Quad Cities
Congestion Management Process

Addendum to the
Connect QC: 2050 Quad Cities
Long Range Transportation Plan

July 2022

Bi-State
Regional Commission

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Addendum to Connect QC 2050: Quad Cities Long Range Transportation Plan

Approved July 26, 2022

by the Quad Cities MPO Transportation Policy Committee

Representing comprehensive, cooperative and continuing transportation planning for the Davenport, Iowa-Illinois Urbanized Area (Quad Cities) by:

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Illinois Department of Transportation
Iowa Department of Transportation
And
Local Units of Government

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ABSTRACT

TITLE:	Congestion Management Process Addendum to Connect QC 2050: Quad Cities Long Range Transportation Plan
AUTHOR:	Bi-State Regional Commission Staff
SUBJECT:	An addendum to the Quad Cities Long Range Transportation Plan documenting the processes and procedures used by the Metropolitan Planning Organization, known as the Quad Cities MPO, as part of metropolitan travel demand forecasting for the Quad Cities metropolitan planning area.
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SOURCE OF COPIES:	Bi-State Regional Commission 1504 Third Avenue Rock Island, IL 61201 (309) 793-6300 www.bistateonline.org
ABSTRACT:	A metropolitan planning organization must prepare a transportation plan in accordance with 49 USC 5303 (i) that inventories modal transportation facilities and looks at factors influencing the metropolitan transportation system over a 20-year forecast period. A travel demand model is used to forecast future traffic based on projections of land use activities in a base year (2015) and horizon years (2030 and 2050). The technical report outlines the data inputs and methodology used to project future traffic within the Quad Cities metropolitan planning area.

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NOTE: Additional membership may include advisory representatives from the Illinois and Iowa Departments of Transportation, planning and research engineers from the Illinois and Iowa Federal Highway Administration, and a community planning representative from the Federal Transit Administration Region VII.

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Introduction

One of the largest concerns for travelers and a region's transportation system is congestion. Congestion results in increased air pollution, decreased gasoline mileage that increases the cost of driving, increased costs in shipping goods and providing services, increased number of accidents, and potentially increased stress-related health problems. Congestion places a burden on all elements of society, from the economy to individual quality of life. Whether it takes the form of trucks stalled in traffic, cargo stuck at overwhelmed seaports, or airplanes circling over crowded airports, congestion costs America billions every year. According to the Texas Transportation Institute's 2019 Urban Mobility Report, congestion cost America $166 billion in 2017. Congestion is the cause of 3.3 billion gallons of wasted fuel and 54 hours/commuter in peak hour traffic jams. Congestion is not a new problem, but rather a problem that has spread from the large metropolitan areas into smaller cities. Since 1982, congestion has spread to more cities, more roadways, more days of the week, and more times during the day. Congestion in small areas today (population less than 500,000) is about the same as the average delay in the very large population group (population over three million) in 1982.

It is important for communities to realize that congestion problems will not solve themselves and to take a proactive approach to alleviate congestion where it occurs. Congestion is different for every community, and could result from a large population, large volumes of commuters, natural land features (such as rivers, oceans, mountains, valleys, etc.), or non-recurring incidences such as traffic accidents. A community that has congestion from a large influx in workers may identify solutions that are different from a community that experiences a lot of congestion due to natural land features. It is important for the community to know their background, so they are able to identify why congestion exists and identify strategies to alleviate it.

Bi-State Area

The Quad Cities Area is located along the Iowa/Illinois border, with the Mississippi River bisecting the area. The Quad Cities planning area boundary had a population of 283,320 people according to the 2018 American Community Survey. The area's population for the *Connect QC 2050: Quad Cities Long Range Transportation Plan* horizon year is forecasted to be between 303,300 and 372,700. Employment in the urban area for base year 2015 was 191,814, and is forecasted at a range between 181,400 and 238,100. Population and employment numbers have an impact on the roadway network in terms of the number of vehicles on the roadway and the number of potential transit users.

Bridges over the Mississippi River are the most important and limiting transportation aspect of the Quad Cities Area. The Quad Cities are joined by five Mississippi River crossings and seven Rock River crossings. The highest average daily traffic (ADT) volume in the entire study area, and one of the highest in the State of Iowa, is 69,700 (2019) on the I-74 bridge over the Mississippi River. The three centrally-located bridge crossings on this river (I-74, Centennial, and Government) are by far the most congested areas in the Quad Cities, particularly when they are under maintenance or rehabilitation. The new I-74 Bridge is complete and will greatly increase capacity of the network and reduce or eliminate congestion in that corridor. It will also allow for additional capacity in the event of closures at other river crossings.

What is Congestion?

The FHWA *Traffic Congestion Reliability Report* defines congestion as "an excess of vehicles on a roadway at a particular time resulting in speeds that are slower–sometimes much slower–than normal or free flow speeds." Although this definition is easy to understand, congestion is not always easy to measure due to changing conditions. Traffic demand varies significantly by time of day, day of the week, season of the year, special events, and emergencies. Capacity of the roadway also varies because of weather, work zones, traffic incidents, or other non-recurring events. There are six major sources of congestion:

- Limited physical capacity (i.e. bottlenecks) –40%
- Traffic incidents–25%
- Bad weather–15%
- Work zones–10%
- Poorly functioning traffic signals–5%
- Special events–5%

There are two types of congestion: recurring and non-recurring. Recurring congestion generally takes place in short time periods, such as "rush hour" and is fairly predictable based on previous days' traffic levels and roadway capacity. Non-recurring congestion is the result of unexpected incidents, such as accidents, stalled cars, bad weather, work zones, and special events. These incidents result in unanticipated delays and driver impatience. It is estimated that almost 60% of traffic delays across the nation is caused by non-recurring incidents.

What is a CMP?

The Congestion Management Process (CMP) is not a new process, but rather one that has evolved over many years. The CMP draws upon existing practices and seeks new approaches and greater integration with the rest of the metropolitan transportation planning process. The FHWA defines the CMP as "a systematic and regionally-accepted for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs. The CMP is intended to move these congestion management strategies into the funding and implementation stages." (Congestion Management Process: A Guidebook).

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 was the first federal transportation act to require a Congestion Management System (CMS). It required a CMS in Transportation Management Areas (TMAs)–urbanized areas with a population over 200,000. The subsequent Transportation Equity Act for the 21st Century (TEA-21), and the most recent transportation acts–Safe, Accountable, Flexible, Efficient Transportation Equity Act-A Legacy for Users (SAFETEA-LU), Moving Ahead for Progress in the 21st Century (MAP-21), and the current Fixing America's Surface Transportation (FAST)–have continued the congestion management requirements for TMAs, with increased expectations for the development of the plan. While ISTEA and TEA-21 referred to this set of activities as a Congestion Management System (CMS), SAFETEA-LU renamed it the Congestion Management Process (CMP), which has carried forward to the current transportation act. The name change is intended to reflect a change in "perspective and practice, to address congestion management through a process that provides for effective management and operations, and an enhanced linkage to the planning process" (Congestion Management Process: A Guidebook).

The purpose of a CMP is to identify congested corridors in an area, form and implement strategies to mitigate the congestion, and monitor the effectiveness of the strategies. The CMP should provide a framework for cost-effective decision making that alleviates congestion and enhances transportation services. A well-designed CMP should help the MPO to:

- Identify congested locations
- Determine the causes of congestion
- Develop alternative strategies to mitigate congestion
- Evaluate multiple strategies
- Propose alternative strategies that best address the congestion
- Track and evaluate the impact of implemented congestion management strategies

The CMP is intended to be a flexible approach to transportation problem solving that builds upon experience in congestion management. The Congestion Management Process is one of many pieces feeding into the metropolitan transportation planning process and is not intended to replace any of the existing pieces, but instead, complement and organize existing methods and techniques. By emphasizing system performance measures, the CMP helps planners identify ways to maximize the use of existing capacity, and to extend the usefulness of proposed improvements by enhancing operational efficiency and effectiveness.

Federal Requirements

FAST regulations state the CMP should result in multimodal system performance measures and strategies that can be reflected in the metropolitan transportation plan and the TIP. Federal regulations (23 CFR Part 450 Subpart C §450.320) state that a congestion management process shall include:

1. *Methods to monitor and evaluate the performance of the multimodal transportation system, identify the causes of recurring and non-recurring congestion, identify and evaluate alternative strategies, provide information supporting the implementation of actions, and evaluate the effectiveness of implemented actions*
2. *Definition of congestion management objectives and 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. Since levels of acceptable system performance may vary among local communities, performance measures*

should be tailored to the specific needs of the area and established cooperatively by the State(s), affected MPO(s), and local officials in consultation with the operators of major modes of transportation in the coverage area

3. *Establishment of a coordinated program for data collection and system performance monitoring to define the extent and duration of congestion, to contribute in determining the causes of congestion, and evaluate the efficiency and effectiveness of implemented actions. To the extent possible, this data collection program should be coordinated with existing data sources (including archived operational/ITS data) and coordinated with operations managers in the metropolitan area*

4. *Identification and evaluation of the anticipated performance and expected benefits of appropriate congestion management strategies that will contribute to the more effective use and improved safety of existing and future transportation systems based on the established performance measures. The following categories of strategies, or combinations of strategies, are some examples of what should be appropriately considered for each area:*

    - *Demand management measures, including growth management, and congestion pricing*
    - *Traffic operational improvements*
    - *Public transportation improvements*
    - *ITS technologies as related to the regional ITS architecture*
    - *Additional system capacity where necessary*

5. *Identification of an implementation schedule, implementation responsibilities, and possible funding sources for each strategy (or combination of strategies) proposed for implementation*

6. *Implementation of a process for periodic assessment of the efficiency and effectiveness of implemented strategies in terms of the area's established performance measures. The results of this evaluation shall be provided to decision makers and the public to provide guidance on selection of effective strategies for future implementation.*

In addition, FAST requires that consideration be given first to strategies that manage demand, reduce single occupancy vehicle (SOV) travel, and improve transportation system management and operations. All other reasonable strategies must be analyzed before a capacity increase is proposed as a congestion management technique. The FAST act also adds an optional stand-alone Congestion Management Plan.

The CMP 8 Process Model

The Process Model that follows is built upon activities or "actions" that are common to successful CMPs, and at a basic level must be implemented to comply with federal regulations. The actions, however, may be integrated into the MPO planning process in many different ways, providing a flexible framework from which MPOs can develop an individualized CMP approach. The elements of a successful CMP defined in the Process Model that follows serve as a guide for the actions to be taken in developing a CMP. Whereas the Interim Guidebook referred to "steps" in the CMP, they are referred to here as "actions," recognizing that while the CMP includes a general sequence of activities, the cyclical nature of the metropolitan planning process means that there are iterations within the sequence, and MPOs may have some variations to this approach. These eight actions, and related questions, include:

1. **Develop Regional Objectives for Congestion Management** – First, it is important to consider, "What is the desired outcome?" and "What do we want to achieve?" It may not be feasible or desirable to try to eliminate all congestion, and so it is important to define objectives for congestion management that achieve the desired outcome. Some MPOs also define congestion management principles, which shape how congestion is addressed from a policy perspective.

2. **Define CMP Network** – This action involves answering the question, "What components of the transportation system are the focus?" and involves defining both the geographic scope and system elements (e.g., freeways, major arterials, transit routes) that will be analyzed in the CMP.

3. **Develop Multimodal Performance Measures** – The CMP should address, "How do we define and measure congestion?" This action involves developing performance measures that will be used to measure congestion on both a regional and local scale. These performance measures should relate to, and support, regional objectives.

4. **Collect Data/Monitor System Performance** – After performance measures are defined, data should be collected and analyzed to determine, "How does the transportation system perform?" Data collection may be on-going and involve a wide range of data sources and partners.

5. **Analyze Congestion Problems and Needs** – Using data and analysis techniques, the CMP should address the questions, "What congestion problems are present in the region, or are anticipated?" and "What are the sources of unacceptable congestion?"

6. **Identify and Assess Strategies** – Working together with partners, the CMP should address the question, "What strategies are appropriate to mitigate congestion?" This action involves both identifying and assessing potential strategies, and may include efforts conducted as part of the MTP, corridor studies, or project studies.

7. **Program and Implement Strategies** – This action involves answering the question, "How and when will solutions be implemented?" It typically involves including strategies in the MTP, determining funding sources, prioritizing strategies, allocating funding in the TIP, and ultimately, implementing these strategies.

8. **Evaluate Strategy Effectiveness** – Finally, efforts should be undertaken to assess, "What have we learned about implemented strategies?" This action may be tied closely to monitoring system performance under Action 4, and is designed to inform future decision making about the effectiveness of transportation strategies.

These actions will be discussed in further detail related specifically to the Bi-State metropolitan area in a later section.

Previous Bi-State Congestion Management Plans

Transportation System Management (TSM) Plan

In 1977, Bi-State Metropolitan Planning Commission, now known as Bi-State Regional Commission, developed a Transportation Systems Management Plan (TSM) for the Iowa-Illinois Quad Cities. The TSM, required by the Urban Mass Transit Administration and the Federal Highway Administration in September 1975, set forth a short-to-intermediate range planning process taking into consideration a broad range of factors not previously covered directly in the transportation planning process.

The goal for the TSM planning process was to "maximize the operational efficiency of the existing transportation system through the implementation of short and intermediate range, low capital intensive improvements which are consistent with the long-range transportation plan."

The plan identified needs for the street and highway system. There were 18 corridors identified as high problem areas by using data such as annual intersection accident data, capacities and traffic volumes for intersection and street segments, the functional classification of each street, and a physical inventory of the street and highway system. Many of the identified corridors are the same ones being identified today as areas of congestion:

- 53rd St. (Davenport)-53rd Ave. (Bettendorf)
- U.S. 6/Kimberly Rd. (Davenport)-Spruce Hills Dr. (Bettendorf)
- Locust St. (Davenport)-Middle Rd. (Bettendorf)
- River Dr. (Davenport)-State St. (Bettendorf)
- Division St. Corridor (Davenport)
- U.S. 6/Brady St./Harrison St. Corridors (Davenport)
- Jersey Ridge Corridor (Davenport)
- I-74 (Iowa) Corridor (Davenport and Bettendorf)
- 18th St. Corridor (Bettendorf)
- 4th Ave. (Rock Island)-18th Ave. (East Moline)
- 18th Ave. (Rock Island)-23rd Ave. (Moline)-42nd Ave. (East Moline)
- Blackhawk Rd. (Rock Island)-John Deere Rd. (Moline)
- 11th St. Corridor (Rock Island)
- I-74 (Illinois) Corridor (Moline)
- Illinois Route 84 Corridor (East Moline)
- Andalusia Rd.-US 6 Corridor
- Rock Island-Moline Corridor
- Moline-East Moline Corridor

A transit analysis section discussed improvements that could be made for the three Quad Cities transit systems. These included things such as reduced peak hour headways, increased routes, early morning/late night service, and Sunday service. Another topic of discussion was transit marketing improvements. Members of the community and planners alike agreed that the marketing of the Quad

Cities transit opportunities was deficient. The TSM contained a Non-Motorized Modes Analysis that focused on bicycling and walking as an alternative to fossil fueled vehicles. A wide range of bicycle projects were proposed, and a brief description of each followed.

Bi-State, to the best of their ability, made sure that the programming of TSM projects was incorporated into the Transportation Improvement Program (TIP). The final step of the TSM was monitoring. The document stated that Bi-State would use accident location studies, travel time studies, traffic volume studies, air quality studies, highway data inventories, vehicle miles of travel studies, vehicle occupancy studies, transit systems performance studies, transit route performance studies, and transit capital inventories for monitoring their progress.

Congestion Management Activities Plan

In October 1997, Bi-State Regional Commission released their second congestion management plan. This plan fell under the federal Intermodal Surface Transportation Efficiency Act (ISTEA). ISTEA gave state and local governments a stronger role in determining how transportation funds are spent. The Congestion Management System (CMS) was defined as "a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet state and local needs." In order for the CMS to be successful, it needed to include processes or methods to monitor and evaluate performance, identify alternative actions, assess and implement cost-effective actions, and evaluate the effectiveness of implemented strategies.

The CMS had four primary sections: system monitoring, strategy consideration, project selection, and effectiveness evaluation. System monitoring provides the information needed to identify existing and potential problems, identify potential solutions, and evaluate the effectiveness of these solutions. The CMS ensures that project selection follows congestion management strategies and that projects are properly considered. Objectives used to guide these decisions include reducing congestion, promoting non-motorized transportation modes, increasing auto and transit occupancy, and minimizing vehicle mile-of-travel. Evaluating the effectiveness of strategies after they have been implemented is important in order to determine if the strategies had their expected effects.

The Congestion Management Activities (CMA) plan provides a list of potential CMS strategies. This includes things such as Transportation Demand Management (TDM), High Occupancy Vehicle (HOV) measures, public transportation capital and operational improvements, growth management, access management, incident management, and Intelligent Transportation Systems (ITS).

The CMA plan identified areas of congestion in the Quad Cities Area. The report stated that congestion was due to social, recreational, or shopping activities, rather than work. The report went on to say that congestion was the "result of inadequate roadway geometrics, poor access control, and incidents." I-74, area bridges, and new shopping areas were locations where congestion occurred most often. Some of the places where Bi-State receives its data for identifying congestion include ILDOT and IADOT Traffic Count Programs, Illinois Roadway Information System (IRIS), Iowa DOT Sufficiency Log, Bi-State Regional Travel Demand Model, Bi-State Geographic Information System (GIS), travel time runs, local count programs, transit data, accident data, and land use data. Another method for identifying problem areas is through the observation and knowledge of agency staff members.

Bi-State Regional Commission used volume/capacity (V/C) ratios and level-of-service (LOS) as performance measures. Practical CMS strategies for the Quad Cities were selected from the previous list. They included traffic system management, transit capital and operational improvements, bicycle and pedestrian improvements, access management, incident management, ITS (video surveillance on the Interstate bridges), and additional lanes.

Congestion Management Process Actions

It is important to look through previous congestion management plans to expand on elements of these plans. These are evolving documents and should not be cast aside. The following contains the eight actions necessary for a Congestion Management Process.

Action 1: Develop Regional Objectives for Congestion Management

Goals are generalized statements and can be seen as 'big picture' or desired end-results. Objectives are specific, measurable statements related to the attainment of goals. When considering goals and objectives, it is important to be S.M.A.R.T.–Specific, Measurable, Agreeable, Realistic, and Time-bound. Objectives need to be specific, so that a number of viable approaches are developed to achieve the objective. They should include quantitative measurements, numeric terms about what is to be accomplished. This allows selected strategies to be evaluated in terms of their effectiveness to accomplish the goals. Planners, operators, and relevant planning participants need to come to an agreement on objectives. Objectives should not be a wish-list; rather, they should be practical and realistic, so they can be completed within the region's resources and demands, which may be continually evolving. Finally, objectives need to have a timeframe by which they will be accomplished.

With S.M.A.R.T. objectives in mind, staff at Bi-State Regional Commission developed goals and objectives for the Quad Cities Area. Since there are a number of goals and objectives to be accomplished and limited data available to track where the region is today, Bi-State along with other stakeholders, decided to apply the S.M.A.R.T. criteria to a few objectives in this plan, italicized below. As Bi-State progresses with the CMP, goals and objectives can be added, revisited, refined, and have S.M.A.R.T. criteria applied. Meetings with the Urban Transportation Technical and Policy Committees, Joint Iowa-Illinois Interdisciplinary Traffic Safety group, and the three transit systems were held to determine if the goals and objectives were appropriate. The following goals and objectives were decided upon:

CMP Goal: Effectively Move Traffic

Objectives:

- *Improve traffic signal retiming/coordination*
  - Continue to synchronize intersections where logical as resources allow
- *Crash reduction*
  - Reduce the number of total crashes by 10% over the next 5 years
  - Reduce the number of secondary crashes by 5% over the next 5 years
  - Reduce the number of crashes at intersections by 10% over the next 5 years
- *Increase work zone management*
- *Improve incident response-especially on bridges*

- *Raise awareness of congestion mitigation strategies*
  - Bridge restriction notification–provide construction information on the Bi-State website, radio stations and news outlets, and various committees
- *Improve Roadway Conditions*
  - Reduce the number of roadway miles in poor surface condition by 3% in the next 5 years
  - Maintain or reduce the number of roadway miles with a V/C ratio greater than one over the next 5 years

CMP Goal: Improve Public Transportation

Objectives:
- *Maintain or expand service hours*
- *Increase on-time performance*
  - Maintain or achieve 90% on-time performance in the next 5 years
- *Create an express bus or rapid transit*

CMP Goal: Reduce Travel Demand

Objectives:
- *Enhance connectivity among the three transit services*
- *Increase transit ridership*
  - Increase total system ridership by 5% in the next 5 years
- *Carpool/vanpool initiatives*
- *Support the implementation of passenger rail service*

CMP Goal: Design Safe, Efficient Streets and Highways

Objectives:
- *Increase use of ITS*
  - Ensure infrastructure technologies are hardened against outside attack.
- *Improve access management*

CMP Goal: Accommodate Transit, Pedestrians and Bicyclists

Objectives:
- *Increase the number of sidewalks, bike lanes, and facilities/amenities for non-motorized transportation*
  - Increase the mileage of bicycle facilities by 10% in the next 5 years
- *Increase the interconnections and linkages between modes*

CMP Goal: Promote Land Use Patterns and Transit Oriented Design Standards

Objectives:
- *Encourage mixed-use developments*
- *Increase street connectivity*
- *Implement park-and-ride lots*

Action 2: Define CMP Network

The second action of a CMP is to decide on a coverage area to be monitored. Extensive system coverage is more beneficial in identifying existing and future congestion locations; it provides better system-wide monitoring over time, system-wide evaluation of management strategies, perspective for the extent and degree of congestion throughout the area, and more accurate results. However, there are also repercussions with increased network coverage, namely more data is needed. Many local roads do not have large amounts of traffic or the available data to determine the amount of congestion on the roadway.

Bi-State Regional Commission decided to focus on roads with a Federal Functional Classification (FFC) of Interstates, Expressway/Freeway, and Other Principle Arterial as identified on Map 4.1 of the *Connect QC 2050: Quad Cities Long Range Transportation Plan*. Functional classification is a system of categorizing road types using guidelines established by the Federal Highway Administration (FHWA). The reason to limit analysis to these corridors is due to the vast size of the region and the availability of data. In future plans, additional roads may be looked at as data becomes available. Most local roads do not experience congestion, so it would not make sense to focus on them; plus most local roads do not have data available to look at congestion levels.

Action 3: Develop Multimodal Performance Measures

The development of performance measures is a key component of the CMP. They measure the location and degree of congestion, and make it possible to evaluate congestion alleviating strategies. They also reveal the extent to which alternative actions or plans will lead to the attainment of objectives. Performance measures are used to identify system problems in general, whereas local level examination is necessary to identify the specific causes and possible solutions for a congestion location. Performance measures can be qualitative or quantitative, system-wide or corridor specific, but they must be consistent with the data that is available to support these performance measures. Some performance measures may be very tempting to use, but would require data that is costly or not readily available. As the CMP progresses, other performance measures and data sources may be incorporated. There are many different aspects of congestion and many performance measures that can be used. The type of performance measure selected will determine what data will be needed and ultimately the way congestion is viewed. *An Interim Guidebook on the Congestion Management Process in Metropolitan Transportation Planning* states that all good performance measures display the following characteristics:

- *Clarity and Simplicity (e.g. simple to present and interpret, unambiguous, quantifiable units, professional credibility)*
- *Descriptive and Predictive (e.g. describes existing conditions, can be used to identify problems and to predict changes)*
- *Analysis Capability (e.g. can be calculated easily and with existing field data, techniques available for estimating the measure, achieves consistent results)*
- *Accuracy and Precision (e.g. sensitive to significant changes in assumptions, precision is consistent with planning applications and with an operation analysis)*
- *Flexibility (e.g. applies to multiple modes, meaningful at varying scales and settings)*[1]

[1] *FHWA, FTA (2008) Congestion Management System-Congestion Mitigation Handbook; An Interim Guidebook on the Congestion Management Process in Metropolitan Transportation Planning*

After considering several possible performance measures, the availability of data, and resource limitations, the following performance measures were chosen for this CMP:

- Volume/Capacity (V/C) Ratios–Location of roadway segments approaching and operating at congested levels (1.0 and above)
- Level of Service (LOS)–Location of roadway segments approaching and operating at unacceptable levels of service (LOS E and F)
- Average Travel Speed for the urban area
- Vehicle Miles Traveled (VMT) for the urban area
- Non-Recurring Delay: Accident/Crash Data (intersection and roadway segments)
- Transit data-transit ridership for the three city bus systems, service hours/locations, and percentage of on-time arrivals

Volume/Capacity (V/C) ratios and Level of Service (LOS) are closely linked performance measures and are often grouped together. V/C ratios are one of the most widely used performance measures to identify roadway congestion. The V/C ratio is defined as the volume of travel on a roadway segment divided by the capacity of the roadway segment. Traffic volume is the number of vehicles passing through a point or section of a roadway during a given time period. Capacity is the maximum number of vehicles that can pass through a point or section of a roadway in one direction during a given time period under prevailing conditions. A road segment that has a V/C ratio of less than one indicates that capacity is greater than demand; a road segment with a V/C ratio greater than one indicates that demand is greater than road capacity. The closer the V/C ratio is to 1.0, the closer the roadway is to maximum capacity, leading to longer delays and "stop and go" traffic.

A second performance measure this plan will use is Level of Service (LOS). LOS is a qualitative measure of roadway performance that is based on V/C ratios. LOS takes into consideration factors such as speed, travel time, density, freedom to maneuver, traffic interruptions, comfort, and convenience. The LOS not only measures operational conditions, but also the motorists' and passengers' perception of traffic conditions. LOS is reported on a scale of A through F, with A representing the best operating conditions and F the worst. General descriptions of operating conditions for each LOS are as follows:

1. LOS A describes completely free-flow operations. Vehicles are virtually unaffected by the presence of other vehicles.
2. LOS B represents moderate free flow, although the presence of other vehicles begins to be noticeable.
3. LOS C represents a range in which the influence of traffic density becomes obvious. The ability to maneuver within the traffic stream is now affected by the presence of other vehicles.
4. LOS D represents a range in which the ability to maneuver is severely restricted because of congestion. Travel speed begins to decline.
5. LOS E represents a roadway at or near capacity and is quite variable. The densities at LOS E vary depending upon the free flow speed and vehicles operating with the minimum spacing at which uniform flow can be maintained.

6. LOS F represents a breakdown in flow. Operations are at the stop-and-go condition.

Bi-State Regional Commission considers LOS grades of "A," "B," "C," and "D" to have an acceptable level of congestion, usually very little. An LOS grade of "E" is considered to be approaching congestion along a roadway. A roadway receiving an LOS grade of "F" is considered congested. Most of the efforts of Bi-State are aimed at relieving congested segments (LOS "F"), while some proactive efforts will be investigated to mitigate future congestion along those roadways approaching congestion (LOS "E").

Table 1
Volume/Capacity (V/C) Ratios and Level of Service (LOS)

V/C Ratio	Operation Conditions	LOS
0-.99	Traffic at free to stable flow	A-D
1.00-1.19	Unstable flow-lower speeds, some stops (approaching congestion)	E
1.20+	Breakdown in traffic flow-stop and go conditions	F

The third and fourth performance measures are used to help determine LOS, but can be a useful tool to look at by themselves. Travel speed can be used as an indicator for congestion. If vehicles are not able to travel the speed limit, there could be too many vehicles on that road segment. Vehicle miles traveled (VMT) could be used to look at how many miles people commute to work; a high VMT could favor public transportation, a low VMT would not.

Another performance measure to look at is crash/accident data. Accidents are considered to be non-recurring congestion. If congestion is the result of accidents, intersections or road segment improvements may be needed. A sixth performance measure that will be used is transit service data. The number of passengers (ridership) by system and as a whole will be looked at. Additionally, transit service hours and on-time performance (if available) will be examined.

Action 4: Collect Data/Monitor System Performance

A data collection program is an integral and essential part of the CMP, which is used in monitoring and evaluating transportation system performance in the region. The data is used to measure system performance before and after implementing the programs to evaluate the effectiveness of the programs and identify sections that need further improvement. Historically, the availability of data has been one of the greatest challenges in monitoring and evaluating system performance. ITS technology increases data availability for major facilities in many metropolitan areas. Transit data is also increasingly available from advanced transportation system applications, which provide information about schedule delay and on-time performance. Data collection needs are based on performance measures and analytical methods. The selected data should be relevant to the area, readily available, timely, consistent, and susceptible to forecasting. The following table displays the six performance measures, how often data will be collected, and the data source.

Table 2
Performance Measures Data Collection

Performance Measure	Update Frequency	Data Source
Volume/Capacity (V/C) Ratios	Every 5 years	IA/IL DOT Traffic Counts
Level of Service (LOS)	Every 5 years	Bi-State GIS
Average Travel Speed	Monthly; Annually; Every 5 years	MetroLINK; Bi-State Travel Time Runs Bi-State Travel Forecasting Model
Vehicle Miles Traveled (VMT)	Every 5 years	Bi-State Travel Forecasting Model
Non-Recurring Delay (crashes/accidents)	Annually	Local Police/Cities
Transit Service Data	Annually	Local Transit Agencies

Action 5: Analyze Congestion Problems and Needs

In order to focus transportation planning efforts, the CMP identifies where congestion occurs and what are its causes. Federal regulation 23 CFR 500.109 defines congestion as "the level at which transportation system performance is unacceptable due to excessive travel times and delays." According to the Federal Highway Administration (FHWA), roadway congestion is comprised of three key elements: severity, extent, and duration. The blending of these elements will determine the overall effect of congestion on roadway users. Three dimensions of congestion include the following:

- Severity – refers to the magnitude of the congestion problem at its peak. Severity has been traditionally measured through indicators such as volume/capacity (V/C) ratios or Level of Service (LOS) measures
- Extent – describes the number of system users or components (e.g. vehicles, pedestrians, transit routes, lanes miles) affected by congestion
- Duration – describes the length in time that users experience congested conditions

Because these elements have a direct relationship, any increase in one will subsequently result in an increase in the others. Therefore, as roadway congestion continues to build (increased severity), more travel will occur under congested conditions (increased duration) affecting an increasing number of motorists and roadway facilities (increased extent). Congestion occurs due to a number of planned and unplanned events.

Recurring Congestion includes:

- Peak Period, Freight, Intersection, Freeway Corridor, Non-freeway corridor, School related, Central Business District, Bottleneck or hot spot, Railroad crossing, or parking related.

Non-Recurring Congestion includes:

- Incident related, Weather, Work zones, Fluctuations in normal traffic flow, or special event traffic.

The congestion management process will focus on the routes that make up the CMP network. The CMP network is made up of those FFCS routes that have INRIX data available. Efforts to improve traffic conditions in the region will begin on the CMP network, and the level of congestion on the network will serve as a gauge for overall congestion in the area.[2]

Action 6: Identify and Assess Strategies

After identifying the corridors that are congested through the use of performance measures, the next step in the CMP is to examine each of these corridors individually and determine which congestion management strategy or strategies would best apply in each situation. Ultimately, this step involves developing an understanding of what the cause of the congestion is on each of the congested corridors. Bi-State Regional Commission has developed a "toolbox" of strategies for agencies to use when dealing with congestion. This toolbox contains many strategies for alleviating congestion. Each tool should be considered and have a high potential for benefiting congestion relief when projects focus on, or have an impact on, congestion. Once this tool has been selected, it can be evaluated in further detail to determine the benefit/cost ratio and impact on the project. When selecting a strategy, it is important to consider implementation difficulty and social, air quality, environmental, and safety effects. Federal regulations state that all reasonable congestion management strategies must be evaluated and deemed inappropriate or infeasible prior to considering a capacity increase as a solution. Table 3 summarizes all of the strategies to be discussed.

Table 3
Congestion Management Strategies

Strategy	Characteristics	Benefit/Cost
Employer Support Programs	Eliminate vehicle trips	Med/high
Alternative Work Hour Programs	Reduce congestion in peak hours	High
Non-Motorized/Non-Traditional Modes	Eliminate/shift vehicle trips	Low
Access Management	Improving flows and efficiency	High
Signalization Improvements	Reduce intersection congestion	High
Growth and Land Use Management	Long term impact on traffic pattern	Medium
Incident Management	Reduce temporal and spot congestion	Med/high
Transit	New programs or activities, shift vehicle trips and routes	Medium
Intelligent Transportation System (ITS) Technologies	Move the flows efficiently	Medium
Infrastructure Development	Increase capacity and flows	High
Parking Management	Encourage bike and pedestrian travel	High

Parts of table taken from MACOG*

The strategy toolbox is broken down into three categories: Operational Improvements, Demand Management, and Infrastructure Development.

Operational Improvements

Operational improvements to the existing transportation network are a subtle, but often very effective way of reducing congestion. These enhancements usually improve either roadway controls or physically improve the roadway itself. Roadway control operational improvements, such as coordinated traffic signals, allow traffic to flow more easily by being better adjusted to actual traffic conditions and patterns. Physical roadway improvements enable the existing road to handle traffic

[2] *DMAMPO (2016)* Congestion Management Process Des Moines Area Metropolitan Planning Organization

more easily. These techniques are designed to improve traffic flow, air quality, and movement of vehicles and goods, as well as improve system accessibility and safety. Below is a list of the operational improvements that are most appropriate for the Bi-State region.

- Signalization improvements
- Incident management (accidents, work zones, weather, special events, emergencies)
- ITS technologies
- Access Management

Signalization improvements – Signalization improvements can include synchronization, which is a relatively inexpensive investment and will allow for smoother traffic flows. Unsynchronized signals can contribute to traffic congestion by drivers experiencing stop-and-go conditions, creating a longer travel time. Signalization improvements could also include removing or adding signals where necessary and updating equipment. Studies have shown that changes in a signal's physical equipment and timing can significantly reduce congestion.

Incident Management – There are several different definitions of incident management. The one that fits best with the Bi-State Region is from *The Traffic Incident Management Handbook.* It defines an incident as "any non-recurring event that causes a reduction of roadway capacity or an abnormal increase in demand." Under this definition, events such as traffic crashes, disabled vehicles, highway maintenance and reconstruction projects, and special events are classified as an incident. The functions of incident management include communication and coordination among agencies, monitoring traffic and road conditions, quick response, and removal times, communication of information to the public regarding the incident, and to safely restore the capacity of the roadway. Incident management is vital to reducing congestion levels. An example of work zone management could be shortening the duration of construction, or moving the construction to periods where traffic volume is relatively low. Public information campaigns can also be an effective incident management approach. An example is promoting Steer It/Clear It to travelers, where the duration of the incident can be shortened significantly. Incident management systems usually include video monitoring and the dispatch systems from police, fire, and medical agencies.

ITS technologies – ITS (Intelligent Transportation Systems) is the application of technology to the surface transportation system to enhance the existing transportation network. This is done through the surveillance, monitoring, and feedback on the mobility of people and goods. There are numerous ITS technologies including Dynamic Message Signs (DMS), Traffic Surveillance Camera Systems, Highway Advisory Radio (HAR), Advanced Traveler Information (such as 511), websites detailing construction, lane closures and traffic alerts, emergency vehicle signal pre-emption, transit vehicle signal priority, and weigh-in-motion systems that measure truck weight without stopping. In 2013, Bi-State Regional Commission released the *Bi-State Regional Intelligent Transportation System (ITS) Architecture Plan*. This plan describes the transportation planning activities related to planning and implementation of ITS technologies in the Bi-State Region for a ten-year time horizon. The ITS Architecture Plan is scheduled to be updated in Summer 2022. A more detailed list of ITS technologies can be found at: http://www.its.dot.gov/index.htm.

Access Management – The Transportation Research Board *2003 Access Management Manual* defines access management as, "the systematic control of the location, spacing, design, and operation of driveways, median openings, interchanges, and street connections to a roadway, as well as roadway design applications that affect access." The objective of access management is to ensure roadway safety and efficient operations while providing reasonable access to land use. The benefits of access management are fewer conflict points, increased mobility (reduced congestion), fewer crashes, increased capacity, and shorter travel times. Access management strategies include designated crosswalks, dedicated right/left turn lanes, installing raised medians, restricting turning movements, eliminating merge points and waving sections at freeway interchanges, improving signal spacing, limiting the number of entry points onto streets (driveway consolidation/removal), and street connectivity. In general, access management solutions can be implemented in a shorter time frame and at less cost than system expansion.

Demand Management

The primary purpose of Transportation Demand Management (TDM) is to reduce the number of vehicles using the road while providing many mobility options. TDM strategies also help in maintaining air quality standards and help ease congestion without high cost infrastructure projects. TDM strategies are intended to maximize the transportation network's capabilities and to assist in the more efficient use of the existing transportation system. Since trip making patterns, volumes, and modal distributions are largely a function of development patterns, it is important that TDM strategies and land use plans coincide. Short-term and long-term TDM strategies are necessary to reduce congestion. The short-term strategies tend to focus on the more immediate issue of too many cars in one place at one time. Long-term strategies lean towards focusing on the root causes of congestion. TDM programs tend to rely on incentives to make shifts in behavior attractive.

Travel Demand Management Strategies

- Alternative Work Hour Programs
- Employer Support Programs
- Parking Management
- Increase use of Non-Motorized/Non-Traditional Modes
- Transit
- Land Use Management

Alternative work hour programs – Alternative work-hour programs allow workers to arrive and leave work outside the traditional work times. While these do not necessarily reduce single occupancy vehicle (SOV) travel, they can disperse commuting traffic. Programs like these are most cost effective to reduce local and peak-hour congestion. There are four main types of alternative work-hour programs: flexible working hours, compressed workweeks, staggered work hours, and telecommuting. With flex time, start and end times vary and tend to fall outside the peak commute times. In a compressed workweek, employees reduce their number of work trips by working a full week in four days. This eliminates one round-trip a week and often places the home-to-work or work-to-home trip outside the peak work hours.

Staggered work hours allow employees to arrive and depart their place of employment at different times, again reducing peak period travel. Telecommuting has become a common alternative work hour program that allows employees to work at home some of the time, thereby eliminating some work trips. Telecommuting became more practical as communication technologies have become more advanced and employers become more comfortable with employees working out of the office. Many employers relied on this alternative work program during the COVID-19 pandemic, as policies have been applied to allow for a degree of telecommuting once the pandemic has passed.

Employer support programs – Employer support programs include things such as preferential parking for people sharing carpools, vanpools, or transit; transportation allowances for transit; and guaranteed ride home programs. Carpools, vanpools, and transit will reduce SOV trips and Vehicle Miles Traveled (VMT) in the region, and can be especially helpful in corridors with large employment centers. The success of these programs depends on the cost of the programs to the user and what incentives can be leveraged to attract and maintain a high number of users. Poor public perception of the local transit system, long transit trip time, the inability of employees to travel home in case of emergency, and high employee costs can cause these types of programs to fail.

Parking Management – Many communities have adopted parking policies to encourage transportation mode shifts, increase capacity, promote access, and improve environmental quality. Parking management strategies include on-street parking restrictions, location-specific parking ordinances, and preferential/free parking for carpoolers.

Increase Use of Non-Motorized/Non-Traditional Modes – This involves improving pedestrian and bicyclist mobility and access. Improvements in this regard may come in the form of multi-use paths, sidewalk additions and upgrades, bicycle lanes and routes, bicycle racks, bike parking, and 'bike and ride' programs enabling bicyclists to carry a bicycle onto public transit or bicycle carriers provided on buses. By providing walkways and bikeways for travel purposes, some people will be motivated to switch from their vehicle to non-motorized forms of transportation, thereby reducing congestion and air pollution. These exclusive non-motorized rights-of-way trails improve safety and reduce travel times for pedestrians and bicyclists (and other wheeled non-motorized vehicles). This benefit will be most notable on shorter trips where there is mixed land use and direct access to the destination. It is important that access is granted to pedestrians and bicyclists at transit facilities to encourage people to use non-motorized transportation for at least part of their trip.

Transit

- Transit fleet expansion
- Transit service expansion
- Traffic signal preemption for transit vehicles
- Transit information systems
- Bus only lanes

Transit service is one of the oldest travel demand measures. An efficient transit system can be a strong incentive in attracting SOV users to switch modes. Transit projects tend to reduce VMT in relatively small quantities, but do improve accessibility and roadway travel times and decrease congestion on the roadway. Transit, as a TDM strategy, is most effective when there is a demand for its service and there are few other options. Technologies such a bus priority signals at intersections, real-time information on transit schedules and arrivals, reserved transit lanes or rights-of-way for transit, and increased/realigned transit routes and frequencies can help reduce transit trip times. Also, implementation of park-and-ride lots could increase ridership levels. However, passengers need to feel that their vehicle will be safe unattended. Another way to attract passengers would be to implement a regional express bus service. The Bi-State Region does not have one central business district like many of the other areas that have implemented an express bus service; however, there are a few large employment areas where this could be possible.

Land Use Management – Land use planning is a significant factor in reducing congestion. Linking land use and transportation planning needs to be a priority in order to enhance alternative transportation. Since trip-making patterns, volumes, and modal distributions are largely a function of land-use development, it is important that transportation planning and land use plans tie together. With a strong linkage of housing, employment, and commercial uses, the number of trips and VMT would not only be lower, but travel modes would also change. The following are key strategies of land use planning: land use controls or zoning; growth management restrictions, such as urban growth boundaries; development policies that support transit-oriented designs for corridors and communities involving homes, jobsites, and shops; incentives, such as tax incentives, for high-density development; urban design improvements (e.g. mixed-use development); infill and densification; and restrictions on the amount and location of development until certain service standards are met.

Infrastructure Development

Infrastructure development involves capacity expansion as well as intersection and lane improvements. Generally, infrastructure development is the most expensive of the congestion mitigation strategies. Alternatives that reduce SOV travel and improve existing transportation system efficiency need to be considered before the addition of travel lanes. Where additional lanes are deemed appropriate, consideration should be given to adding other congestion management strategies to the roadway to increase the effects of the new lanes. The addition of travel lanes is usually seen as a short-term solution to the congestion problem. History has shown that traffic will increase on the new lanes making them just as congested, if not more so, than before. The addition of travel lanes should not be seen as a negative solution. A bus or semi-only lane could be the result, which would reduce buildup sometimes caused by these vehicles. Regions grow, and sometimes roads need to grow to better accommodate the additional traffic. The creation of lanes could also result in closing a gap in the street network design, thereby reducing trip times and pollution. Intersection and lane improvements can reduce congestion and improve safety by redesigning bottlenecks and using access management strategies such as turning lanes, auxiliary lanes, traffic islands, traffic channels, and other appropriate geometric designs. Also, lanes can be sometimes added without widening the roadway through geometric design improvements (lane markings).

Action 7: Program and Implement Strategies

Information developed through the CMP should be applied to establish priorities in the Transportation Improvement Program (TIP). This ensures a linkage between the CMP and funding decisions, either through a formal ranking and weighting of strategies and projects, or through other formal or informal approaches. For the Quad Cities Area, Surface Transportation Program (STP) projects are evaluated using a quantitative process. The STP projects are evaluated on four categories: Level of Service (LOS), Safety, Physical Condition, and Special Consideration. The Special Consideration category includes Air Quality and Automobile Alternatives (sidewalks, transit, and multipurpose trails). The first three categories have a maximum point value of 150, for a total of 450 points possible for a project. Currently, the Special Consideration category awards "bonus" points to projects that pertain to the criteria. All of these categories relate to the CMP; however, the category that most closely coincides with the CMP is Level of Service. Level of Service has three criteria, each worth 50 points: existing volume/capacity ratio, 10-year projected traffic volume, and traffic congestion reduction. Currently, the traffic congestion reduction criterion is all-or-nothing. In the future, this criterion will be considered for revision to a scale rating system to better reflect CMP strategies.

Action 8: Evaluate Strategy Effectiveness

Monitoring and evaluating implemented congestion management strategies improves future decision-making processes. This information can be used to determine if the strategies had their desired effect on the roadway network and to check on the progress towards achieving the established objectives. This information can also be used to refine the objectives, develop new objectives, or remove unnecessary objectives. Monitoring strategy effectiveness has three components: evaluating implemented congestion management strategies, monitoring regional system performance, and assessing and refining objectives as necessary. Evaluating strategy effectiveness can be costly and complicated. Costs arise from collecting the necessary data and from the amount of time needed to sort through the data. Complications arise from outside effects on the roadway network besides the implemented strategies. For example, the addition or subtraction of businesses and residential structures on a roadway segment could have a greater impact on congestion than the implemented strategy and therefore may skew the results.

There are a number of principles to keep in mind to help make the evaluation successful:

- *We learn from failures as well as the successes. Lessons learned in the failures should be documented, so that the same mistakes are not made again.*
- *There are many factors that can cause problems in obtaining a valid evaluation. These include influences other than the implemented project (e.g. construction on nearby roadways), improperly designed data collection methods (e.g. poorly worded survey questions), inadequately trained data collection staff, insufficient sample sizes, or analysis errors.*
- *Plan far enough in advance, especially for the "before" period. The timing of data collection is important, and proper planning helps to preserve flexibility to select time periods that are least subject to outside influences.*

Current Quad Cities Area Efforts

Facility and Signaling Upgrades

In the Bi-State Region, a number of the strategies have been implemented, are currently being implemented, or plan to be implemented in the future. In the FFY 2022-2025 TIP, Bettendorf plans to improve Forest Grove Drive & Middle Road by constructing roundabouts to effectively flow traffic. Bettendorf's Forest Grove Drive project will utilize Iowa Clean Air Attainment Program as a funding source to upgrade the corridor. The State of Illinois has various projects districtwide to implement traffic signal modernizations on U.S. 67 and Andalusia Road.

Since the plan's last update, Davenport improved two major intersections: U.S. 6 and Division St. and 76th St. at Division St. With ICAAP funding, Davenport implemented traffic light synchronization at 53rd Street from Pine St. to Elmore Ave and on U.S. 61 from 53rd St. to 65th St., and on Locust St. from Emerald Dr. to E. Kimberly Rd. On Kimberly Rd. in Davenport, from Fairmount to Elmore, the city replaced signal controllers and interconnected intersections with fiber optic communication cabling. Davenport implemented a traffic operation center for signal management also utilizing ICAAP funding. Bettendorf reconstructed the eastbound entrance ramp to I-80 from Middle Road, which improves access efficiency and safety.

Safety

Map 4.9 of the *Connect QC 2050: Quad Cities Long Range Transportation Plan* shows the high volume crash intersections for the MPO area between 2013 and 2017. There were a total of 34,556 crashes in the Metropolitan Planning Area (MPA) between 2013 and 2017. That is, on average over the 5-year period, 6,911 crashes per year. Performance indicators in this document have set a goal of reducing the total number of crashes by 10% over 5 years.

Federal guidance has suggested that safety performance measures established in MAP-21 and carried forward in the current FAST Act will be focused on reduction of serious and fatal injuries. Between 2013 and 2017 there have been 104 fatalities and 872 serious injuries to due vehicle crashes. Performance measures will be set based on a 5-year rolling average of total serious and fatal crashes as well as normalized serious and fatal crashes per vehicle miles traveled (VMT). Table 4 outlines the five-year average total fatal and serious injuries within the MPA. Current guidance suggests that performance measures will be evaluated on a per state bases so the values are divided as such.

Table 4
5-Year Average (2013-2017) of Serious and Fatal Crashes within the MPA

Severity	State	
	Iowa	Illinois
Fatal	11.2	7.4
Serious	45.8	96

In December 2020, Bi-State Regional Commission published the *Quad Cities Traffic Safety Plan, 2020*. This document identifies and analyzes high crash intersections in the Illinois and Iowa Quad Cities Area. This plan identified and examined the top ten intersections for crashes in both the Iowa and Illinois Quad Cities based on frequency, severity, and crash rate. Bi-State continues to update and enhance crash monitoring and reporting for the region.

Intelligent Transportation Systems (ITS)

Bi-State Regional Commission also maintains the Bi-State Regional Intelligent Transportation Systems (ITS) Reference Architecture, which is currently under review and update. It is a framework for ensuring institutional agreements and technical integration are in place prior to beginning a project or groups of projects that incorporate ITS technology in the implementation. This Reference Architecture aids in the continuous improvement of ITS technology in the region.

Roadway Surface Condition

Roadways in poor surface condition can also increase traffic congestion. They can cause drivers to swerve (which can lead to accidents), to drive slowly through the area (reducing travel speeds), or even cause damage to vehicles. Map 4.6 of the *Connect QC 2050: Quad Cities Long Range Transportation Plan* shows FFC roadways in poor and very poor surface condition in red respectively. Looking at the map, one can see there are a number of roads that show up in less than average condition. It is important to address these roadways as the number of drivers is continually increasing. The map also shows the roadways that are considered to be in fair condition. It is important to also address these roadways before they fall into the category of poor surface condition. There are a number of roadway improvement projects that include patching, pavement rehabilitation, paving, and resurfacing that appear in the FY2022-2025 TIP. Map 4.6 is one piece of the puzzle when trying to prioritize road maintenance.

Travel Demand Analysis

Using the *Connect QC 2050: Quad Cities Long Range Transportation Plan* Travel Demand Forecasting Model, Bi-State was able to determine the level of congestion in terms of Volume over Capacity (V/C) ratio and Level-of-Service (LOS) in the Quad Cities roadways today. Currently, no road segments, across all classes have a V/C ratio greater than 1.0. When it comes to travel speed/delay, most all the congested spots are intersection/signal related according to Google Map typical traffic delays. This shows there is very little roadway segment congestion in the Quad Cities. Therefore, the CMP will look into how optimizing of signal operations could bring about enhanced traffic flow – reduced travel delays.

Travel Time Survey & Historic Traffic Data

Bi-State has access to traffic data through the company INRIX made available through the Iowa DOT. INRIX offers real-time and historic traffic flow data for most of the major roads in the MPO area. Data is collected through cell phones and cataloged for analysis. Information is available at the 1, 5, 15, and 30-minute and 1-hour time segments. Time periods can be selected manually for any time in a year, including up to a year, although yearly data is available at the hour time segment.

INRIX data was utilized to analyze traffic data in corridors set by the Bi-State Regional Commission Transportation Technical Committee. A fall and spring traffic scan analysis was executed, whereas morning peak hours were established from 7:00 a.m. to 9:00 a.m., midday peak hours were from 11:00 a.m. to 1:00 p.m., and the evening peak hours were from 4:00 p.m. to 6:00 p.m. Traffic data analysis was conducted on Tuesdays, Wednesdays, and Thursdays as these days were most likely to represent typical traveling days in the MPO. INRIX data was available for several corridors in the QC MPA, but those that did not have INRIX data available used the previous travel time survey data shown in Table 5.

In terms of the travel time survey, speed data and travel times were recorded with a GPS receiver using the floating car technique (staff drove along each corridor) during morning, midday and evening peak hours. The morning peak hours were from 7:00am to 9:30am; the midday peak hours were from 11:30am to 1:30pm; and the evening peak hours were from 3:30pm to 5:30pm. Each route was traveled three times in each direction. The runs were conducted on Tuesdays, Wednesdays and Thursdays similar to the traffic scan analysis.

If a vehicle is not able to travel the speed limit it may be due to congestion. This data indicates that there is very little congestion at any of the corridors surveyed. The only roadways with average speed limits more than 3 MPH below the posted speed limit are 53rd Street, Kimberly Road, John Deere Road. Most of the corridors were within two miles of the posted speed limit on average.

Table 5
Traffic Flow Analysis, Fall 2011-Spring 2019

Corridor	Community	Posted Speed	2018-2019 Average Speed	2017-2018 Average Speed	2016-2017 Average Speed	2015-2016 Average Speed
US-67 (IA)	Davenport/Bettendorf	35	39.2	38.7	39.4	38
Route 6	Moline/Coal Valley	40	N/A	40.7	40.6	39.6
IL-92	Rock Island/ Moline/E. Moline/Silvis	30	N/A	36.5	36.6	35.7
I - 74	Moline/Davenport	55/65	N/A-60.6	56.8/59.3	57.9/59.5	57.1/59
Kimberly Road	Davenport	35	30.2	31.5	31.4	31.6
US-61 (IA)	Davenport	35	36.1	36.3	37.2	36.4
Corridor	**Community**	**Posted Speed**	**2014-2015 Average Speed**	**2013-2014 Average Speed**	**2012-2013 Average Speed**	**2011-2012 Average Speed**
NW Blvd	Davenport	35/45	39.1	38.2	36.5	35.9
41st Street	Moline	35	33.6	36.4	34.8	33.9
18th Ave/19th Ave	Rock Island/Moline	30	31.8	31.1	31.5	31.9
53rd Street	Davenport/Bettendorf	35/45	35.6/43.8	36.2/44.3	33.1/42.1	34.0/41.4
Locust Street/Middle Road	Davenport/Bettendorf	35/45	34.4	35.2	36.2	35.2
18th Street	Bettendorf	30	29.9	30.5	28.5	27.9
Avenue of the Cities	Moline/East Moline	30/45	32.5	29.5	33.4	31.4
7th Street	Moline	35	35.9	34.1	33.6	32.5
John Deere Road	Moline	55	51.1	53.1	52.3	54.9
Division Street	Davenport	35	35.2	34.9	33.7	34.2

Transit

The Quad Cities Area is served by three fixed-route transit providers. The City of Bettendorf operates a municipal transit system, known as Bettendorf Transit. Bettendorf Transit's service consists of three fixed-routes on 60-minute headways on weekdays and Saturdays. Bettendorf Transit provides service weekdays from 6:00 a.m. to 6:30 p.m. Service is provided on Saturdays from 8:30 a.m. to 5:30 p.m. through River Bend Transit. Bettendorf Transit does not provide service on Sundays or major holidays.

The City of Davenport operates a system, known as CitiBus, with ten fixed routes. Headways of the buses vary by route and also by time of day. In general, headway times for the ten routes are 30 minutes or 60 minutes. CitiBus runs weekdays from 6:00 a.m. to 7:00 p.m. and Saturdays from 9:00 a.m. to 7:00 p.m. CitiBus does not provide service on Sundays or major holidays.

Rock Island County Metropolitan Mass Transit District (RICMMTD) is a specialized taxing entity created specifically for the purpose of providing public transportation in the Illinois Quad Cities; the transit system is known as MetroLINK. MetroLINK consists of 13 fixed routes in the Illinois communities of Carbon Cliff, Colona, East Moline, Hampton, Milan, Moline, Rock Island, and Silvis. Headway times for MetroLINK's routes are 15, 30, or 60 minutes. MetroLINK runs as early as 5:00 a.m. to 10:00 p.m. on weekdays, 7:00 a.m. to 6:30 p.m. on Saturdays, and 8:00 a.m. to 5 p.m. on Sundays. Some specialized routes run extended hours, such as the service to Tyson Foods that begins at 3:27 a.m. Monday through Friday, and the Route 53 Late Night, which runs until 3:12 a.m. Thursday through Saturday. No service is provided on major holidays.

One objective is to increase the number of routes and/or service hours by 5% in the next 5 years. There are a number of ways this can be accomplished. The first could be that two new routes are created; the second could be that the systems increase their hours of operation later into the evening or possibly run a few routes on Sundays; a third could be a combination of the first two.

A second objective related to transit is to increase the frequency of the top three routes in the QC fixed-route system by 5% in the next 10 years. In 2022, Bettendorf had three fixed routes: Route 1-Red, Route 2-Blue, and Route 3-Purple, which make up 43%, 31% and 26% of their system ridership respectively. However, they only make up approximately 2.3% of the entire fixed-route system ridership. CitiBus' Routes 4, 7, and 9 make up 22.4%, 22.0%, and 9.6% respectively of their system ridership. However, like Bettendorf, when compared to the entire fixed-route system, they only make up 10.7% of total ridership. MetroLINK's top three routes are 10-Red with 18%, 30-Green with 24%, and 60-Yellow with 14%. Together, these routes make up 43.7% of all fixed-route ridership.

In 2002, MetroLINK began using a GPS/CAD AVL System known as INIT (Innovations in Transportation, Inc.) on the Metro system, which provides various technologies to improve rider information, system efficiency, and data collection systems. Bus and operator communication occurs via a command center located in the heart of Metro's Operations and Maintenance Center. Real-time location information provides vital information for dispatch and customer service functions. In addition, when buses enter MetroLINK's facility, they automatically connect to a wireless network and send detailed information to a statistics database. This information can then be used to perform extensive route analysis and obtain detailed passenger and fleet information. The INIT system provides real-time passenger information, which is displayed on LED signs or LCD screens at main transfer points and passenger shelters. The system allows passengers with mobile devices to utilize a "TxtLINK" service, which provides over 2,000 stop codes that provide real-time route information via text. Additionally, route and schedule information is provided to Google Transit, which allows riders to plan a transit trip using the Google Maps feature. In early 2013, Metro released the "My QC Metro" mobile app, which uses a rider's GPS location from a mobile device to identify nearby stops and real-time arrival information. MetroLINK continues to upgrade its utilization of real-time technology with CAD/AVL technology and Google Trip Planner. Real-time LED signage at bus shelters and transfer stations allows passengers to have up-to-the-minute information on their bus. All three transit systems have purchased the TransLoc mobile app that allows real-time information, arrival alerts, and route assistance. MetroLINK is also investigating automation and driver assistance technology. Collision avoidance technology was installed in 2020.

MetroLINK has been a leader in environmentally friendly policies, committing to green technologies through the use of Compressed Natural Gas (CNG) vehicles and clean burning diesel fuel, utilizing innovative energy sources in capital infrastructure investments, and promoting the environmental benefits of using transit to potential riders. MetroLINK's first CNG vehicles entered the fleet in 2002 and were powered by John Deere CNG engines. In 2018, MetroLINK introduced its first electric bus and has expanded its electric fleet to 13% of its overall fleet as of 2020.

MetroLINK has committed to transition to environmental sustainability initiatives such as the American Public Transportation Association's (APTA) Sustainability Commitment in 2018. It also achieved silver recognition for efforts pertaining to organization-wide reductions in greenhouse gas emissions, criteria air pollutants, and water usage in 2019. Staff annually sets performance targets and updates APTA on progress towards environmental goals. MetroLINK has partnered with Augustana College, Black Hawk College, and Western Illinois University to offer students unlimited access to the Metro system with a student ID. Black Hawk College has seen the largest increase in ridership, with a more than 300% increase in BHC ridership since 2009. New routes such as the Augustana "Late-Night Route 53" and the WIU "Downtown Connector" are focused on student ridership needs and continue to attract new riders to transit. This data was reaffirmed with a 2015 rider survey that indicated young adults are the largest growing population on the Metro system.

In 2019, MetroLINK introduced a microtransit pilot project in Milan as a supplement to existing fixed-route service. The service offers an on-demand public transportation option within the corporate limits of Milan. Passengers can be picked up and dropped off within the designated service area. Multiple riders may be grouped together based on demand and the location of their destinations.

Davenport CitiBus has transit agreements with Scott Community College, Palmer College of Chiropractic, and Saint Ambrose University enabling students, faculty, and staff to ride without incurring any additional cost. Saint Ambrose University utilizes three CitiBus routes to enhance student access to and from its Health Sciences Building at Genesis West. The agreements are reciprocal with Illinois college and university agreements. Beginning in 2011, the City of Davenport and the Davenport Public Schools System partnered to provide free transit service to schoolchildren between kindergarten and grade 12 upon presentation of their school ID.

In July 2016, Davenport CitiBus launched a new route system that replaces the "hub and spoke" system configuration with a more "grid" oriented configuration that makes greater use of newly constructed accompanying transfer sites. These changes were made in the effort to streamline the routes and increase efficiency. Beginning in 2016, CitiBus began the process of installing new fareboxes utilizing Smart Card technology in its buses. In Fall 2015, Bettendorf Transit also realigned its route system network in recognition of the city's growth and changing landscape, and to maximize efficiency.

Cycling

As of July 2022, the Bi-State MPO had 24.5 miles of striped/marked bicycle lanes. Rock Island has 1.2 miles, Moline has 7.0 miles, East Moline has 6.0 miles, Davenport has 7.38 miles, and Bettendorf has 2.95 miles. The objective is to increase the mileage of striped/marked bicycle lanes by 50% in 10 years from a base year of 2011 or 7.38 miles by 2021. This goal has already been exceeded.

It was determined that all bicycle facilities have the potential to decrease vehicles on the road, so the objective has been revised to include separated trails and other bicycle facilities. Currently, the Quad Cities Metropolitan Area has roughly 215 miles of bicycle facilities.

Conclusion

The CMP is not a static document, but rather one that is continually evolving. Throughout the years, the name has changed as well as a few of the requirements, but the core documentation has remained the same. As time moves on, the CMP document will get progressively more refined and become a more useful tool in ranking or prioritizing projects. The Bi-State Regional Commission is committed to improving upon the process of managing congestion.

Bi-State Regional Commission either produces a number of documents already, such as the *Quad Cities Traffic Safety Plan 2020*, or has access to information to measure congestion. Bi-State will continue to expand upon the goals and objectives as data to track progress is made available. It is important to make the congestion management strategies known and available to decision-makers when there are proposed projects that will have an impact on the roadways. It is also important to note where the region is today in terms of congestion so future progress can be tracked and improvements made.

Parts of this document were developed with help from the following documents: Chicago Area Transportation Study "Congestion Management System;" Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHCMPO) *Congestion Management System*; Evansville MPO (EMPO) *Congestion Management Process*; Huntsville Area Transportation Study (HATS) *Year 2035 Transportation Plan*; Genesee County Metropolitan Planning Commission (GCMPC) *2035 Long Range Transportation Plan*; Greensboro Urban Area MPO (GUAMPO) *2035 Long Range Transportation Plan*; Michiana Area COG (MACOG) *Congestion Management System 2006*; Mid-America Regional Council (MARC) *MARC Enhanced Congestion Management System-CMS Toolbox*; The North Front Range *2035 Regional Transportation Plan*; *2035 Winston-Salem Urban Area Long Range Transportation Plan*; National Cooperative Highway Research Program (NCHRP) *A Guidebook for Including Access Management in Transportation Planning*; Texas Transportation Institute's *2010 Urban Mobility Report*; *Implementing an Effective Congestion Management Process*; St. Louis Region *Congestion Management System-Congestion Mitigation Handbook*; *An Interim Guidebook on the Congestion Management Process in Metropolitan Transportation Planning*; *CMP Innovations: A Menu of Options*; *Advancing Metropolitan Planning for Operations*.