AASHTOWare™ BRIDGE DESIGN AND RATING

Refinement to Convert Line Model to System Model

Presented by David Foremsky, PE, ProMiles

ProMiles®

Line Model versus System Model

Line Model

- Traditional way of modeling girders
- One member at a time; all members are independent
- Can be the result of importing old files (BARS, BAR7)
- Requires calculations outside of BrDR

System Model

- Enter the cross section and framing plan information
- Members are dependent on each other for some calculations
- BrDR calculates loads and distribution factors

Why convert to system model?

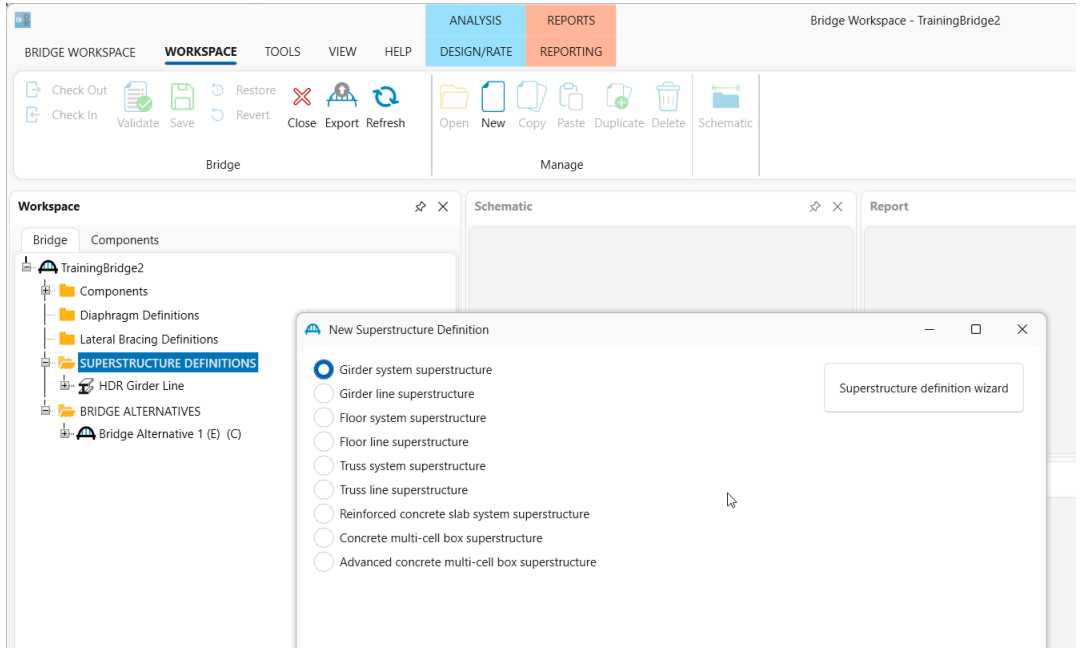
- 3D FEM analysis
- Non-standard gage analysis
- Specify travel path for permit analysis
- Distribution factor calculation
- Able to use substructure module
- Different deterioration for each member
- Easier to keep history of each member
- Can define and rate diaphragms

Do you want to build a ~~snowman~~? system?

- Be prepared!
- Locate drawings of the bridge
- Inspection reports for deterioration

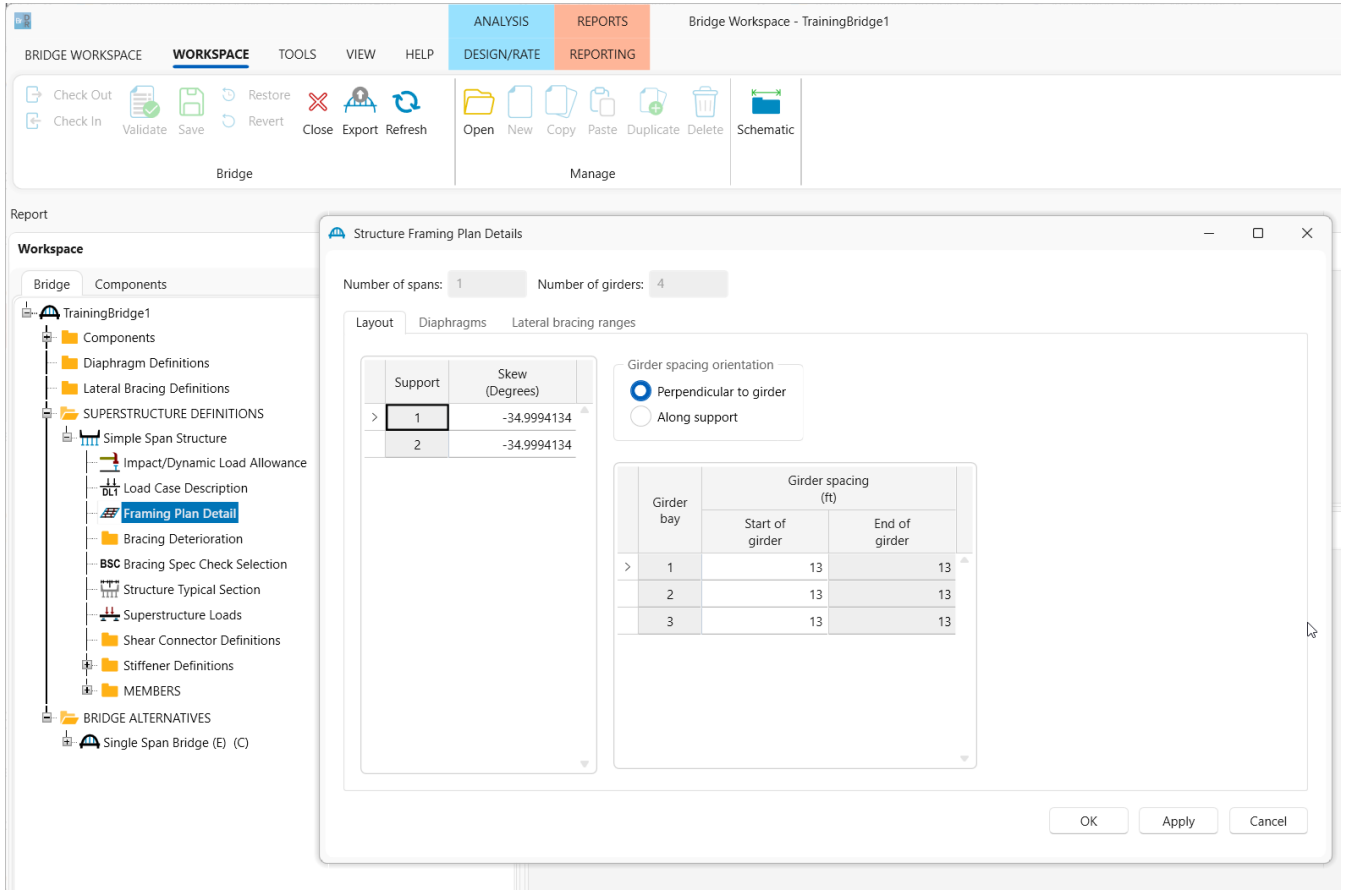
How to Get Started

- Can be defined two different ways
  - Manually create a new Superstructure Definition
  - Using the Superstructure Definition Wizard can save some keystrokes



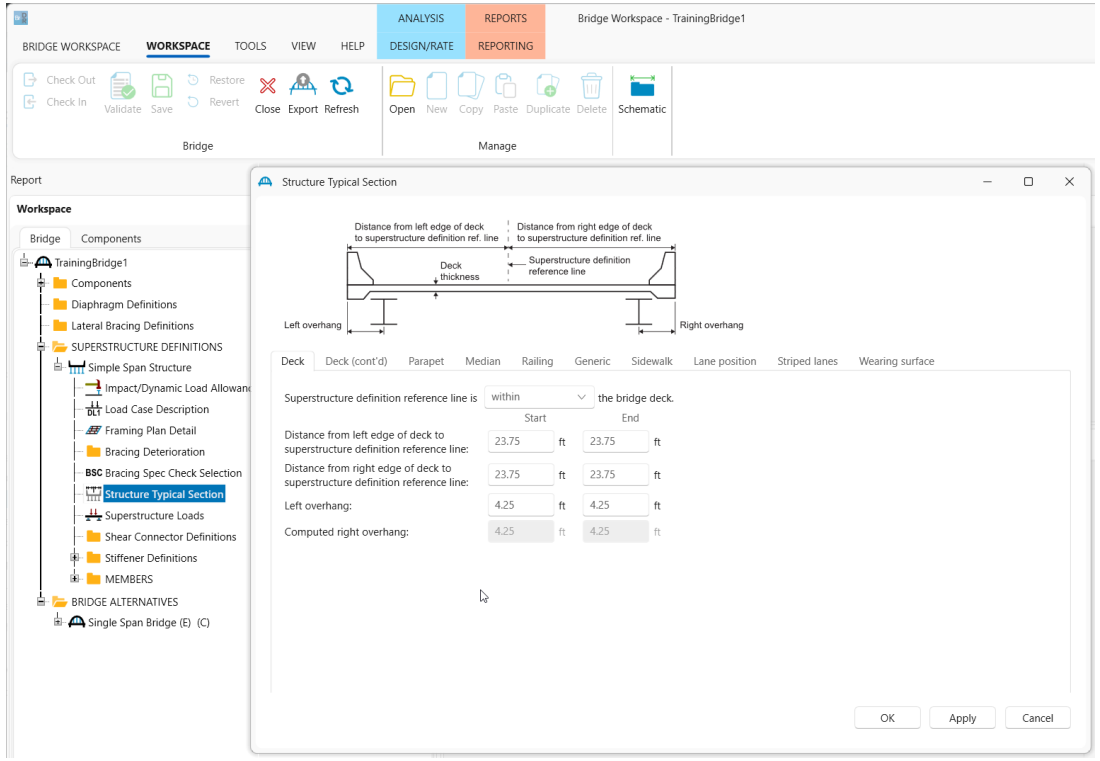
Information needed for a system

- Framing plan information
  - Girder spacing
  - Support skews
  - Diaphragm locations
  - Lateral bracing information



Information needed for a system

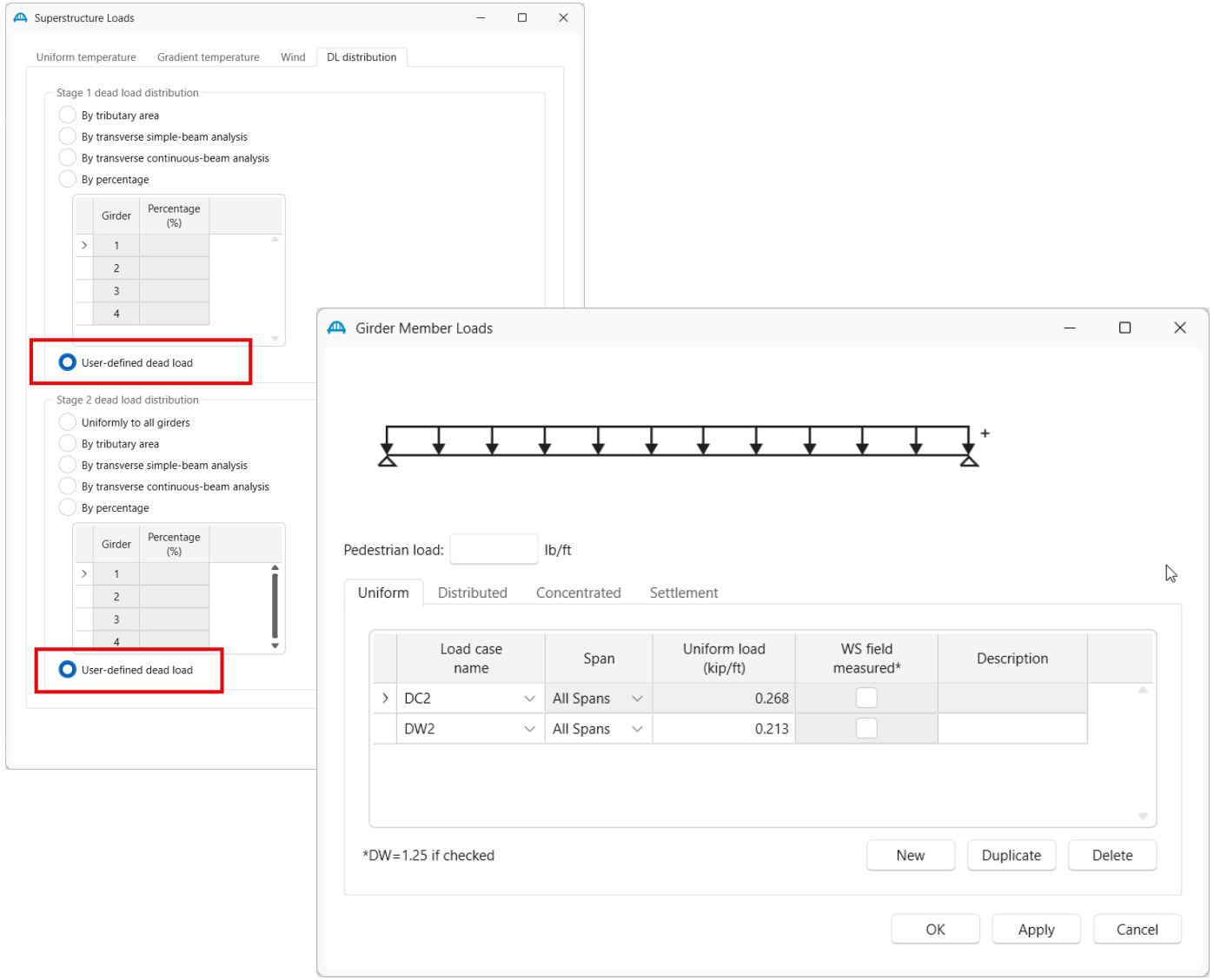
- Typical section information
  - Appurtenance type and location (parapet, railing, sidewalk, etc.)
  - Deck
  - Travelway



Dead Loads

Can be copied from the line model and used as part of the verification process

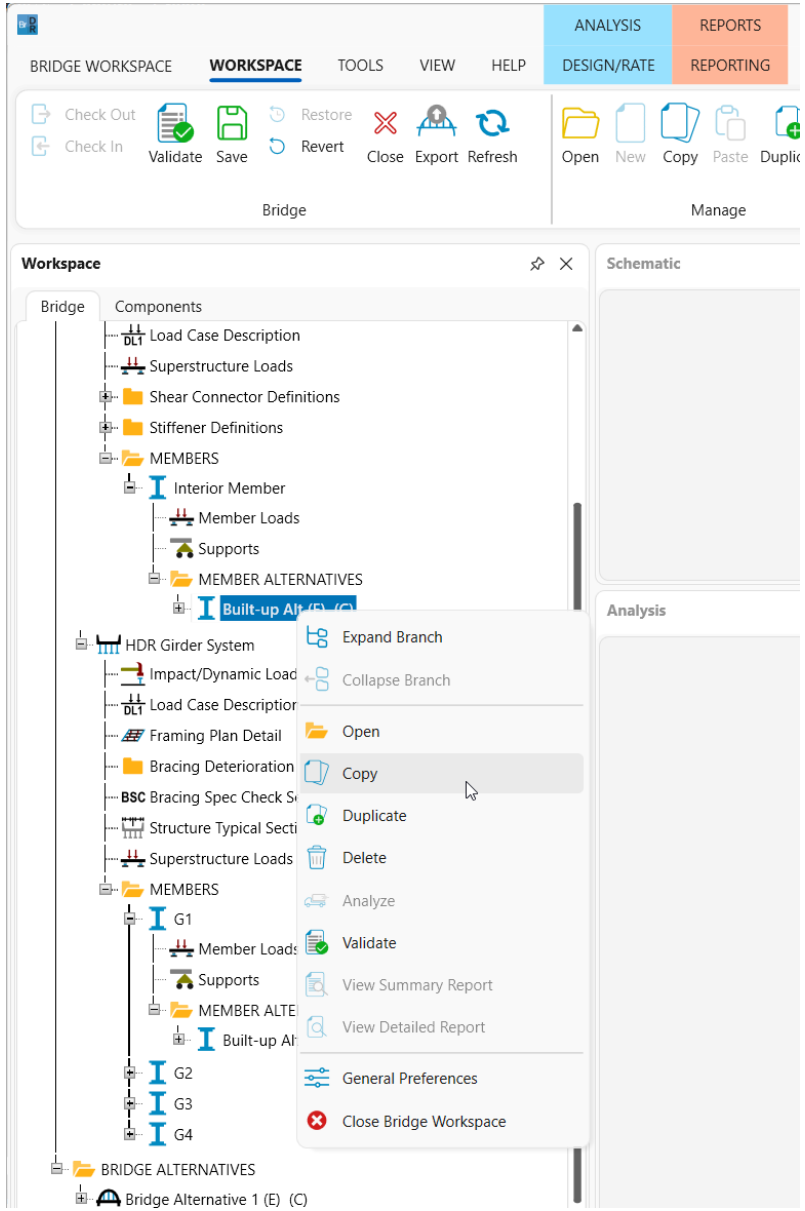
Probably will want to ultimately delete in favor of the values calculated by BrDR



Member Alternatives

Can copy and paste from the line model

Members can also be linked in the system model



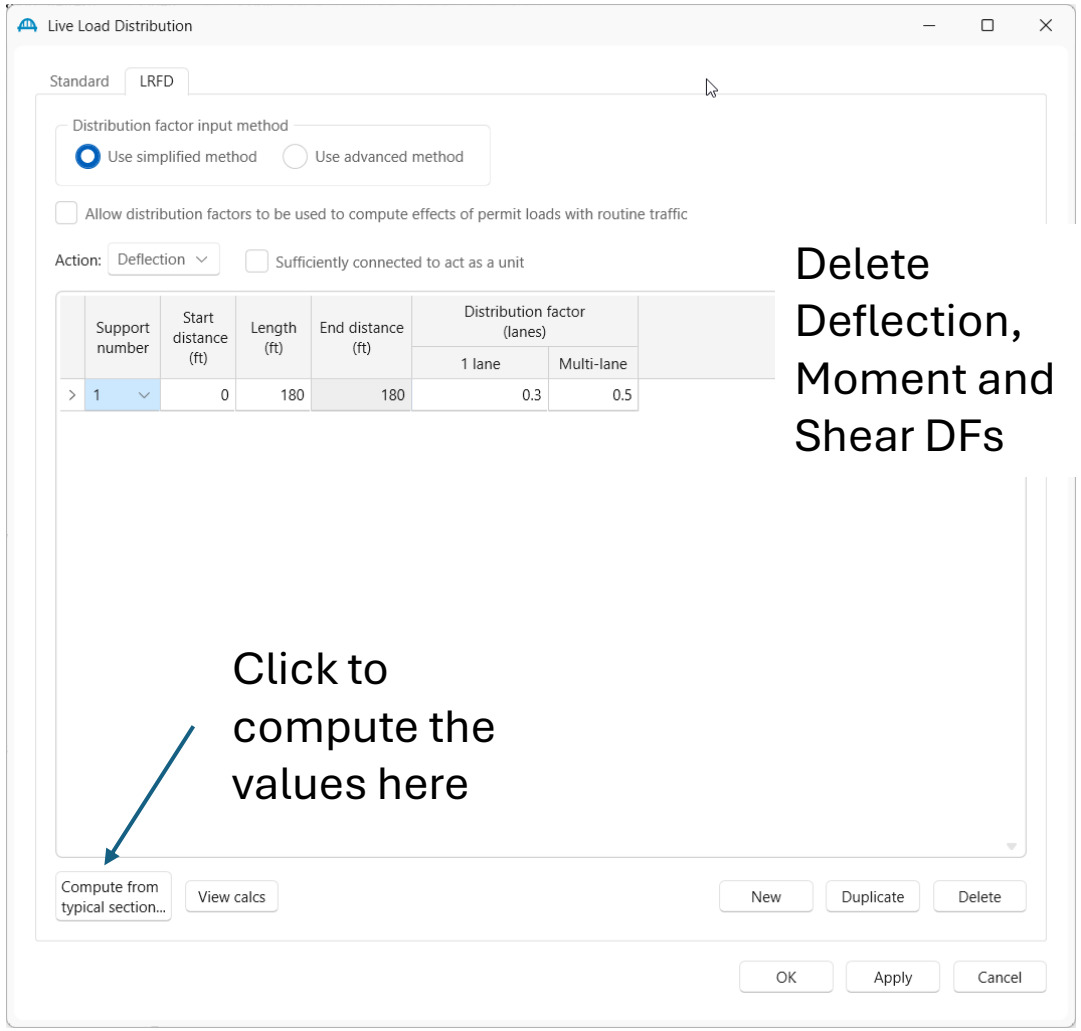
ProMiles

Distribution Factors

If the Member Alternative has been copied from a girder line model, the distribution factors will have already been manually entered

You can delete the distribution factors to have them calculated during the analysis process, or click the “Compute from typical section” button to repopulate the window

May want to keep original distribution factors while verifying the model, and delete or overwrite later



Other Systems

- The information described so far applies mostly to girder systems
- Procedure is very similar for reinforced concrete slab systems
- Floor systems are not as easy to create and define as the girder systems, but there are similar benefits with respect to load and distribution factor calculations

You’ve got a friend in us!

- There a tutorial example on girder line – girder system conversion on the support page at

  aashtowarebrdr.org/bridge-rating-and-design/training/

- Support is always available at brdr@promiles.com

AASHTOWare™ BRIDGE DESIGN AND RATING

Thank you!

You're welcome!

ProMiles®