

39/90
IMPROVING
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	DSP Recommendations for I-39 Mega Project	DTSD SWR I-39/90 Mega Team Response
	(06/01/2018 email from Burkel to Vieth and Vesperman)	(06/20/2018)
1.		e WI/IL state line to Highway 12/18 in Dane County. Immediate implementation
a.	We realize that speed reduction alone will not eliminate crashes.	DTSD agrees with DSP that crashes will not be eliminated by merely reducing the statutory
	However, we believe the reduction in speed will decrease the overall	speed limit along the I-39/90 corridor within the work zones. It is unclear however, how DSP
	number of crashes as well as their severity. With the speed to 55 mph,	concludes reducing the posted speed limit will decrease the overall number of crashes.
	the 85 <sup>th</sup> percentile of motorists will fall within a speed range that allows	According to the Department's <u>Traffic Engineering</u> , <u>Operations &amp; Safety Manual</u> – WisDOT,
	for decreased stopping distance and increased reaction. These factors	June 2005 (Formerly Traffic Guideline Manual)":
	allow a greater opportunity for collision avoidance.	
		"Contrary to popular belief, lower speed limits do not necessarily improve safety. It is
		inappropriate to compare crashes on a fairly short segment of road to the statewide crash
		average, because a speed study is taken at the one section of highway you are dealing with.
		Crashes typically indicate another problem, which is generally not speed. The more uniform the
		speeds of vehicles in a traffic stream, the less chance there is for conflict and crashes."
		Posting speed limits lower or higher than what the majority of drivers are traveling produces
		two distinct groups of drivers: those attempting to observe the speed limit and those driving at
		a speed they feel is reasonable and prudent. These differences in speeds can result in increased
		crashes due to tailgating, improper passing, reckless driving, and weaving from lane to lane.
		However, the number of traffic crashes along any highway is related to numerous factors.
		Regardless of the roadway involved, there are a statistical number of crashes that can be
		expected to occur no matter how safe a roadway is made. Investigations of crashes reveal that
		in the majority of cases there was a clear violation of a traffic law or rule of good driving.
		Proper analysis and evaluation of these factors require the experience and expertise of a traffic
		engineer. Based on these studies and as illustrated in the graph, the lowest risk of being
		involved in a crash occurs at approximately the 85th percentile speed. Figure 3 represents this
		fact that crashes are lowest at the 85th percentile speed."





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	Figure 3. Accident Involvement vs. Motorists Speeds
(06/01/2018 email from Burkel to Vieth and Vesperman)	
	following situations, you may need more distance between your vehicle and the vehicle in front to be safe:"





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						ed to be less tl		•
	especially in platoons. The I-39/90 Mega Public Outreach Team is trying to educa motoring public to leave more space through travel advisories, press releases, an					_		
		oublic to leav	e more spac	e through t	ravel advis	ories, press re	eleases, and	social
	media.							
	To dobo ik		Luna and alaa		مصطاعة مستالم	ما منا امتطال مما		
						resulted in lo ta during I-39		
		_		-	-	d and reported		
	Tesuits for	Julie 2010 al	re incomplet	c and will b	e complied	a and reporter	a out in eari	y July.
		Prior to and i	including 201	L <b>4</b>		2015 aı	nd after	
	Crashes =	1940	Work Zone =	75	Crashes =		Work Zone =	867
	K =	20 (4 6%)	K <sub>WZ</sub> =	2 (4.0%)	K =	8 E0 (2.1%)	K <sub>WZ</sub> =	0
	A = B =	89 (4.6%) 251 (13%)	A <sub>WZ</sub> =	3 (4.0%) 12 (16%)	A = B =	50 (2.1%) 310 (12.9%)	A <sub>wz</sub> = B <sub>wz</sub> =	17 (2.0%) 134 (15.4%)
	C =	209 (10.8%)	C <sub>wz</sub> =	7 (9.3%)	C =	274 (11.4%)	C <sub>WZ</sub> =	
	Total	549 (28.3%)	Total <sub>wz</sub> =	22 (29.3%)	Total	634 (26.4%)	Total <sub>wz</sub> =	257 (29.6%)
b. Post those speed limit signs more frequently along the work zones.	A+B+C=	neroseed the	fraguancy	of regulator	A+B+C=	INAIT EE" sign:	to an amo	unt that is
b. Post those speed little signs more frequently along the work zones.				OTSD has increased the frequency of regulatory "SPEED LIMIT 55" signs to an amount that is well in excess of the Manual on Uniform Traffic Control Devices (MUTCD)* standard that				
	would otherwise be installed within the same project limits to present motorist with spee							
	limitation regulations. With respect to signing the MUTCD states:							
	"Regulato	"Regulatory and warning signs should be used conservatively because these signs, if used to						
	excess, ter	nd to lose the	rir effectivene	ess."				
						1-3. of the <u>Tra</u>	ffic Enginee	ring,
	Operations & Safety Manual states the following:							
						sians on		
	"Although the Department exercises no control over the usage of non-conforming signs on other systems, except on sections being built under state contracts, the Department can and							
	should be looked to for direction in preserving the uniformity of all traffic control devices. Signs							
	are of special concern because they can be designed in almost endless variation.							
	Part 1 of t	he <u>MUTCD</u> gi	ives specific p	ositive pur	ooses for t	he use of stan	dardized tra	offic control
	devices. If these were closely followed by all agencies there would be no need for further							
		-	-			at non-uniforn	n signs are r	more
	effective, g	generally bed	ause of their	uniqueness	5."			





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2		* The MUTCD is a document created by the United States Department of Transportation, Federal Highway Administration and is adopted by reference in accordance with title 23, United States Code, Section 109(d) and Title 23, Code of Federal Regulations, Part 655.603, and is approved as the national standard for designing, applying, and planning traffic control devices. It sets forth standards and principles that govern the design and use of traffic control devices for all streets, highways, and bicycle facilities open to public travel regardless of type or class.
2.	Emergency pull off zones approximately every mile in the work zones.	The control of 20 control of 20 control of c
a.	Currently, there is an average of one emergency pull off zone for every two miles of work zone. The goal in 2017 put forth by DTSD was to have one pull off for every mile. We concur with that goal and would like to see it implemented. The goal would be to accomplish this within 60 days.	<ul> <li>There are a total of 39 emergency pullouts and safe refuge areas along the I-39/90 corridor.</li> <li>21 access points exist via interchanges, Safety Weight Enforcement Facilities (SWEF), and rest areas</li> <li>18 emergency parking/pullout locations along the corridor have been constructed for the 2018 construction season. The exact spacing of these sites are based on proximity to interchanges, entrance/exit ramps, Safety Weight Enforcement Facility (SWEF), and other geographic considerations (e.g., steep slopes, wetlands, hillsides, streams, etc.).         (Reference map of the emergency pullout locations and spacing distances)</li> <li>The design of emergency pullouts were greatly enhanced as part of the I-39/90 project. These additional enhancements include providing a paved surface, providing emergency access, and extending the pull-out distance from 150 to 450 feet in length. Standard detailed drawings depicting these conditions (original and improved) are available for review.</li> <li>The concept of emergency pullout zones is included in the Strategies Matrix; see #9. The I-39/90 Mega Team continues to pursue opportunities with first responders for additional access points throughout construction stages.</li> </ul>
3.	Continue working to provide emergency access points along the counter	
a.	The current work zone configuration with narrow shoulders makes it nearly impossible for emergency responders to get through stopped traffic. Emergency access points strategically placed along the corridor will allow for quicker access to injured parties, quicker assessment of the scene and ultimately quicker clearance times. We had a few access points implemented in 2017 and would like this to continue.	There are currently numerous emergency access points throughout the I-39/90 work zones.  35 points of access using the interchange exit/entrance ramps  21 emergency access points from local roads have been constructed  11 gate access points through the median barrier wall  11 emergency access points through vehicle gates through the barrier wall that separates the traveling public from the work zone  (A map provides the locations of the emergency pullout locations and spacing distances.)





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		The concept of additional emergency access is included in the Strategies Matrix, see #7, 8, and
		61. The I-39/90 Mega Team continues to pursue opportunities with first responders for
		additional access points throughout construction stages.
4.	Additional speed trailers placed at identified high risk or high crash areas	s of the work zone. Immediate implementation.
a.	Speed trailers provide motorists with feedback of their current driving	DTSD agrees that speed trailers provide motorist feedback of the current travelling speeds,
	speeds and how it relates to posted limits. This feedback differs from the	however, there are numerous studies that indicate the benefits of these trailers slow traffic in
	barrage of posted signs motorists experience when traveling in a work	short proximity relative to where they are stationed. They do not slow traffic over a long
	zone of this magnitude and can better influence motorist behavior.	stretch of roadway along the entire corridor. Furthermore, research has proven that the
		effectiveness of these devices lessens after two to three weeks of use. Finally, there are
		limited areas where these can safely be placed alongside the roadway.
b.	We recommend the trailers be placed strategically in high crash areas.	It is difficult to determine statistically significant high crash locations in the I-39/90 work zone.
		Because crashes are random events, crash frequencies naturally fluctuate over time at any
		given site. The randomness of crash occurrence indicates that short term crash frequencies
		alone are not a reliable estimator of long term crash frequency. DTSD typically uses 3-5 years
		of data to determine high crash locations, but this length of analysis is not possible in an I-
		39/90 work zone that changes yearly and even during the construction activities.
		DTSD can provide two additional speed trailers. Rather than attempt to identify high crash
		locations, DTSD will work with DSP to identify locations in the I-39/90 corridor where speeds
		are higher than the average for the corridor. These locations are areas where the risk of speed
		related crashes is the highest and would experience the greatest benefit from the reduction in
		speed associated with the speed trailers.
		Studies have shown the speed trailers lose their effectiveness if they remain in the same
		location for 3-4 weeks. The I-39/90 Mega Team proposes moving the speed trailers monthly to
		other locations that have high measured speeds. The placement of the trailers are constrained
		by their size and visibility over the barrier. The team has identified 10 locations where the
		speed trailers can be placed and proposes to rotate the 6 + 2 additional speed trailers through
		those 10 locations and any new high-speed locations identified. As data indicates, the team
		will continue to look for opportunities to add locations for the speed trailers.
5.	Creative Signage	
a.	Orange "WORK ZONE" signs placed on top of the 55 mph speed limit	DTSD has installed this type of work zone signage at the beginning of the reduced speed limit
	signs.	section of I-39/90.
	i. It is designed to get a driver's attention (See photo for example)	





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WORK ZONE SPEED LIMIT 25	
b. Signs advising CMVs to travel in the left lane	Although restricting trucks to the left lane is common on projects that temporarily widen the
<ul> <li>i. Moving CMVs to the left lane prevents them from passing each other as often, keeps the entrance and exit ramps more visible to motorists and hopefully reduces the speed disparity at those exchanges.</li> </ul>	shoulders and shift trucks away from the temporary shoulders to prevent shoulder pavement failure, it has not shown to improve the traffic operations.
Suggested timeline – as soon as the signs can be placed.	Nationally, there is mobility and safety research into truck lane restrictions. On freeways with less than 40,000 vehicles per day, crashes were reduced when the truck restriction was in place. On freeways with greater than 40,000 vehicles per day (such as I-39/90), crashes were higher than expected. Non-compliance is a significant problem on four-lane freeways and there is no significant impact to operating speeds with the truck restrictions. (Virginia DOT*)  The inside lane of I-39/90 operates 5 mph faster than the outside lane. If a truck restriction were put in place, the outside lane would likely operate 5 mph faster than the inside lane, which would require the merging to occur at a faster speed.  * Virginia Transportation Research Council, Evaluation of Truck Lane Restrictions in Virginia: Phase II  http://vtrc.virginiadot.org/PubDetails.aspx?id=298099
c. Use of DMS signage to indicate a work zone and reduced speed i. Use portable message boards with creative messages indicating conditions are different and speeds reduced, the better the chances of reducing crashes. Messaging example could be: "1 MPH over limit = \$200 FINE" or "Tailgating is for ball parks" Suggested timeline – as soon as message boards arrive.	DTSD has implemented similar creative messages on the DMS. Additional PCMS have been placed along the corridor with speed and safety related messaging.
d. More orange signs/lime green signs indicating motorists are in a work zone. This also includes signage to warn about distracted driving and following too closely.	Additional signage as per 1.b. and 5.a. have been implemented. Lime green (a.k.a. fluorescent yellow-green) is reserved for school, pedestrian, bicycle signs.
6. DSP resource allocation. Immediate implementation	





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a.	Allocate and creatively schedule our mitigation resources to target visibility and/or enforcement efforts during the peak travel times and in the specific zones that are proving the most challenging.  i. We will attempt to add more resources to work zones, but they are limited. This would also require an increase in mitigation funds to cover the cost of increased resources.	DTSD is in strong support of having additional law enforcement presence throughout the corridor. Mitigation funds are available annually. Past annual allocations have not been fully utilized.
	ii. Currently, we have 39 troopers per week assigned Sunday through Saturday to the I-39 project. We are adding 8 more four hour shifts per week for a total number of 47 troopers, an increase of 20%. Sergeants are allowed to work these shifts as well.	It is unclear where the 39 troopers are working on the corridor at any given time. Daily, there is one squad per segment (north, central and south) covering two 4-hour shifts (0700-1100 and 1500-1900) ranging from 12-21 miles each.
		The timing of the additional shifts should be clarified as to whether there is more coverage at the same time or additional coverage throughout the day.
		<ul> <li>DTSD would benefit from any additional enforcement DSP can provide. DTSD recommends adding four times as much law enforcement mitigation service to each corridor segment (e.g., an additional 24 hours per day per segment). Any coverage DSP is unable to provide may be supplemented with county law enforcement at a similar cost.</li> <li>Dane County (north segment) could provide 24 hours per day of law enforcement mitigation coverage.</li> <li>Rock County (south and central segments) could provide 8 hours per day of law enforcement mitigation coverage (56 hours per week)</li> </ul>
		The current DSP cost for providing law enforcement mitigation services for all three segments is approximately \$482,000 per year. If the level service were increased, the cost would be as follows:
		Estimated Annual Cost
		2X current coverage \$964,000
		3X current coverage \$1,450,000  4X current coverage \$1,930,000
		4X current coverage \$1,930,000
	iii. Bring in teams of troopers from other regions to focus on patrol for one week (5 – 8 hr. shifts) at a time. Pros: Add more resources to the project. Cons: incurred hotel costs.	The concept of a dedicated troop was originally proposed to serve the corridor: This would have provided several benefits:  • knowledgeable law enforcement personnel familiar with the entire 45-mile corridor  • knowledge of ongoing construction work and contractor practices  • knowledge of construction project specific emergency access points





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	establish relationships with corridor-wide first responders, project staff, and local municipal staff      and definite and definite and service for the divertice of the construction project.
	provide dedicated service for the duration of the construction project
	Ultimately, DSP determined this strategy was not feasible due to recruit classes, statutory limits on the number of sworn officers, the inability to have more than one recruit class in any given year, and the inability of DSP to fill their vacancies in general.
	The concept of a construction troop is included in the <u>Strategies Matrix</u> , see #19.
	Aside from this concept, DTSD has continually made requests to DSP for additional law
	enforcement mitigation services to increase visibility and law enforcement efforts.
<ol> <li>iv. Increase radius for overtime call outs</li> <li>1. Currently we are at 60 mile radius for call outs.</li> <li>2. Extend call outs to 75 miles which would have to include extra cost for travel time to ensure maximum amount of time in the work zones. Currently, travel is not included for personnel within</li> </ol>	DTSD understands this is a DSP policy issue per their current union contract.
60 miles.	
<ul> <li>b. Utilize inspectors in work zones more efficiently</li> <li>i. With the closing of the SWEFs, inspectors can be assigned during normal shifts to travel the work zones providing a level of visibility as well as conducting inspections on CMVs at the various exchanges and off ramps throughout the work zones.</li> </ul>	Similar to 6.a.iv. above, DTSD understands this is a DSP union policy issue. Further, the closing of the SWEFs was done by the Bureau of Highway Maintenance.
7. Aerial Enforcement. Immediate implementation.	
a. Use aircraft to target erratic driving in the work zones during peak travel times and take enforcement action.	Bureau of Traffic Operations (BTO) removed aerial enforcement from the mitigation strategies worksheet. DSP has stated there are not suitable locations to perform enforcement activities along the I-39/90 corridor, but the I-39/90 Mega Team is willing to discuss establishing locations such as crash investigation sites at interchanges. Also, DSP has previously stated that there are not enough pilots to provide adequate aerial enforcement service.
	The use of aerial surveillance technology is included in the Strategies Matrix, see #21 and #22.
b. Strategically place "Aerial Enforcement Detail" signs at the entrances to the counter-directional work zones to deter speeding.	The traveling public eventually becomes immune to the "Aerial Enforcement Detail" signs if not actively enforced, and this measure becomes ineffective.
8. Communicate with major motor carrier companies. Immediate impleme	ntation





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a.	DSP suggested this in 2017. Communications with companies will make them aware of the work zones, potential delays, narrow shoulders, the signage and afford them the opportunity to relay the information to their drivers who may choose a different route.	WisDOT continually provides stakeholders and the motoring public with 511 Wisconsin information through websites, social media, news releases, etc. The Traffic Management Center (TMC) provides news releases which include the 511 website and distributes to trucking companies.  6/15/2018 WisDOT Motor Carrier Services sent an email on behalf of the I-39/90 project to
		more than 9,000 trucking companies.
9.	Freeway Service Trucks (FSTs)	
a.	Trucks (like the one pictured) are used throughout Dane and Milwaukee Counties and may give law enforcement additional opportunities for scene response and clearing including:	The truck referenced in DSP suggestion 9.c. is the Dane County rapid response and incident management vehicle (e.g., "Beltline Bob" truck). These trucks do not have the ability to relocate vehicles. The truck is provided by the Dane County Sheriff's Office and use is limited to a specific segment along the Beltline; not on I-39/90. This is similar to the truck used by the Milwaukee County Sheriff's Office. These trucks are funded by the respective counties.  Purchasing a truck similar to what is used by the Dane County Sheriff's Office costs approximately \$80,000 furnished. This truck could be outfitted to provide towing services such as adding a wheel lift or other equipment to relocate stalled vehicles at an additional cost. DTSD recognizes that vehicles cannot be purchased using mitigation funds.  As part of the I-39/90 Corridor Project, there currently are three FST trucks serving the segments to provide motorist assistance. FST trucks are specifically designed to relocate two vehicles at one time. Each truck provides 86 hours of coverage per segment per week for a total of 258 hours. The cost of this service for this construction season is \$237,000 per segment for a total of \$711,000 for the entire corridor.
		The use of freeway service trucks is included in the <u>Strategies Matrix</u> , see #19 and #26.
	i. The ability to manipulate barriers quickly, allowing emergency vehicles to enter the opposite lane for easier access to a scene. Current conditions dictate emergency vehicles traveling to an exit to turn around and negotiate through stopped traffic or to travel against normal traffic flow; this delays response times and increases the danger potential.	11 gate access points are available through the median barrier wall (see 3.a.) in addition to numerous other temporary and permanent emergency access points.  As shown below, first responding agencies are using the emergency access points to safely respond to incidents via the work zone.





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	Regard Comments of the comment
	AMBRIDGE AREA EMS
ii. The ability to temporarily move disabled vehicles from traffic lanes allowing for traffic queues to clear.	Push bumpers would provide DSP the ability to safely and efficiently move disabled vehicles out of the travel lanes. DSP currently has a limited number of vehicles equipped with push bumpers. DTSD recognizes that push bumpers and other equipment cannot be purchased using mitigation funds.
	The use of push bumpers on DSP vehicles was suggested as a tool in the <u>Strategies Matrix</u> (see #13).
<ul><li>iii. Provide better visibility for approaching traffic encouraging safer travel.</li></ul>	All I-39/90 FST trucks outfitted to provide safe visibility.



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b.	The trucks could be operated by law enforcement during their assigned	DTSD is open to having DSP operate the FST trucks however, they are currently operated by
	mitigation period and would serve a better suited purpose than the	professional tow truck operators. Providing the trucks similar to "Beltline Bob" would provide
	traditional cruisers. The two vehicles in service are extended cab, four-	some of the service the FST already provides, but not the towing ability.
	wheel drive pickup trucks with special equipment to assist motorists and	
	provide scene security. The vehicles are equipped with a changeable	
	message sign, appropriate fluids, traffic cones and other equipment	
	needed to assist disabled vehicles and warn approaching traffic.	
c.	The photo below is a Dane County FST truck that moved the barrier wall	As noted in 9.a., purchasing a truck similar to what is used by the Dane County Sheriff's Office
	on a recent crash. This allowed Fire and EMS to access the six car crash	costs approximately \$80,000. DTSD recognizes that vehicles cannot be purchased using
	for extrication of two subjects.	mitigation funds.
	Manalans Charles Bares Description Shear S	The I-39/90 FSTs are flatbed tow trucks that can relocate two disabled vehicles at once. The Dane County truck shown in DSP recommendation 9.d. can only push a disabled vehicle and is unable to relocate it from the incident scene. A picture of the I-39/90 FST is shown below.
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10. Oversize Load Restrictions. Immediate implementation.





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a.	Oversize loads wider than 12 feet should be prohibited from traveling through the work zone. When crashes occur, even if one lane remains open, their width makes it impossible for the load to pass the incident scene or traffic to get around the load to continue. The backup then stays in place until the scene is completely clear.	This issue of restricting OSOW has been evaluated by the Bureau of Highway Maintenance (BHM). The DTSD Administrator's Office and the Secretary's Office have stated that the current policy of allowing OSOW through the corridor will remain in effect.
b.	ANY oversize loads should be restricted from traveling on a Friday, Saturday, Sunday or Monday of holiday weekends due to extraordinary traffic volume.	See 10a above; same response.
c.	DSP, DTSD and DOT Permits can work together to provide clear and concise restrictions	See 10a above; same response.