

AASHTO Innovation Initiative

[Proposed] Nomination of Innovation Ready for Implementation

Sponsor

Nominations must be submitted by an AASHTO member DOT willing to help promote the innovation. If selected, the sponsoring DOT will be asked to promote the innovation to other states by participating on a Lead States Team supported by the AASHTO Innovation Initiative.

1. **Sponsoring DOT (State):** Minnesota Department of Transportation
2. **Name and Title:** Katie Walker, MnDOT Office of Research & Innovation Director

Organization: Minnesota Local Road Research Board

Street Address: 395 John Ireland Boulevard

City: St Paul

State: Minnesota

Zip Code: 55104

Email: katie.walker@state.mn.us

Phone: 651-366-3780

Fax: [Click or tap here to enter text.](#)

Innovation Description (10 points)

The term “innovation” may include processes, products, techniques, procedures, and practices.

3. **Name of the innovation:**

Bridge Approach Transition Curb

4. **Please describe the innovation.**

The Bridge Approach Transition Curb redirects the bridge deck storm water runoff from the erosion prone areas immediately behind bridge wing walls and disperses the water to areas that are more vegetated and are far less susceptible to erosion.

5. What is the existing baseline practice that the innovation intends to replace/improve?

The Bridge Approach Transition Curb eliminates the need for continual maintenance to the erosion prone areas behind wing walls.

6. What problems associated with the baseline practice does the innovation propose to solve?

The lack of a transition curb or bridge rail causes stormwater to concentrate at the end of the gutter, which causes washout erosion along a bridge's wing walls that must be repaired. Washout erosion along wing walls is a persistent problem for many local agencies. The Bridge Approach Transition Curb solves this issue without requiring additional drainage structures or stormwater piping.

7. Briefly describe the history of its development.

The Jackson County Public Works Department developed a bridge approach transition curb that has been included on all new bridge construction for about 15 years. The extended curb design protects the area immediately behind the wing walls by reducing the intensity of storm water runoff and gradually channeling it further away from the structure to a less erosion-prone area. The success of the bridge approach transition curb on new bridges inspired Jackson County public works staff to adapt the design for the many of its existing bridges. Five years ago, Jackson County received a \$5,000 grant through the Local OPERA Program (funded by the Minnesota Local Road Research Board) to develop a process for adding the feature to existing bridges, including the design and fabrication of reusable custom metal forms for each corner of a bridge.

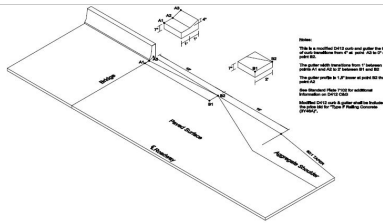
8. What resources—such as technical specifications, training materials, and user guides—have you developed to assist with the deployment effort? If appropriate, please attach or provide weblinks to reports, videos, photographs, diagrams, or other images illustrating the appearance or functionality of the innovation (if electronic, please provide a separate file). Please list your attachments or weblinks here.

Fact-Sheet and Technical Specifications:

http://www.mnltap.umn.edu/opera/projects/2018/documents/bridgeapproach_factsheet.pdf

Video Demonstration: <https://www.youtube.com/watch?v=awoFpG66lKE&authuser=0>

Attach photographs, diagrams, or other images here. If images are of larger resolution size, please provide as separate files.



State of Development (40 points)

Innovations must be successfully deployed in at least one State DOT. The AII selection process will favor innovations that have advanced beyond the research stage, at least to the pilot deployment stage, and preferably into routine use.

9. How ready is this innovation for implementation in an operational environment? Please select from the following options. Please describe.

- ☐ Prototype is fully functional and yet to be piloted
- ☒ Prototype has been piloted successfully in an operational environment
- ☒ Technology has been deployed multiple times in an operational environment
- ☐ Technology is ready for full-scale implementation

Click or tap here to enter text.

10. What additional development is necessary to enable implementation of the innovation for routine use?

Click or tap here to enter text.

11. Are other organizations using, currently developing, or have they shown interest in this innovation or of similar technology?? ☒ Yes ☐ No

MnDOT has received requests for the transition curb specifications from local agencies.

If so, please list organization names and contacts. Please identify the source of this information.

Organization	Name	Phone	Email
Minnesota Department of Transportation	State Aid Bridge Engineer - David Conkel	651-366-4493	dave.conkel@state.mn.us
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

Potential Payoff (30 points)

Payoff is defined as the combination of broad applicability and significant benefit or advantage over baseline practice.

12. How does the innovation meet customer or stakeholder needs in your State DOT or other organizations that have used it?

The innovation reduces maintenance cost for local agency bridges with wing walls.

13. Identify the top three benefit types your DOT has realized from using this innovation. Describe the type and scale of benefits of using this innovation over baseline practice. Provide additional information, if available, using quantitative metrics, to describe the benefits.

Benefit Types	Please describe:
Improved Asset Performance	Eliminates soil erosion along bridge wing walls.
Organizational Efficiency	Eliminates manpower needed to repair soil erosion.
Environmental Benefits	Reduces the amount of soil being eroded.

Provide any additional description, if necessary:

[Click or tap here to enter text.](#)

14 How broadly might this innovation be deployed for other applications. in the transportation industry (including other disciplines of a DOT, other transportation modes, and private industry)?

This application could be deployed by any state or local agency that owns bridges with wing walls.

Market Readiness (20 points)

The All selection process will favor innovations that can be adopted with a reasonable amount of effort and cost, commensurate with the payoff potential.

15. What specific actions would another organization need to take along each of the following dimensions to adopt this innovation?

Check boxes that apply	Dimensions	Please describe:
<input type="checkbox"/>	Gaining executive leadership support	Click or tap here to enter text.
<input checked="" type="checkbox"/>	Communicating benefits	Agency would need to communicate the benefits of adding the transition curb to new bridges or retrofitting existing bridges in order for change to occur. Buy-in would be needed from maintenance staff.
<input checked="" type="checkbox"/>	Overcoming funding constraints	Cost and manpower to retrofit existing bridges is small, but required.
<input checked="" type="checkbox"/>	Acquiring in-house capabilities	Staff will need training on how to design for and install the bridge transition curb.
<input type="checkbox"/>	Addressing legal issues (if applicable) (e.g., liability and intellectual property)	Click or tap here to enter text.
<input type="checkbox"/>	Resolving conflicts with existing national/state regulations and standards	Click or tap here to enter text.
<input type="checkbox"/>	Other challenges	Identification of existing bridges that would benefit from retrofitting.

16. Please provide details of cost, effort, and length of time expended to deploy the innovation in your organization.

Cost: Each curb extension uses about 1 yard of concrete, for a total of 4 yards per bridge. The cost for labor, equipment, and materials for these improvements to an existing bridge total approximately \$7,500 using the specialty metal forms. (It costs approximately \$5,000 to create the specialty metal forms, which can be used to retrofit existing bridges.)

Level of Effort: Retrofitting one bridge takes five maintenance workers one full day and two subsequent half-days.

Time: Retrofitting one bridge takes five maintenance workers one full day and two subsequent half-days.

17. To what extent might implementation of this innovation require the involvement of third parties, including vendors, contractors, and consultants? If so, please describe. List the type of expertise required for implementation.

An agency may need to hire a contractor to develop the specialty metal forms, if they are unable to create them in-house. Agencies could also pool their resources to create and share usage of the specialty metal forms.