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.

- 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.

lescription	NAD 1983/2011 adjustment through US \land	Delta Z	0.0000
ource	NOAA's National Geodetic Survey		
onversion Method	Geocentric Translation	Ellipsoid	
elta X	0.0000	Name	GRS1980
elta Y	0.0000	Description	Geodetic Reference System of 198
lelta Z	0.0000	Equatorial Radius	6378137.0000
		Polar Radius	6356752.3141
lipsoid	^	Eccentricity	0.0818
ame	GRS1980	Source	Stem, L.E., Jan 1989, State Plane
escription	Geodetic Reference System of 1980		
quatorial Radius	6378137.0000	Coordinate System Mo	difiers
olar Radius	6356752.3141	Vertical Datum	North American Vertical Datum of
ccentricity	0.0818	Local Transform Type	Helmert Transform
ource	Stem, L.E., Jan 1989, State Plane Coord	Helmert A	0.99997000
		Helmert B	0.0000000
Coordinate System Modifiers		Offset X	0.000000
ertical Datum	North American Vertical Datum of 1988 (Offset Y	0.000000
ocal Transform Type	No Transform	Offset Z	0.000000

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

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į)	The Geographic Coordinate System contains a Local Transformation. This feature is not supported in Version 08.11.07 and earlier versions. References to or from this model that use the Geographic Reprojection attachment mode will not be displayed in those earlier versions. Are you sure you want to continue?				
	Do not display again.				
	<u>O</u> K Cancel				

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 <u>left</u> shows the Bing imagery on **State Plane**, while the image on the <u>right</u> 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.

