Congestion Management Process For The Kalamazoo Area Transportation Study

Approved:

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Kalamazoo Area Transportation Study
Congestion Management Process

Introduction: The Congestion Management Process

A Congestion Management Process (CMP) is a regionally accepted, systematic approach for managing congestion. It is a multi-modal approach to assess alternative strategies for congestion management and move these strategies into the funding and implementation stages.

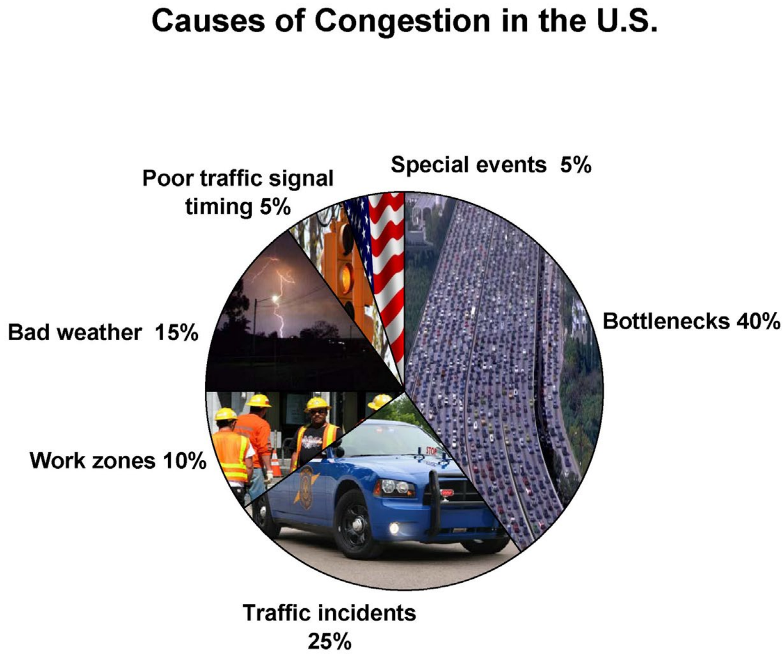
One of the main components of the Kalamazoo Area Transportation Study's Metropolitan Transportation Plan is an analysis of congested roadways in the Kalamazoo metropolitan area and the Management Process to address these congested areas. The Congestion Management Process is a guideline for local agencies in the development of their capital improvement programs within the metropolitan planning area. Because of the limited financial resources available to communities to address roadway congestion, KATS carefully reviews projects to determine their suitability for widening, transit accessibility, and non-motorized access. KATS then selects only the most critical areas recommended by road and transit agencies to become part of the list of capacity improvement projects, intersection improvements, and travel demand management/operation strategies in the planning area. The Congestion Management Process is a tool used by road and transit agencies to determine what level of capacity improvement is most suitable for a corridor and uses data from the KATS Travel Demand Model, verified and supported by real world data, to analyze submitted capacity improvement projects.

The staff of the Kalamazoo Area Transportation Study (KATS) completed a literature review to begin formulating an implementation plan for the Congestion Management Process in the KATS Metropolitan Area by examining several CMP documents from MPOs across the State. This was performed to give KATS a starting point in developing its new CMP. KATS selected the Flint, MI CMP as a starting point in developing this CMP.

This document is divided into the following sections:

1. Identifying the Causes and Types of Congestion
2. Congestion Management Process Network
3. Congestion Management Objectives and Performance Measures
4. Data Collection
5. Congestion Management Strategies
6. Implementation Plan for the CMP
7. Performance Review
8. Congestion Management Summary

1. Identifying the Causes and Types of Congestion



Federal Highway Administration lists the following as the major sources of traffic congestion in the United States:

Bottlenecks are points where the roadway narrows or regular traffic demands cause traffic to backup. These are the largest source of congestion (40%);

Traffic incidents, such as crashes, stalled vehicles, debris on the road cause about 1/4 of congestion problems (25%);

Work zones for new road building and maintenance activities like filling potholes are caused by necessary activities, but the amount of congestion caused by these actions can be reduced by a variety of strategies (10%);

Bad weather cannot be controlled, but travelers can be notified of the potential for increased congestion (15%);

Poor traffic signal timing is a source of congestion on major and minor streets. This isthe faulty operation of traffic signals or green/red lights where the time allocation for a road does not match the volume on that road (5%);

Special events cause "spikes" in traffic volumes and changes in traffic patterns. These irregularities either cause delay on days, times or locations where there usually is none, or add to regular congestion problems (5%);[1]

Types of Congestion

Highway (or roadway) congestion, very simply, is caused when traffic demand approaches or exceeds the available capacity of the highway system. Though this concept is easy to understand, congestion can vary significantly from day to day because traffic demand and available highway capacity are constantly changing. Traffic demands vary significantly by time of day, day of the week, and season of the year, and are also subject to significant fluctuations due to recreational travel, special events, and emergencies (e.g. evacuations). Available highway capacity, which is often viewed as being fixed, also varies constantly, being frequently reduced by incidents (e.g. crashes and disabled vehicles), work zones, adverse weather, and other causes.

To add even more complexity, the definition of highway congestion also varies significantly from time to time and place to place based on user expectations. An intersection that may seem very congested in a rural community may not even register as an annoyance in a large metropolitan area. A level of congestion that users expect during peak commute periods may be

[1] Source: http://www.ops.fhwa.dot.gov/aboutus/opstory.htm

unacceptable if experienced on Sunday morning. Because of this, congestion is difficult to define precisely in a mathematical sense – it represents the difference between the highway system performance that users expect and how the system actually performs.

Congestion can also be measured in several ways – level of service, speed, travel time, and delay are commonly used measures. However, travelers have indicated that more important than the severity, magnitude, or quantity of congestion is the reliability of the highway system. People in a large metropolitan area may accept that a 20-mile freeway trip takes 40 minutes during the peak period, so long as this predicted travel time is reliable and is not 25 minutes one day and 2 hours the next. This focus on reliability is particularly prevalent in the freight community, where the value of time under certain just-in-time delivery circumstances may exceed $5 per minute. System reliability data from the National Performance Measurement Research Data Set has recently become available and will be used to validate model assumptions (HERE Data).
Sources of traffic congestion (FHWA).
http://www.fhwa.dot.gov/congestion/describing_problem.htm

Highway (Roadway) Congestion

Recurring Congestion occurs when traffic is greater than the roadway capacity; this can include peak hour congestion. The urban travel demand model predicts future recurring congestion and transportation planners use this tool to develop recurring capacity deficiencies which are then analyzed for the best transportation capacity improvement projects to alleviate the congested areas.

Non-recurring Congestion – Road closures, construction detours, traffic crashes, weather conditions, special events and disabled vehicles are the main causes of non-recurring congestion. Road closures and construction detours can be modeled for their effects on the transportation system and strategies to minimize the effects of road closures and construction detours are routinely developed on a project-by-project basis. The other types of non-recurring congestion (traffic crashes, weather conditions, and disabled vehicles) are difficult to forecast and require different strategies than recurring congestion.

In this plan we focus on the types of recurring highway congestion caused by:

- Intersection delays, turning movements, and signal timing issues.
- Travel demand greater than general roadway capacity for either the entire 24-hour period or more of the peak periods (AM, Midday, or PM) in the current roadway system, today and the future projections for the Kalamazoo metropolitan area out to 2040.

Multi-Modal Congestion

The transportation system in the KATS Study Area is multi-modal and includes transit, bicycling, and walking as well as freight transportation. The KATS Travel Demand Model currently does not include a mode split with a full fixed route transit model. Future model development for the KATS 2040 Metropolitan Transportation Plan will include a Transit component.

Transit

Fixed route transit service, while reducing vehicle demand, can cause delays to the transportation system when a bus makes frequent stops on a roadway that does not include at least four travel lanes or a bus lane.

Bicycling and Walking

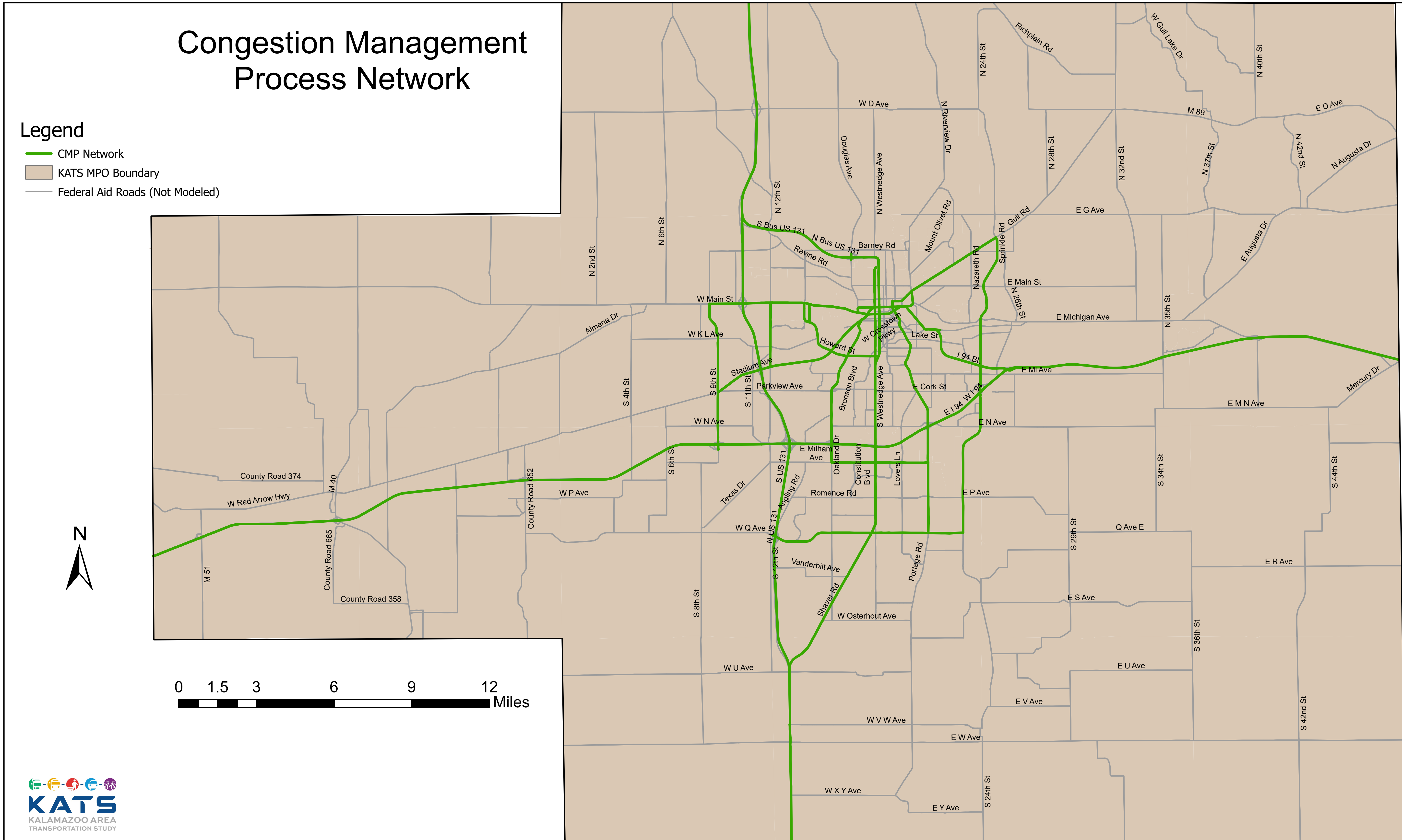
In areas where appropriate, the addition of bicycling and walking facilities such as non-motorized pathways, bike lanes, and sidewalks can take traffic off congested roadways and move people onto alternative forms of transportation. This is one way in which traffic congestion can be alleviated with the incorporation of these forms of travel. See the Non-Motorized Technical Report for further details about these forms of travel in Kalamazoo County.

2. Congestion Management Process Network

The development of the CMP Network is the basis for the data driven objectives and strategies of the CMP.

KATS defines the CMP Analysis Network as those roadways with a National Functional Classification of Principal Arterial, Other Freeway, and Interstate within the Metropolitan Area Boundary. However, data will also be collected on lower functional classification roadways if shown deficient through the KATS Travel Demand Model. Transit, bicycle, and pedestrian networks and their interaction with the CMP Analysis Network will also be documented. A thorough review of previous Metropolitan Transportation Plans identified the importance of this network and its relation to congestion. The most recent federal transportation bill, Moving Ahead for Progress in the 21st Century (MAP-21) also places an emphasis on this network.

Congestion Management Process Network



3. Congestion Management Objectives and Performance Measures

The CMP objectives were developed directly from the KATS Metropolitan Transportation Plan (MTP). The Goals and Objectives for the most recent Metropolitan Transportation Plan were narrowed in focus for the CMP through a committee process. The Goals are taken directly from the KATS Metropolitan Transportation Plan[2]. KATS felt the need to include a multi-modal approach to the goals and objectives. Following the "SMART" (Specific, Measurable, Agreed, Realistic, Time-bound) model, the following goals produced CMP Objectives:

Goal 1: Provide a Surface Transportation System Which Promotes the Efficient Movement of People, Goods, and Services, While Enhancing Economic Development.

Objective 1: Decrease model-based Vehicle Hours Traveled (VHT) by 5% by 2040.

Goal 3: Increase the Accessibility and Mobility Options Available for People, Freight, and Services.

Objective 2: Promote an increase in non-motorized commuting by increasing the access (mileage) to non-motorized facilities by 10% by 2040.

Goal 6: Promote Efficient System Management and Operations of a Multimodal Transportation System.

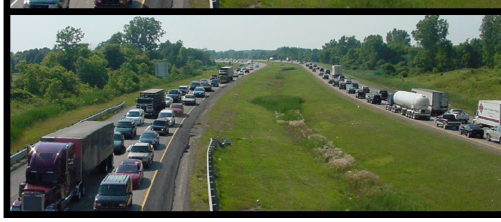
Objective 3: Increase or upgrade the number of corridors by 10% on the CMP network using modern Intelligent Transportation Systems (ITS) by 2040 to improve intersection performance.

Objective 4: Improve average on-time (real world) performance for transit routes located on the CMP network by 10% by 2040.

KATS uses "level of service" (LOS) as the roadway system measurement for congestion in the CMP. The LOS is derived from volume to capacity ratios as illustrated in the table below. A grade of "A" through "F" is assigned to all roadways in the CMP network. Roadways assigned a LOS "A" demonstrate free-flow traffic while LOS "F", being the worst rating, signifies a system failure where the roadway is completely shut down with congestion. The LOS on all roadways in the CMP network were calculated using the KATS Urban Travel Demand Model. Other data elements, including speed, travel time, and delay will also be monitored as needed. Staff will continue the use of this performance measure to evaluate congestion on roadways in future analysis.

[2] KATS Metropolitan Transportation Plan: *http://katsmpo.files.wordpress.com/2012/03/kats-2035-transportation-plan-final-rev-10-6-11.pdf*

Volume to Capacity Severity Ranges

Volume to Capacity Severity Ranges	Volume to Capacity Ratio	Operating Conditions Severity	Level of Service (LOS)	
	0 to 0.84	Traffic at free to stable flow	A-C	STABLE FLOW
	0.85 to 0.99	High density of traffic, but stable flow (Approaching Congestion)	D	
	1.00 to 1.24	Unstable flow – lower speed some stops	E	CONGESTED
	1.25 and greater	Forced or breakdown traffic flow – many stops	F	

An improvement in the LOS of a roadway directly relates to a decrease in VHT. To meet the established CMP Objectives, additional area wide performance measures are needed. They are:

- The extent of the bicycle and pedestrian network (mileage).
- Reliability of performance for transit- measured by percentage of on-time performance (likelihood of increasing transit ridership).

Each of these measures provide a consistent scale of measurement that allows for comparisons of data from year to year.

As of 2020, Kalamazoo County remained on track to meet the 2-year and 4-year targets, and our system is relatively reliable as shown in the charts on the next page.

Statewide Reliability Measures

Performance Measure	Baseline Condition (CY 2017)	2-Year Target	4-Year Target
Level of Travel Time Reliability of the Interstate	85.10%	>75.0%	>75.0%
Level of Travel Time Reliability of the Non-Interstate NHS	85.80%	N/A	>70.0%
Freight Reliability Measure on the Interstate	1.38	<1.75	<1.75

Kalamazoo County Reliability Measures

Performance Measure	2020 Condition
Level of Travel Time Reliability of the Interstate	100%
Level of Travel Time Reliability of the Non-Interstate NHS	89.6%
Freight Reliability Measure on the Interstate	1.09

4. Data Collection

Roadway data, including traffic counts, will continue to be collected throughout the KATS planning area. These counts contribute to the accuracy of the Travel Demand Model (TDM). KATS will be developing a new TDM with the assistance of a consultant throughout FY 2020.

Using the KATS 2016 TDM, an inventory identifying the current performance of the roadway was built to begin to properly monitor the roadway performance within the CMP network. The LOS on any given roadway in the CMP network is calculated using the KATS Travel Demand Model. LOS grades of “A”, “B”, and “C” are considered congestion-free. An LOS grade of “D” is considered to be approaching congestion along a roadway. A roadway receiving an LOS grade of “E” or “F” is considered congested. Most of the efforts of the KATS CMP are aimed at relieving congested segments (LOS “E” or “F”), while some proactive efforts will be investigated to mitigate future congestion along those roadways approaching congestion (LOS “D”).

Through its Congestion Mitigation and Air Quality Program and other planning efforts, KATS maintains an inventory of ITS corridors within the planning area. Further data regarding the operation of these corridors will be collected from local agencies and the Michigan Department of Transportation.

Kalamazoo Metro Transit is in the process of completing an ITS project on its system. This ITS system will give easy access to performance data regarding the delivery of transit services.

With the creation of this CMP, these data categories will be given increased priority within the MPO program.

5. Congestion Management Strategies and Toolbox

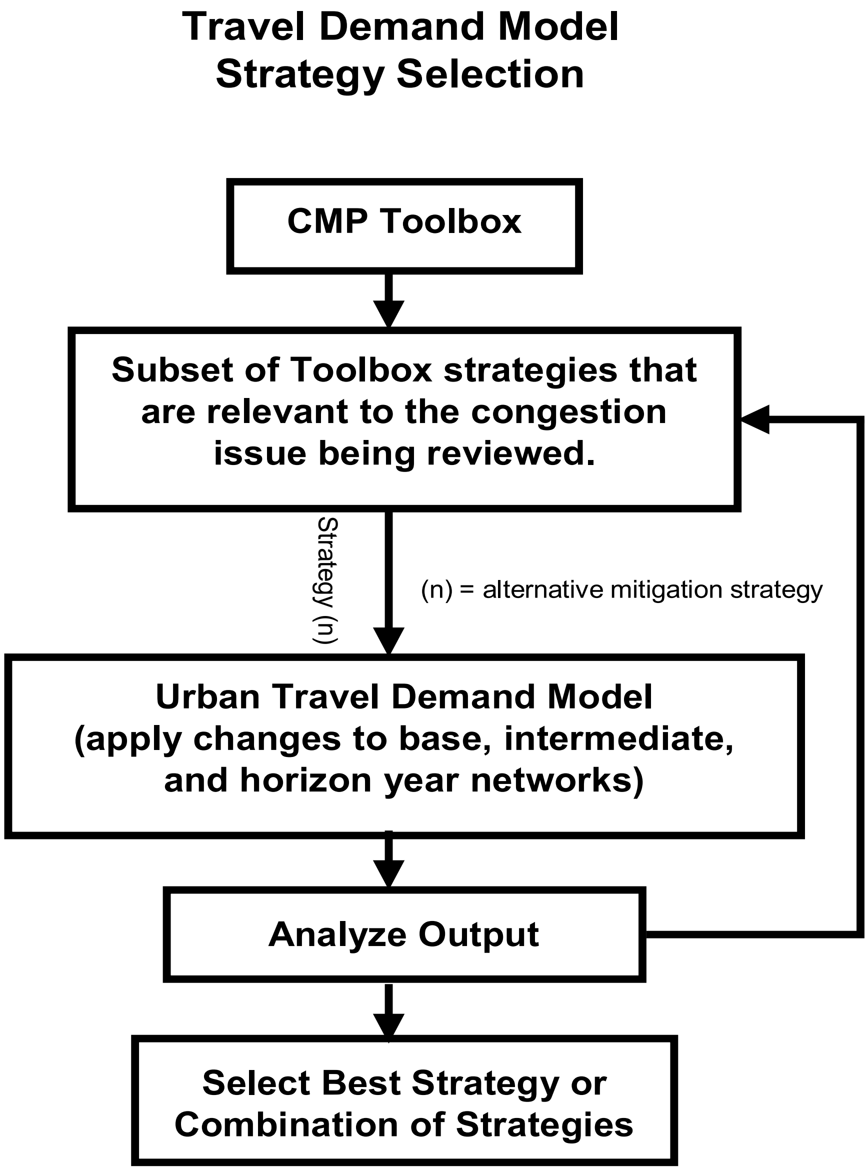
The KATS CMP includes 4 different strategy categories that could be used to manage congestion in the KATS Study Area. The structure of the CMP "toolbox" has the strategies assembled for use in a top-down approach. This approach ensures that solutions that reduce or shift auto trips or improve roadway operations are evaluated before adding roadway capacity. Congestion Management solutions will include the implementation of Transportation System Management (TSM), Travel Demand Management (TDM), and Intelligent Transportation System (ITS) improvements. Staff used the toolbox to determine if the strategies presented in the proposed projects were indeed suitable to help manage congestion in the Kalamazoo Metropolitan Area.

To begin the strategy evaluation, a "toolbox" of congestion mitigation measures was assembled that includes a variety of strategies that could be used. Following an approach used by the New Jersey DOT, the strategy "toolbox" is arranged so that the measures on top take precedence over those on the bottom. Local road agencies will fill out a form during the Metropolitan Transportation Plan call for projects. Each project will be assessed based on its implementation of the Toolbox Strategies:

KATS CMP "TOOLBOX" STRATEGIES:

Strategy #1: Reduce Person Trips or Vehicle Miles/Hours Traveled (VMT/VHT)
Strategy #2: Shift Automobile Trips to Other Modes
Strategy #3: Improve Roadway Operations (signal timing, turning lanes, etc.)
Strategy #4: Adding Thru-Lane Capacity

STRATEGY SELECTION

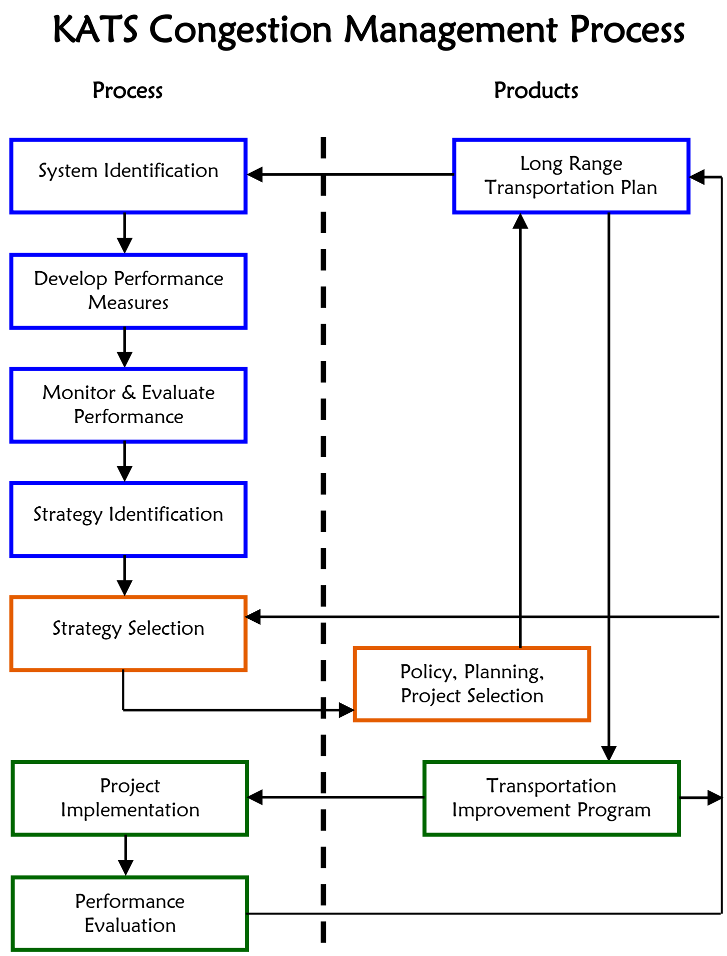


Strategy selection will be performed using the KATS Travel Demand Model and other qualitative data (local knowledge, etc.). Current congestion will be evaluated using real-time data (HERE). The real-time data will be used to validate the travel demand model, which will visualize the current congestion conditions on the CMP network, as well as provide a glimpse into the horizon year. The selection of one strategy over another will be supported by both qualitative (local experience, national statistics, etc.) and quantitative data illustrating where one strategy is more effective than the other, and to what degree. Quantitative data will be provided by the travel demand model. Since the TDM is system based, some strategies may not easily be illustrated in direct model-based improvements. The use of qualitative data, such as nationally recognized statistics and local knowledge, will be used to help assess the potential impact a strategy has on the system in instances where it is found that modeling is not feasible.

6. Implementation Plan for CMP

This particular step brings much of the process to fruition. In the past, prior to project selection, staff has provided considerable information regarding congested corridors throughout the planning area as well as possible congestion mitigation strategies to state, local road, and transit agencies. However, it was up to the road agency to consider congestion strategies when developing project applications and ultimately implement them during construction.

KATS will guide the implementation of the process through education, alternative analysis, project planning, and finally a recommendation to the project selection committee to improve on this phase of the overall process. Staff worked hand in hand with local agencies to incorporate the CMP during these initial phases to ensure projects are designed to effectively mitigate congestion.



Long Range Transportation Plan & Transportation Improvement Program

As the flowchart illustrates, the Congestion Mitigation Process is a significant part of the transportation planning process and exists within the Metropolitan Transportation Plan (MTP). KATS will fully integrate the CMP as part of future MTP development. All future capacity related projects that are selected for the TIP must come directly from the MTP.

Project Implementation

Project implementation currently happens through the Metropolitan Transportation Plan and the Transportation Improvement Program. Staff will work with local road agencies to ensure programmed projects move forward from the programming stages to project implementation and changes to the system will be updated in the CMP as well as in the travel demand model.

7. Performance Review

All elements of the KATS CMP will be reviewed and updated periodically to reflect changes to the region's transportation goals, objectives and changes to the transportation system. These updates will include, at a minimum, an analysis of the CMP network performance and an update of both the CMP road network and the urban travel demand network every four years, in advance of each update to the Metropolitan Transportation Plan.

8. Congestion Management Summary

The alternatives to be modeled as part of the Congestion Management Process can provide increased speed and capacity on the roadways, but to very different degrees of improvement.

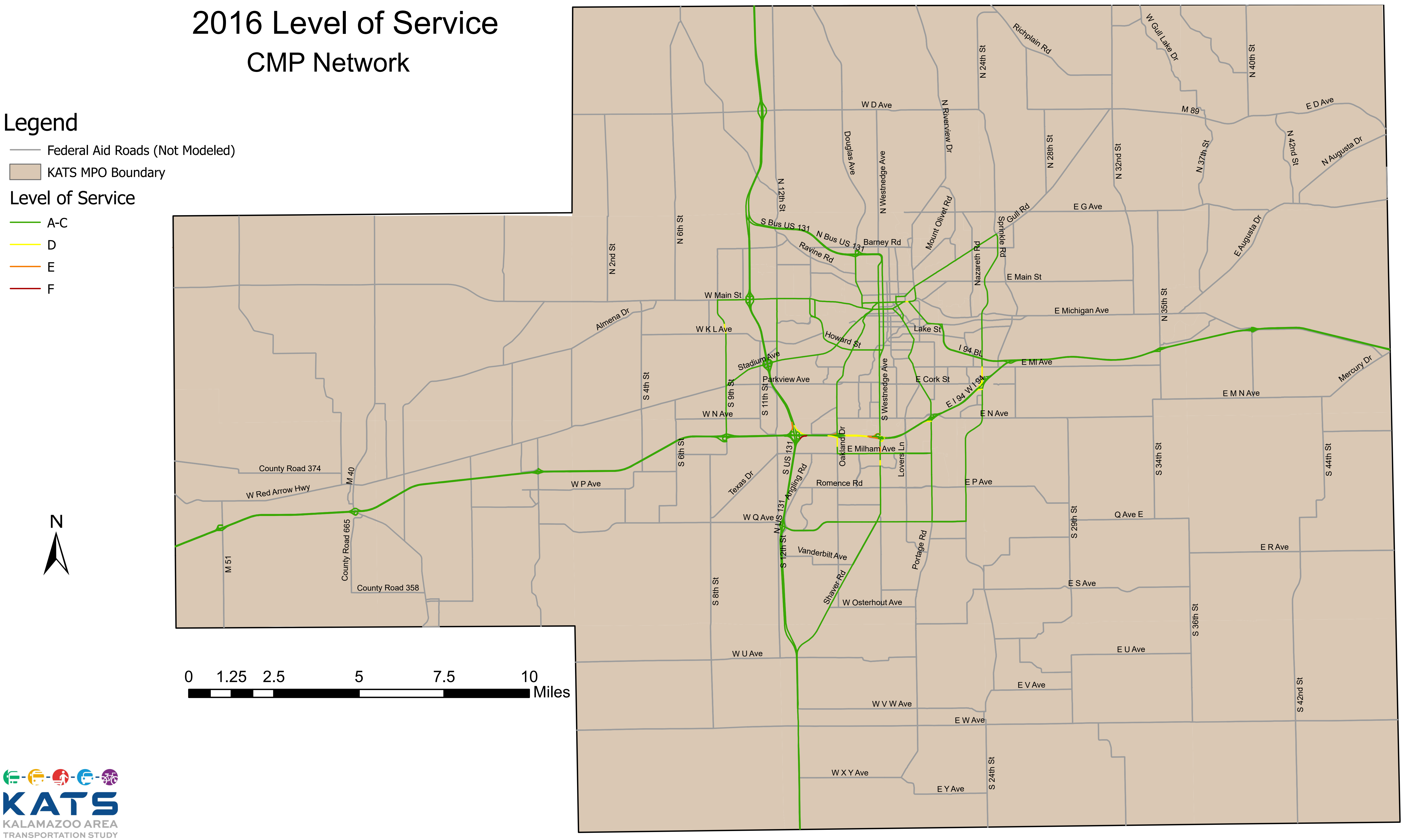
Signal timing has an effect on corridors that are longer and include more frequent signals, but in areas where signals are sparse (over 1 mile apart) the effect was minimal. If a roadway was already congested to a level of service D – F, the effect of timing signals rarely provided enough benefit to improve one level of service, such as from a D to a C.

Adding a center turn lane can have a benefit in some areas and not in others. Depending on the traffic volumes, a center turn lane can sometimes provide a more significant improvement over a signal timing project.

The KATS Travel Demand Model is calibrated as an area-wide model; analysis on individual corridors must take into account the calibration of each corridor which can vary from corridor to corridor and within one corridor itself. As a next step for future Metropolitan Transportation plans, staff recommends looking into additional modeling add-on features for corridor roadway congestion analysis which could provide more accurate alternative analysis and congestion management tools

2016 Level of Service

CMP Network



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2016 Level of Service

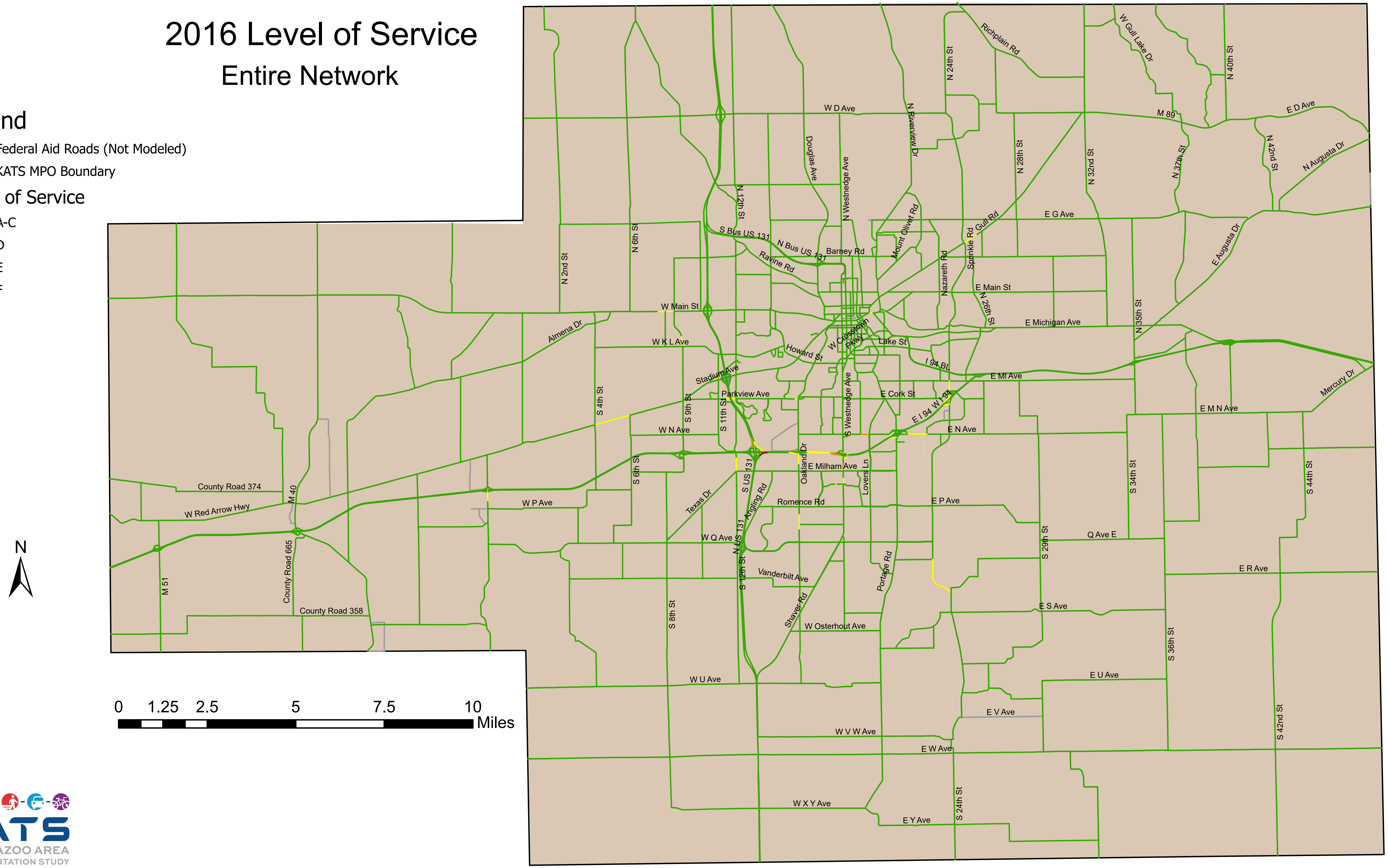
Entire Network

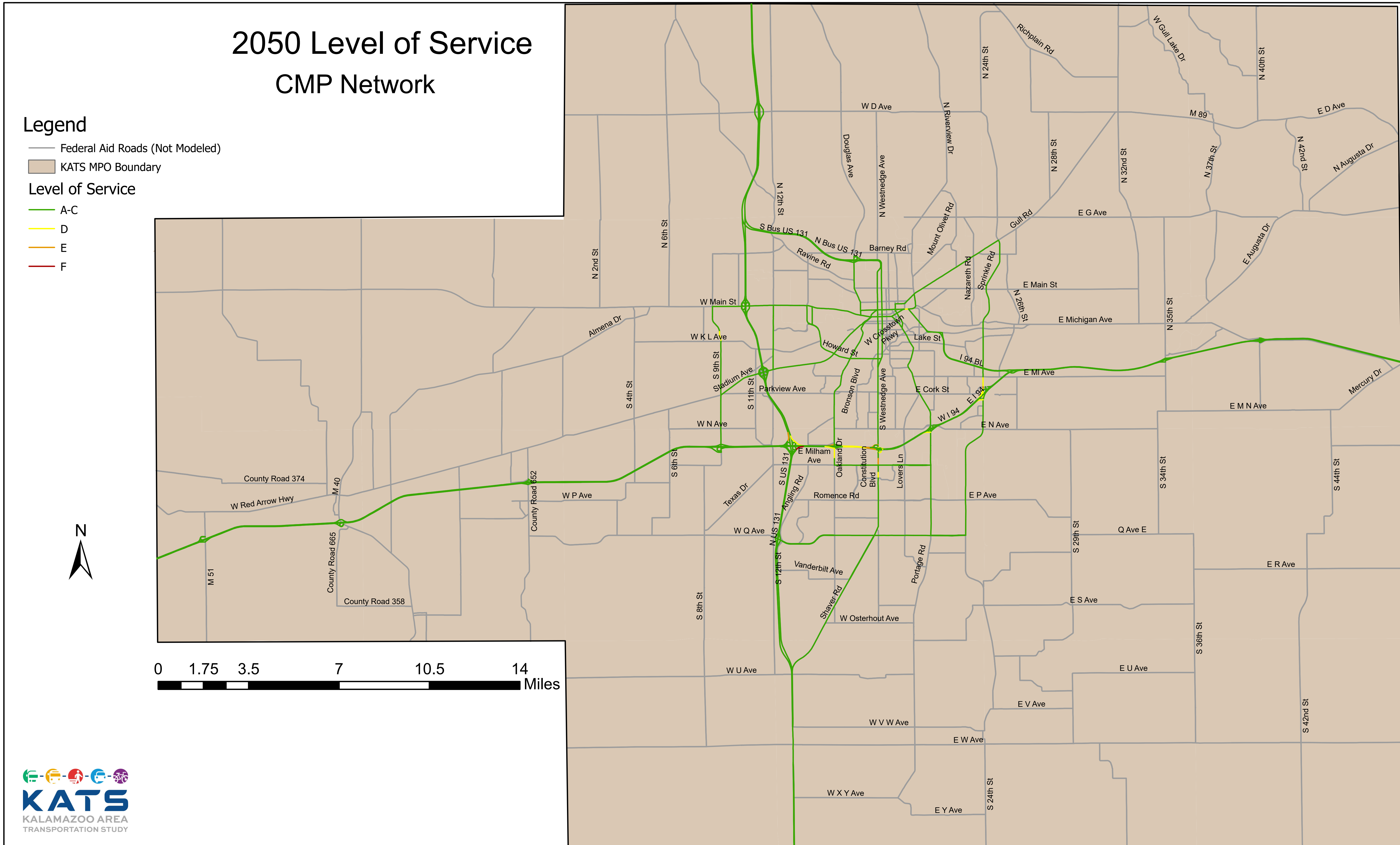
Legend

- Federal Aid Roads (Not Modeled)
- KATS MPO Boundary

Level of Service

- A-C
- D
- E
- F





2050 Level of Service
CMP Network
Legend
Federal Aid Roads (Not Modeled)
KATS MPO Boundary
Level of Service
A-C
D
E
F
N
0
1.75
3.5
7
10.5
14
Miles
KATS
KALAMAZOO AREA
TRANSPORTATION STUDY
W D Ave
M 89
E D Ave
N 24th St
N 40th St
Richplain Rd
W Gull Lake Dr
N Riverview Dr
Douglas Ave
N Westnedge Ave
N 28th St
N 32nd St
N 37th St
N 42nd St
N Augusta Dr
N 12th St
Mount Olivet Rd
Gull Rd
E G Ave
E Augusta Dr
S Bus US 131
N Bus US 131
Barney Rd
Ravine Rd
Nazareth Rd
Sprinkle Rd
N 2nd St
N 6th St
E Main St
N 26th St
W Main St
E Michigan Ave
N 35th St
Almena Dr
W K L Ave
W Crosstown Pkwy
Lake St
Howard St
I 94 BL
S 9th St
Stadium Ave
E MI Ave
S 4th St
S 11th St
Parkview Ave
Bronson Blvd
S Westnedge Ave
E Cork St
E I 94
Mercury Dr
W I 94
E M N Ave
W N Ave
E N Ave
E Milham Ave
Oakland Dr
S 6th St
S US 131
Constitution Blvd
Lovers Ln
S 34th St
S 44th St
County Road 374
M 40
County Road 652
Angling Rd
W Red Arrow Hwy
W P Ave
Texas Dr
Romence Rd
E P Ave
County Road 665
W Q Ave
N US 131
S 29th St
Q Ave E
M 51
S 12th St
Vanderbilt Ave
Portage Rd
E R Ave
County Road 358
S 8th St
Shaver Rd
E S Ave
W Osterhout Ave
S 36th St
W U Ave
E U Ave
E V Ave
W V W Ave
E W Ave
S 42nd St
S 24th St
W X Y Ave
E Y Ave

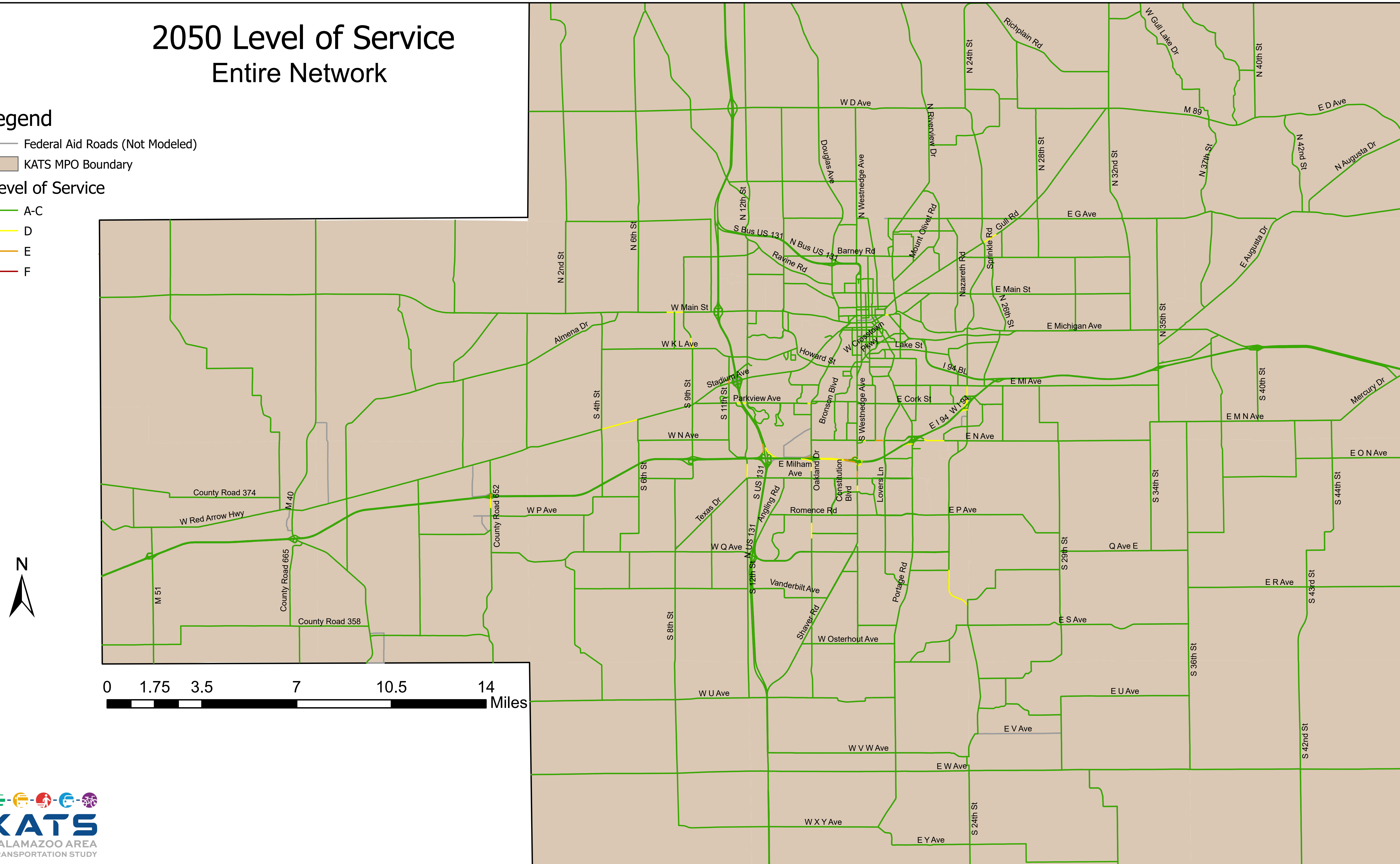
2050 Level of Service
Entire Network

Legend

- Federal Aid Roads (Not Modeled)
- KATS MPO Boundary

Level of Service

- A-C
- D
- E
- F



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2016 CMP Deficiencies

Corridor/ Intersection	From	To	CMP Criteria	Functional Class	EJ Zone
E I-94	Oakland/E I-94 Ramp	E I-94/Westnedge	LOS D	Interstate	No
E I-94/Oakland Ramp	E I-94	Oakland	LOS D	Interstate	No
E I-94/Portage Ramp	E I-94	Portage	LOS D	Interstate	No
E I-94/Sprinkle Ramp	E I-94	Sprinkle	LOS D	Interstate	No
E I-94/Westnedge Ramp	E I-94	Westnedge Ave	LOS E	Interstate	No
N US-131/E I-94	N US-131	E I-94	LOS F	Interstate	No
Oakland	E I-94/Oakland Ramp	Rosewood	LOS D	Principal Arterial	No
Oakland/W I-94 Ramp	W I-94	Oakland	LOS E	Interstate	No
S 9th Street	W Kl Ave	Buckham Wood	LOS D	Principal Arterial	Yes
Sprinkle Road	Cork	Miller Ave	LOS D	Principal Arterial	No
Sprinkle Road	E I-94/Sprinkle Ramp	Sprinkle/W I-94 Ramp	LOS D	Principal Arterial	No
Sprinkle Road	Sprinkle/W I-94 Ramp	Cork Street	LOS E	Principal Arterial	No
Sprinkle/W I-94 Ramp	W I-94	Sprinkle	LOS D	Interstate	No
Stadium Ave	Harrison Street	E Michigan Ave	LOS D	Principal Arterial	Yes
S US-131/W I-94	S US-131/W I-94 & S US-131/E I-94 Ramp	S US-131	LOS E	Interstate	No
Westnedge Ave	E Milham Ave	Boston	LOS E	Principal Arterial	Yes
Westnedge Ave	Gladys	Plaza Dr.	LOS D	Principal Arterial	No
Westnedge Ave	New Hampshire	E I-94/Westnedge	LOS D	Principal Arterial	No
Westnedge/E I-94 Ramp	Westnedge Ave	E I-94	LOS D	Interstate	No
Westnedge/W I-94 Ramp	W I-94	Westnedge Ave	LOS E	Interstate	No
W I-94	W I-94/Oakland Ramp	Westnedge/W I-94 Ramp	LOS D	Interstate	No
W I-94/N US-131 Ramp	N US-131	W I-94	LOS D	Interstate	No
W I-94/Westnedge Ramp	Westnedge Ave	W I-94	LOS D	Interstate	No

2050 CMP Deficiencies

Corridor/ Intersection	From	To	CMP Criteria	Functional Class	EJ Zone
E I-94	Oakland/E I-94 Ramp	E I-94/Westnedge	LOS D	Interstate	No
E I-94/Oakland Ramp	E I-94	Oakland	LOS D	Interstate	No
E I-94/Portage Ramp	E I-94	Portage	LOS D	Interstate	No
E I-94/Sprinkle Ramp	E I-94	Sprinkle	LOS D	Interstate	No
E I-94/Westnedge Ramp	E I-94	Westnedge Ave	LOS E	Interstate	No
N US-131/E I-94	N US-131	E I-94	LOS F	Interstate	No
Oakland	E I-94/Oakland Ramp	Rosewood	LOS D	Principal Arterial	No
Oakland/W I-94 Ramp	W I-94	Oakland	LOS E	Interstate	No
S 9th Street	W Kl Ave	Buckham Wood	LOS D	Principal Arterial	Yes
Sprinkle Road	Cork	Miller Ave	LOS D	Principal Arterial	No
Sprinkle Road	E I-94/Sprinkle Ramp	Sprinkle/W I-94 Ramp	LOS D	Principal Arterial	No
Sprinkle Road	Sprinkle/W I-94 Ramp	Cork Street	LOS E	Principal Arterial	No
Sprinkle/W I-94 Ramp	W I-94	Sprinkle	LOS D	Interstate	No
Stadium Ave	Harrison Street	E Michigan Ave	LOS D	Principal Arterial	Yes
S US-131/W I-94	S US-131/W I-94 & S US-131/E I-94 Ramp	S US-131	LOS E	Interstate	No
Westnedge Ave	E Milham Ave	Boston	LOS E	Principal Arterial	Yes
Westnedge Ave	Gladys	Plaza Dr.	LOS D	Principal Arterial	No
Westnedge Ave	New Hampshire	E I-94/Westnedge	LOS D	Principal Arterial	No
Westnedge/E I-94 Ramp	Westnedge Ave	E I-94	LOS D	Interstate	No
Westnedge/W I-94 Ramp	W I-94	Westnedge Ave	LOS E	Interstate	No
W I-94	W I-94/Oakland Ramp	Westnedge/W I-94 Ramp	LOS D	Interstate	No
W I-94/N US-131 Ramp	N US-131	W I-94	LOS D	Interstate	No
W I-94/Westnedge Ramp	Westnedge Ave	W I-94	LOS D	Interstate	No

Appendix A:
Transportation Deficiency Analysis

Data collected as part of this study was used during the development of the model to provide a check for model base data and assumptions.

Using the outputs of the KATS Travel Demand Model, staff analyzed the corridors in the Metropolitan Planning Area for their level of existing congestion using the base year of the model, 2016 and future congestion using the out year of the plan, 2050.

Areas were considered approaching congestion if they were at a level of service D and over capacity if the level of service was E or F. Areas that were congested from the entire 24-hour period were treated as a congested corridor.

Further details on the congested corridors can be found in Chapter 7 of the 2050 Metropolitan Transportation Plan at www.katsmpo.org.

In future plan development, the CMP network (Principal Arterials and above) maybe be modified to include other roadways that show future congestion.

Appendix B:

CMP Checklist for Metropolitan Transportation Plan Projects

AGENCY

Applicant Agency:
Contact Person:

PROJECT INFORMATION

Project Name:
Project Description:
Project Purpose:

Please provide the current and one historical traffic count from this corridor:

Current Data:	**Historical Data:**
Year ________ Count __________	Year ________ Count __________

***Note: Historical count must have been collected at least five years prior to current count**

Proposed Project Year: ____________

Is the corridor identified as being congested (Level of Service E or F) in or before the proposed project year? ☐ **Yes** ☐ **No**

*Note: All capacity projects must be identified as being congested in or before the year for which the project has been proposed.

What do you feel is the primary cause of congestion along this corridor?

____

____

____

KATS CMP "TOOLBOX" STRATEGIES:

Strategy #1:	Reduce Person Trips or Vehicle Miles/Hours Traveled (VMT/VHT)
Strategy #2:	Shift Automobile Trips to Other Modes
Strategy #3:	Improve Roadway Operations (signal timing, turning lanes, etc.)
Strategy #4:	Adding Thru-Lane Capacity

1) Reduce Person Trips or Vehicle Miles/Hours Traveled

Are land use policies in place to encourage the creation of sidewalks, bike paths, and/or transit facilities along the proposed corridor? Check all that apply.

☐ Sidewalks ☐ Bike Paths ☐ Transit ☐ Rideshare/Carpool ☐ None

Have major businesses along the corridor been informed about strategies to reduce traffic such as telecommuting, flextime scheduling, or a compressed work week?

☐ Yes ☐ No

If "No" was checked for any of the #1 CMP Toolbox Strategies, please explain below why the particular option has not been used to decrease congestion and improve traffic flow along the corridor.

Comments:

____

____

2) Shift Automobile Trips to Other Modes

Are there available transit options along the proposed project corridor?

☐ Yes ☐ No

Are there sidewalks, bicycle lanes, or other non-motorized facilities currently in place along the proposed corridor? Check all that apply

☐ Sidewalks ☐ Bike Paths ☐ Transit ☐ Rideshare/Carpool ☐ None

If "No" was checked for any of the #2 CMP Toolbox Strategies, please explain below why the particular option has not been used to decrease congestion and improve traffic flow along the corridor.

Comments:

____

____

3) Improve Roadway Operations

Have the traffic signals along the corridor been timed for optimal traffic flow?

☐ Yes ☐ No

If yes, when? ____

Is there the potential to improve traffic flow at intersections along the corridor through dedicated turn lanes and/or turning restrictions?

☐ Yes ☐ No

If so, which intersections? ____

Have Intelligent Transportation Systems been implemented along the corridor to help address accidents and other non-recurring congestion?

☐ Yes ☐ No

Has access management been implemented along the corridor to help reduce conflict points and improve traffic flow?

☐ Yes ☐ No

If "No" was checked for any of the #2 CMP Toolbox Strategies, please explain below why the particular option has not been used to decrease congestion and improve traffic flow along the corridor.

Comments:

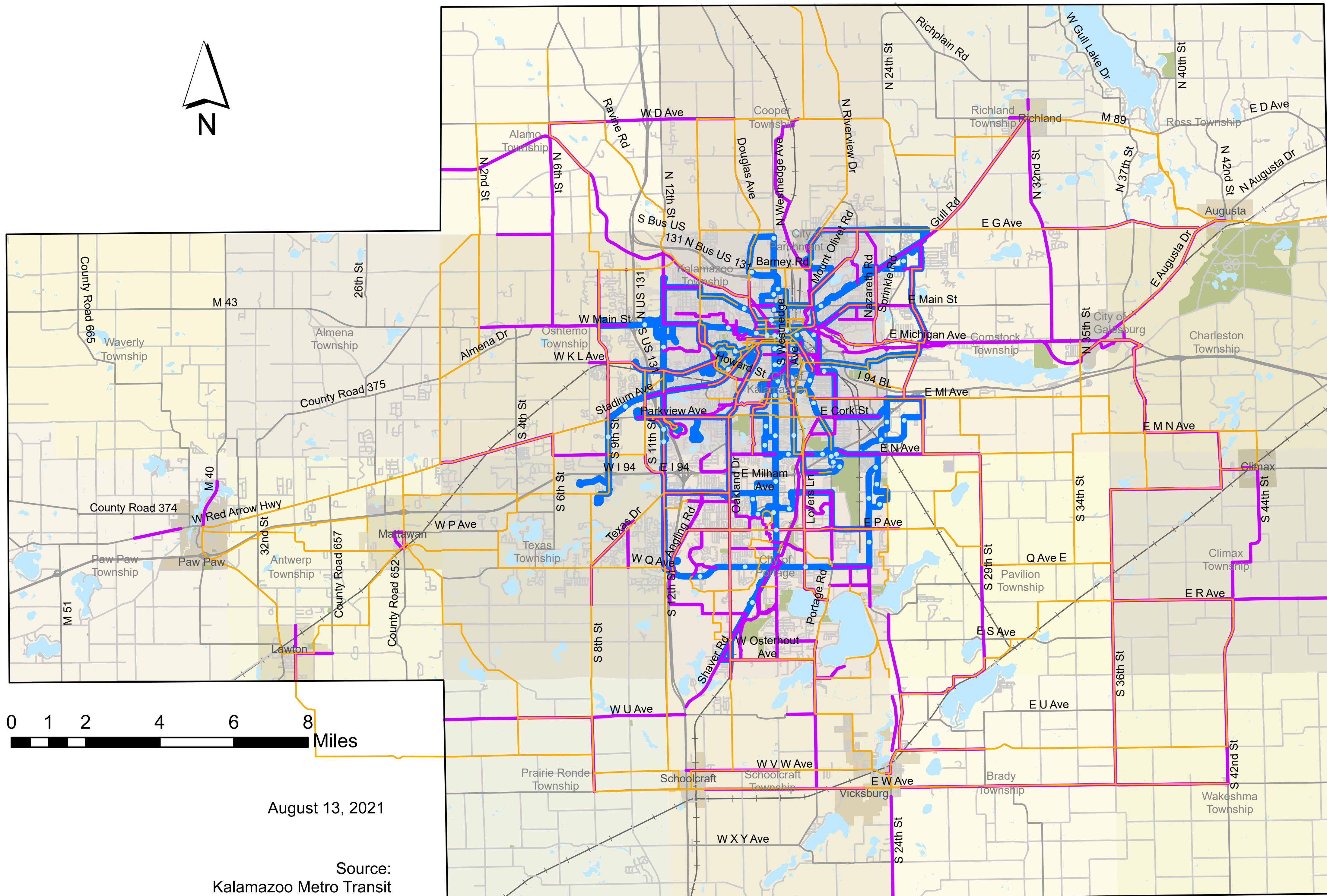
____

____

Metro Routes with Existing and Proposed Facilities

Legend

- Proposed Non-Motorized Facilities
- Existing Non-Motorized Facilities
- Transit Routes
- Gaps in Non-Motorized Routing
- Federal Aid Roads
- Non-Federal Aid Roads
- Railroad
- Lakes
- Parks
- Villages
- MPO Boundary



August 13, 2021

Source:
Kalamazoo Metro Transit
Michigan Geographic Data
Kalamazoo Area Transportation Study

KATS KALAMAZOO AREA TRANSPORTATION STUDY