Project 1120-11-03
WIS 26 – Breezewood Lane
US 41
Winnebago County
Traffic Management Plan
Evaluation Report

January 2013

Executive Summary

Enclosed is the Evaluation Report for the Traffic Management Plan (TMP) for the US 41 Winnebago County expansion project. This project is a Type 4 action as determined by Departments *DRAFT* guidelines for *Work Zone Transportation Management Plan* established in October 2006 and as currently published in the Facilities Development Manual (FDM) (updated August 2008). This TMP Evaluation Report provides feedback as to the effectiveness of the TMP plan. The original TMP was developed in June 2007 and the first and only revision was completed in July 2011. The US 41 project started construction in 2009 and will complete the US 41 mainline work in July 2013. The County Y and GG overpasses will be reconstructed and the County G structure rehabilitated in the future when funding is available, currently scheduled for 2015/2016 construction.

Statement Reflecting the Usefulness of the TMP

The US 41 Winnebago TMP was written in June 2007 and one of the first TMP's written at WisDOT. The TMP was written at a high level scope with general concepts of construction staging and details that were going to be used in the construction. The concepts of construction staging and keeping US 41 open to 2 lanes in each direction during peak travel flow was set up during the environmental phase of the project. Since keeping 2 lanes open in each direction of US 41 was a constraint from the very beginning of the project, the TMP did not add any new information that provided additional benefit. The selected work zone strategies used were more a product of the available funding in the specific years. Overpass and local road reconstruction before mainline construction were concepts that were set in the environmental phase and carried forward since the funding was available to carry out the plan. Overall, the TMP documented the decisions that were already made about staging and work zone. Documenting those decisions and approval by WisDOT central office and FHWA was the greatest benefit of the TMP.

Updates Necessary to Correct the TMP

The TMP was updated in July 2011 with revision #1. Revision #1 was the only update necessary. The updates were done to provide details to the TMP rather than correct anything in the TMP. The update provided details of the construction schedule, TMP measures that were being implemented on US 41. Details of US 41 closures, timeframes, and detours for overpass structure demolition and girder setting were provided. The updated TMP provided a final listing of construction project schedule. This showed the sequence of improvements of US 41 interchange ramp terminal prior to adjacent interchange closures as well as local road improvements prior to the US 41 mainline construction. These updates provided specific project id's and construction year schedules that were mentioned in general terms in the original TMP. The update added clarity to which work zone management strategies were implemented with the project.

Modifications made to the original TMP and their success

Modifications made to the TMP were made only to provide further clarity to what work was being completed on the US 41 Winnebago project. Modifications were not made due to a change of strategy in addressing traffic management. Modifications shown in the July 2011 Revision #1 update were working very well on the project.

Public reaction to TMP

Public reaction to the US 41 TMP and the US 41 Winnebago project in general was very positive. Keeping US 41 open to 2 lanes in each direction during construction was the key. Drivers were able to get through the work zone with little to no delay by keeping lanes US 41 lanes open at peak times. US 41 Winnebago had a very aggressive construction schedule so the comments that WisDOT received through its website, Twitter, and Facebook were very positive to the project. The public was amazed at the progress of the project. The only negative reaction was in 2010 when we closed the overpasses at Witzel and 20th Avenue at the same time. This diverted traffic to WIS 44, 9th Avenue, and WIS 21 interchanges to get across US 41. For 1 to 2 hours in the pm peak congestion at 9th Avenue interchange was heavy due to traffic signals and limited lane capacity.

Overall, given the size of the project and amount of traffic on US 41 the public reaction was very positive with very little negative feedback.

The maximum and average delay time encountered

The US 41 mainline traffic average delay was roughly 5 minutes due to the speed limit being lowered from 65 mph to 55 mph in the work zone. The work zone was 17 miles long at the peak of construction in 2010 and 2011.

With interchange closures in 2011 and 2012, local roads did experience delay in the am and pm peak rush. As an example in 2012, the US 41/21 Interchange was closed from March to October. Witzel Avenue is the local road that is ½ mile south of the US 41/21 Interchange. Witzel Avenue would experience 5 to 10 minutes of added delay in the am and pm peaks. Witzel Avenue was reconstructed in 2010 with multi-lane roundabouts as part of the project. This reconstruction added the necessary capacity to reduce delay. The multi-lane roundabouts functioned very well and greatly improved the traffic flow as well.

In spring 2010, the Witzel Avenue Overpass and 20th Avenue Overpass were under construction at the same time. This forced traffic to use 9th Avenue or Hwy 44 to cross US 41. These overpass closures added traffic to 9th Avenue and caused delays of 15 minutes or more during the am and pm peak for traffic crossing over US 41 due to the number of and timing phasing for the traffic signals located on 9th Avenue. This delay

was Monday – Friday March 1 to mid-June before 20th Avenue and Witzel were completed to provide relief.

In 2011, the US 41/9th Avenue Interchange, US 41/45 Interchange, and US 41/Breezewood Lane Interchange were closed for reconstruction. We did not experience any delays/queuing at the adjacent interchange during construction. This was mainly due to signal timing adjustments made and adding capacity at US 41/44 Interchange, US 41/21 Interchange, and US 41/114 Interchange by adding turning lanes at the ramp terminals.

Overall average delay on US 41 was minimal for the US 41 Winnebago construction. Infrequent delays on US 41 were encountered when an incident occurred when shoulders were not present. Any small vehicle issue in a lane would cause backups for US 41 traffic. The traffic delays encountered with the project were on local roads due to overpass and interchange closures. Those delays were only at am/pm weekday peaks.

Any peak traffic periods exceeding the predicted

No peak traffic times exceeded what we predicted. In fact, delay was less than predicted during our interchange closures. We believe we ended up with a higher traffic diversion than expected and much of the local traffic avoided US 41 if possible. In our July 2011 update, we obtained traffic data that showed roughly a 38% reduction in US 41 mainline traffic in the 9th Avenue area. This diversion off US 41 helped reduce traffic congestion at adjacent interchanges when others were closed.

Frequency of legitimate complaints and nature of the complaints

Complaints were quite low for a project of this magnitude. We did get e-mails/phone calls but they were more of question type inquiries rather than complaints. The biggest traffic complaint was the closure of 20th Avenue and Witzel Avenue Overpasses at the same time. City of Oshkosh residents complained about the added delay to the 9th Avenue corridor. This was not unexpected and we knew this would happen. Unfortunately, the geometry of the corridor, we could not add turn lanes to add storage to help with traffic signal efficiency.
Commuters lived with the weekday queues of 15 minutes for 4 months and moved on. Once the Witzel Avenue and 20th Avenue Overpasses were completed, the complaints were very small if any during the rest of the construction.

We did get quite a few e-mails with positive comments about the traffic on US 41, stating it was much better than they were expecting. Overall, based on the low number of complaints the traffic management went well on US 41 Winnebago project.

Types and numbers of crashes that occurred during construction

In 2010, approximately 65 crashes occurred in the work zone with the severity consisting of 20 injury, 44 property damage, and 1 fatality (Pedestrian crossed over safety fence and tried to walk across US 41 after a music festival at night). The crash types were as follows: 15 sideswipes, 17 no collision, 25 rear end crashes, 7 angle and 1 head on. In 2010, work along US 41was completed mostly at night, utilizing single lane closures. Temporary widening was completed at night with traffic remaining on existing lanes during the day. The work zone was approximately 14 miles of the entire 17 mile corridor.

In 2011, approximately 162 crashes occurred in the work zone with the severity consisting of 52 injury, 110 property damage, and 1 fatality (Male driver had medical condition while driving on roadway and ran off road and crashed off the roadway.). The crash types were as follows: 67 no collision, 64 rear end, 30 side swipe with 1 angle. In 2011, all 17 miles of the project was under construction with 3 interchanges closed. The work zone consisted of 11 foot lanes and 2 foot shoulders. Night time lane closures occurred periodically through the construction season.

In 2012, through September 2012, 147 crashes occurred in the work zone with the severity consisting of 37 injury, 110 property damage, and 0 fatalities. The crash types consisted of 59 no collision, 65 were rear end, 22 side swipe with 1 angle crash. In 2012, 12 miles of the project was under construction with the US 41/21 Interchange closed. The work zone consisted of 11 foot lanes with 2 foot shoulders. Night time lane closures occurred periodically through the construction season.

Types and number of safety patrol incidents

The Department contracted with private towing company to patrol US 41 in the work zone at peak travel times, holidays, and special events from 2011 to 2013. Starting March 5, 2011, 1 truck patrolled the 17 mile work zone from 6:00 am to 10:00 am and 3:00 pm to 7:00 pm Monday through Friday. Saturday hours were from 10:00 am to 7:00 pm and Sunday from 12:00 pm to 9:00 pm. Patrols stopped December 1, 2011 due to winter shutdown. Beginning on March 12, 2012 through November 28, 2102 patrols went from 7:00 am to 7:00 pm Monday through Friday and the same hours as 2011 on weekends. Law enforcement requested and Department agreed to provide 12 hour coverage given the benefits from the 2011 service. Department continues with 6:00 am to 10:00 am and 3:00pm to 7:00pm Monday through Friday, Saturday 10:00 am to 7:00 pm, and Sunday 12:00 pm to 9:00 pm service until July 2013. An extra truck was added for Green Bay Packer traffic. Hours were extended during special events such as EAA and Country USA as well as holiday traffic such as Memorial Day, July 4th, and Labor Day.

Freeway Service Team Route Report

02/21/2011-12/31/2011

Compiled On 1/17/2013

Route: Winnebago - US 41

Counts

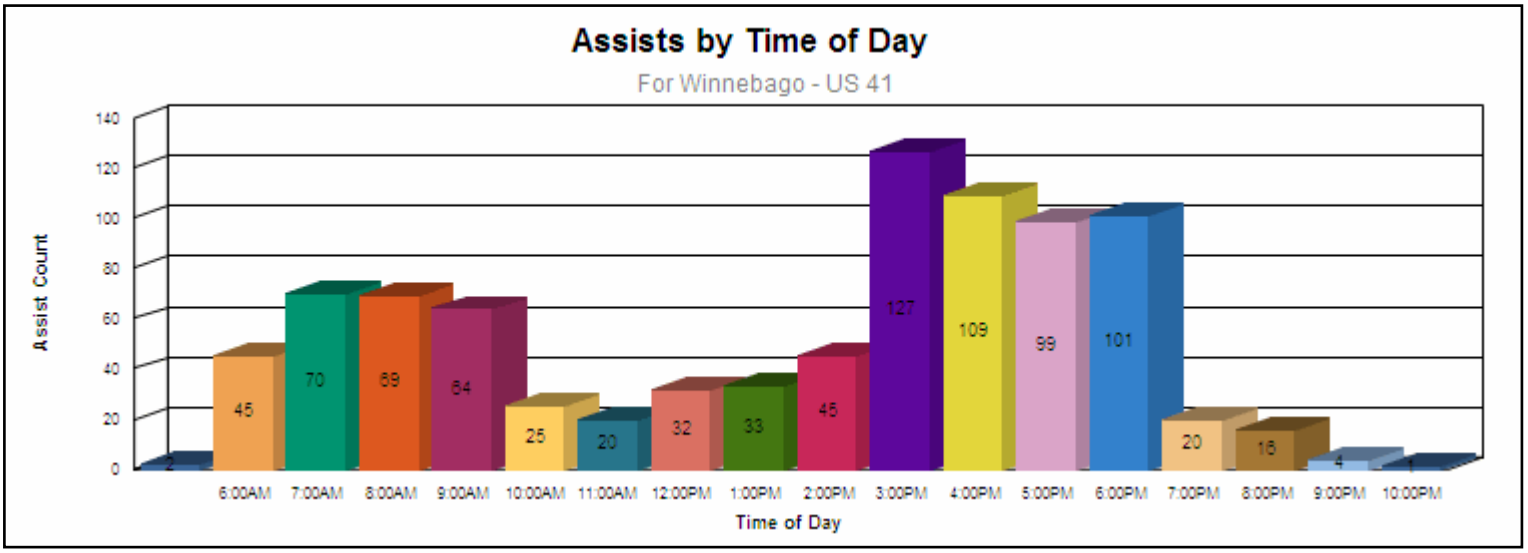
Shifts	467
Hours Patrolled	2347
Assists	882
Avg Assists Per Hour	0.38
Avg Response Time (min)	10
Avg Lane Clear Time (min)	8
Avg Assist Duration (min)	16
Total Miles	85,088
Avg Miles Between Assists	96.47

Services Provided

Checked welfare	98
Flat Tire	176
Gave Directions	20
Jump start	17
Mechanical repair	10
No service	13
No service - Wave off	14
Provided fuel	83
Provided information	2
Provided traffic control	54
Removed debris	68
Towed from S/M	323
Towed from travel lane	120
Transported people	1
Blank	4
Total	1003

Hours of Operation

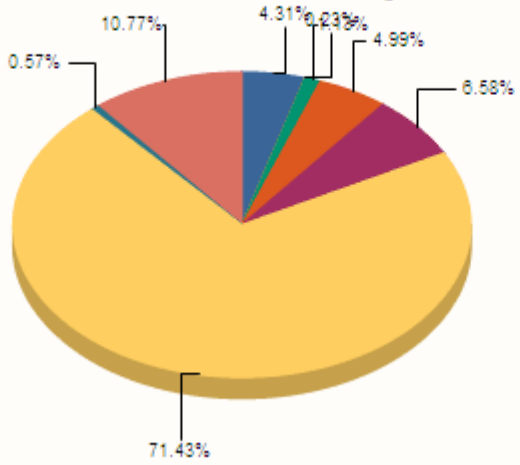
- M-F: 6:00am – 10:00am & 3:00pm – 7:00pm
- Sat: 10:00am – 7:00pm
- Sun: 12:00pm – 9:00pm



*Time periods with no assists not displayed

Cause for Stop

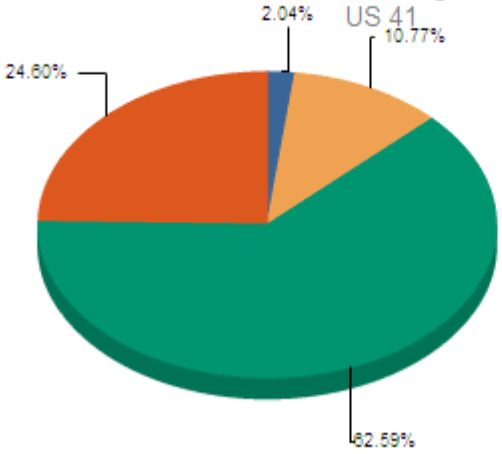
For Winnebago - US 41



Abandoned	38
Animal	2
Crash - Injury	10
Crash - PDO	44
Debris	59
Disabled	630
Pedestrian	5
Other	95
Blank	0
Total:	882

Location of Assist

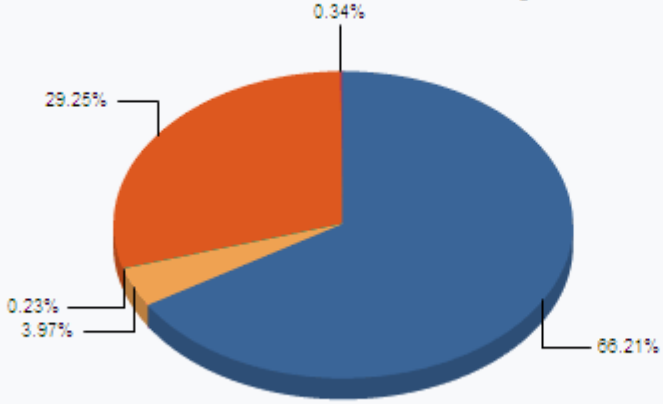
For Winnebago - US 41



Median	18
Ramp	95
Shoulder	552
Travel Lane	217
Blank	0
Total:	882

How Discovered

For Winnebago - US 41



Drove up	584
Saw and changed route	35
STOC dispatch	2
WSP/Sheriff dispatch	258
Other	3
Blank	0
Total:	882

Freeway Service Team Route Report

01/01/2012-12/31/2012

Compiled On 1/17/2013

Route: Winnebago - US 41

Counts

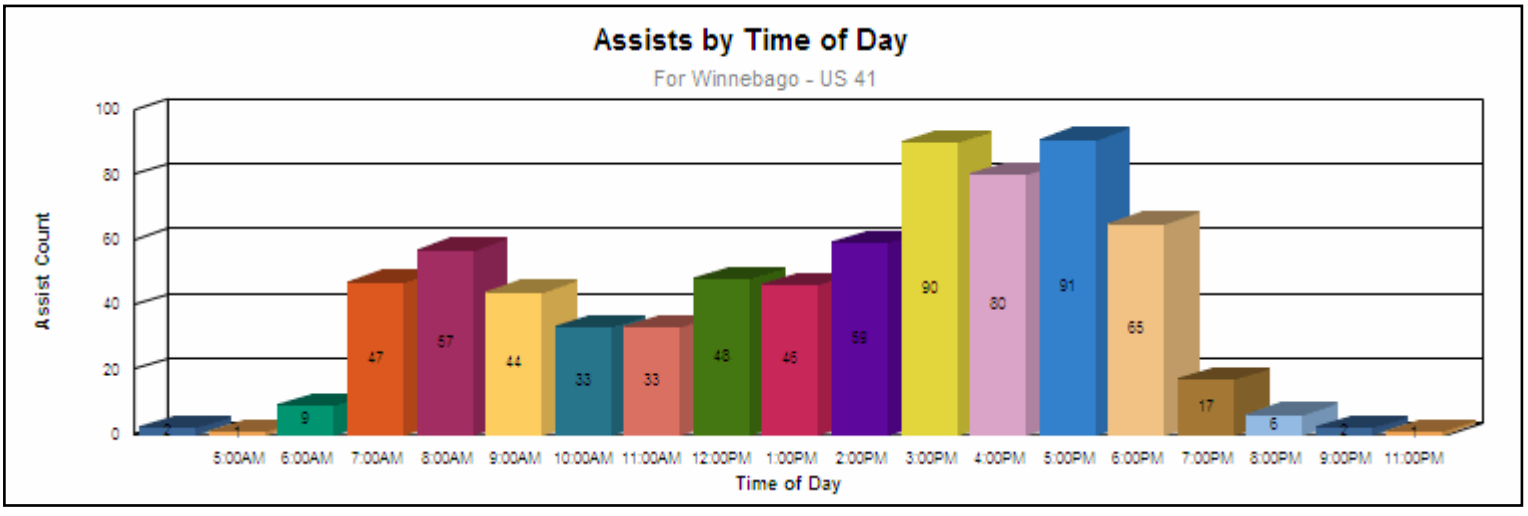
Shifts	405
Hours Patrolled	3209
Assists	731
Avg Assists Per Hour	0.23
Avg Response Time (min)	10
Avg Lane Clear Time (min)	8
Avg Assist Duration (min)	16
Total Miles	115,910
Avg Miles Between Assists	158.56

Hours of Operation

- M-F: 6:00am – 10:00am & 3:00pm – 7:00pm
- Sat: 10:00am – 7:00pm
- Sun: 12:00pm – 9:00pm

Services Provided

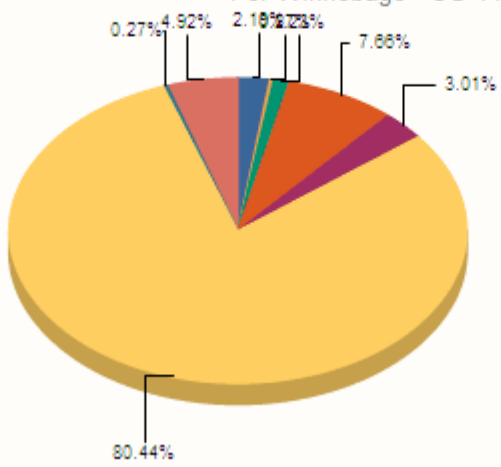
Allowed use of cell phone	1
Arrest	2
Checked welfare	5
Flat Tire	112
Gave Directions	2
Jump start	6
Mechanical repair	4
No service	14
No service - Wave off	3
Provided fuel	98
Provided information	2
Provided traffic control	32
Removed debris	27
Towed from S/M	277
Towed from travel lane	143
Transported people	4
Blank	8
Total	740



*Time periods with no assists not displayed

Cause for Stop

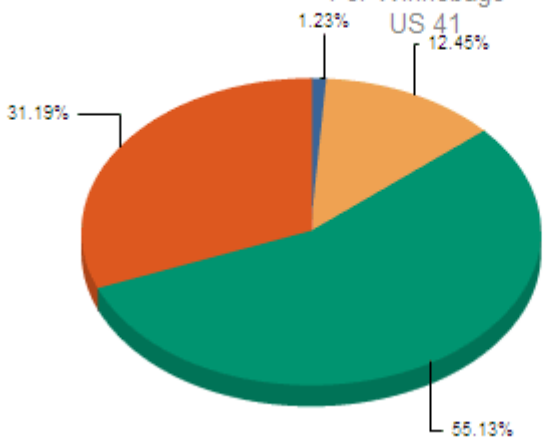
For Winnebago - US 41



Abandoned	16
Animal	2
Crash - Injury	9
Crash - PDO	56
Debris	22
Disabled	588
Pedestrian	2
Other	36
Blank	0
Total:	731

Location of Assist

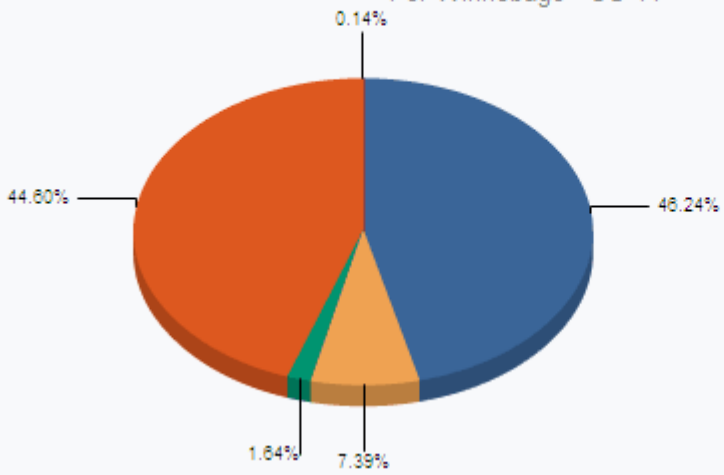
For Winnebago - US 41



Median	9
Ramp	91
Shoulder	403
Travel Lane	228
Blank	0
Total:	731

How Discovered

For Winnebago - US 41



Drove up	338
Saw and changed route	54
STOC dispatch	12
WSP/Sheriff dispatch	326
Other	1
Blank	0
Total:	731

The level of success and performance log for each strategy of the TMP implemented

Speed Limit Reduction	Speed limit reduction from 65 mph to 55 mph was used on the project during construction. This signing with enforcement and narrow work zone helped contribute to lower work zone speeds. Staff also worked with law enforcement to place temporary aerial markings in the work zone for aerial speed enforcement.
Law Enforcement Mitigation Contract	US 41 Winnebago used support from Wisconsin State Patrol. Their timely support of construction was invaluable. We used State Patrol forces to help with speed limit monitoring; equipment move in; and handling traffic during girder demolition or setting. On a major project, having law enforcement available for use with the project is very important.
Temporary Traffic Signals	US 41 Winnebago did not install any temporary traffic signals as part of the project. Existing intersections of concern already had traffic signals, so temporary signals were not needed.
Crash Cushions, Temporary Concrete Barrier, Traffic Control Provisions, and Traffic Control Devices	Details, details, details… traffic control details with the correct number of devices at the correct location to construct the project with enough room for the travelling public and the contractor is essential to a good plan. US 41 Winnebago used all of these devices in the plan. The one traffic control detail that changed through the project and added to later contracts was the detail of how truck traffic can exit/enter the work zone from the US 41 freeway. This detail proved to be a valuable detail for the contractor to access the work site safely and allowed much more work to happen during day than doing at night under a lane closure. Project teams did weekly traffic control inspections with traffic control checklist and provided to prime contractor and traffic control provider. US 41 traffic control engineer also provided inspections as well to check for consistency in the

	corridor as well.
Project Onsite Safety Training and Construction Safety Inspector	An Owner Controlled Insurance Plan (OCIP) was implemented on the US 41 project. The OCIP safety coordinator, along with US 41 traffic engineer, and project inspection staff monitored the traffic control. US 41 traffic engineer and project inspection staff made routine inspections and worked with contractor for improvements and modifications. In the future, having 1 traffic engineer responsible for lane closures into the State Lane Closure System was invaluable. Having one person responsible was much easier and the contractors all learned who they needed to coordinate with on lane closures. Managing traffic control lane closures in this manner is best way to handle this.
Street Sweeping	Street sweeping was used as part of erosion control practices as hauling was used within the project. Street sweeping was not used as TMP practice. Street sweeping should be used for erosion control and not used as TMP strategy on future projects.
Boat Traffic Control	Boat traffic control was provided for work at the main span of Lake Butte des Morts. The plan provided details of where to place buoys to help guide recreational traffic through the zone. The contractor stopped recreational traffic for a few minutes for equipment moves. We did utilize the Winnebago County Sheriff's Department for boat patrol at night during bridge demolition. Boat traffic control was successful for this project with the use of added buoys and law enforcement when necessary. Depending on the amount of boat traffic this should be considered in future waterway projects.
Temporary In-pavement Reflectors and Glare Screens	Temporary pavement reflectors and glare screens were used sparingly on US 41 Winnebago. The in pavement reflectors were used on US 41 mainline crossovers and temporary bypass roadways. Pavement reflectors were lost in winter time due to snowplowing operations. Glare screens

	were used in crossovers at key locations where headlight glare could be issue. We did not glare screen in tangent sections since glare screens tend to be a maintenance issue. The panels did have repairs that needed to be made from time to time. We avoided the maintenance issue by not putting them in the tangent areas and installing them in only key areas.
Snowplowing	Snowplowing in the work zones was completed by the County. We completed a ride review with county patrol superintendents in November of each year to review the work zone to check to see if they had any requests for adjustments for snowplowing procedures. Any snowplowing of contractors work area was done by the contractor as stated in the special provisions.
Truck Mounted Attenuators (TMA)	TMA's were used on the projects. We had situations with mobile operations where an operator was necessary and others where we could install a TMA without an operator for a day. The TMA's were valuable resources used to protect workers and enhance safety to travelling public through the construction work zone. We required the approval/payment of the TMA's by the US 41 traffic engineer so the use of the TMA was done for safety reasons and not for contractor convenience.
Freeway Service Team(FST)	WisDOT contracted with a private towing vendor to patrol US 41 during peak hours, holiday and special events. FST proved to be a valuable tool for breakdowns and incidents in the work zone. Response from law enforcement regarding FST was very positive with much quicker response times. We did change the times/use of the FST during the project based on volumes. We used 2 trucks during peak travel times such as Packer game days to help with quicker response times. On future projects, WisDOT should give strong consideration to how long FST should be employed (construction season vs. entire

	year) so costs can be budgeted early on for its use.
Temporary Pullouts for Disabled Vehicles	US 41 Winnebago constructed 6 temporary pull out areas in the 17 mile project. The temporary pullout areas were used for disabled vehicles during mainline construction. More pullout areas should have been considered for construction given their use, but the US 41 project was constrained with tight work zone and tight frontage roads that areas to construct them were limited. Strong consideration on future projects on the number and location of temporary pullouts should be completed.
Crash Investigation Sites	Crash investigation sites were built in early phases of the project WIS 26, WIS 44, and WIS 76 Interchanges so they could be used with construction. Other crash investigation sites were constructed with the project at 9th Avenue, WIS 21, US 45, and Breezwood Lane. The crash investigation sites were used by law enforcement after incidents quite a bit. Strong consideration should be given to install crash investigation sites on urban freeway projects at all interchanges. The available room allows slow or disabled vehicles to use the crash investigation site for minor repair rather than stopping on freeway.

Recommended/suggested improvements or changes to similar future projects

Recommendation for similar projects is to follow similar pattern for the traffic management plan. Start with the design premise of keeping 2 lanes open on mainline in each direction during construction. If funding sequence allows, reconstruct and/or add capacity on local roads and overpasses prior to mainline construction. Add capacity at adjacent interchanges prior to interchange closures. Close interchange and get in and do construction as quickly as possible and get out. Trying to keep interchange open during construction adds time and cost to the project. Use of incentive/disincentive clauses in the

contracts with interchange closures worked well. All four interchanges where incentive/disincentive was used the contractor met the completion date. Two of the four interchanges opened early which was a benefit for traveling public. This incentive pushed the contractor to monitor schedule and adjust resources to meet the incentive date.

Provide as much room as possible on temporary roadways. We provided 11 foot lanes with 1 foot inside and 2 foot shoulder in areas and that worked, but more room would be better. We provided 12 foot lanes with 6 foot shoulder in temporary bypasses around interchanges and that worked extremely well. The more room you can provide especially with heavy truck traffic helps with traffic flow.

Provide as much room as possible on shoulders during winter months when work is shut down. Providing shoulder room may mean paying for temporary concrete barrier to be moved in fall to provide that room and be moved back in spring once construction begins. These moves of temporary barrier could cost a lot of money but this extra shoulder room is essential for snow storage and vehicle breakdowns.

Freeway service team worked extremely well and improved response time to reduce incidents in the work zone.

Require meeting before each night lane closure between contractors. We required this and it really help eliminate confusion of the contractors of what work was going to be performed, when, and for how long. With multiple work operations going on in a lane closure this meeting facilitated contractors talking to each other and coordinating its work for worker and vehicle safety.

Have monthly coordination meetings with law enforcement, fire departments, and dispatch center. These coordination meetings were an excellent forum to communicate between enforcement and project staff of any issues. The meetings would discuss construction access, future work operations, review past incidents, review communication in those incidents, and traffic flow issues/concerns. These meetings were very productive and provided open communication between enforcement and staff to help solve any project issues.

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