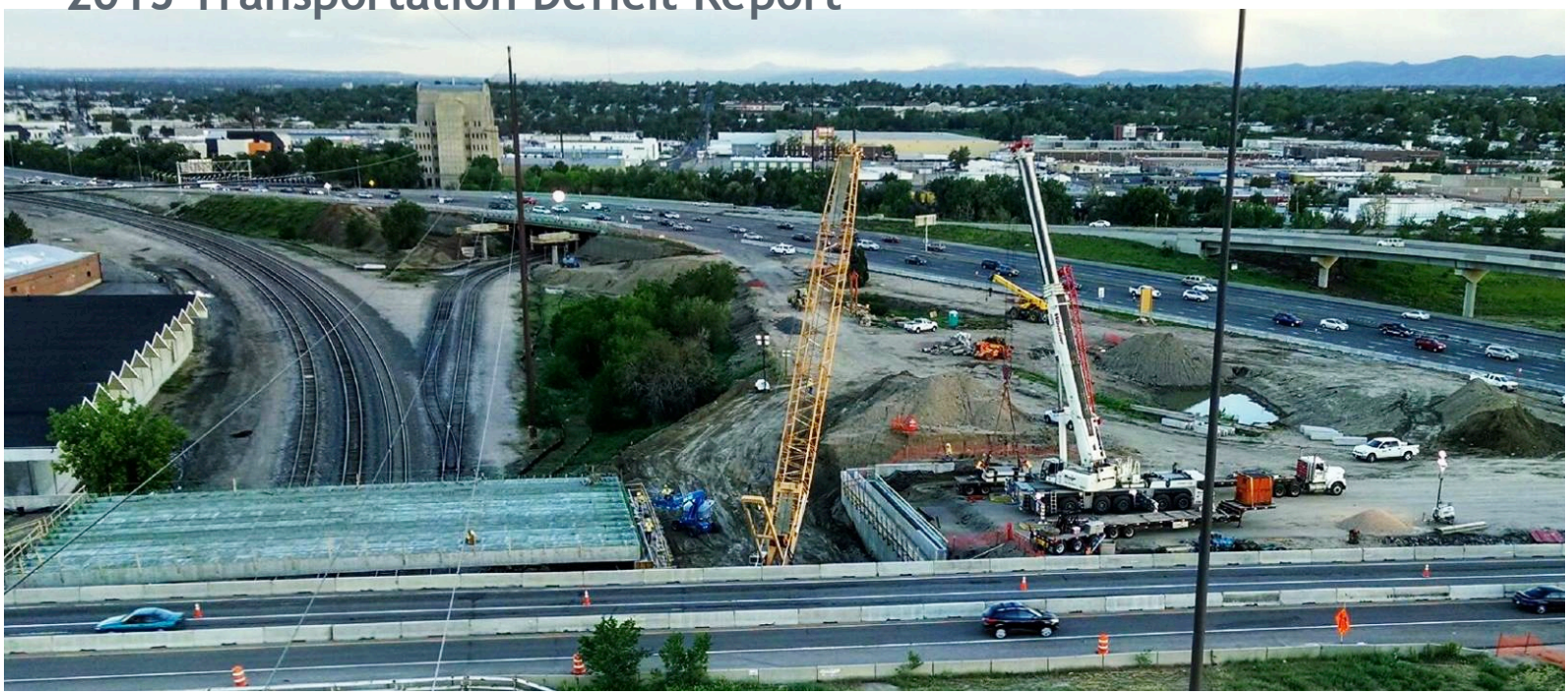
2015 Transportation Deficit Report



COLORADO
Department of Transportation

Transportation Deficit Report 2015

Contents

Overview

Pursuant to the Funding Advancement for Surface Transportation and Economic Recovery Act (FASTER), the Colorado Department of Transportation (CDOT) presents its Transportation Deficit Report for 2015. The annual Deficit Report addresses the goals of repairing deficient highways and bridges and sustaining existing transportation system performance levels.

Included in the report are:

- The estimated costs and resulting deficits or surpluses for sustaining current conditions over the next 10 years.
- The estimated costs and resulting deficits or surpluses for achieving certain fiscally constrained and aspirational goals of the Colorado Transportation Commission within the next 10 years. These goals are stipulated in CDOT's revised Policy Directive 14, which was adopted by the commission in February 2015.
- The annual increase and rate of increase of these costs.
- Factors contributing to the costs, including the rate and distribution of population growth, vehicle size and weight, land use policies and work patterns. Techniques and tools for mitigating these factors also are discussed.

This report incorporates state fiscal years 2016-18 draft program budgets for CDOT's surface treatment, bridge and maintenance programs, which have been recommended to the Transportation Commission. For fiscal years 2019-25, the combined budget for the three programs has been held at $650 million* in this report, with the exception of certain increases expected for the Colorado Bridge Enterprise. While the total amount for the three assets remains constant, budget projections for the bridge and surface treatment programs decrease over this report's 10-year period of analysis to account for increases in the maintenance budget.

Also included in this report are performance results for fiscal year 2014. These results are used to estimate the cost to sustain conditions and to achieve fiscally constrained and aspirational goals (or "Vision" conditions) over the next 10 years.

In developing its fiscal year 2016 budget proposal, CDOT relied on revenue forecasts available at the time. For FASTER receipts, CDOT projects it will receive about $211 million in revenue from fees in fiscal year 2016. Pursuant to FASTER legislation, $10 million of the $211 million will be used for statewide transit projects, and $5 million will be apportioned to local governments in the form of grants for local transit projects.

Note to Readers

This report incorporates fiscal year 2016 draft program budgets and projected revenues as approved by the Transportation Commission in November 2014, although more recent budget data are used when available. The transportation system's performance is projected primarily in conjunction with annual budget development. Forecasts for any costs and revenue sources may change throughout the year.

*This number was corrected in July 2015. The initial submission of this report contained an incorrect figure.

Update

CDOT's "big three" asset categories—pavement, bridges and maintenance—comprise roughly half the Department's annual budget. As such, the funding and performance of these programs requires constant vigilance. In reviewing this year's report, readers should note the following items that may affect the condition of these assets and associated budgets:

- Goals and Visions in this year's report are taken from a new draft of Policy Directive 14 adopted by the Transportation Commission in February 2015. New aspirational goals for bridge and pavement condition on the entire state highway system have been incorporated into the directive. The aspirational goals align with CDOT's Risk-Based Asset Management Plan.
- CDOT continues to develop its Cash and Program Management initiative, which provides the management infrastructure to implement the cash-based programming and budgeting that makes possible the increase in construction related to the Department's Responsible Acceleration of Maintenance and Partnerships, or RAMP, program (see sidebar). The initiative provides the management for scheduling and monitoring CDOT's total capital construction program. CDOT has historically delivered a $500 million construction program. To use its available revenue and draw down its cash reserve, the Department will for the next few years be delivering a $900 million per year program. In this report, the total budgets for the Surface Treatment and Bridge programs include RAMP funds.
- CDOT continues to refine its Asset Investment Management System (AIMS) model, which includes the three assets discussed in this report. AIMS was used for the first time this year to calculate the estimates for bridge costs and condition used in the Deficit Report. The system continues to evolve as asset categories are added. AIMS will produce information on cross-asset optimization for budgeting purposes.
- The Department in 2015 continues to repair damage stemming from the September 2013 floods that severely damaged the transportation infrastructure in northern and eastern Colorado. Almost 490 miles of CDOT roadway were affected by the flood event, 39 roadways were temporarily closed, and more than 200 bridges and culverts were damaged. The U.S. Congress has allocated $450 million in emergency relief funding for Colorado's flood event. The balance for the flood recovery program is being shared by CDOT, local agencies and the Office of Emergency Management. However,

CDOT presses forward on RAMP program

CDOT's new cash-management process made possible the Department's Responsible Acceleration of Maintenance and Partnerships (RAMP) program. RAMP represents an increase in project construction of about $300 million per year for the five years ending in late 2017. RAMP funds are included in the Bridge and Surface Treatment program budgets in this year's Deficit Report. A large portion of these funds will be used for system preservation.

Under its new cash-management system that helps make RAMP possible, CDOT will fund multi-year projects based on year of expenditure. This is a change from previous practice, which required the total amount of a project's cost to be in place before any funds were spent.

The temporary increase in construction activity stemming from RAMP is from existing, already programmed dollars, not new funding sources or new transportation revenue.

RAMP Partnership and Operations projects were approved by the Transportation Commission in October 2013. About half of RAMP funding is being used for these projects, and the other half to help fund CDOT's asset management, including pavement and bridge assets.

program costs are increasing, and CDOT may request additional emergency relief funds from the Federal Highway Administration.

- With passage of the Moving Ahead for Progress in the 21st Century Act (MAP-21) in June 2012, transportation programs had a federal authorization bill for the first time since 2009. However, the MAP-21 authorization expired September 30, 2014. While MAP-21 has been extended until May 31, 2015, uncertainty will remain in the federal outlook until Congress passes a long-term authorization.
- Investments or lack thereof in a given year may not instantly change the performance of the transportation system. Neglecting surface treatment on newer road segments, for example, may not cause noticeable deterioration in those segments this year, but the effects will ripple into subsequent years.

CONTINUED

Based on recent experience, CDOT in early 2015 sees potential for cost increases on partnership projects. The Department has developed a process to manage about half of $80 million in potential increase through scope reductions and additional local matching contributions. In addition, the Transportation Commission has agreed to provide up to $40 million in additional funding.

Repairing Highways

CDOT's Surface Treatment program maintains about 23,000 lane miles of the state highway system. The program, part of CDOT's Materials and Geotechnical Branch, ensures the quality of the system through a range of techniques that include thin maintenance treatments, rehabilitation techniques and reconstruction.

Overall pavement conditions on the system have been deteriorating since 2005, and that trend is expected to continue in the short term. The Department forecasts that under current funding projections—about $221 million per year for the Surface Treatment program—the goal of ensuring that 80 percent of highway system pavement has High or Moderate Drivability Life will be reached around 2028.

CDOT in 2013 began reporting highway pavement conditions in terms of Drivability Life. *(See sidebar for an explanation of this metric.)* Deficit Reports published before 2014 focused on the Remaining Service Life metric for evaluating pavement.

The move to Drivability Life was made to:

- Apply a system that recognizes financial resources and limitations.
- Achieve optimal treatments for each type of roadway and level of traffic, using a lowest life-cycle cost approach.
- Use a system that better reflects roadway quality as experienced by drivers.
- Increase the frequency of surface treatment on low-volume highways. Under the previous system, such highways would deteriorate until full reconstruction was required.

The Drivability Life metric also helps engineers make project choices that maintain the road quality expected by the public.

A Transportation Commission objective is for 80 percent of state highway pavement to have High or Moderate Drivability Life. This goal recognizes financial constraints. The "vision" condition, or "aspirational objective," is for 90 percent of state highway pavement to have High or Moderate Drivability Life. This vision is presented in the Deficit Report for the first time this year. It was among the goals included in CDOT's Risk-Based Asset Management Plan, which were incorporated in early 2015 into the Transportation Commission's Policy Directive 14.

Drivability Life Ratings

CDOT's methodology for evaluating pavement condition is Drivability Life. Drivability Life is an indication in years of how long a highway segment will have acceptable driving conditions based on an assessment of pavement smoothness, surface cracking, rutting and safety.

Pavement with High Drivability Life is predicted to have acceptable driving conditions for more than 10 years.

Pavement with Moderate Drivability Life is predicted to have four to 10 years of acceptable driving conditions.

Pavement with Low Drivability Life is predicted to have fewer than four years of acceptable driving conditions.

Having "unacceptable" driving conditions doesn't mean that a highway is impassable. However, drivers may need to endure rough rides, reduce speeds to navigate around potholes and other types of pavement damage, or otherwise compensate for deteriorating conditions.

Figure 1. Statewide Pavement Goals and Condition by Category, 2014

State Highway System Categories	Goal (Fiscally Constrained)	Vision (Aspirational)	FY14 Condition
National Highway System, (NHS) non-Interstate*	80% High/Moderate Drivability Life	90% High/Moderate Drivability Life	78% High/Moderate Drivability Life
Interstate	80%	90%	89%
Entire State Highway System	80%	90%	73%

**Does not include NHS outside of the State Highway System.*

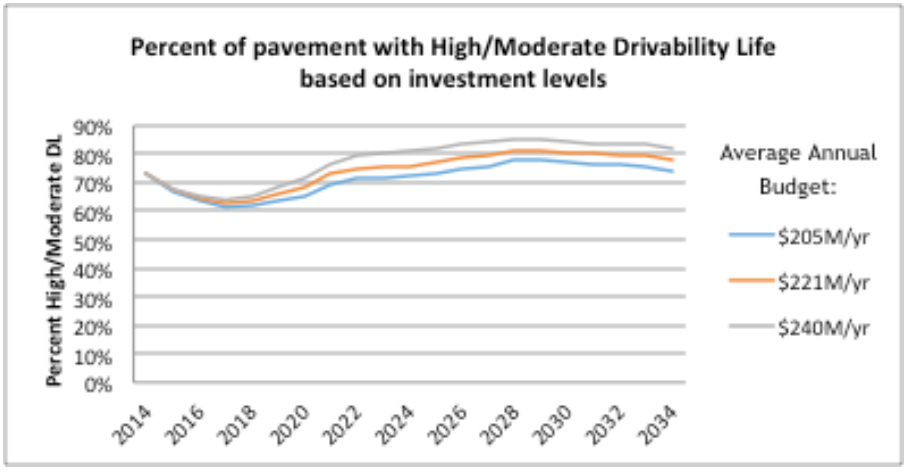
The Surface Treatment program ended fiscal year 2014 with 73 percent of pavement on the state highway system with High or Moderate Drivability Life, down from 82 percent the previous year. More than half of CDOT's highways now have a Drivability Life of between just four and seven years. Because of this, the Department expects a large amount of additional miles to soon move into the Low Drivability Life category.

No historical data is available for comparing current Drivability Life to conditions before fiscal year 2013. See Figure 2 (below) for a look at pavement conditions achievable under different funding levels over the next 10 years.

Cost of Achieving Goal

Achieving the Department's goal of 80 percent High/Moderate Drivability Life in 2025 will require about $2.4 billion over the next 10 years, or an average annual budget of about $240 million. This cost is unchanged since last year's Deficit Report. Against the projected revenue allocation for the Surface Treatment program for the next 10 years, there is an anticipated deficit of about $188 million. *(See Figure 4 on page 8.)*

Figure 2. Pavement Drivability Life versus funding



The chart at left shows pavement conditions on the state highway system that are possible under three different funding levels. A budget of $221 million per year would achieve CDOT's goal of 80 percent High/Moderate Drivability Life around 2028.

The estimated deficit in last year's report to achieve 80 percent was just $9 million. The estimate has grown because of lower projected annual budgets. Budgets for the Surface Treatment program have been adjusted in this "goal" analysis—as well as the "vision" and "sustain" analyses below—to account for CDOT's rising maintenance budget projections.

Cost of Achieving Vision

Achieving the Department's vision of 90 percent High/Moderate Drivability Life in 2025 will require about $3.15 billion over the next 10 years, or an average annual budget of about $315 million. Against the projected revenue allocation for the Surface Treatment program for the next 10 years, there is an anticipated deficit of about $938 million. *(See Figure 6 on page 8.)* This vision condition—appearing in the Deficit Report for the first time this year—is part of CDOT's revised Policy Directive 14, which was adopted by the Transportation Commission in February 2015.

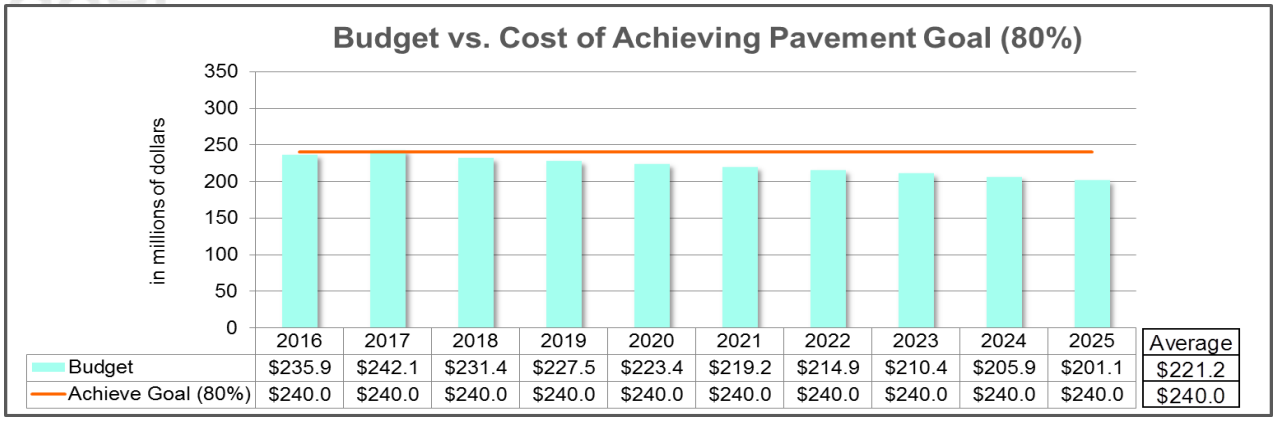
Cost of Sustaining Condition

CDOT in 2014 was below its goal for pavement condition. The cost of sustaining current conditions is therefore lower than achieving the Department's goal and vision. Achieving the current pavement condition of 73 percent High/Moderate Drivability Life in 2025 will require $2.05 billion over the next 10 years, or an average annual budget of about $205 million. Against the projected budget for the Surface Treatment program for the next 10 years, there is a surplus of $162 million, or an average of about $16.2 million per year. *(See Figure 8 on page 9.)* However, maintaining the current condition would fall short of the Department's goal for pavement.

Under this estimate, conditions would dip to a low 61 percent High/Moderate Drivability Life in fiscal year 2017, but return to 73 percent by fiscal year 2025. As previously mentioned, conditions are expected to fall in the near term, because more than half of CDOT's highways have a Drivability Life of between just four and seven years. The cost of sustaining condition is 16 percent lower than in last year's Deficit Report, in part because current pavement condition is lower than a year ago.

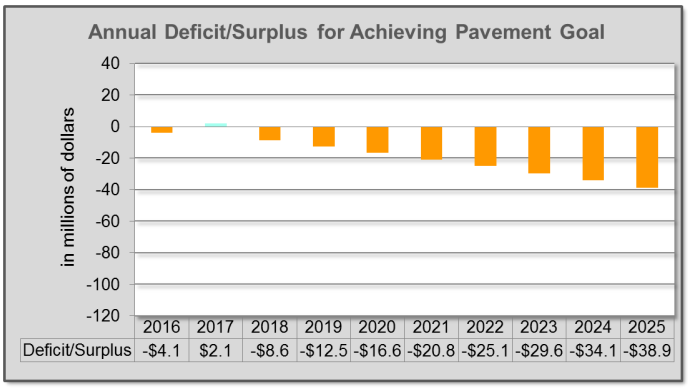
On the left is a stretch of Highway 76A near Keenesburg with Drivability Life of 17 years, or High Drivability Life. The photo on the right, in contrast, shows a stretch of Highway 59 between Sedgwick and Haxtun. The Highway 59 stretch represents a Low-Volume Highway with Drivability Life of nine years (Moderate Drivability Life). CDOT's system for managing pavement, which uses the Drivability Life metric, recommends a chip seal for this road in 2016.

GOAL



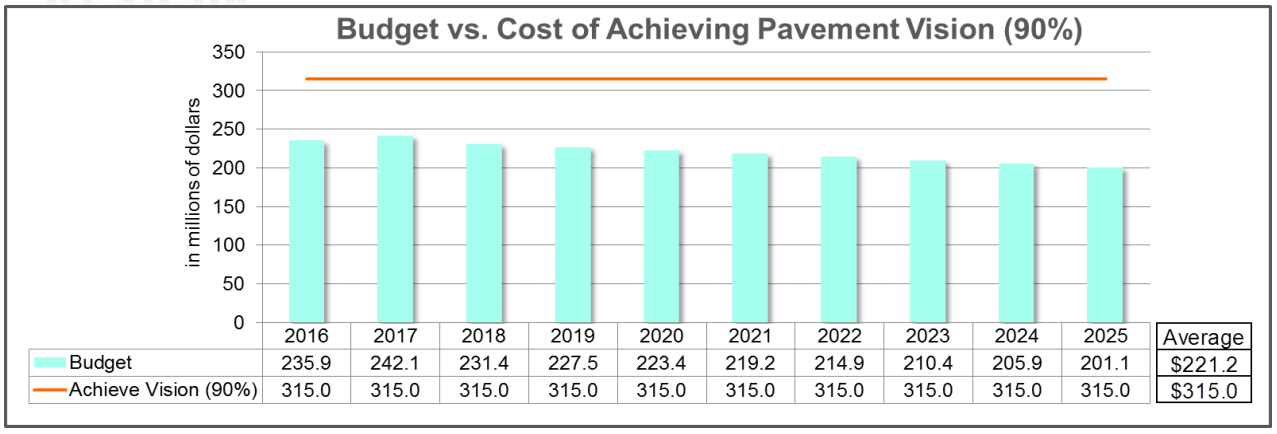
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Average
Budget	$235.9	$242.1	$231.4	$227.5	$223.4	$219.2	$214.9	$210.4	$205.9	$201.1	$221.2
Achieve Goal (80%)	$240.0	$240.0	$240.0	$240.0	$240.0	$240.0	$240.0	$240.0	$240.0	$240.0	$240.0

Figures 3 (above) and 4 (right): The chart above shows the cost of meeting the Transportation Commission's fiscally constrained goal for pavement condition on the state highway system over 10 years, as compared to anticipated funding. As shown at right, the deficit over 10 years is about $188 million.



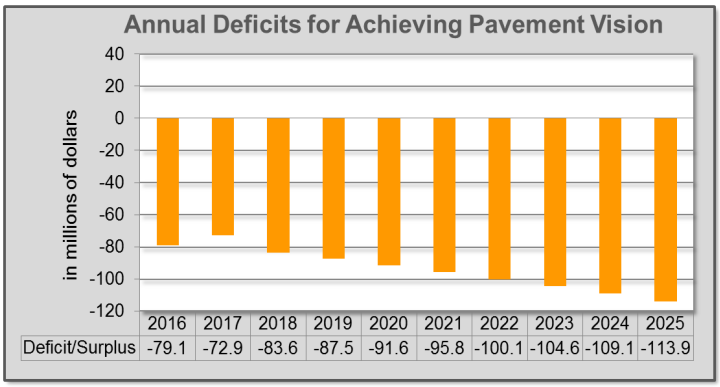
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Deficit/Surplus	-$4.1	$2.1	-$8.6	-$12.5	-$16.6	-$20.8	-$25.1	-$29.6	-$34.1	-$38.9

VISION



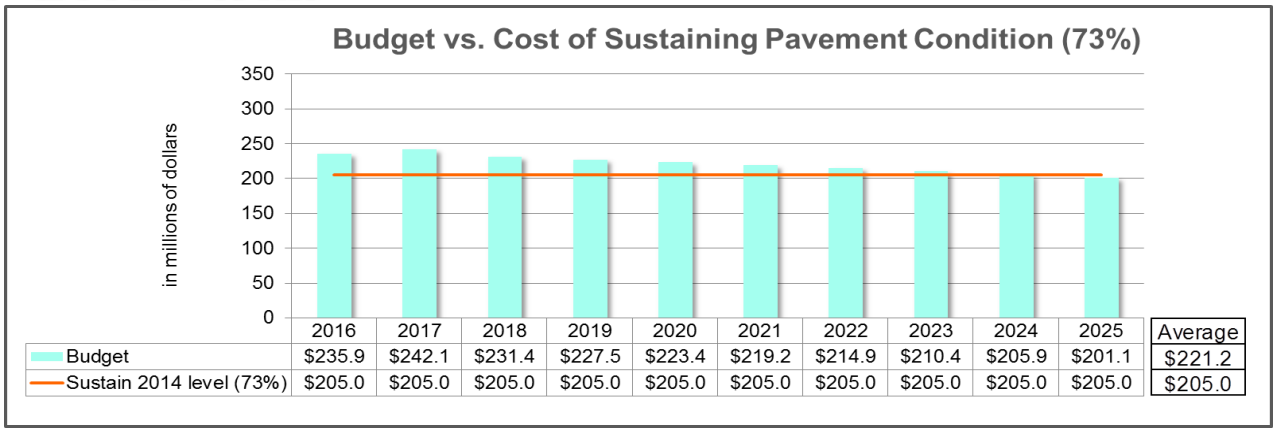
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Average
Budget	235.9	242.1	231.4	227.5	223.4	219.2	214.9	210.4	205.9	201.1	$221.2
Achieve Vision (90%)	315.0	315.0	315.0	315.0	315.0	315.0	315.0	315.0	315.0	315.0	$315.0

Figures 5 (above) and 6 (right): The chart above shows the cost of achieving the "vision" condition for pavement on the state highway system over 10 years, as compared to anticipated funding. The deficit over 10 years is about $938 million.



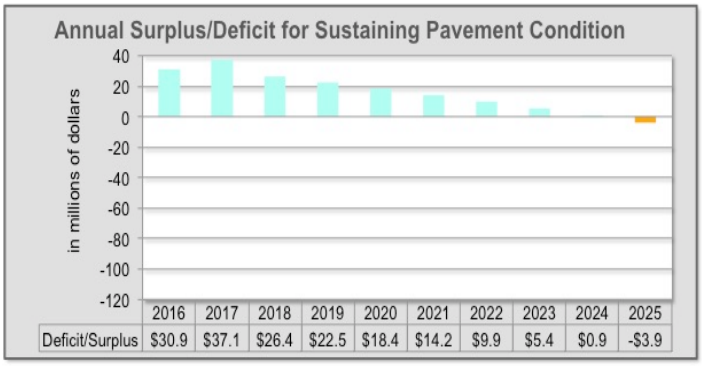
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Deficit/Surplus	-79.1	-72.9	-83.6	-87.5	-91.6	-95.8	-100.1	-104.6	-109.1	-113.9

SUSTAIN



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Average
Budget	$235.9	$242.1	$231.4	$227.5	$223.4	$219.2	$214.9	$210.4	$205.9	$201.1	$221.2
Sustain 2014 level (73%)	$205.0	$205.0	$205.0	$205.0	$205.0	$205.0	$205.0	$205.0	$205.0	$205.0	$205.0

Figures 7 (above) and 8 (right): The chart above shows the cost of sustaining the current condition of pavement on the state highway system over 10 years, as compared to anticipated funding. CDOT projects a surplus of $162 million to sustain the current condition of 73 percent High or Moderate Drivability Life. Sustaining current conditions would mean that pavement condition would remain below CDOT's goal for the state highway system.



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Deficit/Surplus	$30.9	$37.1	$26.4	$22.5	$18.4	$14.2	$9.9	$5.4	$0.9	-$3.9

Factors Contributing to Costs

For a general discussion of inflationary pressures facing CDOT's construction program, see page 25. Below are factors that drive Surface Treatment costs.

Materials Prices. Pavement costs are driven largely by the cost and available supply of Portland Cement, asphalt binder and aggregates. Asphalt binder prices fluctuate greatly and are somewhat correlated to petroleum prices.

Population Growth and Distribution. Surface Treatment resources are allocated based on cost/benefit considerations and roadway characteristics such as the volume of truck traffic. In addition, a growing population increases the Annual Average Daily Traffic (AADT) on state highways and the wear and tear on pavement surfaces.

Population statewide is expected to grow 11 percent, from 5.4 million people today to six million by 2020, according to Colorado's State Demography Office. The Department expects total Vehicle Miles Traveled to grow at about the same rate, because the number of Vehicle Miles Traveled per capita is expected to remain flat. Percentage-wise, population growth going forward is expected to increase the most in the North Front Range, followed by the Western Slope and the Central Mountains, according to the State Demographer.

Vehicle Size and Weight. Vehicle size and weight dictate the design quality of highway segments and are even more significant determinants in surface-quality deterioration than population growth and distribution. Pavement thickness, in fact, is the direct result of anticipated truck freight traffic volume. A stretch of highway handling 80,000 cars and no trucks each day requires just seven inches of pavement. A stretch with a daily count of only 8,000 cars, but 4,000 trucks, requires eight inches. The impact of commercial vehicle traffic is a large factor in the calculation of costs to the Surface Treatment program.

Land-Use Policies and Work Patterns. Land-use patterns have a strong impact on travel demand and on the need for transportation infrastructure, maintenance, repair and improvements. Roadways are designed and constructed for their anticipated traffic loads. Any changing pattern of AADT or of increased truck traffic due to commercial, manufacturing or energy development can alter the projected impacts. When land-use policies evolve and result in redistribution or new access points, increasing traffic on roadways designed for fewer vehicles has an impact, causing unanticipated deterioration and redirection of maintenance resources. Sprawling development patterns act to increase VMT at rates faster than population growth. The result is an increase in demand on transportation infrastructure that exceeds the growth in resources available to provide and maintain that infrastructure.

Surface-Treatment Approach Varies by Road Category

CDOT prioritizes roads into four categories that define potential surface-treatment options. The best treatment option is determined based on Drivability Life ratings, treatment costs, and site-specific design variables. This approach to Surface Treatment—more cost-effective than the Department's previous approach—helps maximize the experience of the traveling public on the state's highways. The four categories are:

1. Interstates are CDOT's most important highways. These national networks provide interconnectivity across the state and nation. Interstate projects are built, rehabilitated and maintained according to Pavement Design Standards of the American Association of State Highway and Transportation Officials (AASHTO), ensuring they meet federal standards and provide reliable service.

2. High-Volume Highways are used by more than 4,000 vehicles per day (as calculated by Average Annual Daily Traffic, or AADT), or more than 1,000 trucks per day. These highways serve a large segment of the traveling public and provide critical routes for the transportation of goods and services across regional boundaries. These projects also follow AASHTO Pavement Design Standards.

CONTINUED

An asphalt paver places fresh, uncompacted asphalt pavement near the Twin Tunnels east of Idaho Springs.

Looking Ahead

2014 was just the second year that CDOT used the Drivability Life metric for reporting pavement condition. The Drivability Life model is allowing CDOT to slowly increase the number of lane miles it treats every year.

Ongoing refinements to Drivability Life calculations will continue as the Department gains experience with the metric. Improvements in coming years will result in changes to assessments of pavement condition and predictive analyses. These improvements will ensure the quality of the Pavement Management System that is used to calculate Drivability Life and to predict future pavement deterioration rates.

CONTINUED

3. Medium-Volume Highways have AADT of between 2,000 and 4,000 and/or truck traffic between 100 and 1,000 vehicles. These projects are treated primarily with minor rehabilitation and pavement maintenance treatments. Major rehabilitation is considered when drivability is poor and project-level analysis reveals compromised pavement structure.

4. Low-Volume Highways have AADT of less than 2,000 and truck traffic of less than 100. These highways are maintained at acceptable drivability standards with pavement-maintenance treatments. Isolated repairs are used to address localized distresses that cannot be fixed with thin pavement preservation treatments. If formally approved by CDOT's Chief Engineer, minor rehabilitation treatments may be used as needed to return the pavement to acceptable drivability condition.

Managing Bridges

CDOT's Bridge program maintains 3,464 major vehicular bridges on the state highway system. These bridges have a total deck area of 32.7 million square feet. Both the number of bridges and the amount of deck area (or riding surface) managed by CDOT change over time as new bridges are put into service and bridge ownership is transferred between the Department and local agencies.

The Department each year submits information on the condition of bridge-deck area to the Federal Highway Administration's National Bridge Inventory. The percentage of deck area on the state highway system rated Not Structurally Deficient in the past four years has been:

- 2011: 92 percent.
- 2012: 93 percent.
- 2013: 94 percent.
- 2014: 94 percent.

See the sidebar at right for an explanation of the Not Structurally Deficient metric.

Improvement from 2011-14 is primarily due to replacements funded by the Colorado Bridge Enterprise, which operates as a government-owned business within CDOT. *(See page 13 for more on the Bridge Enterprise.)*

Like replacement, preservation and repair are important components of ensuring bridge quality. As of early 2015, 84 bridges have had preservation or repair work completed, and 102 bridges are under construction for preservation or repair. In addition, there are 237 bridges for which preservation or repair work is planned through state fiscal year 2015. This includes work such as repairing or replacing bridge expansion joints identified as leaking; installing waterproofing membrane on decks that have asphalt overlays but no such membranes; and sealing bare concrete decks.

The Transportation Commission's objective for bridges is to maintain 90 percent or more of deck area on the state highway system in a condition that is Not Structurally Deficient. This goal is consistent with the minimum bridge condition level for the National Highway System established as part of the federal Moving Ahead for Progress in the 21st Century Act (MAP-21). CDOT will achieve the goal through a mix of preventive maintenance strategies, bridge repair/rehabilitation, and bridge replacements.

Reporting Bridge Condition

CDOT reports major vehicular bridge condition primarily by the percentage of bridge-deck area statewide that is Not Structurally Deficient.

***Structurally Deficient** bridges do not meet minimum standards for condition or load-bearing capacity. They also often have one or more damaged or deteriorated structural members, such as a girder, truss or deck.*

The Moving Ahead for Progress in the 21st Century Act (MAP-21), the federal transportation authorization passed in 2012, sets a minimum level for bridge condition. If more than 10 percent of a state's bridge-deck area on the National Highway System is Structurally Deficient, certain federal funds must be used by that state for improving condition. CDOT's target for bridge condition was revised in 2013 to align with this goal, so 90 percent Not Structurally Deficient is now the Department's goal for deck area condition on the state highway system. This includes bridge deck area on the National Highway System in Colorado.

CDOT's "vision," or "aspirational objective," for bridge condition on the entire state highway system is for 95 percent of deck area to be Not Structurally Deficient.

Colorado Bridge Enterprise

The Colorado Bridge Enterprise was created by FASTER legislation to finance the repair and reconstruction of state-owned vehicle bridges. It does so using revenue from an annual bridge safety fee on vehicle registrations. The fee has been the primary source of revenue for the Bridge Enterprise since it began in 2009.

To receive Bridge Enterprise funding, bridges must be in "Poor" condition. Bridges in Poor condition have a Sufficiency Rating of less than 50 (out of 100) and a status of Structurally Deficient or Functionally Obsolete. *(See sidebar.)*

From the creation of the Bridge Enterprise in 2009 until the end of January 2015, 183 bridges statewide had become eligible for funding through the enterprise. Of those, 133 were eligible for FASTER funding. (The remaining structures had other funding sources, or funding had not been determined.)

As of Jan. 31, 2015, 72 bridges had been repaired or replaced with FASTER funds. In addition, 19 bridges funded by FASTER were in construction; three bridge designs were completed; 15 bridges were in the design stage; and 24 bridge projects were waiting to be scheduled or have an action plan determined. A list of current FASTER bridge projects and a map of their locations is at www.coloradodot.info/programs/BridgeEnterprise.

CDOT anticipates that the Bridge Enterprise will contribute much of the funding for the Interstate 70 viaduct replacement project east of downtown Denver. The current cost estimate for the portion of the project stretching from Interstate 25 to Interstate 225 is $1.17 billion. This includes the viaduct replacement and a new tolled express lane in each direction. Current financing proposals limit the maximum impact to bridge funds for this project to $850 million. Under current proposals, the remaining $320 million would come from sources such as SB 228 funds, a Transportation Infrastructure Finance and Innovation Act (TIFIA) loan, and local sources. A reduction in anticipated SB 228 (non-transit) funds has resulted in a $90 million funding gap for which funding sources continue to be explored. (See page 29 for more on SB-228.)

In the analyses that follow, $50 million per year was assumed to represent the Bridge Enterprise fund contribution and financing. This represents payment on a 35-year bond that would help finance the viaduct.

National Bridge Inventory Classifications

CDOT uses National Bridge Inventory standards established by the Federal Highway Administration to inventory, inspect and classify the condition of major vehicular bridges. The classification is based on a Sufficiency Rating of 0 to 100 and a status of Structurally Deficient, Not Deficient or Functionally Obsolete.

Structurally Deficient bridges do not meet minimum standards for condition or load-bearing capacity and often have one or more structural members (a girder, truss or deck, for example) in deteriorated or damaged condition. A Structurally Deficient bridge is a candidate for repair, major rehabilitation or replacement. The action considered depends on the portion of the bridge that caused the entire bridge to be classified as Structurally Deficient. Major rehabilitations include work such as replacement of the bridge deck, which is the riding surface of a bridge. Other examples include replacement of the superstructure, which comprises the supports immediately below the driving surface, and rehabilitation or strengthening of the substructure, which comprises the foundation and supporting posts and piers of the bridge.

CONTINUED

Cost of Achieving Goal

The cost to achieve CDOT's goal for bridge condition on the state highway system at the end of 10 years is about $1.61 billion, or $161 million per year. Compared to projected budgets including RAMP funds, this forecasts a 10-year deficit of about $41 million, or an average of $4 million annually, to achieve this goal. *(See Figure 10 on page 16.)*

Included in the 10-year cost estimate is $50 million per year as payment on a potential bond to help finance replacing the Interstate 70 viaduct. Replacing the viaduct is a significant component of the cost of keeping deck area at the target level. Risk mitigation costs of $90 million also are included in the estimate. The cost for achieving the goal is 5 percent higher than in last year's report. However, the analyses are not directly comparable due to the addition this year of risk-mitigation goals, new financing assumptions for the Interstate 70 viaduct, and the use of a different model to calculate bridge expenses.

Compared to last year's Deficit Report, budget projections for the bridge program have been lowered to account for CDOT's rising maintenance budget projections. *(See page 2 for more details.)* This is also the case for the "vision" and "sustain" estimates below.

Cost of Achieving Vision

The cost to achieve the bridge vision of 95 percent Not Structurally Deficient is about $2.65 billion over 10 years, which would require an average annual budget of about $265 million. Compared to projected budgets including RAMP funds, this forecasts a 10-year deficit of about $1.08 billion or an average of $108 million annually, to achieve this goal. *(See Figure 12 on page 16.)* Included in the 10-year cost estimate is $50 million per year as payment on a potential bond to help finance replacing the Interstate 70 viaduct. Risk mitigation costs of $465 million also are included in the estimate. This year is the first year that this particular vision of 95 percent Not Structurally Deficient has appeared in the Deficit Report.

CONTINUED

A major vehicular bridge that is Not Deficient will be a candidate for preservation actions many times during its service. Preservation actions slow or temporarily arrest the deterioration of a bridge. Most preservation actions stop or limit water with de-icing chemicals from getting to structural members. Preservation actions include work such as fixing leaking expansion joints and resealing damaged bridge-deck seals.

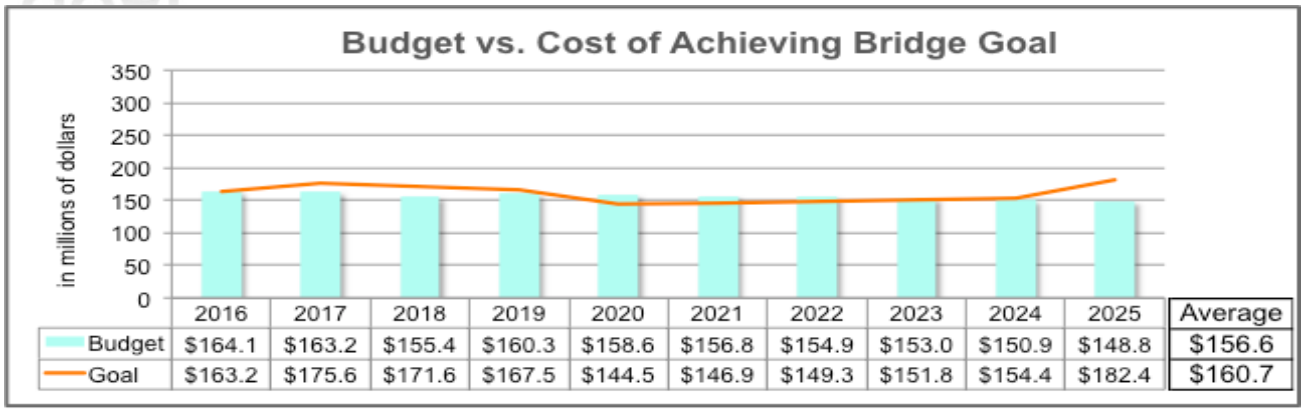
Functionally Obsolete bridges do not meet current minimum geometric requirements and often have inadequate roadway shoulders, insufficient number of lanes to handle current traffic, overhead clearances that are less than minimums, or inadequate widths for roadways or streams underneath. These bridges are candidates for widening or replacement. The action considered depends on why the bridge is classified as Functionally Obsolete. A Functionally Obsolete bridge is typically not a candidate for preservation actions unless the reason for it being Functionally Obsolete can't be addressed, such as an urban bridge that can't be widened due to high right-of-way costs.

Cost of Sustaining Condition

The cost to sustain the current bridge condition of 94 percent Not Structurally Deficient is about $1.67 billion over 10 years, which would require an average annual budget of about $167 million. Compared to forecast bridge program budgets, including the FASTER Bridge Enterprise Special Revenue Fund and RAMP funds, CDOT projects a 10-year deficit of about $105 million, or an average of $10.5 million annually. (See Figure 14 on page 17.) Included in the estimate is $50 million per year as payment on a potential bond to help finance replacing the Interstate 70 viaduct. The "sustain" estimate does not include costs for meeting CDOT's risk-mitigation targets for bridges.

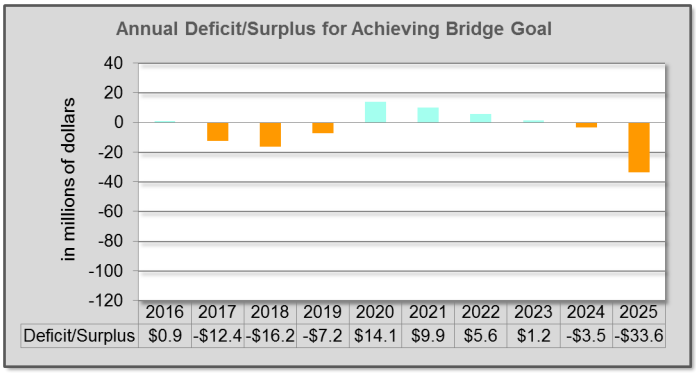
The cost of sustaining conditions is about 26 percent lower than in last year's report. However, these analyses are not directly comparable, because of new financing assumptions for the viaduct and the use of a different model to calculate bridge expenses.

GOAL



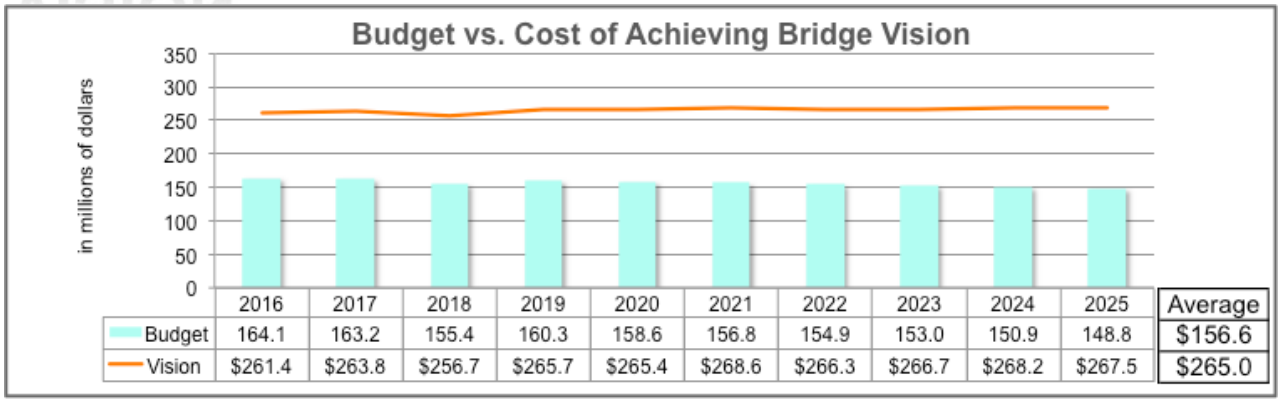
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Average
Budget	$164.1	$163.2	$155.4	$160.3	$158.6	$156.8	$154.9	$153.0	$150.9	$148.8	$156.6
Goal	$163.2	$175.6	$171.6	$167.5	$144.5	$146.9	$149.3	$151.8	$154.4	$182.4	$160.7

Figures 9 (above) and 10 (right): The chart above shows the cost of achieving CDOT's goal for bridge condition on the state highway system in 10 years, as compared to anticipated funding. As shown at right, the deficit over 10 years is about $41 million, or an average of $4.1 million per year.



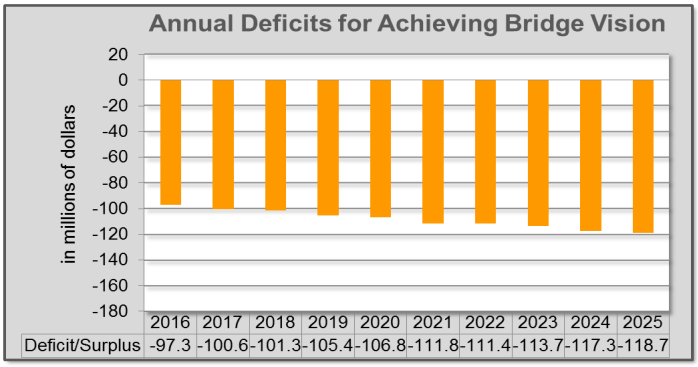
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Deficit/Surplus	$0.9	-$12.4	-$16.2	-$7.2	$14.1	$9.9	$5.6	$1.2	-$3.5	-$33.6

VISION



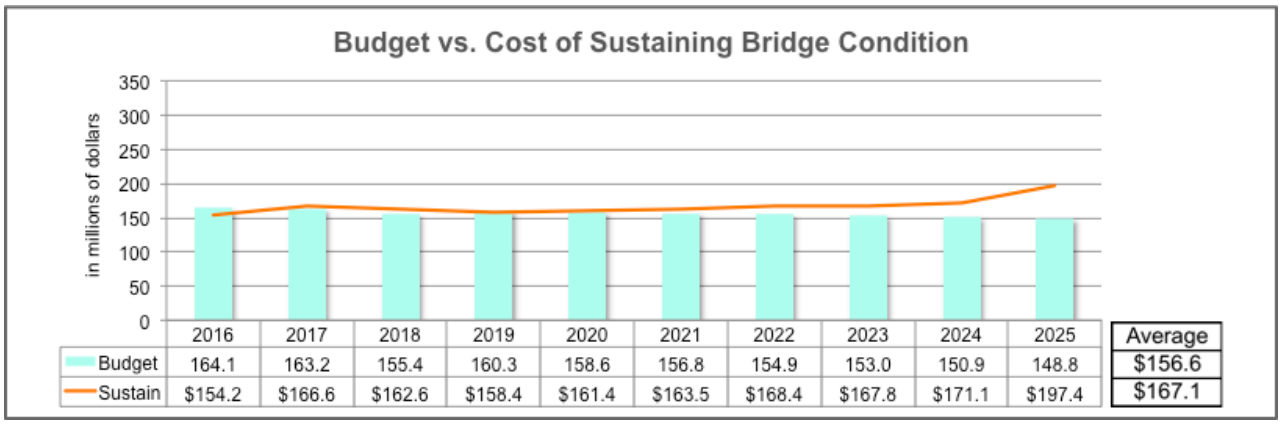
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Average
Budget	164.1	163.2	155.4	160.3	158.6	156.8	154.9	153.0	150.9	148.8	$156.6
Vision	$261.4	$263.8	$256.7	$265.7	$265.4	$268.6	$266.3	$266.7	$268.2	$267.5	$265.0

Figures 11 (above) and 12 (right): The chart above shows the cost of achieving the vision for bridges on the state highway system over 10 years, as compared to anticipated funding. As shown at right, the deficit over 10 years is about $1.08 billion, or an average of $108 million per year.



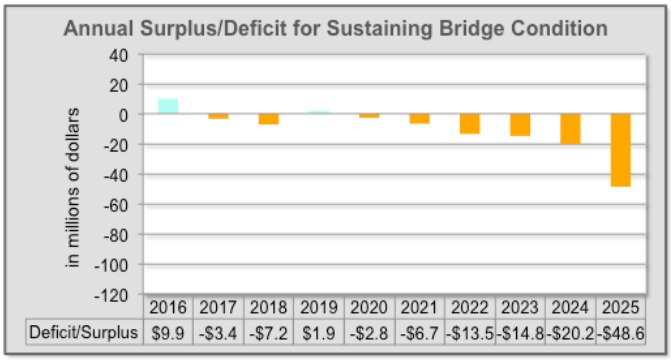
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Deficit/Surplus	-97.3	-100.6	-101.3	-105.4	-106.8	-111.8	-111.4	-113.7	-117.3	-118.7

SUSTAIN



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Average
Budget	164.1	163.2	155.4	160.3	158.6	156.8	154.9	153.0	150.9	148.8	$156.6
Sustain	$154.2	$166.6	$162.6	$158.4	$161.4	$163.5	$168.4	$167.8	$171.1	$197.4	$167.1

Figures 13 (above) and 14 (right): The chart above shows the cost of sustaining the current condition of bridges on the state highway system over 10 years, as compared to anticipated funding. As shown at right, the deficit over 10 years is about $105 million, or an average of $10.5 million per year.



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Deficit/Surplus	$9.9	-$3.4	-$7.2	$1.9	-$2.8	-$6.7	-$13.5	-$14.8	-$20.2	-$48.6

Addressing risks to Colorado's bridges

As mentioned, CDOT's goals for bridges now include addressing risks identified in CDOT's updated Risk-Based Asset Management Plan and the revised, Transportation Commission-approved Policy Directive 14. These risks include:

- **Bridges with vertical clearance lower than the minimum design requirement of 16 feet.** Such bridges are at risk from sustaining repeated hits from commercial vehicles. CDOT has identified 52 such bridges.
- **Bridges with vertical clearance lower than 14.5 feet.** CDOT has identified four bridges lower than the statutory maximum vehicle height of 14.5 feet.
- **Load-Restricted Bridges,** which are bridges whose current capabilities to support extra-legal highway loads are inadequate. These bridges restrict extra-legal weight commerce (i.e., permitted overweight vehicles) movement throughout our state. CDOT has identified 72 Load-Restricted Bridges.
- **Load-Posted Bridges,** which are bridges whose current capabilities to support legal loads are inadequate. These bridges restrict legal load weight vehicle commerce movement throughout our state. CDOT has identified two such bridges.

- **Scour-Critical Bridges,** which are bridges whose foundations are at risk of failure due to erosion. Scour is the most common cause of bridge failure. CDOT currently has 158 Scour-Critical Bridges.
- **Bridges with leaking expansion joints.**
- **Bridges with unsealed or otherwise unprotected deck area.**

Factors Contributing to Costs

For a discussion of inflation facing CDOT's construction program, see page 25.
Factors affecting costs for maintaining, repairing and replacing bridges include:

- **Exposure to the elements**. Exposure of bridges to the elements is the most significant factor affecting bridge conditions. Bridges are designed to withstand high volumes of traffic operating under current and historical weight and size limits. Deterioration of bridges due to exposure affects their ability to carry high traffic volumes over time and can result in weight restrictions.
- **Population growth and distribution.** These factors have a substantial effect on the Annual Average Daily Traffic (AADT) that crosses a bridge. AADT is one of the primary factors that drive a bridge to become Functionally Obsolete. Growth in population and where that population chooses to travel can result in changes in AADT and advance or delay the onset of Functional Obsolescence.
- **Vehicle size and weight.** Deterioration can result in posted weight limits that affect truck routes and the movement of commerce. CDOT issues tens of thousands of oversize or overweight permits annually, but non-permitted overweight vehicles can cause overstress damage to bridges if the load exceeds the bridge's carrying capacity. Non-permitted oversize vehicles can hit bridges and cause damage that lowers bridge condition and requires repair. CDOT performs inspections to identify bridges that require restrictions based on vertical clearance or vehicle weight.
- **Land use policies and work patterns.** Land use policies affect AADT, which is one of the many factors that determine a bridge's sufficiency rating and is indirectly used to determine Functional Obsolescence. A bridge's sufficiency rating is affected by shifts in AADT and truck traffic due to changes in commuting and commercial routes stemming from population growth and development.

Annual Maintenance

Baseline budgets for CDOT's "big three" asset categories—pavement, bridges and maintenance—comprise roughly half of the Department's annual budget. Sustaining performance levels of the Maintenance program is analyzed in this report much like the Surface Treatment and Bridge programs.

The Maintenance program, which is overseen by CDOT's Maintenance and Operations Branch, has a proposed fiscal year 2016 budget of $254 million, representing one of the Department's largest annual investments. The program is designed to keep the state highway system open and safe for the traveling public.

CDOT assigns a letter grade to evaluate the performance of individual maintenance areas *(see sidebar)*, as well as a grade to evaluate overall maintenance service. For fiscal years 2015 and 2016, the Department forecasts overall Maintenance Levels of Service grades of B- and C, respectively. These projections are estimates of what can be achieved with current funding levels. The goal in the Transportation Commission's revised Policy Directive 14, which was adopted by the commission in February 2015, is a B-.

The Transportation Commission also sets a long-term vision, or "aspirational objective", in Policy Directive 14. This current vision—to achieve a B in overall Maintenance Levels of Service over the next 10 years—is more ambitious than the fiscally constrained target.

Separately, the commission has set goals for Snow and Ice Control. The fiscally constrained goal for this Maintenance Program Area is a B, and the "aspirational objective", or vision, is a B+. CDOT achieved a level of service of B for Snow and Ice Control for fiscal year 2014.

Cost of Achieving Goal/Sustaining Conditions

The cost of sustaining a B- for Maintenance Levels of Service over the next 10 years is $3.08 billion, requiring an average annual budget of $308 million. Against anticipated program budgets, this forecasts a 10-year deficit of about $221 million or an average of $22.1 million annually. *(See Figure 16 on page 21.)*

Because it achieves a B- grade for overall Maintenance Levels of Service, sustaining current conditions also meets CDOT's goal.

The cost to sustain conditions has risen 6 percent since last year's report. The estimate has risen in part because it is based on fiscal year 2014

How CDOT Rates Maintenance

CDOT's maintenance program is designed to keep the state highway system open and safe for the traveling public. This involves all activities from the center line of the highway to right-of-way fences.

Maintenance activities are separated into nine Maintenance Program Areas (MPAs):

- *Roadway Surface:*
  Patching and sealing potholes
  Blading unpaved surfaces
- *Roadside Facilities*
  Cleaning drainage structures
  Repairing eroded slopes
  Repairing guardrails
- *Roadside Appearance*
  Controlling vegetation
  Sweeping road surface
  Trash removal
- *Traffic Services*
  Maintaining roadway signs and striping
  Maintaining traffic signals
  Maintaining roadway lighting
- *Structure Maintenance*
  Painting bridges
  Repairing expansion joints
  Patching decks
- *Snow and Ice Control*
  Plowing
  Avalanche control
- *Equipment and Buildings*
  Rest areas
- *Tunnel Activities*
  Tunnel operations
- *Planning and Scheduling*
  Performance budgeting
  Maintenance staff training

CONTINUED

costs, which were higher than fiscal year 2013, because maintenance funds were used on flood recovery and other emergency response efforts. An assumption of 3 percent annual inflation is another factor.

Cost of Achieving Vision

The cost to achieve CDOT's vision of a B for Maintenance Levels of Service over the next 10 years is $3.76 billion, requiring an average annual budget of $376 million. Against anticipated program budgets, this forecasts a 10-year deficit of about $900 million or an average of $90 million annually. *(See Figure 18 on page 21.)*

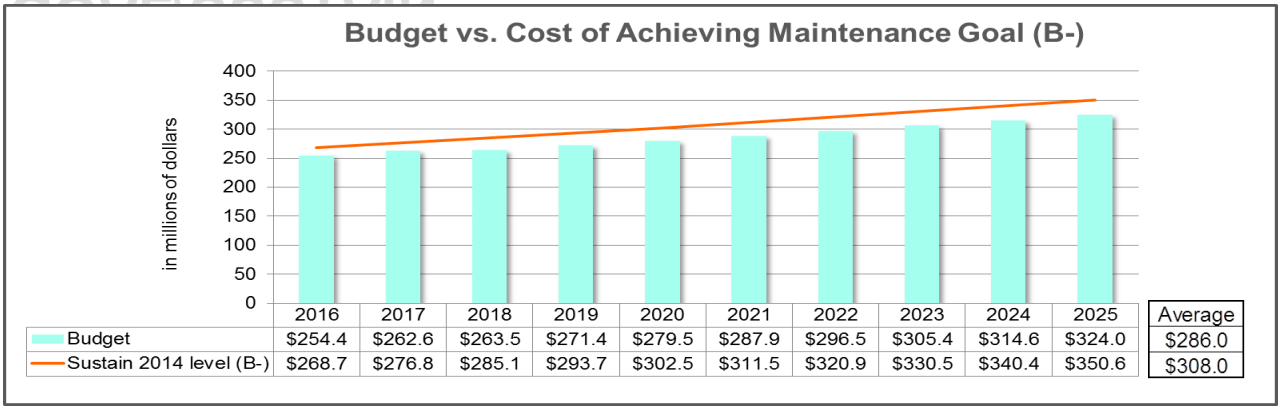
This estimate achieves a B in all individual Maintenance Program Areas for every year of the 10-year analysis. The cost estimate is 7 percent higher than the same scenario in last year's report, when the estimate was $3.5 billion over 10 years. See page 22 for a discussion of factors that contribute to higher maintenance expenses.

CONTINUED

CDOT measures the performance of maintenance service with a "report card" style grading system called Maintenance Levels of Service (MLOS). Each individual maintenance area is given a grade, and those grades are used to determine an overall grade for maintenance. Higher grades can be achieved with higher funding levels.

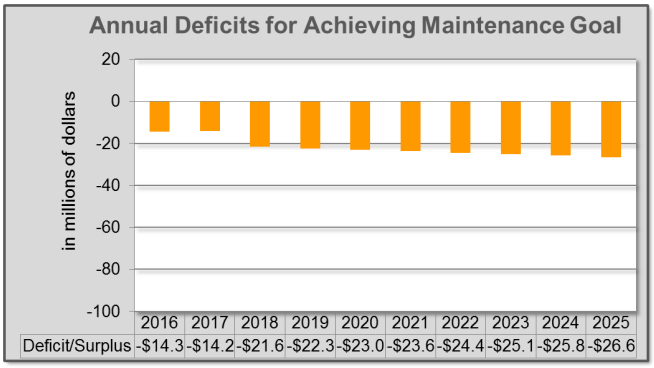
The MLOS budget process consists of a survey of existing conditions, most recent costs and a recommendation of funding to reach the goal set by the Transportation Commission.

GOAL/SUSTAIN



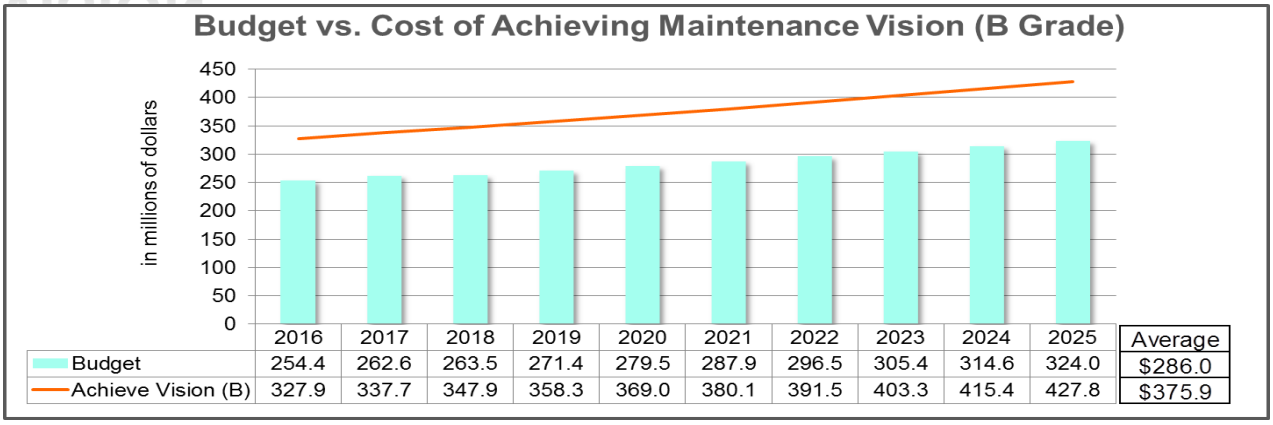
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Average
Budget	$254.4	$262.6	$263.5	$271.4	$279.5	$287.9	$296.5	$305.4	$314.6	$324.0	$286.0
Sustain 2014 level (B-)	$268.7	$276.8	$285.1	$293.7	$302.5	$311.5	$320.9	$330.5	$340.4	$350.6	$308.0

Figures 15 (above) and 16 (right): The chart above shows the cost of achieving the goal of B- for Maintenance Levels of Service, as compared to anticipated funding. As shown at right, the deficit over 10 years is about $221 million, or an average of $22.1 million per year. This estimate also sustains current the maintenance grade, which was a B- in fiscal year 2014.



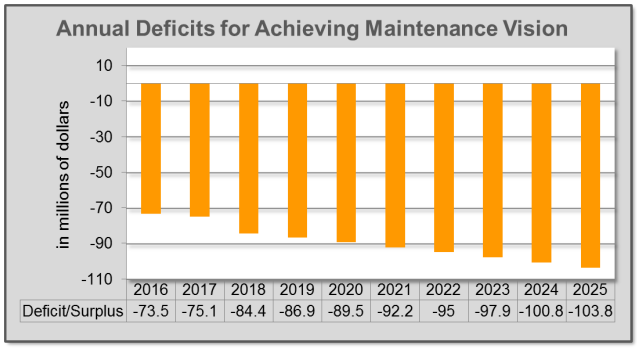
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Deficit/Surplus	-$14.3	-$14.2	-$21.6	-$22.3	-$23.0	-$23.6	-$24.4	-$25.1	-$25.8	-$26.6

VISION



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Average
Budget	254.4	262.6	263.5	271.4	279.5	287.9	296.5	305.4	314.6	324.0	$286.0
Achieve Vision (B)	327.9	337.7	347.9	358.3	369.0	380.1	391.5	403.3	415.4	427.8	$375.9

Figures 17 (above) and 18 (right): The chart above shows the cost of achieving the vision of B for Maintenance Levels of Service, as compared to anticipated funding. As shown at right, the deficit over 10 years is about $900 million, or an average of $90 million per year.



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Deficit/Surplus	-73.5	-75.1	-84.4	-86.9	-89.5	-92.2	-95	-97.9	-100.8	-103.8

Factors Contributing to Maintenance Costs (Estimated and Actual)

Many factors each year influence budget estimates, cost estimates, and deficit estimates for achieving various grades for Maintenance Levels of Service. As examples:

- The estimate of the cost to achieve a particular grade depends heavily on the current grade. The overall maintenance grade for fiscal year 2014 was a B-, down from a B in fiscal year 2013. If other factors are unchanged, it is less expensive to achieve a B if the maintenance program begins with a B instead of a B-.
- The cost to achieve an overall maintenance grade is dependent on the mix of grades achieved in individual Maintenance Program Areas, which make up the overall grade.
- An annual inflation rate of 3 percent is used for costs in this report.

Funding levels for the Pavement and Bridge programs over time can also significantly affect the Maintenance program. Maintaining assets that are in poor condition can be more expensive than doing the same for roads and bridges in better condition.

Weather conditions heavily affect the cost of snow and ice removal and roadway surface conditions. Due to high snowfall, the Department may spend more on snow-and-ice control in a certain year and still achieve a historically low Level of Service. Fuel prices and labor also are significant components of nearly all maintenance activities. The declining price of oil in early 2015 notwithstanding, higher fuel costs in the long-term and other factors have driven up long-term cost trends for most Maintenance Programs Areas. As depicted by the annual budget in Figure 19 (below), snow and ice control is almost a third of the total maintenance budget.

Figure 19. Maintenance Program Area Budgets

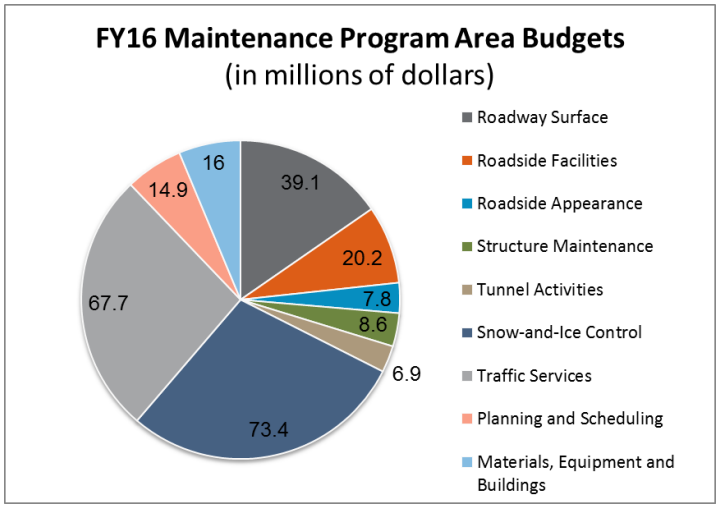
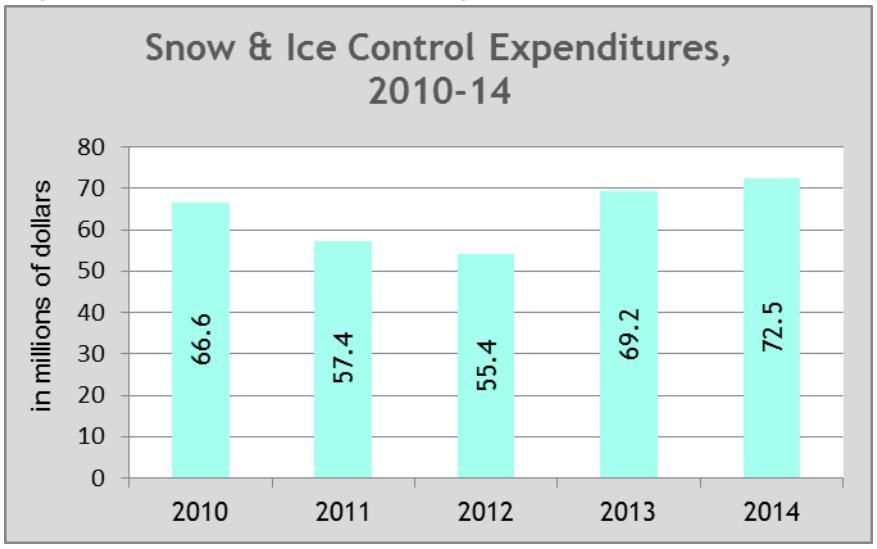


Figure 20. Snow & Ice Control Spending



There is no lasting positive effect on the infrastructure from snow and ice control measures. Rather, there is cumulative harm caused by scraping plow blades across pavement and damaging pavement markings through snow-removal efforts. De-icing chemicals, such as magnesium chloride, also can accelerate the deterioration of infrastructure. Sand used by local jurisdictions carries over to highways and accelerates stripe deterioration. Conversely, funds that provide for new construction or reconstruction of transportation infrastructure have a positive impact on the maintenance program, because new infrastructure requires less maintenance than aging infrastructure.

Keeping roads clear of snow and ice is expected to cost the Department $73.4 million in fiscal year 2016, according to CDOT's proposed budget. An additional $10 million is set aside for snow-and-ice contingency needs and reallocated by the Transportation Commission if not used for that purpose. The cost to keep roads clear during winter storms has increased substantially over the past decade due to cost inflation for fuel, de-icing materials, and snow-fighting technology such as RWIS (Road Weather Information System) and MDSS (Maintenance Decision Support System). In 2001, the average cost per plow mile was $5.31. The cost jumped to $11.79 by fiscal year 2014. Among the factors that have contributed to this increase are higher fuel and equipment costs and the expense of meeting higher performance expectations.

Population Growth and Distribution. Population growth and growth in Vehicle Miles Traveled (VMT) are significant factors in the cost of maintenance efforts. Particularly over the past decade, development of the tourism and energy industries has increased VMT in mountainous and rural areas, where the system can be more costly to maintain due to topography or infrastructure that was not designed to carry the truck volume of recent years. Population distribution also plays a key role, and limited resources may in

some circumstances be focused on high-volume segments in high population areas to alleviate mobility concerns.

Vehicle Size and Weight. A Maintenance Program Area heavily affected by vehicle size and weight is Roadway Surface, which undertakes projects smaller than those typically performed by CDOT's Surface Treatment program. Pavements are designed and constructed to accommodate an expected total of Equivalent Single Axle Load (ESAL) of 18,000 pounds each over a specific period. The design assumes regular maintenance and typical environmental conditions. As the number, size and weight of vehicles increase, so does the deterioration rate of pavement. The rate of deterioration is accelerated by reductions in regular maintenance and increases in the severity of climatic conditions experienced.

Land Use Policies and Work Patterns. The impact of land use policies on transportation infrastructure maintenance is the same as outlined in the Surface Treatment section of this report. Changes in land use policies can result in more traffic on roadways designed for less volume, which can affect deterioration and redirect maintenance resources.

Rising Construction Costs

Colorado's ongoing economic recovery has sparked a construction boom stemming from both residential and non-residential demand. The transportation sector represents about 20 percent of nonresidential construction spending nationwide, according to the U.S. Census Bureau, and CDOT could be considered the biggest consumer of infrastructure construction in Colorado. Prices of major construction items began increasing in late 2013, and a 6 percent increase is forecast for the Colorado Construction Cost Index (CCCI) for 2014-15. Neighboring state transportation departments also report an average inflation rate of 6 percent for their construction programs.

The number of bids rejected by the Department grew significantly in 2014 compared to the average for 2011-13. CDOT believes this increase has been driven by the aforementioned increase in construction activity. A recent study by CDOT's Transportation Performance Branch shows that Department projects attracted fewer bidders in 2014 relative to 2011-13. When fewer bidders vie for a project, it can increase the chance that bids exceed engineering estimates and lead the Department to reject bids.

CDOT's smaller projects have been particularly affected. And compared to the past, projects awarded by CDOT in 2014 were generally closer to their rejection ceilings, which are based on engineering estimates. These findings indicate that the market is saturated, and that contractors have already committed their capacity to projects. This trend is expected to continue for at least two years—until the market attracts new contractors and/or existing contractors increase their capacity. The Department hopes that this anticipated resolution and increased efficiencies will help it cope with inflation in the long term. To counter cost increases, CDOT in some cases has combined projects for cost efficiencies, reduced project scopes, and considered alternative project-delivery methods.

Making the Most of Existing Infrastructure

CDOT expects that financial resources for adding lane capacity or undertaking other expansions will remain limited. Extracting the most benefit possible from existing transportation infrastructure is becoming increasingly important. The Department is responding to this challenge with multiple strategies to reduce costs, curb the growth of Vehicle Miles Traveled and increase mobility and safety within the existing system.

As part of these efforts, CDOT formed the Division of Transportation Systems Management & Operations (TSM&O) in 2013. The division focuses on implementing low-cost, high-value operational improvements to the transportation system. Initiatives include developing command-level partnerships with law enforcement and other stakeholders to implement integrated event, corridor and incident-management strategies.

Other initiatives include implementing peak-period shoulder lanes, improved operations through Active Traffic Management (ATM), managed lanes, and programs such as the Courtesy Patrol and Heavy Tow programs. The Courtesy Patrol program provides services including locating and clearing traffic-related incidents and providing roadside assistance. The primary purpose of the patrol is immediate management of incidents during hours of peak vehicle volume. The Heavy Tow program provides standby heavy wreckers at strategic locations along Interstate 70, between Floyd Hill and Vail Pass. The wreckers move stalled and spun-out commercial vehicles from traffic lanes.

The new division includes CDOT's Intelligent Transportation Systems Branch. ITS systems are a key element of CDOT's demand-management efforts. The ITS Branch maximizes the operational efficiency and management of existing roadways through technology and special programs. Some practices involve methods of traffic control that help maintain flow, such as ramp metering and quick response to crashes. Other practices give real-time traffic information to motorists, empowering them to decide when and where to travel. ITS infrastructure includes devices such as fiber-optic cable along highways, closed-circuit television (CCTV) cameras, variable message signs, ramp meters, high-occupancy vehicle/high-occupancy toll lane (HOV/HOT) systems, road and weather information services and travel-time indicators.

From May through October 2014, the Division of TSM&O and the Division of Highway Maintenance led an unprecedented effort to develop an Interstate 70 Winter Operations Plan for the 2015 winter season with the specific goals of reducing injury and fatal crashes; reducing Interstate 70 closure time; reducing delays in excess of 90 minutes; and reducing the Planning Time Index value. Improvements for the 2015 winter season include expanded ramp metering, expanded Heavy Tow and Courtesy Patrol coverage, increased staffing and equipment readiness for maintenance, and improved implementation of the chain law. CDOT maintenance forces statewide have given to this effort by sending a supplemental crew of 20 snowplow drivers to the corridor every week through winter. Additionally, midrange snowplows were replaced with tandem snowplows that are more appropriate and effective for operations in mountain terrain.

CDOT uses multiple devices along the Interstate 70 corridor to acquire data that help determine real-time traffic speeds and calculated travel times, which are then disseminated to drivers along the highway, to potential drivers and to others via COTrip.org and on various displays at mountain resorts. CDOT Mobile is a free mobile-device app that delivers real-time travel information from COTrip.org. Other tools for delivering traffic information include the 511 phone line and the Department's Facebook and Twitter accounts. Travelers use information from these sources to modify travel routes or times.

CDOT also has turned to transit services to help reduce congestion. The Department's Division of Transit & Rail, created by FASTER legislation, has been working to integrate transit into the state's transportation system. In fiscal year 2013, Colorado's first Freight and Passenger Rail Plan was completed, and the first Statewide Transit Plan was initiated. The division also developed an Interregional Express Bus Plan. Under the plan, CDOT is providing a transit service known as Bustang, which will be launched in spring 2015 and operated by a private vendor. Bustang will provide express bus service along Interstate 25, connecting Fort Collins to Denver and Colorado Springs to Denver. In the Interstate 70 corridor, the bus service will connect Glenwood Springs, Eagle County, Vail and Frisco to Denver. Bustang connects the state's six largest transit agencies, using Denver Union Station as a hub.

The Department continues to be the recipient of Federal Transit Administration grants for Colorado's rural and small urban areas. These funds, in combination with FASTER Transit funds, are distributed and administered by the Division of Transit & Rail to local transit providers statewide.

Conclusion

The outlook for transportation revenue remains uncertain. Changing driving habits, greater fuel efficiency and cost inflation are weakening the ability of state and federal fuel taxes—which have not increased for two decades—to provide sufficient funding. Congress has extended the Moving Ahead for Progress in the 21st Century Act (MAP-21), the current federal transportation authorization, until May 31, 2015. However, the lack of a long-term federal reauthorization makes revenue projections difficult.

Demands placed on Colorado's transportation system are outpacing CDOT revenue. Over the past 20 years, Colorado's population has grown 46 percent, from 3.7 million people to 5.4 million people. The state's population will grow to six million by 2020 and 7.8 million by 2040, according to a November 2014 report from Colorado's State Demography Office. Travel on the highway system has increased in the past 20 years by 43 percent, from 19.8 billion to 28.4 billion miles of vehicle travel per year. This growth has occurred on a highway system with capacity that has grown by just 2 percent, from 22,521 to 23,022 lane miles of state highway.

These trends mean that Coloradans can expect to spend more time in traffic. This will cause more wear and tear on roadways—many of which were not built to accommodate the increased demand—and more extensive maintenance needs.

Coloradans have enjoyed adequate transportation infrastructure. The average work commute statewide is 24.5 minutes, compared to 25.5 minutes nationwide, according to U.S. Census data. Our safety systems are improving, and our snow-and-ice control program is one of the nation's best. However, state highways are becoming more congested, and the transportation infrastructure is aging.

The ongoing economic recovery portends both positive and negative effects for the state's transportation system. Fuel tax collections may grow, while increased travel will further strain the system. The state's unemployment rate fell from 6.2 percent in December 2013 to 4.0 percent in December 2014, according to the U.S. Bureau of Labor Statistics. The December 2014 rate was 1.6 percentage points below the rate for the entire nation.

In a December 2014 report, Colorado's Office of State Planning and Budgeting wrote that increased economic activity in Colorado is driving higher fuel tax

collections, which "are expected to remain strong as consumers and businesses benefit from lower gas prices." Fuel taxes, the office noted, "are collected as a set amount per gallon of fuel, rather than as a percentage of the total sale, which means that fuel tax revenue does not fall as a direct result of lower prices. Lower prices may encourage drivers and businesses to use more fuel and have been associated with increased purchases of more expensive trucks and sport utility vehicles, which could result in higher collections of vehicle registration fees."

Increasing fuel efficiency, however, means that each vehicle will generate less fuel tax revenue than in the past. And the growing number of vehicles on the road means the strain on the highways continues to increase.

Revenue from FASTER fees and other vehicle registration fees, as well as CDOT's RAMP funding program, will help prevent accelerated deterioration of highways and bridges. But those sources are contributing primarily to maintaining the system, and RAMP funding is not permanent. Adding capacity to the transportation system will require CDOT to seek new funding sources.

The Colorado Legislature passed Senate Bill 228 (SB 228) in 2009. SB 228 provides funding for strategic transportation projects through five years of General Fund transfers, provided certain economic triggers are met. Initial forecasts projected the receipt of roughly $200 million per year for five years. In anticipation of SB 228 funds, CDOT and its planning partners identified about $2.3 billion in projects throughout Colorado that could move forward with the funds.

But CDOT now faces significantly reduced projections for SB 228 funds due to a provision of the law that reduces or eliminates funds in years when the Taxpayer Bill of Rights (TABOR) requires a General Fund refund to taxpayers. In addition to the many projects identified around the state, the Department anticipated it would help finance the Interstate 70 East project that includes the viaduct in north Denver by using $270 million in SB 228 funding (or $300 million when including transit elements).

More recent projections of SB 228 suggest that CDOT may only receive $100 million per year for two years. The law requires that 10 percent of SB 228 funds go to transit, leaving $180 million available for highway projects. If all of these funds were applied to the Interstate 70 East project, CDOT would still face a $90 million funding gap on that project. What's more, none of the other projects around the state would be constructed. Actions by the Legislature that would secure SB 228 funding for the Department would help ensure that Colorado's future transportation needs are met.

In summary, CDOT projects it faces a 10-year deficit of $450 million to meet goals for pavement and bridge condition and Maintenance Levels of Service. This includes deficits of $188 million for pavement, $41 million for bridges and $221 million for Maintenance Levels of Service.

The projected cost to meet CDOT's goals has risen from last year's Deficit Report due to factors such as actual and projected inflation, the inclusion of risk-mitigation goals for bridges, and the refinement of models used to forecast asset conditions and costs.

Colorado and other states continue to look for innovative ways to optimize the efficiency of their transportation networks and to minimize the impact of continued deterioration.

For questions about this report, please contact William Johnson, Asset Management Branch Manager, at will.johnson@state.co.us or Toby Manthey, CDOT Performance Analyst, at toby.manthey@state.co.us.