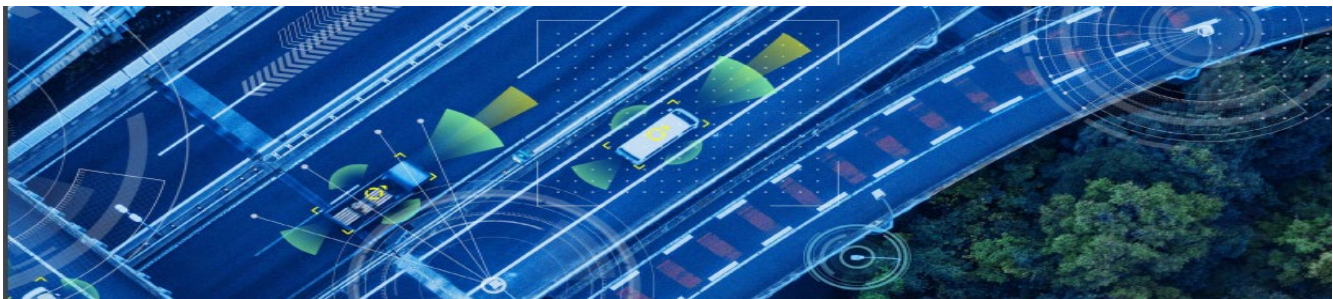


Asset Management for Traffic Engineering

Transportation systems continue to increase in number and complexity because of rapid advancements in technology and user/system demands. MnDOT needs to ensure the operational reliability of these systems, but also do so with the maximum cost effectiveness.

These assets, such as signal systems, intelligent transportation systems, and innovative pavement markings, aid in the development of connected and automated vehicles that greatly increase safety and mobility; provide alternative means to address congestion through incident and road weather management; and create safer travel for all modes of transportation. Because of their nuanced performance and life cycle considerations, they require concerted effort effectively manage.



To meet the demands of this complex situation, asset management principles rely on good data, such as asset inventory and inspection information, and tools, such as the TAMS (Transportation Asset Management System), to improve management efficiency. This is important over both the short- and long-term.

MnDOT believes it is vital to practice and continue to advance Transportation Asset Management because TAM:

- Is a performance-based approach that uses agency goals and objectives to drive resource allocation. Asset management relates resource needs to the construction, maintenance, and operation of transportation infrastructure assets.
- Enables transportation agencies to improve accountability, decision-making, and coordination between maintenance and capital programs and better manage the available funding.

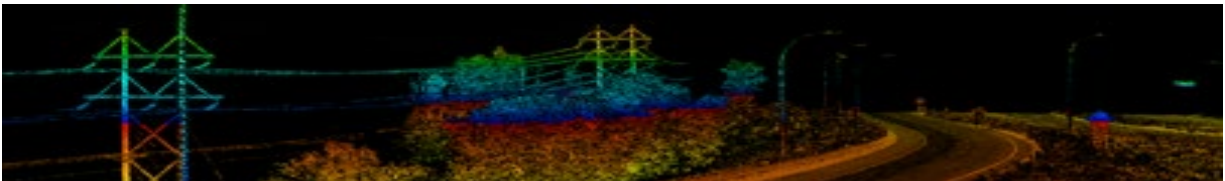
The collection, management, and analysis of quality asset inventory and condition data is a critical part of asset management. Asset management implementation benefits from well-planned information technology systems that consider the decision-making processes that agencies use to keep assets operational and safe.

MnDOT made a strong commitment to managing our assets by adopting an Asset Management Strategic Implementation Plan, which sets a departmental vision (and set of strategic objectives and action plans). In other words, MnDOT is committed *“To effectively manage transportation assets by mitigating risk, optimizing return on investment, and using the best available information and tools.”*

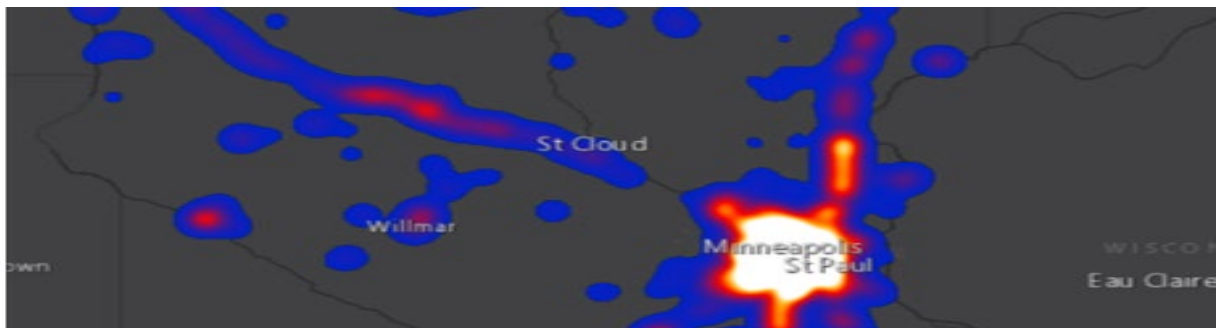
Maturing Traffic Engineering Asset Management at MnDOT

Traffic Engineers play a crucial role in asset management. They make critical asset trade-off decisions daily based on funding limitations and safety impacts. Important examples of how a traffic engineer can advance asset management include:

1. Ensuring that asset inventory and condition data is kept up to date in TAMS, so the data is readily available for planning, scoping, maintenance tracking, and responding to public complaints.
2. Promoting better and more efficient ways to obtain and update data; for example, using automated vehicle location data for striping data, remote sensing, and artificial intelligence technologies for signs.



3. Collaborating with various partners, such as bridge, pavement, and maintenance staff, to better understand asset risk and performance. For example, this may include reviewing signal inspection results and planning for maintenance or capital repair needs or investigating the density and costs of traffic barrier repairs and recommending future improvements.



4. Promoting “taking care of what we have” by carefully planning and working closely with partners (e.g., Electrical Services Section) in preventive maintenance activities to prevent an asset from needing a total replacement or from failing catastrophically. A project is underway that will utilize data from MnDOT’s Transportation Asset Management System (TAMS), the State Transportation Improvement Program

(STIP), and traffic signal construction project lettings to investigate maintenance, rehabilitation, and replacement investments made on the Metro District’s traffic signal systems. Trends and relationships observed in the data will be analyzed to understand the extent to which asset management practices impact traffic signal performance and life and then provide recommendations for changes to asset management practices that would improve traffic signal performance and life cycle.

- Using analytics, such risk, costs, ages, etc., to assist with decision-making. Shown below is a signal system dashboard that was created in ArcGIS Online from TAMS data.



Signal System Dashboard

District Traffic Engineering staff have a high level of responsibility. With the challenges of delivering construction project engineering, fielding constituent inquiries, and keeping abreast of emerging technologies, traffic engineering staff are now asked to use tools and data to manage the system in a more analytical way. As in other areas of change, extra effort can be required, especially initially. MnDOT is willing to make an investment with the expectation that it will leverage higher returns in management efficiencies over time. It can’t be done without the support of the Traffic engineering community, but this community has reliably risen too far more difficult challenges.