Collaborative Hydraulics: Advancing to the Next Generation of Engineering
C.H.A.N.G.E.

https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/change.cfm

Innovation Implementation Stage Definitions	Prompt Questions for Describing the Implementation Stage The following questions are intended to help you determine your current implementation stage. While it is not mandatory to respond to each question, providing some narrative describing your current status will be helpful to the EDC teams.
Not Implementing. The State is not currently using the innovation (Collaborative Hydraulics) anywhere in the State and is not interested in using 2D bridge hydraulic modeling and visualization tools.	Has the state determined that 2D modeling is not beneficial to their project delivery after learning the benefits of 2D modeling? Does the state lack the resources or expertise to begin an evaluation of 2D modeling? Does the state have limited access to 2D modeling training due to course prioritization or funding limitations?
Development Stage. The state is interested in pursuing the CHANGE initiative and the use of 2D bridge hydraulic modeling, however has not had an opportunity to test 2D bridge hydraulic modeling software on a State project. The State is interested in pursuing the innovation or seeking additional information on how to implement it. For example: The state has acquired 2D bridge modeling software and considering its use on projects.	Is the state seeking information on 2D bridge hydraulic modeling and training for their staff/consultants? Does the state have the resources or expertise to begin an assessment of 2D modeling? Has the state hosted specific 2D modeling training for bridge hydraulic modeling or sent staff to the training? (NHI Course 135095 Two-dimensional Hydraulic Modeling of Rivers at Highway Encroachments) Has the state participated in workshops, webinars, or peer exchanges related to 2D modeling? Has the state requested technical assistance from the FHWA Resource Center for 2D modeling?
Demonstration Stage: The state is testing/piloting the use of 2D bridge hydraulic modeling and has used 2D modeling on projects on a limited basis. For example: The state is currently using 2D modeling on a limited basis but needs additional development support	Has the state used 2D modeling for any phase of project development? Has the state compared 2D model results with any previous 1D model results or measured data? Has the state contacted other states to learn from their 2D modeling experiences?
Assessment Stage: The state has been actively using 2D modeling on projects and has concluded that the CHANGE initiative is beneficial and is moving to institutionalize 2D bridge hydraulic modeling in its policies, procedures and guidelines. For example: The state is currently using 2D modeling on project design and plans to include guidance in their hydraulics manual)	Has the state decided to use 2D bridge hydraulic modeling on their projects and currently working to train more staff and integrate it into their policies, procedures, and guidelines? Has the state established an implementation champion or team? Has the state created an Implementation Plan or included 2D bridge hydraulic modeling guidance in their hydraulics manual? Has the state completed a hydraulic analysis and design with a 2D model (either in-house or by a consultant)? Is 2D bridge hydraulic modeling used throughout the states divisions/regions, or only by a portion?
Institutionalized: The state has adopted 2D bridge hydraulic modeling and graphical visualization tools for project delivery, when appropriate and has institutionalized 2D bridge hydraulic modeling in its policies, procedures and guidelines. For example: The state is currently using 2D bridge hydraulic modeling on project designs and has incorporated guidance in their hydraulics manual)	Does the state routinely use 2D bridge hydraulic modeling and graphical visualization tools on complex hydraulic projects, and has 2D bridge hydraulic modeling guidance been integrated into their policies, procedures, and guidance (hydraulics manual)? Does the state have at least one 'champion' who is well versed in 2D bridge hydraulic modeling application and can provide technical direction to others?

Final Report Questions:

Reporting Period:	**Final Report: December 2018**
2) Division Contact for additional information:	
3) What is the State's current stage of innovation implementation? Review the Innovation Profile Template and select the appropriate implementation stage for this innovation.	(Choice) ☐ Not Implementing ☐ Development Stage ☐ Demonstration Stage ☒ Assessment Stage ☐ Institutionalized
4) Describe the State's accomplishments for this reporting period (both State DOT and local agency accomplishments). Please provide EDC-4 highlights with good "so what" nuggets. -- What would another state be interested in and/or how could leadership use the information I am providing? -- If the State has advanced to the next implementation stage, consider the prompt questions in the chart and explain the advancements made to support your selection. -- Please include benefits as part of your explanation (i.e. time/cost savings, delay/crash reductions, etc.)	NMDOT has or is currently using 2D modeling to plan/design new bridge replacements for 6 projects. Initial (1D) analysis of two of these bridges indicated significant overtopping of the roadway and existing and proposed structures for the design storm. Subsequent 2D modeling showed that upstream flooding (existing condition) was not related to the structures and that the proposed structures would meet hydraulic design criteria. NMDOT also obtained and has deployed 5 UAVs to acquire terrain data needed required for 2D modeling at significant cost savings and more responsive timeliness. NMDOT is planning to develop a 2D modeling addendum for our drainage manual, expected to be published in Fall 2019.
5) Describe any additional assistance needed by your state.	NMDOT will need SMS training for new employees, as well as additional training on bridge scour analysis using SMS and the Hydraulic Toolbox.
6) Describe any implementation obstacles or lessons learned. Also, indicate if and how your state can provide assistance to others in their implementation of this innovation.	Model review tools provided by FHWA along w/ peer review/third party checking of models is extremely valuable w regard to developing accurate models. The initial learning curve is very steep and being able to get feedback/guidance from more experienced users can make a big difference for new users.
7) The responses have been coordinated with the necessary transportation agencies and Division Office technical resource.	*(Choice)* ☐ Yes ☐ No