

DRAFT Scope for “Highway System Management and Operations” Strategy Paper

Strategy papers are designed to be moderate-length (20-30 pages), meant to define specific problems, assess current conditions, and identify potential policy directions to move forward in the next long-range plan. Some of these policy directions could have direct bearing on the scenario development process; these issues and their implications for technical analysis should be identified for CMAP’s Research and Analysis Team.

This strategy paper will focus on three areas. 1) Which operational strategies are in use in the region today, and to what extent? 2) What are the major opportunities to pursue new or expanded operational strategies? 3) What are the likely costs and benefits of doing so, and 4) are particular public-sector infrastructure investments needed to support future operational strategies?

GO TO 2040

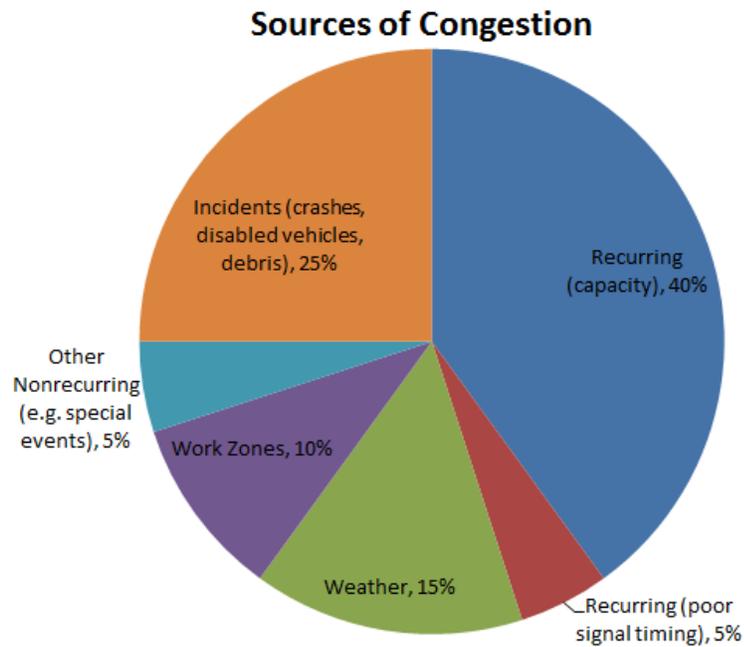
The GO TO 2040 Regional Vision describes a future multimodal transportation system that is “safe, accessible, easy to navigate, affordable, and coordinated with nearby land use,” reduces congestion and improves regional mobility, and supports “reinvestment in our existing communities...leading to environmentally sensitive and fiscally efficient outcomes.”

To achieve this , GO TO 2040 seeks to maintain existing infrastructure of all types and gain operational efficiencies from it,” make additional investments in transit and freight, use innovative and sustainable finance and **system management ideas...**”

GO TO 2040 included a few specific system management and operations recommendations such as congestion pricing and parking pricing. Aside from the small number of major capital project recommendations, there was little discussion of where these strategies should be applied or what investments were necessary to support them.

In addition, there were other more general recommendations for modernization strategies that should be prioritized. The short list of examples included real time traveler information systems, traffic signal improvements (timing, interconnects, transit signal priority) and implementing traffic management centers.

Ultimately, the purpose of these investments is to improve reliability and safety, and to reduce congestion. Research has shown that imbalance between demand and capacity accounts for about 40% of congestion. Many of these causes interact with each other, but perhaps 60% of congestion nationwide is caused by sources that are best addressed by operational changes rather than capacity improvements.



Source: FHWA Office of Operations

http://www.ops.fhwa.dot.gov/congestion_report/executive_summary.htm#overview

This strategy paper is an opportunity for the region’s system operators to participate in a review of current and future management and operations practices, and the technologies that support them. This review will provide more specific direction for analysis of the transportation system in the next plan and potentially be incorporated in assessment of transportation scenarios utilized during plan development.

Research questions

Addressing highway management and operations questions is new to northeastern Illinois’ regional transportation planning efforts. Therefore, the questions will start with developing a description of what the agencies are doing today as well as their planned shorter term improvements.

In the long term, there are a number of new technologies that are expected to become widespread within the timeframe of the next plan horizon. The connected and smart city will integrate transportation infrastructure as nodes in the “internet of things,” including both vehicles and infrastructure. Intelligent infrastructure components will be needed to take advantage of this capability. The process of changing or upgrading current “dumb” infrastructure will become increasingly important, along with developing the back office systems to support them. The availability of reliable and redundant power and communications will also be touched on.

The operational areas we will consider include:

- Incident and Emergency Management
- Weather Management
- Work Zone Management

- Special Events Management
- Signal Coordination and Timing
- Traffic Management Centers
- Traveler Information
- System Monitoring

For each operational area, the paper will assess:

1. Current conditions
 - a. For each of the operational areas, what strategies is the region using today?
 - b. How were the deployment locations selected?
 - c. Should these strategies be expanded?
 - d. What equipment and technology is being used?
 - e. Are there changes in strategy or equipment which can be expected to reduce costs in the future?
 - f. Can we quantify the effectiveness and cost of today's strategies?
2. For each of the operational areas, what new strategies are the agencies considering in the near term?
 - a. Will these strategies replace any current strategies?
 - b. How are deployment locations selected?
 - c. What equipment and technology will be used?
 - d. What is the expected effectiveness and cost of the strategies?
3. Building the foundation for the for the future smart transportation system.
 - a. What are the foundations for of the system of the future?
 - b. What costs are associated with building the foundations?
 - c. How do they get implemented?
 - d. How can we prioritize the activities and locations for the foundation?

The paper will briefly consider how the operational strategies combine to support integrated corridor management, parking management, active traffic management, vehicle to infrastructure integration, mobility as a service, commercial vehicle systems and autonomous vehicles.

Project approach and required analyses

The goal of this effort is to develop a list of recommended operations activities that can be used to provide input to scenario development and the next plan's inclusion of more specific operations recommendations. FHWA and other organizations have collected information about the effectiveness and cost of many strategies. These should be sufficient for developing planning level estimates. Also, a large number of strategies and technologies have been included in the region's ITS Architecture and should be included in the analysis. The project approach will follow this scheme:

1. Characterize the problem to be addressed
2. Identify current and future strategies to address the problem
3. Identify potential application locations, costs, benefits

4. Develop tentative recommendations

Engagement strategy

CMAP's Regional Transportation Operations Coalition (RTOC) and the Advanced Technology Task Force (jointly) are the primary working groups for this project; no new resource group is planned to be convened.

Along with the committee as a whole, there are a number of individuals with special expertise in operations and intelligent transportation system development. CMAP staff will try to engage them individually in some more lengthy and in-depth discussions about the current and desired future of operations in the region.

Timeline and interim deliverables

The overall timeline for the strategy papers is described in the [long-range plan schedule and strategy paper development process](#) memo presented to the Transportation Committee at their May meeting. Staff is still developing a timeline and list of expected memos and products for the **Highway System Management and Operations** strategy paper.