



## **FISCAL YEAR 2009** ANNUAL PERFORMANCE REPORT



COLORADO DEPARTMENT OF TRANSPORTATION

# 2009 ANNUAL PERFORMANCE REPORT

## TABLE OF CONTENTS

|  |    |
|--|----|
| Executive Summary  | 3  |
| Introduction   | 6  |
| <b>SECTION 1: HOW IS CDOT FUNDED AND HOW ARE FUNDS USED?</b> |    |
| • How is CDOT funded?  | 6  |
| • How does CDOT invest its revenue?                          | 8  |
| <b>SECTION 2: PERFORMANCE RESULTS OVERVIEW</b>               |    |
| • How does CDOT report its performance?                      | 10 |
| • Performance Summary  | 11 |
| <b>SECTION 3: PERFORMANCE RESULTS DETAIL</b>                 |    |
| • Safety   | 12 |
| - Driver Safety  | 12 |
| - Employee Safety  | 20 |
| • System Quality   | 23 |
| - Bridge Condition   | 23 |
| - Pavement Condition   | 25 |
| - Maintenance  | 26 |
| • Mobility   | 30 |
| • Program Delivery   | 35 |
| - Project Delivery   | 35 |
| - Human Resources  | 36 |
| - Disadvantaged Business Enterprise                          | 38 |
| - Strategic Project Delivery                                 | 39 |
| <b>SECTION 4: FUTURE PERFORMANCE</b>                         |    |
|  | 41 |
| Acknowledgements   | 42 |

# COLORADO'S TRANSPORTATION SYSTEM

(as of June 30, 2009)

|               | ROADWAY CENTER<br>LINE MILES | NUMBER<br>OF BRIDGES |
|---------------|------------------------------|----------------------|
| <b>STATE</b>  | <b>9,134</b>                 | <b>3,429</b>         |
| <b>COUNTY</b> | <b>58,822</b>                | <b>3,171</b>         |
| <b>CITY</b>   | <b>15,329</b>                | <b>1,512</b>         |
| <b>OTHER*</b> | <b>4,878</b>                 | <b>120</b>           |
| <b>TOTAL</b>  | <b>88,163</b>                | <b>8,232</b>         |

\*Includes E-470 and Northwest Parkway

## EXECUTIVE SUMMARY

As a responsible steward of the public's tax dollars, CDOT works to deliver a transportation system that is safe, that moves people and goods efficiently and that has the capacity to support sustainable growth and development. Because Colorado's economy, quality of life and environment are strongly affected by our transportation system, it is important to regularly evaluate performance and make the necessary adjustments to provide the best possible transportation system to Coloradans and visitors to our state. Since 1998 the Annual Performance Report has communicated to our customers the results CDOT achieves with the resources we are provided. The resources made available to the department have declined since 2007, and are not expected to keep pace with inflation in the coming years. Declining revenues and increasing costs coupled with the state's aging infrastructure and growing population present obstacles to the continued delivery of an efficient and effective transportation system.

At the heart of the funding shortfall is the declining value of fuel taxes. During FY 2009 63 percent of CDOT revenue came from fuel taxes. The federal fuel taxes of \$.184/gallon for gas and \$.244 for diesel have not changed since 1993 and the state gas tax of \$.22/gallon and \$.205 for diesel have not changed since 1991. Since these taxes are not indexed to inflation, the same approximate \$.40/gallon for gas is collected today that was collected back in 1993. The Department's largest resource for adequately maintaining and improving the transportation system is fixed at a rate deemed adequate for 1993. Also, since 1993 the fuel economy of vehicles has increased, providing substantially less revenue per mile of highway use. In addition, the growth of hybrid, electric and alternative fuel vehicles will mean less gasoline and diesel consumption and the generation of less fuel tax revenue in the years ahead, despite continued demands on the system.

104<sup>th</sup> Avenue Bridge over South Platte River

On the cost side, construction inflation prior to the recession had eroded the buying power of the fuel tax. The same dollar spent for transportation system improvements in 1993 bought only \$0.42 worth in 2009, as measured by the Colorado Construction Cost Index (CCI). While construction costs have increased, the demands placed on the transportation system have also increased. Colorado's population has increased 50 percent since the 1990 census, topping 5.1 million this year with another 1.2 million people expected by 2020. The U.S. Census Bureau estimates that Colorado grew at the fourth fastest rate in the nation in 2009. Compounding this, the actual use of the transportation system, as measured by vehicle miles traveled, has grown faster than the population. In 2008, 28.1 billion miles were driven on state highways, a 59 percent increase from 1990.

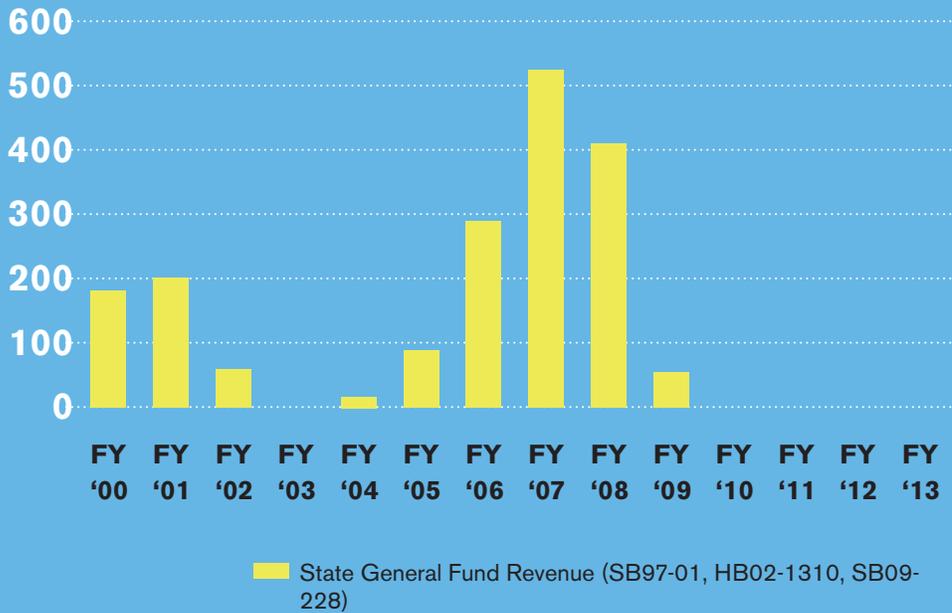
The 2035 Statewide Transportation Plan outlines the increasing gap between available resources and resources required to maintain Colorado's transportation system. Between 2008 and 2035, \$123 billion in revenue is forecast as available for transportation in Colorado. However, the cost to sustain the system at current levels of performance is estimated at \$176 billion and the cost to accomplish the vision outlined in the plan at \$249 billion. This gap continues to grow as the value of the gas tax is further eroded and the state's population and transportation demands continue to increase.

Fiscal Year 2009 presented another challenging year for the department as this funding gap continued to grow. Total revenue declined by \$68 million from 2008. While the department worked to deliver the same level of service, the continued reduction in resources is having a negative impact in key areas. Pavement condition as measured by the percent of pavement statewide in good and fair condition declined from 53 percent good/fair in 2008 to 50 percent good/fair in 2009. It is anticipated in 2010 that only 46 percent of pavement will be in good and fair condition, representing the first time since 2000 that there will be more pavement in poor condition than in good and fair condition. Similarly, the number of bridges in poor condition increased in 2009 with 128 of the state's bridges in poor condition, up from 125 in 2008.

Governor Ritter and the Colorado Legislature took an important first step in addressing this transportation funding gap with the 2009 passage of Funding Advancement for Surface Transportation and Economic Recovery (FASTER). FASTER will provide an estimated \$250 million annually for transportation improvements in Colorado through modest increases in vehicle registration fees, and additional surcharges. A significant portion of these funds will flow to local governments to meet their needs, as well as provide dedicated funding to address deficient bridges, and transit needs within the state. While the 2009 session resulted in enhanced transportation funding

# STATE GENERAL FUND SUPPORT FOR TRANSPORTATION IS UNRELIABLE

(\$ millions)



due to FASTER, it witnessed the repeal of the general fund transfer elements of Senate Bill 97-001 and House Bill 02-1310. Combined, these two bills provided \$2 billion in general fund revenue to CDOT from 1997-2009. The revenue generated by these two bills was significant and resulted in the construction of much needed improvements, but the funding was inconsistent from year to year (\$0 to \$500 million) which made it difficult for the department to conduct effective long range planning.

The American Recovery and Reinvestment Act (ARRA) signed into law by President Obama in February 2009 provided over \$506 million in additional transportation funding for Colorado. This total included over \$385 million “ready to go” road and bridge projects and over \$120 million for transit projects across the state. The primary objective of ARRA funded projects is to preserve and create jobs and promote economic recovery. While FASTER and ARRA provide positive momentum in the effort to rebuild Colorado’s transportation infrastructure, they address only a portion of the long-term funding shortfall. The Colorado Transportation Finance and Implementation Panel, a blue-ribbon panel formed by Governor Bill Ritter in 2007, recommended raising an additional \$1.5 billion annually for transportation. While important initial steps, ARRA and FASTER only provide a part of the funding necessary to build and maintain a 21<sup>st</sup> century transportation system. Maintaining or improving upon existing system quality and safety will require additional long-term solutions.

The bottom line is this: sustaining Colorado’s existing transportation system and expanding it to meet the needs of current and future users cannot be done with the future revenues

currently projected. Fulfilling Colorado’s basic transportation needs through 2030 will require more than double the expected revenue over that time period. Maximizing use of the available resources therefore becomes ever more critical. This report demonstrates where CDOT has met its performance targets for the prior fiscal year and where it hopes to do better.



I-70 congestion

Sustaining Colorado’s existing transportation system and expanding it to meet the needs of current and future users cannot be done with the future revenues currently projected. Fulfilling Colorado’s basic transportation needs through 2030 will require more than double the expected revenue over that time period.

## INTRODUCTION

This report communicates the department's performance in Fiscal Year 2009 (July 2008 through June 2009). The report is organized in the following manner:

**SECTION 1 – PROVIDES A RECAP OF THE DEPARTMENT'S REVENUES AND EXPENDITURES**

**SECTION 2 – PROVIDES A SUMMARY OF 25 PERFORMANCE INDICATORS**

**SECTION 3 – PROVIDES NARRATIVE ON EACH MEASURE AND WHAT AFFECTED RESULTS**

**SECTION 4 – DISCUSSES FACTORS THAT WILL INFLUENCE PERFORMANCE IN FUTURE YEARS**

## SECTION 1

## HOW IS CDOT FUNDED AND HOW ARE FUNDS USED?

### HOW IS CDOT FUNDED?

While during calendar year 2009 the state's transportation system benefited from a significant influx of federal ARRA funding and future years will benefit from the inauguration of FASTER, CDOT's principal source of revenue is still federal and state fuel taxes. During FY 2009 63 percent of CDOT revenue came from fuel taxes. Because fuel taxes are levied as cents per gallon, the revenue generated depends on the number of gallons sold, not the sales price of the fuel. When the retail price per gallon of gas approached \$4.00 in June of 2008, the same \$.40/gallon in tax was being collected as when the price was \$2.00 per gallon.

Additionally, the increasing fuel efficiency of cars and trucks has contributed to a decline in gas tax revenue when measured on a per mile of highway usage basis. Average passenger

vehicle mileage in 1991 was 21.2 miles per gallon; in 2006 it was 22.4 miles per gallon according to the U.S. Bureau of Transportation Statistics. That means fuel consumption and fuel tax revenue per mile has dropped more than 5 percent.<sup>1</sup> The result is less funds to operate and maintain the state's transportation system while use of the system continues to increase. While the per gallon fuel taxes have remained constant since 1993, inflationary increases in maintenance and construction costs have averaged just over three percent per year. The \$3.20 worth of transportation system maintenance and improvements that each driver paid with a fill-up in 1993 bought only \$1.36 worth in 2009. A solution is needed to balance the increasing demands being placed on the system with a commensurate level of revenue.

<sup>1</sup> [http://www.bts.gov/publications/national\\_transportation\\_statistics/html/table\\_04\\_23.html](http://www.bts.gov/publications/national_transportation_statistics/html/table_04_23.html)

State and federal motor fuel taxes are the primary funding source for Colorado's roads. While the per gallon fuel taxes have remained constant since 1993, inflationary increases in maintenance and construction costs have averaged three percent per year, eroding the purchasing power of CDOT's primary revenue source.

# CDOT FUNDING SOURCES

FY 2009 (\$ millions)

35.2%

FEDERAL HIGHWAY ADMINISTRATION AND HIGHWAY SAFETY (FEDERAL GAS TAX) \$538.9

9.2%

OTHER FEDERAL, STATE AND LOCAL \$139.4

2.6%

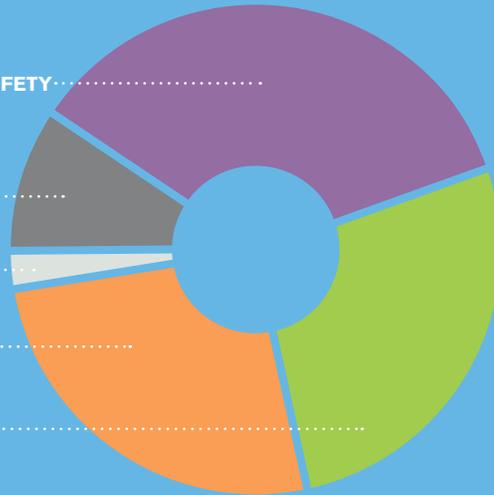
STATE GENERAL FUND (SB97-01, HB02-1310, SB09-228) \$39.1

25.5%

STATE ARRA \$385.4

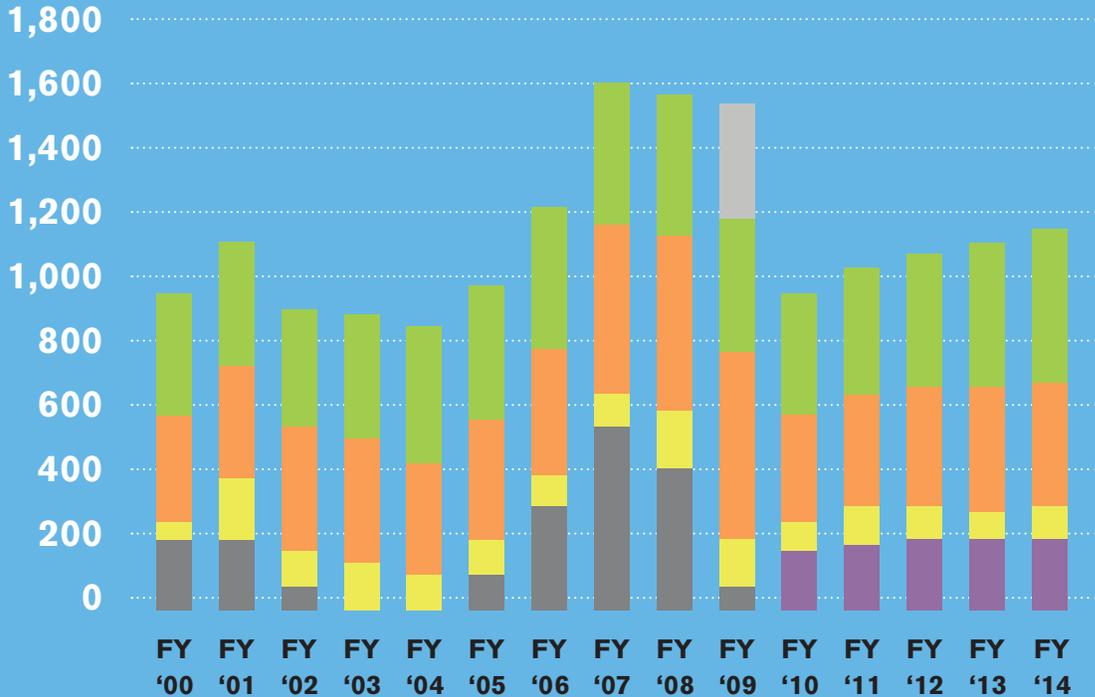
26.8%

STATE HIGHWAY USERS TAX FUND (STATE GAS TAX) \$408.9



## CDOT FUNDING SOURCES BY FISCAL YEAR

Actual FY 2000-FY 2009 and Projected FY 2010-FY 2014 (\$ millions), as of October 2009 budget development.



- Senate Bill 09-108 ("FASTER") Revenue
- Other federal, state and local
- State Highway Users Tax Fund (State Gas Tax)
- State General Fund Revenue (SB97-01, HB02-1310, SB09-228)
- Federal Highway Administration and Highway Safety (Federal Gas Tax)
- ARRA (American Recovery and Reinvestment Act)



I-70 Westbound at Eisenhower Tunnel

## HOW DOES CDOT INVEST ITS REVENUE?

CDOT allocates its revenues to four major investment categories that correspond to goals and objectives set by the Colorado Transportation Commission. The department exists to provide for safe and convenient travel throughout Colorado, to preserve the public's multi-billion dollar investment in its transportation infrastructure and to efficiently invest the resources made available by taxpayers. These functions – safety, mobility, system quality and program delivery – serve as the department's investment categories. Debt service represents the repayment of bonds issued for 28 strategic projects identified in 1996 as high priority projects of statewide significance. Debt service on the bonds currently consumes \$167 million of CDOT annual revenue.

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

The safety investment category focuses resources in two key program areas: roadway safety and driver behavior. Roadway safety performance is measured by total crash rates, fatal crash rates and injury crash rates. Driver behavior performance is measured by tracking seatbelt usage rates and alcohol related fatal crashes. The performance in these areas is impacted not only by CDOT investments in safety design, engineering and programs, but also by many external factors such as auto manufacturer technology, law enforcement and motorist demographics.

**System Quality** - *activities, programs and projects that preserve the function and aesthetics of the existing transportation infrastructure.*

Investments in this category impact the surface quality and remaining service life of roadways and the structural condition of bridges. The primary system quality program areas are pavement, bridge, roadside facilities and roadside appearance. The percentage of pavement and bridge deck area in good or fair condition is the measure used to assess the condition of pavement and bridges statewide. A report card style letter grade is used to assess performance for roadside facilities and roadside appearance.

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

This category includes investments made for accessibility to the transportation system, transportation options and snow and ice control. Minutes of delay per traveler in congested

state highway segments and a letter grade for snow and ice control are the key measures reported for mobility performance. An investment in mobility does not necessarily translate to an expansion of the state's highway system. It may represent an investment in alternative modes or improved efficiency of the existing system.

**Program Delivery** – *efforts to ensure the efficient and successful delivery of CDOT's programs and services.*

The percent of design projects meeting established schedules and the percent of annual employee turnover measure performance in program delivery.

**Strategic Projects** – *established in 1996, this program identified 28 high priority projects of statewide significance based on the overall visibility, cost and return on investment in addressing on-going needs of safety, mobility and reconstruction.*

To date, 21 of the 28 projects are either complete or have received the total funding established for them by the Commission when it initially set up the strategic investment program. Bonds were issued to accelerate the funding of some of these projects. All bond proceeds are expended. The bond payments will consume about \$167 million of CDOT's resources annually through 2017. The \$167 million in debt obligation represents a fifth piece of the investment category pie in order to account for the entire 2009 budget. An additional \$25 million of the 2009 budget spent toward strategic project completion has been allocated 70% to mobility, 15% to safety, and 15% to system quality, in an effort to capture the intended benefits of the strategic project program. This allocation will also be used in future years for which strategic project funds are available.



## CDOT BUDGETED INVESTMENTS BY CATEGORY

FY 2009



## TRAFFIC LIGHT INDICATOR



**FAILURE** TO ACHIEVE OBJECTIVE

**PROGRESS** TOWARD OBJECTIVE

**ACHIEVED** OBJECTIVE

## SECTION 2

## PERFORMANCE RESULTS OVERVIEW

### WHY DOES CDOT REPORT ITS PERFORMANCE?

CDOT reports its performance for the benefit of the users of the state's transportation system, its planning partners and its own decision makers. The annual performance report communicates the results of our efforts to deliver on the mission of CDOT with the resources we are provided. CDOT continues to encounter challenges presented by reduced revenues, increasing costs and increasing demands being placed on the aging system by new users. The system is reflecting years of underinvestment.

This report does not attempt to address whether CDOT is delivering the transportation system it needs to thrive in the 21<sup>st</sup> century. The objective is to report on how CDOT is performing with the resources made available to it. Many of the objectives within this report are established annually as the Transportation Commission sets program funding levels for the year ahead.

Meeting objectives, therefore, does not necessarily mean that a particular program is performing at the commission's desired level. Rather, it implies that given the available funding, the program is meeting or exceeding expectations.

This report communicates performance using traffic light signals. Green lights indicate an objective was accomplished, yellow lights indicate progress was made but ultimate performance fell short and red lights indicate the objective was not achieved.

The objective is to report on how CDOT is performing with the resources made available to it.

## 2009 PERFORMANCE SUMMARY

|  | 2009 Objective<br>with<br>Available Revenue | 2009<br>Actual<br>Performance | R | Y | G |
|--|---|-------------------------------|---|---|---|
|  |   |                               |   |   |   |
| <b>SAFETY</b>  |   |                               |   |   |   |
| TOTAL CRASHES PER 100 MILLION VEHICLE MILES TRAVELED <sup>2</sup>          | 283.7                                       | 260.6                         |   |   |   |
| FATAL CRASHES PER 100 MILLION VEHICLE MILES TRAVELED <sup>3</sup>          | 1.00  | .99                           |   |   |   |
| INJURY CRASHES PER 100 MILLION VEHICLE MILES TRAVELED <sup>2</sup>         | 66.6  | 60.5                          |   |   |   |
| PERCENT OF DRIVERS AND OCCUPANTS USING SEATBELTS                           | 82.5  | 81.1                          |   |   |   |
| ALCOHOL-RELATED FATAL CRASHES AS PERCENT OF ALL FATAL CRASHES <sup>3</sup> | 38.5  | 40.0                          |   |   |   |
| NUMBER OF CDOT VEHICLE ACCIDENTS   | 336   | 330                           |   |   |   |
| NUMBER OF WORKERS' COMPENSATION CLAIMS                                     | 408   | 370                           |   |   |   |
| DOLLAR AMOUNT OF WORKERS' COMPENSATION CLAIMS (MILLIONS)                   | \$1.8                                       | \$2.6                         |   |   |   |
| STRIPING, SIGNS, SIGNALS AND GUARDRAIL MAINTENANCE                         | C   | B-                            |   |   |   |
| <b>SYSTEM QUALITY</b>  |   |                               |   |   |   |
| PERCENT BRIDGE DECK AREA IN GOOD AND FAIR CONDITION                        | 92.5  | 94.4                          |   |   |   |
| PERCENT PAVEMENT IN GOOD AND FAIR CONDITION                                | 50.0  | 50.0                          |   |   |   |
| OVERALL MAINTENANCE LEVEL OF SERVICE                                       | C+  | B-                            |   |   |   |
| ROADWAY SURFACE MAINTENANCE  | B-  | B+                            |   |   |   |
| BRIDGE MAINTENANCE   | C   | C+                            |   |   |   |
| ROADSIDE MAINTENANCE   | B-  | A-                            |   |   |   |
| ROADSIDE LANDSCAPE MAINTENANCE   | C   | B                             |   |   |   |
| TUNNEL MAINTENANCE   | B-  | C+                            |   |   |   |
| <b>MOBILITY</b>  |   |                               |   |   |   |
| MINUTES OF DELAY PER TRAVELER IN CONGESTED STATE HIGHWAY SEGMENTS          | 18  | 18                            |   |   |   |
| SNOW AND ICE CONTROL   | B-  | C+                            |   |   |   |
| ON-TIME PERFORMANCE FOR BUSES ON THE I-25 HOT LANES (AS PERCENT)           | -   | 99                            |   |   |   |
| <b>PROGRAM DELIVERY</b>  |   |                               |   |   |   |
| PERCENT OF DESIGN PROJECTS MEETING ESTABLISHED SCHEDULE                    | >60.9                                       | 65.9                          |   |   |   |
| PERCENT OF ANNUAL EMPLOYEE TURNOVER  | 8-10  | 7.1                           |   |   |   |
| PERCENT OF DISADVANTAGED BUSINESS ENTERPRISE (DBE) PARTICIPATION           | 12.8  | 10.3                          |   |   |   |
| EQUIPMENT, BUILDINGS AND GROUNDS MAINTENANCE                               | C   | C                             |   |   |   |
| PLANNING AND TRAINING MAINTENANCE WORKERS                                  | B-  | B-                            |   |   |   |

<sup>2</sup> 2005  
<sup>3</sup> 2008

## SAFETY

## OVERVIEW

A transportation system that is safe for drivers, cyclists, pedestrians, CDOT employees and contractors is a cornerstone of a successful transportation system. This section reports on both driver safety and employee safety.

## Driver Safety

Providing a safe and secure transportation system is CDOT's highest priority. The mission of CDOT's Office of Transportation Safety and Traffic Engineering is to reduce the incidence and severity of motor vehicle crashes and the associated human and economic loss. The *National Cooperative Highway Research Program (NCHRP) Project 20-24(37C)* compared Colorado's safety performance results to other states in the US from the period 2000-2002 with those in 2005-2007. This draft report clearly shows how Colorado has emerged as a leader in roadway safety:

**22** % decrease  
in total fatalities

**31** % decrease  
in fatalities per 100 million  
VMT (Vehicle Miles Traveled)

**35** % decrease  
in speeding-related  
fatalities

**30** % decrease  
in young driver involvement  
in fatal crashes

**22** % decrease  
in pedestrian  
fatalities

**20** % decrease  
in alcohol-related fatalities (driver  
blood-alcohol content greater  
than 0.08)

**35** % decrease  
in unrestrained passenger  
fatalities, all seat positions

Source: NCHRP 20-24(37C)

Some of these successes are due to the passage of important traffic safety legislation, such as lowering the blood-alcohol content (BAC) threshold to 0.08 percent in 2004 (HB 04-1021) and the law requiring a helmet for motorcyclists under 18 years of age and their passengers (HB 07-1117). Fines for failure to comply with child restraint and booster seat requirements and for seat belt violations were increased (HB 08-1010). Laws were passed to increase penalties for drunk driving (HB 08-1010), expand the use of interlock devices and to provide \$2 million annually for increased high-visibility DUI enforcement (HB 08-1194). In addition, a number of improvements have been made to the Graduated Driver's License law for teen drivers, as well as other legislative changes to improve safety across the state. Grass roots organizations have had a significant impact, and public information programs have served to raise awareness of the risks and responsibilities of driving.

In addition, through innovative engineering practices, CDOT has reduced crashes by identifying and making safety improvements at roadway locations where higher rates of crashes are detected. Evaluation methodologies such as pattern recognition analysis and roadway diagnostic safety assessments provide the current best practice in targeting appropriate locations for safety improvements. These methodologies address: reducing the frequency of roadway departure-type crashes and mitigating the effects of leaving the road, reducing crashes at intersections and selecting qualified sites for safety improvement projects through such programs as Federal Hazard Elimination and High Risk Rural Roads. Hazard elimination is the largest component of the safety budget.

In 2009, the American Association of State Highway and Transportation Officials (AASHTO) awarded CDOT its Safety Leadership Award for its "strong leadership" and "success in reducing highway fatalities and serious injuries." In its press release AASHTO said, "Colorado has achieved a significant decrease in fatalities in part due to strong and active partnerships among safety stakeholders that address all aspects of highway safety. Colorado uses an innovative project identification and prioritization method to determine how best to spend limited safety dollars that includes a comparative analysis of roadway segments, intersections and spot locations and a binomial probability analysis method known as Pattern Recognition and Direct Diagnostics."



Traditional roadway safety improvements include better signing, freshly painted road stripes, new acceleration and deceleration lanes and identifying and correcting “Hot Spots” where correctable accident patterns are occurring. FASTER legislation provides funding via a road safety surcharge on motor vehicle registrations for road safety projects. The first group of these projects will be undertaken during FY 2010 and include variable message signing, guardrail and rumble strip installations, barrier repairs, shoulder and interchange improvements and other safety enhancements.

In addition to physical traffic safety improvements, the department also supports and coordinates driver behavior programs, such as “The Heat is On” and “Click it or Ticket,” to raise driver awareness and discourage irresponsible behavior.

The Statewide Total Crash Rate is the primary means of measuring the department’s effectiveness in increasing safety for users of the state highway system. The total crash rate is the number of crashes per 100 million vehicle miles traveled on Colorado highways. In 2005, we achieved our objective of 283.7 or less. Vehicle crash data is maintained by the Colorado Department of Revenue. Software upgrades are being implemented to allow CDOT access to vehicle crash data for time periods after 2005. Data on fatal accidents is provided by the Fatality Analysis Reporting System and is current through calendar year 2008.

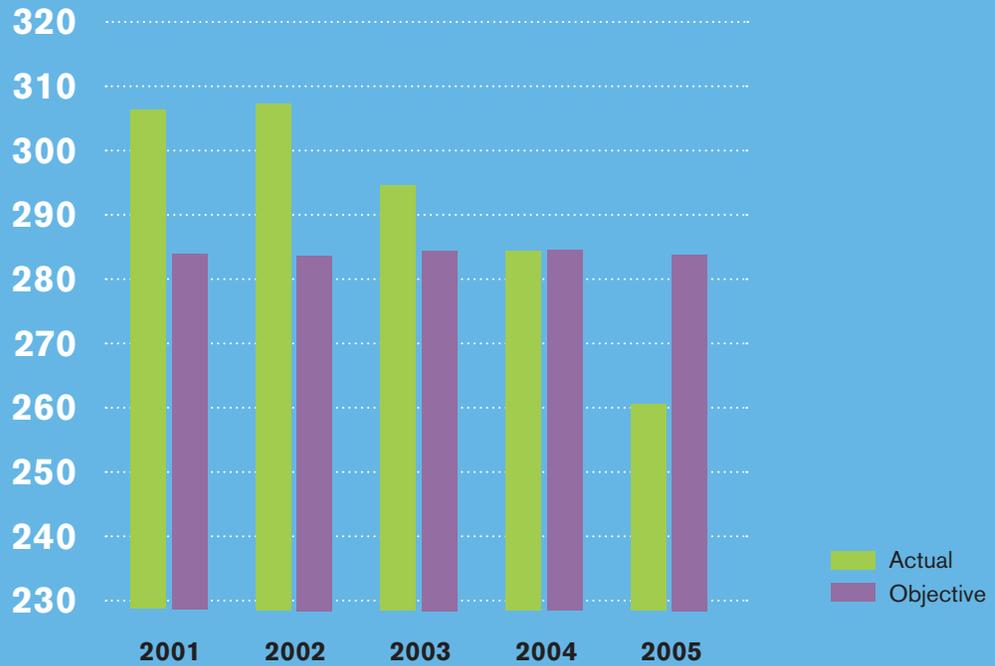


## PRIMARY MEASURE

Total Crash Rate, Number of Crashes per 100 Million VMT  
FY 2009 Roadway Safety Budget: \$33.8M  
Annual Objective: 283.7  
Actual: 260.6 (2005)

## TOTAL CRASHES

per 100 Million Vehicles Traveled 2001-2005



Although vehicle crashes are trending downward, drivers today face an increasing number of distractions affecting driver attention. Cell phones, MP3 players, CD changers and on-board information systems interfere with driver attention, and are a frequent cause of accidents. But from a standpoint of technology benefits, enhanced vehicle safety features, such as side impact airbags and vehicle stability control continue to provide better protection to vehicle occupants. Roadway improvements such as providing wider lanes and shoulders, eliminating roadside obstacles and improving intersections, plus training and driver awareness programs and law enforcement, all help to reduce the occurrence and severity of crashes.

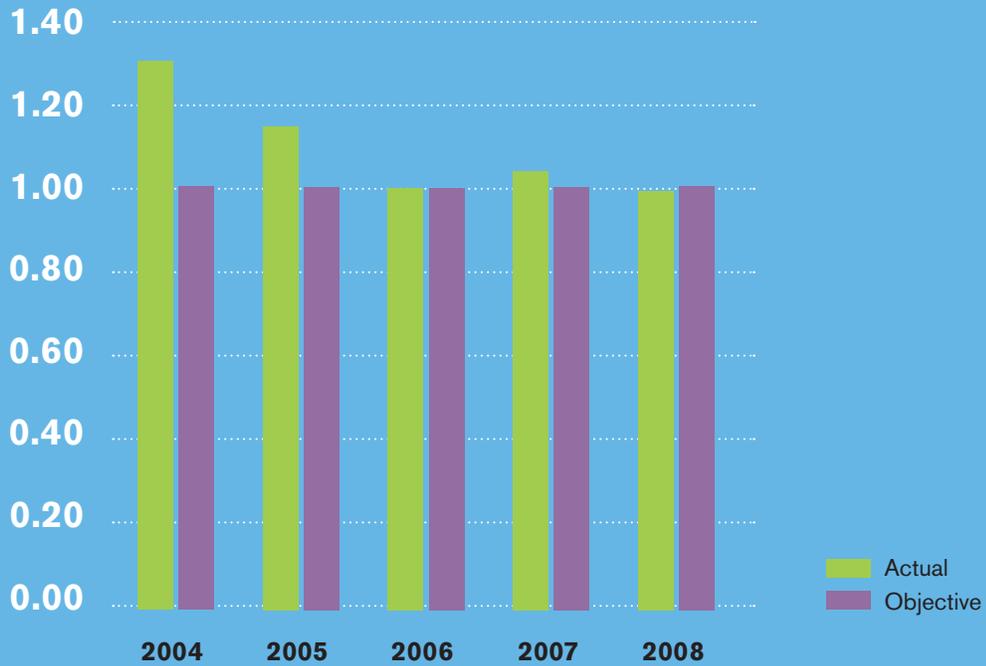




## SUPPORTING MEASURE

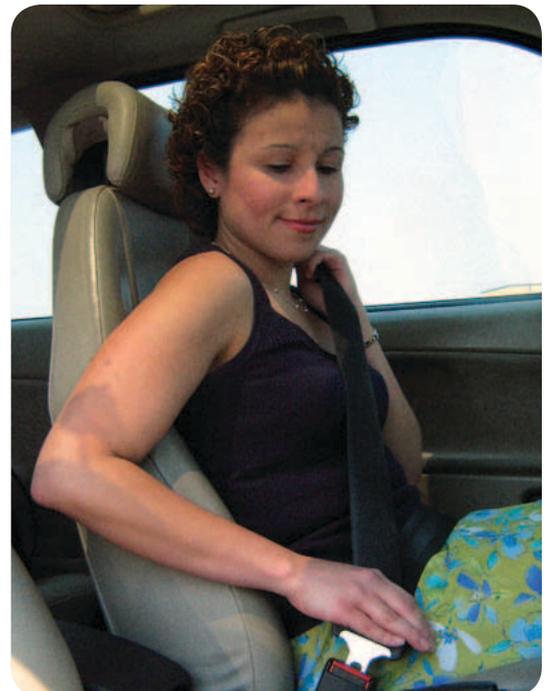
Statewide Fatal Crash Rate, Number of Fatal Crashes per 100 million VMT  
FY 2009 Roadway Safety Budget: \$33.8M  
Annual Objective: 1.00  
Actual: .99 (2008)

FATAL crashes  
per 100 Million Vehicles Traveled 2004-2008



The emotional and economic costs of fatal accidents are staggering. The National Highway Traffic Safety Administration estimates each fatality results in a cost of nearly \$1 million.<sup>3</sup> In 2008 there were over 37,000 accident fatalities nationally and 548 in Colorado.<sup>1</sup> In 2008, the state achieved the objective of having no more than one fatal crash per 100 million vehicle miles traveled. The fatal crash rate in Colorado remains significantly lower than the national average of 1.16 fatal crashes per 100 million vehicle miles traveled.<sup>2</sup>

1 <http://www-fars.nhtsa.dot.gov/States/StatesCrashesAndAllVictims.aspx>  
2 <http://www-fars.nhtsa.dot.gov/Crashes/CrashesTime.aspx>  
3 [http://www.nhtsa.dot.gov/people/injury/olddriver/1\\_chap\\_5.htm](http://www.nhtsa.dot.gov/people/injury/olddriver/modeldriver/1_chap_5.htm)



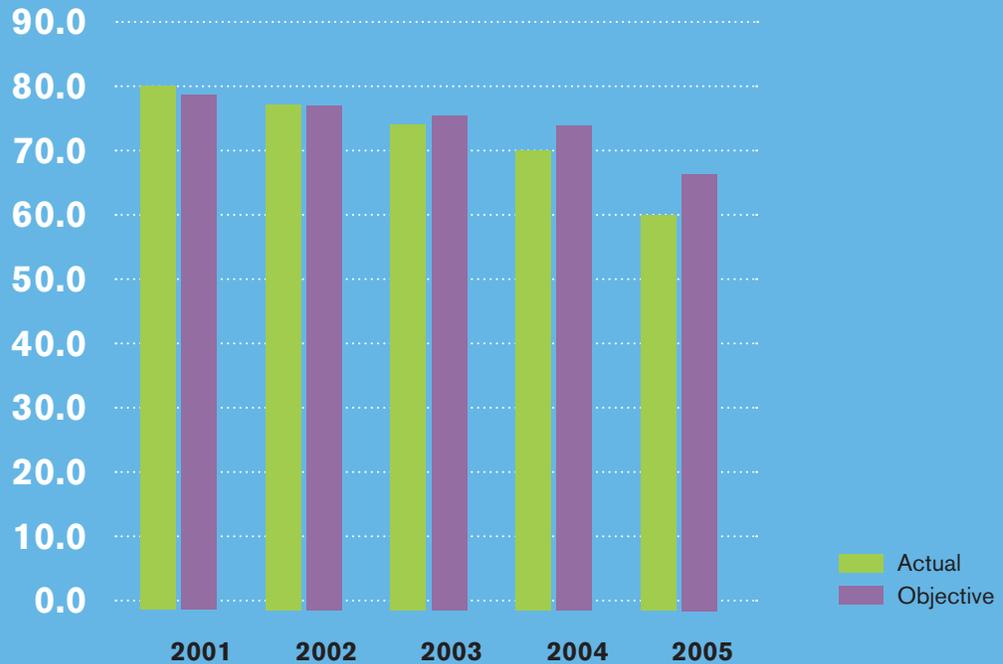


## SUPPORTING MEASURE

Statewide Injury Crash Rate, Number of Injury Crashes per 100 million VMT  
FY 2009 Roadway Safety Budget: \$33.8M  
Annual Objective: 66.6  
Actual: 60.5 (2005)

## INJURY CRASHES

per 100 Million Vehicles Traveled 2001-2005



FUTURE

DETAIL: SAFETY

OVERVIEW

FUNDING

EXECUTIVE SUMMARY

The injury crash rate provides for the accurate comparison, across years, of crashes involving injury. This figure is calculated by dividing the number of injury crashes in a year by the number of vehicle miles traveled (in hundred millions).

Crashes involving injury can result in significant monetary costs. Depending on the severity, an injury sustained in an automobile crash can result in costs ranging from \$10,000 to \$60,000. These costs include emergency services, traffic delays, property damage, victim work loss and employer costs. Adding costs for loss of quality of life means a total cost of \$30,000 to \$180,000 for a traffic related injury.

Direct Diagnostics and Pattern Recognition have helped reduce fatal crashes by 31% since 2001.

Similar to your annual physical when your doctor takes a blood sample or listens to your heart rate, the Safety and Traffic Engineering Branch (STE) at CDOT performs diagnostic procedures to improve the "health" of the transportation system. If a blood test indicates your cholesterol is above normal levels, your doctor will likely recommend more exercise, a healthier diet, or possibly prescribe treatment. Similarly, when data shows

accidents occurring at a rate higher than the norm for similar roadway sections or intersections, the STE Branch prescribes treatments to improve conditions and bring accident levels down.

For example, the accident history for the intersection of Arapahoe Road (State Highway 88B) and Havana Street indicated that out of all the accidents occurring at this location, 52% were the result of approach turn type accidents (left turn in front of a vehicle coming from the opposite direction). A comparison revealed that for similar intersections across the state, approach turns comprise only about 20% of total accidents. In an effort to reduce the number of approach turn crashes, the STE Branch recommended the installation of a fully protected left turn arrow. Fully protected means left turns are allowed only on a green arrow which takes the decision away from the driver on whether or not to make a left turn through a gap in oncoming traffic. The new signal was installed in 2001. In the four years prior to installation of the new signal, 54 approach turn accidents had occurred. In the four years following installation only three approach turn accidents occurred.

These Direct Diagnostic and Pattern Recognition techniques have played a large role in improving the health of Colorado's transportation system. Since the full implementation of these analysis methods in 2001, the number of fatal crashes statewide has declined by 31%.



## SUPPORTING MEASURE

Statewide Seatbelt Usage  
FY 2009 Driver Behavior Safety Budget: \$8.7M  
Annual Objective: 82.5%  
Actual: 81.1% (2008)



## PERCENT OF DRIVERS AND OCCUPANTS USING SEATBELTS

2005-2009



The failure to wear a seat belt contributes to more fatalities than any other single traffic safety-related behavior. In 2006, 55 percent of drivers or occupants killed in car crashes were not buckled up<sup>1</sup>. It is estimated that half of these victims would have survived their crash if they had buckled up. Nationally, that equates to over 8,000 lives that could have been saved by seat belt use. In addition to saving lives, increased seat belt use can result in significant monetary savings. Americans pay over \$14 billion annually in injury-related costs for people who don't wear seat belts.

In Colorado, 45.8 percent of occupant fatalities in 2008 involved persons who were not buckled up.<sup>2</sup> Teens are particularly at risk. In 2005 the seat belt usage rate for drivers and occupants age 16 to 20 was 70.4 percent, about 10 percent lower than the overall usage rate for Colorado.

In an attempt to increase seat belt use and driver safety among young drivers, from October of 2007 through May 2008 NHTSA and CDOT conducted a statewide teen seat belt campaign. The campaign, specifically tailored to teens, emphasized countermeasures known to increase seat belt use, and was conducted on a scale large enough to produce significant improvement in seat belt use for this age group. The campaign included high-visibility enforcement, messages and

materials tailored towards teens and their families regarding enforcement of seat belt laws and parental monitoring of teen seat belt use. These programs had a positive effect on getting teens to buckle up. Colorado's statewide annual seat belt survey conducted in June 2009 showed the use rate among teens at 80.6 percent, up substantially from 72.9 percent in 2007.

Seat belt use continues to be higher in States where the vehicle operator can be stopped by law enforcement if any of the vehicle's occupants are not using seat belts ("primary law" States) than in those with weaker enforcement laws ("secondary law" States). In 2008, seatbelt use was 88 percent in primary law states versus 75 percent in secondary law states. Colorado is one of 24 states without a primary seatbelt law.<sup>3</sup>

The overall seat belt usage rate in Colorado decreased slightly between 2008 and 2009, from 81.7 percent to 81.1 percent. We slightly missed our objective of 82.5 percent, and fell short of the national average of 83 percent. It is hoped that continuing educational efforts will result in at least 82.5 percent of all Coloradans wearing seat belts by 2010.

<sup>1</sup> <http://www-nrd.nhtsa.dot.gov/Pubs/810948.PDF>

<sup>2</sup> <http://www-fars.nhtsa.dot.gov/People/PeopleRestrains.aspx>

<sup>3</sup> <http://www-nrd.nhtsa.dot.gov/Pubs/811036.PDF>

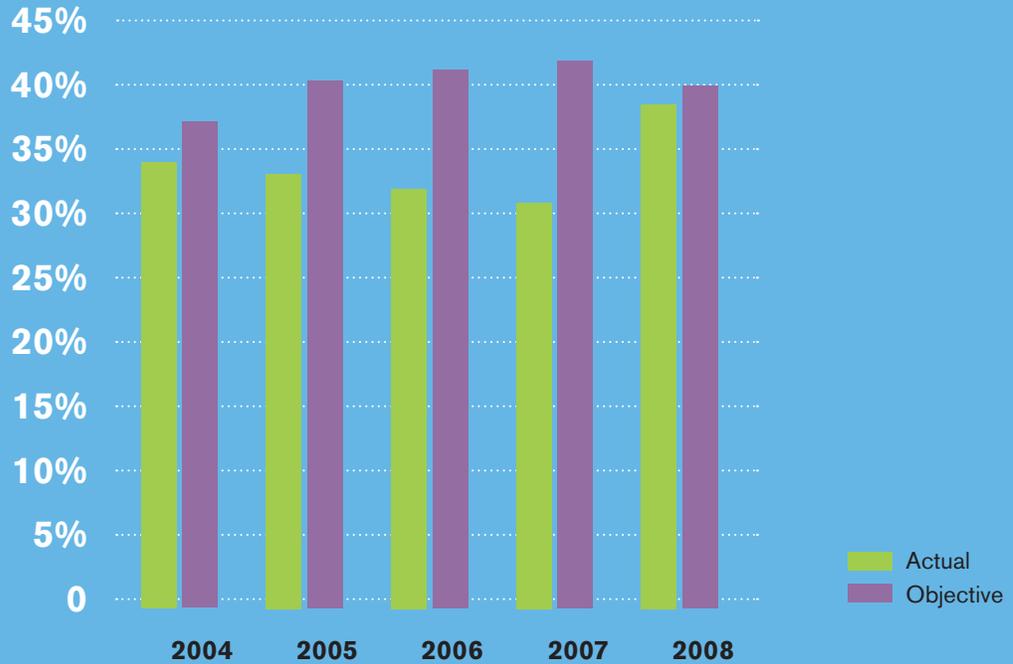


## SUPPORTING MEASURE

Statewide Alcohol-related Fatal Crashes, Alcohol-related Fatal Crashes as a Percent of All Fatal Crashes  
FY 2009 Driver Behavior Safety Budget: \$8.7M  
Annual Objective: 38.5%  
Actual: 40.0%

## ALCOHOL RELATED FATAL CRASHES

As percent of all fatal crashes 2004-2008



Nationally, someone is killed by a drunk driver every 45 minutes. In 2008 roughly 13,773 people died in drunk driving related crashes across the country. Alcohol-impaired driving accounted for 39.6 percent of traffic fatalities in 2008. About three in every ten Americans will be involved in an alcohol-related crash at some time in their lives.<sup>1</sup>

The Office of Transportation Safety (OTS) and the Public Relations Office strive to combat drunk driving through public awareness campaigns and collaborations with groups such as Mothers Against Drunk Driving. Public information campaigns such as "The Heat is On" have a positive effect on the reduction of alcohol-related fatalities. Increased public awareness, however, is only part of the solution. Increased law enforcement to enforce impaired driving laws, especially on sections of roadway with a high incidence of alcohol related fatalities, also has a demonstrable effect on the number of alcohol-related fatalities. OTS enhances its enforcement strategy with Checkpoint Colorado during the summer months. OTS also provides advanced training in the detection of impaired drivers for Colorado Law Enforcement.

Progress in reducing alcohol related crashes is measured by comparing alcohol related fatal crashes as a percent of all fatal crashes. In 1981 61.9 percent of all motor vehicle fatalities in Colorado were alcohol-related. Significant progress has been made in the intervening years. In 2008 alcohol was a factor in 40.0 percent of all fatal crashes. Despite progress, this remains above the objective of 38.5 percent.



The Colorado Department of Transportation credits the 2009 "100 Days of Heat" DUI enforcement for a 50 percent drop in alcohol-related fatalities this summer. Preliminary data indicates that 30 people have been killed in alcohol-related crashes between May 22nd and the end of August, compared to 58 people during the same time-period last year.

<sup>1</sup> <http://www.madd.org/Drunk-Driving/Drunk-Driving/Statistics.aspx>



## SUPPORTING MEASURE

Striping, Signs, Signals and Guardrail (Traffic Services MPA)  
Annual Objective: C      Planned: \$57.4M  
Actual: B-                      Spent: \$60.7M

### STRIPING, SIGNS, SIGNALS AND GUARDRAIL MAINTENANCE

FY 2005-FY 2009



As part of their work activities, CDOT maintenance crews ensure that traffic and informational signs are in good condition and easy to read and also repair and replace guardrail that helps keep vehicles on the road. Colorado's extreme winter temperatures and snowfall take a toll on pavement striping and markings so a significant amount of time during the summer months is dedicated to repainting stripes and reapplying pavement markings to make a safer and more enjoyable driving experience. Other activities in this area include maintaining Intelligent Transportation Systems and Courtesy Patrol activities. These activities help achieve mobility and safety objectives and are discussed later in the report.

In 2009, CDOT exceeded its objective in striping, signs, signals and guardrail, achieving a B-.



### Employee Safety

The department values the safety of its employees as much as it values the safety of the traveling public. CDOT's Office of Transportation Safety (OTS) manages education and training programs to promote on-the-job safety, and to minimize the number of accidents occurring on the job. OTS delivers and manages a number of employee safety programs, including "100 Safe Days of Summer." This program debuted in 2007 as a pilot program, and in its first year employee accidents declined 60 percent from the same 100 days the year prior. A follow up program, "Putting the Freeze on Accidents" debuted during the winter of 2008-2009 and continued to build awareness among CDOT employees of safe work habits. Employee reporting is a key element of the programs. Employees are encouraged to report "close calls" so that learning and changes in work processes can occur to help minimize accidents in the future.

Progress in employee safety is measured by the number of CDOT vehicle accidents and the number and dollar value of workers' compensation claims each year.



I-70 Shrine Pass Bridge

## NUMBER OF CDOT VEHICLE ACCIDENTS

FY 2005-FY 2009



### SUPPORTING MEASURE

Number of CDOT Vehicle Accidents  
 Annual Objective: 336  
 (10% reduction from previous year results)  
 Actual: 330

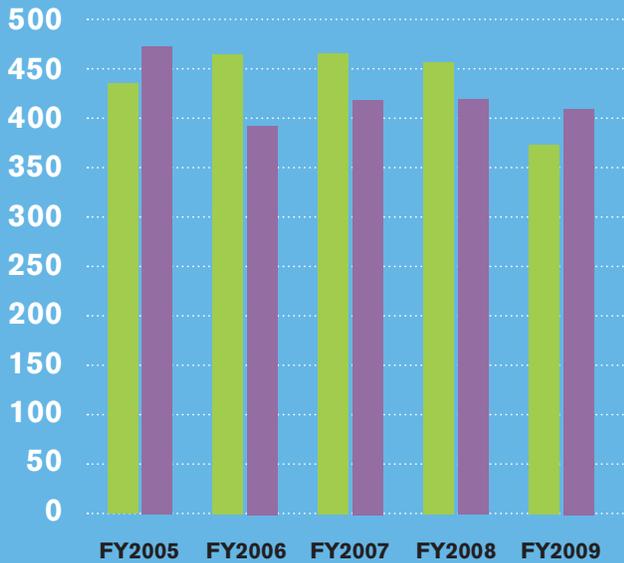
■ Number of Accidents  
 ■ Objective - 10% reduction from prior year

The majority of CDOT vehicle accidents occur when the vehicle is traveling straight forward. Accidents involving parked vehicles and those backing up are the second and third highest frequency accident categories. In 2009, forward moving accidents occurred with nearly twice the frequency of accidents occurring while parked or backing up. Maintenance personnel continue to be trained on a driving simulator with emphasis on

the best ways to avoid potential accidents. Non-CDL personnel who drive CDOT vehicles are offered a defensive driver training course with emphasis placed on avoiding distractions and following and stopping distances to avoid rear-end collisions. In 2009 the department had 330 vehicle accidents which accomplished the objective of reducing accidents by at least 10% from prior year levels.

## NUMBER OF WORKERS' COMPENSATION CLAIMS

FY 2005-FY 2009



### SUPPORTING MEASURE

Number of Workers' Compensation Claims  
 Annual Objective: 408  
 (10% reduction from previous year results)  
 Actual: 370

■ Number of Claims  
 ■ Objective - 10% reduction from prior year

There was significant improvement in reported accident rates at CDOT during fiscal year 2009. The department reduced the number of claims by 18 percent from 2008, but worker safety performance still has room for improvement. Roughly 12 percent of the department's work force is injured every year. Nearly 68 percent of all worker injuries involve maintenance personnel. The most common injuries include back, knee and shoulder

injuries while lifting and handling objects. Sprains, strains and contusions are the cause of most maintenance worker injuries. Low back and knee injury prevention education addresses how to minimize the potential for incurring these types of injuries and is offered to both maintenance and non-maintenance personnel. Maintenance personnel are also being educated on correct lifting procedures and body mechanics.

## WORKERS COMPENSATION CLAIMS (IN MILLION \$)

FY 2005-FY 2009



### SUPPORTING MEASURE

\$ Amount of Workers' Compensation Claims  
 Annual Objective: \$1,777,342  
 (10% reduction from previous year results)  
 Actual: \$2,636,285

■ \$ Amount of Claims  
 ■ Objective - 10% reduction from prior year

Although the department missed the objective of reducing claims by 10 percent from 2008, claims have significantly declined since the 2005-2007 period. CDOT continues efforts to prevent accidents through education, communication and the provision of safety equipment. CDOT continues to examine all safety related

program aspects to find areas to improve employee safety (e.g. data collection, reporting, training, communication, planning, equipment, materials, etc.) and a new safety plan will include new objectives based on our comparison analysis.

4<sup>th</sup> Street bridge construction in Pueblo

CDOT is proud to recognize its Chief Engineer Pam Hutton who, in October 2009, received the Thomas H. MacDonald Memorial Award from the American Association of State Highway and Transportation Officials (AASHTO), AASHTO's highest honor. In bestowing the award AASHTO acknowledged Ms. Hutton's "exemplary leadership of the Department's comprehensive safety program" as well as her work with motorcycle safety and as the Governor's highway safety representative.

# SYSTEM QUALITY

## OVERVIEW

Colorado's transportation infrastructure represents a multi-billion dollar investment. These investments constitute Colorado's transportation assets and CDOT is responsible for maintaining and improving these assets. The Transportation Commission has placed a high priority on maintaining the existing infrastructure. Each year, the department reports on the physical condition of these assets as well as the efforts made by our maintenance forces to perform on-going maintenance. Objectives are set relative to the funds available to support these activities. With additional funding the objectives would be higher.



### PRIMARY MEASURE

Percent of Bridge Deck Area in Good and Fair Condition  
 FY 2009 Budget: \$28.7M  
 Annual Objective: 92.5%  
 Actual: 94.4%

## % BRIDGE DECK AREA IN GOOD/FAIR CONDITION VS. ANNUAL BRIDGE FUNDING (MILLIONS)



### Bridge Condition

Colorado's 3,429 major vehicular state highway bridges are a critical component of the state's roadway infrastructure. The temporary closing of these structures reduces capacity, can shut down corridors, push traffic onto other roadways less capable of handling the traffic and increase travel time for drivers. The department is committed to keeping the bridges on Colorado's highways in safe condition.

The National Bridge Inventory standards established by the Federal Highway Administration are used to inventory and classify the condition of the major vehicular bridges. The classification is based on a sufficiency rating of 0-100 and a status of not deficient, functionally obsolete, or structurally deficient. Major vehicular bridges in poor condition have a sufficiency rating less than 50 and status of structurally deficient or functionally obsolete. Bridges in Poor condition do not

meet all safety and geometry standards and require reactive maintenance to ensure their safe service. For the purpose of determining bridge-funding needs it is assumed that bridges in poor condition have exceeded their economically viable service life and require replacement or major rehabilitation. Major vehicular bridges in fair condition have a sufficiency rating from 50 to 80 and a status of structurally deficient or functionally obsolete. Bridges in Fair condition marginally satisfy safety and geometry standards and either require preventative maintenance or rehabilitation. Major vehicular bridges in good condition are all remaining major bridges that do not meet the criteria for Poor or Fair. Bridges in good condition generally meet all safety and geometry standards and typically only require preventative maintenance.

A bridge is structurally deficient if it does not meet minimum standards for condition or capacity. A structurally deficient bridge often has one or more members in poor condition due to deterioration or other damage. Having only a small portion of a bridge in poor condition can result in the entire bridge being classified as structurally deficient. Structurally deficient bridges require monitoring, maintenance, or repair to ensure their safe use and continued service. A bridge is functionally obsolete if it does not meet current minimum geometric requirements. Bridges classified as functionally obsolete often have inadequate roadway shoulders, insufficient number of lanes to handle current traffic volumes, overhead clearances less than minimums, or inadequate widths for roadways or streams passing

underneath. Functional obsolete bridges may need signage, reduced speeds, or traffic control devices to ensure safety.

CDOT reports bridge condition by the percent of bridge deck area statewide in good or fair condition. The Colorado Transportation Commission has an aspirational goal of maintaining the bridge deck area statewide at a minimum of 95 percent in good and fair condition. Realizing available resources are inadequate to achieve that goal, attainable objectives are set each year based on the available revenue. In 2009 the department exceeded the objective of 92.5 percent of bridge deck area in good and fair condition. In 2009, 128 of the state's 3,429 major vehicular bridges were in the poor category, which is an increase from 125 poor bridges in 2008. It is estimated that replacement of these 128 bridges will cost over \$2.0 billion, including \$800 million alone for the I-70 viaduct in Denver. With FASTER legislation, bridge safety surcharges will allow the department, through its Statewide Bridge Enterprise, to finance, repair, reconstruct, or replace any bridge designated as poor. October 2009 projections anticipate this revenue source to generate about \$42 million in FY09 and about \$72 million in FY10.

The condition of Colorado's bridges is a major concern in the long-term. Bridges in poor condition are not only a potential safety hazard, but represent major maintenance costs. A one percent increase in "poor" deck area results in a \$313 million liability for the department to rehabilitate or reconstruct that bridge area.



Added to the poor list, I-70 Business Route over I-70, Idaho Springs (Structure number F-14-Y)



Removed from poor list, US 34 over Big Thompson River (Structure number C-15-AI was replaced with C-15-AN)

In 2009, 128 of the state's 3,429 major vehicular bridges were rated poor, up from 125 in 2008. With FASTER legislation, bridge safety surcharges will allow the department, through its Statewide Bridge Enterprise, to finance, repair, reconstruct, or replace any bridge designated as poor. October 2009 projections anticipate this revenue source to generate about \$42 million in FY09 and about \$72 million in FY10.

## % PAVEMENT IN GOOD/FAIR CONDITION VS. ANNUAL PAVEMENT FUNDING (millions)



### Pavement Condition

It is far more economical to maintain roadway surfaces than to reconstruct them. When roadway surfaces are not maintained, the roadway must be reconstructed from the ground up. The cost of pavement preservation treatments on a mile of road can be less than \$120,000 per mile as compared \$2.6 million per mile or more to reconstruct a roadway. Maintaining existing infrastructure first is a top priority. The pavement management program at CDOT works to implement the most cost effective surface treatment and pavement maintenance program possible.

The primary measure of pavement quality is the percent of pavement statewide that is in good or fair condition. CDOT evaluates the condition of highway pavement based on how many years remain before reconstruction is the only economically viable option. A good condition rating means there is a remaining service life (RSL) of 11 or more years; a fair rating indicates a remaining service life of six through 10 years; and a poor rating represents a remaining service life of less than six years. A poor highway segment is one that has a compromised base or sub-base and the only economically viable option is major rehabilitation or complete reconstruction.

Pavement quality on the state's road system has been deteriorating at an accelerated rate in recent years. This is due to a number of factors, including increasing truck traffic and several harsh winters. Additionally, the existing network is aging, resulting in the need for more extensive rehabilitation work. The most significant linkages to deterioration of the system, however, include inadequate funding and rising costs. Construction costs

have risen significantly in recent years. In 2003 the department paid \$38.23 per ton for asphalt pavement. By 2009, the average was \$65.25 per ton. At the same time, funding available to maintain current conditions has actually decreased.

The Colorado Transportation Commission has an aspirational goal of maintaining the state's highway system pavement at a minimum of 60 percent in good or fair condition. Realizing that projected funding will not allow attainment of that goal, lower level attainable objectives are set each year based on available funding. For 2009 the objective of 50 percent in good and fair condition was achieved. At 50 percent, poor-rated roadways comprise about 11,500 lane miles. The cost to replace or fully rehabilitate them, in 2009 dollars, would be approximately \$14.6 billion. Gains made from 1993 to 2005 allowed the system quality to peak that year at 65 percent good/fair. However, the trend has reversed since 2005. Using RSL, the projected condition in 2010 is 46 percent good/fair, a 4 percentage-point decline from 2009.

Conditions on Colorado roads will continue to deteriorate over the next several years without an increase in funding levels. Based on revenue forecasts, the overall good/fair condition statewide is projected to drop to 38 percent by 2014. While interstates and other major state highways comprise approximately 50 percent of Colorado's lane miles, these roads carry 85 percent of the vehicle miles traveled. The prioritization of pavement quality on these heavily traveled routes is critical to the provision of a strong economy and a safe roadway system. Unfortunately, the trade-off in prioritizing these roadways is the further deterioration of some less traveled roads.

The size and weight of vehicles is among the most significant factors affecting pavement condition and repair costs. One delivery truck causes the same amount of damage as about 1,500 passenger vehicles. One tandem axle truck, such as a dump truck, causes the same amount of damage as nearly 3,000 passenger vehicles and a typical 18 wheeler, 5 axle combination truck, causes the same amount of damage as over 5,000 passenger vehicles. Approximately 90% of the cost of repairing pavement damage is due to commercial motor vehicle use.

**Maintenance**

CDOT's maintenance workers are a common sight on Colorado's state highways. The CDOT Maintenance Program is designed to keep the state highway system open and safe for the traveling public. This involves all activities from the centerline of the highway to the right-of-way fences. The department measures the delivery of maintenance service with a school report card style grading system that estimates the achievable grade with available budget. Higher grades could be achieved with higher funding levels.

Absent a new revenue source, the objective grade level for 2011 is expected to decline to a C, and by 2014 decline to a D.

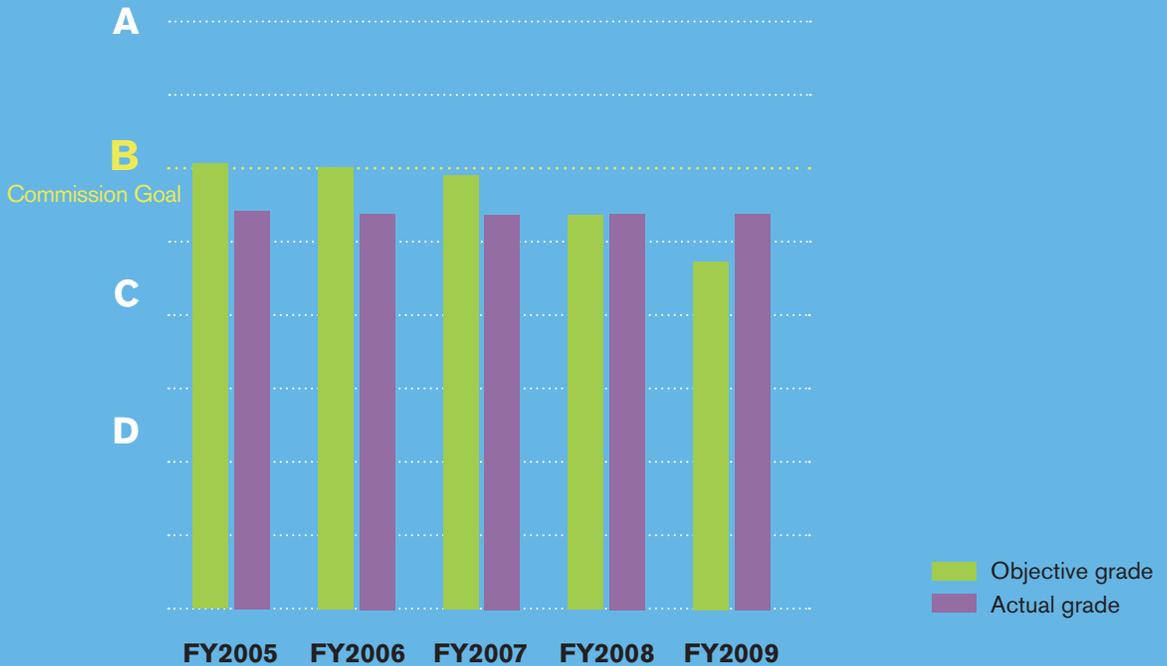


**PRIMARY MEASURE**

Statewide Overall Maintenance Levels of Service  
 Annual Objective: C+      Planned: \$225.4M  
 Actual: B-                      Spent: \$232.9M

**OVERALL MAINTENANCE LEVEL OF SERVICE**

FY 2005-FY 2009



FUTURE

DETAIL: SYSTEM QUALITY

OVERVIEW

FUNDING

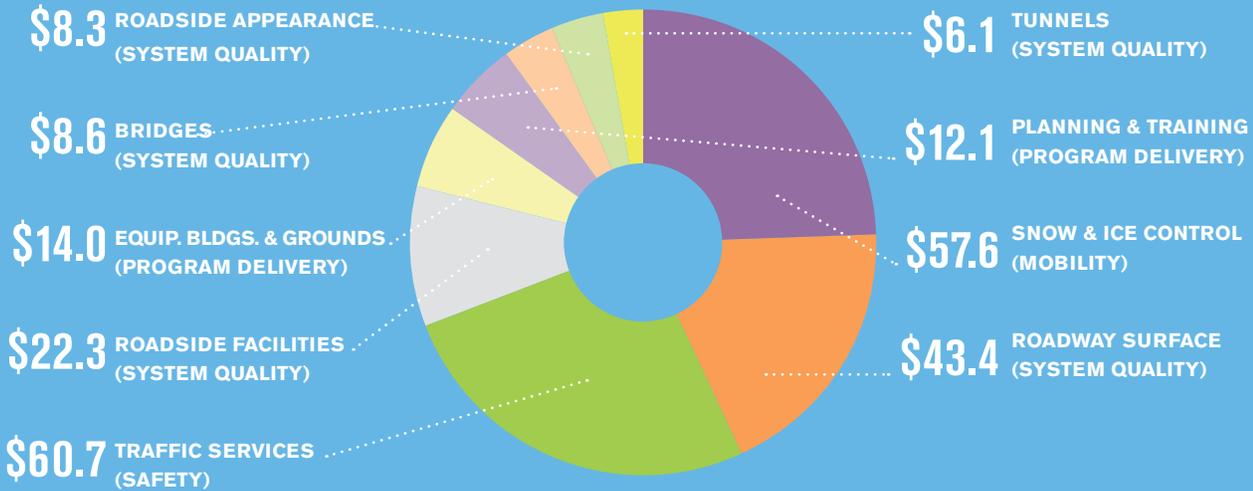
EXECUTIVE SUMMARY

In 2009, CDOT exceeded its overall statewide Maintenance Level of Service (MLOS) objective of C+. The statewide overall maintenance objective and actual grades over the most recent five year period range from a C+ to a B. The steady grades reflect a carefully administered maintenance management system. The overall grade is expected to decrease in coming years; budgeted dollars are not keeping pace with the rising costs of fuel and materials and increasing needs for bridge maintenance activities. Absent of a new revenue source the objective for FY11 is expected to decline to C and by 2014 the level of service is expected to fall to a D.

The overall Maintenance Level of Service grade is comprised of nine maintenance program areas (MPAs) that relate to specific work activities performed by CDOT maintenance workers. Five of the nine MPAs contribute to system quality and are reported here in the system quality investment category. The remaining four MPAs are reported in their respective investment categories as detailed in the chart on the following page.

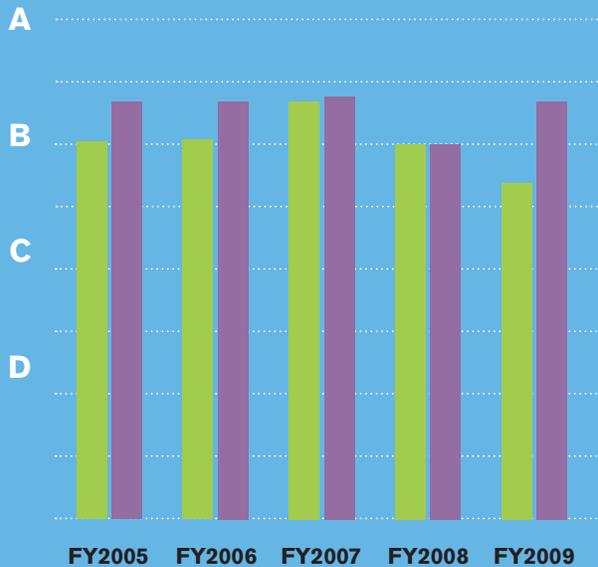
## SPENDING BY MAINTENANCE PROGRAM AREA (MPA)

FY 2009 (in millions)



## ROADWAY SURFACE MPA

FY 2005-FY 2009



### SUPPORTING MEASURE

Maintaining Roadway Surface (Roadway Surface MPA)  
 Annual Objective: B-  
 Actual: B+  
 Planned: \$44.8M  
 Spent: \$43.4M

Objective grade  
 Actual grade

The department continues to report strong performance in maintaining the roadway surface, despite Colorado's severe winter weather and increasing truck traffic. Maintenance activities include patching and sealing road surfaces and fixing potholes. The preservation of the state's system of roadways is of major strategic significance, and these maintenance activities are a high priority.

However, consistent reductions in funding for reconstruction of existing roads places an increased demand and workload on

maintenance workers to keep older roadways at an acceptable level of service. This transfers to maintenance the task of keeping up some roadways after they have aged beyond their expected lifespan, until funds become available for reconstruction. It costs more to maintain roadway surfaces that have exceeded their design life than to maintain newer infrastructure, forcing a disproportionate allocation of funds into maintaining older roads and leaving less for other maintenance activities.

## STRUCTURE MAINTENANCE MPA

FY 2005-FY 2009



### SUPPORTING MEASURE

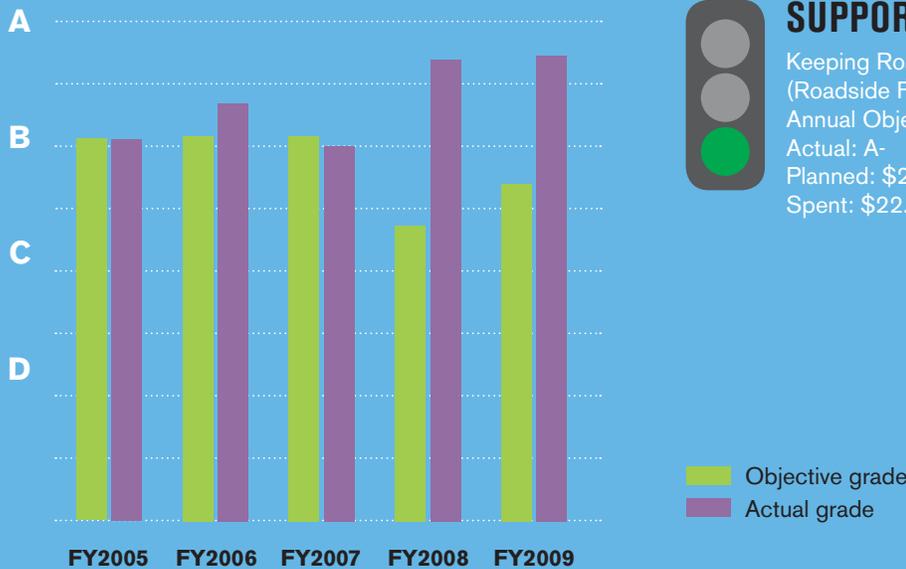
Maintaining Bridges  
 (Structure Maintenance MPA)  
 Annual Objective: C  
 Actual: C+  
 Planned: \$12.3M  
 Spent: \$8.6M

CDOT maintenance staff performs preventative and reactionary maintenance to help preserve bridge assets. This grade reflects only an assessment of maintenance activities and does not reflect the actual bridge condition, which is discussed on page 21.

In 2009, CDOT exceeded its objective and achieved a bridge maintenance grade of C+, comparable to the C+ rating achieved in 2008. During the year, approximately \$2.3 million dollars were transferred to bridge projects that were not completed in the fiscal year. The MLOS system only shows funds as being spent in the fiscal year the projects are completed.

## ROADSIDE FACILITIES MPA

FY 2005-FY 2009



### SUPPORTING MEASURE

Keeping Roadways and Shoulders Clear  
 (Roadside Facilities MPA)  
 Annual Objective: B-  
 Actual: A-  
 Planned: \$20.4M  
 Spent: \$22.3M

Standing water, a mudslide or trash on the road can not only be an eyesore, but can also prove dangerous and delay traffic. This maintenance activity includes sweeping shoulders of sand and salt, cleaning up road kill and cleaning drainage structures and ditches. In 2009 the department exceeded its objective and achieved an A- level of service.

## ROADSIDE APPEARANCE MPA

FY 2005-FY 2009



### SUPPORTING MEASURE

Maintaining Roadside Landscape  
(Roadside Appearance MPA)  
Annual Objective: C  
Actual: B  
Planned: \$7.5M  
Spent: \$8.3M

Objective grade  
Actual grade

Two key activities of maintaining roadside landscape are mowing and treatment of noxious weeds. Both activities provide an aesthetic benefit and a safety benefit. In general, the mowing activities in and near cities perform more of an aesthetic purpose, while mowing on rural highways is done primarily for safety. High grasses and weeds in rural areas limit visibility and can be unsafe if they hide animals that may unexpectedly enter the roadway.

In 2009, CDOT exceeded its objective and achieved a B grade in Roadside Appearance.

## TUNNEL MAINTENANCE MPA

FY 2005-FY 2009



### SUPPORTING MEASURE

Maintaining Tunnels  
(Tunnel Maintenance MPA)  
Annual Objective: B-  
Actual: C+  
Planned: \$6.8M  
Spent: \$6.1M

Objective grade  
Actual grade

The Eisenhower-Johnson and Hanging Lake tunnels are critical connections between the Eastern and Western slopes of the state. The tunnels have extensive electrical and mechanical systems that must be maintained to provide reliable service and operation. The tunnels also require washing, structural maintenance and repair, emergency response, snow removal and sanding.

In 2009, the department achieved a C+ grade, missing its objective of B-.

# MOBILITY

Keeping Colorado on the move is a key responsibility of the Colorado Department of Transportation. Colorado serves as a key distribution center for the growing Rocky Mountain Region so its ability to efficiently move goods and people contributes greatly to the state and region's economic prosperity. A transportation system that expedites the flow of goods to Canada and Mexico, which are the state's largest international trading partners, is vital. Additionally, tourism contributed over \$12 billion to the state's economy in 2008 and tourists expect easy access to ski areas in the winter and other recreational activities in the summer.

Mobility funding represented 20 percent of the department's budget in 2009. These funds are invested in adding new lanes, improving intersections, plowing snow, providing courtesy tow service in congested areas, informing travelers of road conditions and completing projects that are expected to reduce air pollution.



## PRIMARY MEASURE

Minutes of Delay per Traveler on Congested State Highway Segments  
Objective: 18  
Actual: 18 (2008)

The department's primary measure of mobility is minutes of delay per traveler on congested state highway segments. Travel time delay is the difference between the travel time on highways at the free flow speed and the time it takes to travel with heavy traffic.

A highway is considered congested when the peak traffic is at or over 85 percent of what the highway was designed to handle. Seventy-one corridors around the state, representing 845 centerline miles, have been identified as congested. Over 90 percent of total congestion delay occurs on urban highways during the weekday work commute. These corridors are located primarily in metro areas along the Front Range including Denver, Colorado Springs and Ft. Collins. The remaining 10 percent of delay occurs in recreational corridors during peak weekend traffic. Recreational corridors include I-70 West, ski area access corridors and portions of roadway in Grand Junction and Durango, among others.

In 2008, the latest year for which data is available, the average travel time delay on all congested corridors was calculated at 18 minutes per person, with practically no change in congested vehicle miles traveled in the past year. This is the same delay as reported in 2007, representing the second year of relief from what had been a steady upward trend through 2006. When the price of gasoline reached over \$4.00 per gallon in the summer of 2008 many people changed their driving habits through such strategies as consolidating trips, switching to transit, joining car pools and vanpools and walking or bicycling to work or for errands. Also, Colorado's average unemployment

rate climbed from 3.9 percent in 2007 to 4.9 percent in 2008 which meant fewer people were commuting to and from work resulting in less peak time congestion. According to the Denver Regional Council of Governments (DRCOG), these changes in driving habits resulted in an estimated five percent fewer miles driven in the Denver region in August 2008, compared to August 2007.

If the driving habits adopted by many people during the summer of 2008 become permanent, the future growth in congestion may slow. However, over the next 20 years, travel time delay is expected to increase substantially and the number of roadway segments that experience pervasive, severe congestion is expected to more than double. A recent report by DRCOG estimates that by 2035 the average trip to work will take 33.7 minutes, up from 25 minutes in 2005.

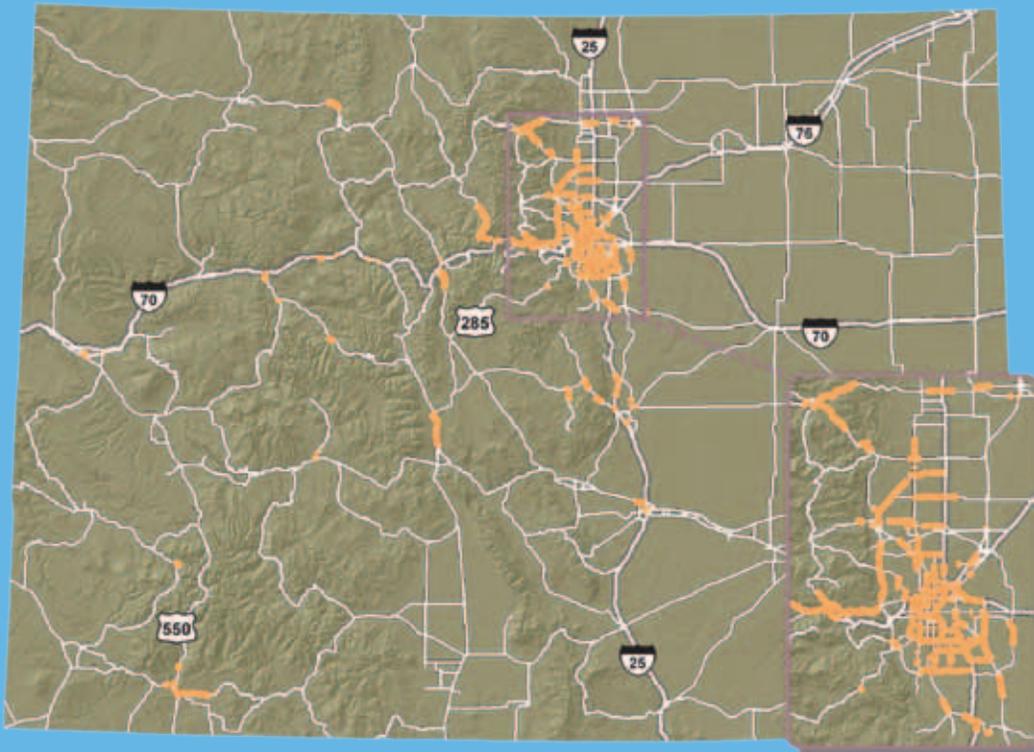
Land use policies that encourage higher density development will help slow the growth of congestion.

# DAILY VEHICLE MILES TRAVELED ON CONGESTED HIGHWAYS

(in Millions)



## COLORADO CONGESTED HIGHWAYS



Source IRIS 2008

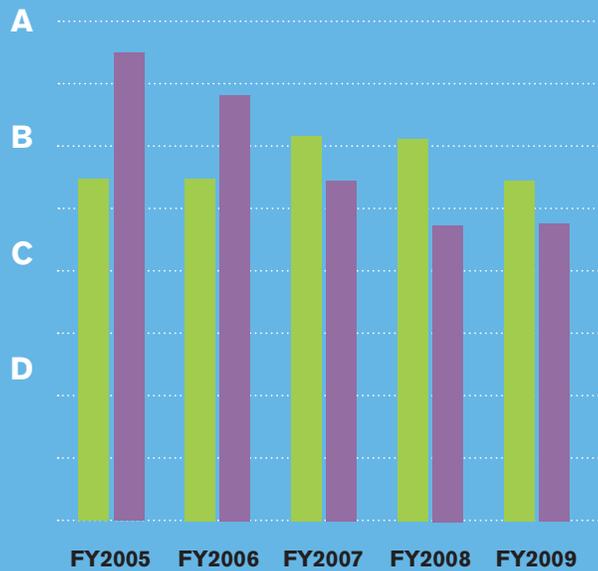
As part of its effort to increase mobility, CDOT manages the Mile High Courtesy Patrol (MHCP) service on multiple highway segments in the Denver area. The service helps motorists who have experienced an accident, stalled engine or flat tire quickly get their vehicle out of traffic and repaired. A 2003 study showed the service yielded a reduction of more than 500,000 hours of vehicle delay and saved motorists more than \$9 million dollars annually as a result of assistance in more than 6,000 incidents. MHCP currently covers over 80 miles of heavily traveled freeways in the Denver area.



The estimated annual congestion cost for Colorado's 71 congested corridors is \$825 million.

## SNOW AND ICE CONTROL MPA

FY 2005-FY 2009



### SUPPORTING MEASURE

Snow and Ice Control  
(Snow and Ice Control MPA)  
Annual Objective: B-  
Actual: C+  
Planned: \$50.0M  
Spent: \$57.6M

Objective grade  
Actual grade

Snowy and icy roads are a danger to the traveling public and can also result in significant travel delays. Snow and ice control, as a means to keep Colorado moving, is reported as a supporting performance measure for the mobility investment category.

This program area consumes a significant percentage of the total maintenance budget and since it is dependent on the weather, expenditures and resulting performance grades are unpredictable from year to year. In 2009, almost 25 percent of total maintenance expenditures were for snow and ice control. Unlike other maintenance activities there is no lasting positive effect on the infrastructure from snow and ice control activities. Its purpose is simply to maintain safe travel conditions during inclement weather.

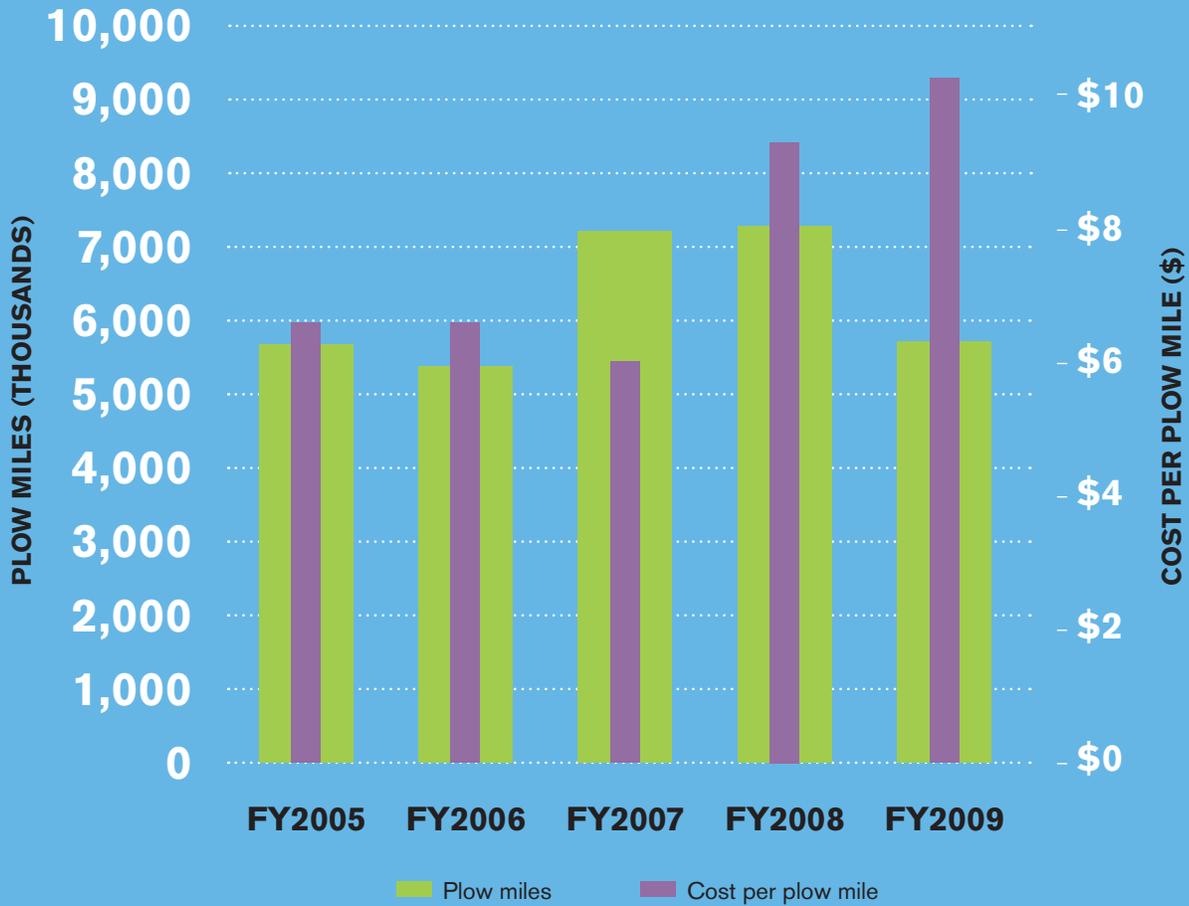
The cost of fuel and deicing materials increased again in 2009 meaning less miles could be cleared with the same amount of funds. This was the primary reason the department missed the objective grade of B-. In 2009 our grade for snow and ice control was C+.

In 2008 the cost per plow mile of clearing state highways in Colorado was \$9.16. In 2009 this cost increased to \$10.22 per plow mile.

The graph below illustrates the total number of annual plow miles and the cost per plow mile for fiscal years 2005 through 2009.

## TOTAL PLOW MILES AND COST PER PLOW MILE

(FY 2005-FY 2009)



Snow removal, Red Mountain Pass



Photo: Keith Rapley

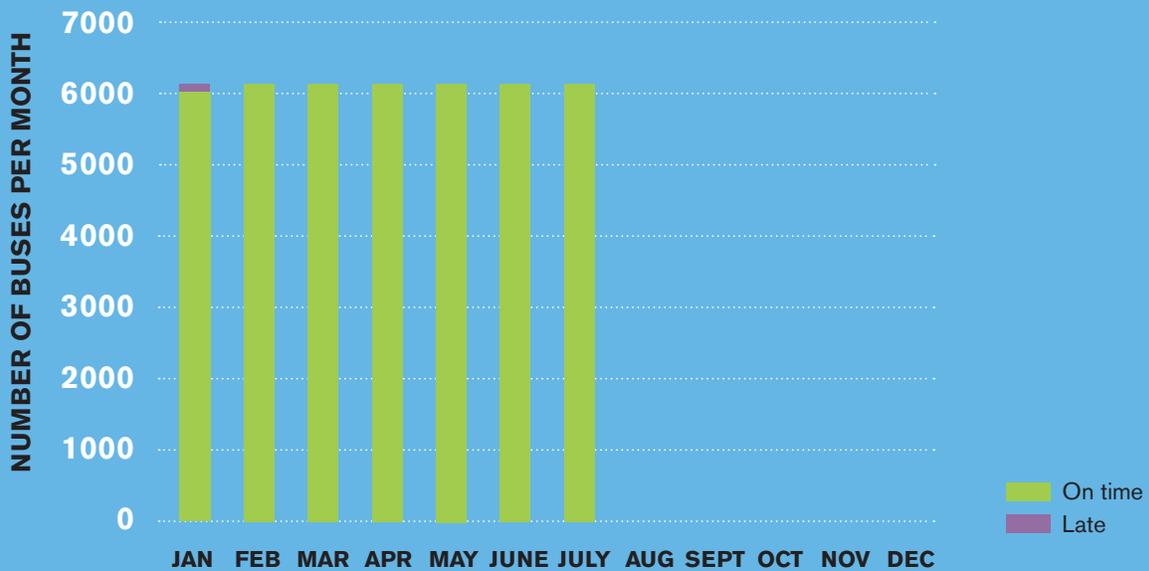


### SUPPORTING MEASURE

On-time Performance for Buses on the I-25 Express Lanes  
 Actual: 98.2% on-time (January-July 2009)

### MONTHLY BUS TRAVEL TIME PERFORMANCE

On the I-25 Express Lanes, 2009

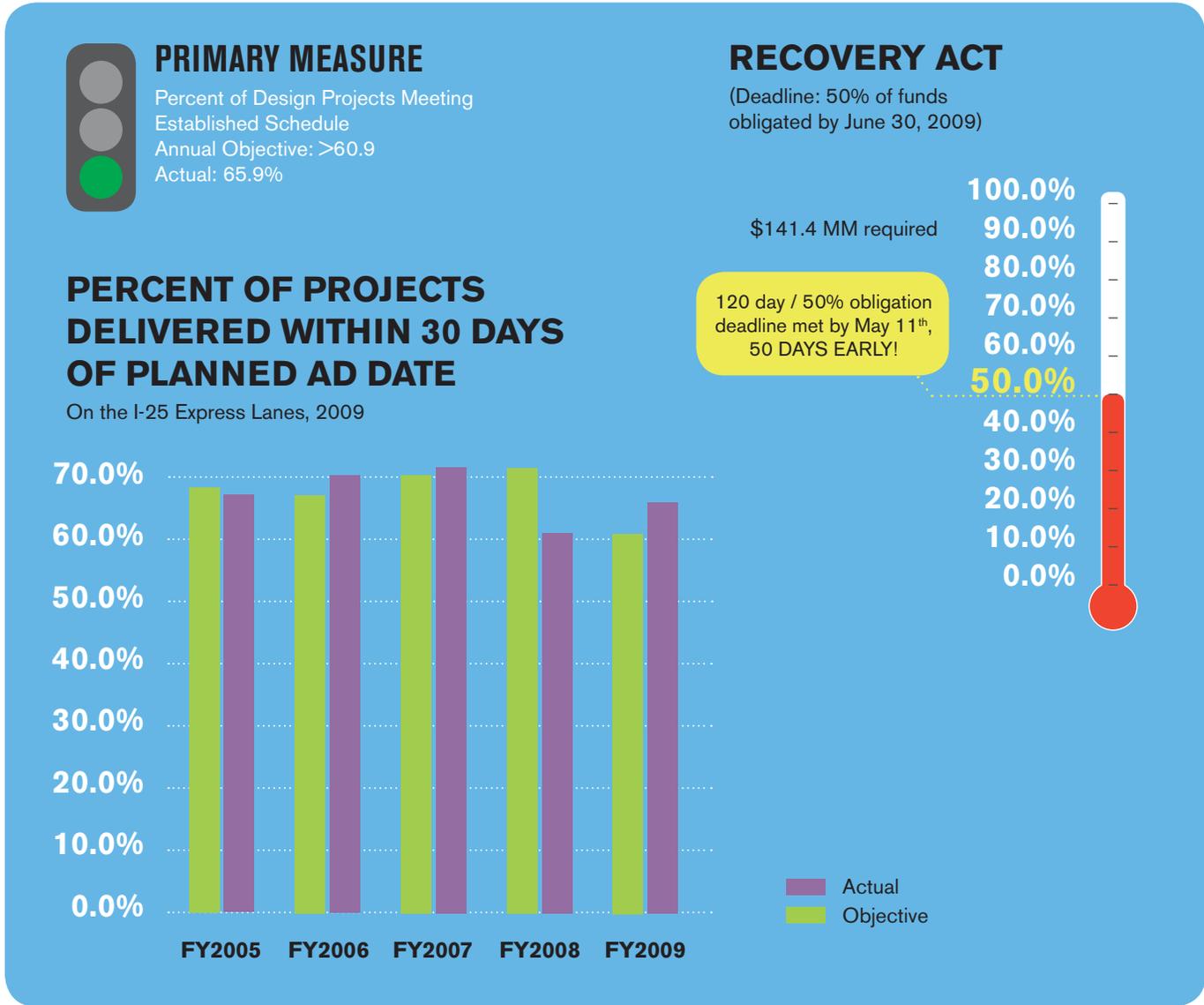


In June 2006, HOV lanes on I-25 became HOV/Express lanes. The conversion made it possible for solo drivers who choose to pay a toll to use the lanes along with buses, carpool vehicles and motorcyclists, who continue to use the lanes free of charge. CDOT monitors travel time on the Express lanes to ensure that Express lane traffic does not cause delay for buses and carpoolers. For the first seven months of 2009, 98.2 percent of buses using the HOV lanes were on time.

# PROGRAM DELIVERY

## Project Delivery

On time project delivery is a primary measure of the department's ability to efficiently and effectively utilize its resources. CDOT designs the majority of its projects and then solicits bids from contractors for the construction phase. The point at which the design work is complete and construction bids are solicited is called the "ad date." At the beginning of each fiscal year the department assigns ad dates for projects to be designed that year. The percent of projects that meet their planned ad date is the department's measure for "on time" project delivery. The Transportation Commission established the objective of improving year over year percent of projects that were delivered within 30 days of the planned ad dates.



During FY 2009 65.9 percent of projects advertised within 30 days of their planned dates. This percentage rose above the objective and last year's actual of 60.9 percent. But more significantly than successfully reaching most planned ad dates, the department met all ARRA obligation deadlines.

With the enactment of the American Reinvestment and Recovery Act of 2009 on Feb 17, 2009, states were given explicit, incentive-based performance measures for the program – by June 30 obligate 50% of their allocations and by March 2, 2010 obligate 100% with the incentive that funding not obligated up to the requirement by other states would be available to those that met the requirement through "redistribution."

Colorado jumped at this new stimulus funding and during the week of May 11th, just six weeks after receiving its apportionment, met the 50% goal by obligating \$141 million in 30 projects, placing itself in the top 25 states to do so. By June 30th, CDOT had obligated 59 projects worth \$211 million (49% more than required). While all states met the June 30 goal making no redistribution funds available, Colorado received accolades in meeting its goal so early by several organizations, including auditing agencies. Because of the timing of ARRA, most ARRA progress will be reported in the FY 2010 Annual Performance Report.



I-70 Vail Pass



## SUPPORTING MEASURE

CDOT's Annual Employee Turnover Rate  
 Annual Objective: 8-10%  
 Actual: 7.1%

## EMPLOYEE TURNOVER RATES

FY 2005-FY 2009



### Human Resources

Hiring and retaining a knowledgeable and motivated workforce is key to accomplishing CDOT's mission. From FY 2008 to FY 2009 the employee turnover rate decreased from 9.0 percent to 7.1 percent. A turnover rate between

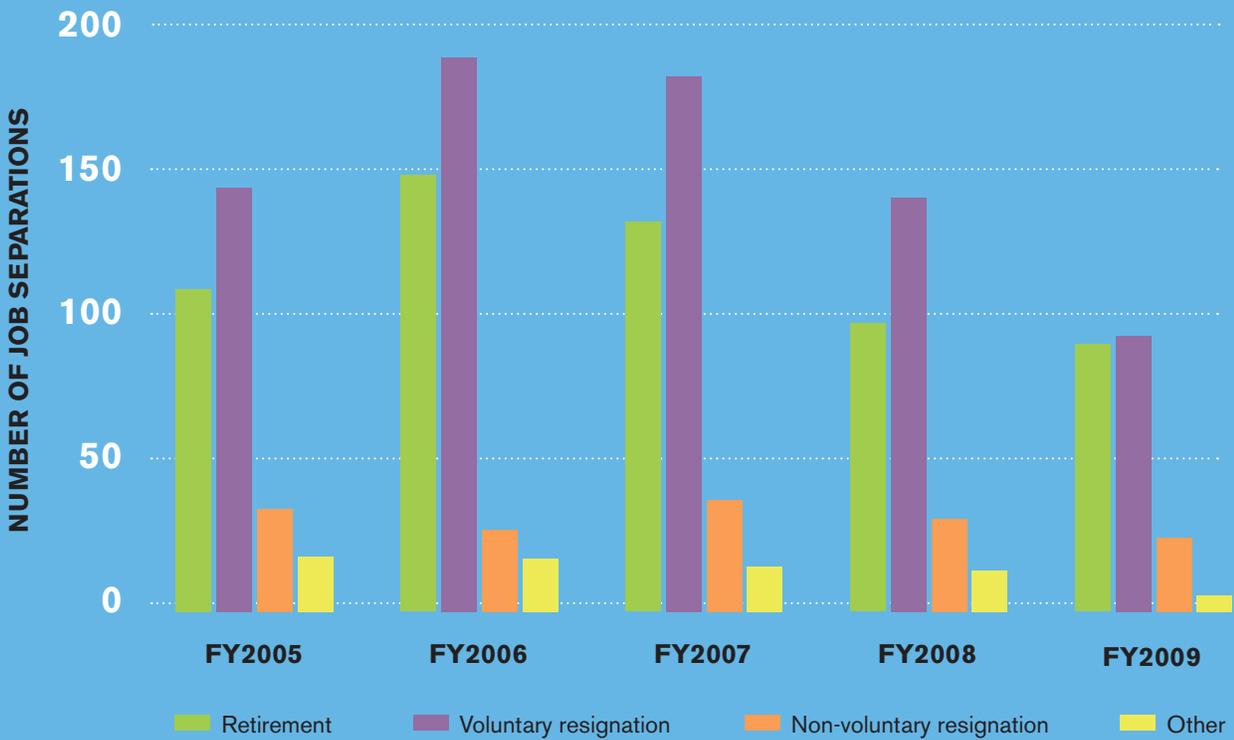
8-10 percent is generally considered healthy. Usually, the department's employee turnover rate falls when the overall unemployment rate increases. During FY 2009 Colorado's unemployment rate increased from 4.8 percent to 7.6 percent.<sup>10</sup> Employers statewide were hiring fewer workers during this period which helped reduce the turnover among CDOT workers.

<sup>10</sup> [http://data.bls.gov/PDO/servlet/SurveyOutputServlet?data\\_tool=latest\\_numbers&series\\_id=LASST08000003](http://data.bls.gov/PDO/servlet/SurveyOutputServlet?data_tool=latest_numbers&series_id=LASST08000003)

The total number of CDOT employee separations declined to 213 for FY 2009 from 282 during FY 2008. Even though the turnover rate has declined since 2006, it is anticipated that nearly 24 percent of CDOT's workforce will be eligible for full service retirement during the next five years. Translated into people, it is an average of 147 employees a year who are eligible for full service retirement.

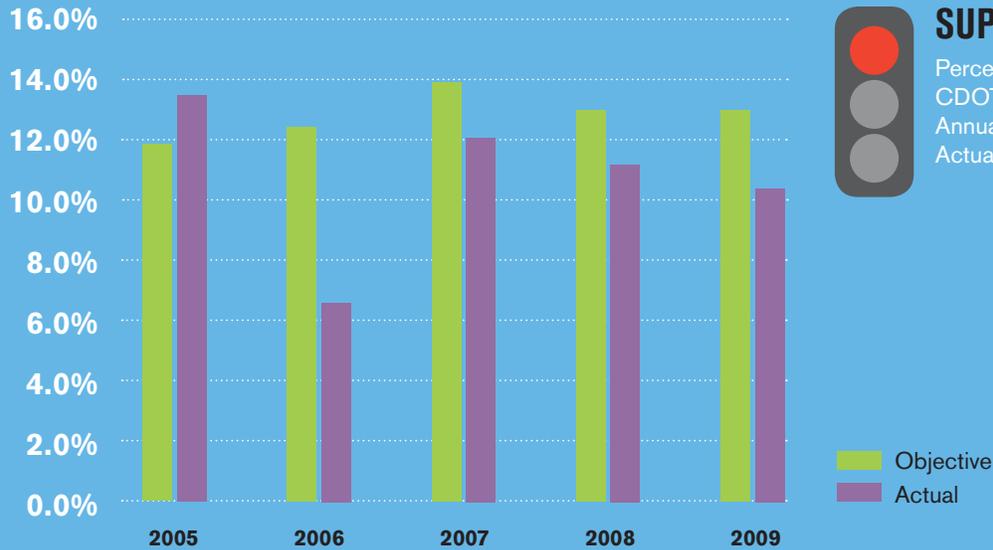
## CDOT EMPLOYEE SEPARATIONS

FY 2005-FY 2009



## DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION

2005 - 2009



### SUPPORTING MEASURE

Percent DBE Participation in CDOT Projects  
Annual Objective: 12.8%  
Actual: 10.3%

### Disadvantaged Business Enterprise (DBE) Participation

In 1983, Congress enacted the first disadvantaged business enterprise (DBE) statutory provision. This provision requires that at least 10 percent of the federal funds authorized for the highway and transit financial assistance programs be expended with DBEs. The program fosters a competitive market place by creating a level playing field where DBEs can compete fairly for contracts. Ultimately, the program assists the development of DBEs to compete successfully in the marketplace outside the program.

CDOT sets an annual objective percentage of DBE participation in construction projects. In 2009, CDOT achieved 10.3 percent participation, missing a 12.8 percent objective.

## EQUIPMENT, BUILDINGS AND GROUNDS MPA

FY 2005-FY 2009



### SUPPORTING MEASURE

Maintaining Equipment, Buildings & Grounds (Equipment, Buildings and Grounds MPA)  
Annual Objective: C  
Actual: C  
Planned: \$12.8M  
Spent: \$14.0M

The upkeep of equipment, buildings, grounds and rest areas is a component of the department's maintenance activities and helps ensure the efficient delivery of its services. The department accomplished its objective in this category in 2009. It did so, however, at an additional cost of roughly \$1.2 million above planned expenditures.



## SUPPORTING MEASURE

Planning & Training (Planning & Scheduling MPA)  
Annual Objective: B-  
Actual: B-  
Planned: \$13.3M  
Spent: \$12.1M

## PLANNING AND SCHEDULING MPA

FY 2005-FY 2009



Forty percent of CDOT's employees are maintenance workers. The efficient delivery of maintenance service requires the planning of work activities and training of maintenance personnel. Annually, approximately five percent of the overall maintenance budget is spent on planning and training. Effective planning and reporting is a critical component of the maintenance management program, which assists CDOT in using resources as efficiently and effectively as possible.

### Strategic Project Delivery

In 1996 the Transportation Commission identified 28 high priority projects of statewide significance in increasing safety, mobility and reconstruction. These projects have collectively become known as the "7<sup>th</sup> Pot" and were identified as high priority based on their visibility, cost and return on investment. To accelerate construction of these projects and save on inflation costs, CDOT issued bonds and uses federal and state revenues to pay back bondholders over time. Issuing bonds for the TREX and COSMIX projects is estimated to have saved over \$1 billion in construction-related inflation costs. Funding obligations for 21 of the 28 projects have been completed for just over \$2 billion. It is anticipated the seven remaining projects will cost \$3 billion (not accounting for inflation) to complete. Completion of these projects is dependent on the future of general funds (non-highway dedicated funds) allocated by the legislature on an annual basis.

To date, funding obligations for 21 of 28 high priority strategic projects identified by the Transportation Commission in 1996 have been met.

## Status of Strategic Projects

| Project                               | Completed or % Funded | Project                                    | Completed or % Funded |
|---------------------------------------|-----------------------|--|-----------------------|
| I-25 / US 50 / SH 47 Interchange      | ✓                     | US 34 / I-25 to US 85                      | ✓                     |
| I-25 / S. Academy to Briargate        | ✓                     | US 287 / Broomfield to Loveland            | ✓                     |
| I-25 / US 36 / SH 270                 | ✓                     | SH 82 / Basalt to Aspen                    | ✓                     |
| I-225 / Parker Rd.                    | ✓                     | Santa Fe Corridor                          | ✓                     |
| I-76 / 120th Ave.                     | ✓                     | Southeast MIS / I-25 / Broadway to Lincoln | ✓                     |
| I-70 / I-25 Mousetrapp Reconstruction | ✓                     | US 550 / New Mexico State Line to Durango  | ✓                     |
| I-25 / Owl Canyon Rd. to Wyoming      | ✓                     | US 160 / SH 3 to the Florida River         | ✓                     |
| East I-70 / Tower Rd. to Kansas       | ✓                     | US 287 / Campo to Hugo                     | 89%                   |
| North I-25 / SH 7 to SH 66            | ✓                     | Powers Boulevard – Colorado Springs        | 60%                   |
| US 50 / Grand Junction to Delta       | ✓                     | I-70 / DIA to Eagle County                 | 11%                   |
| US 285 / Goddard Ranch to Foxton Rd.  | ✓                     | I-25 / Denver to Colorado Springs          | 54%                   |
| US 160 / Wolf Creek Pass              | ✓                     | I-25 / Denver to Fort Collins              | 52%                   |
| US 40 Berthoud Pass                   | ✓                     | I-70 / East Corridor                       | 24%                   |
| C-470 Extension                       | ✓                     | US 6 / West Corridor                       | 7%                    |

## Senate Bill 97-001 Transit Capital Projects

Beginning in 2006, 10 percent of the Senate Bill 97-001 general funds made available to the department have been invested in transit capital projects. At the conclusion of Fiscal Year 2009, the Transportation Commission had approved over \$69 million for 26 transit capital projects across Colorado. Awarded projects include transit vehicles, intermodal centers and planning studies. Due to the elimination of Senate Bill 97-001 during the 2009 legislative session, the RTD Access-A-Ride buses will receive only partial funding and the City of Longmont Rail Extension Design project will not be funded.

| Project   | Complete, In progress or % Funded |
|---|-----------------------------------|
| North Front Range Metropolitan Planning Organization – 3 Buses                        | ✓                                 |
| City of Steamboat Springs – Intermodal Center in Craig                                | ✓                                 |
| City of Colorado Springs – 19 Buses for FREX (Front Range Express)                    | ✓                                 |
| North West Colorado Council of Governments – Rail Implementation Study                | ✓                                 |
| Town of Avon - Intermodal Center  | ✓                                 |
| North Front Range Metropolitan Planning Organization- 14 Vans for Vanpool             | ✓                                 |
| City of Durango - Intermodal Center   | ✓                                 |
| Gunnison Valley Regional Transportation Authority (Gunnison) – 4 Buses                | ✓                                 |
| Special Transit (Boulder) – Bus   | ✓                                 |
| Southern Ute Community Action Programs (Ignacio) – Bus                                | ✓                                 |
| Neighbor to Neighbor – Salida Intermodal Facility                                     | ✓                                 |
| Eagle County Regional Transit Authority – Maintenance & Storage Facility in Leadville | ✓                                 |
| Roaring Fork Transit Authority – 11 Buses   | ✓                                 |
| Rocky Mountain Rail Authority – High Speed Rail Feasibility Study                     | In progress                       |
| Grand Valley Transit/Mesa County – Grand Junction Intermodal Center                   | In progress                       |
| City of Fort Collins – Bus Rapid Transit Implementation                               | In progress                       |
| City of Fort Collins - Intermodal Center  | In progress                       |
| Special Transit – (Boulder) Operations/Maintenance Facility                           | In progress                       |
| City of Greeley – 4 Buses   | In progress                       |
| City of Pueblo – 3 Buses  | In progress                       |
| Regional Transportation District (RTD) – 16th Street Mall Shuttle                     | In progress                       |
| RTD - Colfax Ave. Transit Improvements  | In progress                       |
| RTD - Denver Union Station Improvements   | 100% Funded                       |
| RTD/US 36 Mayors – Bus Rapid Transit Improvements at Table Mesa in Boulder            | 100% Funded                       |
| RTD – 45 Access-a-Ride Buses  | 39% Funded                        |
| City of Longmont – Rail Extension Design  | Not funded                        |

Colorado's state highway system faces declining performance in several key areas. Though the department has made significant strides in safety measures, important system quality components such as pavement and maintenance will suffer continued deterioration. Years of wear and tear, deferred maintenance, an increase in heavy truck traffic and harsh weather have all taken their toll. Half of Colorado's roads are in poor condition and motorists are paying the price. It is estimated our rough roads are adding \$335 to the annual cost of owning a car due to damaged tires and suspensions and reduced fuel efficiency. Motorists pay twice for poor roads since the cost of reconstructing a road costs three times more than if the same road would have been properly maintained during its life.

While the American Recovery and Reinvestment Act provided a one-time infusion of \$404 million to address the backlog of delayed projects it is only a small portion of the \$1.5 billion per year additional transportation investment recommended by the Governor's Blue Ribbon Panel. The Funding Advancement for Surface Transportation and Economic Recovery (FASTER) will help by contributing nearly \$250 million annually to the funding shortfall and by repairing many poor bridges. But it represents only a portion of the amount needed to deliver a 21<sup>st</sup> century transportation system to Coloradans.

CDOT is continually looking for alternative approaches to get more out of our existing network. There are ways to use technology (ramp metering), encourage new travel and work behavior (flex time), innovate with programs (additional truck chain-up areas) and encourage traveler choices (HOV lanes) that yield greater benefits from the system we already have in place.

Coloradans must continue to recognize that without embracing these alternative methods, our roadways will continue to become more congested and less safe, and our highways and bridges will continue to deteriorate.

Continued use and expansion of these alternative methods, however, will not alone meet the objectives, goals and vision for transportation that have been well identified through public planning processes. CDOT is confronted with a revenue model built on fuel taxes that, at current projections, will not allow the department to sustain the existing performance of the transportation network even with these gains at the margins. If Colorado were to embrace, on a statewide basis, every one of these alternative methods, we would still have 115 bridges that are more than 75 years old and 6,282 lane miles of highway that need to be completely reconstructed or undergo major rehabilitation. Alternative methods will not produce enough savings over the next 10 years to adequately repair or replace our aging infrastructure.

Again, the bottom line is this: Sustaining the existing transportation system's level of performance and expanding it to meet the needs of current and future Coloradans cannot be done with the future revenues currently projected. Fulfilling all of Colorado's basic transportation needs through 2030 will require more than double the expected revenue over that time period. The department will continue to strive to support those measures of the system deemed most critical.



I-70 Variable Message Sign



C-470 and Yosemite ramp meter

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Sustaining the existing transportation system and expanding it to meet the needs of current and future Coloradans cannot be done with future revenues currently projected. Meeting Colorado's basic transportation needs through 2030 will require more than double the expected revenue.



COLORADO DEPARTMENT OF TRANSPORTATION