T-4 Responses to Prefabricated Bridge Railings RNS:

Paul Santo, P.E., Bridge Design Engineer, Bridge Design Section, Hawaii DOT, Paul.Santo@hawaii.gov, 01-10-2013:
The only comment I have is that the railing shapes to be tested should be ones that are known to meet MASH specifications otherwise test results would be inconclusive if anchorages survive but railing shape "fails". Also because the number of railings tested will be limited, there should be guidance provided for applicability of the test results of the anchorages for other existing crash-tested railing shapes.

E. David Lambert III, P.E., Director of Bridge Engineering and Infrastructure Management, State Transportation Engineer, New Jersey DOT, Dave.Lambert@dot.state.nj.us, 01-11-2013:
NJ has reviewed this...our one comment is that the report doesn't specify to what type of bridge deck the railing is to be anchored. We're assuming concrete, however, there are other types of steel decks used mostly on moveable bridges (eg. orthotropic, steel grid, etc) and FRP decks. There is a lack of guidance for anchor details and design on these types of decks. The proposed research may need to include these bridge decks as part of the study.

Wayne B. Symonds, P.E., Structures Design Engineer, Vermont Agency of Transportation, Wayne.Symonds@state.vt.us, 01/14/2013:
I think this is a great research topic; thanks for pulling it together. Vermont's comments:

- Task 1: Can we bring industry into the conversation early and include them in the survey?
- Task 3: It is unclear to whether the task is to develop new rail systems or to identify 5 existing systems and re-design for anchorage systems that support prefabrication.
- Task 3: Work plan should also consider construction tolerances and ability to accommodate camber etc.
- Task 4: In addition to just testing 5 systems, it would be great if there could be some generalized findings about whether emulative connections (splice sleeves, grouted joints, etc) would be considered acceptable for all existing crash tested bridge rail systems.

Matthew J. Chynoweth, P.E., Engineer of Bridge Field Services, Michigan DOT, ChynowethM@michigan.gov, 01/14/2013:
The only comment I have is to possibly add an item to the tasks to evaluate how these barriers and connections may impact the deck overhang design, as this could have an impact on the design of the exterior precast deck panels.

Douglass A. Robb, P.E., Bridge Design Engineer, Bridge Design, DelDOT Transportation Solutions, Douglass.Robb@state.de.us, 01/14/2013:
I second Wayne's comment on the value of the proposed research topic. Delaware is certainly very much in support of it.

Similar to Matthew and Dave's comments, we would also hope to see information / guidance come out of this research addressing the effects on the superstructure system and not just the anchorage/connection detail. The FHWA approved details are fairly limited with respect to superstructure type and often leave us making difficult interpretations and judgments. A few examples of common structure types for us with limited bridge railing crash-testing include:

- Adjacent box beam bridges and the effect of a rail impact on the supporting exterior

box beam.
- Barriers mounted on headwalls for rigid frames and/or box culverts and the connection required between the headwall and frame or culvert.

We certainly recognize the testing will be limited, so the more bang for the buck the better for everyone.

Might also want to consider emphasizing under Part VII the safety benefits this research will offer by validating design assumptions.

Kevin Goeden, P.E., Chief Bridge Engineer, South Dakota DOT, kevin.goeden@state.sd.us, 01/14/2013:
The only comment that we would add to those already provided by the group is to clarify what is intended in Task 4 with respect to “durability testing”. Typically, this term is associated with long term life and ability to withstand wear and tear over time (including corrosion resistance). Not sure if the intent here is to determine survivability of the barrier and/or anchorage for single impact vs. multiple, or to attempt to take into account other factors such as anchor section loss over time due to corrosion, etc.

Wayne J. Seger, P.E., Director, Structures Division, Tennessee DOT, Wayne.Seger@tn.gov, 01/14/2013:
Looks like the others have given a bunch of good comments to refine the problem statement. I would just like to re-iterate Kevin's thought regarding the durability testing. I think it needs to include or clarify the connection pullout if impacted and/or does it mean corrosion. Thinking along the line of corrosion seems to be a very important aspect of connecting to the deck (whatever type of deck). Just thinking of the typical bridge cross-section with a cross-slope, all water (and chlorides) flow toward the shoulder and would leak under the barrier attacking the connection to the rail as well as flow around the edge of the deck slab and possibly deteriorate the slab. Otherwise this would be a great piece of research to move forward.