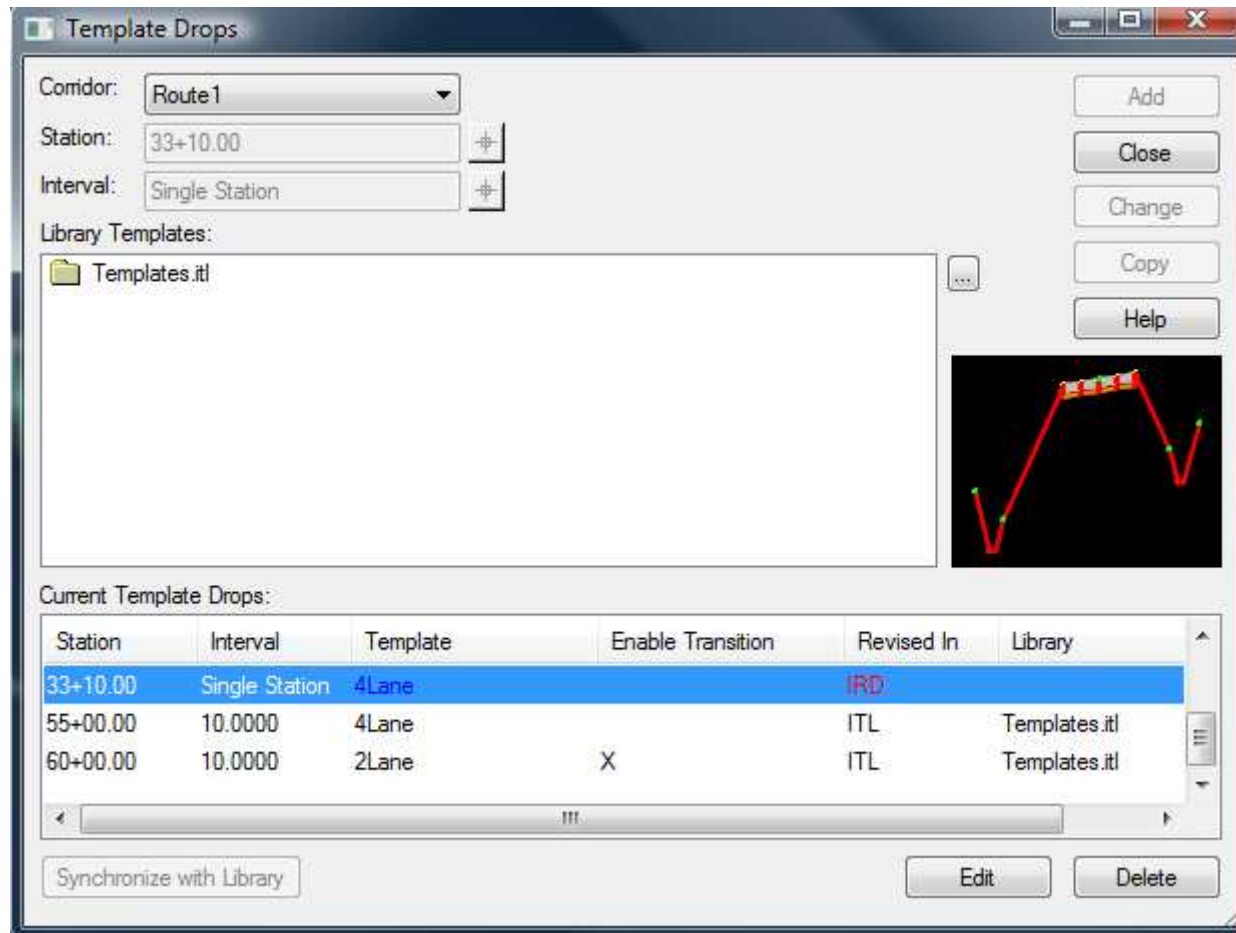# Best Practices In Roadway Designer

Presented by: Patrick Evans, PE

Bad Practices ...

Single Template Drop Caveats

Single Template Drop Caveats

- Intended use → final design "touch-ups".

- WYSIWYG template (static)

- Tight intervals may force quick changes

- No processing or point control usage

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Single Template Drop Caveats

- Use for fixing "challenging / unique areas" not handled by templates

- Culvert crossings

- Cross-overs

- Not intended for end condition overrides

Syncing Templates – When & Where

Syncing Templates – When & Where

- ITL changes vs. IRD changes → Preliminary design vs. final design

- Bulk "batch" edits belong in the ITL file

- Long corridors may require many template drops

- ITL changes allow quick preliminary design changes

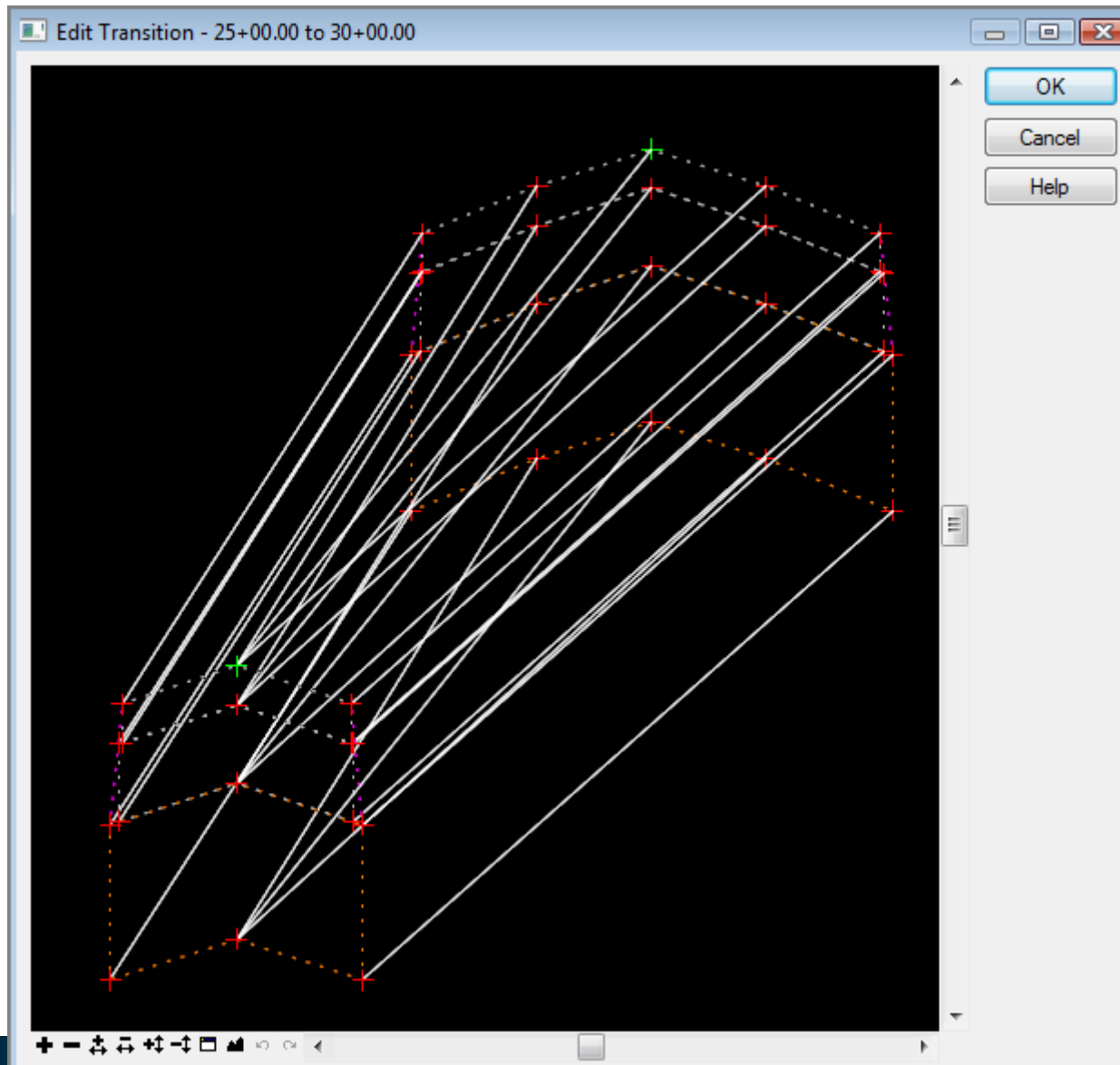**B Bentley**®

Syncing Templates – When & Where

- ITL changes allow quick preliminary design changes

  - Pavement layer thicknesses

  - Curb types

  - End conditions

  - Etc.

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Syncing Templates – When & Where

- IRD Changes → Final design

    - Transitional widths for specific geometry

    - Specific station ranges

    - Corridors

    - Etc.

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Managing Transitions

Managing Transitions

- MicroStation XM → Re-syncing templates to the ITL file resets transitions

- MicroStation V8i → Transitions remain intact "if possible"

  – No need to "re-do" transitions assuming point names are the same
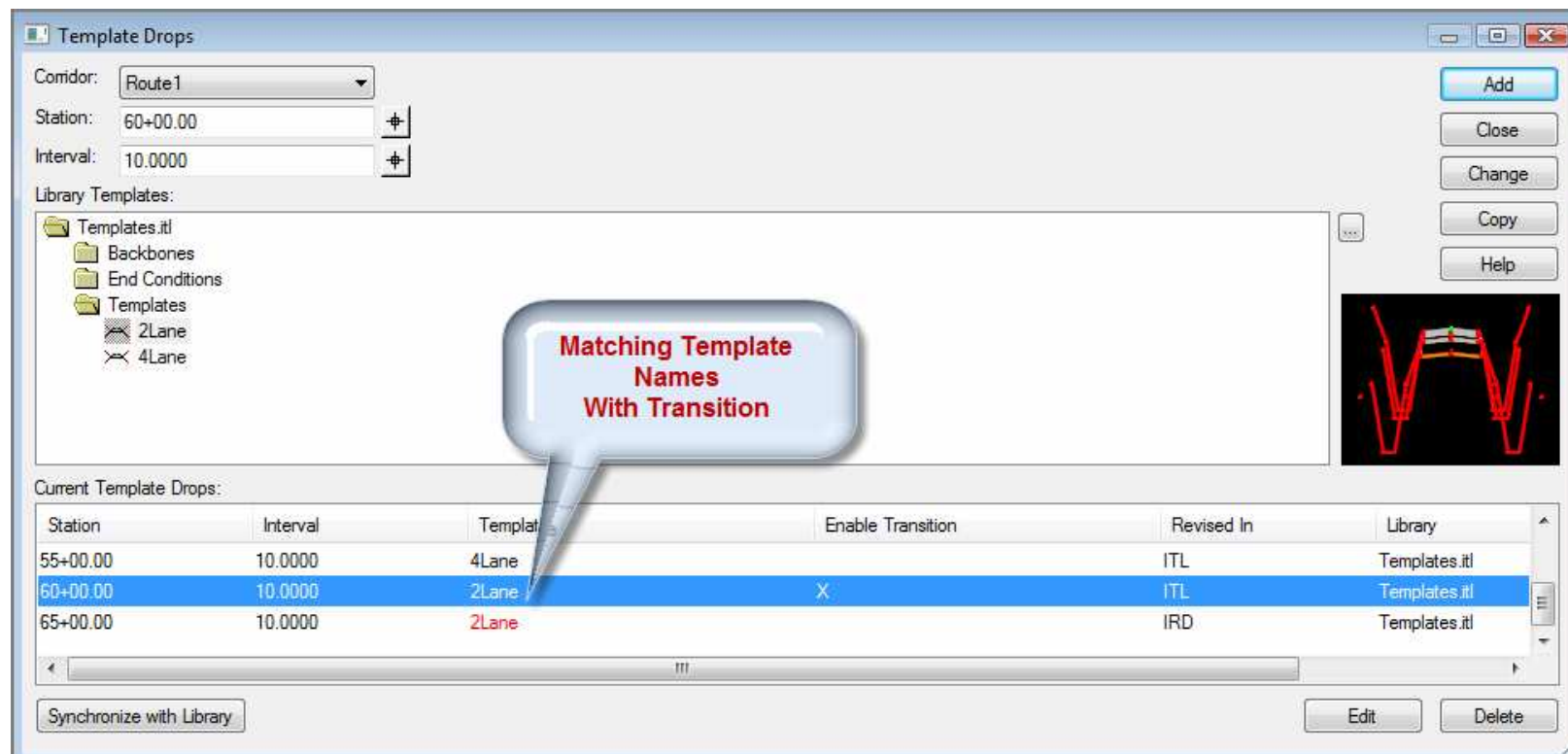
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Managing Transitions

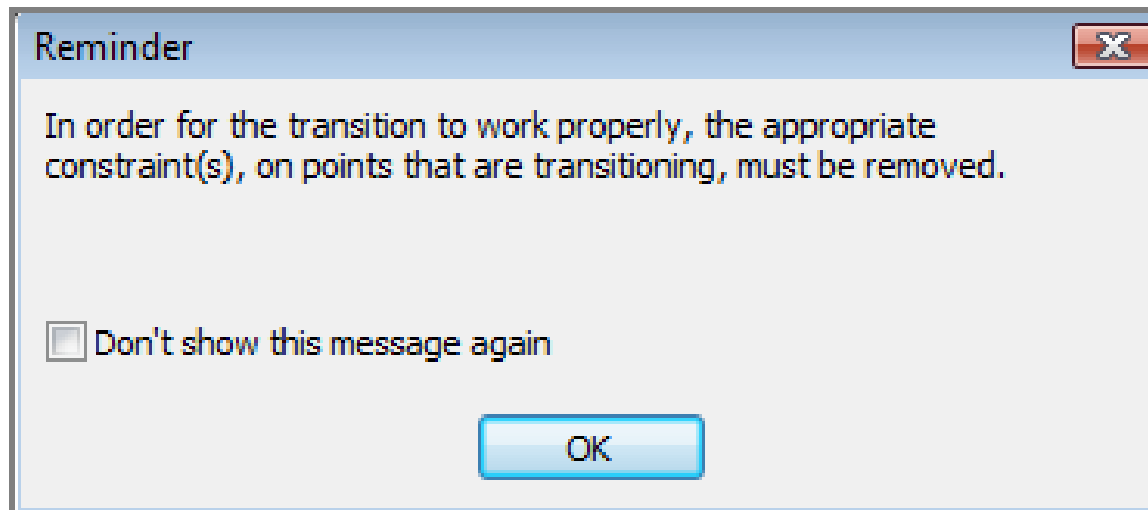- MicroStation V8i → Added ability to enable or disable transitions directly in the template drop dialog.
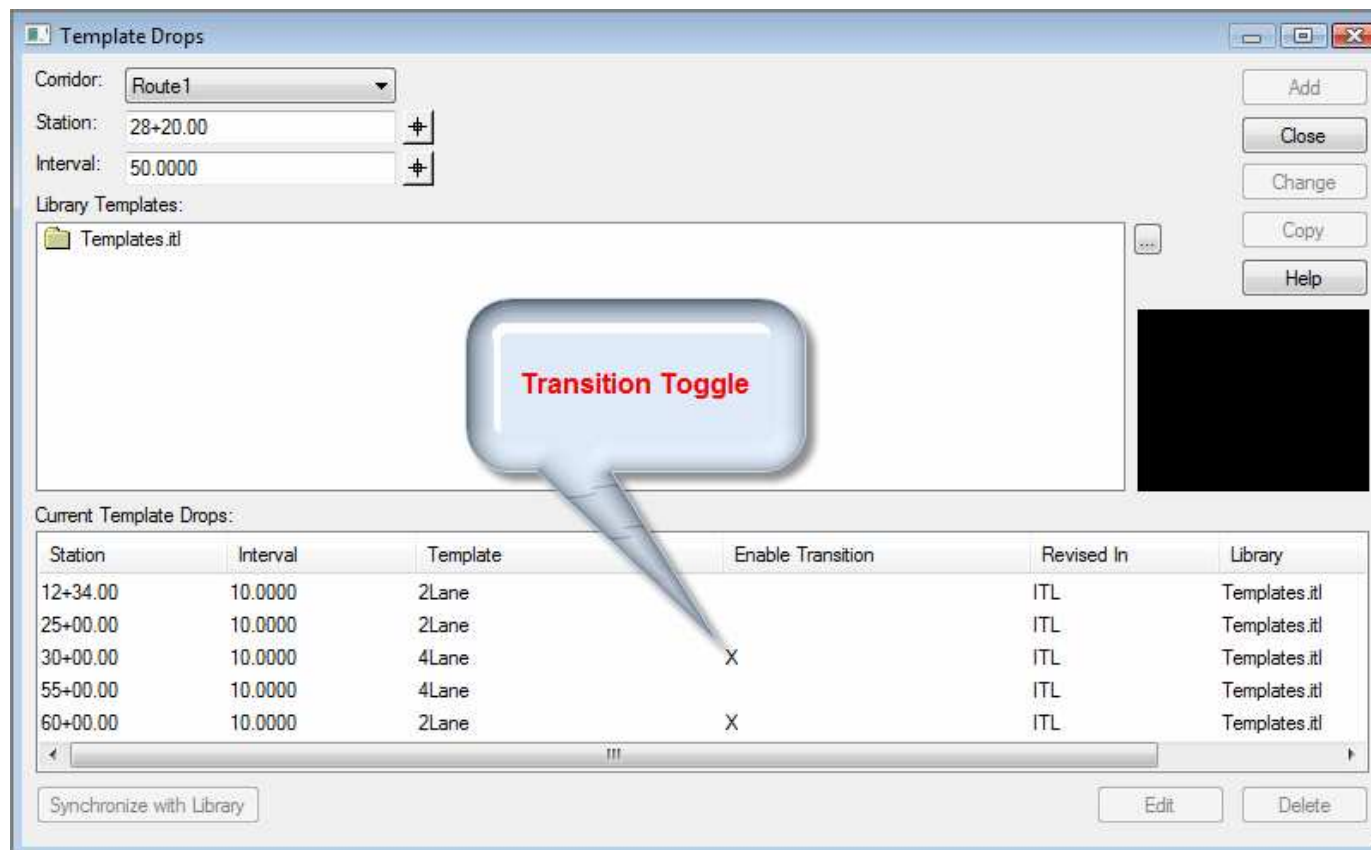
Managing Transitions

- MicroStation V8i → Added ability to transition between two templates of the same name

Managing Transitions

- MicroStation V8i → Added reminder prompt for releasing of constraints

Reminder

In order for the transition to work properly, the appropriate constraint(s), on points that are transitioning, must be removed.

☐ Don't show this message again

[OK]

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End Condition Exceptions – Final Design

End Condition Exceptions – Final Design

- Too many End Condition Exceptions may indicate the need for a template "re-design"
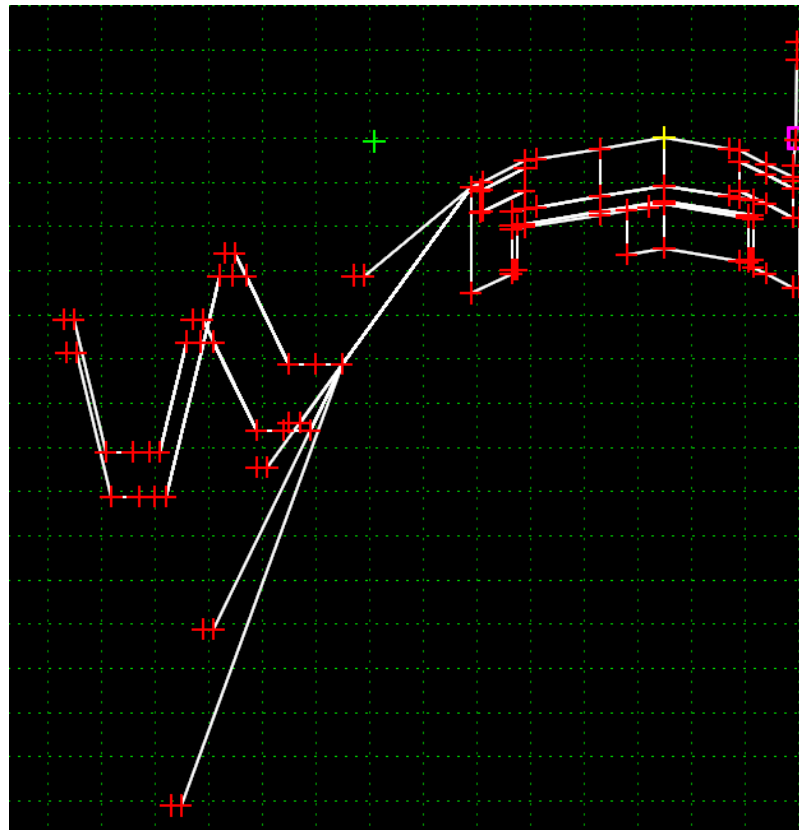
The Super Template

End Condition Exceptions – Final Design

Be careful to avoid the "super template" approach

End Condition Exceptions – Final Design

Be careful to avoid the "super template" approach

- A "happy medium" should be considered between too few and too many options

- Too few options results in a lot of End Condition Exceptions

- Too many options results in an unmanageable template

- Just because "You Can" doesn't mean "You Should"

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End Condition Exceptions – Final Design

Use the Backbone Only option for bridges and intersections
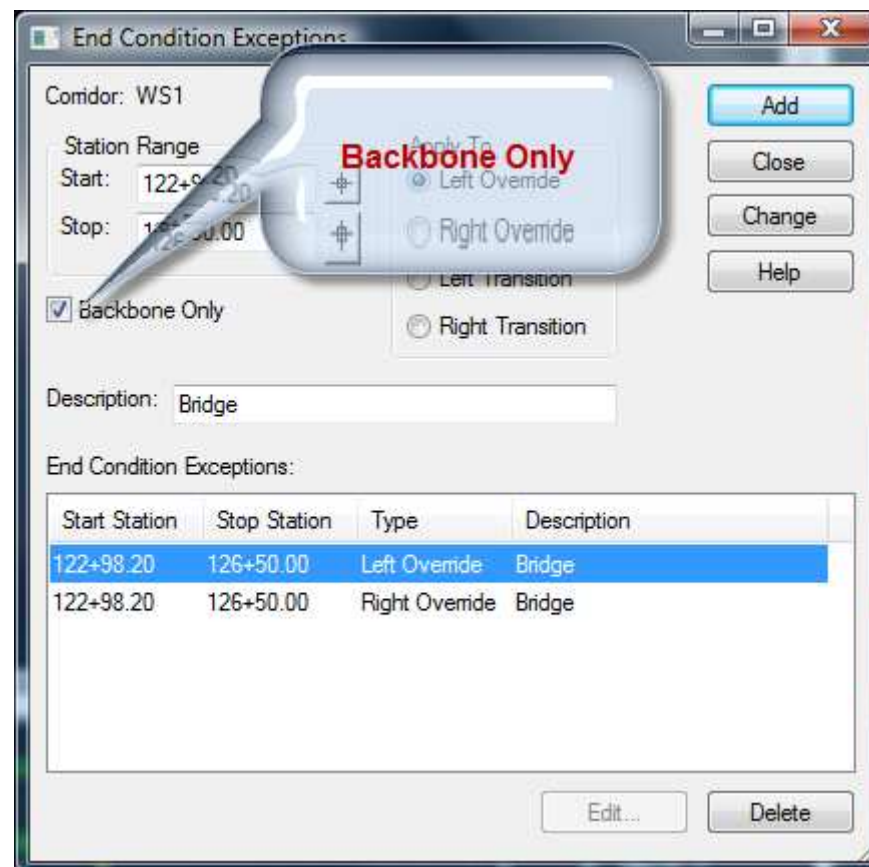
End Condition Exceptions – Final Design

Added a "Description" field in V8i to assist with Change tracking
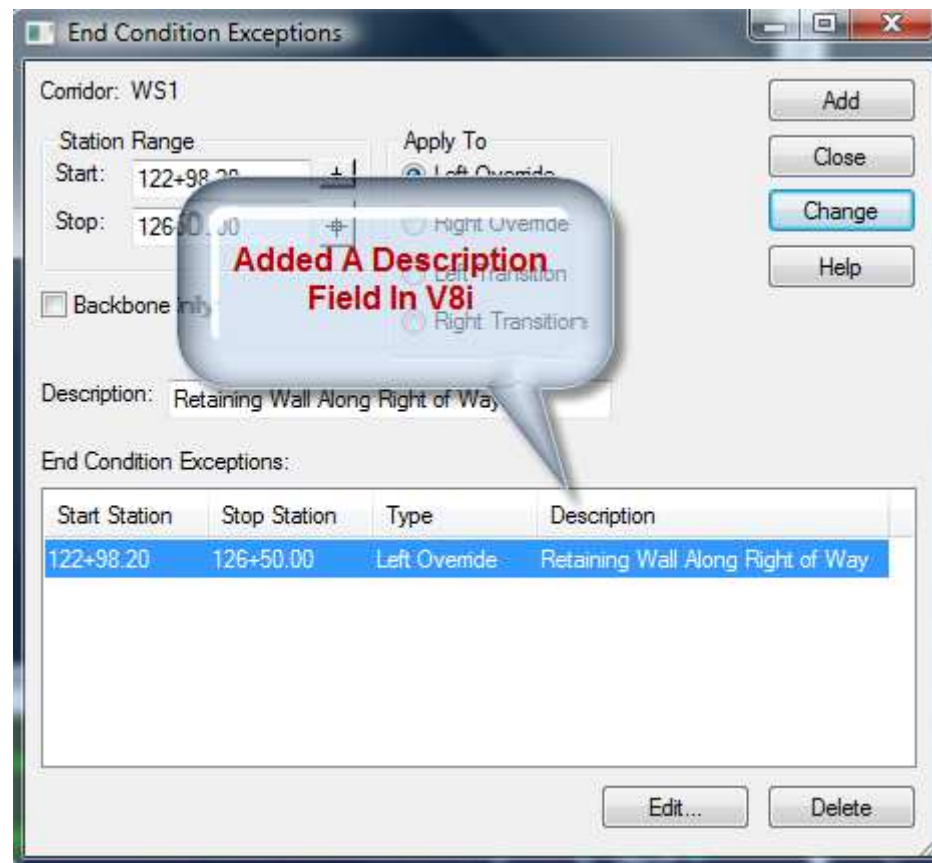
Hierarchy of Constraints

- There are several ways to "constrain" a template point

    - Conventional point constraints in a template

    - Parametric constraints

    - Style constraints

    - Point controls

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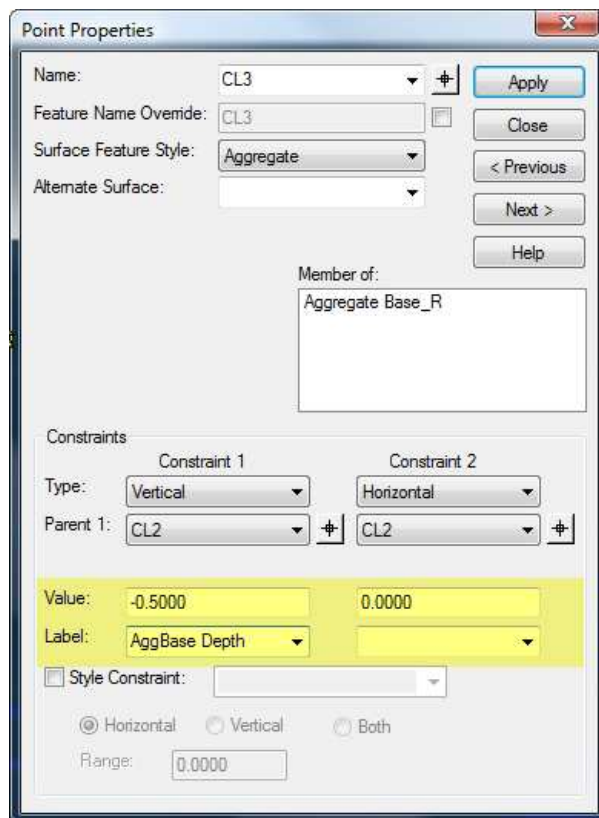
Hierarchy of Constraints

The least priority is the template point Constraint.
The Constraints establish the "Starting Point".

Hierarchy of Constraints

The second highest priority is the
Parametric Constraint

Hierarchy of Constraints

The third priority is the template point Style Constraint. This constraint overrides the "starting point" searching for alignments.

Hierarchy of Constraints

The fourth and highest priority is the Point Control

Template Drops Versus Point Controls

- Creating a new template for every little change is cumbersome and difficult to manage

    – Bulk changes for many templates takes time

    – Transitions will be numerous

    – Difficult to pass the project to another designer

    – Consider driveways for example…

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Template Drops Versus Point Controls

- Point Controls easily transform a "static" template into a "dynamic" template

  - Easily manage varying width pavements and shoulders

  - Used in conjunction with Component Display Rules to automate routine changes like driveways and side roads

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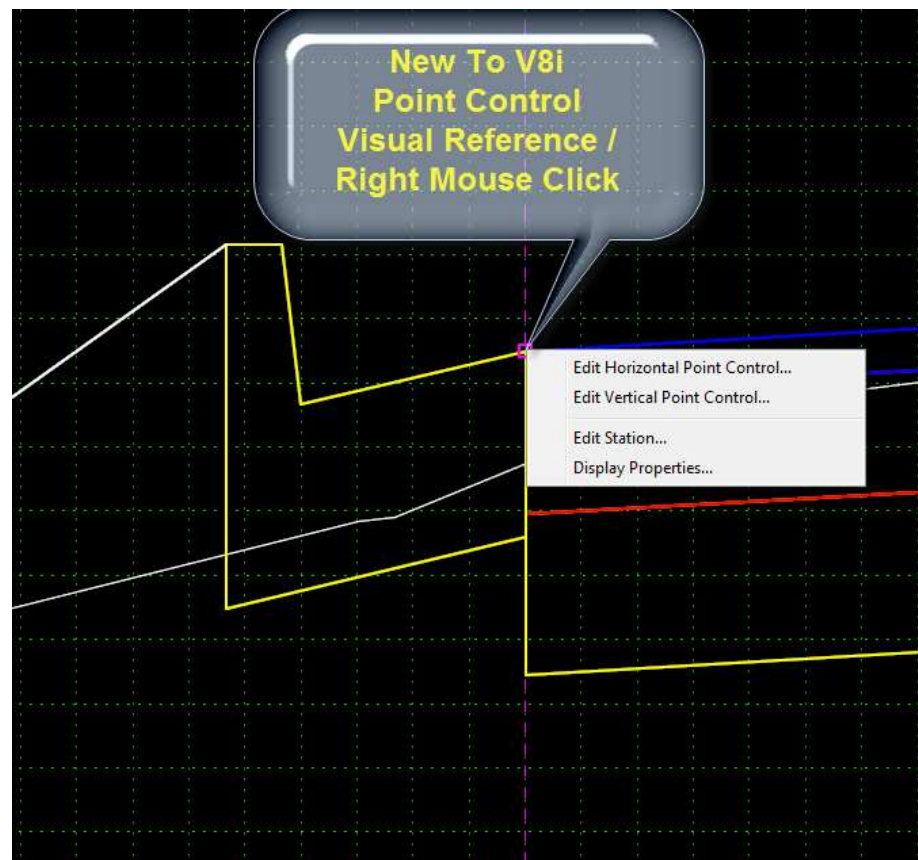
Display Reference Usages

Display Reference Usages

A good "rule of thumb" is to use Display References for items the designer is trying to avoid.
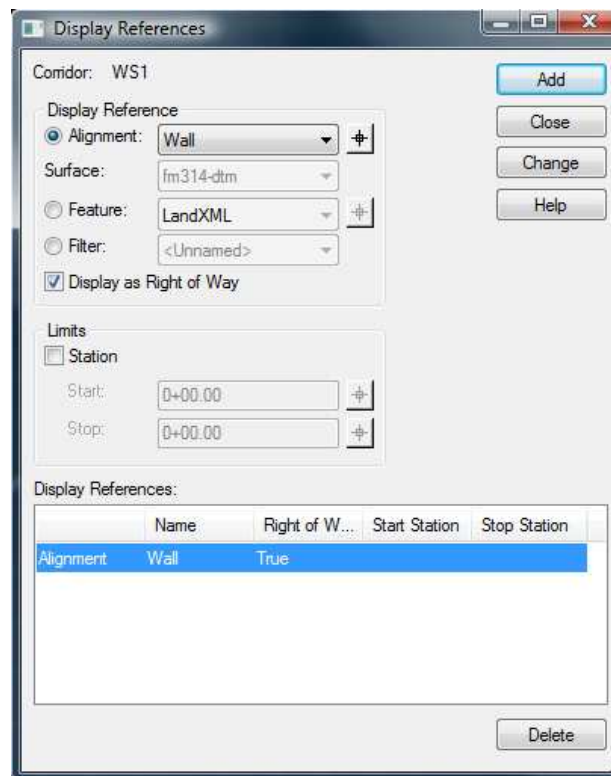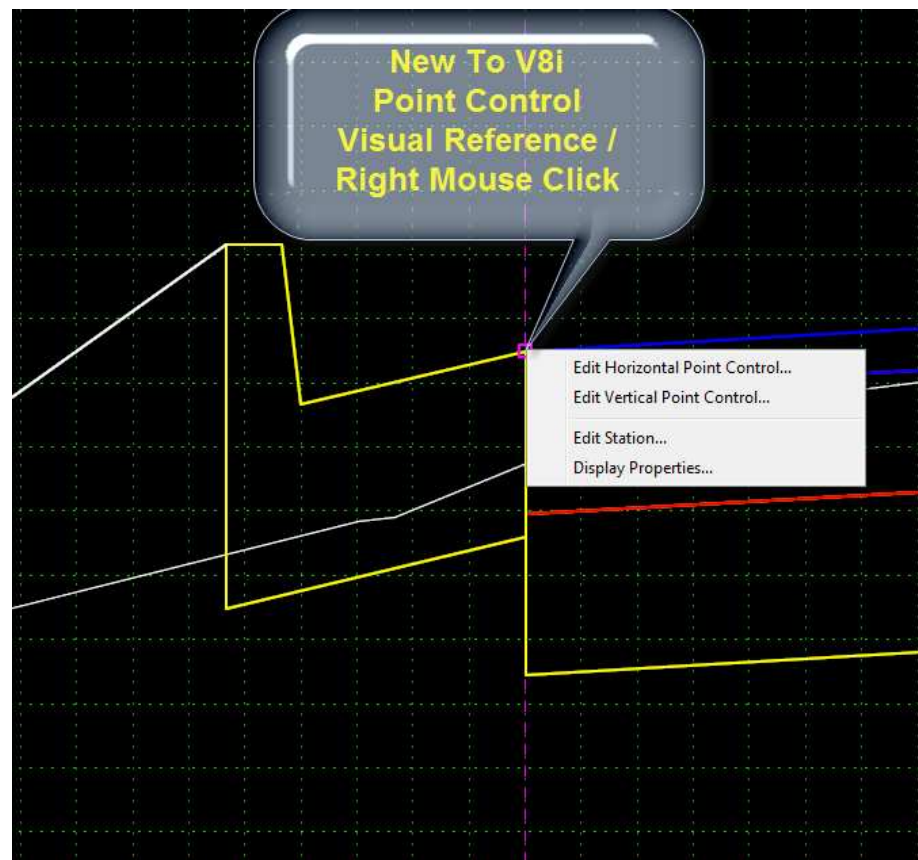
Display Reference Usages

New to V8i, Point Control visual reference reduces the need for enabling as many Display References
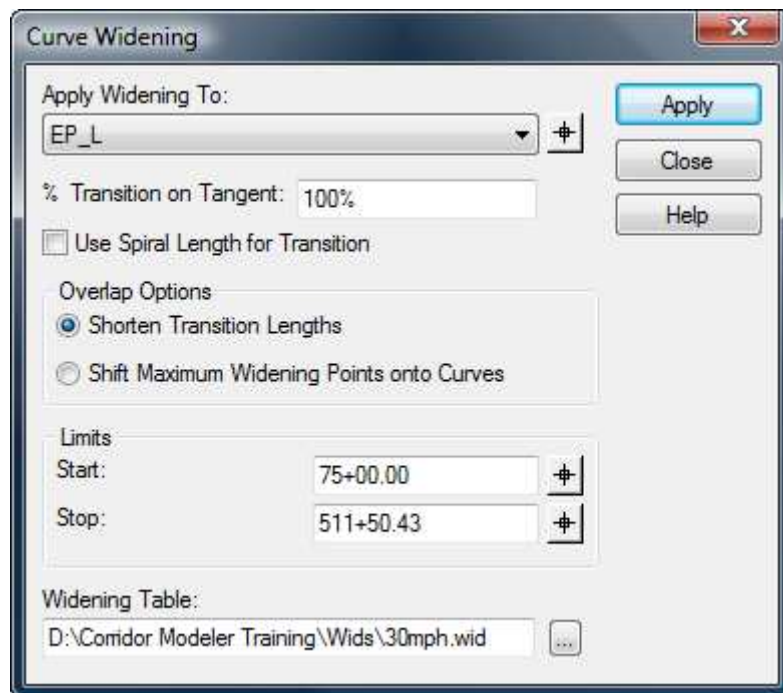
Display Reference Usages

The more display references used…
the **slower** the processing.

Automated Curve Widening

Curve widening tables allow for insertion
of point controls through curves and transitions.


```
; Cross section Type 1,3 & 4
; Lane width = 3.50 m
;  Rad    Wi      Li      Wo      Lo
     0    3.50    2.5     3.50    2.5
   100    1.75    25      0       0
   500    1.50    25      0       0
  1000    1.25    25      0       0
  2000    0.75    25      0       0
  5000    0.50    25      0       0
```

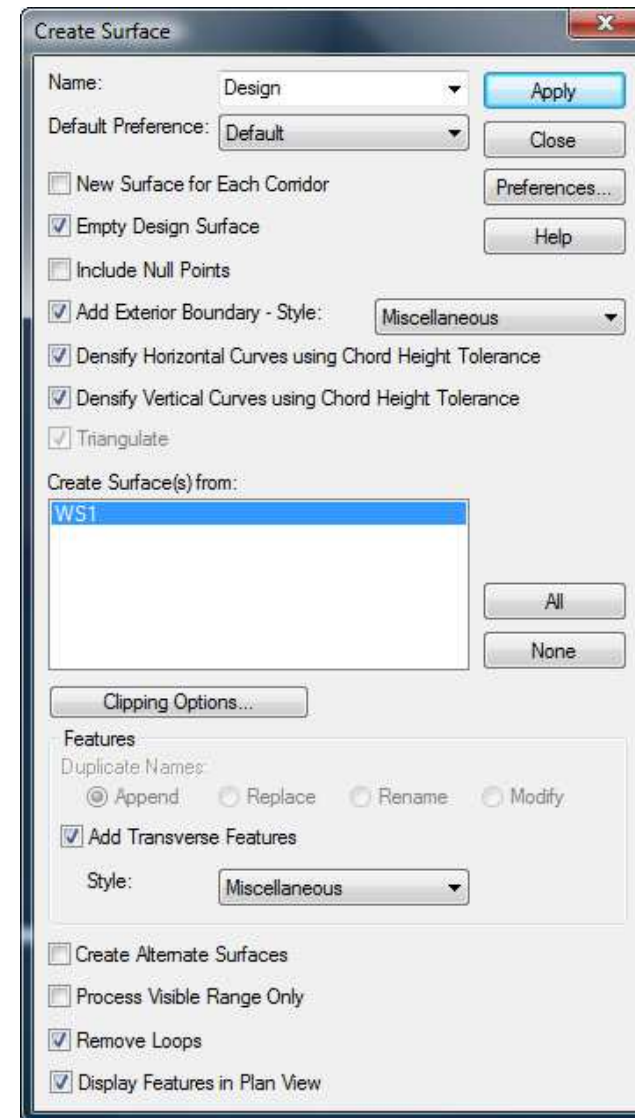Where:

Rad = Radius

Wi = Widening inside of curve

Li   = Length of transition inside of curve

Wo = Widening outside of curve
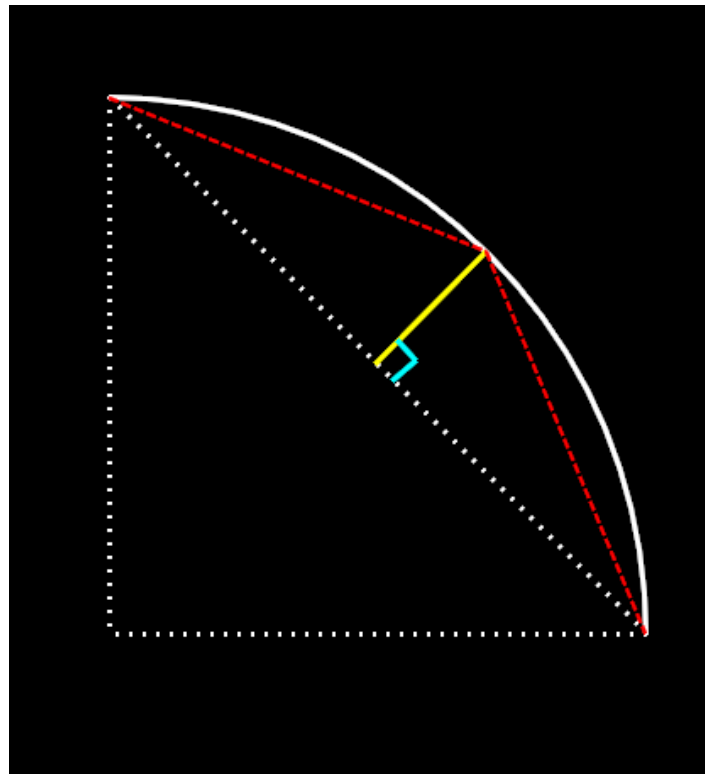
Lo = Length of transition outside of curve

Creating Surfaces

There are some
important options that
are sometimes
overlooked…

Creating Surfaces

Densify Horizontal / Vertical Curves

Creating Surfaces

Densify Horizontal / Vertical Curves

- Using horizontal and vertical chord height tolerances, more triangles will be introduced creating a "smoothing" effect.

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Creating Surfaces

Using Cardinal and External Control Points

- • These additional template drop locations assure a much more accurate surface
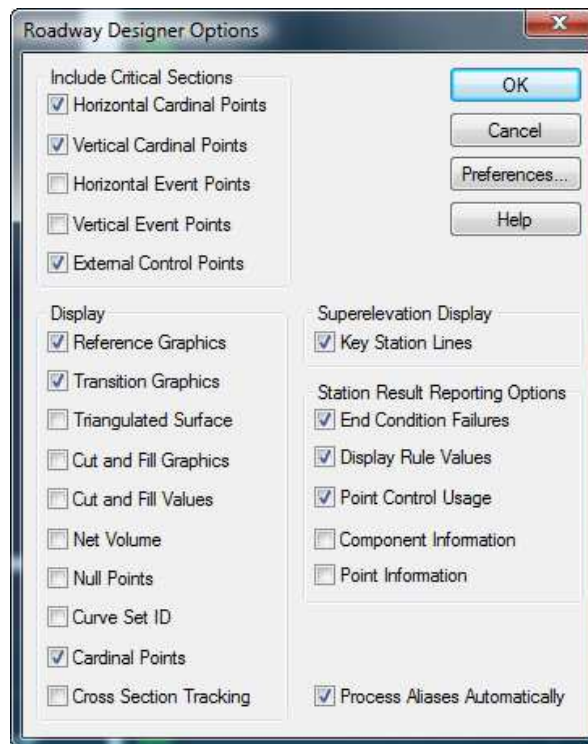
Secondary Alignments

• Modifies cross section direction. The cross section will be radial to each secondary alignment.
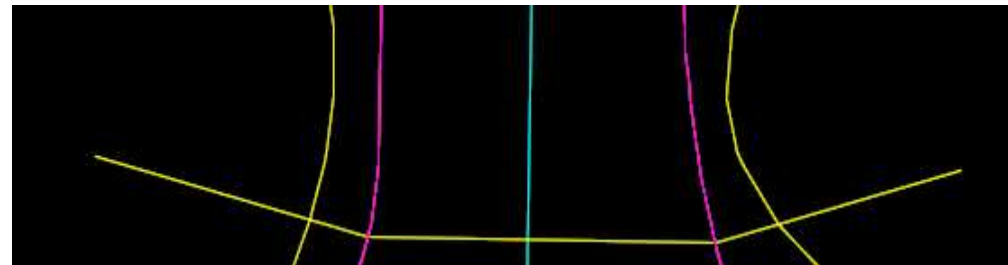
Secondary Alignments

- Mimics construction

- More accurate DTM

- Minimizes "looping" in tight radii

Managing Corridors

- The Corridor Management tool provides the means to evaluate several design alternatives.

Managing Corridors

- Using the Copy command, a user can copy a complete design to an alternate Corridor name within the same design IRD file.

Managing Corridors

- Likewise using the Copy From command, a user can copy a complete design to an alternate Corridor name from within another design IRD file.

Managing Corridors

- By copying a design corridor to a different alternate name a user can easily evaluate design changes such as:

  - Profile alternates

  - Design speed changes

  - Super elevation changes

  - Etc.

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Questions?

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