Creating 3D Design Deliverables from ORD

Introduction

Procedures for creating the digital design handoffs, specifically the alignments and surfaces, used in bidding and construction from InRoads are well understood. The different structure of the engineering data in ORD requires a new set of procedures.
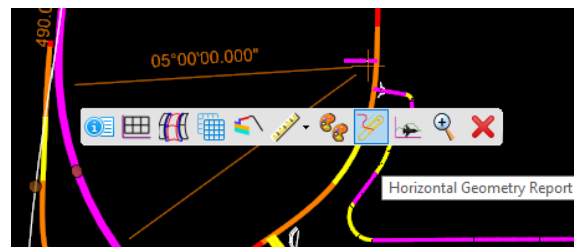
Alignments

Reports

Reports for alignments can be created three ways: from the Civil Context menu, the right-click menu or the Reports tool on the Home and Geometry tabs.
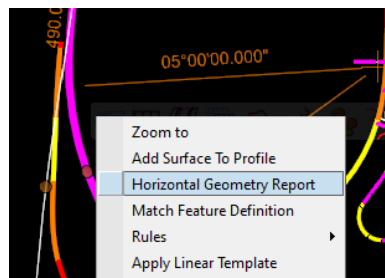
Civil Context Menu

Select the alignment and hover over it. The Civil Context menu will appear shortly. Select the Horizontal Geometry Report tool; it looks like a paper clip with a red, squiggly line. This will bring up the Report Browser where you can select the desired report stylesheet. Report stylesheets that include the vertical alignment will include the active profile.
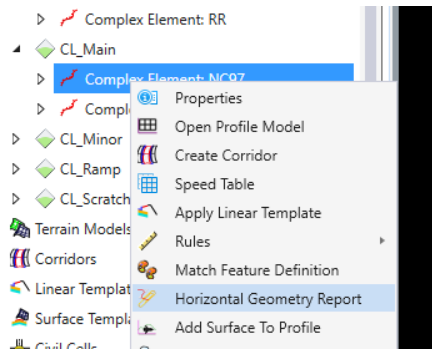

Right-Click Menu

Right-click on the alignment (it does not need to be selected) and select Horizontal Geometry Report. This will provide the same results as the Civil Context menu method.
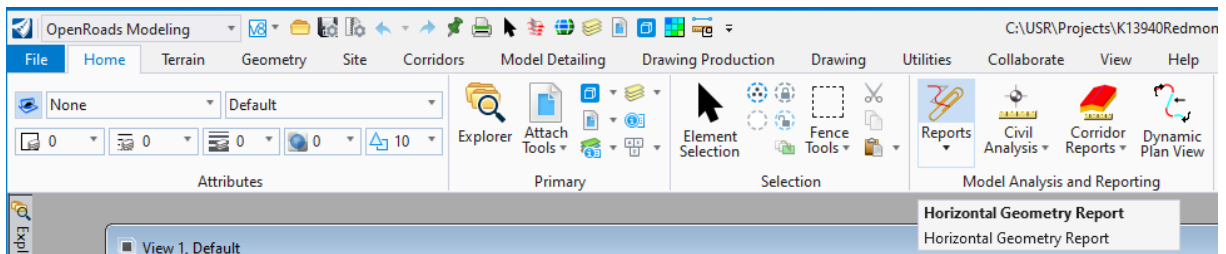

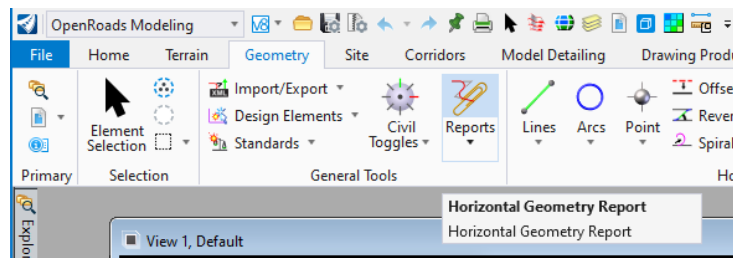A twist on this method is to right-click on the alignment in Explorer.

Reports Tool

The Reports tool can be found in the Model Analysis and Reporting group on the Home tab and the General Tool group on the Geometry tab.
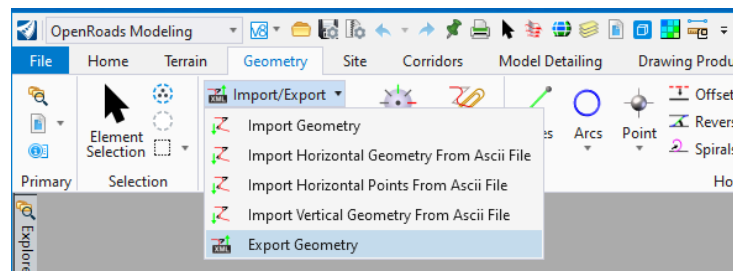

Unlike the other methods, the Reports tool allows reporting on multiple alignments and can include selected profiles, event points and interval-based reports. Alignments can be selected one-by-one after invoking the command or a set of alignments can be selected before invoking the command.

LandXML

In the General Tools group, on the Geometry tab, select Export Geometry from the Import/Export dropdown. Alignments can be selected in one of two ways: create a selection set before invoking the command or select the alignments during the export process.

Check or uncheck the "Only Active Profiles" box as desired. There is no option for no profiles. Follow the heads-up prompts:

1. Select LandXML as the export type.
2. Select the alignments to export.
    a. If a selection set is active, there is a prompt to accept the selection set.
    b. Otherwise, select the desired alignments and reset when selection is complete.
3. Select the LandXML version to use. Any version will work for alignments.
4. Save the file.

All of the selected alignments are exported into a single file. If individual files are desired for each alignment, go through the process selecting only one alignment at a time.
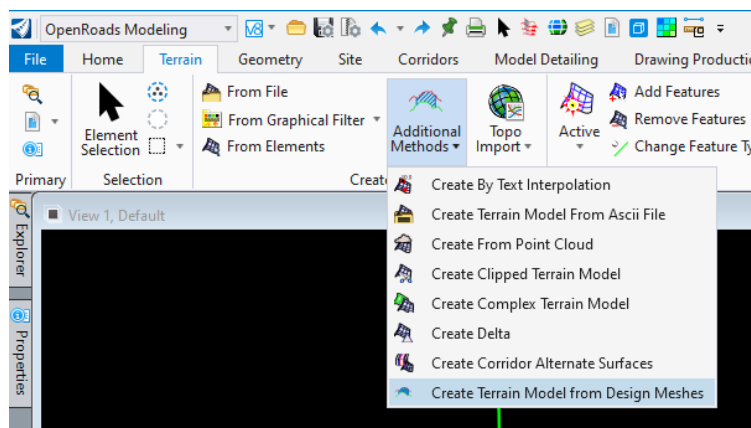
Design Terrain Models

Two types of design terrain model data are need for estimating and construction: features and triangles. Features – breaklines, random points and boundaries - are the source data used to create a terrain model. They are used for estimating linear items such as curb, striping and guardrail and for automated guidance of linear roadwork such as grading and paving. Triangles are calculated elements that define the shape of a terrain model. They are used for estimating area and volume quantities and for automated guidance of site work such as ponds, landscaping and intersections.

ORD's modeling process does not create design terrain models directly. Use the tools in the Create section of the Terrain tab to create a terrain model. In general, a design terrain model can be created from graphics, from a corridor or a combination of the two.

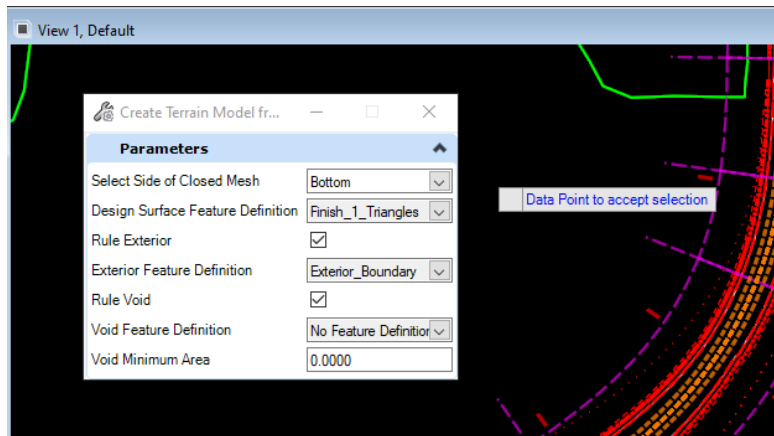## Creating a Design Terrain Model from a Corridor

Ideally, design terrain models are created in separate files from the corridors. The corridor and associated files (geometry, superelevation, target terrains, etc.) must be attached to the file in which the design terrain models are being created. The corridor is processed in the active file ignoring the display settings of the corridor feature definition.

Create Terrain Model from Design Meshes

This method creates a triangulated terrain model of either the top mesh or bottom mesh of the corridor. This is essentially the surface seen by looking straight down or up, respectively, to the corridor. The

only features that can, optionally, be created with this method are exterior boundaries and voids. Other than those features, the terrain model is simply triangles. Mesh edges are treated as breaklines so additional breaklines to control triangulation should not be required.
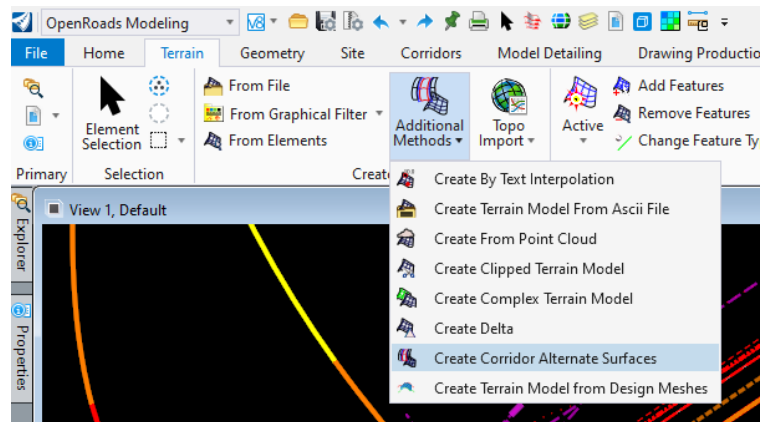

The name of the design terrain model comes from the default name defined in the feature definition. Likewise, the names of the exterior and void features are named based on the defaults defined in their respective feature definitions.

The terrain model is not ruled to the corridor so it does not update when the corridor is modified.

The confirmation prompt to accept selected corridors is a red herring. At no time during execution of the command is an opportunity given to make a selection. The command will process all attached corridors and create a single terrain model.

Create Corridor Alternate Surfaces

This method creates design terrain models for each of the alternate surfaces defined in the corridor. The terrain model is ruled to the features in the corridor (**not** displayed graphics) and is updated when the corridor is modified. The terrain model is triangulated solely from the linear features and does not include a boundary. Transverse features and boundaries can be added but, since they are not ruled to the corridor, they

will need to be updated manually whenever the corridor is modified. Due to limitations of the software, features can be assigned to only one alternate surface. Some features, such as the subgrade shoulder, are normally part of more than one surface. Those features can be added graphically, either individually or via a graphical filter.

There are no options for this command and the only prompt is to identify the corridor. Once selected, the corridor is processed and the surfaces are created with no feature definitions. If the corridor targets the <Active Surface>, then the appropriate surface must be active in the current design file. Assign

feature definitions after creating the design terrain models. The terrain model names are automatically created using the format *corridorname.altsurfacename* – e.g., "Main.SG" or "Main.AB ". There is no option to limit which surfaces are created

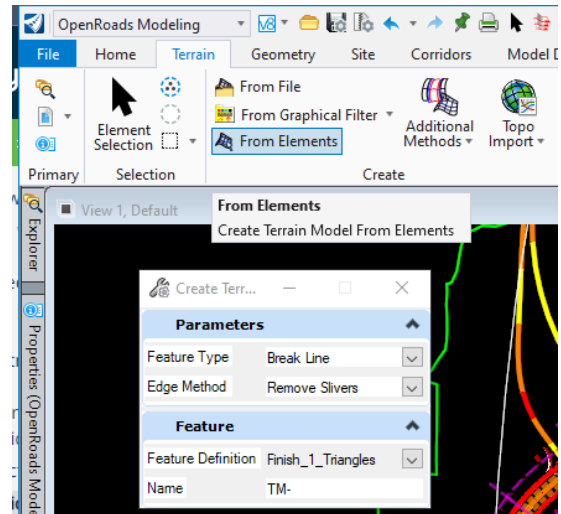## Create Design Terrain Model from Graphics

Design terrain models can be created by importing graphical elements from the active file or a reference. Terrain model features will be ruled to the graphic elements and will update when the graphics are modified.

Create a Terrain Model from Elements

This tool is used to create a terrain model from individual elements or from a MicroStation selection set.

Set the feature definition and assign a name in the tool box; there are no prompts for these fields. The default name is controlled by the feature definition but any name can be assigned in the toolbox. Select the desired elements and reset when done. Alternatively, create a MicroStation selection set before invoking the command and accept the selected elements when prompted. The command will then prompt for feature type and edge method before creating the new terrain.

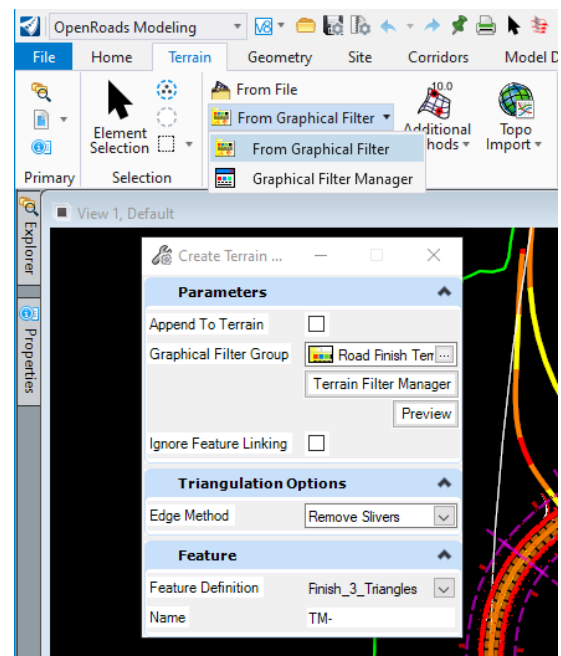This tool cannot be used to modify an existing terrain.

Create a Terrain Model from Graphical Filter

This tool is used to create a terrain model from a group of elements meeting criteria previously defined in a graphical filter.

Set the feature definition and assign a name in the tool box; there are no prompts for these fields. Select "No" when prompted to append to a terrain. In the toolbox, select the desired graphical filter or filter group. The "Preview" button will highlight the elements meeting the filter criteria. After selecting the triangulation edge method, data point to accept the selected elements. The feature type is established in the graphical filter so there is no prompt.

Take note, this command does not respect level visibility or reference clipping or masking. It will select all elements in the current model and its displayed references meeting the filter criteria.

If using this command to add features to a terrain, select "Yes" when prompted to append to a terrain. Then either select the existing terrain graphically or pick it
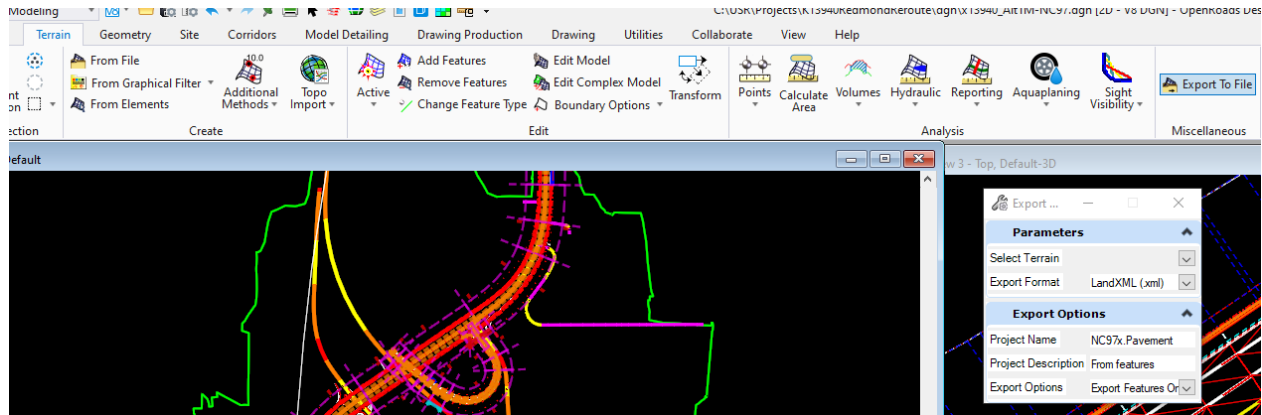
from the drop-down list in the toolbox. The remainder of the workflow is the same. The terrain feature definition and name fields are ignored.

LandXML

The export process can be started in one of three ways: from the Export To File command found in the Miscellaneous group on the Terrain tab, Civil Context menu or the right-click menu.

Export to File

Select the Export To File command from the Miscellaneous group on the Terrain tab. Identify the terrain for export and the export format.
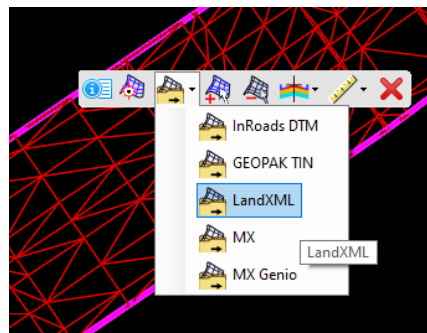

Enter a project name and project description for the exported data; the fields default to the last values used.

Select the export option: triangles only, features only or both. The method of design surface creation will determine what information is available for export. Triangles can be exported from any terrain model but some terrains have few, or even no, exportable features. A surface created from a mesh may contain no features. At most, it can have exterior and interior boundaries. If a terrain model is created from lines and points, those features can be exported. Further, if the terrain model is ruled to either graphics or a corridor, those features are exported with names and feature definitions included
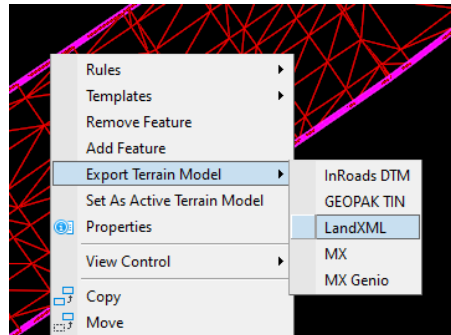
Civil Context Menu

Select the terrain and hover over it. The Civil Context menu will appear shortly. Select LandXML from the Export Terrain Model tool drop-down.

Right-Click Menu

Right-click on the terrain (it does not need to be selected) and select LandXML from the Export Terrain Model drop-down. This will provide the same results as the Civil Context menu method.

A twist on this method is to right-click on the alignment in Explorer.

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