to for your average which is the line there. We are situated in Michigan. We are right next to Lake Michigan which tends to have a huge impact on us in the wintertime. You can see the four year average that we did a lot of spikes in delay cost in the winter months. The two weeks there that are above average were due to some pretty significant winter storms this last year. The lower averages in the summer shall we have been able to keep our impacts relatively low. There are portions of the chart that are close in June. The result for me works on we had with a lot of impact. Overall for the 124 miles we were staying below average but we have had some delays that we were hoping would be less. Essentially, if you use it as a tool for a while, one of the outcomes, is that you've seen the delays become substantial we have been able to justify spending extra dollars on projects to six there were two nighttime operations. We been able to do that by demonstrating the cost to users by heading -- having blessed -- less delays. We pushed projects two different calendar years. We've modified traffic control schemes has been excessive. So, the findings from this effort on performance measures and project coordination, without metric to define success it can be a struggle to move in the right direction.

Determining the end result is a destination. With the outcome performance measurement that drive the actions leading to it. The appropriate question needs to be turned to take active steps to get the goal. As you go through the process you have to ask if you are measuring the right thing. As I stated before it can be process and some measures do not provide the benefits you are looking for.

Actively pursuing performance measures does drive change. Number two, when works on mobility reported it stays in everyone's mind and affects their decision-making. Mobility and reliability needs to be in everyone's vocabulary. The users of the network need to be thought of as customers. They also represent a monetary value. While told are tangible assets paying for the network is also monetary value that they can spend waiting in traffic and it needs to be considered as part of a control plan. Thirdly,

what traffic engineers know and understand mobility concepts, organizations may not always be structured to place mobility at the top of its priority. In order to make that happen you need to have support from top level management. Lastly, I'd like to point out using user costs, there is a potential to relay this information to the public to tell the story of how they provide better service. There is also balance between money spent on construction and money lost on -- in time by roadways users. It's tricky but it can be proven a useful tool for operations. With that, I will open it up for questions.

Thank you Steve. The first question, how was the TTD Max of 15 minutes and 10 minutes determined?

The 15 and 10 minutes was determined mostly based on the length of the segments. We has several system interchanges along the way from freeway to freeway connections. We try to use travel time from the state line to another freeway as one segment, and then, to the next maker -- major freeway and basically we divided up the time accordingly. >> Thank you.

Well, everyone is taking a moment to take the stress type there quashes. I'm going to bring up three questions that we will take -- asked the audience to can't -- answer. It is a short answer question. Your question is limited to 250 characters. You may only answer the question once. If you and's press if you enter the second -- enter a second time it will override the first time. Does your agency have any business processes in place to do court or level project and? Second question, are there any tools or agency uses for quarter level project coronation? And our final question digit your agency use any performance measures to track court or work performance? >> Take a moment answer those questions. In addition, if you have any questions for Steve or John type them into a chat pod. We will pause for a moment while everyone does that. >> If you answered yes to any of the questions in the polls if you could provide more information that would be very helpful. >> Well people are responding to the questions, I will turn to John. She said yes, this is our phone call performance measure. Where their Macs cueing that traveled cash also weather crash rate goals for goals associated with these types of crashes? >> In terms of crashes

We have not had a goal per se other than adopting the national towards that. We work really hard to protect the queue in order to prevent death from happening on the quarter and also, we work hard to prevent creating hotspots on the core door and that could be like I said, even through traffic shifts, narrowing the lanes, or, things like creating ponding during Lane events during age is not full install jet. We have to do some temporary drainage mitigation measures to make sure that we do not pond the interstate before we are fully constructed. What we do have, is a monthly -- two screenshots on performance that comes from a monthly court or performance document that we develop every month towards the district that gives a monthly snapshot plus a 2.5 your average of how those performances are going. I just showed you two pages of that report if you want a copy of the most recent report, I can provide that to you.

Thank you John.

Steve, what works on traffic control training is required of contractors?

I am not aware of any training that is required. I will have to look into that and see if there is any.

I can speak for Waco.

When they put all this together someone on the contractors project team had to go through the OSHA works own thing. And that was stated in the bid document. >> Thank you gentlemen.

Just a reminder to people that are answering are pulling question if you answer yes to any of the questions if you could provide more information that would be helpful. Back to Steve, it would like to know what the actual delay cost by type users that you would use.

Okay, what we use for users for passenger vehicles is for eight dollars an hour or use \$31.73 to be specific. It's based on federal highways publications essay -- which is a payment design. So, I was other assets out there for trucks which put them higher but this is how we use in Michigan, and adjusted based on inflation every year. >> Thank you Steve. As we do not have many questions left. Like to offer the phone lines as well if anyone would like to ask a question or make a comment over the phone please press star one on your phone keypad in that will put you in the queue to have your phone lines open. In addition, the like to comment on any of your polling questions please press star one on your phone keypad and that will put you in the queue to have your phone lines open. >> Steve, I believe this is for you Richard would like to know do limit the length of closures we do not specify typically what the maximum length of a closure is. Usually, it is set up based on projects by projects if it is an overnight closer, it is usually limited to the number amount of project -- production they can do.

But if it is a permanent works own, which is kind of depends on the project itself. >> May I add something Nicole?

Sure Copley's.

In Waco Steve makes a good point. Given, that we limit the contractor to 7 PM to 7 AM. That puts a limitation how much they can do any given a. And also to close a lane or both lanes of the traffic requires the traffic control set up so a lot of times, it takes the traffic control subcontractor 45 minutes to an hour to get the lane closures set up for working in they can -- they are done to 10 or 10.5 hours of work in a night. Typically, they shut down the freeway for localized activity. To place the deck of an overhead bridge, to do some striking to move barricades for traffic shifts in those types of things. Whenever the lane pavement test whether it be Portland -- pouring cement concrete. That new pavement work is done behind barriers and, it is not impact traffic. Our contract stated that the contractors between 7 AM and 7 PM are to leave the main lane open to at least two lanes in each direction's. And do something happens there will be a Lane rental fee -- penalty fee. So, that's kind of where we are at. Kind of like Steve said, the lane.

Thank you gentlemen. At this time, I'm going to close our polls and hand it back over to Martha to provide some closing remarks.

Thank you Nicole. >> Now, I would like to take the opportunity to share with you a few resources that are available. We have developed a smarter works own interactive toolkit which is currently available on the national work zone website. If tools and resources to try to use product -- project coordination as well as technology coordination. You can find the webinar recording and information of the bones on the website as well. We do have other resources available. They are available right now which is also included the PowerPoint presentation that you can download please join us on our next webinar on October on October 22 -- 26th one -- 1 PM to 2:30 PM Eastern time. It will be on technology application showcase the queue warning system. It is provided. My webinar number five will be programmed based project coordination is scheduled for Monday, November 2. Again, you can find all the information that we have shared in additional tools and resources the national works on clearing statement. Think of for joining us. We hope to see you at the next smart works owns webinar.

At this time it looks like we have gone through all the question. We do not have any more questions. I think we will go ahead and close at. The recording will be available online in the next two or three weeks. I will send an email to everyone who is registered once it is available to. Is again, it will be held

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on October 26 and the topic is smarter works owns technology showcase. The link is available on a slide up. I will be sending out an invitation for email. Thank you everyone for attending and thank you to our presenters. Help everyone enjoys the rest of their day. >> This concludes today conference call he may now disconnect. >> -- You may now disconnect. >> [Event Concluded]