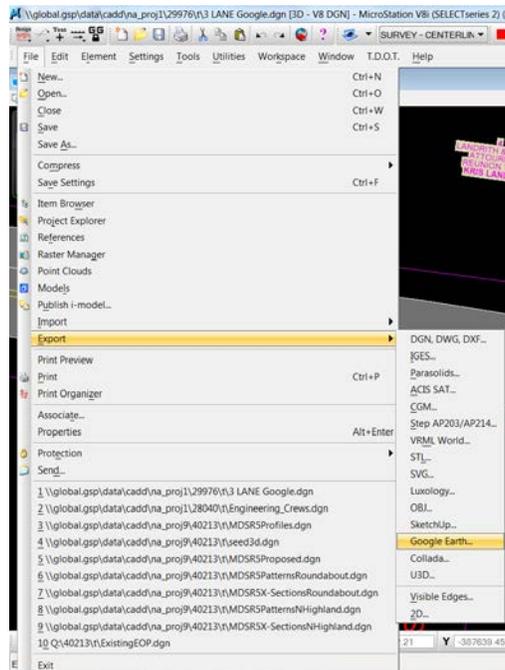


## Task: Exporting 2d Microstation files to Google Earth

**Purpose:** Exporting Microstation design files to Google Earth can benefit a design team in many different ways. Not only does Google Earth provide an aerial background, but it is easily accessible on smartphones, tablets, and non-CAD user laptops. Google Earth can be used as a reference, but should not be used as a design tool.

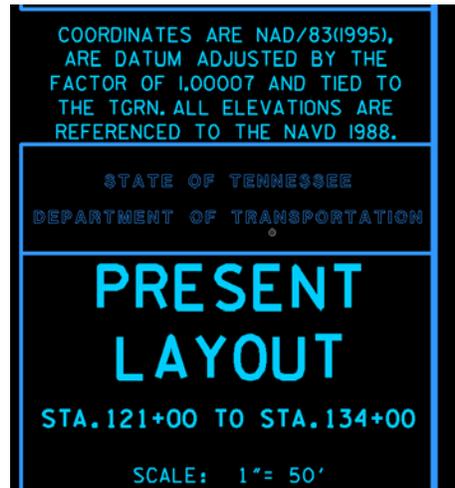
1. If Google Earth is not downloaded on your computer, download the latest version of Google Earth from the following website: <https://www.google.com/earth/explore/products/>
2. Open Microstation V8i and create a new Seed3d.dgn file named *GoogleEarthExport.dgn*
  - a. **Due to the necessity to move, scale, and rotate files, it is important that all work is performed through the reference toolbox in this DGN file.**
3. Attach all DGN references that you wish to be exported to Google Earth in Coincident World.
4. Make sure to turn On/OFF any levels that you wish to be exported to Google Earth. There is an opportunity to turn levels on and off in google earth.
5. Test the positioning of your design by exporting the DGN's to Google Earth. Go to **File>Export>Google Earth**



6. Save the .KMZ to the project folder as **LocationTest.kmz**. Once you hit save, Google Earth automatically opens, and focuses on your location. *Note: The majority of TDOT projects will not fall directly into place the first time exporting. Some projects will require un-factoring the datum adjustment administered by the surveyor, and other projects will require a best-fit adjustment by moving, rotating, and scaling the referenced DGN's.*
7. If your design falls directly into place, then skip to **“Google Earth Capabilities”**

8. If the design does not line up with Google Earth:

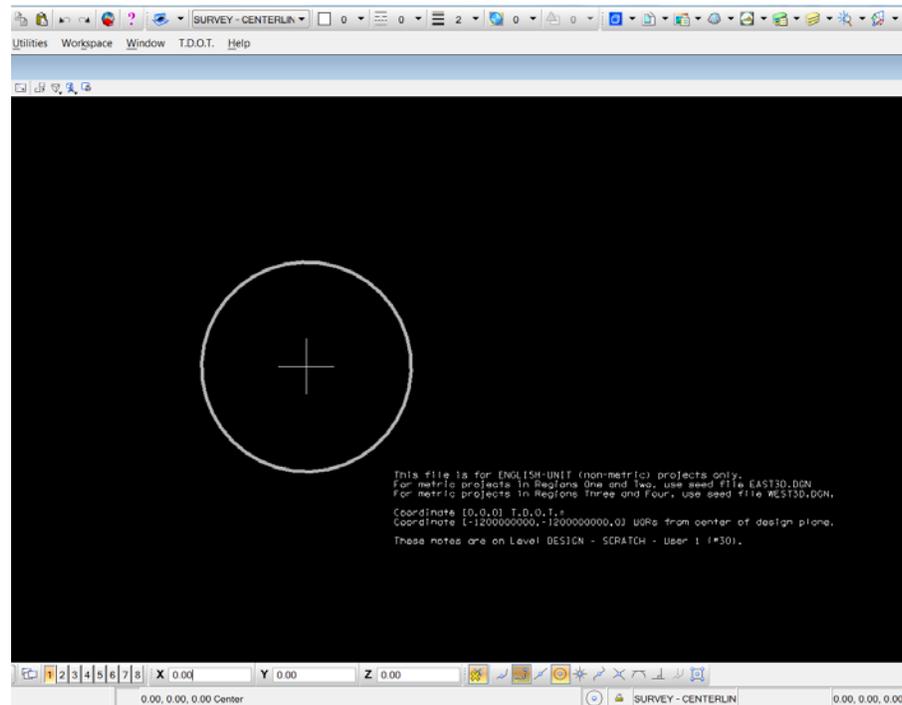
- a. Close out of Google Earth, and return to the *GoogleEarthExport.dgn* Microstation file. Determine the Datum Adjustment Factor that has been provided by the surveyor by looking in the bottom right corner of one of the Present Layout sheet files as shown below:



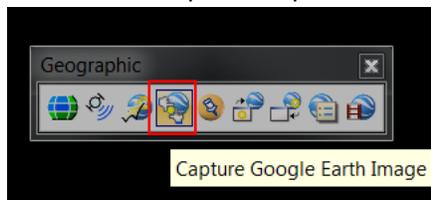
- b. To remove the datum adjustment from the dgn files, you must scale all references by the following factor:  $\frac{1}{Adjustment\ Factor}$

- c. In the example project, the references would be scaled at a factor of  $\frac{1.0}{1.00007} = 0.99993$

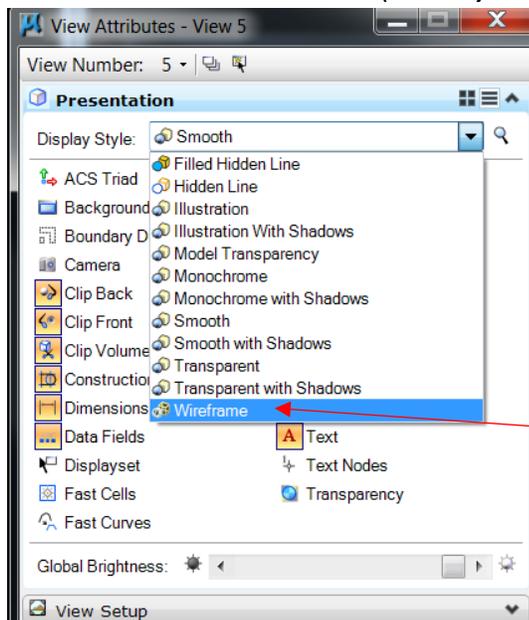
At the origin point of 0,0 in the seed file that you created:



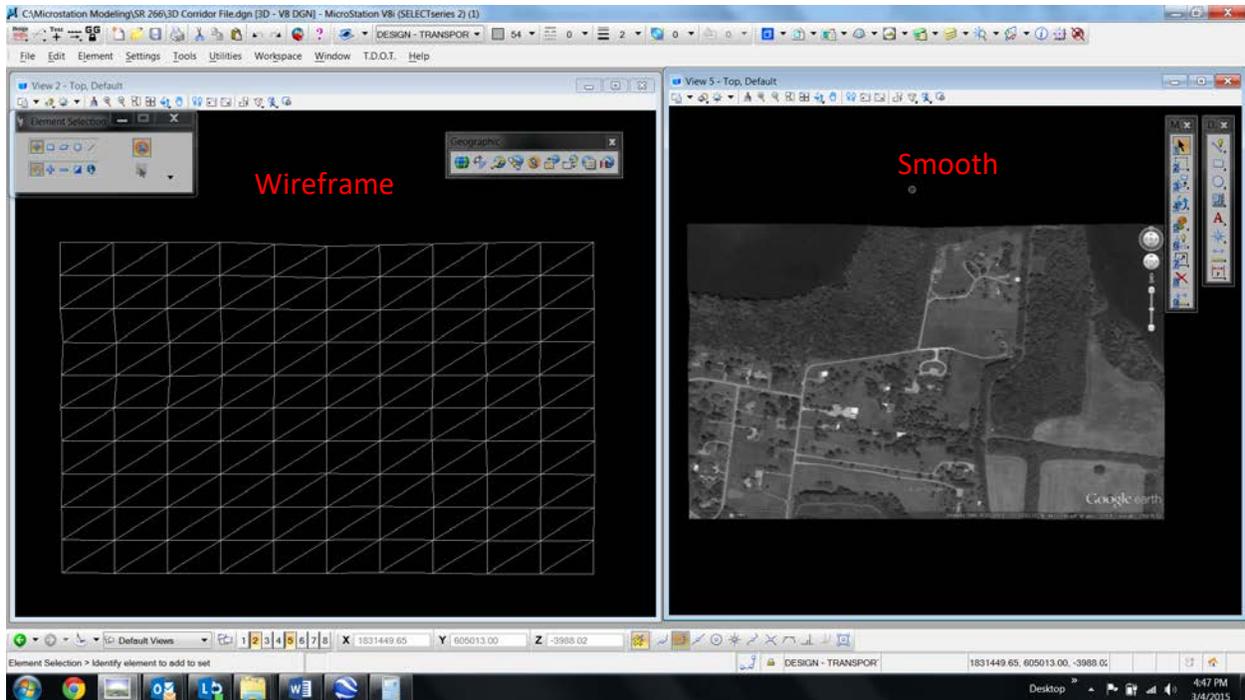
- d. Once the references have been scaled by an “un-adjustment” factor at the origin point of 0.00, 0.00. You have removed the datum adjustment.
  - e. Export the un-adjusted files to Google Earth: **File>Export>Google Earth** and save the KMZ file as **LocationTest.kmz** - Yes to overwrite, and Google Earth will open the updated design.
  - f. If your design falls into place correctly, skip to “**Google Earth Capabilities**”
- 9. If the DGN’s are not lining up after removing the datum adjustment:**
- a. If the DGN files are still a small or large distance away from where they should be, it is likely that the original survey that the design was based around was not Geo-referenced in the beginning. It is not unusual for some design files to export to Google Earth, and show up in another state, or possibly the ocean.
  - b. Now we will Import Google Earth to Microstation to determine where our references should be aligned in order to export successfully.
  - c. In Google Earth, center the view on a known point of the project (Beginning intersection or known point in survey is preferred).
  - d. In Microstation, open the Google Earth toolbar : **Tools>Geographic>Open Toolbox**
  - e. Click the **Capture Google Earth Image** command button, then left click inside the open window to accept the capture:



- f. Once you left click, Microstation has captured a 3d Google Image. If a white mesh of triangles do not show up, click the  **FIT VIEW** button to find the imported mesh.
- g. The image below represents the imported Google Image into Microstation with two different view modes selected. (**CTRL+B**)



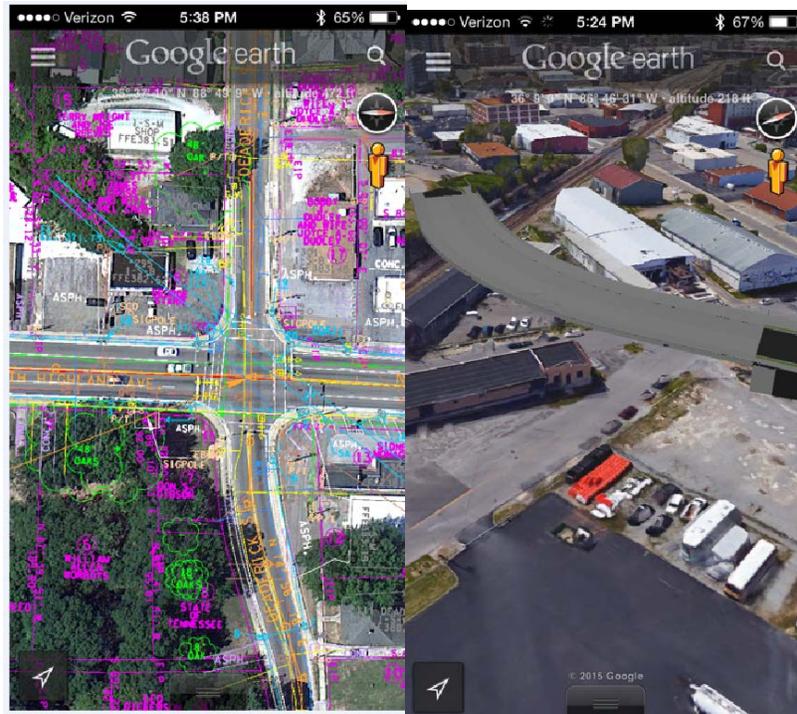
Default Display is  
Wireframe



- h. Repeat the Google Capture step E a couple of times to provide multiple points of reference to move, rotate and scale the attached DGN references.
- i. Once you have your referenced DGN files lined up where you want them, you can delete or turn off the captured Google Images, and export the DGN files to Google Earth.

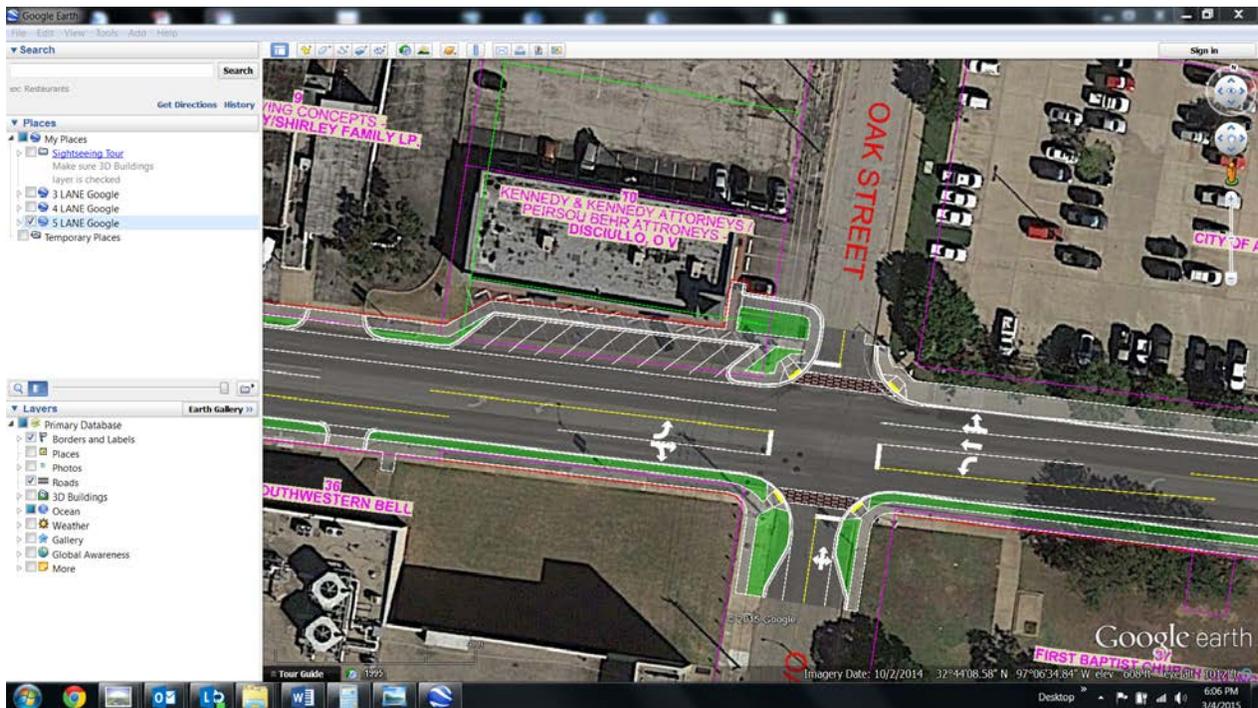
#### Google Earth Capabilities:

- **Sharing:** Once you create a KMZ file that represents the correct location of your design, it can be shared via email and interactively viewed without any special Bentley software.
- **Mobile Capabilities:** A design KMZ file can be opened on any smart phone or tablet that has Google Earth installed. With the Location services turned on, mobile devices can be used in the field to check a survey, or walk a new alignment, yielding decent accuracy. As shown below, 2D linework shows up better than 3D models on mobile devices.



- **Public Involvement / Advertisement:**

- A simpler design model .KMZ can be displayed on a City/State webpage for stakeholders to visit, download, and view at their leisure to soak in the impacts of the proposed project.



- In some cases, Google Earth can show the designer/owner what type of impacts the proposed improvements will have on the environment from the street view function. *It should be noted that google earth will shift your drawing in street view by the offset of the camera to the centerline.*
- The example below shows a proposed extension of the existing roadway where the vehicles are currently parked. The design model was created by running the Bentley Corridor Modeler, and exporting a DGN with the displayed model surface, with a smooth display setting.

