2020 Congestion Management Process

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December 2020

Akron Metropolitan Area Transportation Study
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This report is the product of a study financed (in part) by the U.S. Department of Transportation's Federal Highway Administration, Federal Transit Administration and the Ohio Department of Transportation.

Cooperative transportation planning by the Village, City and County governments of Portage and Summit Counties and the Chippewa and Milton Township areas of Wayne County; in conjunction with the U.S. Department of Transportation and the Ohio Department of Transportation.

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Introduction

In 2020, the COVID-19 pandemic rapidly altered future transportation assumptions. In the opening months of the pandemic, many businesses were forced to temporarily close or radically change their operations. Statewide stay-at-home orders encouraged people to stay home, schools shifted to virtual classes and employees worked from home if they were able.

Data collected during the first half of 2020 indicated that traffic volumes fell over 40 percent. Transit ridership fell 60 percent. Demand for bicycles left stores with empty shelves and park usage increased. Many normally congested highways flowed smoothly as adjacent parking lots for malls, plazas, schools, and office buildings were nearly empty. While most stay-at-home orders have expired, the question has become what does the future look like? Many businesses have committed to keeping employees home for the foreseeable future. Others have returned to business as usual. What will be the long term impacts of the COVID-19 pandemic on transportation?

The Akron Metropolitan Area Transportation Study (AMATS) is the Metropolitan Planning Organization (MPO) for the Akron metropolitan area. One of the primary duties of AMATS is to identify congestion in the region, as well as to provide solutions to reduce or eliminate it. More than just a daily inconvenience, congestion affects the overall economy, reducing our ability to travel reliably to work, school and to complete the timely delivery of goods and services. Idling vehicles emit unnecessary pollutants into the atmosphere and waste costly and limited fuel.

This AMATS *2020 Congestion Management Process (CMP)* identifies existing congestion on our region's arterials, intersections, freeways, freeway interchanges, and ramps. It examines public transit levels of service availability and freight needs. It also isolates and examines congestion related to traffic incidents. Later sections identify demand and supply-side strategies, as well as other strategies to manage regional congestion. In the final section, specific recommendations to address congested areas will be presented.

The Congestion Management Process

The Congestion Management Process (CMP) is a federally required effort for metropolitan areas that are designated as Transportation Management Areas (TMAs). A TMA is a Census Bureau designated urban area with more than 200,000 residents. The Federal Highway Administration (FHWA) defines a CMP as: "a systematic and regionally accepted approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meets state and local needs."

Each CMP is required to include the following criteria per the Congestion Management Process: A Guidebook by FHWA and CFR 450.322(a).

1. Develop regional objectives
2. Define the CMP network
3. Develop multimodal performance measures
4. Collect data and monitor system performance
5. Analyze congestion problems and needs
6. Identify and assess strategies
7. Program and implement strategies
8. Evaluate strategy effectiveness

A sound, effective CMP integrates with the entire metropolitan planning process, working to achieve the goals and objectives outlined in the long-range transportation plan and influencing the prioritization and programming of projects for the short- and medium-term. CMPs provide transparent structure and information to decision-makers by analyzing system performance and assessing alternative strategies to improve performance. Strategies are attainable policies or projects that are tailored to local, state, and regional needs.

A periodic congestion performance report is published describing the change in federal performance measures. The performance report identifies effective strategies for congestion management, enabling the region to methodically improve system performance.

Regional Objectives

The objective of the CMP is to identify and minimize congestion and delay on the transportation system. Minimizing congestion and delay will improve the efficiency of the movement of people and goods. Congestion management objectives define what the region wants to achieve regarding congestion management, and are an essential part of an objectives-driven, performance-based approach to planning for operations. Congestion management objectives should serve as one of the primary points of connection between the CMP and the Metropolitan Transportation Plan (MTP), and will serve as a basis for defining the direction of the CMP and performance measures that are used. The development of congestion management objectives should rely heavily on stakeholder participation and an understanding of the needs and desires of the public related to congestion. Traditionally, the CMP has often focused on capacity issues, and used engineering measures focused on motor vehicles, such as volume-to-capacity ratios. In defining appropriate congestion management objectives, planners and decision-makers should consider the following questions:

- What does the public really care about with regard to congestion?
- How high of a priority is traffic congestion in the region?
- What type of congestion is most problematic for the public and freight shippers?
- What aspects of congestion are most important to address to support livability, safety, and economic vitality, among other goals?

Regional objectives should ideally focus on outcomes – such as hours of delay, system reliability, and access to traveler information. However, they may also be written using output measures – such as incident clearance time or number of traffic signals retimed annually. In all cases, objectives should be stated in a way that meaningful performance measures can be derived from the objectives. An ideal objective should be **SMART**: **S**pecific, **M**easurable, **A**greed, **R**ealistic, and **T**ime restricted.

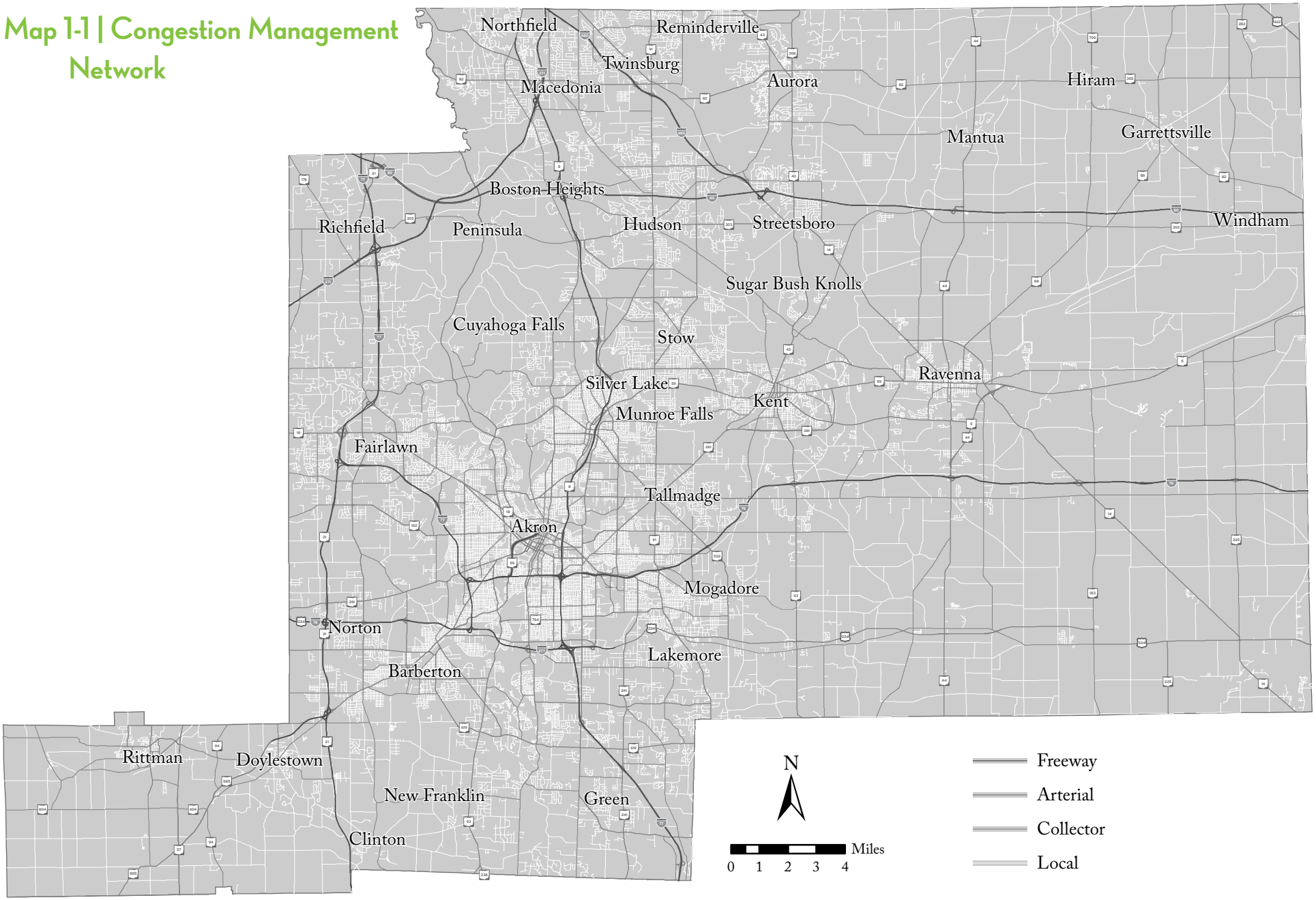
The CMP Network

The roadway network considered for the CMP analysis is made up of 540 miles of roadways in the Akron metropolitan area and is shown on Map 1-1. The following roadways are included in the network for the CMP:

- All roadways included on the National Highway System
- All roadways classified as Principal Arterials in the Federal Functional Classification System
- Major intersections that experience high traffic volumes
- All roadways identified as potential congestion problems by the AMATS Policy Committee
- Other roadways to ensure a continuous CMP highway system

Although the CMP has traditionally focused primarily on the road network, the CMP network should consider the transit, bicycle, and pedestrian networks as well as their interface with the highway network. Doing so can help take advantage of strategies that rely upon the other modes to reduce single occupancy vehicle (SOV) travel. Typically,

Map 1-1 | Congestion Management Network



collectors and local roadways are not included in the roadway analysis of the CMP since it would be time-consuming to address these roadways and they generally have relatively low traffic volumes and congestion levels; however, these facilities should still be considered as potential bicycle, pedestrian, or transit corridors.

Multimodal Performance Measures

Performance measures are a critical component of the CMP. According to Federal regulations, the CMP must include "appropriate performance measures to assess the extent of congestion and support the evaluation of the effectiveness of congestion reduction and mobility enhancement strategies for the movement of people and goods." Performance measures can be used at the regional level and the local level. At the regional level, performance measures can be used to compare plan alternatives in the development of the MTP. At the local level, performance measures are used to identify locations currently experiencing or anticipated to experience congestion problems in the future. They also are used to support assessment and selection of congestion mitigation strategies and evaluation of implemented strategies. Transit performance measures provide information on the conditions experienced by transit travelers. Aspects of transit travel conditions include:

- Passenger crowding or utilization – measured by passenger loads relative to vehicle capacities
- Reliability of performance or schedule adherence – measured by percentage of on-time performance

Freight performance measures focus on the movement of goods that generally utilize other types of performance measures but focus on roadways with a high volume of trucks or designated as freight corridors.

Collect Data and Monitor System Performance

There are many types of data that can be used as part of the CMP process. The following list is not exhaustive, but includes several common types of data that are used in the CMP.

Traffic Volume Counts – It is necessary to collect traffic data in order to measure the performance of the transportation system. Traffic counts are taken on a regular basis on the roadway network. AMATS and ODOT coordinate traffic data collection efforts to make sure all necessary highways are included. This data is then used as an input to model traffic congestion on the existing and future roadway network. Public transit information was received from both public transit agencies (METRO RTA and PARTA) within the AMATS area. This information is summarized in chapter 4. Freight analysis can be found in chapter 5. The CMP focuses on traffic congestion that is identified both at specific locations and at the system level.

Electronic Traffic Datasets – Cell phone data collected by phone companies along highway corridors can be used to report travel speeds and origin-destination data. Cellular service providers and joint ventures with other private companies have begun to offer this service to some transportation agencies. This CMP report utilized data provided through INRIX and Streetlight.

Transit Data – A wide range of transit data is available and gathered from transit agencies, including boarding and alighting statistics, total ridership, on-time performance, and transit vehicle capacity. Public transit information was received from both transit agencies (METRO RTA and PARTA) within the AMATS area.

Bicycle / Pedestrian Data – Many MPOs collect data on the location and condition of bicycle/pedestrian facilities, such as sidewalks, bicycle lanes, and off-road paths. AMATS collects count information on the use of bicycle and pedestrian facilities, either manually or through the use of Miovision technology.

Crash Data – AMATS publishes an annual report detailing traffic crashes in our region; the latest version being published in December 2019. Traffic Crashes 2016-2018 analyzed traffic crashes for arterials and intersections between 2016 and 2018, utilizing crash records provided by the Ohio Department of Public Safety (ODPS) and the Ohio Department of Transportation (ODOT) for the years 2016, 2017 and 2018. This report is useful in determining locations where non-recurring congestion due to incidents is likely to occur.

Analyze Congestion Problems and Needs

Data collected must be translated into meaningful measures of performance. Specific locations with congestion problems need to be identified along with the sources of these problems. The complexity of translating data into meaningful information for analysis varies. Sometimes it takes time to understand the data and how to process it. One example is the use of electronic cell phone data. This data is collected continuously and represents a large volume of data that must be collapsed into some form that provides useful information. While this type of data can be extremely helpful to MPOs in understanding reliability issues and sources of delay, considerable effort may be needed to convert the data into a useful format for planning purposes.

Identify and Assess Strategies

The identification and assessment of appropriate congestion mitigation strategies is a key component of the CMP. AMATS now needs to turn the data and analysis into a set of recommended solutions to effectively manage congestion and achieve congestion management objectives. One size does not fit all and congestion management strategies need to be designed according to the specific characteristics of the highway and adjacent area. These strategies are categorized into five tiers, ranked generally by efficacy of mitigating congestion:

Tier 1: Demand management
Tier 2: Traffic and roadway operational improvements
Tier 3: Public Transportation and multi-model improvements
Tier 4: ITS Strategies
Tier 5: Capacity expansion

Program and Implement Strategies

Implementation of CMP strategies occurs on three levels: system or regional, corridor, and project. Regional-level implementation of congestion management strategies occurs through inclusion of strategies in the fiscally-constrained MTP and the TIP. At the corridor level, more specific strategies such as bicycle and pedestrian improvements and operational improvements can be assessed in studies and implemented using a variety of funding sources such as Surface Transportation Block Grant (STBG) program and Congestion Mitigation and Air Quality (CMAQ) program. Scoring systems could treat projects differently based on location or strategy type according to congestion levels, or community goals. For instance, more points might be allotted to projects in very congested locations, or, specifically to certain types of projects in the urban core than to projects in areas where further development is not desired.

Evaluate Strategy Effectiveness

Evaluation of strategy effectiveness can be seen as either a sequential step within the CMP process or as an on-going process. This is an essential, required element of the CMP that is often overlooked. The primary goal of this action is to ensure that implemented strategies are effective at addressing congestion as intended, and to make changes based on the findings as necessary. Two general approaches are used for this type of analysis:

- System-level performance evaluation - Regional analysis of historical trends to identify improvement or degradation in system performance, in relation to objectives; and
- Strategy effectiveness evaluation - Project-level or program-level analysis of conditions before and after the implementation of a congestion mitigation effort

Findings that show improvement in congested conditions due to specific implemented strategies can be used to encourage further implementation of these strategies, while negative findings may be useful for discouraging similar strategies in similar situations.

What is Congestion?

One of the critical and complex tasks of the CMP is to define congestion. Studies have shown that congestion is a relative rather than an absolute condition. People "feel" roads are congested at different levels of operations. Technically, congestion occurs when the number of vehicles on a facility exceeds the maximum number of vehicles that a roadway or intersection can accommodate at that point in time, whether because of the physical limitations of the facility or because an event (such as rain) has temporarily hindered vehicular movement. Traffic congestion is characterized by slower speeds, longer trip times, vehicular queueing, travel time uncertainty, and increased traffic collisions.

Components of Congestion

While it is difficult to use a single value to describe all individuals' concerns about congestion, there are four components that interact in a congested roadway or system. These components vary among and within urban areas – smaller urban areas, for example, have shorter durations of congestion than larger areas.

Duration – this is how much time congestion affects the travel system.

Extent – this is an estimate of the number of people or vehicles affected by congestion, and by the geographic distribution of congestion.

Intensity – this is the severity of the congestion that affects travel. It is typically used to differentiate between levels of congestion on transportation systems and to define the total amount of congestion.

Reliability – this is the variation in the other three elements. Reliability is a measure of the extent to which the traveler's experience matches their expectation. The variable is the impact of non-recurrent congestion on the transportation system.

Recurring and Non-Recurring Congestion

Research into travelers' views of congestion has shown that predictable travel times are a primary concern. Having reliable travel time is a crucial factor affecting traveler behaviors, including choices of route, departure time, and mode. One commonly accepted definition of travel time reliability, given by the Federal Highway Administration, states that "Drivers are used to congestion and they expect and plan for some delay, but most travelers are less tolerant of unexpected delays. Travel time reliability measures the extent of this unexpected delay." Travelers and firms may account for the variability in their trips and transport of goods by building in time-buffers as insurance against late arrival. This implies that the consequences of late arrivals are costly. Congestion is broadly categorized as either recurring (predictable) or non-recurring (unpredictable) congestion. Congestion, both recurring and non-recurring, vary significantly depending on the season, day of the week, and even time of day. Furthermore, both recurring and nonrecurring congestion may occur at the same time, exacerbating any event.

Recurring Congestion

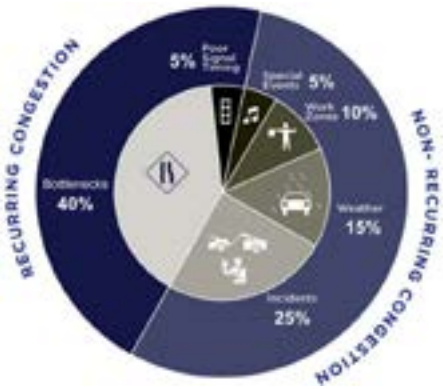
Recurring congestion is congestion that occurs repeatedly at predictable times and locations, e.g. at bottlenecks or on corridors with poorly coordinated traffic signals, usually during the peak hour periods. Simply put, recurring congestion occurs because travel demand exceeds system capacity. There are many strategies available to mitigate this type of congestion through demand management, operational improvements, and multimodal strategies. Integration of land-use and transportation decisions enables agencies to coordinate efforts to address this demand side of congestion. Elimination of all recurring congestion may not be either feasible (due to physical and financial constraints) or desirable (in terms of the implications to community of unfettered vehicular travel). Recurring congestion is generally considered the least frustrating because its effects are known and can be planned for.

Non-Recurring Congestion

In contrast, non-recurring congestion incidents can occur at any time, including during non-peak travel times, and is often associated with traffic crashes, weather events, special events, work zones, and emergencies. This is the congestion that most often frustrates people. It is especially bad when a non-recurring incident magnifies the magnitude and extent of congestion during "normal" recurring congestion. Non-recurring congestion is difficult to address without proper prior planning. The sources of non-recurring congestion are broad:

- Roadway debris
- Roadway construction and maintenance work zones
- Inclement weather
- Disabled vehicles
- Law enforcement activities
- Traffic crashes
- Special events

The chart to the right illustrates the distribution of the various types of congestion on U.S. transportation networks.



Congestion Caused by Trucks

Trucks are often slower to get moving; therefore, they can add to the length of congestion time. Once slowed down a truck will take longer to get started than a passenger car. Roadways with high volumes of truck might be more congested then those that are almost exclusively passenger cars. It is very important to recognize corridors with high percentage of trucks when analyzing congestion. Truck freight movement is very important to keep the economy thriving.

Congestion Caused by Railroad Grade Crossings

An at-grade crossing is where a railway and roadway intersect. The AMATS area has a number of at-grade crossings with significant train and vehicle volumes. This source of congestion is often overlooked when addressing congestion. When a passing train delays traffic on a busy roadway it creates a large platoon of vehicles that cause problems throughout the roadway network. Ideally, highway-rail grade crossings would be separated if feasible.

Roadway Methodology and Analysis

Historically traffic congestion in the AMATS CMP was measured by using a volume to capacity (V/C) ratio. This ratio is based on the volume of traffic during peak hours verses the capacity of the roadway. This method requires the collecting traffic volume data and knowing the physical characteristics of the highway itself. However in recent years new technology has enabled traffic engineers and planners to obtain traffic data through the collection of cell phone and other GPS device location data. Traffic data collected in this manner is done over a period of months or years and is more representative than data collected over one or two days. Once collected this data is aggregated and analyzed to provide transportation analysis.

INRIX is one such aggregator and monitors real-time traffic flow on some 260,000 miles of roadway in the United States. INRIX data is made available to AMATS through the Ohio Department of Transportation (ODOT). As real-time data is collected it is then stored and becomes historical data. The data used for this CMP Report was collected over the calendar year of 2017.

The first analysis portion of the CMP was done using data from the INRIX platform. However there were some streets and roads that needed analyzed that INRIX did not have data for. For those remaining segments AMATS used another application called Streetlight. This application uses the same principles that INRIX allowed AMATS to develop unique highway segments for analysis. The analysis process is different but the results are calculated using a similar methodology as INRIX.

The segment lengths using INRIX are predetermined and cannot be altered. In Summit and Portage counties there were 1,627 predetermined segments. The Streetlight platform allows AMATS to identify termini for segments. AMATS used segments used in previous CMP reports as a guideline when defining Streetlight segments. Once INRIX and Streetlight data was combined, AMATS further defined the segments as: Freeway Segments, Freeway Ramps, Freeway Interchanges, Arterial Segments, and Intersections.

Each segment that is bi-directional is analyzed by direction. For example, if a segment runs east and west it is analyzed in the westbound direction and the eastbound direction separately. The congestion analyses focused on three time periods:

- Morning from 5:00 AM to 11:00 AM
- Mid-day from 11:00 AM to 4:00 PM
- Evening from 4:00 PM to 10:00 PM

The daily AM peak and the PM peak were derived from the morning and evening time periods. Some areas that have a high concentration of restaurants and retail businesses may also have a mid-day peak and these were also considered. Only weekdays were used since this is when most recurring congestion occurs. The roadway network considered for the CMP analysis is made up of 540 miles of roadways in the Akron metropolitan area and is shown on Map 1-1, in Chapter 1). The following roadways are included in the network for the CMP analysis:

- All roadways included on the National Highway System
- All roadways classified as Principal Arterials in the Federal Functional Classification System
- Major intersections that experience high traffic volumes
- All roadways identified as potential congestion problems by the AMATS Policy Committee
- Other roadways to ensure a continuous CMP highway system

Next congestion was determined. According to INRIX the definition of congestion is anytime the travel speed falls below 65 percent of the free-flow speed. The free flow speed is determined by measuring what the speed is when the traffic is presumed to be flowing unrestricted. The free-flow speed is not the speed limit. The free-flow speed on a highway that has a posted speed limit of 55 miles per hour (mph) would normally be between 60 and 65 mph. The 65 percent of free-flow speed was chosen for all roadway segment type except freeway segments. AMATS decided to use 75 percent of free-flow speed on freeway segments given their higher speed and smaller changes can have a greater impact on the system.

The speeds were compiled in 15 minute periods and averaged over the entire year for the same day and time period. If an event such as an accident or construction activity slowed traffic just temporarily the other days would average out that event. In the analysis the real speed has to be less than 65 percent (75 percent for freeway segments) of the free-flow speed averaged over four consecutive 15 minute periods or one hour to be considered congested.

Based on the methodology described above, AMATS completed a roadway analysis. A comprehensive listing of all freeway segments, freeway ramps, freeway interchanges, arterial segments, and intersections analyzed is listed in Appendix A. All congested roadways are listed in the recommendations chapter sorted from most to least congested. Recommendations for improving these congested segments are in Chapter 10 of this report.

Transit Methodology and Analysis

Funding and promoting transit is a key element in a multi-modal transportation system. With a reliable and efficient transit system in place, overall roadway congestion can be relieved. Improving transit operations, improving access to transit, and expanding transit service can help reduce the number of vehicles on the road by making transit more attractive and accessible. In this chapter transit level of service has been analyzed. It is discussed more fully in the AMATS *2020 Transit Plan*.

There are two primary providers of public transportation in our region: METRO RTA, which serves Summit County, and the Portage Area Regional Transportation Authority (PARTA), which serves Portage County. Both agencies operate traditional fixed-route bus service, demand-response services for low-income, elderly and disabled passengers, and express bus service to key communities, such as Cleveland. AMATS assists these local transit agencies in providing the best possible public transportation service for the greater Akron area.

While passenger overcrowding is not a general system-wide issue in our area, on-time performance and reliability are important to effective transit service. Transit on-time performance is affected by congestion on the roadway as well as passenger loading and unloading, payment, etc. Congested transit routes can lead to poor on-time performance and unreliability of the transit network. This is an issue to those who rely on transit, especially vulnerable populations such as individuals and families living in poverty, older adults, and the disabled. When transit is efficient and reliable, it can provide an effective alternative to single occupancy vehicle travel and help reduce traffic congestion.

Transit Headway Performance Analysis

In previous reports, AMATS staff has analyzed the Level of Service of routes for both METRO RTA and PARTA. For this report, a different approach has been used that better characterizes the service that is provided by these transit agencies.

Superior Performance – Frequent service, passengers don't need schedules

Acceptable Performance – Service unattractive to choice riders, maximum desirable wait time

Potential Service Improvement – Extended wait time, service unattractive to all riders

Headway Performance Analysis

METRO's Downtown Akron Shuttle (DASH) service is listed as Superior Performance. The DASH is a recent addition to METRO's service, and provides frequent service every 10 minutes between the hours of 7 a.m. and 7 p.m. as well as 15 minute service on weekday evenings. The route quite often attracts choice riders - people who have a car or another transportation option. Attracting choice riders to transit helps alleviate traffic congestion, particularly during peak periods of travel.

METRO RTA shows the vast majority of their routes as Potential Service Improvement, which means that passengers are waiting a minimum of 30 minutes for the bus to pick them up, and many of them are waiting even longer. The majority of routes after 6 pm have extended wait times, which make them unattractive to riders, while some routes don't run at all. This creates a burden for those workers whose shift ends after this time. Retail and restaurant workers who very often return home in the evening or late at night are more likely to use transit due to low-wage jobs, and have to wait over an hour for a bus. METRO could work to improve the headways for second-shift workers by adding buses to routes in the evening; however this would require large capital and operating expenses.

METRO is in the process of collecting feedback for their Strategic Plan, which they expect to complete in the summer of 2020. Additionally, they are currently exploring the idea of adding a Bus Rapid Transit (BRT) corridor to the Akron area. This could greatly improve the overall LOS for the agency. The costs for BRT are lower than for light passenger rail service.

Characteristics of BRT may include:

- Dedicated Bus Lanes
- Signal preemption
- Increased Bus Frequency
- Off-board Fare Collection
- Platform-level boarding

METRO anticipates a decision by early 2021 regarding the feasibility of a BRT being added to their system. A consultant has already been hired and the process has commenced.

PARTA removed three routes and added one since the last time their Headway Performance was studied in 2016. About half of the routes are split between being Superior Performance and Acceptable Performance. This means that riders wait at most 15 minutes for the bus, making the service attractive to most transit riders. The other half of the routes is listed as Potential Service Improvement. Although this type of service is extremely undesirable due to its extended wait times, and choice riders would likely find another form of transportation, these routes provide the opportunity to increase bus service and attract new riders. In 2016, PARTA had more routes

operating frequently, but had some routes that didn't run at all in the evenings. Now, all routes run approximately 16 hours a day on weekdays, with limited service on the weekends. This change could mean that there are fewer buses to go around, reducing the frequency for bus service and contributing to the reduction in performance. More buses and more drivers are a costly solution, but would give the routes increased frequency.

Table 4-1 | PARTA Fixed-Route Headway Performance Analysis

ROUTE #	DESCRIPTION	AM PEAK (7-9 AM) AVG HEADWAY (MINS)	HEADWAY PERFORMANCE	DAYTIME (9AM - 4PM) AVG HEADWAY (MINS)	HEADWAY PERFORMANCE	PM PEAK (4-6 PM) AVG HEADWAY (MINS)	HEADWAY PERFORMANCE	EVENING (7 PM +) AVG HEADWAY (MINS)	HEADWAY PERFORMANCE
COUNTY SERVICE									
30	Interurban West (Kent to Stow)	30	AP	30	AP	30	AP	38	PSI
35	Interurban East (Kent to Ravenna)	30	AP	30	AP	30	AP	38	PSI
40	Suburban North (Kent)	45	PSI	45	PSI	45	PSI	65	PSI
45	Suburban South (Kent)	45	PSI	45	PSI	45	PSI	58	PSI
60	Black Squirrel	30	AP	30	AP	-	PSI	-	PSI
70	Windham / Garrettsville	105	PSI	105	PSI	105	PSI	105	PSI
80	Raven West (Ravenna)	60	PSI	60	PSI	60	PSI	60	PSI
85	Raven East (Ravenna)	60	PSI	60	PSI	60	PSI	60	PSI
90	Akron Express	90	PSI	105	PSI	90	PSI	-	PSI
100	Cleveland Express								
CAMPUS SERVICE									
51	Campus Loop	21	AP	15	AP	15	AP	30	AP
53	Reverse Loop	30	AP	15	AP	30	AP	30	AP
55	Allerton	15	AP	15	AP	15	AP	15	AP
57	Stadium Loop (Summer / KSU Breaks)	30	AP	30	AP	30	AP	-	PSI
58	Summit East / Front Campus	8	SP	8	SP	12	SP	31	PSI
59	Stadium Night Loop	-	PSI	-	PSI	-	PSI	30	AP

Table 4-2 | METRO RTA Fixed-Route Headway Performance Analysis

ROUTE #	DESCRIPTION	AM PEAK (7-9 AM) AVG HEADWAY (MINS)	HEADWAY PERFORMANCE	DAYTIME (9AM - 4PM) AVG HEADWAY (MINS)	HEADWAY PERFORMANCE	PM PEAK (4-6 PM) AVG HEADWAY (MINS)	HEADWAY PERFORMANCE	EVENING (6 PM +) AVG HEADWAY (MINS)	HEADWAY PERFORMANCE
LOCAL ROUTES									
1	West Market	21	AP	21	AP	31	PSI	36	PSI
2	Arlington	22	AP	21	AP	31	PSI	38	PSI
3	Copley / Hawkins	24	AP	21	AP	29	AP	69	PSI
4	Delia / N Hawkins	33	PSI	48	PSI	29	AP	-	PSI
5	Joy Park / Gilchrist	43	PSI	51	PSI	53	PSI	-	PSI
6	East Market / Lakemore	30	AP	33	PSI	28	AP	66	PSI
7	Cuyahoga Falls Ave	32	PSI	36	PSI	37	PSI	70	PSI
8	Kenmore / Barberton	35	PSI	41	PSI	39	PSI	70	PSI
9	Vern Odom Blvd / East Ave	40	PSI	37	PSI	38	PSI	60	PSI
10	Howard / Portage Trail	32	PSI	46	PSI	51	PSI	71	PSI
11	South Akron	87	PSI	75	PSI	-	PSI	-	PSI
12	Tallmadge Hill	28	AP	38	PSI	38	PSI	57	PSI
13	Grant / Firestone Park	32	PSI	38	PSI	44	PSI	70	PSI
14	Euclid / Barberton Express	26	AP	36	PSI	34	PSI	68	PSI
17	Brown / Inman	25	AP	40	PSI	58	PSI	71	PSI
18	Thornton / Manchester	80	PSI	61	PSI	77	PSI	72	PSI
19	Eastland	46	PSI	43	PSI	46	PSI	61	PSI
21	South Main	40	PSI	40	PSI	40	PSI	40	PSI
24	Lakeshore	43	PSI	34	PSI	50	PSI	70	PSI
26	W. Exchange / White Pond	37	PSI	40	PSI	69	PSI	80	PSI
28	Merriman Valley	69	PSI	56	PSI	40	PSI	-	PSI
30	Goodyear / Darrow	40	PSI	40	PSI	43	PSI	70	PSI
33	State Road / Wyoga Lake	60	PSI	40	PSI	120	PSI	95	PSI
34	Cascade Village / Uhler	34	PSI	34	PSI	43	PSI	71	PSI
CIRCULATOR ROUTES									
50	Montrose Circulator	35	PSI	35	PSI	35	PSI	33	PSI
51	Stow Circulator	36	PSI	36	PSI	37	PSI	36	PSI
53	Portage / Graham	44	PSI	74	PSI	-	PSI	-	PSI
59	Chapel Hill Circulator	50	PSI	35	PSI	45	PSI	33	PSI
DOWNTOWN CIRCULATOR									
54	DASH	10	SP	10	SP	10	SP	14	
NORTH COAST EXPRESS COMMUTER SERVICE TO CLEVELAND									
60	NCX - Cuyahoga Falls to Cleveland	35	PSI	-	PSI	60	PSI	-	PSI
61	NCX - RKP to Cleveland	26	AP	121	PSI	33	PSI	-	PSI
TOWN CENTER ROUTES									
101	Richfield / Bath	55	PSI	104	PSI	-	PSI	-	PSI
102	Northfield	54	PSI	48	PSI	41	PSI	66	PSI
103	Stow / Hudson	113	PSI	93	PSI	94	PSI	-	PSI
104	Twinsburg / Creekside	91	PSI	101	PSI	94	PSI	68	PSI
110	Green / Springfield	55	PSI	99	PSI	53	PSI	-	PSI

On-Time Performance Analysis

Transit Reliability or schedule adherence is an important component of transit service. If transit is able to maintain acceptable levels of reliability it provides confidence to passengers that they will not miss their bus or be late to their intended destination. Both METRO RTA and PARTA maintain on time data for all of their transit routes. The table below shows that METRO RTA and PARTA maintain strong reliability and overall have improved the reliability of their system from 2018 to 2019.

Table 4-3 | PARTA On-Time Performance Analysis

ROUTE #	DESCRIPTION	2018 ON-TIME %	2019 ON-TIME%
30	Interurban West (Kent to Stow)	85.4%	85.5%
35	Interurban East (Kent to Ravenna)	73.8%	78.3%
35S	Interurban East (Kent to Ravenna) Saturday	77.1%	74.1%
40	Suburban North (Kent)	80.3%	77.7%
45	Suburban South (Kent)	85.0%	81.3%
51	Campus Loop	74.9%	77.5%
53	Reverse Loop	68.9%	79.3%
55	Allerton	37.5%	68.9%
57	Stadium Loop (Summer / KSU Breaks)	70.8%	76.0%
58	Summit East / Front Campus	60.7%	65.3%
59	Stadium Night Loop	69.8%	76.3%
60	Black Squirrel	60.0%	75.2%
70	Windham / Garrettsville	84.9%	83.4%
80	Raven West (Ravenna)	83.5%	80.1%
85	Raven East (Ravenna)	84.6%	86.8%
90	Akron Express	74.1%	75.9%
100	Cleveland Express	57.0%	49.9%
Annual System Total On-Time %		**71.9%**	**76.0%**

Table 4-4 | METRO RTA On-Time Performance Analysis

ROUTE #	DESCRIPTION	2018 ON-TIME %	2019 ON-TIME%
1	West Market	57.8%	65.6%
2	Arlington	74.1%	74.8%
3	Copley / Hawkins	72.3%	75.9%
4	Delia / N Hawkins	74.5%	75.5%
5	Joy Park / Gilchrist	67.5%	68.0%
6	East Market / Lakemore	74.8%	75.7%
7	Cuyahoga Falls Ave	79.8%	76.2%
8	Kenmore / Barberton	79.9%	80.6%
9	Vern Odom Blvd / East Ave	73.6%	74.2%
10	Howard / Portage Trail	71.8%	74.7%
11	South Akron	81.6%	83.7%
12	Tallmadge Hill	84.6%	83.3%
13	Grant / Firestone Park	84.5%	86.6%
14	Euclid / Barberton Express	83.1%	81.6%
17	Brown / Inman	74.9%	73.3%
18	Thornton / Manchester	78.1%	79.3%
19	Eastland	78.7%	81.6%
21	South Main	80.5%	89.7%
24	Lakeshore	52.4%	53.8%
26	W. Exchange / White Pond	78.9%	79.1%
28	Merriman Valley	81.9%	78.5%
30	Goodyear / Darrow	81.6%	81.7%
33	State Road / Wyoga Lake	81.4%	81.3%
34	Cascade Village / Uhler	75.0%	73.1%
50	Montrose Circulator	82.5%	83.8%
51	Stow Circulator	81.5%	79.0%
53	Portage / Graham	83.1%	79.5%
59	Chapel Hill Circulator	86.9%	87.2%
54	DASH	72.2%	67.3%
60	NCX - Cuyahoga Falls to Cleveland	61.4%	59.2%
61	NCX - RKP to Cleveland	57.7%	58.4%
101	Richfield / Bath	72.0%	66.3%
102	Northfield	58.4%	61.0%
103	Stow / Hudson	69.6%	61.3%
104	Twinsburg / Creekside	66.7%	63.4%
110	Green / Springfield	71.6%	70.0%
Annual System Total On-Time %		**75.0%**	**75.6%**

Freight Methodology and Analysis

The movement of freight is an important part of a fully functioning transportation system. The efficient movement of freight within and through a region is critically important to industry, retail commerce, agriculture, international trade and terminal operators. Metropolitan areas with their air cargo airports, freight yards, trucking terminals, and shipping facilities, are especially affected by freight movement issues. Freight congestion can include delays at airports, water ports, rail facilities, and on highways. In this CMP we mostly focus on highway-based freight congestion, where AMATS could assist in funding improvements.

The AMATS freight planning process:

- Defines those elements of the area's transportation system that are critical for the efficient movement of freight
- Identifies ways to measure system performance in terms of freight movement
- Develops freight-oriented data collection and modeling in order to identify problems and potential solutions, and ultimately
- Recommends broad strategies and specific projects designed to improve the movement of freight throughout the transportation network

The highest priority needs in the AMATS area regarding freight movement involve improvements to the highway system. The AMATS *Highway Preservation Needs* Report and the *Congestion Management Process (CMP)* Report address the needs of the AMATS area in terms of highway improvements that streamline the flow of freight in the region.

AMATS's freight planning process includes three primary strategies:

- Developing and maintaining databases and analysis tools for decision-making
- Interacting with AMATS members and freight stakeholders to better understand the freight system, identify common issues, and build consensus
- Incorporating freight into the regional transportation planning process

Trucks

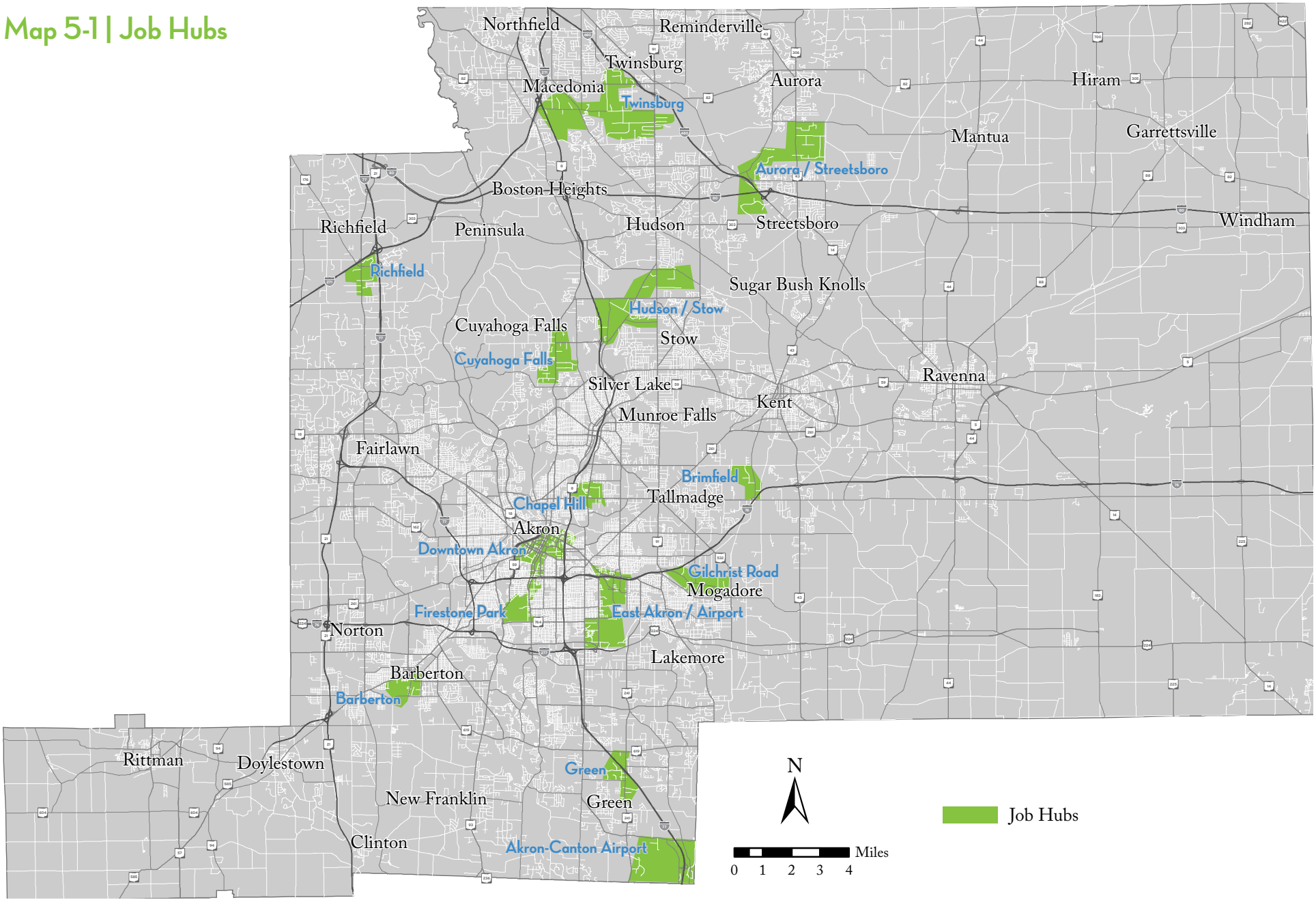
Freight movement, by way of trucks, is heavily concentrated on freeways and major state routes. The number of trucks on these roads range from 50 to 15,000 trucks per day, with I-76 through Summit and Portage counties being the busiest freeway for trucks. Highway improvements such as the widening of I-76 east of SR 21 and the improvement of the High St / Broadway St interchange along with planned improvements to the Central Interchange and widening of SR 8 and I-77 through and south of Akron will help improve the efficiency of freight movement on the area's roadways.

In its *2020 Freight Plan*, AMATS analyzed truck freight as it relates to key job hubs in the greater Akron area. Job hubs were identified based on the number of traded-sector jobs in a particular area, with a focus on places with job density in the top 5 percent in the region. The job hubs are clusters of employment in sectors of the economy like manufacturing or business consulting that can export (or trade) goods and services outside of Northeast Ohio. Table 5-1 below includes congested locations near the 14 job hubs identified in the AMATS *2020 Freight Plan*.

Table 5-1 | Job Hub Congestion Locations

LOCATION	DESCRIPTION	JOB HUB
Akron	Firestone Blvd from S Main St to Grant St	Firestone Park
Akron	Firestone Blvd from Grant St to S Main St	Firestone Park
Akron	Wilbeth Rd (SR-764) at Manchester Rd (SR-93)	Firestone Park
Akron	Euclid Ave from Rand St to Dart Ave	Downtown Akron
Akron	SR-8 SB from Forge St to E Market St (SR-18)	Downtown Akron
Akron	SR-8 SB from Perkins St Off Ramp to Perkins St On Ramp	Downtown Akron
Akron	SR-8 SB from Glenwood Ave On Ramp to Perkins St Off Ramp	Downtown Akron
Akron	W Exchange St from Paul Williams St to S Main St	Downtown Akron
Akron	Perkins St (SR-59) from Union St to SR-8 SB Ramps	Downtown Akron
Akron	SR-8 SB from Tallmadge Ave Off Ramp to Tallmadge Ave On Ramp	Chapel Hill
Akron	SR-8 SB from E Cuyahoga Falls Ave On Ramp to Tallmdage Ave Off Ramp	Chapel Hill
Akron	E Tallmadge Ave (SR-261) from Gorge Blvd to SR-8 SB Ramps	Chapel Hill
Akron	Home Ave from Annapolis Ave to Howe Ave	Chapel Hill
Akron	E Tallmadge Ave (SR-261) from SR-8 SB Ramps to Gorge Blvd	Chapel Hill
Akron	Home Ave from Howe Ave to Annapolis Ave	Chapel Hill
Cuyahoga Falls	State Rd from Marc Dr to Bath Rd	Cuyahoga Falls
Cuyahoga Falls / Stow	Steels Corners Rd from Wyoga Lake Rd to Bridgewater Pkwy	Cuyahoga Falls
Cuyahoga Falls	State Rd from Marc Dr to Steels Corners Rd	Cuyahoga Falls
Cuyahoga Falls	State Rd from Bath Rd to Graham Rd	Cuyahoga Falls
Cuyahoga Falls	State Rd from Quick Rd to Steels Corners Rd	Cuyahoga Falls
Green	Massillon Rd (SR-241) from I-77 SB Ramps to I-77 NB Ramps	Green
Green	Massillon Rd (SR-241) from I-77 NB Ramps to I-77 SB Ramps	Green
Brimfield Township	Tallmadge Rd from I-76 WB Ramps to I-76 EB Ramps	Brimfield
Brimfield Township	Tallmadge Rd from I-76 EB Ramps to I-76 WB Ramps	Brimfield
Macedonia	I-271 NB Off Ramp to SR-8	Twinsburg
Macedonia	SR-8 SB from I-271 SB On Ramp to I-271 NB Off Ramp	Twinsburg
Twinsburg	E Aurora Rd (SR-82) from I-480 WB Ramps to Darrow Rd (SR-91)	Twinsburg
Streetsboro	SR-14 from I-80 Ramps to SR-43	Aurora / Streetsboro
Streetsboro	I-480 SB Ramp to I-80	Aurora / Streetsboro
Streetsboro	Aurora Hudson Rd from I-480 SB Ramps to Frost Rd	Aurora / Streetsboro
Akron	Waterloo Rd (US-224) at George Washington Blvd (SR-241)	East Akron / Airport
Akron	Waterloo Rd (US-224) at George Washington Blvd (SR-241)	East Akron / Airport
Akron	Waterloo Rd at Arlington St	East Akron / Airport
Richfield	Wheatley Rd at Brecksville Rd	Richfield
Richfield	Brecksville Rd at Wheatley Rd	Richfield
Richfield	Brecksville Rd at Wheatley Rd	Richfield
Richfield	Wheatley Rd at Brecksville Rd	Richfield
Stow	Steels Corners Rd from Bridgewater Pkwy to SR-8	Hudson / Stow
Hudson	Terex Rd from Hudson Dr to Darrow Rd (SR-91)	Hudson / Stow
Stow	Steels Corners Rd from SR-8 to Hudson Dr	Hudson / Stow
Hudson	Terex Rd from Darrow Rd (SR-91) to Hudson Dr	Hudson / Stow

Map 5-1 | Job Hubs



Railways

There are approximately 393 at-grade crossings in the AMATS area (many are on abandoned or out of service rail lines). High volume crossings are prioritized by scoring the number of trains per day and the average daily traffic volume (ADT). The table below lists locations that have scores greater than 100. The number of trains per day varies from year to year depending on the count locations provided by ORDC and PUCO. Ideally, highway-rail grade crossings would be separated if feasible. Grade separation projects eliminate safety and delay concerns by redirecting the vehicle, pedestrian and bicycle traffic above or below the railroad tracks. Construction of overpasses and underpasses are very costly, and not always feasible due to geographic configuration.

Table 5-2 | High-Volume At-Grade Crossings

RANK	STREET (LOCATION)	TRAINS PER DAY	VEHICLE ADT	SCORE
1	Stow Rd (Hudson)	70	10,280	720
2	Broad Blvd (Cuyahoga Falls	32	15,385	492
3	S Main St (Munroe Falls)	27	16,694	451
4	E Twinsburg Rd (Macedonia)	74	5,550	411
5	Bailey Rd (Cuyahoga Falls)	27	13,315	360
6	E Hines Hill Rd (Hudson)	62	3,710	230
7	Hudson Run Rd (Barberton)	32	5,161	165
8	Fairview Ave (Barberton	29	5,251	152
9	W Summit St (Kent)	27	5,438	147
10	W Waterloo Rd (Twinsburg Township)	31	4,383	136
11	N Arlington St (Akron)	27	4,630	125
12	E Highland Rd (Twinsburg Township)	10	11,679	117
13	W Market St (Akron)	4	25,530	102

Freight recommendations are included in Chapter 9 of this report along with other highway and transit recommendations.

Incident-Related Traffic Congestion

Incident-related traffic congestion is congestion that occurs due to a non-recurring incident. In most cases, this incident is a traffic crash. While crashes can happen anywhere at any time, some locations are more prone to crashes than others. Locations with both frequent crashes and recurrent congestion will be significantly more congested. Effective transportation planning requires that incident-related congestion be analyzed.

In order to analyze incident-related traffic congestion, traffic crash data must be reviewed. AMATS publishes an annual report detailing traffic crashes in our region; the latest version being published in December 2019. *Traffic Crashes and Safety Performance Measures 2016-2018* analyzed traffic crashes for arterials and intersections between 2016 and 2018, utilizing crash records provided by the Ohio Department of Public Safety (ODPS) and the Ohio Department of Transportation (ODOT) for the years 2016, 2017 and 2018.

Arterials

Areas of incident-related congestion are determined based on a composite score which considers both number of crashes and their severity to determine locations where incident-related congestion is most likely to occur. For a complete description of how the composite score is determined, please review the methodology in the AMATS *Traffic Crashes and Safety Performance Measures 2016-2018* report. Table 6-1 and Map 6-1 displays the top 50 arterial locations.

Intersections

Similar to arterial segments, areas of incident-related intersection congestion are determined based on composite score. The top 50 high crash intersections are listed on Table 6-2 and displayed on Map 6-2.

Locations where the two previously mentioned lists coincide with areas of recurring congestion are shown on Map 6-3.

Freeways

The analysis of freeway crashes in the AMATS area is done by the central office of the Ohio Department of Transportation (ODOT) in Columbus. ODOT's analysis of freeways is done using their own methodology which is derived from the Highway Safety Manual. The freeway system is divided into rural and urban and is analyzed by examining segments that are one-tenth of a mile long.

In an effort to make data-driven decisions and determine operationally sensitive corridors throughout the state, ODOT has developed the Traffic Operations Assessment Systems Tool (TOAST). In TOAST routes are segmented into the State Priority System with breaks at the urban area boundaries, interchange center points, and road functional class changes. Multiple data categories make up TOAST. For each category, data ranges were normalized into values of 0-10, then multiplied by a weighting factor. The total score for a route is calculated as a percent based on the score for each category divided by the total possible maximum score. In general, the higher the percent, the better the route is performing; whereas, the lower the percent, the more likely a route is to benefit from improvements. The data categories that make up TOAST are listed below:

Travel Time Performance – Percent of time motorists can travel at or near (90%) of the reference speed (free-flow speed defined by data provider).

Bottlenecks – A potential bottleneck is detected when speeds on a segment drop to 65% of reference speeds and cause at least a two-minute delay.

Incident Clearance – The time from report of an incident until the entire scene is cleared.

Secondary Crashes – Percent of crashes that occurred as a result of a previous incident.

Volume Per Lane – Calculated based on a weighted average for each segment.

Freight Corridors – Weighted average of percent trucks (average daily truck volume ÷ average daily total volume).

Safety Performance – A route's potential for safety improvement by density based on its peer group.

ODOT has analyzed the freeway network in the AMATS area. The results of this analysis are shown on Map 6-4.

Table 6-1 | High Crash Roadway Segments 2016-2018

RANK	ROADWAY SECTION	FROM	TO	LENGTH (MILES)	AVERAGE DAILY TRAFFIC	TOTAL CRASHES	CRASHES PER MILE PER YEAR	CRASH RATE	SEVERITY INDEX	BIKE RELATED	PED RELATED	LOCATION
1	E Main St (SR-59)	Willow St	Luther Ave	0.41	18,195	86	69	10.46	1.53		2	Kent
2	S Cleveland-Massillon Rd	IR-77	Rosemont Blvd / Elgin Dr	0.53	21,780	65	41	5.15	1.71			Fairlawn
3	Medina Rd (SR-18)	IR-77	Cleveland-Massillon Rd (CR-17)	0.69	30,889	149	71	6.34	1.54			Copley Twp
4	W Market St (SR-18)	Cleveland-Massillon Rd	Smith Rd	0.57	24,530	95	56	6.21	1.53		2	Fairlawn
5	Copley Rd (SR-162)	St Micheals	S Hawkins Ave	0.49	9,328	39	26	7.78	1.62		1	Akron
6	S Prospect St	Ravenna SCL	Lake Ave	0.18	9,640	11	21	5.84	2.09			Ravenna
7	E Aurora Rd (SR-82)	Olde Eight Rd	SR-8	0.82	15,150	76	31	5.61	1.50			Macedonia
8	Canton Rd (CR-66)	Sanitarium Rd (CR-136)	Waterloo Rd (US-224)	1.01	14,870	85	28	5.19	1.56		2	Springfield Twp
9	Ghent Rd	W Market St (SR-18)	Smith Rd	0.38	9,230	36	31	9.31	1.44			Fairlawn
10	SR-14	SR-303 (W)	SR-303 (E)	0.36	25,578	51	48	5.10	1.47			Streetsboro
11	SR-14 / SR-44	SR-59	SR-5 (end SR-14 overlap)	0.39	17,345	34	29	4.63	1.59			Ravenna Twp
12	Arlington Rd	Turkeyfoot Lake Rd (SR-619)	Green North Corp Line	0.95	20,305	145	51	6.86	1.37		1	Green
13	W&E Main St (SR-59)	Sycamore St	Prospect St	0.26	14,100	39	50	9.81	1.36		1	Ravenna
14	Massillon Rd (SR-241)	Boettler Rd	Turkeyfoot Lake Rd (SR-619)	1.01	21,609	130	43	5.46	1.38			Green
15	Kent Rd (SR-59)	Fishcreek Rd	Stow East Corp Line	0.35	18,730	26	25	3.62	1.69			Stow
16	State Rd	Portage Trail	Graham Rd	0.27	22,210	24	30	3.70	1.50	2	2	Cuyahoga Falls
17	Howe Ave	Cuyahoga Falls Corp Line	Main St	0.27	29,263	42	51	4.77	1.38		1	Cuyahoga Falls
18	E Main St (SR-59)	Horning Rd	Kent East Corp Line	0.52	19,184	48	31	4.44	1.46		2	Kent
19	State Rd	Cuyahoga Falls Corp Line	Broad Blvd	0.70	14,700	43	21	3.83	1.70			Cuyahoga Falls
20	Graham Rd	Fishcreek Rd	Stow East Corp Line	0.66	14,750	53	27	5.00	1.45			Stow
21	SR-44	Tallmadge Rd (CR-18)	SR 5 (NB off from IR-76)	0.66	27,333	56	28	2.84	1.68			Rootstown Twp
22	Brittain Rd	Eastwood Ave	E Tallmadge Ave (SR-261)	1.19	12,350	73	21	4.55	1.62		2	Akron
23	W Market St (SR-18)	Miller Rd	Fairlawn East Corp Line	0.68	17,540	73	36	5.61	1.36			Fairlawn
24	S Arlington St	E Waterloo Rd	E Wilbeth Rd (SR-764)	0.70	12,800	49	23	4.96	1.45		3	Akron
25	Howe Ave	Main St	Buchholzer Blvd	0.69	24,551	58	28	3.13	1.52			Cuyahoga Falls
26	W Exchange St	Rhodes Ave	Dart Ave	0.54	8,040	32	20	6.67	1.44			Akron
27	E Main St (SR-59)	Freedom St (SR 88)	SR 14/SR 44	0.76	13,724	57	25	5.01	1.39			Ravenna
28	S Water St	Haymaker Pkwy (SR 59)	E Main St	0.18	5,260	14	26	13.78	1.29		1	Kent
29	Broad Blvd / Broadway East	Second St	Newberry St	0.29	16,170	36	41	6.90	1.17			Cuyahoga Falls
29	Arlington Rd (CR-15)	IR-77 / Green NCL	Killian Rd (CR-135)	0.61	18,130	55	30	4.52	1.36		1	Springfield Twp
31	Fuller Rd	7th Ave	5th Ave	0.28	1,000	14	17	45.99	1.43			Akron
32	W Streetsboro St (SR-303)	Boston Mills Rd	Main St (SR-91)	0.55	14,446	42	26	4.86	1.38	1		Hudson
33	E Tallmadge Ave (SR-261)	N Main St	Gorge Blvd	0.60	16,610	53	29	4.84	1.34		1	Akron
34	SR-14	IR-480 ramp to Turnpike	SR 303 (W)	1.18	31,551	113	32	2.77	1.48			Streetsboro
35	Goodkirk St	Buchtel Ave	E Market St (SR-18)	0.24	29,263	31	43	4.02	1.32			Akron
36	E Exchange St	S Broadway St (SR-261)	Spicer St	0.76	21,113	95	42	5.43	1.21	1	3	Akron
37	Graham Rd	Hudson Dr	Silver Lake West Corp Line	0.44	28,680	42	32	3.05	1.43			Stow
38	W Market St (SR-18)	Ghent Rd	Miller Rd	0.29	28,390	44	50	4.83	1.27			Fairlawn
39	Graham Rd	Oakwood Dr / Wyoga Lake Rd	Hudson Dr	0.72	21,205	45	21	2.70	1.67			Stow
40	E Main St	Water St	Willow St	0.27	9,070	22	27	8.20	1.18			Kent
41	Brittain Rd	E Tallmadge Ave (SR-261)	Independence Ave	0.61	12,614	45	24	5.31	1.31		2	Akron
42	Wooster Rd W	14th St NW	Wooster Rd N	0.75	10,919	35	16	3.91	1.63		1	Barberton
43	N Main St	E Tallmadge Ave	E Cuyahoga Falls Ave	0.36	10,420	17	16	4.14	1.59		2	Akron
44	Front St / Kent Rd (SR-59)	Bailey Rd	Oak Park Blvd	0.36	12,791	26	24	5.20	1.31			Cuyahoga Falls
45	Canton Rd (SR-91)	Akron SCL	Triplett Blvd	0.35	15,180	21	20	3.58	1.48			Akron
46	N Main St (SR-91)	Streetsboro St (SR-303)	Owen Brown St	0.23	20,220	25	36	4.88	1.16			Hudson
47	Darrow Rd (SR-91)	Kent Rd (SR-59)	Stow Rd	0.65	14,896	41	21	3.88	1.39			Stow
48	State Rd	Broad Blvd	Portage Trail	0.96	15,343	61	21	3.78	1.39	2	1	Cuyahoga Falls
49	S High St (SR-261)	E Exchange St	E Market St (SR-18)	0.67	7,771	46	23	8.11	1.13			Akron
50	Garfield Rd W (SR-82)	Aurora Rd (SR-43)	Chillicothe Rd (SR-306)	0.24	9,885	16	22	6.19	1.25			Aurora

Map 6-1 | Top 50 High-Crash Roadway Sections

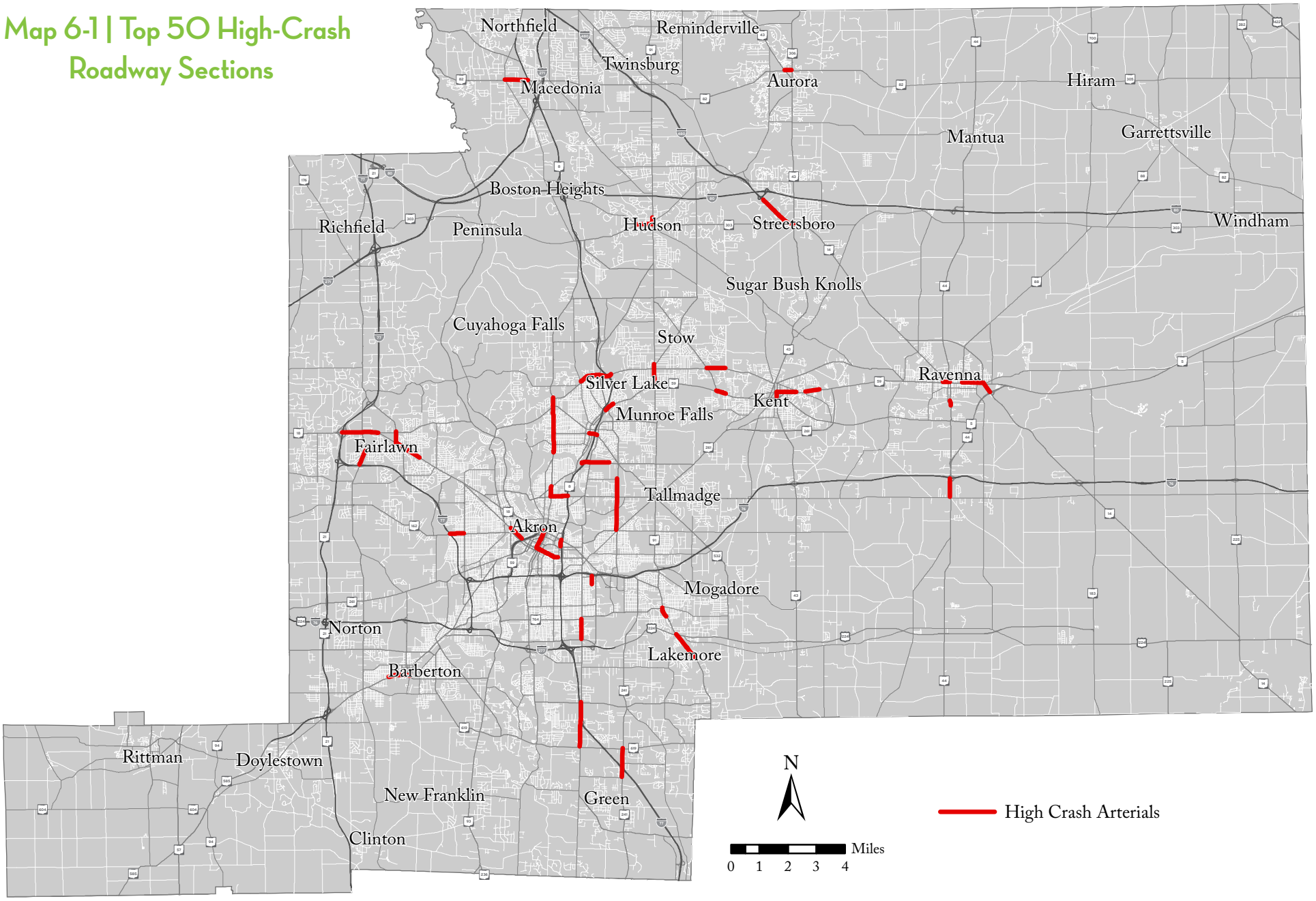
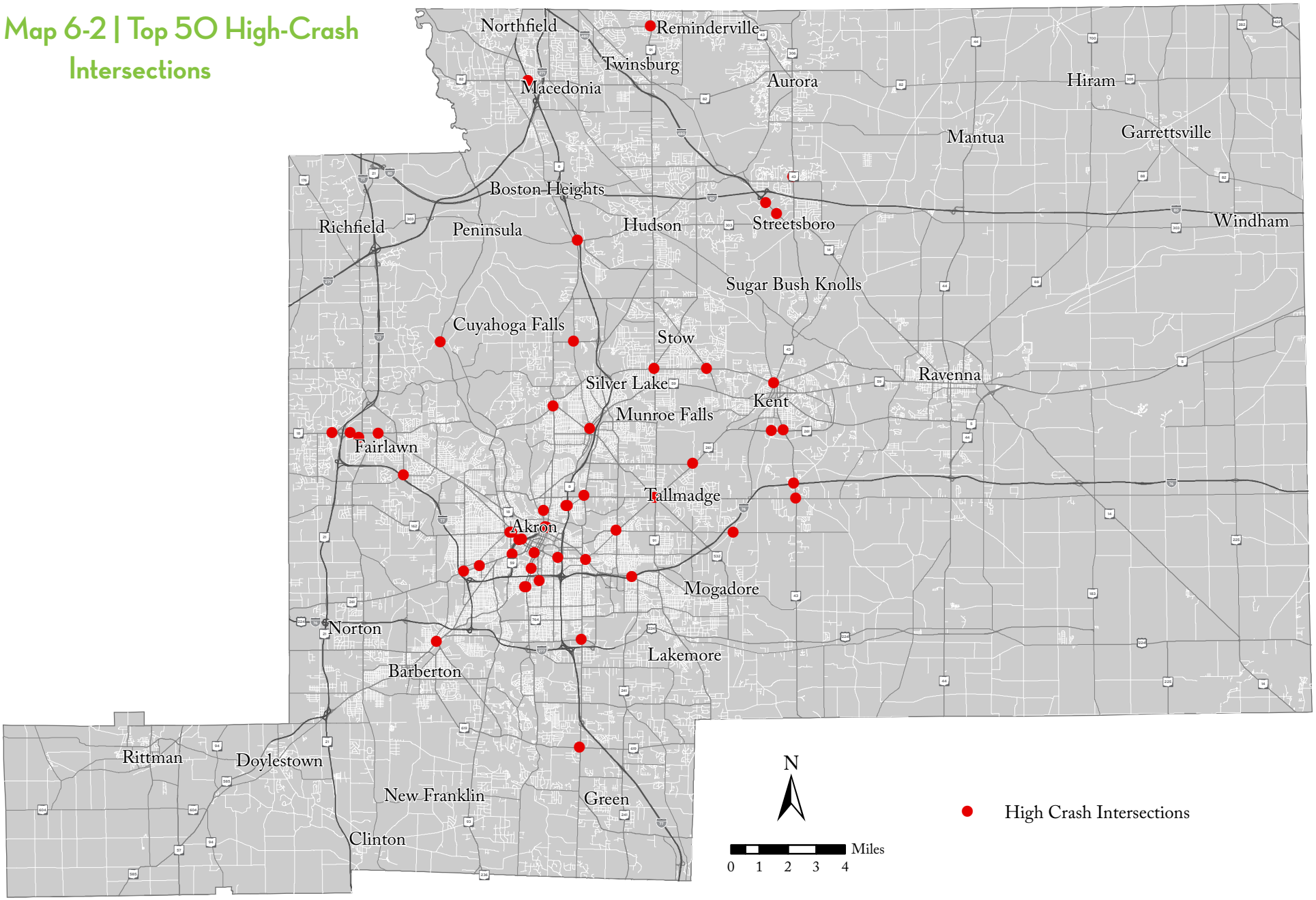


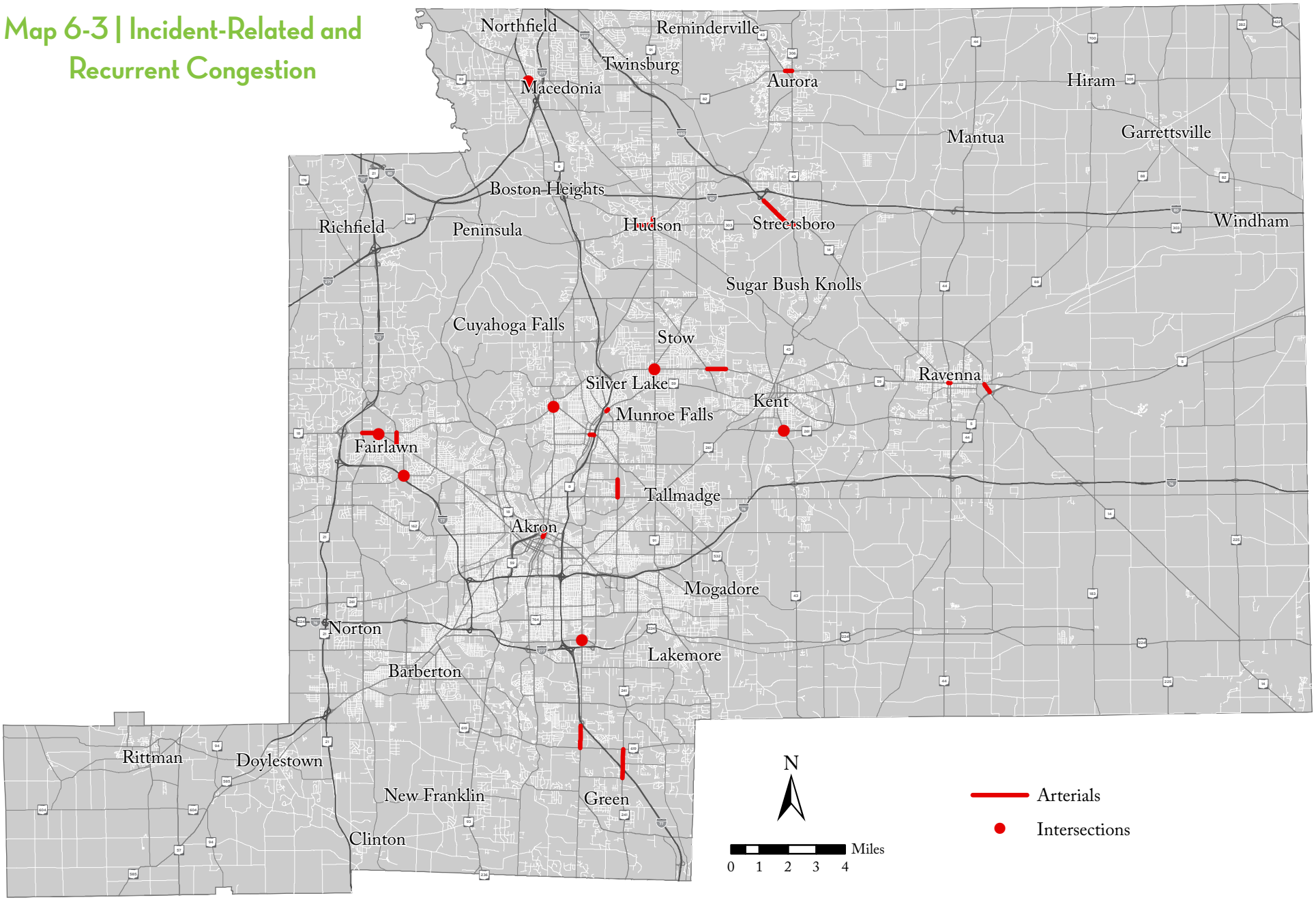
Table 6-2 | High Crash Intersections 2016-2018

RANK	STREET	INTERSECTING STREET(S)	APPROACH AVERAGE DAILY TRAFFIC	TOTAL CRASHES	CRASH RATE	SEVERITY INDEX	BIKE RELATED	PED RELATED	LOCATION
1	S Maple St (SR-162)	Rhodes Ave	13,195	43	2.98	1.84	1		Akron
2	S Maple St (SR-162)	W Cedar St	13,820	36	2.38	1.83	1		Akron
3	SR-14 / SR-303	SR-43	41,044	135	3.00	1.47			Streetsboro
4	Darrow Rd (SR-91)	Graham Rd	34,456	80	2.12	1.53			Stow
5	S Broadway St	E Miller Ave	16,680	40	2.19	1.65		2	Akron
6	Portage Trail	2nd St	29,350	61	1.90	1.56			Cuyahoga Falls
7	W Market St (SR-18)	Smith Rd	24,604	44	1.63	1.77			Fairlawn
8	Vernon Odom Blvd (SR-261)	Superior Ave	13,265	32	2.20	1.75			Akron
9	E Tallmadge Ave (SR-261)	Home Ave	29,800	57	1.75	1.56			Akron
10	SR-14	Brook Valley Trail / Shady Lake Dr	31,551	49	1.42	1.94			Streetsboro
11	S Broadway St	E Thornton St	19,670	53	2.46	1.45			Akron
12	Graham Rd	Fishcreek Rd	28,940	55	1.74	1.55	1		Stow
13	Opportunity Pkwy (SR-261)	Dart Ave	12,938	31	2.19	1.71			Akron
14	MLK Jr. Blvd (SR-59)	N Broadway St (SR-261)	22,402	46	1.88	1.57			Akron
15	S Miller Rd	Ridgewood Rd / IR-77 Ramps	28,552	52	1.66	1.58			Fairlawn
16	SR-43	Tallmadge Rd	19,640	34	1.58	2.09		2	Brimfield Twp
17	Bellows St	Crosier St	3,230	27	7.63	1.67			Akron
18	N Howard St	Glenwood Ave	10,360	25	2.20	1.80			Akron
18	SR-14	Mondial Pkwy / Singletary Dr	31,551	53	1.53	1.57			Streetsboro
20	Riverview Rd	Ira Rd	5,266	22	3.82	1.82			Cuyahoga Falls
21	MLK Jr. Blvd (SR-59)	N High St (SR-261)	25,308	40	1.44	1.75		1	Akron
22	W Exchange St	Rand Ave	14,630	31	1.94	1.65			Akron
23	Vernon Odom Blvd (SR-261)	S Hawkins Ave	18,960	45	2.17	1.44			Akron
24	E Exchange St	Spicer St	22,975	46	1.83	1.48	1		Akron
25	Darrow Rd (SR-91)	Glenwood Dr	19,320	64	3.03	1.28			Twinsburg
26	E Market St (SR-18)	Case Ave	19,260	44	2.09	1.45		2	Akron
27	SR-261	Franklin Ave / Sunnybrook Rd	10,762	23	1.95	2.22			Kent
28	Brookmont Dr	Brookwall Dr	6,020	20	3.03	1.80			Fairlawn
29	E Turkeyfoot Lake Rd (SR-619)	Arlington Rd	29,089	50	1.57	1.52			Green
30	Mantua St (SR-43)	SR-261	28,953	56	1.77	1.43			Kent
31	Steels Corners Rd	Wyoga Lake Rd	16,569	38	2.09	1.47			Cuyahoga Falls
32	Old Forge Rd	Mogadore Rd	2,320	20	7.87	1.70			Brimfield Twp
33	S Arlington St	E Waterloo Rd	21,783	40	1.68	1.50			Akron
34	SR-43	IR-76 Ramps / Edson Rd	51,626	59	3.24	1.24			Brimfield Twp
34	Portage Trail	State Rd	34,965	86	2.25	1.26		1	Cuyahoga Falls
36	Tallmadge Circle		38,034	249	5.98	1.15	1		Tallmadge
37	SR-303	Akron Cleveland Rd / SR-8 Ramps	20,971	50	2.18	1.36			Boston Heights
38	Medina Rd (SR-18)	Springside Dr	37,789	51	1.23	1.71			Bath Twp
39	Glenwood Ave	SR-8 Ramps / Gorge Blvd	10,988	38	3.16	1.37			Akron
40	N Mantua St (SR-43)	Fairchild Ave	28,500	49	1.57	1.49	1		Kent
41	E Market St (SR-18)	Mogadore Rd / IR-76 Ramps	37,408	63	1.54	1.44	1	1	Akron
41	S Main St	Miller Ave / Old Main St	10,010	29	2.65	1.52	1		Akron
43	Northeast Ave (SR-261)	E Howe Rd / N Munroe Ave	18,426	57	2.83	1.25			Tallmadge
44	W Cedar St	Rand Ave	13,120	24	1.67	2.00			Akron
45	Medina Rd (SR-18)	Crystal Lake Rd / Montrose West Ave	48,380	66	1.25	1.58			Bath Twp
46	Brittain Rd	Eastland Ave / Eastwood Ave	21,735	48	2.02	1.38		1	Akron
47	State St (SR-619)	Wooster Rd N (SR-619)	23,600	39	1.51	1.56			Barberton
48	S High St	Selle St	14,420	28	1.77	1.64			Akron
49	SR-8	Aurora Rd (SR-82)	35,035	80	2.09	1.25			Macedonia
50	Tallmadge Ave	N Howard St	16,050	33	1.88	1.48	1	1	Akron

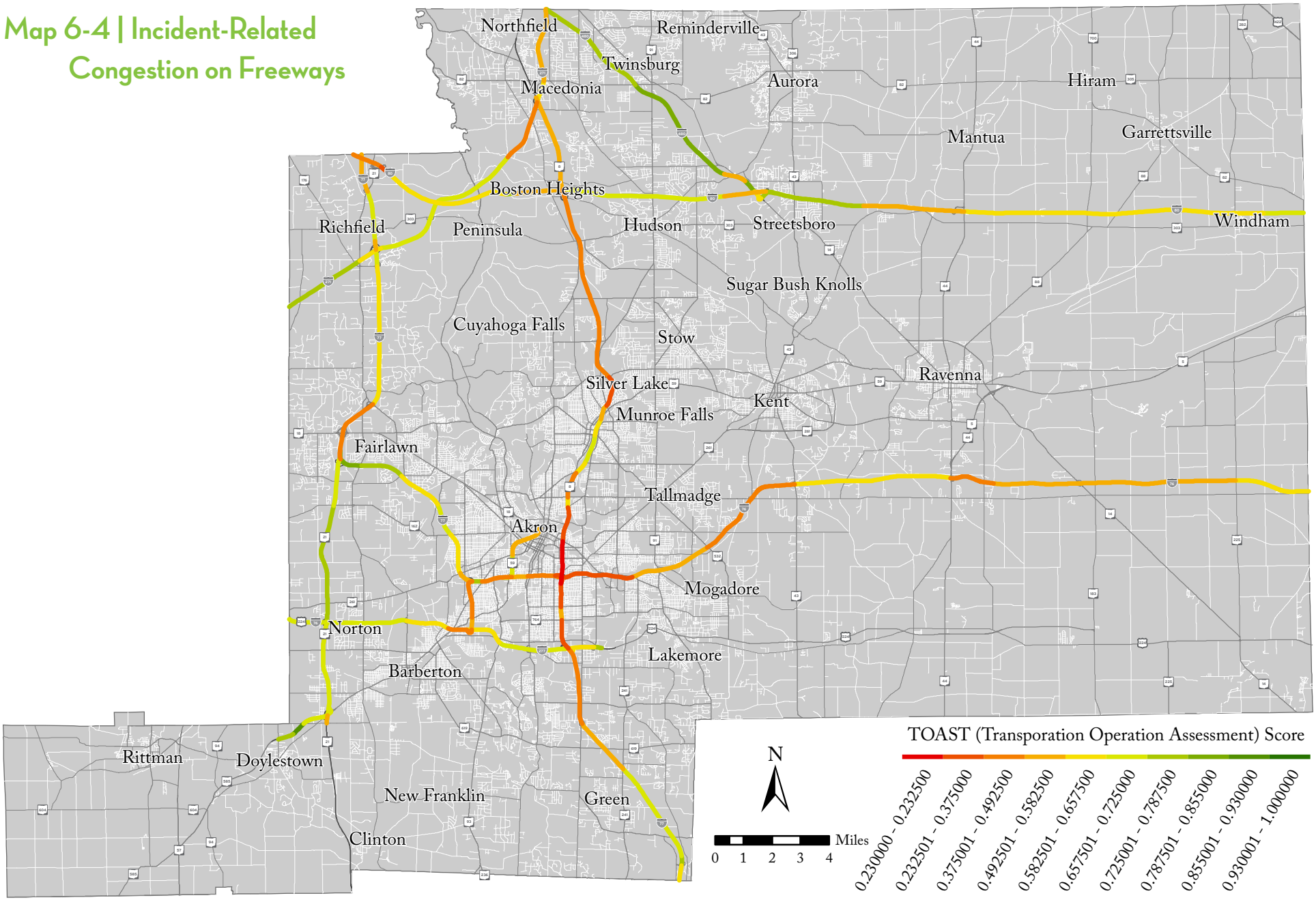
Map 6-2 | Top 50 High-Crash Intersections



Map 6-3 | Incident-Related and Recurrent Congestion



Map 6-4 | Incident-Related Congestion on Freeways



Performance Measures

Transportation Performance Management is required by MPOs as stated in MAP-21 and continued in the FAST Act. Transportation Performance Management is defined as a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. Within Transportation Performance Management, there are performance measures. Performance measures related to the CMP include Level of Travel Time Reliability (LOTTR) and Level of Truck Travel Time Reliability (LOTTTR), Peak Hour Excessive Delay (PHED) and Mode Share or Non Single Occupancy Vehicle (Non-SOV) travel. Each of these performance measures have their own respective targets.

Travel Time Reliability and Freight Movement Performance Measures

Federal rules 23 CFR 490.507 and 23 CFR 490.607 establish National Highway System travel time reliability and Interstate System freight reliability measures. For both personal travel time reliability and freight travel time reliability measures, ODOT is required to establish 2-year and 4-year targets within a four year performance period. The two current (2020) targets are listed in Table 7-1 below:

Table 7-1 | ODOT Travel Time Reliability Targets

Level of Travel Time Reliability		
TRAVEL TIME RELIABILITY	**2-YEAR TARGET**	**4-YEAR TARGET**
Interstate Travel Time Reliability	85%	85%
Non-Interstate NHS Travel Time Reliability	N/A	80%
Level of Truck Travel Time Reliability		
TRUCK TRAVEL TIME RELIABILITY	**2-YEAR TARGET**	**4-YEAR TARGET**
Interstate Truck Travel Time Reliability	< 1.50	< 1.50

Level of Travel Time Reliability (LOTTR) is defined as the ratio of the longer travel times (80th percentile) to a "normal" travel time (50th percentile). The measures are the percent of person-miles traveled on the relevant portion of the NHS that are reliable. If the longer travel time is greater than or equal to 1.5, the roadway segment or corridor is considered unreliable.

The variability or change in congestion on a day-to-day basis provides a measure of reliability. Recurring congestion is generally predictable, regularly occurring, and typically caused by excess demand compared to the capacity of the system. Conversely, non-recurring congestion causes unreliable travel times and is caused by transient events such as traffic incidents, weather conditions, work zones, or special events. This form of congestion is often the most frustrating for travelers. National estimates indicate that nearly 50% of all congestion is non-recurring (FHWA, October 2019).

LOTTR assesses the consistency or dependability of travel times from day to day or across different times of the day on the Interstate and Non-Interstate NHS systems. FHWA defines LOTTR as the percent of person-miles on the Interstate and NHS that are reliable. LOTTR is calculated as the ratio of the longer travel times (80th percentile) to a "normal" travel time (50th percentile), using NPMRDS or equivalent data. Data are collected in 15-minute segments during all time periods between 6 AM and 8 PM. Reliability measures are grouped into three weekday time periods (6-10 AM, 10 AM - 4 PM, 4- 8 PM) and one weekend time period (6 AM – 8 PM). Any roadway segment or corridor that has a reliability index of 1.5 or greater during any time period is considered to be unreliable. For example, a roadway segment with a free-flow speed of 60 mph where the observed average travel speed during one of the time study periods is 40 mph, would have a LOTTR value of 1.5.

Truck Travel Time Reliability (TTTR) is the ratio generated by dividing the 95th percentile travel time by the normal time (50th percentile) for each Interstate segment. The TTTR Index is established by multiplying each segment's largest ratio of five reporting periods by its length then dividing the sum of all length-weighted segments by the total length of Interstate. If the longer truck travel time is greater than or equal to 1.5, the roadway segment or corridor is considered unreliable.

Data for TTTR are also collected in 15-minute segments during all time periods throughout the day. Reliability measures were grouped into three weekday time periods (6-10 AM, 10 AM-4 PM, 4-8 PM), one weekend time period (6 AM – 8 PM), and one overnight time period for all days (8 PM-6 AM). Any roadway segment or corridor that has a reliability index of 1.5 or greater during any time period is considered to be unreliable.

The data used to assess travel time reliability and establish targets is sourced from FHWA's National Performance Management Research Data Set (NPMRDS). ODOT is participating in FHWA's Performance Management Analytical Tool pooled fund where a contractor assists states in calculating NPMRDS travel time reliability metrics.

AMATS' current performance is documented in the following Table 7-2:

Table 7-2 | AMATS Travel Time Reliability

Level of Travel Time Reliability						
YEAR	**2014**	**2015**	**2016**	**2017**	**2018**	**AVERAGE**
Interstate TTR	97.6%	96.5%	97.6%	98.6%	98.5%	97.8%
Non-Interstate NHS TTR	60.7%	63.1%	59.8%	89.3#	90.4%	72.7%
Interstate TTTR Index	0.01	0.01	0.01	0.01	0.01	0.01

AMATS meets the performance targets for travel time reliability on the interstate system and on truck travel time. The AMATS non-interstate system meets the target as of 2017. Overall state of Ohio performance is documented in table 7-3 below:

Table 7-3 | Ohio Travel Time Reliability

Level of Travel Time Reliability						
YEAR	2014	2015	2016	2017	2018	AVERAGE
Interstate TTR	92.4%	90.3%	90.6%	90.7%	89.1%	90.6%
Non-Interstate NHS TTR	68.5%	67.4%	66.8%	90.5%	90.1%	76.7%
Interstate TTTR Index	1.46	1.48	1.45	1.34	1.38	1.42

Peak Hour Excessive Delay (PHED)

ODOT and the Ohio MPOs collectively established a single target for each applicable urbanized area for the first performance period by May 20, 2018. As part of a phased implementation approach, only four-year targets were reported in the State's baseline performance period report that was due on October 1, 2018. There is no requirement for states to report two-year targets or baseline condition for this specific measure in the report for the first performance period. With the first mid-performance period progress report, due October 1, 2020, four-year targets may be adjusted, and two-year condition/performance will be reported as baselines.

Traffic congestion will be measured by the annual hours of peak hour excessive delay (PHED) per capita on the National Highway System (NHS). The threshold for excessive delay will be based on the travel time at 20 miles per hour or 60% of the posted speed limit travel time, whichever is greater, and will be measured in 15-minute intervals. Peak travel hours are defined as 6-10 am local time on weekday mornings and 3-7 pm on weekday afternoons, providing flexibility to state DOTs and MPOs. The total excessive delay metric will be weighted by vehicle volumes and occupancy.

For the establishment of the PHED measure, ODOT and its partner agencies reviewed data from 2017 using the RITIS Analytics Tool, which draws data from the NPMRDS. For the establishment of the Percent of Non-SOV Travel Measure, ODOT and its partner agencies used the American Community Survey data's estimates of the percentage of people that travel to work by means other than driving alone (i.e. carpooling, telework, biking, walking, or taking the bus). ODOT was able to review five years of data, noting stable travel patterns for this measure. Upon analysis, ODOT and its partner agencies adopted targets based on recent travel trends and future expected performance.

AMATS is located in part of the Cleveland urbanized area (UZA). Consequently, ODOT, NOACA and AMATS coordinated the setting of targets for the Cleveland area. The Cleveland urbanized area performance is documented in the Charts 7-1 and 7-2.

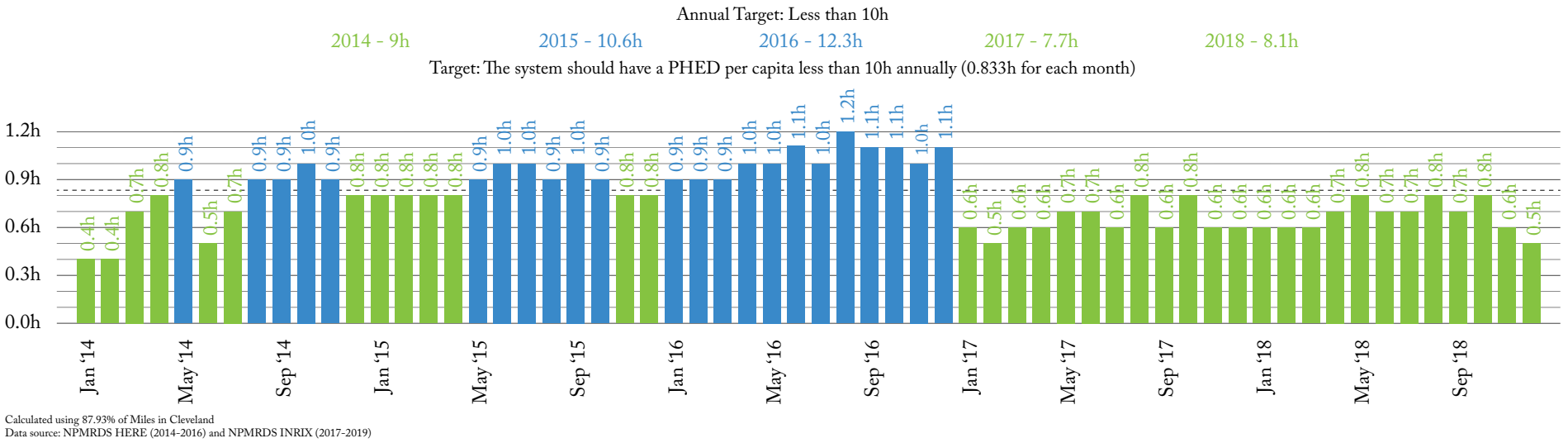
Mode Share (Non-SOV Travel)

Mode share is a measure of the percentage of each mode on all surface transportation occurring in the urbanized area. Modes of surface transportation include driving alone in a motorized vehicle (Single Occupancy Vehicle), car or van pooling, public transportation, commuter rail, walking, or bicycling as well as travel that is avoided by telecommuting. Non-SOV travel, defined by the FHWA, applies to any travel occurring on modes other than driving alone in a motorized vehicle. An analysis of mode share includes a calculation of the percent of Non-SOV travel within the urbanized area. This metric is derived from the U.S. Census Bureau's American Community Survey (ACS) data. Higher levels of Non-SOV travel can reduce an area's traffic congestion by removing additional vehicles from the roadways. The PHED and Non-SOV measures and targets are listed in Table 7-4 as follows:

Table 7-4 | Peak Hour Excessive Delay and Non-Single Occupancy Vehicle Travel

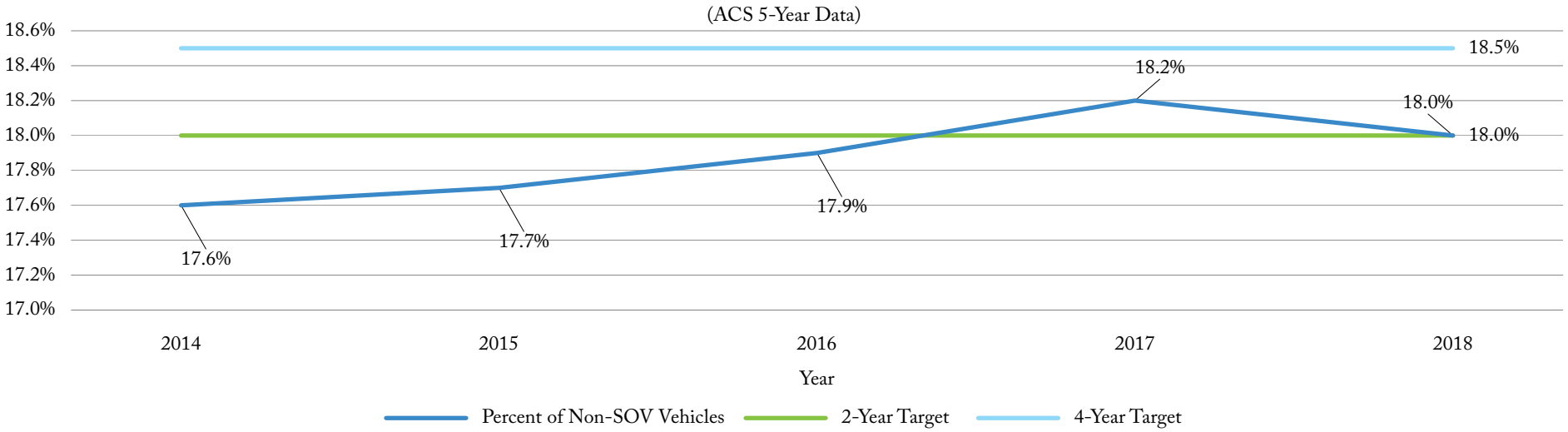
Peak Hour Excessive Delay (PHED)		
URBANIZED AREA PHED	2-YEAR TARGET	4-YEAR TARGET
Peak Hour Excessive Delay per Capita - Cincinnati	N/A	< 12 hrs / yr
Peak Hour Excessive Delay per Capita - Cleveland	N/A	< 10 hrs / yr
Peak Hour Excessive Delay per Capita - Columbus	N/A	< 12 hrs / yr
Non-Single Occupancy Vehicle (Non-SOV) Travel		
URBANIZED AREA PERCENT OF NON-SOV TRAVEL	2-YEAR TARGET	4-YEAR TARGET
Percent of Non-SOV Travel - Cincinnati	17.4%	17.4%
Percent of Non-SOV Travel - Cleveland	18.0%	18.5%
Percent of Non-SOV Travel - Columbus	18.2%	19.0%

Chart 7-1 | Cleveland Urbanized Area: MAP-21 Peak Hours Excessive Delay per Capita



Calculated using 87.93% of Miles in Cleveland
Data source: NPMRDS HERE (2014-2016) and NPMRDS INRIX (2017-2019)

Chart 7-2 | Cleveland Urbanized Area: Annual % of Non-Single Occupant Vehicles



Congestion Management Strategies and Assessments

After thoroughly scanning and assessing the defined CMP network, AMATS has established generalized strategies that best match the Code of Federal Regulations (CFR), FHWA guidance, and regional transportation planning context. A strategy or combination of strategies that are appropriate for deficient corridors and segments are selected based on the type of congestion. Effectively managing congestion over time requires a multi-faceted approach. Thus, the strategies are categorized into five tiers, ranked generally by the efficacy of mitigating congestion. The strategies in the top tiers should be given priority over the lower ones. The tiers are:

Tier 1: Demand management
Tier 2: Traffic and roadway operational improvements
Tier 3: Public Transportation improvements
Tier 4: ITS Strategies
Tier 5: Capacity expansion

Tier 1: Demand Management

Demand-side strategies represent a more modern approach to managing traffic congestion. Demand-side strategies include those that focus on reducing vehicles on the roadway either permanently or during the busiest times of the day. City rush-hours are an example of when demand exceeds supply. A highway that easily accommodates traffic throughout most of the day is congested with vehicles during morning and afternoon peak hours. Demand-side management is any strategy that reduces the number of vehicles on the road at one time. Generally, demand-side congestion strategies cost significantly less than supply-side ones do. Below are examples of potential demand management strategies:

- Telecommuting – AMATS is one of many organizations that have had employees work from home, i.e., telecommuting. Telecommuting can directly reduce work-related trips during the peak hours of the day when most congestion occurs. Another related benefit is an improvement in air quality. While in previous reports, telecommuting was not seen as being feasibly on a large scale, the COVID-19 pandemic has shown the impacts of large scale telecommuting by drastically reducing traffic.
- Flexible/Alternative Work Hours – Working outside the typical workweek and workday timeframe. It may not eliminate vehicles on the road but could eliminate vehicles on the road during peak hours when congestion is the worst.
- Carpooling – More than one person using a vehicle for a trip with similar origin or destination. Carpooling reduces SOV due to commuters sharing a ride with one or more people for trips. This reduces the number of vehicles on the road. Software makes it easier to create carpools and vanpools by matching similar trip origins, destinations, and times.
- Employer Incentive Program – Incentives may be offered by employers to encourage carpooling or public transportation. This may be financial or some other sort of perk.
- Encouraging a Shift to Alternative Modes of Transportation – using transit, bicycling, walking, or other non-motorized travel. Bicycle and pedestrian modes may also include e-bikes, scooters, skateboards, mobility-assistance devices, etc. Though buses do count as a vehicle on the road, they retain the capability to significantly reduce the total number of vehicle miles traveled. Bicycling, walking, and other modes of alternative transportation can eliminate vehicle miles traveled. However, these modes may not be feasible if trip lengths are too long. Typical trip length for a bicycle commute is up to four miles and up to one mile for a pedestrian.

Tier 2: Traffic and Roadway Operational Improvements

Tier 2 strategies play an important role in congestion management. These strategies emphasize on getting more out of the existing transportation system. The strategies include but not limited to the following:

- Intersection and street improvements by adding and extending exclusive turning lanes – exclusive and safe space for vehicles waiting to turn left.
- Reversible commuter lanes on the freeways – more lanes for peak demand traffic flow without more pavement width.
- Variable speed limits – allows traffic to efficiently utilize capacity at a safe speed.
- Variable message signs – enables drivers to take alternative routes to avoid congestion.
- Exclusive shoulder lanes for buses – frequent stopping can occur outside of the flow of traffic.
- Geometric improvements to road and intersections – improves traffic flow and reduces incident related congestion by correcting geometric deficiencies.
- Channelization – facilitates the safe and orderly movement of traffic and defines the paths of traffic by physical separation.
- Median barriers (moveable) to facilitate more capacity during peak periods – more lanes for peak demand flow without adding more pavement.
- Traveler information – information given to travelers to help reduce uncertainty and stress. It also can help avoid congestion, improve safety and save time.
- Complete Streets – Designing streets to enable safe access for users of all ages

and abilities, including pedestrians, bicyclists, motorists, and transit riders.
- Overpasses or underpasses at congested intersections or railroads – provides uninterrupted traffic flow by removing intersection conflict points.

Tier 3: Public Transportation (Transit) Improvements

The public transportation improvement strategies focus on making public transportation more convenient and accessible in the AMATS region. It is worth mentioning that these strategies may be linked with tier 1 and tier 2 strategies. METRO and PARTA control the transit service strategies within the AMATS region with AMATS offering suggestions. The following strategies are included in this category:

- Expanding transit services – adds new vehicles to expand transit services.
- Optimal control of headways by realigning transit service schedules and stop locations – provides better accessibility to transit to a greater share of the population.
- Providing real-time information on transit schedules and arrivals using various ITS strategies – provides real-time information so potential transit riders can estimate wait time.
- Universal transit fare cards and incentives – may be offered to students, employees, or residents to help reduce the cost of transit to the user.
- Bus Rapid Transit – high-quality bus-service that utilizes dedicated lanes, busways, traffic signal priority, off-board fare collection and enhanced or elevated stations to make transit more efficient and reliable. These lines work best in dense urban areas.
- Prioritizing transit vehicles at traffic signals – gives transit vehicles priority at signals to help them run on schedule.

Tier 4: ITS Strategies

These strategies are strongly linked with most of the congestion management strategies. The recommended ITS strategies in the AMATS region are listed below:

- Traffic Signal Improvements – Optimizing and coordinating the timing of traffic signals to improve traffic flow through a corridor or specific intersections.
- Simulation models – Although, the AMATS has established travel demand models for predicting and evaluating the traffic in the region, simulation models may be used to analyze and evaluate the impact of operational strategies.
- Cars Connected to Cars / Cars Connected to Infrastructure – When one vehicle can communicate to another vehicle nearby—in front, behind, etc. it's the core of autonomous driving technology. Sensors detect what's going on around the vehicle and additional technology can share that data with other vehicles on the road. The vehicle is also able to send and receive information about the infrastructure that can include physical things such as traffic signals and weather alert systems. The vehicle can send that data out while simultaneously the infrastructure can send important data back to it.
- Real-time traffic feedback – The real-time traffic feedback provides information about the traffic around the city. A popular real-time feedback app used in Ohio was developed by ODOT and is called OHGO. It provides real-time information about traffic conditions, incidents, construction projects, and weather. It can be viewed on cell phones and computers.

Tier 5: Capacity Expansion

As our national road network has grown dramatically over the last several decades, only a limited amount of funding remains for new road and lane construction. Construction and right-of-way costs for new roads are very expensive. New roads and adding additional through lanes is considered a last resort as system preservation is the main objective in the AMATS region. Financial restrictions, adverse environmental impacts, and project duration also make capacity improvements less attractive and feasible.

Capacity expansion may be necessary on major arterials and freeways as most other are not congested enough to warrant such an improvement. These roadways may benefit from capacity expansion projects as it will improve flow of all vehicles including transit and freight vehicles, not just passenger vehicles. This could reduce emissions and fuel consumption, and increased productivity and economic development. However,

typically constructing new lanes is followed with additional demand for the roadway as travel times improve. More vehicles begin to use the roadway which then begins to reduce travel times. This is referred to as induced demand.

The capacity improvements include the following strategies:

- Removing bottlenecks by constructing new lanes – removes or corrects short, isolated, and temporary lane reductions and substandard design elements.
- Closing gaps in the existing network - provides more connections and means of traveling between places.
- Add travel lanes on major freeways and streets (including truck climbing lanes on grades) - allows for additional vehicles to move through an area uninhibited by congestion.

Evaluation of Strategies

Congestion management strategies were evaluated based upon their effectiveness and feasibility. The effectiveness was determined by how well each strategy would reduce congestion in the AMATS area. To make this determination, the strategies were reviewed by examining regional characteristics, previous local success of the strategies and examples from other urban areas. Decisions on the effectiveness of each strategy were made based on the data collected and staff input. Feasibility was rated by the degree to which the strategy could be realistically implemented in the region. Table 8-1 lists the strategies along with their corresponding effectiveness and feasibility.

Table 8-1 | Congestion Management Strategies

TIER	STRATEGY	BENEFITS	EFFECTIVENESS	FEASIBILITY
Tier 1: Demand Management	Telecommuting	Reduces traffic, especially during peak hours	Medium / High	Medium
	Flexible / Alternative Work Hours	Reduces traffic, especially during peak hours	Medium	Low / Medium
	Carpooling	Reduces traffic, especially during peak hours	Medium / High	High
	Employer Incentive Program	Reduces traffic, especially during peak hours	Medium / High	Low
	Alternative Modes of Transportation	Reduces traffic	Low / Medium	Low
Tier 2: Operational Improvements	Adding Exclusive Left Turning Lanes	Improves traffic flow / safety	Medium / High	Medium
	Reversible Commuter Lanes on Freeways	Improves traffic capacity / flow	Medium / High	Low
	Variable Speed Limits	Improves traffic capacity / flow	Low / Medium	Low
	Variable Message Signs	Improves traffic flow and reduces additional congestion	Low / Medium	Medium
	Exclusive Shoulder Lanes for Buses	Improves traffic flow / safety	Medium	Low
	Geometric Improvements to Road and Intersections	Improves traffic flow / safety	Medium / High	High
	Channelization	Improves traffic flow / safety	Low / Medium	Medium
	Median Barriers (Moveable) to Facilitate More Capacity During Peak Period	Improves traffic capacity / flow	Medium / High	Low
	Traveler Information	Improves traffic flow / safety	Low / Medium	High
	Complete Streets	Improves capacity for alternative modes of transportation	Low / Medium	Medium
	Overpasses or Underpasses at Congested Intersections or Railroads	Improves traffic flow / safety	High	Low / Medium
Tier 3: Public Transit Improvements	Expanding Transit Services	Encourage transit use / reduces SOV vehicles	Low	Low
	Optimal Control of Headways by Realigning Transit Service Schedules and Stop Locations	Makes transit easier to use / reduces SOV vehicles	Low	Medium
	Providing Real-Time Information on Transit Schedules and Arrivals Using Various ITS Strategies	Makes transit easier to use / reduces SOV vehicles	Low	Medium
	Universal Transit Fare Cards and Incentives	Makes transit easier to use / reduces SOV vehicles	Low	High
	Bus Rapid Transit	Makes transit easier to use / reduces SOV vehicles	Medium	Medium
	Prioritizing Transit Vehicles at Traffic Signals	Makes transit easier to use / reduces SOV vehicles	Medium	Medium
Tier 4: ITS Strategies	Traffic Signal Improvements	Improves traffic flow / safety	Medium / High	High
	Simulation Models	Helps determine and fund projects with the most impact	Medium / High	Medium
	Cars Connected to Cars / Cars Connected to Infrastructure	Improves traffic flow / safety	Medium / High	Low
	Real-Time Traffic Feedback	Improves traffic flow / reduces additional congestion	Medium / High	High
Tier 5: Capacity Expansion	Removing Bottlenecks by Constructing New Lanes	Improves traffic flow / safety	Medium	Low
	Closing Gaps in the Existing Network	Improves traffic flow / safety	Medium	Low
	Add Travel Lanes on Major Freeways and Streets (Including Truck Climbing Lanes on Grades)	Improves traffic flow / safety	Medium	Low

Congestion Management Recommendations

Roadways

In the previous chapter, 5 tiers of congestion management strategies were identified and evaluated to determine their effectiveness and political feasibility. In this chapter AMATS applies these strategies to areas of congestion within the AMATS region.

As a reminder the tiers are as follows:

Tier 1: Demand management
Tier 2: Traffic and roadway operational improvements
Tier 3: Public Transportation improvements
Tier 4: ITS Strategies
Tier 5: Capacity expansion

Freeway Segments

Each freeway segment was analyzed by direction throughout the 2017 year. Then, the peak-hour with the lowest speed percent was used to determine congestion levels for each segment. Table 9-1 and Map 9-1 includes 32 freeway segment locations that have a speed of 75 percent or lower of free-flow speed, i.e., congested. Recommendations have been listed for each congested segment. Given that the data was taken from calendar year 2017, a few locations have had projects completed or have upcoming projects soon; therefore, the recommendation for these locations is to monitor them in the future. These are still listed in the table with the project number and description included to make future monitoring easier.

Overall, the freeways within the AMATS region function well, and most will continue to do so into the future. Ohio Department of Transportation (ODOT) is in charge of maintaining freeway segments and funding improvements on these segments. ODOT coordinates with AMATS on a regular basis to define potential projects. This coordination helps maintain good traffic flow throughout the region.

Freeway Ramps

Each freeway ramp was analyzed throughout the 2017 year. Those freeway ramps that had a speed of 65 percent or less of free-flow speed are considered congested. Table 9-2 lists and Map 9-2 shows the 10 freeway ramps that were considered congested. Please note that many of these ramps are related to I-80, the Ohio Turnpike, and are therefore are controlled and maintained by their commission.

Freeway Interchanges

Each freeway interchange was analyzed throughout the 2017 year. Freeway interchange segments are typically segments on arterial roadway that are between freeway interchange ramps. The freeway interchange segments that had a speed of 65 percent or less than free-flow speed are considered congested. Table 9-3 lists and Map 9-3 displays the 15 freeway interchange segments that were considered congested. Please note that many of these segments are adjacent to congested arterial segments or intersections.

Arterial Segments

Each arterial segment on the network was analyzed by direction throughout the 2017 year. Then, the peak-hour with the lowest speed was used to determine whether a segment is congested. Table 9-4 and Map 9-4 include 89 arterial segment locations that have a speed of 65 percent or lower of free-flow speed, i.e., congested. Recommendations are listed for each congested segment. Given that the data was taken from calendar year 2017, a few locations have had projects completed or have upcoming projects soon; therefore, the recommendation for these locations is to monitor them in the future. These locations are still listed in the table with the corresponding project number and description to make future analysis easier. Some congested locations might only have a recommendation to monitor after nearby construction is complete because these segments might be impacted by other construction projects nearby and that specific location might also have limited feasibility for improvements.

Intersections

Intersections were analyzed throughout the 2017 year to determine congested approaches. Intersections were considered congested if the peak-hour speed was 65 percent or less of the free-flow speed. These congested intersections are listed in Table 9-5 and shown on Map 9-5. Each congested segment in the table includes a recommendation, even if that recommendation is to monitor the intersection in the future, similar to arterials.

Table 9-1 | Freeway Segment Recommendations

NAME	POLITICAL UNIT	PEAK TIME	% FREE FLOW	RECOMMENDED TIER
I-271 NB bet SR 82 and I-480	Macedonia	7:30-8:30 AM	32.04	Project 89548 complete, included adding through lanes; Monitor
SR 8 SB bet Forge St and Market St	Akron	4:45-5:45 PM	32.61	Project 102329 planned, includes added through lanes; Monitor
SR 8 SB bet Glenwood Ave and SB On-ramp	Akron	4:45-5:45 PM	33.74	Project 91710 planned, includes new bridges with auxiliary lanes; Monitor
SR 8 SB through the Perkins St interchange	Akron	4:45-5:45 PM	34.00	Project 102329 planned, includes added through lanes; Monitor
SR 8 SB bet Tallmadge On-ramp and Glenwood Ave Bridge	Akron	4:45-5:45 PM	34.68	Project 91710 planned, includes new bridges with auxiliary lanes; Monitor
SR 8 SB bet Glenwood Ave On-ramp and Perkins St Off-ramp	Akron	4:45-5:45 PM	37.56	Project 91710 planned, includes new bridges with auxiliary lanes; Monitor
SR 8 SB through the Tallmadge Ave interchange	Akron	4:45-5:45 PM	38.06	Project 91710 planned, includes new bridges with auxiliary lanes; Monitor
I-77 NB through the I-80 Interchange	Richfield	7:30-8:30 AM	40.70	Project 111405 planned, includes adding through lanes; Increased express bus service; Monitor
SR 8 SB bet Market St and the Central Interchange	Akron	4:45-5:45 PM	41.16	Project 102329 planned, includes added through lanes; Monitor
I-77 NB S of I-80 Ramps	Richfield	7:30-8:30 AM	42.96	Project 111405 planned, includes adding through lanes; Increased express bus service; Monitor
SR 8 SB bet Cuyahoga Falls on ramp and Tallmadge off ramp	Akron	4:45-5:45 PM	48.03	1 and 4
I-77 NB bet Brecksville Rd and I-80	Richfield	7:30-8:30 AM	57.66	Project 111405 planned, includes adding through lanes; Increased express bus service; Monitor
SR 8 SB bet Gorge Blvd and On-ramp from Cuyahoga Falls Ave	Akron	4:00-5:00 PM	63.53	1 and 4
SR 8 SB bet Valley View Rd and SR 82	Macedonia / Sagamore Hills Twp	5:00-6:00 PM	64.31	1 and 4
I-76/77 EB through the Main St/Broadway St interchange	Akron	4:45-5:45 PM	65.28	Project 77269 nearly complete, included reconstruction and modification of access points; Monitor
I-76/77 EB bet west of Wolf Ledges Off-ramp to Wolf Ledges Off-ramp	Akron	4:45-5:45 PM	65.59	Project 77269 nearly complete, included reconstruction and modification of access points; Monitor
I-76/77 EB bet Wolf Ledges Off-ramp and Wolf Ledges bridge	Akron	4:45-5:45 PM	65.85	Project 77269 nearly complete, included reconstruction and modification of access points; Monitor
SR 8 SB bet ramp split and I-76 mainline	Akron	5:00-6:00 PM	66.89	Project 102329 planned, includes added through lanes; Monitor
SR 8/I-77 SB bet I-76 and Lovers Lane	Akron	5:00-6:00 PM	67.1	Project 102329 planned, includes added through lanes; Monitor
I-76/77 EB bet South St On-ramp and Main St Off-ramp	Akron	4:45-5:45 PM	67.12	Project 77269 nearly complete, included reconstruction and modification of access points; Monitor
SR 8 SB bet Front St and Howe Ave On-ramp	Akron	4:00-5:00 PM	67.13	1 and 4
I-76/77 EB bet Wolf Ledges and Grant St	Akron	4:45-5:45 PM	68.08	Project 77269 nearly complete, included reconstruction and modification of access points; Monitor
I-76/77 EB bet Grant St and Grant St On-ramp	Akron	4:45-5:45 PM	69.51	Project 77269 nearly complete, included reconstruction and modification of access points; Monitor
I-77 NB bet Arlington Rd and I-277/US 224	Coventry Twp	7:30-8:30 AM	71.0	Project 106002 planned, includes add through lanes; Monitor
I-77 NB at Waterloo Rd	Akron / Coventry Twp	7:30-8:30 AM	71.87	1 and 4
I-77 NB bet Waterloo Rd and Wilbeth Rd	Akron	7:30-8:30 AM	72.09	1 and 4
SR 8 NB bet E Market St and Perkins Off-ramp	Akron	5:00-6:00 PM	72.89	Project 102329 planned, includes added through lanes; Monitor
SR 8 SB through the Portage Trail interchange	Cuyahoga Falls	7:30-8:30 AM	72.99	1 and 4
SR 8 SB through the Howe Ave interchange	Cuyahoga Falls	4:00-5:00 PM	73.34	1 and 4
SR 8 NB bet Perkins St Off-ramp and the High Level Bridge	Akron	5:00-6:00 PM	73.48	Project 91710 planned, includes new bridges with auxiliary lanes; Monitor
I-77 SB bet Lovers Lane and Cole Ave	Akron	5:00-6:00 PM	73.64	1 and 4
SR 8 SB bet Broad Blvd and the SB On-ramp	Cuyahoga Falls	7:30-8:30 AM	73.78	1 and 4

Table 9-2 | Freeway Ramp Recommendations

NAME	POLITICAL UNIT	PEAK TIME	% FREE FLOW	RECOMMENDED TIER
SR 8 NB to I-80 EB Connector	Boston Heights	5:00-6:00 PM	40.71	1, 2 and 4
I-271 NB to SR 8 intersection	Macedonia	7:45-8:45 AM	44.37	1, 2 and 4
I-80 WB Connector bet I-80 and SR 8	Boston Heights	5:15-6:15 PM	46.69	1, 2 and 4
Ramp from I-80 WB Connector to I-77 NB	Richfield	7:30-8:30 AM	54.98	Project 111405 planned, includes adding through lanes; Monitor
I-271 SB to SR 8 intersection	Macedonia	9:00-10:00 PM	55.33	1, 2 and 4
I-480 SWB Connector bet I-480 and I-80	Streetsboro	9:15-10:15 PM	57.22	1, 2 and 4
I-80 EB Connector bet SR 8 SB and I-80	Boston Heights	5:00-6:00 PM	57.23	1, 2 and 4
I-80 EB to I-80 WB connector (SR 8 exit)	Boston Heights	5:15-6:15 PM	59.16	1, 2 and 4
SR 21 SB to I-76 WB	Norton	9:30-10:30 AM	60.80	1, 2 and 4
I-80 WB to I-80 WB connector (SR 8 exit)	Boston Heights	5:00-6:00 PM	64.10	1, 2 and 4

Table 9-3 | Freeway Interchange Recommendations

NAME	DIRECTION	POLITICAL UNIT	PEAK TIME	% FREE FLOW	RECOMMENDED TIER
SR 59 Perkins St through the SR 8 interchange	EB	Akron	4:30-5:30 PM	46.68	2 and 5
Tallmadge Ave through the SR 8 interchange	WB	Akron	3:00-4:00 PM	51.79	2 and 5
White Pond Dr through the I-77 interchange	SB	Akron	4:15-5:15 PM	52.19	2 and 5
Tallmadge Rd through the I-76 interchange	WB	Por Co-Brimfield Twp	12:00-1:00 PM	53.01	Project 98585 planned, includes operational improvements; Monitor
White Pond Dr through the I-77 Interchange	NB	Akron	7:30-8:30 AM	56.31	2 and 5
SR 241 Massillon Rd through the I-77 interchange	NB	Green	3:00-4:00 PM	56.73	Project 90415 underway, includes widening and roundabouts; Projects 103172 & 103173 upcoming, includes roundabouts; Monitor
Tallmadge Rd through the I-76 interchange	EB	Por Co-Brimfield Twp	4:15-5:15 PM	57.68	Project 98585 planned, includes operational improvements; Monitor
Howe Ave through the SR 8 interchange	EB	Cuyahoga Falls	12:15-1:15 PM	57.77	2 and 5
SR 303 through the SR 8 interchange	WB	Boston Heights	7:30-8:30 AM	57.81	2 and 5
Broad Blvd through the SR 8 interchange	EB	Cuyahoga Falls	3:00-4:00 PM	57.84	2 and 5
SR 8 SB through the I-271 interchange	SB	Macedonia	7:30-8:30 AM	62.26	2 and 5
Massillon Rd through the I-77 interchange	SB	Green	4:15-5:15 PM	62.38	Project 90415 underway, includes widening and roundabouts; Projects 103172 & 103173 upcoming, includes roundabouts; Monitor
SR 261 Tallmadge Ave through the SR 8 interchange	EB	Akron	3:00-4:00 PM	62.58	2 and 5
SR 532 Southeast Ave through the I-76 interchange	SB	Tallmadge	5:15-6:15 PM	62.70	2 and 5
Ghent Rd through the I-77 interchange	NB	Sum Co-Bath Twp	5:00-6:00 PM	63.64	2 and 5

Table 9-4 | Arterial Segment Recommendations

NAME	DIRECTION	POLITICAL UNIT	PEAK TIME	% FREE FLOW	RECOMMENDED TIER
Brittain Rd from Independence Ave to Howe Ave	NB	Akron	7:00-8:00 AM	28.60	2, 3 and 4
SR 91 from Aurora St to SR 303	SB	Hudson	4:00-5:00 PM	30.80	4
SR 91 from Veterans Way to SR 303	NB	Hudson	7:00-8:00 AM	32.80	4
SR 91 from SR 303 to Aurora St	NB	Hudson	5:00-6:00 PM	37.80	4
SR 91 from Valley View Rd to Aurora St	SB	Hudson	5:00-6:00 PM	38.00	4
SR 59 from Union St to SR 8 SB ramps	EB	Akron	3:00-4:00 PM	40.50	2 and 4
SR 303 from Boston Mills to Atterbury Blvd	EB	Hudson	5:00-6:00 PM	41.10	4
Cedar St from Rand St to Dart Ave	EB	Akron	7:45-8:45 AM	43.48	Project PID 88990 completed, included signal interconnect and bike lanes, Monitor
SR 14 from SR 303 W Jct to SR 303 E Jct	EB	Streetsboro	5:00-6:00 PM	44.02	Project PID 99879 completed, included signal interconnect, Monitor
SR 18 from SR 59 to High St	EB	Akron	8:30-9:30 AM	44.85	3 and 4
SR 303 from Atterbury Blvd to SR 91	EB	Hudson	5:00-6:00 PM	47.10	4
SR 91 from Georgetown Rd to Terex Rd	SB	Hudson	6:00-7:00 PM	47.30	4
SR 14 from SR 5 WB ramps to SR 59	WB	Por Co-Ravenna Twp	7:15-8:15 AM	47.53	2
Firestone Blvd from S Main St and Grant St	EB	Akron	5:00-6:00 AM	48.53	Monitor after nearby construction is complete
SR 241 from Raber Rd to Boettler Rd	SB	Green	10:00-11:00 AM	49.50	Project 90415 underway, includes widening and roundabouts; Projects 103172 & 103173 upcoming, includes roundabouts, Monitor
West Ave from Brittain Rd to Tallmadge Circle	EB	Tallmadge	3:00-4:00 PM	51.44	2
SR 91 from SR 303 to Veterans Way	SB	Hudson	5:00-6:00 PM	51.50	4
SR 59 Front St from 2nd St to Hudson Dr	EB	Cuyahoga Falls	3:00-4:00 PM	51.56	2
SR 241 from Graybill Rd to Steese Rd	SB	Green	1:00-2:00 PM	51.90	Monitor after nearby construction is complete
SR 241 from SR 619 to Raber Rd	SB	Green	5:00-6:00 PM	52.20	Project 90415 underway, includes widening and roundabouts, Monitor
Steels Corners Rd from Bridgewater Pkwy to SR 8	EB	Stow	3:00-4:00 PM	52.70	4
Ravenna Rd from SR 91 to Idlewood Dr	NB	Twinsburg	6:00-7:00 PM	53.10	4
SR 303 from Akron Cleveland Rd to Terex Rd	EB	Hudson	7:00-8:00 AM	53.30	4
SR 303 from Hayden Pkwy to SR 91	WB	Hudson	4:00-5:00 PM	53.40	4
W Exchange St from Dart Ave to Rand St	WB	Akron	6:15-7:15 AM	53.76	Project 88990 completed, included signal interconnect and bike lanes, Monitor
Hudson Dr from Walmart Dr to Graham Rd	SB	Stow	12:00-1:00 PM	54.10	Monitor after nearby construction is complete
SR 14 from I-80 ramps to SR 43	EB	Streetsboro	4:45-5:45 PM	54.14	Project 99879 completed, included signal interconnect; Monitor

Table 9-4 | Arterial Segment Recommendations

NAME	DIRECTION	POLITICAL UNIT	PEAK TIME	% FREE FLOW	RECOMMENDED TIER
SR 82 from SR 306 to SR 43	WB	Aurora	9:15-10:15 AM	54.43	Project 107761 planned, includes signal interconnect; Monitor
State Rd from Marc Dr to Bath Rd	SB	Cuyahoga Falls	3:00-4:00 PM	55.20	Monitor after nearby construction is complete
SR 303 from Hayden Pkwy to Stow Rd	EB	Hudson	7:00-8:00 AM	55.50	4
Steels Corners Rd from Wyoga Lake Rd to Bridgewater Pkwy	EB	Cuyahoga Falls/Stow	7:00-8:00 AM	55.60	4
High St from SR 59 to SR 18	SB	Akron	7:45-8:45 AM	55.75	2 and 4
SR 241 from Boettler Rd to Raber Rd	NB	Green	4:00-5:00 PM	55.80	Project 90415 underway, includes widening and roundabouts; Projects 103172 & 103173 upcoming, includes roundabouts; Monitor
Brittain Rd from Howe Ave to Independence Ave	SB	Akron	10:00-11:00 AM	56.30	2, 3 and 4
SR 241 from Graybill Rd to Boettler Rd	NB	Green	4:00-5:00 PM	56.30	Monitor after nearby construction is complete
Ridgewood Rd from I-77 NB On-ramp to Miller Rd	EB	Fairlawn/Copley Twp	7:45-8:45 AM	56.43	4
SR 241 from SR 619 to Raber Rd	SB	Green	5:00-6:00 PM	52.20	Project 90415 underway, includes widening and roundabouts, Monitor
Steels Corners Rd from Bridgewater Pkwy to SR 8	EB	Stow	3:00-4:00 PM	52.70	4
Ravenna Rd from SR 91 to Idlewood Dr	NB	Twinsburg	6:00-7:00 PM	53.10	4
SR 303 from Akron Cleveland Rd to Terex Rd	EB	Hudson	7:00-8:00 AM	53.30	4
SR 303 from Hayden Pkwy to SR 91	WB	Hudson	4:00-5:00 PM	53.40	4
W Exchange St from Dart Ave to Rand St	WB	Akron	6:15-7:15 AM	53.76	Project 88990 completed, included signal interconnect and bike lanes, Monitor
Hudson Dr from Walmart Dr to Graham Rd	SB	Stow	12:00-1:00 PM	54.10	Monitor after nearby construction is complete
SR 14 from I-80 ramps to SR 43	EB	Streetsboro	4:45-5:45 PM	54.14	Project 99879 completed, included signal interconnect; Monitor
SR 82 from SR 306 to SR 43	WB	Aurora	9:15-10:15 AM	54.43	Project 107761 planned, includes signal interconnect; Monitor
State Rd from Marc Dr to Bath Rd	SB	Cuyahoga Falls	3:00-4:00 PM	55.20	Monitor after nearby construction is complete
SR 303 from Hayden Pkwy to Stow Rd	EB	Hudson	7:00-8:00 AM	55.50	4
Steels Corners Rd from Wyoga Lake Rd to Bridgewater Pkwy	EB	Cuyahoga Falls/Stow	7:00-8:00 AM	55.60	4
High St from SR 59 to SR 18	SB	Akron	7:45-8:45 AM	55.75	2 and 4
SR 241 from Boettler Rd to Raber Rd	NB	Green	4:00-5:00 PM	55.80	Project 90415 underway, includes widening and roundabouts; Projects 103172 & 103173 upcoming, includes roundabouts; Monitor
Brittain Rd from Howe Ave to Independence Ave	SB	Akron	10:00-11:00 AM	56.30	2, 3 and 4
SR 241 from Graybill Rd to Boettler Rd	NB	Green	4:00-5:00 PM	56.30	Monitor after nearby construction is complete
Ridgewood Rd from I-77 NB On-ramp to Miller Rd	EB	Fairlawn/Copley Twp	7:45-8:45 AM	56.43	4
SR 241 from SR 619 to Raber Rd	SB	Green	5:00-6:00 PM	52.20	Project 90415 underway, includes widening and roundabouts, Monitor
Steels Corners Rd from Bridgewater Pkwy to SR 8	EB	Stow	3:00-4:00 PM	52.70	4
Ravenna Rd from SR 91 to Idlewood Dr	NB	Twinsburg	6:00-7:00 PM	53.10	4
SR 303 from Akron Cleveland Rd to Terex Rd	EB	Hudson	7:00-8:00 AM	53.30	4
SR 303 from Hayden Pkwy to SR 91	WB	Hudson	4:00-5:00 PM	53.40	4
W Exchange St from Dart Ave to Rand St	WB	Akron	6:15-7:15 AM	53.76	Project 88990 completed, included signal interconnect and bike lanes, Monitor
Hudson Dr from Walmart Dr to Graham Rd	SB	Stow	12:00-1:00 PM	54.10	Monitor after nearby construction is complete
SR 14 from I-80 ramps to SR 43	EB	Streetsboro	4:45-5:45 PM	54.14	Project 99879 completed, included signal interconnect; Monitor
SR 82 from SR 306 to SR 43	WB	Aurora	9:15-10:15 AM	54.43	Project 107761 planned, includes signal interconnect; Monitor
State Rd from Marc Dr to Bath Rd	SB	Cuyahoga Falls	3:00-4:00 PM	55.20	Monitor after nearby construction is complete
SR 303 from Hayden Pkwy to Stow Rd	EB	Hudson	7:00-8:00 AM	55.50	4
Steels Corners Rd from Wyoga Lake Rd to Bridgewater Pkwy	EB	Cuyahoga Falls/Stow	7:00-8:00 AM	55.60	4
High St from SR 59 to SR 18	SB	Akron	7:45-8:45 AM	55.75	2 and 4
SR 241 from Boettler Rd to Raber Rd	NB	Green	4:00-5:00 PM	55.80	Project 90415 underway, includes widening and roundabouts; Projects 103172 & 103173 upcoming, includes roundabouts; Monitor
Brittain Rd from Howe Ave to Independence Ave	SB	Akron	10:00-11:00 AM	56.30	2, 3 and 4
SR 241 from Graybill Rd to Boettler Rd	NB	Green	4:00-5:00 PM	56.30	Monitor after nearby construction is complete
Ridgewood Rd from I-77 NB On-ramp to Miller Rd	EB	Fairlawn/Copley Twp	7:45-8:45 AM	56.43	4
Ravenna Rd from Chamberlin Rd to Cuyahoga Co Line	NB	Twinsburg	7:00-8:00 AM	60.60	Project 113165 planned, includes intersection improvements at Shephard; Monitor
SR 59 from Prospect St to Chestnut St	WB	Ravenna	12:15-1:15 PM	60.63	4

Table 9-4 | Arterial Segment Recommendations

NAME	DIRECTION	POLITICAL UNIT	PEAK TIME	% FREE FLOW	RECOMMENDED TIER
Brittain Rd from Independence Ave to Tallmadge Ave	SB	Akron	6:00-7:00 AM	60.70	2, 3 and 4
SR 59 from Chestnut St to Prospect St	EB	Ravenna	12:00-1:00 PM	60.70	4
Aurora Hudson Rd from I-480 SB Ramps to Frost Rd	EB	Streetsboro	7:00-8:00 AM	60.90	Project 92561 completed, included signal interconnect, turn lanes, bridge widening; Monitor
SR 303 from SR 91 to Atterbury Blvd	WB	Hudson	5:00-6:00 PM	60.90	4
Locust St from Exchange St to Cedar St	SB	Akron	6:00-7:00 AM	61.34	Monitor after nearby construction is complete
SR 82 from SR 91 to Cannon Rd	WB	Twinsburg	5:00-6:00 PM	61.37	4
Newberry St from Broad Blvd to Portage Trail	NB	Cuyahoga Falls	1:00-2:00 PM	61.40	2 and 4
SR 82 from SR 43 to SR 306	EB	Aurora	10:00-11:00 AM	61.48	Project 107761 planned, includes signal interconnect; Monitor
SR 303 from Atterbury Blvd to Boston Mills	WB	Hudson	12:00-1:00 PM	61.70	4
SR 91 from Hudson Dr to Terex Rd	SB	Hudson	6:00-7:00 PM	61.70	4
Terex Rd from SR 91 to Hudson Dr	WB	Hudson	4:00-5:00 PM	61.80	Monitor after nearby construction is complete
S Arlington Rd from SR 619 to I-77 SB ramps	NB	Green	5:00-6:00 PM	62.36	4
SR 91 from Terex Rd to Hudson Dr	NB	Hudson	12:00-1:00 PM	62.70	4
Ghent Rd from Smith Rd to Market St	SB	Fairlawn	5:00-6:00 PM	63.00	2 and 4
SR 18 from High St to SR 59	WB	Akron	4:45-5:45 PM	63.15	3 and 4
Cleveland Massillon Rd from Bywood Ave to Elgin Dr	SB	Fairlawn	5:00-6:00 PM	63.20	Project 103293 underway, includes widen to 5 lanes, roundabout, signal upgrade; Monitor
State Rd from Bath Rd to Graham Rd	SB	Cuyahoga Falls	3:00-4:00 PM	63.20	Monitor after nearby construction is complete
SR 18 from Union St to High St	WB	Akron	4:45-5:45 PM	63.21	3 and 4
SR 91 from Terex Rd to Georgetown Rd	NB	Hudson	12:00-1:00 PM	63.30	4
Ghent Rd from I-77 SB Ramps to Cleveland Massillon Rd	NB	Sum Co-Bath Twp	5:00-6:00 PM	63.37	Project to realign intersection and add new right turn lane underway; Monitor
Cedar St from Dart Ave to Locust St	EB	Akron	7:45-8:45 AM	63.41	Monitor
SR 91 North Ave from Howe Rd to Tallmadge Circle	SB	Tallmadge	4:45-5:45 PM	63.44	Project 93444 completed, included reconstruction with turn lanes and sidewalks; Monitor
SR 59 under the SR 18 Market St bridge	EB	Akron	7:00-8:00 AM	63.85	Project 75436 completed, included SR 59 rerouting and intersection improvements at Howard/ Main; Monitor
Graham Rd from Bath Rd to Wyoga Lake Rd	EB	Cuyahoga Falls	4:00-5:00 PM	63.90	2
Opportunity Pkwy from Cedar St to SR 59	WB	Akron	5:00-6:00 AM	63.95	Monitor after nearby construction is complete
SR 59 from River St to Water St	EB	Kent	5:00-6:00 PM	64.15	Monitor after nearby construction is complete
SR 18 Market St bridge over SR 59	EB	Akron	8:00-9:00 AM	64.21	3 and 4
N Miller Rd from Sand Run Pkwy to Market St	SB	Fairlawn	5:00-6:00 PM	64.33	2
Broad Blvd from 2nd St to SR 8 SB ramps	EB	Cuyahoga Falls	5:00-6:00 PM	64.45	2 and 4
Reimer Rd from Medina Line Rd to Cleveland Massillon Rd	EB	Norton	5:00-6:00 AM	64.56	Monitor after nearby construction is complete
SR 82 from I-480 WB ramps to SR 91	EB	Twinsburg	5:00-6:00 PM	64.74	4
State Rd from Quick Rd to Steels Corners Rd	SB	Cuyahoga Falls	2:00-3:00 PM	65.00	Monitor after nearby construction is complete

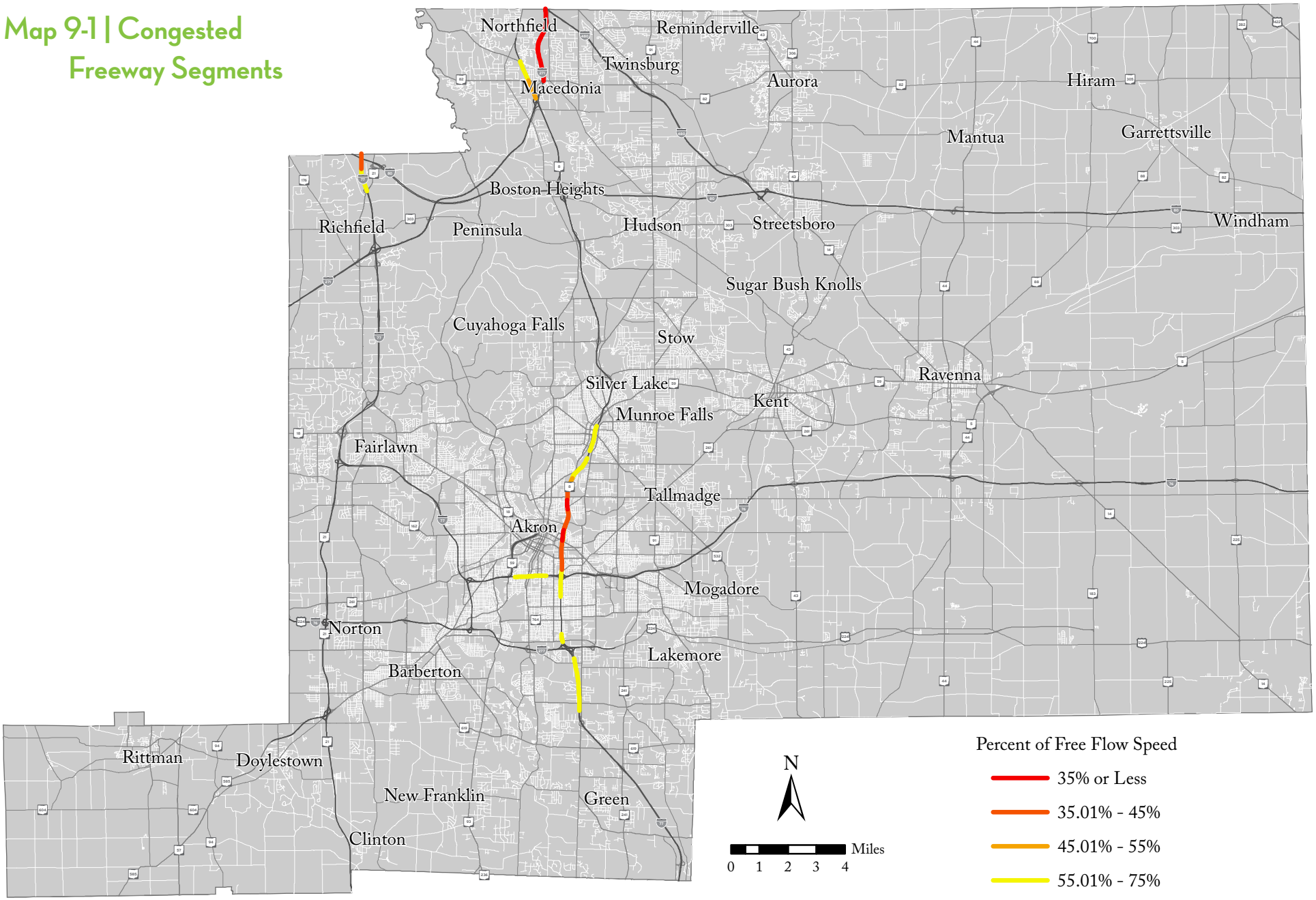
Table 9-5 | Intersection Recommendations

NAME	DIRECTION	POLITICAL UNIT	PEAK TIME	% FREE FLOW	RECOMMENDED TIER
SR 8 NB S of and adjacent to SR 82	NB	Macedonia	3:00-4:00 PM	33.99	4
SR 8 SB north leg of SR 82 intersection	SB	Macedonia	12:00-1:00 PM	34.57	4
SR 14/44 N of and adjacent to SR 59	EB	Por Co-Ravenna Twp	1:15-2:15 PM	47.76	Monitor after nearby construction is complete
SR 8 NB S of and adjacent to Valley View Rd	NB	Macedonia	3:00-4:00 PM	49.82	4
Southeast Ave NW of Eastwood Ave	SB	Tallmadge	4:45-5:45 PM	51.19	2
US 224 E of and adjacent to SR 241	WB	Akron	9:15-10:15 AM	52.79	Monitor after nearby construction is complete
SR 91 both legs of Graham Rd intersection	SB	Stow	5:00-6:00 PM	54.67	Monitor after nearby construction is complete
SR 18 W Market St at Ghent Rd	EB	Fairlawn	1:45-2:45 PM	54.83	4
US 224 W of and adjacent to SR 241	EB	Akron	7:15-8:15 AM	55.81	Monitor after nearby construction is complete
SR 44 through US 224 intersection	NB	Randolph Twp	5:00-6:00 PM	55.83	4
Ridgewood Rd bet I-77 NB on ramp and Miller Rd	EB	Fairlawn/Copley Twp	7:45-8:45 AM	56.43	4

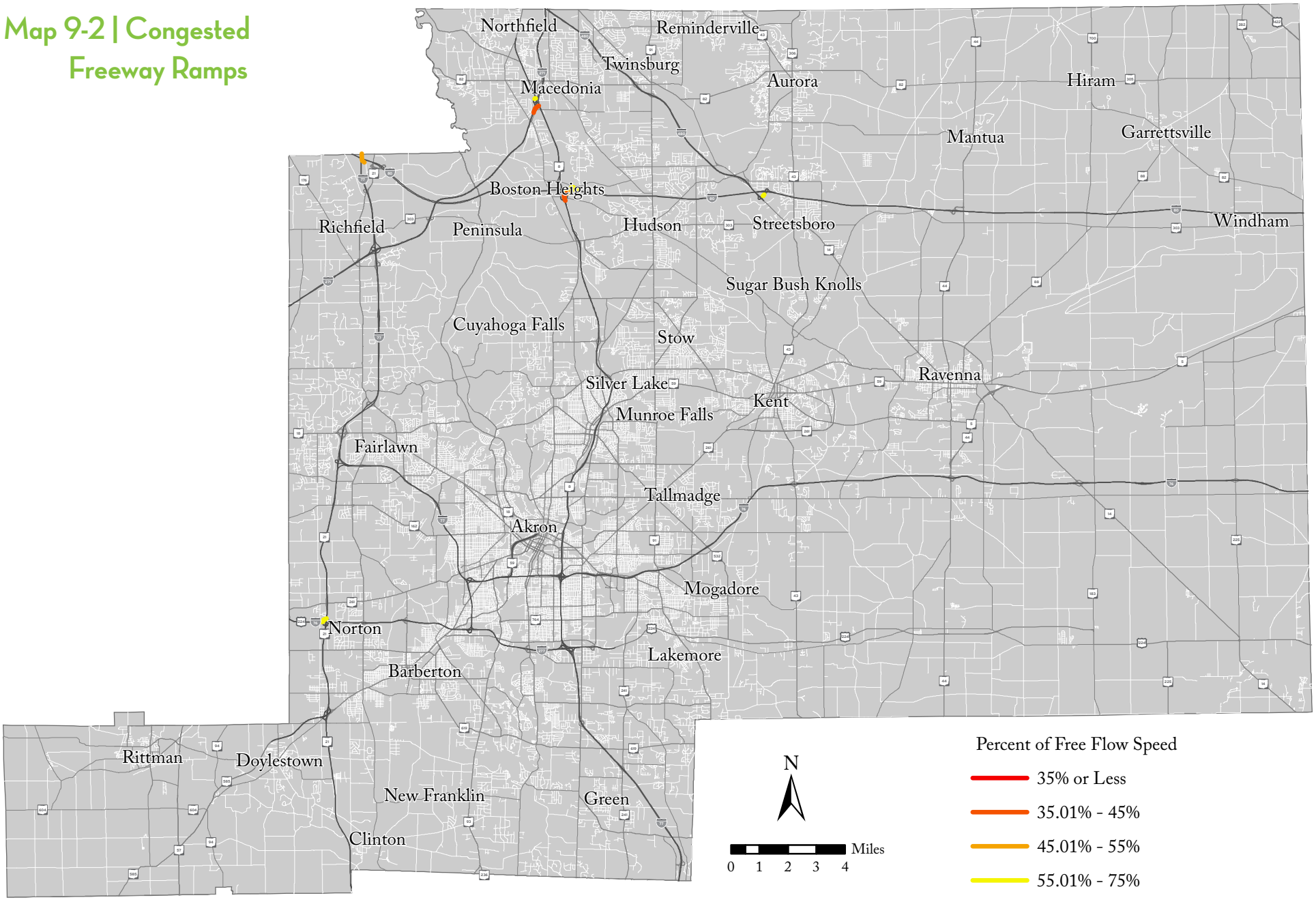
Table 9-5 | Intersection Recommendations

NAME	DIRECTION	POLITICAL UNIT	PEAK TIME	% FREE FLOW	RECOMMENDED TIER
Wheatley Rd through the Brecksville Rd intersection	NB	Richfield	5:30-6:30 PM	56.62	2
Cleveland Massillon Rd through Copley Circle	SB	Sum Co-Copley Twp	7:30-8:30 AM	57.33	Project 103171 completed, included additional turn lanes; Monitor
Brecksville Rd through the Wheatley Rd Intersection	SB	Richfield	5:15-6:15 PM	57.86	2
Broad Blvd bet RR tracks and SR 8 NB ramps	WB	Cuyahoga Falls	4:30-5:30 PM	58.04	Monitor after nearby construction is complete
Merriman Rd W of and adjacent to Portage Path	SB	Akron	5:00-6:00 PM	58.69	2
Ghent Rd N of and adjacent to W Market St	SB	Fairlawn	5:00-6:00 PM	58.89	4
SR 261 S of and adjacent to Summit Rd	EB	Kent/Franklin Twp	4:00-5:00 PM	58.96	4
SR 43 through SR 261 intersection	NB	Kent	4:45-5:45 PM	59.13	2
Portage Trail Ext W of and adjacent to State Rd	EB	Cuyahoga Falls	12:00-1:00 PM	60.10	Project 108084 planned, includes add two-way left turn lane; Monitor
SR 91 N of and adjacent to Graham Rd	NB	Stow	5:00-6:00 PM	60.87	Monitor after nearby construction is complete
Canton Rd through the US 224 Intersection	NB	Sum Co-Springfield Twp	4:00-5:00 PM	61.31	Project 89113 underway, includes concrete median and turn lanes; Monitor
Cleveland Massillon Rd through Copley Circle	NB	Sum Co-Copley Twp	7:30-8:30 AM	61.31	Project 103171 completed, included additional turn lanes; Monitor
SR 44 at the US 224 intersection	SB	Por Co-Randolph Twp	5:00-6:00 PM	61.44	4
US 224 through the SR 91 intersection	EB	Sum Co-Springfield Twp	4:45-5:45 PM	61.61	Project 89113 underway, includes concrete median and turn lanes; Monitor
Brecksville Rd through the Wheatley Rd Intersection	NB	Richfield	7:45-8:45 AM	62.03	2
SR 91 Canton Rd through the US 224 intersection	SB	Sum Co-Springfield Twp	5:00-6:00 PM	62.32	Project 89113 underway, includes concrete median and turn lanes; Monitor
Wilbeth Rd E of and adjacent to SR 93	WB	Akron	4:00-5:00 PM	62.46	Monitor after nearby construction is complete
Cleveland Massillon Rd bet the Ridgewood Roads	NB	Fairlawn/Copley Twp	3:00-4:00 PM	63.44	Project 108131 completed, included add turn lanes; Monitor
Merriman Rd at Portage Path Intersection	NB	Akron	5:00-6:00 AM	63.67	2
Waterloo Rd through the Arlington St intersection	EB	Akron	3:00-4:00 PM	63.99	Project 96359 completed, included intersection improvements; Monitor
SR 43 through US 224 intersection	NB	Por Co-Suffield Twp	8:00-9:00 PM	64.01	4
E Main St W of and adjacent to Willow/Haymaker	EB	Kent	4:00-5:00 PM	64.11	Project 112026 planned, includes reconstruction with median, roundabouts, and bus pull-outs; Monitor
Cleveland Massillon Rd through Ghent Rd intersection	NB	Sum Co-Bath Twp	7:45-8:45 AM	64.14	Project to realign intersection and add new right turn lane underway; Monitor
SR 18 E of and adjacent to Smith Rd	WB	Fairlawn	4:00-5:00 PM	64.49	4
Wheatley Rd through the Brecksville Rd intersection	SB	Richfield	5:00-6:00 PM	64.51	2
SR 82 through the SR 8 intersection	WB	Macedonia	12:15-1:15 PM	64.59	4
Portage Trail Ext E of and adjacent to Portage Path	WB	Akron/Cuyahoga Falls	11:30 AM-12:30 PM	64.63	Monitor after nearby construction is complete

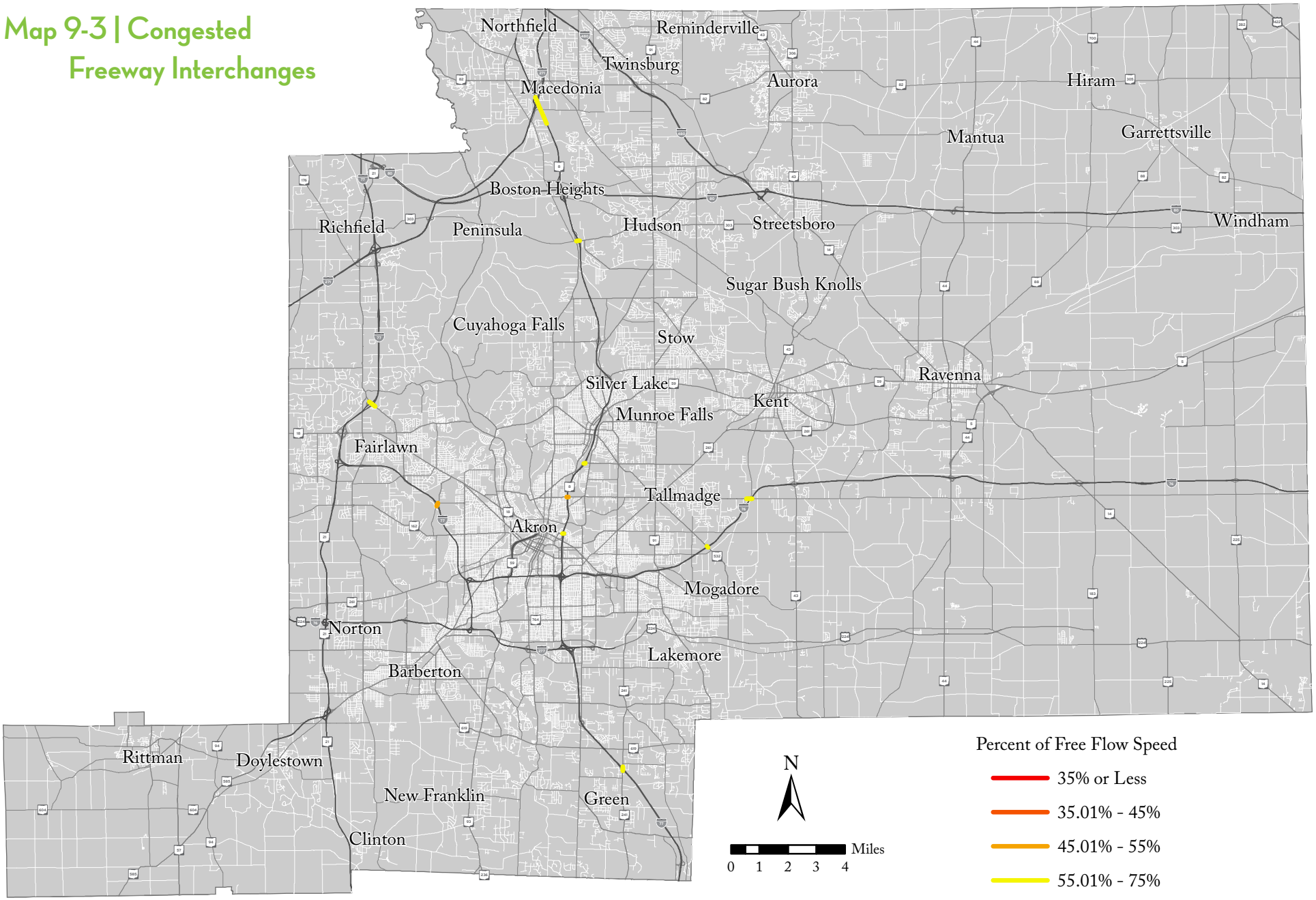
Map 9-1 | Congested Freeway Segments



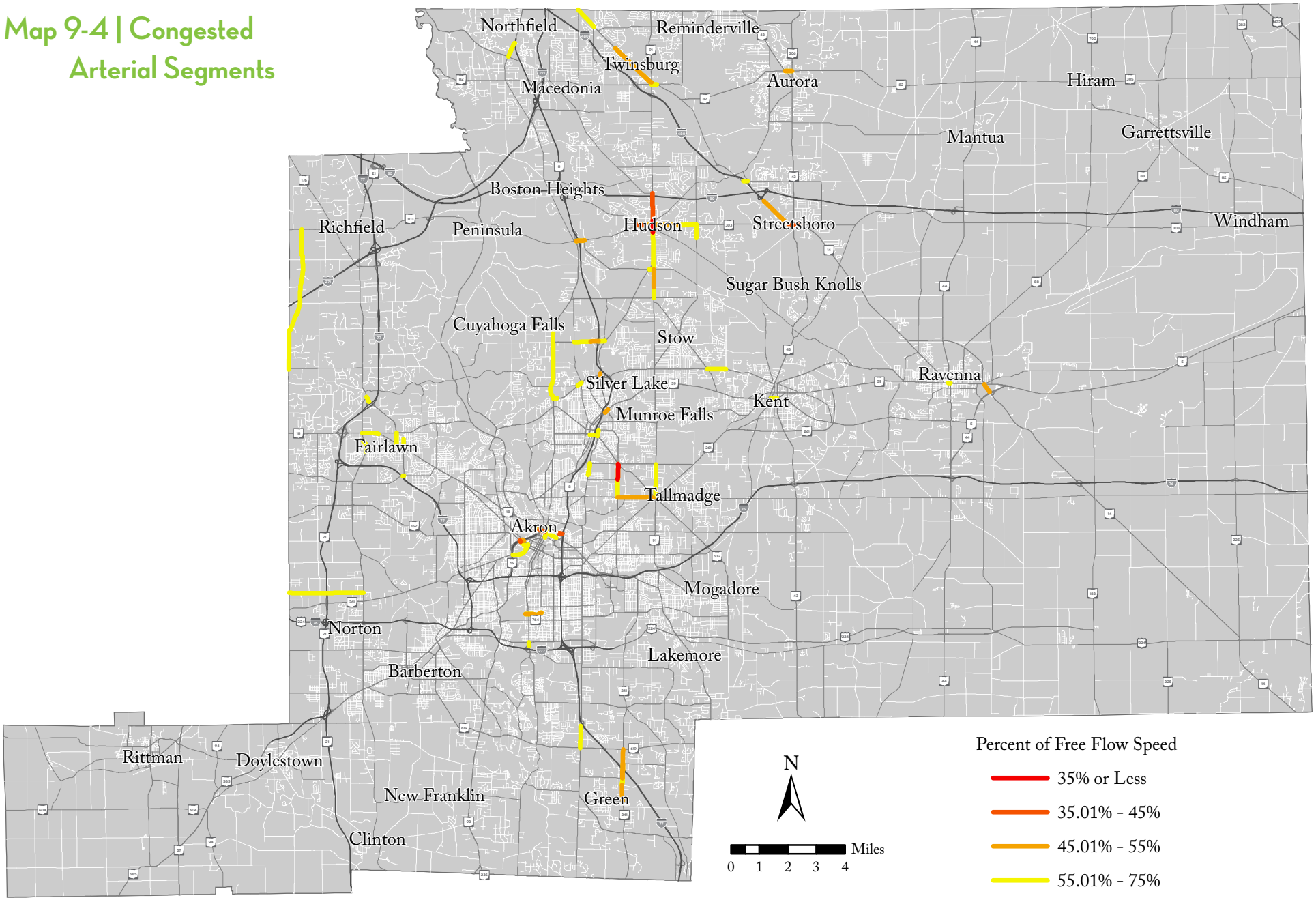
Map 9-2 | Congested Freeway Ramps



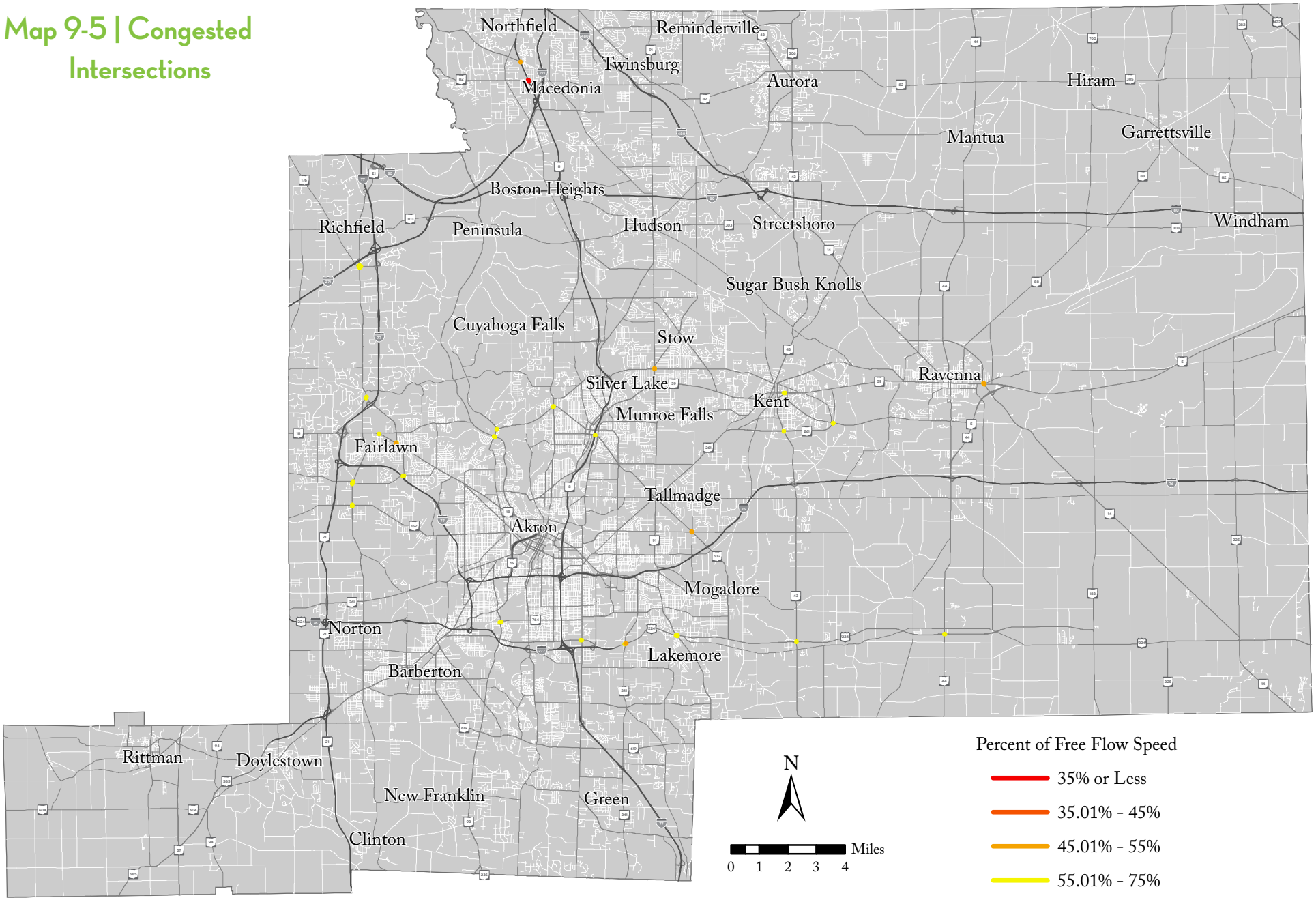
Map 9-3 | Congested Freeway Interchanges



Map 9-4 | Congested Arterial Segments



Map 9-5 | Congested Intersections



Public Transit

As part of the congestion management process, AMATS identifies potential strategies to alleviate congestion and evaluates the expected effectiveness of those strategies in improving the efficiency and safety of existing and future transportation systems. As an established method for reducing single occupancy vehicles (SOVs), strategies aimed at making transit more attractive or accessible can help to reduce the number of vehicles on the road.

The 2020 AMATS Transit Plan made a number of recommendations suited for congestion management. Specific strategies include: high frequency fixed route transit service on congested arterials, realigning routes and services to meet demographic changes, flexible fare policies and employer-based incentive programs, transit oriented land use development, integrating the scheduling and services of the region's transit agencies and improving access to multiple modes of travel (pedestrian, bicycle, vehicle).

Public transportation will never completely replace the automobile for most people. However, with a well maintained and effective public transit system, an increasing percentage of people may come to rely on transit for their transportation needs. Ultimately, any increase in transit use will reduce congestion and vehicle emissions in the AMATS area.

Increased Service Frequency (Headways)

High ridership transit routes on congested roadways have the potential to improve transportation if headways are improved. Transit has always been an affordable alternative to cars. With headways improved to the point that schedules are no longer necessary, transit becomes an easy choice in high density development areas. For this reason, it is recommended that transit agencies review their routes and consider adding more frequent service on their busiest routes.

Consider Transit Oriented Development

Certain intersections or neighborhoods are particularly viable for frequent transit service. Transit stops with characteristics such as high population and job densities, proximity to popular destinations and overall neighborhood vitality may be greatly enhanced through the establishment of transit oriented development/design (TOD) nodes.

METRO's restructured route system intends to use a number of nodes outside of the city center to connect multiple routes beyond the standard radial system. TOD at these nodes would aid in transit ridership and efficiency. Common TOD treatments include:

- Wide, pedestrian friendly sidewalks
- Buildings containing a mixture of uses, built near and facing towards the street
- Incorporation of an inviting ground-level feel: active uses, transparency, pedestrian shelters, bicycle racks, attractive signage, etc.
- Parking located behind the building, typically with alleyway access
- Well-designed bus shelters, bus stops and bus pull-offs (bus bays) for comfortable waiting and loading/unloading, developed in coordination with local communities

Continued Support for NEORide – Cross County Service and Coordination

Public transportation in Ohio has historically been funded through a dedicated portion of the county sales tax. Because of this funding structure, there has been a long-standing principle of only operating services within an agency's home county. NEORide is a Council of Governments (COG) formed originally by Akron METRO RTA, PARTA and SARTA (Stark County) in 2014 to coordinate fixed route and demand response service in northeast Ohio. This on-going transit study is examining the potential for expanded transit service linking Portage, Summit and Stark counties. Integrated services would create transit connections that are needed by transit users across the three counties, improve the efficiency and effectiveness of existing services, and would reduce the operating costs of all three agencies. The NEORide Inter-County Transit study identifies these inter-county transit needs and develops innovative approaches to improve inter-county services in the region. Cross-county service is a key strategy to growing overall transit ridership and a positive transit culture in our region. Key cross-county corridors include:

- Aurora - Streetsboro - Hudson - Stow - Cuyahoga Falls - Akron
- Akron - Cuyahoga Falls - Stow - Kent - Ravenna
- Akron - Green - North Canton - Canton
- Akron - Barberton - Norton - Wadsworth
- Solon - Aurora - Streetsboro

Please see the *2020 Transit Plan* for more specific details regarding transit recommendations.

Freight (Trucks and Railroads)

Proper freight movement can help reduce congestion on highly traveled roadways. Most truck freight movement is on interstates and state routes, so an improvement to those roadways will help both car and truck traffic. Please see the recommended highway improvements above, as many of those improvements will significantly impact freight.

Railroad-highway intersections are a source of congestion and safety concerns. Specific improvements related to rail recommendations are listed below.

- Provide support or engage in public-private partnerships to alleviate congestion on rail lines (such as CSX Lambert to Warwick section near Clinton and NS Cleveland to Pennsylvania Line that passes through Macedonia, Hudson and Ravenna on its way to Alliance)
- Improve rail lines owned by METRO RTA and make them available to local industry.
- Preserve out of service rail lines for future rail use or conversion to bike/pedestrian trails
- Consider public/private partnerships with the rail companies in order to improve freight service in the area
- Improve the Hines Hill Road crossing of the Norfolk-Southern line in Hudson
- Rail grade separation at the following locations:
  - The Stow Road crossing of the Norfolk-Southern Line in Hudson
  - The North Main Street (SR 91) crossing of the CSX Line in Munroe Falls

Please see the *2020 Freight Plan* for more detailed information regarding freight.

Evaluating Strategy Effectiveness

Performance monitoring is not a one-time event, but rather an ongoing activity that must be matched to existing and future resources. This is how the AMATS will monitor not only the ongoing performance of the region's transportation system, but also the effectiveness of the strategies and projects that are put in place. By evaluating congestion in the area, AMATS can determine which strategies worked the best in mitigating specific types of congestion, and which had the least impact. This will in turn identify the best actions in subsequent CMP updates.

The CMP provides a framework for weighing congestion relief projects against one another in terms of effectiveness but does not establish priorities for the region. To effectively monitor the performance of the system, access to good, reliable and consistent data is important. AMATS and ODOT have longstanding data collection efforts, such as traffic volumes, pavement conditions and crashes, but there are issues related to standardization of data. AMATS is committed to an effective regional transportation monitoring system. It is important for AMATS to ensure the data collection efforts are coordinated to facilitate meaningful and efficient analysis. Performance measures are applied at multiple dimensions within the AMATS planning process and include evaluation of strategies at every stage in the process:

- Regional Analysis of Performance Measures
- Project-level Analysis of Performance Measures
- Determination of progress towards regional goals and objectives

The implemented strategies will be monitored to assess their effectiveness. Monitoring techniques and schedules will be dependent on the type of improvement that is implemented, and the data availability. It may take years to assess the benefits of safety-type improvements that are intended to reduce crash rates, crash severity, or incidents. Conversely, the benefits of capacity improvements are relatively easy to measure and assess.

The benefits of the implemented strategies will be documented in a biannual report. For the improvements that may not be accurately measured in a two-year time frame, results will be presented with a description of the limitations of monitoring. Capacity projects and other improvements that are implemented through non- CMP methods will still be monitored to determine their benefits. Based upon the monitoring results, the learned facts will feedback for the CMP to verify and update the used performance measures, the applied data analysis techniques, and the considered strategies. If necessary, the CMP objectives and the CMP itself will be adjusted.

All AMATS funded projects, related to improving congestion, sold between 2016 and 2019 were evaluated for effectiveness of reducing congestion. AMATS analyzed the projects' percent free flow speed in 2016 and 2019 to try to capture the percent before and after the project. This process can help AMATS determine the effectiveness of congestion related strategies. While AMATS included projects sold in 2019 those projects will continue to be monitored because most were not operational until at least 2020. A few of the earlier projects were multi-year projects meaning that their completion date might be in 2019 or later. These projects will also need to be monitored as new data becomes available.

It is important to keep in mind that while these projects were related to congestion, the main intent of the project may not have been congestion alleviation. Some projects were designed to improve safety, sometimes not just for vehicles but also pedestrians and bicyclists. If the project's main goal was not to reduce recurring congestion, the percent free flow speed may not have changed after project completion. This is not an indictment of the project and each project must be analyzed individually while keeping in mind the goals and intent of the project.

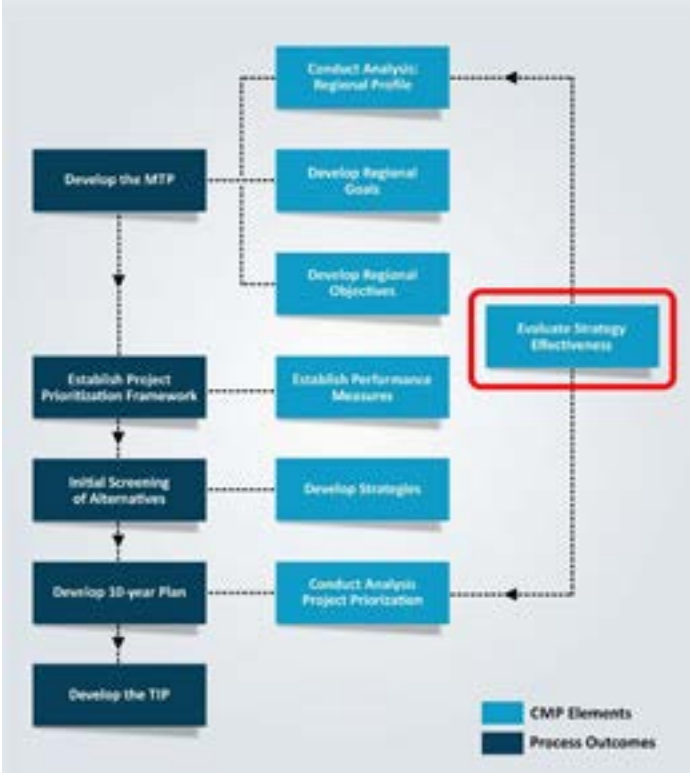


Table 10-1 | Evaluation of Strategies Effectiveness and Congestion

FY SOLD	CY COMPLETED	PID	POLITICAL UNIT	LOCATION	TYPE OF WORK	SEGMENT / DIRECTION	2016 WORST % FREFLOW	2019 WORST % FREFLOW	2016 PEAK PERIOD TRAFFIC VOL	2019 PEAK PERIOD TRAFFIC VOL	IMPROVEMENT TYPE	AFFECT ON CONGESTION AND TRAFFIC
2016	2019	84546	Kent	E Summit St from S Lincoln St to Loop Rd	Coordinated Signals, Intersection Improvements, Raised Median, Sidewalks, Bike Lanes	S Lincoln St to Risman Dr (2-way)	64	61	1,619	1,765	Operational, Bike / Ped, Safety	No significant change
						Risman Dr to Johnston Dr (EB only)	N/A	65	N/A	1,638		N/A
						Johnston Dr to Fraternity Cir (WB only)	60	61	942	1,785		No significant change in congestion / Traffic increased
						Johnston Dr to Campus Center Dr (EB only)	65	68	1,683	1,674		Congestion decreased
						Campus Center Dr to Johnston Dr (WB only)	55	67	1,502	1,568		Congestion significantly decreased / No significant change in traffic
						Campus Center Dr to Loop Rd (2-way)	65	64	2,141	2,782		No significant change in congestion/traffic increased
2016	2017	93441	Ravenna	Highland Ave & Diamond St, Highland Ave & Sycamore St, Diamond St & Cleveland Ave	Signal Coordination, Preemption, Ped Signals, Curb Ramps	N Diamond St from W Main St to Cleveland Rd (2-way)	42	79	56	N/A	Operational, Ped, Safety	Congestion significantly decreased
						Cleveland Rd from W Highland Ave to N Diamond St (2-way)	77	76	1,897	1,845		No significant change in both congestion and traffic
						W Highland Ave from Phelps St to Day St (2-way)	84	83	113	281		No significant change in congestion / Traffic increased
						N Sycamore St from W Main St to W Highland Ave (2-way)	80	69	1,047	1,747		Congestion and traffic both increased
2016	2017	88528	Coventry Twp Springfield Twp	Arlington Rd	NB Left Turn Lane at Warner Rd, Signal Interconnect, Sidewalks	Chenoweth Rd to Akron S Corp line (2-way)	74	70	2,720	1,653	Operational, Ped	No significant change in congestion / Traffic decreased
2016	2019	93432	Akron	Brittain Rd	Signal Coordination, Fiber Optics	E Market St to Eastwood Ave (2-way)	65	77	594	933	Operational	Congestion significantly decreased / Traffic increased
2016	2017	85076	Norton	Cleveland Massillon Rd	Median Turn Lane, Signal Upgrades	Pleasant Dr to Greenridge Rd (2-way)	70	76	3,505	3,063	Operational	Congestion decreased / Traffic decreased
2016	2019	88990	Akron	W Exchange St / Cedar St	Signal Interconnect, Lane Reduction, Parking, Bike Lanes	W Exchange St from S Portage Path to Rhodes Ave (2-way)	83	78	4,900	4,858	Operational, Bike, Safety	No significant change in both congestion and traffic
						W Exchange St from Rand Ave to Rhodes Ave (WB Only)	85	79	2,857	2,786		No significant change in both congestion and traffic
						W Exchange St from S Broadway St to Rand Ave (WB Only)	78	68	2,055	1,906		Congestion slightly increased
						Cedar St from Water St to Broadway St (2-way)	74	76	123	1,072		Congestion decreased / Traffic decreased
						W Cedar St from Rhodes Ave to Water St (EB only)	80	78	1,068	1,136		Congestion decreased / Traffic decreased
2016	2019	93435	Akron	W Market St	Upgrade Signals	Portage Path to S Summit St (2-way)	65	61	1,410	1,248	Operational	Congestion decreased
2016	2020	75436	Akron	SR-59 Rerouting	Reconstruct SR-59 on Rand Ave and Dart Ave	N Howard St to Exchange St (SB Only)	87	80	6,090	2,754	Reconfigure, Safety	Congestion increased / Traffic significantly decreased
						Exchange St to N Howard St (NB Only)	80	73	5,656	180		Congestion increased / Traffic significantly decreased
2016	2020	77269	Akron	Main / Broadway Interchange	Reconstruct & Modify Access to Main / Broadway Interchange, Remove Freeway Access to/from Wolf Ledges Pkwy / Grant Interchange	IR-76/77 from Princeton St to Summer St (EB Only)	87	86	8,485	12,386	Reconfigure, Safety	Congestion decreased / Traffic significantly increased
						S Main St from Thornton St to Miller Ave (SB Only)	N/A	72	N/A	2,197		Low congestion
						IR-76/77 W of Main St Interchange On-ramp (WB Only)	78	90	3,112	195		Congestion decreased / Traffic significantly decreased
						IR-76/77 W of Main St Interchange Off-ramp (WB Only)	N/A	83	N/A	4		No congestion
						Wolf Ledges Pkwy over IR-76/77 (2-way)	79	73	1,371	3,109		Congestion slightly increased / Traffic significantly increased
						Grant St over IR-76/77 (2-way)	75	81	642	1,378		Congestion decreased / Traffic significantly increased
2016	2017	93444	Tallmadge	SR-91 North Ave	Median Turn Lane, Sidewalks	Tallmadge Circle to Garwood Dr (2-way)	65	69	2,611	3,700	Operational, ped, and safety	Congestion decreased/Traffic significantly increased
2016	2017	82956	Hudson Stow Boston Heights	SR-91 Darrow Rd	Turn Lanes, New Signal, Bridge Replacement	Norton Rd from Lawnmark Dt to Sodalite Dr (2-way)	70	71	1,459	1,681	Operational, bike/ped, and safety	Congestion slightly increased / Traffic increased
						SR-91 from Fishcreek Rd to Norton Rd (2-way)	70	69	4,288	4,593		Congestion decreased / Traffic increased
						SR-303 Bridge over Hike & Bike Trail (2-way)	72	76	4,601	4,683		Congestion decreased / Traffic increased
2016	2019	88968	Akron	SR-162 Signals	Signal Interconnect	Collier Rd to Glendale Ave (2-way)	59	67	16	131	Operational	Both congestion and traffic increased
2016	2019	93439	Akron	SR-261 Signals	Signal Coordination	Home Ave to Brittain Rd (2-way)	72	72	4,119	4,333	Operational	No significant change
2017	2018	92561	Streetsboro	Frost Rd	Turn Lanes, Signal Interconnect, Bridge Widening	IR-480 to SR-43 (2-way)	77	80	1,127	1,336	Operational, Safety	No significant change
2017	2017	88548	Hudson	SR-91 / Prospect St	Signal Interconnect, Bike Lanes, Sidewalk	SR-91 (Main St) at Prospect St	60	56	5,417	5,153	Operational, Bike / Ped	No significant change

Table 10-1 | Evaluation of Strategies Effectiveness and Congestion

FY SOLD	CY COMPLETED	PID	POLITICAL UNIT	LOCATION	TYPE OF WORK	SEGMENT / DIRECTION	2016 WORST % FREFLOW	2019 WORST % FREFLOW	2016 PEAK PERIOD TRAFFIC VOL	2019 PEAK PERIOD TRAFFIC VOL	IMPROVEMENT TYPE	AFFECT ON CONGESTION AND TRAFFIC
2017	2018	93436	Akron	SR-18 Signals	Signal Coordination, Reconstruct Kenilworth / Elmdale Intersection	Hawkins Ave to Portage Path (2-way)	69	72	2,294	2,052	Operational, Safety	No significant change
2018	2018	93442	Kent	SR-43 (S Water St)	Turn Lanes, Signal Interconnect, Sidewalk Ramps	SR-261 to Summit St (2-way)	71	75	4,067	4,455	Operational, Ped	No significant change
2018	2020	104042	Akron	S Main St, Phase 1	Street and Sidewalk Replacement, Roundabout, Bike Lanes	Cedar St to Mill St (2-way)	N/A	69	N/A	642	Operational, Bike / Ped	No significant change
2018	2020	92032	Twinsburg	SR-91 (Darrow Rd)	Widen to 4 Lanes, Sidewalk, Intersection Improvements	Glenwood Dr to North Corp line (2-way)	70	73	4,805	5,265	Add Capacity, Ped	No significant change
2019	2020	99879	Streetsboro	Streetsboro Signal Upgrade	Signal Interconnect, Emergency Preemption	SR-14 from Mondial Pkwy to Diagonal Rd (2-way)	69	64	2,323	2,834	Operational, Safety	Both congestion and traffic increased
						SR-43 from Pike Pwky to Seasons Rd (2-way)	67	67	2,001	2,241		No significant change
						SR-303 From Market Sq to SR-14 (2-way)	59	71	869	1,354		Congestion significantly decreased / Traffic increased
						Streetsboro Rd from SR-14 to Root Dr (2-way)	66	67	161	315		No significant change
2019	2020	97638	Norton	Cleveland Massillon Rd	Median Turn Lane, Signal Upgrades, Sidewalk	Shannon Ave to Pleasant Dr (2-way)	76	73	1,547	1,233	Operational, Ped, Safety	Congestion slightly increased / Traffic decreased
2019	2021	108164	Akron	S Main St, Phase 2	Street and Sidewalk Replacement, Roundabout, Bike Lanes	Mill St to SR-59 (NB only)	65	49	536	688	Operational, Bike / Ped	Congestion significantly decreased / Traffic increased
						SR-59 to Mill St (SB only)	71	61	783	484		Congestion significantly decreased / Traffic decreased
2019	2022	96670	Akron Barberton	IR-76	Reconstruct IR-76 / Wooster / East Ave / State St Interchanges	Central Ave to 27th St (EB Only)	94	95	8,478	8,386	Reconfigure, Safety	No significant change
2019	2021	89113	Lakemore	SR-91 / US-224 / Canton Rd	Standard lanes, raised median, turn lanes, sidewalk	Springfield Lake Dr to Farmdale Rd (2-way)	73	65	3,151	3,613	Operational, Ped, Safety	No significant change
2019	2020	103171	Copley Twp	SR-162 (Copley Rd)	New EB Left Turn Lane, New SB Right Turn Lane	Sunset Dr to Cleveland Massillon Rd (Copley Circle) (2-way)	81	77	3,271	2,551	Operational, Safety	No significant change
						Schoolcraft Ave to Cleveland Massillon Rd (Copley Circle) (2-way)	73	83	1,846	3,096		Congestion significantly decreased / Traffic significantly increased
2019	2021	88556	Akron	SR-261 (Tallmadge Ave)	Reduce to 3 Lanes, Realign Dayton St Intersections, Signal Upgrades, Sidewalk Upgrade	N Main St to Gorge Blvd (2-way)	74	56	2,580	2,444	Operational, Ped, Safety	Congestion increased / Traffic decreased

Conclusion

Congestion management is an important element of the transportation planning process. Millions of federal, state and local transportation improvement dollars have been invested in highly effective projects all throughout the AMATS region, which has greatly reduced overall congested within the region. With limited availability of funding for transportation improvements expected into the foreseeable future, it is to our advantage to focus our resources on these most congested segments of our region's roadway network.

In summary, there are fewer extremely congested areas today than in the past. The benefit of this reduction is that we can better leverage decreasing transportation funding by focusing on only the most important regional areas of concern. Unfortunately, most of these remaining areas of concern have not yet been addressed due to their tremendous complexity and/or cost. The many communities and agencies that comprise AMATS must continue diligently working together to find unique solutions to address our remaining congested areas, and to wisely allocate available resources to implement those solutions.

The recommendations in this report will be considered for inclusion into the upcoming long-range regional transportation plan, *Transportation Outlook 2045*. If the recommendations from this report are adopted in the Plan, they will include a more detailed project description and will include costs and an estimated implementation schedule.

Appendix

Table A-1 | CMP Final Analysis Segments

POLITICAL UNIT	NAME	% FREEFLOW	TIME	TYPE	DIRECTION	TIME PERIOD
Akron	Brittain Rd from Independence to Howe Ave	28.60	7:00 - 8:00	Arterial	Northbound	PM
Akron	SR-8 SB bet Forge and Market St	32.61	4:45 - 5:45	Freeway	Southbound	PM
Akron	SR-8 SB bet Glenwood Ave and SB on Ramp	33.74	4:45 - 5:45	Freeway	Southbound	PM
Akron	SR-8 SB through the Perkins St Interchange	34.00	4:45 - 5:45	Freeway	Southbound	PM
Akron	SR-8 SB bet Tallmadge on Ramp and Glenwood Ave Bridge	34.68	4:45 - 5:45	Freeway	Southbound	PM
Akron	SR-8 SB bet Glenwood Ave on Ramp and Perkins St off Ramp	37.56	4:45 - 5:45	Freeway	Southbound	PM
Akron	SR-8 SB Through the Tallmadge Ave Interchange	38.06	4:45 - 5:45	Freeway	Southbound	PM
Akron	Exchange St bet Main St and Paul Williams St	39.97	4:00 - 5:00	Arterial	Eastbound	PM
Akron	SR-59 bet Union St and SR-8 SB Ramps	40.50	4:45 - 5:45	Arterial	Eastbound	PM
Akron	SR-8 SB bet Market St and the Central Interchange	41.16	4:45 - 5:45	Freeway	Southbound	PM
Akron	Cedar St bet Rand St and Dart Ave	43.48	7:45 - 8:45	Arterial	Eastbound	AM
Akron	SR-18 bet High St and SR-59	44.85	4:45 - 5:45	Arterial	Eastbound	PM
Akron	SR-59 Perkins St through the SR-8 Interchange	46.68	4:30 - 5:30	Freeway Interchange	Eastbound	PM
Akron	SR-8 SB bet Cuyahoga Falls on Ramp and Tallmadge off Ramp	48.03	4:45 - 5:45	Freeway	Southbound	PM
Akron	Firestone Blvd bet S Main and Grant St	48.53	5:00 - 6:00	Arterial	Eastbound	AM
Akron	US-224 E of and adjacent to SR-241	51.63	2:00 - 3:00	Intersection	Westbound	MD
Akron	Tallmadge Ave through the SR-8 Interchange	51.79	3:00 - 4:00	Freeway Interchange	Westbound	MD
Akron	White Pond Dr through the IR-77 Interchange	52.19	4:15 - 5:15	Freeway Interchange	Southbound	PM
Akron	W Exchange St bet Dart Ave and Rand St	53.76	6:15 - 7:15	Arterial	Westbound	AM
Akron	IR-76 / IR-77 EB	55.63	4:45 - 5:45	Ramp		PM
Akron	High St bet SR-18 and SR-59	55.75	4:45 - 5:45	Arterial	Westbound	PM
Akron	US-224 W of and adjacent to SR-241	55.81	7:15 - 815	Intersection	Eastbound	AM
Akron	Brittain Rd from Howe to Independence	56.30	5:00 - 6:00	Arterial	Southbound	PM
Akron / Cuyahoga Falls	Home Ave from Annapolis to Howe	57.40	12:00 - 1:00	Arterial	Northbound	MD
Akron	Broadway St bet Mill St and SR-18 Market St	57.62	4:45 - 5:45	Arterial	Eastbound	PM
Akron	Euclid Ave from Dart to Rand	58.00	8:00 - 9:00	Arterial	Eastbound	AM
Akron	Merriman Rd W of and adjacent to Portage Path	58.69	5:00 - 6:00	Intersection	Southbound	PM
Akron	Firestone Blvd from S Main St to Grant St	58.80	10:00 - 11:00	Arterial	Westbound	PM
Akron / Coventry Twp	S Main St bet Waterloo Rd and IR-277 EB Ramps	60.27	4:00 - 5:00	Arterial	Southbound	PM
Akron	Brittain Rd from Independence to Tallmadge Ave	60.30	4:00 - 5:00	Arterial	Southbound	PM
Akron	Locust St bet Cedar St and Exchange St	61.34	6:00 - 7:00	Arterial	Westbound	AM
Akron	Wilbeth Rd E of and adjacent to SR-93	62.46	4:00 - 5:00	Intersection	Westbound	PM
Akron	SR-261 Tallmadge Ave through the SR-8 Interchange	62.58	3:00 - 4:00	Freeway Interchange	Eastbound	MD
Akron	SR-18 bet Union St and High St	63.21	4:45 - 5:45	Arterial	Westbound	PM
Akron	Cedar St bet Dart Ave and Locust St	63.41	7:45 - 8:45	Arterial	Eastbound	AM
Akron / Cuyahoga Falls	Home Ave from Howe to Annapolis	63.50	12:00 - 1:00	Arterial	Southbound	MD
Akron	SR-8 SB bet Gorge Blvd and on Ramp from Cuyahoga Falls Ave	63.53	4:00 - 5:00	Freeway	Southbound	PM
Akron	Merriman Rd at Portage Path Intersection	63.67	5:00 - 6:00	Intersection	Northbound	AM
Akron	SR-59 under the SR-18 Market St bridge	63.85	7:00 - 8:00	Arterial	Eastbound	AM
Akron	Opportunity Pkwy bet Cedar St and SR-59	63.95	5:00 - 6:00	Arterial	Westbound	AM
Akron	Waterloo Rd through the Arlington St Intersection	63.99	3:00 - 4:00	Intersection	Eastbound	MD
Akron	SR-18 Market St bridge over SR-59	64.21	5:00 - 6:00	Arterial	Eastbound	PM
Akron / Cuyahoga Falls	Portage Trail Ext E of and adjacent to Portage Path	64.63	11:30 - 12:30	Intersection	Westbound	MD
Akron	Brittain Rd from Chapman to Eastwood	65.10	5:00 - 6:00	Arterial	Southbound	PM
Akron	Ramp from IR-76 WB to IR-77 SB	65.17	4:45 - 5:45	Ramp		PM
Akron	Brittain Rd from E Market St to Bauer	65.20	7:00 - 8:00	Arterial	Northbound	AM

*Table sorted alphabetically by Political Unit, then by Percent Free Flow Speed.

Table A-1 | CMP Final Analysis Segments

POLITICAL UNIT	NAME	% FREEFLOW	TIME	TYPE	DIRECTION	TIME PERIOD
Akron	IR-76/77 EB through the Main St / Broadway St Interchange	65.28	4:45 - 5:45	Freeway	Eastbound	PM
Akron	Waterloo Rd through the Arlington Rd Intersection	65.29	5:00 - 6:00	Intersection	Westbound	AM
Akron	Perkins St through the SR-8 Interchange	65.30	7:30 - 8:30	Freeway Interchange	Westbound	AM
Akron	SR-93 between IR-277 EB on Ramp and Waterloo Rd	65.53	3:00 - 4:00	Arterial	Northbound	MD
Akron	Waterloo Rd bet SR-93 and IR-277 WB on Ramp	65.57	3:00 - 4:00	Arterial	Eastbound	MD
Akron	IR-76/77 EB bet South St West of Wolf Ledges off Ramp	65.59	4:45 - 5:45	Freeway	Eastbound	PM
Akron	IR-76/77 EB bet Wolf Ledges off Ramp and Wolf Ledges bridge	65.85	4:45 - 5:45	Freeway	Eastbound	PM
Akron	Brittain Rd from Bauer to E Market St	66.50	7:00 - 8:00	Arterial	Southbound	AM
Akron	Cuyahoga Falls Ave bet Riverside Dr and SR-8 SB Ramps	66.71	5:00 - 6:00	Arterial	Westbound	PM
Akron	SR-8 SB bet Ramp split and IR-76 Mainline	66.89	5:00 - 6:00	Freeway	Southbound	PM
Akron	SR-93 between IR-277 EB Ramp and Waterloo Rd	66.89	4:00 - 5:00	Freeway Interchange	Northbound	PM
Akron / Fairlawn / Copley Twp	Ridgewood Rd at Miller Rd	66.96	5:00 - 6:00	Intersection	Eastbound	PM
Akron	SR-8 / IR-77 bet IR-76 and Lovers Lane	67.10	5:00 - 6:00	Freeway	Southbound	PM
Akron	IR-76/77 EB bet South St on Ramp and Main St off Ramp	67.12	4:45 - 5:45	Freeway	Eastbound	PM
Akron	SR-8 SB bet Front St and Howe Ave on Ramp	67.13	4:00 - 5:00	Freeway	Southbound	PM
Akron	Cuyahoga Falls Ave from Riverside Dr to SR-8 SB Ramps	67.51	4:45 - 5:45	Arterial	Eastbound	PM
Akron	Arlington St bet Market St and Buchtel Ave	67.75	4:45 - 5:45	Arterial	Southbound	PM
Akron	SR-241 NB just S of and adjacent to US-224	67.75	4:00 - 5:00	Intersection	Northbound	PM
Akron	Cedar from Rand to Dart	67.80	10:00 - 11:00	Arterial	Eastbound	AM
Akron	Brittain Rd from Goodyear to Newton St	67.80	3:00 - 4:00	Arterial	Northbound	MD
Akron	Brittain Rd from Goodyear to Bauer	67.90	7:00 - 8:00	Arterial	Southbound	AM
Akron	IR-76/77 EB bet Wolf Ledges and Grant St	68.08	4:45 - 5:45	Freeway	Eastbound	PM
Akron	IR-271 NB bet SR-82 and IR-480	68.22	5:15 - 6:15	Freeway	Northbound	PM
Akron	Brittain Rd from Tallmadge Ave to Independence	68.30	2:00 - 3:00	Arterial	Northbound	MD
Akron	W Thornton St bet Dart Ave and S Main St	68.41	6:00 - 7:00	Arterial	Eastbound	AM
Akron / Fairlawn / Copley Twp	Ridgewood Rd at Miller Rd Intersection	68.48	4:00 - 5:00	Intersection	Westbound	PM
Akron	Kelly Ave bet US-224 WB Ramps and Exeter Rd	68.58	4:45 - 5:45	Arterial	Southbound	PM
Akron	Ridgewood Rd bet Miller Rd and Halifax Rd	68.68	11:00 - 12:00	Arterial	Eastbound	MD
Akron	Grant St bet Thornton St and IR-76/77	68.75	4:15 - 5:15	Arterial	Southbound	PM
Akron	High St from Cedar to Bartges	68.80	12:00 - 1:00	Arterial	Westbound	MD
Akron / Bath Twp	Smith Rd bet Revere Rd and Sand Run Rd	69.22	5:00 - 6:00	Arterial	Eastbound	PM
Akron	Kenmore Blvd bet Lakeshore Blvd and Ira Ave	69.30	5:00 - 6:00	Arterial	Eastbound	AM
Akron	IR-76/77 EB bet Grant St and Grant St on Ramp	69.51	4:45 - 5:45	Freeway	Eastbound	PM
Akron	IR-77 SB bet Lafollette St and Mckinley St	69.59	4:45 - 5:45	Ramp		PM
Akron	N Firestone Blvd bet Grant St and Coventry St	69.63	6:00 - 7:00	Arterial	Eastbound	AM
Akron	Grant St through the IR-76 Interchange	69.77	3:00 - 4:00	Freeway Interchange	Southbound	MD
Akron	Euclid Ave bet East Ave and Diagonal Rd	69.83	11:00 - 12:00	Arterial	Westbound	MD
Akron	Tallmadge Ave bet N Main St and SR-8	69.90	3:00 - 4:00	Arterial	Eastbound	MD
Akron	Brittain Rd from Bauer to Goodyear Ave	70.00	3:00 - 4:00	Arterial	Northbound	MD
Akron	Brittain Rd from Evans to Tallmadge Ave	70.00	12:00 - 1:00	Arterial	Northbound	MD
Akron	SR-261 bet SR-59 NB off ranp and Rand	70.02	5:00 - 6:00	Arterial	Westbound	AM
Akron	Tallmadge Ave bet SR-8 and N Main St	70.03	4:15 - 5:15	Arterial	Westbound	PM
Akron / Coventry Twp	S Main St bet IR-277 WB Ramps and Waterloo Rd	70.09	815 - 9:15	Arterial	Northbound	AM
Akron	SR-59 bet SR-18 and Union St	70.12	7:45 - 8:45	Arterial	Westbound	AM
Akron	SR-18 E Market St through the IR-76 Interchange	70.32	4:00 - 5:00	Freeway Interchange	Westbound	PM
Akron	Buchtel Ave bet Fountain St and Goodkirk St	70.45	11:00 - 12:00	Arterial	Westbound	MD

*Table sorted alphabetically by Political Unit, then by Percent Free Flow Speed.

Table A-1 | CMP Final Analysis Segments

POLITICAL UNIT	NAME	% FREEFLOW	TIME	TYPE	DIRECTION	TIME PERIOD
Akron	SR-241 South leg of US-224 Intersection	70.51	5:00 - 6:00	Intersection	Southbound	PM
Akron	Grant St from IR-76 to E Thornton St	70.96	5:00 - 6:00	Arterial	Northbound	AM
Akron	Brittain Rd from Newton to Goodyear	71.00	5:00 - 6:00	Arterial	Southbound	PM
Akron	White Pond Dr bet Mull Ave and Frank Blvd	71.03	4:00 - 5:00	Arterial	Southbound	PM
Akron / Springfield Twp	US-224 bet Massillon Rd and Canton Rd	71.10	4:45 - 5:45	Arterial	Eastbound	PM
Akron	SR-18 bet General St and Seiberling St	71.20	7:30 - 8:30	Arterial	Westbound	AM
Akron	Thornton Ave bet East Ave and SR-93	71.28	6:00 - 7:00	Arterial	Eastbound	PM
Akron	Exchange St bet Main St and Broadway St	71.32	5:00 - 6:00	Arterial	Eastbound	AM
Akron	Thronton bet S Main and Dart Ave	71.36	5:00 - 6:00	Arterial	Westbound	AM
Akron	IR-77 / Vietnam Veterans Memorial Hwy NB	71.44	7:30 - 8:30	Ramp		AM
Akron	Grant St from Cole to IR-76/77	71.70	5:00 - 6:00	Arterial	Northbound	AM
Akron	Brittain Rd from Eastwood to Tonawanda	71.70	4:00 - 5:00	Arterial	Southbound	PM
Akron / Coventry Twp	IR-77 NB at Waterloo Rd	71.87	7:30 - 8:30	Freeway	Northbound	AM
Akron	SR-93 Manchester Rd North leg of Wilbeth Rd Intersection	71.92	1:45 - 2:45	Intersection	Southbound	MD
Akron / Coventry Twp	S Main St through the IR-277 Interchange	72.08	4:00 - 5:00	Freeway Interchange	Southbound	PM
Akron	IR-77 NB bet Waterloo Rd and Wilbeth Rd	72.09	7:30 - 8:30	Freeway	Northbound	AM
Akron	Manchester Rd bet IR-277 EB Ramps and Waterloo Rd	72.26	5:00 - 6:00	Arterial	Southbound	PM
Akron	S Arlington Rd S of and adjacent to Waterloo Rd	72.44	5:00 - 6:00	Intersection	Northbound	PM
Akron	Buchtel Ave bet E Market and N Arlington St	72.55	11:00 - 12:00	Arterial	Eastbound	MD
Akron / Fairlawn	SR-18 bet Rand St and Ghent Rd	72.55	3:00 - 4:00	Arterial	Westbound	MD
Akron	Buchtel Ave bet Union St and Goodkirk St	72.84	3:00 - 4:00	Arterial	Eastbound	MD
Akron	SR-8 NB bet E Market and Perkins off Ramp	72.89	5:00 - 6:00	Freeway	Northbound	PM
Akron	SR-59 bet Market St and Union St	72.93	7:00 - 8:00	Arterial	Eastbound	AM
Akron	Wilbeth Rd bet Allendale St and Coventry St	72.99	3:00 - 4:00	Arterial	Westbound	MD
Akron	Buchtel Ave from Arlington St to E Market	73.17	11:45 - 12:45	Arterial	Westbound	MD
Akron / Cuyahoga Falls	Portage Trail bet N Portage Path and Northampton Rd	73.29	5:15 - 6:15	Arterial	Eastbound	PM
Akron	Home Ave from Tallmadge to Independence	73.30	3:00 - 4:00	Arterial	Northbound	MD
Akron	Broadway St bet SR-18 Market St and SR-59	73.38	5:00 - 6:00	Arterial	Eastbound	PM
Akron	SR-8 NB bet E Market and the High Level Bridge	73.48	5:00 - 6:00	Freeway	Northbound	PM
Akron	Grant St from N Firestone Blvd to Cole Ave	73.60	5:00 - 6:00	Arterial	Northbound	AM
Akron	IR-77 SB bet Lovers Lane and Cole Ave	73.64	5:00 - 6:00	Freeway	Southbound	PM
Akron	Brittain Rd from Tonawanda to Newton	73.70	4:00 - 5:00	Arterial	Southbound	PM
Akron / Fairlawn / Bath Twp	Smith Rd bet Ghent Rd and Revere Rd	73.86	5:00 - 6:00	Arterial	Eastbound	PM
Akron	SR-261 bet Rand and the NB exit Ramp	74.03	7:00 - 8:00	Arterial	Eastbound	AM
Akron	Kenmore Blvd E of and adjacent to 4th St	74.23	5:00 - 6:00	Intersection	Westbound	PM
Akron	SR-18 E Market bet Seiberling St and General St	74.43	7:00 - 8:00	Arterial	Eastbound	AM
Akron	Arlington St bet Wilbeth and Triplett Blvd	74.55	7:00 - 8:00	Arterial	Northbound	PM
Akron	Arlington St bet Wilbeth Rd and Triplett Blvd	74.55	7:00 - 8:00	Arterial	Eastbound	PM
Akron	E Market bet Union St and Goodkirk Rd	74.56	4:45 - 5:45	Arterial	Eastbound	PM
Akron	Home Ave from Independence to Annapolis	74.70	4:00 - 5:00	Arterial	Northbound	PM
Akron / Springfield Twp	Hillbish Ave from Krumroy Rd to US-224	74.86	5:00 - 6:00	Arterial	Northbound	AM
Akron	N Arlington St bet E Market St and Buchtel Ave	74.92	6:45 - 7:45	Arterial	Northbound	AM
Aurora	SR-82 bet SR-43 and SR-306	54.43	5:00 - 6:00	Arterial	Westbound	PM
Barberton	Robinson Ave from SR-619 to Van Buren	65.50	3:00 - 4:00	Arterial	Westbound	MD

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Table A-1 | CMP Final Analysis Segments

POLITICAL UNIT	NAME	% FREEFLOW	TIME	TYPE	DIRECTION	TIME PERIOD
Barberton	Norton Ave bet Barber Rd and Wooster Rd N	69.40	7:00 - 8:00	Arterial	Eastbound	AM
Barberton	Wooster Rd North through the IR-76 Interchange	71.82	3:00 - 4:00	Freeway Interchange	Westbound	MD
Barberton	Wooster Rd N through the IR-76 Interchange	72.51	3:00 - 4:00	Freeway Interchange	Eastbound	MD
Barberton	Robinson Ave from Van Buren to Wooster Rd W	72.70	3:00 - 4:00	Arterial	Westbound	MD
Barberton	Robinson Ave from Wooster Rd W to Van Buren	74.20	3:00 - 4:00	Arterial	Eastbound	MD
Boston Heights	SR-8 NB to IR-80	40.71	5:00 - 6:00	Ramp		PM
Boston Heights	WB Connector bet IR-80 and SR-8	46.69	5:15 - 6:15	Ramp		PM
Boston Heights	EB Connector bet SR-8 SB and IR-80	57.23	5:00 - 6:00	Ramp		PM
Boston Heights	SR-303 through the SR-8 Interchange	57.81	5:15 - 6:15	Freeway Interchange	Westbound	PM
Boston Heights	IR-80 EB to SR-8	59.16	5:15 - 6:15	Ramp		PM
Boston Heights	IR-80 WB to SR-8	64.10	5:00 - 6:00	Ramp		PM
Boston Heights / Boston Twp	Akron Cleveland Rd from Seasons Rd to SR-303	73.30	7:00 - 8:00	Arterial	Northbound	AM
Cuyahoga Falls	SR-59 Front St bet 2nd St and Hudson Dr	51.56	5:00 - 6:00	Arterial	Eastbound	PM
Cuyahoga Falls	State Rd from Marc to Bath	55.20	5:00 - 6:00	Arterial	Southbound	PM
Cuyahoga Falls / Stow	Steels Corners Rd from Bridgewater to Wyoga Lake	55.60	7:00 - 8:00	Arterial	Eastbound	AM
Cuyahoga Falls	Graham Rd from Lillis to State Rd	57.10	3:00 - 4:00	Arterial	Westbound	MD
Cuyahoga Falls / Stow	Steels Corners Rd from Wyoga Lake to Bridgewater	57.10	5:00 - 6:00	Arterial	Eastbound	PM
Cuyahoga Falls	Howe Ave through the SR-8 Interchange	57.77	4:45 - 5:45	Freeway Interchange	Eastbound	PM
Cuyahoga Falls	Broad Blvd through the SR-8 Interchange	57.84	5:00 - 6:00	Freeway Interchange	Eastbound	PM
Cuyahoga Falls	Broad Blvd bet RR tracks and SR-8 NB Ramps	58.04	4:30 - 5:30	Intersection	Southbound	PM
Cuyahoga Falls	State Rd from Marc to Steels Corners	59.00	7:00 - 8:00	Arterial	Northbound	AM
Cuyahoga Falls	Portage Trail Ext W of and adjacent to State Rd	60.10	12:00 - 1:00	Intersection	Eastbound	MD
Cuyahoga Falls	Newberry St from Broad to Portage Tr	61.40	6:00 - 7:00	Arterial	Northbound	PM
Cuyahoga Falls	State Rd from Bath to Graham	63.20	4:00 - 5:00	Arterial	Southbound	PM
Cuyahoga Falls	Graham Rd from Bath Rd to Wyoga Lake Rd	63.90	4:00 - 5:00	Arterial	Eastbound	PM
Cuyahoga Falls	Broad Blvd EB bet 2nd St and SR-8 SB Ramps	64.45	5:00 - 6:00	Arterial	Eastbound	PM
Cuyahoga Falls	State Rd from Quick to Steels Corners	65.00	2:00 - 3:00	Arterial	Southbound	MD
Cuyahoga Falls	Portage Trail through the SR-8 Interchange	65.08	7:15 - 815	Freeway Interchange	Westbound	AM
Cuyahoga Falls	Front St at the Broad Blvd Intersection	66.06	9:00 - 10:00	Intersection	Northbound	PM
Cuyahoga Falls	State Rd from Graham to Bath	68.10	4:00 - 5:00	Arterial	Northbound	PM
Cuyahoga Falls	Graham Rd from Wyoga Lake Rd to Bath Rd	68.10	2:00 - 3:00	Arterial	Westbound	MD
Cuyahoga Falls	Front St bet 2nd St and Hudson Dr	68.14	4:45 - 5:45	Arterial	Westbound	PM
Cuyahoga Falls	2nd St South and adjacent to Oakwood Dr	69.33	9:00 - 10:00	Intersection	Northbound	PM
Cuyahoga Falls	Broad Blvd EB bet 6th St and 2nd St	69.69	3:00 - 4:00	Arterial	Eastbound	MD
Cuyahoga Falls	Steels Corners Rd from State to Wyoga Lake Rd	69.90	7:00 - 8:00	Arterial	Eastbound	AM
Cuyahoga Falls	Hudson Dr from Graham to SR-8 NB Ramp	70.40	3:00 - 4:00	Arterial	Southbound	MD
Cuyahoga Falls	Portage Trail bet 6th St and SR-8	70.50	3:00 - 4:00	Arterial	Eastbound	MD
Cuyahoga Falls	State Rd from Steels Corners to Marc	70.50	3:00 - 4:00	Arterial	Southbound	MD
Cuyahoga Falls	Graham Rd from State Rd to Lillis	70.60	1:00 - 2:00	Arterial	Eastbound	MD
Cuyahoga Falls	State Rd from Steels Corners to Quick	70.80	7:00 - 8:00	Arterial	Northbound	AM
Cuyahoga Falls	Broad Blvd E of and adjacent to 2nd St	70.93	5:00 - 6:00	Intersection	Eastbound	PM
Cuyahoga Falls	Hudson Dr from SR-59 to SR-8 NB Ramp	71.10	7:00 - 8:00	Arterial	Northbound	AM
Cuyahoga Falls	Newberry St from Portage Tr to Broad	71.20	1:00 - 2:00	Arterial	Southbound	MD
Cuyahoga Falls	State Rd from Bath to Marc	71.50	4:00 - 5:00	Arterial	Northbound	PM

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POLITICAL UNIT	NAME	% FREEFLOW	TIME	TYPE	DIRECTION	TIME PERIOD
Cuyahoga Falls	State Rd from Seasons to Quick	71.60	7:00 - 8:00	Arterial	Southbound	AM
Cuyahoga Falls	Hudson Dr from SR-8 NB Ramp to Graham	71.70	7:00 - 8:00	Arterial	Northbound	AM
Cuyahoga Falls	Hudson Dr from SR-8 NB Ramp to SR-59 SB	72.70	5:00 - 6:00	Arterial	Southbound	PM
Cuyahoga Falls	SR-8 SB Through the Portage Trail Interchange	72.99	7:30 - 8:30	Freeway	Southbound	AM
Cuyahoga Falls	Steels Corners Rd from Wyoga Lake to State	73.10	7:00 - 8:00	Arterial	Eastbound	AM
Cuyahoga Falls	2nd St through and N of Broad Blvd	73.13	5:00 - 6:00	Intersection	Southbound	AM
Cuyahoga Falls	Graham Rd from Bath Rd to Lillis	73.30	12:00 - 1:00	Arterial	Westbound	MD
Cuyahoga Falls	SR-8 SB through the Howe Ave Interchange	73.34	4:00 - 5:00	Freeway	Southbound	PM
Cuyahoga Falls	Portage Trail Ext bet Northampton Rd and State Rd	73.40	5:15 - 6:15	Arterial	Westbound	PM
Cuyahoga Falls	SR-8 SB bet Broad Blvd and the SB on Ramp	73.78	7:30 - 8:30	Freeway	Southbound	AM
Cuyahoga Falls	Portage Trail bet 6th St and SR-8 SB Ramps	74.07	3:00 - 4:00	Arterial	Westbound	MD
Cuyahoga Falls	Bailey Rd / Hudson Dr from Munroe Falls Ave to SR-59	74.30	7:00 - 8:00	Arterial	Northbound	AM
Cuyahoga Falls	2nd St bet Portage Trail and Oakwood Dr	74.50	5:00 - 6:00	Arterial	Southbound	PM
Cuyahoga Falls	2nd St-Portage Trail to Oakwood Dr	74.90	5:00 - 6:00	Arterial	Northbound	AM
Fairlawn	SR-18 W Market St at Ghent Rd	54.83	1:45 - 2:45	Intersection	Eastbound	MD
Fairlawn / Copley Twp	Ridgewood Rd bet IR-77 NB on Ramp and Miller Rd	56.43	7:45 - 8:45	Arterial	Eastbound	AM
Fairlawn	Ghent Rd N of and adjacent to W Market St	58.89	5:00 - 6:00	Intersection	Southbound	PM
Fairlawn / Bath Twp	SR-18 bet Smith Rd and Cleveland Massillon Rd	60.15	4:45 - 5:45	Arterial	Westbound	PM
Fairlawn	Ghent Rd bet Market St and Smith Rd	63.00	5:00 - 6:00	Arterial	Southbound	PM
Fairlawn	Cleveland Massillon Rd Bywood to Elgin	63.20	5:00 - 6:00	Arterial	Southbound	PM
Fairlawn / Copley Twp	Cleveland Massillon Rd bet the Ridgewood Roads	63.44	3:00 - 4:00	Intersection/Arterial	Northbound	MD
Fairlawn	N Miller Rd bet Market St and Sand Run Pkwy	64.33	5:00 - 6:00	Arterial	Southbound	PM
Fairlawn	SR-18 E of and adjacent to Smith Rd	64.49	4:00 - 5:00	Intersection	Westbound	PM
Fairlawn	Cleveland Massillon from IR-77 to Elgin	66.20	5:00 - 6:00	Arterial	Southbound	PM
Fairlawn	Smith Rd N of and adjacent to SR-18	66.72	1:15 - 2:15	Intersection	Westbound	MD
Fairlawn / Copley Twp	Cleveland Massillon Rd bet IR-77 and SR-18	70.13	5:00 - 6:00	Arterial	Southbound	PM
Fairlawn	Cleveland Massillon Rd from Elgin to Bywood	71.90	12:00 - 1:00	Arterial	Northbound	MD
Fairlawn	SR-18 bet Cleveland Massillon Rd and Smith Rd	73.36	1:15 - 2:15	Arterial	Eastbound	MD
Fairlawn / Copley Twp	Ridgewood Rd through the IR-77 Interchange	73.77	8:00 - 9:00	Freeway Interchange	Eastbound	AM
Fairlawn / Copley Twp	Cleveland Massillon Rd bet the Ridgewood Rd offset legs	74.19	8:00 - 9:00	Intersection/Arterial	Southbound	AM
Green	SR-241 from Boettler to Raber SB	50.50	4:00 - 5:00	Arterial	Southbound	PM
Green	SR-241 from Steese to Graybill SB	51.90	1:00 - 2:00	Arterial	Southbound	MD
Green	SR-241 from Raber to SR-619 SB	52.20	5:00 - 6:00	Arterial	Southbound	PM
Green	SR-241 from Raber to SR-619 SB	52.70	12:00 - 1:00	Arterial	Southbound	MD
Green	SR-241 from Raber to SR-619 SB	54.00	7:00 - 8:00	Arterial	Southbound	AM
Green	SR-241 from Boettler to Raber SB	54.30	12:00 - 1:00	Arterial	Southbound	MD
Green	SR-241 from Boettler to Raber NB	55.80	4:00 - 5:00	Arterial	Northbound	PM
Green	SR-241 from Graybill to Boettler NB	56.30	4:00 - 5:00	Arterial	Northbound	PM
Green	SR-241 Massillon Rd through the IR-77 Interchange	56.73	4:45 - 5:45	Freeway Interchange	Northbound	PM
Green	SR-241 from Graybill to Boettler NB	57.80	2:00 - 3:00	Arterial	Northbound	MD
Green	SR-241 from Boettler to Raber SB	59.60	10:00 - 11:00	Arterial	Southbound	AM
Green	SR-241 from Graybill to Boettler SB	60.50	4:00 - 5:00	Arterial	Southbound	PM
Green	SR-241 from Graybill to Boettler SB	61.30	12:00 - 1:00	Arterial	Southbound	MD
Green	SR-241 from Graybill to Boettler NB	62.00	10:00 - 11:00	Arterial	Northbound	AM

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POLITICAL UNIT	NAME	% FREEFLOW	TIME	TYPE	DIRECTION	TIME PERIOD
Green	S Arlington Rd bet SR-619 and IR-77 SB Ramps	62.36	5:00 - 6:00	Arterial	Northbound	PM
Green	Massillon Rd through the IR-77 Interchange	62.38	4:15 - 5:15	Freeway Interchange	Southbound	PM
Green	SR-241 from Steese to Graybill SB	64.40	10:00 - 11:00	Arterial	Southbound	AM
Green	SR-241 from Graybill to Boettler SB	64.50	9:00 - 10:00	Arterial	Southbound	AM
Green	Lauby Rd NB S of exit Ramp / CAK entrance	65.35	5:00 - 6:00	Intersection	Northbound	PM
Green	S Arlington Rd through the IR-77 Interchange	65.72	5:00 - 6:00	Freeway Interchange	Southbound	PM
Green	Arlington Rd bet IR-77 SB Ramps and SR-619	66.18	5:00 - 6:00	Arterial	Southbound	PM
Green	Lauby Rd at the IR-77 Ramps / Airport Entrance Intersection	66.58	5:00 - 6:00	Intersection	Southbound	PM
Green / Coventry Twp	IR-77 NB through the Arlington Rd Interchange	71.49	7:30 - 8:30	Freeway Interchange	Northbound	AM
Green	Arlington from Greensburg to E Caston	71.90	7:00 - 8:00	Arterial	Northbound	AM
Green	Lauby Rd NB S of and adjacent to Greensburg Rd	74.27	9:00 - 10:00	Intersection	Northbound	PM
Hudson	SR-91 From SR-303 to Aurora St SB	30.80	4:00 - 5:00	Arterial	Southbound	PM
Hudson	SR-91 from Veterans Way to SR-303 NB	32.80	7:00 - 8:00	Arterial	Northbound	AM
Hudson	SR-91 From SR-303 to Aurora St SB	36.10	3:00 - 4:00	Arterial	Southbound	MD
Hudson	SR-91 From SR-303 to Aurora St NB	37.70	7:00 - 8:00	Arterial	Northbound	AM
Hudson	SR-91 From SR-303 to Aurora St NB	37.80	5:00 - 6:00	Arterial	Northbound	PM
Hudson	SR-91 from Aurora to Valleyview SB	38.00	5:00 - 6:00	Arterial	Southbound	PM
Hudson	SR-303 from Boston Mills to Atterbury EB	41.10	5:00 - 6:00	Arterial	Eastbound	PM
Hudson	SR-91 From SR-303 to Aurora St NB	41.40	12:00 - 1:00	Arterial	Northbound	MD
Hudson	SR-91 from Veterans Way to SR-303 NB	42.00	5:00 - 6:00	Arterial	Northbound	PM
Hudson	SR-91 From SR-303 to Aurora St SB	43.80	8:00 - 9:00	Arterial	Southbound	AM
Hudson	SR-303 from Atterbury to SR-91 EB	47.10	5:00 - 6:00	Arterial	Eastbound	PM
Hudson	SR-91 Georgetown to Terex SB	47.30	6:00 - 7:00	Arterial	Southbound	PM
Hudson	SR-303 from Boston Mills to Atterbury EB	49.70	12:00 - 1:00	Arterial	Eastbound	MD
Hudson	SR-91 from Veterans Way to SR-303 NB	49.90	12:00 - 1:00	Arterial	Northbound	MD
Hudson	SR-91 from Aurora to Valleyview SB	50.10	3:00 - 4:00	Arterial	Southbound	MD
Hudson	SR-91 from Veterans Way to SR-303 SB	51.50	5:00 - 6:00	Arterial	Southbound	PM
Hudson	SR-303 from Boston Mills to Atterbury EB	52.10	7:00 - 8:00	Arterial	Eastbound	AM
Hudson	SR-303 from Atterbury to SR-91 EB	52.30	3:00 - 4:00	Arterial	Eastbound	MD
Hudson	SR-303 from Akron Cleveland to Terex EB	53.30	7:00 - 8:00	Arterial	Eastbound	AM
Hudson	SR-303 from SR-91 to Hayden Pkwy WB	53.40	4:00 - 5:00	Arterial	Westbound	PM
Hudson	SR-91 from Veterans Way to SR-303 SB	53.60	3:00 - 4:00	Arterial	Southbound	MD
Hudson	SR-303 from Atterbury to SR-91 EB	55.10	7:00 - 8:00	Arterial	Eastbound	AM
Hudson	SR-303 from Hayden to Stow EB	55.50	7:00 - 8:00	Arterial	Eastbound	AM
Hudson	SR-91 from Norton to Georgetown SB	57.10	5:00 - 6:00	Arterial	Southbound	PM
Hudson	Stow Rd from Canterbury to SR-303	57.60	7:00 - 8:00	Arterial	Northbound	AM
Hudson	Terex Rd from Hudson to SR-91	57.80	4:00 - 5:00	Arterial	Eastbound	PM
Hudson	SR-91 from Norton to Georgetown SB	58.80	12:00 - 1:00	Arterial	Southbound	MD
Hudson	SR-91 from Hudson to Veterans Way NB	59.10	7:00 - 8:00	Arterial	Northbound	AM
Hudson	SR-303 from SR-91 to Hayden Pkwy EB	60.00	8:00 - 9:00	Arterial	Eastbound	AM
Hudson	SR-303 from Akron Cleveland to Terex WB	60.10	7:00 - 8:00	Arterial	Westbound	AM
Hudson	SR-303 from Hayden to Stow EB	60.20	3:00 - 4:00	Arterial	Eastbound	MD
Hudson	SR-91 from Veterans Way to SR-303 SB	60.50	8:00 - 9:00	Arterial	Southbound	AM
Hudson	SR-303 from Akron Cleveland to Terex WB	60.80	5:00 - 6:00	Arterial	Westbound	PM
Hudson	SR-303 from Atterbury to SR-91 WB	60.90	5:00 - 6:00	Arterial	Westbound	PM

*Table sorted alphabetically by Political Unit, then by Percent Free Flow Speed.

Table A-1 | CMP Final Analysis Segments

POLITICAL UNIT	NAME	% FREEFLOW	TIME	TYPE	DIRECTION	TIME PERIOD
Hudson	SR-91 Terex to Hudson Dr SB	61.70	6:00 - 7:00	Arterial	Southbound	PM
Hudson	SR-303 from Boston Mills to Atterbury WB	61.70	12:00 - 1:00	Arterial	Westbound	MD
Hudson	Terex Rd from SR-91 to Hudson Dr	61.80	4:00 - 5:00	Arterial	Westbound	PM
Hudson	SR-303 from Atterbury to SR-91 WB	61.80	12:00 - 1:00	Arterial	Westbound	MD
Hudson	SR-91 Terex to Hudson Dr SB	62.30	8:00 - 9:00	Arterial	Southbound	AM
Hudson	SR-303 from SR-91 to Hayden Pkwy EB	62.40	3:00 - 4:00	Arterial	Eastbound	MD
Hudson	SR-91 Terex to Hudson Dr NB	62.70	12:00 - 1:00	Arterial	Northbound	MD
Hudson	SR-91 from Hudson to Veterans Way NB	63.20	5:00 - 6:00	Arterial	Northbound	PM
Hudson	SR-91 Georgetown to Terex NB	63.30	12:00 - 1:00	Arterial	Northbound	MD
Hudson	SR-303 from Boston Mills to Atterbury WB	63.70	5:00 - 6:00	Arterial	Westbound	PM
Hudson	SR-91 from Aurora to Valleyview SB	64.10	8:00 - 9:00	Arterial	Southbound	AM
Hudson	SR-303 from Hayden to Stow EB	64.10	4:00 - 5:00	Arterial	Eastbound	PM
Hudson	Hudson Dr from Terex to Norton	68.20	5:00 - 6:00	Arterial	Southbound	PM
Hudson	Stow Rd from Barlow to Norton	69.40	5:00 - 6:00	Arterial	Southbound	PM
Hudson	Stow Rd from Ravenna to Barlow	70.30	5:00 - 6:00	Arterial	Southbound	PM
Hudson	Stow Rd from Barlow to Ravenna	70.40	7:00 - 8:00	Arterial	Northbound	AM
Hudson	SR-303 bet SR-91 and Stow Rd	71.58	3:00 - 4:00	Arterial	Westbound	MD
Hudson / Twinsburg Twp	SR-91 bet SR-303 and Twinsburg Rd	72.09	5:00 - 6:00	Arterial	Southbound	PM
Hudson	Stow Rd from Norton to Barlow	72.40	7:00 - 8:00	Arterial	Northbound	AM
Hudson	Stow Rd from Canterbury to Ravenna	73.00	5:00 - 6:00	Arterial	Southbound	PM
Hudson	Terex Rd from Barlow to SR-303	73.50	5:00 - 6:00	Arterial	Westbound	PM
Hudson	Stow Rd from Ravenna to Canterbury	74.40	7:00 - 8:00	Arterial	Northbound	AM
Hudson	SR-91 bet Hudson Dr and SR-303	74.90	7:30 - 8:30	Arterial	Northbound	AM
Kent / Franklin Twp	SR-261 S of and adjacent to Summit Rd	58.96	4:00 - 5:00	Intersection	Eastbound	PM
Kent	SR-43 through SR-261 Intersection	59.13	4:45 - 5:45	Intersection	Northbound	PM
Kent	E Main St W of and adjacent to Willow / Haymaker	64.11	4:00 - 5:00	Intersection	Eastbound	PM
Kent	SR-59 bet River St and Water St	64.15	5:00 - 6:00	Arterial	Eastbound	PM
Kent	E Main St bet Willow St and Gougler Ave	67.74	5:00 - 6:00	Arterial	Westbound	PM
Kent	Fairchild from SR-43 to Hudson Dr	70.50	5:00 - 6:00	Arterial	Westbound	PM
Macedonia	SR-8 NB South of and adjacent to SR-82	33.99	3:00 - 4:00	Intersection	Northbound	MD
Macedonia	SR-8 SB North leg of SR-82 Intersection	34.57	12:00 - 1:00	Intersection	Southbound	MD
Macedonia	IR-271 NB to SR-8	44.37	7:45 - 8:45	Ramp		AM
Macedonia	SR-8 NB South of and adjacent to Valley View Rd	49.82	3:00 - 4:00	Intersection	Northbound	MD
Macedonia	IR-271 SB to SR-8	55.33	9:00 - 10:00	Ramp		PM
Macedonia	IR-271 NB just North of SR-82	57.09	7:30 - 8:30	Freeway	Northbound	AM
Macedonia	SR-8 NB South of and adjacent to Valley View Rd	57.40	7:15 - 815	Intersection	Northbound	AM
Macedonia	SR-8 SB through the IR-271 Interchange	62.26	7:30 - 8:30	Freeway Interchange	Southbound	AM
Macedonia / Sagamore Hills Twp	SR-8 SB bet Valleyview and SR-82	64.31	5:00 - 6:00	Arterial	Southbound	PM
Macedonia	SR-82 through the SR-8 Intersection	64.59	12:15 - 1:15	Intersection	Westbound	MD
Macedonia	SR-82 through the IR-271 Interchange	65.45	12:15 - 1:15	Freeway Interchange	Westbound	MD
Macedonia / Sagamore Hills Twp	SR-82 bet SR-8 and Boyden Rd	67.46	5:00 - 6:00	Arterial	Westbound	PM
Macedonia	SR-82 at the SR-8 Intersection	70.60	7:45 - 8:45	Intersection	Eastbound	PM
Macedonia	SR-8 through the IR-271 Interchange	70.94	7:30 - 8:30	Freeway Interchange	Northbound	AM
Macedonia	SR-8 to IR-271 SB	72.13	5:00 - 6:00	Ramp		AM

*Table sorted alphabetically by Political Unit, then by Percent Free Flow Speed.

Table A-1 | CMP Final Analysis Segments

POLITICAL UNIT	NAME	% FREEFLOW	TIME	TYPE	DIRECTION	TIME PERIOD
Macedonia / Sagamore Hills Twp	SR-82 bet Boyden Rd and SR-8	72.15	5:15 - 6:15	Arterial	Eastbound	PM
Macedonia	SR-8 SB to IR-271 SB	72.53	4:45 - 5:45	Ramp		PM
Macedonia	SR-8 SB South leg of Valleyview Intersection	72.68	5:00 - 6:00	Intersection	Southbound	PM
Macedonia / Sagamore Hills Twp	SR-8 NB bet SR-82 and Valley View Rd	73.32	5:15 - 6:15	Arterial	Northbound	PM
Northfield / Sagamore Hills Twp	Olde Eight Rd from SR-8 to Valleyview	67.10	5:00 - 6:00	Arterial	Southbound	AM
Northfield / Sagamore Hills Twp	Olde Eight Rd from Valleyview to SR-8	71.20	5:00 - 6:00	Arterial	Northbound	PM
Norton	SR-21 SB to IR-76 WB	60.80	9:30 - 10:30	Ramp		AM
Norton	Reimer Rd bet Medina Line and Cleve Mass Rd	64.56	5:00 - 6:00	Arterial	Eastbound	AM
Norton	IR-76 WB to SR-21 SB	65.62	9:00 - 10:00	Ramp		AM
Norton	SR-21 NB to IR-76 WB	67.36	9:00 - 10:00	Ramp		AM
Norton	Cleveland Massillon Rd through the IR-76 Interchange	69.92	3:00 - 4:00	Freeway Interchange	Southbound	MD
Norton	Barber Rd bet Clark Mill and Summit Rd	73.37	5:00 - 6:00	Arterial	Northbound	PM
Norton	SR-21 SB to IR-76 EB	73.46	12:15 - 1:15	Ramp		MD
Norton	SR-261 through the SR-21 Intersection	74.44	7:15 - 815	Freeway Interchange	Eastbound	AM
Portage Co - Ravenna Twp	SR-14 bet SR-5 WB Ramps and SR-59	47.53	7:15 - 815	Arterial	Westbound	AM
Portage Co - Ravenna Twp	SR-14/44 N of and adjacent to SR-59	47.76	1:15 - 2:15	Intersection	Eastbound	MD
Portage Co - Ravenna Twp	SR-14/44 North leg of SR-59 Intersection	48.07	1:15 - 2:15	Intersection	Southbound	MD
Portage Co - Brimfield Twp	Tallmadge Rd through the IR-76 Interchange	53.01	4:00 - 5:00	Freeway Interchange	Westbound	PM
Portage Co - Randolph Twp	SR-44 through US-224 Intersection	55.83	5:00 - 6:00	Intersection	Northbound	PM
Portage Co - Randolph Twp	SR-44 at the US-224 Intersection	61.44	5:00 - 6:00	Intersection	Southbound	PM
Portage Co - Suffield Twp	SR-43 through US-224 Intersection	64.01	8:00 - 9:00	Intersection	Northbound	PM
Portage Co - Ravenna Twp	SR-14/44 North of and adjacent to SR-59	64.20	4:00 - 5:00	Intersection	Northbound	PM
Portage Co - Rootstown Twp	SR-44 bet Tallmadge Rd and IR-76 EB Ramps	65.17	4:45 - 5:45	Arterial	Southbound	PM
Portage Co - Suffield Twp	SR-43 through the US-224 Intersection	65.97	10:00 - 11:00	Intersection	Southbound	AM
Portage Co - Suffield Twp	SR-43 through the SR-261 Intersection	66.31	4:45 - 5:45	Intersection	Southbound	PM
Portage Co - Ravenna Twp	SR-59 W of and adjacent to SR-14/44	66.61	5:00 - 6:00	Intersection	Westbound	AM
Portage Co - Rootstown Twp	SR-44 NB through the IR-76 Interchange	67.19	4:45 - 5:45	Freeway Interchange	Northbound	PM
Portage Co - Rootstown Twp	SR-44 bet Tallmadge Rd and IR-76	67.34	7:15 - 815	Arterial	Northbound	AM
Portage Co - Ravenna Twp	SR-14/44 bet SR-5 and SR-59	70.33	3:00 - 4:00	Arterial	Northbound	MD
Portage Co - Rootstown Twp	SR-44 bet Prospect St and IR-76 WB Ramps	71.11	5:15 - 6:15	Arterial	Southbound	PM
Portage Co - Franklin Twp	SR-261 South leg of Intersection with Summit St	73.19	4:45 - 5:45	Intersection	Westbound	PM
Portage Co - Edinburg Twp	SR-14 bet IR-76 EB Ramps and Rock Spring Rd	73.63	5:00 - 6:00	Arterial	Eastbound	PM
Portage Co - Ravenna Twp / Ravenna	SR-14 bet Infirmary Rd and SR-44 / Chestnut St	74.55	4:00 - 5:00	Arterial	Eastbound	PM
Ravenna	SR-59 bet S Prospect St and N Chestnut St	60.63	12:15 - 1:15	Arterial	Westbound	MD
Ravenna	SR-59 Main St bet Chestnut St and Prospect St	60.67	4:00 - 5:00	Arterial/Intersection	Eastbound	PM
Ravenna	SR-59 bet Diamond St and Chestnut St	67.25	3:00 - 4:00	Arterial	Eastbound	MD
Richfield	IR-77 NB Through the IR-80 Interchange	40.70	7:30 - 8:30	Freeway	Northbound	AM
Richfield	IR-77 NB South of IR-80 Ramps	42.96	7:30 - 8:30	Freeway	Northbound	AM
Richfield	Ramp from IR-80 to IR-77 NB	54.98	7:30 - 8:30	Ramp		AM
Richfield	Wheatley Rd through the Brecksville Rd Intersection	56.62	5:30 - 6:30	Intersection	Northbound	PM
Richfield	IR-77 NB bet Brecksville Rd and IR-80	57.66	7:30 - 8:30	Freeway	Northbound	AM
Richfield	Brecksville Rd through the Wheatly Rd Intersection	57.86	5:15 - 6:15	Intersection	Southbound	PM

*Table sorted alphabetically by Political Unit, then by Percent Free Flow Speed.

Table A-1 | CMP Final Analysis Segments

POLITICAL UNIT	NAME	% FREEFLOW	TIME	TYPE	DIRECTION	TIME PERIOD
Richfield	Brecksville Rd through Intersection with Wheatly Road	62.03	7:45 - 8:45	Intersection	Northbound	AM
Richfield	Wheatly Rd through the Brecksville Rd Intersection	64.51	5:00 - 6:00	Intersection	Southbound	PM
Richfield / Richfield Twp	Wheatly Rd through the IR-77 Interchange	69.80	4:45 - 5:45	Freeway Interchange	Southbound	PM
Richfield	WB Connector bet IR-80 and SR-21	72.48	8:45 - 9:45	Ramp		PM
Richfield	Bet IR-80 Connector Rd WB to SR-21	72.71	8:45 - 9:45	Ramp		PM
Richfield	Brecksville Rd at IR-80 Interchange	74.29	7:45 - 8:45	Freeway Interchange	Northbound	AM
Stow	Steels Corners Rd from Bridgewater to SR-8	52.70	5:00 - 6:00	Arterial	Eastbound	PM
Stow	Hudson Dr from Walmart Dr to Graham	54.10	5:00 - 6:00	Arterial	Southbound	PM
Stow	SR-91 North Leg of Graham Rd Intersection	54.67	5:00 - 6:00	Intersection	Southbound	PM
Stow	Graham Rd from Portage Co Line to Fishcreek	57.70	2:00 - 3:00	Arterial	Westbound	MD
Stow	Steels Corners Rd from SR-8 to Hudson	58.80	5:00 - 6:00	Arterial	Eastbound	PM
Stow	SR-91 N of and adjacent to Graham Rd	60.87	5:00 - 6:00	Intersection	Northbound	PM
Stow	Graham Rd from Baird to Fishcreek Rd	66.00	7:00 - 8:00	Arterial	Eastbound	AM
Stow	SR-91 bet SR-59 and Graham Rd	66.36	5:00 - 6:00	Arterial	Southbound	PM
Stow	Steels Corners Rd from SR-8 to Bridgewater	66.50	5:00 - 6:00	Arterial	Eastbound	PM
Stow	Stow Rd from Fishcreek to SR-91	66.60	3:00 - 4:00	Arterial	Southbound	MD
Stow	Hudson Dr from Graham to Walmart Dr	67.50	8:00 - 9:00	Arterial	Northbound	PM
Stow	Graham Rd from Fishcreek to Portage Co Line	67.70	7:00 - 8:00	Arterial	Eastbound	AM
Stow	Steels Corners Rd from Hudson to SR-8	68.20	5:00 - 6:00	Arterial	Eastbound	PM
Stow	Hudson Dr from Steels Corners to Springdale	69.40	12:00 - 1:00	Arterial	Southbound	MD
Stow	Stow Rd from SR-91 to Fishcreek	70.70	4:00 - 5:00	Arterial	Northbound	PM
Stow	Graham Rd from Fishcreek to Baird	71.30	3:00 - 4:00	Arterial	Westbound	MD
Stow	Hudson Dr from Springdale to Steels Corners	72.80	12:00 - 1:00	Arterial	Northbound	MD
Stow	Graham Rd from SR-91 to Charring Cross	73.10	5:00 - 6:00	Arterial	Eastbound	PM
Stow	Graham Rd from Charring Cross to SR-91	74.30	3:00 - 4:00	Arterial	Westbound	MD
Streetsboro	SR-14/303 bet W jct and E jct	44.02	5:00 - 6:00	Arterial	Eastbound	PM
Streetsboro	SR-14 bet IR-80 Ramps and SR-43	54.14	4:45 - 5:45	Arterial	Eastbound	PM
Streetsboro	SWB Connector bet IR-480 and IR-80	57.22	9:15 - 10:15	Ramp		PM
Streetsboro	Aurora Hudson Rd from IR-480 SB Ramps to Frost Rd	60.90	7:00 - 8:00	Arterial	Eastbound	AM
Streetsboro	NEB Connector bet IR-480 and IR-80	67.12	9:15 - 10:15	Ramp		PM
Streetsboro	SR-14/303 bet West Junction and East Junction	72.19	3:00 - 4:00	Arterial	Westbound	MD
Streetsboro	SR-14 bet SR-43 and the IR-80 Ramps	73.60	12:15 - 1:15	Arterial	Westbound	MD
Streetsboro	SR-303 E of and adjacent to SR-14 (East)	73.86	7:00 - 8:00	Intersection	Westbound	AM
Summit Co - Copley Twp	Cleveland Massillon Rd through Copley Circle	57.33	7:30 - 8:30	Intersection	Southbound	AM
Summit Co - Northfield Center Twp	Olde Eight Rd from Valleyview to SR-82	58.70	12:00 - 1:00	Arterial	Southbound	MD
Summit Co - Richfield Twp	Medina Line Rd bet Bath Rd and SR-303	59.89	6:00 - 7:00	Arterial	Southbound	AM
Summit Co - Copley Twp	Cleveland Massillon Rd through the circle	61.31	7:30 - 8:30	Intersection	Northbound	AM
Summit Co - Springfield Twp	Canton Rd through the US-224 Intersection	61.31	4:00 - 5:00	Intersection	Northbound	PM
Summit Co - Springfield Twp	US-224 through the SR-91 Intersection	61.61	4:45 - 5:45	Intersection	Eastbound	PM
Summit Co - Springfield Twp	SR-91 through the US-224 Intersection	62.32	5:00 - 6:00	Intersection	Southbound	PM
Summit Co - Bath Twp	Ghent Rd bet Cleveland Mass Rd and IR-77 SB ent Ramp	63.37	5:00 - 6:00	Arterial	Northbound	PM
Summit Co - Bath Twp	Ghent Rd through the IR-77 Interchange	63.64	5:00 - 6:00	Freeway Interchange	Northbound	PM
Summit Co - Bath Twp	Cleveland Massillon Rd through Ghent Rd Intersection	64.14	7:45 - 8:45	Intersection	Northbound	AM

*Table sorted alphabetically by Political Unit, then by Percent Free Flow Speed.

Table A-1 | CMP Final Analysis Segments

POLITICAL UNIT	NAME	% FREEFLOW	TIME	TYPE	DIRECTION	TIME PERIOD
Summit Co - Northfield Center Twp	Olde Eight Rd from SR-82 to Valleyview	65.50	3:00 - 4:00	Arterial	Northbound	MD
Summit Co - Bath Twp / Copley Twp	SR-18 bet Cleveland Massillon Rd and IR-77 NB Ramps	67.03	12:30 - 1:30	Arterial	Westbound	MD
Summit Co - Coventry Twp	S Main St bet Swartz Rd and N Turkeyfoot Rd	67.47	7:30 - 8:30	Arterial	Northbound	AM
Summit Co - Coventry Twp	S Main St at the Killian Rd Intersection	68.58	9:00 - 10:00	Intersection	Northbound	PM
Summit Co - Copley Twp	SR-162 Copley Rd through the SR-21 Interchange	68.69	7:45 - 8:45	Freeway Interchange	Eastbound	AM
Summit Co - Bath Twp / Copley Twp	SR-18 E of and adjacent to Medina Line Rd	68.87	5:15 - 6:15	Intersection	Westbound	PM
Summit Co - Bath Twp / Copley Twp	SR-18 bet IR-77 NB Ramps and Cleveland Massillon Rd	69.60	5:15 - 6:15	Arterial	Eastbound	PM
Summit Co - Coventry Twp	IR-77 NB bet Arlington Rd and IR-277 / US-224	70.96	7:30 - 8:30	Freeway	Northbound	AM
Summit Co - Bath Twp	Cleveland Massillon Rd through the Ghent Rd Intersection	71.36	5:00 - 6:00	Intersection	Southbound	PM
Summit Co - Copley Twp	Cleveland Massillon Rd bet Copley Rd and Ridgewood Rd	72.86	4:45 - 5:45	Arterial	Southbound	PM
Summit Co - Bath Twp	Ghent Rd bet IR-77 SB Ramps and Cleveland Massillon Rd	73.16	5:00 - 6:00	Arterial	Southbound	PM
Tallmadge	SouthEast Ave NW of Eastwood Ave	51.19	4:45 - 5:45	Intersection	Southbound	PM
Tallmadge	West Ave bet Brittain Rd and Tallmadge Circle	51.44	4:45 - 5:45	Arterial	Eastbound	PM
Tallmadge	SR-532 SouthEast Ave through the IR-76 Interchange	62.70	5:15 - 6:15	Freeway Interchange	Southbound	PM
Tallmadge	SR-91 North Ave bet Tallmadge Circle and Howe Rd	63.44	4:45 - 5:45	Arterial	Southbound	PM
Tallmadge	SouthEast Ave through the IR-76 Interchange	70.42	3:00 - 4:00	Freeway Interchange	Northbound	MD
Tallmadge	NorthWest Ave bet Howe Rd and Tallmadge Circle	70.52	4:00 - 5:00	Arterial	Southbound	PM
Tallmadge	SouthEast Ave bet Eastwood / Munroe and IR-76	71.58	5:00 - 6:00	Arterial	Northbound	PM
Tallmadge	SouthEast Ave NW and adjacent to Eastwood / Munroe Intersection	74.57	11:15 - 12:15	Intersection	Northbound	MD
Twinsburg	Ravenna Rd from SR-91 to Idlewood	49.90	2:00 - 3:00	Arterial	Northbound	MD
Twinsburg	Ravenna Rd from Idlewood to SR-91	57.60	6:00 - 7:00	Arterial	Southbound	AM
Twinsburg	Ravenna Rd from Chamberlin to Cuyahoga Co Line	60.60	7:00 - 8:00	Arterial	Northbound	AM
Twinsburg	SR-82 bet SR-91 and Cannon Rd	61.37	5:00 - 6:00	Arterial	Westbound	PM
Twinsburg	SR-82 bet IR-480 WB Ramps and SR-91	64.74	5:00 - 6:00	Arterial	Eastbound	PM
Twinsburg	SR-91 NB through the IR-480 Interchange	68.13	4:45 - 5:45	Freeway Interchange	Northbound	PM
Twinsburg	Ravenna Rd from Cuyahoga Co Line to Chamberlin	69.30	5:00 - 6:00	Arterial	Southbound	PM
Twinsburg	SR-91 bet Twinsburg Rd and IR-480	71.64	4:45 - 5:45	Arterial	Northbound	PM
Twinsburg	SR-82 EB through the IR-480 Interchange	72.17	4:45 - 5:45	Freeway Interchange	Eastbound	PM
Twinsburg	Ravenna Rd from Chamberlin to Idlewood	72.40	7:00 - 8:00	Arterial	Southbound	AM

*Table sorted alphabetically by Political Unit, then by Percent Free Flow Speed.





The *2020 Congestion Management Process* is published by:
Akron Metropolitan Area Transportation Study
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Akron, Ohio 44308-1423
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This report was prepared by the Akron Metropolitan Area Transportation Study (AMATS) in cooperation with the U.S. Department of Transportation, the Ohio Department of Transportation, and the Village, City and County governemtns of Portage and Summit Counties and a portion of Wayne County.