Data & Analysis Technical Assistance Program Technical Webinar: State and Local Agency Safety Data Integration Experiences

September 18, 2014, 2:00 to 3:30 EST
Participants: 100

FINAL TRANSCRIPT:

Operator: At this time, all participants are in a listen-only mode. If you should require assistance during the call, please press star, then zero. I would now like to turn the conference over to your host, Heather Richardson. Please go ahead.

Heather Richardson: Thank you, Joe. On behalf of the Federal Highway Administration's Office of Safety, I'd like to welcome everyone to the second Data and Analysis Technical Assistance Program Quarterly Webinar. My name is Heather Richardson and I'm with the U.S. DOT Volpe Center in Cambridge, Massachusetts. And joining us as presenters today are Bob Pollack from the Federal Highway Office of Safety, Susie Forde from Wisconsin DOT, David Blackstone from Ohio DOT, Tim Colling from the Michigan Technical University, and John Hicks from Tennessee DOT. Before we begin, I just want to point out a couple of key features of our web room. On the top left side of your screen you'll find the audio call in information and list of attendees. On the bottom left of the screen is your chat pod. If you are having any technical difficulties please use the chat pod to send me a message. You can also use your chat pod to submit questions to our presenters throughout the webinar. At the end, we will queue up questions to answer during the Q&A session. At the end of the webinar you'll also have a chance to use the chat pod to suggest ideas and topics for future webinars that you would like to have presented. Today our webinar will run until 3:30 and we are recording this session so that it will be available to those who cannot join us and for your future reference. It will be on the RSDP website in a couple of weeks and we'll email out the website to all of the people who registered for the webinar today. Now if you haven't already done so, please take a moment to answer the four poll questions that you have on your screen. How many people are participating along with you today, what part of your organization do you work in, how did you hear about today's webinar and what type of agency do you work for? I'll give it just one minute to finish up. And with that I'd like to turn the webinar over to Bob Pollack who will introduce us to the data and analysis technical assistance program in today's presenters. Bob is a transportation specialist in the Federal Highway Office of Safety and a member of the Data Analysis team. He is currently the Program Manager for the Roadway Data Improvement Program, the Model Inventory Roadway Elements Reassessment, and the Data and Analysis Technical Assistance Program. Go ahead Bob.

Bob Pollack: Thank you, Heather, and good afternoon or good morning to everybody and thanks for joining us on our second technical webinar. Next slide please? Before we get into the program I'd like to take just a minute to talk about the Roadway Safety Data Program. This program is developed through the Federal Highway Office of Safety and it is intended to assist state and local agencies to improve their

data collection, improve their data quality and improve their data analysis. And this is done with the intent of supporting state and local highway safety programs and under the RSDP the pogroms really fall into four broad categories. Those categories are: data guidance, resource development, technical assistance of which today's program is part of the technical assistance effort, and then training. If I could have the next slide? Now, little bit about the Data and Analysis Technical Assistance Program. This program is really set up to assist state and local agencies with almost any type of data problem, data issue they may be having be it in regards to data collection, data quality, data analysis. The program is really intended to take any issue that you may be having and to try and find a technical expert or an individual who could provide the type of guidance or technical direction that you may need to address the problem that you are having. So we've got the website to apply for technical assistance under the Data and Analysis Technical Assistance Program listed here. And if you're having any type of problem, I would encourage you to go ahead and submit an application. Or if you are having trouble or answering any of the questions as part of that application process, please feel free to contact me and I'll be happy to try and assist you to complete the application process. Now, also as part of the Data and Analysis Technical Assistance Program, we are conducting these quarterly webinars to provide information out to the practitioners of roadway and traffic data. And that is really what today's program is. It's one of our quarterly technical assistance webinars. So next slide please.

Here is a copy of today's agenda. And Heather introduced briefly by name the individuals who will be presenting on today's webinar. I'll give you a little bit of their background. Our first presenter is going to be Susie Forde. She is the Section Chief of Data Management with the Wisconsin DOT Susie is responsible for managing the Wisconsin Department of Transportation's Highway System Data Architecture. And this includes the State Trunk Highway System and local roads, the highway performance monitoring system, traffic count databases, as well as state and local control networks. Our second presenter is going to be David Blackstone. David is the Manager of the Ohio Department of Transportation's Information Management Section. He is responsible for the overall management of ODOT's Roadway Information System, the HPMS system, Annual Mileage Certification Program, the Linear Referencing System and GIS functions used by ODOT. And he's been involved in GIS technology for more than 20 years. Dr. Tim Colling is the Director of the Center for Technology and Training at Michigan Tech. Dr. Colling is primarily involved in outreach and research activities in the field of pavement management and traffic safety engineering. He's the Principle Investigator for the Road Soft Asset Management Program. And he is part of the Civil and Environmental Engineering Department at Michigan Tech. And our final presenter today is going to be John Hicks from the Tennessee Department of Transportation. John is the GIS Manager in the Long Range Planning Division for TDOT His office maintains the Linear Referencing System Spatial Network, the TRIMS Roadway Database, and the office also produces county, city, and special GIS maps including the official map of Tennessee. And John has been with TDOT for over 28 years. Those individuals will be our presenters this afternoon.

And just to kind of set the stage a little bit for what we're planning to cover here this afternoon if I could have the next slide please? Thank you. Under MAP-21, the state is required to have a state safety data system to perform safety problem identification and counter measure analysis on all public roads under the Highway Safety Improvement Program. And as a specific part or specific requirement under MAP-21,

there is a provision that state is expected to have the capability to link state data systems including traffic records with other data systems in the state. And another of the programs that we run under the RSDP is the Roadway Data Improvement Program where we work with states to assess practices and procedures being used by the states in the collection and maintenance of roadway data. And we've done a limited number of these and we have not found as a kind of a standard practice in the states that we worked with, standard practice of integrating or sharing data between state and local agencies. So one of the things that we were attempting to do with this current project is and if I could have the next slide? The integration of State and Local Safety Data Project, is a project that we undertook to look for to research examples of good examples of states' safety data integration practices to develop guidance on the integration of local data into the state systems, and as part of that we have identified case studies. The four presenters this afternoon will present on their project within their state, and present the challenges, the benefits, reasons for success, and lessons they've learned and key findings as part of the integration of state and local data within their particular systems. So with that I would like to turn it over to Susie from Wisconsin who will be our first presenter. So, Susie, please take it away.

Susie Forde: Okay, thank you, Bob and good afternoon everybody. I'm just waiting to get control of the PowerPoint…

Susie Forde: And Heather I see that but I don't see my navigation buttons.

Heather Richardson: Okay, that's odd.

Susie Forde: If you just want to advance my slides, I'll do the same as Bob and say "If you could advance the slide?" That will work.

Heather Richardson: Perfect.

Susie Forde: Okay, let's advance to the next slide. Okay, good afternoon everybody Wisconsin's information system for local roads or WISLR is an example of successful development of a safety and asset management system designed specifically to meet local stakeholder need. For Wisconsin that included developing the new system in a spatial framework different than what was already in place for our state maintained roads. In Wisconsin, state statute 86302 governs the annual inventory and mileage certification of local and county roads that support the distribution of over 400,000,000 of general transportation aids to local governments. State statute language changes in 2000 shifted inventory responsibility of these roads from the DOT to local. Also effective in 2001, locals were now expected to collect and submit payment ratings every two years. Based on the need to enable comprehensive analysis in asset management of local roadways in Wisconsin, the department decided to create a statewide local road network. The project would also address the need to provide users with various methods to access data whether it's Internet, GIS, tabular, or spreadsheet. Next slide, please.

Before 2002 the DOT maintained over 1,900 individual CAD and GIS local road maps. There was also a 20-plus year old local road database where no attributes were tied to location. The solution was to develop a web-based GIS application integrating roadway data with locations. And some of the challenges we faced with that project was the effort to convert and develop a new statewide local road network with the attributes tied to locations. Wisconsin has over 1,900 local jurisdictions where 66 percent of them are towns and their filing system was mainly paper-based; so many of the locals at that time did not have access to computers or even the Internet. For the project to be successful it was critical to select a linear referencing method that users could understand. Next slide.

WisDOT selected the On/At Linear Referencing Method because it's simple and provides a standardized way to identify location of roadway data. So a primary reason On/At and Toward was selected is roadway sections are easy to describe using this method and fairly intuitive to relate to. So the On/At and Toward represent reference points on the road that locate data. If you want to identify an attribute along a stretch of roadway all you need to know is the road name. So the On route is the road that you want to collect or identify roadway attribute data. The At route is the intersection that defines where to begin to measure. And in the example you'll see a big green dot by Pebble Lane. And the offsets are used to locate roadway data that may not begin at an intersection. The Toward route allows you to indicate the direction of travel from the At route. So in this example we are looking at the Towards route is Church Street so you know you are heading east from Pebble Lane. In this example I show two different attributes. One with an intersection which is the surface type that begins at the intersection so you are on County Highway A at Pebble lane when you are referencing the surface type. If you look at the left and right shoulder information, you can see that you have a three foot gravel and then it changes to five feet of gravel and it's not at an intersection. And so in that situation you would use offset to be able to reference that. So our WISLR system GIS map, the query tools, and the reports, they are built off this L.R.M. And overall we found that locals have not had any difficulty using the On/At and Toward. It is fairly straightforward and pretty instinctive to use. Next slide?

This slide displays WISLR's home page where authorized users can select the county and municipality that they wish to view using the dropdown arrows. WISLR provides many benefits to the locals. They have web access to their data now 24/7 versus receiving a hard copy paper from the department only once a year. There's also a statewide road network with the roadway data tied to location and a centralized system where WISLR users can view any location anywhere statewide. But they can only update roadways within their jurisdiction. Next slide?

Heather Richardson: Susie, would it be possible for you to speak up just a little bit? I see that some people are having a hard time hearing.

Susie Forde: Oh okay, no problem.

Heather Richardson: Thank you.

Susie Forde: You bet. Another benefit derived from WISLR is the ongoing improved data quality. Locals and the DOT have shared responsibilities for roadway attribute and mileage changes in the system by statue local governments are to submit mileage changes to the department by December 15th of every year. The DOT conducts a ten percent smart and random sampling of roadways statewide, and also field verified new roads added to the system. We also reconcile the 100,000 plus miles every year. Next slide?

This is where many of the callers may have a stronger interest. I wanted those first few slides just to really show you how we built the system. And on this one, the WISLR Statewide Local Road Network also has line work for the State Highways for visual reference and what that means is that we have the state line work in WISLR but we have no state attributes tied to that state roadway location. But what we found in our development and use of the system without those state highways there would be a lot of gaps in the local road network in addition to people use that for a frame of reference when they are looking for location. So having the state highways in WISLR has allowed the department to leverage WISLR's state wide local road network for comprehensive safety analysis. The department has a crash mapping and analysis project and in here, you're able to display both state and off-state crashes on a single map and also we built an automated tool to locate off-state crashes using the On/At Linear Referencing method. So if you look at the first graph, map on the left, those only have the state crashes on and then using WISLR and the automated tool to be able to locate the local crashes, you can see a lot more crashes appear. And since we know the majority of crashes occur on our off-state systems, having the ability to view both state and off-state on a single map, our safety engineers really like that. Next slide?

Some of our key findings is that WISLR really gives our local agencies control over their data, access to it 24 by 7 means that data errors can be identified and resolved quicker. The department shows its long term commitment by continually investing in WISLR. That way the local agencies know that the system will still be there in the future. WISLR provides ongoing user training and is a presence at various local government associations. We typically show up annually at our Wisconsin Towns Associations, we're there at the various GIS venues statewide. And over the years having WISLR has meant that local agencies could avoid the cost of developing their own GIS-based data management system and that saves some time and money while of course increasing compatibility statewide. Not only does WISLR support our State Statute 86302 for inventory and certification of local roads. It provides a foundation for expanded asset management and safety functionality. This expanded use of WISLR system encourages much greater use for the system. And that concludes Wisconsin's presentation and now I'll hand it off to David Blackstone with Ohio DOT

David Blackstone: Very good, thank you, Susie. Can everybody hear me okay? I see "yes" on the chat box. Okay very good. What I'd like to do is what I'm going to present today is very similar to what Susie presented and so I won't delve into some of that stuff, it's a duplication but sort of focus on what I consider to be somewhat unique. We call our system in Ohio the Location Based Response System and sort of the unofficial is "Create it once, use it a bunch". Similar to most DOTs over the years we have spent a lot of effort to go out and have some sort of inventory for our mileage whether it be for our requirements or for federal requirements and we had the luxury at one time to have a very large field staff and we were able

to send people out. We had ten to twelve people. They were able to go out and basically collect and update the inventory. So just as a reference for Ohio which is probably similar to a lot of states for what we call our state system, we have approximately twenty thousand miles of road, county twenty-eight, and as you can see for basically a total of 121,000 miles of road. So what we were directly responsible over is actually the smaller of all of our systems but we had to have some method to maintain at least some sort of basic information of what the route number was and maybe even the measurements here for the inventory purposes. Well, as our state (as most DOTs) as staff reductions went into place and you had less people and then of course about the same time a lot of people said "Well we should be able to use this for more than just an inventory or for federal reports, what about these other areas that could use some sort of basic roadway network whether it be routing purposes or for in Ohio it was about 2002. We really started looking at a better way to use our network here that could be leveraged by the safety.

So that was just more of a visual. Again we're not the biggest state but that's the state of Ohio with basically 123,000 miles of road. Of course as most states, Columbus is the middle and in addition to the size of the network here, one of the areas that we had to inventory were two, three, four hours' drive. So in addition to the mileage as similar to Susie, government here in Ohio we have 88 counties. Over 1,300 townships and basically 732 cities we have to have some sort of coordination with. And again as I mentioned here, the original inventory was basically developed for federal mileage certification as far as HPMS, being a big driver. We also have at the state level a very similar type of program to where we apportion tag revenue to our counties and townships based on their local mileage. And as I indicated it was very route-centric in the sense of we wanted to identify what county was it in, was it a county road? Was it a township? And what was the length so that we could actually have mileages to basically apportion or tag revenue back to our counties and townships in some cases or cities.

What happened as I indicated staff got reduced and then we had a lot of areas that basically wanted to use our network. Probably the biggest driver for our evolution to enhancing our system was our Office of Safety. They wanted to be able to go out and identify crashes. Our route based system is good for a lot of things. Highway patrol typically locates crashes based off of Interstate-70 and a milepost. But once you get off the state system, most locals, which in Ohio that is actually the majority of our crashes, are on what we call our off-state local system. They typically use a street name and address, an offset, or maybe some sort of physical feature such as crash occurred 200 feet west of the intersection of Westland Mall. As we started to take a deeper look at enhancing this, we also started to have some conversations with our 9-1-1 folks. At the time in Ohio there was basically some of the phase two compliancy to where they were required to start to locate cell phone calls to a physical address.

So a number of things came together at once. The 9-1-1, the other part that came together I guess that helped us out was, which I know is a little different, but we actually have a fairly active statewide GIS body and we as an agency are part of that group. And one of the things that we were looking at from a statewide asset was whether there's any benefits to have a sort of an Ohio version of an all-roads network. And the big drivers of that, of course, was what we call OGRIP which is our office of State GIS office. The other of course is the DOT. There has to be some responsibility or involvement by the DOT

whether it's a highway or a roadway. And of course the other is at the local level. Historically for our statewide certification process we've dealt with county engineers and Ohio has had the luxury of each of our counties have a county engineer which is an elected position but they are basically responsible for the local roads and at some level of involvement for basically our county and township roads. One individual we have never historically had any involvement with was the 9-1-1 office. And as we went out and had some meetings and tried to get a gauge of what the requirements were, the 9-1-1 was probably one of the bigger surprises that we were able to identify as a partner in this project.

So after much discussion, visiting counties, getting a better idea of what the requirements were, we went through there and at a state level came up with a goal for an LBRS which again was to create a comprehensive and consistent accurate and maintained multidirectional statewide asset. Really the whole intent of this was to go from a top-down, to where us as a DOT would send our forces out and try to keep on top of all the changes on these local roads that were maintained by a number of authorities in different parts of the state. So really the LBRS was what if we just went and had something to where we could provide technical resources and funding to the locals to meet these requirements, and then what we would do as part of the contract, M.O.A. actually, they would be required to maintain it and then provide it to us on a regular basis. So as we did this assessment and was planning to move forward we also went through and wanted to take a look at what are the benefits? The one thing we found which was really surprising is that in the state of Ohio this is actually 2003, 2004 around that time, is we took a look at how much was being spent by your locals, which would include counties, 9-1-1 folks buying data, MPO.s. So this was a combination of having staff create, maintain, and or purchase commercial data set it basically was in the range of eighty to a hundred million dollars per year was being spent in the state of Ohio. So that was a very good argument to come in there and actually try to take those funds, make those available to come up and apply those to a statewide data set. The other is the benefit was multipurpose and I mean multipurpose was a type of attributes and the type of topology that may be needed is quite different depending on the use. And it was sort of lowest common denominator. With the 9-1-1 probably being one of the bigger drivers of what we collected and how we modeled the data. And of course number three is the safety program. In Ohio and I'll have some slides to show how this benefited but it benefited us at a statewide level. But the other it did is basically be using the same network at the state level as we did with the MPOs as well as the counties when we went out to either locate or identify crashes we were basically using the same system. And of course number four, locally maintained and validated. Even when we had 12 people doing fieldwork, you just don't have the same benefit of a local. You know, if you were in a certain county on the far reaches of the state, you are much more intimately familiar with the changes, the road names, when a road opens, when a road closes and what we could be here in Columbus. And of course the big pleasant surprise with the 9-1-1 is of all the local offices, they probably have the greatest need to ensure that their roadway network is modeled correctly and has the correct name, address ranges, etcetera. And again, I have a number of these slides so I'm not going to go into detail but as we went through with LBRS, we identified a number of partners out there. Some of these were partners who actually provided funding. The others which I know it sounds a little ironic, but these were people who once the data set was developed basically integrated into their system. Now the benefit of that is the more people at the local level the more agencies or offices at the local level who would start to use the data set, the greater chances are that the locals are going to maintain it, and if there are are

already issues in it as far as names or roads missing or being digitized incorrect, the greater the chance they are going to be identified.

And again this slide shows some offices but this showed and again I am one being very keyed into this, but we've also our department of developmental and started to use the data our department of taxation at state level just trying to use the data for identifying sales tax. Health Department, believe it or not when disease gets-- there's outbreaks of the disease, in Ohio we still have some of those on-site sewage disposal systems which need to be permitted so now they have an address. I don't know if it's listed here but we also found that school districts were starting to use it to help us on the routing of their buses. Well I do have school districts here. So suddenly once the data became available, we first started there was maybe three major offices, but as the data was used and the locals actually saw the benefits of it, more and more of the locals as well as state agencies started to take a look at this data to use in lieu of some of the data. Either they were creating themselves or buying from a commercial provider. And again, I can't over emphasize the benefit that the 9-1-1 provided to this project. And especially safety. Very similar in sort of a reverse method the requirements of 9-1-1 getting an emergency vehicle to a specific address is very similar to when a law enforcement official locates or fills out a crash form that have the correct information to us to come back to our system here to locate that. So again I think at least in Ohio, one of the reasons we've been successful is the participation of our county-based 9-1-1 folks.

And again, this is just as we were going through with our project and trying to make some arguments of why we needed to go this route of the local data. Here's an example and I'm not sure if we actually marked which caller represents which dataset. But as we went through we have a dataset to the left basically represents some of the data that we maintained and spent money on maintaining, the U.S. DOT, Census, local governments and our vendor community. And I think there's a later slide if I remember how to do the draw, but one of the things that happens when, there we go, let's see. The red arrow says this is a ditch. I guess what I wanted to point out with that was the fact that that is a commercial data set. And that was digitized by somebody maybe in country, maybe out of country, but they went through their use of whatever sources were available that was probably cost effective to put in a road. And literally when we went to look at this data very closely, that road that was digitized as "Duck Run" was literally Duck Run, a creek.

The other as we did our LBRS was in addition to going through with your typical street names and address ranges. The 9-1-1 which drove a lot of this wanted to have the ability to also have the street address locations and some of the benefits of that is if you're familiar with a way a state DOT works with their roadway network, that's for the most part an interpolated distance, and addresses when you have range is interpolated. And really what the slide is depending on if you use the interpolated distance, you would come to one location which is up to your upper right. But in reality, since addresses aren't linear in nature, the actual address where the crash occurred or in this case where you needed to dispatch the ambulance, it would have actually been the location in the lower left. And again from an LBRS I won't get into the detail but one of the requirements we came up with was not just to have basically the roadway attributes that would lead to DOT's needs but as you can see from the charts the left and right or the

databases we went through there and we had a lot of attributes such as again the route number, what jurisdiction, EMA or EMS. dispatching areas, but we also included street names and addresses for each of that. So from a safety standpoint what this provides is suddenly I have a segment that is broken down by any of these features which would have our official route number, our what we call from-to milepost or log point. But it also have the street name and the address. So if you were geocoding for the crashes that occur on a local road, that would go to the segment based on the street name and address range. But suddenly that's the same segment that you can do a fairly easy conversion over to what would be ODOT's route number and milepost.

And again a quick slide here of showing in addition to the segments. We also had the address ranges. The other nice thing about the LBRS being developed and maintained by the locals is that in the upper left-hand corner you can see, oh there's my arrow. You can see up here that one of the sources that one of us will use will be imagery to update our data sets. Well, most imagery unless you have a very large budget is usually something that is only done on a five, six, seven, eight, ten year rotation and as you can see those addresses are basically located in a development to where the imagery which I believe at the time was one of the most recent, has not been updated to reflect the new housing.

And again a couple of examples of some assessment testing we did one of our counties which for whatever reason Clark County is one of those counties that is sort of the middle of the ranking as far as urban area cities. It's what we consider our average county. In that county we did some tests of locating some crashes, 4,383 crashes. Before we had the LBRS using our current system was as you see was able to locate basically 24 percent of the crashes. Once we had an LBRS data set and made it available in our system and reran the numbers. Basically those percentages flipped. So we went from 24 percent that were locatable to 70 and 30 percent that were un-locatable.

And as you can see this is Clark County, sort of the mid-western part of the state. The blue, were the crashes we were able to locate prior to LBRS based on our current system. And as you can tell most of those were the ones where the local law enforcement was using some sort of route log point based system and the red were the crashes, the additional crashes we could locate. As you can see in the middle of the screen, that's the city of Springfield and then of course splattered throughout the county, most of those red are the crashes that are located on the local system.

And just one more statistic that we did. We did some comparison between basically some commercial data set with the LBRS segments and then the LBRS with the address locations and we did these on one of our township roads, city roads over in Clark County. And as you can see when we use a national data provider was able to locate approximately 50 percent of the crashes on the township, 63 percent in the city with an overall total of 61. When we brought the LBRS into it you'll notice that number went up to 67, the city went up to 95. One of the big reasons for the difference in the increase between township and the city, within the township roads a lot of those crashes are still intersection referenced. Crash occurred at the intersection of Central and Broad or 200 feet east or west. Whereas in the city typically a police officer

will be using a street address, street name and address. So by having that available, that's where you saw the dramatic jump to 95 percent. And then when we bring in to the equation the LBRS street and the street addresses, suddenly our township went up to 80 percent and our city went up to 97 percent.

And again, this is Ohio and I know the relationship between the DOT and other agencies vary quite a bit. But again for us I think the collaboration with the 9-1-1 folks being a vital partner was very beneficial for us. And again we are considered to be already Arnold compliant and some of this program here has allowed a lot more closer cooperation with the safety and the Federal Highway side. And again like I said I think it's a win-win-win for everybody out there. That's all I have my part of the presentation. I believe next on the list is Tim from Michigan. Tim?

Tim Colling Thanks, Dave. As Dave said, my name is Tim Colling. I'm Director the Center for Technology and Training here at Michigan Tech University. Michigan Tech has had a center that's dealt with local agency, transportation issues since the 1980s. And Center for Technology and Training is where our Local Technical Assistance Program is located here in Michigan. I work on a regular basis with their DOT and our local agency folks specifically in the safety area. And I can see by the participant log here today we've got quite a few other LTAP centers. That's great to see my other colleagues around the country from other LTAP centers that are safety advocates and local agency advocates. And of course I would be remiss if I didn't recognize my partners from Michigan DOT safety programs. I see some folks around there as well.

So today I'm going to talk a little bit about a program that we've had in Michigan for quite some time. It's called Road Soft and it's a safety management and asset management system that was a partnership between Michigan DOT, Michigan Tech University and our local agencies here in Michigan. Thinking about how to describe all of the things that are going on in Michigan in the little time that we have, when I think about traffic safety on the local side in Michigan, it’s really these three things or these three categories come up: data, tools, and training. And pretty much everything that we're doing here in Michigan relating to local agencies, relating to safety falls into one of those three categories. So obviously data access, meaningful data access is a key component to safety analysis for any local agency or any agency, actually. And when I say meaningful access, that means electronic data that's geographically located that can manipulate it and interrogate it to get to the heart of traffic safety issues. And Michigan has had a very long history of doing that and providing that to the local agencies.

The next thing that usually comes in once you have the data is the need for tools. So tools that speed analysis, safety analysis, and help get results faster and help to get better, more accurate results in a reasonable amount of time. So tools help do the heavy lifting in terms of safety analysis that help us get to an end result in a timeframe that's acceptable. And the last part of kind of the last cog in the wheel is training and technical assistance. So we've got some great programs in Michigan including the MDOT Local Safety Initiative, the Local Technical Assistance Program, and the training component of the Road Soft program that allow local agencies to call in and get technical assistance or training to help them

along the way to accomplish their goals. So even if we had great data and having great tools, having access to training to understand how to use those tools is critical.

So just looking back where we've come from in Michigan, like I said, we really have a long history of providing data access to our local agencies. At the credit our DOT folks in the safety area and as well as our folks in Michigan State Police that were pretty visionary in providing crash data access to our local agencies. Going back as far as the '80s there was a program at the DOT where local agencies could call in. This is obviously before the Internet and shared data bases were common. They could call into the DOT and provide a location and get a summary report of the crash data that they have mailed to them. And while that sounds archaic right now, at the time it was pretty cutting edge stuff. As the 1990s went along and computer networks or at least bulletin board systems were common, the DOT worked with Michigan Tech in a program called the Michigan Accident Location Index, MALI, that's our locating system. MALI in a Minute - that was the name of the system. So it was a system that local agencies could get login credentials, dial in through a modem, and then get access to all of their crash records and download them to their computer and have some ability to manipulate that data and create different reports instantly. So again at the time we kind of laugh at some of these green bar paper and modems that you actually had to plug your phone into. But at the time those were cutting edge things.

About that same general time frame there was a project that was getting started called Road Soft and this was a project between our DOT Michigan Tech University with support from our Michigan local agencies, our counties and cities. And Road Soft was originally started as a standalone computer system that was installed at each local agency, and it was primarily focused in asset management, pavement management. That was at least the initial thought of Road Soft. In developing Road Soft in the early stages of Road Soft, we needed a method for locating or describing local roads before we had a mapping system, a unified map in the state. So the system that was adopted was our MALI system, Michigan Accident Location Index. So that was the linear referencing system that was used to locate crashes in Michigan. It was also very handy in locating other assets. So the adoption of that in the development of Road Soft was it really helped out when someone said “Hey, wouldn't it be possible to display this crash data for local agencies and give them a little bit more power to be able to distribute say ten years of crash data to them every year, and for them to be able to use a computer program that they own that's on their system to do basic safety analysis.” Road Soft started in 1993, which was the very first version. This is a copy of the user's manual in '93 and it was pretty basic. It was primarily focused on safety analysis and pavement analysis at the time.

About 2000 we had a similar project to the projects that Susie Forde just described in Wisconsin and Dave talked a little bit about in Ohio. We had a statewide mapping program that went forward and was released in right around 1999/2000 called the Michigan Framework Base Map project. So it's very similar in nature to the Ohio and Wisconsin program so it's a statewide base map that is continually updated that pretty much all state data sets are used or referenced to. So anything from aerial census data to road data is all related back to that framework base map. And our state agency the Center for Shared Solutions manages that, continues to update it. As this was coming out, it was obvious that integration

with the statewide framework base map would be a huge benefit to Road Soft users so we took the initiative to move Road Soft from a desktop computer program that was primarily just forms, to a program that had a GIS interface in it. So the ability to get a statewide map allowed us to deliver when an agency would first start at Road Soft they would have ten years of crash data. They would have all their roads in a GIS format and then as the years went on they got access to other layers like aerial photos, wetland layers, stream layers, railroad layers, different jurisdictional boundaries.

So the spatial data, the spatial aspect of it was a real benefit to giving content or context I should say to the crash data that we've had. As Road Soft developed over time it started to develop different modules. So Road Soft is local agency driven or user driven software so the local agencies, because the software there is there for the local agencies in Michigan, it's driven by their wants and needs. Because it did have an asset management focus as well as a safety focus, there were a lot of asset management modules, asset management centric modules I should say that got developed over the years. Modules dealing with guardrails, culverts, signs, markings, signals, traffic counts, bridges, sidewalks, basically any asset in the built environment. As well as a GPS enabled laptop data collector that would allow local agencies to go out and collect data quickly and efficiently. When we started looking at these initially these were kind of looked at just as infrastructure modules. But really when you start looking at it, they have a huge safety component when these data sets are integrated. So the ability to look at crash data in conjunction with traffic signal or sign data, the ability to look at different features in the roadway all have a huge benefit for our local agencies.

So jumping forward to where we are today with Road Soft, it's a fully functional GIS-based asset management and safety management system. In Michigan we have because the program is supported by the Michigan DOT and the Michigan local agencies that use it, the program is available for at no cost to our local agencies. So they simply call us up and ask for a version of Road Soft for their agency and they get a CD shipped out within a matter of days. We have about 630 local agencies in Michigan. About 400 of those are active users in Road Soft. And I guess another metric that we always look at in Michigan is the Big 124. We have our 83 counties, our 40 largest cities, and Michigan DOT. That's 124 agencies and they control about 92 percent or manage about 92 percent of the road network in Michigan. And all of those agencies in the Big 124 with maybe one exception are Road Soft users.

So the basic functionality in Road Soft in dealing with data we have I guess what you'd call basic GIS functionality. The ability to sort, filter, and group data into based on different attributes - nothing any different than you would have in a GIS system, a standard GIS system. What we've been able to do in Road Soft through some of the user interfaces is to create a method to be able to go from very large groupings of data down to actually right down to the source documents. So we can sort, filter, slice and dice data based on different characteristics. And drill right down to the very specific source data. So each agency has ten years of crash data that is available both electronically in a readout format that they can run queries against, as well as in image format where they can look at the actual historical data record to see if there's a change.

Some of the tools in Road Soft because again, the data access is a big part of it, but the next part is the tools to try to get to manipulate the data sets that they have. Some of the tools that I want to talk about really quickly, we have several network screening tools for traffic safety data so we can screen based on road segments, based on curves, or based in intersections. And then as modifiers we can use any field that's in the data base. So whether it's a road type or use the conjunction whether it's a signalized or signed intersection, we can use basically all the features that are in the data base. And we can use several different screening methods, rate, frequency, equivalent property damage only. So that helps the local agencies narrow in on locations that are specifically causing them problems.

Once we have narrowed in on a specific location we can drill down and manipulate data in different ways. So Road Soft has tools that create a couple of different kinds of collision diagrams and each one of those collision diagrams is interactive. So if we were to click on the little icon for the right angle crashes in one of these crash diagrams it would automatically take us to a listing of those crashes that were in that specific group. We can also use different tools like a summary reporting tool so we can get some really quick tabulated statistics on pretty much any group of crashes. For example we can look at the jurisdiction as a whole, or we can look at it as a specific intersection or individually grouped crashes.

We can also go right to some different charting and graphing tools where you can chart or graph any function that's in the crash data. So for example if I were looking at specific intersection of interest, I could drill down to a specific type of crashes, maybe the right angle crashes on one quadrant of the intersection. And then I could look at things like the percentages of light and dark crashes to see if there were maybe visibility issues related to it.

The last thing I want to talk about in terms of tools with Road Soft is the integration with other sources of data. We realize that management systems whether they are safety management systems or asset management systems run on data and they are very data intensive. So we worked over the last couple of years to integrate with other data systems that are out there. So for example some our region planning agencies have photo logs that they are able to collect and Road Soft integrates with those photo logs. We've also taken a step to integrate with Google and Bing Maps functionality so we can basically go to a location in Road Soft, do a right click and get to a similar location in either Google Maps or Bing Maps. And from there go to street view. So if we're looking at crashes for example on a curve we can use those other two data sources: street view and Google or Bing Maps to try to provide context for the data.

We can also take the data set that we have in Road Soft, any of the data functionality and export it out into a format that links with Google Earth. So the same curve that we were looking at, we've taken the crash data out there and linked it into a Google Earth, opened it in Google Earth and can use some of the data that's there and in this case we're looking at that same curve. And you can actually see some of the topography in the area so again it gives us more context to maybe what's occurring at that particular location.

The last kind of leg of the stool is training and education. We're always, a common saying around here is "If all you know how to use is a hammer, pretty soon everything that you touch looks like a hammer to you." So from our standpoint, we tried to provide technical assistance and training to use the tools that we provide and to analyze the data. So here are some of the programs that we have here at Michigan Tech and some of the programs that are at our DOT namely the DOT's Local Safety Initiative. There's programs that will allow local agencies to pretty much get on-demand help from either a software engineer if they're talking about a computer program or a civil engineer with a traffic safety background to try to solve or help solve their problems. Those programs range from training showing how to use the specific tool like Road Soft to technical assistance in our local technical assistance program where we have somebody that can help work through a problem. To I guess the ultimate level is the Michigan DOT's Local Safety Initiative Program where the local agency can actually take advantage of a very highly trained safety engineer and get them to come in to their agency and solve a problem for them.

I guess closing thoughts. I started with data tools and training. And really when I look at that those are the kind of the three areas that the activities in Michigan filter into when we talk about safety and local agencies. Really the strategy that developed those three areas were based on removing the "I-can'ts". What we refer to as the I-can'ts. So "I don't have access to data. I can't do traffic safety analysis." Well, there's the first step is meaningful access to the data. "This analysis takes too long. I can't spend the time to do it." Okay here's tools to ease that work load. "I'm not sure what I'm looking for. I'm not specifically a traffic safety engineer." Great. Here's tools that can uncover relationships that lead to causal factors behind crashes. "You know I really don't have a safety background. I'm not a safety engineer. I need somebody to help me." Great, here is technical support and training programs and the Michigan DOT local safety initiative program that will actually do those things for you. So the focus in Michigan really has been to remove any objections or barriers to doing safety analysis. Thanks very much for your time. I'm going to turn it over now to John Hicks and John is going to tell us what is going on in the great state of Tennessee. John? Take it away.

John Hicks: Alright, thank you, Tim. As Tim mentioned I'm John Hicks. My main function, I'm a GIS manager and my main function is to manage the LRS. database as far as on the geometry side. But the group I am in also houses the database and we also do GIS maps. And I'd also like to mention that Brian Hurst of the Project Safety section is here if there are any questions at the end related to safety projects or crash statistics or anything like that.

So starting off, some challenges we identified as it relates to a local road integration is obviously the majority of crashes occur on local roads because that makes up the most mileage of state road networks. We had to think about the types of data that was available and how we would obtain it or how it would be implemented. And also we wanted things to stay consistent as all processes and procedures were in place. We wanted some consistency there.

To start out - just some statistical information about the roads in Tennessee: There is about 95,000 miles of public roads. Of that around 14,000 are interstates or state highway miles. Another 15,000 or so are functionally classified routes that receive federal or state assistance in maintaining. So that leaves roughly 67,000 miles of actual local publically maintained roads in Tennessee. We were fortunate in one regard. At TDOT we've always managed to have local road data in our enterprise database. Although and we maintained the same attributes for those roads as we do on our state maintain system. What we didn't have previously was we could not have the local roads in our GIS network because we do not have the geometry so they could not be included even though we have tabular data. So things that occur on local roads, we could not map in an automated system. As it relates to this webinar, one of the main ones would be crash data. Obviously the majority of fatal crashes or incapacitating crashes occur on these local roads. They make up two-thirds of our roadway network so therefore a large percentage of those are going to be happening on those roads. So we needed some data to determine how to improve safety on these roads. There was not a lot of local road data there to help us out so we had to really decide how we were going to go about getting some data to use that would help us reach our goals of increasing the accuracy and timeliness of our data. When local road data was available, obviously they did not have our linear reference system applied to it so we really wanted since we had the majority of the data already, we really wanted to get the geometry and have a complete roadway network. Local data a lot of the county highway departments or city street departments, a lot of them just had Excel spreadsheets if that. Some of them just had one map that might be on a wall that looked to be 30 years old and they just drew on it with a felt-tipped marker or something when they made additions and such.

Our LRS database here at TDOT is called TRIMS, which is an acronym for Tennessee Roadway Information Management System. It's a single integrated LRS. It has all state and local roadway. It contains data on structures, pavement, we have photo logs and it includes the crash data are also in there. As I mentioned we had local road data in the database and we had real irregular cycle based on staffing and different factors. We did not have an established five-year or six-year cycle that we did each county. There's just too many miles, too many counties etcetera. So what we did in 2007 we issued an RFP and we had the local road center lines collected and they also upped the roadway inventory on the existing roads and added any new roads that were built since the last time that particular county was inventoried. This data was obviously integrated and we were able to successfully build a complete state network, and the contract lasted for five years so we had Tennessee has 95 counties, so we created a schedule and then one of the counties kind of grouped together to reduce the amount of dead head time to each county. But in a five-year period, all 95 counties were collected. At the same time we were doing this, the Department of Safety was going to implement auto features to locate crashes. So that was another reason why it was good that we actually had a complete network where crashes later than from the data base through dynamic segmentation or whatever their locations could be determined.

This is a screen capture of just what a data maintenance screen for our database looks like. It has each one of the database tables for each route sorted in tab form. A user or editor can switch between the tables but the main three tables data that is collected for roadway inventory. And the first one is the one displayed there are route features, which is the event data along the route which would include intersections including what type if any of traffic control - the location of structures, public buildings such

as schools, City Hall, things like the location of cohorts. We also note where you enter and leave the city boundaries. The second table is a segment table. It divides the roadways into segments based on their cross section from the left roadway to the right roadway. So any time an attribute as far as shoulder width or pavement width or medians change, it would create a different segment. And finally the geometric data that includes such attributes as number of lanes, speed limits, the direction in a one way or two way street, access control; things of that nature. And we also track school zones. And we do this like I said on the local road network just as we would on our state highway system. From the inventory that is collected on each roadway another table is populated and it contains the data on roads as it relates to functional class. Are you inside or outside an urban area or a city area or are you in the county? And other administrative information such as who owns the road and is it a county agency? What could be a federal park system road, etcetera? Along with the GPS center lines that was collected from this project, from the raw GPS data we're able to develop an application that calculates and we put in our TRIMS database also horizontal and vertical curve data and stopping and passing sight distances which can also be used in some safety studies.

The TRIMS database that I just described is a client server based application. As we built our network adding the local roads to it, we needed a visual. We needed a visual. We needed a map display application. So through contracts we developed a map interface that is web based and almost all users at TDOT of the TRIMS application have been migrated over to the e-TRIMS application thus reducing the amount of IT involvement as far as loading new versions of software and such does not have to occur anymore. The only ones that are still using the client server are the data maintainers and the ones who make changes. The tools are there in the database to transfer sections of routes, entire routes to other identifier or LRS is based on county, route, and log mile in one cardinal direction. So when we have divided roadways the return side is logged with in the inventory direction when it is showing some type of median code for those. We don't definitely maintain bidirectional system for those divided segments. On this display, this is just a section of downtown Nashville. From e-TRIMS you have all these same dynamic segmentation capabilities, complex queries across multiple tables, so other tables besides those that we collect data for on the road are then used in the application in addition to crash data would be traffic data, the ADT stuff, any type of query on structures, the location. Like I say we have the location on the routes where the structures are and then there's obviously a separate structures table that has all the attribute information about individual structures. So like I said advanced querying, dynamic segmentation. We have the ability to export your queries to both shape file. If you have to email results to somebody or you can export it to KML and place all the segments on it in Google Earth if you need an ortho.

Zoomed in just closer into the downtown Nashville area, we did a query for crashes specifically in downtown Nashville on the local road network. So on this slide the local roads are colored in white and the state or function class roads are the ones that are kind of a goldish-yellow color. Just an example of a query where we could show our features on a local road network now; also they have completed the work that I mentioned earlier in the Department of Safety where they could auto-locate crashes now from the police vehicle. And that is where they're able to click on a map. It's not our map. They have their own map. But when the officer clicks on the map a log of the roadway information about that, the location is denoted by lat-long. And then a lot of the fields related to the roadway, the location, the name, etcetera,

roughly 50 percent of the form can be filled out by that one click. And only extenuating circumstances about the crash and things would have to be filled out by the police officer. And now we have TDOT receives those crash records electronically so they are entered into our system at a high rate. And also previous years' crashes that had to be manually entered into our database, that backlog was eliminated through the use of contractors in extremely fast fashion. Now we periodically when TDOT receives the data from a bunch of these reports there is the import routine where the crash is given based on the latitude-longitude capture of the crash, it is given that log mile that we need that places it on our LRS.

So the results or our local road data collection is we already had like I was mentioning earlier, the rule that govern our data collection on the state highway systems was used also on the local road system by our contractor. So we have consistent standards on those and as it relates to crash data then the ability to access all roadway information in one place. Detailed data analysis results towards a wide variety of projects and funding requests. For example local agencies working with TDOT and now use e-TRIMS and it's used to justify safety project funding. As I mentioned earlier, the system also helped resolve crash data quality issue as far as for timeliness, completeness and accuracy. And then there still as probably everybody who works with these can relate to, there's still encounter a few police departments that want to still submit the old paper reports, but there is a mandate that January 1 of this upcoming year 2015 that all reports must be expediting the process.

Some of our key findings that may be applicable to other states integrating data, I mentioned earlier the list of data standards was given to the contractor. It had been in place for many years and we made sure that they had to adhere to those same standards so it came in the proper formats. We still have several QA/QC procedures that we performed prior to entering the data into the TRIMS data base. Those were developed in-house as far as mainly validating codes, making sure they were no- where required data was it was there. There were no values, etcetera. Also since we are having a contract to collect the local roads, we had to we made sure that we went out and did an update of our state system prior to them being in the county because they had to integrate the local roads intersections onto our state highways, so we made sure that that was done also. And during the contract, since we had never really collected on such a large level, a local road network, some of those established rigid standards that we wanted the contractor to follow, we had to make adjustments also. Because based on our prior network only containing the state highway system, there were some circumstances that arise when you're collecting all the roads. And since the end of the contract and due to our resources here, we're looking at ways to make modifications and updates to the state system as new roads are built by local jurisdictions. A lot of our local road inventory since then has revolved when we are updating a state highway because due to a construction project, any local roads that tie in to that location we update those as well. And so for long term we're looking at different methods. We just don't have the people to maintain the entire network ourselves, either. So some of those options we're looking at are we want to include the local agencies more. Maybe have them capable of giving maybe not all but more LRS data information about their roads. But if anything at least if we knew where the locations were as they were adopted by their county commissions or city governments. And we're also looking at change detection software because TDOT does on a cycle have statewide orthos flown by each TDOT region each year so we're on a four-year cycle of updates. And with that, I think that's all I have. I will give it back to Heather.

Heather Richardson: Thank you, John. We have gone through quite a bit of information in a pretty short period of time so if you need more information as you can see on the screen there are case studies are under the RSDP Noteworthy Practices. And you can also contact Stuart Thompson in the Federal Highway Administration who runs this program. Additionally I just wanted to provide the contact information for all the presenters as well as the Federal Highway RSDP team. And so next we're going to move into questions, a Q&A. So far no one has entered any into the chat pod but I did have a couple I thought of as I was listening and Tim had mentioned the need for kind of ongoing training and technical assistance for local groups. I just wanted to check in with some of the other presenters on what your state does for technical assistance and training of for the local side of the data. And anyone can chime in.

David Blackstone: Hey Heather?

Heather Richardson: Yes?

David Blackstone: Was Susie going to jump in? I was going to reply.

Heather Richardson: No you can reply, go ahead.

David Blackstone: Yeah I saw Tim actually has a pretty good program. We don't have anything formal. What we tried to do as far as maintaining the data was to at the county level identify one office that would be own the dataset and again in most cases it's been the 9-1-1 folks. And the nice thing about the 9-1-1 is whether it be safety or federal highway, a lot of the data we submit has to have some sort of standard, you know, HPMS etcetera. For 9-1-1 they also have an umbrella organization, NINA, so a lot of their datasets at 88 counties, as long as you work with the 9-1-1 folks, they've got certain standards that most of the vendors who do 9-1-1 operations have to abide by. So we haven't necessarily provided formal training but by getting the data into an area and maintained by that 9-1-1 area has somewhat ensured that the data was somewhat consistent. As we all know, you can have different names for different columns but the more important part is the format of the data as far as the street name, what standards they abide by. Most of those NINA standards and the vendors use the postal service for naming conventions etcetera. So we didn't really do a formal training but again by getting the 9-1-1 folks to take over ownership of the maintenance of it, that in itself instilled some sort of consistency in the data.

Heather Richardson: Thanks, Dave. Does Susie or John want to add thing to that, what your experience has been?

Susie Forde: And we're talking about training, Heather?

Heather Richardson: Yeah, just bringing the local agencies and organizations up to speed in the system and making sure they have the technical capacity to participate.

Susie Forde: In Wisconsin there is probably two different training aspects. One that falls under the data management section; and that we are doing the training on the inventorying and the certification of the local roads and maintaining data within WISLR and we do that in a couple of different ways. We do face-to-face trainings and overall we've done that every couple of years where we go out maybe five places strategically located throughout the state so that many of the locals could attend. In addition to it we do provide CDs with a computer based training and we're updating to offer that so that locals can access it via Web WISLR. We partnered with our university and we've done some WISLR line training so we've outreached in a couple of different forums to ensure we are capturing those newly elected officials so that they are up to speed with everything we do. But it's on the DMV side that actually is doing the training for similar to some of the other presentations where they are talking about leveraging it in locating crashes or submitting the data that way. That's done under DMV and so they conduct that training. And I know they are out annual, at least annually, with locals.

Heather Richardson: Okay. We also got a question in from Arizona DOT traffic planning and research. They want to know for each of the states, what percentage or your agencies are sending their crash in electronically? And then Dustin Kazan from Maryland responded that for their system they have 100 percent reporting or starting January 2015. But for the presenters, can you speak to what percentage of the locals or the other contributing agencies are submitting electronically for you?

John Hicks: This is John. As I mentioned we will be at 100 percent in January. Probably right now we are in the 80 percent range. The majority of those not submitting are probably in the large metropolitan areas.

David Blackstone: This is Dave with Ohio. I don't have all the-- I mean that would be our safety folks but just overall what we've found is it's about 100 percent. And even electronically I mean when we say that we have like our Highway Patrol has a built-in laptop so they are actually collecting the data off of GUI and then submitting that basically as a file. We have others who are actually going through still using a hard copy what we call our OH-1 which is our state crash form. And they will scan that and send it in. And then you will have a few, and usually it's the opposite, the metropolitan areas in Ohio that are pretty good about it because they have the technology. It's typically our counties that are just a little more backward and they are still filling out hardcopies with pen and then basically copying those and mailing those into our Public Safety.

Heather Richardson: Okay. I want to be respectful of everyone's time. We've hit the 3:30 mark so I'm going to pass it back to Bob Pollack just to close us out. Bob, can you take it?

Bob Pollack: Sure, thank you, Heather. And again thanks to everybody for participating on the webinar this afternoon. Hopefully you learned something out of it and perhaps got some ideas about better ways of integrating state data with local data. On the screen in front of you you've got information about where a copy of today's program can be obtained, and also we want to take this opportunity to announce our next webinar which will be on the Road Safety Data and Analysis Tool Box which is a product that the RSDP will be unveiling and it will be coming out right about the same time as the webinar on December 9th. So if you join us at that time you'll get a lot more information about the tool box and what its capabilities are and how it can benefit you and your agency. So with that again, my thanks to everybody for participating this afternoon and I hope everybody has a good day. So thank you all.

Heather Richardson: Thank you everyone.