Expert Opinion | Overcoming Civil Design Challenges with MicroStation's Enhanced Capabilities

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Computer-aided design (CAD) software has changed the landscape for civil design over the years, from hand-drawn blueprints, to digital 2D drafting, and now integrating 3D models into design workflows. For road, bridge, tunnel, rail and other civil engineering professionals, CAD tools are the foundation of their projects, and are used to support the entire workflow from start to finish with construction-ready deliverables. MicroStation® is the software of choice from transportation firms and civil engineers worldwide.

CAD FUNDAMENTALS

In the vast ecosystem of software applications, Robert Jones, Cadventure's Principal Consultant describes MicroStation as being a "big cuddly bear." To explain, there are software applications on the market that can be considered specialist applications, and some that you would think of as being generalist applications. Specialist software applications are like the animals that live a specific lifestyle, such as carnivores and herbivores. If a cheetah cannot catch its prey or the grass is not growing for the antelope, those animals struggle. Similarly, you have specialist software applications that are only designed to do handle specific tasks, and that often comes at a tradeoff. Whether it be requiring a limited file format or losing the ability to interact with other software, they can be quite frustrating, and ultimately unproductive.

On the other hand, the bear as an omnivore has the flexibility to forage for fruit and nuts when they are in season or go fishing and hunting when the opportunity presents itself. Jones tends to think of MicroStation as a generalist application and likens it to the bear because it has the functionality to perform a variety of jobs well, as needed. For a lot of people, it acts as the fundamental platform on which many civil engineering workflows depend—including those in the transportation industry.

MICROSTATION: THE BACKBONE OF BENTLEY APPLICATIONS

In terms of 3D applications, Jones believes MicroStation is a good intermediary—a broker that can take in data from many different sources without needing to do conversions.

The MicroStation toolset is the basis that allows for data integration between different software applications. Even Bentley's industry-leading civil applications, such as OpenRail™ and OpenRoads™, leverage the power of MicroStation's functionality to ensure interoperability across the family of solutions.

INTEROPERABILITY

MicroStation is an excellent application for repairing and recycling 2D and 3D data that comes from outside sources. It acts as an intermediary between other design applications, especially when such applications cannot interact directly with one another or when the data produced by a software must be altered before it can be consumed by another. MicroStation enables the user to reference the material, clean it up, and repurpose the data.

MicroStation functions as a quality control application when transferring data from another program because, regardless of where the information originates, MicroStation enforces a standard so you know it will perform properly in particular conditions. In places where data is not well-formed or lacks specific metadata—like BIM information—MicroStation is able to extract useful metrics from it and report that information in a BIM-like way. Jones thinks that MicroStation's interoperability is a significant factor in what makes it so useful.

3D MODELING

There are many tasks in civil design that require 3D modeling applications. Often, specialist applications such as OpenRoads or OpenRail have useful parametric capabilities that help set up and path the slope, drainage, and fall of a road or railway track, and then create sections and cuts through that information—but discipline-specific products are not typically used to model the complimentary objects along the side of the road or track such as signs, power cables, buildings, or other structures that need to be represented in the drawing or deliverable. Typically, those are simplified schematic objects that are used to represent those elements, so MicroStation is a helpful instrument for constructing those objects in 3D.

GEO COORDINATION

MicroStation is excellent at importing large data sets, and that is important when referencing big things like point clouds, reality meshes, and large models. This is a critical feature because it allows the user to see the overall picture and design in context.

MicroStation allows for geospatial information integration, which is essential in the transportation industry. When data has a common coordination system it has the ability to cross reference files, allowing them to communicate and locate each other's information accurately. This is especially important for long-distance transportation projects when the curvature of the Earth is a factor. MicroStation is useful for carefully and accurately locating design information, whether it is on a large scale or even a local sort of site or object scale.

Overall, MicroStation is a powerful application for civil design projects from roads to bridges, tunnels to railways, and everything in between. MicroStation scales based on the size and complexity of your project whether you are designing a parking lot or an entire road or railway system. MicroStation is the application of choice for transportation.

To hear more from Robert Jones and other industry experts, watch our MicroStation for Transportation Webinar series.