Congestion Management Procedures
Wasatch Front Regional Council

Introduction

The Congestion Management System (CMS) is a tool to support development of the Long Range Transportation Plan and the Transportation Improvement Program for the Wasatch Front Regional Council (WFRC). The process is reviewed and guided by two congestion management subcommittees, organized from the Ogden-Layton and Salt Lake technical advisory committees. The CMS identifies congestion reduction needs and provides information and suggestions to decision-makers to meet those needs. Demand management and system management strategies are evaluated with the intent to resolve the congestion without increasing highway capacity if possible. The results of the CMS contribute to an efficient and effective transportation system, increased mobility, and maximized utility from limited resources.

The CMS defines performance measures and strategies to relieve congestion. Identifying congested locations and evaluating congestion relief strategies require collecting travel time data and "before and after" data on actual transportation projects implemented in the Wasatch Front area. The CMS evaluates several system management and demand management strategies and then describes ongoing activities and suggests needed actions for each. Mitigation generally appropriate for each functional class of highway is also discussed. Another role of the CMS is to determine if additional capacity is warranted by demonstrating whether anticipated congestion can be relieved by demand management and system management strategies alone.

The following discussion explains the procedures currently applied in the WFRC Congestion Management System.

Performance Measures and Data Collection

After evaluating several potential peformance measures, including volume/capacity and various speed and delay measures, the congestion management subcommittees chose to use modeled afternoon peak-period delay and vehicle miles of travel (VMT) reductions as the primary performance measures of the CMS. Through data analysis, the subcommittees determined that highway sections with modeled afternoon peak-period delay exceeding the threshold of 500 vehicle hours/mile are considered "congested". For example, on a street carrying 5,000 vehicles during the PM peak period, this translates to six (6) minutes of delay per vehicle. It should be noted that this criterion was supplemented with engineering judgment, since modeled levels better reflect relative changes in conditions than actual conditions. With this in mind it should also be noted that modeling results should be used with discretion as decision tools and not as the final word.

Data collection is necessary in order to support a more in-depth understanding of the causes of congestion. For example, monitoring the performance of implemented congestion mitigation strategies such as signal timing impacts, carpool rates, and vehicle delay. Data collection activities focus on four (4) areas: system monitoring, location identification, cause identification, and project level "before and after" data.

Congestion Identification

In the Wasatch Front region, peak period delay is expected to increase from approximately 80,000 vehicle hours (system-wide) in 2003 to over 250,000 vehicle hours in 2030. This delay increase is expected even after the implementation of new highway and transit capacity at the existing rate of public investment. Most of this delay occurs in the south and southwest areas of the Salt Lake valley immediately outside the I-215 belt route, with significant delay also occurring on I-15. Substantially more congestion will also occur on facilities in Weber County and northwest Davis County which provide access to I-15 and to major generators.

Congestion Mitigation Strategies

The arsenal of strategies to lessen congestion appears to be expanding. In urban Utah, where rapid growth of single family housing and related life style clearly predominates, the addition of new general purpose traffic capacity appears both needed and effective at controlling congestion. Yet, experience from around the country points to the fact that new travel demand will inevitably outpace the ability to provide new travel capacity. The ability to better manage the system, including maximizing the effectiveness of signal systems and maintaining existing traffic capacity, are strategies which should be given considerable attention. Similarly, the demand for single occupant vehicle travel appears to be growing, even disc ounting the growth in population. Better ways to manage both the supply of traffic capacity and the demand for additional travel must be considered.

More efficient means of travel should be identified and supported in order to allow existing revenue sources to meet the public's demand for efficient mobility. The following list provides many of the traditional as well as non traditional congestion mitigation controls available to the Wasatch Front Area which are discussed in further detail in Chapter 3 of the CMS document.

Demand Management and Demand Reduction

Ride share Promotion
Car Sharing
Staggered and Flexible Work Hours
Telecommuting
Growth Planning
Transit Improvements
High Occupancy Vehicle (HOV) Lanes
Walk / Bicycle
Employer Commute Programs
Trip Reduction Programs
Congestion Pricing
Parking Management
Auto-Related Taxes / Fees

System Management and System Efficiency

Signal System Improvements / Coordination
Capacity Additions
Access Management
Intelligent Transportation Systems (ITS)
Incident Management
Reversible Lanes
Ramp Metering
Intersection / Interchange Geometrics

Recommendations / Justification

Congestion management strategies, beyond direct additions of traffic capacity, have not received the attention necessary to seriously challenge the growth in traffic congestion in the Wasatch Front region. Yet, amidst the growth in congestion and the inability to spend sufficient funds to keep up with the growth in congestion by adding new traffic capacity, it is difficult to erode funding further by encouraging spending on what have been relatively inefficient solutions. Non traditional congestion management solutions must be considered from two perspectives if they are going to successfully mitigate urban congestion.

First, a program of regional congestion mitigation strategies must be developed as part of the transportation planning process. A list of ongoing activities and recommended future actions are presented in Chapter 4 of the CMS document. A general prioritization of these strategies is also proposed. It is hoped and encouraged that sponsors of congestion mitigating projects may begin to look beyond the problems of today and propose solutions on a region-wide basis which will show wide spread congestion mitigation benefits. Admittedly, several regional solutions offer relatively small advantages in existing congested locations. However, on an aggregate basis, combinations of these strategies will have significant effects.

Second, site specific congestion mitigation strategies are encouraged in two ways. Sponsors of new capacity projects must begin to explore operational enhancements to new traffic capacity which could improve and maintain the service of the new capacity as well as reduce the demand for single occupant vehicles. A checklist of operational enhancements and demand management appropriate for each highway functional class is presented in the CMS. Members of the congestion management committee make follow-up visits to individual project sponsors to review appropriate congestion mitigation strategies.

The congestion management committee also identify a few congestion locations in the region as target projects for the congestion mitigation strategies discussed in this report.

Although engineers, planners, and economists often have a preferred "solution" to congestion and mobility challenges, there really is no single solution. To be effective, one needs to examine how congestion mitigation actions complement one another and how, over the long run, these actions will influence future travel patterns.

Effectiveness Evaluation

It is difficult to adequately compare the effectiveness of demand management strategies versus system management strategies because the immediate objectives of each are different. For demand management, the goal is to reduce trips and VMT; for system management, the objective is to increase speed. Data collected obviously varies depending on the particular strategy. The data collection provides a means to improve the selection of strategies for implementation because an indication of the cost-effectiveness of certain actions in a local setting can be obtained with the data and relevant cost information.

Chapter 5 of the CMS document contains performance data from local congestion mitigation projects including signal coordination, new capacity, intersection and interchange improvements, ramp metering, ride share programs, light rail service, bus service, and park and ride lots. Further evaluation is needed on some of these projects and programs as the data in many cases is limited both in terms of the number of projects evaluated and the length of time of the evaluation. Local data for intelligent transportation systems and incident management programs is still being collected and evaluated. For a copy of the CMS document contact Kip Billings at 363-4230 x 115 or kbillings@wfrc.org.