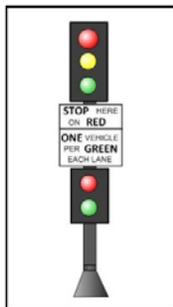


Q4 Reports for State Plan Website (October-December 2016)

SAFETY

Driver's Handbook Updates - Transportation System Management & Operations Division has been coordinating with the Colorado Department of Revenue to provide several editorial and illustrative updates to the 2017 edition of *Colorado Driver's Handbook*. Information about traction regulations, "Move Over Law," managed lanes, new signs, marijuana and driving, and new types of interchanges will be included. Also, the *Handbook* will be updated with details about how drivers can obtain information about roadway conditions. Staff from the Public Information Office and the Office of Transportation Safety assisted in compiling the information. CDOT provided these illustrations of more modern signals for the handbook, as well as others:



Ramp Meter



Sample VMS Message

Safety Funding - Traffic and Safety Engineering Branch at CDOT headquarters worked on some phase of safety funding in the last quarter of 2016. During October-December, the Branch prepared for the next round of applications for the Local Agency Safety Studies Program. The program gives smaller municipalities the opportunity to receive "personalized" traffic engineering assistance, and five smaller towns will be selected. Also, the Branch recently received applications for safety project funding assistance through the recurring federal Highway Safety Improvement Program (HSIP). In early 2017, CDOT Region and HQ traffic engineering offices will evaluate the individual projects and prioritize project funds over the coming construction seasons as requested by the local agencies.

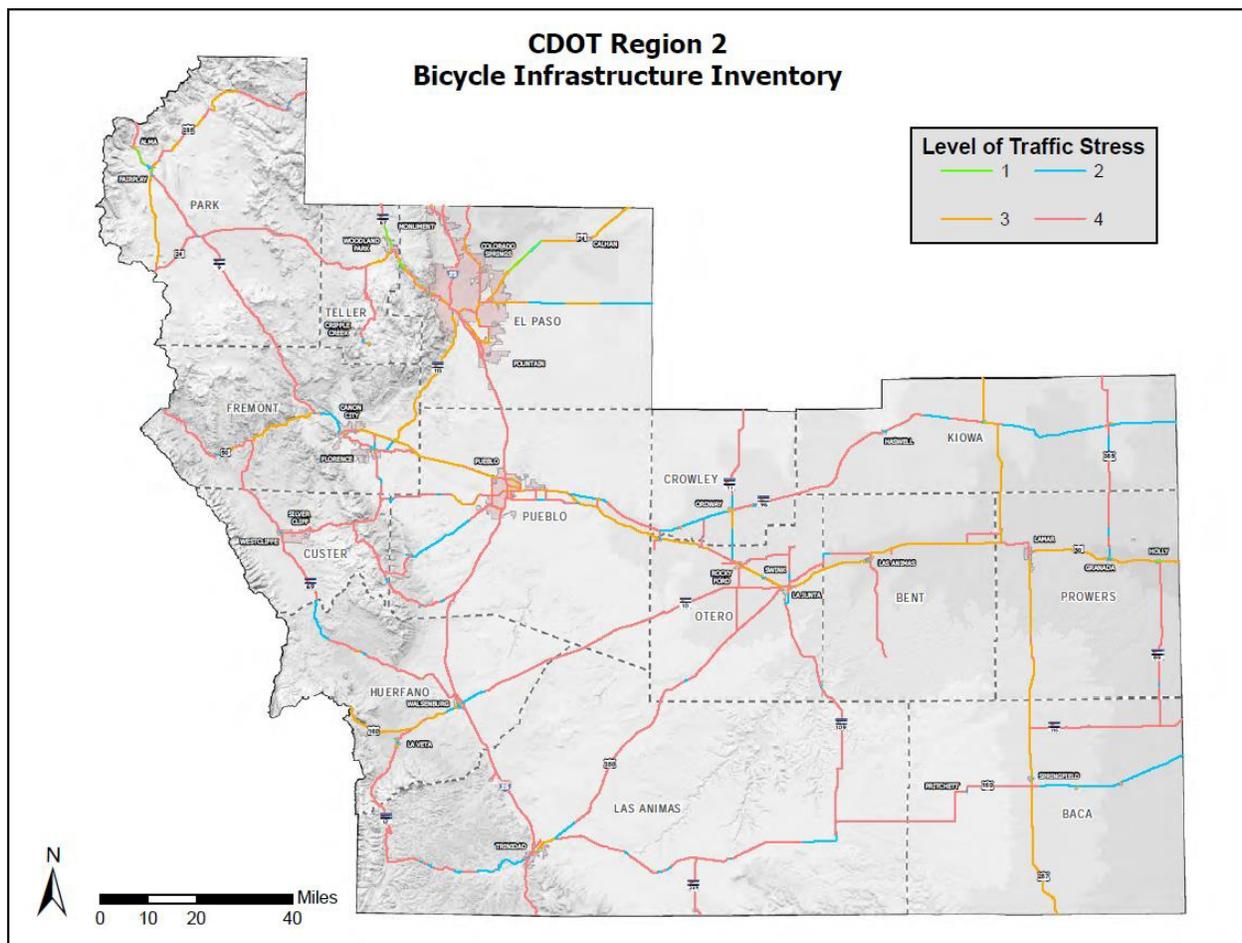
MOBILITY

Bike/Pedestrian Inventory - The Bicycle/Pedestrian/Scenic Byways Section completed the CDOT Region 2 bicycle and pedestrian inventory pilot this fall and will be utilizing the format to begin conducting similar inventories in the other four CDOT Regions. The purpose of the inventory is to gain a fuller picture of the presence of bike and pedestrian facilities adjacent

to, crossing, or in state highway rights of way. The inventory considered two types of bicycle friendliness measurements:

- Bicycle Level of Service (BLOS)- Rates friendliness based on such things as width of facility, pavement condition, amount of vehicular traffic, percentage of truck traffic, and vehicle speed.
- Level of Traffic Stress (LTS) - Rates friendliness based on the perceived stress a user experiences when using the facility by considering things like the overall size of the roadway and the level of separation from vehicular traffic.

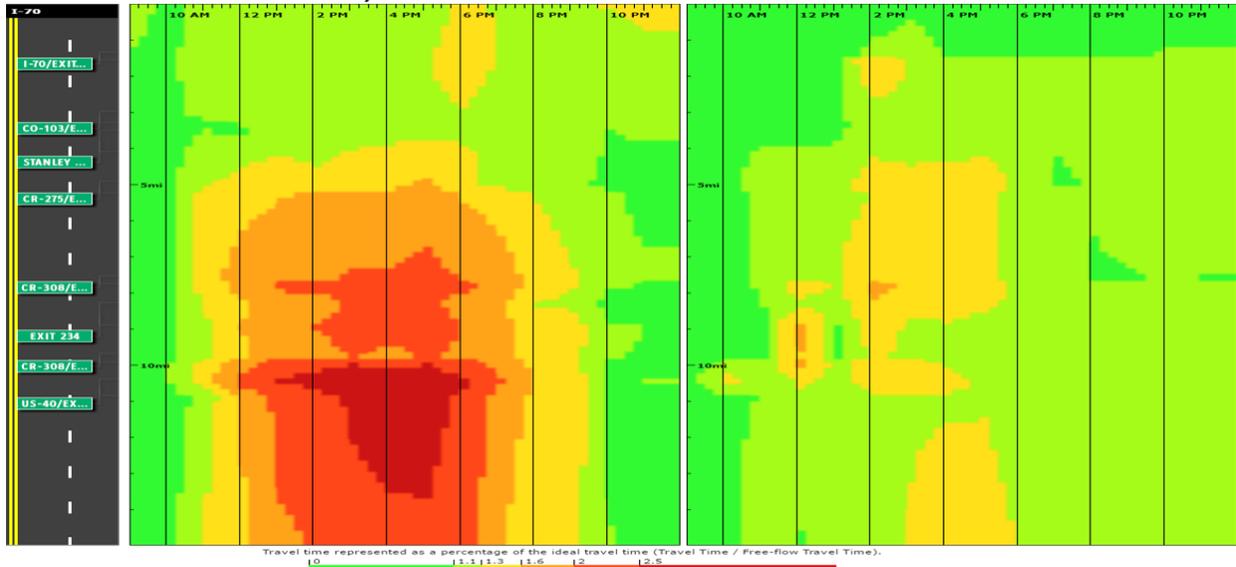
These two methods of measurement don't always align with each other. A facility providing an excellent LTS score, for example, may be a two-lane roadway with wide shoulders and low traffic levels, but one that is heavily used by trucks. Since the percentage of truck traffic is not considered in the LTS calculation, this score may not accurately reflect bicycle friendliness. Conversely, a roadway with low traffic volumes but high speeds may appear friendly according to the BLOS calculation but present a rather stressful situation to bicyclists. CDOT is still analyzing the information collected, but it is likely that a combination of both methodologies will be used to evaluate friendliness.



Level of Traffic Stress - This Level of Traffic Stress map for CDOT Region 2 shows the highways with high stress for bicyclists as red; medium, gold; low, blue; and little or no stress, green. (Map courtesy of CDOT Bike-Pedestrian-Scenic Byways Section)

Express Travel - [I-70 Eastbound Mountain Express Lane](#) launched successfully in late 2015, and in 2016 has improved holiday afternoon travel times by 26 percent, and evening peak travel times by a whopping 52 percent.

Travel Time Index (Eastbound Sundays on I-70 from Milepost 228-243, Georgetown to Veterans Memorial Tunnel)



Heat Map - In this “heat map” chart, the areas where traffic speeds slow are shown in red. The box on the left indicates areas of significant congestion before the I-70 eastbound mountain express lane was constructed. The box on the right shows post-completion improvements in travel speeds (shown in green) where congestion used to occur. (Chart courtesy of CDOT High Performance Transportation Enterprise)

The status of other planned and existing express lane projects is:

- U.S. 36 reached substantial completion and Phase 2 tolling began in March 2016. U.S. 36 is demonstrating peak hour travel time improvements of 20-29 percent.
- In July, North I-25 tolls began on Segment 2 and completion of financing and groundbreaking on Segment 3 took place. Advance planning is going forward for improvements on Segments 7 and 8. Segment 2 is from Milepost 217 (US 36 intersection) to MP 223 (120th Avenue); Segment 3 is from MP 223 (120th Avenue) to MPO 229 (SH 7); Segment 7 is from MP 255 (SH 402) to MP 259 (Crossroads Boulevard); and Segment 8 is from MP 259 (Crossroads Boulevard) to MP 269 (SH 14). Refer to the I-25 map, below.



Corridor Segments Handout (2).pdf

- C-470 broke ground for new Express Lanes in August, celebrating the start of highway reconstruction to serve more than 100,000 motorists per day in a highly congested corridor.

Webinar Highlights Mobility Options - On December 6, CDOT's Division of Transportation Development and Office of Government Relations co-hosted a webinar entitled *Together We Go: The Current State of Transportation in Colorado* for the Colorado Municipal League (CML). The webinar provided CML members information on the 2040 Statewide Transportation Plan, the current state of transportation in Colorado, and recent mobility innovations such as opening of the I-70 Eastbound Mountain Express Lane and the RoadX initiative to begin employing technology-enabled congestion relief and safety improvements. The full audio from the webinar can be found at: [http://www.cml.org/Issues/Transportation/2016-12-06-\(recording\)-Together-We-Go--The-Current-State-of-Transportation-in-Colorado/](http://www.cml.org/Issues/Transportation/2016-12-06-(recording)-Together-We-Go--The-Current-State-of-Transportation-in-Colorado/)

Bustang Ridership Still Growing - Ridership of CDOT's interregional bus service on I-25 and I-70 continues to grow, with ridership up 72 percent from a year ago, according to a quarterly report given to the Transportation Commission on Jan. 18 for October-December 2016. Bustang had a total of 73,380 system passengers and a 52 percent increase in fare box recovery. Included in the overall figures are:

- The Rams Route (from Colorado State University in Fort Collins to Denver Union Station, leaving CSU on Friday afternoons and returning Sunday) was 84 percent full for the last semester and had a 123 percent fare box recovery.
- The Bustang routes to football games of the Denver Broncos had a 109 percent fare box recovery. Tickets for the Bustang service for the Broncos is \$30 roundtrip. The two-game pilot was extended to five games. Next year will be the first full season for the service, as well as for the Rocky Mountain Showdown (the CSU and CU-Boulder game at the stadium).



Bustang Buzz - Word is getting out about the I-25 and I-70 interregional bus service CDOT provides through a vendor, with the result that ridership is way up over the previous year. (CDOT Photo)

ECONOMIC VITALITY



Big Impact – This scene is from Mt. Evans Scenic Byway, which accounted for about one quarter of the economic impact of all the 26 byways in Colorado. (CDOT Photo)

Byways Contribute to Economy - Colorado's 26 scenic and historic byways contributed nearly \$800 million in economic impact annually to the state's economy from 2009 to 2014,

according to the CDOT *Colorado Byways Economic Data Analysis* released in November. The economic impacts come from visitors who spent money in communities along the byways. Scenic byways supported nearly 4,000 jobs throughout the state. The Mount Evans Scenic Byway accounted for about a quarter of all economic impacts during the 5-year study period. The economic impact report can be viewed on the [scenic byways website](#) under Links and Resources.

The National Scenic Byways celebrated its 25th anniversary in December. Colorado established its program via an executive order signed on March 16, 1989, by Gov. Roy Romer that created the Scenic and Historic Byways Commission. The national program began with the signing of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1999. ISTEA provided grant money for management plans and amenities along the scenic byways. The program's discretionary funding continued through 2012, prior to Moving Ahead for Progress (MAP-21) and Fixing America's Surface Transportation (FAST) Act. The two acts did not include discretionary federal funding for byways.

MAINTENANCE

I-70 Pilot Gets Underway - In September, CDOT began a pilot project to assess the risk and resiliency of I-70 across the state, from Kansas to Utah, to better prepare for the risks of floods, fire, rock fall, and other physical events.

The method that will be employed was developed as part of the program to recover from the floods of 2013 and was most recently used for the rock fall in Glenwood Canyon to analyze potential mitigation measures. The 12-month pilot will provide quantified risk and resilience information for assets on I-70 to assist in prioritizing projects at key locations where risk is high and resilience is low. If successful, the pilot can be applied to future asset management, project prioritization, and maintenance practices in critical corridors around the state. I-70 was selected for the pilot due to diversity of terrain, environmental constraints, statewide significance, and its rural, recreational, and urban character, among many other reasons. For more information, please see the [document](#) presented to the Transportation Commission in September.



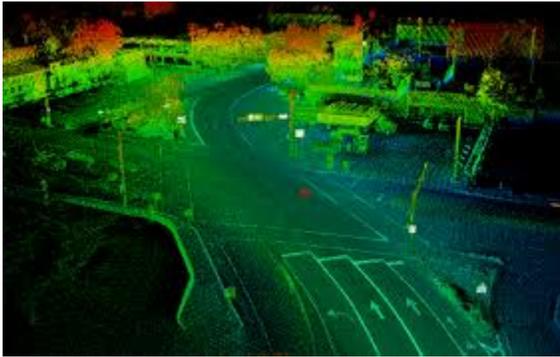
I-70 at Dusk - Its varied topography, from plains to mountains, and importance to the state's economy make I-70 a logical choice for a risk and resiliency pilot project. (CDOT Photo)

Internal Highway Maintenance Improvements - The CDOT Division of Highway Maintenance is undertaking a number of improvements to its business processes that may help the division deal with maintenance issues sooner and faster. The improvements include:

- **Mobile Solutions** - In November, the division kicked off a project that will make it possible for maintenance personnel to report on work they're doing from the field; do mapping that models the roads and associated assets such as signs, guardrails, and culverts; and implement a geographic information system (GIS) software that will work with CDOT's current GIS software to ensure accuracy and consistency of data.
- **Maintenance Levels of Service** - In October, the division began the Maintenance Levels of Service (MLOS) SAP Integration project that takes the findings of the budget model analysis portion of the Optimization Project and incorporates the needed improvements into the budgeting system. The performance-based budgeting system, called MLOS, allocates the Maintenance budget throughout the state and reports on performance through CDOT's Asset Management program. During October, November and December, the Office of Information Technology technical experts and the division's subject matter experts completed knowledge transfer and started designing the new budget system.



- Asset Inventory - During October, November and December, division employees finished collecting wall inventory and condition assessments, part of an effort that began in 2015 to update current inventory data. Division employees collect inventory through handheld devices while contractors collect inventory data remotely from videos and a technique called LiDAR. (LiDAR is a remote sensing method, short for light detection and ranging. The data is often collected by air.) However, some assets must be viewed on site, particularly those that aren't that visible from the roads, such as pipes and culverts. The asset inventory began with collecting data on guardrails, followed by culvert information. More than 43,000 culverts were inventoried and conditions assessed throughout the state.



LiDAR – This artist's depiction shows how data on highway transportation assets is collected. (Illustration courtesy of CDOT Division of Highway Maintenance)



Bridge Inspection – CDOT employees inspect a bridge, one of the asset condition inspections that can't be done by air. (Photo courtesy of CDOT Division of Highway Maintenance)