Preparing for the New Superelevation Standards in the Connect Edition

Dan Ahern, Content Development Manager
Bentley Systems

A Look Back

GEOPAK - *.sep

InRoads - *.sup

MX - *.srl

50 states in the United States = 51 ways of doing super
196 countries in the world = to many ways to count

Bentley®

Requirements for NEW Superelevation

- Include **ALL** legacy functionality
- Customizable
  - Formulas & Tables
  - Key Stations
  - User Defined Inputs
- Can be modified by the "Average User"
  - Universal Format
  - Editing Tool
  - Customizable without a Developer
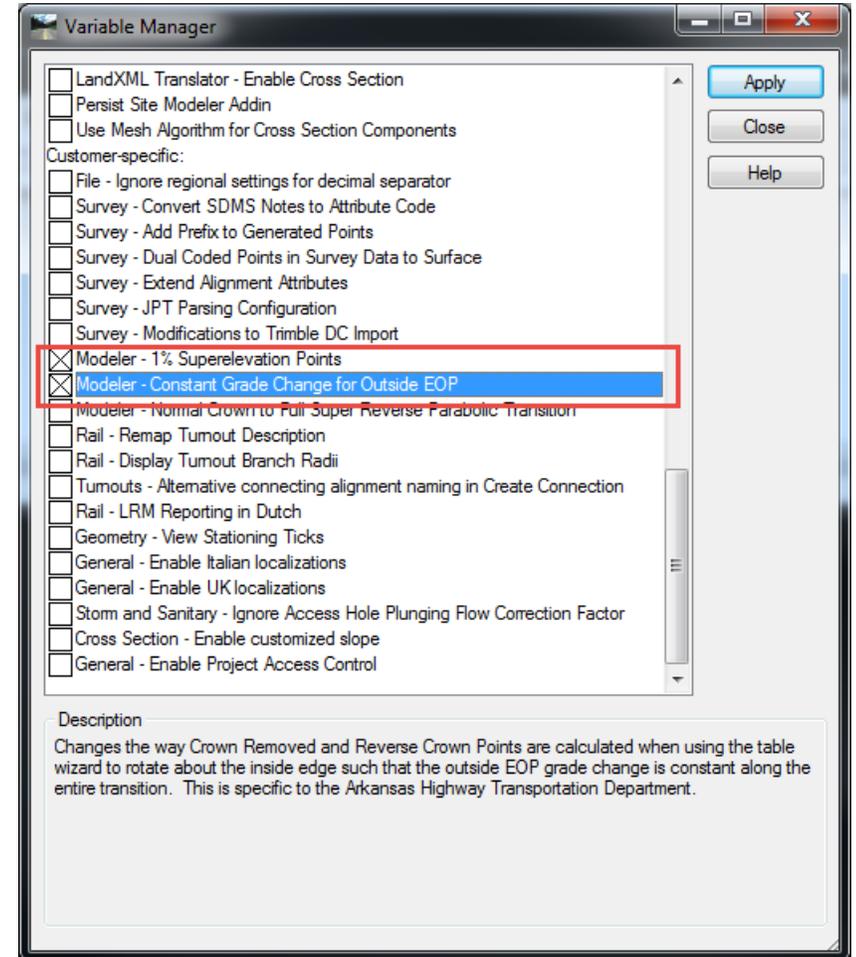
Currently

OpenRoads Designer CONNECT Edition

EAP – December 2016

Commercial Release – 2017

Bentley®
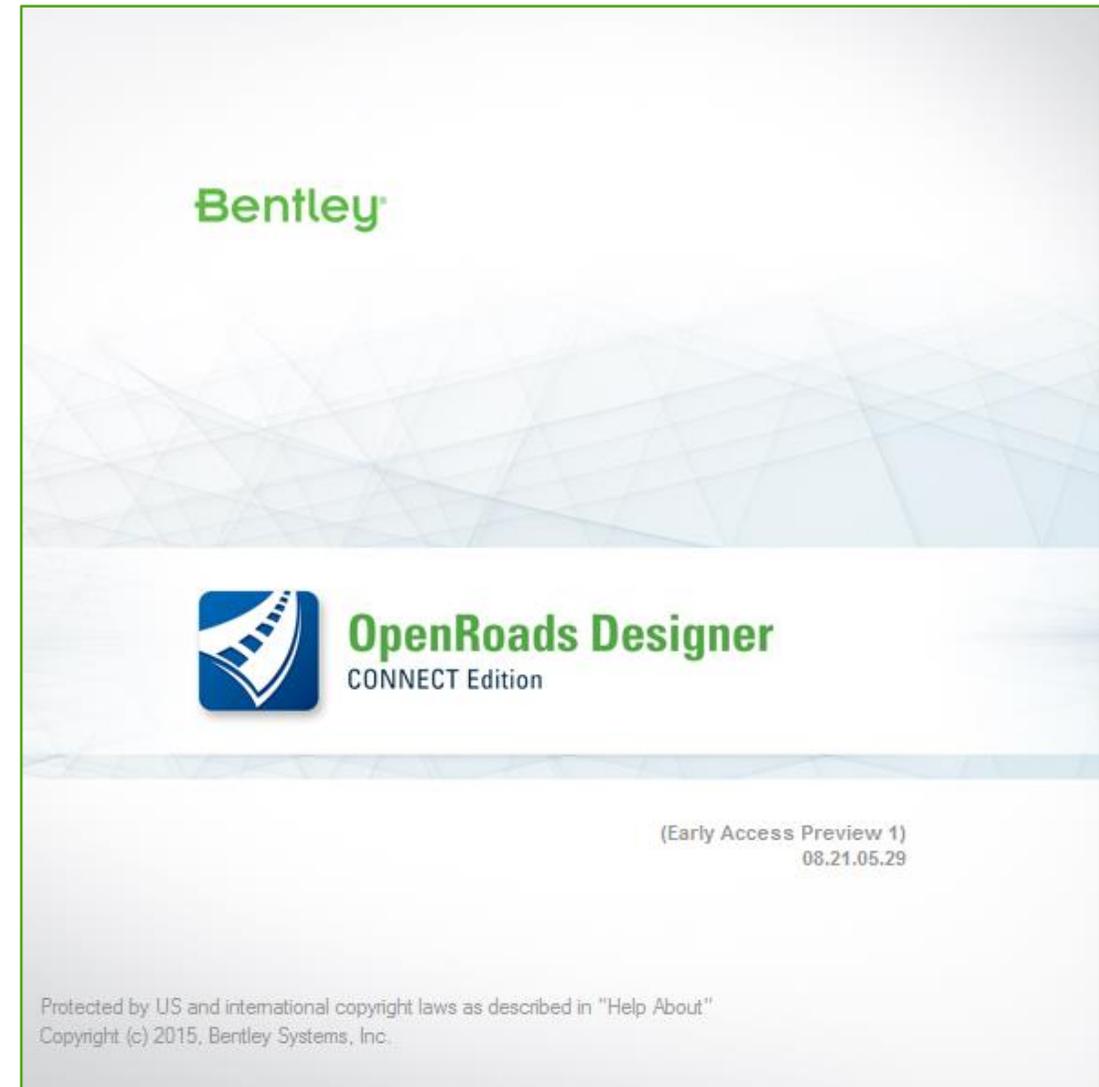
Superelevation Process

1. Create Superelevation Section

2. Create Superelevation Lanes

3. Calculate Superelevation

4. Assign to Corridor

Bentley®
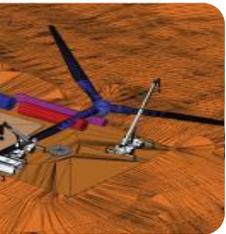
NEW Technology and Tools

One Step Superelevation

- When creating the Superelevation section(s), pick the Corridor instead of the Alignment
    - Creates Superelevation Sections
    - Creates Superelevation Lanes
    - Calculates Superelevation
        - Uses 'default settings'
    - Assigns to Corridor
        - *Corridor must be in the same file.*

Locate Corridor or Alignment

Bentley®
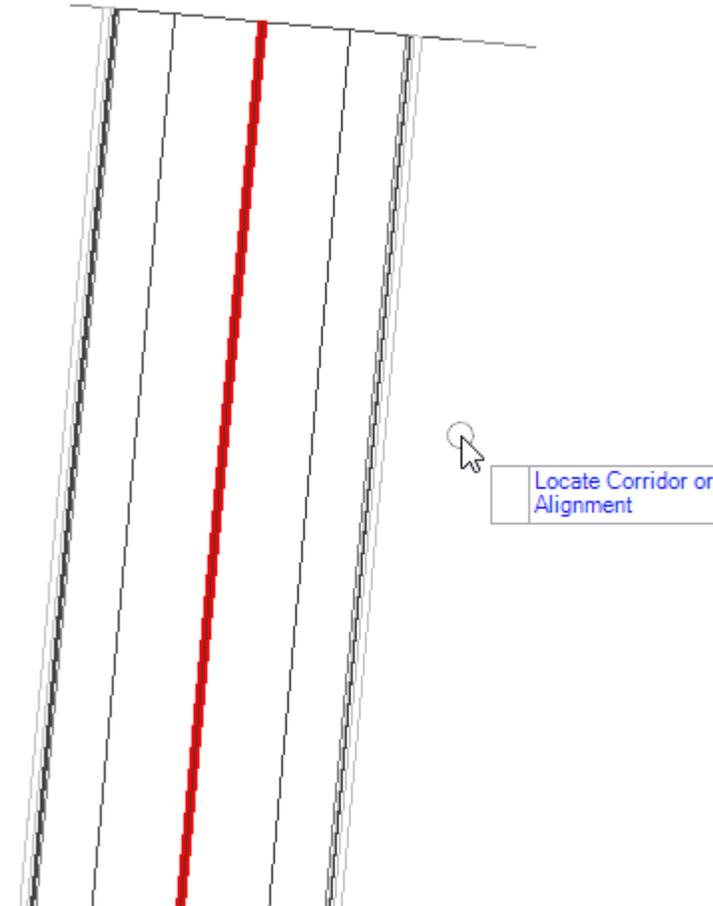
Superelevation Lanes by Template

Creates lane configurations based on templates

– Uses Superelevation points in template to identify lanes

Create Superelevation Lanes by Road Template

Bentley®
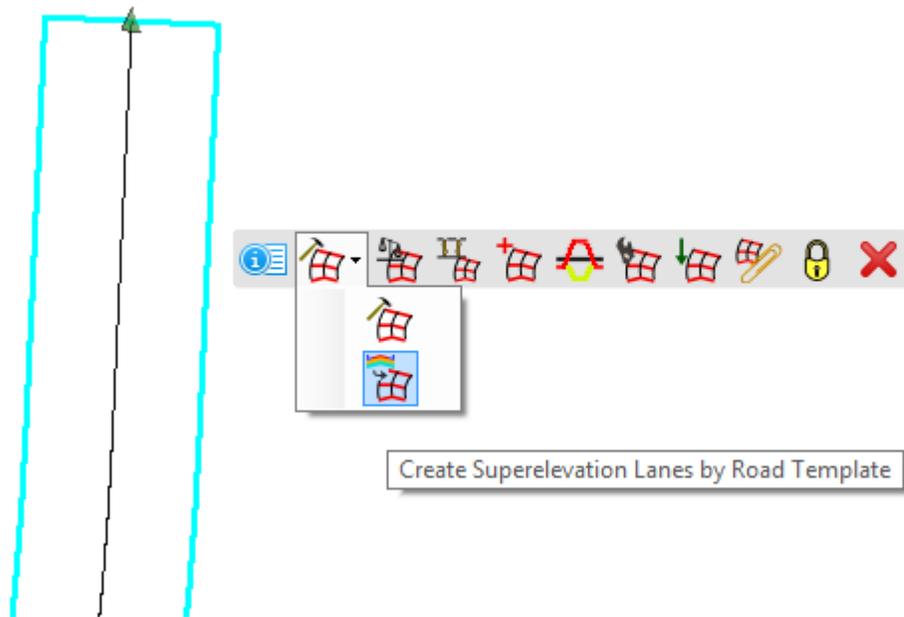
Pivot Methods

All Legacy Pivot Methods now supported
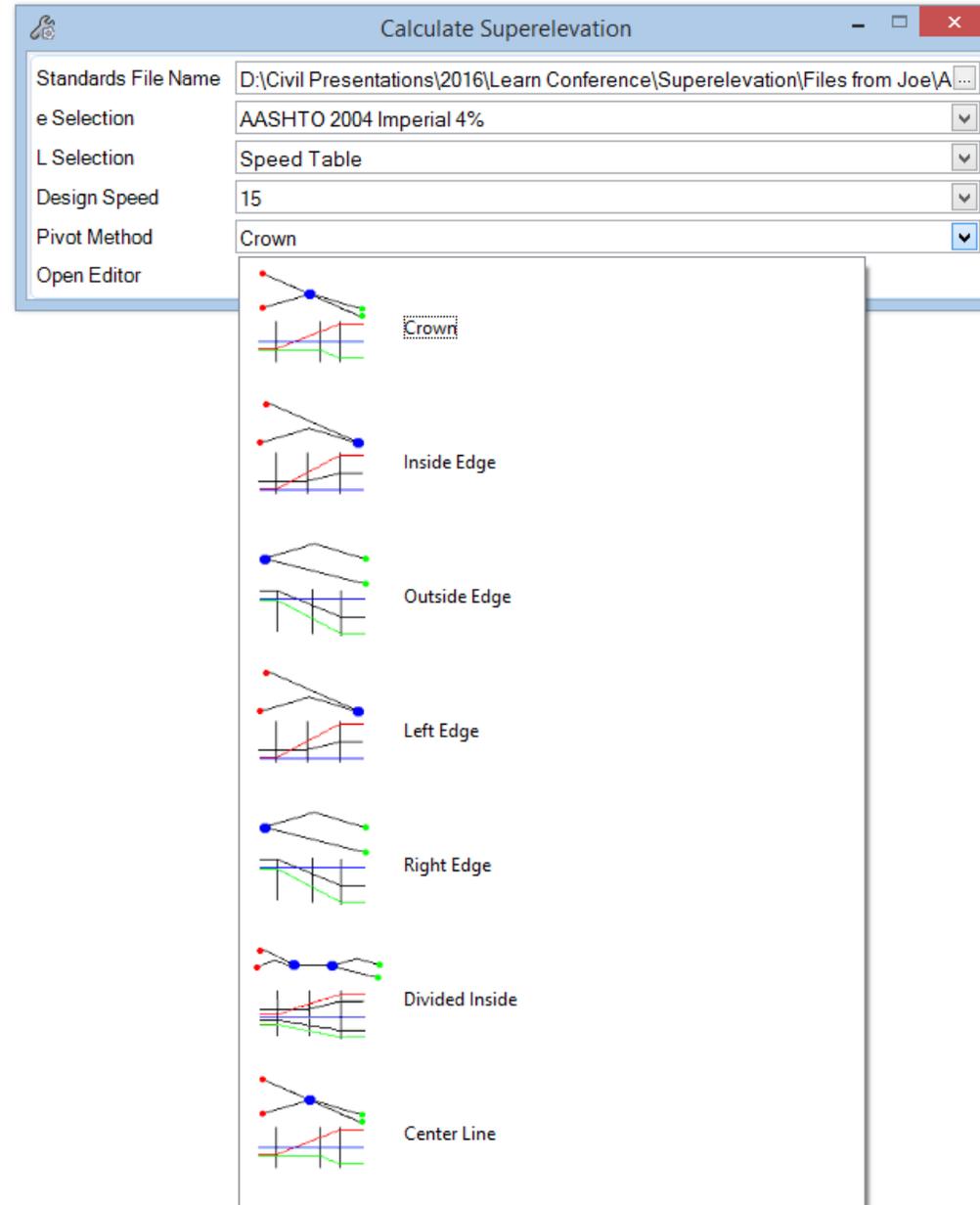
Superelevation Calculation Report

Superelevation Calculation Report

Report Created: Friday, November 4, 2016
Time: 5:18:22 PM

File Name:
Input Grid Factor: **Note:** All units in this report are in meters unless specified otherwise.

Section Name:	Lanes by Template-1
Base Horizontal Name:	
Standards Filename:	C:\ProgramData\Bentley\OpenRoads Designer CONNECT 10.00.00\Configuration\WorkSpaces\OpenRoads - Metric\Standards\Superelevation\Metric.xml
Design Speed:	120
Pivot Method:	Divided Inside
E Selection:	10%
L Selection:	Speed Table
Calculation Units:	meter

Lane Set:	1
Left Offset:	-40.66
Right Offset:	-33.34

Curve Set: 1	**Outside Lane: EOP_RM - CL_L**	**Start Station: 0+000.000**	**End Station: 0+000.000**

Global Variables:

NRotatedLanes	2.0
PivotType	5 (Divided Inside)
WidthLane	3.657607319
InitialCrossSlope	-0.0199999998961069
UseSpiralLength	false
PercentOnTangent	0.7
LengthsAreTotalTransition	false
UseRunoutLength	false
Radius	463

Superelevation Model

- Super Diagram in a managed model (*e.g. profiles, cross sections*)
- Editable
- Rules/Relationships

Bentley®
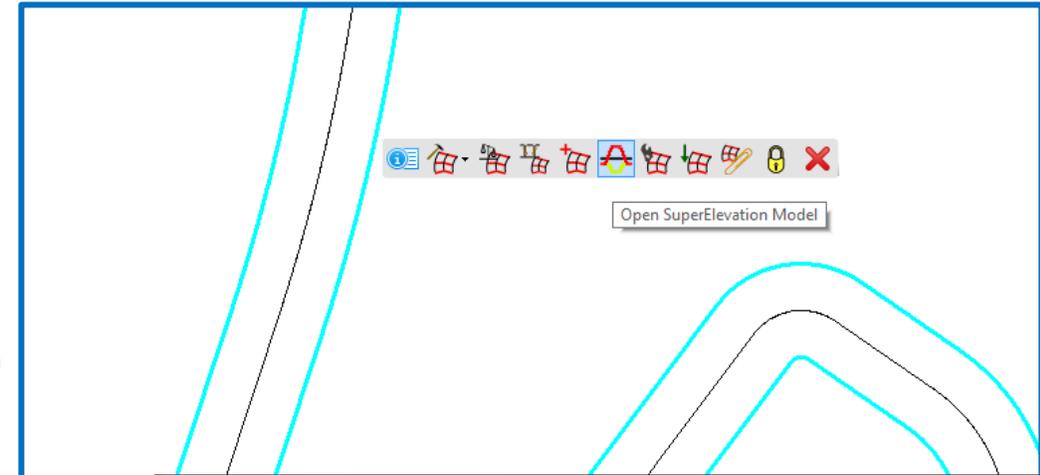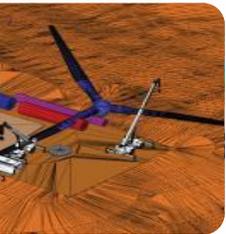
Superelevation Rules File

Superelevation Rules File

Replaces all former preference files
XML Format
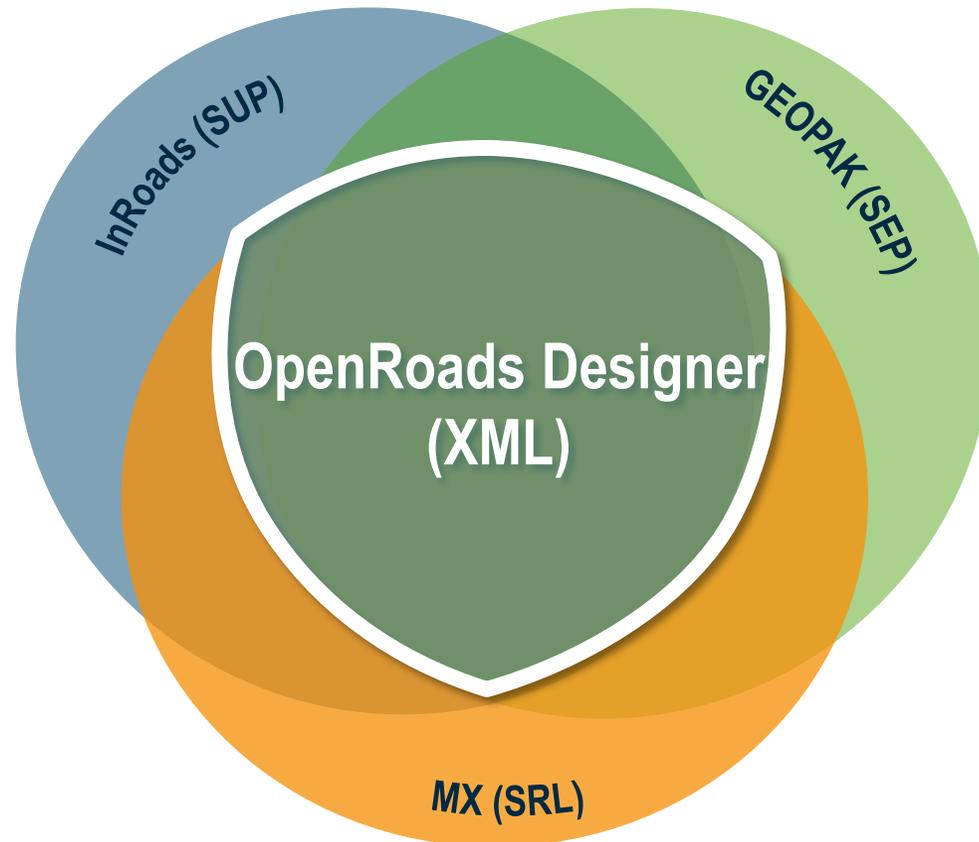
Superelevation Rules File

- **Everything** is in the XML
  - No other files required

- Edit through Interface or any XML editor

General

- Units
- Rounding Values
- Default Settings
  - *For "One Step" Superelevation*


```
<Units length="meter" stationRoundingValue="1" crossSlopeRoundingValue="0.01" />
<DefaultSettings eSelection="12%" lSelection="Speed Table" designSpeed="40" pivotMethod="Crown" />
```

Rate Calculations

Create Rate Tables

- – *Create Manually*
- – *Import from SUP or SEP*

Rate Calculations

Create Rate Tables

- – *Create Manually*
- – *Import from SUP or SEP*

Create Rate Equations

Transition Calculations

Create Transition Tables

- *Create Manually*
- *Import from SUP or SEP*

Create Transition Equations

Transition Options


```
<TransitionOptions interpolateTables="false" percentTransitionOnTangent="0.7" useSpiralLength="false" lengthsAreTotalTransition="false" transitionType=
"Linear" nonLinearCurveLength="0" startInsideLaneRotationWithOutside="false" />
<RunoutOptions isFixedLength="false" length="" />
```

Bentley®

Custom Key Stations

Default Cross Slopes
- ***Normal Crown*** *(e.g. 2%)*
- ***Flat*** *(0%)*
- ***Reverse Crown*** *(e.g. 2%)*
- ***Full super*** *(e.g. 6%).*

Custom Key Stations
- *Any cross slope*
- *For example, at 1%*

** Note: These can also be used in customized formulas

Bentley®

Custom Key Stations


```
<CustomKeyStations description="MTO customizations">
    <CustomKeyStation type="Custom" equation="" crossSlopeEquation="0.01" description="MTO 1% super points"/>
</CustomKeyStations>
```
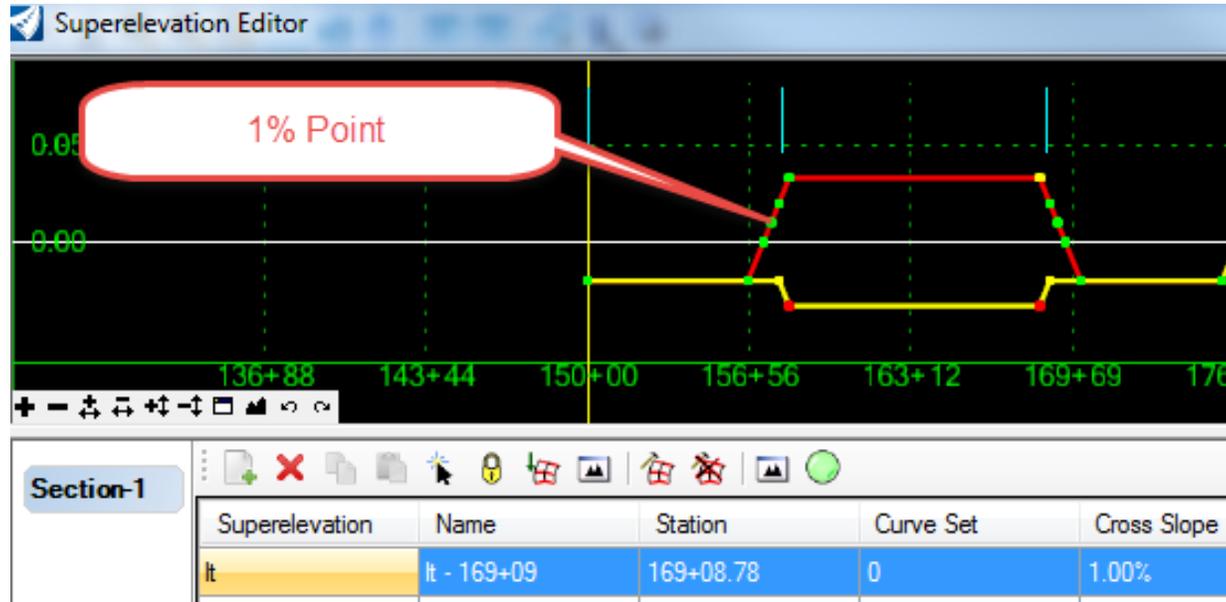
User Variables

Prompt the User for some value(s) before calculating the Superelevation?

- – *String*
- – *Integer*
- – *Decimal*
- – *Boolian*

Bentley®

Thank You

Have a great conference!

Bentley
Advancing Infrastructure