

BUILDING THE NEXT GENERATION

# AASHTOWare BRIDGE®

PRODUCT NEWSLETTER

## BrDR

- Understanding the BrDR Ribbon Interface
- BrDR Analysis Results Comparison Tool
- BrDR Load Rating Tool—LRFR
- BrDR Report Tool
- BrDR Advanced Concrete Post-Tensioned Beams

## BrM

- Life Cycle Cost Analysis (LCCA)
- BrM Analytical Tools
- BrM Critical Findings/Request for Action Module
- BrM User Certification Module
- BrM Mobile Bridge Inspection
- Solicitation to Remain Compliant with Changes to Federal Requirements

August • 2021



# Letter from the Chair



Greetings from the AASHTOWare Bridge Task Force. We continue to live during very dynamic times. Many of us have been back to the office since last summer and some of us are still working from home. Some have even adopted a hybrid approach of working in the office and working from home.

Throughout this all, our contractors and users continue to deliver high quality work—whether it is updated software, bridge designs or bridge load ratings.

AASHTOWare released Bridge Management™ 6.4 in January 2021 and Bridge Management 6.5 in June 2021. Those releases introduced many new updates and bug fixes to the software. For additional details on these releases, see the Letter from the AASHTOWare Bridge Task Force Vice-Chair.

AASHTOWare also released Bridge Design and Rating™ 7.0 in January 2021. This release marked the conclusion of the multi-year project, with a short hiatus for the change in contractor. Many states have adopted this new version and are taking advantage of the new features and processing speed increases. Some states are taking a ‘wait and see’ approach and will adopt the modernized system following the release of Version 7.1.

So, what is in version 7.0? The new version significantly upgraded the core technology to a modern software architecture that takes advantage of new and existing hardware as well as the latest software technology. With the modernized AASHTO analytical engine, there are significant improvements on the analysis runtime performance for all structure types and the modern software architecture allows for future performance enhancements. Modifications to the User Interface also provide an enhanced user experience. In addition to those improvements, this release provides the following capabilities and features:

- AASHTO LRFD Bridge Design Specifications updates (9th Edition);
- AASHTO Manual for Bridge Evaluation updates (3rd Edition with 2020 Interim Revisions);
- Load Rating Tool enhancements: LFR analysis of floor systems, multi-cell box beams, and culverts; and
- Ability to specify vehicle and traffic lane placement settings for live load analysis of floor beams and floor trusses.

Scheduled for delivery in August 2021, Bridge Design and Rating 7.1 is currently in Beta testing. Some of the many new features delivered in 7.1 include:

- Analysis Results Comparison Tool
- BrM Web Services Integration
- 3D Analysis for Superstructures with hinges
- Schedule based RC I-beam with Post Tensioning (Caltrans and Mississippi)
- Multiple smaller enhancements for Multi-cell Box Culverts (Caltrans)
- Enhanced Load Rating Tool Permit Analysis Settings
- Bug Fixes and maintenance issues

Bridge Design and Rating 7.2 is currently in the design phase and development will start soon. Some of the new features that will be included are:

- PS Design Tool—Phase 2
- Steel Girder Design Tool
- IFC Data Exchange
- Addition of MCB and Multi-Girder LRFR—Load Rating Tool
- Addition of Slab Systems LFR & LRFR—Load Rating Tool
- Bug Fixes and maintenance issues

As a reminder, AASHTOWare will continue to support Bridge Design and Rating 6.8.4 until June 30, 2022. Only critical bug fixes will be incorporated into 6.8.4 during this time. Start making plans to migrate from the legacy version to the current software. Please contact ProMiles for assistance in any migration questions.

Mark Bucci led an effort to clean up, clarify, and document the current process for handling BrDR bugs, issues, and maintenance items. The newly refined process will be posted on the [aashtowarebridge.org](http://aashtowarebridge.org) website once the documentation has been completed. As a component of the refined process, the AASHTOWare Bridge Task force will establish a BrDR Backlog TAG for users to participate in the process of handling the many issues that arise each year. Mark will reach out to the user community to solicit seek volunteers to serve as Technical Advisory Group or TAG members.

Mike Johnson is leading the BrDR Culvert TAG effort to implement metal culverts into the product. Following Chapter 12 of the Bridge Design Manual and methodologies used by several states in spreadsheets, the Culvert TAG has had several meetings to move this effort forward. The

TAG is making great progress and has only a few items that still need to be addressed before design can begin.

Vinacs Vinayagamoorthy is leading the BrDR Reports TAG effort to revise and enhance BrDR reporting and data output. This initiative will support a more consistent approach to BrDR reporting and better meet the needs of our users. The Reports TAG has had several meetings and have come up with some great ideas. The Task Force will work with ProMiles to take their recommendations forward for incorporation into future releases of the product.

I don't want to close this out without thanking one last time the following states who contributed both funding and DOT staff to support the successful completion of the BrDR Modernization Project. Special thanks to Alabama, California, Idaho, Illinois, Iowa, Kansas, Michigan, Minnesota, Mississippi, Montana, New Mexico, New York, Ohio, South Dakota, and Wisconsin. The project would have never been successful without the funding and the volunteer time the states provided to review mockups, review design documents, and beta test the software.

Todd Thompson, P.E.  
AASHTOWare Bridge Task Force Chair

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## Farewell to Judy Tarwater

We want to take this opportunity to thank someone who has played a huge role in AASHTOWare Bridge's growth in the last decade. Judy Tarwater will be retiring at the end of 2021 after a fruitful decade of serving as the AASHTOWare Bridge Project Manager. AASHTOWare Bridge has grown tremendously under her guidance and the Task Force's oversight. While we're all sad to see her go, we're excited that she will have more time to dedicate to her lovely family and her sewing projects.

Thank you, Judy. You will be missed!



*Judy has been so outstanding in organizing and keeping us informed. She is proactive, exceptionally welcoming, and so responsive. We also loved having Jay travel with her and coordinate and join us in evening activities, so we will want to thank Jay, as well. Judy and Jay are family, and it has made traveling and volunteering by the Task Force members so much more enjoyable since Judy takes special 'care' of all of us.*

–Tom Saad P.E., FHWA

*Judy, I had the privilege of being the Chair of the AASHTOWare Bridge Task Force when you joined us in 2012. Through your high degree of enthusiasm and professionalism, there is no question BrM, BrR, and BrD have seen an incredible rate of growth and improvement in the last nine years. Thank you so much for devoting your time and incredible energy to assisting the Task Force and its contractors in developing such incredibly powerful software that benefits all the state DOTs and the traveling public they serve. Congratulations on your second "retirement," and best of wishes on your future endeavors!*

–Tim Ambrecht P.E., S.E., Illinois Department of Transportation

*Judy has been a wonderful project manager for the AASHTOWare Bridge Task Force. I've had the pleasure to work with her as the Chair of the Task Force. She tackles any task, no matter how small, big, important, menial, with the same amount of enthusiasm, detail, and professionalism. She anticipates and prepares for our (Task Force) needs before we even know we have needs. Her level of managing even the smallest of details continues to amaze me almost every day. Her attention to detail for every meeting ensures we can get as much work done during our meetings. She will be greatly missed, and I am glad she can spend more time with family and on her hobbies.*

–Todd S. Thompson, P.E., South Dakota Department of Transportation

# Understanding the BrDR Ribbon Interface

In the modernized BrDR user interface, the ribbon provides, at the top of the window, a logical organization of the commands the end user will use to create and work on bridges. Bridge Explorer, Bridge Workspace, Library, and Configuration each have their own ribbons. Each tab on the ribbon represents a single focal point for the operation of the commands on the tab, containing groups of commands that act on the single focal point of the tab. The ribbon interface makes access to the commands quicker and apparent; and helps to discover all the features and functionalities in one location. The modernized BrDR user interface provides a balance of the three basics aspects of a good user interface design: discovery, learning, and efficiency.

## Bridge Explorer Ribbon

The Bridge Explorer application button opens a menu of Bridge Explorer specific application-wide commands to access features such as user preferences and system data export/import.

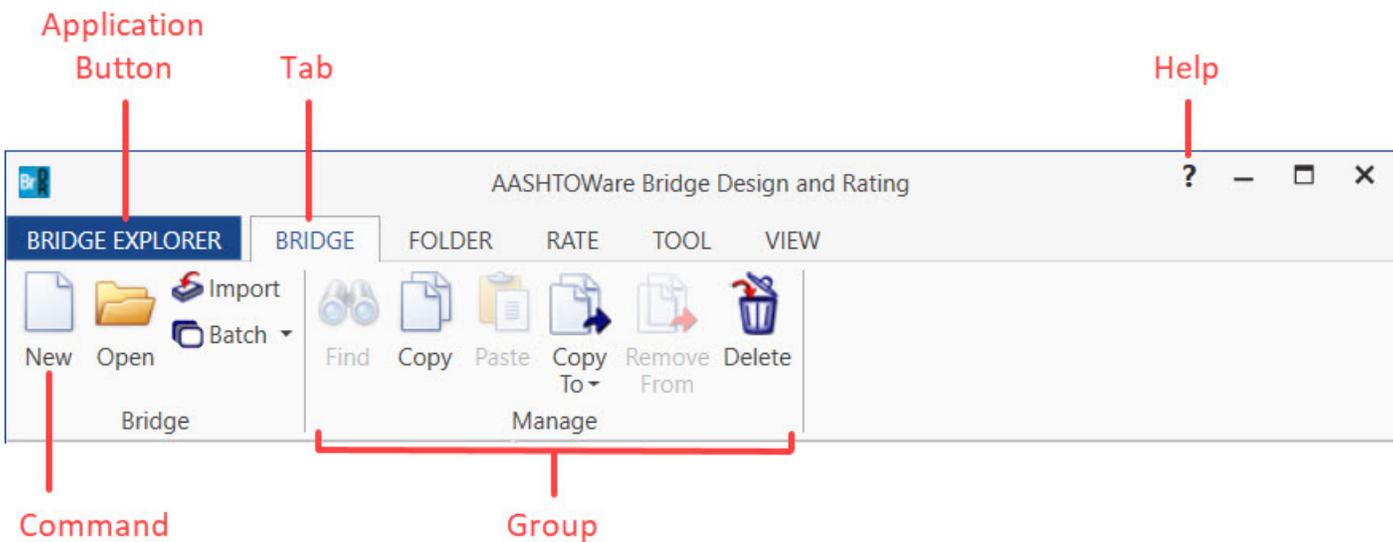


Figure 1. The Bridge tab is composed of commands to operate on and manage bridges.

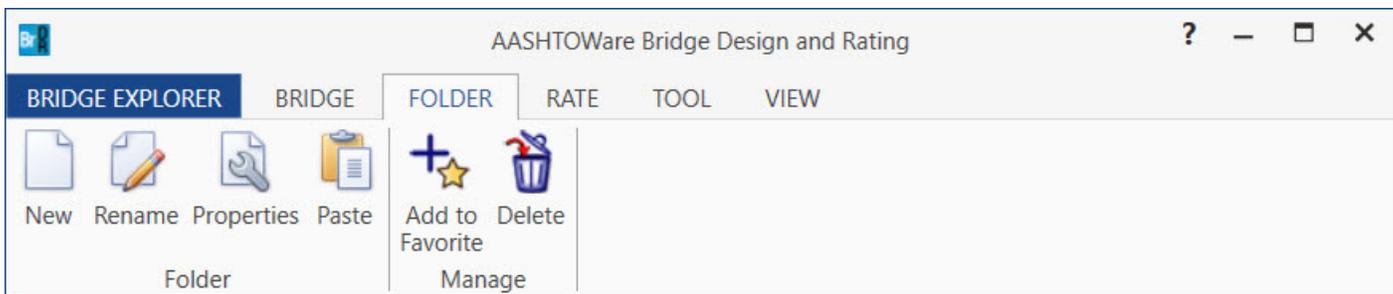


Figure 2. The Folder tab is composed of commands to operate on and manage folders.

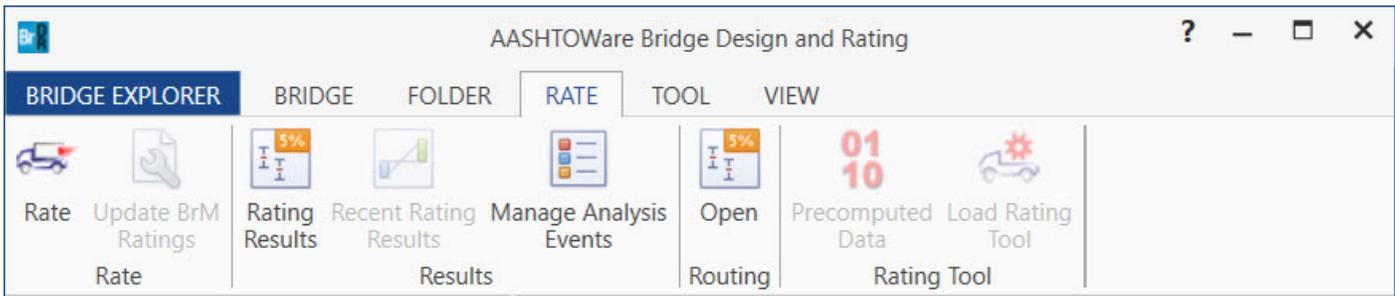


Figure 3. The Rate tab is composed of commands to access the load rating features in the Bridge Explorer.

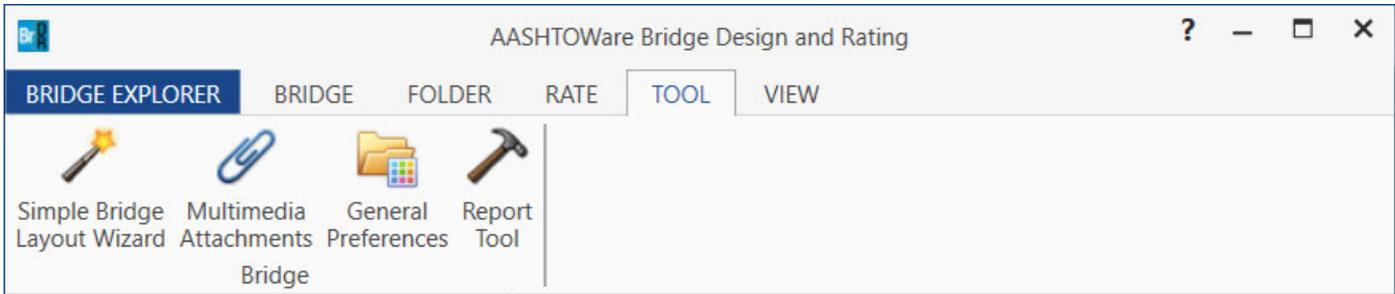


Figure 4. The Tools tab is composed of commands to access the tools to operate on bridges.

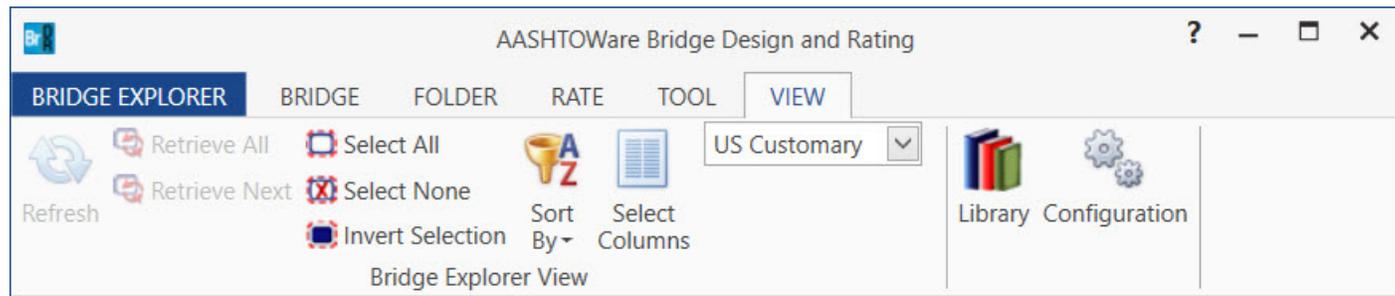


Figure 5. The View tab is composed of commands to configure and control the information displayed in the Bridge Explorer. The Library command opens the Library module and the Configuration command opens the Configuration module of the program.

# Bridge Workspace Ribbon

The Bridge Workspace application button, which can be accessed whenever a bridge is opened from the Bridge Explorer, opens a menu of Bridge Workspace specific application-wide commands to access features such as printing and help configuration.

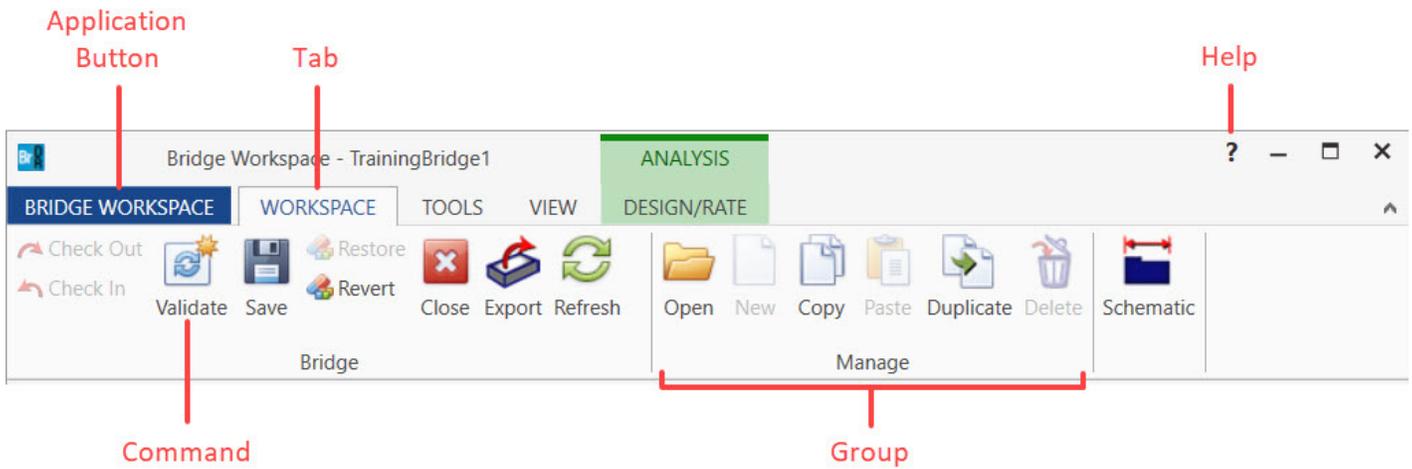


Figure 6. The Workspace tab is composed of commands to operate on the bridge and manage the components of the bridge.

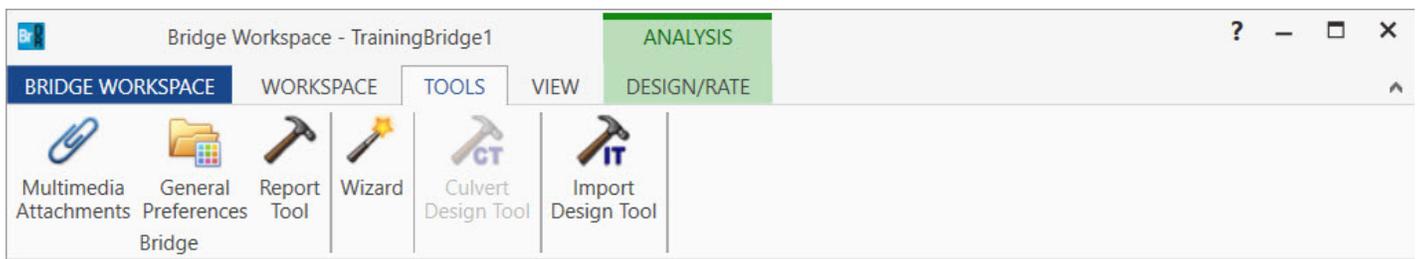


Figure 7. The Tools tab is composed of commands to access the tools to operate on the bridge.

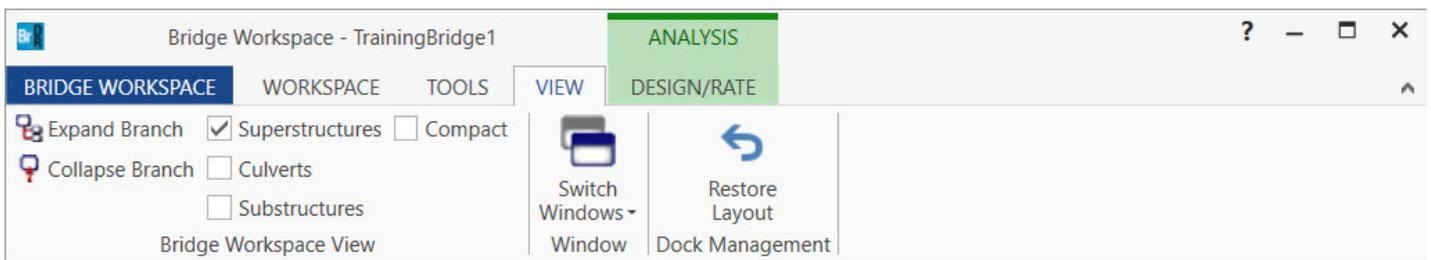


Figure 8. The View tab is composed of commands to configure and control the information displayed in the Bridge Workspace.

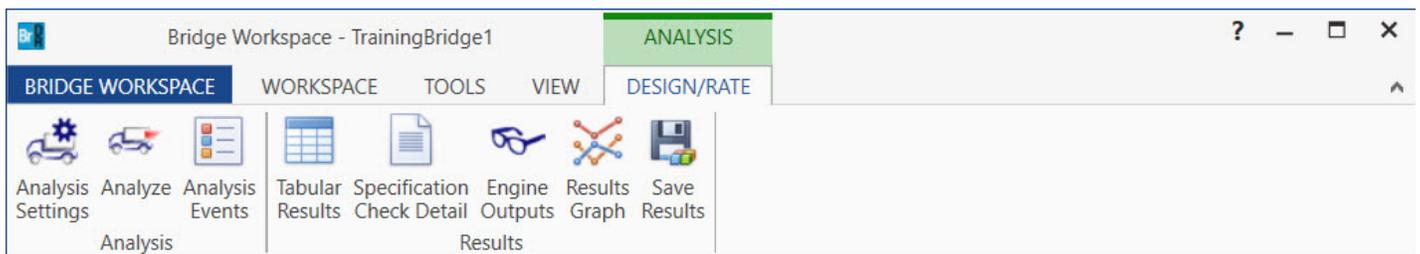


Figure 9. The Design/Rate tab is composed of commands to access the design review and load rating features in the Bridge Workspace.

# Analysis Results Comparison (ARC) Tool— New in Release 7.1

Historically, agencies have had different approaches to testing and upgrading to new versions of AASHTOWare Bridge Design-Rating (BrDR). Some agencies install new software versions immediately after the release with little to no testing, while other agencies perform extensive in-house testing or refrain from adopting the new version until the version has been out for a while and used by other agencies in a production environment. When implementing a new version, the rating results of a bridge or a group of bridges can change due to a variety of factors. These changes—which can lead to either beneficial or unfavorable results—are due to issue fixes or enhancements included in the new version, code changes, the inclusion of additional information to refine the analysis, or issues introduced in the new version. Regardless of the reason, agencies should be aware of the details of how a new version will affect the way they manage their bridge inventory.

To assist the states in assessing the impact that a new version of BrDR will have on the rating of the bridges in their inventory, the Analysis Results Comparison (ARC) tool compares the results between any version of AASHTOWare Bridge Design-Rating beginning with version 7.0 (i.e., all modernized versions of BrDR). For example, the ARC tool can be used to evaluate the rating results from BrDR version 7.1—which has an anticipated release date of August 2021—with the rating results from BrDR 7.0. Using this tool, agencies can compare the rating factors for a representative sample or all of the bridges in their inventory. The tool has three levels of comparison, with each increasing level providing more in-depth analysis. The three levels include: Level 1—Overall Controlling Bridge rating; Level 2—Member Alternative rating; and Level 3—Point of Interest analysis. The three levels are described in more detail later in this article.

When launched, the ARC tool opens the main Dataset Explorer window. This window allows the user to create, manage, and compare datasets. It also allows the user to run a scan for the versions of BrDR supported by the ARC tool.

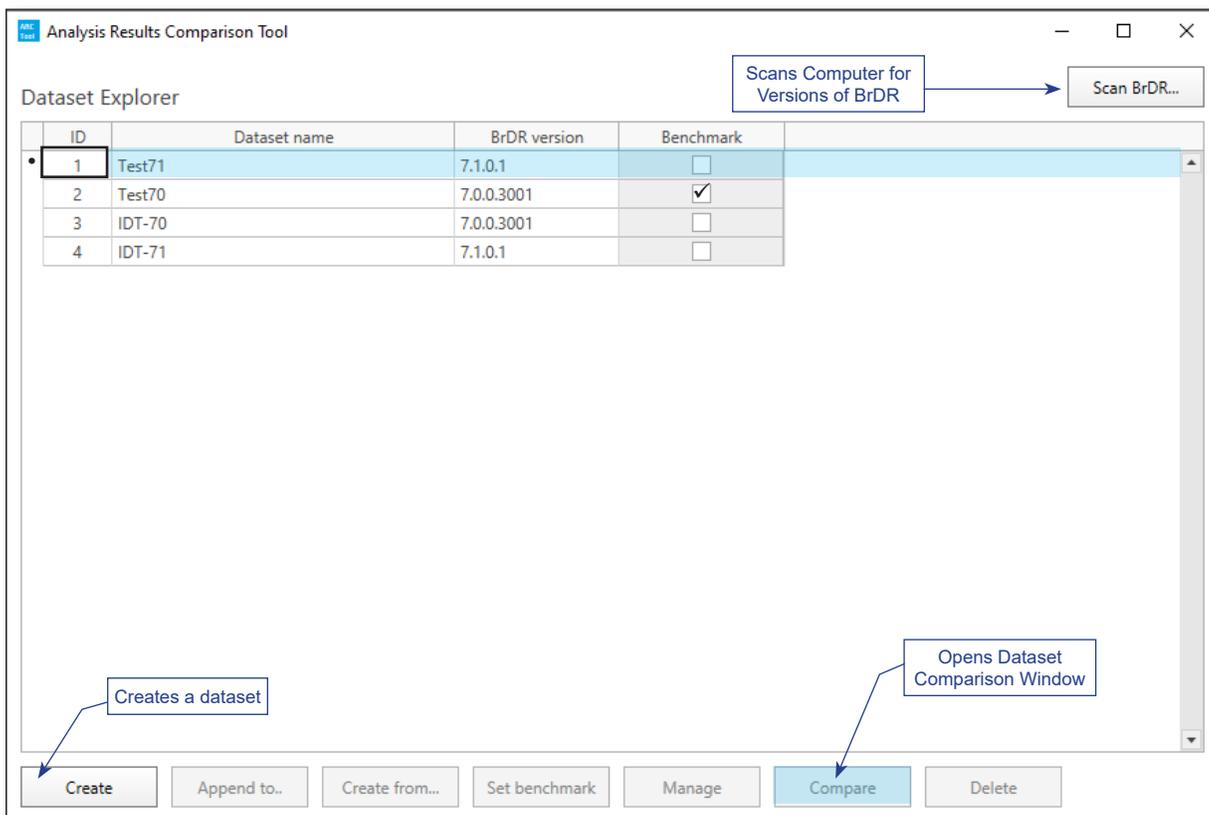
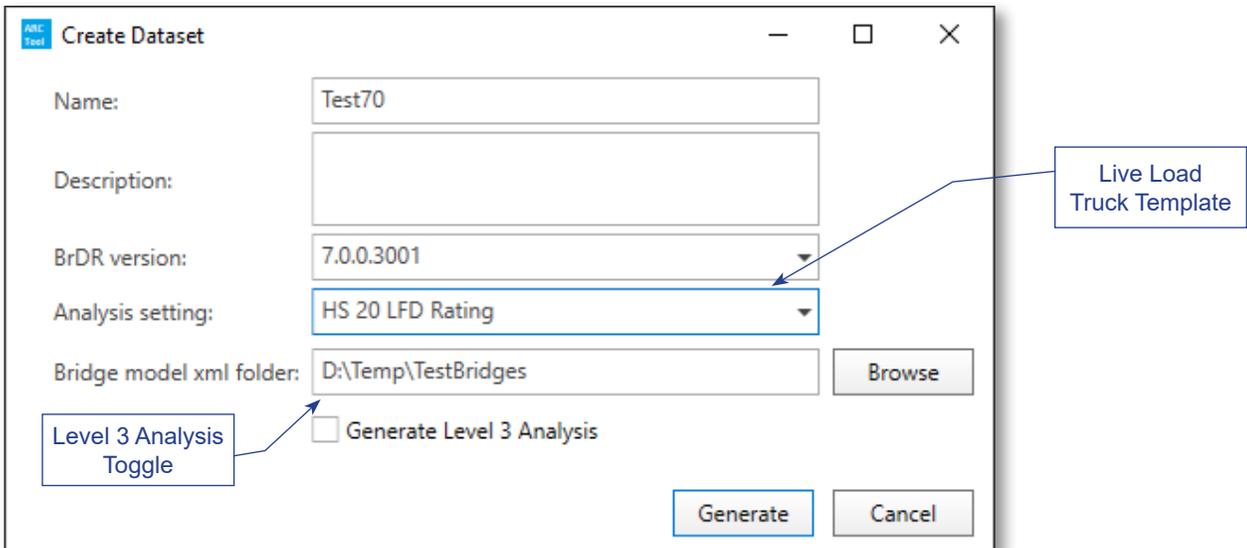


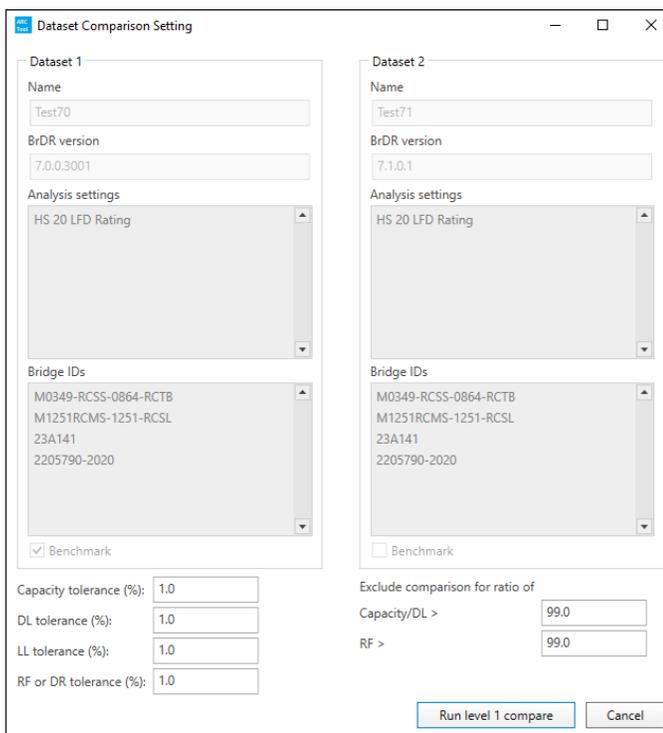
Figure 1. Analysis Results Comparison Tool Main Screen

The Create Dataset window is used to set the version to be used, define the analysis setting, and provide the location where the dataset will be stored. The window also has a checkbox to allow Level 3 analysis. The Level 3 analysis will provide much more detail for comparing each version; however, it produces much larger data files. To limit dataset file size, creating Level 3 datasets for a select group of bridges needing additional analysis is preferred. All bridges could be analyzed for both Level 1 and Level 2 analysis. Note that if/when an error is encountered when analyzing a bridge, the ARC tool closes the bridge with the error and continues to analyze the remaining structures. The bridge with the error will still be included in the list of bridges in the Level Comparison windows; however, the results for that structure will be blank.



**Figure 2. Create Dataset Window**

Through the ARC tool main Dataset Explorer window, two datasets can be selected for comparison. Clicking on the Compare button opens the Dataset Comparison Setting window. This window is used to specify a percent difference at which the ARC tool will flag the results. The tolerance for Rating Factor or Design Ratio (RF or DR) is used for flagging Level 1 and Level 2 analysis results. Capacity, Dead Load, and Live Load tolerances are used for Level 3 analysis.



**Figure 3. Dataset Comparison Settings Window**

The Level 1 Comparison window displays a comparison of the controlling load-rating factor for each dataset at the overall bridge level. The “Location same” and “Limit state same” column values will be shown in red if either of those respective values are different between the two datasets. Percentages changes are displayed in red if the value is greater than the specified tolerance.

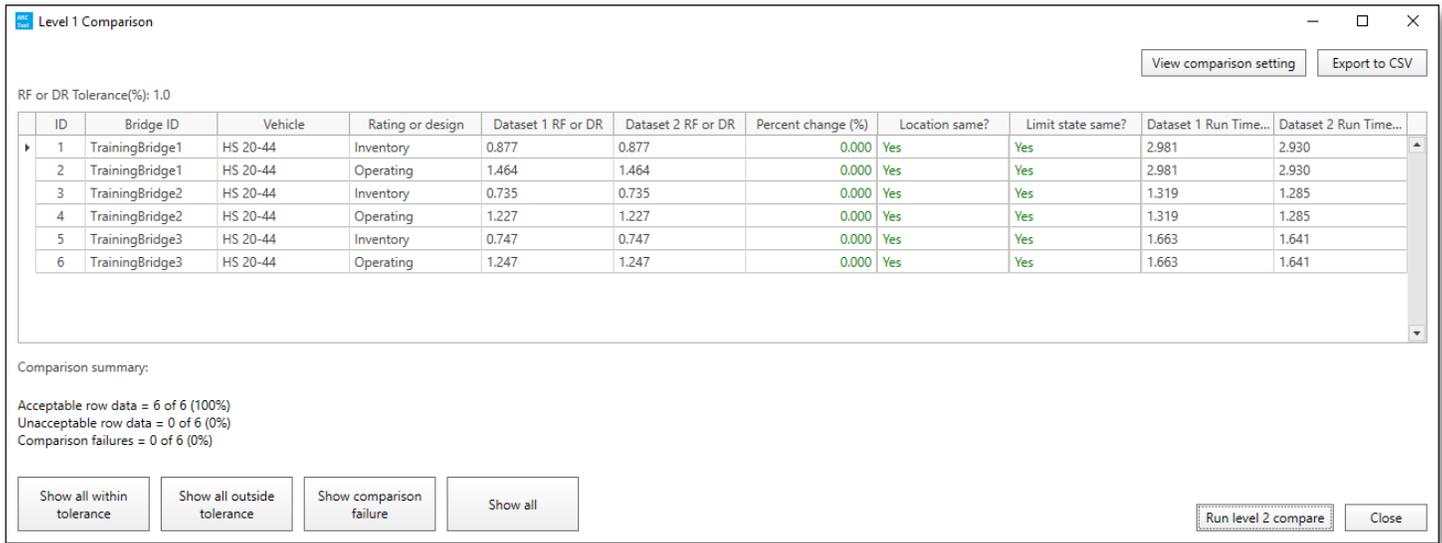


Figure 4. Level 1 Comparison Window

The Level 2 Comparison window displays a comparison of the controlling load-rating factor for each dataset at the member level. Similar to Level 1, the “Location same” and “Limit state same” column values will be shown in red if either of those respective values are different between the two datasets. Percentages change are displayed in red if the value is greater than the specified tolerance.

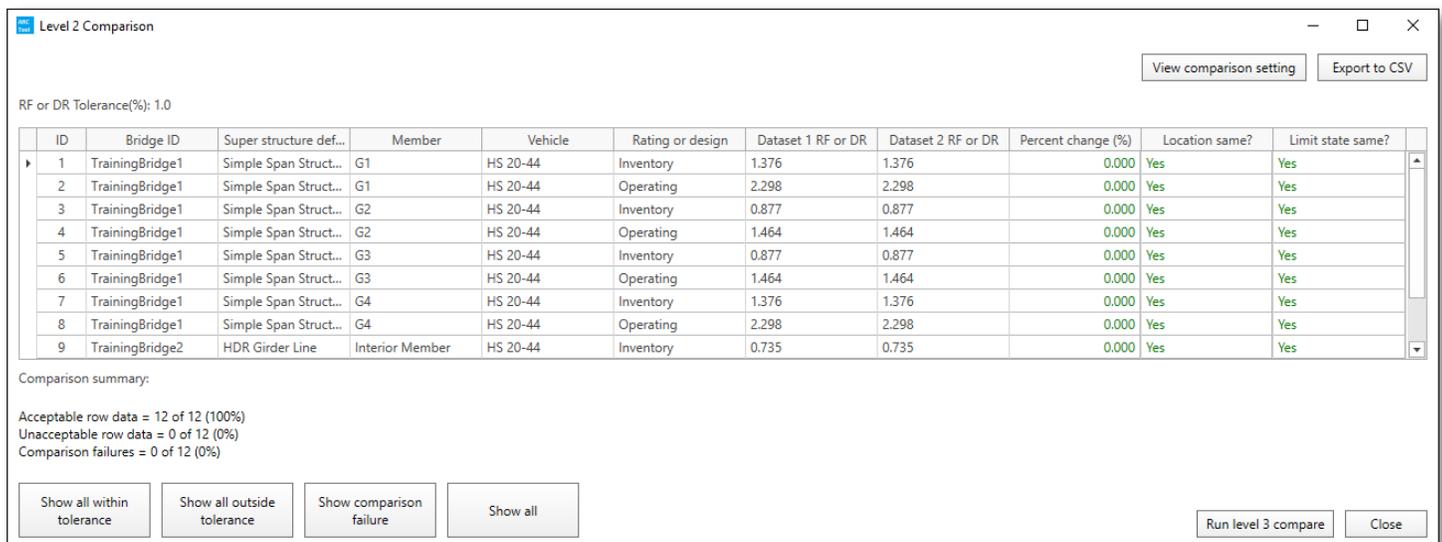
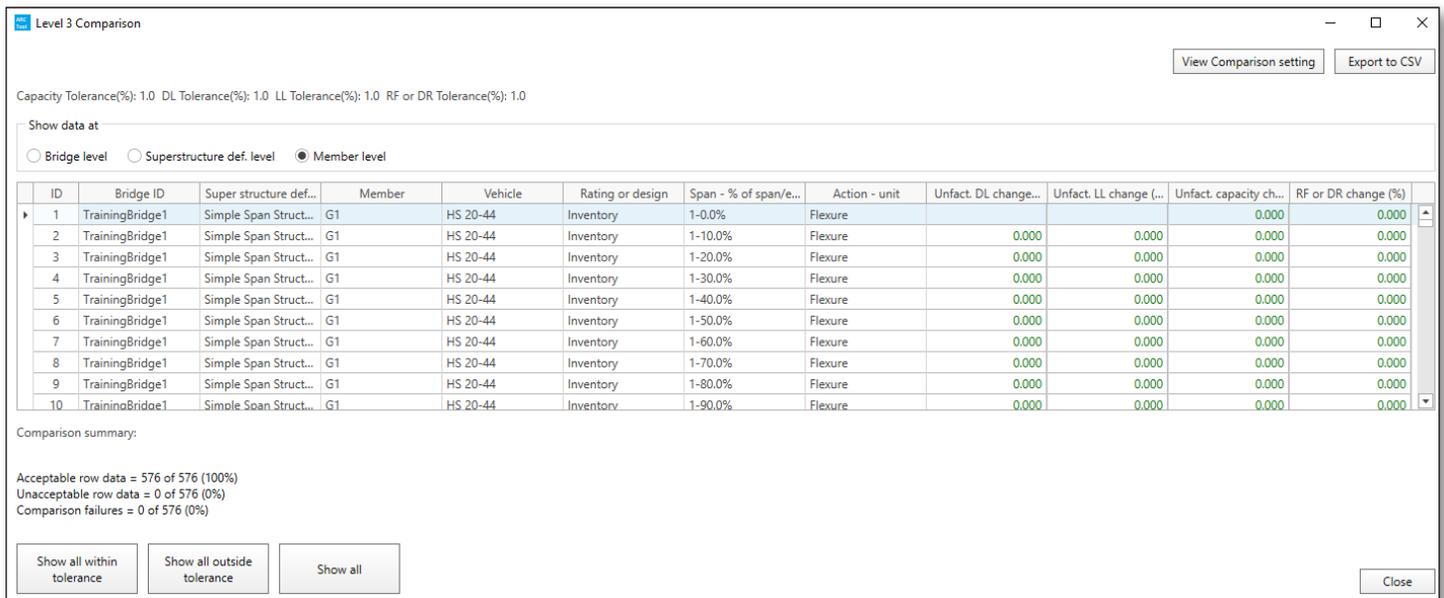


Figure 5. Level 2 Comparison Window

Level 3 analysis is an in-depth comparison of the results. This comparison shows differences in dead load, live load, and capacity at all points of interest set under the control options. This window can be used to pinpoint where the differences are in a model to assist in understanding why the rating factor or design ratio is different. The Level 3 analysis produces large files; therefore, it is recommended to perform the Level 3 analysis only on select bridges that require further analysis.



**Figure 6. Level 3 Comparison Window**

The ARC tool assists in testing new BrDR releases to provide comparison information that will provide agencies with the confidence they need to upgrade to the most current release of the software. The results can be retained and new versions can be compared to multiple past versions. For all comparison levels, the results can be exported to a CSV file that can then be saved in Microsoft Excel format to assist in managing the comparisons.

The ARC tool included in the BrDR version 7.1 release is the first generation of the tool. As agencies take advantage of this new tool, the Task Force welcomes input on features and/or recommended enhancements that could be included in the tool to support easier version comparison testing going forward.

## Load Rating Tool for LRFR Coming in Release 7.2

Bridge Rating version 6.8.1 introduced a new feature for quickly computing load ratings using the LFR method. The Load Rating Tool processes live load independent data required for computing a load rating which is saved in advance of the request for a load rating. The availability of the precomputed data greatly reduces the computation time when a load rating is requested.

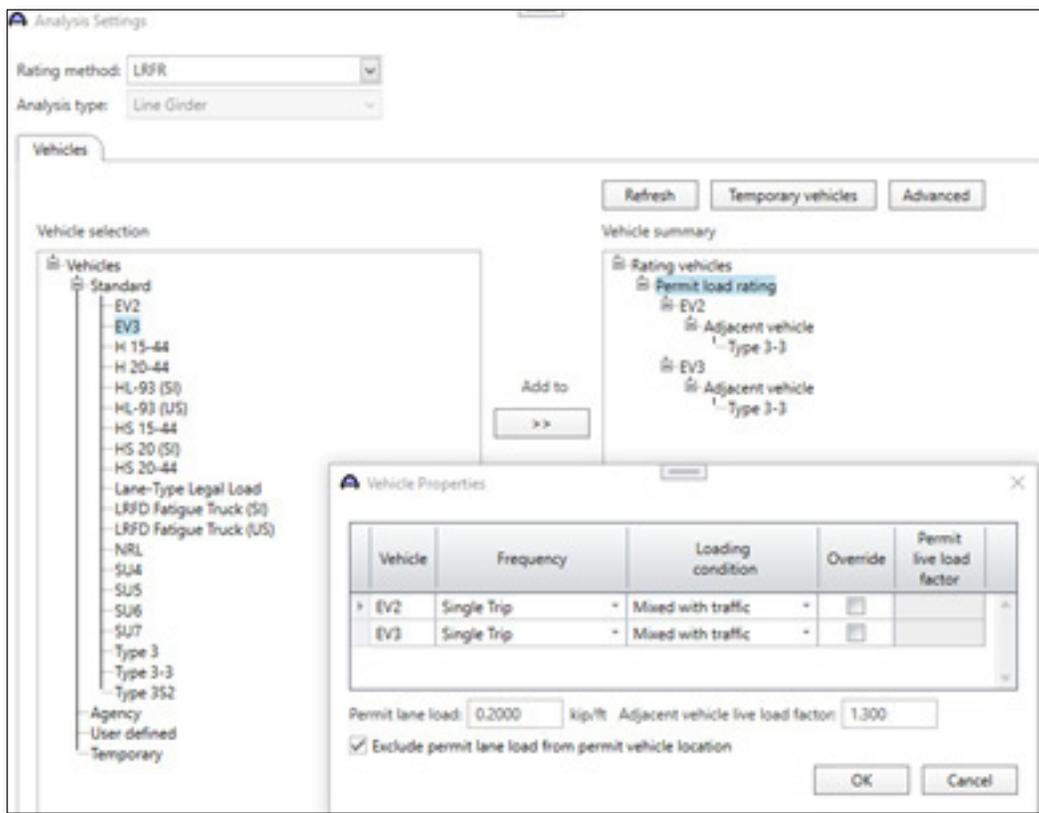
The Load Rating Tool for LFR has been a great success with quite a few states using this feature extensively in their permit routing systems. Building upon this success, this feature will be enhanced to support LRFR in version 7.2 slated for January 2022 release. Service unit contributions from Idaho TD, Illinois DOT, Indiana DOT, Kansas DOT, Louisiana DOTD, Ohio DOT, South Carolina DOT, Virginia DOT, and the support of the BrDR Task Force made this enhancement possible.

Multi-girder superstructure (girder system/line), multi-cell box (reinforced concrete and post-tensioned), and slab system superstructure will be supported in this enhancement. The superstructure types currently supported by the Load Rating Tool and the versions they are first available are:

**Table 1. Superstructure and Rating Types by Version**

Superstructure Type	LFR	LRFR
Multi-girder (RC, PS, Steel)	6.8.1	<b>7.2</b>
Multi-Cell Box	7.0	<b>7.2</b>
Culvert	7.0	
Floor System	7.0	
Slab System	7.1	<b>7.2</b>

The Precomputed Data window will be upgraded to support running precomputed data analysis based on either LFR, LRFR, or Member Alternative analysis method type. The controls options override will be upgraded based on the selection of the analysis method type. Load Rating Tool analysis can be performed either for LFR, LRFR, or Member Alternative analysis method type. LRFR analysis through the Load Rating Tool will support running permit load rating analysis with adjacent vehicle. Permit load rating will also support running with a permit lane load along with the provision of gapping lane load at the permit vehicle location. Figure 1 illustrates the supported permit load rating features for the Load Rating Tool.



**Figure 1. LRFR Permit Load Rating Configuration**

## BrDR Reports Tool—Initial Version Coming in Release 7.3

Currently, AASHTOWare Bridge Design-Rating has the capability to design and load rate many bridge types and produce various individual reports for each type. Over time, as new capabilities and features have been incorporated

into the product, the software has become increasingly complex. Existing BrDR reports have been developed over the life of the product to meet the specific needs identified when new features were introduced. This approach has resulted in BrDR reports existing in various formats and scattered throughout the software, making it difficult to generate a comprehensive bridge report.

Feedback from the user community has identified the need for a BrDR comprehensive bridge report as a high priority for the product to address the reporting limitations that currently require workarounds. In the absence of comprehensive bridge reporting within BrDR, some agencies have developed their own tools to process and combine BrDR-generated reports into more comprehensive reports. Agency users require a simple tool that allows them to generate a comprehensive report within the BrDR software.

In response to this feedback, ProMiles, the Bridge Task Force, and the BrDR Reports TAG are actively researching, planning, and developing bridge schema definitions and reports mockups to support the development of a new BrDR Reports Tool. The basic premise of the BrDR Reports Tool is to provide a platform that will easily support user-generated comprehensive reports for available structure types, which will include input data, graphics, analysis results, specification check data, design review summary, and load rating summary reports. The BrDR Reports Tool will provide the user with BrDR report templates that can be readily used for report generation, as well as facilities that will allow the user to easily modify reports templates or create new reports. The first release of the BrDR Report Tool—planned for August 2022—will deliver a limited feature set (BrDR version 7.3).

## Advanced Concrete Member Alternatives Available in Release 7.1

New for the 7.1 release scheduled for August 2021 is the introduction of a new Advanced Concrete Member Alternative that can be either reinforced concrete or post-tensioned concrete. The post-tensioned concrete member alternatives allow partial length tendons, which allows regions of the beam to be analyzed as post-tensioned and other regions to be analyzed as reinforced concrete. The new Advanced Concrete Member Alternatives are available in girder system and girder line superstructure definitions. This new feature includes the ability to define post-tensioned I-beams and the ability to use the features of a girder system superstructure definition to model a multi-cell box structure as individual concrete beams.

Features of the new Advanced Concrete Member Alternatives include:

- Wide variety of cross sections can be modeled including non-symmetric and precast shapes
- Regions of post-tensioning and regions of reinforced concrete within the same member
- Overlapping post-tensioning tendons
- Selection of stage of post-tensioning application
- Post-tensioned I-beams

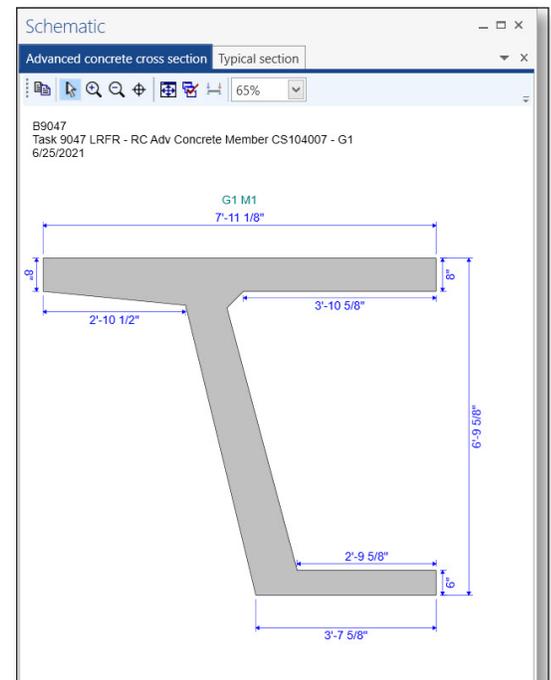
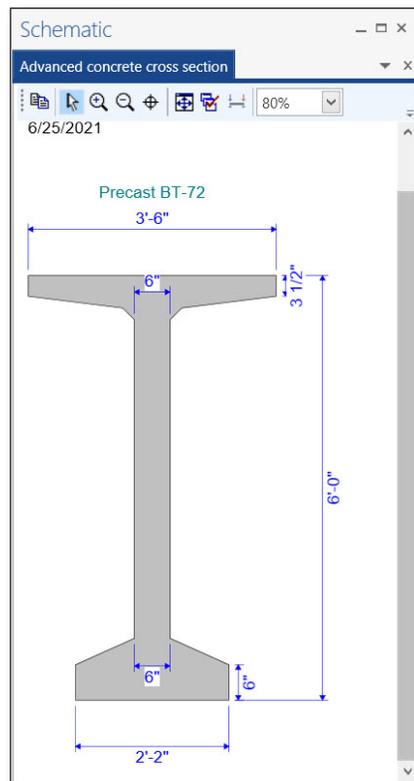


Figure 1. Variety of Cross Sections

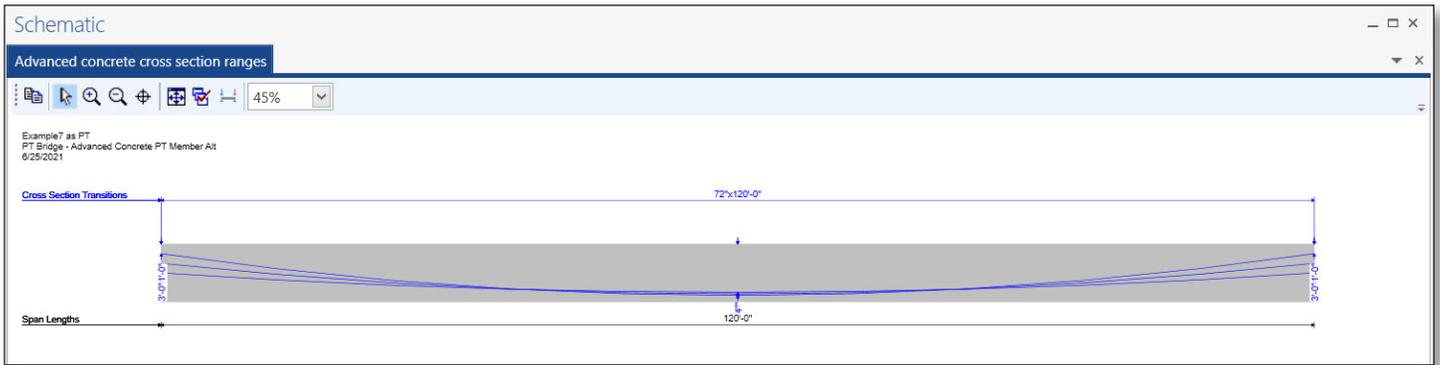


Figure 2. Overlapping Tendons

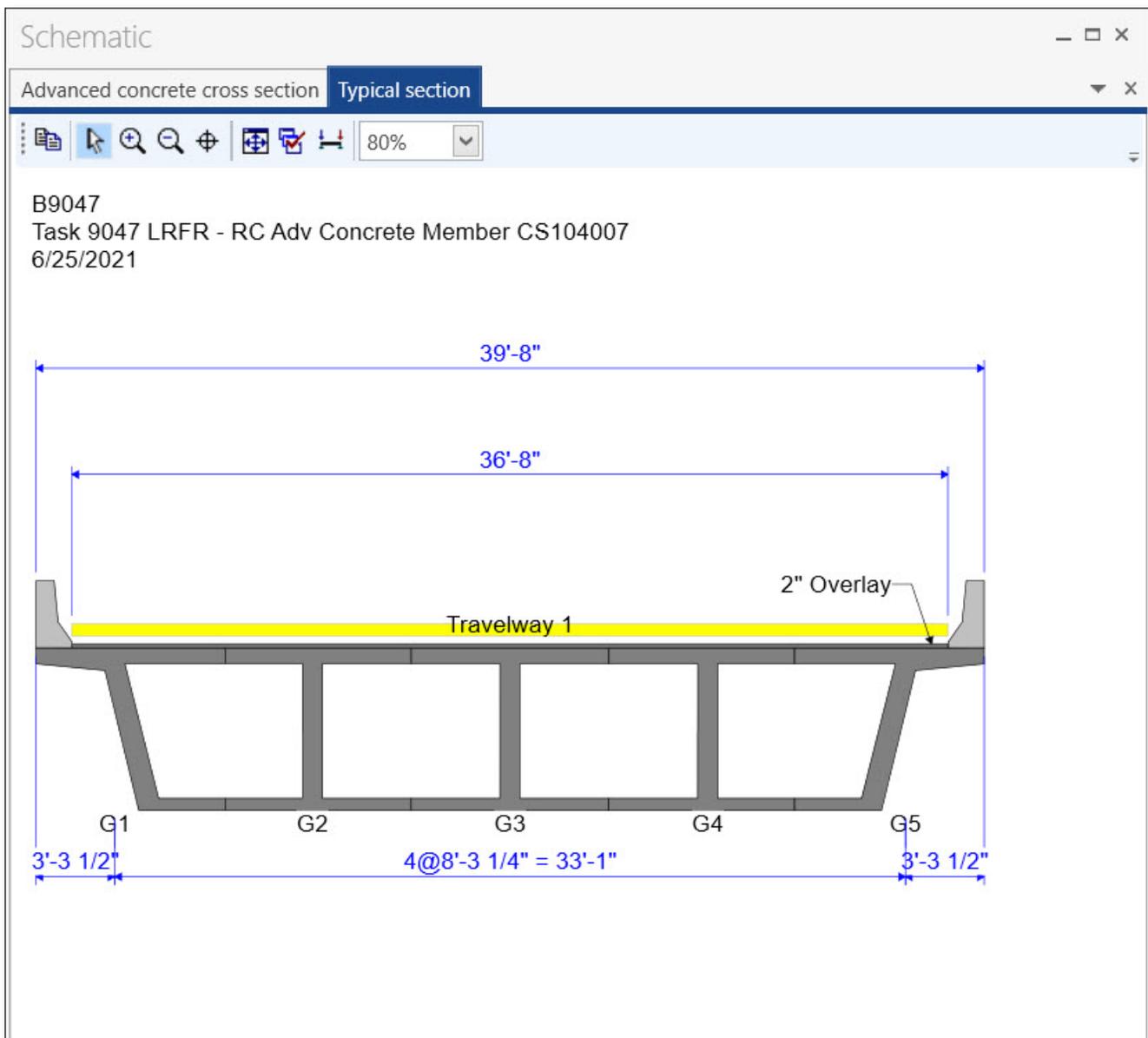


Figure 3. Multi-Cell Box Modeled as Individual Advanced Concrete Girders

# BrDR Service Request Management

While AASHTOWare BrDR has long provided support services to its users, a recent re-evaluation and redesign of the process has been undertaken to provide better transparency throughout the review process for all users. Led by Task Force member Mark Bucci, the focus of the redesign includes an increased awareness of the categorization of service requests and the process for managing these requests based on the overall short term/long term benefits and the impact the request will have.

For the purposes of monitoring user requests, the following definitions have been established and have been in place for some time:

**Table 1. Service Request Categories and Definitions**

<b>Term</b>	<b>Definition</b>
Bug	An issue which prevents the software from working the way it was originally designed to work.
Urgent Bug	A bug which prevents users from performing critical business functions.
Critical Bug	A bug which produces incorrect final results without warning the user.
High Priority Bug	A bug which produces incorrect results or prevents portions of the program from functioning, however, the user is alerted to the error (e.g., the program crashes and an error window is displayed or a warning is issued).
Low Priority Bug	A bug which causes minor inconvenience to business process but has a known workaround.
Maintenance	Missing or improperly handled functionality or feature that was not identified or scoped during development, but should be addressed.
Enhancement	New functionality or improved usability that would expand the software feature set.
High Impact	Resolution would benefit many states/clients, significantly improve software performance, or provide features that are in high demand.
Low Impact	Resolution would benefit few states/clients, address isolated issues, or provide nominal improvements to existing features.

To facilitate and oversee the BrDR Service Request Management process, a Backlog TAG will be established to monitor the process. The responsibilities of the TAG will include:

- **Escalated Issue Review**—This is a review of issues that have been escalated based on the engineering approach (interpretation of the code or different engineering approach) and issue type assignment (disagreement on the issue type assignment).
- **Bug Evaluation**—Evaluate whether a bug is Urgent, Critical, High Priority, or Low Priority.
- **Maintenance and Enhancement**—Evaluate and categorize issues to determine if they are High Impact or Low impact.

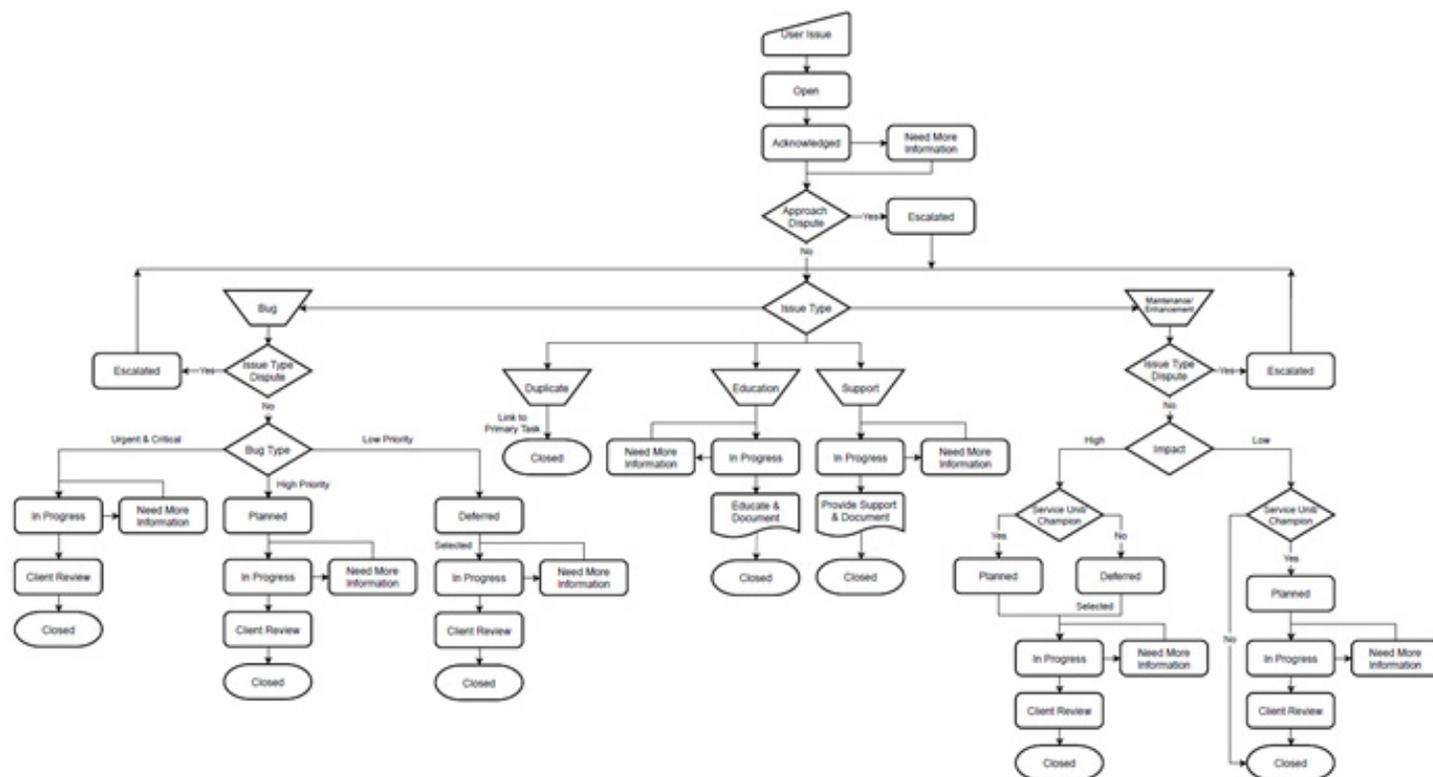
To guide the TAG involvement and to establish the benefit/impact and the short versus long-term nature of the requests, an Issue Evaluation Process has been developed to help categorize requests.

	Urgent/ Short Term	Not Urgent/ Long Term
High Benefit/ High Impact	<b>Quadrant 1</b> <ul style="list-style-type: none"> <li>Urgent Bug Fix</li> <li>Critical Bug Fix</li> </ul>	<b>Quadrant 2</b> <ul style="list-style-type: none"> <li>High Priority Bug Fix</li> <li>Low Priority Bug Fix</li> <li>Maintenance Item</li> <li>Multi-State Enhancement</li> <li>Task Force Directed Work</li> </ul>
Low Benefit/ Low Impact	<b>Quadrant 3</b> <ul style="list-style-type: none"> <li>State Specific Enhancement</li> <li>Isolated Issues</li> </ul>	<b>Quadrant 4</b> <ul style="list-style-type: none"> <li>Nice-to-Have Features</li> <li>Nominal Improvement to Existing Features</li> </ul>

**Figure 1. Issue Evaluation Benefit/Impact**

- **Quadrant 1**—Issues will be fixed as soon as possible under the software maintenance contract.
- **Quadrant 2**—Bugs will be fixed in upcoming release other items will be evaluated to identify potential implementation issues, identify related issues, establish a rough estimate, and prioritized based on User Group voting or through Task Force directed work.
- **Quadrants 3 and 4**—Option will be provided for state funded service unit work or volunteer to champion effort to increase interest with other states. Otherwise, user will be notified that issue will not be incorporated and will be closed.

The figure below illustrates the anticipated workflow of the Service Request Management Process:



**Figure 2. Service Request Management Process**

Through this process and oversight, the BrDR Task Force will work to provide timely action on service requests that best serve the BrDR user group community as a whole, while providing a mechanism for agencies to improve the software for their individual needs.

# Letter from the Vice Chair



The AASHTOWare Bridge Task Force would like to thank the user community for the AMAZING contributions over the last 12 months ranging from service unit donations, to participation on our Technical Advisory Groups, to pre-solicitation funding commitments to incorporate the proposed

changes to the National Bridge Inspection Standards and the new Specifications for the National Bridge Inventory. Your involvement is what ensures the AASHTOWare Bridge Management software remains up to date to meet the ever-changing challenges of bridge inspection and management across the country. Many enhancements were made to AASHTOWare Bridge Management in 2021 and more are coming! This newsletter provides information on the new functionalities available and the upcoming improvements planned for the AASHTOWare Bridge Management software.

In January of 2021 AASHTOWare Bridge Management Version 6.4 was released with the following key features:

- Multimedia Enhancements
- Addition of the remaining Federal Highway Administration (FHWA) validation checks
- Addition of a “Date Entered” and “Entered By” fields on the Tunnel Inspection page
- Enhanced Mapping to view surrounding bridges
- Improved Optimizer log
- Added a Weighted option to the Percent Condition State field for the Element Condition State action type on the Network Policies task
- Various bug fixes and usability enhancements identified by the user community

In June of 2021, version 6.5 was released which significantly improved the Life Cycle Cost Analysis (LCCA) module in BrM. This release was a true ‘team effort’ including major contributions from the Optimizer and Testing TAGs to ensure this release is as impactful as possible for our users. A summary of the key features of this release are below but more information pertaining to LCCA can be found on page 18.

AASHTOWare Bridge Management Version 6.5 includes the following key features:

- LCCA Module to generate optimal Life Cycle Plans through recursive analysis.
- LCCA Policies can be used to prevent a bridge from falling below a certain threshold
- Visually compare up to three plans via Performance, Timing and Life Cycle Cost charts
- Added optimization queues to observe which optimization is currently running
- Allow optimizer to recalculate the structure weight for each year of the optimization period
- Added Action User Cost as an associated benefit groups option for actions
- NBI Element Conversions report that shows how the conversion profiles are interacting with the inspection data
- Time in State report to identify how long bridges remain in their NBI Condition Ratings

In addition to the two releases in 2021, we have started the development of Version 6.6, which will include two new, highly anticipated modules supported directly by DOT involvement and funding contributions. More information about these new features can be found in the articles that begin on page 19. Version 6.6 is currently in development with a planned release in early 2022 with the following key features:

- Funding by Project Category
- Critical Findings/Request for Action Module
- User Certification Module
- STIP Project Import Tools
- Various bug fixes and usability enhancements identified by the user community

Finally, the Task Force continues to monitor the proposed changes to the National Bridge Inspection Standards as well as the new Specifications for the National Bridge Inventory. A date has not been established for the official release of these proposed changes; however, the Task Force remains vigilant to ensure we are ready to respond without delay. Once the FHWA changes are complete, AASHTO will finalize and issue the solicitation request to fund AASHTOWare Bridge Management (BrM) revisions to support compliance with the NBIS and SNBI. The amount of the solicitation will depend on

the extent of the changes that will be required but is expected to be \$300,000 per agency. To ease the impact to agency budgets, commitments paid over a two-year period will be an option. We ask that all agencies strongly consider supporting this important undertaking through participation in the upcoming project solicitation. More information on the project solicitation is provided on page 22.

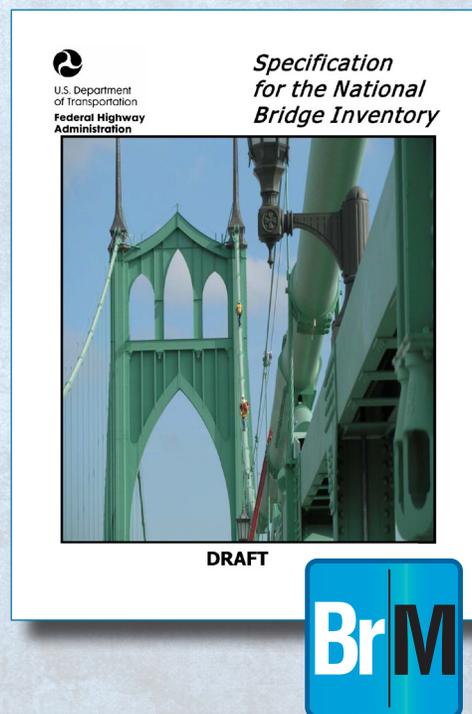
If there is anything the Task Force can do to improve your experience with the AASHTOWare Bridge Management software, please feel free to contact us. The Task Force strives to provide the best bridge management software to meet the needs of all our users.

Eric Christie, P.E.  
Vice-Chairman AASHTOWare Bridge Task Force

## BrM to Remain Federally Compliant—Solicitation Coming Soon

BrM supports the full life cycle of bridge management including bridge inventory management, inspection, life cycle planning, maintenance, capital program project selection and preliminary planning.

- National Bridge Inspection Standards (NBIS) and Coding Guide changes, now named the Specifications for the National Bridge Inventory (SNBI), which are expected to be finalized in late 2021.
- Planning is underway for a BrM project to adopt and incorporate SNBI changes.
- AASHTO to reach out to FHWA to request approval for members to use State Planning and Research (SP&R) funds at 100% federal participation (no agency match required).
- Stay tuned! We need your support to secure sufficient funding to make this project successful.



# Life Cycle Cost Analysis (LCCA)—Why Your Agency Should Upgrade to BrM Version 6.5

LCCA is a cost-centric approach used to select the most cost-effective alternative that accomplishes a preselected project at a specific level of benefits assumed to be equal among project alternatives being considered. While the initial version of the BrM LCCA module—delivered in 2016—provided a great start, this module was the first of its kind. Version 6.5 provides a completely new and improved version of the LCCA module which is going to significantly help agencies do exactly what they are setting out to do, to complete life cycle cost analysis and maximize the health of their bridge networks.

This development of the revamped module went through an extended collaboration process, taking roughly 18 months to design, develop, test, and implement in total, with the help of direct state department of transportation involvement via Testing and Optimization TAG member participation. Special thanks to all who participated to make this release possible.

At the highest level, the new LCCA Optimization module will allow agencies to generate optimal Life Cycle Plans. The module analyzes different alternatives and recursively selects the alternatives with the least life cycle costs. In other words, the software examines all possible actions and combinations of actions to determine the right cadence of maintenance, repair, rehabilitation, and replacement to identify the lowest overall cost to maintain the bridge during a specified period.

So, why should your agency upgrade to version 6.5? The answer is simple... This release will help your agency meet its goals/objectives identified in your Transportation Asset Management Plans (TAMP). The LCCA module identifies projects to complete to meet your metrics/goals being targeting with locking in actions around your signature and critical bridges.

For additional information on the LCCA enhancement, please review the 6.5 release video here: <https://www.youtube.com/watch?v=khFs-wVU4yY&t=3s>

Questions can be forwarded to [Mayvue at BrM@mayvue.com](mailto:Mayvue at BrM@mayvue.com). Mayvue has plenty of resources available to discuss this release, life cycle cost analysis in general, or answer other questions that you may have.

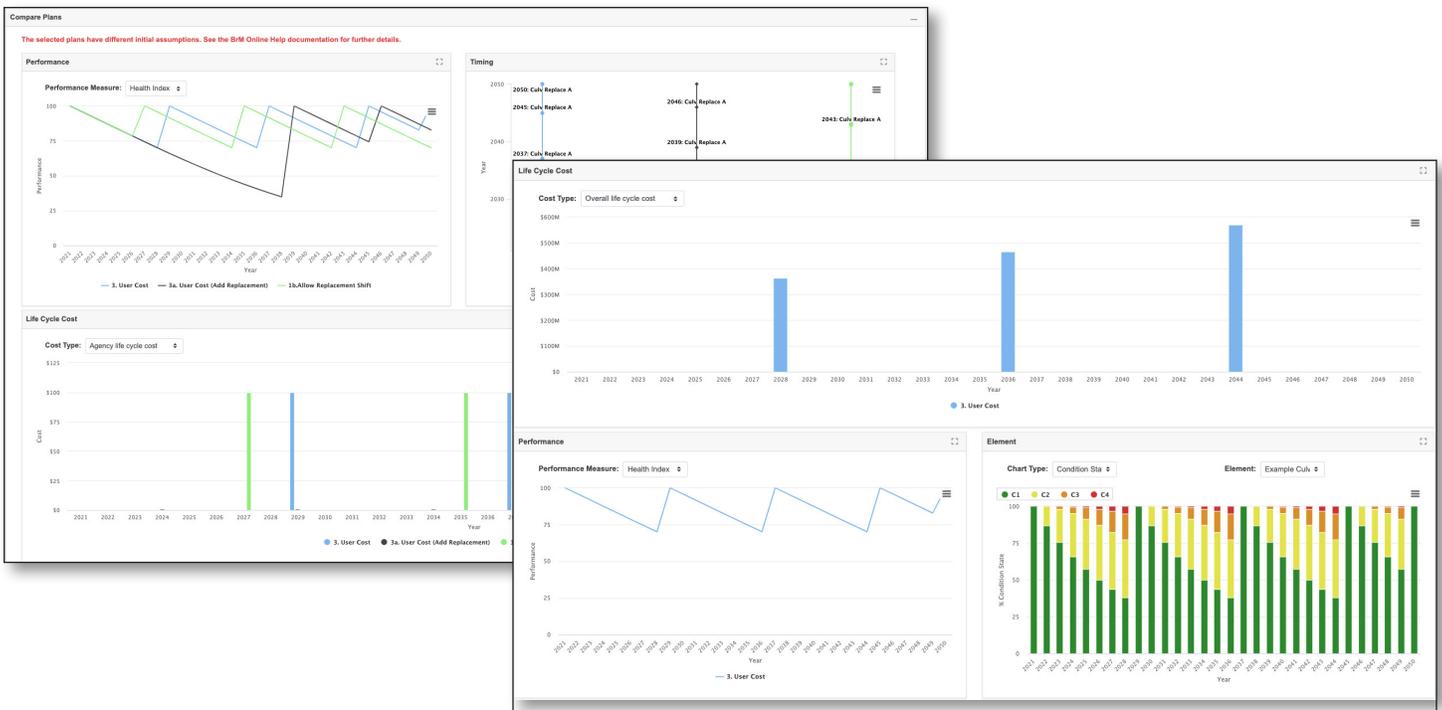


Figure 1. LCCA Module Screens

## Analytical Tools

The AASHTOWare Bridge Management Task Force is in constant pursuit of providing the user community with effective and easy-to-use tools to perform their jobs effectively. Analytical tools are a recent addition to the BrM software that provides exactly that. Version 6.5 of the software added two additional reports: NBI Element Conversions Report and Time in State Report. These reports work in both Oracle and SQL Server. Additionally, Mayvue is working on a Project Importer tool that will be available in Version 6.6. The goal of these tools is to allow users to analyze their bridge networks and optimization results more easily.

- NBI Element Conversions Report (available in 6.5): This shows how the conversion profiles are interacting with the inspection data.
- Time in State Report (available in 6.5): This shows how long bridges have been in their rating condition, including when the bridge was assigned a condition rating along with the last date that it was in that condition. Available in 6.5.
- Project Importer (coming in Version 6.6): This feature will allow users to download a Microsoft Excel template from the Project > Upload Project. From there, the user can populate the template with their project information and upload/import those projects into BrM. This will eliminate the manual data entry that previously existed for agencies.

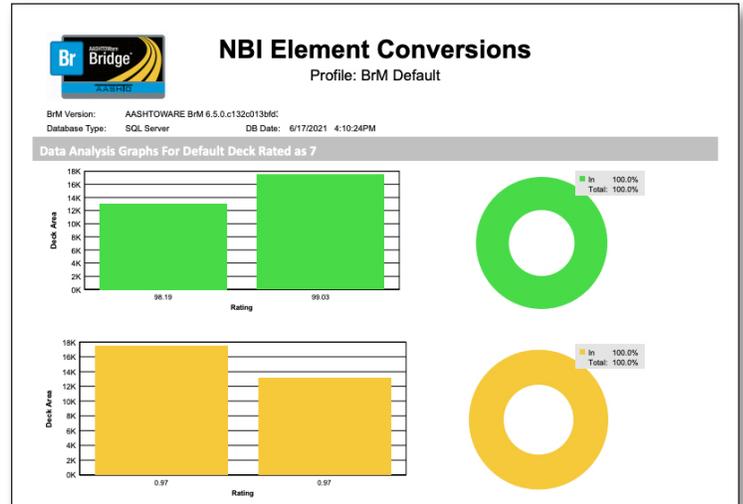


Figure 2. NBI Element Conversions Report

## Critical Findings/Request for Action (RFA) Module Coming Soon to BrM

In a joint development effort, the South Carolina Department of Transportation (SCDOT), Michigan Department of Transportation (MDOT), and Bridge Management Task Force designed and funded a critical findings/request for actions module that allows agencies to configure critical findings workflows at the agency level. It also allows for the creation, editing, and viewing of a critical finding within BrM, as well as the ability to see a complete list of critical findings for a given bridge and find pertinent information in BrM. A dashboard view for administrative users is also included. The design was reviewed and vetted through multiple iterations and various modifications to ensure it is flexible for use by all agencies.

This module will be available to the user community beginning in Version 6.6. The module will include the following components, which create a great foundation for initial usage. We hope that agencies quickly adopt and enhance this module as needed.

- Critical Findings Navigation and Bridge Summary Page
- Critical Findings Configuration page
- Critical Findings Bridge Level List
- Critical Findings Page
- Critical Findings Dashboard
- Modified Work Candidates Page
- Critical Findings Email Notifications

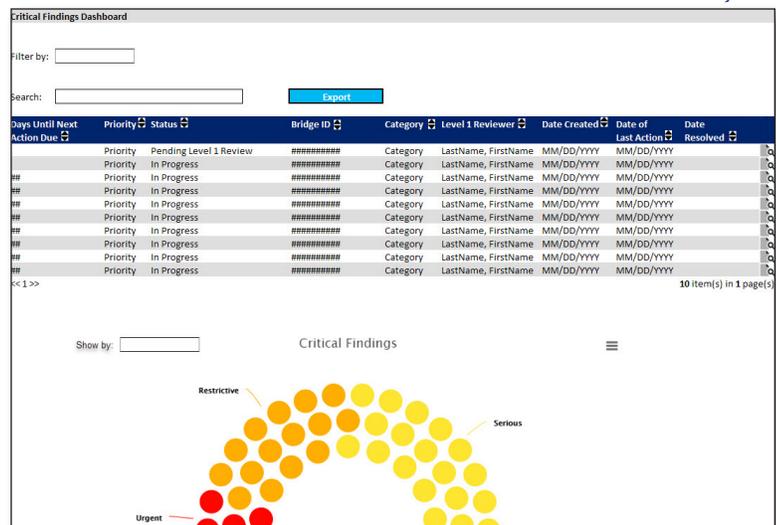


Figure 1. Critical Findings Dashboard

# User Certification Module

Version 6.6 will also provide a module for managing user certifications within BrM, another high priority identified by BrM users. The design of and funding for this enhancement was a joint initiative of the South Carolina Department of Transportation (SCDOT), the Michigan Department of Transportation (MDOT), and the AASHTOWare Bridge Task Force. The module provides agencies with the ability to configure user certifications, experience requirements, and ultimately qualifications within BrM. The software contains logic to identify user qualifications for certain actions by using the certifications and experience information configured to support agency requirements. Additionally, users will be provided with a screen to manage and update their own work experience and certifications, including submission for approvals. The module provides a central location to review submitted user certifications for approval and allows administrators to monitor and manage current certifications and qualifications existing in the system.

Overall, the addition of this module assists in the complete bridge inspection and management process, which is a goal of the Task Force.

The AASHTOWare Bridge Management Task Force is excited to continue its joint development effort with SCDOT and MDOT and bring additional enhancements and modules to the BrM community.

The figure displays several screenshots from the User Certification Module interface:

- User List:** A table listing users with columns for User ID, First Name, Last Name, Agency, Phone Number, Email Address, and BrM Active status. It includes search filters and an 'Export' button.
- Manage User Certifications:** A table showing certification details with columns for Name, Agency, Category, Certification, Date Taken, Expiration Date, Hours, Submitted Date, Status, and Approved/Denied by.
- User Qualifications:** A table listing user qualifications with columns for Name, Agency, Qualification, Active, Expiration Date, Temporary Qualification, and Temporary Qualification Comment.
- Temporary Qualifications Backup:** A table for backup of temporary qualifications with columns for Name, Agency, Qualification, and Comment.
- My Account Information:** A form for user profile details including First Name, Last Name, User ID, Agency, Phone, and Email.
- My Active Qualifications:** A table showing active qualifications with columns for Qualification and Expiration.
- My Years of Experience:** A table for tracking experience with columns for Experience Type, Experience Start, Experience End, and Number of Years.
- My Certifications:** A table for user certifications with columns for Category, Certification, Date Completed, Expiration Date, Hours, and Status.
- My Signature / Stamp:** A form for uploading a signature and a stamp, with 'Browse for File' buttons and 'Apply', 'Change Password', and 'Cancel' options.

Figure 1. Display Samples from Certification Module

# Mobile Bridge Inspection Application Now Available!

## Bridge Inspection Software in the Palm of Your Hand



In the July 2020, AASHTOWare bridge products newsletter, the Task Force advised that Mayvue was undertaking the development of a mobile bridge inspection application with the full support of the Task Force. The BrM Mobile Bridge Inspection powered by Mayvue application functions as an add-on to the AASHTOWare Bridge Management software and should be available to agencies through the AASHTOWare catalog in late Summer 2021.

Mayvue worked with several volunteer agencies to design this application with the goal of streamlining the inspection process, organizing the mobile application to what makes the most sense, and ensuring the most important features are available in the initial release. Some of the most desired features included in the mobile bridge inspection application are:

- **Bi-directional sync**—start in the field and finish at the office
- **Multimedia**—capture and upload photos and sketches in the field directly from your phone or tablet
- **Capture complex data**—view and modify cross section, element, and clearance data
- **Configurable workflow**—configure the data collection screens to what works for your agency
- **Feature parity**—will remain in sync with BrM features

Please contact Mayvue ([mobile@mayvue.com](mailto:mobile@mayvue.com)) for more information on this new offering.

## National Bridge Inspection Standards (NBIS) and Coding Guide Changes/Specifications for the National Bridge Inventory (SNBI)

As you are aware, the Moving Ahead for Progress in the 21st Century Act (MAP-21) required the U.S. Secretary of Transportation to update the National Bridge Inspection Standards (NBIS). Through a Notice of Proposed Rulemaking (NPRM), FHWA proposed updates to the NBIS to address MAP-21 requirements, incorporate technological advancements including the use of unmanned aerial systems, and address ambiguities identified since the last update to the regulation in 2009. Published in the Federal Register on November 12, 2019, the Federal Register docket accepted comments on the NPRM through March 13, 2020. The FHWA also proposed significant updates to the FHWA Recording and Coding Guide to conform to the NBIS updates and make other improvements. The updated Coding Guide is named the Specifications for the National Bridge Inventory (SNBI). FHWA also accepted comments on this document to the NBIS Federal Register docket through March 13, 2020.

The final draft of the NBIS and SNBI that addresses comments submitted in the Federal Register is under review by the new FHWA/USDOT administration then requires White House Office of Management and Budget (OMB) review and approval. Therefore, publication is not expected to occur in the immediate future.

## Solicitation to Remain Federally Compliant

AASHTO's licensing agencies have an enormous investment in their bridge and structure network and maintaining it in the most optimal and safe manner. At strategic times AASHTO, on behalf of the AASHTOWare Bridge Task Force issues project solicitations to fund significant improvement initiatives or to revise the core functionality of the BrM software to assist agencies in remaining federal compliant. Donations by member agency participants are pooled to achieve defined large-scale objectives through work plans with the contractor. The solicitation process is employed to fund significant mandated enhancements that are necessary to ensure the software remains relevant.

The Task Force continues to monitor the proposed changes to the NBIS and SNBI. A date has not been established for the official release of these proposed changes; however, the Task Force remains vigilant to ensure we are ready to respond without delay. The development of the project work plan and project solicitation documentation—based on the requirements spelled out in the November 2019 NPRM—is in progress. The project work plan and solicitation will be aligned with the final NBIS/SNBI requirements once they are finalized and published.

Once complete, AASHTO will finalize and issue the solicitation request to fund AASHTOWare Bridge Management (BrM) revisions to support compliance with the NBIS and SNBI. The amount of the solicitation will depend on the extent of the changes that will be required, but is expected to be \$300,000 per agency. To ease the impact to agency budgets, commitments paid over a two-year period will be an option. We ask that all agencies strongly consider supporting this important undertaking through participation in the upcoming project solicitation.

## Opportunity to Commit Funding to the Project Solicitation Sooner Than Later

Based on feedback received from several AASHTO Member Agencies interested in participating in the upcoming project solicitation, we have learned that some agencies have “earmarked” funding in their current fiscal year budgets to commit funding towards the NBIS/SNBI BrM project.

The solicitation commitment process cannot commence until the work plan is finalized and the work plan cannot be finalized until the requirements have been published. Therefore, for those agencies interested in committing funding to this important initiative prior to the publication of the NBIS/SNBI changes and issuance of the project solicitation, an alternate mechanism has been established to commit funding for the project.

Funding for the NBIS/SNBI BrM project can be committed to AASHTO via the FY2022 Member Software Request Form: Additional Enhancement Funding. All funding contributed in this manner will be reserved to support the project solicitation.

The Task Force has prioritized maintaining AASHTOWare Bridge Management's compliance with national standards as its highest objective for the future. We will continue to monitor the timing of the release and continue to make you aware as we learn new information.

## Product

### WEBSITES

AASHTOWare® Bridge Management:  
<https://www.aashtowarebridge.com/bridge-management/>

AASHTOWare® Bridge Rating and Design:  
<https://www.aashtowarebridge.com/bridge-rating-and-design/>

### SAVE THE DATES

#### 2022 AASHTOWare Bridge User Group Meetings

##### Rating and Design Bridge User Group (RADBUG)

August 2–3, 2022—New Orleans, LA  
RADBUG website: [www.aashtobr.org](http://www.aashtobr.org)

##### Bridge Management User Group (BrMUG)

September 13–14, 2022—Minneapolis, MN  
BrMUG website: [www.br mug.com](http://www.br mug.com)

For additional information on the bridge product user group meetings, please contact Ryan Fragapane, AASHTOWare Bridge Products Project Manager ([rfragapane@ashto.org](mailto:rfragapane@ashto.org))

## AASHTOWare Bridge Product Contractors

### AASHTOWare Bridge Management

Mayvue Solutions, LLC  
700 River Avenue, Suite 423  
Pittsburgh, PA 15212  
Contact: Josh Lang, CEO  
Phone: 877-462-9883  
Email: [BrM@mayvue.com](mailto:BrM@mayvue.com)

### AASHTOWare Bridge Design and Rating

ProMiles Software Development Corporation  
300 Corporate Center Drive, Suite 310  
Moon Township, PA 15108  
Contact: Herman Lee, Project Manager  
Phone: 412-509-0587  
Email: [BrDR@promiles.com](mailto:BrDR@promiles.com)

## AASHTOWare Bridge Task Force

**Todd Thompson—South Dakota DOT**  
Chair, Bridge Products Task Force

**Eric Christie—Alabama DOT**  
Vice Chair/Task Force member, BrM

**Beckie Curtis—Michigan DOT**  
Task Force member, BrM

**Craig Nazareth—Rhode Island DOT**  
Task Force member, BrM

**David Hedeem—Minnesota DOT**  
Task Force member, BrM

**Kent Miller—Nebraska DOT**  
Task Force member, BrM

**Derek Constable—FHWA**  
Task Force FHWA Liaison, BrM

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**Mark Bucci—Louisiana DOTD**  
Task Force member, BrDR

**Michael Johnson—Idaho TD**  
Task Force member, BrDR

**Jeffrey Ruby—Kansas DOT**  
Task Force member, BrDR

**Vinacs Vinayagamoorthy—California DOT**  
Task Force member, BrDR

**Tom Saad—FHWA**  
Task Force FHWA Liaison, BrDR

**Ryan Fragapane—AASHTO**  
Project Manager



## About AASHTOWare®

The AASHTOWare technical service program has a rich history of serving its customers and being a leader in bringing the power of technology through automation to the public sector transportation industry.

As we look to the future, it is important that we build on this rich and robust tradition to create the next generation of technology solutions and continuously improve service to our customers. We base our success on the commitment of hundreds of volunteers, in partnership with the private community, to produce quality products that meet the common needs of our customers. The challenges we face now and into the future are increasingly more complex than in the past. To ensure continued success as we establish our next generation of products and services, we will clearly focus on a mutually agreed upon set of principles and values to drive our strategic plan, vision, mission, goals and objectives.

### American Association of State Highway and Transportation Officials

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