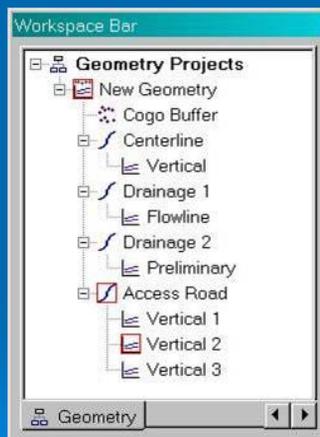




Geometry Intro - Objectives

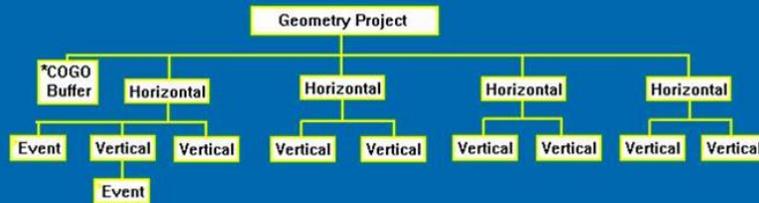
- An InRoads Geometry Project overview
- A look at the Geometry Project file Structure
- Opening and Creating Geometry Projects
- Horizontal Alignment layout tools and key-ins
- Viewing existing H. Alignments & Stationing
- Setting the start Station & Station Equations
- Saving the InRoads Geometry data
- Some other Geometry commands & tools

The Geometry Project



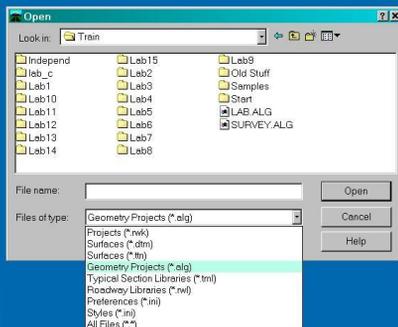
- The **Geometry Project** is where the COGO Point & Alignment information is stored and organized.
- It acts as a warehouse for all project geometry
- A single job may have more than one project associated with it

The Geometry Project Structure



- The overall Geometry Project contains:
 - The COGO Point Buffer
 - Horizontal Alignments
 - Vertical Alignments
 - Horizontal & Vertical Event Points

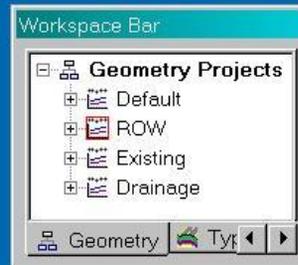
Loading a Geometry Project



- Use the *InRoads* > *File* > *Open* command to load an existing geometry file
- Always make sure that the *Files of Type* is set properly

Several Geometry Projects

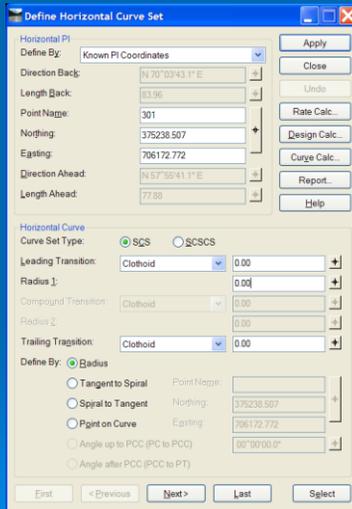
- Many Geometry Projects can be loaded in InRoads
- Each Geo Project has the complete Geometry file structure stored with it
- The 'active' Project defines the collection of Geometry that InRoads is actively working on
- Only the *active* geometry can receive input



Horizontal Alignments

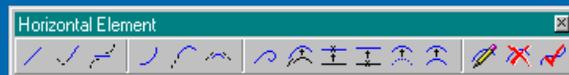
- Create the 'slot' in the Geometry Project
- Layout the Horizontal Alignment via
 - ▲ Horizontal Curve Set method (PI's)
 - ▲ Horizontal Element method (Elements)
 - ▲ Simplified Horizontal Element method
 - ▲ Traverse tools (Direction, Angle/Deflection, Curve)
 - ▲ Create Alignment by COGO Points
 - ▲ Regression Analysis
 - ▲ Import from Graphics
 - ▲ Import from an ASCII or .ICS file

Defining Horizontal Curves



- **Define Curve** from the *Horizontal Curve Set* toolbar will define & edit the horizontal curves
 - ⤴ Upper Portion Editor
 - ⤴ Lower area Defines Curve
 - ⤴ Spirals or not
 - ⤴ Curve & Design Calcs
 - ⤴ Undo (InRoads V8.3 only)

Horizontal Element Tools



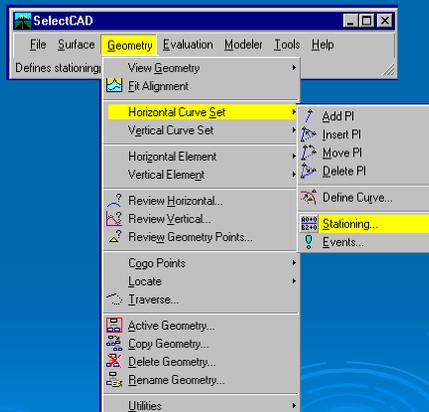
- **Horizontal Element** tools are another method for creating and editing horizontal alignments.
- These tools work with 'components' versus PIs
- **Discontinuities** refer to 'gaps' in a feature or alignment and are permissible in InRoads V8
- Layout the lab tangents using these tools if you feel like expanding your layout options.

Precision Key-ins

- Precision Key-ins are available in addition to location by data points in the CAD file
 - ♣ InRoads key-ins:
 - NE=northing, easting, {elevation}
 - DI=distance, direction [di=50.25,n90e]
 - SO=sta, off, elev, horiz align name, geo proj name
 - DO=easting offset, northing offset
 - ♣ CAD key-ins
 - XY=x-axis value, y-axis value, {z-axis value}
 - DX=delta x, delta y, {delta z}

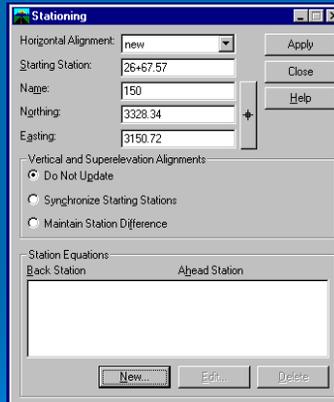
The Beginning Station

- The default start station is 0+00 for a new alignment
- Select *Geometry > Horizontal Curve Set > Stationing...* to access the Stationing dialog box



Defining the Beginning Station

- The upper portion of this dialog box enables you to define or redefine the **Starting Station**
- Consider the Vertical & Super Stationing if done
- Use the lower area to set any **Station Equations** along the alignment

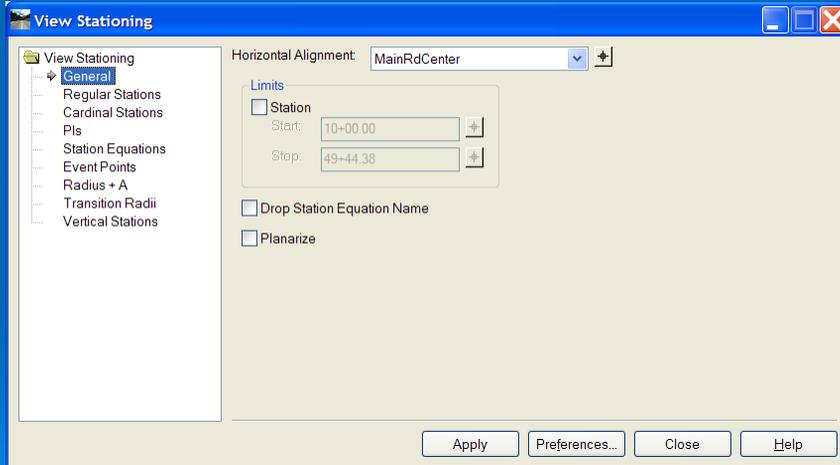


Display the Alignment Stationing



- Select **Geometry** > **View Geometry** > **Stationing...** to display the stationing along the horizontal alignment.

Display the Alignment Stationing



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Saving Your Data

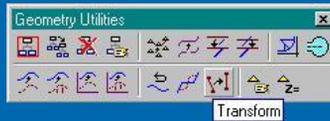
- Remember that while working in InRoads the Geometry Data is manipulated and stored in memory, not on the hard drive.
- Use the *File > Save > Geometry Project*, or *Save As* command to save your alignment data when it's appropriate



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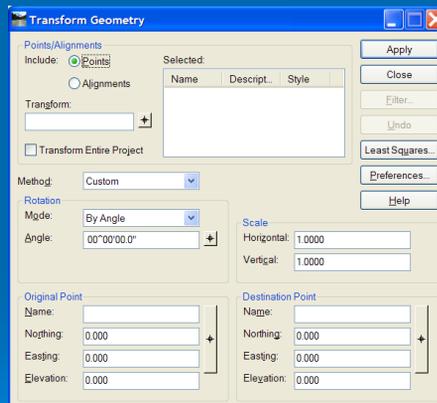
Transform



- Sometimes observations are collected and coordinates are processed using an assumed initial coordinate, you can translate the resultant points and alignments to the appropriate coordinate system by going to **Geometry > Utilities > Transform**

Transforming Geometry

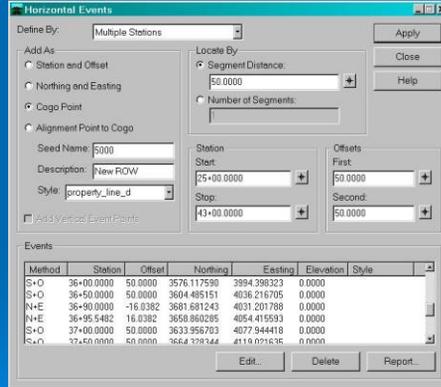
- Identify the Geometry to transform
 - Choose the *Filter* to select a portion of the geometry project
- The *Methods* allow you to convert to Metric or Imperial
- The H & V Scale factors are rigid body scaling, not warping.



Horizontal Event Points

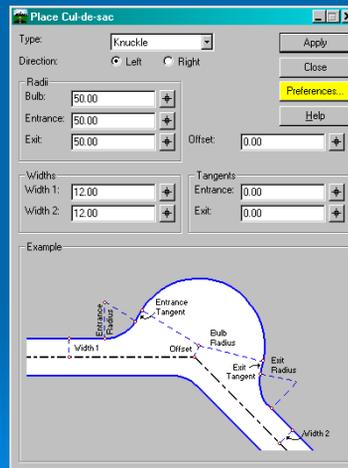
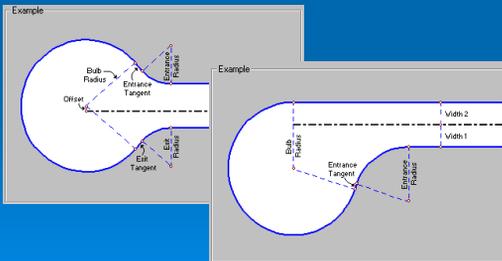


- Event Points: based on alignment data
- Points added as:
 - COGO
 - Station / Offset
 - Northing / Easting
- Single or Multiple points at a time



Laying Out Cul-de-sacs

- Cul-de-sacs are part of *Geometry Utilities*
 - Select the *Type*
 - Enter the dimensions
 - Follow the prompts

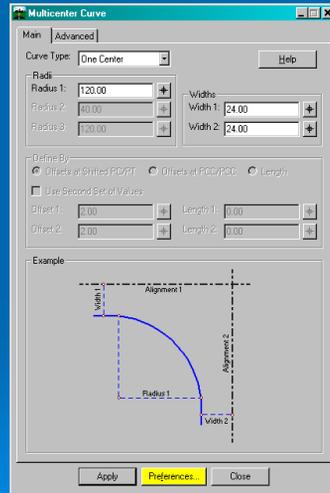
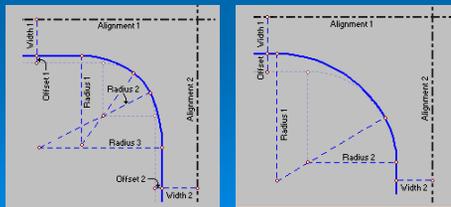


Placing Curb Returns

Geometry > Utilities > Multicentered Curve

- One Center
- Two Center
- Three Center

Enter Radius and Widths



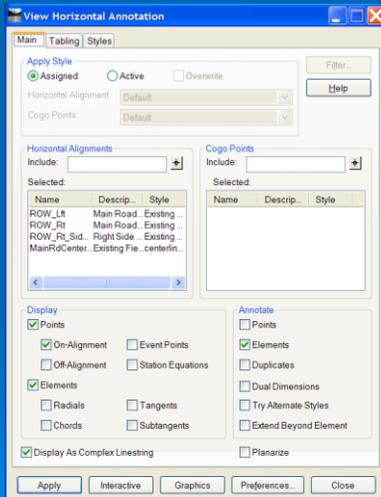
Other Geometry Utilities

Other Geometry Utilities will help to construct and work with Horizontal Alignments

- Join
- Trim Alignment
- Extend Alignment
- Partial Delete
- Transpose
- Parallel Horizontal by Element
- Parallel Horizontal by Station
- Assign names



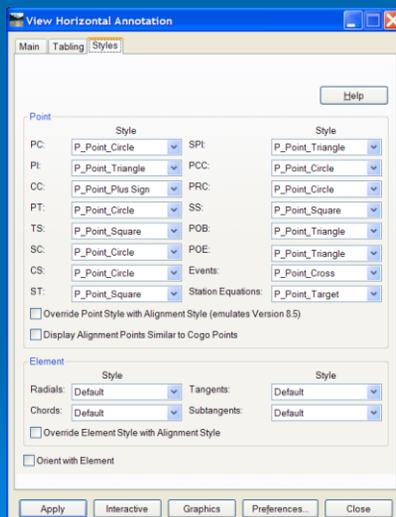
View Horiz. Annotation - Main



• The *View Horizontal Annotation* command displays Horizontal Geometry

- Style: Assigned or Active
- Cogo Points and / or Horizontal Alignments
- Identify items to *Annotate*
- Identify items to *Display*

View Horiz. Annotation – Styles

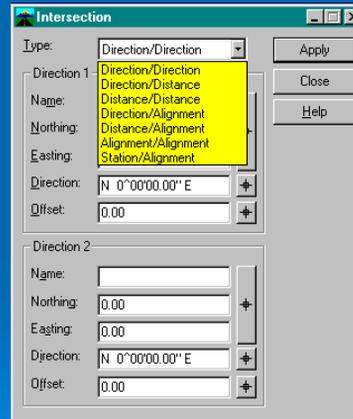


• The *View Horizontal Annotation* tool can display different Styles at the various horizontal key points

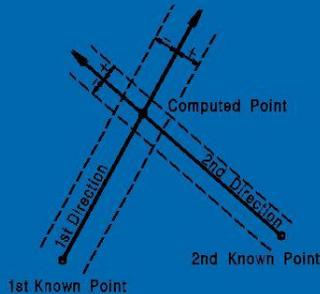
Intersection Commands

● *Geometry > Locate > Intersection commands*

- Direction / Direction
- Direction / Distance
- Distance / Distance
- Direction / Alignment
- Distance / Alignment
- Alignment / Alignment
- Station / Alignment



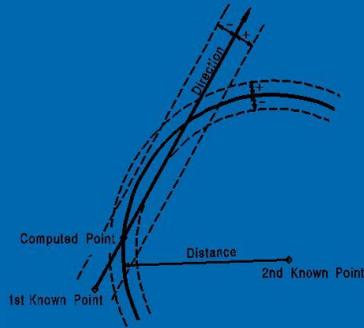
Direction / Direction Intersect



● *Direction / Direction*



Direction / Distance Intersect

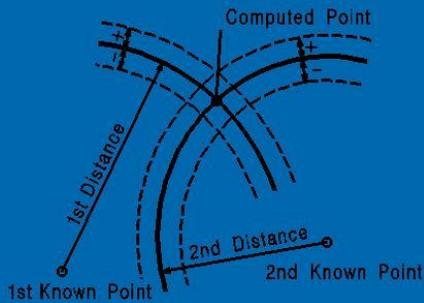


Direction / Distance

Direction	
Name:	1000
Northing:	3339.58
Easting:	3225.24
Direction:	N 82°23'28.57" E
Offset:	0.00

Distance	
Name:	253
Northing:	3359.39
Easting:	3316.29
Distance:	0.00
Offset:	0.00

Distance / Distance Intersect

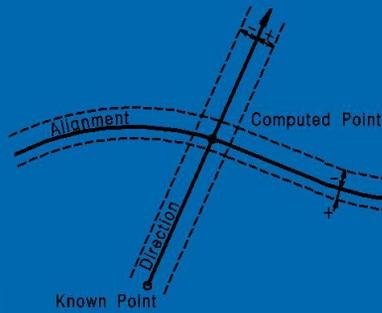


Distance / Distance

Distance 1	
Name:	1000
Northing:	3339.58
Easting:	3225.24
Distance:	100.00
Offset:	0.00

Distance 2	
Name:	253
Northing:	3359.39
Easting:	3316.29
Distance:	250.00
Offset:	0.00

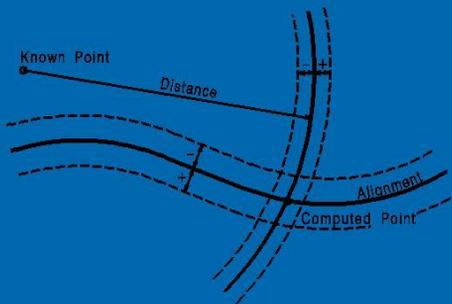
Direction / Alignment Intersect



Direction / Alignment

Intersection	
Type:	Direction/Alignment
Apply	
Close	
Help	
Direction	
Name:	1000
Northing:	3339.5770
Easting:	3225.2370
Direction:	N 0°00'00" E
Offset:	0.0000
Alignment	
Name:	new
Offset:	0.0000
<input type="checkbox"/> Extend to Intersection	

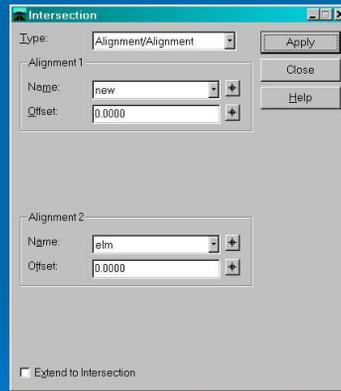
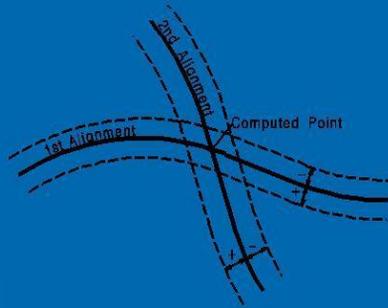
Distance / Alignment Intersect



Distance / Alignment

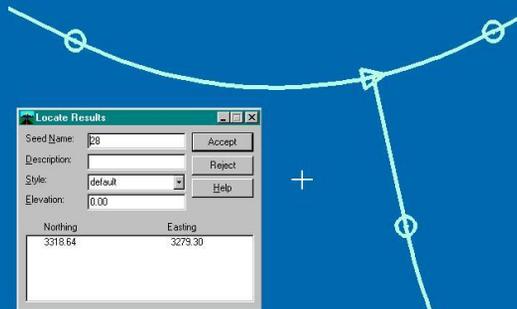
Intersection	
Type:	Distance/Alignment
Apply	
Close	
Help	
Distance	
Name:	1000
Northing:	3339.5770
Easting:	3225.2370
Distance:	125.0000
Offset:	0.0000
Alignment	
Name:	new
Offset:	0.0000
<input type="checkbox"/> Extend to Intersection	

Alignment / Alignment Intersect



Alignment / Alignment

Intersection Results



Temporary graphics are displayed showing the possible results prior to accepting the solution.

Geometry Intro - Summary

- InRoads Geometry is stored in a structured file
- All new components of the Geometry file are created under *File > New* (ie: G. Proj, H & V)
- **Horizontal PI's** can be set by precision key-in.
- Choose the appropriate geometry layout method, or use what you are comfortable with
- Once the Geometry is created you can:
 - **Display** the active alignment and its stationing
 - Reset the **beginning station** of the alignment
 - **Save** the alignment data to disk