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DATE: September 19, 2016
TO: Statewide Transportation Advisory Committee
FROM: Debra Perkins-Smith, Director, Division of Transportation Development
SUBJECT: Policy Directive 14 Performance and Suggested Changes

Background
PD 14 provides a framework for development of the Statewide Transportation Plan (SWP) and guides the distribution of resources in the SWP, the Statewide Transportation Improvement Program (STIP), and the annual budget. To better align budget setting with PD 14, the Transportation Commission is annually reviewing the performance of PD 14 objectives to determine if there is a need to modify objectives or realign resources in an effort to meet an objective(s).

Details
Explanations of Performance
The attached PD 14 Scoreboard graphically summarizes performance of PD 14 objectives for the current and prior year. Since most performance measures generally lag by roughly a year, the current performance year is 2015. The scorecard also includes information on the dedicated funding sources and funding levels associated with each objective. The notes column provides additional background, technical details, and recommended next steps, where applicable.

Safety: With one exception, safety objectives were not met in 2015. An increase in fatalities and serious injuries can be partially attributed to an increase in vehicle miles traveled (VMT) of approximately 3% between 2014 and 2015. However, objectives for the rate of fatalities and serious injuries were also not met. Additionally, objectives for bike and pedestrian fatalities and serious injuries were not met. This is likely the result of an increase in VMT and bike/ped activity, and possible growth in distracted driving.

System Performance: CDOT changed highway traffic speed vendors in 2015. Although fundamentally the same type of data, some modifications to methodology and reporting are required, which results in changes to the Planning Time Index (PTI) objectives. Numbers for 2014 have been reported using the new dataset to provide a reasonable comparison. The data shows an improvement from 2014, however, additional data is needed to determine if this is a trend, or variation year to year. Despite the improvement from 2014, objectives for Interstates and NHS continue to not be met. The improvement from 2014, however, did result in achievement of the objective for Colorado Freight Corridors. Transit system performance data is based on data from the National Transit Database, which is currently lagging by about two years. As such, 2015 performance data is not yet available and will be included in next year's report.

Infrastructure Condition: In general, infrastructure condition performance for highway assets remained relatively consistent with 2014 performance, with the most significant changes seen in Drivability Life (DL), geohazards, traffic signals, and walls. Objectives for maintenance, tunnels, culverts, and transit were met, performance was mixed on bridge and highway, and objectives were not met on buildings, ITS, fleet, geohazards, traffic signals, and walls. On the surface, DL for the NHS seems to have improved from 2014 to 2015. The apparent improvement is due to a change in the equation used to calculate the International Roughness Index (IRI). This change affects non-interstate asphalt highways (a majority of CDOT-owned facilities), and the apparent improvement is not expected to continue in the long term. The change in geohazards is based on a program evolving from rockfalls to a more holistic geohazard management plan that includes rock falls, landslides, and other geologic events. With respect to transit, the condition of the rural transit fleet in fair, good, or excellent condition increased from 65% to 81%. The increase is likely the result of improved data collection, as well as changes to grant selection processes that prioritize the replacement of older, higher mileage vehicles.

Proposed Changes
Staff has identified several proposed changes to PD 14. Changes reflect refinements and clarifications to existing objectives, technical modifications such as the changes to PTI, and changes to align with recent federal performance measure rulemaking. The proposed changes are highlighted in red in the first column of Attachment A. Proposed changes include:

System Performance
- Highways: Recommend changing the objectives (to align with new speed data) to: a PTI of 1.05 or less on 90% or greater on Interstate centerline miles; a PTI of 1.16 or less on 90% or greater of NHS centerline miles, excluding Interstates; and a PTI of 1.12 or less on 90% or greater of Colorado Freight Corridor centerline miles.

- Transit Connectivity: Clarify current objective by qualifying as "CDOT funded" passenger service.

Infrastructure Condition:

- Geohazards: Recommend changing "% of sites" to "% of segments" to correspond with new FHWA standards. This also requires a revision in the target from 60% to 80% in year 2015.

- Transit Asset Condition: Recommend changing to "CDOT completion of a group transit asset management plan, with the involvement and participation of CDOT transit grantees, by December 2017." This change is due to new federal regulations requiring a statewide transit asset management plan, not individual asset management plans by each transit grantee.

- Tunnels: Recommend changing to "Percentage of network tunnel length with all elements in equal or better condition than 2.5 Weighted Condition Index." The proposed objective is based on recommendations for safe and reliable tunnel operations from the recently published National Tunnel Inspection Standards.

- Walls: Recommend changing to "Percentage of CDOT-owned walls, by square foot, that are structurally deficient (have a rating of 4 or less)." This is recommended to better align with the performance metric of other structural assets, like culverts and bridge.

Next Steps

- Action on updated PD 14 at October Transportation Commission meeting
- Consideration of PD 14 in development of FY 2018 CDOT Budget

Attachments

- 2015 PD 14 Scorecard

2015 Policy Directive 14 Scorecard

-Revised 9/13/2016-

Safety

All Highways

PD 14.0 Objectives	2015 Budget	2015 Target	2015 Results	2015 Target Met?	2014 Budget	2014 Target	2014 Results	2014 Target Met?	Dedicated Funding Sources*	Notes
Reduce fatalities by 12 per year from 548 in 2008 to 344 in 2025	$97.4 million	464	547		$128.1 million	476	488		FASTER Safety HSIP Highway Safety Education Hot Spots	The increase in fatalities can be largely explained by a 3% increase in VMT between 2014 and 2015. The FAST Act doesn't require state DOT establishment of safety targets until August 2017. The FAST Act also requires a rolling five-year average for the safety objectives, or targets, not annual objectives, also in August 2017. The reduction in dedicated funding between 2014 and 2015 is due to a shift in a portion of FASTER Safety funds to asset management programs that have a clear safety benefit (geohazards, signals, tunnels, culverts, and surface treatment). Beginning in FY 15, $40 M of FASTER Safety funds was allocated to asset management. The likelihood is that overall funding to safety related projects or project components has not changed significantly year to year. Because a third of our fatalities involve occupants not wearing seat belts, significant numbers of lives could be saved if Colorado had a primary seat belt law. Recommended next steps - continued improvement and application of safety analysis, and more strategic use of safety funding for safety projects. The SHSP identified eight strategic emphasis areas for CDOT, as well as other safety stakeholder agencies, to focus safety improvement efforts. In CDOT's dedicated safety programs, HQ and Regions are collaborating to use state of the art safety analysis techniques to find the most effective locations for crash reduction, and fund those projects in a strategic four-year plan. (SHSP)
Reduce the fatality rate per 100 million VMT by 0.02 per year from 1.03 in 2013 to 0.79 in 2025		0.99	1.085			1.01	1.00			
Reduce the serious injuries by 90 per year from 3,200 in 2013 to 2,120 in 2025		3020	3199			3110	3217			
Reduce the serious injury rate by 0.2 per 100 miliion VMT per year from 6.86 in 2013 to 4.46 in 2025		6.46	6.34			6.66	6.57			
Reduce the economic impact of crashes annually by 1% over the previous calendar year		$4.52 B	$4.81 B			$4.57 B	$4.71 B			
Bike & Pedestrian										
Reduce the number of bicyclist and pedestrian fatalities involving motorized vehicles, from 67 in 2013 to 47 in 2015	N/A	64	78		N/A	65	75		N/A	The increase in bike and pedestrian fatalities and serious injuries is likely the result of an increase in VMT and bike/ped activity, and possible growth in distracted driving. Recommended next steps - implement PD 1602.1 as a means to incorporate bicycle and pedestrian accomodation in all that we do. Work to identify High Priority Bicycle Corridors so that bicyclists have a better understanding of which facilities are best for riding. Evaluate the Share the Road Program and develop strategies to help all road users better understand the responsibilities as motorists, bicyclists or pedestrians. Map the locations of crashes involving bicyclists amd motorists to determine if there are any patterns in the facility types where these crashes have occured. Determine if certain facility types need replacement or modification for greater safety of all users.
Reduce the number of bicyclist and pedestrian serious injuries involving motorized vehicles from 469 in 2013 to 311 in 2025		443	482			456	478			

System Performance

Highways

PD 14.0 Objectives	2015 Budget	2015 Target	2015 Results	2015 Target Met?	2014 Budget	2014 Target	2014 Results	2014 Target Met?	Dedicated Funding Sources*	Notes
Prevent the spread of congestion by maintaining a Planning Time Index (PTI) of 1.05 or less on 90% or greater of Interstate centerline miles	$36.0 million	90%	85.4%		$20.2 million	90%	82.1%		ITS Maintenance ITS Investments TSMO Performance Program Congestion Relief	CDOT changed highway traffic speed vendors in 2015, resulting in a change to PTI objectives. The original PTI numbers were 1.25 or less for Interstates and for Colorado Freight Corridors centerline miles and 1.08 or less for NHS centerline miles. The data shows an improvement from 2014, however, additional data is needed to determine if this is a trend of variation year to year. In FY17, $12.1 million was allocated to the budget program, Road X, which will implement new technologies with the potential to reduce traffic congestion. Recommended next steps - continued deployment of operational solutions, new technology, targeted capacity improvements, and other strategies.
Prevent the spread of congestion by maintaining a PTI of 1.16 or less on 90% or greater of National Highway System (NHS) centerline miles, excluding Interstates		90%	88.5%			90%	87.5%			
Prevent the spread of congestion by maintaining a PTI of 1.12 or less on 90% or greater of Colorado Freight Corridor centerline miles		90%	91.6%			90%	85.5%			
Transit										
Increase ridership of small urban and rural transit grantees by at least an average of 1.5%, per year, statewide over a five-year period beginning in 2012	$42.1 million	22,127,177	N/A	N/A	$38.0 million	21,800,174	22,306,420		FTA Programs FASTER Transit	Ridership targets are generated from a compounding 1.5% increase from the base ridership in 2012 of 21,160,595. The target at the end of the five year period, in 2017, is a ridership of 22,795,970, a 7.7% increase from 2012 ridership. Ridership and revenue service mile results come from the National Transit Database. FY15 ridership data and revenue service miles data is anticipated in November 2016. Recommend next steps - Divison of Transit and Rail (DTR) to work with the small urban and rural transit grantees with a new funding allocation methodology, which will accommodate new transit providers and maximize the ridership achieved with available funding. Retain an on-call consultant to assist with revenue service miles data collection, among other tasks.
Maintain or increase the total number of revenue service miles of CDOT-funded regional, inter-regional, and inter-city passenger service over that recorded for 2012		N/A	N/A	N/A		N/A	N/A	N/A		

Infrastructure Condition

Transit

PD 14.0 Objectives	2015 Budget	2015 Target	2015 Results	2015 Target Met?	2014 Budget	2014 Target	2014 Results	2014 Target Met?	Dedicated Funding Sources*	Notes
Maintain the percentage of vehicles in the rural Colorado transit fleet at no less than 65% operating in fair, good, or excellent condition, per Federal Transit Administration Guidelines	$42.1 million	65%	81%*		$38.0 million	65%	65%		FTA Programs FASTER Transit	*The 2015 results for percentage fleet operating in fair, good, or excellent condition is the current condition as of August 2016. The increase from 2014 to 2015 is partially due to 1) 2015 being the first year grant partners were asked to provide vehicle condition data, and 2) a grant selection process that strategically prioritizes replacing older and higher-milage vehicles. Recommended next steps - DTR to continue to encourage rural Colorado transit agencies to update inventory and condition of their fleet annually, according to the Federal Transit Administration (FTA) guidelines on age and mileage of vehicles. Complete group transit asset management plan by December 2017.
CDOT completion of a group transit asset management plan, with the involvement and participation of CDOT transit grantees, by December 2017		N/A	On Track	N/A		N/A	On Track	N/A		
Highways										
Achieve 80% High/Moderate Drivability Life for Interstates based on condition standards and treatments set for traffic volume categories	$235.2 million	80%	91%		$238.8 million	80%	89%		Surface Treatment Program RAMP Funding	In FY15 pavement is expected to achieve 91% high/moderate DL on Interstates, 84% high/moderate DL for NHS, and 79% high/moderate DL for all state highways. The primary reason for an uptick in condition is a change to the equation used to calculate our International Roughness Index (IRI), specifically for non-Interstate asphalt highways (which is a majority of our facilities). It should be noted that the forecast shows that these levels of DL are not maintainable over time. Recommended next steps - staff will work to improve/tighten the link between pavement maintenance and pavement model recommendations, and evaluate the effect of pavement preventive maintenance on DL to identify strategies.
Achieve 80% High/Moderate Drivability Life for NHS, excluding Interstates, based on condition standards and treatments set for traffic volume categories		80%	84%			80%	78%			
Achieve 80% High/Moderate Drivability Life for the state highway system based on condition standards and treatments set for traffic volume categories		80%	79%			80%	73%			
Bridges										
Maintain the percent of NHS total bridge deck area that is not structurally deficient at or above 90%	$168.2 million	90.0%	94.85%		$160.1 million	90.0%	94.95%		Colorado Bridge Enterprise On-System Bridge RAMP Funding	A structurally deficient bridge is typically one where corrosion or deterioration has resulted in a portion of the bridge being in poor condition; for example, where water leaking through an expansion joint has caused the end of a steel girder to rust. Currently exceeding target and will continue to exceed target through 2025; however, the bridge program has 7 metrics geared towards mitigation of risk (below), and four of those are not achieving their target. (% of CDOT-owned bridges over waterways that are scour critical, % of CDOT-owned bridges posted for load, % of leaking expansion joint by length on CDOT-owned bridges, and % of CDOT-owned bridge deck area that is unsealed or otherwise unprotected.) Recommended next steps - for the four risk mitigation metrics not achieving their target, staff are undertaking analysis to identify additional strategies. Current strategies include identifying bridges that can easily be repaired or remedied with the most cost-effective treatment.
Maintain the percent of state highway total bridge deck area that is not structurally deficient at or above 90%		90.0%	94.49%			90.0%	94.42%			
Percentage of CDOT-owned bridges over waterways that are scour critical		5.0%	6.6%			5.0%	7.1%			Scour critical bridges are at risk of failure during a storm event of sufficient size. A total estimated annual budget of $3.9 million is needed each year to achieve target by 2025.
Percentage of bridge crossings over Interstates, U.S. routes and Colorado state highways with a vertical clearance less than the statutory maximum vehicle height of 14 feet-6 inches		0.4%	0.4%			0.4%	0.4%			A bridge with a vertical clearance less than 14'-6"-- statutory maximum vehicle height--has a high risk of being hit by a tall load or legal load. A total estimated annual budget of $3.6 million is needed each year to achieve target by 2025.
Percentage of bridge crossings over Interstates, U.S. Routes and Colorado state highways with a vertical clearance less than the minimum design requirement of 16 feet-6 inches		4.8%	4.8%			4.8%	4.8%			16'-6" is the minimum clearance used when designing new bridges over a roadway. A bridge with a vertical clearance less than 16'-6" but greater than or equal to 14'-6" has a medium to high risk of being hit by a tall load. A total estimated annual budget of $44.2 million is needed each year to achieve target by 2025.
Percentage of CDOT-owned bridges posted for load		0.0%	0.1%			0.0%	0.1%			Vehicles meeting the legal load limits (as defined in C.R.S. 42-4-502 - 42-4-504) can travel on Colorado Interstates, US and State Highways without an approved permit. Our older bridges may need to be posted since some of these bridges were not designed for legal loads. Load posted structures impact mobility by restricting both legal and permitted loads. A total estimated annual budget of $3.2 million is needed each year to achieve target by 2025.
Percentage of CDOT-owned bridges with a load restriction		3.0%	2.5%			3.0%	2.6%			Permit loads (as defined in the Colorado Bridge Weight Limit Map/CDOT Bridge Rating Manual) are typically heavier and longer than the legal loads and require an approved permit in order to travel on Colorado highways. Our older bridges may need to be restricted for passage since some of these bridges were not designed for permit loads. Permitted loads have a certain combination of axle weight and spacing that distributes the load in an acceptable combination for crossing over structures. A total estimated annual budget of $11.8 million is needed each year to achieve target by 2025.
Percentage of leaking expansion joint by length on CDOT-owned bridges		15.0% or less	18.9%			15.0% or less	18.8%			Leaking expansion joints allow water and deicing chemicals onto superstructure and substructure elements which can accelerate corrosion and lead to early onset of a structural deficiency. Keeping expansion joints sealed slows the rate of bridges dropping into structurally deficient. A total estimated annual budget of $37.3 million is needed each year to achieve target by 2025.
Percentage of CDOT-owned bridge deck area that is unsealed or otherwise unprotected		30.0% or less	35.1 %			15.0% or less	31.0%			Unsealed bridge decks deteriorate faster than sealed bridge decks. A total estimated annual budget of $14.7 million is needed each year to achieve target by 2025.

Infrastructure Condition

Buildings

PD 14.0 Objectives	2015 Budget	2015 Target	2015 Results	2015 Target Met?	2014 Budget	2014 Target	2014 Results	2014 Target Met?	Dedicated Funding Sources*	Notes
Statewide letter grade (Percent C or better)	$20.8 million	90%	80%		$11.3 million (revised)	90%	86%		Property Allocation Program RAMP Funding	Given the current planning budgets, buildings will not achieve its target between now and 2025, the last year of the analysis. In 2025 the expected performance is 72%. A total estimated annual budget of $50 million is needed each year to achieve target by 2025. Recommended next steps – staff will improve awareness of preventive maintenance as a priority, and determine level of funding needed for building preventive maintenance.

ITS

PD 14.0 Objectives	2015 Budget	2015 Objective	2015 Results	Objective Met?	2014 Budget	2014 Objective	2014 Results	Target Met?		
Average Percent Useful Life	$27.6 million	90% or less	114%		$16.2 million	90% or less	126%		ITS Maintenance RAMP Funding	Given the current device count, ITS is anticipated to reach its target in 2020 and then hover around it through 2025. However, by 2020 the number of devices will likely double and dramatically increase further by 2025 due to CDOT's participation in fast-paced technology applications to highway infrastructure. Such rapid asset increases will have an impact on overall performance. Recommended next steps – staff to refine inventory by breaking down devices into manageable maintenance pieces that can be tracked individually for cost savings advantages. Staff will also investigate the benefits of preventive maintenance for select devices, and further refine device useful life parameters by tracking asset service life to compare to manufacturer estimates.

Fleet

Average Percent Useful Life	$14.0 million	70% or less	90%		$14.2 million	70% or less	97%		Road Equipment Program RAMP Funding	Given the current planning budgets, fleet is expected to reach its target by 2020, though it is is expected to drop off in 2025 Recommended next steps – staff will communicate the importance of fleet planning and develop Regional fleet optimization recommendations, develop a fleet performance measure that reflects cost effectiveness rather than asset life, and monitor implementation of fleet preventive maintenance work orders.

Culverts

Percent of culverts that have a Structurally Deficient rating of 4 or less	$9.6 million	5%	4%		$11.5 million	5% or less	3%		Structures On-System RAMP Funding	This metric is expected to reach 6.4% by 2025. A total estimated annual budget of $10 million is needed each year to achieve target by 2025. Recommended next steps – staff are undertaking analysis to identify strategies.

Geohazards

Percent of segments at or above risk grade C	$9.1 million	80%	78%		$5.2 million	60%	47%		Rockfall Mitigation RAMP Funding	Given the current planning budgets, geohazards is not expected to meet its target between now and 2025, with an expected performance of 72% in 2025. A total estimated annual budget of $30 million is needed each year to achieve target by 2025. Recommended next steps – staff are undertaking analysis to identify strategies.

Tunnels

Percentage of network tunnel length with all elements in equal or better condition than 2.5 Weighted Condition Index	$12.4 million	80%	91%		$7.4 million	N/A	N/A	N/A	Structures On-System RAMP Funding	Tunnels are expected to be at 78% by 2025. A total estimated annual budget of $40 million is needed each year to achieve target by 2025. 2014 data is unavailble, since this is a new proposed objective for which data was not previously collected. Recommended next steps – staff are undertaking analysis to identify strategies.

Traffic Signals

Percent intersections with at least one component beyond 100% Useful Life	$1.5 million	15% or less	27%		$1.5 million	15% or less	52%		Traffic Signals Program	Given the current planning budgets, signals will not reach its target of 15% between now and 2025, the last year of the analysis. A total estimated annual budget of $35 million is needed each year to achieve target by 2025. Recommended next steps – staff are undertaking analysis to identify strategies.

Walls

Percentage of CDOT-owned walls, by square foot, that are structurally deficient (have a rating of 4 or less)	$0.0 miliion	1%	5%		$0.0 million	1%	1%		Structures On-System RAMP Funding	Walls are expected to be at 3.2% by 2025. A total estimated annual budget of $15 million is needed each year to achieve target by 2025. Recommended next steps – staff are undertaking analysis to identify strategies.

Maintenance

PD 14.0 Objectives	2015 Budget	2015 Target	2015 Results	2015 Target Met?	2014 Budget	2014 Target	2014 Results	2014 Target Met?	Dedicated Funding Sources*	Notes
Maintain a LOS B grade for snow and ice removal	$74.3 million	B	B		$69.6 million	B	B		Snow and Ice Control Snow and Ice Reserve	The MLOS system is undergoing a review by a consultant and will be modified over the next couple of years. Recommended next steps – staff will evaluate maintenance design options based on life-cycle cost considerations and update standards, develop a preventive maintenance tool kit, and establish a funding program for preventive maintenance activities.
Maintain an overall MLOS B minus grade for the state highway system	$251.3 million	B-	B-		$249.0 million	B-	B-		Maintenance	

*** Additional flexible funding sources with a wide range of eligibility could be used to address multiple objectives. Examples include RPP, STP-M, CMAQ, and TAP**