



## Winona Bridge Work Package #5

### Bridge No. 5900 (Existing Bridge) Rehabilitation and Reconstruction

#### Q&A #1

Question:

A change or evolution of bridge design standards was one reason expressed by MnDOT as contributing to the cost growth for work package #5. Please provide detailed background information as to how and why this occurred.

Answer:

Prior to 9/10/13, the bridge design protocol MnDOT used was the Load Factor Rating (LFR) method. This utilized an HS-20 design vehicle. On 9/10/13, the MnDOT Bridge Office Policy Committee discussed establishment of a policy regarding the appropriate design code to use for bridge repair and rehabilitation projects. Given that the AASHTO Standard Specifications for Highway Bridges have not been updated since 2002, and had several documented deficiencies, the committee agreed that repair and rehabilitation projects should be evaluated and designed using the current edition of the AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications along with the latest Load Rating/Load and Resistance Factor Rating (LRFR) requirements from the Manual for Bridge Evaluation (MBE). The AASHTO LRFD Bridge Design Specifications are founded in the latest research, incorporating the variability in material properties and loading, as well as being statistically calibrated to provide uniform reliability. There are many differences between LFR and Load and Resistance Factor Rating (LRFR), one of which is the design vehicle. As previously mentioned LFR uses HS-20, and LRFR uses HL-93. See this link for background on HS-20 and HL-93 (<http://www.aboutcivil.org/aashto-hl-93-loading-design.html>).

All new bridges MnDOT designs use the LRFD methodology. Many states, including Minnesota, use the AASHTO LRFD Bridge Design Specifications as the framework for their design, but they have modifications that are set by policy groups at the states that focus the specifications for issues that are specific to their state. One example is that states with larger legal or permit loads design for vehicles beyond the HL-93 notional vehicle that is specified in AASHTO. MnDOT policy is to always use the modified HL-93 double truck loading (110% instead of 90% as spelled out in AASHTO) to encompass the loading that we see from our permit vehicles. The guidance can be found in the MnDOT LRFD Bridge Design Manual (BDM): <http://www.dot.state.mn.us/bridge/pdf/lrfdmanual/section03.pdf> (p. 3-5). Originally, it was included in the BDM on February 14, 2015 as part of a memo to designers (2005-01) and was incorporated into the text of the manual in 2015. This is the bridge design protocol used in the Final Design for work on the existing bridge for work package #5.

Question:

Who made that decision?

Answer:

See above. The Bridge Office Policy Committee consists of technical experts from all three sections of the Bridge Office – planning and hydraulics, design, and construction and maintenance, as well as a representative from the Federal Highway Administration.

Question:

Over recent years, MnDOT appears to have transitioned from HS 20 to HL 93 standards for bridge rehabilitation projects. Could you describe that transition? What rehab projects started become subject to the new standard? When?

Answer:

Since 9/10/13 transition projects were handled in 3 categories:

1. Final design starting after 9/10/13: Follow LRFD specifications.
2. Final Design at 60% stage or greater: Allow LFD specification but encourage LRFD if schedule allows.
3. Final design less than 60%: Follow LRFD specs unless scheduling challenges in completing plans.

Question:

Did the FHWA set deadlines for transition to using HL 93 load rating for evaluating in-place bridges? If so, what were those deadlines?

Answer:

There is no deadline set by FHWA for evaluating in-place bridges. All new bridges must use LRFR.