# CMAP
# PROJECT - SCOPE STATEMENT
## August 7, 2019

## 1. Project Background and Description

Intersections account for the vast majority of delay occurring on arterials, with poorly timed traffic signals constituting part of the problem. Northeastern Illinois has approximately 8,000 signalized locations, making signal maintenance and retiming potentially an area of significant congestion and delay savings.

The subject was explored in the Highway Operations Paper (2017), which recommended:

• modernizing traffic signals

• retiming traffic signals

• expanding the use of central signal systems

• investing in the roadway communications system

• researching and report back on the state of the region's traffic signals

• review traffic signal policies around interstate interchanges

The Regional ITS Architecture Update project, expected to be complete at the end of 2019, also includes a report on the region's communications infrastructure and considerations for its future expansion. Modern and centralized traffic signals depend on communications capabilities and this paper will be a useful input to this project.

CMAP wishes to support improved traffic signal operations and requires more information on regional needs in this area and the benefits and costs associated with different investment types. Signal retiming, controller replacement, communications infrastructure, and Automated Traffic Signal Performance systems can each improve traffic signal performance. There are potentially other valuable signal system investments that should be explored.

Many of the region's traffic signal systems are in disrepair, outdated, poorly functioning, and lacking modern capabilities. This project will create the foundation for a Regional Traffic Signal Improvement Program that can reduce congestion and delay, improve safety and travel time reliability, and reduce maintenance and operations costs. The program will also help meet regional highway system performance goals.

## 2. Project Goals

1. Develop a shared UNDERSTANDING of the condition of the region's traffic signals among the region's system operators, policy makers, and program developers.

2. Develop a shared VISION of the desired traffic signal system.

3. Develop EVIDENCE showing that the vision supports regional priorities for multimodal mobility, safety, and state of good repair goals.

4. Develop a recommended PLAN that prioritizes investments needed to move the region's signal systems towards the vision.

5. Recommend an appropriately sized investment PROGRAM structured to support implementing the improvement plan.

6. Obtain support from CMAP committees to APPROVE the program structure.

## 3. Other Considerations and Relevant Past Work

Traffic signals play an important major or supporting role in almost all CMAP planning work. The following reports provide discussions and recommendations that should be considered in the development of the Regional Traffic Signal Improvement Program. *Additional information exists at system operator agency offices, and we will request it early in the project.*

- *ON TO 2050 Mobility chapter, promoting policies to improve management of the arterial system to support reduced congestion and improved reliability for all users, including transit riders and freight movement, bicyclists and pedestrians.*
- *ON TO 2050 Implementation Matrix referencing multiple activities to improve traffic signals , including "establish(ing) a program to modernize traffic signals, including the provision of TSP and centralized communications."*
- *Climate Resilience strategy paper outlines ways we can improve and manage our assets, including traffic signals, communications, and traffic management centers to be resilient in the face of climate change and allow real time management to respond to emergencies.*
- *Highway Operations strategy paper which recommends modernizing and retiming traffic signals, expanding central signal systems, and considering improving operations before expanding roadways.*
- *Emerging Transportation Technology strategy paper discussing new ways connected vehicles and transportation infrastructure will interact in the future.*
- *Transit Modernization strategy paper recommending improved consideration of bus needs when planning road improvements, including transit signal priority.*
- *Stormwater and Flooding strategy paper recommending consideration of operational strategies to maintain highway system performance during flood events.*
- *Health Equity strategy paper citing road safety concerns that prevent people from bicycling or walking.*
- *Highway System Performance Trends report included system conditions for pavement and bridges, but lacks an inventory of traffic signal condition.  The report recommends targeting the NHS system for investment.*
- *Non-motorized Transportation white paper recommends limiting delay for pedestrians at intersections, installing bicycle signal heads, and coordinated signal timing.*
- *Safety white paper shows that traffic signals controlled intersections for 60% of severe crashes where the pedestrian was in the crosswalk, and left turning vehicles injure or kill nearly three times as many pedestrians as right turn vehicles. Protected rather than permissive left turn policies are a consideration to improve safety, and pedestrian countdown signals should be considered. Other maintenance and modernization practices*

> are recommended to ensure driver compliance with traffic signals and increase safety for everyone, including automated enforcement.
> - *Transportation Asset Management Recommendations* (TAM) memo describes TAM as a process to minimize the life-cycle asset costs necessary to attain performance goals. ON TO 2050 supports asset management activities, including activities to extend the useful life of signals and communications infrastructure.
> - *ON TO 2050 System Performance Report* includes goals for safety, including for non-motorized users, and system performance (highway reliability, peak hour excessive delay, and mobile source emissions). Traffic signals play an important part in arterial performance.

## 4. Project Scope: Phase, Tasks, Milestones, and Deliverables

1.0 Existing Condition Report (shared Understanding))
    1.1 Complete backlog signal data input
    1.2 Review agency traffic signal management plans and other documents
    1.3 Request additional data needed for complete existing conditions report
        1.3.1 Controller age
        1.3.2 Software version
        1.3.3 Year retimed
        1.3.4 Failure reports
    1.4 Develop summary tables, charts and maps of signal database
    1.5 Draft existing condition report
    1.6 Milestone RTOC/ATTF presentation, review & agreement
    1.7 Deliverable accepted Existing Condition Report

2.0 Develop description of desired future traffic signal conditions (shared Vision)
    2.1 Review CMAP and partner agency documents
    2.2 Review FHWA Arterial Traffic Management Recommendations
    2.3 Develop system Goals and Objectives
    2.4 Document support for regional and agency policies
    2.5 Milestone RTOC/ATTF Discussions & Agreement
    2.6 Deliverable accepted Traffic Signal System Vision Document

3.0 Develop a Plan that prioritizes investments (supporting Evidence)
    3.1 Evaluate gaps between existing conditions and desired future conditions
    3.2 Develop priority investment areas (geographic, technology) that may consider
        3.2.1 IDOT (or other) safety tiers/locations
        3.2.2 School locations
        3.2.3 Pedestrian accommodations
        3.2.4 Bicycle accommodations
        3.2.5 Freight corridors
        3.2.6 Expressway access & egress
        3.2.7 National highway system
        3.2.8 Economically disconnected areas
        3.2.9 Expected traffic growth
        3.2.10 Opportunities for interagency signal coordination
    3.3 Traffic signal needs summary (investment Priorities)
    3.4 Compare efficiency of retiming vs. other investments
        3.4.1 Before and after signal coordination and timing (SCAT) reports
        3.4.2 Automated traffic signal performance monitoring (ATSPMS) data
    3.5 Milestone RTOC/ATTF Discussions & Agreement

## 5.  Specific Exclusions from Scope

This project will not address partner agency budgeting, staffing, training, or procedures

This project will not address partner agency signal operating policies

## 6.  Assumptions and Constraints

- *A portion of CMAQ funding can be used to implement the recommended signal program, RTOC and PSC will support*

- *A Nicholas will assist with loading information into the signal inventory*

- *The team includes 2 members whose positions are currently vacant*

- *CMAP does not have a traffic or signal engineer to provide advice on potential technical questions. We will therefore rely on RTOC members for their expertise. Justin Effinger from Lake County has volunteered for this role.*

## 7.  High-Level Timeline/Schedule

*The schedule is oriented around the RTOC schedule. RTOC should be introduced to the subject and also be able to review and provide input on the draft and final reports.*

|  | Jul-19 | Aug-19 | Sep-19 | Oct-19 | Nov-19 | Dec-19 | Jan-20 | Feb-20 | Mar-20 | Apr-20 | May-20 | Jun-20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *RTOC Meetings* |  |  | X |  |  | X |  |  | X |  |  | X |
| Scope and Schedule |  |  |  |  |  |  |  |  |  |  |  |  |
| Existing Conditions Report |  |  | Draft |  |  | Final |  |  |  |  |  |  |
| Vision Development |  |  | Discuss |  |  | Draft |  |  | Final |  |  |  |
| Signal Investment Plan |  |  |  |  |  | Discuss |  |  | Draft |  |  | Final |
| Signal Program Design |  |  |  |  |  |  |  |  | Draft |  |  | Final |

Discuss=memo/material introducing the subject

Draft = outreach on specific ideas for the document

Final = document for approval

## APPROVAL AND AUTHORITY TO PROCEED

We approve the project as described above, and authorize the team to proceed.

| Name | Title | Date |
|------|-------|------|
|  | Project Manager |  |
|  | Sponsor |  |

| | | | |
|---|---|---|---|
| Approved By | Date | Approved By | Date |