

GEOPAK

Cross Sections with Criteria

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WELCOME

- Please turn off/silence your cell phones.
- Questions???
 - Please feel free to ask questions as we...



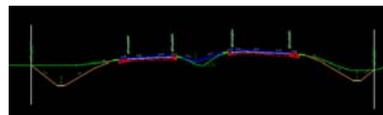
Objectives

- Define the Workflow for creating roadway cross sections using the GEOPAK Road tools through GEOPAK Project Manager and criteria files.
- Learn which GEOPAK Road tools to use and how they work.



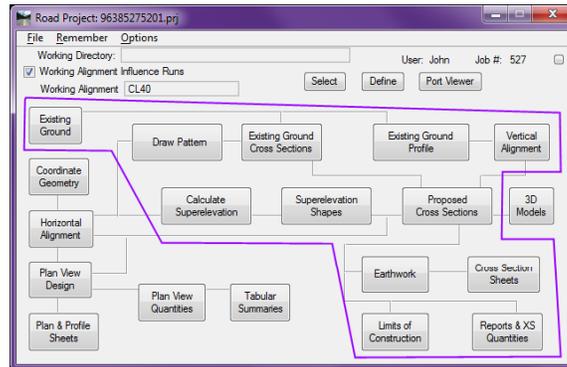
Basic Workflow

- Survey – DTM – Create GEOPAK “TIN” File
- Create Pattern Lines
- Cut Existing Ground Cross Sections
- Add Soil Boxes, High Water Elevations, Utilities, Labels
- Generate Existing Ground Profile
- Develop Proposed Profiles
- Create Shapes for Cross Slopes
- Run Proposed Cross Sections
- Generate Earthwork Quantities
- Cut Cross Section Sheets
- Cross Section Reports



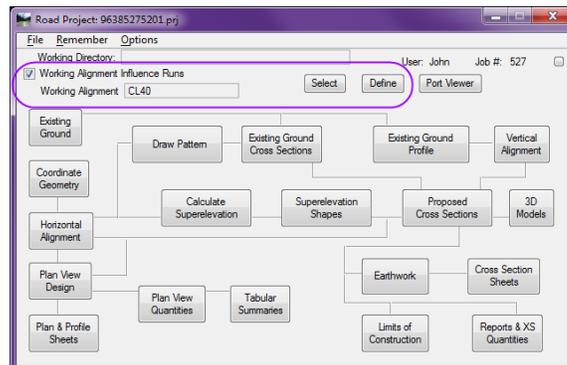
GEOPAK Project Manager

- Most of the tools needed for cross sections can be accessed through the Road Project dialog.



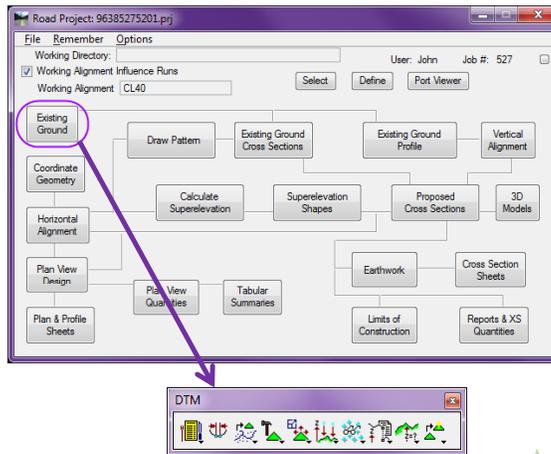
GEOPAK Project Manager

- Working Alignment
 - Used to populate the common project information found in the many tool dialog boxes.



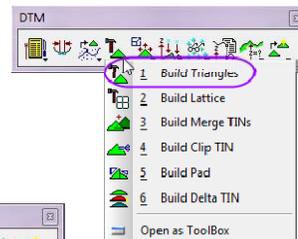
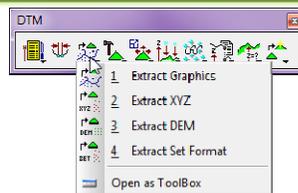
Create GEOPAK "TIN" File

- Existing Ground opens the DTM toolbar.
 - Contains the tools needed to convert the survey information (DTM or xyz data) into a tin (triangulated irregular network) file.
 - Used for the existing ground surface for other GEOPAK tools.



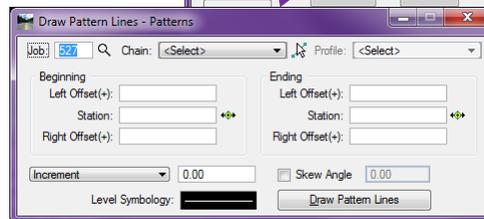
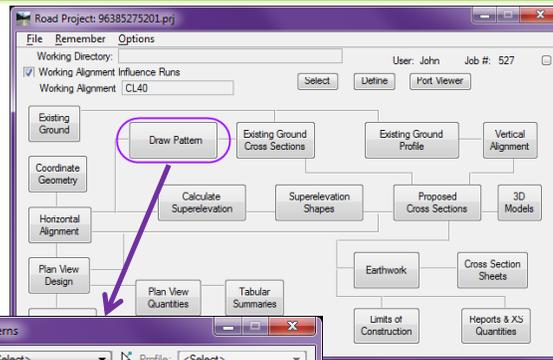
Create GEOPAK "TIN" File

- Most Common Method
 - Extract Graphics
 - Creates .dat file
 - Build Triangles
 - Creates .tin file
 - Load DTM
 - Used to view triangles or contours.



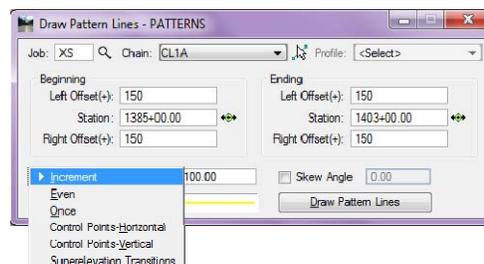
Create Pattern Lines

- Pattern Lines graphically define where the cross sections are to be cut.



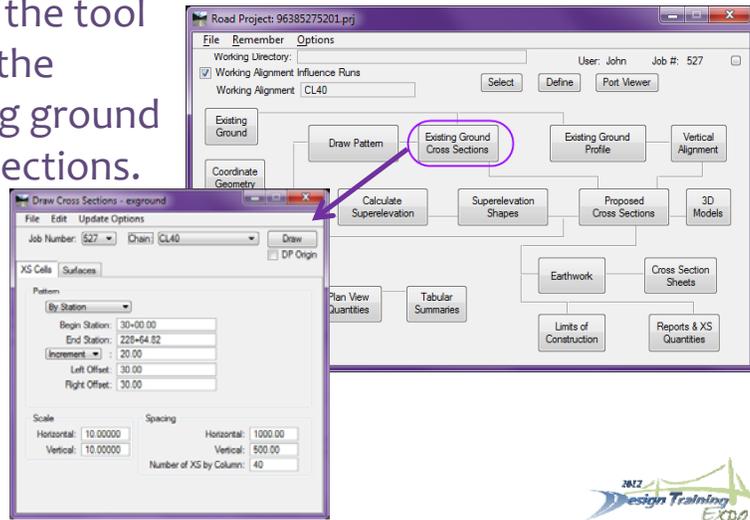
Create Pattern Lines

- Pattern lines can be cut individually, at incrementing stations, on even stations, and at control points from horizontal or vertical alignments and at superelevation transition points.



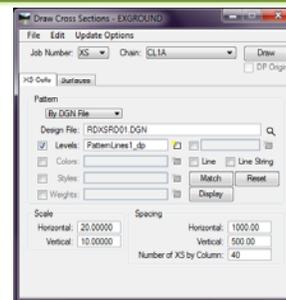
Cut Existing Ground Cross Sections

- Opens the tool to cut the existing ground cross sections.



Cut Existing Ground Cross Sections

- XS Cells defines the pattern line definition as well as the scale and spacing for the created cross section cells.

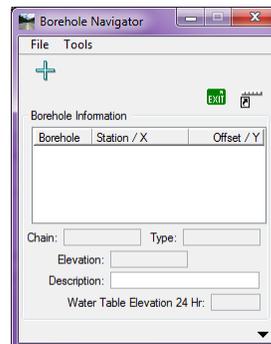
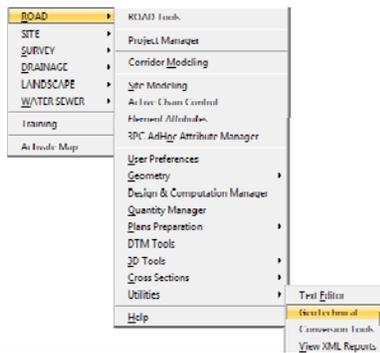


- Surfaces defines the tin file to use to cut the ground surface as well as the symbology to use. It is recommended to use the option for Line String.

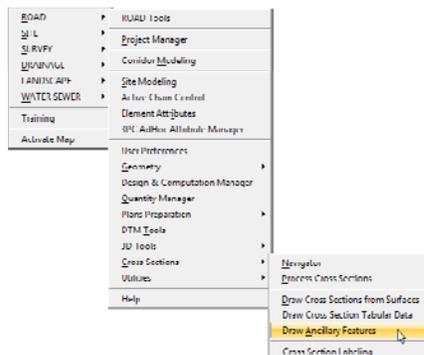
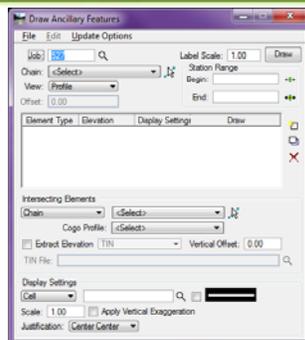


Add Soil Boxes & High Water Elevations

- Borehole Navigator
 - Tool NOT found on the Road Project dialog...
 - Accessed from Applications Menu or Road Tool box



Add Utilities & Labels

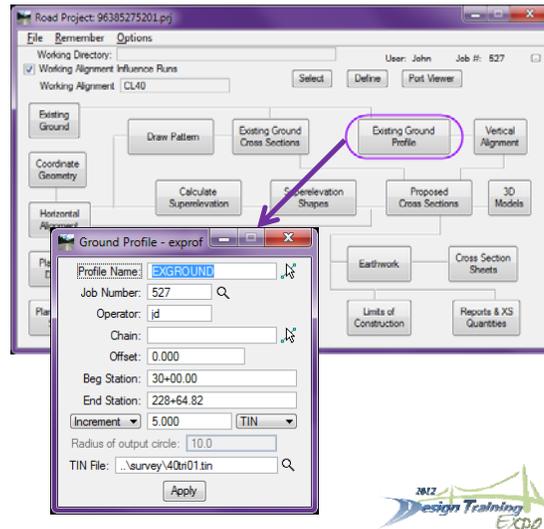


- Draw Ancillary Features
 - Tool NOT found on the Road Project dialog...
 - Accessed from Applications Menu or Road Tool box



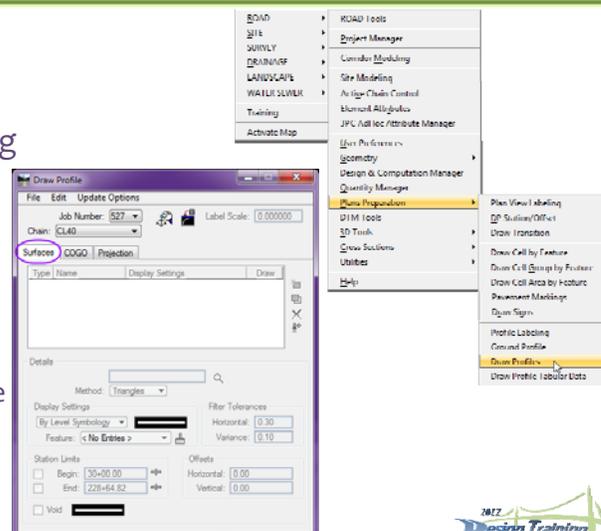
Generate Existing Ground Profile

- Option 1
 - Existing Profile can be generated using the Ground Profile Tool
 - Accessed through the Road Project dialog



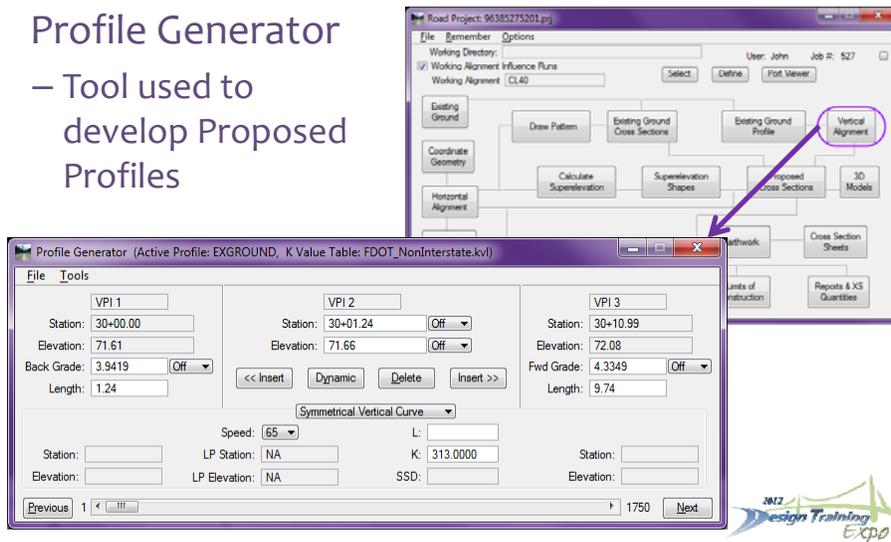
Generate Existing Ground Profile

- Option 2
 - Existing Profile can be generated using the Draw Profiles tool
 - Accessed through the Applications menu or Road Tool box
 - Existing Profile is generated from the Surfaces Tab



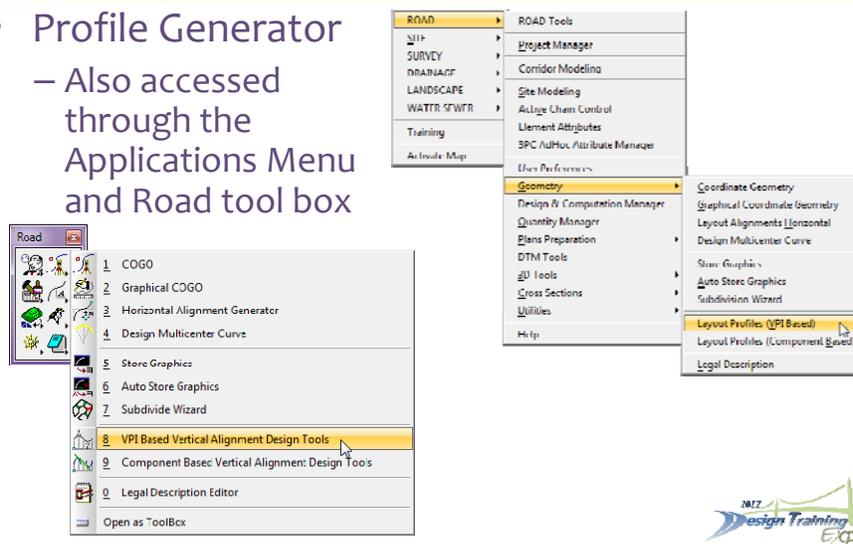
Develop Proposed Profiles

- Profile Generator
 - Tool used to develop Proposed Profiles



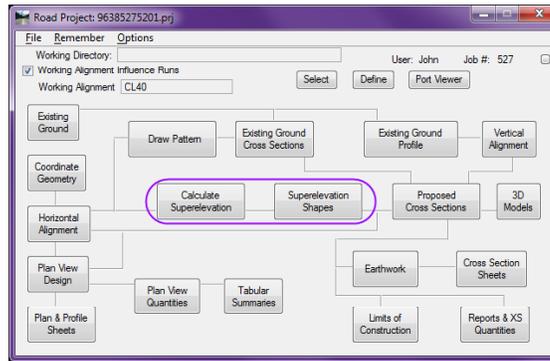
Develop Proposed Profiles

- Profile Generator
 - Also accessed through the Applications Menu and Road tool box



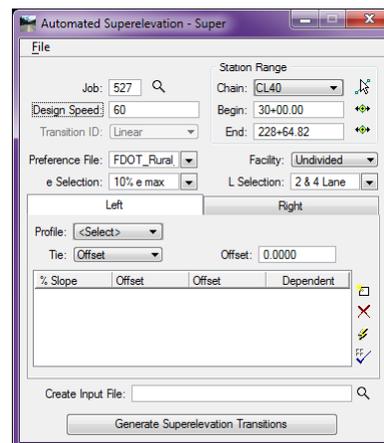
Create Shapes for Cross Slopes

- Tool locations
 - Road Project dialog
 - Applications Menu under Cross Sections
 - Road tool box



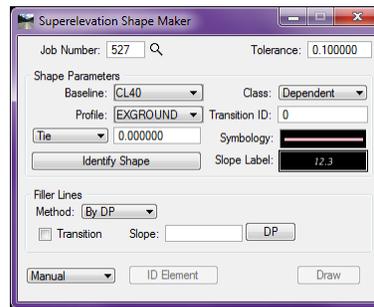
Create Shapes for Cross Slopes

- Option 1
 - Automated Superelevation
 - Calculates the superelevation and transitions
 - Generates shapes for the entire alignment
 - Recommended for the main travel lanes



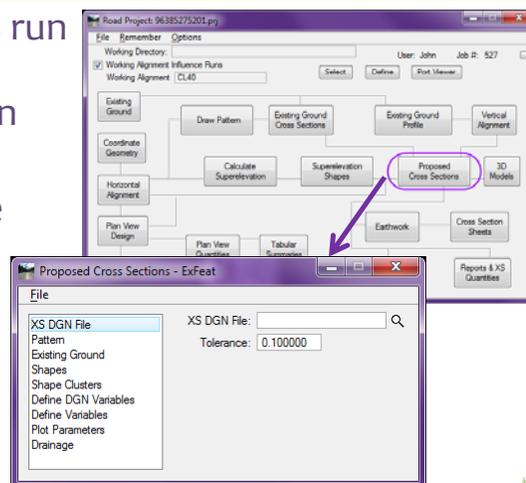
Create Shapes for Cross Slopes

- Option 2
 - Superelevation Shape Maker
 - Must manually calculate the superelevation and transitions
 - Recommended for turn lanes or other sections not typical to the entire project



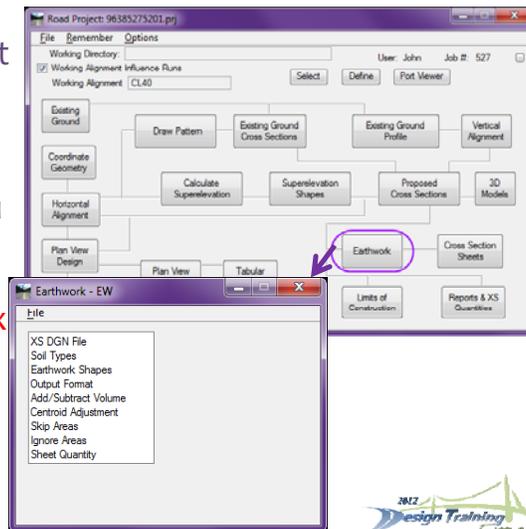
Run Proposed Cross Sections

- The FDOT Criteria is run through the Typical Section Generator in Project Manager.
- 5 typicals to choose from:
 - Draw_ROW
 - Existing_Features
 - Proposed_Features
 - Div_ExSlope
 - Undiv_ExSlope



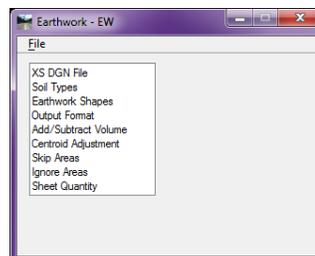
Generate Earthwork Quantities

- Accessed through GEOPAK's Road Project Manager
 - Road Project dialog
 - Road Project Manager Task Menu
 - **NOTE: Accessing the tool through the Road Toolbox will not work.**



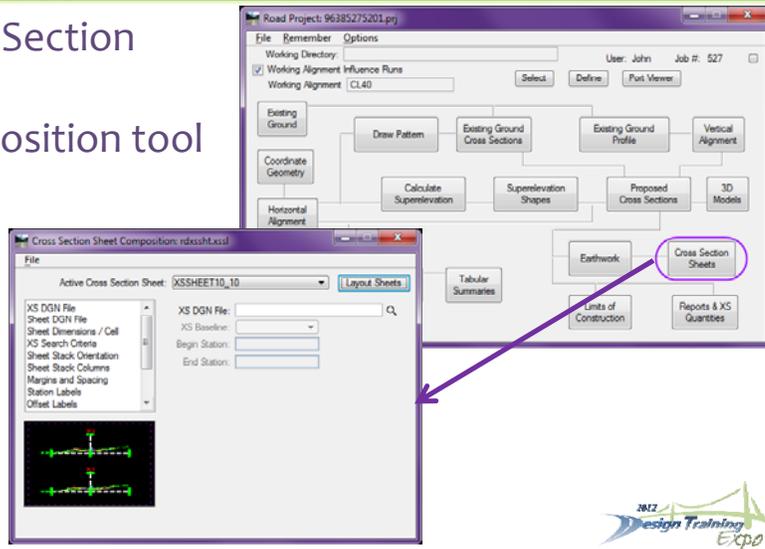
Generate Earthwork Quantities

- Uses end area method to calculate quantities
- Generates a text file that can be used with the Cross Section Sheet Composition tool to place earthwork quantities on the sheets



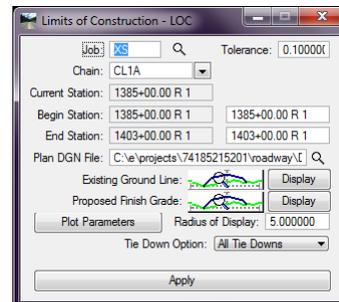
Cut Cross Section Sheets

- Cross Section Sheet Composition tool



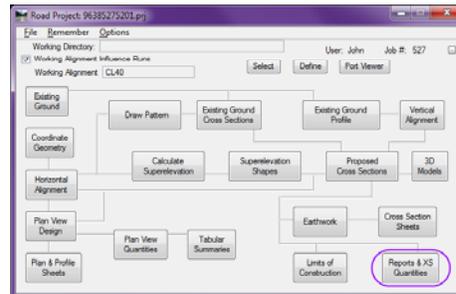
Limits of Construction

- Tool used to draw the limits of construction into the design view
- Different symbology can be defined to draw the lines representing the cut and fill sections along the project.



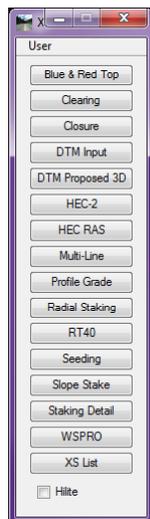
Cross Section Reports

- There are many cross section report tools provided with GEOPAK. Only a few are used by FDOT.



Cross Section Reports

- There are many cross section report tools provided with GEOPAK. Only a few are used by FDOT.
 - Clearing Report
 - Useful for obtaining clearing & grubbing quantities
 - DTM Proposed 3D Report
 - Generates xyz data for break lines at each cross section to build a tin and 3D model
 - Multi-Line Report (Most commonly used)
 - Used to create GEN files for Construction
 - Profile Grade Report
 - Prints high and low point elevations for existing and proposed grades
 - Searches sections for low points or text string to generate horizontal & vertical alignments and stores directly into GPK file.
 - Seeding Report
 - Provides seeding slopes distances and calculates area.
 - Slope Stake Report
 - Generates reports with offsets and elevations as well as superelevation information.



More Information

- More information on the tools covered in this session can be found in the FDOT GEOPAK for Roadway Designers – Advanced course manual.

<http://www.dot.state.fl.us/ecso/downloads/documentation/AdvancedGEOPAKforRWDesigners/AdvancedGEOPAKforRWDesigners.shtm>



Questions???



Thank-you for joining today's session.

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<http://www.dot.state.fl.us/ecso>

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