

### 3.1.2

## **Modeling Current and Future Rail Network Level of Service (LOS) Conditions Using GIS: A Case Study from the Minnesota DOT Comprehensive Statewide Freight and Rail Plan**

### **Presenter**

Kevin Ebright-McKeehan  
GIS Associate  
Cambridge Systematics, Inc.  
[kebrightmckeehan@camsys.com](mailto:kebrightmckeehan@camsys.com)

### **Co-Presenter**

For the Minnesota Department of Transportation, analysts were tasked with creating a statewide plan for the state's freight and passenger rail service. As part of the plan, MnDOT directed analysts to evaluate current railroad network conditions, identify operational chokepoints, determine future conditions, and model infrastructure improvements. To achieve this, analysts built a Linear Referencing System (LRS) atop the state's rail network, undertook a robust data collection effort, interviewed stakeholders, developed performance measures, and modeled through ESRI ArcGIS products current and future rail traffic conditions, and a number of infrastructure investment proposals. Analysts utilized a number of variables for this process, including track ratio, rail line volume, signaling control system, and track condition. Volume-to-capacity (V/C) ratios and level of service (LOS) calculations were computed for both the freight and passenger networks under current conditions and under a series of network scenarios, from a full-build-out of all identified improvements to a no-build scenario. Prevailing costs were attached to the improvements, which included modernizing signaling control systems, adding more track to the network, and upgrading deficient bridges.