Chicago Metropolitan Agency for Planning

233 South Wacker Drive
Suite 800
Chicago, Illinois 60606

312 454 0400
www.cmap.illinois.gov

Transportation Committee

Agenda
Friday, November 18, 2016
9:30 a.m.
Cook County Conference Room
233 S. Wacker Drive, Suite 800
Chicago, Illinois

The Transit Forum will begin at 8:00 a.m. in the DuPage room

1.0 Call to Order/Introductions **9:30 a.m.**

2.0 Agenda Changes and Announcements

3.0 Approval of Minutes— Oct 21, 2016

4.0 Coordinating Committee Reports

In October 2016, the MPO Policy Committee and the CMAP Board approved a revised Coordinating Committee structure. The revised Committees—the Planning and Programming Committees-- have not yet met and will meet in early 2017.

5.0 FFY 14-19 Transportation Improvement Program (TIP)

5.1 **Federal Fiscal Year 2017-2021 State/Regional Resource Table and Update to Selected Years of the TIP (Russell Pietrowiak)**

The State/Regional Resources Table has been developed for use in determining fiscal constraint. Implementers are in the process of awarding, moving or removing all FFY 2016 line items from the TIP. To assure continuation in programming, the selected years of the TIP specified in Attachment A of the TIP Change Procedures will be updated to FFY17.

Action Requested: Acceptance of the FFY 2017-2021 State/Regional Resources Table and concurrence with the update of Attachment A of the TIP Change Procedures.

5.2 **TIP Amendments and Administrative Modifications (LeRoy Kos)**

TIP Amendment 17-01 was published to the eTIP web site on November 9, 2016 for committee review and public comment. A memo summarizing the formal TIP amendment 17-01 and administrative amendment 17-01.01 is attached.

Action Requested: Approval

5.3 **Proposed Meeting Dates for 2017 (LeRoy Kos)**
The proposed meeting dates for the Transportation Committee for 2017 are:

Transportation Committee Meeting
1/20/17
3/3/17
4/28/17
6/16/17
8/4/17
9/29/17
11/17/17

Action Requested: Approval

6.0 ON TO 2050

6.1 **Financial Plan Development – Investment Trends (Doug Ferguson)**
As an early step in financial plan development, in September staff presented TC with historical revenue trends and projections relative to actual. To complement that analysis, staff has prepared a summary of how that funding has been obligated and awarded.
Action Requested: Discussion

6.2 **Highway Performance Trends Snapshot (Jesse Elam)**
A series of reports on the transportation network are planned, including an analysis of trends in highway performance. The **Travel Trends Snapshot** was released earlier this fall. Staff will present the major points of the highway trends snapshot for feedback by the committee. A similar presentation on transit system performance will be brought to the committee in winter.
Action Requested: Discussion

6.3 **Asset Management Paper Key Directions (Tom Murtha)**
Asset management has become a focus of federal regulation under MAP-21 and now the FAST Act. The paper will address the regulations as well as potential MPO roles in asset management to provide background for ON TO 2050.
Action Requested: Discussion

6.4 **Transit Ridership Growth Study (Martin Menninger)**
GO TO 2040 includes goals to significantly increase public transit usage. Staff will present results from an exploratory study to evaluate more specifically what would have to occur to reach those goals, including transit capital investments as well as policy changes related to parking, roadway pricing, and land use, among

others. The results will be used to inform the selection of recommended strategies and the process of setting targets for ridership growth in the region in the next long-range plan.
Action Requested: Discussion

6.5 **Regionally Significant Projects Update (Doug Ferguson)**
A 45-day public comment period was held to solicit additional regionally significant projects from the public and from implementing agencies for projects outside their jurisdiction. Staff will provide an update on the list of projects and next steps.
Action Requested: Information

6.6 **Highway Operations Draft Strategy Paper (Claire Bozic)**
In consultation with the Regional Transportation Operations Coalition, for the past year staff has been developing a strategy paper on highway operations and management with the intent of reviewing current policies, emerging issues, and potential future directions for ON TO 2050. Highway management strategies optimize the efficiency, safety, and reliability of the highway system through coordinated operations. Congestion due to incidents – rather than recurring congestion caused by predictable commute traffic – remains one of the largest causes of delay. Management initiatives may also facilitate better use of limited capacity, reducing the need for system expansion. Staff will provide an overview of the draft paper and will be seeking comments from the committee over the upcoming month.
Action Requested: Discussion

6.7 **Introduction to Highway Safety Strategy Paper (Todd Schmidt)**
This spring the Federal Highway Administration finalized the **national performance management measures for the Highway Safety Improvement Program**, requiring state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) to establish annual targets on all public roads for five safety measures. CMAP has the option to establish quantitative targets specific to the MPO planning area or commit to supporting the state DOT targets. In consultation with the Regional Transportation Operations Coalition, CMAP is preparing a highway safety strategy paper in order to provide analysis to support the development of these targets and to identify safety strategies and policies for CMAP to consider in ON TO 2050.
Action Requested: Discussion

7.0 Travel Survey Update (Craig Heither)
This fiscal year CMAP will be beginning a new household travel survey to refresh the Travel Tracker survey conducted in 2007-08. The primary use of the data collected from the household travel and activity survey will be to estimate and calibrate CMAP's activity-based travel model and trip-based travel model to reflect the current travel choices made by the residents of the region. Staff will give a brief update on the scope and timeline of the project.
Action Requested: Information

8.0 Legislative Update (Gordon Smith)

Discussion and an update of on-going state legislative issues will be presented to the committee.

Action Requested: Information

9.0 Status of the Local Technical Assistance Program

The current status report on the LTA program is included in the meeting materials.

Action Requested: Information

10.0 ON TO 2050 Bi-Monthly Report

The current status report on the progress of ON TO 2050 analyses is included in the meeting materials.

11.0 Other Business

12.0 Public Comment

This is an opportunity for comments from members of the audience. The amount of time available to speak will be at the chair's discretion. It should be noted that the time for the public comment period will immediately follow the last item on the agenda.

13.0 Next meeting

The next Transportation Committee meeting will be January 20, 2017.

14.0 Adjournment

Committee Members

_____ Charles Abraham	____ Adrian Guerrero	_____ Mark Pitstick
_____ Gabrielle Biciunas	____ Luann Hamilton	_____ Tom Rickert
_____ Darwin Burkhart	____ Robert Hann	_____ Leon Rockingham
_____ Lynnette Ciavarella	____ Scott Hennings	_____ Joe Schofer
_____ Michael Connelly	____ Emily Karry	_____ Madeline Shepherd
_____ John Donovan***	____ Tom Kelso	_____ Lorraine Snorden
_____ Doug Ferguson	____ Jennifer (Sis) Killen*	_____ Chris Snyder
_____ John Fortmann	____ Fran Klaas	_____ P.S. Sriraj
_____ Tony Greep***	____ Christina Kupkowski	_____ Ken Yunker
_____ Jacky Grimshaw	____ Randy Neufeld	_____ Rocco Zucchero**

*Chair **Vice-Chair ***Non-voting

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Chicago Metropolitan Agency for Planning (CMAP) Transportation Committee

Minutes

October 21, 2016

Offices of the Chicago Metropolitan Agency for Planning (CMAP)
Cook County Conference Room
Suite 800, 233 S. Wacker Drive, Chicago, Illinois

Committee Members Present:	Chair – Sis Killen, Brian Carlson – IDOT District One, Mike Connelly – CTA, Doug Ferguson – CMAP, Scott Hennings – McHenry County, Emily Karry – Lake County, Tom Kelso – IDOT Central Office, Patrick Knapp – Kendall County, Christina Kupkowski – Will County, David Kralik – Metra, Beth McCluskey – IDOT OIPI, Mark Pitstick – RTA, Tom Rickert – Kane County, Leon Rockingham – Council of Mayors (via phone), Dave Seglin – CDOT, Madeline Shepherd – MPC, Lorraine Snorden – Pace, Chris Snyder – DuPage County, Steve Strains - NIRPC, Rocco Zucchero – Illinois Tollway
Absent:	Darwin Burkhart – IEPA, John Donovan – FHWA, Tony Greep - FTA, Jacky Grimshaw – CNT, Adrian Guerrero – Class 1 Railroads, Robert Hann – Private Providers, Randy Neufeld – Bicycle and Pedestrian Task Force, P.S. Siraj - Academic and Research, Ken Yunker - SEWRPC
Others Present:	Mike Albin, Garland Armstrong, Heather Armstrong, Len Cannata, Maria Choco Urban, Vicky Czuprynski, Jackie Forbes, Mike Fricano, Han Fung Hui, Jessica Hector-Hsu, Arnold Kasemsarn, Mike Klemens, Aimee Lee, Ashley Lucas, Kelsey Mulhausen, Brian Pigeon, Brian Plum, Peter Skosey, Kyle Smith, Chris Strom, Tammy Wierciak
Staff Present:	Alex Beata, Anthony Cefali, David Clark, Teri Dixon, Kama Dobbs, Lindsay Hollander, Kristin Ihnchak, Elizabeth Irvin, Leroy Kos, Jen Maddox, Tom Murtha, Liz Oo, Ross Patronsky, Noel Peterson, Gordon Smith, Simone Weil, Barbara Zubek

1.0 Call to Order and Introductions

Committee Chair Sis Killen called the meeting to order at 9:34 a.m.

2.0 Agenda Changes and Announcements

There were no agenda changes or announcements.

3.0 Approval of Minutes

A motion to approve the minutes made by Mr. Connelly, seconded by Mr. Seglin, carried.

4.0 Coordinating Committee Reports

Ms. Killen stated that the Regional Coordinating Committee did not have a formal meeting but did talk about the change in the structure of the Regional Coordinating Committee. The committee received a presentation about the socio-economic forecast totals and local area allocation process. She stated that the next meeting date has not been scheduled.

Mr. Zucchero stated that at the last Local Coordinating Committee meeting the change in committee structure was discussed. At the meeting, there was also a presentation by CMAP staff about the training provided to the Village Planning Commission in Homer Glen. Mr. Zucchero thought the training was very effective.
He went on to say that the Local Coordinating Committee also discussed LTA project implementation, CMAP's role as an implementer, and mentioned the upcoming call for projects in May 2017.

5.0 Cook County Long Range Plan

Ms. Choco Urban presented Cook County's 2040 Long Range Transportation Plan that was approved by the Cook County Commissioners on August 2016. She stated that the plan provides a framework for future transportation investments and policies, and ensures that Cook County is contributing to the mobility of goods and people through the region. It has been 76 years since Cook County last produced a long range transportation plan. In the presentation, Ms. Choco Urban showed maps of Cook County displaying Cook County roads and the entire transportation network. Cook County does not own a continuous or significant portion of the transportation system. Ms. Choco Urban stated that Cook County Board President Preckwinkle keenly understands the importance of transportation to the County's economic and community health and has advocated for the County to take on a leadership role. She stated the plan can be found at cookcountyil.gov/transportation.

The five priorities of the plan were presented. They are public transportation, freight capital, equity, modernizing the transportation system, and increasing investment in transportation. Lack of investment in and around systems, maintaining and modernization of systems and increased investment were common themes across all the

priorities of Cook County's Long Range plan. The County will be more aggressive when applying for grants. Another strategy the County plans to employ includes blending fund sources to maximize funding. Ms. Choco Urban explained that Cook County did not wait for the plan to be finished to start work. She gave example of various projects throughout Cook County such as the Rosemont Transit Center, Lake Cook Road bike and pedestrian bridge, and the Touhy Avenue project.

Mr. Zucchero complimented the plan and stated that he thinks the plan is engaging and visually appealing. Ms. Shepherd commended Cook County for including equity as a priority. Mr. Connolly stated he is looking forward to working with Cook County in the future.

6.0 ON TO 2050

6.1 Infill/TOD Snapshot

Ms. Oo gave a presentation on the Infill/TOD Snapshot that staff is currently working on. She explained that a snapshot is a highly visual, data-driven summary of current conditions and region wide trends. She presented findings, including an evaluation of regional progress towards infill development. She stated the definition of infill is the construction of new buildings or redevelopment of existing properties on vacant, abandoned, or underutilized land in built up areas with existing infrastructure. She presented maps of the region to show three baseline categories for areas which were minimally infill supportive, moderately infill supportive, and highly infill supportive.

Mr. Seglin asked for a definition of the word underutilized. Ms. Oo stated that CMAP has evolved in their definition of underutilized and acknowledged that the underutilized portion is difficult to identify and define. Mr. Seglin noted that in the region there is good prime farmland that is utilized to its best use. Ms. Oo stated that is a good sign of the need to define some of the components even better, including "underutilized." The Lands in Transition strategy paper will tackle strategies to preserve agricultural, natural, and open lands, and where and how to develop previously undeveloped lands.

Mr. Seglin stated that there are some areas in the region that are not completely infill supportive but the category minimally infill supported implies there is still some level of infill supportiveness. Ms. Oo responded by noting that map areas colored white do not support infill. The geographic scale of analysis, block groups, are very large at the edges of the region. These large block groups might have some small pockets of built-out areas with existing infrastructure and any development that takes place in or adjacent to these built out areas would be considered infill. However, the large size of some block groups would obscure the infill supportiveness of these small pockets so the category is labeled as "minimally" infill supportive to acknowledge the data limitations of the unit of analysis.

Mr. Strains asked if brownfields are identified. Ms. Oo responded by saying CMAP created a strategy paper about brownfields several years ago and she said she will distribute the report. Mr. Strains stated that sometimes there is a reason for a property not being developed. Mr. Connelly suggested that Ms. Oo post or link the brownfields strategy paper. Mr. Rickert asked how much CMAP has spoken with municipalities that are in the areas that are less infill supportive and wanted to know if there are strategies or methods that can help support some of the infill planning activities. He stated that the courts do not support protection of undeveloped lands and comprehensive planning activities. He would like to know where this is going and if there have been discussions with municipalities on the outskirts. Ms. Oo stated that there are several strategy papers that answer his question. One is the reinvestment and infill strategy paper and the other is the lands in transition paper. Ms. Oo will connect Mr. Rickert with Nora Beck, the lands in transition strategy paper's project manager.

Mr. Connelly said that one of his concerns is development not occurring where the current transit system has already been built. This might result in transit agencies being pressured to extend to areas where there is currently no transit. Mr. Connelly also stated that it is helpful for the region to see where we have underutilized assets that we can potentially steer development towards. Ms. Killen agreed and stated that we should continue to direct development to areas with existing infrastructure rather than providing transit when development occurs outside these areas.

6.2 Local Area Allocation Process

Ms. Ihnchak gave a brief overview of the local area allocation process. She explained that CMAP is federally-required to create a forecast that informs the region's planning activities and it is also useful to find the trends and provide the information to municipalities for their planning efforts. The local area allocation will take the regional socioeconomic forecast total for population, households, and jobs and disaggregate it to the local level, ultimately providing county and municipal total projections at 5-year intervals.

There will be a workshop from 1:00 p.m. to 3:00 p.m. on November 18 to discuss more details; stakeholders are invited to provide feedback on the different strategies and trends that will drive the tool's results. In January or February initial totals will be reviewed with counties and major municipalities to make sure the results make sense. In February there will be another workshop to review results and get feedback from stakeholders.

Mr. Rickert stated that about six months ago, Kane County started updating some of their socio-economic data and in that process they utilized the 2040 numbers. He stated that some municipalities are concerned with where the numbers are coming from and a lot of them want to be engaged. He stated that the workshops seem to be for the county level planning and asked if there will be an opportunity for direct municipal input. Ms.

Ihnchak stated that CMAP will develop a strategy to engage municipalities after the February meeting but is not sure what form that will take.

6.3 Trends for Scenario Development

Ms. Oo explained that alternative futures scenario planning is an approach that helps identify trends and explained that for this project CMAP is looking at macro trends. She stated that CMAP is focusing on five futures related to mobility, land use, climate change, public resources and regional economy.

CMAP is currently collecting feedback on the five futures and will be identifying and reviewing strategies to address the impacts of the futures. CMAP will host futures workshops around the region to gather public input on impacts and strategies. Ms. Oo asked the committee what they are wary of and most excited about. Ms. Killen stated that maybe many people in the room are wary about the diminished resources but this is alongside the technological advances which are exciting. Mr. Strains asked if these are the only futures that CMAP will be asking about. Ms. Oo responded that these are the five futures that CMAP will focus on. Mr. Pitstick stated that suburban office parks and strip malls becoming less utilized is troubling. Mr. Zucchero stated that with more opportunities for working from home, it might not encourage urban living. He also stated with climate change, urban living might not be the most attractive when people might not need to own a car or to leave their house. Mr. Rickert stated that this is different from what CMAP has done in the past with alternatives and he glad that staff is looking at these five areas.

Mr. Connolly stated that he would be cautious about the rate of technological change. For example, ten years ago people focused on electric cars. Technology might not move as fast as predicted. Mr. Connelly also stated that Northeastern Illinois is more desirable than other areas such as Florida and New Jersey which are losing land area to rising sea levels as climate change occurs. Mr. Connelly stated he is concerned about the lack of tools to measure impacts of vehicle miles traveled. He gave an example of ordering something on Amazon instead of going to the suburban malls. Mr. Connelly said we do not have a way to measure that VMT impact of online retail. Ms. Shepherd said that economic restructuring is an important issue especially when looking at the geographic component and how it changes land uses, where the workforce is located and the impact on disadvantaged classes. Mr. Kralik stated that there is incredible opportunity for policy to shape the wide range of possibilities such as the future of the autonomous cars.

6.4 Public-Private Partnerships

Mr. Beata presented a proposed approach for addressing public-private partnerships in ON TO 2050. He reviewed the current language in GO TO 2040, subsequent staff efforts, and recent national trends in the PPP industry. Based on this analysis, staff proposes largely retaining the current language, with various updates and clarifications to reflect the changing regulatory and industry context, better articulate the public interest in PPP

agreements, and ensure that PPP facilities fit into the regional transportation network. The Transportation Committee agreed that the staff proposal is a reasonable way to discuss PPPs in the new plan. Ms. Killen stated that CMAP is on the right track with getting the updates together.

6.5 Utility Coordination

Mr. Beata presented a memo on improved coordination with utilities that included three potential avenues for improvement: better access to data, formal coordination councils, and statutory changes. The goal is to reduce construction delays for transportation projects. The Transportation Committee agreed that coordination with utilities is a major cause of delay, that early planning with utilities is advantageous, and that avoiding utilities in the first place is a preferable approach. Some members noted that they have successful coordination efforts already, while others noted that utilities are unwilling to coordinate early on in the planning and programming process.

Ms. Killen said utilities are a significant cause of project delays. On the construction side, delays drive up the cost and dictate the schedule. She stated that looking at things on a regional level would help because everyone deals with the same players. Ms. Karry stated that Lake County has a utility coordination council and they start coordination early in phase one but there are still a few non-responsive players, which has raised costs. Ms. Karry stated that Lake County charges utilities a fee for putting facilities in their right of way. She stated that some utilities do not know where their facilities are located. She said that she would like to exploring strengthening statutory language more. Mr. Snyder stated that this is a problem for every transportation agency that deals with utilities. He stated that in DuPage County they are beginning a process to look at their permitting, specifically utilities. He stated that their goal is not to relocate the utilities but to avoid utilities. He also stated that contacts at utility companies change too often. Ms. Kupkowski stated that the biggest issue in Will County is that utilities will not review plans until they have reached the pre-final stage and the project is scheduled for letting. Mr. Carlson said IDOT has the same issue. Mr. Rickert stated that he does not know how much of this issue can be addressed by the time ON TO 2050 is released. He stated that there are many complex issues and he said he does not think there is enough time to address them before ON TO 2050 is adopted. Ms. Killen stated that Cook County has a utility council where the utility companies are informed of Cook County's five-year plan. She said that both the utility companies and the local agencies need to inform each other about what their plans.

6.6 Plan Indicators Development Scope

Mr. Peterson gave an overview of the plan indicators development project. He stated that the goal of the project is to create a set of indicators that will both quantify the goals of and measure the implementation progress of ON TO 2050. He stated there are three major components: to re-evaluate and refine the indicators in GO TO 2040, develop new indicators for ON TO 2050, and set near-term and long-term targets for all indicators in

the plan. He stated that towards the end of the fiscal year he will come back to the committee to get feedback on the proposed set of indicators.

Mr. Snyder made a comment that when the goal is to have 10% structurally deficient bridges, the public thinks it should be 0%. He stated that he thinks it should be turned into a positive by saying not structurally deficient. Mr. Murtha stated that new federal regulations are going to change how some data are collected or reported, which could impact existing indicators.

Mr. Rickert stated that there are some bridges that have been built in the last five years that are structurally deficient because they do not meet the shoulder requirement or for other reasons. Mr. Peterson stated that Mr. Rickert is referring to the functionally obsolete classification and said those are not included in the measure of structurally deficient. Mr. Carlson stated that public perception is that a structurally deficient bridge is unsafe, when in fact it only means that it needs more frequent inspections.

7.0 Regional Greenways and Trails Plan

Mr. Daly gave a progress report the update of the Regional Greenways and Trails Plan, last updated in 2009. CMAP worked with County DOTs and Planning Departments, Forest Preserve and Conservation Districts, and subregional councils to update the plan to reflect more current regional and subregional trail priorities. The proposed plan has 3,161 miles of trails.

Mr. Strains asked how many links connect to Northwest Indiana. Mr. Daly replied that there are about ten connections to Indiana. Mr. Snyder asked how many of the 3,161 miles are built. Mr. Daly replied about 40% of the total mileage of trails is completed. Mr. Rickert made a motion, seconded by Mr. Strains to approve the updated map of the Regional Greenway and Trails Plan to guide the funding recommendations of the Transportation Alternatives Program. The motion carried.

8.0 Legislative Updates

8.1 USDOT MPO Coordination and Planning Area Reform Rule

Mr. Smith stated that the comment period has been extended to October 24. He said that he anticipates USDOT to move forward with this rule, despite the concerns. USDOT staff will compile the comments and assemble a report. He stated that once that happens it will be shared with the committee. Mr. Snyder asked what can be done at the legislative level about this amendment. Mr. Smith responded that Congress can restrict the funding for that effort or states can sue the USDOT for overstepping their authority.

8.2 Constitutional Lockbox Amendment

Mr. Smith gave a quick summary of the Constitutional Lockbox Amendment and the concerns about the ambiguities in the amendment. He stated that regional planning is not explicitly identified in the language as eligible for funding. Mr. Smith stated that

CMAP is continuing discussions with partners about strategies to address the amendment on the implementation side. Mr. Seglin noted that Cook County has ended diversions of transportation funds without having to amend the constitution. Mr. Snyder asked if the real amount of diverted funds is known. Mr. Smith replied that the proponents identified $6 billion diverted over a ten-year period of time. CMAP staff came up with $520 million. Mr. Snyder stated that he thinks that there will be a public perception that previously diverted money will be returned, but the amendment only impacts future funding.

9.0 2017 Proposed Transportation Committee Meeting Schedule

Ms. Killen stated that the proposed dates will be brought forward for consideration at the November Transportation Committee meeting.

10.0 Status of the Local Technical Assistance Program

Ms. Killen stated that there is an update in the packet.

11.0 Other Business

Ms. Killen stated that Mr. Strains is retiring at the end of the month and thanked him for his service.

12.0 Public Comment

Mr. Armstrong stated that he was concerned about utility coordination. He said that local agencies need to communicate with utility companies and to have a backup plan. Ms. Killen stated that she agrees that the coordination with utility companies is ongoing and the expectations are continuing to be defined.

13.0 Next meeting

The next Transportation Committee meeting will be held on November 18, 2016.

14.0 Adjournment

On a motion by Ms. Karry, seconded by Mr. Snyder, the meeting adjourned at 11:37 am.

FFY 2017 State / Regional Resources (All figures are in $ millions)

Draft November 2016

		FFY 2017			FFY 2018			FFY 2019			FFY 2020			FFY 2021			Summary FFY 2017 - 2021		
FHWA State Resources[1]	**TIP Code**	Federal	Match	Total	Federal	Match	Total	Federal	Match	Total	Federal	Match	Total	Federal	Match	Total	Federal	Match	Total
National Highway Performance Program	NHPP	712.930	178.233	891.163	712.930	178.233	891.163	712.930	178.233	891.163	712.930	178.233	891.163	712.930	178.233	891.163	3,564.650	891.163	4,455.813
National Highway Freight Program	NHFP	38.415	9.604	48.019	38.415	9.604	48.019	38.415	9.604	48.019	38.415	9.604	48.019	38.415	9.604	48.019	192.075	48.019	240.094
Surface Transportation Program	STP-Urban	188.396	47.099	235.495	188.396	47.099	235.495	188.396	47.099	235.495	188.396	47.099	235.495	188.396	47.099	235.495	941.980	235.495	1,177.475
Highway Safety Improvement Program	HSIP	75.918	8.435	84.353	75.918	8.435	84.353	75.918	8.435	84.353	75.918	8.435	84.353	75.918	8.435	84.353	379.590	42.177	421.767
Bridge[2]	STP-Bridge	36.197	9.049	45.246	36.197	9.049	45.246	36.197	9.049	45.246	36.197	9.049	45.246	36.197	9.049	45.246	180.985	45.246	226.231
Recreational Trails	RECTP	1.510	0.378	1.888	1.510	0.378	1.888	1.510	0.378	1.888	1.510	0.378	1.888	1.510	0.378	1.888	7.550	1.888	9.438
Rail-Highway Grade Crossings	RHGC	10.710	1.190	11.900	10.710	1.190	11.900	10.710	1.190	11.900	10.710	1.190	11.900	10.710	1.190	11.900	53.550	5.950	59.500
Transportation Alternatives Program	TAP-State	18.787	4.697	23.484	18.787	4.697	23.484	18.787	4.697	23.484	18.787	4.697	23.484	18.787	4.697	23.484	93.937	23.484	117.421
Statewide subtotal[3]		1,082.863	270.716	1,353.579	1,082.863	258.684	1,341.548	1,082.863	258.684	1,341.548	1,082.863	258.684	1,341.548	1,082.863	258.684	1,341.548	5,414.317	1,293.421	6,707.738
FHWA (Regional/Urban) Resources[4]																			
STP Local	STP-Local	135.135	33.784	168.919	133.762	33.441	167.203	133.762	33.441	167.203	133.762	33.441	167.203	133.762	33.441	167.203	670.183	167.546	837.729
STP Counties	STP-County	5.589	1.397	6.986	5.084	1.271	6.355	5.084	1.271	6.355	5.084	1.271	6.355	5.084	1.271	6.355	25.925	6.481	32.406
CMAQ	CMAQ	103.923	25.981	129.903	103.923	25.981	129.903	103.923	25.981	129.903	103.923	25.981	129.903	103.923	25.981	129.903	519.613	129.903	649.517
TAP Local	TAP-Local	8.948	2.237	11.185	8.948	2.237	11.185	8.948	2.237	11.185	8.948	2.237	11.185	8.948	2.237	11.185	44.740	11.185	55.925
Regional Subtotal		253.595	63.399	316.993	251.717	62.929	314.646	251.717	62.929	314.646	251.717	62.929	314.646	251.717	62.929	314.646	1260.461	315.115	1,575.577
Total Available FHWA/State/Local Resources		**1,336.458**	**334.115**	**1,670.573**	**1,334.580**	**321.613**	**1,656.193**	**1,334.580**	**321.613**	**1,656.193**	**1,334.580**	**321.613**	**1,656.193**	**1,334.580**	**321.613**	**1,656.193**	**6,674.778**	**1,608.536**	**8,283.315**
Transit (FTA region-wide)[5,6] (as of 8/25/16)																			
Section 5307/5340	5307/5340	248.634	0.000	248.634	253.720	0.000	253.720	258.958	0.000	258.958	264.307	0.000	264.307	269.677	0.000	269.677	1,295.296	0.000	1,295.296
Section 5337 State of Good Repair	5337	241.366	0.000	241.366	245.535	0.000	245.535	249.763	0.000	249.763	254.064	0.000	254.064	258.429	0.000	258.429	1,249.157	0.000	1,249.157
Section 5339 Bus and Bus Facilities	5339	12.834	0.000	12.834	13.104	0.000	13.104	13.381	0.000	13.381	13.655	0.000	13.655	13.950	0.000	13.950	66.924	0.000	66.924
Section 5310 Seniors & Individuals with Disabilities[7]	5310	6.544	0.000	6.544	6.359	0.000	6.359	6.359	0.000	6.359	6.359	0.000	6.359	6.359	0.000	6.359	31.980	0.000	31.980
Transit subtotals by FFY		509.378	0.000	509.378	518.718	0.000	518.718	528.461	0.000	528.461	538.385	0.000	538.385	548.415	0.000	548.415	2,643.357	0.000	2,643.357
State/RTA/Local Transit Funds[8]			173.515			241.509			39.692			169.000			11.000			634.716	
Total Available Resources for Transit				**682.893**			**760.227**			**568.153**			**707.385**			**559.415**			**3,278.073**
Total (All Resources)				**2,353.466**			**2,416.420**			**2,224.346**			**2363.578**			**2215.608**			**11,561.388**

TIP Code = fund source designation in CMAP's eTIP Database

1. FHWA State Resources are derived from FHWA's apportionment notice 4510.805 (http://www.fhwa.dot.gov/legsregs/directives/notices/n4510805/index.cfm) dated 2/17/2016

2. Bridge funds are funds identified for bridges by IDOT for the seven counties in the CMAP region, in IDOT circular 2015-20.

3. Federal resources do not include Metropolitan Planning or State Planning and Research (SPR) funds. These funds are 17.225 and 28.690 in FFY17. SPR funds are deducted from NHPP, STP, HSIP, Railway-Highway Crossings and CMAQ per the FAST Act.

4. Regional resources are based on FHWA suballocation of apportionment guidance (https://www.fhwa.dot.gov/cfo/suballocation_qa.cfm) and IDOT memorandums and circular (2015-20) pertaining to regional resource allocations for STP-Local, TAP-Local, STP-Bridge, STP-County.

5. Transit resources are provided to CMAP by the RTA and are current as of 08/25/16. Federal transit resources are primarily FTA formula funds and do not include competitive grants such as CMAQ that the service boards are eligible to apply for.

6. FTA grants require a 20% match. To fulfill the match requirement CTA, Metra, Pace, and RTA may provide a cash match, but routinely use Transportation Development Credits in lieu of a cash match. It is anticipated that Transportation Development Credits will continue to be used as a match for the foreseeable future.

7. Section 5310 funds are derived from FTA Apportionment tables: https://www.transit.dot.gov/funding/apportionments/table-8-fiscal-year-2016-section-5310-enhanced-mobility-seniors-and

8. These funds are comprised of bonds, sales tax, local funds, etc. for use on capital projects, as reported by the RTA.

Note: The match ratio used to calculate the match amount is based on the typical match ratio for each fund source and is assumed to be available from the state and local jurisdictions.

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MEMORANDUM

To: **CMAP Transportation Committee**

From: **CMAP Staff**

Date: **November 10, 2016**

Re: **Transportation Improvement Program (TIP) Amendments**

Since the September committee meeting, staff and project programmers completed the transition from the 16-00 TIP, as amended throughout the year, to the 17-00 TIP, completing, deleting, or carrying forward 1,870 projects with a total cost of over $59.1 billion. Projects with all funding obligated were designated as completed. Projects that have funds programmed in federal fiscal years (FFYs) 2017 – 2021 or phases in past years that are in Advance Construction status were carried forward. Major Capital Projects, deferred CMAQ-funded projects, and other projects with all funding programmed in years after FFY 2021 that implementers are actively working to advance were also carried forward. The full 17-00 report is available on the amendments tab of the eTIP public web page.

Following the development of the 17-00 TIP, project programmers submitted a total of 99 Formal Amendments for Transportation Committee consideration. Additionally, a total of 279 Administrative Amendments were submitted, reviewed, and accepted by staff. Summary information is presented below. A list of projects and report of the full change details for each amendment are available on the Amendments tab of the eTIP public web page.

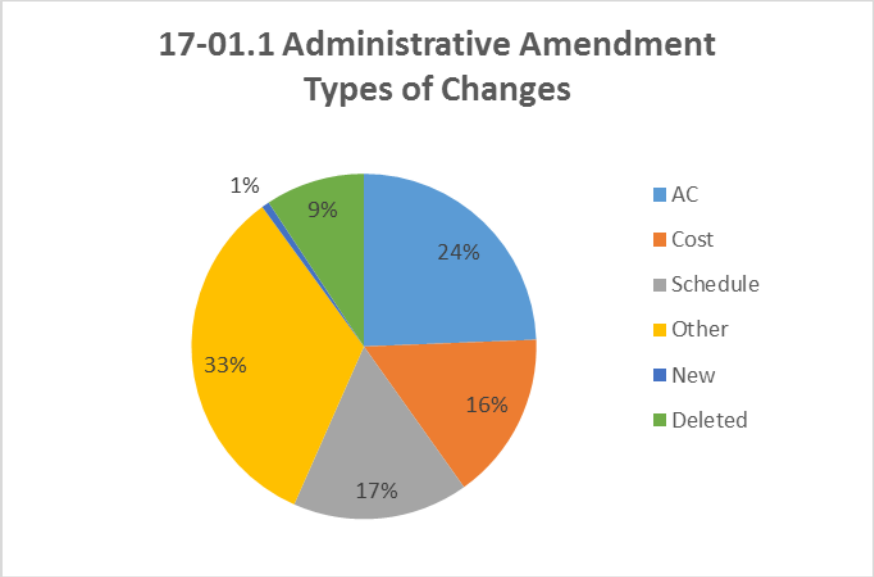
<u>Formal Amendment 17-01</u>

A total of 99 Formal Amendments were submitted for Transportation Committee approval. New projects account for 29 of the submitted amendments, adding a total cost (all fund sources, in all prior, current, and future years) of $58 million. Eight projects were deleted, removing a total cost of $4.4 million. Fourteen cost changes exceeding amendment thresholds were submitted with a net decrease of $62.3 million. Other changes included changes to fund sources, project schedules, and project scope. The overall change in total project cost within all prior, current, and future years was $27.2 million, as summarized below.

Type of Change	# of Projects	Change in Total Cost	Total Cost Before	Total Cost After
New Project	29	$58,015,660	$0	$58,015,660
Schedule	26	$5,445,150	$221,957,450	$227,402,600
Fund Sources	15	$22,082,000	$290,683,000	$312,765,000
Cost change	14	-$62,309,111	$599,974,062	$537,664,951
Delete Project	8	-$4,429,000	$4,429,000	$0
Scope	7	$8,373,750	$16,796,172	$25,169,922
Grand Total	**99**	**$27,178,449**	**$1,133,839,684**	**$1,161,018,133**

Administrative Amendment 17-01.1

A total of 279 Administrative Amendments were submitted, reviewed, and accepted by staff. Administrative amendments include new projects that are not federally funded or have all federal funds in future years, conversion of project phases to or from Advance Construction (AC), cost changes that are below CMAP's amendment thresholds, changes to project schedules within the years of the TIP, changes to fund sources, and other miscellaneous changes that do not affect the scope, schedule, or funding of projects in a way that requires committee approval.



With the start of the new federal fiscal year (FFY), there were a significant number of project phases converted from Advance Construction (AC) status into actual obligations, and a somewhat low number of phases placed into AC. Cost adjustments made with the AC conversions added $27.3 million in total cost to the TIP. Also, with the completion of the prior federal fiscal year, programmers and staff made an effort to update past years' obligation information. These changes account for one third of the "Other" changes. While there were only two new projects added administratively, 26 projects were deleted from the TIP, removing nearly $34.5 million in total cost. The most significant additional cost added administratively, totaling $206.5 million, is from cost changes below amendment thresholds. When combined, the overall change in total cost in the TIP made administratively was just over $200 million. The type of change, number of projects affected, and total project cost information is shown below. Total project cost includes all project phases in prior, current, and future years.

Type of Change	# of Projects	Change in Total Cost	Total Cost Before	Total Cost After
Phase(s) converted from Advance Construction status	54	$27,349,541	$2,369,112,725	$2,396,462,266
Phase(s) placed in Advance Construction status	14	$291,031	$558,914,761	$559,205,792
Cost changes below amendment thresholds or in future years	44	$206,476,229	$2,016,741,866	$2,223,218,095
New projects (State/Local funding or all federal funds in MYB)	2	$2,400,000	$0	$2,400,000
Deleted projects (State/Local funding or all federal funds in MYB)	26	-$34,490,000	$34,490,000	$0
Fund sources updated	15	$323,620	$539,864,900	$540,188,520
Minor scope changes	8	-$6,135,000	$40,929,192	$34,794,192
Schedule change within TIP years	46	$795,499	$731,203,593	$731,999,092
Updated obligations	21	$5,700,510	$309,628,171	$315,328,681
Other	49	-$2,421,041	$452,111,082	$449,690,041
Grand Total	**279**	**$200,290,389**	**$7,052,996,290**	**$7,253,286,679**

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MEMORANDUM

To: CMAP Transportation Committee

From: CMAP staff

Date: November 10, 2016

Re: Transportation Obligation and Award Trends

In September, the Transportation Committee was presented with historical revenue trends, as well as past revenue forecasts in comparison to actuals, in order to help lay the groundwork for the ON TO 2050 financial plan for transportation. As a next step, this memo documents trends in how the region has chosen to invest its funds in comparison to the recommendations in GO TO 2040, with the purpose of providing background to help guide the CMAP committees' discussion of the allocation categories to be included in the financial plan. These allocation categories are to be discussed first with the TC in January.

GO TO 2040 included a set of broad recommendations on how to invest the region's limited capital funding. It recommended prioritizing operations, maintenance, and modernization over expansion. It also recommended an increased commitment to public transit, including increased capital investment. A small portion of the region's resources were to be devoted to major capital projects. Given the relatively short time that has elapsed since GO TO 2040 was adopted, and the long lead-up to obligating or awarding project funds, it is inherently difficult to compare the plan recommendations to actual investments. However, the comparison is instructive and provides some insight into how to track the implementation of financial plan recommendations.

Overview of Annual Obligations and Awards

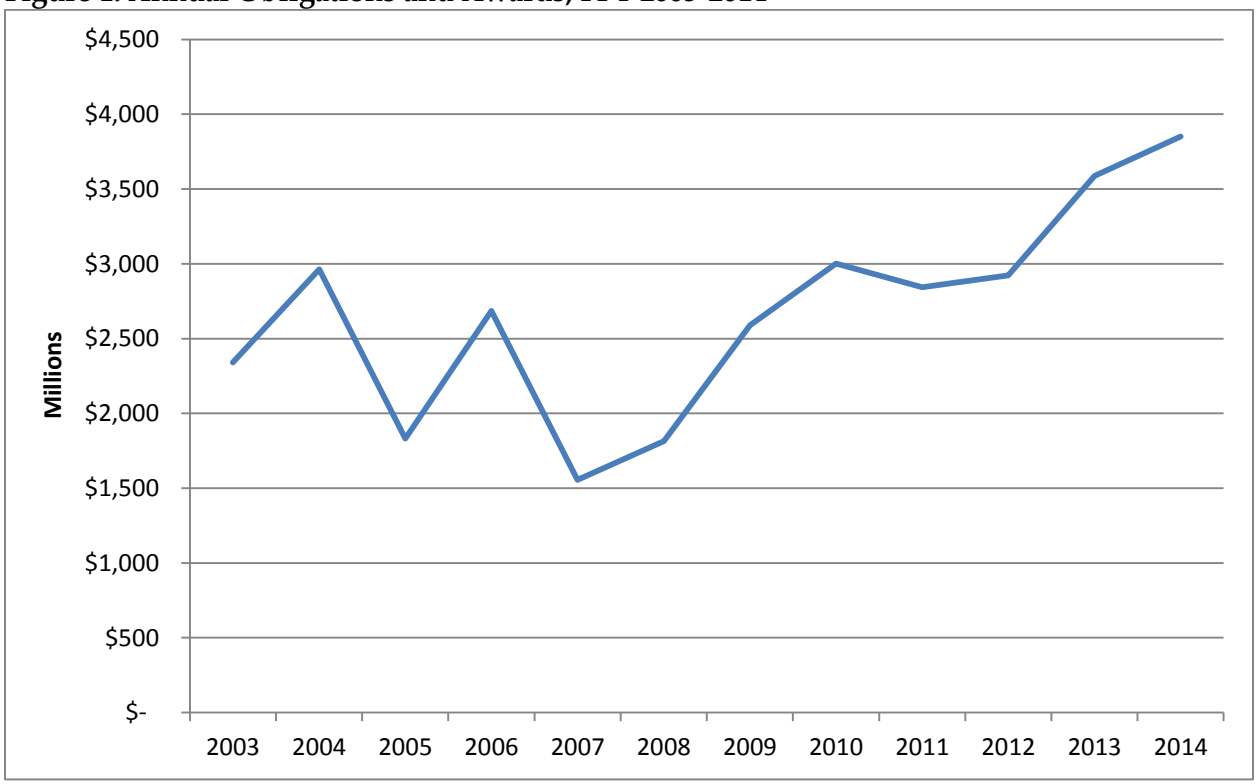
The chief source of the data in this memo is the annual Regional Project Award and Obligation Report for Northeastern Illinois. This report, required by 23 USC CFR 450.334, identifies obligations or awards of project phases that occurred in the previous Federal Fiscal Year (FFY) in the CMAP region.[1] The last ten years (2005-2014) of federal surface transportation

[1] The "obligation" occurs when federal authorization, i.e. a stated commitment from the U.S. Department of Transportation to financially participate in a project, is secured. Once that commitment is made, the available funds are assigned to the project for reimbursement. Authorization occurs approximately six weeks before the bid letting, i.e. opening of bids for requested work, for construction phases and when an agreement is entered between the state of Illinois and the local sponsor for pre-construction phases. The

authorizations and state and county transportation awards have been assembled from the annual reports. To facilitate alignment with the financial plan, the funds are shown in nominal dollars.

Going back to 2003, federal authorizations and awards and state and county transportation awards have fluctuated between a low of $1.56 billion in 2007 to a high of $3.85 billion in 2014 (Figure 1). Because an obligation or an award occurs in a specific year does not mean that those funds are expended in that year. It may take several years for an obligation or award to be fully expended and a project to be completed. For example, a large roadway or transit project might take several years to construct, but the award of those funds would occur in the first year of construction. The 2003 and 2004 data are included in Figure 1 to clarify total obligation and award trends but are not included in the remainder of the analysis because historical data are insufficient to provide detail on the obligations and awards.

Figure 1. Annual Obligations and Awards, FFY 2003-2014



Source: CMAP Regional Project Award and Obligation Report 2003-2014

The main reasons for large increases in annual obligations and awards can be attributed to the passage of new federal transportation bills and new capital programs. The year 2006 shows an increase of $853 million because the Safe, Accountable, Flexible, Efficient Transportation Equity

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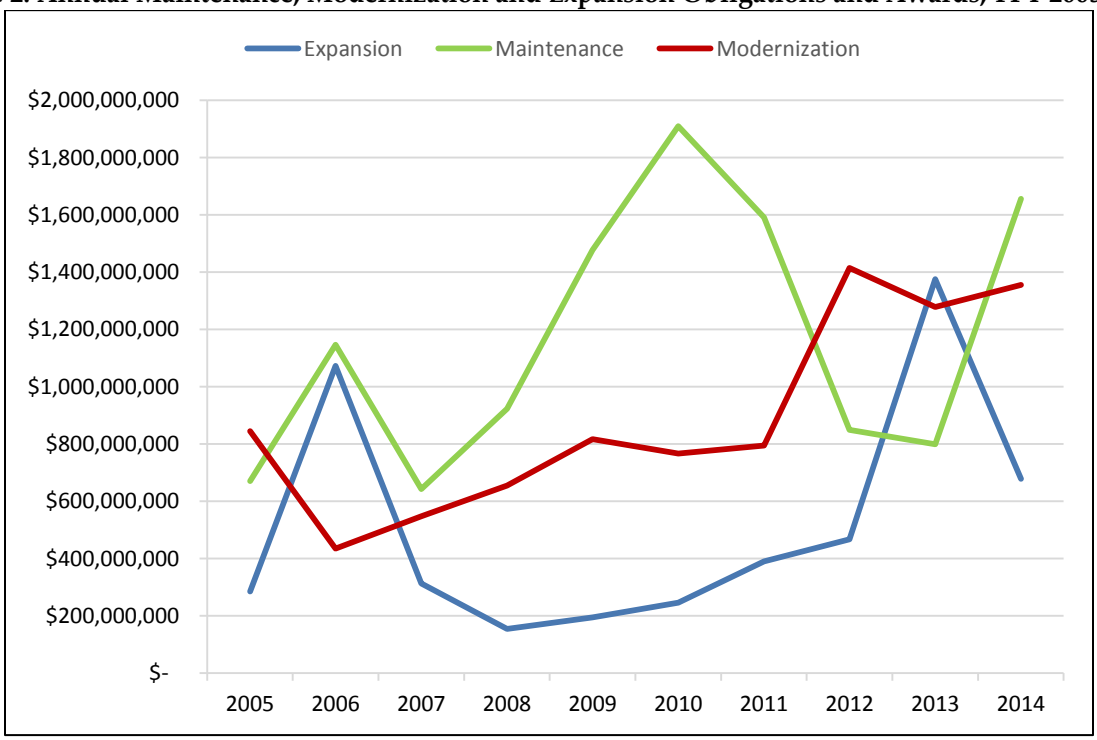
"award" occurs when a bid or request for proposals (RFP) has received proposals, the contractor has been selected, and a contract has been executed between the two parties. For federally funded projects, both obligation and award must occur. For all other projects, only the award occurs. Award information is considered more accurate than authorization because it reflects an actual agreement between the project sponsor and a contractor. However, for some projects authorization data is used as it is the only information available at the time the report is prepared.

Act: A Legacy for Users (SAFETEA-Lu) was signed into law only 2 months prior to the start of the 2006 federal fiscal year. The same happened in 2013 with the passage of Moving Ahead for Progress in the 21st Century Act (MAP-21) and a $667 million jump in awards. The other major increases in 2009 and 2010 can be attributed to the American Recovery and Reinvestment Act of 2009 (ARRA).

Maintenance, Modernization and Expansion

Since FFY 2011, projects have been classified into one of three categories: maintenance, modernization, or expansion. The project classifications are based upon the project's work type in either the Transportation Improvement Program (TIP) or as reported by the project implementing agency. The classification is intended to demonstrate how plan priorities from GO TO 2040, particularly the focus on maintenance and modernization, are being implemented over time. Over the ten-year period, maintenance and modernization of the system has accounted for 80 percent of the obligations and awards while expansion was only 20 percent. The decline in maintenance spending after 2010 is a consequence of the major increase in funds for maintenance work as a result of ARRA. The ARRA program accounts for $673 million dollars in 2009 and 2010, with 65 percent going towards projects classified as maintenance.

Figure 2. Annual Maintenance, Modernization and Expansion Obligations and Awards, FFY 2005-2014

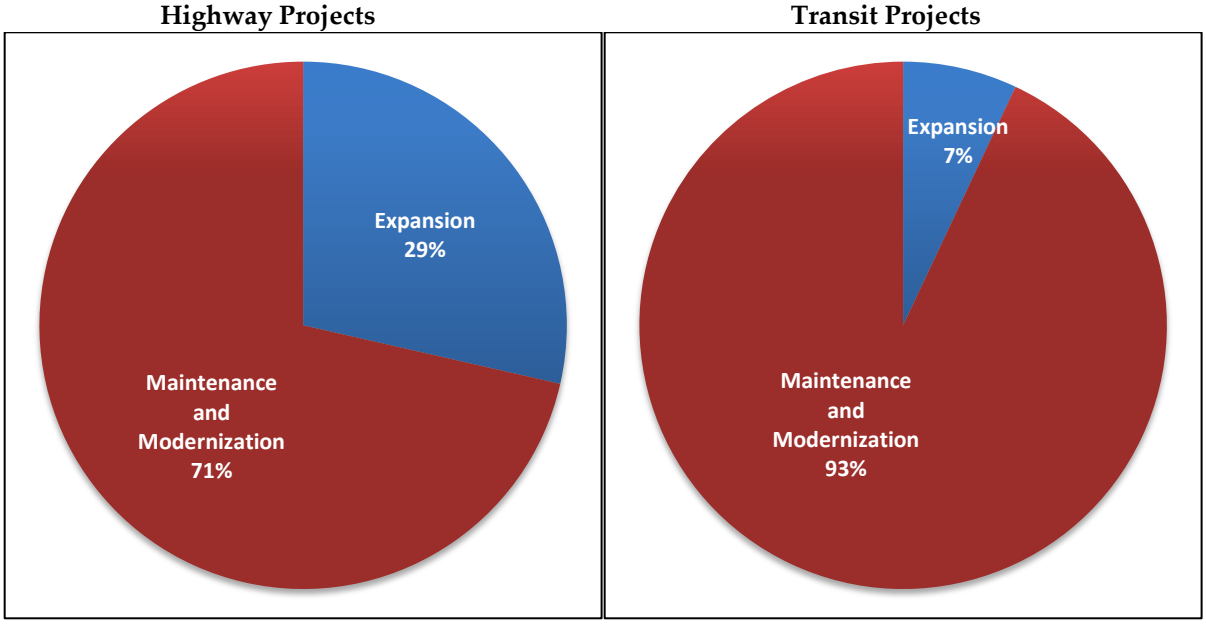


Source: CMAP Regional Project Award and Obligation Reports 2005-2014

This data suggests that the region is prioritizing maintenance and modernization as recommended by GO TO 2040. Given that the region's transportation system is mature, this is to be expected. But the plan did not make specific recommendations on how much should be invested in maintenance versus expansion, so it is not possible to be more precise about how well the region's investments are tracking the policy framework in GO TO 2040.

Breaking down the expansion category versus maintenance and modernization by mode shows a different picture (Figure 3). For highways, 29 percent of obligations/awards were for expansion projects, while for transit only 7 percent were for expansion. Note that the expansion category used here is broader than the major capital projects allocation used in GO TO 2040, which only includes larger expansion projects (i.e., new expressway or rail capacity). To account for maintenance work performed as part of expansion projects, maintenance costs were estimated and separated from the total using unit costs for reconstruction elements.

Figure 3. Percentage of Expansion vs Maintenance and Modernization Obligations and Awards by Highway or Transit Mode, FFY 2005-2014



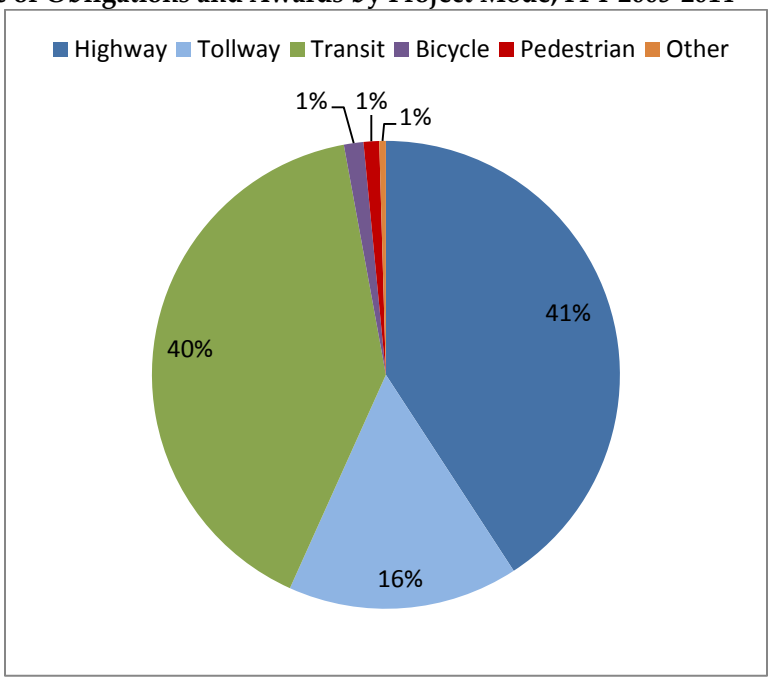
Source: CMAP Regional Project Award and Obligation Reports 2005-2014

Obligations and Awards by Project Mode

Overall, roadways, including toll roads, have received the most investment over the decade of this analysis (Figure 4), followed by transit.[2] GO TO 2040 calls for an increased investment in the region's transit system. Between 2005 and 2009, transit projects only accounted for 32 percent of the obligations and awards. Beginning in 2010, transit obligations and awards did in fact rise somewhat (Figure 5). The average annual transit obligations and awards over the last 5 years is 46 percent. Thus, looking just at this ten-year period, the region has increased investment in the transit system, although again an obligation may result from a programming decision made years prior. As with GO TO 2040's focus on maintenance and modernization, it is not possible to be more precise about the degree to which investments match with plan recommendations.

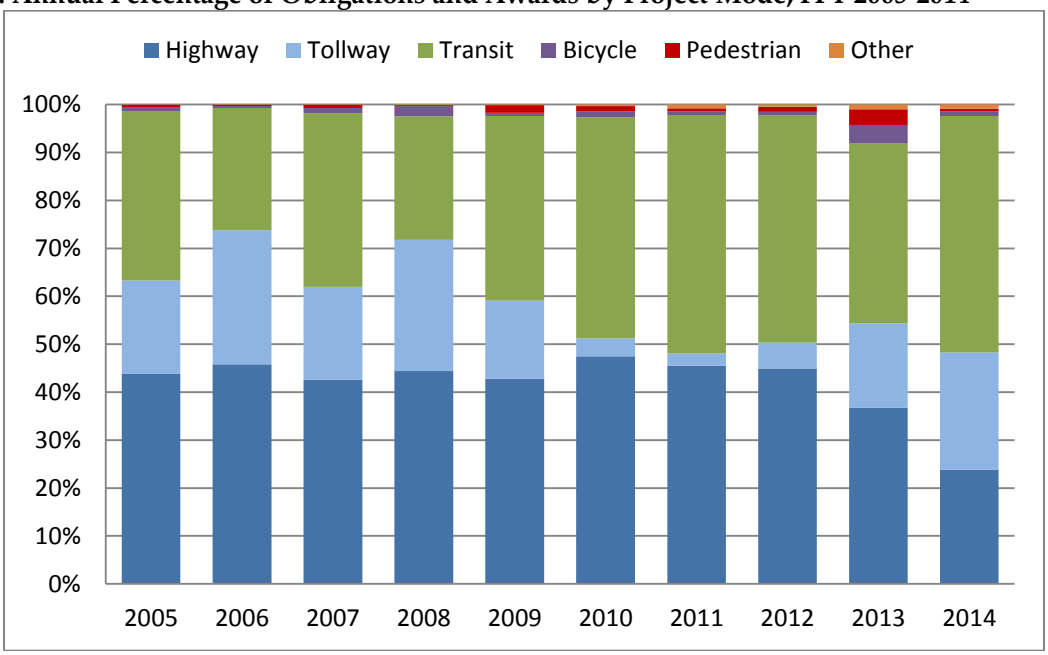
[2] The non-motorized modes appear to account for only 2 percent of obligations and awards. That percentage is likely somewhat higher, however, but bicycle and pedestrian accommodations are often bundled into highway projects. At this time there is no way to separate those associated funds from the highway obligations and awards.

Figure 4. Percentage of Obligations and Awards by Project Mode, FFY 2005-2014



Source: CMAP Regional Project Award and Obligation Reports 2005-2014

Figure 5. Annual Percentage of Obligations and Awards by Project Mode, FFY 2005-2014



Source: CMAP Regional Project Award and Obligation Reports 2005-2014

Obligations and Awards on Major Capital Projects

A key element of GO TO 2040 and previous plans was the priority list of major transportation projects that fit within the plan's fiscal constraint. The obligations and awards attributable to major capital projects over the last ten years totaled $3.6 billion, or 14 percent of all obligations and awards. A majority of that was obligated or awarded to highway projects in the amount of $2.8 billion while transit received $768 million. This included obligations and awards on projects such as the Brown Line Capacity project, the rehabilitation of the Blue Line Cermak Branch (Pink Line) project, I-355 Southern Extension, I-90 Jane Adams Reconstruction and Widening project and the Elgin O'Hare Western Access project.

With the development of ON TO 2050, the region has expanded the definition of major capital projects to include projects over $100 million which change capacity on the NHS, expressways, principal arterials along with transit service changes and state of good repair projects costing over $250 million. Using this definition, the obligations and awards for the last ten years would come to $5.4 billion.

Conclusion

Based on this analysis, the region's investment decisions have generally been trending in the direction set out in GO TO 2040. However, the investment recommendations in GO TO 2040 are broad. ON TO 2050 is expected to have somewhat more detailed transportation expenditure categories or "allocations" in its financial plan. This will be discussed by TC starting in January 2017. Potentially, these allocations could be compared with past years' investments as a baseline.

Questions

- Is the maintenance, modernization, and expansion rubric a helpful way to categorize and track projects?
- Would more precision in the recommendations for maintenance, modernization, and expansion or other categories be useful for future tracking?
- Do you have initial thoughts about the expenditure categories for ON TO 2050?

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MEMORANDUM

To: **Transportation Committee**

From: CMAP Staff

Date: November 11, 2016

Re: Transportation Asset Management: State of the Practice, Policy Options, and MPO Role

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This memo reviews the basics of Transportation Asset Management (TAM) and discusses the state of the practice of TAM, focusing on the applicability to municipalities. It is part of a series of memos contributing to an ON TO 2050 strategy paper that will identify potential future directions for TAM. A March 2016 memo to Transportation Committee reviewed the state of the practice nationally and in the region, as well as defining the key policy questions for the project. This memo reviews policy options for ON TO 2050, with final recommendations to be prepared in 2017 after inter-agency consultation. The work will be complete in early 2017.

As part of this process, staff is collecting data, seeking input of the Transportation Committee, and initiating a dialogue about the potential benefits and limitations of asset management as a strategy to maximize the benefits of transportation system expenditures.

Transportation Asset Management Background

TAM is a process to minimize the life-cycle asset costs necessary to attain performance goals (see the complete federal definition in the text box). It is a proven technique for cost efficiency, providing superior outcomes within constrained budgets. Pavement management programs in particular employ proven techniques to cost-effectively extend pavement life. Hence, this memo will concentrate on pavement management.

MAP-21 and the FAST Act required the implementation of asset management by transit agencies and IDOT (for the National Highway System). Because transit agencies and IDOT are subject to federal regulations on asset management, this memo will concentrate on local agencies' pavement assets. The federal regulations and the MPO role are summarized in a separate memo.

> *Asset management is a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on both engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost. – 23 USC 101*

Local-agency highway assets are of interest because of the large scale of highway expenditures. In

addition to the federal-aid highway program we are all familiar with, an analysis of the US Census Bureau's Census of Governments 2013 survey indicated total highway outlays of over $1.5 billion for 99 of the largest communities, of which almost half were for capital outlays.[1]

According to CMAP analysis of 2016 municipal survey results, a minority of communities have instituted asset management programs. Resources are available from IDOT and other sources for those wishing to institute such a program.[2] This memo will lay out options for more focused programs and policies.

A basic asset management system, e.g., a pavement management system, typically consists of the following elements and capabilities:[3]

<u>Elements of a Basic Asset Management System</u>

1. Definition of system;
2. Software system to support asset management;
3. Asset inventory;
4. Asset condition assessment data, linked to the inventory;
5. Analytical processes and decision support tools, including a menu of asset treatments with expected costs and treatment outcomes;
6. Policy-based performance measures and targets by which to evaluate various investment scenarios;
7. A project-based prioritization of investments;
8. Management reports of results.

<u>Capabilities of a Basic Asset Management System</u>

1. Provides a definitive, central resource for an asset's inventory and condition;
2. GIS integration;
3. Analyzes different maintenance strategies;
4. Analyzes different budget scenarios;
5. Tracks and forecasts progress toward adopted maintenance targets;
6. Provides management information that justifies a particular budget request.

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[1] This excludes federal-aid projects, which are generally let through IDOT. However, some communities, notably Chicago, locally let federal projects.

[2] See, for example, Illinois Center for Transportation, *Implementing Pavement Management Systems for Local Agencies: Implementation Guide.* August, 2011. Posted at http://www.idot.illinois.gov/assets/uploads/files/transportation-system/manuals-guides-&-handbooks/t2/p052.pdf. Accessed November, 2016.

[3] Ibid.

Basic asset management implementation among local agencies in the Chicago Region.

CMAP included several questions related to pavement management in its 2016 CMAP Municipal Plans, Programs, and Operations Survey.[4] Slightly fewer than half of agencies completing the survey confirmed they had a formal pavement management plan in place (See Figure 1)[5]. Only 40 percent of municipalities confirmed that they used a pavement condition measure – the choices given were pavement condition index, condition rating survey, or remaining service life -- that can reasonably be used as part of a pavement management system (Figure 2). Similarly, 39 percent of municipalities stated that they have established long-term performance targets for their primary pavement condition measure (Figure 3). Finally, Figure 4 shows that, even though the above figures show that many communities have a pavement management system in place, actual decisions are made through other processes ("worst first," advisory board recommendations) perhaps resulting in higher long-term costs.

Figures 1 through 4 demonstrate that many municipalities in northeastern Illinois have some level of asset management programs for pavement, and that some of the asset management programs are well developed. But most asset management programs we inquired about do not have basic features or functionality.

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[4] Following are the asset management questions from CMAP's 2016 Municipal Survey:

24) Does your community use a formal pavement management system to prioritize local street maintenance and repair, either alone or as part of a multi-jurisdictional group? ☐ Yes, alone ☐ Yes, as part of a group ☐ No

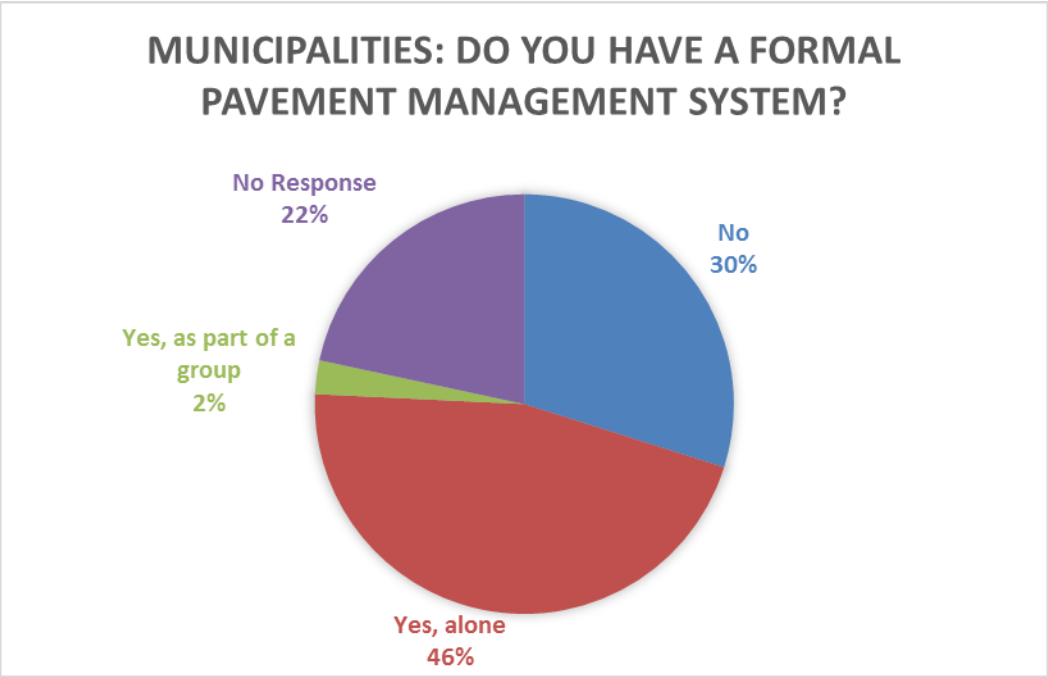
25) What is your *primary* pavement condition measure? ☐ Condition Rating Survey (CRS) ☐ International Roughness Index (IRI) ☐ Pavement Condition Index (PCI) ☐Remaining Service Life (RSL) ☐Other (e.g., visual inspection – please describe):

26) For your primary pavement condition measure, have you established long-term performance targets? ☐ Yes ☐ No ☐ Not applicable

27) What is your primary method of prioritizing resurfacing and reconstruction projects: ☐ Advisory board or elected official recommendations ☐ Address community complaints ☐ Fix the worst conditions first ☐ Minimize life cycle costs to meet performance targets ☐ Other (please describe)

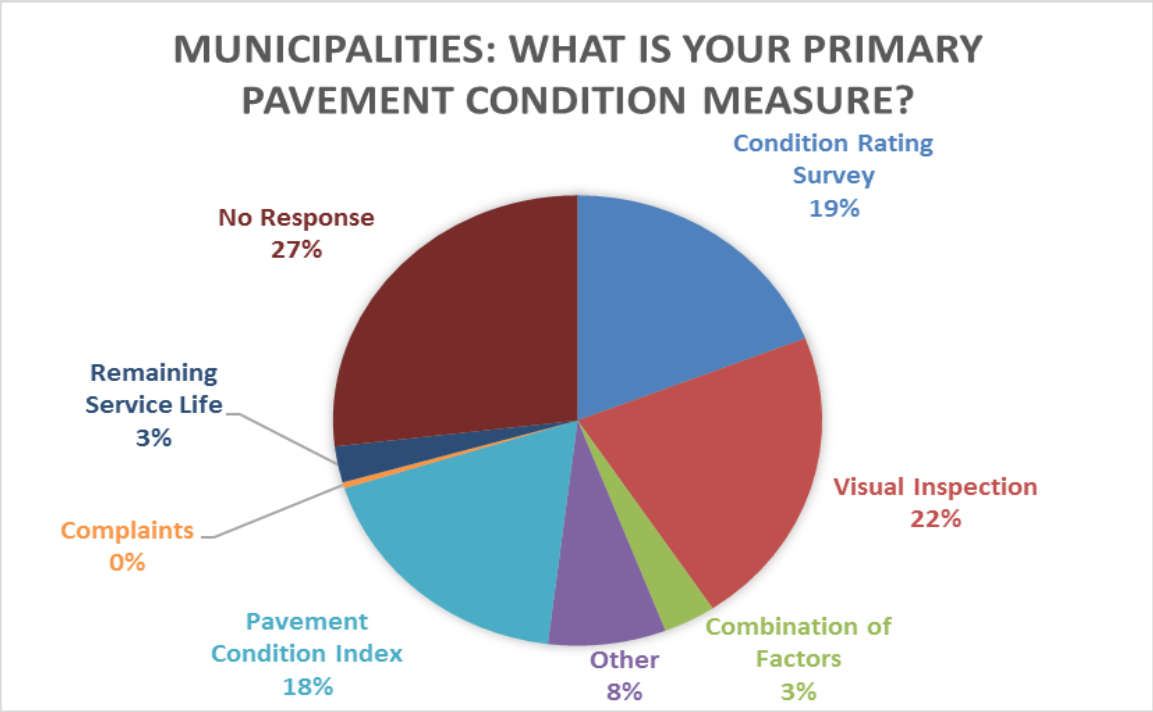
[5] One of the 2016 questions was also asked in the 2012 survey. While 64% of municipalities indicated they had a pavement management in 2012, the 2012 sample size (182) was smaller than in 2016 (231).

Figure 1: Pavement Management System



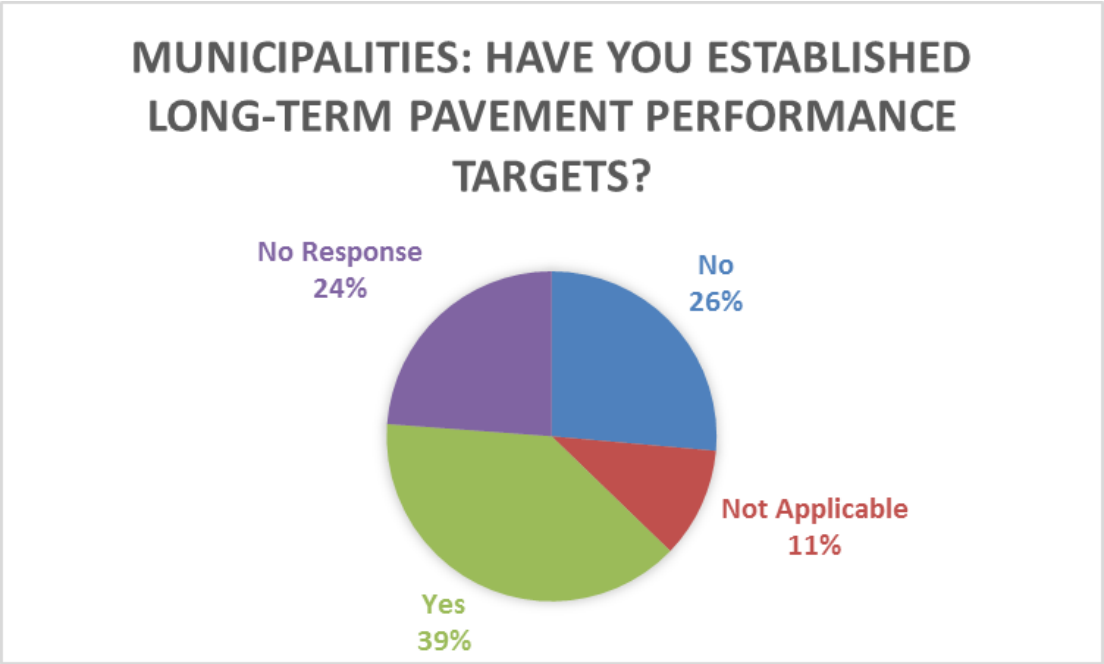
Source: 2016 CMAP Municipal Plans, Programs, and Operations Survey

Figure 2: Pavement Condition Measure



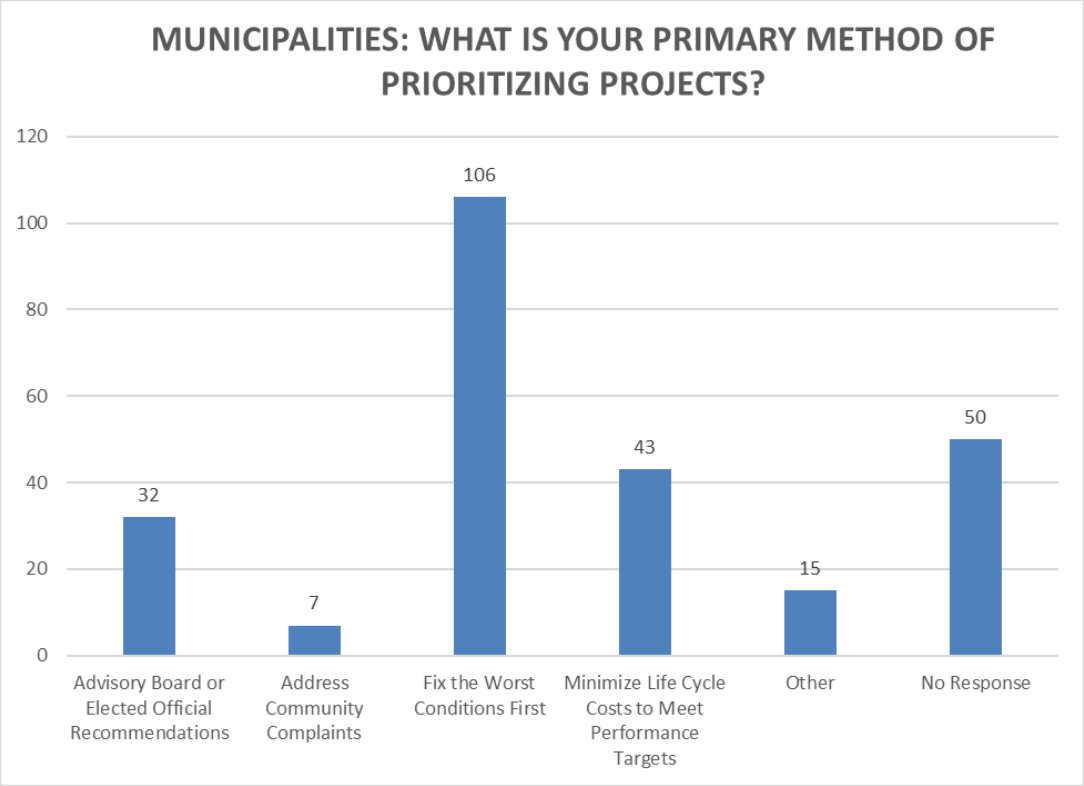
Source: 2016 CMAP Municipal Plans, Programs, and Operations Survey

Figure 3. Established Long-Term Performance Targets



Source: 2016 CMAP Municipal Plans, Programs, and Operations Survey

Figure 4. Primary Prioritization Method



Source: 2016 CMAP Municipal Plans, Programs, and Operations Survey

The precise impact of the lack of robust pavement management programs is unclear. Information about municipal pavement conditions and expenditures on pavement projects in the Chicago region is scarce. While we know that pavement condition has gotten better on the NHS routes in recent years, far less is known about condition off the NHS, and even if conditions are improving, it is not clear that the improvements are being pursued cost-effectively. Expenditure data provides little clarity; there is a great deal of variation in total highway outlays per centerline mile of municipal streets, as shown in the table below.

Variation in Municipal Outlays per Mile for Highways, Chicago Region, 2013

Percentile	10th	25th	50th	75th	90th
Municipal Outlays per Centerline Mile of Roadway Jurisdiction, 2013	$12,051	$21,003	$32,803	$45,456	$63,506

Source: CMAP Analysis of 2013 Census of Governments

There are many reasons for the variation in expenditures shown above. There may be inefficiencies in expenditures, or inadequate revenues for the need. In addition, some recently-developed communities with new infrastructure have lower costs than older communities. Lastly, communities undertaking large, locally-let capital projects have much higher outlays than otherwise comparable communities.

It is worth noting that an asset management system may not always point to decreased expenditures. After all, if pavements have not received adequate investment over time, an asset management program may demonstrate the need for additional funds to maintain satisfactory pavements, as was shown when Naperville implemented a pavement management program.[6] But while the goal is to minimize the lifecycle costs necessary to attain a performance goal, an asset management program in an environment of constrained budgets may be left to show the investments that are most effective given the constrained budget. Thus the actual budget impacts that can be expected depend on the context.

Basic asset management implementation in other metropolitan regions.

The **Metropolitan Transportation Commission (MTC),** the MPO for the nine-county San Francisco Bay Area, pioneered asset management in the 1980s to address local road and street maintenance needs and has a well-developed system addressing basic asset management needs for pavements. In 1981, MTC found that spending for local roadway maintenance had a deficit of $100 million per year, and that the region's streets and roads had a deferred maintenance cost of $300 to $500 million. In response, MTC began its pilot pavement management system in six communities in 1984, and implemented the program region-wide in 1986.[7] Given this history

[6] Illinois Center for Transportation. http://www.idot.illinois.gov/assets/uploads/files/transportation-system/manuals-guides-&-handbooks/t2/p052.pdf. Op. cit., p. 28.

[7] http://www.psrc.org/assets/11807/AssetManagementPeerReviewSummary2014May.pdf Page 4

and well-developed system, other MPOs look to MTC as a model for asset management implementation.[8]

MTC garnered initial stakeholder support for developing a regional asset management program through a common understanding of the need for additional pavement preservation resources. Advocacy, consensus, and feedback are maintained through MTC's Local Streets and Roads Working Group, which is comprised of regional public works directors and transportation managers.[9]

Moreover, the Pavement Management Technical Assistance Program (P-TAP) provides MTC's jurisdictions with assistance and expertise to implement and maintain a pavement management system, accurate pavement conditions, engineering design for pavement rehabilitation projects, and supports the region's management of non-pavement street and road assets. MTC has dedicated about $1.5 million of federal money annually for P-TAP grants as of August 2016.[10] The MTC-developed pavement management system, "StreetSaver," helps local cities and counties better maintain pavement within their jurisdiction. It was one of the first in the country to be tailored specifically for cities and counties, rather than for state highways. The system's scope includes all 100 municipalities in the Bay Area, nine counties, 42,800 lane miles of arterials, collectors, residential streets, and bridges. MTC prioritizes asset management in all aspects of their transportation planning process, and uses StreetSaver for data storage, long-range scenario planning, needs identification, and funding decisions.[11]

MTC has adopted a "Fix it First" approach to transportation planning, with the target of a pavement condition index score of 75, *satisfactory* out of 100 (the regional score as of August 2016 is 66, *fair*).[12] Over 87% of long-range regional transportation funding has been dedicated to maintaining the existing system. More broadly, MTC has effectively integrated pavement preservation into a variety of regional planning goals, with connections to focused growth and economic development.[13]

For short-range transportation programming, MTC relies on the StreetSaver system to select projects for regional discretionary funds. Though these funds are allocated to cities and counties using a performance-based formula, projects using regional funding must be recommended by

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[8] Much of this summary is developed from a Puget Sound Regional Council review conducted as PSRC was studying asset management implementation.

[9] http://www.psrc.org/assets/11807/AssetManagementPeerReviewSummary2014May.pdf Page 4

[10] http://mtc.ca.gov/our-work/invest-protect/investment-strategies-commitments/fix-it-first/local-streets-and-roads-0

[11] http://www.psrc.org/assets/11807/AssetManagementPeerReviewSummary2014May.pdf Page 4

[12] http://mtc.ca.gov/our-work/invest-protect/investment-strategies-commitments/fix-it-first/local-streets-and-roads

[13] http://www.psrc.org/assets/11807/AssetManagementPeerReviewSummary2014May.pdf Page 6

StreetSaver and be sponsored by an agency whose pavement management system has been certified by MTC.[14]

The **Northeast Ohio Areawide Coordinating Agency (NOACA)** is the MPO for the five-county Cleveland region. NOACA's asset management program is still in its early stages, having adopted its first Provisional Transportation Asset Management Policy in 2014.[15] That same year, NOACA began to implement the policy with a pavement analysis of federal-aid highways. The process is limited to federal-aid roads, but is managed by NOACA regionwide. However, NOACA staff reported that only "a handful" of communities implemented pavement management on their own, despite technical assistance and software available from the Ohio Department of Transportation.

NOACA has used the asset management system to present a dire picture of federal-aid pavement assets. The NOACA area has 1,500 lane-miles of freeways, almost 7,000 lane miles of other federal-aid roads, and more than 3000 bridges. 34 percent of pavements and 11 percent of bridges in the Cleveland region are not in a state of good repair. The cost to achieve a state of good repair is $3.2 billion.

However, while NOACA has completed the analysis, it has not identified funds necessary to achieve a state of good repair, or any new funds in general, to put the asset management system to work. Thus, the NOACA program is less advanced than the MTC program, and has substantially less upside potential because it does not harness local street improvements, but is limited to just the federal-aid system.

The **Michigan Department of Transportation** (MDOT) has placed an emphasis on regional strategies for asset management since 2002. Passed in 2002, Act 499 of the State of Michigan Public Acts encourages all agencies (primarily MPOs) using state transportation funds to implement an asset management system.[16] The act created the state's Transportation Asset Management Council (TAMC), and dedicated funding for asset management. TAMC. The TAMC, comprised of MDOT, county road commissions, MPOs, municipalities, and other appropriate stakeholders, provides leadership and oversight for the asset management system. TAMC sets the statewide transportation asset management strategy, goals for collecting condition data, and strategic goals for roads and bridges. Activities include surveying and reporting the condition of roads and bridges by functional classification categories, and assessing completed and planned investments in roads and bridges.[17] In addition, the TAMC submits an Annual Report describing the asset management-related efforts and condition of the road and bridge system from the prior year.[18]

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[14] http://www.psrc.org/assets/11807/AssetManagementPeerReviewSummary2014May.pdf Page 7
[15] http://www.noaca.org/modules/showdocument.aspx?documentid=5082.
[16] https://www.legislature.mi.gov/documents/2001-2002/publicact/pdf/2002-PA-0499.pdf
[17] http://tamc.mcgi.state.mi.us/TAMC/#/aboutus#overview
[18] http://www.michigan.gov/documents/mdot/AM_Facts_TAMC_Newsletter061114_459071_7.pdf

MDOT allocates $1 million annually for pavement preservation activities. This funding is distributed through the TAMC for the following purposes:

- Local agency reimbursement for pavement data collection costs on federal-aid and local routes
- Local and state asset management plan development
- Training and capacity building for local agencies
- Continuous enhancement and distribution of the Roadsoft software

For local agencies, the state maintains a grant program for collecting pavement condition data on local routes. Local access and/or residential routes are surveyed relatively infrequently and are not required to be reported.[19] MDOT requires that local agencies use Roadsoft GIS software to qualify for financial assistance for collecting pavement condition data on Federal Aid roads. Roadsoft was developed by Michigan Technological University, and is widely used throughout the state as a local pavement management system. It is available to all public agencies at no cost.[20]

Possible Ways to Encourage Transportation Asset Management for Local Agencies

Modern asset management for local communities could be promoted in several ways. Over the next few months, staff will consult stakeholders to identify an ON TO 2050 plan recommendation from among the options below (or other options identified by stakeholders):

Option 1: Provide Technical and Financial Assistance Directly to Municipalities. For this option, CMAP would adopt policies encouraging transportation asset management through ON TO 2050. To implement the policy, CMAP could provide financial assistance for developing or improving local transportation asset management through the UWP process, subject to other funding needs, potentially contracting through CMAP's Local Technical Assistance program. This takes advantage of existing processes and can reduce the up-front cost for participating communities, but the impact might be limited to a few communities as UWP and LTA resources would be limited.

Option 2: Selected Local Councils of Mayors or Counties to Pilot Subregional Pavement Management Implementation among Municipalities. This approach would implement an asset management system akin to MTC's, but at the Council or County level. The goal would be asset management deployment among all municipalities in the Council or County; policies on participation would probably be necessary to accomplish this. The roadways addressed in the pavement management system could be all streets or just those other than local (i.e., federal aid routes). Depending on the Council or County, municipalities could remain responsible for their individual pavement management systems, as in the Bay Area, or have a joint program.

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[19] http://www.psrc.org/assets/11807/AssetManagementPeerReviewSummary2014May.pdf Page 11
[20] http://www.psrc.org/assets/11807/AssetManagementPeerReviewSummary2014May.pdf Page 12

Although not required, such a program could ideally include a non-federal financial package available to participating councils to address pavement deficiencies identified in the asset management program.

Option 3: Implement a Regional Program. This option would be to replicate the universal program in the fashion of the MTC or the more limited approach of NOACA, which is focused just on the federal-aid system. A regional program and standards would be developed, and projects proposed for funding come from an asset management plan. However, it is anticipated that substantially increased financial assistance or reallocation of existing funding would be necessary for both the implementation of the asset management plans and to finance the improvements called for in the plans. The advantage of this option is that it would be a bold initiative, with substantial benefits early in the program. The disadvantage is that there may be a substantial cost to fund necessary improvements.

For the above approaches, consultation will be initiated with Transportation Committee representatives, asset management staff previously identified by Transportation Committee representatives, Council of Mayors staff, and county transportation department staff. Based on these planning consultations and further consideration by CMAP staff, a recommendation will be presented to the Transportation Committee at a later date.

Next Steps

Following are the next steps:

1. Interagency consultation and development of recommendation for ON TO 2050 approach to municipal transportation asset management.
2. Exploration of special topics in asset management plans, such as the risk-based approach required by federal regulation; target setting; and the consideration of user costs in asset management plans.

Action Requested: Discussion

Staff contact

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MEMORANDUM

To: **Transportation Committee**

From: CMAP Staff

Date: November 11, 2016

Re: Transportation Asset Management: Update on Final Federal Rulemaking

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This memo reviews the final federal rules on transportation asset management (TAM). It is part of a series of memos contributing to an ON TO 2050 strategy analysis that will identify potential future directions for TAM.

Recent Federal Rules on Transportation Asset Management

Federal rules on asset management were recently finalized for transit agencies (July 2016, posted at https://www.transit.dot.gov/TAM/rulemaking) and for state departments of transportation (October, 2016, posted at https://www.federalregister.gov/documents/2016/10/24/2016-25117/asset-management-plans-and-periodic-evaluations-of-facilities-repeatedly-requiring-repair-and). The federal regulations set out primary responsibilities for asset management plans with the transit agencies and, for the National Highway System regardless of jurisdiction, the state department of transportation. The primary role of the MPO for each of these rules is ensuring consistency of financial plans, programs, and performance targets. The basic requirements of each regulation are laid out below.

Transit. As noted in a recent CMAP policy update (where additional information is available), each public transportation provider must develop and implement its own transportation asset management (TAM) plan. These plans must contain an asset inventory, condition assessments of inventoried assets, a prioritized list of investments to improve state of good repair (SGR), and various implementation activities. The rule would require an initial TAM plan to be completed by every transit provider by October 1, 2018. The plans are to be updated every four years and must consider funding levels and funding sources that are reasonably available each fiscal year. The TAM update cycle is also to coincide with major updates to the transportation improvement program for which CMAP is responsible as the region's federally designated

metropolitan planning organization (MPO). Fortunately, this plan development schedule aligns with the development of ON TO 2050.

Second, the rule specifies four performance measures for capital asset condition, which transit agencies would need to track over time. Third, the rule directs transit agencies to set annual performance targets for those measures. The initial targets are to be set three months after the rule is finalized, that is by January 1, 2017, well before the TAM plans are due, and revised at least annually. Fourth and last, additional information related to capital asset condition and annual condition targets is to be reported to the National Transit Database, a repository of statistics about transit systems.

FTA has established four performance measures in the final rule. (1) Rolling stock assets such as buses and rail cars and (2) non-revenue service vehicles will both be measured by the percent of vehicles by category that have met or exceeded their useful lives. For (3) infrastructure, the measure will be the percentage of track segments, signals, and systems with performance restrictions. For (4) facilities, the performance will be measured by the percent of facilities within an asset class rated "marginal" or "poor" on FTA's Transit Economic Requirements Model rating scale. While not directly addressed in the new rule, MPOs such as CMAP are also required to set performance targets for transit asset condition 180 days after the transit agencies set their targets.[1] Thus, CMAP would need to establish its inaugural annual asset condition target, at the earliest, by the end of June 2017. An important task for CMAP is how to fit the process of setting these short-range targets into the long-range plan context.

National Highway System. The Illinois Department of Transportation is required to establish a TAM Plan for National Highway System (NHS) pavements and bridges, regardless of highway jurisdiction. The TAM Plan must include a summary listing and condition of NHS pavement pavements and bridges; performance targets for NHS pavements and bridges; asset management objectives and measures; a performance gap analysis; risk analysis; life-cycle planning; a **10-year** financial plan for the NHS; and investment strategies.[2]

Performance measures for the National Highway System pavements and bridges are expected to be announced on December 14, 2016.[3]

To be blunt, implementing this final rule will require unprecedented coordination between and among IDOT, counties, and municipalities. An initial plan, explaining asset management plan processes, is due on April 30, 2018. A fully compliant plan is due on June 30, 2019, after the completion of ON TO 2050. However, because of the level of required coordination, this

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[1] 23 CFR 450.306(d)(2) through 23 CFR 450.306(d)(4)(i). Posted at http://www.ecfr.gov/cgi-bin/text-idx?node=se23.1.450_1306&rgn=div8. Accessed November, 2016.

[2] FHWA. *Asset Management Plans and Processes Fact Sheet*. October, 2016. Posted at https://www.fhwa.dot.gov/asset/pubs/hif17006.pdf. Accessed November, 2016.

[3] FHWA. *Asset Management Final Rule. External Webinar Slide Presentation.* Posted at https://www.fhwa.dot.gov/tpm/rule/161109presentation.pdf. Accessed November, 2016.

deadline is probably tight. According to the FHWA's Fact Sheet, "the deadline may be extended if the FHWA determines the State has made a good-faith effort."[4]

The MPO's role is established in the metropolitan planning regulations.[5] Those rules state that an MPO shall integrate the goals, objectives, performance measures, and targets described in state TAM plans for the NHS, as well as transit asset management plans, described above.

Next Steps

Following are the next steps:

1. Coordination with transit agencies on 2017 target development.
2. Determination of how to integrate a 10-year NHS financial plan into ON TO 2050.

Action Requested: Information

Staff contact
Tom Murtha, Senior Planner, tmurtha@cmap.illinois.gov, 312-386-8649

[4] FHWA, *Asset Management Plans and Processes Fact Sheet*. Op. cit.
[5] 23 CFR 450.306(d)(4)(i). Posted at http://www.ecfr.gov/cgi-bin/text-idx?node=se23.1.450_1306&rgn=div8. Accessed November, 2016.

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MEMORANDUM

To: **Transportation Committee**

From: CMAP staff

Date: November 10, 2016

Re: Regionally significant projects submitted for ON TO 2050 consideration through public comment

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After developing an initial list earlier this fall based on submissions by project sponsors, a 45-day public comment period was held to solicit additional regionally significant projects to consider in ON TO 2050. This public comment period closed on October 31, 2016. A total of 18 projects were submitted by the public; the submittals are compiled here.

Regionally significant projects are to be either (a) highway capacity projects on the National Highway System (NHS) and transit capacity projects with separate right-of-way or priority over other traffic that are greater than $100 million, or (b) state of good repair projects on particular transit lines or roadways that are at least $250 million (as opposed to system-wide programs of projects). Preliminary review suggests 15 projects submitted by the public would meet these thresholds and have sufficient information to be considered, while three do not:

- The Tango Ultra-Narrow Commuter Car project is a vehicle purchase for a new car sharing program, not a highway or transit capacity project.
- The Skytech Transportation proposal is for a concept of combining freight and commuter transportation systems in one system that operates over existing freight rail lines. The proposal does not provide location-specific information or other project details.
- The South Side Express Bus is estimated to be less than $100 million.

The remaining 15 projects included two circumferential monorail routes submitted by researchers affiliated with the Illinois Institute of Technology; three commuter rail conversions to rapid transit and the CrossRail project by Midwest High Speed Rail; eight streetcar/light rail projects submitted by Chicago Streetcar Renaissance; a conversion of Metra Electric service to rapid transit by the Coalition for a Modern Metra Electric and Cook County; and a new cross-town tollway and transit route by an individual citizen.

In addition to the project submittals, staff received a letter in support of the CrossRail Chicago proposal and a letter from a consortium of 20 organizations and individuals requesting that staff remove the Illiana Expressway project from the listing of projects being considered.

The draft final universe of projects to be considered in ON TO 2050 is included as an appendix to this memo along with maps of project locations. This includes the projects originally identified by implementers, the 15 projects submitted via public comment, an additional add-lanes project along Vollmer Rd submitted by Cook County[1], and seven additional projects identified by the Illinois Department of Transportation that would reconstruct and/or add capacity to existing expressways.

Before project evaluation begins, staff will work with the Transportation Committee and other stakeholders to discuss the types of measures and other information needed in the evaluation. A forum on highway projects was held prior to the Transportation Committee meeting on July 22, 2016 and a transit forum is scheduled for the morning of November 18, 2016.

Action requested: Information

Staff Contact:
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[1] This project was submitted through the public comment process but is being treated as an implementer-submitted project.

CMAP

Draft Universe of Regionally Significant Projects for Consideration in ON TO 2050

RSP ID*	Proposed Implementer	Project Name	North/West Limits	South/East Limits	Short Description	Total Capital Cost	GO TO 2040**
87	CDOT	Mid-City Transitway	Jefferson Park Station (Blue Line)	87th St	New Transit Rail	$ 1,000,000,000	UC
103	CDOT	River North-Streeterville Transit Improvements			New Transit Bus	$ 400,000,000	N
104	CDOT	South Lakefront-Museum Campus Access Improvement			New Transit Bus	$ 400,000,000	N
85	CDOT	West Loop Transportation Center Phase I	Clinton at Lake St	Clinton at Congress Pkwy	Transit Station Improvements	$ 600,000,000	C
88	CDOT	West Loop Transportation Center Phase II			New Transit Station and Rail Extension	$ 2,000,000,000	UC
125	CDOT	North Lakefront Light Rail Line	Lawrence Ave	McCormick Place	New Streetcar/Light Rail Line	$ 445,000,000	NS
126	CDOT	South Lakefront Light Rail Line	North Ave/LaSalle Ave	Jackson Park	New Streetcar/Light Rail Line	$ 310,000,000	NS
127	CDOT	Superloop Light Rail Line	Navy Pier	McCormick Place	New Streetcar/Light Rail Line	$ 305,000,000	NS
128	CDOT	Madison Street and Jackson Street Light Rail Lines	United Center/Union Station	Millennium Park/Grant Park	New Streetcar/Light Rail Line	$ 130,000,000	NS
129	CDOT	Clark Street Light Rail Line	Addison Ave	North Ave	New Streetcar/Light Rail Line	$ 295,000,000	NS
130	CDOT	Downtown Ring Light Rail Line	Division St and Lake Shore Dr	McCormick Place	New Streetcar/Light Rail Line	$ 445,000,000	NS
131	CDOT	The Burnham Ring Light Rail Line	Fullerton Ave and Cannon Dr	Jackson Park	New Streetcar/Light Rail Line	$ 1,100,000,000	NS
132	CDOT	Milwaukee Avenue Streetcar and O'Hare Blue Line Express	Montrose Ave	Loop	New Streetcar/Light Rail Line	$ 450,000,000	NS
120	Cook County	Vollmer Rd	Kedzie Ave	Western Ave	New Arterial Lanes and Bridge Reconstruction	$ 100,000,000	NS
106	CTA	Ashland Ave BRT	Irving Park Rd	95th St	New Transit Bus	$ 160,000,000	N
93	CTA	Blue Line Forest Park Branch Reconstruction	Forest Park Terminal and Yard	Clinton Station	Transit Rail Improvements	TBD	N
59	CTA	Blue Line West Extension	Either Maywood, Oak Brook, or Lombard	Forest Park Station	Transit Rail Extension	$ 2,573,000,000	UC
94	CTA	Brown Line Capacity Expansion	Kimball Terminal	Loop	Transit Rail Improvements	TBD	N
60	CTA	Brown Line Extension	Jefferson Park Station (Blue Line)	Kimball Station	Transit Rail Extension	$ 4,139,000,000	UC
62	CTA	Circle Line North (Phase III)	Armitage Station	Ashland/Lake Station	New Transit Rail	$ 2,237,000,000	UC

* RSP ID corresponds to the labels found on the project maps

** C = Fiscally Constrained Project; UC = Unconstrained Project; N = New Submitted by Implementer, NS = New Submitted through Public Comment Period

CMAP

Draft Universe of Regionally Significant Projects for Consideration in ON TO 2050

RSP ID*	Proposed Implementer	Project Name	North/West Limits	South/East Limits	Short Description	Total Capital Cost	GO TO 2040**
61	CTA	Circle Line South (Phase II)	Pink Line 18th St Station	Red Line 18th/Clark St	New Transit Rail	$ 1,000,000,000	UC
107	CTA	Green Line Extension	Green Line Cottage Grove Station	63rd and Stony Island Ave	Transit Rail Extension	$ 1,000,000,000	N
63	CTA	Orange Line Extension	Midway Station	Ford City Mall	Transit Rail Extension	$ 498,000,000	UC
57	CTA	Red Line Extension (South)	US-12/US-20/95th St	130th St	Transit Rail Extension	$ 2,300,000,000	C
58	CTA	Red Purple Modernization Phase I	Howard Station	Belmont Station	Transit Rail Improvements	$ 2,100,000,000	C
58	CTA	Red Purple Modernization Phase II	Linden Station (Purple Line)	Belmont Station	Transit Rail Improvements	$ 4,200,000,000	C
108	CTA	South Halsted BRT	79th St Red Line Station	Harvey Transportation Center	New Transit Bus	TBD	N
64	CTA	Yellow Line Enhancements and Extension	Old Orchard Rd	Dempster Station	Transit Rail Extension	$ 294,000,000	UC
33	IDOT	Circle Interchange	I-290 and Adams St	Congress Parkway and Polk St	Major Highway Interchange Reconstruction and Expansion	$ 410,000,000	C
32	IDOT	I-190 Access Improvements	US-12/US-45/Mannheim Rd	Cumberland Ave	Corridor Improvement	$ 375,000,000	C
30	IDOT	I-290 Managed Lane	US-12/45/20/Mannheim Rd	Racine Ave	Corridor Improvement	$ 1,600,000,000	C
34	IDOT	I-55 Add Lanes and Reconstruction	I-80	Coal City Rd	Major Highway Add Lanes and Reconstruction	$ 839,000,000	UC
29	IDOT	I-55 Managed Lane	I-90/I-94	I-355	Corridor Improvement	$ 400,000,000	C
35	IDOT	I-57 Add Lanes	I-80	Proposed I-57/IL-394 Connector	Major Highway Add Lanes and Reconstruction	$ 895,000,000	UC
36	IDOT	I-80 Add / Managed Lanes	Ridge Rd	US-30	Corridor Improvement and Major Highway Add Lanes	$ 1,288,400,000	UC
37	IDOT	I-80 Managed Lanes	US-30	I-294	Corridor Improvement	$ 450,000,000	UC
38	IDOT	I-80 to I-55 Connector	I-80	I-55	New Major Highway	$ 100,000,000	UC
14	IDOT	IL-131/Greenbay Rd	Russell Rd	Sunset Ave	New Arterial Lanes	$ 161,714,000	N
15	IDOT	IL-173/Rosecrans Rd	IL-59	US-41/Skokie Hwy	New Arterial Lanes	$ 119,900,000	N
6	IDOT	IL-31 Front St	IL-120	IL-176	New Arterial Lanes	$ 113,200,000	N

* RSP ID corresponds to the labels found on the project maps

** C = Fiscally Constrained Project; UC = Unconstrained Project; N = New Submitted by Implementer, NS = New Submitted through Public Comment Period

CMAP

Draft Universe of Regionally Significant Projects for Consideration in ON TO 2050

RSP ID*	Proposed Implementer	Project Name	North/West Limits	South/East Limits	Short Description	Total Capital Cost	GO TO 2040**
109	IDOT	IL-43/Harlem Ave	BRC Railroad/65th St		Arterial and Railroad Grade Separation	$ 213,000,000	N
110	IDOT	IL-47	Charles Rd	Reed Rd	New Arterial Lanes with Intersection Improvements and Bridge Replacement	$ 299,956,000	N
10	IDOT	IL-60	IL-176/Maple Ave	CN RR	New Arterial Lanes and Grade Separatio	$ 123,200,000	N
11	IDOT	IL-62/Algonquin Rd	IL-25	IL-68	New Arterial Lanes	$ 119,500,000	N
13	IDOT	IL-83/Barron Blvd	Petite Lake Rd	IL-120/Belvidere Rd	New Arterial Lanes	$ 118,438,000	N
111	IDOT	IL-83/Kingery Hwy	31st St	Central Ave	New Arterial Lanes	$ 100,350,000	N
31	IDOT	Illiana Corridor	I-55	I-65	New Major Highway	$ 1,000,000,000	C
89	IDOT	Lake Shore Drive Reconstruction	Hollywood Ave	US-41/Grand Ave	Highway Reconstruction	$ 911,000,000	N
112	IDOT	US-12/95th St	Stony Island Ave		Intersection Improvement with Bridge Relocation	$ 154,100,000	N
113	IDOT	US-20/Lake St	Randall Rd	Shales Pkwy	Arterial Reconstruction with Bridge Replacement	$ 109,100,000	N
114	IDOT	US-45/Olde Half Day Rd	IL-60/Townline Rd	IL-22/Half Day Rd	New Arterial Lanes	$ 107,590,000	N
135	IDOT	I-94 Bishop Ford Expressway	I-57	US-6	Major Highway Reconstruction and Corridor Improvements	$ 813,000,000	N
136	IDOT	I-90/1-94 Kennedy and Dan Ryan Expressways	Hubbard St	31st St	Major Highway Corridor Improvement and Reconstruction	$ 3,632,000,000	N
137	IDOT	I-55 Stevenson Expressway	Lake Shore Dr	I-80	Major Highway Add Lanes and Reconstruction	$ 3,318,000,000	N
138	IDOT	I-90 Kennedy Expressway	Jane Adams Tollway	Kennedy/Edens Junction	Major Highway Reconstruction and Corridor Improvements	$ 1,787,000,000	N
139	IDOT	I-94 Edens Expressway	Tollway Spur	Lawrence Ave	Major Highway Reconstruction and Corridor Improvements	$ 1,861,000,000	N
140	IDOT	I-90/I-94 Kennedy Expressway	Kennedy/Edens Junction	Hubbard St	Major Highway Reconstruction and Corridor Improvements	$ 1,611,000,000	N
141	IDOT	I-290/IL-53	I-88	Lake Cook Rd	Major Highway Reconstruction and Corridor Improvements	$ 2,936,000,000	N
46	Kane Co	Randall Rd	Corporate Boulevard	North of Oak St	Add Arterial Lanes	$ 277,000,000	N
3	McHenry Co	McHenry-Lake Corridor	US-12/Stateline	IL-120	New Major Highway	$ 1,200,000,000	N

* RSP ID corresponds to the labels found on the project maps

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Draft Universe of Regionally Significant Projects for Consideration in ON TO 2050

RSP ID*	Proposed Implementer	Project Name	North/West Limits	South/East Limits	Short Description	Total Capital Cost	GO TO 2040**
51	McHenry Co	North Algonquin Fox River Crossing	Virginia Rd and IL-31	Haegers Bend Rd	New Arterial Road and Bridge	$ 100,000,000	N
98	Metra	A-2 Crossing Rebuild			Commuter Rail Improvements	$ 500,000,000	N
71	Metra	BNSF Extension-Oswego/Plano	Aurora	Oswego/Plano	Commuter Rail Extension	$ 840,000,000	UC
115	Metra	BNSF Extension-Sugar Grove	Sugar Grove	Aurora	Commuter Rail Extension	$ 500,000,000	N
72	Metra	BNSF Improvements			Commuter Rail Improvements	$ 447,000,000	UC
116	Metra	Heritage Corridor Extension	Joliet	Wilmington	Commuter Rail Extension	$ 500,000,000	N
73	Metra	Heritage Corridor Improvements			Commuter Rail Improvements	$ 199,000,000	UC
75	Metra	Metra Electric Extension	University Park	South Suburban Airport	Commuter Rail Extension	$ 291,000,000	UC
74	Metra	Metra Electric Improvements	Millennium Station	University Park	Commuter Rail Improvements	$ 447,000,000	UC
117	Metra	Milwaukee District North Extension-Richmond	Richmond	Fox Lake	Commuter Rail Extension	$ 500,000,000	N
76	Metra	Milwaukee District North Extension-Wadsworth	IL-176 near I-94	Wadsworth	Commuter Rail Extension	$ 644,000,000	UC
77	Metra	Milwaukee District North Improvements			Commuter Rail Improvements	$ 130,000,000	N
118	Metra	Milwaukee District West Extension-Hampshire	Hampshire	Big Timber Rd	Commuter Rail Extension	$ 500,000,000	N
78	Metra	Milwaukee District West Extension-Marengo	Marengo	Big Timber Rd	Commuter Rail Extension	$ 422,000,000	UC
79	Metra	Milwaukee District West Improvements			Commuter Rail Improvements	$ 447,000,000	UC
80	Metra	North Central Service Improvements			Commuter Rail Improvements	$ 332,000,000	UC
81	Metra	Rock Island Extension	Minooka	Joliet	Commuter Rail Extension	$ 317,000,000	UC
82	Metra	SouthEast Service	LaSalle St Station	Crete	Commuter Rail Improvements	$ 830,000,000	UC
83	Metra	SouthWest Extension			Commuter Rail Extension	$ 328,000,000	UC
67	Metra	SouthWest Service Improvements / 75th St Corridor Improvement Program Elements	LaSalle St Station	Manhattan	Commuter Rail Improvements	$ 1,025,000,000	C

* RSP ID corresponds to the labels found on the project maps

** C = Fiscally Constrained Project; UC = Unconstrained Project; N = New Submitted by Implementer, NS = New Submitted through Public Comment Period

Draft Universe of Regionally Significant Projects for Consideration in ON TO 2050

RSP ID*	Proposed Implementer	Project Name	North/West Limits	South/East Limits	Short Description	Total Capital Cost	GO TO 2040**
84	Metra	STAR Line	O'Hare to Schaumburg	Joliet	New Commuter Rail Line	$ 3,000,000,000	UC
119	Metra	STAR Line Eastern Segment	Joliet	Lynnwood	Commuter Rail Extension	$ 500,000,000	N
120	Metra	STAR Line Northern Segment	Hoffman Estates	Waukegan	Commuter Rail Extension	$ 500,000,000	N
68	Metra	UP North Improvements	Kenosha, WI	Ogilvie Transportation Center	Commuter Rail Improvements	$ 447,000,000	C
66	Metra	UP Northwest Extension			Commuter Rail Extension	$ 584,000,000	C
69	Metra	UP West Improvements	Elburn, IL	Ogilvie Transportation Center	Commuter Rail Improvements	$ 524,000,000	C
118	Metra	Modern Metra Electric	Millennium Park Station	Park, Blue Island and South Chicago	Conversion of Existing Commuter Rail Line to Rapid Transit Line.	$ 1,000,000,000	NS
121	Metra	Rock Island RER Service	LaSalle St Station	Blue Island	Conversion of Existing Commuter Rail Line to Rapid Transit Line.	TBD	NS
122	Metra	UP North RER Service	Kenosha	Ogilvie Station	Conversion of Existing Commuter Rail Line to Rapid Transit Line.	TBD	NS
123	Metra	UP Northwest RER Service	Harvard	Ogilvie Station	Conversion of Existing Commuter Rail Line to Rapid Transit Line.	TBD	NS
124	Metra	CrossRail Chicago	O'Hare	University Park	New Rail Line	$ 3,904,000,000	NS
105	Pace	Express Bus Expansion			New Transit Bus	$ 1,775,000,000	N
102	Pace	Pulse-ART Expansion			New Transit Bus	$ 1,400,000,000	N
119	RTA	S.M.A.R.T. - Suburban Metropolitan Area Rapid Transit	Highland Park and Evanston	East Hazel Crest/Hyde Park	Two Circumferential Monorail Routes	$ 15,000,000,000	NS
25	Tollway	Central Lake County Corridor: IL 53 North and IL 120			New Major Highway	$ 2,650,000,000	C
20	Tollway	Elgin O'Hare Western Access			New Major Highway; Extension; Add Lanes	$ 3,427,100,123	C
24	Tollway	I-290/I-294 Interchange Improvement			Major Highway Interchange Reconstruction	$ 540,000,000	N
21	Tollway	I-290/IL 53 Interchange Improvement			Major Highway Interchange Reconstruction	$ 265,000,000	N
23	Tollway	I-294 Central Tri-State Mobility Improvements	Balmoral Ave	95th St	Major Highway Corridor Reconstruction	$ 1,694,000,000	UC
22	Tollway	I-294 Interchange Addition	I-57		New Major Highway Interchange	$ 420,000,000	C

* RSP ID corresponds to the labels found on the project maps

** C = Fiscally Constrained Project; UC = Unconstrained Project; N = New Submitted by Implementer, NS = New Submitted through Public Comment Period

Draft Universe of Regionally Significant Projects for Consideration in ON TO 2050

RSP ID*	Proposed Implementer	Project Name	North/West Limits	South/East Limits	Short Description	Total Capital Cost	GO TO 2040**
134	Tollway	Cross-Town Tollway and CTA Route	Cicero Ave at I-90/I-94	75th St at I-94	New Toll Road with New Transit Rail	$ 10,000,000,000	NS
53	Will Co	Caton Farm-Bruce Rd Corridor	US-30, Caton Farm Rd & Gaylord Rd	IL-7/159th St & Cedar Rd	New Arterial Lanes and Bridge	$ 385,288,250	N
55	Will Co	Laraway Rd	US-52	Harlem Ave	New Arterial Lanes	$ 202,776,500	N
56	Will Co	Wilmington-Peotone Rd	IL 53	Drecksler Rd	New Arterial Lanes	$ 254,512,000	N

Notes: 1. When the cost is listed as "TBD," no current estimate is available but is expected to meet the regionally significant project cost thresholds.

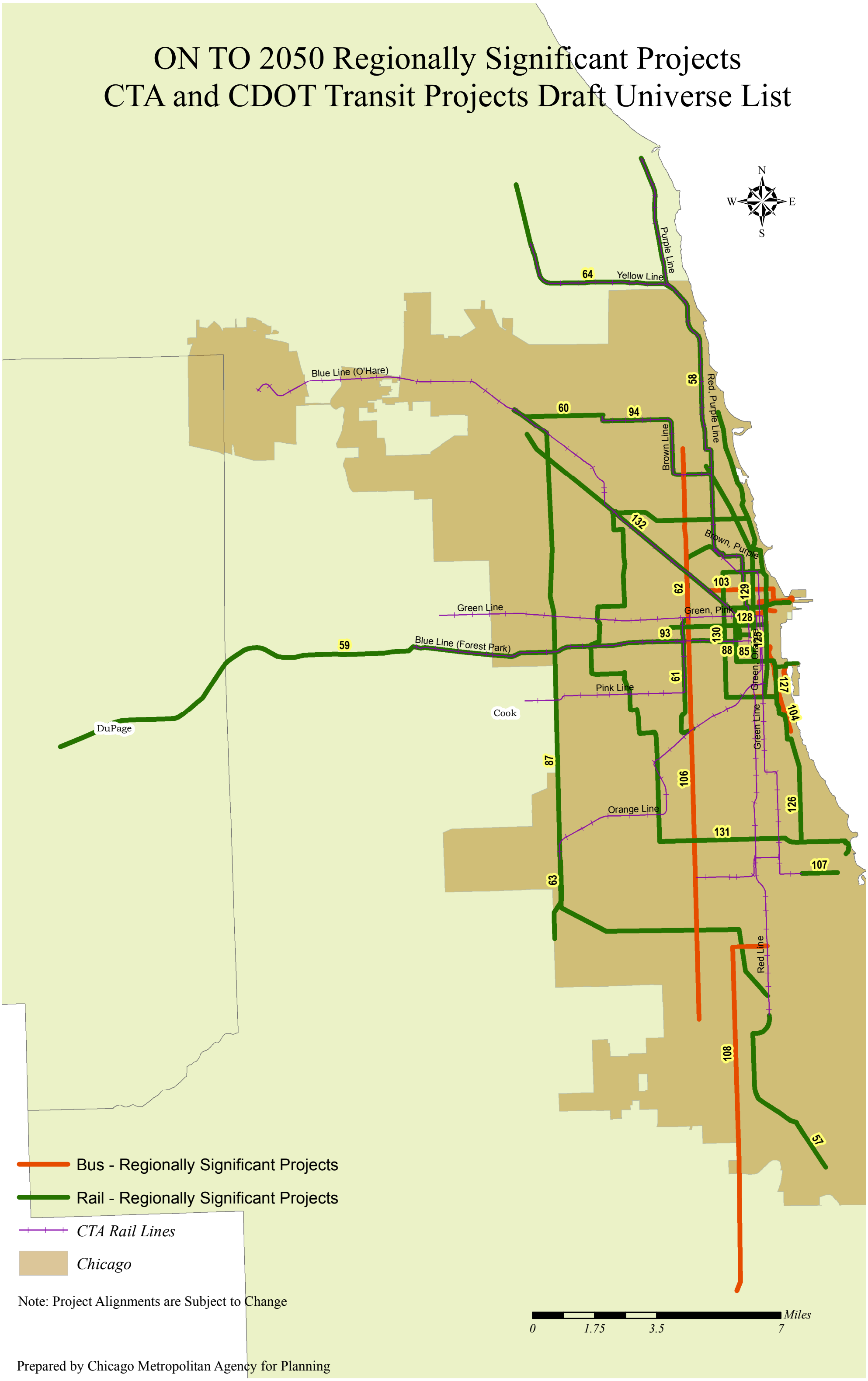
2. The Total Capital Costs are estimates and the year of estimation varies by project. These cost will be modified in the future so that all are consistent for purposes of comparison.

3. To be considered a regionally significant project, a project should 1) Costs at least $100 million and (a) changes capacity on the National Highway System (NHS) or is a new expressway or principal arterial, or (b) changes capacity on transit services with some separate rights-of-way or shared right-of-way where transit has priority over other traffic; or 2) Costs at least $250 million and improves the state of good repair for a particular highway or transit facility.

* RSP ID corresponds to the labels found on the project maps

** C = Fiscally Constrained Project; UC = Unconstrained Project; N = New Submitted by Implementer, NS = New Submitted through Public Comment Period

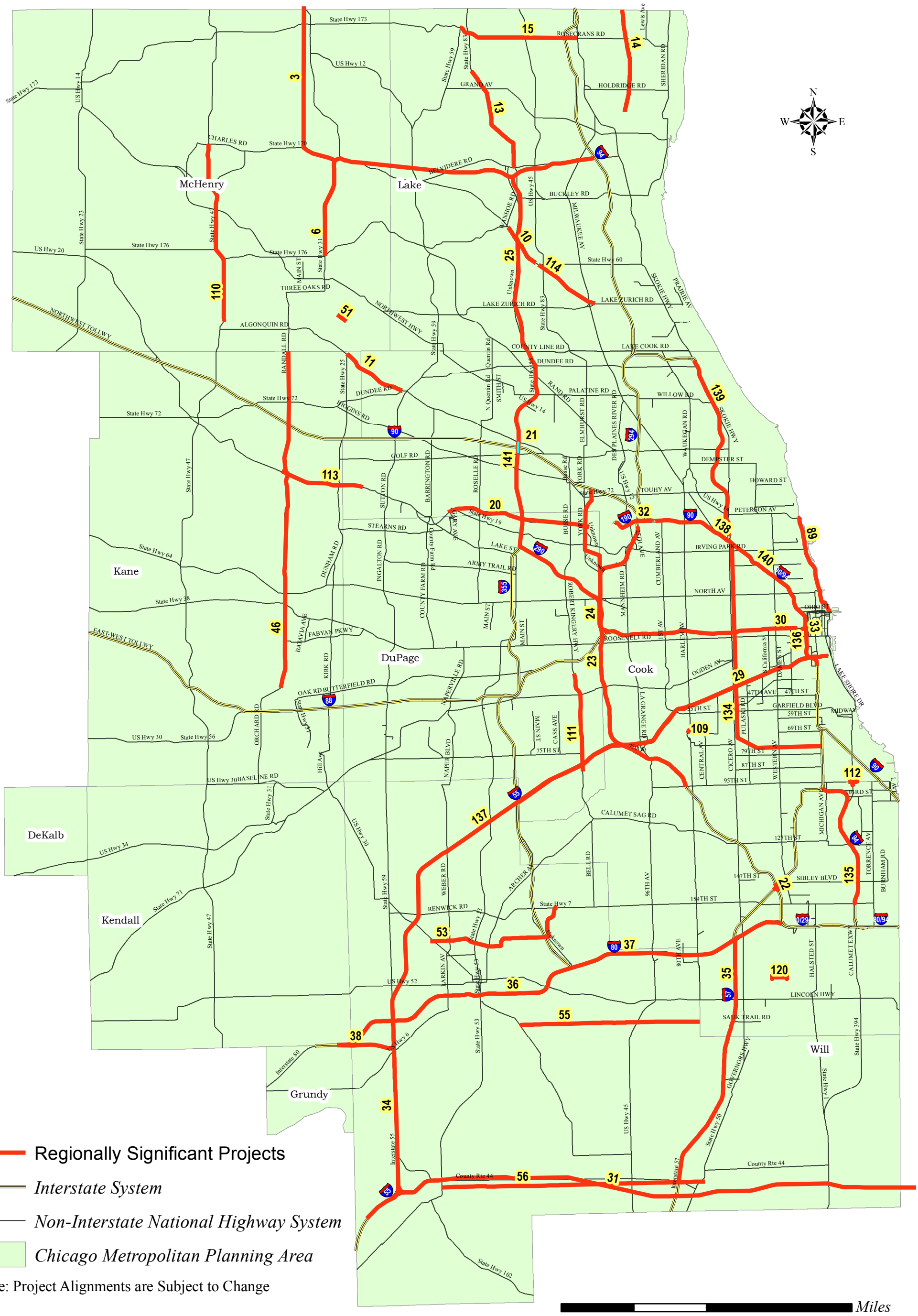
ON TO 2050 Regionally Significant Projects
CTA and CDOT Transit Projects Draft Universe List



Note: Project Alignments are Subject to Change

Prepared by Chicago Metropolitan Agency for Planning

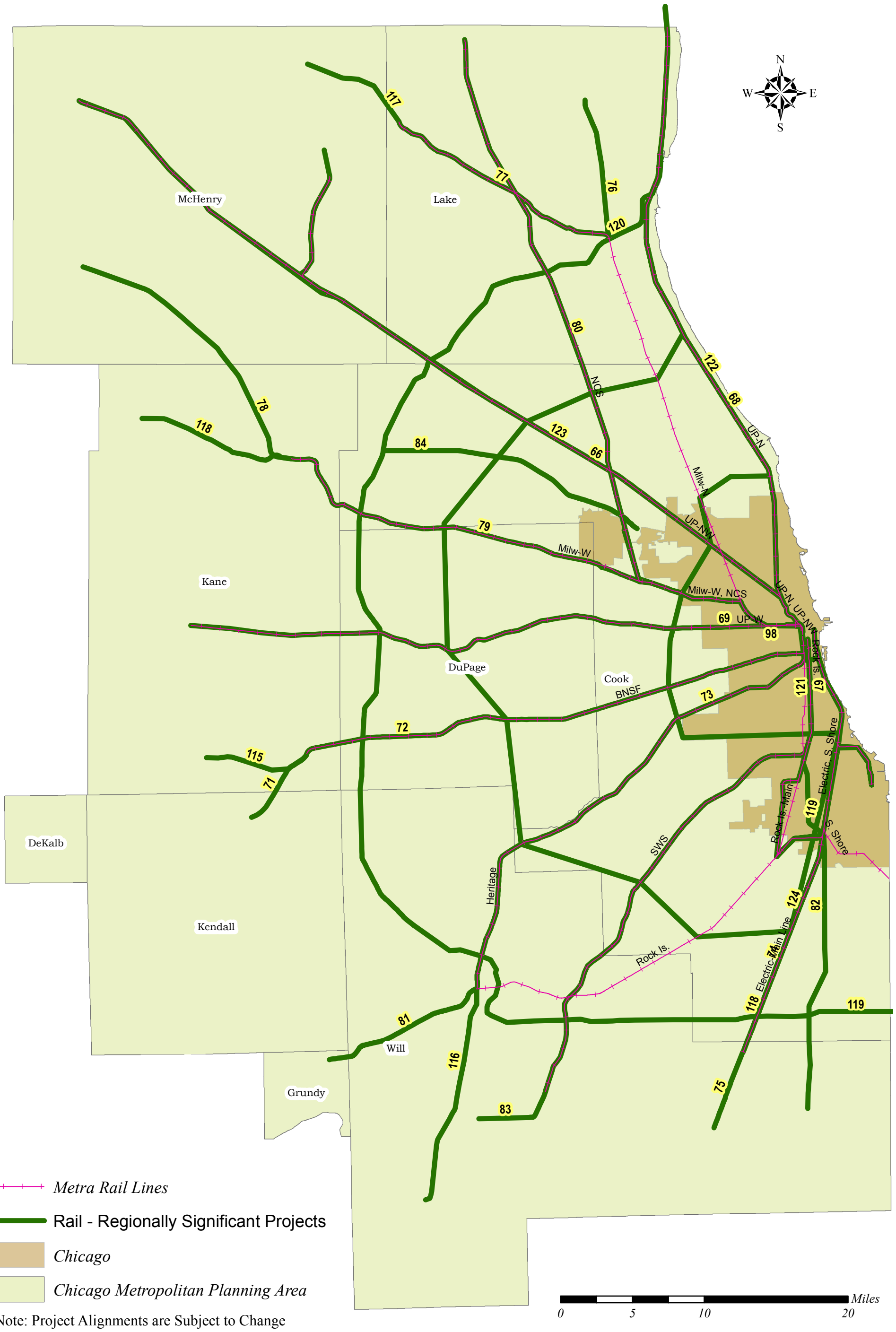
ON TO 2050 Regionally Significant Projects
Highway Projects Draft Universe List



Note: Project Alignments are Subject to Change

Prepared by Chicago Metropolitan Agency for Planning

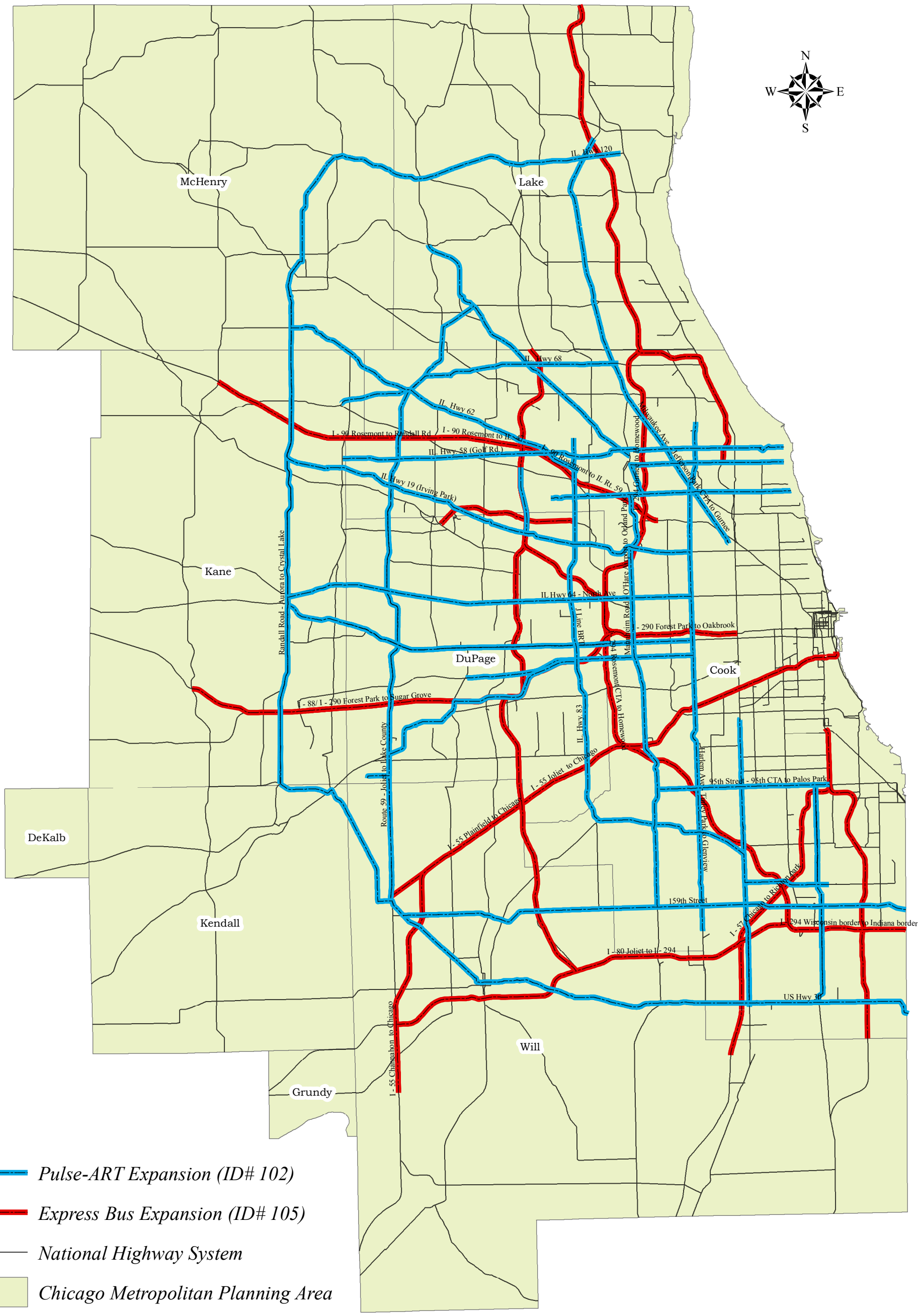
ON TO 2050 Regionally Significant Projects
Metra and RTA Transit Projects Draft Universe List



Note: Project Alignments are Subject to Change

Prepared by Chicago Metropolitan Agency for Planning

ON TO 2050 Regionally Significant Projects
Pace Transit Projects Draft Universe List



Note: Project Alignments are Subject to Change

Prepared by Chicago Metropolitan Agency for Planning

Highway Operations Strategy Paper

Draft November 2016

Introduction

As part of the ON TO 2050 comprehensive regional plan development process, this paper explores ways to improve highway operations to enhance our region's mobility and accessibility. Besides federal requirements to include operations in long-range planning,[1] highway management and operations are important to regional planning for a number of reasons. Highway management strategies optimize the efficiency, safety, and reliability of the highway system through coordinated operations. Congestion due to incidents – rather than recurring congestion caused by predictable commute traffic – remains one of the largest causes of delay. Management initiatives may also facilitate better use of limited capacity, reducing the need for system expansion.

Increasingly, highway management involves data, communications, and technologies that help system managers optimize traffic flow and respond to situations as they arise. This increasing reliance on data and communications is expected to facilitate a more modern, performance-driven operations environment for the highway system which will enhance overall regional mobility.

Highway management and operations includes traffic incident detection and response, providing information for travelers, roadway weather detection and response, managed lanes, traffic signal coordination, work zone management, and transportation demand management. Many operations strategies are in place now, including visible efforts like open road tolling, radio traffic reports, IDOT Minutemen and Illinois Tollway HELP trucks, and reversible lanes on the Kennedy Expressway, as well as "back-end" efforts like optimizing traffic signal timing or better managing construction zones. But given new data, technologies, and communications, there is the opportunity to expand and intensify the use of these strategies.

Ultimately, the application of improved highway management and operations techniques to address the non-recurring sources of congestion results in a system that operates more efficiently, reliably, and safely, with less cost than capacity expansion. Underlying all operational decisions is the necessity of balancing the mobility and accessibility needs of all highway users, including pedestrians, bicyclists, transit vehicles, drivers passing through the community, and drivers using the facility to access local destinations. These choices impact how highways integrate with the communities they serve. A well-managed highway system works better for all users and reduces congestion, fuel use, and travel time for passenger and freight vehicles. In fact, management and operations strategies can contribute greatly to achieving policy goals for northeastern Illinois' transportation system, helping establish a system that is safe, accessible, easy to navigate, affordable, and coordinated with nearby land uses.

[1] Long-range plans are required to include "operational and management strategies to improve the performance of existing transportation facilities to relieve vehicular congestion and maximize the safety and mobility of people and goods." (23 USC § 134(i)(F))

The MPO Role in Planning for Operations

The role of operations and management strategies in improving highway performance has a long history in Chicago-area regional planning. In 1988 an eight-point plan called "Operation Green Light: a transportation plan for Northeastern Illinois" was developed by the Illinois Department of Transportation in cooperation with the Regional Transportation Authority, the Illinois Tollway, the Chicago Area Transportation Study, and the Northeastern Illinois Planning Commission. Two of the eight points were focused on highway operations. The plan recommended improving freeway traffic management by expanding surveillance, dynamic message signs, highway advisory radio, ramp metering, implementing electronic toll collection, and expanding the emergency traffic patrol service and improving arterial traffic management by developing a region-wide incident detection network and an arterial congestion monitoring system. Operation Green Light resulted in a five-year, $1 billion funding program to improve roadway operations.[2]

Nationwide, MPOs have incorporated operations into their normal planning activities in a variety of ways, as shown in Table 1. Although CMAP's main avenue to include operations in our activities remains limited to maintaining operations committees -- the Regional Transportation Operations Coalition (RTOC) and the Advanced Technology Task Force (ATTF) -- CMAP has awarded UWP funding for operations-oriented planning projects, and has also committed a significant amount of operations funding through the Congestion Mitigation and Air Quality (CMAQ) Program, with funds going toward projects such as traffic management centers, traffic signal modernization, traffic signal interconnects, intersection improvements, ramp metering, and transit signal priority systems. Additionally, Surface Transportation Funds (STP) have also been used to implement highway operations projects.

Table 1: Examples of MPO Planning for Operations

Agency Primary City (Population in Millions)	Operations Committee	Regional Transportation Operations Plan	M&O Plan Chapter or Section	M&O Funding Set-Aside
Chicago Metropolitan Agency for Planning Chicago IL (8.3)	Yes	No	No	No
North Central Texas Council of Governments Dallas-Ft Worth TX (6.4)	No	Yes	Yes	Yes
Delaware Valley RPC Philadelphia PA (5.6)	Yes	Yes	Yes	Yes

[2] Cure for Gridlock, Chicago Tribune Blair Kamin and David Ibata, February 1990

Agency Primary City (Population in Millions)	Operations Committee	Regional Transportation Operations Plan	M&O Plan Chapter or Section	M&O Funding Set-Aside
Maricopa Association of Governments Phoenix AZ (3.8)	Yes	Yes	Yes	Yes
Puget Sound Regional Council Seattle WA (3.7)	Yes	Yes	Yes	No
San Diego Association of Governments San Diego CA (3.1)	No	Yes	Yes	Yes
Denver Regional Council of Governments Denver CO (2.8)	Yes	Yes	Yes	Yes
Portland Metro Portland OR (1.9)	No	Yes	Yes	Yes
MetroPlan Orlando Orlando FL (1.8)	Yes	No	Yes	Yes

Source: Programming for Operations: MPO Examples of Prioritizing and Funding Transportation System Management & Operations Strategies (FHWA, 2013), agency websites.

Potential Framework for ON TO 2050

The Regional Vision for GO TO 2040 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 recommends investing in existing infrastructure to gain operational efficiencies from it, and prioritizing modernization projects when making investment decisions. The 2040 goals lead directly to the need for an increased commitment to improving highway operations by the region's system operators and emergency responders.

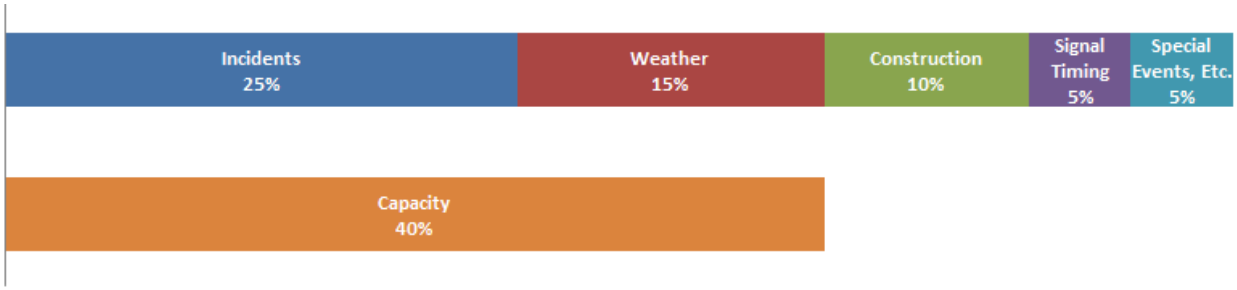
ON TO 2050 presents an opportunity to build on the recommendations of GO TO 2040 with more specific strategies to improve highway operations, which is the subject of this strategy paper. To develop such a framework, CMAP staff researched best practices and new ideas from other areas of the country as well as interviewing operations personnel from the highway agencies. Overall strategy paper development was guided by the Regional Transportation Operations Coalition and the Advanced Technology Task Force. While many of the strategies outlined below can be supported by CMAP through its planning processes, funding programs,

outreach, and technical assistance, most will necessitate the leadership of transportation implementers and other entities to come to full fruition.

Consider Operations Improvements before Capacity Additions

Making operations improvements should be the first option in considering how to improve mobility in the region. Highway congestion caused by crashes, weather, or other incidents cannot be alleviated through capacity improvements. In these cases, any reductions in delay must come from the way the highways are managed and operated. In fact, perhaps 60 percent of congestion nationwide is caused by non-recurring sources – like incidents, construction, and weather -- that are best addressed by operational changes rather than adding capacity.

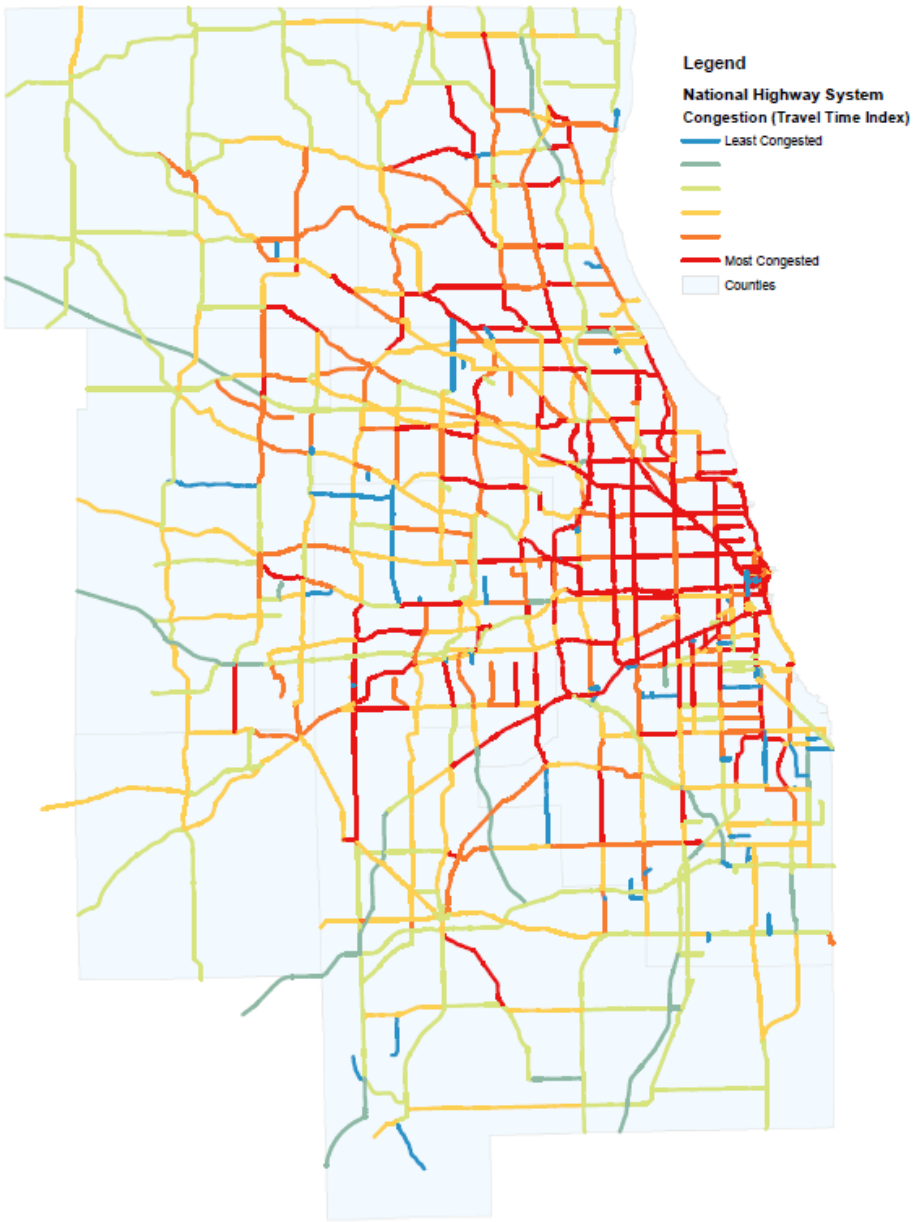
Figure 1: Sources of congestion



Source: FHWA Office of Operations
http://www.ops.fhwa.dot.gov/congestion_report/executive_summary.htm#overview

Even when insufficient capacity is the cause of congestion and delay, capacity expansion is not practical in some locations. Improving system operations offers another avenue to improve roadway travel conditions. As Figure 2 shows, the most congested locations tend to occur in the most built-out areas of the region where system operators may not own sufficient right of way for expansion, and obtaining additional right of way is costly and disruptive to communities.

Figure 2: Congested Locations

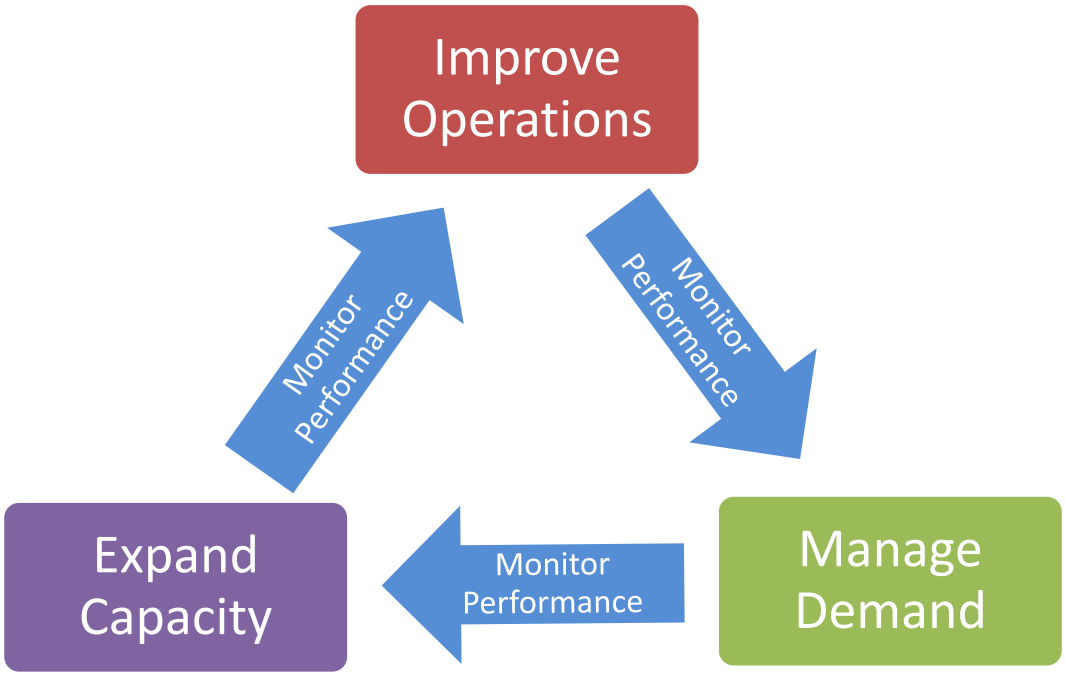


Many management strategies can stretch tight agency budgets by extending the benefits of a new capital expenditure over a longer period of time, or increase vehicle throughput and perhaps delay the need for capacity additions. In addition, consideration of traffic management can be part of a phased approach to highway improvements, reflecting a limited funding environment.

Numerous strategies considered in this paper have benefits many times their cost, while typical highway capacity additions have much lower benefit/cost ratios. Implementing highway management strategies can often optimize flow to reduce the impact of congestion without additional capacity. Even if congestion cannot be eliminated, the daily onset of congestion may

be delayed by smoothing traffic flow and managing incidents. And in recurring oversaturated traffic conditions, effective highway management can shift from optimizing existing traffic flow to managing demand through mechanisms such as congestion pricing and various trip reduction programs. In cases where demand management is not feasible, the cost-effectiveness and feasibility of capacity additions can be reviewed.

Reducing congestion through improved operations is one part of a performance based approach to system improvement. The approach includes monitoring performance, implementing operational improvements, managing demand and expanding capacity where appropriate, in a continuous cycle.



Lastly, many management and operations strategies presuppose an infrastructure investment, e.g., dynamically managing traffic flow after a special event may require an advanced highway traffic signal system with communications infrastructure. Understanding future operations system requirements will result in better preparatory capital investment decisions now.

Enhance Communication and Coordination to Improve Highway Operations

Increasingly, highway management involves data, communications, and technologies that help system managers optimize traffic flow and respond to situations as they arise. On a regional scale, the highway system is most effectively managed when communication extends coordination beyond an individual operating agency by establishing communication between highway agencies, emergency management services, transit operators, and real time traveler

information services. The long-term goal is a connected management system operating as presented in Figure 3, where individual agencies can monitor and manage their own equipment in the field such as cameras, message signs, and traffic signals. Highway and emergency response agencies exchange information and share camera images. Highway agencies actively adjust traffic control equipment, and inform the public of road conditions. Information is passed to other highway and transit agencies who can also respond by making changes in their own systems. The continuous and automatic flow of data and communications facilitates a more modern, performance-driven operations environment for the highway system. This requires coordination between agencies and agreements on how to share data and what to do in response to shared information. In interviews, operations staff often suggested that agency policies are more difficult to overcome than technological constraints. The rest of this section describes investments and activities the region can pursue that bring us closer to the goal, and includes:

- developing traffic management centers, which house the staff, hardware, and decision support software and act as the communications hubs for all higher level highway operations capabilities;
- developing a regional communications network, which provides the linkage between modern equipment in the field and the decision support in the management center, and allows communication to flow between different agencies and the public;
- improving incident response, which includes training, communications, and policies which speed up clearance and reduce secondary crashes;
- improving weather response by improving traveler information and targeting response to locations known to be especially susceptible to weather impacts;
- modernizing and retiming traffic signals, and developing expanded capabilities of controlling them from a traffic management center;
- reducing work zone duration to reduce delay and safety impacts;
- implementing interstate and arterial active traffic management by blanketing critical corridors with a combination of equipment, communications and policies to improve operations; and
- implementing integrated corridor management so a system of roadways and transit can be operated as a unit, improving travel conditions by balancing demand among them.

Figure 3: Regional Highway Operations System

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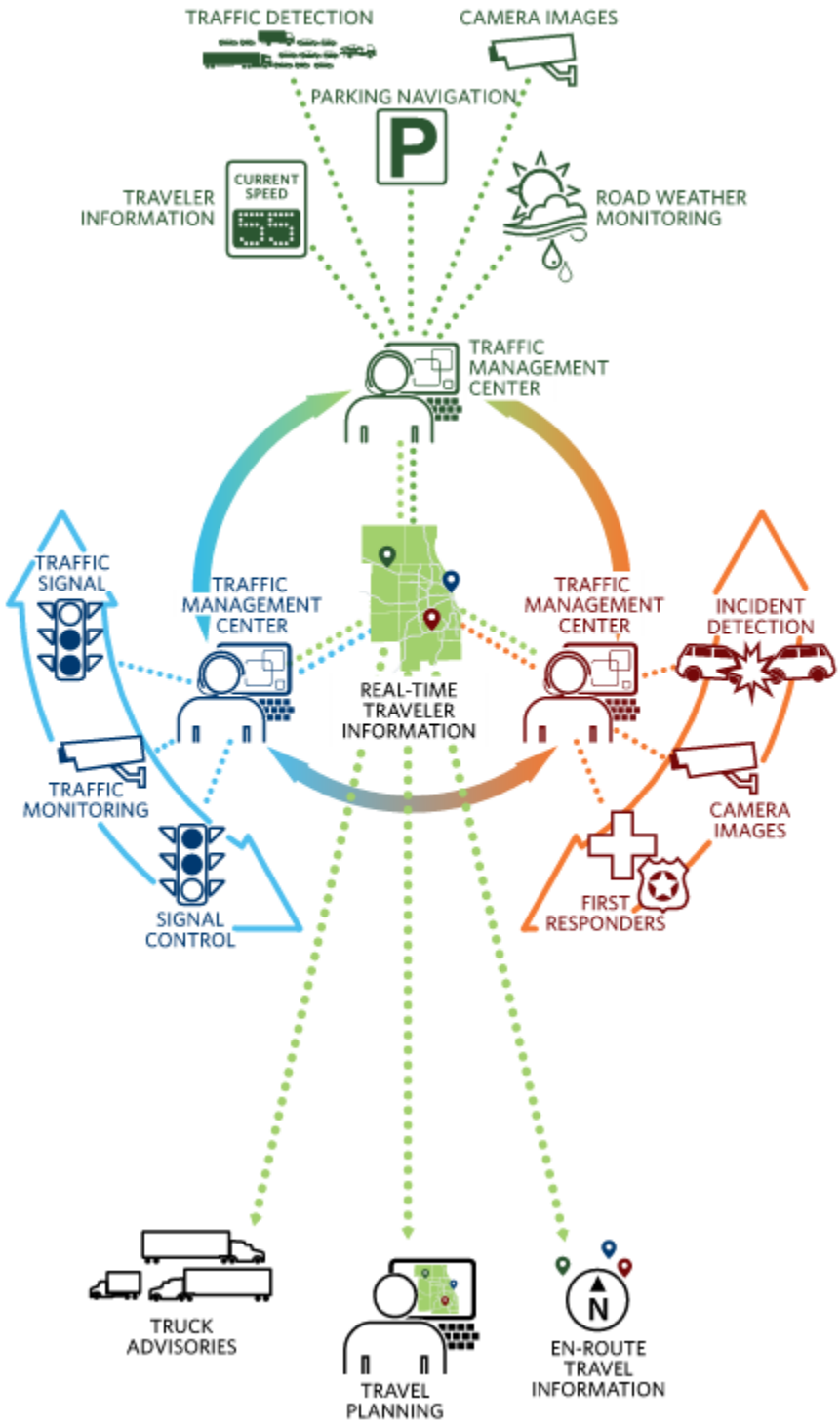
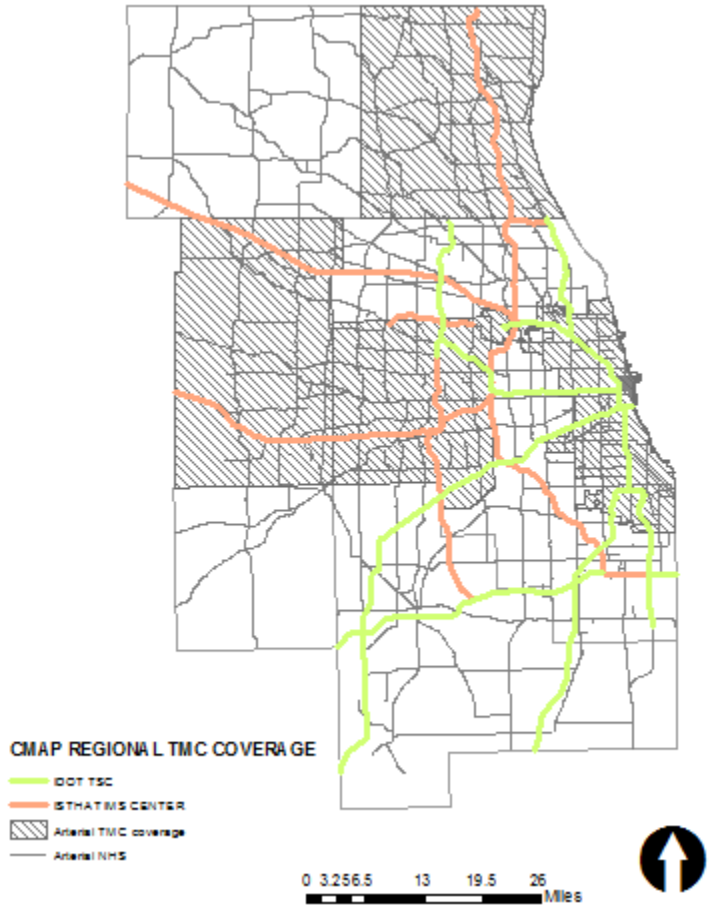


Expand and Potentially Regionalize Traffic Management Centers

The hub for all the data-dependent activities and systems used in highway management is the traffic management center (TMC), and so providing all urban areas of the region with TMC coverage is critical. TMCs host the hardware, software and staff that monitor and operate all the region's highway systems. Typical traffic management center functions include providing traffic incident detection and surveillance, providing coordination among various agencies, and monitoring traffic signal equipment, and dispatching resources to fix malfunctioning equipment.

Figure 4. Existing and programmed traffic management centers



The largest TMCs are the Tollway's Traffic and Incident Management System and IDOT's ComCenter, the latter of which acts as the 24-hour incident management and operations center for IDOT District 1 interstates (Figure 4). IDOT also has its Transportation System Center (TSC), which is responsible for monitoring the vehicle detection system on IDOT's District 1 expressway system. IDOT does not maintain an arterial traffic management center.

Cook County does not maintain a traffic management center and continues to advocate for development of an arterial traffic management center to be shared with the Illinois Department of Transportation. Especially in northwest Cook County, there are many congested IDOT and Cook County jurisdiction arterials that would benefit from coordinated management. Maintaining a joint center would facilitate that coordination. The Chicago Department of Transportation operates a "mini-TMC" out of its Traffic Control Room, which will be expanded as needed until a more permanent facility is built with the Chicago Office of Emergency Management and Communications hosting the hardware (servers and communications). It is expected that the Chicago TMC and the 911 Center will integrate operations and communications to some degree.

In DuPage's Virtual TMC, monitoring and management are assigned to a workstation in the DuPage County complex. DuPage County DOT, the City of Naperville and the City of Aurora are use-testing the same traffic management software which will likely form the software foundation of the virtual center. In Lake County, the Lake County PASSAGE Traffic Management Center (TMC) operates the County roadways and provides motorists real time traffic congestion information due to crashes and construction events. In Kane County, and the TMC was constructed in 2015, following a 2007 feasibility study, and should become operational in 2016. McHenry, Kendall, and Will Counties have no current plans to develop TMCs.

Lastly, some consideration should be given to how to integrate communications between traffic management centers. In the current CMAP ITS Architecture this is envisioned to happen using the IDOT Gateway Traveler Information System (GTIS) as a communications hub, eliminating the need for agencies to connect with multiple centers. However, in agency interviews some operations staff expressed concern about whether the GTIS will be robust enough to support this. In addition, developing and staffing multiple traffic management centers is costly, which has been the main impediment to developing them. A regional center would eliminate the need for integrating multiple TMCs, and share the staffing, hardware and software costs. This could be a virtual TMC or traditional brick and mortar location. CMAP should undertake a study of the costs and benefits of implementing a regional, multi-jurisdictional traffic management center, either virtual or traditional.

Invest in the Communications Backbone

Real time monitoring of the system and communication with field equipment requires a robust and redundant communication system. Active traffic management requires the ability to monitor and communicate with all field equipment, including traffic signals, cameras, dynamic message signs, other operations centers, and in the future perhaps even vehicles on the roadway. In agency interviews, staff stated that often the most difficult part of implementing intelligent transportation system projects was establishing the communication infrastructure to support them. Most of the agencies use a combination of wireless and fiber communication, but

the volume of data transmission, especially camera images, requires the high capacity linkages most often provided by fiber optic cables.

In addition to supporting current traffic management activities, the existence of a systemwide communication system must be in place to take advantage of future Vehicle to Infrastructure (V2I) capabilities. Communication between the receiving and transmitting field devices and the traffic management center will be required, potentially meaning a large investment is needed depending on whether existing fiber is available.[3]

For a number of reasons, including the recurring cost of using publicly available communication systems and security concerns, transportation agencies in our region have been building private communication networks to support traffic management activities. The Illinois Tollway has complete coverage of its 286 mile system and has written agreements to share fiber communication capacity with the Gateway Traveler Information System and the Lake County Division of Transportation. The Illinois Department of Transportation has an extensive fiber optic network, but there is a need to inventory and review location and condition of the system.[4]

In the near future, Lake County DOT will share just over 100 miles of fiber with other agencies (ISTHA, IDOT and Cook County), plus it will have 38 miles of county-owned fiber. DuPage and Kane Counties are installing fiber links as needed as they develop their central traffic signal control capabilities (discussed more later). The Chicago Department of Transportation has an inventory of the location of its extensive fiber communication system. There are also 902 miles of traffic signal interconnect on the arterial system, which can be counted as segments of communication infrastructure serving individual systems in the field. These systems form the beginning of communication coverage on the arterial system. Old signal interconnects may communicate with copper wires, but new ones are all installed with fiber communications. When the systems become part of a central signal system, communication to the traffic management center is added.

A region-wide inventory of transportation-related fiber-optic cable does not currently exist, which makes planning for expansion opportunities more difficult. If agencies agree on the future communication layout, they may be able to incorporate features during normal roadwork that make expansion to build the system easier and cheaper. Retrofitting roadways

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[3] "According to AASHTO, some sites may only require an upgrade to their current backhaul system to support expected bandwidth requirements for connected vehicle communications. However, 40 percent of all traffic signals have either no backhaul or will require new systems, according to AASHTO. The difference in cost between tying into an existing fiber-optic backhaul and installing a new fiber-optic backhaul for the sites is significant, according to DOT. The average national cost to upgrade backhaul to a DSRC roadside site is estimated to vary from $3,000, if a site has sufficient backhaul and will only need an upgrade, to $40,000, if the V2I site requires a completely new backhaul system, according to AASHTO estimates." Intelligent Transportation Systems Vehicle-to-Infrastructure Technologies Expected to Offer Benefits, but Deployment Challenges Exist, United States GAO, September 2015

[4] Procurement for that inventory was in process as of late 2015.

with fiber optic communication is costly.[5] Even requiring the installation of empty conduit when projects are constructed would decrease the cost of adding communications in the future. Extra capacity can be provided by including extra fiber in an installation, or using larger conduit so more cable can be added later. It might not be sensible to require this for every construction project, but could be practical on roadways that were included in a communications system master plan.

A number of agencies in the region have lost communication with all field equipment because of damage to a critical system link. As the communication system of each of the agencies expands, opportunities for links between agencies and resulting redundant paths will become available. Expanding the system and creating the necessary redundancy may proceed in a smoother and more predictable way if the region has an understanding of how the system should or will be developed. In interviews and through committee meetings, the region's highway agencies have expressed a desire to work together to develop a communications master plan. The plan would require assembling information about the communications infrastructure owned by individual agencies and including it in a single database where it can be viewed at a regional scale. If agencies have developed expansion plans, those linkages could also be included. Note that agencies have expressed concerns about the vulnerability of the communication system if this data were public, and most believe it would be necessary to keep it private. CMAP is an appropriate coordinator of this activity.

Focus More Resources on Incident Management

Since incidents like crashes, broken down or abandoned vehicles, and debris on roadways cause so much of the non-recurring delay in the region, improving incident management is a priority. Each incident presents an opportunity to reduce congestion through earlier detection and verification, faster response, and adherence to quick clearance principles. Reducing incident duration also reduces the potential for additional incidents ("secondary incidents") caused by congestion resulting from the first incident. Nationwide, approximately 20 percent of all incidents are secondary incidents.[6]

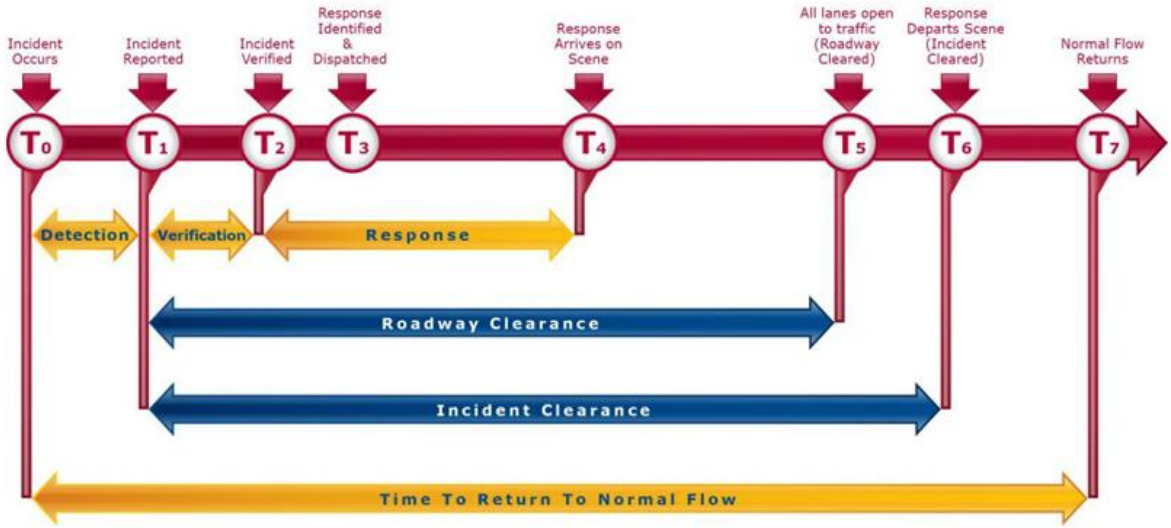
Incident management includes a number of steps, each with the potential for reducing the total amount of time needed to return traffic to normal flows (Figure 5). However, unlike other highway operations activities, incident management is largely managed by a public safety

[5] According to USDOT Intelligent Transportation Systems Joint Program Office, the cost of in-ground fiber optic cable installation might range $21,000 – $55,000 per mile but "in ground installation would cost significantly less if implemented in conjunction with a construction project." According to a Chicago Department of Transportation staff member, locations with very complex underground utility systems like the City of Chicago can incur costs of $0.5 – 1.0 million per mile for design and construction of fiber optic communication.

[6] FHWA Office of Operations Traffic Incident Management Webpage. http://ops.fhwa.dot.gov/aboutus/one_pagers/tim.htm

agency, with the transportation agency playing a supporting role. Therefore, much of the work to improve performance falls upon the public safety agencies.

Figure 5: Timeline of incident management process



http://www.ops.fhwa.dot.gov/publications/fhwahop15007/chapter1.htm

Better Incident Detection

Automated detection methods can be more effective for early detection than relying on human observation. Analyzing vehicle detection system or probe data (that is, GPS traces indicating traffic speed) can detect potential incidents and generate automated notifications to traffic management center operators. Traffic cameras with automated incident detection capabilities have been tested on expressways in the region and have been found to accurately identify the occurrence of most traffic incidents. At the time they were tested, they were expensive compared to the existing closed circuit television camera systems, but they can return benefits 12 times their cost.[7] IDOT and the Illinois Tollway should explore the use of automated incident detection equipment on the interstates.

While some counties also use video imaging traffic detection to provide data for the traffic signals, using camera technology to detect incidents is unlikely to become widespread on the arterial system, as there are too many miles of coverage needed and the stop and go flows make detection by camera difficult. On arterials, it may be possible instead to use real-time probe data to alert operators to changes in expected flows that can indicate an incident. Cameras would be needed to manually verify the existence and characteristics of an incident. At critical arterial locations, more CCTV cameras should be installed to aid incident detection.

[7] Benefit Cost Analysis of Accelerated Incident Clearance Final Report, Clemson University Transportation Systems Research and Education prepared for South Carolina Department of Transportation, 2007

Integrate Public Safety Answering Points (PSAP)

The PSAP is the call center receiving 911 calls and dispatching appropriate emergency responders. Since CCTV and other sensing devices do not fully cover the entire region, communications with public safety agencies, including PSAPs, is necessary. PSAPs have the most accurate real time information about highway incidents, so transportation agencies are seeking direct automated electronic communications with computer-aided dispatch (CAD) systems operated by PSAPs. Often, the PSAP has a policy for staff to notify departments of transportation about incidents rather than implementing such an automated process. During major highway incidents when public safety resources are being deployed, transportation communications may be a lower priority, resulting in significantly delayed responses to incidents.

Information exchange can improve incident response by allowing transportation agencies to change traffic signal timing, alter ramp meter timing, provide real time traveler information, and take other steps to manage the transportation network during major incidents. Field operations staff can also more quickly remove spills and debris and repair damaged equipment. In addition, the support provided by the DOT can increase safety for emergency responders. Sharing access to CCTV video, including camera control, is common in these arrangements and provides important information to responders who are en-route to the scene.

In 2002, the Illinois Tollway and Illinois State Police District 15 collaborated to deploy a two-way data exchange between their traffic management centers and dispatch service. This innovative approach built upon the unique agency dispatch operation that already handled State Police and Tollway maintenance and operations from a single CAD system. The deployment became recognized in the transportation industry as the first of its kind. Since that time, Lake County Division of Transportation (LCDOT) has also established connections to many PSAP operators within the county. Some of these agreements have included LCDOT camera and congestion data in return for PSAP highway incident dispatch data. While not all of the Lake County integration efforts include a two-way component, the benefits remain.

The region's transportation operators are certain that additional integration efforts will further enhance the safety and mobility of the region. However, progress on establishing this required[8] information exchange has been difficult. PSAP-to-transportation operator information exchanges typically require development of formal operational policies and agreements. Before

[8] Recent federal regulations require departments of transportation to provide timely and accurate dissemination of traffic incident data to the traveling public, giving the state strong reason to encourage PSAP integration as a way to obtain that information. (Real-Time System Management Information Program [1201]) "The timeliness for the availability of information related to roadway or lane blocking traffic incident will be (…) 10 minutes or less from the time that the incident is verified for roadways within Metropolitan areas. (…) Establishment of the real-time information program for traffic and travel conditions on the Interstate system highways shall be completed no later than November 8, 2014. Establishment of the real-time information program for traffic and travel conditions reporting along the State-designated metropolitan area routes of significance shall be completed no later than November 8, 2016."

those can occur, participants must understand the information to be shared, when it will be shared, and with whom it will be shared. In addition, information exchanged between these systems is sensitive, and there are legitimate concerns about maintaining appropriate levels of privacy and software system security. For example, IDOT District 1 has been working for 10 years to implement an agreement for integrated communications with the Illinois State Police and the Cook County Sheriff. The Illinois Tollway and Lake County Department of Transportation experiences offer potential solutions to protect privacy and maintain secure exchanges of information between computer systems.

In January 2016, Public Act 099-0006 required counties to reduce the number of 911 centers by half, and creates an office of Statewide 911 Administrator within the Illinois State Police to develop, implement and oversee a uniform 911 system, excluding municipalities with more than 500,000 residents (City of Chicago). This process provides an opportunity to advance the goal of PSAP integration as part of the standardization of the statewide system, and to also reduce the number of PSAP communications connections that must be developed to exchange the desired information.

Expand Full Function Service Patrols

To keep roadways clear of debris and disabled vehicles, both the Illinois Department of Transportation and the Illinois Tollway employ emergency traffic patrols on the region's expressways and tollways. Northeastern Illinois developed the first continuous service freeway service patrol in the nation in 1960. [9] The goal of the service patrol is to detect and remove incidents quickly. Patrols perform minor vehicle repairs, provide fuel, change tires, remove debris, and provide assistance to emergency responders at crash scenes. They are integrated within the agency incident management system, and may also be dispatched to a location from the traffic management center. IDOT's patrols, called "Minutemen," cover the core Cook County IDOT expressway system twenty-four hours a day, every day of the year. The IDOT service patrol provides over 115,000 assists annually – or over 315 per day. This service is also important for keeping the shoulder clear for Pace bus on shoulder service on I-55 as well as the planned service on 1-94. The Illinois Tollway service patrols, called Highway Emergency Lane Patrol or H.E.L.P, patrol the entire tollway system between 5 am and 8 pm on weekdays. In 2015, H.E.L.P patrol staff assisted 30,000 drivers.

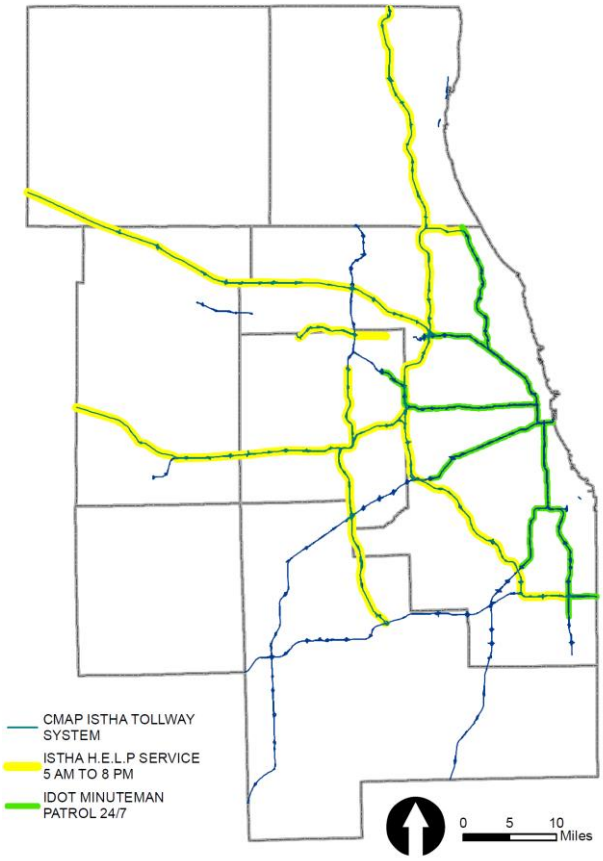
Important attributes of service patrols include coverage area, frequency of patrol, hours of operation, and type of patrol vehicles (Figure 6). Agency operations staff has expressed a desire to extend service patrol coverage, frequency and hours of service. In a study completed in 2009, the Missouri Department of Transportation estimated that the Motorist Assist (MA) program provides an annual benefit cost ratio of 38:1.[10] This high ratio is based in part on the relatively

[9] Federal Highway Administration Service Patrol Handbook, FHWA, November 2008

[10] Evaluation of Freeway Motorist Assist Program Final Report, University of Missouri, HDR Engineering and Missouri Department of Transportation, 2010

low operational cost of service patrols, and the fact that the researchers included the costs of secondary incidents, which have not always been reflected in analyses of these programs. The researchers estimated that the service patrols reduced secondary crashes by over 1,000 per year. The emergency patrol services should be expanded to cover all the region's expressways on a 24/7 basis.

Figure 6: Coverage area of IDOT Minutemen and Tollway HELP patrol



Shorten Investigations of Major Crashes

A crash requiring an investigation may close a roadway for hours. Although the region does not currently track performance in the area of crash clearance, an analysis of detailed crash activity records (2008 – 2011) provided by the Illinois Department of Transportation provides a view into clearance time. When a crash results in a fatality, the duration of an incident can be especially lengthy. As Table 2 shows, the median clearance time of fatal accidents is over four hours.

Table 2: Categorized Clear Times Percentiles in Hours for 1,256 IDOT Incidents on IDOT Arterials and controlled access expressways with a Range of 0.2 hrs.- 48.0 hrs (2008-2011)

Response Clear Times Categories	25th Percentile	Median	75th Percentile
Fire Department	1.00	2.22	7.57
Injury/Ambulance/Hospital	1.39	3.50	7.08
Fatal	2.50	4.47	7.22

Source: CMAP analysis

In a survey conducted of jurisdictions in 21 states, 73% require medical examiners or coroners to respond to the crash site before the deceased can be removed.[11] Illinois is a state with this requirement, and waiting for a coroner to arrive on scene can contribute to extended highway closure times. A number of states have instituted policies such as allowing responding emergency medical staff to certify the death, allowing on-scene responders to electronically transmit vital signs to a remotely located coroner for verification, allowing on-scene responders to move the body to a safer location to protect public safety (Pennsylvania Turnpike Commission), or move the body with the permission of the coroner by telephone or other mode (Rhode Island DOT).[12]

As a way to ensure that reducing the duration of incidents is a priority for all agencies involved, a number of states have enacted **Open Roads Policies** (for example Florida, Georgia, Minnesota, Maryland, Tennessee, and Washington). Open roads policies define agency responsibilities for incident response.[12] For example, law enforcement agencies commit to performing investigations as quickly as possible and may require non-critical portions of the investigation to occur when lighter traffic conditions prevail. They agree to close only the travel lanes necessary to deal with the incident, and they work with transportation agencies to set up appropriate traffic control, establish alternate routes, and expedite traffic movement at the incident scene.

Kansas City Scout, the bi-state (Kansas, Missouri) traffic management system, implemented a traffic incident management program in 2007. Prior to that time, investigators gave no consideration to the implications of a highway shutdown and it was not uncommon for it to take 4 to 6 hours to clear the roadway. The Kansas City Police department typically would not call a Medical Examiner until the police work was finished and would not call for tow trucks until the investigation was complete. Following a 2007 Traffic Incident Management Summit, vehicle crash squads were established, and a target of 90 minutes maximum closure time was adopted. As a result, secondary incidents were reduced by 47 percent, and the average time to clear incidents was reduced from 39 minutes to 22 minutes. For "level 3" incidents (greater than 90 minutes) average incident duration was reduced by 111 minutes.[13]

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[11] NCHRP Synthesis 318 Safe and Quick Clearance of Traffic Incidents, A Synthesis of Highway Practice, Transportation Research Board , 2003

[12] Traffic Control Concepts for Incident Clearance, FHWA, 2009

[13] Major Crash Investigation and Traffic Incident Management Presentation, KC Scout, undated

The region, working with system operators and municipal, county, and state police, should establish a goal to reduce the amount of time roads are closed due to crash investigations and develop strategies to address them. The upcoming development of state and regional safety performance measures to meet federal requirements offers one potential implementation avenue. CMAP will explore this topic in the upcoming Safety Strategy Paper.

Enhance Driver Removal and Authority Removal Laws

A key component of incident clearance programs are the enactment of removal laws. Removal laws require that disabled vehicles and spilled cargo are moved out of driving lanes as quickly as possible if this can be safely achieved. While Illinois has enacted a driver removal law, anecdotally it seems that drivers involved in crashes often do not remove their vehicles from the traffic lanes. Removal laws are not useful if drivers or law enforcement are unaware of their existence. Information describing laws providing authority for highway operator to remove vehicles impeding the safe flow of traffic should be widely available.

Authority Removal laws allow an authority, generally including police, fire, or department of transportation staff to order a driver to remove a vehicle from the roadway if it constitutes a hazard or obstructs traffic. Under state law, police or a highway authority may move any vehicle obstructing a roadway[14], and the City of Chicago is authorized to designate any city department to remove vehicles from the roadway.[15] State law also authorizes towing of a vehicle on or adjacent to the roadway when ordered by a law enforcement official.[16] In addition to personal vehicles, authority removal laws include authority to remove commercial vehicles and their spilled freight. In 2014 commercial trucking crashes (tractor with trailer, tractor without trailer, single unit truck) represented only about 7 percent of the region's crashes, but a crash that includes spilled cargo is a major incident. The Illinois vehicle removal laws do not address relocation of spilled cargo off the roadway.

Lastly, the need to clear the roadway should not be hampered by concerns about liability and damaged cargo. Some States have enacted laws to protect responders from being responsible for damages to vehicles and cargo caused by responsible incident clearance procedures. National models are available, such as one from the I-95 Corridor Coalition.[17] Highway authorities should be protected from damage claims.

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[14] 625 ILCS 5/11-404 (C)

[15] 625 ILCS 5/4-212.1

[16] 625 ILCS 5/4-203

[17] The critical element of this policy is that "governmental agencies responding to incidents, including but not limited to law enforcement, firefighting, emergency medical services, hazardous materials, transportation agencies and other emergency governmental responders are authorized to exercise the incident clearance functions enumerated in this section. If such functions are exercised with reasonable care and at the direction of the incident commander, those governmental agencies and their personnel and other designated representatives are insulated from liability resulting

Provide Training for Emergency Responders

Emergency responders include police, fire, ambulance, and vehicle towing and recovery.[18] When emergency personnel are on the scene of a traffic incident, there is always a danger of a responder becoming a crash victim. Many emergency responders are harmed in the line of duty. Thus, first responders tend to focus on life safety to the exclusion of other needs. In a 1997 study of urban arterial incident management, researchers found that maintaining traffic operations was a low priority for emergency responders.[19] Agency interviews revealed this situation continues today. Effective traffic incident scene management could improve safety for responders as well as make navigating the area easier and safer for drivers. Interviews with highway system operators indicated that performance in this area was very uneven, and they expressed a desire for local agencies to work towards better performance and standard traffic incident management procedures.

The Illinois Department of Transportation recognized this need and in 2011 started working with the Illinois Center for Transportation at Southern Illinois University to develop a training program intended for law enforcement, fire departments, emergency medical personnel, tow and recovery operators, highway department staff, and 911 center operators. At this point, many of those needing training have not yet been trained (Figure 7). The training includes incident command system training, response vehicle parking guidelines, the use of high visibility apparel, on-scene emergency lighting procedures, and the use of temporary traffic management devices including queue warnings. State law now requires this training for tow truck operators; however, the law does not require local public safety agency personnel to receive such training. State law should also require incident management training for law enforcement and fire/rescue organizations.

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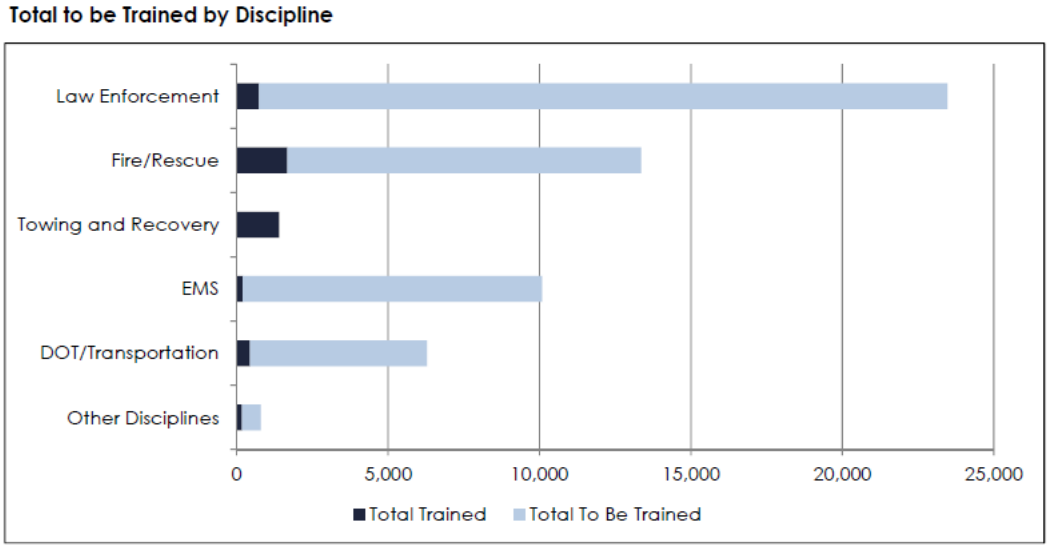
from such actions taken pursuant to incident clearance (…)" Incident Responders' Safety Model Law, I-95 Corridor Coalition

[18] The region's tollway system is patrolled by the Illinois State Police (ISP) District 15. The dispatch for ISP District 15 is housed within the Illinois Tollway Building. ISP District 2 serves the non-tollway interstates in DuPage Kane, Lake and McHenry Counties. ISP District 5 serves non-tollway interstates in Kendall and Will Counties. ISP Chicago District serves Cook County non-tollway interstates. The arterial system is patrolled by county and municipal police departments. Incident response for the entire system of interstates and arterials relies on local fire, rescue and towing/recovery staff.

[19] Managing Incidents on Urban Arterial Roadways, Richard A. Raub and Joseph L. Shofer, Transportation Research Record volume 1603, 1997

Figure 7: Illinois Highway Incident Management Training Recipients as of November 16, 2015



Source: Illinois Training Report, Illinois Department of Transportation (November 2015)

Improved Vehicle Technology

Over 90 percent of crashes nationwide are attributable to human error. [20] Technological innovations have the potential to greatly reduce crashes and crash severity. Automated vehicles include systems to perform functions that have historically been controlled by the driver. The Insurance Institute for Highway Safety reports that vehicles with automatic braking systems, which function as front crash avoidance systems, reduced rear end collisions by 40%.[21] The Institute also found that electronic stability control, standard on 2012 and later models, "lowered the risk of a fatal single-vehicle crash by about half, and the risk of a fatal rollover by as much as 80%."

The new systems are proving to be effective and are becoming more widely available. Higher cost auto models offer crash avoidance automation features such as front crash protection, lane departure warning, blind spot detection, adaptive headlights, and parking assist. A number of these technologies are also available for commercial vehicles. As the technology proves its value and the cost of including it on vehicles is reduced, these options will become either standard or required and will permeate the vehicle fleet. These technologies only require auto makers to install them, with no special investment needed from the road operator side.

Connected/automated vehicles go a step farther in the automation ability. While automated vehicles are equipped with on-board sensors to detect conditions immediately surrounding the

[20] Traffic Safety Facts, National Highway Traffic Safety Administration, February 2015

[21] Insurance Institute for Highway Safety Highway Loss Data Institute Status Report Volume 51 Number 1 ,January 2016

vehicle and response systems to react to detected conditions, connected vehicles can receive information beyond both the immediate vicinity and the types of information that detectors can sense. This technology requires that vehicle devices (vehicle to vehicle, V2V) or roadside devices (vehicle to infrastructure, V2I) transmit information to detect. A vehicle in the front of the platoon may broadcast deployment of its brakes, allowing the following vehicles to reduce speed without directly detecting the slowing vehicle. Additionally, roadside equipment may listen for vehicle information and transmit it back to a traffic management center for use – such as detecting the deployment of antilock braking systems that may indicate roadway icing. The region is already deploying V2I in the form of transit signal priority (TSP), a partnership project between IDOT, county DOTs, the City of Chicago, RTA, Pace and the Chicago Transit Authority, using a radio on the bus to communicate specific messages to a radio at the traffic signal. Any transmission of dynamic information from the traffic management center to a field radio will require supporting communication infrastructure, as will any collection of intelligence from vehicles for use in managing the system. In addition, traffic management center hardware, software and staffing will be needed to support the system. The advance of this technology will likely require roadside devices to exchange information with vehicles and transmit information between the device and a center – another reason for operating agencies in the region to implement traffic management centers.

This does not mean that significant investment in incident management is unnecessary. Our future includes a fleet of vehicles with crash avoidance technology, but the rate of market penetration into the general fleet may be slow. For example, in 1985 antilock braking systems became available. Twenty-five years later, by 2010, 88 percent of registered vehicles had antilock braking systems.[22] As the new features are incorporated into the region's fleet, the number and severity of crashes should decline. However, the region's fleet will continue to include a large number of vehicles without accident avoidance systems for the foreseeable future.

Full automation represented by driverless vehicles is many years away. Developing the technology, standards, and regulations underpinning the system will likely take decades. It is possible that automated vehicles will require some infrastructure investment, as yet unknown. It is also possible that automated vehicles may eliminate the necessity of other infrastructure investments such as traffic lights and message signs. Traffic may become more self-organizing, changing the requirements of the traffic management center. At this time, impacts are purely speculative.

Consider Ways to Improve Weather Response

Inclement weather is estimated to cause 15 percent of congestion, increasing the number of crashes and delays and reducing road capacity. About half the days in a typical year have weather conditions that impact driving, contributing to road closures, traffic slowdowns,

[22] Insurance Institute for Highway Safety Highway Loss Data Institute Bulletin Volume 28, Number 26, April 2012

crashes, and damage to electronic devices such as traffic lights, message signs, and cameras. Existing regional strategies to mitigate impacts include traveler information and alerts, weather advisories, vehicle restrictions such as banning trucks during high winds, road closures for flooding or drifting snow, anti-icing/deicing road surface treatments, plowing, and pumping water from flooded locations.

Some deficiencies currently exist in the availability of real time road weather information. While IDOT and the Tollway report their weather information to TravelMidwest, as does Lake County, the other counties currently do not. Real time road weather information should be available system-wide across the region, although this will depend on implementation of traffic management centers in the other counties.

Weather responsive traffic management is not widely used today, except for closing roads to traffic under severe conditions. The expansion of ITS devices and traffic management capabilities will support a variety of weather responsive traffic management strategies such as variable speed limit systems to reduce speeds during inclement weather, coordinated traffic signal timing that reflects the slower speed of travel in corridors during bad weather, alternative signal plans to support detours, and increasing the coverage of emergency vehicle patrols to remove disabled vehicles more quickly.

Climate change is already causing more frequent road flooding and heat- and cold-related pavement failures. Freezing and thawing has also damaged underground communication infrastructure. An analysis of road performance under severe weather conditions should be performed to highlight critical locations for management and operations changes and to plan for detours and traffic management needed to support them. It will be important to collect and analyze information about how facilities perform under various weather scenarios so agencies can develop planned responses to weather events. Focusing incident management resources on locations which are known to be especially impacted by rain or snow can reduce congestion and secondary incidents.

Pavement flooding information has not been collected on a regional basis, and there is no standard pavement flooding reporting system. It is unknown today what the impact of flooding has been on our roadway operations. CMAP should develop a regional pavement flooding reporting system should be developed to help plan for flood events.

Finally, power outages are often connected to extreme weather. Under normal conditions, a power failure is a time consuming inconvenience. In an emergency situation, the same power failure can cripple our ability to respond to emergencies, warn travelers of danger ahead, or move people to safer locations. As our reliance on technology to operate the roadways increases, it will be important for agencies to include provision of backup power for system components.

Modernize and Retime Traffic Signals

Intersections account for the vast majority of delay occurring on arterials. Some of this is unavoidable, but poorly timed traffic signals make the situation worse. According to the Institute of Transportation Engineers, about three-quarters of the nation's traffic signals can be improved by retiming or updating equipment. Comprehensive signal retiming programs can reduce overall travel time 7%-13%, delay 15%-37%, and fuel use by 6%-9%.[23] Northeastern Illinois has approximately 8,000 signalized locations, making signal maintenance and retiming potentially an area of significant savings in the region in aggregate.

Traffic signals that are not timed to reflect traffic patterns increase travel delay, crashes, fuel consumption and pollution. Signal retiming and maintenance is often ad-hoc. Regular agency monitoring may reveal problems, but poorly functioning signals are too often addressed when the public submits complaints to the operating agency. For instance, according to a Chicago Department of Transportation official, "We are largely in a firefighting mode, relying on calls from the public to 311 (the city's nonemergency hotline) and from aldermen."[24] Unfortunately, traffic signals that provide basic functions are often considered to be performing well enough, and maintenance may be delayed or canceled even though the signal operation could be improved. Agencies should establish standards for signal timing field review and timing practices, and commit the resources needed to achieve them.

The Institute of Transportation Engineers recommends field reviews of signal operations be performed annually for all intersections, and that intersections be systematically retimed every 3 – 5 years. [25] Traffic signal retiming is a cost effective way to improve highway operations, with a cost / benefit ratio of 40:1 or more.[26] Retiming a single intersection costs about $6,000, but the cost is reduced to about $4,000 per intersection if multiple intersections are being retimed[27] including traffic counts, modeling, and field observation. At $4,000 per intersection, it would cost $32 million to retime the region's 8,000 signalized intersections. If each signal were retimed every 5 years the cost would be $6.4 million annually.

Transportation agencies appreciate the value of traffic signal timing. IDOT's coordinated signal systems were each the subject of a before and after study for conditions and performance. They are re-evaluated every 5-7 years. Lake County DOT retimes traffic signals in coordinated corridors every 5 years, following the IDOT standard. Implementation of the region's bus transit improvement program, Bus Rapid Transit and Transit Signal Priority (TSP), requires traffic signals to be optimized in the bus corridors. For example, as part of the Loop Link BRT project, traffic signals were retimed at about 100 locations. During 2005 and 2006 the City of

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[23] http://www.ite.org/signal/index.asp

[24] Getting Around, Jon Hilkevitch, Chicago Tribune, July 2012

[25] Traffic Signal Audit Guide, Institute of Transportation Engineers, 2007

[26] 2007 National Traffic Signal Report Card – Executive Summary, Institute of Transportation Engineers, 2007

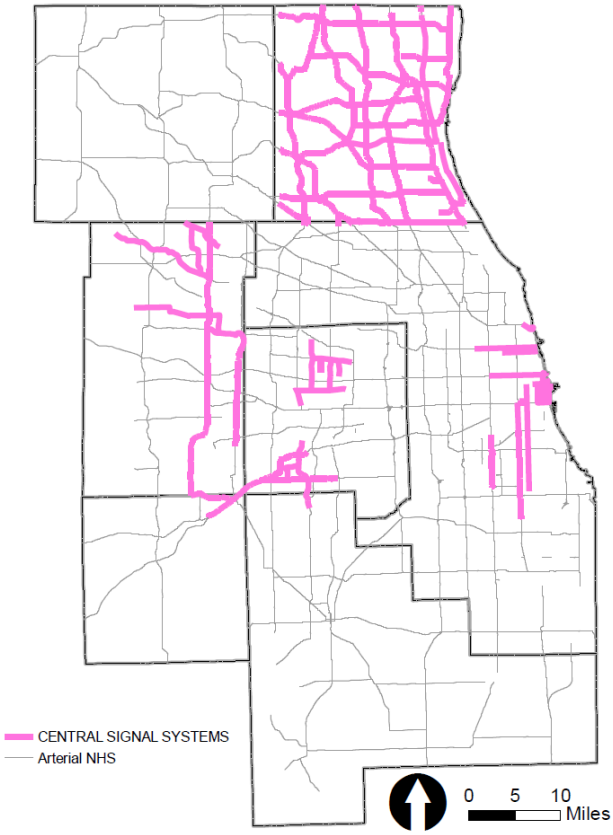
[27] Lake County DOT estimate, April 2016

Naperville re-optimized three traffic signal systems, reducing peak directional travel time 32%.[37]

Expand the Use of Central Signal Systems

Central signal systems provide the ability to actively monitor traffic signals and highway operations in real time, and communicate desired changes to the traffic signals from a central office. For example, if a road were blocked by an incident, traffic management staff in a central office could observe traffic patterns at traffic lights in the vicinity using cameras and transmit new instructions to a group of signals to accommodate the new traffic pattern. The results could then be observed from the central office to confirm that the changes had the desired effect, and further adjustments can be made as needed. The inclusion of an adequate number of cameras also creates a significant resource for improving incident response, allowing sharing of images with emergency responders. A complete central signal system requires significant investment in communications, hardware, software, and cameras to observe system performance, and trained operators to manage the system.

Figure 8. Existing and programmed central signal systems in the region



Interviews with system operators suggest that the operators' ultimate goal is to monitor and manage traffic signals using central signal systems. A number of central signal systems are in place or are in the process of implementation, but much of the region remains unconnected (Figure 8). DuPage County is developing a central traffic signal system; Phase 1 construction is

underway, and completion is expected by June 2016. Kane County is also developing a central signal system. The Illinois Department of Transportation owns the largest number of traffic signals in the region and has not implemented any central traffic signal control technology. Instead, IDOT has entered into agreements that allow other entities to include IDOT signals within their central systems.

There are a variety of existing signal system coordination agreements between agencies. As central systems become more developed, the potential for coordinating signal operations between jurisdictions will be improved. Center to center integration has been considered the route by which this will happen, although other approaches are possible.[28]

Reduce Work Zone Duration

Work zones are estimated to cause 10% of congestion. A review of expressway construction reports from TravelMidwest.com on December 31, 2015 shows over 100 construction locations on the expressway system in the CMAP region. There were 4,287 work zone crashes in Illinois in 2014, with 30 fatalities. [29] Of the fatalities, 90 percent were road users, not construction workers. Work zone management strategies are used to minimize delay, minimize congestion, and ensure driver and worker safety. Each road construction project includes a transportation management plan that addresses operational strategies, temporary traffic control devices, and public information. There are many specific strategies available to planners, engineers, and contractors to meet the goals, and they are selected based on an evaluation of the tradeoffs between traffic flow and construction efficiency.

Both the Illinois Tollway and the Illinois Department of Transportation use technology to manage work zones. Cameras and speed monitoring equipment allow operators to track traffic around the zone. Portable queue detection systems that sense when traffic is backed up and relay the information to a sign before the construction zone, warning drivers of stopped traffic ahead, can be used if needed. Camera speed enforcement may be used. Speed feedback signs, which measure vehicle speeds and display a warning if the vehicle is traveling over the posted speed, have been effective. These systems are most widely used for interstate construction, but are also useful for large arterial projects. Arterial projects also include attention to signal plans that accommodate rerouted traffic. Note that rerouted traffic may not travel the routes project planners envisioned. A central signal system and cameras for observation make responding to this eventuality much easier to do.

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[28] In DuPage County, testing of a different strategy is being planned. In this instance, DuPage County plans to host the hardware and software for a "virtual" traffic management center. The City of Naperville and the City of Aurora will be the first members of the virtual center, and use the hardware and software to manage their own signals. This should reduce the cost of procuring hardware, software, maintenance and upgrades of the signal management system.

[29] 2014 Illinois Crash Facts and Statistics, Illinois Department of Transportation, 2015

Reducing the amount of time a location is under construction reduces the disruption it causes. Bonuses or penalties can be included in contracts to encourage timely work completion. Working during times of day with low traffic volumes, and controlling lane closures by time of day can also reduce construction impacts on highway users. Agencies in our region have successfully employed these strategies. Many exciting new construction techniques and materials are also becoming available that will reduce project completion time or extend the time between maintenance and rehabilitation treatments. Increasing the value placed on operational impacts and mobility may increase the speed of adoption.

Implement Active Traffic Management

The future of congestion management is the application of selected real-time strategies in a coordinated fashion on individual roadways, which is often called *active traffic management* (ATM). Active traffic management is the ability to dynamically manage traffic based on current and expected traffic conditions. While northeastern Illinois implemented reversible lanes and ramp metering decades ago, other active traffic management strategies have not been used in the region. However, they have been widely used across the United States (see Figure 9). Nationwide, active traffic management applications are more widely found on expressways than on arterials. Further, several countries in Europe have used ATM for years, increasing overall capacity by up to 22 percent, throughput by up to 7 percent, a decline in crashes and secondary incidents by up to 30 percent and 50 percent, respectively. ATM has helped delay the onset of traffic congestion and made travel times more reliable.[30]

[30] Active Traffic Management Fact Sheet, Texas A&M Transportation Institute

Figure 9: Active Traffic Management Locations

Source: [Active Transportation Demand Management Program Brief: Active Traffic Management](), FHWA Office of Operations, October 2012

Active Expressway Management

Active expressway management will be most effective when multiple strategies are used in combination. Implementing these capabilities requires development or expansion of field equipment deployment, communication infrastructure, backup power systems, and traffic management center hardware and software to operate. The prioritization section below discusses places where active traffic management strategies might be most appropriate. Some potential expressway management strategies include the following:

- **Dynamic lane management**, which opens and closes travel lanes based on travel conditions such as downstream incidents. For instance, dynamic lane management was implemented by the California Department of Transportation (CalTrans) on northbound SR-110, an 8.2 mile section of freeway that had an accident rate of 3.36 accidents per million vehicle miles when the expected rate was 0.73. Peak hour average vehicle delay was over 20 minutes. Restriping provided an optional dynamically managed lane and

the result was delay reduced to under 5 minutes and a 30% reduction in accidents from the previous year.[31]

- **Speed harmonization,** which involves gradually lowering speeds before a heavily congested area in order to reduce stop-and-go traffic. It has the potential to smooth traffic, increase the number of vehicles that a roadway can handle, and improve safety by making it easier for drivers to change lanes when necessary.
- **Dynamic shoulder use**, which allows the road shoulder to be opened and closed to all or selected traffic based on travel conditions. This strategy provides extra capacity at critical times.
- **Dynamic speed limits** modify speed limits based on traffic and weather conditions. Dynamic speed limits can reduce crashes and delay the onset of congestion. With a goal of improving safety, the Wyoming Department of Transportation implemented dynamic speed limits on four portions of I-80, which appears to have avoided an estimated 50 crashes per year on I-80.[32] The system also helped them reduce road closures due to weather.
- **Congestion pricing**, which manages demand and congestion using tolling, increasing vehicle throughput and providing drivers with reliable travel times. This strategy was recommended by GO TO 2040, and the region is moving toward a new managed lane on the I-55 Stevenson Expressway, which IDOT is studying and hopes to build by 2019.

The Illinois Tollway is currently rebuilding and widening the Jane Addams Memorial Tollway (I-90) as a 21st century, state-of-the-art corridor linking Rockford to O'Hare International Airport. I-90 will be the first facility equipped to implement active traffic management, starting on the eastern side. The project includes reliable power and communications, and ATM system related equipment and systems (cameras, wireless traffic sensors, dynamic message signs, road weather stations) to support lane management. The technology is flexible enough to accommodate changes in future lane management such as implementing congestion pricing and the use of Vehicle to Infrastructure (V2I) communication.

Active Arterial Management – Smart Corridors

Managing the region's arterials is important because arterials carry 64% of the region's annual vehicle miles traveled on non-local roadways. Smart Arterial Corridors include technologies that monitor and respond to arterial traffic conditions in real time, such as traffic surveillance systems to monitor traffic conditions. Real time arterial traveler information about congestion and crashes can be distributed. Real time system performance can be used to help operate traffic signals and detect incidents. Automated speed and traffic signal enforcement can reduce the number of crashes. Cameras can provide information about incident impacts to traffic

[31] Dynamic Lane Management an ITS Solution to Enhance Safety and Mobility, presentation by Sheik Moinuddin, P.E., Caltrans Division of Operations, 2012

[32] WYDOT's Variable Speed Limits presentation, R. Vince Garcia, P.E.

operations staff. Intelligent parking systems that monitor available parking capacity and provide real time information to drivers can reduce the number of vehicles cruising to find a parking space and improve enforcement of time of day parking restrictions.

While the technology needed to actively manage the arterial system has only recently reached maturity, Smart Corridors are not a new concept for the CMAP region. In 2001, the City of Chicago began a project to implement Smart Corridor technology on Cicero Avenue in the vicinity of Midway Airport.[33] More recently, the Cook-DuPage Smart Corridor Study was undertaken in the Cook-DuPage corridor, a large swath of the western suburbs. This project screened and prioritized 45 candidate corridors based on 11 criteria and selected four as pilot projects for implementation. The four selected corridors are Cermak/22nd/Butterfield (Cicero Avenue to Winfield Road), Harlem Avenue (Glenview Road to 95th Street), North Avenue (Cicero Avenue to DuPage/Kane County Line), and Roosevelt Road (Harlem Avenue to DuPage/Kane County Line). Conceptual design plans were developed for the four corridors and included recommendations for specific technologies that should be considered for each segment of the roadways. Work is underway to identify funding and begin implementing these projects. CMAP supported this project by providing planning funds for the study and should support implementation by treating applications for CMAQ funding favorably when they are submitted for individual project components.

Integrated Corridor Management

Integrated corridor management represents the next step in cooperatively managing interstate, arterial and transit system operations. It can be defined as the operational coordination of multiple transportation networks and cross-network connections comprising a corridor and the coordination of institutions responsible for corridor mobility.[34] The goal of ICM is to improve mobility, safety, and other transportation objectives for travelers and goods.

The United States Department of Transportation partnered with eight transportation agencies, or Pioneer Sites, in large urban areas to research how integrated corridor management can be implemented. Ultimately, the sites in Dallas and San Diego were selected as Pioneer Demonstration Sites where integrated corridor management deployment began in spring 2013.[35] These efforts are too new to provide observed data on program impacts, but study modeling suggests a number of benefits (Table 3). Separate efforts in San Francisco on the "I-80 Integrated

[33] The project includes advanced traffic management capabilities incorporating 19 traffic signals, seven closed circuit televisions, two dynamic message signs and multiple traffic detectors. Future enhancements will include adaptive signal controls and other roadside device enhancements. The advanced traveler information system includes highway advisory radio providing information on the status of at-grade rail crossings in the corridor (gate down/gate up). Dynamic message signs will provide information on travel conditions on nearby I-55.

[34] Integrated Corridor Management Concept Development and Foundational Research Phase 1, Task 3.1 Develop Alternative Definitions, USDOT ITS Joint Program Office, April 2006.

[35] Integrated Corridor Management (ICM) Demonstration Sites,

Corridor Mobility Project" and Virginia "I-95/I-395 Integrated Corridor Management Initiative" are also underway to apply ICM concepts to improve corridor performance.

Table 3: Expected Annual ICM Benefits of Pioneer Sites on Corridor Performance

	San Diego	Dallas	Minneapolis
Person Hours Saved	246,000	740,000	132,000
Reduction in Travel Time Variance	10.6%	3%	4.4%
Gallons of Fuel Saved	323,000	981,000	17,600
Tons of Mobile Emissions Saved	3,100	9,400	175

Source: Integrated Corridor Management Modeling Results Report: Dallas, Minneapolis, and San Diego, FHWA, February 2012

Interviews with system operators in the CMAP region revealed that they were concerned about the interaction between the interstate and arterial systems, and felt that the need for a more holistic approach to system management is clear. They highlighted the impact that deteriorating traffic conditions on one system have on other systems. Some operators were concerned about whether the arterial system could accommodate traffic "routed off" the expressway during an incident, especially in a congested corridor. However, traffic diversion to arterials already happens, and unexpected changes in traffic patterns in a corridor that includes interstates, arterials, and transit can be better accommodated if policies and systems are put in place to respond to it. Some comments suggested that the main obstacle to integrated management is agency policy and not technology.

Integrated corridor management is a flexible tool to smooth traffic in corridors, with policies and procedures agreed upon by the stakeholders in the corridor, including emergency responders. Agencies would establish locations and conditions under which integrated management would take place, agreed upon procedures for responding to potential conditions, policies to help decide which procedures should be applied, and authority for staff to implement the procedures. Establishing these agreements happens during the development of the corridor plan. Integration can be as limited as establishing responsive signal policies around certain interstate ramps, automated display of other jurisdiction system conditions on dynamic message signs, or a full application including arterials, interstates, and transit services in a corridor. In interviews with operators and in committee discussions, there was agreement that many locations in the region offered the potential for improved operations provided by integrated management. There are even some existing examples of limited integration in the region where arterial traffic signals are managed to improve ramp and mainline expressway safety, and where different system operators post messages about conditions on other corridor roadways.[36]

[36] The Army Trail Road Queue Backup Protection system: at I-355 and Army Trail road in DuPage County ttraffic signal coordination and integration has been implemented. A traffic monitoring system detects significant changes

Identification of Potential ICM Combinations

A few candidates for integrated corridors readily come to mind. For example, the Kennedy Expressway currently operates two reversible lanes between the Edens Expressway and Ohio Street. In the past, traffic flow was more directional and providing extra capacity in the prevailing direction reduced congestion in that direction. As time passed and total traffic grew, traffic became heavy in both directions during the morning and evening peak, reducing the benefit of the reversible lanes. "The decision is absolutely getting harder to make," said an IDOT engineer. "There simply is not much benefit to be gained by making the switch when there is equity in the volume of inbound and outbound traffic."[37]

The CTA Blue Line train operates in this corridor with 798 parking spaces at the Rosemont station and 1633 spaces at the Cumberland stop. Metra's Union Pacific Northwest line parallels the roadway and from Cumberland to Clybourn has 1884 parking spaces. The Pace bus Pulse Milwaukee Line will travel on Milwaukee Avenue between Golf Road and Jefferson Park transportation station. Jefferson Park Transit Center links the Blue Line O'Hare branch, the Metra UP Northwest line and multiple bus routes. Elston Avenue and Milwaukee Avenue both parallel the Kennedy Expressway. Integrated corridor management in this location could include conversion of the reversible lanes to bi-directional express toll lanes and active traffic management on the general purpose lanes. Arterial traffic signal timing plans could support detouring traffic during interstate incidents. The system could also include real time information about travel times and costs on the express toll lanes, general purpose lanes, public transportation and arterials to downtown, as well as real time parking availability information and parking reservation capabilities. En-route information could be provided allowing people to change route or mode.

CMAP should undertake a planning study to identify other locations where integrated corridor management can improve corridor operations, and should also fund planning activities that work towards implementing active expressway management, active arterial management, and integrated corridor management. Traffic signal policies around interstate interchanges can also be reviewed to identify places where changes can improve performance. The evaluation of potential locations for integrated corridor management can be undertaken using performance data. A key indicator of whether roadways and transit services operate as a system is what happens to traffic on one roadway or transit service in the corridor when there is a disruption of

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in volumes of traffic on Army Trail Road and locations west of this interchange. Tollway ramp devices initiate an alarm at the DuPage County Division of Transportation (DDOT) office and activate a pre-installed timing programs designed to clear ramps of queued traffic so it doesn't back up onto the expressway. There also a number of locations in the region where arterially located dynamic message signs provide traffic information for nearby interstates, for example IL 83 at IL 64, IL 83 at I-290, US 6 at Dixie Highway, and several others. There are agreements between the Illinois interstate operators and operators of neighboring states to display requested information on DMS signs, but these are not automated and are subject to the authority of the TMC operator.

[37] Getting Around: As Kennedy Traffic Swells, Reversible Lanes Lose Their Magic, Jon Hilkevitch, Chicago Tribune, November 2013

traffic on another. Performance data showing roadway travel times on an average day compared to travel times during an incident should provide a picture of performance linkages between roadways. Transit ridership on an average day and on the disrupted day can also be analyzed.

Establish Regional Objectives for Highway Operations

GO TO 2040 established goals for transportation system performance, including congestion reduction, transit system usage, system condition, and others. The plan supported performance-based programming as a way to ensure that transportation funds are spent effectively to meet desired performance goals. These goals will be refined during ON TO 2050 and at that time operations objectives should be considered to help meet the goals. The operations objectives for ON TO 2050 goals can guide the selection of operations strategies. Operations objectives should be specific, quantifiable, realistic, have a reasonable timeframe and be consensus based. When the selected operations strategies are implemented, it is important to track system performance (monitoring and evaluation) to identify necessary changes or new strategies.

Based on the strategies discussed in this paper, the process to develop ON TO 2050 should consider a number of operations-oriented objectives and CMAP should commit to tracking performance in those areas. These may include:

- Reducing clearance time for traffic incidents on expressways by x%;
- Reducing delay associated with traffic signals by x%; and
- Reducing delay associated with work zones by x%.

Operations objectives are measureable and address results, not inputs. Strategies to address these might be to add automatic incident detection and communication with emergency responders to our traffic management centers, replace outdated traffic signals with modern signals that generate high resolution data used to monitor and retime signals, and implement electronic construction management systems to reduce project delivery delays caused by slow paper communications processes.

Prioritize Investments in Highway Operations

Regional performance goals have not been set yet in the process to develop ON TO 2050. However, over the last five years CMAP has been developing databases of performance information intended to help prioritize investments by helping us understand which locations seem most in need of investment based on performance. Observed performance both shows where operational improvements could enhance system performance and establishes a baseline for system performance evaluation when improvements are made.

As an example of how the region might use performance-based selection, existing performance data was applied to the National Highway System (NHS) expressways and arterials. The NHS

system "consists of roadways important to the nation's economy, defense and mobility" and includes interstates, other principal arterials, strategic highway network roads, major strategic highway network connectors, and intermodal connectors. [38]

A number of performance datasets were used to score and prioritize the system:

- **Importance to regional travel** was measured using the annual average daily traffic included in the 2014 Illinois Roadway Information System (IRIS) from the Illinois Department of Transportation (IDOT). This was used for expressways and arterials.
- **Importance to freight movement** was measured using heavy commercial vehicle volumes included in the 2014 Illinois Roadway Information System (IRIS) file from IDOT. This was used for expressways and arterials. The data included for arterials may be of poor quality but better data is not available at this time.
- **Congestion** was measured using the travel time index calculated using 2012 highway probe data. The travel time index is the ratio of average peak hour travel time to free flow travel time. A higher number shows that there is more traffic on average in the peak than during free flow times, while a number closer to one shows that there isn't much more traffic in the peak than during free flow times. This was used for expressways and arterials.
- **Reliability** was measured using the planning time index calculated using 2012 highway probe data. The planning time index is the ratio of the 95th percentile time (travel time on a particularly bad day) to free flow time. An index close to one indicates that on a bad day the travel time isn't much worse than free flow travel time, and high numbers show that a bad day is much worse than free flow travel time. These indices are larger than the travel time index.
- **Safety** was measured using the rate of fatal and serious injury crashes per vehicle mile traveled over a 5 year period. The crash data was provided by IDOT's safety data mart, and the vehicle miles traveled was calculated using the 2012 IDOT IRIS file. This was used for expressways and arterials.
- **Availability of existing ITS infrastructure** was measured by the percent of the segment included in a traffic signal interconnect. This indicates that there is communication infrastructure available and came from the CMAP traffic signal interconnect inventory, updated in 2012. This was only used for arterials because expressways do not use traffic signals.
- If an arterial **serves an expressway interchange** it is the point of integration between the arterial system and the expressway system. This was determined through a visual inspection of the NHS system. This was only used for arterials.

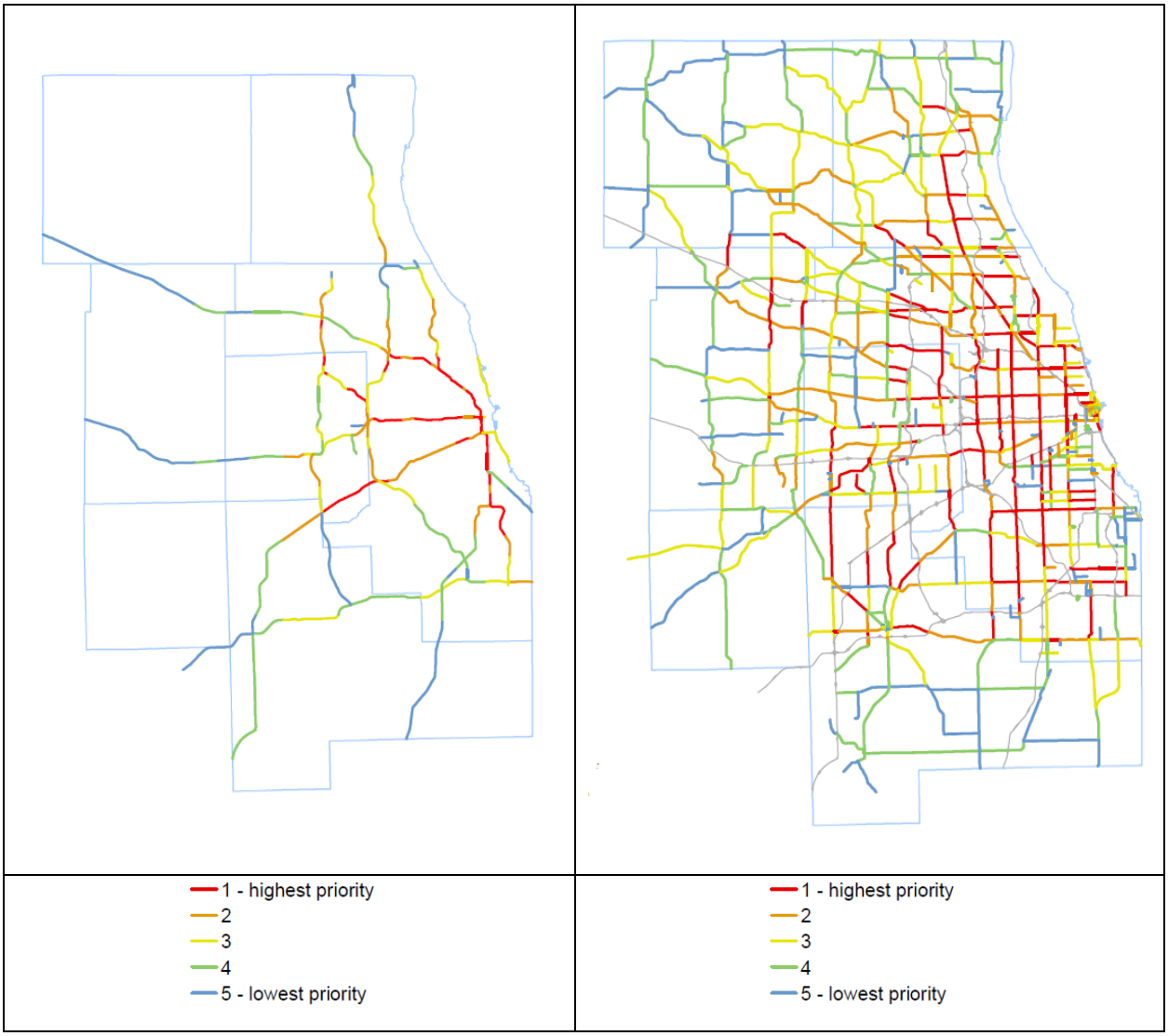
[38] National Highway System, FHWA Office of Planning , Environment and Realty webpage

- If the Regional Transportation Authority (RTA), the Chicago Transit Authority (CTA) and Pace suburban bus plan to include the road as part of the **transit signal priority** system, prioritization should reflect its increased importance. An analysis determined whether any part of road segment was a TSP route using a shapefile from the RTA. This was only used for arterials.

Because averaging would tend to wash out locations of most need, and the application of operations improvements should focus on improving performance at the worst locations, segment scoring was based on the worst measured conditions. A segment traffic volume score was assigned by the highest traffic location. The freight volume score was assigned by the highest segment freight volume. The safety score was also assigned based on the worst location. The travel time index and planning time index are directional and differ by time of day. The worst segment direction during the worst time of day was used to assign those scores. In all of these cases, the segments were sorted from worst to best and divided into 5 quantiles. The combination of these scores resulted in a prioritization of the network from first priority, which should be evaluated for operational improvements first, to the last priority which would be evaluated farther in the future. (Figure 10).

On the arterials, a segment received a score of five if it served an interstate interchange, and zero if it did not. It received a five if it included any transit signal priority locations and zero if it did not. The signal interconnect score was assigned based on the percent of segment served by a signal interconnect. No signal interconnect received zero. Up to twenty percent received one point, twenty to forty percent received two points, forty to sixty percent received three points, sixty to eighty percent received four points and eighty to 100 percent received 5 points. All of the scores were added for total "need points." The need points were again ranked highest to lowest. These were used to generate priority recommendations of one to 5. Expressways and arterials were scored and prioritized separately. Based on this work, it is clear we can use existing data to support performance based planning for operations improvements. In addition, it will be necessary to consider arterials separately from the expressways system since the operations metrics available for each system differ considerably.

Figure 10: Expressway and Arterial Priority Segments



Next Steps

While most of the activities necessary to improve highway operations can only be initiated by our partners who operate the systems, there are a number of activities CMAP and regional partners can pursue to promote improved roadway operations.

Arterial Management

- Research and report back on the state of the region's traffic signals. CMAP is currently developing a signal database that should be populated by the end of 2017.
- Launch an effort to develop a regional fiber optic communication location database. This is a longer-term effort that can begin after the completion of ON TO 2050.

Integrated Corridor Management

- Review traffic signal policies around interstate interchanges.
- Identify opportunities for integrated corridor management using observed highway operations data. This is an important near-term effort that would help develop priorities for ON TO 2050.

Incident Management

- As part of the region's safety goal development process, as required under federal law, initiate discussions about regional incident response objectives and how to achieve them. This is a shorter-term activity.
- Sponsor educational activities focused on quick clearance principles and laws.
- Advocate for inclusion of communication between emergency call centers and traffic management centers as a standard 911 system feature. This is a shorter term activity.

Travel Weather Management

- Develop a flooded pavement reporting system to track the impacts of heavy rain events. This is a longer-term activity that may begin after ON TO 2050.

Special Event Management

- Advance a plan to coordinate outreach to municipalities and private venues for reporting special events. This is a longer-term effort that can take place with the completion of ON TO 2050.

Work Zone Management

- Undertake a study to evaluate the region's utility relocation performance and quantify the associated cost and travel impacts. This is a longer-term effort that can take place with the completion of ON TO 2050.

MPO Processes

- Complete a congestion reduction study to quantify the benefits of operational strategies. This will be undertaken by CMAP in 2017.
- Develop operations objectives to support ON TO 2050 Plan goals.
- Work with implementers to identify funding opportunities for projects in the region's ITS Architecture.[39] This should be a regular activity discussed with RTOC, other committees, and individual stakeholders.
- Support highway system operations by funding operations oriented projects through the Unified Planning Work Program (UWP) and Congestion Mitigation and Air Quality (CMAQ) programs.

[39] Northeastern Illinois ITS Architecture v3.0, http://data.cmap.illinois.gov/its_arch_v30/index.htm, approved January 2015.

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MEMORANDUM

To: **Transportation Committee**

From: CMAP Staff

Date: November 18, 2016

Re: Introduction to Highway Safety Strategy Paper

As part of the development of the next regional plan, CMAP staff is preparing a series of **strategy papers** – reviewing current policies, emerging issues, and potential future directions – on various issues. While GO TO 2040 includes broad recommendations for the region's highway operators to improve safety through a variety of actions, it was not a major focus of the plan. Furthermore, under new federal rules, metropolitan planning organizations (MPOs) must now seek to meet annual performance targets for highway safety. To explore how to address the federal safety performance measure rules and how to include safety in ON TO 2050, CMAP is preparing a strategy paper on highway safety. The paper is being developed in consultation with the Regional Transportation Operations Coalition (RTOC) and is expected to be complete by summer 2017.

The paper is anticipated to review how peer MPOs address safety in their long range plans, explore CMAP's potential role in regional highway safety, develop a synopsis of current crash trends in the region, identify safety strategies and policies for CMAP to consider in ON TO 2050 that reduce traffic-related serious injuries and fatalities, and explore how to meet safety targets for the region under new federal requirements.

The Importance of Highway Safety

Ensuring the safety of all transportation system users, motorized and non-motorized, is a top priority for all transportation agencies in the region. However, after declining sharply in the late 2000s, traffic-related serious injuries and fatalities remained steady for several years and have begun to increase again nationwide, although the uptick is slight in the region. Besides the loss of life and disability that result from serious crashes, they have other impacts on the region's transportation system. A road can be shut down for hours when a fatal or serious injury crash occurs, resulting in secondary incidents and significant congestion.

Transportation agencies across the United States have refreshed their emphasis on safety by joining coalitions that aim to eliminate roadway fatalities. The City of Chicago launched a

Vision Zero initiative with a goal of eliminating fatal and serious injury traffic crashes by 2026. The Illinois Department of Transportation (IDOT) has also embraced a long-term goal of zero fatalities. The "Road to Zero Coalition" was recently created through a partnership of the National Highway Traffic Safety Administration, Federal Highway Administration, Federal Motor Carrier Safety Administration and the National Safety Council with a goal to end roadway fatalities within the next 30 years.

New Federal Rules

The final rules for the Highway Safety Improvement Program (HSIP) and **national performance management measures for the Highway Safety Improvement Program** (Safety PM) went into effect on April 14, 2016. The Safety PM requires state departments of transportation (DOTs) and MPOs to establish safety targets as five-year rolling averages on all public roads for: (1) the number of fatalities, (2) the rate of fatalities per 100 million vehicle miles traveled (VMT), (3) the number of serious injuries, (4) the rate of serious injuries per 100 million VMT, and (5) the number of non-motorized fatalities and non-motorized serious injuries. The MPO has the option to establish quantitative targets specific to the MPO planning area or commit to supporting the state DOT targets, and the MPO must show how it is planning and programming projects toward meeting those targets. The state DOT and MPO are to coordinate in developing the safety targets. State DOTs can be penalized if the state is not meeting or making significant progress towards achieving the safety targets. CMAP will need to adopt its inaugural highway safety targets or commit to helping meet state targets by February 2018 (IDOT's first targets are to be set in August 2017).

Treatment of Highway Safety in Other Regions

Along with safety performance under the recently passed Safety PM Rule outlined above, MPOs must address the safety and security of the region's transportation system in the regional planning process. The extent to which MPOs are involved in safety planning varies broadly, however. For instance:

- The North Central Texas Council of Governments (NCTCOG) devotes a chapter to safety in Mobility 2040, the long range transportation plan for the Dallas-Fort Worth (DFW) region, and has a transportation safety program area. NCTCOG supports the Toward Zero Deaths vision and actively supports planning efforts to develop regional safety programs and projects.

- The Mid-America Regional Council (MARC) in Kansas City sets a highway fatality target in its long-range plan. The current target is to halve fatalities by 2040.

- The Boston Region MPO includes improving highway safety as one of the region's goals, and safety accounts for the largest share of the weight in the evaluation process for proposed TIP projects in the Boston region. The MPO intends to use performance measures to demonstrate progress towards state and regional goals.

- The Delaware Valley Regional Planning Commission (DVRPC) uses safety as part of its project evaluation for the Transportation Alternatives Program (TAP). Safety is scored by asking the applicant a series of questions regarding how safety is addressed in the proposed project and if there is a history of crashes involving pedestrians or cyclists.

In general, reviewing the approaches of peer MPOs provides examples of how to integrate safety into planning and programming. The strategy paper will include a fuller discussion of how other regions address highway safety.

Stakeholder Discussion

One of the most important parts of the strategy paper development process is documenting the efforts of highway agencies in the region. CMAP staff has begun interviews with state and local agencies to learn more about their priorities and gain insight on the types of safety initiatives the agencies find effective and that they actively implement. The interviews are intended to inform the development of potential regional recommendations. Furthermore, the interviews will provide insight on how transportation agencies consider safety as they develop highway improvement projects which will allow the recommendations identified in the strategy paper to be informed by current practices in the region.

It important to highlight that IDOT has released county level Strategic Highway Safety Plans (SHSPs) to assist counties in Illinois with a high number of serious-injury and fatal crashes. A county-level SHSP was completed for all seven counties in the CMAP region, with six of the seven counties in the CMAP region in the top ten statewide for the number of serious-injury and fatal crashes. The county SHSPs are data-driven documents that incorporate the "4Es" of safety (education, enforcement, engineering, and emergency response) to reduce the number of serious-injury and fatal crashes on local roads. The county SHSP identifies safety emphasis areas for the county to focus its safety efforts and data to assist in locating safety related projects in the county.

Potential Focus Areas for Strategy Paper

While it is early in the process of developing the strategy paper, the Transportation Committee could provide some helpful feedback on possible focus areas. First, given the resources being invested in highway safety on the state system and ON TO 2050's local audience, the strategy paper could potentially focus more on refining strategies and policy recommendations to improve highway safety at the local level.

Given that pedestrian and bicycle-related serious crashes are rising, and are making up a larger fraction of all serious crashes, the paper could also focus on recommendations and strategies in this area. The safety benefits of traffic calming, streetscaping, and designing for complete streets could be highlighted in the strategy paper, helping to provide more specificity on the ways that designing for livable communities promotes highway safety.

With a greater emphasis by FHWA on linking performance measures with programming, the safety strategy paper can explore ways to link safety objectives more clearly to transportation

programming. For instance, in the last two CMAQ cycles, safety has been used as an evaluation measure in scoring proposed highway projects. However, CMAP's Transportation Alternatives Program scoring does not directly include safety benefits. Some consideration could also be given to helping spur greater interest in the local Highway Safety Improvement Program. At the same time, it may be that engineering projects are a relatively small component of potential safety gains and that the other three "Es" – enforcement, emergency response, and education – provide more opportunities for cost-effective safety improvement.

Per the final rulemaking, the MPO has the option to develop safety targets for the planning area or commit to planning and programming to help meet the state DOT targets. Thus, the strategy paper will consider the merits of both approaches and provide potential regional safety targets for CMAP committees and governing boards to consider. The development of potential regional safety targets and the associated costs of achieving the targets would rely on trend analysis, literature review, stakeholder input, and expected project/program benefits.

Discussion questions

1. Given the requirement to meet short-term (annual) targets, it seems appropriate to try to put those annual targets into the context of a long-range goal in ON TO 2050. What long-term goals might CMAP consider? A goal based on achieving zero deaths, or something else?

2. What other focus areas should CMAP consider besides or instead of the ones in the "Potential Focus Areas" section above?

3. Are there particular safety successes by highway agencies in the region that the strategy paper should point to as a model?

Staff contact

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Action requested: Discussion

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MEMORANDUM

To: CMAP Board and Committees

From: CMAP Staff

Date: November 2, 2016

Re: Local Technical Assistance Program Update

The CMAP Board and committees receive regular updates on the projects being undertaken through the Local Technical Assistance (LTA) program, including those receiving staff assistance and grants. To date, 188 local projects have been initiated. Of these, 137 projects have been completed, 47 are fully underway, and 4 will get actively underway in the near future.

Further detail on LTA project status can be found in the attached project status table. Projects that appear in this document for the first time, or that were recently completed, are noted and highlighted in italics.

ACTION REQUESTED: Discussion

Projects Currently Underway

Project	CMAP lead	Timeline	Assistance type	Status and notes
Arlington Heights bicycle-pedestrian plan (see website)	John O'Neal	May 2014-Jan. 2017	Staff assistance	Preliminary draft plan in final stages of review by Village and Bicycle and Pedestrian Advisory Committee (Steering Committee). BPAC/SC meeting on draft plan meeting planned for Nov./Dec.
Aurora downtown plan (see website)	Lindsay Bayley	May 2015-Jan. 2017	Staff assistance	Drafting of downtown plan is currently underway. City Staff will review the draft in mid-November.
Beach Park planning priorities report (see website)	Ricardo Lopez	Jan.-Dec. 2016	Staff assistance	Outline of draft recommendations submitted to Village staff for review. Meeting with Village staff to discuss recommendations scheduled for November 21.
Bensenville zoning update (see website)	Jake Seid	Oct. 2015-June 2017	Staff assistance	The project team continued its work on the Recommendations Memo in collaboration with Village staff. The Memo will be presented to the project Steering Committee in the coming months.
Berwyn stormwater management plan (TBD)	Nora Beck	July 2016-June 2017	Consultant assistance	The City and CMAP staff are developing a steering committee and outreach plan for the project. CMAP staff are conducting an ArcHydro analysis as a preliminary step to understand flooding issues and a water quality analysis. CMAP is working with stormwater engineering consultant to finalize the scope for their portion of the project.
Berwyn zoning revisions (see website)	Kristin Ihnchak	Jan. 2013-Jan. 2017	Staff and consultant assistance	No update.
Brookfield comprehensive plan	Heidy Persaud	Oct. 2016 – Oct. 2017	Consultant assistance	Brookfield staff is developing a steering committee for a tentative November meeting date. The next Village newsletter will feature the plan and process.
Calumet Park planning priorities report (website)	Sam Shenbaga	May 2015-Nov. 2016	Staff assistance	Final report completed and approved by staff. Presentation to Plan Commission being scheduled by Village.
Campton Hills zoning and subdivision regulations	Kristin Ihnchak	Jul. 2014 - Apr. 2017	Consultant assistance	No update.
Chicago Heights zoning update	Maggie Jarr	Aug. 2016-Apr. 2017	Consultant assistance	CMAP and Chicago Heights selected a contractor. CMAP/City intergovernmental agreement nearing completion.
Chicago North River Communities neighborhood	Brian Daly	Nov. 2015-June 2017	Staff assistance	CMAP staff is writing and finalizing the existing conditions report.

Project	CMAP lead	Timeline	Assistance type	Status and notes
plan (see website)				
Chicago Pilsen-Little Village neighborhood plan (see website)	Evy Zwiebach	Dec. 2013-Dec. 2016	Staff assistance	CMAP staff provided comments to DPD on the revised draft plan. In the next month, staff will continue providing comments as DPD completes subsequent revisions.
Chicago Pullman National Historic Park transportation plan (https://pullmantransportation.com/)	Lindsay Bayley	June 2015-Mar. 2017	Consultant assistance	NPS staff, Volpe, and CMAP are reviewing the draft recommendation outline. Planning for an open house in mid-November or early December is underway.
Chicago Riverdale area transportation plan	Tony Manno	Nov. 2016-Oct. 2017	Consultant assistance	Consultant selection is complete, and CMAP and CDOT are working on the IGA. The project remains on schedule to begin in November.
Cicero comprehensive plan (see website)	Jonathan Burch	Apr. 2014-TBD	Consultant assistance	Contractor is working with the Town to develop a schedule to finish the project and adopt the almost-complete plan.
Cook County subregional growth plan	Jonathan Burch	May-Dec. 2016	Staff assistance	Staff is working on a series of small data requests in preparation for a Sounding Board meeting in early November.
Cook County (Maine-Northfield) unincorporated area plan (see website)	John Carlisle	July 2016-Dec. 2017	Staff assistance	First public kickoff meeting was October 19. Second public kickoff meeting will be Tuesday, November 15, at Crowley Park Field House, 749 Huber Ln., Glenview. MetroQuest survey is being developed. Key stakeholder interviews are underway, and focus groups and take-home workshop materials are being developed.
Crystal Lake transportation plan (see website)	Nora Beck	Mar. 2014-Dec. 2016	Staff assistance	The City of Crystal Lake provided feedback on the draft plan, CMAP staff to respond and schedule steering committee review.
Des Plaines comprehensive plan	Heidy Persaud	Nov. 2016-Feb. 2018	Staff assistance	Des Plaines staff led a city tour for CMAP staff on October 14. A steering committee is being developed for a tentative November meeting date.
DuPage County / Hanover Park Homes for a Changing Region (see website)	Jonathan Burch	Nov. 2014-Mar. 2017	Consultant assistance	Near-term work will focus on developing recommendations memos for Hanover Park and Glendale Heights. The consultant presented West Chicago recommendations to local officials in early October.
DuPage County Elgin-O'Hare Corridor Bicycle and Pedestrian Plan (see website)	John O'Neal	May 2015-Mar. 2017	Consultant assistance	ECR finalized and posted on consultant's project website and on CMAP project webpage. Consultant team currently coordinating next steps for community and stakeholder engagement and drafting key recommendations and prioritization methodology memos.

Project	CMAP lead	Timeline	Assistance type	Status and notes
Elmwood Park zoning assessment	Patrick Day	Nov. 2014-Nov. 2016	Staff assistance	CMAP staff have created an assessment memo, annotated zoning ordinance, and proposed zoning map, and will present these materials at a November 14 Steering Committee meeting.
Franklin Park comprehensive plan (see website)	John Carlisle	Apr. 2015-Jan. 2017	Staff assistance	Village staff is reviewing the draft plan. Engineering consultant T.Y. Lin has provided preliminary assessments of bike recommendations and additional detail on bikeway facilities. Steering committee and partner agency review should begin in November.
Governors State University green infrastructure plan	Holly Hudson	June 2015-TBD	Consultant assistance	Following project restart in September, staff participated in two conference calls during October with the project consultant and GSU staff to review remaining tasks, outstanding data needs, deliverables, and revised completion schedule.
Hampshire planning priorities report (see website)	Tony Manno	Mar. 2016-Jan. 2017	Staff assistance	The draft community profile is under internal review. The previous plans, key issues and recommendations sections are being drafted.
Harvard zoning update	Jake Seid	TBD	Consultant assistance	CMAP received three responses to the RFP. Consultant selection expected in January.
Homer Glen plan commissioner training	Patrick Day	Feb.-Nov. 2016	Staff assistance	CMAP staff will perform the final plan commissioner training (third in a series of three trainings) on November 3.
Huntley zoning update	Patrick Day	May 2015-TBD	Consultant assistance	Ordinance drafting is currently underway.
Impact DuPage affordable housing strategy	Jonathan Burch	Mar.-Dec. 2016	Staff assistance	Staff are working on a recommendations memo in preparation for a steering committee meeting the last week of November.
Joliet Chicago Street plan	Stephen Ostrander	TBD	Consultant assistance	Interviews with consultant teams occurred on October 7. City and CMAP staff chose preferred consultant team and prepared justification memo for CMAP Board approval on November 9.
Lisle downtown parking plan (see website)	Lindsay Bayley	Mar. 2016-Feb. 2017	Staff assistance	CMAP staff conducted parking occupancy counts for all downtown parking lots and streets, and is currently processing the data and incorporating the results into the existing conditions report. Working with the consultant Houseal Lavigne, a collaboration is underway with the overlapping downtown Master Plan Update process, to avoid duplication of efforts.
Lower Salt Creek Watershed-based Plan	Holly Hudson	Jan. 2016-Dec. 2017	Staff assistance	Staff continued to work with project partners DuPage County Stormwater Management (DCSM) and DuPage River Salt Creek

Project	CMAP lead	Timeline	Assistance type	Status and notes
				Workgroup (DRSCW) on watershed resource inventory (WRI) requirements; a draft WRI was submitted to Illinois EPA on October 28. Staff attended the October 26 DRSCW meeting and presented an overview of the project at a Salt Creek stakeholder public meeting on the same date. CMAP also continued working to coordinate a pollutant load modeling workshop for project partner and Illinois EPA staff.
McHenry County Fox River corridor study	Kate Evasic	Sept. 2016-Dec. 2017	Staff assistance	Staff conducted kickoff meeting with steering committee on October 25. Corridor profile section of the existing conditions report is complete. Initial outreach and data analysis is underway.
Metropolitan Planning Council Great Rivers project	Evy Zwiebach	Dec. 2015-Dec. 2016	Staff assistance	CMAP and MPC staff continues to prepare for suburban Cook County community meetings, the first of which will focus on the Cal-Sag Channel and will take place in the late Fall or early Winter. In the next month, staff will circulate a survey to begin engaging stakeholders in advance of the community meeting.
Midlothian 147th Street corridor improvements (see website)	Tony Manno	Apr. 2016-Feb. 2017	Staff and consultant assistance	A Fall Event was held on October 22 to highlight the project and solicit feedback from area residents and business owners. Over 100 people attended the event and provided feedback on ways to improve the corridor. Stormwater and flooding analysis is underway and the first steering committee meeting is scheduled on November 9.
North Lawndale community plan (see website)	Brandon Nolin	Feb. 2016-July 2017	Staff assistance	Existing conditions report presented to Steering Committee in October. Final report will be made available for public review in November. LISC Quality of Life coordination is on-going with the next round of outreach taking place in early 2017.
O'Hare area truck route coordination	Alex Beata	July 2016-June 2017	Consultant assistance	Data collection and analysis continues. The Steering Committee is scheduled to meet December 7 to review technical progress and discuss a project vision.
Palos Park bikeways and trails plan	John O'Neal	Nov. 2016-June 2017	Consultant assistance	Consultant selection and proposed contract/scope of work will be brought for Board approval in November.
Park Forest zoning revisions (see website)	Kristin Ihnchak	June 2013-Mar. 2017	Staff and consultant assistance	A follow up conversation with Terra Engineering was held to review their comments on the draft code and initial stormwater regulations.

Project	CMAP lead	Timeline	Assistance type	Status and notes
Regional truck permitting project (see website)	Alex Beata	Jan. 2015-Nov. 2016	Consultant assistance	Draft report was presented to the Steering Committee on October 31. Final comments are due November 8 and the final report is expected to be presented to the CMAP Freight Committee on December 5.
Richmond planning priorities report (see website)	Maggie Jarr	Feb.-Nov. 2016	Staff assistance	Report was presented at the Village Board meeting on October 20.
Richton Park capital improvement plan (see website)	Brandon Nolin	June 2015-Jan. 2017	Staff assistance	CIP process being relaunched with completion in early 2017 ahead of end of Village's fiscal year. The CIP will incorporate results of the stormwater management plan (described below)with MWRD collaboration.
Richton Park stormwater management plan (see website)	Kate Evasic	Apr.-Dec. 2016	Consultant assistance	Project is on hold until a separate floodway study that will inform the plan is complete. CMAP staff continues to check in with consultant performing floodway study and market study. The market study of the I-57 Corridor will be completed by early November.
Romeoville comprehensive plan (see website)	Brandon Nolin	Apr. 2016-June 2017	Consultant assistance	Community Assessment Report delivered by consultant with Steering Committee review on November 2. Community workshop will be held November 17. Project website is https://bigpictureromeoville.com.
South Elgin zoning update (see website)	Patrick Day	Oct. 2014-June 2017	Staff assistance	Internal review of a draft Module 1 (of 3) of the UDO is underway.
South Holland comprehensive plan (see website)	Stephen Ostrander	Apr. 2015-Feb. 2017	Staff assistance	CMAP staff and Village staff developed design for community-wide open house event scheduled for December 13 that will present and seek feedback on findings and issues and opportunities to be addressed in plan. Additionally, CMAP contracted with SB Friedman to conduct in-depth office and hotel market analysis for major site in Village's Interstate Zoning District, which is now underway.
SSMMA Complete Streets plan (see website)	John O'Neal	July 2014-Dec. 2016	Staff assistance	Production of draft plan (i.e. text to accompany 2008 SSMMA Bicycle Plan update) currently underway. Team meeting to determine next steps and draft plan production responsibilities held Oct. 14.
Sugar Run Creek area plan (see website)	Brandon Nolin	May 2015-Dec. 2016	Staff assistance	Public Open House to was held in October. Targeting November/December for presentation to Will County Land Use and Development Committee and County Board.
Villa Park zoning ordinance	Patrick	July 2015-	Consultant	Drafting of Module 2 of the ordinance is currently underway.

Project	CMAP lead	Timeline	Assistance type	Status and notes
	Day	TBD	assistance	
Westchester zoning ordinance	Kristin Ihnchak	Nov. 2014-Dec. 2016	Consultant assistance	A steering committee meeting to discuss the draft ordinance was held on October 19.
Wilmington downtown plan	Maggie Jarr	TBD	Staff assistance	IGA and scope of work will be approved at City of Wilmington November board meeting. Coordination on staffing and schedule underway with project kick-off likely in January 2017.
Winthrop Harbor comprehensive plan (see website)	*Sam Shenbaga*	*Sept. 2014-Oct. 2016*	*Staff assistance*	*Newly completed. Plan adopted unanimously by Village Board on October 18.*

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MEMORANDUM

To: CMAP Board and Committees

From: CMAP Staff

Date: November 2, 2016

Re: ON TO 2050 Update

The CMAP Board and committees receive regular detailed updates on the various components of ON TO 2050 plan development that are most relevant to them. Since the volume of work associated with plan development is too large for every committee to learn about every component individually, this bi-monthly memo provides a brief status update on all major ongoing elements of plan development, including links to recent presentations and interim or final products when available. Projects that appear in this document for the first time, or that were recently completed, are noted and highlighted in italics.

ACTION REQUESTED: Information

Regional Snapshot Analyses

Project	CMAP lead	Timeline	Status and links
Regional economic clusters (see website)	*Simone Weil*	*Jul. 2015 – May 2016*	*Project complete. The snapshot was published. Copies continue to be disseminated at relevant meetings and shared via the website and social media.*
Travel behavior trends (see website)	*Elizabeth Irvin*	*Jul. 2015 – Sep. 2016*	*Project complete. The snapshot's release coincided with a transportation-related ON TO 2050 Big Ideas forum. Media coverage and promotion of the report continue.*
Demographic trends (see website)	Jacki Murdock	Aug. 2015 – Nov. 2016	Internal review is nearing completion and graphics treatment is underway.
Freight system trends (see website)	Alex Beata	Jul. 2015 – Dec. 2016	The draft is undergoing internal review.
Infill and TOD trends (see website)	Evy Zwiebach	Aug. 2015 – Dec. 2016	The draft snapshot narrative continues to undergo internal review. Updated findings were presented to CMAP's Council of Mayors, Land Use, and Transportation Committees in October.
Highway system trends	Jesse Elam	Jul. 2015 – Jan. 2017	No update.
Transit network trends	Martin Menninger	June 2016 – Feb. 2017	Initial findings will be presented at TC in November.
Local food	Brian Daly	Jun. 2016 – Mar. 2017	The project scope and initial findings from research and data collection on local food indicators and policy activities were presented to the Environment and Natural Resources Committee in September. Staff is outlining the snapshot and beginning to draft the narrative.
Tax policy	Simone Weil	Jun. 2016 - TBD	This project is on hold due to staffing changes.
Non-motorized transportation	*Lindsay Bayley*	*Oct. 2016 – May 2017*	*Newly added to report. A project scope was developed and is undergoing internal review.*
Natural resources	*Jared Patton*	*Oct. 2016 – Jun. 2017*	*Newly added to report. A project scope was developed and is undergoing internal review.*

Assessment of New Policy Directions

Project	CMAP lead	Timeline	Status and links
Green infrastructure co-benefits (see website)	*Kristin Ihnchak*	*Sep. 2015 – Apr. 2016*	*Project complete. The strategy paper was finalized and posted on the web for feedback.*
Transportation system funding concepts (see website)	*Lindsay Hollander, Alex Beata*	*Jul. 2015 – May 2016*	*Project complete. The strategy paper was finalized and posted on the web for feedback.*
Highway operations (see website)	Claire Bozic	Jul. 2015 – Nov. 2016	The draft is undergoing internal review.
Reinvestment and infill strategies (see website)	Tony Manno, Liz Oo	Oct. 2015 – Nov. 2016	The draft policy framework and strategies were presented to Land Use and Housing Committees in October. Staff will meet with the Resource Group on November 1 to seek feedback on the draft strategy paper.
Tax policies and land use trends (see website)	Lindsay Hollander	Dec. 2015 – Nov. 2016	The draft is undergoing internal review.
Climate resilience (see website)	Kristin Ihnchak	Jul. 2015 – Nov. 2016	The draft is undergoing final edits and formatting.
Housing supply and affordability (see website)	Jonathan Burch	Jan. 2016 – Dec. 2016	The draft is undergoing internal review.
Transit modernization (see website)	Martin Menninger	Jan. 2016 – Dec. 2016	Interviews with transit agencies have been completed and are being summarized for review by the Resource Group. An initial framework and findings are being developed.
Transportation technology	Elizabeth Irvin	Jun. 2016 – Dec. 2016	The consultant conducted interviews with experts in transportation technology and presented initial findings to CMAP staff on October 27.
Lands in transition (see website)	Nora Beck	Jan. 2016 – Jan. 2017	The policy framework will be presented to the Land Use and Economic Development Committees in November. Staff are drafting the strategy paper and will ask for Resource Group review in December.
Asset management (see website)	Tom Murtha	Feb. 2016 – Jan. 2017	Staff reviewed final rules for transit system and National Highway System asset management that were issued by USDOT. Research continued on the state of the practice. Findings will be presented to Transportation Committee in November.

Project	CMAP lead	Timeline	Status and links
Inclusive growth (see website)	Jacki Murdock	Oct. 2015 – Feb. 2016	A draft of the inclusive growth strategy report was completed and is now undergoing internal review. Staff presented draft strategies to CMAP working committees.
Water	Jason Navota	Sep. 2016 – Mar. 2017	Project underway; internal project initiation meeting completed. Scope was presented to the ENR Committee in early August. Background research and initial challenges to be presented to ENR in November.
Energy	Dan Olson	Jun. 2016 – May 2017	The consultant held a first meeting of Resource Group in September and plans to hold monthly meetings in addition to sub-group meetings once final topic organization for the paper has been decided.
Municipal capacity	Patrick Day	Jun. 2016 – Jun. 2017	The Resource Group will review staff research on definitions and metrics of municipal capacity at its second meeting on November 3. Staff will present the project scope and initial research at a joint LU/ED working committee meeting on November 16. The consultant will convene the first project focus group in late November.
Stormwater	*Nora Beck*	*Nov. 2016 – Jun. 2017*	*Newly added to report. The scope will be presented to the ENR Committee in early November.*
Economic resilience	*Simone Weil*	*Nov. 2016 – Oct. 2017*	*Newly added to report. A project scope was developed and is undergoing internal review.*

Other Plan Development Tasks

Project	CMAP lead	Timeline	Status and links
Communications strategy	Tina Fassett Smith	Ongoing	The final Emerging Priorities report was approved by the CMAP board and released in October. The second ON TO 2050 snapshot report -- on travel trends -- was published in September. Development continues and is nearing completion on a new CMAP web page template that will house interactive maps and infographics in support of snapshots and other plan content, with anticipated rollout during this quarter. Four ON TO 2050 Big Ideas forums have been planned and executed, with the next – on the future of urbanization in the region – to take place in Aurora on December 6. Development of

Project	CMAP lead	Timeline	Status and links
			digital public engagement tools to assist with outreach during summer of FY17 has begun. Detailed ON TO 2050 communications and engagement plans for FY17 and FY18 are also in development.
Data and tool development	Zach Vernon	Ongoing	Staff assembled documentation for datasets and tools generated in FY16, and coordinated with snapshot managers and communications staff to release tabular data from completed snapshots on the CMAP Data Hub. Continued to develop analytical tools and data products to inform topical research. Outputs for the tax policies and land use trends strategy paper included standardized tax district boundaries using 2014 parcel/assessor data for 3 counties.
Financial plan	Lindsay Hollander	Ongoing	Outreach with experts is taking place to flesh out expenditure forecasting assumptions. Draft revenue forecasts are underway.
Layers	Kristin Ihnchak	Ongoing	A scan of local plans for reinvestment priorities was completed and the layers team is working with the local area allocation team to incorporate the findings, along with identified infill opportunity areas, into the forecast tool. The conservation layer team completed a review of other organizations' schemes for identifying high quality natural areas and is in the process of applying thresholds to conservation data to obtain preliminary conservation maps.
Outreach activities	Jane Grover	Ongoing	The ON TO 2050 Big Ideas Forum Series is continuing with the third, fourth, and fifth events: 1) September 22: **Have we reached peak driving?** CMAP and the Northwestern University Transportation Center hosted this event on future travel in the region. 2) October 27: **Designing the Future: Gen X and Millennials in 2050**. Enterprise Community Partners and the Lifetime Communities Collaborative, joined CMAP as partners for this forum at the University of Illinois Chicago. 3) December 5: **Will We Continue to Suburbanize?** Chuck Marohn from Strong Towns and Carolyn Schofield, McHenry

Project	CMAP lead	Timeline	Status and links
			County Board Member, will serve on the panel to take place at the Two Brothers Roundhouse in Aurora. Planning has begun for CMAP's sixth forum – on transportation technologies – in early 2017. Staff will maintain continuing contact with the over 250 regional organizations engaged in the first phase of public outreach, as well as expand the agency's network to build new partners and allies. Finally, staff has begun to craft outreach strategies for public engagement for the scenario development phase of ON TO 2050 plan development in 2017.
Regionally significant projects	Jesse Elam	Ongoing	The public call for projects ended on October 31. Staff will brief TC on project ideas and comments received at its November meeting.
Scenario development	Liz Oo	Ongoing	A memorandum was created to introduce five possible futures on which to focus research, analysis, and public engagement. In September and October, staff presented these futures to the Economic Development, Environment and Natural Resources, Housing, Land Use, and Transportation Committees, as well as the Council of Mayors. In October, staff hosted a working session with representatives from the media to discuss the five futures and ON TO 2050. Staff has also begun initial discussions with the consultant about interactive visual engagement tools.
Socioeconomic forecast	David Clark	Ongoing	Staff reviewed and commented on the draft regional forecast final report and (with consultant) presented 2050 forecast totals to the working committees and the Regional Coordinating Committee. Staff gave an introductory presentation about the local allocation tool to working committees and is working with the consultant on refining the tool and developing the necessary data inputs.

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