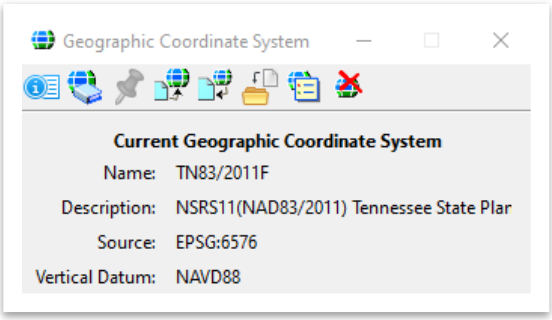
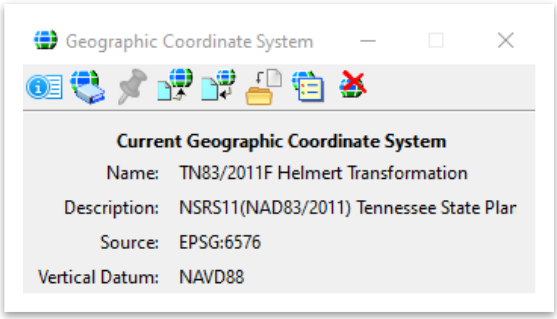
Workflow for Converting DGN Files from Project Datum to State Plane Coordinates in ORD

The following is a workflow to convert ORD design files from **project datum** to **state plane coordinates**. Once converted to state plane coordinates, the design file can be used in GIS systems, Google Earth, or other applications based on state plane coordinates. The same workflow shown below can be used to convert ORD design files from state plane coordinates to project datum by using the datum adjustment factor (**DAF**) instead of the inverse of the DAF in Step 5 and reprojecting the data as shown in Step 9.

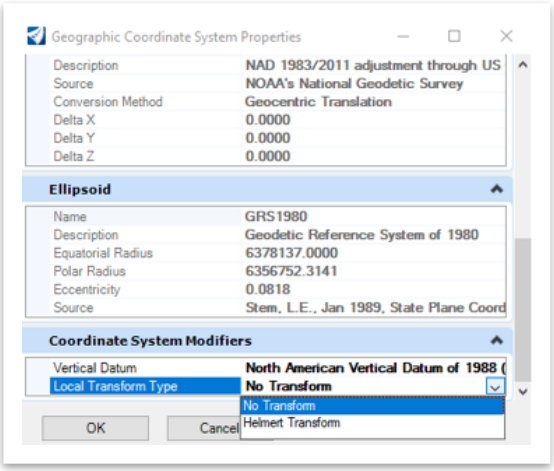
1. Copy all required data into a file to be used for data conversion and detach all reference files. Rename the file to be converted so that it is indicative that it has been converted. For example, if using the PRJ NAME-DES-ROW file, rename it to PRJ NAME-DES-ROW-State Plane.
2. Type in **Coordinate System** into the search ribbon and open the menu to select the Geographic Coordinate System.
3. The current coordinate system should be set to **TN83/2011**. The coordinate system may or may not have been modified for a local transformation. A DAF is typically used by survey to implement a project datum. When receiving a file from survey, the surveyor may or may not have input the local transformation. The examples below show coordinate systems without a local transformation and with a local transformation. Steps 4-7 may be used to align the ORD background Bing imagery with the survey data and project files.

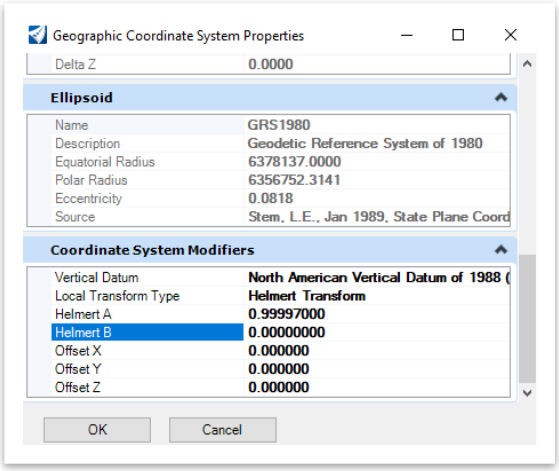




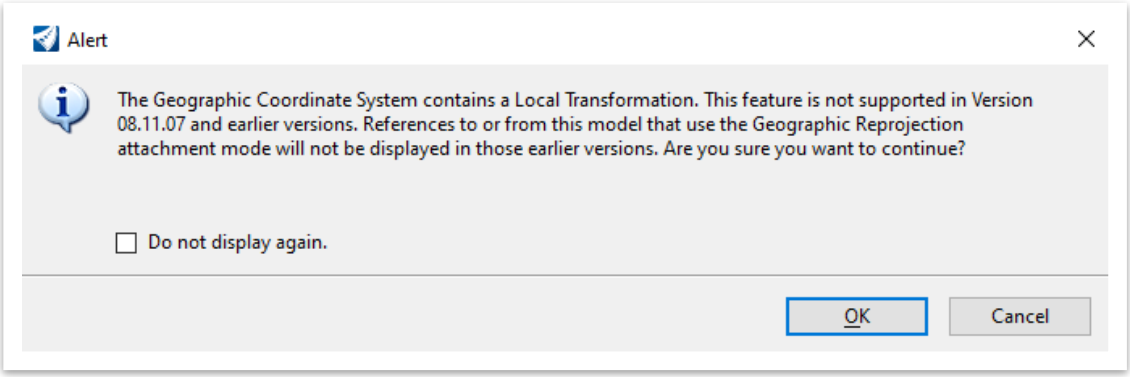
4. If not already present, a **Helmert Transformation** should be used within ORD to align the background Bing imagery with the project survey data. If a Helmert Transformation is already present, skip to Step 9. To input a Helmert Transformation, the inverse of the project datum adjustment factor is input as a **Helmert A** value. Click on the **Details** icon of the Geographic Coordinate System dialog box and scroll down to the **Coordinate System Modifiers** heading.

5. Under **Local Transform Type**, change from No Transform to **Helmert Transform**. Under **Helmert A**, key-in the <u>inverse</u> of the survey provided DAF. In the example below, the DAF is 1.00003, so a value of **0.99997000** is input for the Helmert A value.

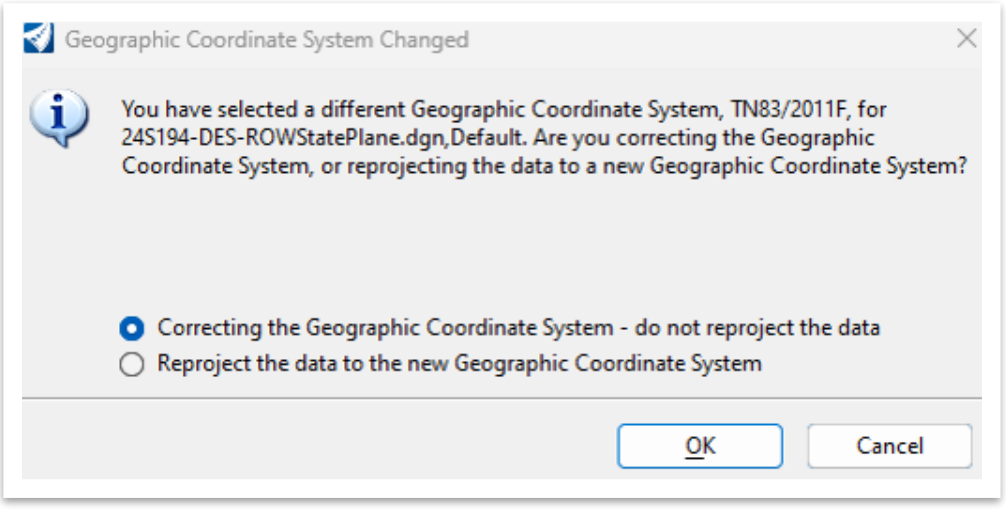




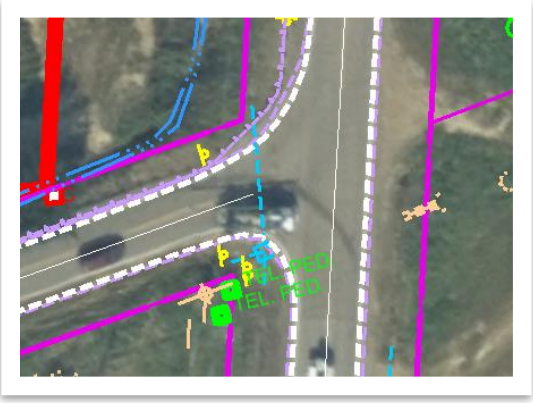
6. The following dialog box will appear. Click **OK**.



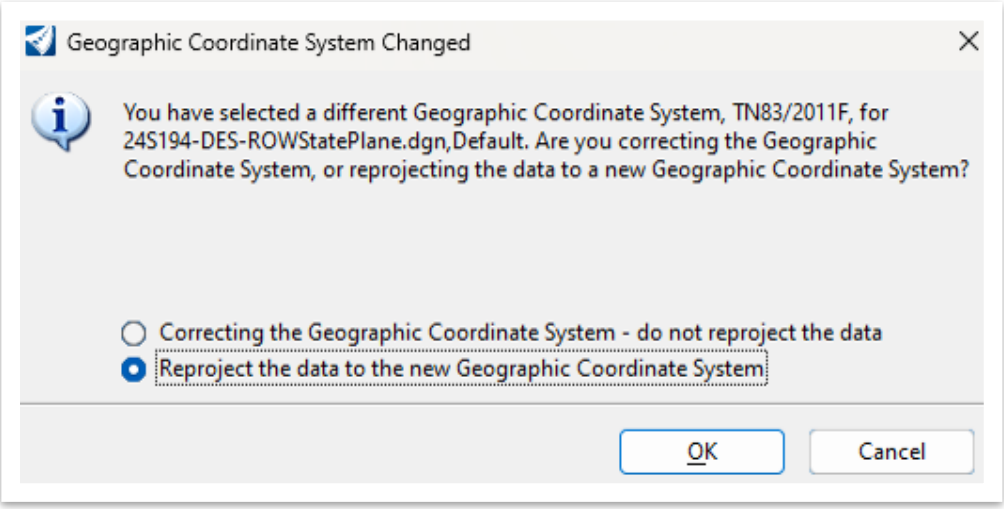
7. The following dialog box will also appear. Be sure to choose **Correcting the Geographic Coordinate System - do not reproject the data**.



8. The images below show the effects of the previous steps. The image on the left shows the Bing imagery on **State Plane**, while the image on the right shows the Bing imagery adjusted to the **project datum**. It is important to note that the Steps 4-7 do not change the ORD file coordinates, but simply adjust the background Bing imagery to the project datum.



9. To shift the project data from a project datum to state plane coordinates for external use, a similar procedure should be followed. Reopen the **Coordinate System** dialog box, and this time, remove the **Helmert transformation**. When removing the Helmert transformation, the following dialog box will again appear. Be sure to rename the file so that it is indicative that it is State Plane. This time, select **Reproject the data to the new Geographic Coordinate System**. This will change the physical coordinates of the design file, and this file should only be used for external purposes (it will no longer match the project design files).



10. The design file can now be provided, as needed, for project information on TN State Plane within a GIS system or exported to Google Earth.