OBD Implementation FAQs

OpenBridge Designer (OBD) Implementation Frequently Asked Questions

Bridge Division

1. **What is OpenBridge Designer (OBD)?**

   OBD is a bridge workflow manager. When installing OBD the following programs are also installed: OpenBridge Modeler (OBM), LEAP Bridge Steel, LEAP Bridge Concrete, RM Bridge, and ProStructures. Prostructures is installed as part of OBM and requires a separate license.

   OBD serves as the workflow manager for Design and Analysis, and Bridge Models created with OBM (BIM Workflow). OBD allows the user to create Standalone files in each of the applications instead of using the BIM workflow.

2. **What is the difference between OpenBridge Designer (OBD) and OpenBridge Modeler (OBM)?**

   OBD is a workflow manager. OBM is the tool within OBD that is used to generate the 3D bridge model using smart structural elements, geometry, and terrain data read from OpenRoads Designer.

   OBM can be obtained as standalone application to create the 3D bridge model. OBD is only needed when utilizing BIM workflow or accessing the design and analysis applications. The design and analysis applications (LEAP Bridge Steel, LEAP Bridge Concrete, and RM Bridge) are now only available as part of OBD.

3. **Do we need OpenBridge Designer (OBD) or is OpenBridge Modeler (OBM) enough to create the required 3D bridge model?**

   OBM is all that is needed to create the 3D bridge model. OBD is a suite of applications used for modeling, design, and analysis of bridges. If the design and analysis applications within OBD are not being used, OBM is enough to create the 3D bridge model.

4. **Is OpenRoads Designer (ORD) enough or do we also need OpenBridge Modeler (OBM)?**

   While ORD is a very powerful tool, it lacks the ability to place individual bridge elements. OBM is required for the creation of an intelligent 3D bridge model.

5. **When should I start using OBD/OBM?**

   Any new project that starts on or after June 1, 2022 will require a 3D bridge model. If a contract has been awarded but not started prior to June 1st it will be up to the district if they want to include a 3D model as part of the deliverables.

6. When is a bridge project considered new?

Refer to OpenRoads Designer (ORD) implementation information to determine if the project is considered new as of June 1, 2022 (https://www.txdot.gov/business/resources/design-tools-training/openroads-designer.html). Where the roadway portion of the project requires ORD for the corridor model, a 3D bridge model will most likely be required.

7. What training is available?

Below is a list of online trainings from Bentley:

a. Bentley LEARN OBD Training (Requires subscription): View Learning Path (bentley.com)

b. Bentley LEARN ORD Training (Requires subscription): View Learning Path (bentley.com)

c. Bentley LEARN LumenRT (Requires subscription): View Learning Path (bentley.com)

d. YouTube ORD Channel: OpenRoads Designer

e. YouTube OBD Channel: OpenBridge Designer Overview - YouTube

f. YouTube LumenRT Channel: LumenRT Basics Tutorial - YouTube

Below are links to TxDOT training:

a. TxDOT OBM Training: OpenBridge Modeler CONNECT Edition (BRG300)

b. TxDOT ORD Training: OpenRoads Designer for Plan Development (DES750)

8. Why do we need a 3D bridge model?

Starting June 1st, 2022, the roadway engineers working for TxDOT started using OpenRoads Designer (ORD). ORD is the Roadway/H&H/Survey 3D modeling solution from Bentley. To keep up with this transition and keep moving forward, the Texas bridge engineers will start using OBM to create intelligent 3D bridge models. OBM connects natively to ORD and can read and update geometric data. A 3D bridge model referenced into a corridor model can help better visualize the project as a whole and lead to identifying possible conflicts with utilities, vertical and horizontal clearances, excavation, and schedule that might otherwise be overlooked. This is the foundational step TxDOT has taken to move towards Digital Delivery and creating a Digital Twin of the TxDOT system.

9. How will the 3D bridge model be used?

The 3D bridge model can be used to visualize the bridge and identify possible conflicts with utilities, vertical and horizontal clearances, excavation, and schedule.

The 3D bridge model can also be used to generate 2D drawings.

The 3D bridge model will be a means to convey information to stakeholders (i.e. contractors, fabricators, and inspectors) as we move toward the model being the contract document.

10. Do we still need to create 2D sheets (Layout and Details)?

Yes, using the Sheet Boundary and Section Callouts tools within OBM and ProStructures the user can generate and annotate the same 2D drawings that we use now from the 3D model. The 2D sheets can still be created in the traditional way.

11. When will the 3D bridge model substitute the 2D sheets (Digital Delivery)?

TxDOT is still in the exploration and research and development phase of digital delivery. The target timeframe is within the next 5 years.

12. Should ORD or OBM be used to create alignments and profiles?

It is highly recommended to use ORD to create all the geometry and terrain data for the bridge. OBM does have the tools to create horizontal and vertical alignments; However, OBM does not have the tools for Corridor modeling.

13. Do we use OBD to create bridge layouts? Do we use OBD for 2D bridge details?

OBD/OBM is used to create the 3D bridge model. The model is then used to create Plan and Elevation for the Bridge Layout. From there, either OBM or Microstation can be used to annotate the bridge layout. OBM or Microstation can be used to create the 2D bridge details sheets.

14. With the new requirement of OpenBridge Designer, per May 5, 2022 memo, do existing bridge contracts need to add 3D bridge models as part of the deliverables?

The intent is to use OpenBridge Designer (OBD), utilizing OpenBridge Modeler (OBM) for the 3D bridge model, when using OpenRoad Designer (ORD).

Below are 3 scenarios for existing bridge contracts, and how to handle them as of June 1, 2022.

i) Contract and Work Authorizations (WA) have been executed for the project (both Specific Deliverable and Indefinite Deliverable contracts)

   a) The requirement for a 3D bridge model using OpenBridge Designer (OBD) is at the discretion of the district if they want to pursue a supplemental to include the 3D bridge model in the work authorization.

ii) Indefinite Deliverable Contract where the WA has not been executed for the project, but fee schedule and scope have been negotiated.

   a) The requirement for a 3D bridge model using OBD is at the discretion of the district based on impacts to project schedule.

iii) New contracts and new WAs for Indefinite Deliverable Contracts

   a) The 3D bridge model using OBD (utilizing OBM for 3D bridge modeling) is required in the contract.

15. Is there any guidance/information on how to handle PGSuper-OBD interfacing?

There is currently no connection between PGsuper and OBD.

We are using the OBM module of OBD for the bridge modeling. The user will need to enter the haunch into OBM either by Start and End Haunch or Min Haunch and Camber. Camber information from PGSuper can be entered into the Camber tables in OBM. However, this is only for reporting purposes. If the user is using the reports from PGsuper there is no need to input the camber into OBM.

16. What contract language will be included for new design-bid-build projects? Will the same language be included in the design-build contracts?

The base contract language for PS&E and on- & off-system bridge replacements includes the 3D bridge model requirement.

17. Will the models be submitted with each design submittal (30%, 60%, etc)?

Currently the 3D bridge model will be a deliverable for the Preliminary Bridge Layout Review (PBLR) (typically at 30% or 60%) and 100% submittals since they are needed to create the bridge layouts. The district has the discretion to request the model at additional milestones.

It is important for the model to be at a level comparable to the plans at each milestone and once digital delivery is adopted in the future, the 3D model will be required as part of all milestone submittals.

18. Will the 3D bridge model be part of the PBLR submittal?

The 3D bridge model is required for PBLR. The 2D bridge detail sheets will also be part of the PBLR submittal. Bridge class culverts do not require a 3D model at this time. Culverts are modeled in ORD.

19. Is TxDOT continuing to use FDOT with OBM?

FDOT is only required to properly display the Bridge Standard drawings found on our Standards website, and to properly display previously created drawings using FDOT font. Moving forward TxDOT will start using Engineering Fonts for all plan production.

20. What about break back on abutments?

Bentley is continuing to work on this. We do have parametric cells that support the break back in the abutment, and they are included in the workspace.

21. When displaying an OBM model into a profile view, is there a way to see all bridge elements regardless of where the section cut is placed?

The only way at the moment is to change the presentation setting in the references dialog of the 3D cut from Cut to Forward; however, this presentation style is not as clean as the Cut and will show all lines that are represented in the 3D view.

22. How will retaining walls be modeled?

Retaining walls will be modeled in ORD.

23. Will there be bridge annotation styles similar to ORD Roadway annotation style that reflect TxDOT bridge-specific annotation?

We developed text styles, dimensions styles, and basic annotation groups for the Bridge Layouts. We have not developed additional annotation styles since the annotation tools are strictly for 2D (Plan Labeler). When OBM has the same workflow (2D in 3D) as ORD, we will consider developing some annotations. We do use the same text as ORD, and we do have the text styles and dimension styles. Please submit your suggestions here: bridge3ddesign@txdot.gov

24. What is the expectation about using the steel and concrete features of OBD so that analysis and design can be a dynamic part of the process?

We will continue to use PGSuper for concrete superstructure, which offers no interface with OBM. For now, we are using OBM strictly for modeling and plan production. It is up to the engineer to determine the engineering application for their design. TxDOT is not specifying a design software, just OBM for modelling purposes at this time.

25. Is there expectation of using OBM for quantities?

Consultant Contracts were updated to have a submittal at 100% of a letter that compares geometry and quantities between OBM and traditional methods. We are working with Bentley to make enhancements including the reports in both OBM and ProStructures.

26. Will you be providing level of detail guidelines for OBM? For example, do you expect steel splices to be shown, etc.?

TxDOT will be creating guidance on Level of Detail of the models in the future. For now, the model needs to have 3D elements for slab, beams, abutments, wingwalls, caps, columns, and foundations. However, we will not be requiring details that OBM is not capable of creating. We still will have to create a 2D file to provide those additional details such as the break backs on abutments.

27. Eventually, the goal is to move away from MicroStation and have plan production done through ORD and OBM, correct?

Correct for all geometric projects (meaning those that have earthwork and/or changes to the vertical or horizontal alignments. For non-geometric projects, MicroStation CONNECT Edition may suffice. In Bridge Division we use both OBM and MicroStation. It is easier for a Technician to use MicroStation than OBM, but you do not have to have both applications. OBM is capable to do all plan production.

28. Is riprap around a bridge expected to be modeled in ORD for now and not in OBM?

OBM added the ORD tools to model ripraps. But it is the same workflow as ORD.

29. **Regarding the new ORD/OBD versions, will they be backward compatible?**

    The short answer is no because the schema changes. Earlier versions of OBM will be able to open as Read Only using OBM 10.12 (2022 R2).

30. **Are TxDOT customizations for OBM included by Bentley, or is there a version update from TxDOT?**

    TxDOT is using the out of the box (OTB) OBM. The templates are included in the workspace.

31. **Can we use OBD to model 2 bridges (open joint) with the same substructure?**

    Yes, Bentley has posted several videos about this process on YouTube.

32. **Is bridge widening possible (i.e., using both older bridge standards to newer)?**

    Yes. However, the haunch placed by OBM is restricted by the deck, so if the deck is cut partially on the top flange, the haunch will stop at that location as well.

33. **Do we have to install OBM to design bridges and bridge class culverts even though we have ORD on our computer?**

    Bridge class culverts are in ORD, no need for OBM. If it is a bridge (not culvert), you do need OBM to create the model, but OBM does not do the design, it is purely modeling. Design can be done using LEAP or RM, or another external tool like VBent, CAP18, etc.

34. **Will there be a library on TxDOT site where we can download updated cell libraries? Particularly parametric cells for various custom abutments / piers?**

    All parametric cells we develop for OBM are included in the workspace.

35. **Where do we find TxDOT's information on OpenRoads Designer (ORD)?**

    Information on OpenRoads Designer (ORD) implementation for TxDOT can be found on the Design Division's webpage.

    https://www.txdot.gov/business/resources/design-tools-training/openroads-designer.html

36. **Who do I contact with questions about OpenBridge Designer?**

    Send questions to bridge3ddesign@txdot.gov.