

June 12, 2018

TOPIC: I-39/90 Shoulder Width during Construction

BACKGROUND:

During 2012, the design parameters were established for the I-39/90 corridor. The parameters are documented in a Project Corridor Manual whose purpose is to: supplement other industry design manuals such as: FDM, AASHTO, MUTCD, TGM etc.; provide consistency among the various design teams; and to fill in gaps where existing design guidance is ambiguous, states a range of values, or is left up to the designer. One such example is the width of shoulder needed for traffic during construction. The initial shoulder width recommended by the CMT, and documented in the Project Manual, was 2' LT and 8' RT for all TWTL construction traffic. Traffic is separated by TCB. The 8' RT side shoulder width was increased from the EA width of 2'. The overall width of this typical section is 70'.

The 8' shoulder width on the right side was initially recommended for the following reasons:

- ✓ Provide adequate space for a disabled vehicle to move completely out of the right most travel lane.
- ✓ Provide greater than normal shy distance due to high truck count.
- ✓ Provide space for first responders/incident management vehicles to reach the disabled motorist.
- ✓ Increase the potential to keep 2-lanes open during incident response.
- ✓ Increase lane capacity during construction. Per FDM 11-50-30.5 "Shoulder width less than 6 feet will also reduce capacity of an adjacent lane".
- ✓ Provide room to bring in material if needed for emergency maintenance of the live traffic lanes.
- ✓ Provide room for snow storage should counter directional traffic be extended through winter (not typical).
- ✓ Provides room for OSOW vehicles.

FINANCIAL CONSIDERATIONS:

During summer 2013, due to statewide monetary concerns, the I-39/90 CMT was asked to provide a priority list of items that would save money on the project. See attached list. Five of the items that were chosen to reduce the entire corridor cost are:

Remove Beltline Interchange (Phase 2) from I-39/90 Corridor Project	\$223 M
Change NB full depth shoulders to trapezoidal	\$7.5 M
Reduce inside shoulder width in areas with CBSS from 14' to 12'	\$2 M
Reduce clear zone width from 44' to 36'	\$6.2 M
Reduce right side temporary shoulder width during construction from 8-foot to 4-foot	\$6 M

These revisions were implemented during preliminary/final design and cost \$XXXXX in design amendments. The construction cost savings was realized in the August 2014 TPC Report.

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DOCUMENT SEARCH:

March 2, 2018 – meeting with DSP regarding upcoming 2018 construction season work zones. Topics included: work zone lane configuration; crash data; traffic volumes, speed data, incident response, response time flow chart.

August 3, 2017 – e-mail from JV with rough cost estimate for widening outside temporary shoulders to 8' for 1 remaining contract and 1 under construction_contract. Cost is \$25-\$30 million.

April 20, 2015 – Final 2014 Cost Reduction Opportunities, Scenario 1, Phase 1 distributed to CMT.

June 11-13, 2013 – FHWA Cost Estimate Review (CER) Workshop. Reducing width of temporary outside shoulder from 8' to 4' listed as a cost opportunity in FHWA CER Workshop meeting notes.

July 19, 2013 - Cost Reduction Matrix sent to DOT Administration. Reducing width of temporary shoulder width from 8' to 4' ranked at #5. Cost savings of \$6 M. Impacts listed.

July 2013 – FHWA CER Final Report - reduction of temporary shoulder width from 8' to 4' listed as a cost opportunity. Cost range \$6.3 - \$7 M with a 75% probability.

July 10, 2013 – distribution of table documenting cost savings for reducing temporary shoulder width from 8' to 4'. \$7 million savings.

August 2, 2013 – summary memo from central segment regarding cost savings changes they were directed to make on Monday July 29, 2013. Included temporary shoulder reduction from 8' to 4'.

February 18, 2014 – I-39/90 Project Manual revised to reduce temporary shoulder width from 8' to 4'.

Reduction Ranking	Scope item costs estimate	Item Description	Affected Construction Project ID	Included in TPC Estimate (Y/N)?
1	\$223M	Remove Beltline Interchange (Phase 2) from the I-39/90 Corridor Project	Multiple	Y
2	\$7.5M	Do not make NB shoulders full depth	Multiple	Y
3	\$2M	Reduce inside shoulder width in areas where there is median barrier from 14' to 12'	Multiple	Y
4	\$6.2M	Reduce 44-foot clear zone to 36-foot	Multiple	Y
5	\$6M	Reduce right side temporary shoulder width during construction from 8-foot to 4-foot.	Multiple	Y
6	\$1-3M	Reduce ramp design speeds for two system interchanges	Multiple	Y
7	\$3M	Minimum design standards	Multiple	Y
8	\$5M	Do not build 4th lane through Janesville	Multiple	Y
9	\$10M	Remove Gateway access at I-43 Interchange	1003-10-79, 1003-10-80	Y
10	\$1.5	Do not build Rock River Bridge substructure to support future 4th lane	1005-10-71	Y
11	\$5M	Janesville MSE walls/footprint	Multiple	Y
12	\$21.5M	Remove alternate route improvements from Majors funding (Local)	3653-00-72, 3621-00-76, 5966-10-70, 5966-00-72	Y

Impacts of not including in project

The Beltline Interchange would have to be enumerated as a separate project of incorporated into one of the near-by study projects.

The NB shoulder is currently full depth pavement for incident management & future 4th lane accommodations.

Inlets will protrude out into the shoulder because there will not be the 2' gutter area

Width recommended by BPD based on crash study. FHWA will accept 36-foot clear zone. Reduction in standard could cause an increase in run off the road crashes. At this point, some projects would not be able to go back to the 44-foot clear zone without significant re-work in design.

Affects incident management, snow storage, quick clearance and other operational and safety measures. OSOW and freight in general will suffer form reduced roadway width. Reducing the shoulder width will also reduce the capacity of our construction zone, increasing the frequency and duration of construction related delays to motorists.

The design already requires an exception to the WisDOT standard that ramp design speed should be no lower that mainline design speed minus 10 mph. The ramp speed could be compromised farther to "pull in" the designs at the expense of safety and operations.

Applies to 12 overpass grade separations. By using minimum design standards for local road profiles, could reduce side road touchdown points and reconstruction costs. EA did not include side road design.

MSE walls should still be built to accommodate a future fourth lane in this tight, urban area. Level of Service would reach LOS D in design year and be near a LOS E. FHWA would have to make an exception to their LOS C requirement.

City of Beloit would need to access the Gateway Business Park, east of I-39, using the Hart Road Interchange (1.6 miles away). Environmental document included a commitment to access for the development from I-39.

When the lane needs to be added, the river would need to be disturbed again. The hammerhead design is not easily expandable for adding lanes in the future.

There would be no room to expand in the near future.

Improvements would have to be made using 3R or Backbone funds. Fewer funds will be available for Region 3R and Backbone needs. (CTH J, Hart, CTH G)