# Overview
# Congestion Management Process
# Wasatch Front Regional Council

## Introduction

The Congestion Management Process (CMP) is a tool to support development of the Regional Transportation Plan and the Transportation Improvement Program for the Wasatch Front Regional Council (WFRC). The CMP 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 reduce the congestion without increasing highway capacity. The results of the CMP contribute to an efficient and effective transportation system, increased mobility, and maximized utility from limited resources.

The CMP defines performance measures and strategies to relieve congestion. Identifying congested locations and evaluating congestion relief strategies requires collecting travel time data and "before and after" data on actual transportation projects implemented in the Wasatch Front area. The CMP 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 considered, and specific improvements identified for selected locations.

Another role of the CMP is to determine if additional capacity is warranted by demonstrating whether anticipated congestion can be relieved by transportation demand management (TDM) and transportation system management (TSM) strategies alone. In the event additional capacity is needed, the CMP recommends TSM and TDM strategies to be incorporated into the new capacity projects.

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

## Performance Measures and Data Collection

Based on the Highway Capacity Manual definition of level of service, the CMP defines congestion as level of service "E" or worse which is based on volume/capacity ratios in the case of freeways and operating speeds in the case of arterials. It should be noted that this criterion is supplemented with engineering judgment, since modeled levels better reflect relative changes rather than absolute changes in traffic conditions. With this in mind it should also be noted that modeling results should be used with discretion as a decision tool and not as a definitive design requirement.

Data collection is necessary in order to support a more in-depth understanding of congestion. Data collection activities focus on four (4) areas: system monitoring, congestion identification, determining causes of congestion, and project level "before and after" data.

## Congestion Identification

In the Wasatch Front region, annual per capita delay is expected to increase from approximately 10 hours (system-wide) in 2007 to about 26 hours in 2040 with the RTP fully implemented. Without the RTP improvements in highway and transit capacity and operations, annual delay per capita in 2040 would be over 53 hours. The 2040 delay with the RTP implemented occurs in the south and southwest areas of the Salt Lake valley 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 is predominately in the form of single family housing, the addition of new general purpose traffic capacity is necessary to manage future 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 discounting 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 nontraditional congestion mitigation controls available to the Wasatch Front Area.

**Demand Management Strategies**

Rideshare Promotion
Car Sharing
Staggered and Flexible Work Hours
Telecommuting
Growth Planning
Transit Improvements
High Occupancy Vehicle (HOV) Lanes

Park and Ride
Walk / Bicycle
Employer Commute Programs
Trip Reduction Programs
Congestion Pricing
Parking Management
Auto-Related Taxes / Fees

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

## Recommendations / Capacity Evaluation

Congestion management strategies, beyond direct additions of traffic capacity, have a positive yet limited potential to address the challenge of growing traffic congestion in the Wasatch Front region. Nontraditional 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 is developed as part of the transportation planning process. A list of ongoing activities and recommended future actions has been developed. A general prioritization of these strategies is also proposed. Admittedly, some regional solutions offer relatively small advantages to specific congested locations. However, on an aggregate basis, combinations of these regional strategies will have measurable 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 level of service of the new capacity project as well as reduce the demand for single occupant vehicles. A checklist of operational enhancements and demand management appropriate for each highway functional class has been compiled. WFRC staff make follow-up visits to individual project sponsors to review appropriate congestion mitigation strategies. City and county planners also identify congested locations in the region as target projects for congestion mitigation strategies to be implemented using funds from the Congestion Mitigation/Air Quality program.

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, over the long run, how these actions will influence future travel patterns.

In order to evaluate the need for additional capacity, WFRC staff modeled highway level of service under two conditions. The CMP includes modeling a "no-build" scenario (existing highway network, future travel demand, and future transit service) and a "CMP" scenario which adds TSM and TDM strategies to the "no-build" scenario. Each TSM and TDM strategy is defined in mathematical terms in the travel demand model as a factored amount of the modeled capacity or demand as appropriate for each strategy and the functional class of the link in question. Each link in the model can then be analyzed to determine if TSM and TDM strategies alone can meet projected demand or if additional capacity is warranted.

## Effectiveness Evaluation

It can be challenging 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 preserve capacity by reducing delay. 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.

Staff from WFRC and UDOT systematically collect speed data using GPS recording devices in their personal vehicles. While this data is valuable for assessing the performance of the transportation system (arterial streets in particular), it is limited in coverage and sample size. UDOT is exploring the possibility of obtaining commercially available cell phone data to evaluate arterial street performance. The cell phone data is much more extensive in coverage and sample size than could possibly be achieved using the current method of GPS devices and personal automobiles.

Performance data has been obtained for local congestion mitigation projects including signal coordination, new capacity, intersection and interchange improvements, ramp metering, rideshare 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.

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