Overview of Needs Analysis

Federal transportation legislation requires Metropolitan Planning Organizations with population exceeding 200,000, known as Transportation Management Areas, to establish and execute a Congestion Management Process (CMP) as an integral part of the metropolitan transportation planning process. This requirement ensures that comprehensive measures are in place to effectively manage and address congestion within the region.

Highway congestion occurs when the traffic demand approaches or surpasses the capacity of the highway system. The level of traffic demand varies greatly depending on the time of day, day of the week, and season of the year. It is also subject to significant fluctuations caused by recreational travel, special events, and emergencies such as accidents and evacuations. The available highway capacity, although often perceived as fixed, is in fact constantly changing due to various factors. Incidents like crashes and disabled vehicles, work zones, adverse weather conditions, and other causes frequently lead to a reduction in the available highway capacity. Two types of congestion are defined as follows,

Recurring Congestion: the relatively predictable congestion caused by routine traffic volumes operating in a typical environment; and

Non-Recurring Congestion: unexpected or unusual congestion caused by unpredictable or transient events, such as crashes, inclement weather, or construction.

Process for Determining and Addressing Needs

Level of Travel Time Reliability (LOTTR), which is a federally required performance measure, was taken into consideration in the congestion deficiency analysis to identify travel reliability on the highway network. LOTTR is defined as the ratio of the longer travel times (80th percentile) to a "normal" travel time (50th percentile) and can be obtained from the Regional Integrated Transportation Information System (RITIS) database. It evaluates the consistency and dependability of travel times on both interstate and non-interstate NHS systems. This assessment encompasses variations in travel times from day to day and across different times of the day. The reliability measures were categorized into four distinct time periods: three for weekdays (6-10 a.m., 10 a.m. - 4 p.m., and 4-8 p.m.) and one for weekends (6 a.m. - 8 p.m.). Any roadway segment or corridor that has a reliability index of 1.5 or higher during any given time period is classified as unreliable.

In addition, GVMC staff utilized the travel demand model to conduct the deficiency analysis for the 2050 Metropolitan Transportation Plan (MTP). This analysis aimed to project and identify potential congestion deficiencies that are anticipated to occur by the year 2050.

To determine the future travel demand for each federal aid facility in the region, an analysis of the volume to capacity ratio (V/C) was conducted. The GVMC travel demand model provides estimates for volume, speed, and travel time on each road. GVMC staff utilized the AM and PM peak hour volume-capacity (V/C) ratio from the travel demand model to identify congested corridors on the existing and future highway network. The identified corridors are categorized as "low/no congestion," "moderate congestion," or "severe congestion," as summarized below.

V/C Ratio	Congestion Level
V/C<0.8	Low/No Congestion
0.8= <v c<1.0<="" td=""><td>Moderate Congestion</td></v>	Moderate Congestion
V/C>=1.0	Severe Congestion

Identified Needs/Deficiencies

The reliability deficiency list provides information on LOTTR and identified segments that are deemed unreliable. The reliability deficiency list can be accessed by clicking on the link <u>here</u>. The map below displays the 2022 LOTTR data within the GVMC region:



GVMC 2022 LOTTR Map

The V/C ratio analysis results in a comprehensive list of federal aid facilities that are either currently operating above their designed capacity or are expected to become deficient by the year 2050. The congestion deficiency list includes details on V/C ratio and identifies segments that are congested. To access the complete list, please click on the links here (2019 AM, 2019 PM, 2050 AM, 2050 PM). It is important to note that designating a facility as deficient does not automatically imply future widening; rather, it signifies the need for focused attention on these "deficient" facilities. The maps below display the AM and PM peak period V/C ratio in the GVMC region for both model base year 2019 and MTP horizon year 2050:



2019 AM Peak V/C Ratio Map







Need 1: Additional Funding

The transportation needs across all modes in the GVMC's area far exceed the available resources. The congestion and reliability deficiency analysis conducted by GVMC indicates a need of significantly more funding than the current available resources to enhance the transportation system. While federal transportation funding offers some flexibility, it is inevitably limited. Therefore, GVMC encourages its members to explore alternative funding sources, including millages, special assessments, and grants, to improve the transportation system in their respective areas.

Need 2: Address Congestion Related to Capacity and Reliability Issues within the GVMC Region

Addressing congestion related to capacity and reliability issues involves implementing targeted strategies and improvements to alleviate traffic congestion and enhance the reliability of the transportation network. This includes implementing measures such as optimizing traffic signal timings, improving roadway geometries, adding additional lanes or capacity enhancements, enhancing public transit options, promoting ridesharing and carpooling initiatives, implementing intelligent transportation systems, and exploring innovative transportation solutions. The aim is to improve the flow of traffic, reduce travel times, enhance reliability, and ultimately provide a smoother and more efficient transportation experience for commuters and travelers.

Costs to Address the Needs/Recommendations

The 2023-2026 Transportation Improvement Program (TIP) for the GVMC region has allocated a funding need of approximately \$7.74 million to address the local identified capacity and reliability deficiencies.

Based on the delay cost estimation provided by RITIS, the GVMC region has experienced an average annual delay cost of \$167.19 million from 2019 through 2022. This figure highlights the economic impact of congestion on the region during this period. Therefore, addressing the identified capacity and reliability deficiencies would result in an estimated annual savings of approximately \$167 million for travelers. By improving travel reliability and reducing congestion, we can significantly enhance travel efficiency and decrease the economic burden imposed by delays.