# **Chapter 11 - Cross Sections**

Changes in template design and the data stored in the DTM have made it necessary to change the Create Cross Section dialog box. At the same time, the dialog box layout has been redesigned. To display a set of Cross Sections:

#### **Chapter Objectives:**

- Demonstrate the process of creating and displaying cross section
- Illustrate how to annotate a set of cross sections
- Describe updating cross sections

## **Creating and Displaying Cross Sections**

While completing the following steps, pay particular attention to the preferences and settings used to create and display cross sections. Understanding what preferences and settings to use whill save a lot of time.

- 1. Select Evaluation > Cross Section > Create Cross Section from the InRoads bar menu.
- 2. From the *Create Cross Sections* dialog box, <D> the **Preferences** button.
- 3. From the *Preferences* dialog box, highlight the desired preference and *<D>* Load.
- 4. **<D> Close** to dismiss the *Preferences* dialog box.

Create Cross Section	Set Name:	SH86			
I General Source	Create:	Window and Data 👻			
Include	Interval:	50.00 +			
Controls	Left Offset:	-80.00 +			
Layout	Right Offset:	80.00 +			
- Grid	Vertical Exaggeration:	2.0000			
Details	Show Data Outside Surfaces:	Bevation Range		Preferences	
	Object	Name		Name: 10H 5V 120' Wide	Close
	Default	Default	BYL	20H 10V 120' Wide 20H 10V 200' Wide	Load
	12345 existing gro 12345DES	un T_Existing Ground Default	BYL	40H 20V 160' Wide 40H 20V 240' Wide	Save
				40H 20V 240 Wide 40H 20V 320' Wide	Save A
	-	Prop	erties	Stacked 20 per column	Delete
		Prop	ciucs		Help
				Active Preference: CDOT	

- 5. Toggle on the surfaces to include in the cross sections.
- 6. Select *Include* from the dialog box explorer.

7. Verify that *Components* is toggled on.

reate Cross Section		
Create Cross Section General Source Controls Custom Layout Axes Grid Ottails ASCII	Surface Crossing Features Adjust Range Projected Features Ahead Band: 10.00 Back Band: 10.00 Components Annotation Volumes	
	Storm and Sanitary Crossing Structures Projected Structures Ahead Band: 10.00 Back Band: 10.00	
	Apply Preferences Close	Help

- 8. Toggle on other options as desired.
- **Note:** The user does not have the option to choose which features are displayed from this dialog box. All features from the selected surfaces that can be displayed will be displayed.
- **Note:** Annotate runs the Annotate Cross Section command using the preference specified in the Surface Properties for the annotation preference.
- **Note:** Volumes runs the End Area Volumes command using the Tools > Options > General > Preferred Preference as the preference for the volumes command.
- 9. Select **Controls > Limits** from the dialog box explorer.
- 10. Set the *Station Limits* as desired.

🚔 Create Cross Section				- • •
Create Cross Section General Source	Elevation High: Low:	0.00		
Controls	Station Start: Stop:	100+00.00 125+00.00	+ +	

11. Select Controls > Critical Sections from the dialog box explorer.

12. Toggle on the desired critical sections.

Keate Cross Section		
Create Cross Section General Source Include Controls Limits Critical Sections Fiant Display Custom Custom Axes Grid Grid	Horizontal Cardinal Points Horizontal Event Points Vertical Cardinal Points Vertical Event Points Superelevation Event Stations Template Entries Key Stations External Control Points	
Details		

- 13. **<D> Apply**, then **<D>** in the view window to place the cross sections.
- 14. **<D> Close** to dismiss the *Create Cross Sections* dialog box.

#### **Annotating Cross Sections**

Annotation from the *Create Cross Section* command is controlled by the preference defined in the surface properties. Use the *Annotate Cross Section* command to specify the data to display in the cross sections and how the data will be displayed.

- 1. Select Evaluation > Cross Section > Annotate Cross Section from the InRoads bar menu.
- 2. From the *Annotate Cross Sections* dialog box, *<D>* the **Preferences** button.
- 3. From the *Preferences* dialog box, Highlight the desired preference and *<D>* Load.
- 4. **<D> Close** to dismiss the *Preferences* dialog box.
- 5. Select the desired *Cross Section Set* from the drop down menu or use the target button.
- 6. Select Annotate Cross Section > General from the dialog box explorer.
- 7. Toggle on the surface(s) to annotate.

ross Section Set:	Surfaces Preference	+	
SH 86 🔻 🚽	12345 existing grourCDOT		
Annotate Cross Section	X 12345DES CDOT		
Points			
Segments			
Frame	Limits		
	Station Range		
	Start End		
	203+80.28 * 260+43.16	* *	
	Location		
	Object O Axis O Frame		

- 8. Select **Points** from the dialog box explorer.
- 9. Toggle on *Include Points* to display point annotation.

Annotate Cross Section									x
Cross Section Set:	V	Include Points							
SH 86 - +		Object	Position	Prefix	Suffix	Precision	Format	Name	
Annotate Cross Section		Leader							
General		Center	1	Gnd		0.1			
Points	$\boxtimes$	Offset	1	Off =		0.12			
· i General	$\boxtimes$	Elevation	-1	PG =		0.12			
- Segments		Station	1	Skew	S	0.1	\$\$+\$\$.\$\$		
Features		Skew Offset	1	Skew	C	0.1			
Frame		Description	1						
		ider Length: Offset Tolerance; Points from ASCII; Drop Station Equatio	n Name		0.00				
				Apply	/	Preferences	Close	e Help	•

- 10. Select **Segments > General** from the dialog box explorer.
- 11. Toggle on *Include Segments* to display segment annotation.

Mannotate Cross Section								×
Cross Section Set:	Include Points							
SH 86 🔹 🔸	Object	Position	Prefix	Suffix	Precision	Format	Name	
Annotate Cross Section	Leader							
General	Center	1	Gnd		0.1			
- Conts	Offset	1	Off =		0.12			
🕸 General	Elevation	-1	PG =		0.12			
- Segments	Station	1	Skew S		0.1	\$\$+\$\$.\$\$		
Features	Skew Offset	1	Skew C		0.1			
Frame	Description	1						
	Leader Length: Offset Tolerance: Points from ASCII: Drop Station Equatio	n Name	_	0.00				
			Apply	P	references	Close	e Help	,

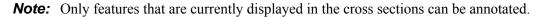
12. Select **Features > General** from the dialog box explorer.

H 86 👻 🚽	*	Object	Position	Prefix	Suffix	Precision	Format	Name	
Annotate Cross Section		Leader	120		2	12	10	5	
General		Offset	1	Off:		0.12			
Points	$\boxtimes$	Elevation	-1	Elev:		0.12			
Segments		Station	2	Skew S		0.1	55+55.55		
- Features		Skew Offset	1	Skew C		0.1			
🏟 General		Feature Station	1	Off:		0.12	5555.55		
Custom		Feature Name	1						
Annotate		Feature Description	1						
- Frame		Feature Style	1						
	1000	ider Length: Drop Station Equatio	n Name	10	.00				

13. Toggle on *Include Features* to display feature annotation.

- 14. Select Features > Annotate from the dialog box explorer.
- 15. Highlight the features to annotate.

ross Section Set:	Feature:	The second			1.41	Styles
	_	Style	Description	-	+	Filter
Annotate Cross Section		BC_CenCenterline	Created by roadway	1.000		
General		MA_Lift Centerline	Created by roadway			
Points		MA_Lift Centerline	Created by roadway			
Segments		MA_Lift Centerline	Created by roadway			
- Features	12345DES-L	T_ABCD_EOP	Created by roadway			
General	12345DES-L	T_ABCD_HINGE	Created by roadway			
	12345DES-L	T_ABCD_LANELINE	Created by roadway			
- 🌩 Annotate	12345DES-L	T_HMA D_EOP	Created by roadway			
Frame	12345DES-L	T_HMA D_EOP	Created by roadway			
	12345DES-L	T_HMA D_EOP	Created by roadway			
	12345DES-L	T_HMA D_LANELINE	Created by roadway			
	12345DES-L	T_HMA D_HINGE	Created by roadway			
	12345DES-L	T_HMA D_LANELINE	Created by roadway			
	12345DES-L	T_HMA D_EOP	Created by roadway			
	12345DES.L	T HMA D FOP	Created by madway	Ψ.		



- 16. **<D> Apply** to annotate the cross sections.
- 17. **<D> Close** to dismiss the dialog box.

## **Updating Existing Cross Sections**

Cross sections retain their association with the surfaces and features they display and therefore they can be updated as desired. Update Cross Section is used for three general situations; when the currently displayed data has changed, when new data is needed, and when currently displayed data needs to be removed from the sections. The process for updating cross sections is described below.

- 1. Select Evaluation > Cross Section > Update Cross Section from the InRoads bar menu.
- From the Update Cross Section dialog box, on the General leaf, select the Cross Section Set to be updated using the drop down menu or <D> the "target" button then <D> on the desired cross section.
- 3. Toggle on the desired *Mode*. These are:
  - *Refresh* used to update existing cross section data.
  - *Display On* used to add additional data to the cross sections.
  - *Display Off* used to remove data from the cross sections.
- 4. Set the *Station Range* as desired. To update the whole cross section set, toggle off *Station Range*. To update part of the set, toggle on *Station Range* and key in the desired *Start* and *Stop* stations.
- 5. If the data being updated has annotation, this can be modified as well. Toggle on **Annotation** in the *Update* area.
- 6. Features that fall above or below the cross section grid are not usually displayed. To display those features, toggle on **Show Features Outside Elevation Range**.

oss Section Set:	Mode: 💿 Refresh 💿 Display On 💿 Display Off	
H 86_2 👻	+ Start: 203+80.28 Stop: 260+43.16	
Update Cross Section  Update Cross Section  Suffaces  Components  Crossing Features  Projected Features  Storm and Sanitary	Limits Station Range Stat: 203+80.28 * Stop: 260+43.16 * Update Annotation Show Features Outside Bevation Range	

- 7. Select the **Surfaces** leaf.
- 8. Highlight the surface(s) to be updated.

Update Cross Section			
Cross Section Set: SH 86_2	Start: 203+80.28 Stop: 2	Display Off 60+43.16	
General General Components Consoing Features Projected Features Storm and Sanitary	Surface: Name 12345 existing ground 12345DES	Description Existing Ground from multi Created from roadway de	<b>∳</b>
		Apply Close	Help

- 9. If the surface to be updated is a design surface, Select the *Components* leaf.
- 10. In the *Surface* list, select the desired surface(s).
- 11. In the *Component* list, select the desired component(s). To select all of the components, <**R**> in the *Component* list and <**D**> **Select All**.

		sh 🔘 Display On 🤅	Display Off		
H 86_2 ·	+ Start: 203+80.3	28 Stop: 260-	+43.16		
Update Cross Section	Surface:				
General	Name		Description		
Surfaces Components Crossing Features Projected Features	12345DES	(	Created from roadway de		
Storm and Sanitary					
	Component:			_	
	Name	Style	Description	<u>^</u>	÷
	ABC	D_ABC_Class 6			
	HMA_Lift1 HMA_Lift2	D_HMA_Pvmt D_HMA_Pvmt			
		D_HMA_Pvmt			
		to D_SHOULDER-E		-	

To add or modify surface features in the cross sections, select the Crossing Features and/or the Projected Features leaves. Crossing features generally run parallel to the alignment. Typical crossing features are pavement features in the design surface, right of way lines, or utility lines. Projected features generally run perpendicular to the alignment. Typically, these are drainage structures or utility lines.

To display or update Crossing Features:

- 12. Select the Crossing Features leaf.
- 13. In the *Surface* list, select the desired surface(s).
- 14. In the *Feature* list, select the desired features(s). To select all of the features, <**R**> in the *Feature* list and <**D**> **Select All**.

	Mode: © Refresh + Start: 203+80.28 Surface:	Display On     Stop: 260+	) Display Off 43.16	
Update Cross Section General Surfaces Components Urossing Features Projected Peatures Storm and Sanitary	Name Default 12345 existing ground 12345DES	Name Description Default 12345 existing ground Existing Ground from multi		
	rodiaro.			] ]÷!
	Exterior Boundary SH 86-HMA_Lift1_Ce SH 86-LT_HMA_Lift1 SH 86-LT_HMA_Lift1 SH 86-LT_POSS	Exterior Boundary Centerline .D_EOP .D_LANELINE	Created by roadway d Created by roadway d Created by roadway d Created by roadway d Created by roadway d	
				Styles Filter

To add or modify projected features:

- 15. Select the Projected Features leaf.
- 16. In the *Surface* list, select the desired surface(s).
- 17. In the *Feature* list, select the desired features(s). To select all of the features, <**R**> in the *Feature* list and <**D**> **Select All**.

The Bandwidth sets the distance from the cross section station that data can be used for display. To set the Bandwidth:

- 18. Toggle on Redefine.
- 19. Key in the desired Ahead and Back values.

ross Section Set: SH 86_2  Update Cross Section	Mode: ⊘ Refresh	lay On 💿 Display Off top: 260+43.16	
General Surfaces Components Crossino Features Projected Features Storm and Sanitary	Name		
	Default 12345 existing ground 12345DES	g ground Existing Ground from multi Created from roadway de	
	Feature:		
	Name Style		Desc ^ 🔶
	T_Gas Line Low Pres T_Gas	Gas L	
	T_Gas Line Low Pres T_Gas	Gas L	
	T_Gas Line Low Pres T_Gas	Gas L	
	T_Gas Line Low Pres T_Gas	Line Low Pressure	Gas L +
	Bandwidth Ahead: 10.00	♦ O Use Existing	
	10.00	-	Styles
	Back: 10.00	♦	Filter
			<u> </u>

After making all of the desired settings:

- <D> Apply to execute the command, then <D> Close to dismiss the Update Cross Section dialog box.
- *Important!* Always use this command to turn off features displayed from a design surface before running Roadway Modeler and recreating the same surface. Otherwise, the features will not be recognized by the new surface and cannot be turned off or updated later.

#### Chapter Summary:

- Use the predefined preferences before changing the dialog box settings.
- Cross section annotation and volume data can be displayed when cross sections are generated. These options use the surface Preference and the Preferred Preference.
- Annotate Cross Section is used to add text data to the cross sections.
- Update Cross Section is used to redisplay modified data, add new data, and remove unwanted data from cross sections.