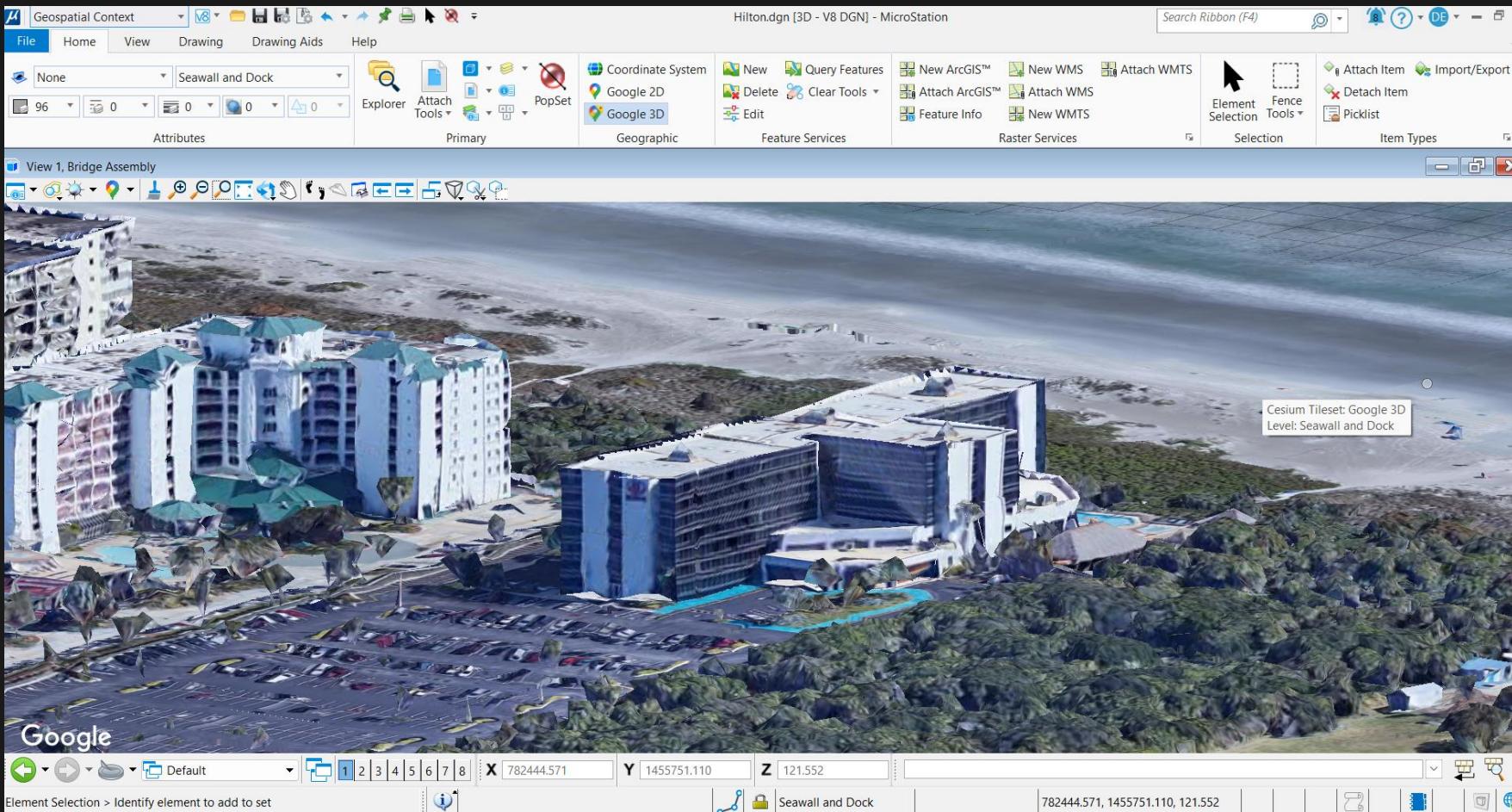


Geospatial 101: Design in context





MicroStation's Geospatial capabilities

Dan Eng - Product Expert

Tamicca Sellars – MicroStation Product Manager

Bentley[®]

Presenters



Tamicca Sellars
MicroStation Product Manager

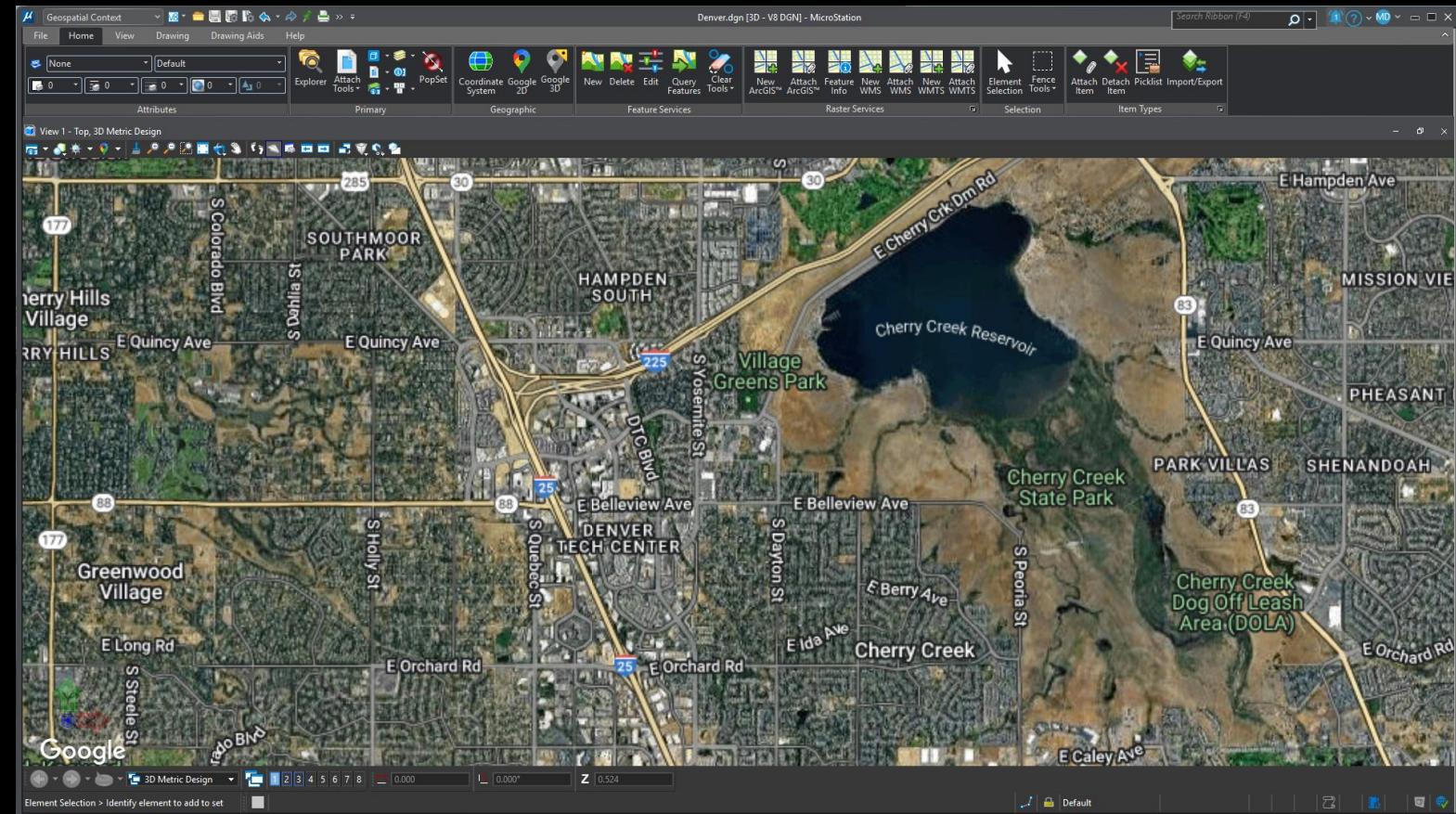


Dan Eng
MicroStation Product Expert

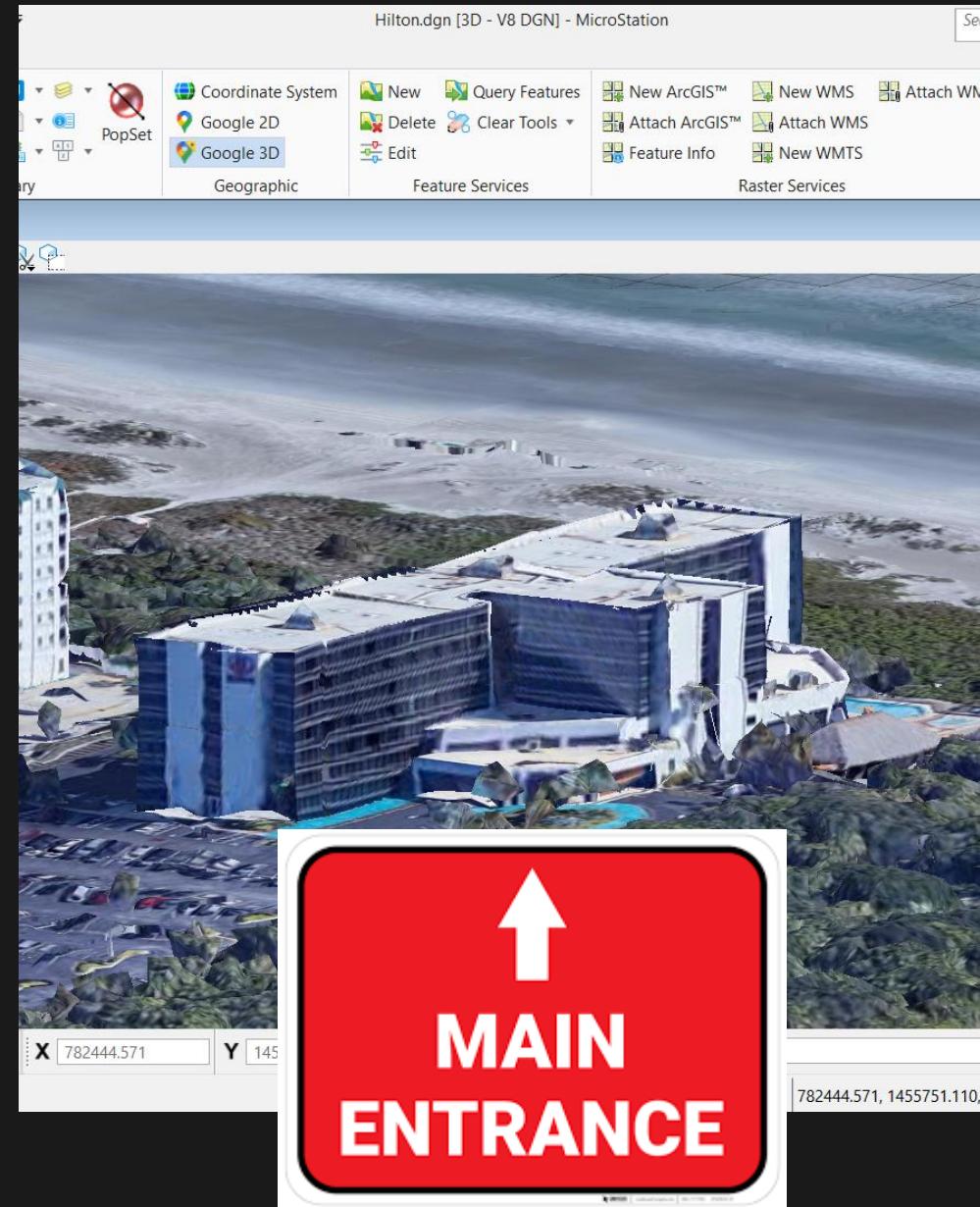


Agenda

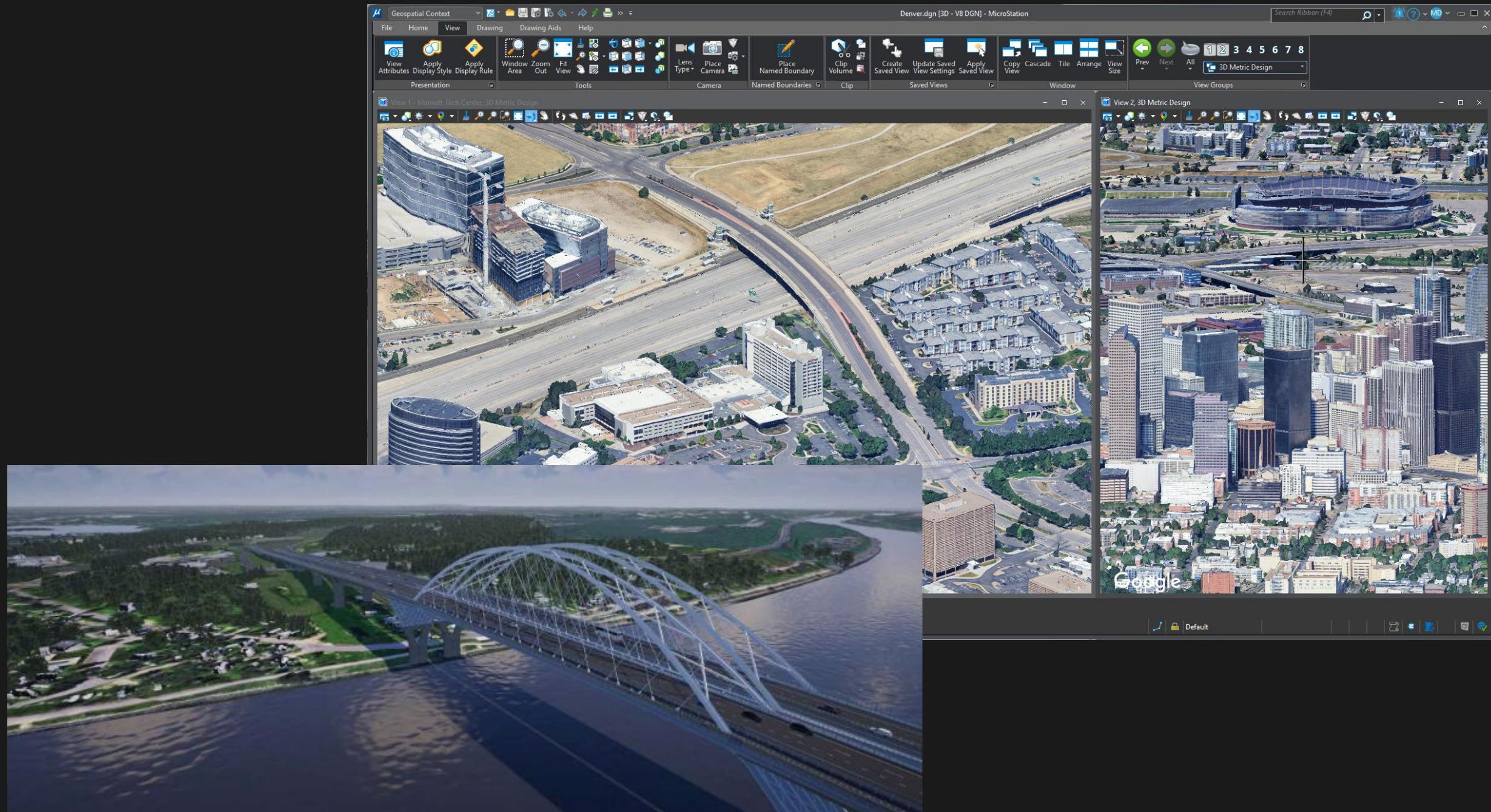
- Introduction: What is Geospatial
- Why designing in context?
- Importance of Coordinate Systems
- What's new in MicroStation 2025
- Q/A We want to hear from you



We are here!







Designing without understanding your surroundings
is like working with blinders on!



Why Designing in Context with Geospatial data?



Bring informed contextual data to your designs



Expand the depth and breadth for evaluating your file and the environment around you



Feature rich data to help communicate your design



Evaluate your design with its surroundings



Aid with Informed decisions

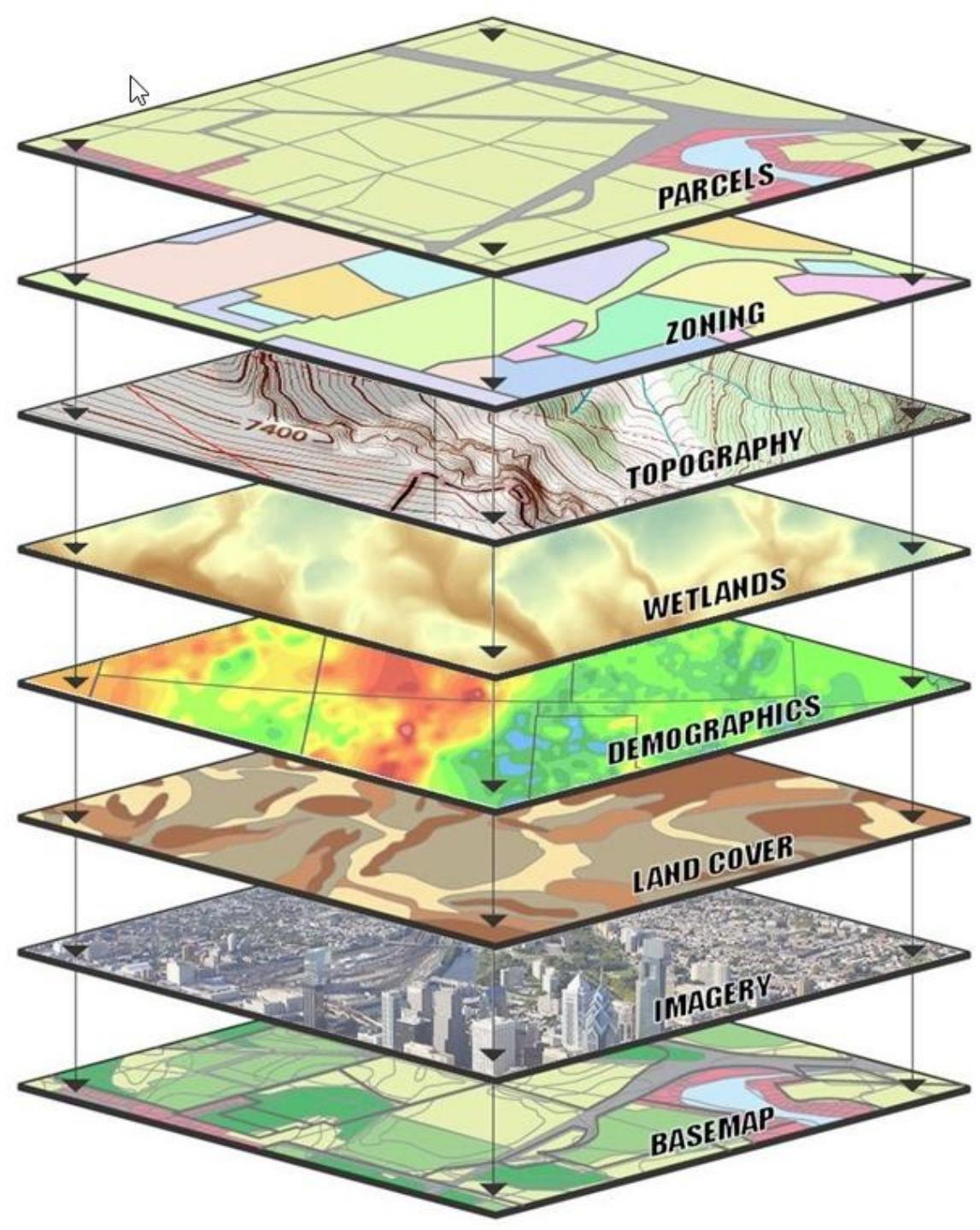


Insights into your location

What is Geospatial Data?

Information that includes geographic component (objects, structures, event or real-world phenomena), associated with a location on the Earth.

It is also called geospatial data, georeferenced data, as well as geodata or context data.

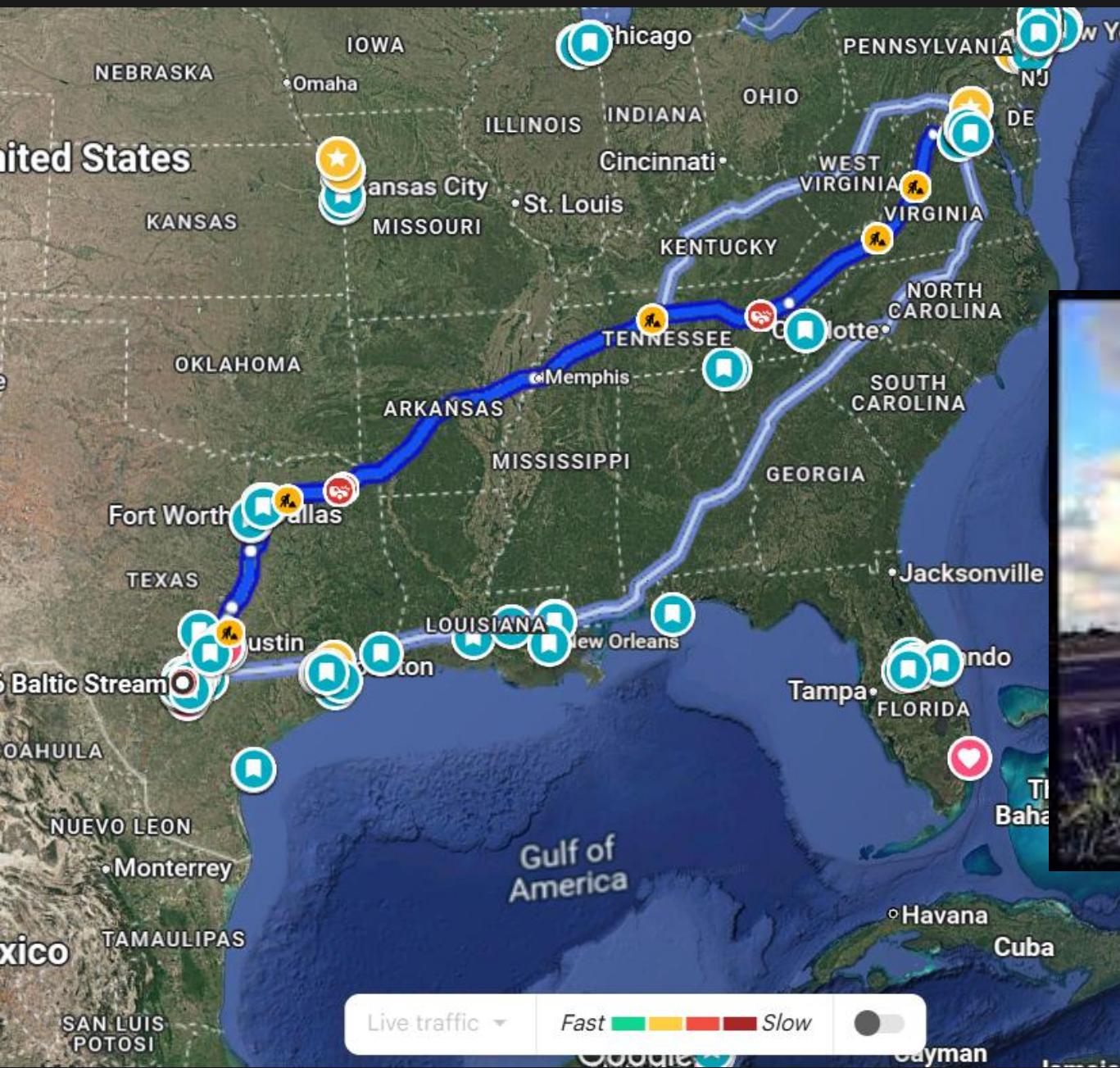


Who should use Geospatial tools?

Anyone who:

- wants to bring greater contextual information to their Infrastructure model
- wants to communicate their design better
- wants to expand their understanding of their design and the impact on the surrounding environment
- needs to plan based on historical geographical data





None Default

0 0 0 0

Explorer Attach Tools PopSet Coordinate System New Query Features New ArcGIS™ New WMS Attach WMTS Element Selection Fence Tools

Google 2D Delete Clear Tools Attach ArcGIS™ Attach WMS Feature Info New WMTS

Google 3D Edit

Raster Services Selection Item Types

Attributes

Explorer

File

Items

Search

- Maryland Safe Zones - Automated Speed Camera
- mdot_sha_chart_traffic_cameras
- Reports
- Sheet Index
- Resources
- Links

View 1 - Top, 3D Imperial Design

Element Selection

Query Features

Spatial Area: Active View

Named Boundary:

Selected Feature Classes in these Connections:

- Feature Connections
 - Maryland_Safe_Zones
 - Maryland_Safe_Zones - Automated Speed Camera
 - CHART_Cameras

Query Cancel

Properties

Elements (1)

Maryland Safe Zones - Au

Items

Shape

General

Element Cell: Maryland_Safe_Zone

Cell Name: Maryland_Safe_Zones

Cell Type: Graphic

Class: Primary

Number: 1

Template: Maryland_Safe_Zones

Annotation: False

Is Annotated: False

Geometry

Origin: 822717ft 3.061in, 447112ft

Rotation: 0.000°

Rotation: 0.000°

Rotation: 0.000°

Scale X: 1.00000

Scale Y: 1.00000

Scale Z: 1.00000

Extended

Model: 3D Imperial Design

Last Modified: 2/24/2025 10:10:20 AM

Modified: Not Modified

New: Not New

Locked: Unlocked

Display: (From View Display)

Named Presentation

3D Model: False

Top: False

Bottom: False

Front/Back: False

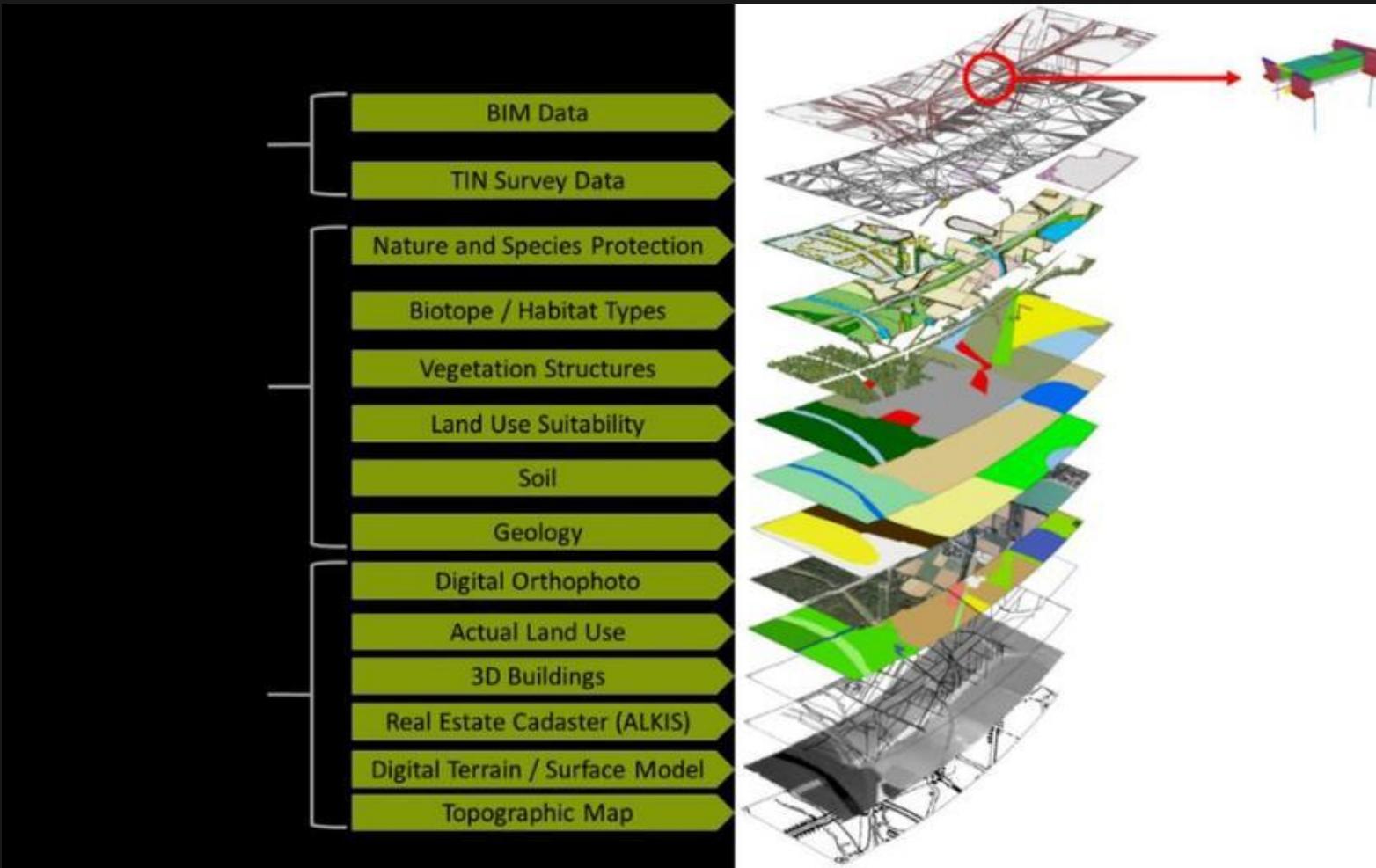
Left: False

Right: False

Importance of Coordinate Systems



Design in Context: Importance of Coordinate Systems

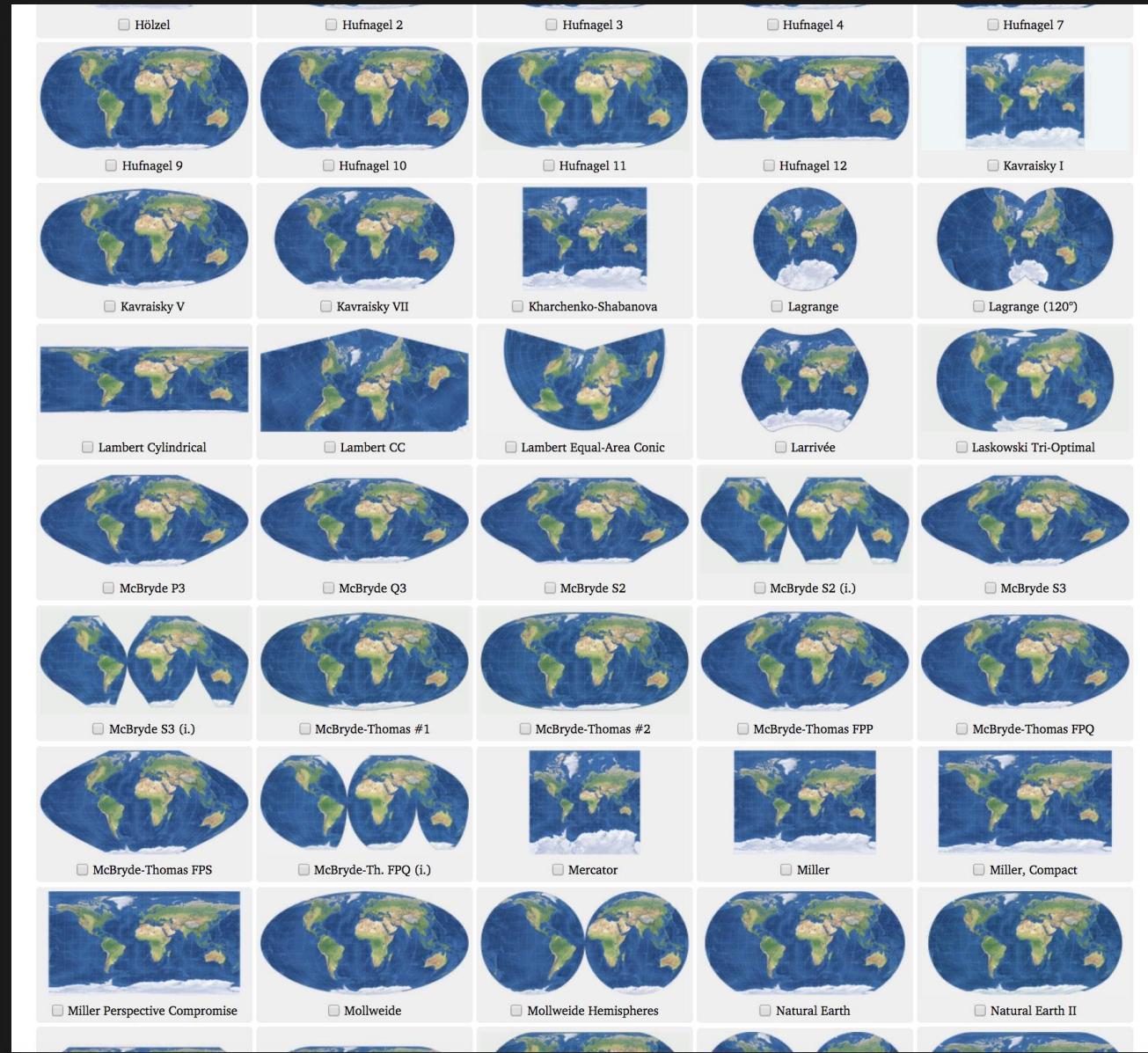


Combining data from various sources, leveraging coordinate systems, units, file formats, is the path to proper design in context and create digital twin.

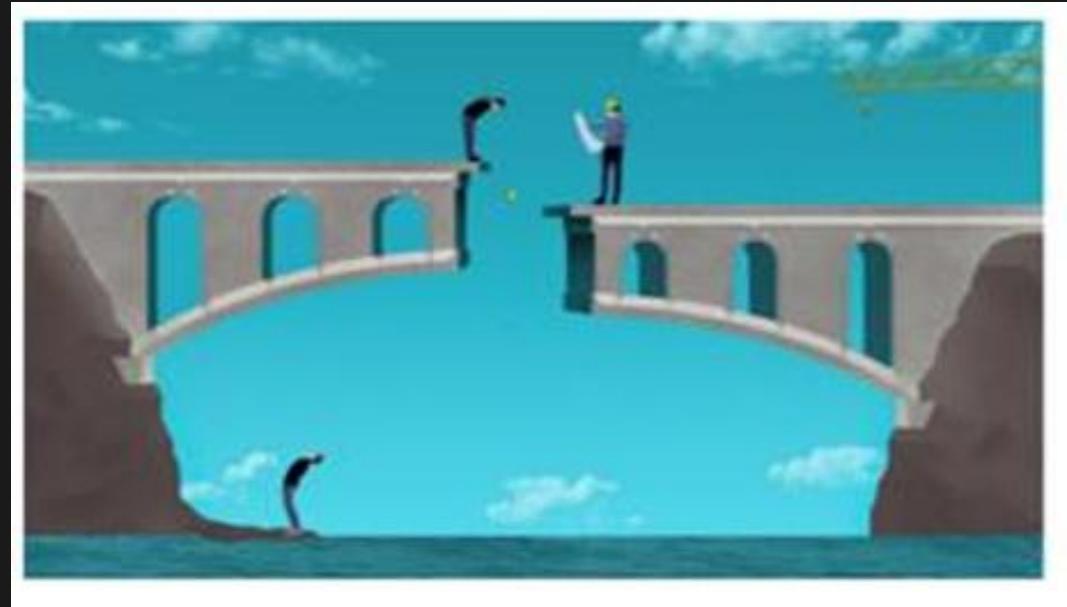
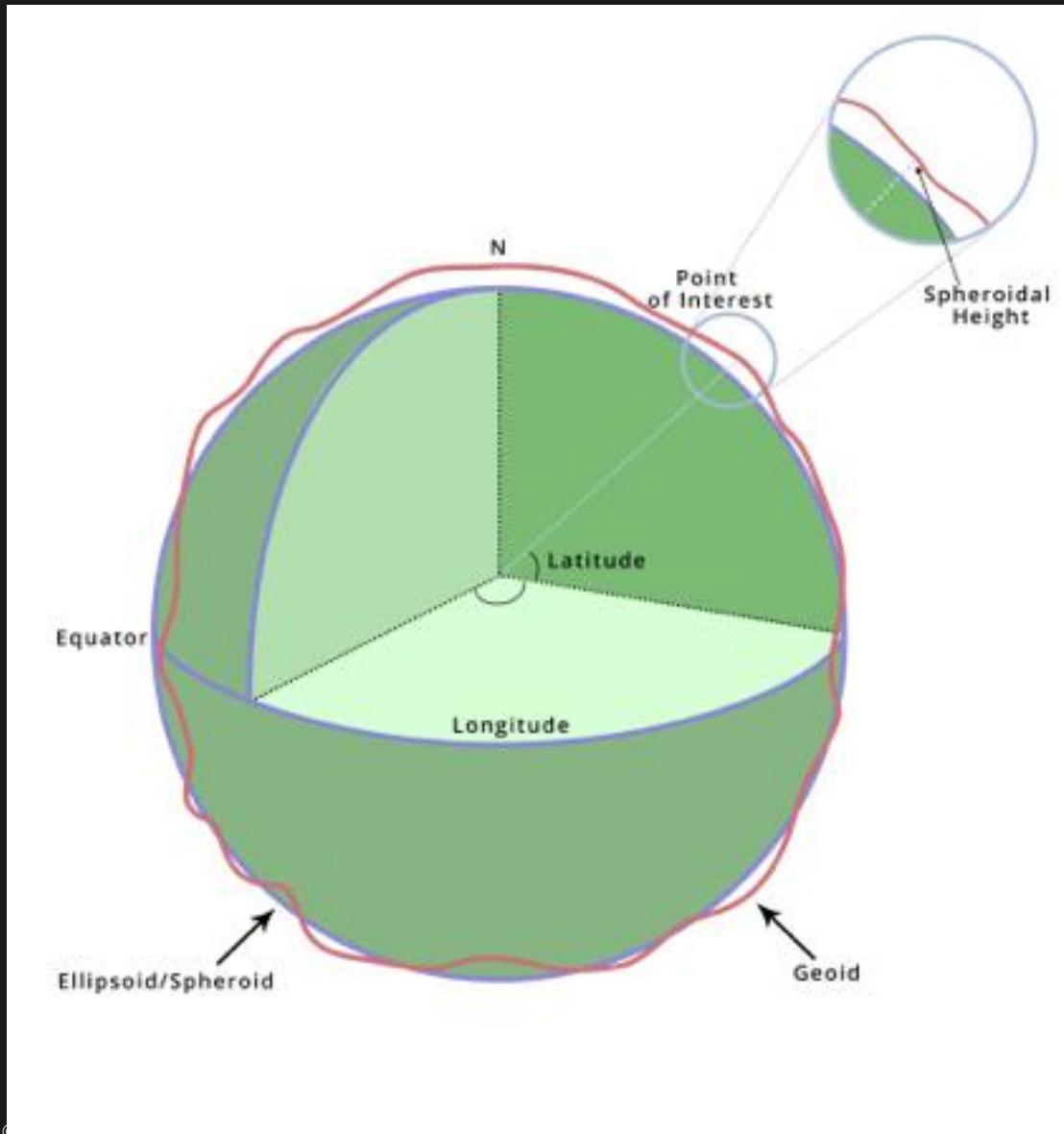
The Earth is not flat!



Projection methods: none is perfect



Importance of Vertical Datum



A datum is a reference system that defines the shape of the Earth (using an ellipsoid) and the origin and orientation of latitude and longitude lines. Essentially, it provides a framework for accurately measuring locations and elevations on the Earth's surface.

You think it is done? It's not!



The National Geodetic Survey (NGS) is in the process of modernizing the National Spatial Reference System (NSRS). NGS plans to replace all three North American Datum of 1983 (NAD 83) frames and all vertical datums of the NSRS, including the North American Vertical Datum of 1988 (NAVD 88), with four new terrestrial reference frames and one new geopotential datum to which all geodetic coordinates and derived coordinates within the NSRS will be referenced.

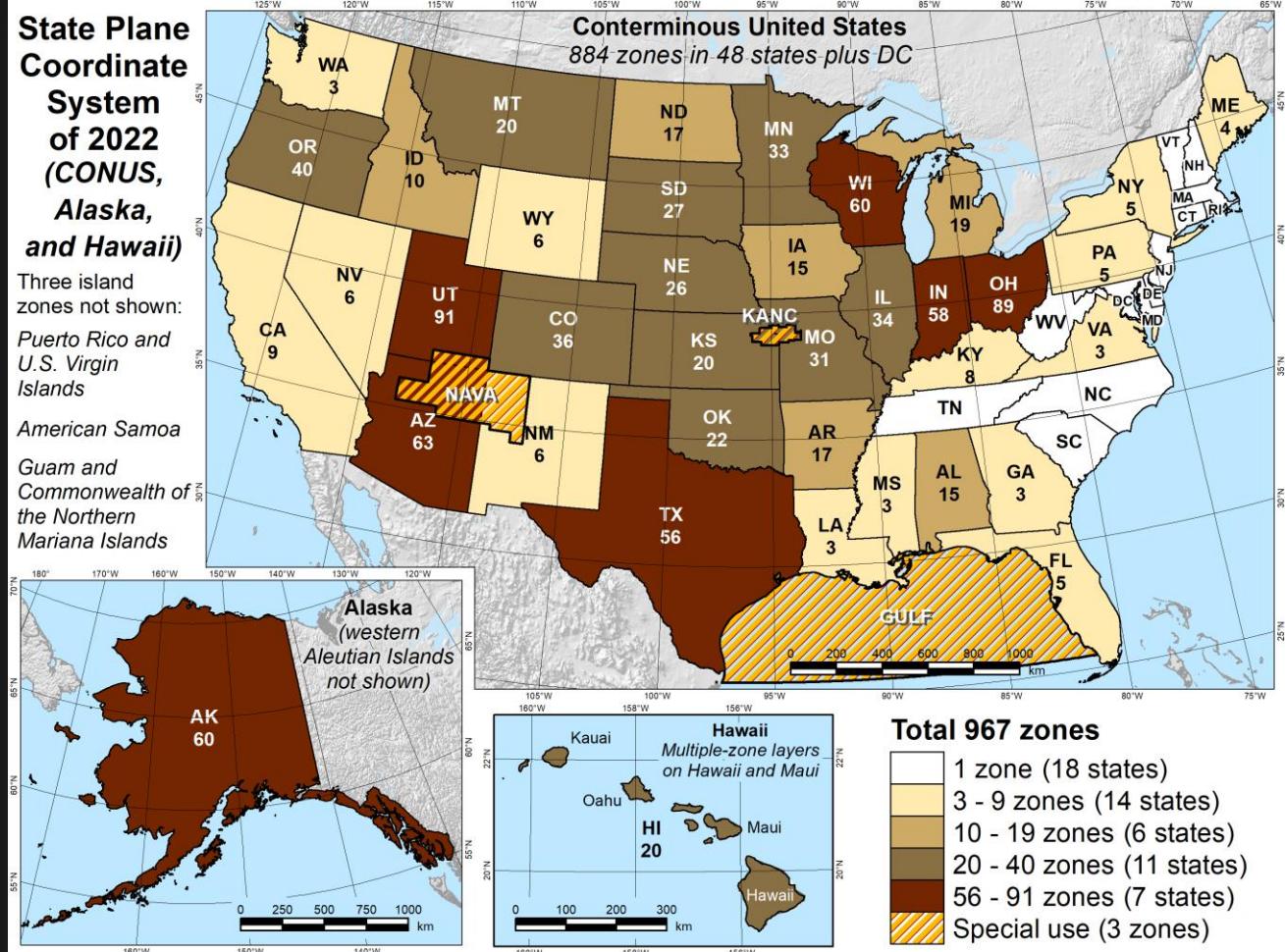
State Plane Coordinate System of 2022 (CONUS, Alaska, and Hawaii)

Three island zones not shown:

Puerto Rico and U.S. Virgin Islands

American Samoa

Guam and Commonwealth of the Northern Mariana Islands



Need for custom coordinate systems

The image shows a screenshot of the MicroStation Ideas Portal. It displays three separate ideas as cards:

- Idea MSR-I-1017: Add Amtrak Coordinate System EPSG 20050 to Library of Coordinate Systems**

Created by Daniel Olausen in MicroStation Ideas Portal on Aug 31, 2022

Request the addition of ACS2021 (Amtrak Coordinate System 2021) to the Library of Coordinate Systems within Microstation. This coordinate system is a requirement for surveys along Am Northeast Corridor from Washington DC to Boston MA.

9 VOTE

Status: Future consideration

Categories: 3D Modeling

Created by: Guest

Created on: Aug 6, 2025
- Idea MSR-I-1595: Add RH2000 to the list of vertical coordinate systems**

In Sweden the RH2000 (EPSG:5613) is used extensively. Could it please be added to the list of vertical coordinate systems?
- Idea MSR-I-1595: A new NTv2 file for incorporation in to the Bentley GCS**

Created by Steven Cooper in MicroStation Ideas Portal on Apr 3, 2024

Hi, we have a new NTv2 for inclusion in the GCS from Network Rail. The attach function below does not recognize a .zip. What is the best way to share the files with you? Kind Regards Steve.

9 VOTE

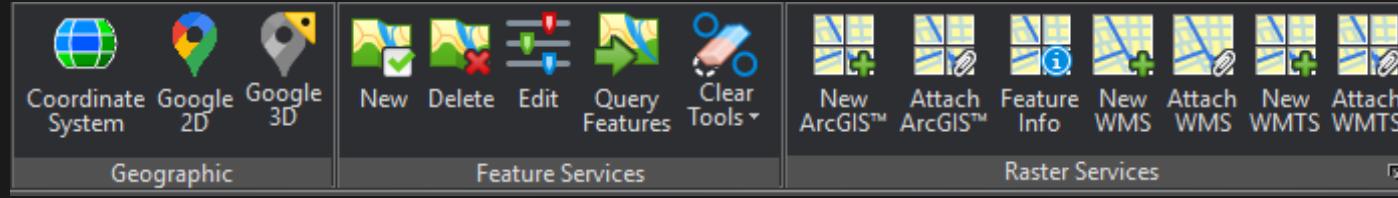
Status: Future consideration

Categories: 3D Modeling

Created by: Guest

Created on: Aug 6, 2025

Geospatial Context tools in MicroStation



Integrating Geospatial Context with MicroStation®

Upgrade Your CAD Designs with MicroStation's Geospatial Context Workflow

Geospatial Context: What's New in MicroStation 2025

**Google Maps
Integration**

**Google
Photorealistic 3D
Tiles Support
(Tech Preview)**

**Geospatial
Context in Python
API**

**Esri File
Geodatabase
Support**

Cell Fixed Size

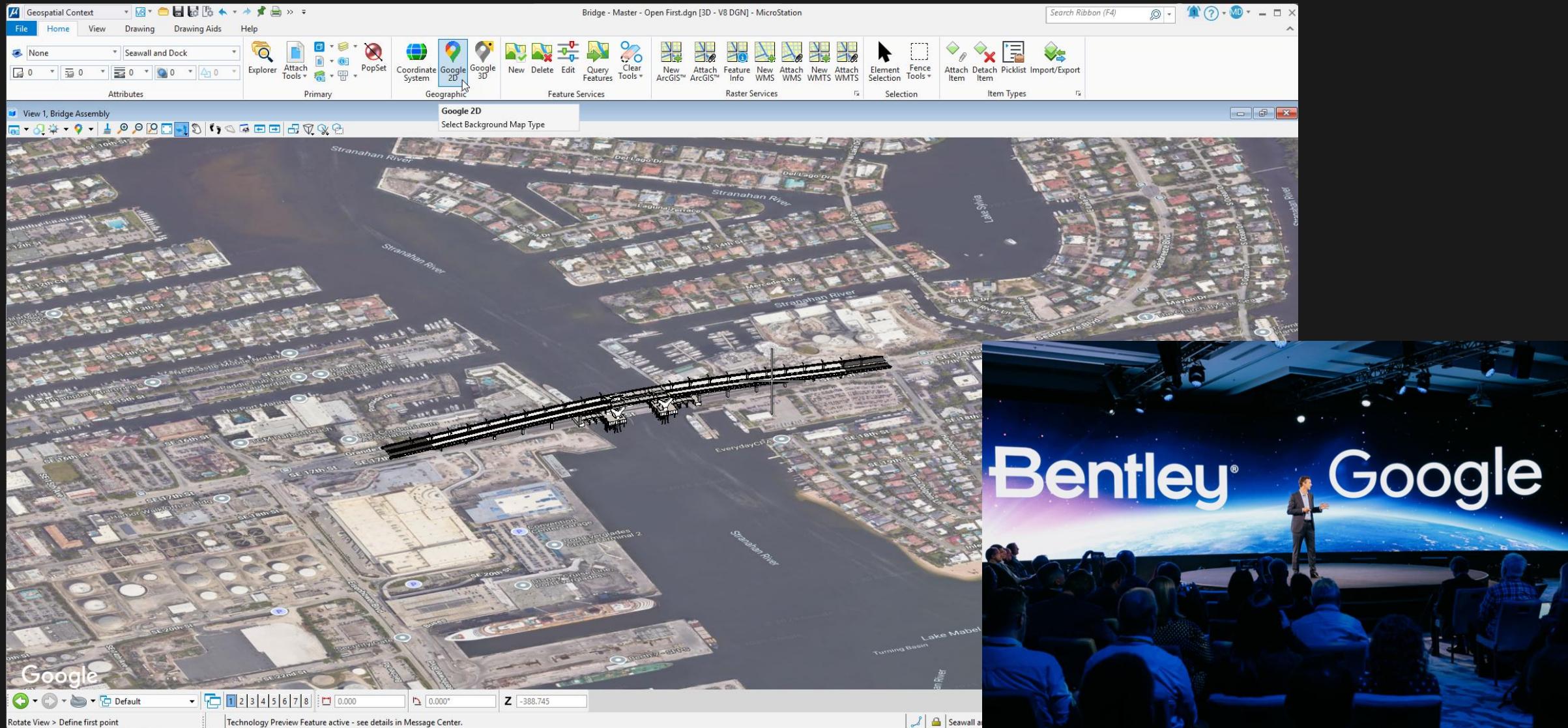
**OGC 3D Tiles
Support**

**New Vertical
Datum**

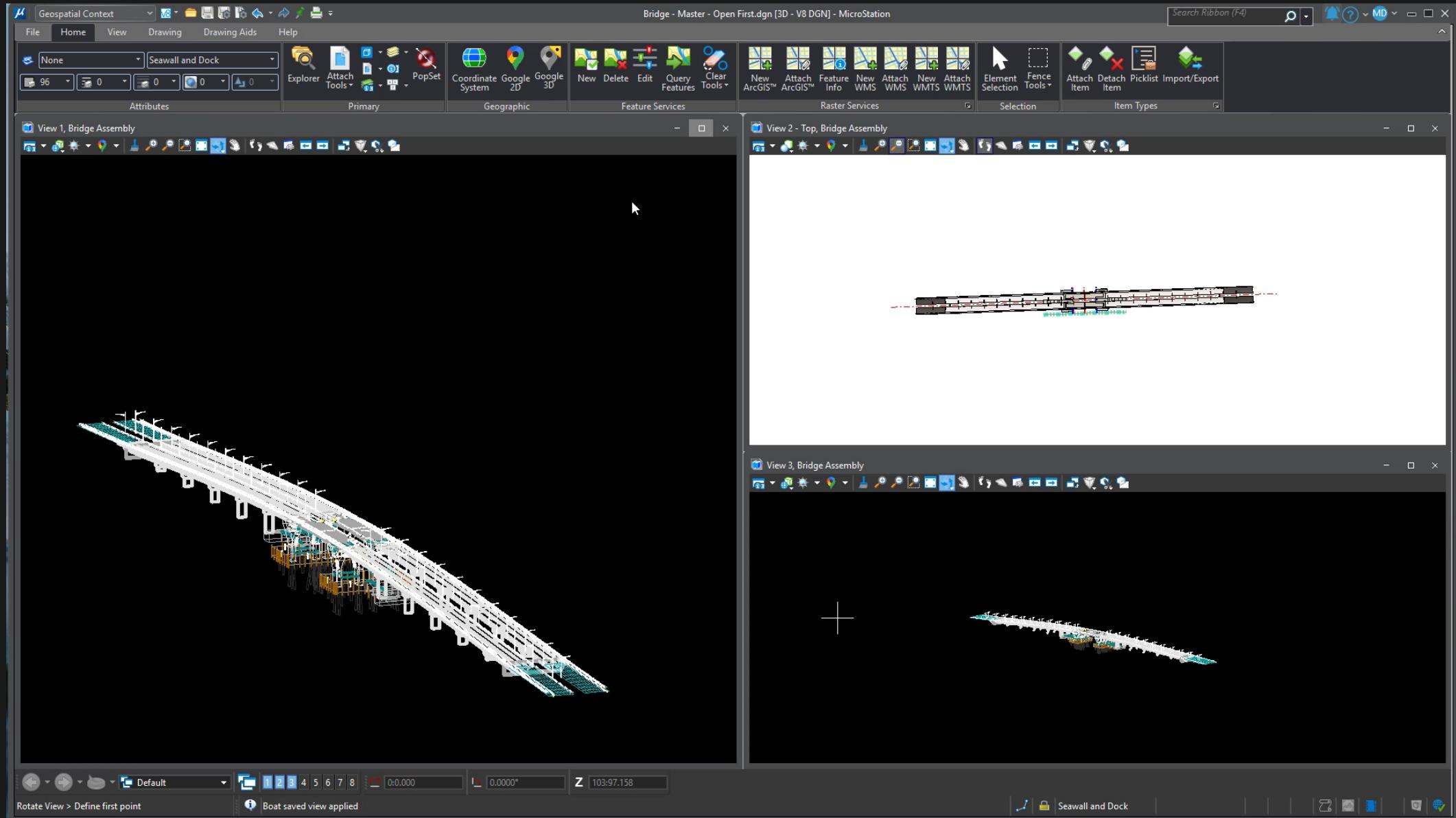
**New GCS icon for
quick access to
Coordinate
Systems**

**OGC API Feature
Service (Tech
Preview)**

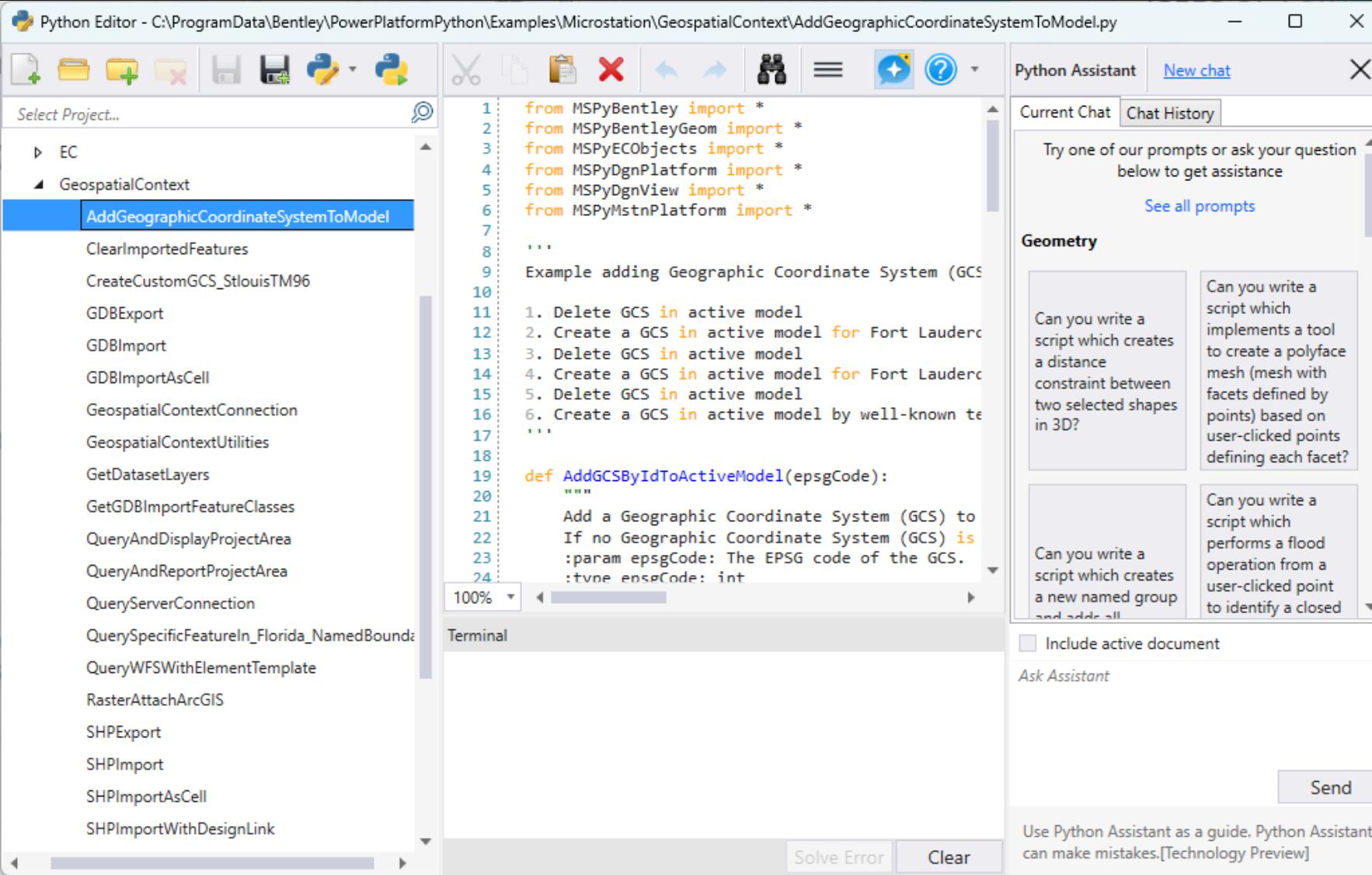
Google Maps Integration



Google Photorealistic 3D Tiles Support (*Tech Preview*)



Geospatial Context Python API – Delivered Examples



The screenshot shows the Python Editor interface with the following details:

- Title Bar:** Python Editor - C:\ProgramData\Bentley\PowerPlatformPython\Examples\Microstation\GeospatialContext\AddGeographicCoordinateSystemToModel.py
- Toolbar:** Includes standard file operations (New, Open, Save, Print, Copy, Paste, Find, Replace, Undo, Redo, Find in Chat, Chat, Help).
- Left Sidebar:** A tree view showing project structure. The 'GeospatialContext' folder is expanded, and the 'AddGeographicCoordinateSystemToModel' script is selected, highlighted with a blue background.
- Code Editor:** The script content is as follows:

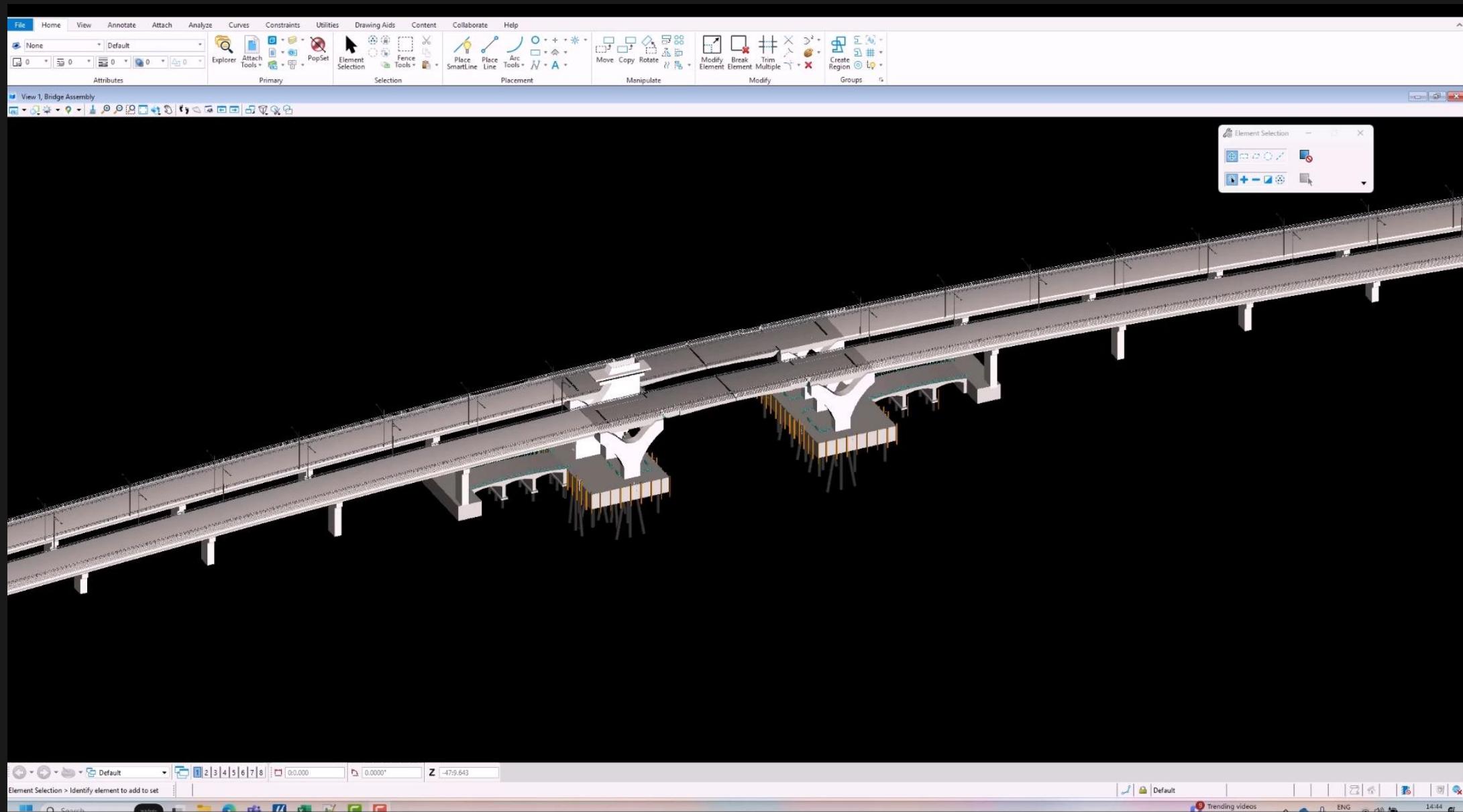
```
1  from MSPyBentley import *
2  from MSPyBentleyGeom import *
3  from MSPyECObjects import *
4  from MSPyDgnPlatform import *
5  from MSPyDgnView import *
6  from MSPyMstnPlatform import *
7
8  ...
9  Example adding Geographic Coordinate System (GCS)
10
11 1. Delete GCS in active model
12 2. Create a GCS in active model for Fort Lauderdale
13 3. Delete GCS in active model
14 4. Create a GCS in active model for Fort Lauderdale
15 5. Delete GCS in active model
16 6. Create a GCS in active model by well-known text
17 ...
18
19 def AddGCSByIdToActiveModel(epsgCode):
20     """
21         Add a Geographic Coordinate System (GCS) to
22         If no Geographic Coordinate System (GCS) is
23             :param epsgCode: The EPSG code of the GCS.
24             :type epsgCode: int
25     """
26
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```

Terminal: The terminal pane is empty, showing the text "Terminal".

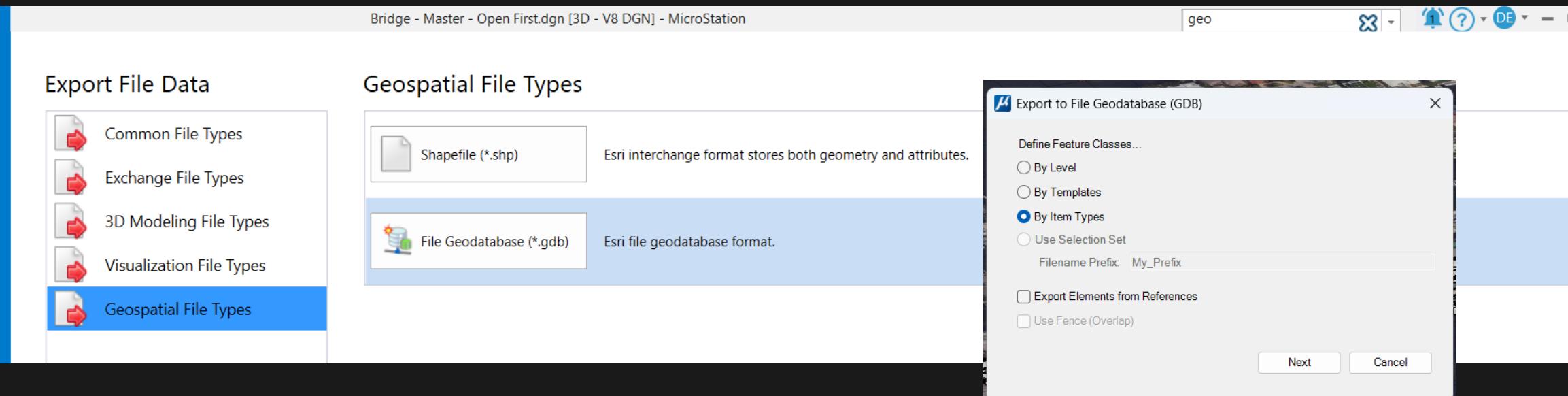
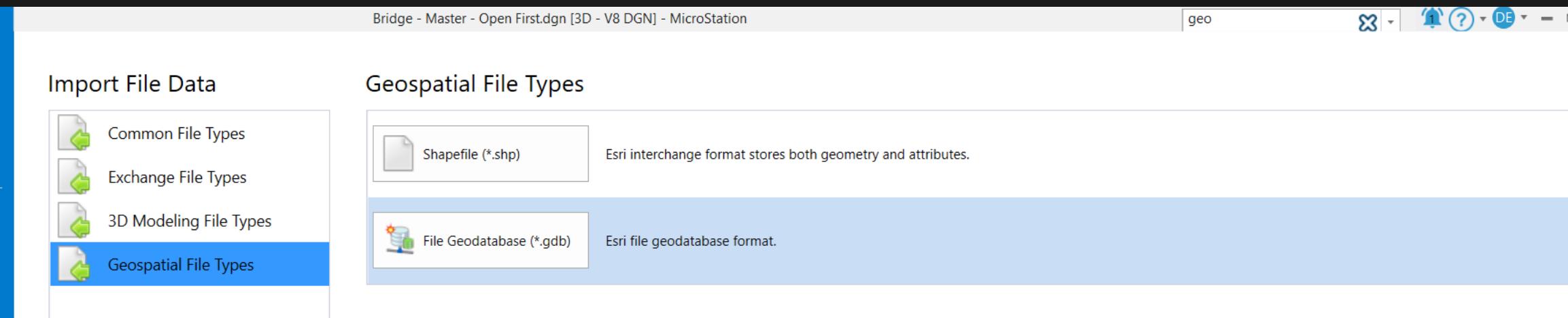
Python Assistant: A sidebar on the right with the following sections:

- Current Chat:** A text input field: "Try one of our prompts or ask your question below to get assistance" and a "See all prompts" link.
- Geometry:** A list of questions:
 - Can you write a script which implements a tool to create a polyface mesh (mesh with facets defined by points) based on user-clicked points defining each facet?
 - Can you write a script which creates a distance constraint between two selected shapes in 3D?
 - Can you write a script which performs a flood operation from a user-clicked point to identify a closed
- Ask Assistant:** A "Send" button and a note: "Use Python Assistant as a guide. Python Assistant can make mistakes. [Technology Preview]".

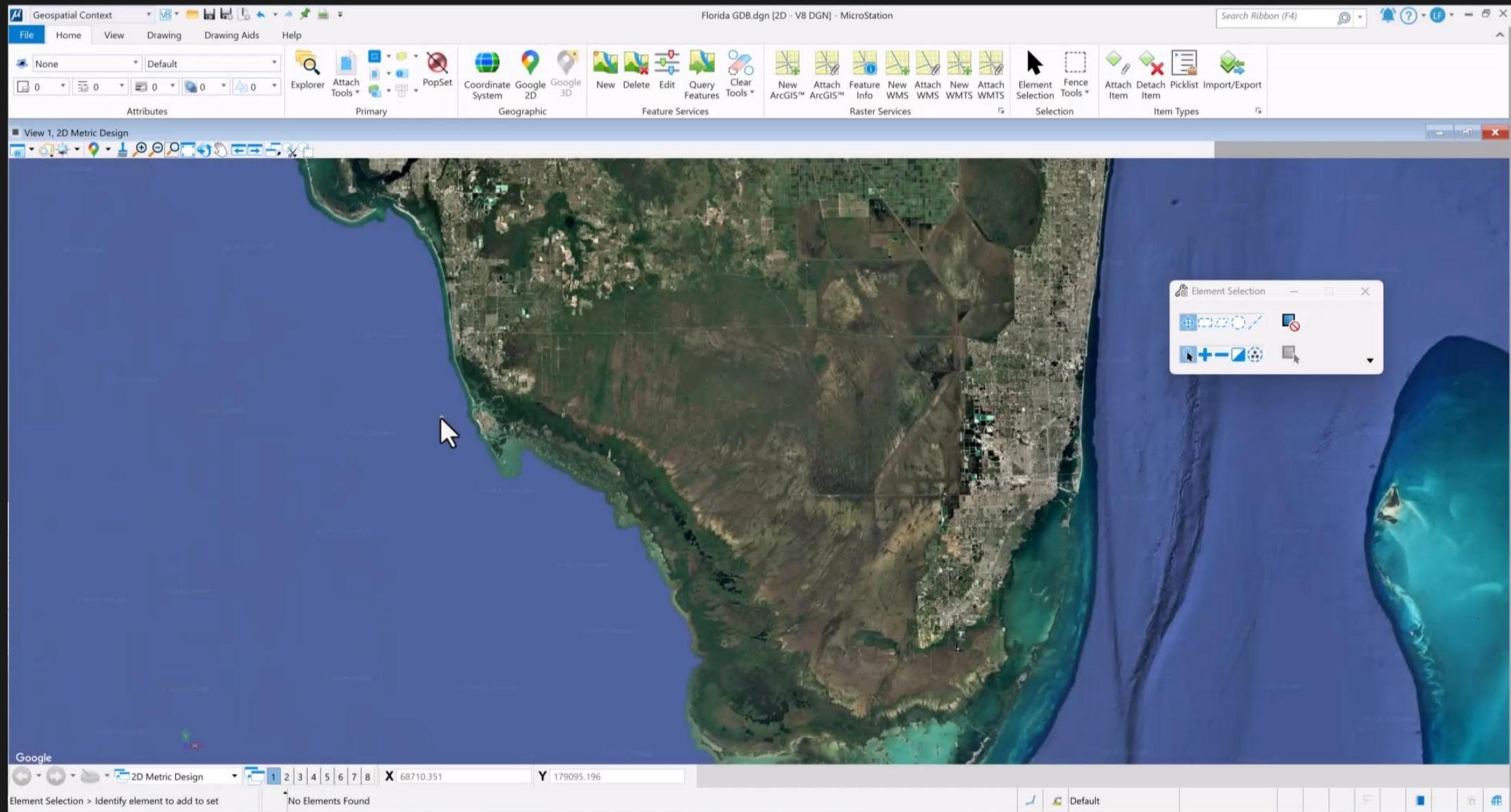
Geospatial Context Python API – Demo video



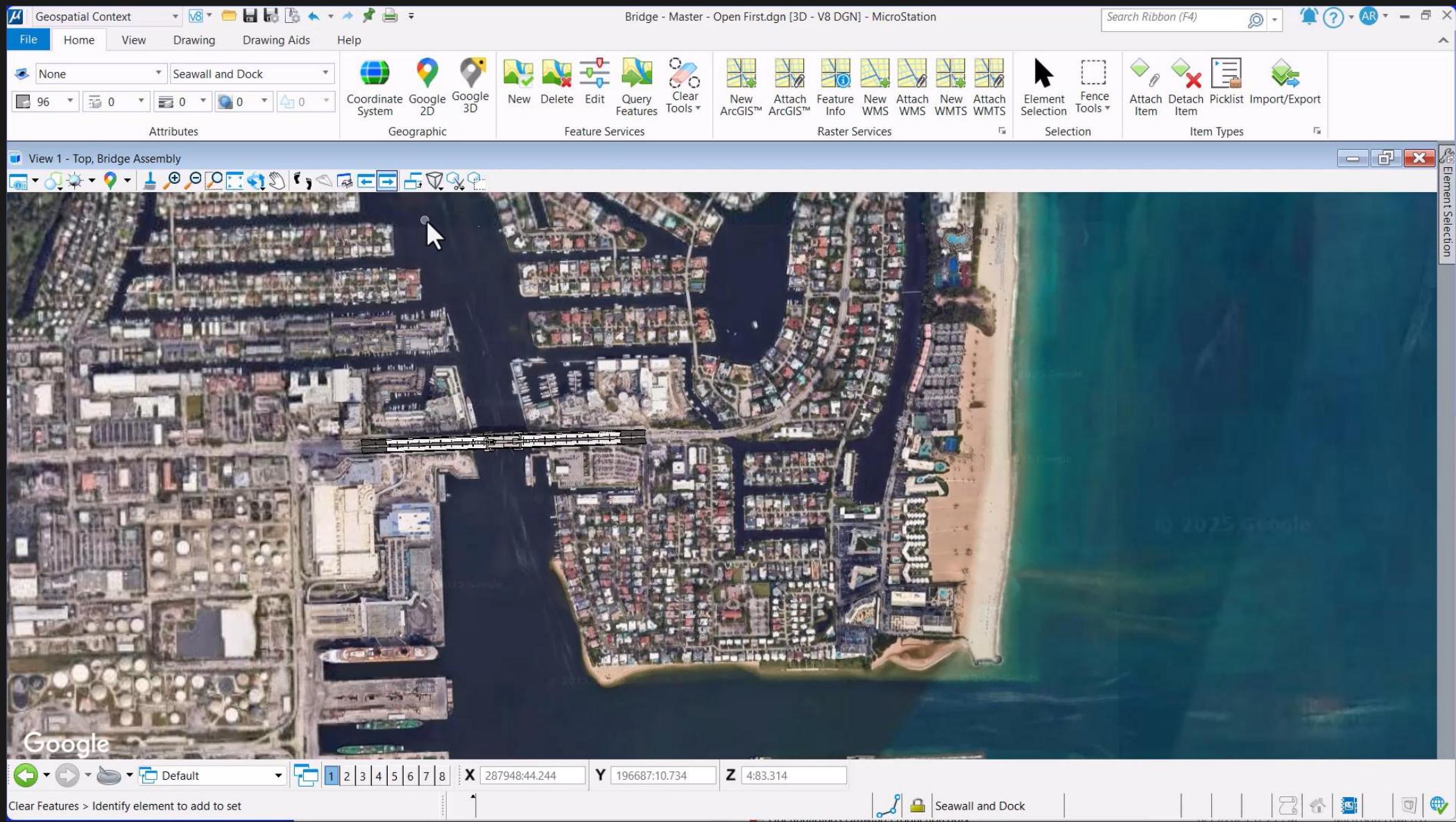
Esri File Geodatabase Support – Import/Export



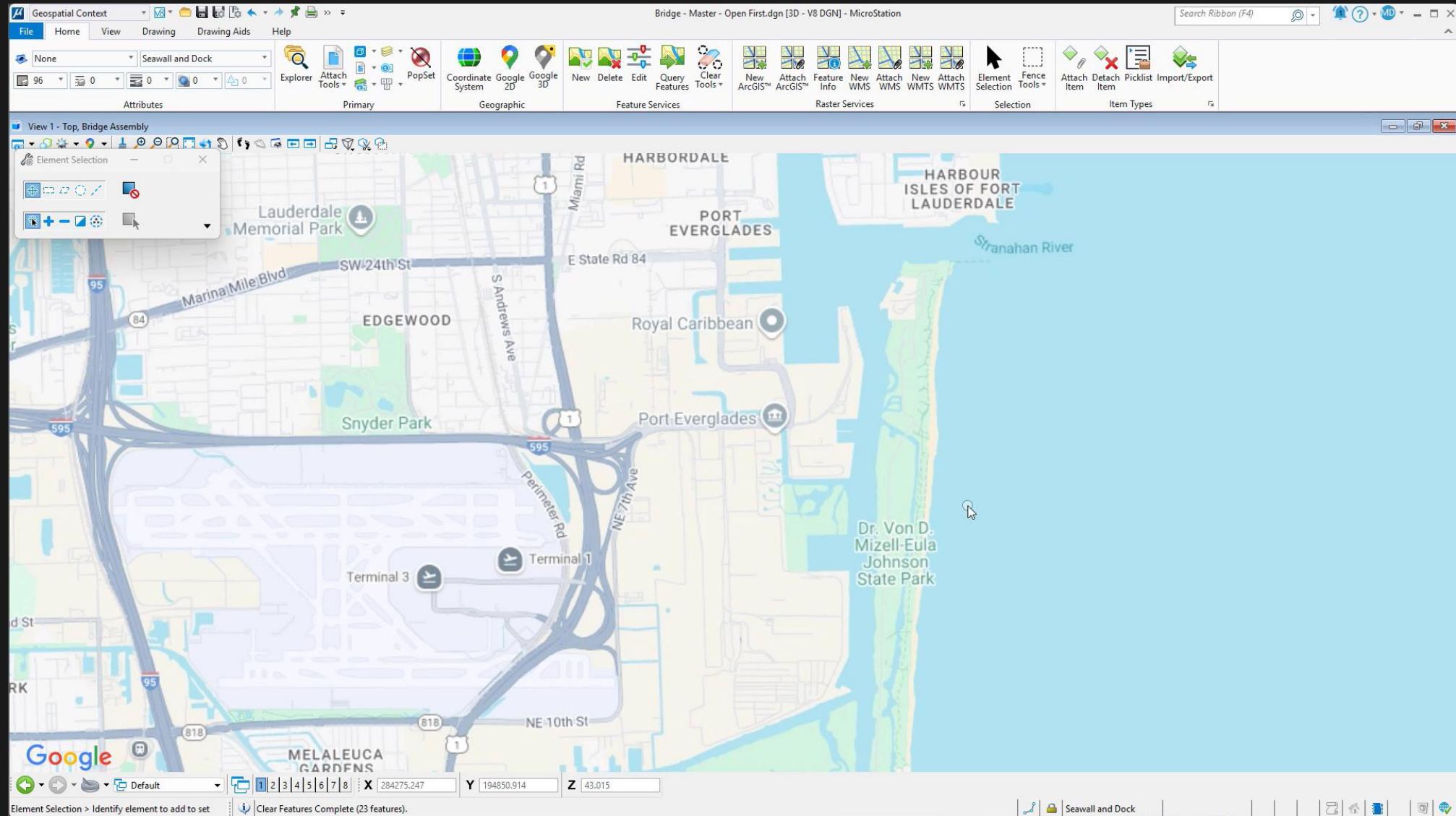
Esri File Geodatabase – Demo / Video



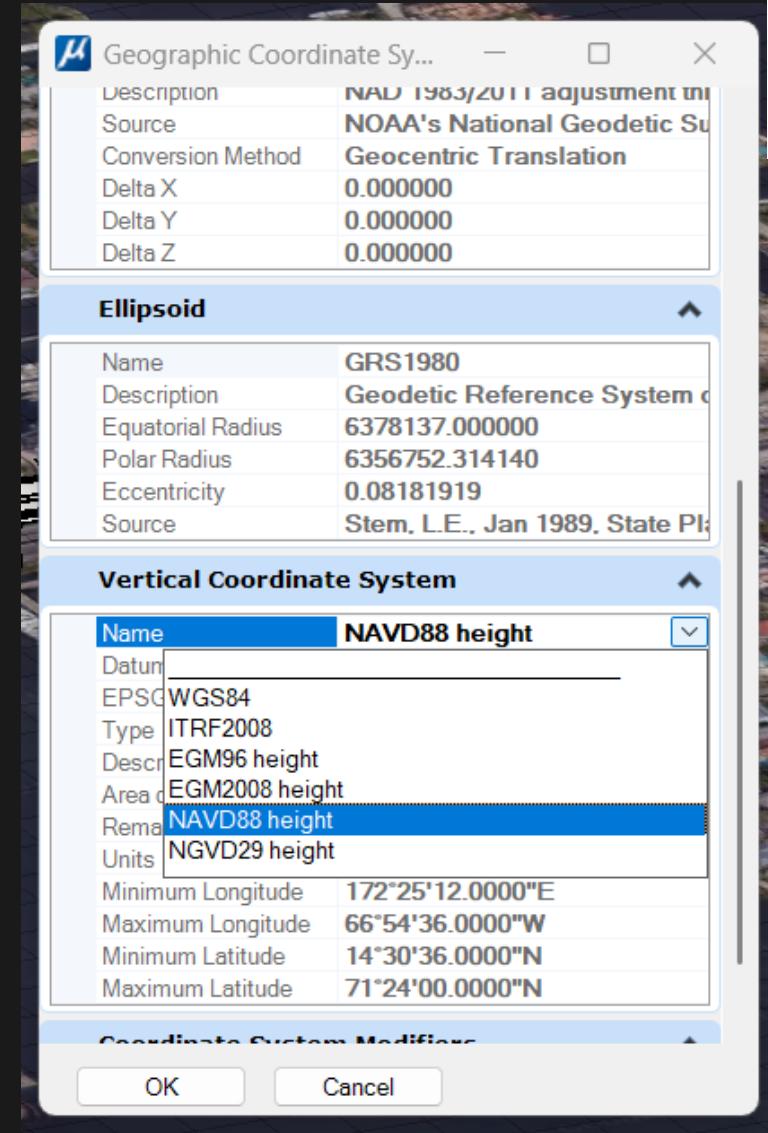
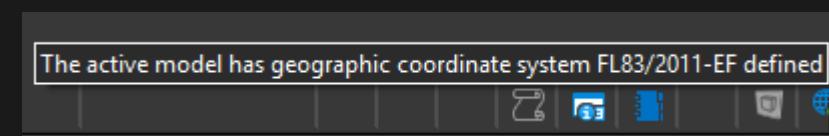
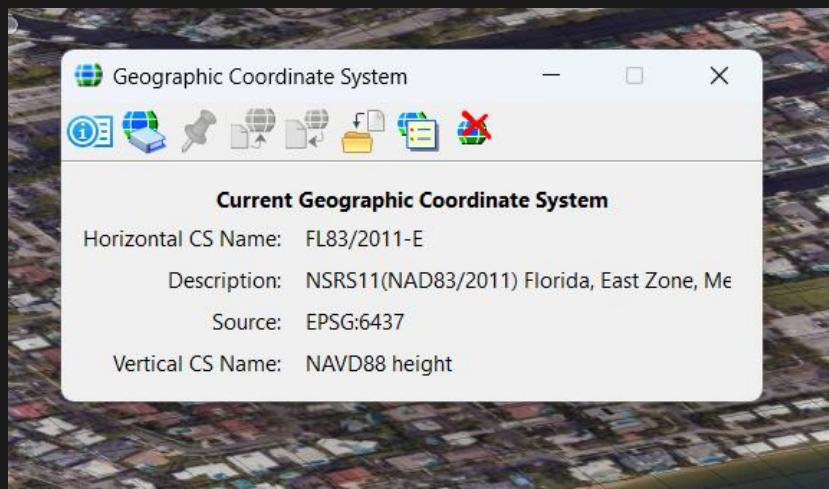
Cell Fixed Size



2025.00.00.01.62 - WFS Blynscy integration



New Vertical Datums



OGC API Feature Services (*Tech Preview*)

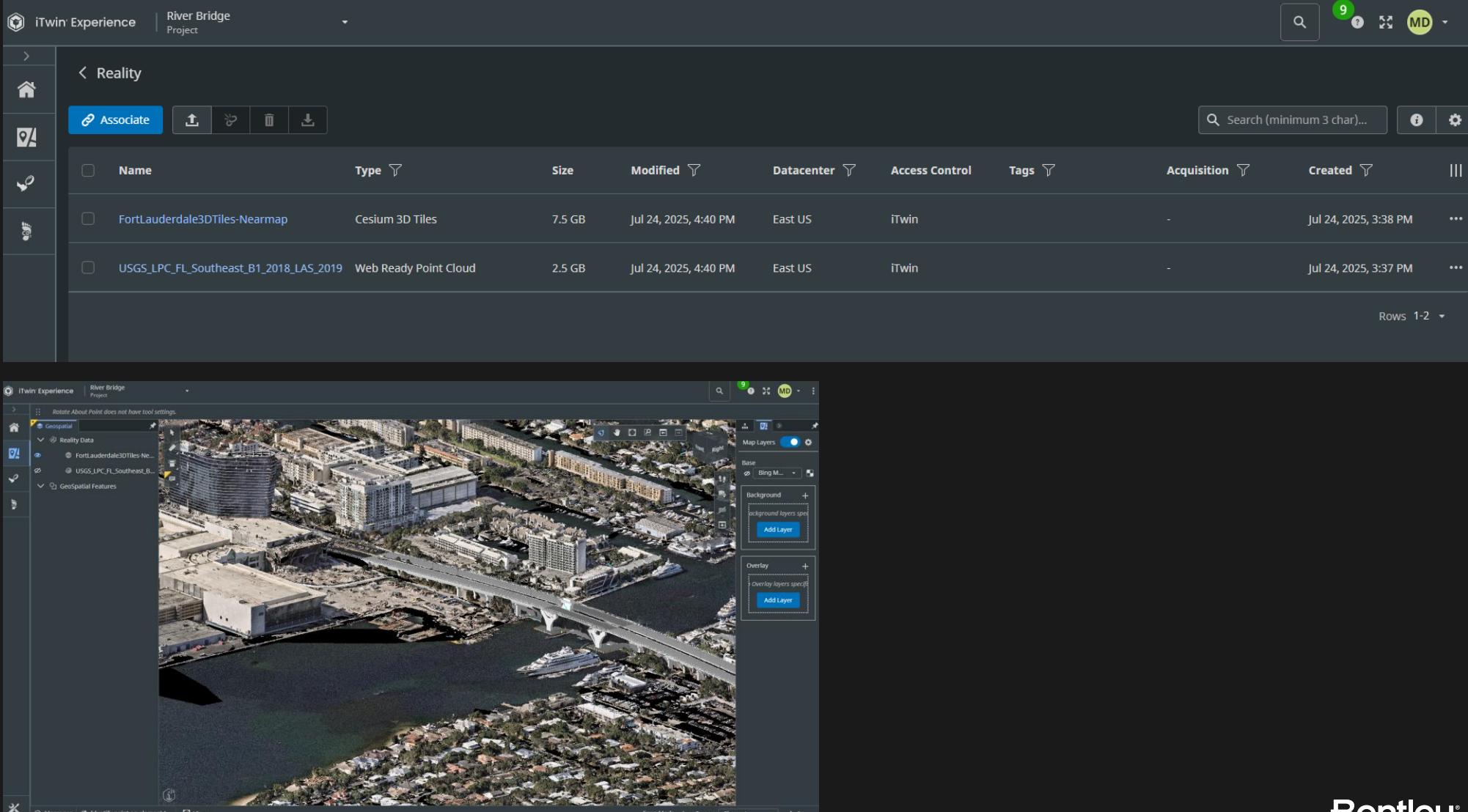


OGC API Features is the new, RESTful standard developed by the Open Geospatial Consortium (OGC) for accessing and managing geospatial feature data over the web. It is considered the evolution of the older Web Feature Service (WFS) standard.



Support OGC 3D Tiles format – The open standard for massive, 3D geospatial datasets

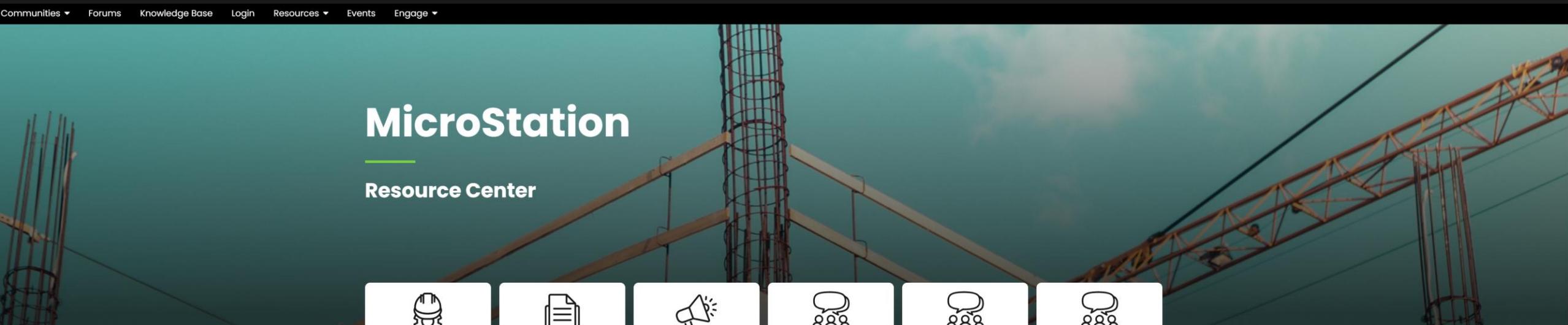
The 3D Tiles specification, an open standard initially developed by [Cesium](#), is used for streaming and rendering large-scale 3D geospatial datasets like buildings, terrain, and point clouds.



The screenshot shows the iTwin Experience software interface. The top half is a list view titled 'Reality' showing two items: 'FortLauderdale3DTiles-Nearmap' (Cesium 3D Tiles, 7.5 GB, modified Jul 24, 2025, 4:40 PM, Datacenter East US, Access Control iTwin) and 'USGS_LPC_FL_Southeast_B1_2018_LAS_2019' (Web Ready Point Cloud, 2.5 GB, modified Jul 24, 2025, 4:40 PM, Datacenter East US, Access Control iTwin). The bottom half is a 3D viewer showing a bridge over a river with buildings and terrain. The left sidebar shows a tree view of 'Geospatial' data, with 'Reality Data' expanded to show the two listed items. The right sidebar shows 'Map Layers' settings for 'Base' (Bing Maps), 'Background' (Add Layer), and 'Overlay' (Add Layer).

Name	Type	Size	Modified	Datacenter	Access Control	Tags	Acquisition	Created
FortLauderdale3DTiles-Nearmap	Cesium 3D Tiles	7.5 GB	Jul 24, 2025, 4:40 PM	East US	iTwin			Jul 24, 2025, 3:38 PM
USGS_LPC_FL_Southeast_B1_2018_LAS_2019	Web Ready Point Cloud	2.5 GB	Jul 24, 2025, 4:40 PM	East US	iTwin			Jul 24, 2025, 3:37 PM

MicroStation Ideas Portal



Communities ▾ Forums Knowledge Base Login Resources ▾ Events Engage ▾

MicroStation

Resource Center

 MicroStation	 Knowledge Base Articles	 Release Announcements	 MicroStation Forum	 MicroStation Forum (日本語)	 MicroStation Forum (Deutsch)
 MicroStation Forum (Español)	 Announcements Forum	 MicroStation Files	 [Bentley Library] Examples	 [Bentley Library] Utilities	 [Bentley Library] Standards ColorBooks
 Coffee Corners	 Events & Webinars	 Watch MicroStation YouTube Videos	 MicroStation on LinkedIn	 Learn MicroStation	 MicroStation Ideas

Accreditation



Bentley Accreditation Program

Your Official Bentley Credential

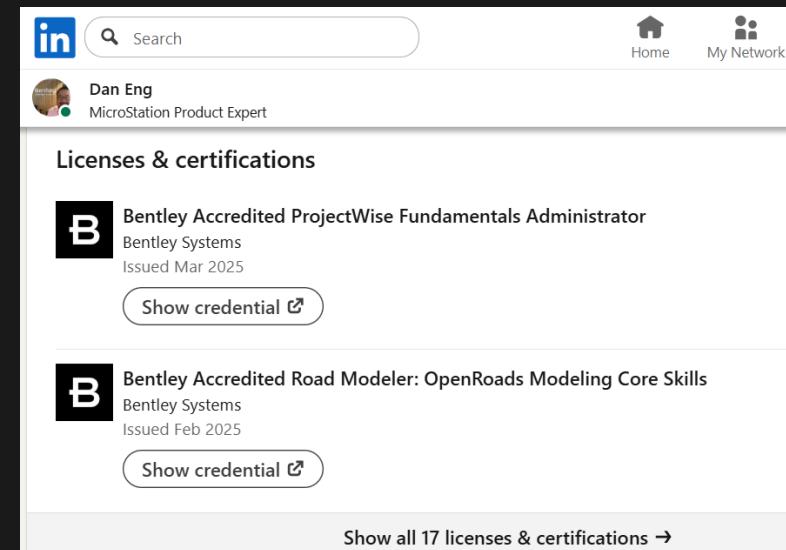
Why Bentley Accreditation?

 Bentley's Official Credential Get endorsed by Bentley for latest professional skills.	 Account Advantage Enhance employee skills required for AEC Projects to increase productivity.	 Skills That Matter Learn best practices and Bentley recommended workflows.
 Industry Recognition Get recognition in the industry with official credential from Bentley.	 Digital Badges Earn publicly verifiable digital badges which are easily shareable across your network.	 Career Advancement Advance your career with right skills set.

Dan Eng
Product Expert, MicroStation

Bentley Systems, Incorporated
685 Stockton Drive, Exton, PA 19341, United States
<https://www.bentley.com>

Bentley



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Dan Eng
MicroStation Product Expert

Licenses & certifications

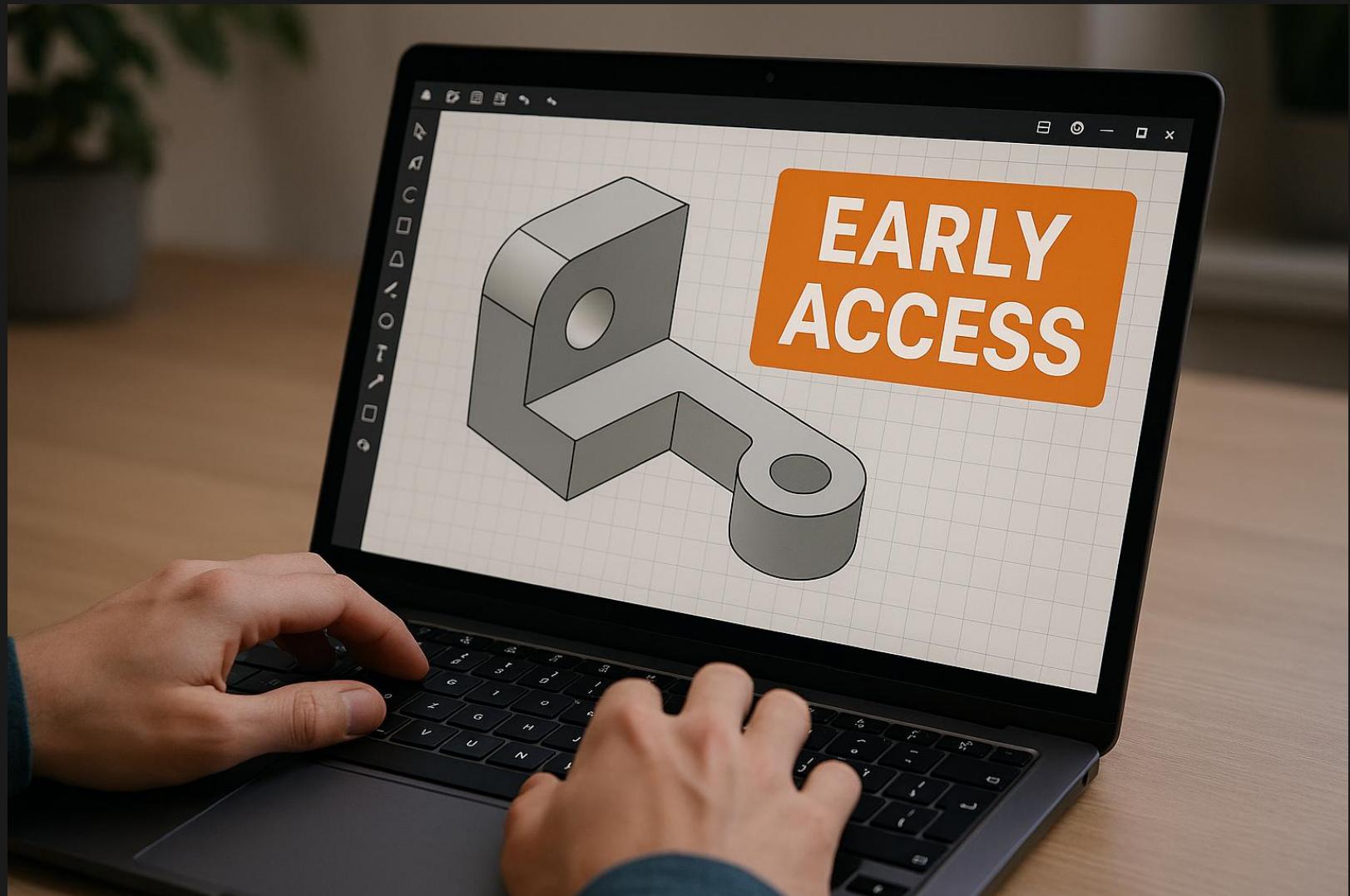
 Bentley Accredited ProjectWise Fundamentals Administrator
Bentley Systems
Issued Mar 2025
[Show credential](#)

 Bentley Accredited Road Modeler: OpenRoads Modeling Core Skills
Bentley Systems
Issued Feb 2025
[Show credential](#)

[Show all 17 licenses & certifications](#)

Ways to Participate and interact with the MicroStation Team

- Early Access Program
 - Non-disclosure Agreement (NDA)
 - Must have a MicroStation license
 - Able to access Nutanix environment



Product Research



Software ▾ Industries ▾ Digital Twins ▾ Support ▾ Services ▾ Company ▾ ⚒ Shop

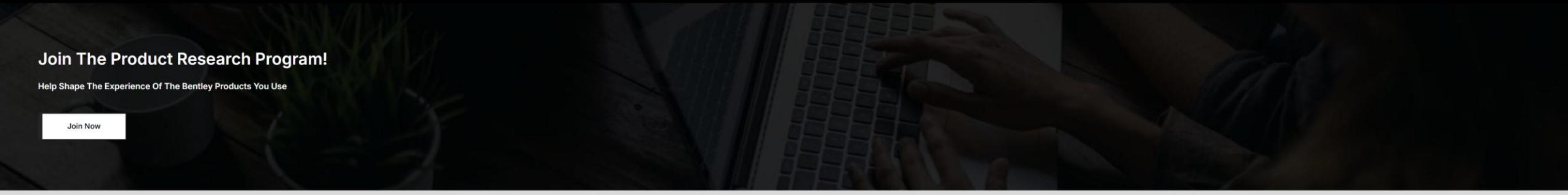
👤 Login ▾ ⚒ Lang ▾

Home / Product Research

Join The Product Research Program!

Help Shape The Experience Of The Bentley Products You Use

Join Now



Why Product Research?

The challenges of infrastructure can be complex, but its software doesn't have to be. You are the expert in your field, and we need your help to stress-test our solutions against YOUR reality.

How Does It All Work?

The first step is to simply [tell us you're willing to participate](#). If there is a match between your expertise and an upcoming product research activity, we'll contact you and arrange a time to meet with a researcher. You'll attend the online session, try out the product, and provide your feedback. Our product teams then use your input to improve the experience of the product you use.



What Will We Do?

Product Research sessions are virtual 1-on-1 sessions between a user and a researcher. A typical session lasts ~45 minutes and might include testing a prototype or exploring workflows. No preparation required!

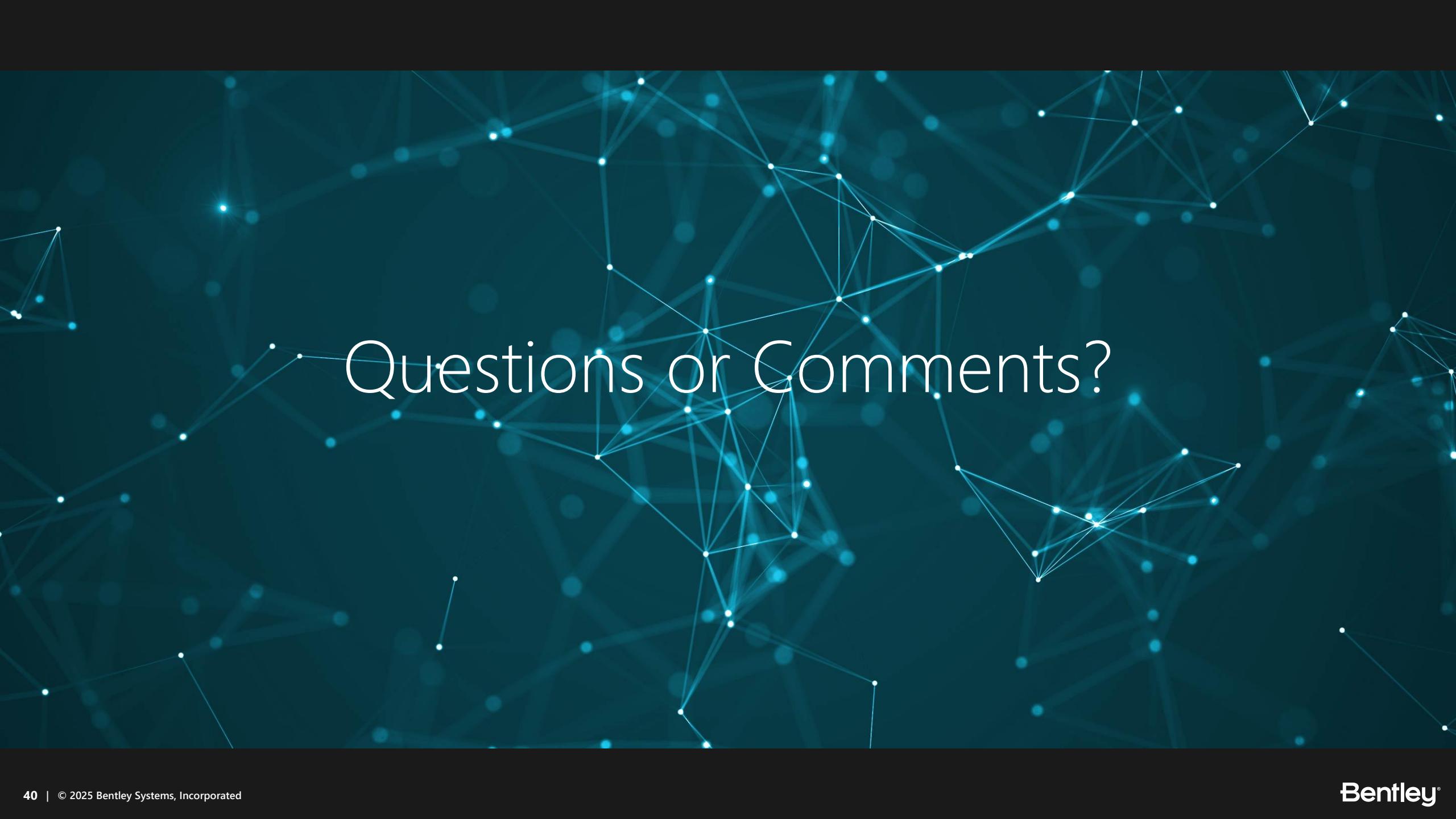


What Is In It For You?

Your voice influences what gets built into the products you use. Be heard, share your feedback with the product team and get a glimpse of potential solutions.

Interested? Join Us In A Lab.

Join Now



Questions or Comments?