



# Congestion Relief Program Guidelines

Colorado Department of Transportation  
Division of Transportation Development  
August 25, 2004

## Table of Contents

	Page
Summary	3
Introduction	4
Program Objectives	5
Program Funding	5
Eligible Activities	5
How Funds Get Prioritized	7
Long Range Planning	7
STIP	8
Performance Measures	8
Appendices	
A    Transportation Investment Strategy Investment Category Definitions, Goals, Programs	10
B    Transportation Commission Resolution TC-1213 Creating Congestion Relief Program	12
C    Transportation Commission Resolution TC-1289	13
D    Description of .85 or greater V/C Calculation and Data Sources	15
E    Descriptions of Eligible Activities	15

## Congestion Relief Program Summary

The objective of the Congestion Relief Program is to show measurable improvements to congestion on the State Highway System.

In accordance with the 2030 Statewide Plan Resource Allocation adopted July 15, 2004, \$8 million in Congestion Relief Program Funds will be distributed annually to CDOT Engineering Regions beginning FY06-07. The distribution is based on the percentage of vehicle miles traveled (VMT) on congested roadway segments within each CDOT Region. A roadway segment is considered congested when the volume to capacity ratio is greater than or equal to .85 during the 30<sup>th</sup> highest hourly volume. Congestion relief funds must be applied to projects on segments of the State Highway system that have congestion at or above .85 volume to capacity.

Congestion Relief projects are selected based on CDOT's State Transportation Improvement Program (STIP) guidelines and process. CDOT regions select projects based on cost-effective measures. Applicants must indicate the candidate project goal, base line data before the project is started and evaluate the congestion improvements after project completion using appropriate performance measures such as travel time index, duration of congestion and level of service.

Eligible projects include activities for study or implementation such as access management, signal time, ramp metering, turn lanes, median separators, incident management, alternative modes, and TDM/ITS strategies. Other major construction projects such as interchange reconstruction, new travel lanes and transit facilities are eligible if the benefit of the congestion relief dollars can be tracked. Funds are ineligible for indirect mobility projects such as preliminary engineering and environmental studies.

Congestion relief funds may be leveraged with other transportation funds if the project is a congestion relief project, the total project benefits can be measured and documented, and the project would not otherwise have been implemented without the congestion relief funds.

## Introduction

Mobility is an important consideration to Colorado's quality of life. Colorado's Transportation Commission has emphasized mobility in both the Colorado Department of Transportation's Vision and Mission:

*"To enhance the quality of life and environment of the citizens of Colorado by creating an integrated transportation system that focuses on moving people and goods, by offering convenient linkages among modal choices."*

*"To provide the best multi-modal transportation system for Colorado that most effectively moves people, goods, and information."*

Mobility is one of the Commission's four investment categories, along with System Quality, Safety, and Program Delivery (see Appendix A for a description of these investment categories and their related goals, objectives, and programs).

In January 2003, the Transportation Commission formed a Special Committee of representatives from the Statewide Transportation Advisory Committee (STAC) and CDOT's Executive Management Team (EMT) to develop consensus recommendations on revenue projections and resource allocation for the 2030 Plan. The Special Committee's work concluded in July 2003. One non-consensus proposal of the STAC/EMT Special Committee discussed with the Transportation Commission was the creation of a new Congestion Relief program.

During the Commission's deliberations on resource allocation in September and October 2003, the Commission recognized the problem congestion poses to mobility all across the state. Consequently, at its October 16, 2003 meeting, the Commission passed a resolution creating a Congestion Relief Program as part of the Mobility Investment Category (see Appendix B).

## Program Objectives

The Commission established the Congestion Relief Program to address congestion issues on the state highway system. Consequently, the Commission's objective for the program funds is to show measurable improvements on congested state highways with  $\geq .85$  Volume/Capacity (V/C). See Appendix C for details on how the .85 or greater V/C is calculated and the source of the data for these calculations.

Projects considered for Congestion Relief funds must include a stated "goal" to be achieved with the funds. Projects must be selected using cost-effective measures. Additionally, the performance measures to be used to illustrate the current condition and measure project results must be identified. Project benefits must be measured and documented. More information about goals and performance measures can be found in the section, "How Funds Get Prioritized", starting on page 6.

## Program Funding

The Transportation Commission authorized an annual average funding level of \$8 Million<sup>1</sup> for the Congestion Relief Program. In accordance with the Transportation Commission's July 15, 2004 Resource Allocation, the funds will be distributed to each CDOT Region based on the percentage of vehicle miles traveled on congested roadway segments within each Region. A roadway segment is considered congested when the volume to capacity ratio is greater than or equal to .85 during the 30<sup>th</sup> highest hourly volume. Congestion Relief funds must be applied to projects on the state highways that have congestion at or above the ratio of .85.

## Eligible Activities

Due to limited funds available at this time, the following activities/strategies/improvements are recommended in order to gain the most from a congestion relief project. See Appendix D for more detail on these activities.

---

<sup>1</sup> The \$8 million is based on an annual average over the ten-year period (2005-2014) and is in constant 2005 dollars.

Eligible Activities For Study or Implementation:

- Access Management
- Signal Timing Measures
- Ramp Metering Measures such as installation of signals at entrance ramps of freeway type facilities
- Construction of turning lanes and median separation
- Incident Management Programs
- Intelligent Transportation System applications
- Travel Demand Management Strategies
- Alternate Modes measures such as park and rides or improved transit operations

Other major construction projects eligible as long as the benefit of the Congestion Relief Program dollars can be tracked:

- Tolling/Hot Lane activities such as conversion of HOV to HOT lane configuration
- Interchange reconstruction
- New travel lanes
- New transit facilities

The Congestion Relief funds are to be leveraged with other transportation funds such as Regional Priority Program, STP-Metro, local, private, and other funds if:

- The project is a congestion relief project,
- Total project benefits can be measured and documented, and
- Project would not otherwise have been implemented in the same timeframe without the Congestion Relief investment.

The Congestion Relief funds are not eligible for indirect mobility projects such as Preliminary Engineering (PE), Environmental Assessments (EA) and Environmental Impact Statement (EIS) studies as these activity expenditures would not contribute towards any measurable result in performance and the studies may take a long time to be completed. In the future, if funds for the Congestion Relief Program become more substantial, NEPA documents and PE eligibility may be reconsidered. However, the Congestion Relief funds are eligible for a study regarding ITS, TSM, TDM programs which could subsequently be implemented with the Congestion Relief funds.

## How Funds Get Prioritized

The Congestion Relief funds are projected for the long range (20+ years) planning period as well as the six-year Statewide Transportation Improvement Program (STIP) period.

### Long Range Planning:

Early in the regional transportation plan update cycle, CDOT's Division of Transportation Development (DTD) provides the map of state highways with  $\geq .85$  V/C to the CDOT Regions and the regional planning organizations around the state. DTD will provide a listing of the mapped locations within each CDOT Region that have a V/C ratio equal or above .85 as a companion to the map. These state highway segments are the only locations eligible for Congestion Relief funds. The Congestion Relief funds are not eligible for local roadways. There may be minor changes to the map/list annually, due to DTD updating annual Average Daily Traffic (AADT), Capacities, Directional Distribution (DD), Design Hour Volume (DHV), and percent trucks. These are the factors used in determining the volume to capacity (V/C) ratios.

CDOT's Office of Financial Management and Budget (OFMB) provides resource allocation planning control totals for both the long range plan and the STIP periods and makes this information available to the six CDOT Regions, the Metropolitan Planning Organizations (MPOs) and the regional planning commissions (RPCs) around the state. The Congestion Relief Program funding is included in this information.

Consideration of congested facilities should be part of the regional planning process, particularly while inventorying the existing transportation system, and developing corridor Visions, goals, and strategies.

The CDOT Regions and the regional planning organizations (MPOs and RPCs) have the discretion to jointly decide whether the Congestion Relief program funds will be specifically allocated to corridors within the regional transportation plans for fiscal constraint purposes or will remain in a CDOT Region "pool" within the Statewide Plan to be prioritized through the STIP process.<sup>2</sup>

---

<sup>2</sup> The STIP is updated every two years through the Project Priority Programming Process, or 4 P.

If the decision is made to allocate Congestion Relief funds to corridors within the regional transportation plans, discretion is left with the CDOT Region on how to evaluate among the corridors for allocation purposes. At a minimum, some portion of the corridor must be included on the DTD map illustrating  $\geq .85$  V/C.

STIP:

Early in the STIP update process, DTD will provide updated V/C maps/lists to the CDOT Regions and the regional planning organizations. Each CDOT Region is responsible for prioritizing their Congestion Relief funds through the STIP process. All STIP projects funded with congestion relief funding must adhere to CDOT's STIP Guidelines and Process and include the following information:

- the goal of the project,
- base line data (the "before" scenario) for the appropriate performance measures is required in order to evaluate and prioritize the candidate projects, and
- project selection cost-effectiveness measures developed by the CDOT Region.

Once a project is selected to receive Congestion Relief funds in the STIP, responsibilities for collecting and computing subsequent performance measure data (the "after" scenario") must also be determined. At a minimum, the total project benefit from the combined Congestion Relief and other transportation funds must be measured and documented. The CDOT Regions will be responsible for assembling and providing information to CDOT's DTD by June 30th. DTD will assemble the data and working with OFMB, provide a report on Congestion Relief Program expenditures and results annually to the Commission, starting in fall, 2008.

## Performance Measures

DTD recommends that the following three Mobility Performance measures that give the best results be used for the before and after studies to determine the effectiveness of the congestion relief project that is being proposed. The Travel Time Index (TTI) is recommended for both urban and rural corridors, whereas the Duration of Congestion and Level of Service (LOS) measures are recommended for urban conditions.

**Travel Time Index (TTI)** - Is the ratio of peak period travel time to free-flow travel time. The TTI expresses the average amount of extra time it takes to travel in the peak relative to free-flow travel. A TTI of 1.3, for example, indicates a 20-minute off-peak trip will take 26 minutes during peak travel periods. A threshold TTI of 1.1 for rural and 1.2 for urban would be used for consideration of need. Project success/targets would then be determined by a pretest TTI and a post-test TTI for the segment. At the present time, DTD has TTI data for more than 40 corridors statewide. New locations as a result of a congestion relief project could be added to DTD's annual study, or Region and/or the MPO staff could obtain such data, and provide the data to DTD. The baseline data collected could then be compared with the data that is collected after completion of a specific project to determine the improved level of mobility and to determine if the project goals were met. The target goal should be determined based on the location of the corridor. However, the goal should consider reducing the index by 5 to 10 percent in urban areas and 10 to 15 percent in rural areas.

**Duration of Congestion** - This measure represents the hours of the day that a segment of the highway operates at v/c ratio equal or greater than .85. Data requirements consisting of hourly volumes (24 to 48 hours) could be collected by local jurisdictions, MPO staff or CDOT Regions and DTD could provide assistance to smaller communities. This measure is recommended for urbanized areas only and the target goal should be determined based on the location of the corridor. However, a reduction of 5 percent could be used as a threshold.

**LOS (Level of Service)** - LOS describes the level of congestion on a road at a given time. Using the scale A-F, a facility is rated for its level of congestion. The LOS calculations will produce the delay (seconds/vehicle) that the motorist experience at an intersection. Therefore, beside the LOS, delay numbers before and after improvements could also be measured and used as a performance measure. This measure is only recommended if the proposed project involves improvements to an isolated intersection. If an entity is considering a larger type project, major data collection efforts would be required to produce the necessary data to calculate LOS. This information may be available from corridor type studies. DTD, CDOT Region offices, and or MPO's may be additional sources of data needs for such analysis.

## Appendix A

# Transportation Investment Strategy

**Safety:** Programs, services and projects that reduce fatalities, injuries, and property damage for all users of the system.

Goal:

- Reduce transportation-related crashes, injuries and fatalities and the associated loss to society.

Programs:

- Driver Behavior Program
- Roadway Safety Program

**System Quality:** Programs that maintain the functionality and aesthetics of the existing transportation infrastructure at Transportation Commission defined service levels.

Goals:

- Preserve the transportation system.
- Keep the system available and safe for travel.

Programs:

- Pavement
- Bridge
- Roadside Maintenance
- Rest Areas
- Traffic Operations
- Tunnels

**Mobility:** Programs, services, and projects that provide for the movement of people, goods, and information.

Goals

- Improve mobility
- Increase travel reliability

Programs:

- Highway Performance
- Alternative Mode Performance
- Facility Management
- Travel Demand Management
- Road Closures
- Congestion Relief

Program Delivery: Support functions that enable the delivery of CDOT's programs and services.

Goals:

- Deliver high quality products and services in a timely fashion.
- Attract and retain an effective and qualified workforce.
- Foster an environment that respects workforce diversity.

Programs:

- Strategic Support
- General Support
- Program Support
- Property/Equipment

## Appendix B

### Resolution Number TC-1213

WHEREAS, in accordance with C.R.S. 43-1-106(8)(a), the Transportation Commission has the duty to formulate the general policy with respect to the management, construction, and maintenance of public highways and other transportation systems in the state; and

WHEREAS, in accordance with C.R.S. 43-1-1101, the Colorado General Assembly recognizes that the Department of Transportation is the proper body to perform statewide transportation planning with the cooperation of the regional planning commissions and local government officials; and

WHEREAS, pursuant to C.R.S. 43-1-113(2), the Transportation Commission as the policy making body for the Department of Transportation is responsible for the development and adoption of an annual budget allocation plan for moneys subject to its jurisdiction; and

WHEREAS, in accordance with C.R.S. 43-1-113(1), all funds and moneys to the credit of the Department of Transportation, with the exception of Aviation Funds, shall be expended under the supervision and direction of the Transportation Commission; and

WHEREAS, the Transportation Commission has determined that congestion relief is a critical need throughout the State of Colorado; and

WHEREAS, the Transportation Commission desires to establish a congestion relief program within the Mobility investment category to address congestion issues on the State highway system; and

WHEREAS, the Transportation Commission supports allocating resources to the Congestion Relief Program and initial funding of \$8.0 million per year beginning in FY 2006-07 to be distributed to the regional transportation districts based upon the percentage of lane miles [Note: changed to congested VMT in TC -1289, July 15, 2004] with greater than or equal to .85 volume to capacity;

NOW, THEREFORE, BE IT RESOLVED that the Transportation Commission hereby directs the Executive Director to establish a Congestion Relief Program and allocate resources in the Statewide Transportation Plan and the Statewide Transportation Improvement Program (STIP). CDOT staff will develop Congestion Relief Program standards and expenditure guidelines.

## Appendix C

### Resolution Number TC-1289

WHEREAS, in accordance with C.R.S. 43-1-106(8)(a), the Transportation Commission has the duty to formulate the general policy with respect to the management, construction, and maintenance of public highways and other transportation systems in the state; and

WHEREAS, in accordance with C.R.S. 43-1-1101, the Colorado General Assembly recognizes that the Department of Transportation is the proper body to perform statewide transportation planning with the cooperation of the regional planning commissions and local government officials; and

WHEREAS, pursuant to C.R.S. 43-1-113(2), the Transportation Commission as the policy making body for the Department of Transportation is responsible for the development and adoption of an annual budget allocation plan for moneys subject to its jurisdiction; and

WHEREAS, in accordance with C.R.S. 43-1-113(1), all funds and moneys to the credit of the Department of Transportation, with the exception of Aviation Funds, shall be expended under the supervision and direction of the Transportation Commission; and

WHEREAS, the Transportation Commission acknowledges that there are insufficient funds to meet performance objectives and to preserve the existing State highway system as well as provide for congestion relief; and

WHEREAS, based upon revenue projections used for the 2030 Statewide Plan, it is estimated that \$3,046,334,000 of Senate Bill 97-001 sales and use tax funding will be available after 7<sup>th</sup> Pot commitments have been completed, as defined in Resolution Number TC-1231; and

WHEREAS, the Transportation Commission acknowledges that the availability of S.B. 97-001 funding has historically been extremely volatile; and is questionable given the length of time (19 years) before anticipated revenue from this source is projected to be available; and

is based upon current law and revenue projections when the 2030 Plan process began in June 2003; and

WHEREAS, the Transportation Commission recognizes that:

No strategic plan has been developed nor adopted by the Commission for use of these funds after the 7<sup>th</sup> Pot. Projects shown in the plan for utilization of these funds must be on the list developed in the 2003 Strategic Implementation Plan. Project inclusion in the 2030 Plan utilizing these funds does not obligate the Commission, nor the planning region,

to include these projects when the next strategic program is developed. These projects are not on parity with the 7<sup>th</sup> Pot Program for use of strategic funding; and

WHEREAS, significant changes that have occurred since the last adopted resource allocation documentation dated November 24, 2003 include: creating planning totals for Pikes Peak Area Council of Governments and North Front Range MPO; and including the 7<sup>th</sup> Pot as defined in Resolution TC-1231, adopted by the Transportation Commission on December 18, 2003; adjusting the Congestion Relief distribution to reflect congested VMT instead of congested Lane Miles, as agreed to by the Transportation Commission in June 2004; and adoption of a methodology for allocating \$3,046,334,000 of Senate Bill 97-001 sales and use tax funding, which is a weighting of the Investment Categories as follows: 40% System Quality, 50% Mobility, and 10% Safety; and

WHEREAS, the Transportation Commission acknowledges that this Resource Allocation is for the 2030 Statewide Plan, and that the planning process begins anew with each Long Range Plan cycle, approximately every three years, and the Transportation Commission intends that with each new planning cycle, there will be a public involvement process whereby revenue projections and resource allocation issues are reassessed; and

WHEREAS, during each Long Range Plan cycle, the Transportation Commission will carefully consider statewide performance issues, and set performance goals for each of the Investment Categories: System Quality, including the Pavement and Bridge Management Mobility, including a new model and management system to be developed for Congestion Relief Safety, including education, enforcement and construction programs; and

WHEREAS, the Transportation Commission expects that each Transportation Planning Region will use these performance goals to guide them in a new prioritization of all projects within their area of responsibility, for inclusion in the new Statewide Plan; and

WHEREAS, this resolution shall sunset with the implementation of the next Statewide Plan, it being the desire of the Transportation Commission that public input, circumstances at that time, and new Transportation Commission performance goals be taken into consideration when the next plan is put in place.

NOW, THEREFORE, BE IT RESOLVED, that the current resource allocation/control totals dated July 15, 2004, and attached hereto, are adopted for the 2030 Statewide Plan.

## Appendix D

### .85 or Greater V/C Calculation and Data Sources

The V/C ratios are calculated by DTD using the latest traffic data. The V/C ratios are updated annually to reflect the changes in the latest traffic volumes. The volume represents the 30<sup>th</sup> highest hour volume (peak hour) and are calculated based on the data from the permanent automatic traffic recorders and short duration traffic data collection activity during any given year. The hourly maximum capacity values are calculated based on the procedures outlined in the Highway Capacity Manual.

The source for all the above-mentioned data is a DTD database called TCORIS, which is updated annually and maintained by DTD.

## Appendix E

### Descriptions of Eligible Activities

Access Management is a process for providing access to land development, while preserving the safety and capacity of the transportation system. Access Management activities that could be implemented are:

- Development of an Access Control Plan for a specific corridor in accordance with the requirements of the State Highway Access Code.
- Consolidation of closely spaced access points.
- Restricting left turn movements at intersections to improve the capacity of the through movement.
- Providing adequate auxiliary right and left turn lanes.
- Providing adequate storage length for turn lanes.
- Improving driveway turning radii and width.

Signal Timing measures include:

- Changing the signal timing cycle to improve the operational capacity of the intersection. This can be done using the Highway Capacity Software.
- Changing the signal timing to incorporate lead/lag and other types of signal configurations. Again, this can be done using the Highway Capacity Software.
- Coordination of traffic signal timings within a corridor to improve signal progression.

Ramp Metering measures results in demand to be spread out over a longer period and thus limiting the congestion caused by merging movements. This measure could be implemented by:

- Installation of signals at entrance ramps of freeway type facilities. Ramp metering along a section of freeway should only be used when an overall system benefit will be achieved.

Construction of Turning Lanes measure would provide:

- Adequate left and/or right turn lanes at intersections. The lane(s) should include proper deceleration, taper, and storage lengths.

Installation of Median Separators could be achieved by:

- Providing a raised barrier to limit the turning movements at intersections, thus reducing the number of conflict points.
- Providing for a painted median.
- Providing a continuous two way left turn lane.

Tolling/Hot Lane activities could include:

- Conversion of an existing HOV facility to HOT lane configuration. This measure would allow single occupant vehicles to use the HOV lane(s) for a predetermined fee/toll.

Incident Management Programs could utilize:

- Studies to implement various Incident Management Programs
- Courtesy Patrol measures to respond, clear, and restore the traffic to normal conditions.
- Creation of an incident management protocol/program among CDOT, law enforcement agencies, and the media.

Intelligence Transportation System is the application of technology and system engineering processes to improve transportation services. Some of the measures are:

- Studies to implement ITS programs
- Installation of Variable Message Signs (VMS)
- Providing travelers information through the use of VMS and/or Highway Advisory Radios.
- Providing real time traffic data.
- Installation of roadway surveillance cameras.
- Installation vehicle loop detectors for incident management purposes.

Travel Demand Management Strategies could include:

- Studies to implement TDM programs
- Installation of High-Occupancy Vehicle Lanes.
- Implementation of a Ridesharing program.

- Implementation of a Vanpool/Carpool program.
- Telecommuting programs.

Alternate Modes measures could include:

- Construction of Park-and Ride facilities.
- Improved transit operation such as better schedules, more frequency, etc.