

**DEPARTMENT OF TRANSPORTATION  
FY 2012-13 JOINT BUDGET COMMITTEE HEARING AGENDA  
Thursday, Jan 5, 2012**

**9:00 am – 10:30 am**

**9:00-9:10 INTRODUCTIONS AND OPENING COMMENTS**

**9:10-9:30 A. PERFORMANCE-BASED GOALS AND BUDGET REQUEST**

**1. Please describe the process the department used to develop its strategic plan.**

*The Department of Transportation updates its strategic plan annually as part of the process for developing the annual budget request to the General Assembly. Every five years, the Transportation Commission oversees an intensive process to revisit its goals and objectives in conjunction with federally mandated adoption of the statewide transportation plan. The Commission last engaged in an earnest strategic planning session in 2008 – the 2035 Plan. . CDOT Policy Directives 13 and 14 form the basis of the Strategic Plan and were last updated in 2010 to underscore the importance of Safety in the CDOT mission statement.*

*The commission will undertake a new series of strategic planning discussions that will in part support the launch of the next statewide long range plan.*

*It is worth noting that the CDOT Strategic Plan, perhaps unlike that of others department, corresponds to CDOT's current Investment Categories and not to our various Divisions. Staff believe this is more meaningful to the public than categorizing objectives by CDOT division such as "Accounting and Finance, "Human Resources and Administration," or Region 1 and Region 2. These categories are an integral part of the 2035 Long Range Plan, and in future strategic planning initiatives staff expects the commission to move to a customer-facing set of budget categories as presented in the FY 2012-13 department budget request.*

**2. Is the fatal crash rate per 100 million vehicle miles traveled a valid performance measure for the Department's safety objective to maintain federal goals for vehicle crash fatalities? Have other things that are external to CDOT efforts (i.e. new traffic laws or technological improvements like airbags) contributed to the lower fatal crash rate?**

*Yes, the fatal crash rate per 100 million vehicle miles traveled is a valid performance measure for the department's safety objective. The National Highway Traffic Safety Administration (NHTSA) requires that every state department of transportation report fatalities and fatal crashes through its Fatality Analysis Reporting System (FARS) Program. "Toward Zero Deaths" is in fact a national initiative, adopted in 2010, that states have chosen to approach in different ways.*

*According to NHTSA's early projections, the number of traffic fatalities nationally fell just over one percent between 2009 and 2010, from 33,808 to 33,334 (preliminary). Since 2005, fatalities have dropped nearly 25 percent, from a total of 43,510 fatalities in 2005. The same estimates also project that the fatality rate will be the lowest recorded since 1949, with 1.09 fatalities per 100 million vehicle miles traveled, down from the 1.14 fatality rate for 2009. The decrease in fatalities for 2010 occurred despite an estimated increase of nearly 21 billion miles in national vehicle miles traveled. CDOT believes that*

*tracking both fatalities and fatal crashes provides valuable information in helping support the department's core value of Safety.*

*Recently, there has been a national movement toward incorporating serious injuries as a primary performance metric for transportation safety. In addition to fatal crash rate, CDOT reported in its last Annual Performance Report serious injury crash rate, injury crash rate, total crash rate, seatbelt usage rate, and percent of alcohol-related fatal crashes.*

*Yes, other external factors have significantly contributed to fatality reductions across the country. The NHTSA has a legislative mandate under Title 49 of the United States Code, Chapter 301, Motor Vehicle Safety, to issue Federal Motor Vehicle Safety Standards (FMVSS) and Regulations to which manufacturers of motor vehicle and equipment items must conform and certify compliance. At a state level, seatbelt laws and cell phone and texting laws have helped reduce fatalities and serious injuries in those states. Seatbelt use rate, for example, is in most years about 10% higher in those states with primary seatbelt laws than in those with secondary seatbelt laws such as Colorado.*

*The fatal crash rate is a valid performance measure; it clearly accounts for traveled mileage and how it impacts the number of fatal crashes that occur. However, the nation has recognized that a more explicit, easily understood, and meaningful measure is the number of lives lost. Several states and the American Association of State Highway and Transportation Officials (AASHTO), in collaboration with NHTSA and FHWA, have adopted additional measures focusing on lives. One is halving fatalities by 2027 from 2007, when AASHTO adopted the revised national goal. "Toward Zero Deaths" is a national highway strategy, recognizing that not one death is acceptable and our national efforts should be moving toward preventing all deaths.*

*According to the most recently released FARS data set by NHTSA on December 9, 2011, in 2010 there were 449 fatalities statewide (410 fatal crashes). Of these 449 fatalities, 247 (55.0%) occurred on "the roadway" and 202 (45.0%) occurred "running-off" the road. The preliminary reports show 141 (34.2%) alcohol-related crashes which have resulted in 155 (34.5%) fatalities. Also, 164 (51.7%) of these fatal crashes, excluding motorcyclists, were not using seat belts.*

*The table below summarizes the types of fatal incidents on Colorado's highways in 2010, including 82 motorcyclist fatalities.*

**Table 1: Highway Fatalities in Colorado in 2010**

<b>Description</b>	<b>Fatality</b>
Collision with Motor Vehicle	160
Rollover/Overturn	95
Pedestrian and Pedal cyclist	43
Fixed Objects	119
Other Object (not fixed)	7
Live Animal	6
Others	19
<b>Total</b>	<b>449</b>

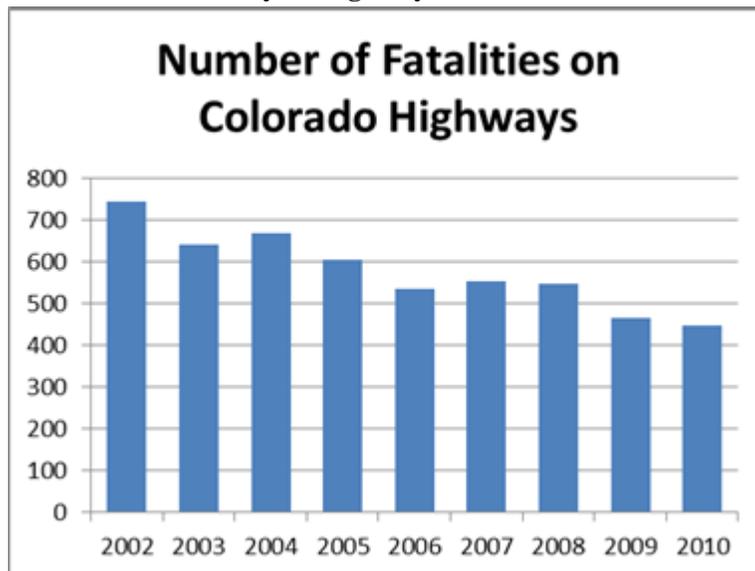
**3. Does the fatal crash rate number include only those crashes that occur on Federal highways, or does it include both State and Federal highways?**

*The 2010 fatal crash rate (0.87) includes crashes and 100 Million vehicle miles traveled on ALL Colorado roads.*

**4. How many lives are lost due to fatal crashes in Colorado each year and on what highways are these fatal crashes occurring?**

*There were 449 reported fatalities in 2010 on Colorado roads/highways, a decrease of just over 3% from 465 in 2009 and nearly a 40% decrease from the peak of 743 in 2002. One hundred ninety-four of the fatalities (43.2%) occurred on “State Highway System,” 77 of the fatalities (17.1%) occurred on “interstate System”, and 178 of the fatalities (39.6%) occurred on “off-System Roads”, i.e., City Streets and County Roads that are not interstate, or US or state highway.*

**Table 2: History of Highway Fatalities in Colorado**



**5. Does CDOT have any metrics that measure the performance of the Department in reducing or eliminating fatalities of CDOT employees? Should this metric be included in the Department's strategic plan? What measures does the department take to reduce fatalities? Can the Department provide data to track fatalities back to FY 2006-07?**

*CDOT does not track employee fatalities as a “performance metric,” but does track employee fatalities. Since FY 2006-07, the department has unfortunately experienced the following fatalities.*

**Table 3: CDOT Employee Fatalities by Year**

Year	Employee Fatalities
2007	1
2008	2
2009	1

Year	Employee Fatalities
2010	0
2011	0

*Because the number of employee fatalities is a relatively low number and while eliminating fatalities is a high priority for the department, staff believes tracking workplace accidents within the strategic plan is more indicative of department-wide emphasis on safety. The CDOT Safety Action Plan, published annually gives all employees specific information about how to ensure their own safety and the safety of their co-workers on a daily basis, and how to help CDOT address lingering challenges in other key safety areas. The current plan's key safety areas focus on:*

- 1. Reducing injuries to backs, knees, and shoulders, which account for the highest injury rates.*
- 2. Reducing accident severity and frequency of strains, sprains, and contusions.*
- 3. Promoting ownership in reducing accidents and injuries through responsible and accountable actions.*

*To work toward increased safety at CDOT, the Chief Engineer's Safety Star Award Program recognizes the CDOT Engineering Region that exhibits the best safety performance as measured by:*

- 1. Incident Rate*
- 2. Total Lost Workdays (Labor)*
- 3. Total Vehicle Accidents (Chief Engineer Objective-25% reduction)*
- 4. Total Backing Accidents (Chief Engineer Objective-50% reduction)*
- 5. % of Region participation in the CDOT Wellness Council's annual Health Risk Assessment (HRA)*
- 6. Number of near-misses reported*

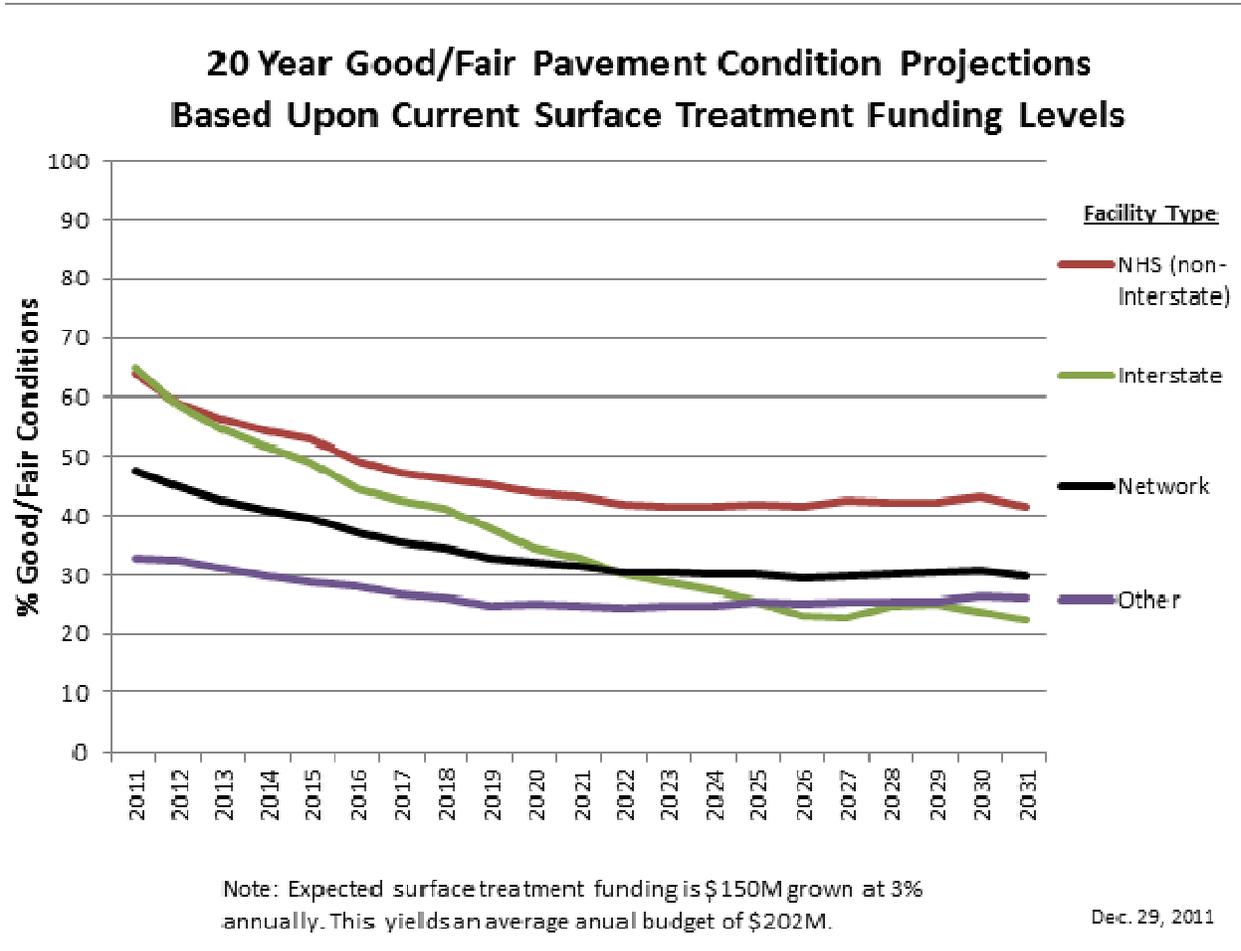
**6. Why has CDOT lowered its benchmark for the percent of pavement in good or fair condition year after year? Is there something below the poor rating for pavement? Should the performance metric for pavement focus on those roads in poor condition rather than those in good or fair condition?**

*The Transportation Commission, through its Policy Directives 13 and 14, aspires to provide Coloradans a system with at least 60% good or fair surface on the state highway system. However, the Commission recognizes that CDOT total funding stream is inadequate and thus annually adopts a budget-conscious target that has required decreasing the expectation in order to meet fiscal constraints.*

*There is a rating below the "poor" rating for pavement. While poor pavement has a remaining service life of zero to five years, "Zero Poor" pavement has no remaining service life. Currently, 34% of CDOT's roads have zero remaining service life. This does not mean that they cannot be driven on. This means that the only economically viable treatment is complete reconstruction.*

*CDOT could shift its metric to percent of roads in poor condition (100% minus current good/fair percentage) or to percent of roads in zero-poor condition and is in fact in the process of evaluating the most meaningful measure to the public.*

**Table 4: Projection of Good/Fair Conditions on the State Highway System By Facility Type**



**7. Please provide the good/fair/poor maps that have been created for State roads.**

*Please see Appendix A for statewide and regional good/fair/poor maps.*

**8. Did the General Assembly shift responsibility for the maintenance of some low traffic bridges from the State to localities? If so, has this impacted performance measures related to the condition of bridges on State roads?**

The General Assembly has not taken any recent action to directly transfer the ownership and/or maintenance responsibility of bridge structures from CDOT to local governments. CDOT has the authority to transfer state highway assets (including bridges) to local governments provided that local governments are willing to accept those assets. Eight bridge structures have been transferred from CDOT to local governments in the last two fiscal years. None of these structures are rated as poor, and the impact of these transfers on the percentage of bridge decking in good or fair condition on the state highway system was less than one one-hundredth of one percent.

**9. Please reconcile the JBC staff assertion that growth in vehicle miles traveled has outpaced growth in revenues over the past couple of decades with the Department’s claim that increased gas prices and individual motorist economic conditions have resulted in fewer vehicle miles traveled in recent years. Additionally, what does it cost CDOT to install the real time congestion signage over State highways? Have these signs impacted the minutes of delay per traveler in congested corridors?**

Over the last twenty years, growth in nominal revenue to the Department has grown 4.7 percent per year on average. This figure is higher than the corresponding annual growth figure for vehicle miles traveled, which is 2.2 percent. However, when adjusted for real purchasing power the Department’s revenue has grown by 0.4 percent per year on average since 1991, which is significantly slower than growth in vehicle miles traveled.

**Table 5: A Historical Comparison of Vehicle Miles Traveled and CDOT Revenue**

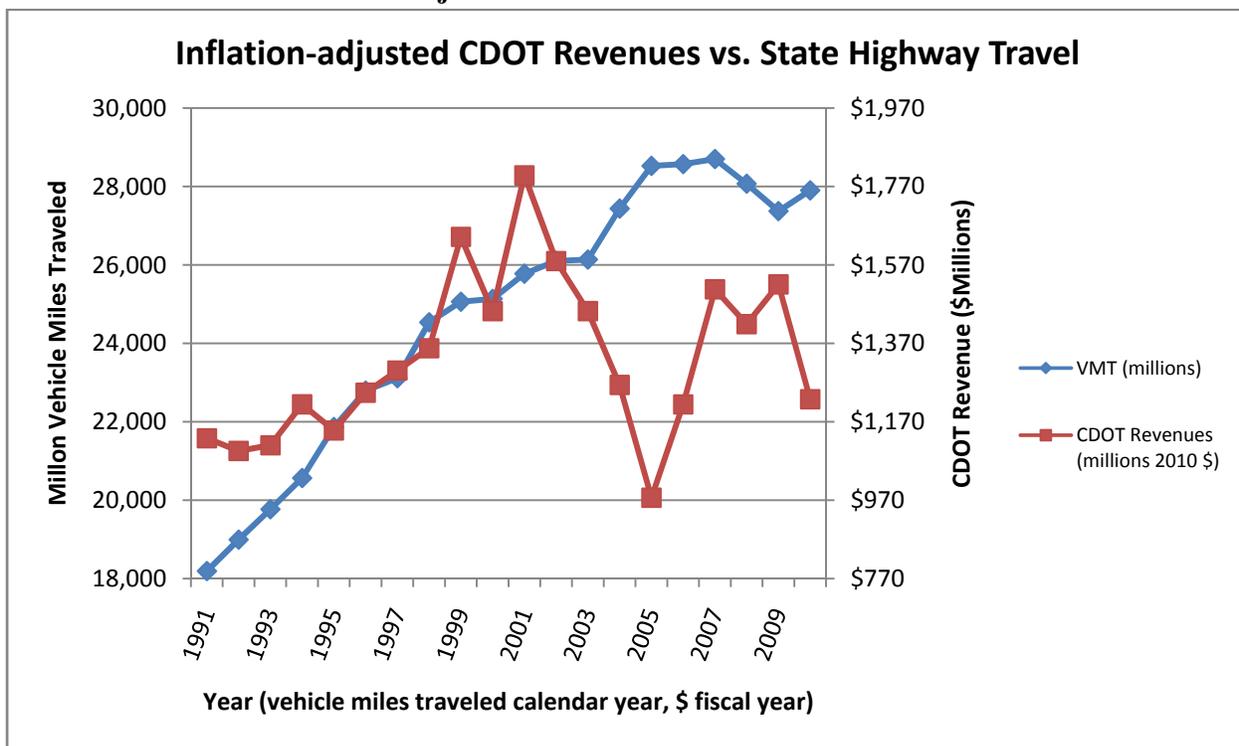
Measure	1991	2010	% Growth	CAAGR <sup>1</sup>
Vehicle Miles Traveled (millions)	18,192.0	27,898.0	153.4%	2.2%
State Funding to CDOT (\$millions)	228.2	640.9	280.9%	5.3%
Inflation-adjusted State Funding To CDOT <sup>2</sup> (\$millions)	525.3	640.9	122.0%	1.0%
Total CDOT Revenue (\$millions)	490.0	1,227.5	250.5%	4.7%
Total CDOT Inflation-adjusted Revenue <sup>2</sup> (\$millions)	1,128.0	1,227.5	108.8%	0.4%

1. Compound Average Annual Growth Rate

2. Adjusted to 2010 Purchasing Power by the CDOT Construction Cost Index

As may be seen in the chart below, vehicle miles traveled on the state highway system in Colorado decreased between 2007 and 2009, representing the only instances in the last twenty years when vehicle miles traveled declined from one year to the next. The Department attributes this decline to macroeconomic factors.

**Table 6: Inflation-adjusted CDOT Revenues vs. Vehicle Miles Traveled**



Highway overhead Variable Message Signs (VMS) on which real-time traveler time information is provided cost about \$300,000 to install. VMS is not only used to provide real-time traveler time information, but also to provide a myriad of other information, such as; road and weather conditions, incident related and alternative route information, traffic related messages, regulatory messages, event information and law enforcement safety related information. VMS signs are also replicated on the web site so that the traveling public can also see the messages prior to their trip

Although the Department projects substantial benefits under conservative assumptions to motorists from its efforts to give motorists real-time information about traffic conditions using Intelligent Transportation Systems (see Appendix B), quantifying these benefits precisely is challenging because it necessarily involves estimating trips not taken, postponed, detoured, etc., which are not directly observable. There is a growing body of peer-reviewed academic literature regarding the effectiveness of VMS; generally, the results are favorable but vary to some degree on factors specific to each highway segment, available alternate routes, the type of information displayed, and the characteristics of the drivers themselves. See <http://nexus.umn.edu/papers/vms.pdf> for an in-depth discussion of past research and a study of VMS on the Minnesota state highway system.

**10. Please rank the top ten most congested areas of the state.**

The Department’s congestion data is point-based rather than corridor-based or area-based. Congestion is measured by the ratio of a highway’s traffic volume to its designed capacity (v/c ratio), and a highway point with a v/c ratio above 0.85 is generally considered to be congested. The ten points with the highest v/c ratios in Colorado are on Interstate 25 through Denver.

*Please see Appendix C for maps of congested portions of the state highway system.*

**11. Within program delivery, is the percent of design projects advertised in 30 days the right metric if it does not take into account those projects with rescheduled timelines (i.e. accelerated or combined with other projects to be more efficient)? Please provide additional detail on why the actual for this performance metric was so low in FY 2010-11.**

*The Department recognizes that its performance in getting projects advertised on schedule could be better. This will be a focus of the Chief Engineer and of the Department's process improvement efforts.*

*The performance for Design On Time dipped in FY 2010-11 for a number of factors. Factors include:*

- *a large influx of federal revenue that enabled the department to shift resources to larger projects;*
- *increased project scopes;*
- *combined projects; and*
- *seeking to realize other construction efficiencies.*

**12. Was there an environmental compliance violation in the past 12 months along the I-70 corridor where materials were used with chemicals that poison the water system? Are these chemicals being used as part of CDOT projects elsewhere in the State?**

*In early February 2011 there was an accidental release of volatile organic chemicals (predominantly styrene, a commonly used curing agent for the installation of drainage pipes in highway culverts that dissipates upon contact with oxygen) during a CDOT-managed construction project referred to as the "Eisenhower Johnson Memorial Tunnel (EJMT) Culvert Repair Project," and identified as CDOT project number MTCE 0703-366, and CDOT project control number (PCN) 18027. The styrene release resulted in a temporary impact to surface water and to a drinking water intake within the upper reaches of the Clear Creek Watershed in Clear Creek County, Colorado.*

*Following recognition and notification of the release and noted effects limited to the Loveland Valley drinking water supply, CDOT subsequently notified the Colorado Department of Public Health and Environment (CDPHE) and filed an environmental release report. Downstream users of Clear Creek water were notified of the release with the issuance of the release report, and by telephone and e-mail correspondence, and CDOT and its contractor initiated an aggressive release response, surface water testing, and mitigation program overseen (and subsequently permitted) by the CDPHE.*

*The response included providing a replacement (trucked in) supply of potable water to the affected area of the Loveland Ski Resort (Loveland Valley), and temporary closure of intake valves by downstream users of Clear Creek until testing results demonstrated cleanup of impacted supplies was complete.*

*As of the date of this report, CDOT and its contractor have completed the following:*

- *Coordinated response, cleanup, and mitigation requirements with affected stakeholders, water users, and the regulatory community;*

- Prepared and implemented a Mitigation Plan (dated February 17, 2011), and a revised Mitigation Plan dated March 30, 2011;
- Applied for and received (and subsequently requested closure) of two groundwater remediation discharge permits under CDPHE General Permit COG315000, including Certification numbers COG315228 (for Loveland Basin Snowmaking Pond cleanup) and COG315231 (for Loveland Valley Raw Water Pond cleanup);
- Operated and installed various diversions and bypasses to prevent flow of runoff through recently lined culverts until such time that treatment of impacted water was complete, as demonstrated by analytical results.
- Mobilized two onsite treatment units to treat contained styrene-impacted water (and its sources) at the Loveland Basin Snowmaking Pond and the Loveland Valley Raw Water Pond to levels within permitted concentrations, prior to permitted discharge. Treatment units were removed from the Snowmaking Pond (upper pond) on March 30, 2011 and from the Raw Water Pond (lower pond) on March 14, 2011;
- Between February 8, 2011 and the June 3, 2011, CDOT collected and has analyzed over 200 water samples and five soil samples for the purposes of release confirmation, response, reporting, mitigation plan requirements, and discharge permit requirements;
- Submitted required monthly Discharge Monitoring Reports per respective discharge permit requirements;
- Met on numerous occasions with representatives of Loveland Ski Area, the CDPHE, the Environmental Protection Agency (EPA), Clear Creek County, and other stakeholders, and held numerous internal meetings to address the issue, so that an occurrence of the type experienced could be avoided in the future.
- Revised its contractor specifications for use of the culvert repair systems of the type employed on this project to prevent any future issues with contamination; and
- Tabulated analytical results.

*The Department is currently engaged in discussions with the CDPHE as to what enforcement action, if any, the CDPHE may take as a result of this incident.*

#### **9:30-9:45 B. STATE TRANSPORTATION FUNDING DEFICIT**

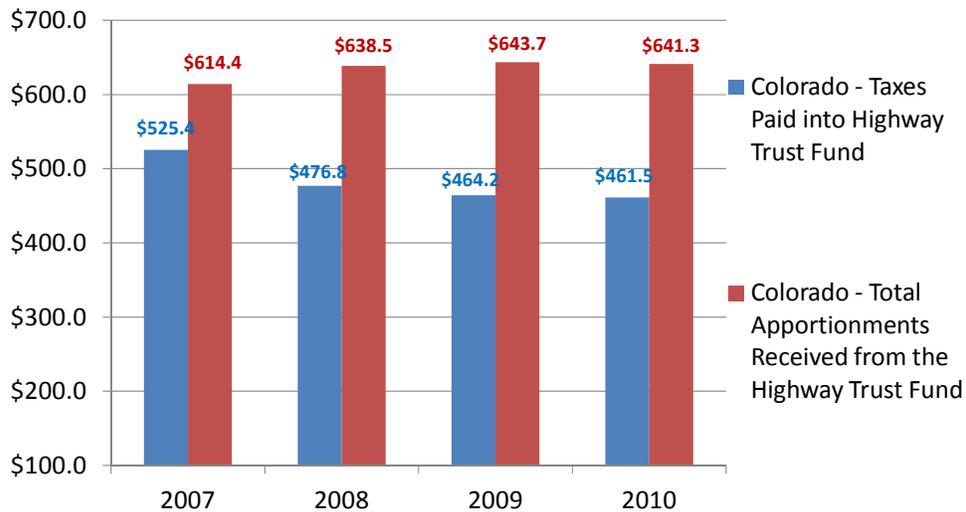
**13. Please provide historical data on the State's rate of return on federal gasoline and diesel tax revenues originating in Colorado (i.e. how much does the State contribute to the Federal Highway Trust Fund and how much does the U.S. Department of Transportation pay back). If Colorado contributes \$1 in federal fuel tax revenues how much does the State get back? How does that compare to other states?**

*Please see the tables below for summary information regarding the amounts contributed to, and received from, the highway account of the federal Highway Trust Fund (HTF) by motorists in Colorado.*

*The current Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU; P.L. 109-59) was designed to draw down a multi-billion dollar fund balance in the HTF. This authorization expired in October 2009 but has been extended by a series of continuing resolutions*

that have prolonged a structural deficit between receipts and expenditures, necessitating several multi-billion dollar transfers from the General Fund of the U.S. Treasury.

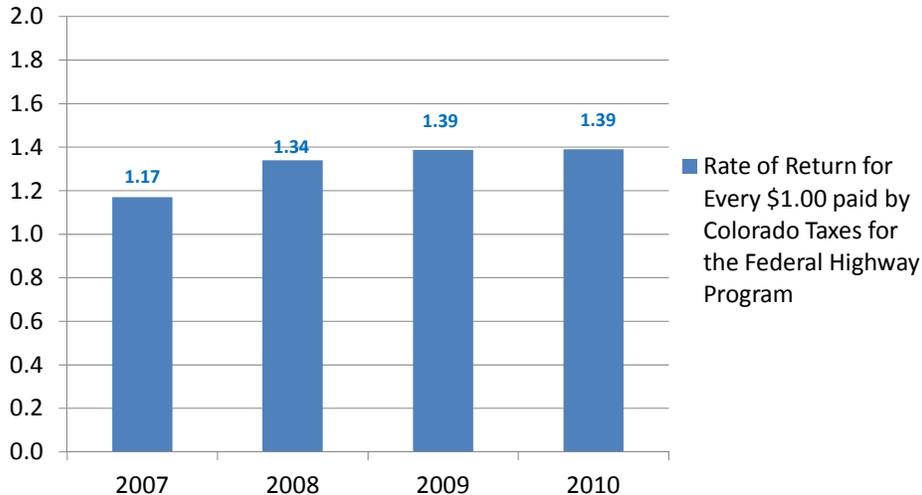
**Table 7: Federal Transportation Funding**  
Taxes Paid vs. Apportionments Received (in Millions)



*Note: The figures above include user fee/tax revenues credited to the highway and transit accounts of the HTF, and highway and transit apportionments from the HTF.*

*Presently, all states receive more in apportionments than they pay into of the Highway Trust Fund because of the aforementioned structural imbalance between revenues and expenditures.*

**Table 8: Federal Transportation Funding**  
Taxes Paid vs. Apportionments Received



**14. Please provide an update on the status of State bridges now that FASTER has been fully implemented. How many projects have been completed with FASTER dollars and what was the final cost associated with those projects? How did final costs compare to projected costs?**

*Since the inception of the Bridge Enterprise in July 2009, 155 bridges have been identified as eligible for replacement by the Enterprise using S.B. 09-108 funding due to their “poor” sufficiency ratings. Of those, 35 bridges have been replaced using other sources of funds including the Department’s apportionment of American Recovery & Reinvestment Act funding.*

*As of December 2011, 18 of the remaining 120 poor bridges have been replaced, 15 are in construction, 14 have design complete, 44 are in design, and 29 bridges are not yet scheduled.*

*Eighteen structures have been completed to date with funding generated by Senate Bill 09-108. Their combined projected (or budgeted) cost was approximately \$39.2 million. Their combined final actual cost was approximately \$34.1M. This reflects a \$5.1 million cost savings or 13.0 percent.*

**15. How many jobs were created as a result of FASTER projects? Were all of these jobs contractor jobs or were additional FTE hired as a result of FASTER?**

*In February of 2011, CDOT developed and implemented a standard special provision (FASTER Monthly Employment Report) that has been subsequently included in all Bridge Enterprise construction contracts. This special provision is very similar to the ARRA (American Recovery and Reinvestment Act) monthly job reporting requirements. Based upon jobs data collected during the 2011 calendar year, approximately 230,000 craft labor man-hours were funded by the FASTER program.*

Based upon the pre-construction expenditures during the 2011 calendar year, there were approximately 135,000 man-hours of professional labor funded by the FASTER program. For future FASTER professional service based contracts, CDOT intends to incorporate the same jobs-reporting special provision into their respective contracts as well.

FASTER Safety funds are more difficult to quantify since some projects are funded in whole by FASTER Safety funds, and some are partially funded by other funds. Through information developed for the ARRA program, we are able to back into the following numbers:

Consultant work in projects supported partially or in whole by FASTER Safety funds since January 2010 through December 2011, for \$32 million awarded was approximately 50 employees (225,000 hours) over almost two years (or 100 FTE).

Contractor work in projects supported partially or in whole by FASTER Safety funds since January 2010 through December 2011, for \$245 million awarded was approximately 400 employees (1.66 million hours) over almost two years (or 800 FTE).

**16. What effect did the one-time influx of ARRA funding have on bridge and highway projects in the State?**

The Department received \$404 million in funding for highway projects and \$12.5 million in funding for transit projects from the American Recovery & Reinvestment Act (ARRA). Under current surface treatment investment levels, CDOT expects the network Good/Fair percentage to drop 3% to 4% every year. CDOT's deployment of ARRA funding temporarily reduced the rate of network pavement condition deterioration to a 1% drop in Good/Fair per year in 2010 and 2011. In 2009 CDOT's network pavement condition was 50% Good/Fair. In 2011, CDOT's network pavement condition is measured at 48% Good/Fair, which is 5.0 percentage points higher than it would have been without ARRA funding.

Table 9: ARRA Project Status (December 2011)	
Obligated Projects	115
Advertised and Awarded Projects	115
Active Projects	33
Construction Complete	82

Please visit <http://www.coloradodot.info/projects/arra/ARRACombined.pdf> for a complete list of ARRA projects and <http://www.coloradodot.info/projects/arra/SavingsProjects> for additional projects authorized from cost savings on the original ARRA projects.

**17. What is the status of the bond issue for FASTER?**

In December 2010 the Department issued \$300 million of Build America Bonds at an effective net interest rate of 3.9 percent to accelerate the replacement of 73 poor bridges. The principal balance is currently scheduled to be repaid in 2041.

**18. What impact do super loads have on State roads? Is the impact greater for local roads with lower traffic volumes? How are local stakeholders and authorities involved in the decision to**

**allow super loads on local roads? Does the \$400 fee that is currently charged meet the need caused by super loads?**

*The Department does not presently have data with which to answer this question, either for roads on or off the state highway system. However, the Department has federal research funds that will be programmed for the purpose of studying this issue.*

*CDOT does not have jurisdiction over local roads, therefore, CDOT cannot make decisions related to the operation of any oversize/overweight load on local roads. However, CDOT does require every extralegal load applicant to provide CDOT with proof of authorization from the local jurisdiction for the use of any local roadway included in the proposed transport. CDOT will not issue a state permit until proof of local authorization is provided.*

*The Department's administrative costs to process a super load permit exceeds the fee the Department is authorized by the General Assembly to collect.*

**19. Please provide figures on whether the additional fees paid by the owners of heavy vehicles cover the extra cost to the State transportation system.**

*The Department cannot currently quantify the marginal cost to the state highway system's condition from extralegal loads. However, it is reasonable to expect that these costs exceed the permit revenues collected. This is due to the fact that the stress caused to a road surface by a vehicle is proportional to the fourth power of the amount of mass carried over a vehicle's axle. For example, a 20,000-pound single axle consumes on the order of 1,000 times more pavement life than a 2,000-pound single axle (a typical axle weight of a mid-sized passenger motor vehicle). The constructed depth of the pavement of any particular segment of the state highway system is directly proportional to the expected traffic from heavy vehicles; building roads to withstand traffic from heavy vehicles adds significantly to the total life cycle cost.*

**20. What does CDOT currently do to integrate land use in its long term transportation planning? How can the Department play a greater role in promoting consistency between transportation improvements and State or local planned growth and economic development?**

*The Department provides data and limited technical assistance to the planning efforts of local governments and incorporates the planning decisions of those entities into the Long Range Plan for transportation in Colorado.*

**21. Several measures to mitigate costs were discussed in the 2011 Deficit Report, including the use of intelligent transportation systems, efforts to alter demand, and offering more options in terms of modes of transportation. Please provide an update on specific programs that are being implemented by the Department along these lines. Are there policies that CDOT can bring the General Assembly on how to do best practices for cost-cutting measures that are not under CDOT's control (i.e., land use, telecommuting, etc.)?**

*The Department continues to deploy Intelligent Transportation Systems (ITS) and other efforts to manage demand and give motorists real-time information with which to plan their travel. Some highlights include:*

**CoTrip** (<http://www.cotrip.org>) – For calendar year 2010, 16 million persons visited the COTrip web site requesting 258 million pages of information and the web site transmitted 18 terabytes of information. Additionally, the 511 Interactive Voice Response System took 2.3 million calls. These numbers represent significant increases over the past year, and attest to both the demand for information and the value that travelers place on it.

**Ramp Metering** – Over the last several years the Department has installed traffic signals at on-ramps to major limited-access highways such as Interstates 25, 70, U.S. Highways 6 and 36, and Colorado State Highway 470. By managing access to congested corridors during peak travel periods, resulting highway throughput is higher, leading to reduced total travel time and increased safety for motorists.

**Rolling Speed Harmonization** – In the fall of 2011 the Department, in conjunction with the Colorado State Patrol and the Silverthorne Police Department, began to actively manage the speed of vehicles on Interstate 70 near the Eisenhower-Johnson Memorial Tunnels (EJMT) by using law enforcement vehicles as pace cars. By harmonizing the speed of vehicles on the approaches to the tunnel, the Department aimed to increase throughput, reduce accidents, and reduce the need to meter traffic at the tunnels.

Although the fall harmonization periods were a limited test case, the results were strongly favorable.

Results from the second test included:

- Speeds averaged 55 mph (posted speed 60 mph) from Silverthorne to the EJMT; 50 mph (posted 50 mph) within the EJMT; and 60 mph (posted 65 mph) from the EJMT to Empire Junction. When traffic congestion occurs, the average speed along this 27-mile segment varies between 10 and 30 mph.
- The data showed very high compliance among drivers and speed differentials between vehicles were reduced, even for vehicles traveling outside the paced group of vehicles – a key determinant since wide variations in speed lead to higher probability of accidents which, in turn, substantially increases congestion.

The Department will fully implement Rolling Speed Harmonization on Interstate 70 in early 2012. It is projected to operate when ski traffic is at its highest, primarily on Sunday afternoons. The Department will continue to monitor results to determine how to optimize the use of Rolling Speed Harmonization.

The Department appreciates the General Assembly's interest in policies to manage demand for the limited capacity of the state's transportation system. The Department will continue to work with its stakeholders and Executive Branch policymakers to formulate policies and best practices regarding the state transportation system; however, at this time the Department does not have specific recommendations for the General Assembly.

## **9:45-10:00 C. PROGRAM DELIVERY**

**22. How does CDOT determine the condition of State roads, and what role do these ratings play in the Department's process for allocating maintenance and surface treatment dollars? Please provide an overview of the process used by CDOT to prioritize and choose amongst the myriad of potential transportation projects in the State.**

*The condition of a Colorado state highway is measured by Remaining Service Life (RSL), which identifies how many years a pavement will last until Reconstruction is the only cost-effective recourse.*

*To calculate the RSL, CDOT collects condition distress information annually on all highways. Smoothness, rutting, transverse cracking, longitudinal cracking, fatigue cracking (on asphalt only), and corner breaks are identified and quantified for every 1/10th-mile segment of highway. These raw distress measurements are normalized on an "index" scale of 0-100, where 100 indicates that the pavement is free from that type of distress. Normalizing the data creates a scale of comparability between the different distress types. If a stretch of highway has a Transverse Cracking Index of 98 and a Rutting Index of 55, then one can easily deduce the critical distress (in this hypothetical case rutting) and treat the pavement accordingly.*

*The Pavement Management Program has software that quantifies the benefit (added RSL) of different types of treatments on a given road during different times in the road's lifecycle. The benefits of performing maintenance, rehabilitation, and reconstruction on the road are balanced against the treatments' costs. By way of this cost-benefit analysis, CDOT determines the most cost-effective treatment, or series of treatments, for the given road.*

*The Pavement Management Program also has the capability to apply the cost-benefit analyses statewide to determine the most efficient projects across the state. The cost-benefit rankings of projects across the state are weighted, in part, by traffic volume. The result of this weighting is that projects with more traffic are deemed more beneficial than similar projects with less traffic. The Pavement Management Program can identify and recommend a list of efficient treatments across the state for the next 20-years that is fiscally constrained under a given budget scenario, by comparing cost-benefit values. CDOT's goal is to have 70% of resurfacing projects match the Pavement Management recommendations. Currently, CDOT matches 76%. The Pavement Management Program cannot account for the infinite number of site-specific variable that may contribute to the condition of a unique stretch of highway. The 70% goal allows for project-level flexibility for upon un-modeled conditions.*

**23. What percentage of the Construction, Maintenance, and Operations line is construction versus maintenance or operations? How does the Department determine the relative levels of funding for each program area within this line item?**

*Please see the table below for a summary of the proposed FY 2012-13 Transportation Commission Allocations within the Construction, Maintenance, and Operations line item.*

*Of the Department's \$1.1 billion in annual funding, approximately half is dedicated to specific programs by state and federal law. The remaining flexible funding is allocated by the Transportation Commission to strike a balance between minimizing the rate of structural deterioration of the state highway system (construction) and keeping the system open, convenient, and safe (maintenance).*

**Table 10: FY 2012-13 Construction, Maintenance, and Operations Breakdown**

Category	FY 2012-13 Allocation
<b>Construction</b>	
Construction-type Activities	241.4
Debt Service on Construction Projects	168.0
<b>Total Construction</b>	<b>409.4</b>
<b>Maintenance</b>	
Maintenance-type Activities	242.4
Property & Equipment	26.7
COP Payment for CDOT Properties	1.1
<b>Total Maintenance</b>	<b>270.2</b>
<b>Operations</b>	
Project-Related Indirect Expenses	65.9
Staff Branches	28.5
Planning & Research	10.7
<b>Total Operations</b>	<b>105.1</b>
<b>Total Pass - Through Funds</b>	<b>181.2</b>
<b>Total Contingency</b>	<b>20.0</b>
<b>Total Construction, Maintenance, and Operations Line Item</b>	<b>986.0</b>

Note: The Department’s request for the annually appropriated Administration line item is \$24.5 million or 2.2 percent of the total request.

**24. Please provide an update on memorandums of understanding (MOUs) that the Department entered into with different regions of the State that were meant to determine funding levels for projects in those regions. Does the Transportation Commission follow the MOUs? If not, how does the Commission decide on projects?**

*The Transportation Commission does endeavor to honor the commitments in the MOUs. The agreement is not intended to be met on a year-by-year basis, but rather as an average over time. For the MOU with Denver Regional Council of Governments (DRCOG), this tolerance has been met over the last few years. For the Pikes Peak Area Council of Governments (PPACG), the allocations have been a bit short of the tolerance over the last few years. The Department has averaged 8.56%, while the aspiration has been 9.48%. The recent allocation of funds to the area for Interstate 25 north of Colorado Springs will bring the percentage up, and CDOT staff is working with PPACG staff to ensure the commitments are met over time.*

**25. When were these MOUs created? Does the lack of money overall impact the ability of the Transportation Commission to adhere to the MOUs? If so, in what way?**

*The MOU with DRCOG was finalized in November 2004 and the MOU with PPACG was finalized in April of 2005. The MOUs were put in place at a time when funding assumptions were quite different than is the reality of today. The Transportation Commission’s primary objective is to maintain the existing system in the best condition it can within its funding constraints. To best allocate funds for system preservation, the Commission allocates most of its available funds through the use of formulae to a variety of categories such as surface treatment, maintenance, bridges, etc.*

*When the MOUs were signed, two large statutory transfers of state General Fund revenue to the State highway Fund (S.B. 97-001 and H.B. 02-1310) were in effect. These two funding sources were distributed for projects largely related to population and mobility and their availability was critical to making the commitments embedded in the MOUs. For example, the Pikes Peak region has comparatively few state*

*maintained highways so when funds are allocated by formula to maintain the system (routine maintenance, surface treatment bridge replacement, etc.), the Pikes Peak region receives significantly less than the 9.48% goal contained in the MOU. So long as the Department was receiving SB97-001 and HB02-1310 funds, however, the Department was comfortable that it could meet the commitments in the MOUs. With the repeal of SB 97-1 and HB 02-1310, however, the Commission no longer has access to the funding sources it counted upon when it entered into the MOUs*

*Despite the loss of these two funding sources, the Transportation Commission continues to make significant efforts to stay close to the percentages in the MOUs. It has done so by opportunistically taking advantage of some unanticipated federal funds. In 2009 one of the largest projects funded with the federal stimulus (ARRA) funds was the Woodman Road project in Colorado Springs and more recently, when federal aid for FY 2011 came in above estimate, funding was provided for a major expansion of I-25 also in Colorado Springs.*

**26. What types of educational programs are being implemented by the Department to ensure people do not text while driving?**

*Fiscal Year 2010-11 was the first year in which funding was available for the Department to do a statewide distracted driving campaign. Considerable effort was given to research and campaign development during this first phase of outreach. Major accomplishments included:*

- *An online campaign to reach young drivers, who are most at risk for distracted driving;*
- *Website banner ads included an animated scrolling of potential things drivers can hit when distracted, with the tagline of “millions of scenarios, one result”;*
- *News releases;*
- *Posters; and*
- *A Public Service Announcement (PSA) contest in 2009 in which students developed a PSA that is still played on television stations across the state.*

*Prior to the current year, the focus of the Department’s outreach efforts was solely on teens and the cell phone ban for drivers under age 18. In the current year, the campaign expanded to reach other age groups as well. The campaign is focused not only on texting but other types of distractions as well.*

*Public Relations Outreach Summary:*

- *Posters*
- *Public Service Announcements*
- *News Releases*
- *Electronic Sign Messages*

*FY11 Paid Media Summary:*

- *\$28,000 of federal transportation safety funding*
- *3,156,490 online impressions*
- *276 radio traffic sponsorships in Denver/Boulder, Colorado Springs/Pueblo and Fort Collins/Greeley Designated Market Areas.*

**27. Please provide an update on the proposed High Performance Transportation Enterprise projects for the I-70 corridor.**

*The High Performance Transportation Enterprise is managing the review of an unsolicited proposal received on July 15, 2011 for roadway and multimodal improvements to I-70 from C-470 to Silverthorne. Reviewers include staff from Region 1 and FHWA, in addition to stakeholders from the I-70 corridor. As noted at the December 14 HPTE Board of Directors meeting, if CDOT and HPTE decide to move forward the next step will be a solicitation for comparable proposals--likely in February, 2012. In keeping with the HPTE procurement guidelines, this solicitation will maintain a fair, competitive and transparent process.*

*Related to this, the HPTE and CDOT are seeking FHWA Value Pricing Pilot Program (VPP) funds to explore and validate the feasibility of a multimodal highway and transit solution for this portion of the I-70 corridor. Part of the requested funds will be used to engage the I-70 Collaborative Effort in this endeavor.*

*More information about the I-70 Mountain Corridor Programmatic Environmental Impact Study and Record of Decision can be found at <http://www.coloradodot.info/projects/i-70mountaincorridor>.*

**28. Please provide an update on what the Division of Transit and Rail is doing (including federal money on transit and rail).**

*During FY 2012-13 the Division of Transit & Rail (DTR) will embark on the following projects and initiatives:*

- The Division is offering calendar year 2012 contracts to 31 rural transit operators. The contracts are for \$7.6 million in FTA rural public transportation formula funds administered by CDOT.*
- As Congress has suspended its earmarking of discretionary capital FTA funds, the FTA has instead been offering these discretionary funds on a competitive basis nationwide, asking that states apply on behalf of rural transit agencies. The Division applied on behalf of rural communities and was awarded \$3.55 million from the State of Good Repair program for five rural transit operators.*
- The Division applied on behalf of four local jurisdictions seeking funds from an FTA pilot program, the Veterans Transportation and Community Living Initiative, which promotes incorporation of veterans transportation programs into existing efforts to improve the coordination of human services transportation. All four were selected, and the Division was awarded full funding of \$1.32 million, one of the largest per capita grants given to a state.*
- The Interregional Connectivity Study (ICS) will be on-going and nearing completion by year end; this study will identify and evaluate a future passenger rail (emphasis on ultimate high speed rail) network for the Front Range and the I-70 corridor to Eagle County, with an emphasis on the "connectivity" with the RTD FasTracks system and DIA.*

- *The I-70 Mountain Corridor Advanced Guideway System (AGS) Feasibility Study also will be on-going and nearing completion by year end; this study will complement the ICS effort and examine possible technologies and alignments. The AGS effort will engage the transit system manufacturing and concession industry in the analysis.*
- *CDOT will update and expand upon a 2008 Intercity Bus Study to include regional and commuter bus routes, inventory intermodal facilities in the state, examine the need for increased and improved intermodal connections among local, regional and intercity bus and Amtrak routes at intermodal facilities around the state, and evaluate whether, how and when CDOT should participate in such a project.*
- *The Division will develop a State Transit Plan as input to the 2040 Statewide Long Range Transportation Plan.*
- *In late 2009 CDOT conducted a statewide competitive application process for both the Local and Statewide FASTER Transit funds for Fiscal Years 2010 through 2012. In January 2010 the Transportation Commission approved the award of 86 projects. The awards, totaling \$38.1 million, were made to a total of 46 different organizations. Those 86 projects are serving a total of 40 counties; no projects were requested from the 24 counties not served by a project. The awards, some of which are leveraging federal funds, include everything from 80 bus purchases to information technology improvements to the construction or improvement of 11 park-and-rides and 8 bus-related facilities.*

**29. Please provide an update on the Division of Aeronautics.**

*There are several ongoing programs and initiatives in the Division of Aeronautics that may be of interest to the Joint Budget Committee and the members of the General Assembly:*

- *Aviation Fuel Tax Reimbursements – Legislation created in 1991 allows for the collection of State Sales Tax and Excise Taxes on aviation jet fuel and aviation gasoline. These funds are distributed back to the seventy-six public-use airports through a Discretionary Grant Program and a formula that returns 65% of the fuel taxes back to airports where the fuel was sold. In 2013 the Division projects that \$39.4 million will be collected from aviation fuel taxes. Pursuant to Section 43-10-109 (3), C.R.S. (2011), the Transportation Commission may allocate up to 5.0 percent of the fund’s revenues for operating expenses; the Division has historically utilized less than 2.0 percent for this purpose.*
- *Aeronautics Airport Grant Program – The discretionary grant program for the 2012 calendar year will distribute approximately 19 million dollars to 46 Colorado public-use airports that submitted applications. These funds will be used for high-priority projects identified in the State Aviation System Plan and individual airport Capital Improvement Planning documents.*
- *Colorado Surveillance Project-Mountain Radar – This project is a cooperative effort between the State and the FAA to enhance safety, capacity and efficiency in the airspace serving the Colorado’s Ski Country Airports by employing emerging NextGen technologies (<http://www.faa.gov/nextgen>). This project has successfully deployed NextGen equipment at the airports serving Craig, Hayden, Steamboat Springs and Rifle. Phase II will implement similar improvements to the airports serving Durango, Gunnison, Montrose and Telluride. Colorado is*

*the first State to coordinate resources with the FAA to implement innovative application of NextGen technologies.*

#### **10:00-10:15 D. MOTORCYCLE OPERATOR SAFETY TRAINING PROGRAM**

*On September 12, 2011, the Office of the State Auditor released a performance audit of the MOST program. Recommendation 8 of that report states that CDOT should work with the General Assembly to discontinue the MOST program or implement changes in the program to address the recommendations in the audit. CDOT does not yet have a recommendation on whether the program should continue. The department has conducted multiple stakeholder meetings and is surveying past participants of the training program to determine what elements of the program, if any, should continue. The department plans to share their findings with the Audit Committee and other members of the General Assembly no later than February, 2012. The department answers to the following questions regarding the MOST program should not be construed as support for or opposition to the program continuing.*

**30. What is the department's role in the MOST program? How many FTE in the Department are used for the MOST program? Why are almost 15 percent of total MOST expenditures used for administrative expenses? What does CDOT use administrative moneys for? Why has the percentage used on administrative expenditures varied over the years?**

*The mission of the Motorcycle Operator Safety Training (MOST) program is to subsidize accessible, high quality, low cost motorcycle training to Colorado residents and active duty military personnel. The program focuses on training as the first step a rider can take to riding safer. MOST contracts with independent training organizations throughout Colorado for the purpose of delivering training. The department's role is to approve training curricula for use in Colorado and ensure the independent training organizations follow the set standards. The training courses help develop the knowledge, attitudes, habits, and skills necessary for the safe operation of a motorcycle. As the number of motorcycle registrations in Colorado increase, the number of motorcycle endorsements on drivers' licenses increase as well. The focus of the MOST program is to train as many new riders as possible.*

*The MOST program began in 1991 with three training contractors. In 2011, the program consists of 15 contractors utilizing approximately 45 training locations. They train approximately 10,000 new and experienced riders each year. The MOST certified sponsors offer training year round. The state certified training contractors are permitted to charge a competitive fee for their services. These fees also will vary according to the time of year and other factors determined by the training facilities. All MOST certified contractors are subject to the MOST Rules and Regulations as defined in 2 CCR 602-3.*

*The department has one full-time FTE in the Office of Transportation Safety (OTS) to coordinate the program, and is supervised by an FTE who spends a portion of his time overseeing the program staff. Other staff within OTS, including the Director, provides staff support and oversight of the program. Section 43-5-502 (1) (c), C.R.S. (2011) specifies that in no event shall the office expend more than fifteen percent of the total cost of the program for administrative costs. Historically, administrative costs have been 10%-15% of the program's costs. However, because the program has grown from overseeing three contractors to overseeing 15, the oversight demands of MOST program staff have increased.*

*CDOT's administrative costs for the MOST program include:*

- *CDOT employee salary and related benefit cost;*
- *Costs related to the daily administration of the MOST program by CDOT staff;*
- *In state travel by OTS staff to conduct MOST related business;*
- *MOST Annual Report Costs;*
- *Office supplies ordered and used by CDOT for administration of the program;*
- *Copying, printing and form reproduction for CDOT forms;*
- *Tuition/registration costs for the MOST program manager or MOST project manager as it relates to the MOST program; and*
- *In- state travel and other costs for vendors designated for the promotion of the MOST program and not related to a contract or purchase order may also be expensed under MOST Administrative Operating with CDOT approval.*

*In years where the administrative costs of the program were higher, it is primarily due to increased promotion of the MOST program, such as providing a MOST booth at various events to promote the value of motorcycle training, and increased professional services to provide paid media to educate the public on motorcycle safety issues. The media side of the program has recently been determined to be a contract expense rather than an administrative expense, and will not be expensed to the administrative side in the future.*

**31. Why does the State provide a subsidy for motorcycle training programs? What evidence is there to suggest the subsidy is still needed?**

*One of the intentions of the program is to make motorcycle safety training more accessible and less costly to a greater percentage of Colorado consumers, thereby enabling a greater percentage of Colorado motorcyclists to enroll in the program. One question the department is trying to answer is whether that subsidy is still necessary. If the department is able to determine that fewer motorcyclists would take the safety training without a state subsidy, then to remove the subsidy would compromise highway safety. A survey is being conducted to ask graduates of the training, as well as motorcyclists who have never taken the training, whether the existence or elimination of a state subsidy would impact their interest in taking one of the certified safety training courses. The survey is expected to be completed in January, 2012.*

**32. Given that one-third of MOST contractors are not passing along tuition subsidies to their students, as is statutorily required, would it be more cost effective to provide tuition subsidies directly to students rather than through MOST contractors?**

*CDOT is currently considering whether a tuition subsidy is necessary or desirable to further advance motorcycle safety in Colorado. If it is determined that a tuition subsidy should continue, it is critical that all program contractors pass along the subsidy to students in a clear and uniform way. One option would be to have CDOT provide the subsidy directly to students. While that option is under consideration, it is likely one of the more costly options, as it would require the department to issue approximately 9,000 to*

10,000 checks per year and could require additional resources (FTE) to accomplish the task. The department will have a recommendation on whether to continue tuition subsidies and the method to provide those subsidies by February, 2012.

**10:15-10:30 E. OTHER QUESTIONS COMMON TO ALL DEPARTMENTS**

**33. How does the Department define FTE? Is the Department using more FTE than are appropriated to the Department in the Long Bill and Special Bills? How many vacant FTE does the Department have for FY 2009-10 and FY 2010-11?**

*OSPB and the Department of Personnel and Administration (DPA) are working with all departments to provide quarterly reports on FTE usage to the JBC. These reports will ensure that all departments are employing the same definition of FTE. This definition comprises a backward-looking assessment of total hours worked by department employees to determine the total full-time equivalent staffing over a specific period. We intend for these reports to provide the JBC with a more clear linkage between employee head-count and FTE consumption. As it concerns FTE usage in excess of Long Bill 'authorizations,' departments will continue to manage hiring practices in order to provide the most efficient and effective service to Colorado's citizens within the appropriations given by the General Assembly.*

**34. Please explain why actual FTE decreased for the Department from FY 2009-10 to FY 2010-11 while actual expenditures increased from \$1.42 billion in FY 2009-10 to \$1.46 billion in FY 2010-11. Are these the correct levels for FTE?**

*The FTE amounts provided for informational purposes in the Department's FY 2012-13 budget request were incorrect due to a report in the Department's SAP enterprise resource planning system that did not properly extract complete information about hours worked in each of the Department's appropriation codes.*

*The table below reflects FTE usage data from the Colorado Personnel & Payroll System (CPPS):*

**Table 11: CDOT FTE Usage**

<b>Long Bill Line Item</b>	<b>FY 2009-10</b>	<b>FY 2010-11</b>
Administration	194.0	178.3
Construction, Maintenance, and Operations	2,930.7	2959.3
High Performance Transportation Enterprise	0.4	1.5
<b>Total</b>	<b>3,125.1</b>	<b>3,139.0</b>

*It should be noted that annual changes in the Department's FTE will not generally correlate to annual changes in the Department's budget, actual revenues, or actual expenditures. Although the Department has purposely operated below the FTE levels authorized by the Transportation Commission for some time, significant changes in the Department's annual funding primarily affect the number and size of contracts let to the Department's private sector partners for major rehabilitation and reconstruction projects on the state highway system.*

**35. Please explain why the Department has audit recommendations that have not been fully implemented after extended periods of time. What are the obstacles the Department has faced in**

**implementing recommendations? How does it plan to address outstanding audit findings? If applicable, please focus on those financial audit findings classified as "material weakness" or "significant deficiency".**

*With respect to the Performance Audit #1907 of the CDOT Division of Aeronautics, Recommendation 6A, the Colorado Aeronautical Board continues to review the outcome of the grant program as it relates to the existing Colorado Aviation System Plan (CASP). The CASP update is now scheduled for completion in early 2012.*

*With respect to the Performance Audit #1907 of the CDOT Division of Aeronautics, Recommendation 6C, the Colorado Aeronautical Board continues to utilize the 2005 CASP to evaluate how grants address system wide goals and priorities. The CASP update is now scheduled for completion in early 2012.*

*With respect to the Performance Audit #1117 of Cash and Project Management, Recommendation #1, the Department continues to make progress on its cash management. For example, the Department is upgrading its cash reporting to show federal obligation limitation, encumbrances and future encumbrances. In addition, the Department's upgraded SAP enterprise resource planning system, known as Public Budget Formulation (PBF) will include a cash management module by FY 2012-13.*

**36. Please provide any updated information on audit recommendations that the Department has not fully implemented at least 48 hours prior to the hearing.**

**ADDENDUM: OTHER QUESTIONS FOR WHICH SOLELY WRITTEN RESPONSES ARE REQUESTED**

**1. What is the Department's entire Information Technology (IT) budget for FY 2011-12 and FY 2012-13? Does the Office of Information Technology (OIT) manage the Department's entire IT budget? If not, what IT activities is the Department managing separate from OIT and what percentage is that of the entire IT budget for the Department for FY 2011-12 and FY 2012-13? Of the IT activities the Department still manages outside of OIT, what could be moved to OIT?**

*Nearly all IT-related personnel appropriations have been consolidated into the Governor's Office of Information Technology. IT-related professional services and operating expense budgets continue to reside in departments' individual appropriations, and have not been consolidated into OIT. At this time, it is expected that budgets for IT professional services and operating expenses will remain in the departments' individual appropriations. However, during this fiscal year, all IT procurements will be centralized through the Office of Information Technology (the OIT Storefront). For FY 2012-13, the Executive Branch believes this represents the most efficient division of IT-related appropriations to ensure that departments maintain appropriate discretion in making technology and program decisions. The Executive Branch will consider further consolidation of IT appropriations in future fiscal years.*

*CDOT's IT Budget for FY11-12 is \$27.4 million and FY12-13 is projected to be \$26.3 million. \$10.5 million of FY11-12's IT budget and \$9.1 million of FY12-13's budget is paid to OIT in the form of reimbursements as reappropriated Funds for services provided and overhead.*

*Funds disbursed to OIT are for OIT employees whose work supports CDOT and systems/services CDOT receives for using statewide applications. CDOT also uses numerous IT systems that are CDOT-specific*

*(computer aided design for example) that is not used statewide. The funds not disbursed to OIT support these types of systems and applications.*

*More services and expenditures may move to OIT in the future. Whether or not this occurs depend on OIT decisions regarding greater use of statewide applications. A good example is CDOT's Enterprise Resource Planning System (ERP), SAP. Currently this ERP is a CDOT-specific application and CDOT directly pays all the costs associated with it to SAP and consultants. If OIT elects to procure SAP as a statewide application, presumably the licenses and costs associated with that system would then flow through OIT.*

*A key factor, however, in all of this is that most of the cost associated with these systems CDOT uses are a shared expense with the Federal Highway Administration (FHWA). The FHWA requires CDOT to control the budget and pay for services received for federal reimbursement purposes, and thus any system which would put OIT in complete control of the CDOT IT budget instead of on a reimbursable model which includes a means to validate that CDOT is charged at a reasonable rate and in equitable manner would imperil the Department's ability to pass a significant portion of these costs through to the FHWA.*

**2. What hardware/software systems, if any, is the Department purchasing independently of the Office of Information Technology (OIT)? If the Department is making such purchases, explain why these purchases are being made outside of OIT?**

*While CDOT does purchase software/hardware for CDOT-specific systems and licenses at a cost of approximately \$3.6 million per year, CDOT coordinates all such purchases with the consent and approval of OIT. CDOT and OIT have both been working hard to advance our relationship and make sure all parties are aware of any activities in relation to IT purchases.*

**3. Please list and briefly describe any programs that the Department administers or services that the Department provides that directly benefit public schools (e.g., school based health clinics, educator preparation programs, interest-free cash flow loan program, etc.).**

*Safe Routes to School is a federally mandated program. Its objective is to enable and encourage children to walk and bicycle to school, to make walking and bicycling to school safe and more appealing, and to facilitate the planning, development and implementation of projects that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools. Eligible infrastructure activities include:*

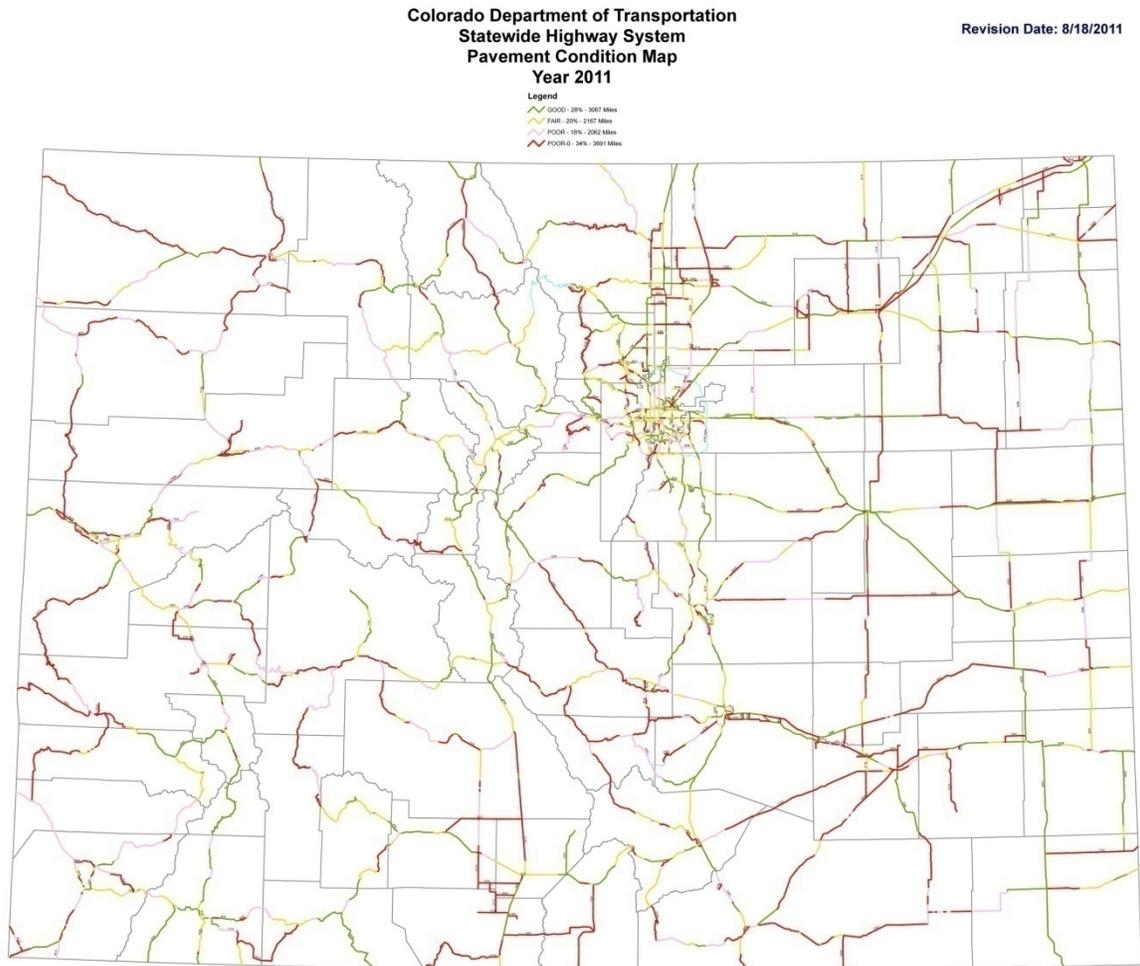
- Sidewalk improvements, traffic calming and speed reduction improvements;*
- Pedestrian and bicycle crossing improvements;*
- On-street bicycle facilities;*
- Off-street bicycle and pedestrian facilities and secure bike parking; and*
- Traffic diversion improvements in the vicinity of schools (within approximately 2 miles).*

*Funds are apportioned to States based on their relative shares of total enrollment in primary and middle schools, but no State receives less than \$1 million. Federal highway funds comprise 100% of the funding for this program. These funds remain available for four years after expiration of the federal legislation under which they are authorized and are subject to the overall obligation limitation on federal highway*

*funding. The Department expects Colorado to administer \$1.8 million in Safe Routes to School funds in FY 2012-13.*

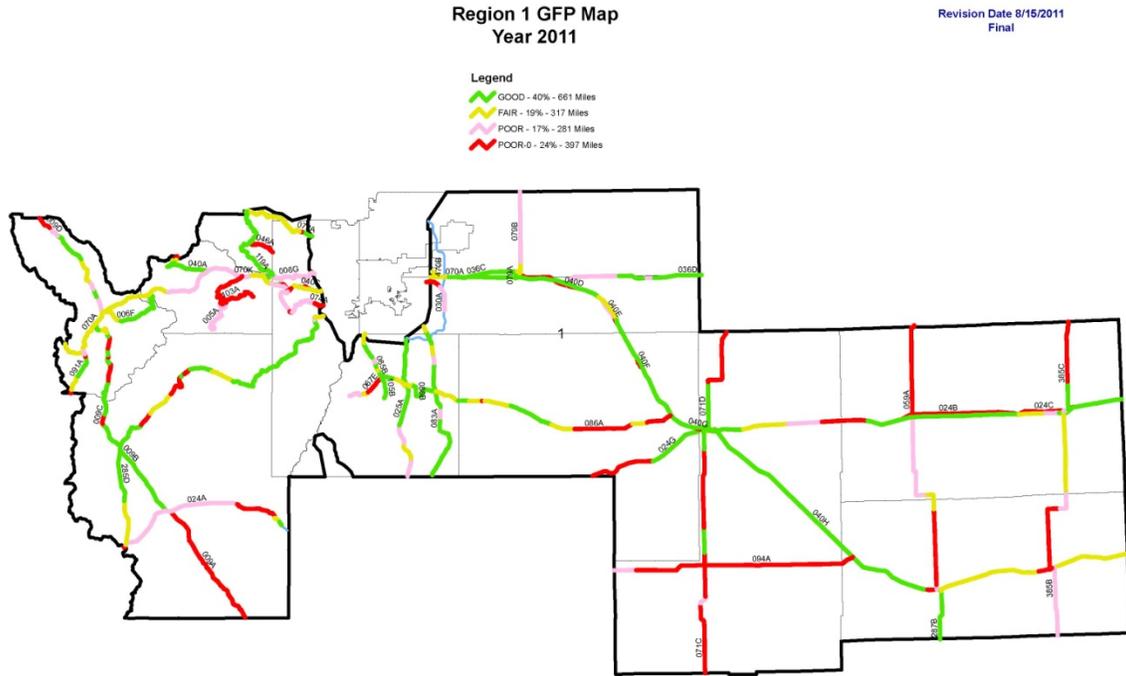
Appendix A: Statewide Good/Fair/Poor Maps

Table 12: Good/Fair/Poor Map for All Regions



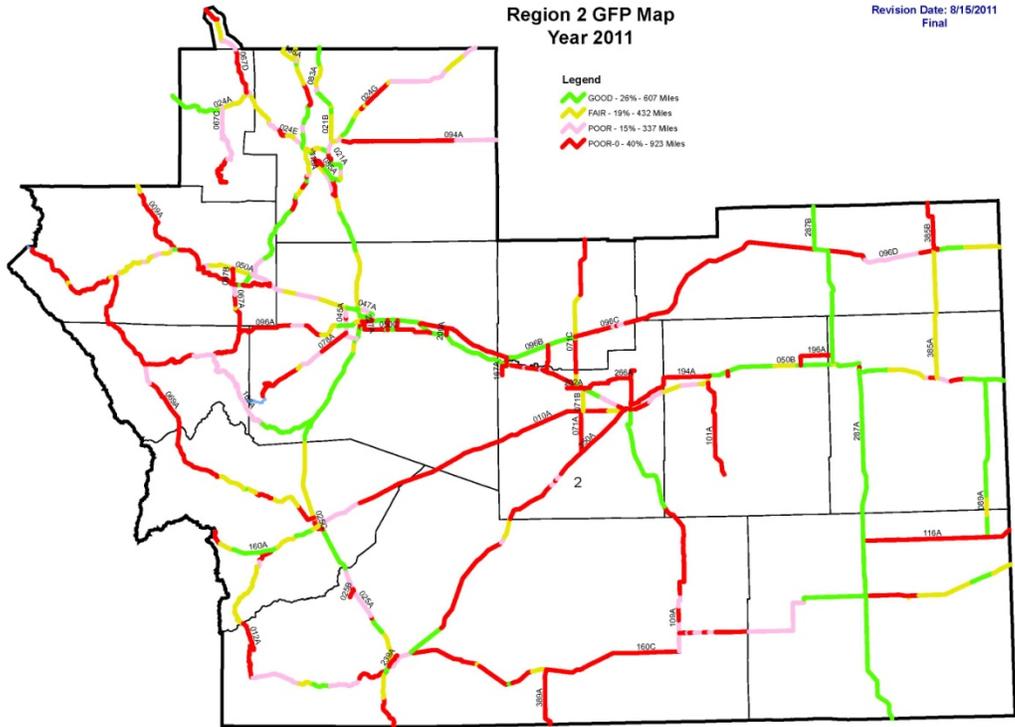
Appendix A: Statewide Good/Fair/Poor Maps

Table 13: Good/Fair/Poor Map for Region One



Appendix A: Statewide Good/Fair/Poor Maps

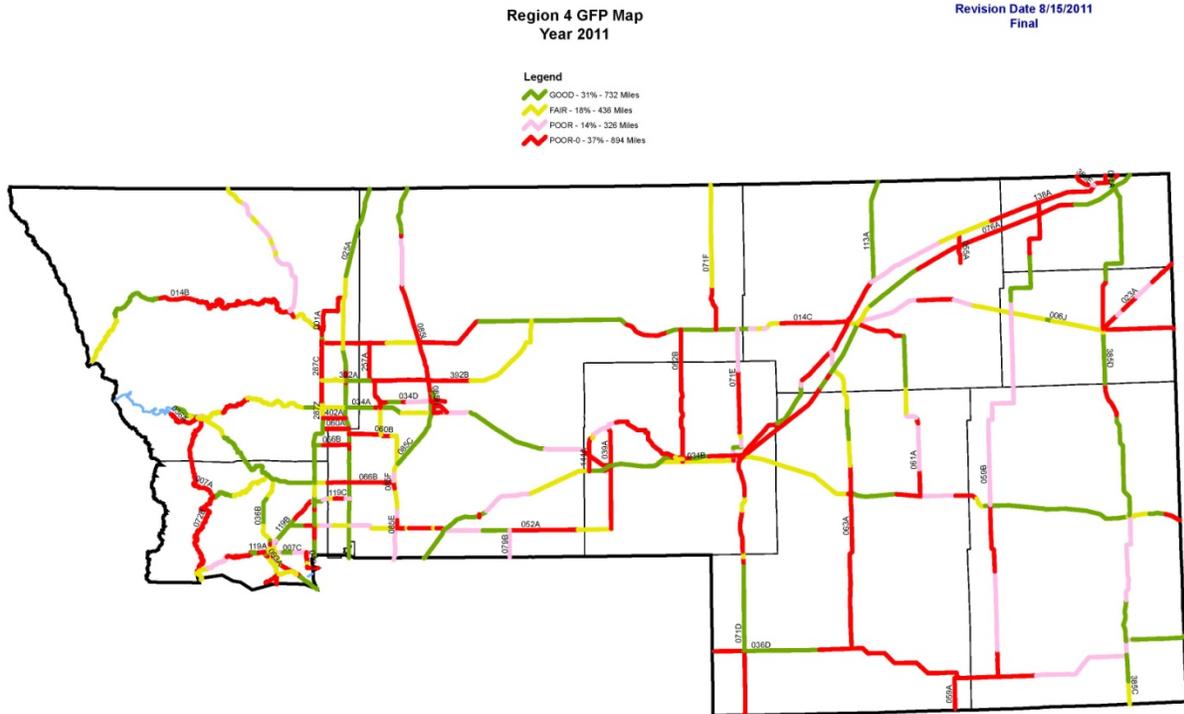
Table 14: Good/Fair/Poor Map for Region Two





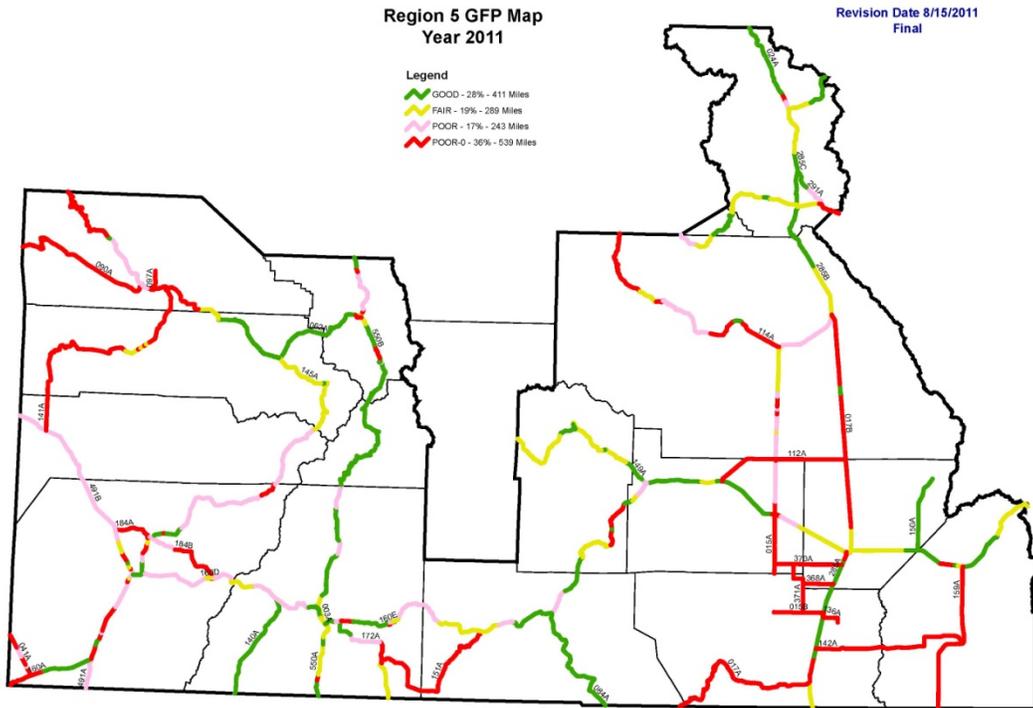
Appendix A: Statewide Good/Fair/Poor Maps

Table 16: Good/Fair/Poor Map for Region Four



Appendix A: Statewide Good/Fair/Poor Maps

Table 17: Good/Fair/Poor Map for Region Five





## **Appendix B: An Example of ITS Strategies in Use**

### **C470 (Bowles Avenue to Alameda Avenue) Real Time Traveler Information Project**

#### **1. Purpose and Goals of the Project**

The purpose of the project is to install fiber optic cable/devices and connect existing devices on C470 from Bowles Avenue to Alameda Avenue to implement the real-time traveler information project and advanced traffic and incident management strategies. This will complete fiber installation/devices and complete the redundant fiber ring connection on C-470 between I-25 and I-70.

Currently fiber optic cable exists on C470 from I-70 to Alameda on the west and from I-25 to Santa Fe on the east (project is nearing completion, which installed devices on the entire corridor). A project is being designed, which is scheduled to go to bid in November, to extend fiber optic cable/devices and connect existing devices, i.e., ramp meters, traffic signals, etc. from Santa Fe to Bowles.

Fiber optic cable provides fast and reliable communications and allows CDOT to have complete command and control of the devices and integrate them into the CTMC system. The project will implement the real-time traveler information, and advanced traffic and incident management applications on the corridor.

This project will provide significant traveler information and safety benefits to the traveling public due to cell coverage being available to access emergency response and network surveillance in the corridors, which will allow CDOT to detect, verify and communicate with law enforcement and emergency responders to respond faster and at the appropriate level to incidents.

#### **2. Summary of Project Benefits**

The project benefits are displayed in two categories: Traveler Information and Incident Management. The benefits were calculated using a very focused and conservative approach. The benefits that are shown concentrated only on one element within each category. In the Traveler Information category the benefit only applied to vehicles and travelers operating during the weekday peak period. In the Incident Management category the benefit was only applied to 15% of vehicles and travelers during an incident that resulted in a full roadway closure, which for C-470 was both lanes in the direction of travel. Obviously, traveler information benefits would be enjoyed by vehicles and travelers in non-peak conditions and incident management benefits would apply to travelers that choose alternative routes during an incident; however, at this time it was not possible to calculate these benefits due to lack of empirical data and other resources.

#### **3. Traveler Information Benefits**

As mentioned, the Traveler Information category benefit only applied to vehicles and travelers operating during the weekday peak period, which was calculated for vehicles using 40% of the weekday ADT and was calculated for travelers using 1.1 travelers to vehicle. Two main benefit components of travel time savings and delay savings were then calculated by using 50% of vehicle and traveler weekday peak

period numbers. A travel time savings value was estimated in three categories: 60 seconds, 180 seconds and 300 seconds as the weekly benefit, and used to calculate benefits to travelers and vehicles in the peak period with respect to vehicle hour and person hour travel savings and person hour cost savings within each category. A delay savings value was also estimated in three categories: 30 seconds, 90 seconds and 150 seconds as the weekly benefit, and used to calculate benefits to vehicles in the peak period with respect to reduction in CO emissions, fuel consumption and fuel cost savings.

The minimum annual traveler information benefits ( extracted from the companion C470 DRCOG ITS Pool Project Benefits spreadsheet – 60 second travel time savings/30 second delay savings category) to vehicles and travelers operating during the weekday peak period are as follows:

- CO Reduction (lbs./year) 32,288
- Vehicle Hour Travel Savings 60,913
- Person Hour Travel Savings 67,004
- Person Hour Travel Cost Savings \$1,386,068
- Fuel Consumption Reduction Cost Savings \$46,050
- Total Person Hour/Fuel Reduction Cost Savings \$1,386,118

As stated 50% of the vehicle and traveler weekday peak period volume, which was calculated at 40% of total ADT, was assigned traveler information benefits. This translates into 20% of the total ADT, which we believe is both reasonable and conservative based on two studies. A European study showed that 30% to 90% of travelers noticed VMS and 40% said they changed their route as a result of the VMS (1). The University of Wisconsin conducted a driver survey regarding traveler information on VMS on the roadway. The survey results showed that about 70% said they adjusted their travel time based on information provided on the VMS (2).

#### **4. Incident Management Benefits**

As mentioned, the Incident Management category benefit only applied to 15% of the vehicles and travelers during an incident that resulted in a full roadway closure, which for C-470 was both lanes in the direction of travel. Two main benefit components of travel time and delay savings were calculated using the combined delay savings to response time and incident reduction time and applied as a benefit to the vehicles and travelers only for the number of incidents that resulted in a full roadway closures. The travel time savings value was used to calculate benefits to travelers and vehicles with respect to vehicle hour and person hour travel savings and person hour cost savings. The delay savings value was used to calculate benefits to vehicles with respect to reduction in CO emissions, fuel consumption and fuel cost savings.

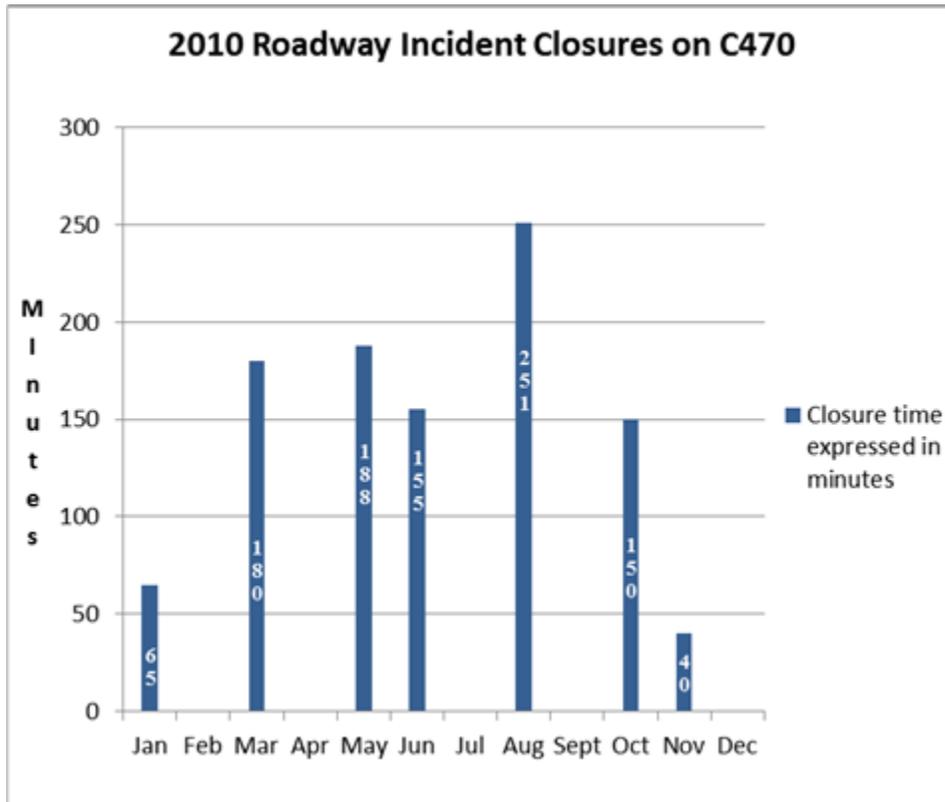
The annual incident management benefits (extracted from the companion C470 DRCOG ITS Pool Project Benefits spreadsheet) to vehicles and travelers operating during an incident that resulted in a full roadway closure are as follows:

- CO Reduction (lbs./year) 17,783
- Vehicle Hour Travel Savings 16,774

- Person Hour Travel Savings 18,452
- Person Hour Travel Cost Savings \$340,252
- Fuel Consumption Reduction Cost Savings \$25,363
- Total Person Hour/Fuel Reduction Cost Savings \$365,615

In 2010 there were 12 full-roadway closure incidents totaling 1,029 minutes (17.2 hours). The shortest closure time was 15 minutes, the longest closure time was 183 minutes and the average incident response time, which is defined as the time from initial notification of the incident to on site arrival, was 11.17 minutes. The following graph shows the total incident closure time for each month.

**Table 19: C470 Closures**



The reduction to incident response time of 42% was calculated based on three studies, which show that incident management applications can reduce incident response times from 20% to 61%. A Puget Sound study showed that incident response time was reduced by 61% (3), a Portland State Incident Response Evaluation showed that incident response was reduced by 45% (4) and a San Antonio TransGuide study (before and after implementation) showed that incident response was reduced by 20% (5) as a result of improved traffic surveillance and incident response. In addition this study showed that primary incidents were reduced by 35%, secondary incidents by 30%, weather related incidents by 40% and overall incidents by 41%. A study by the Florida Department of Transportation (6) regarding its SunGuide System showed that incident durations were decreased by 11% due to improved network surveillance and incident management response.

## **5. Total Traveler Information and Incident Management Benefits**

Total Traveler Information and Incident Management benefits is estimated to be \$1,751,733, which translates to .95 benefit/cost ratio. Total Vehicle Hour Travel and Person Hour Travel savings are 77,687 and 85,456 hours, respectively. Total CO reduction is 50,071 lbs./year and total fuel consumption reduction is 20,404 gallons/year.

However, as mentioned above, this is a very conservative estimate regarding the projected benefits. For example, traveler information benefits are attributed to only 50% of the vehicles operating during the peak weekday period estimating travel time savings of 60 seconds per vehicle per week, which is only 12 seconds per day, and delay savings of 30 seconds per vehicle per week, which is only 6 seconds per day. It is much more likely that the traveler information benefits will be much greater than this. For this reason, the spreadsheet shows a range of benefits that would be realized if the travel time savings and delay savings were 180/90 seconds and 300/150 seconds, thereby translating to total benefits of \$4,523,970 and \$7,296,247 with a benefit/cost ratio of 2.46 and 3.96, respectively. Incident Management benefits, as mentioned above, focus only on travel time savings and delay savings benefits related directly to full roadway closures. The benefits do not include other benefits, which are significant, to incidents that do not result in full-roadway closures and reduction to the number of incidents directly attributable to full network surveillance and improved incident response.

## **6. Performance Metrics to Measure Benefits**

To measure and validate the estimated traveler information and incident management project benefits, CDOT will perform the following performance measure activities:

### Traveler Information

Collect and analyze ADT and travel time data in peak period to determine and quantify effect of traveler time information on the corridor and related benefits. This will be performed before and after implementation of the project in order to identify a base line and measure improvement.

Use floating car application at to-be determined intervals and headways to collect data and determine travel time, travel time reliability and travel time predictability. This will be performed before and after implementation of the project in order to identify a base line and measure improvement.

Following project implementation, turn off real-time travel time application for a week and use floating car application to collect data and determine travel time, travel time reliability and travel time predictability, and to see if there was any degradation as a result thereof. This is a possible performance measure and depends upon the feasibility of turning off the real-time travel time application.

### Incident Management

Collect and analyze accident data including; number of incidents, closure time and response time. and compare to before and after previous period. This will be performed before and after implementation of the project in order to identify a base line and measure improvement.

Perform case studies concerning incidents to determine and quantify effect of providing incident/alternative route information on the corridor and intersecting corridors with respect to travel time savings, delay savings, incident response time and incident duration time. Two to three case studies per year will be performed.

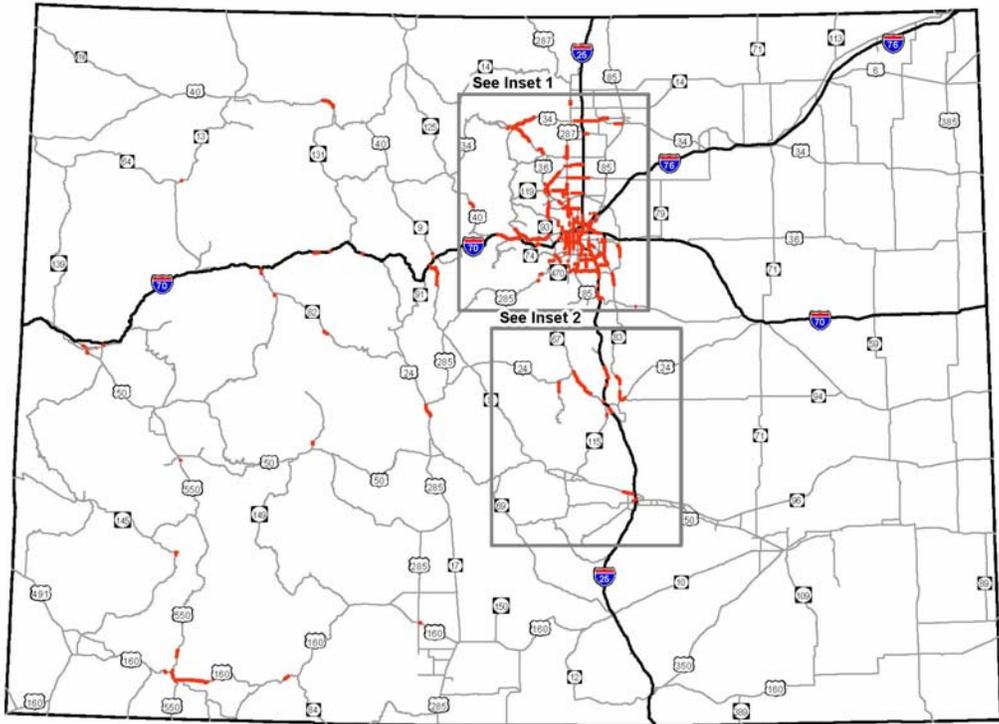
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5. Henk, R.H. *Before-and-After Analysis of the San Antonio TransGuide System*. in *76<sup>th</sup> Annual Meeting of the Transportation Research Board*. January 1997. Washington D.C.
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## Appendix C: Congested Routes on the State Highway System

Table 20: Highway Statistics Statewide

### CDOT 2010 Highway Statistics Statewide Volume-to-Capacity (V/C) Ratio $\geq 0.85$



Data Source: CDOT, IRIS2010  
www.dot.state.co.us

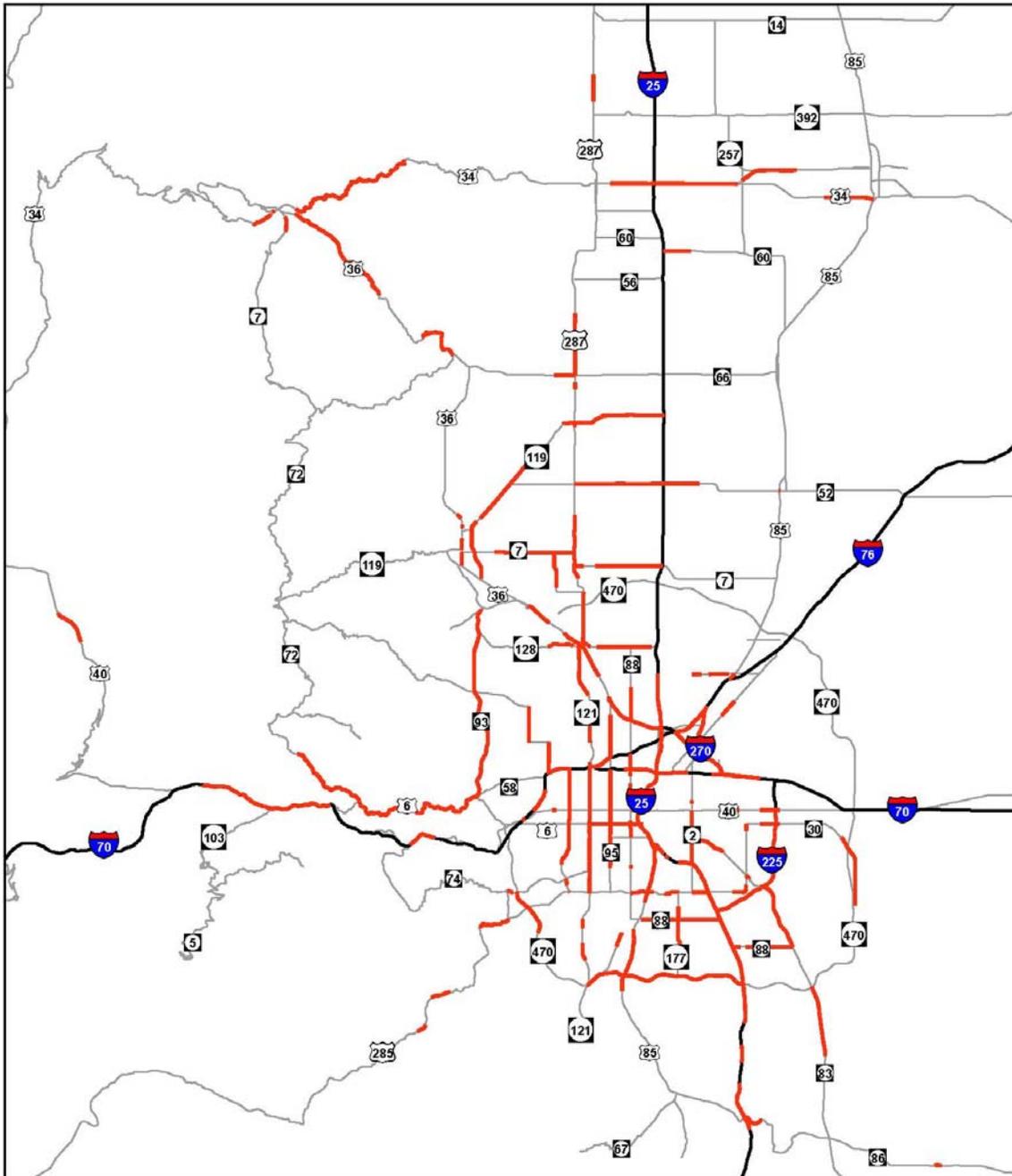


Statewide V/C Ratio  $\geq 0.85$  Totals:  
Total Centerline Miles: 492 | Total Lane Miles: 1,928



Appendix C: Congested Routes on the State Highway System  
Table 21: Highway Statistics Denver

CDOT 2010 Highway Statistics  
Inset 1: Denver Metropolitan Volume-to-Capacity (V/C) Ratio  $\geq 0.85$



Data Source: CDOT, IRIS2010  
[www.dot.state.co.us](http://www.dot.state.co.us)

1" = 10  
Miles



