



COLORADO

Department of Transportation

Division of Transportation Development
Performance and Asset Management Branch
Multimodal Planning Branch
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Denver, CO 80222

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

Purpose

To report on progress made towards meeting the objectives in Policy Directive (PD) 14 in the areas of Safety, Infrastructure Condition, System Performance, and Maintenance, and review suggested changes.

Action

Transportation Commission (TC) input on suggested changes to PD 14 for future TC action.

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 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).

Several workshops have been held in recent months on the performance of the asset management (or Infrastructure Condition and Maintenance) objectives. The September workshop will focus on the current performance of safety and system performance, and suggested changes for safety, system performance, and asset management.

Details

Explanations of Performance

Attachment A: 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. Attachment A 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: While objectives for the rate of fatalities and serious injuries were met, total fatalities increased in 2015, missing the objective. The increase in fatalities is largely due to an increase in vehicle miles traveled (VMT) of approximately 3% between 2014 and 2015. Objectives for bike and pedestrian fatalities and serious injuries were also 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. This transition has been completed for all three system performance measures: Planning Time Index (PTI) for Interstates, National Highway System (NHS) excluding Interstates, and Colorado Freight Corridors. 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.

Options for the TC to consider in reviewing proposed changes include:

- Make no changes. Do not update PD 14.
- Make proposed changes, with modifications. Approve updated PD 14 in October.
- Accept proposed changes as identified by staff. Approve updated PD 14 in October.

Next Steps

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

Attachments

- Attachment A: 2015 PD 14 Scorecard
- Attachment B: PD 14 as adopted in February 2015

2015 Policy Directive 14 Scorecard

Safety										
All Highways										
PD 14.0 Objectives	2015				2014				Dedicated Funding Sources*	Notes
	Budget	Target	Results	Target Met?	Budget	Target	Results	Target Met?		
Reduce fatalities by 12 per year from 548 in 2008 to 344 in 2025	\$97.4 million	464	546		\$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. 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	0.937			1.01	1.00			
Reduce the serious injuries by 90 per year from 3,200 in 2013 to 2,120 in 2025		3020	2644			3110	3217			
Reduce the serious injury rate by 0.2 per 100 million VMT per year from 6.86 in 2013 to 4.46 in 2025		6.46	3.34			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 accommodation 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 and motorists to determine if there are any patterns in the facility types where these crashes have occurred. 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				2014				Dedicated Funding Sources*	Notes
	Budget	Target	Results	Target Met?	Budget	Target	Results	Target Met?		
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. Recommended next steps - Division 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				2014				Dedicated Funding Sources*	Notes
	Budget	Target	Results	Target Met?	Budget	Target	Results	Target Met?		
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-mileage 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%	94.7%		\$160.1 million	90.0%	95.0%		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. 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. 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. 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. 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. 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. 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. 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.
Maintain the percent of state highway total bridge deck area that is not structurally deficient at or above 90%		90.0%	94.4%			90.0%	94.0%			
Percentage of CDOT-owned bridges over waterways that are scour critical		5.0%	6.6%			5.0%	7.1%			
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%			
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%			
Percentage of CDOT-owned bridges posted for load		0.0%	0.1%			0.0%	0.1%			
Percentage of CDOT-owned bridges with a load restriction		3.0%	2.5%			3.0%	2.6%			
Percentage of leaking expansion joint by length on CDOT-owned bridges		15.0% or less	18.9%			15.0% or less	18.8%			
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%			

Infrastructure Condition										
Buildings										
PD 14.0 Objectives	2015				2014				Dedicated Funding Sources*	Notes
	Budget	Target	Results	Target Met?	Budget	Target	Results	Target Met?		
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										
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 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 unavailable, 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 million	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				2014				Dedicated Funding Sources*	Notes
	Budget	Target	Results	Target Met?	Budget	Target	Results	Target Met?		
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.
Maintain an overall MLOS B minus grade for the state highway system	\$251.3 million	B-	B-		\$249.0 million	B-	B-		Maintenance	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.

* 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

COLORADO DEPARTMENT OF TRANSPORTATION		<input checked="" type="checkbox"/> POLICY DIRECTIVE <input type="checkbox"/> PROCEDURAL DIRECTIVE	
Subject			Number
Policy Guiding Statewide Plan Development			14.0
Effective	Supersedes	Originating Office	
2.27.15	14.0: 3.20.08 13.0: 12.14.06	Division of Transportation Development	

I. PURPOSE

This Policy Directive provides an overall framework for the transportation planning process through which a multimodal, comprehensive Statewide Transportation Plan will be developed and implemented. With limited funding available, the Colorado Department of Transportation (CDOT) has developed a vision for the Statewide Transportation Plan that guides investment for Colorado's multimodal transportation system and that balances:

- Preservation and maintenance, and incorporation of risk-based asset management,
- Efficient system operations and management practices,
- Capacity improvements, and
- Incorporation of safety in all areas

Policy Directive 14.0 performance objectives will guide the distribution of resources in the Statewide Transportation Plan, the Statewide Transportation Improvement Program, and the annual budget. This Policy Directive will be revised, as needed, to update performance objectives or incorporate additional goal areas.

II. AUTHORITY

23 United States Code (U.S.C.) 134, 135 and 450, PL 112-141 ("Moving Ahead for Progress in the 21st Century" or "MAP-21"), and its implementing regulations.

§ 43-1-106(8)(a), C.R.S. Transportation Commission

§ 43-1-1103, C.R.S. Transportation planning

Transportation Commission Rules Governing the Statewide Transportation Planning Process and Transportation Planning Regions (2 CCR 601-22)

III. APPLICABILITY

This Policy Directive applies to all CDOT Divisions and Regions involved in implementing the Statewide Transportation Plan in cooperation with CDOT's planning partners: the 10 rural Transportation Planning Regions and the five Metropolitan Planning Organizations.

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IV. DEFINITIONS

“Aspirational Objectives” are those objectives, or targets, toward which CDOT may strive if CDOT receives revenues beyond those projected.

“Drivability Life” is an indication in years of how long a highway will have acceptable driving conditions based on an assessment of smoothness, pavement distress, and safety. Drivability Life implements traffic volume based categories, and associated category drivability condition standards and allowed pavement treatments. Unacceptable driving condition is specific to each traffic volume based category and means drivers must reduce speeds to compensate for poor conditions, navigate around damaged pavement, or endure intolerably rough rides. The Risk-Based Asset Management Plan identifies three categories of Drivability Life: High (greater than 10 years of Drivability Life remaining); Moderate (4-10 years); and Low (3 or fewer years).

“Geohazards” are geologic hazards that affect the transportation system and include debris flow, embankment distress, landslides, rockfall, rockslides, and sink holes.

“National Highway System” (NHS) is a federally designated system of roadways important to the nation's economy, defense, and mobility. The NHS includes Interstate highways as well as other roadways. Not all NHS roadways are part of the state highway system.

“Maintenance Level of Service” (MLOS) is a qualitative measure describing operational conditions on the roadway. Overall maintenance level of service is a combined grade for nine maintenance program areas. For snow and ice control, the LOS B level includes maintaining high levels of mobility as much as possible, and proactive avalanche control.

“Performance Measures” are the ways that direction toward a goal is measured.

“Performance Objectives” are the specific targets for a performance measure that an organization intends to meet to make progress toward a goal.

“Planning Time Index” (PTI) is a measure of travel time reliability. For this performance measure it is defined as the 95th percentile travel time divided by travel time at free-flow speed. In general terms, it identifies the extra time needed to arrive on-time for a trip 19 times out of 20. For example, for a PTI₉₅ of 1.5, a worker should plan 45 minutes for a trip that takes 30 minutes in free flow conditions ($30 \text{ minutes} \times 1.5 = 45 \text{ minutes}$) to be on-time 19 out of 20 times (which would mean the worker would be late only one of the 20 work days in a month).

“Revenue Service Miles” are the miles of service operated by transit vehicles and available to the general public.

“Serious Injuries” are evident incapacitating injuries which prevent injured persons from walking, driving or normally continuing the activities they were capable of performing before being injured in traffic crashes.

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“Vehicle Miles Traveled” (VMT) is a measurement of miles traveled by vehicles obtained by multiplying the Annual Average Daily Traffic (AADT) count by the length of the roadway segment.

V. POLICY

1. Policy. It shall be the policy of CDOT that the Statewide Transportation Plan and statewide performance objectives stated herein will guide distribution of financial resources to meet or make progress toward objectives in four goal areas: safety, infrastructure condition, system performance, and maintenance. Financial resources should be directed toward achieving the objectives within the first 10 years of the planning horizon (2016-2025). Projects should be selected to support the goals and objectives and will be included in the Statewide Transportation Improvement Program (STIP). Annual budget decisions will be guided by these performance objectives as well as CDOT’s Risk Based Asset Management Plan. Prior to funding new initiatives, funds should be directed to achieving the objectives in each area while recognizing constraints on some funding sources. Aspirational objectives guide the use of funds received that are above baseline revenue projections.

2. Goals. PD 14.0 goals guide development of the multimodal Statewide Transportation Plan and of performance objectives. The goals are:

- SAFETY – Moving Colorado toward zero deaths by reducing traffic-related deaths and serious injuries by one-half by 2030.
- INFRASTRUCTURE CONDITION – Preserve the transportation infrastructure condition to ensure safety and mobility at a least life cycle cost.
- SYSTEM PERFORMANCE – Improve system reliability and reduce congestion, primarily through operational strategies and secondarily through the addition of capacity. Support opportunities for mode choice.
- MAINTENANCE – Annually maintain CDOT’s roadways and facilities to minimize the need for replacement or rehabilitation.

PD 14.0 and Statewide Plan Goals are in alignment with the MAP-21 National Goals. For the Statewide Plan, goals are expressed in more public-friendly terms and include: Safety, Mobility (System Performance in PD 14.0), Economic Vitality (not yet identified in PD 14.0), and Maintaining the System (Infrastructure Condition and Maintenance in PD 14.0).

3. Performance Measures and Objectives. Performance measures describe how statewide success will be evaluated and performance objectives establish statewide achievement levels which are used to direct investment decisions primarily focused on a 10-year planning horizon (2016-2025). Explanations of how the objectives will be measured and budget categories-

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Maintain, Maximize, Expand, and Pass-Through Funds/Multi-Modal Grants- that fund the four goal areas are listed below with the appropriate goals.

a) HIGHWAY SAFETY:

The highway safety objectives (with the exception of the economic impact of crashes objectives) were set after studying trends from 2008 through 2013. Safety measures and objectives apply to *all* roads in the state. The other safety measures and objectives in this section are subsets of the highway measures and objectives. The budget categories that fund Safety are Maintain, Maximize, and Expand.

(1) All Highways

MEASURES:

- Number of fatalities
- Fatalities per vehicle miles traveled (VMT)
- Number of serious injuries
- Serious injuries per VMT
- Economic impact of crashes

OBJECTIVES:

- Reduce fatalities by 12 per year from 548 in 2008 to 344 in 2025.
- Reduce the fatality rate per 100 million VMT by 0.02 per year from 1.03 in 2013 to 0.79 in 2025.
- Reduce serious injuries by 90 per year from 3,200 in 2013 to 2,120 in 2025.
- Reduce the serious injury rate by 0.2 per 100 million VMT per year from 6.86 in 2013 to 4.46 in 2025.
- Reduce the economic impact of crashes annually by 1% over the previous calendar year.

ASPIRATIONAL OBJECTIVE:

- Reduce the fatality rate per 100 million VMT to 0.75 in 2025.

(2) Bike and Pedestrian

MEASURES:

- Number of bicyclist and pedestrian fatalities involving motorized vehicles
- Number of bicyclist and pedestrian serious injuries involving motorized vehicles

OBJECTIVES:

- Reduce the number of bicyclist and pedestrian fatalities involving motorized vehicles from 67 in 2013 to 47 in 2025.
- Reduce the number of bicyclist and pedestrian serious injuries involving motorized vehicles from 469 in 2013 to 311 in 2025.

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b) INFRASTRUCTURE CONDITION:

The infrastructure condition objectives for highways and bridges are intended to be achieved or maintained over the first 10 years of the planning horizon (2016-2025). The budget category that funds Infrastructure Condition is Maintain, except for Transit which is funded with Pass-Through Funds/Multi-Modal Grants.

(1) Bridges

MEASURES:

- Condition of National Highway System (NHS) bridges
- Condition of state highway bridges
- Risk-Based Asset Management Plan measures for bridges (See Appendix A for additional bridge measures.)

OBJECTIVES:

- Maintain the percent of NHS total bridge deck area that is not structurally deficient at or above 90%.
- Maintain the percent of state highway total bridge deck area that is not structurally deficient at or above 90%.
- Meet bridge objectives in the Risk-Based Asset Management Plan. (See Appendix A for additional bridge objectives.)

ASPIRATIONAL OBJECTIVES:

- Achieve the percent of NHS total bridge deck area that is not structurally deficient at or above 95%.

(2) Highways

MEASURES:

- Pavement condition of the Interstate System
- Pavement condition of the NHS, excluding Interstates
- Pavement condition of the state highway system

OBJECTIVES:

- Achieve 80% High/Moderate Drivability Life for Interstates based on condition standards and treatments set for traffic volume categories.
- Achieve 80% High/ Moderate Drivability Life for NHS, excluding Interstates, based on condition standards and treatments set for traffic volume categories.
- Achieve 80% High/Moderate Drivability Life for the state highway system based on condition standards and treatments set for traffic volume categories.

ASPIRATIONAL OBJECTIVES:

- Achieve 90% High/Moderate Drivability Life for Interstates based on

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condition standards and treatments set for traffic volume categories.

- Achieve 90% High/ Moderate Drivability Life for NHS, excluding Interstates, based on condition standards and treatments set for traffic volume categories.

(3) Other Assets

MEASURE:

- Risk-Based Asset Management Plan measures for other assets (See Appendix A for measures for buildings, Intelligent Transportation Systems (ITS) equipment, roadway fleet, culverts, geohazards, tunnels, traffic signals, and walls)

OBJECTIVE:

- Meet objectives in the Risk-Based Asset Management Plan (See Appendix A for objectives for buildings, ITS equipment, roadway fleet, culverts, geohazards, tunnels, traffic signals, and walls)

(4) Transit

MEASURE:

- Transit Asset Condition

OBJECTIVES:

- Maintain the percentage of vehicles in the rural Colorado transit fleet to no less than 65% operating in fair, good, or excellent condition, per Federal Transit Administration definitions.
- Ensure that all CDOT transit grantees have Asset Management Plans in place for state or federally funded vehicles, buildings and equipment by 2017.

ASPIRATIONAL OBJECTIVE:

- Increase the percentage of vehicles in the rural Colorado transit fleet to no less than 70% operating in fair, good, or excellent condition, per Federal Transit Administration definitions.

c) SYSTEM PERFORMANCE:

The system performance objectives for Interstates, NHS and State Highway system are intended to be achieved within the first 10 years (2016-2025) of the planning horizon. The system performance objectives for transit begin in 2012 either for a five-year rolling average or as the baseline year. The budget categories that fund System Performance are Maximize, Expand, and Pass-Through Funds/Multi-Modal Grants.

(1) Interstates, NHS and State Highway system

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MEASURES:

- Interstate Performance – Planning Time Index (PTI)
- NHS Performance excluding Interstates – PTI
- Colorado Freight Corridors Performance – PTI

OBJECTIVES:

- Prevent the spread of congestion by maintaining a PTI of 1.25 or less on 90% or greater of Interstate centerline miles.
- Prevent the spread of congestion by maintaining a PTI of 1.08 or less on 90% or greater of NHS centerline miles, excluding Interstates.
- Prevent the spread of congestion by maintaining a PTI of 1.25 or less on 90% or greater of Colorado Freight Corridor centerline miles.

(2) Transit**MEASURES:**

- Transit Utilization – Ridership statewide for small urban and rural “transit grantees”
- Transit Connectivity – Revenue service miles provided

OBJECTIVES:

- Increase ridership of small urban and rural transit grantees by at least an average of 1.5% statewide over a five-year period beginning with 2012.
- Maintain or increase the total number of revenue service miles of regional, inter-regional, and inter-city passenger service over that recorded for 2012.

ASPIRATIONAL OBJECTIVES:

- Increase ridership of small urban and rural transit grantees by at least an average of 1.7% statewide over a five-year period beginning with 2012.
- Increase the statewide total number of revenue service miles of regional, inter-regional, and inter-city passenger service by at least an average 1.7% over a five-year period beginning with 2012.

d) MAINTENANCE:

Maintenance objectives are established based on annual funding levels and measured annually. The budget category that funds Maintenance is Maintain.

MEASURES:

- Level of Service (LOS) for snow and ice removal
- Overall Maintenance Level of Service (MLOS) for the state highway system

OBJECTIVES:

- Maintain a LOS B grade for snow and ice removal.

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- Maintain an overall MLOS B minus grade for the state highway system.

ASPIRATIONAL OBJECTIVES:

- Achieve a LOS B+ grade for snow and ice removal.
- Achieve an overall Maintenance LOS B grade for the state highway system.

VI. DOCUMENTS REFERENCED IN THIS POLICY DIRECTIVE

Appendix “A” “CDOT Risk-Based Asset Management Plan Performance Measures and Objectives”

VII. IMPLEMENTATION PLAN

Additional measures and objectives are planned or currently under development. As additional measures and objectives are finalized they will be brought forward for consideration of incorporation into PD 14.0. This includes measures and objectives in the following areas: Bike and Pedestrian, Truck Freight, Freight Rail, Economic Vitality, and Environmental Sustainability.

This Policy Directive will be implemented by the Division of Transportation Development, with the Office of Financial Management and Budget, the Division of Transportation Systems Management & Operations, and the Division of Transit & Rail, and in collaboration with other CDOT Divisions and CDOT Regions. Funds will be directed to budget categories to support accomplishment of the objectives. The Division of Transportation Development will report annually on performance of the transportation system to track progress toward objectives. At a minimum, the Division of Transportation Development will review and update or reaffirm this Policy Directive with each Plan update cycle in collaboration with the Office of Policy and Government Relations, Office of Financial Management and Budget, Division of Transportation Systems Management & Operations, Division of Transit & Rail, and other CDOT Divisions and CDOT Regions.

VIII. REVIEW DATE

This directive shall be reviewed on or before February 2018.

Herman J. Steuking III
Secretary, Transportation Commission

2-27-15
Date of Approval

Appendix A: CDOT Risk-Based Asset Management Plan Performance Measures and Objectives

Asset	Measure	Current Performance	Objective (Target)	Aspirational Objective (Target)
Bridges	Percentage of state highway total bridge deck area that is not structurally deficient	94%	90% ^a	95% ^a
	Percentage of NHS total bridge deck area that is not structurally deficient	95%	90% ^a	95% ^a
	Percentage of CDOT-owned bridges over waterways that are scour critical	7.1%	5%	1%
	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%
	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%	2%
	Percentage of CDOT-owned bridges posted for load	0.1%	0%	0%
	Percentage of CDOT-owned bridges with a load restriction	2.6%	3%	1%
	Percentage of leaking expansion joint by length on CDOT-owned bridges	18.8%	15%	5%
	Percentage of CDOT-owned bridge deck area that is unsealed or otherwise unprotected	31%	30%	5%
	Pavement	Percentage high-moderate drivability life for Interstates based on condition standards and treatments set for traffic volume categories	89%	80% ^a
	Percentage high-moderate drivability life for CDOT-owned NHS, excluding Interstates based on condition standards and treatments set for traffic volume categories	78%	80% ^a	90% ^a
	Percentage high-moderate drivability life for the State highway system based on condition standards and treatments set for traffic volume categories	73%	80% ^a	90%
Maintenance	Statewide Letter Grade	B-	B-a	B ^a
Buildings	Statewide Letter Grade	86% C or Better	90% C or Better	100% C or Better
ITS	Average Percent Useful Life	126%	90%	85%
Fleet	Average Percent Useful Life	103%	70%	50%
Culverts ^b	Percentage Critical Culverts	2.9%	5%	2%
Geohazards	Number of Sites with letter grade C or better	47%	60%	90% ^c
Tunnels	Key components of fire/life safety must not exceed 100% of useful life, based on manufacturer's specification, condition inspections and maintenance history.	TBD ^d	100%	100%
Traffic Signals ^e	Percent intersections with at least one component beyond 100% Useful Life	52%	15%	0%
Walls ^f	Percentage of CDOT-owned walls, by square foot, that are in condition state 3 or 4 (poor or severe).	1%	1%	0.5%

^a Highlighted measures and objectives are those that are identified specifically in the Infrastructure Condition section of PD 14.

^b These measures and objectives are from the Infrastructure Condition section of PD 14.

^c Culverts are minor structures between 4' and 20'.

^d Some sites will always remain in the D category due to traffic volume. And at some sites, to effectively eliminate or significantly reduce the likelihood is beyond the scope of the Geohazards Program.

^e Objective pending data collection.

^f Overall signal infrastructure includes signal assemblies, cabinets and controllers.

The walls inventory and condition are being collected under a 2 year project, so the information in this table is based on estimates.