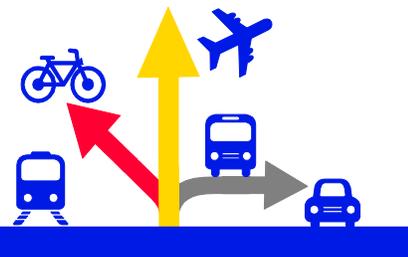


# NEEDS AND GAP TECHNICAL MEMORANDUM

March 23, 2015

**TRANSPORTATION  
MATTERS**



**STATEWIDE TRANSPORTATION PLAN**



**COLORADO**  
Department of  
Transportation

## What is a Needs and Gap Analysis?

A needs and gap analysis is an estimate of long-range capital and operating investment needs to keep the transportation system functioning effectively as well as a discussion of the methods and sources used to derive them. Transportation investment needs are generally defined as the dollars required to accomplish the Statewide Transportation Plan goals for Safety, Mobility, Economic Vitality, and Maintaining the System. The needs estimate encompasses asset management, maintenance, expansion, intelligent transportation systems (ITS)/operations, safety, rural, small urban, and interregional public transportation investment requirements. A funding gap occurs when the projected revenues are less than the needs estimate.

## Why does CDOT do a Needs and Gap Analysis?

CDOT does a needs/gap analysis to understand the costs associated with the transportation needs identified by the Statewide Transportation Plan and the amount of funding available. This allows CDOT to identify whether additional funding is needed to meet Colorado's transportation needs. The needs estimates also reflect a stronger connection to objectives and in most cases quantitative outcomes, consistent with the evolution of CDOT towards a performance management orientation in investment decision-making through Policy Directive (PD) 14 and other initiatives. PD 14 provides the overall framework for the transportation planning process through the Statewide Transportation Plan and guides the investment decisions for the multi-modal transportation system.

## How did CDOT Determine Needs?

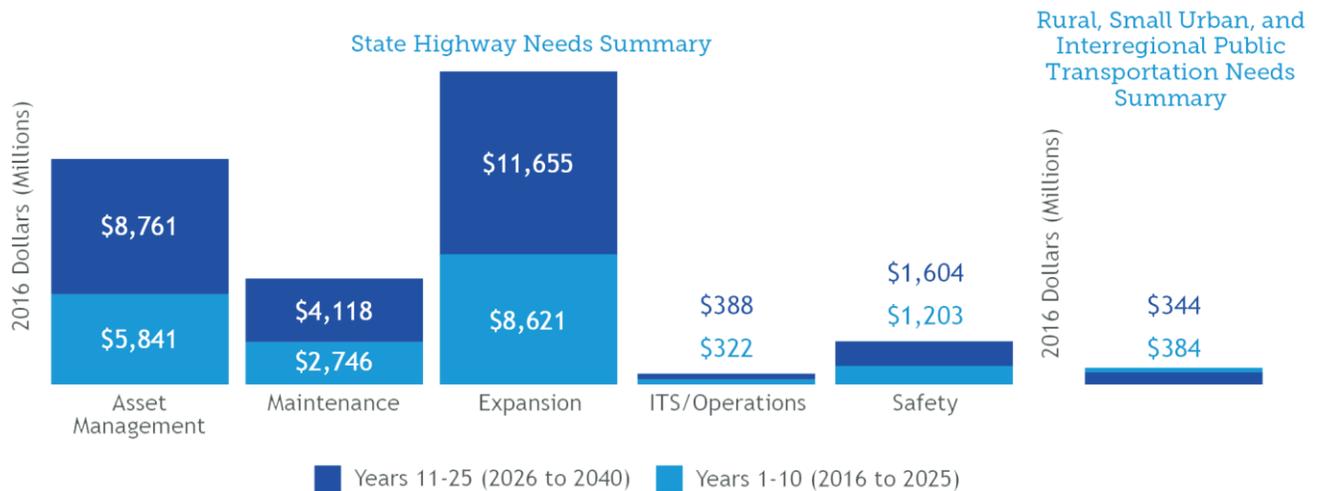
CDOT used a range of data to identify multi-modal investment needs. CDOT considered needs over a 25-year time horizon and divided the needs into categories and into two time periods: a short-term planning horizon of 10-years (2016 to 2025) and a long-term planning horizon (2026 to 2040). The following categories of transportation needs were analyzed.

- **Asset Management and Maintenance:** Asset management includes replacing and rehabilitating existing and future transportation facilities on a long-term basis, including preventative maintenance. Maintenance includes the everyday and annual maintenance of the transportation system; for example: snow plowing, equipment maintenance, and minor road and bridge repairs. The CDOT Program Distribution, the results of the most recent CDOT Asset Management Delphi process (now known as budget setting), and the CDOT Transportation Deficit Report were used to determine the needs. The Deficit Report was used for its long-term analysis of asset management and maintenance needs while the Delphi results and programs distribution were used for categories not covered in the Deficit Report.
- **Expansion:** Investments that add capacity to the multi-modal transportation system by enhancing existing facilities or creating/building new infrastructure and services. These investments were separated into the short-term (2016 to 2025) and the long-term (2026 to 2040) planning horizons. The needs were determined through Metropolitan Planning Organization (MPO) (2035 or 2040) and Regional Transportation Plan (2040) documents, lists developed by the Transportation Planning Regions (TPRs), CDOT Region project lists and data, and other existing lists of projects. The team also used safety data from CDOT (known as level of service for safety, or LOSS), travel time data and speed data (for the National Highway System (NHS) only) from the Federal Highway Administration (FHWA), and information from environmental documents and

- MPO plans. Projects were screened and validated as potential needs based on criteria that included safety, low travel speeds, congestion levels, environmental document completion, and regional input. The input received from regional planners assisted in providing context for long-term economic vitality and development needs.
- **ITS/Operations:** Activities to improve traffic flow without adding capacity. This includes ITS, which provide traveler information and assists in better managing traffic flow. CDOT reviewed the CDOT Program Distribution, the draft 2014 CDOT Strategic Highway Safety Plan, and the 2014 Transportation Systems Management and Operation Plan. The team also used information found in the MPO and Regional Transportation Plan documents.
  - **Safety:** Safety is generally enhanced with every project. The safety category includes education and targeted safety focused projects such as rail crossings and safety hot spots. CDOT created maps and a database showing the severity and locations of crashes and congestion, and evaluated the potential of projects to address these issues.
  - **Bicycle/Pedestrian:** CDOT is conducting an inventory of bicycle/pedestrian facilities on and along the state highway system that will include a route system that serves recreational and commuter markets and that provides connectivity between attractions, work locations, and population centers. The route system will require bicycle/pedestrian compatible features such as wider shoulders and lanes, signs, new bridges, and sidewalks. These needs will be developed and analyzed once the inventory is complete.
  - **Rural, Small Urban, and Interregional Public Transportation:** A preliminary analysis of rural and interregional transit needs was prepared for the plan. This includes costs for operations such as driver salaries, and vehicle maintenance and fuel, as well as capital costs for regular fleet replacement and rehabilitation. TPRs plan for services that reach a variety of travel markets, including commuting, low-income, elderly, and disabled populations in low population density areas. In addition, expansion investments were also considered to address unmet current needs or meet anticipated future needs, based on demographic or socioeconomic growth projections. CDOT is conducting a more detailed transit needs analysis that will be completed in the future. The needs as identified represent the current level of funding going to the rural and small urban transit through CDOT and existing funding for interregional transit. The current analysis does not include MPO interregional or high speed rail needs.

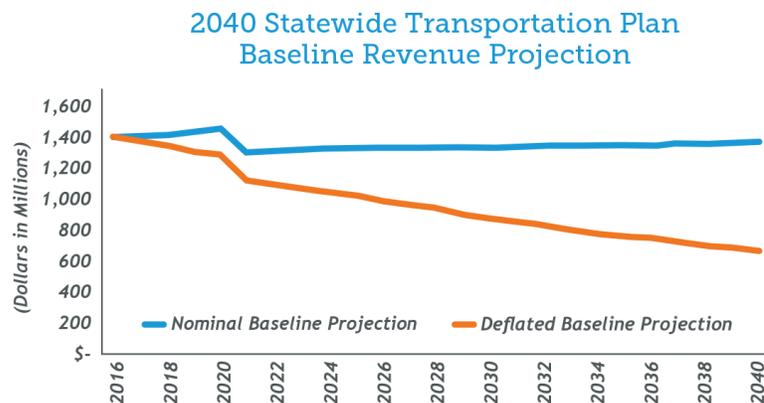
## Needs Summary

According to the plan team's analysis, CDOT, in its role as owner-operator of the state multimodal transportation system, requires approximately \$46.0 billion (in 2016 dollars) in funding over the next 25 years. Most of the funding required is for expansion of the highway system (\$20 billion), followed by asset management at \$14.6 billion, and \$6.9 billion for maintenance. ITS/operations, safety, rural, and interregional public transportation needs account for the remaining needs.



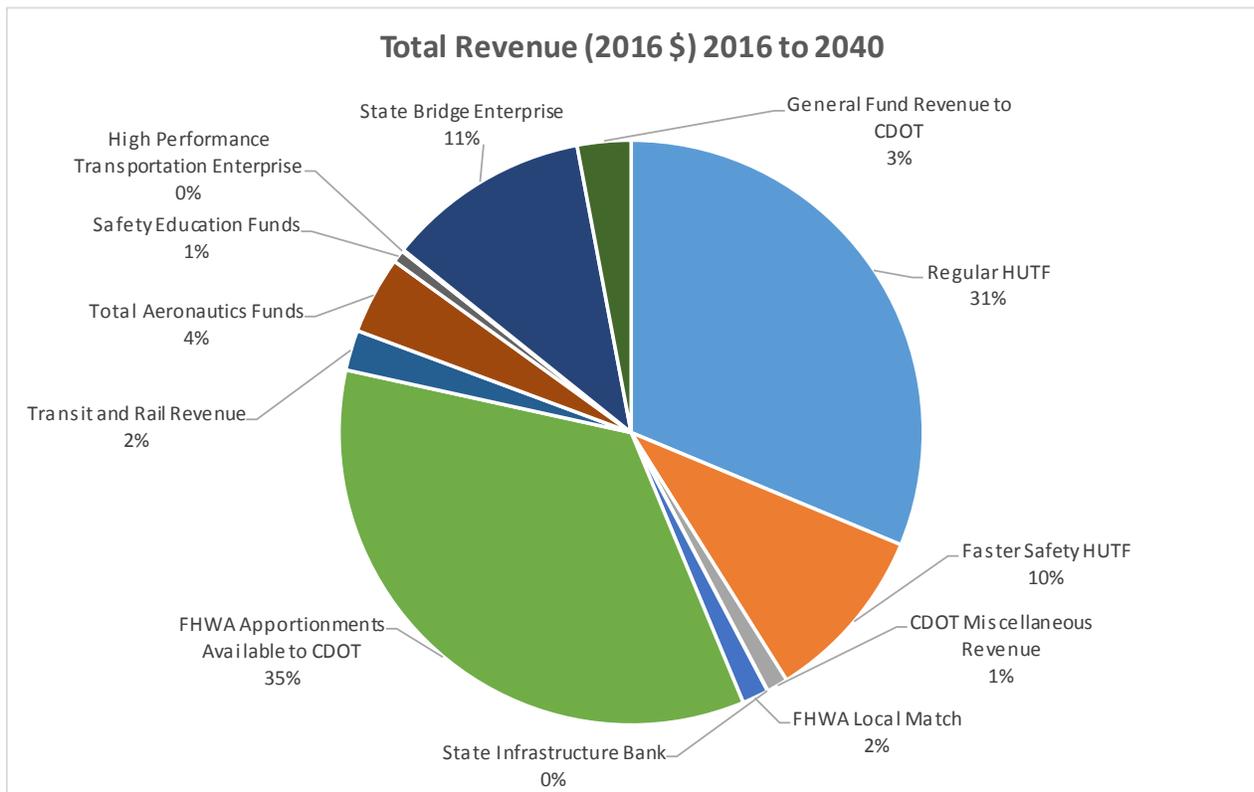
## Revenue Summary

CDOT, through legislative authority, uses transportation revenues from various taxes and fees to fund the entirety of its transportation program. CDOT forecasts future revenues based on projected federal funding, population growth, vehicle use and turnover, and future fuel efficiency. This baseline revenue forecast shows higher revenue levels between 2016 and 2020 as it includes \$800 million (\$160 million per year for 5 years) from Senate Bill 228. From 2020 on, revenue is forecast to grow at less than 0.5 percent per year, lower than the anticipated rate of inflation.



CDOT projects a revenue stream of about \$24.7 billion for 2016 to 2040 from a number of sources (Table 1). Some of these funding sources require expenditure on specific parts of the transportation system. For instance, bridge funds and safety funds are required to be used for targeted project types. In addition, some funding received by CDOT is required to be passed through to other agencies and are considered deductions from CDOT revenue. Some examples include aeronautics, MPOs, and off-system bridges. The deductions from revenue estimates are shown in the table below and reduce CDOT revenue \$3.7 billion resulting in a 25-year revenue of \$21.0 billion. The approved program distribution is the Transportation Commission approved forecast of annual funds available within each revenue category from 2016 to 2040. The program distribution is shown in the Transportation Estimated Needs and Gaps Technical Memorandum.

<b>Table 1: Total Revenue Less Deductions (2016 \$) 2016-2040</b>	
<b>Total Revenue (all entities)</b>	<b>\$ 24,754,122,801</b>
Aeronautics	\$ 1,062,702,281
Program Delivery/Administration	\$ 1,315,744,326
Transportation Alternatives Program	\$ 242,480,990
Metropolitan Planning	\$ 139,861,105
Bridge Off-System	\$ 169,479,520
Debt Service	\$ 313,704,339
Infrastructure Bank	\$ 5,035,039
Bridge Enterprise Debt Service	\$ 327,036,675
Bridge Enterprise Program Delivery/Administration	\$ 34,090,331
High Performance Transportation Enterprise (HPTE) Program Delivery/Administration	\$ 24,661,370
FASTER Transit (estimate of MPO allocations)	\$ 69,948,614
<b>Total Deductions</b>	<b>\$ 3,704,744,591</b>
<b>Total Less Deductions</b>	<b>\$ 21,049,378,211</b>



## Current Funding Situation

Projected revenues for the Statewide Transportation Plan include a projection of nearly \$735 million in the first 10 years provided by legislation called Senate Bill 228. These funds would provide for important strategic highway and transit projects. More recent forecasts of revenue, however, suggest that these funds may be substantially reduced or eliminated with the latest forecast calling for only a little over \$200 million. As a result, the gap identified later may actually be larger.

## Funding Gap

CDOT compared the short-term (2016 to 2025), the long-term (2026 to 2040), and the 25-year needs estimate to the revenue estimate to produce an estimate of the funding gap. The team adjusted the revenue forecast to convert the annual stream of revenues into a constant year 2016 estimate at a rate of 3 percent per year (known as deflating). This adjustment produces a comparison that is more valid and representative of the true difference. In the short-term (2016 to 2025), the needs outpace the revenue by \$8.77 billion, which equates to \$877 million funding gap each year between 2016 and 2025. The funding gap continues in the long-term with a \$16 billion gap or over a billion dollars a year between 2026 and 2040. The projected needs (2016 to 2040) exceed revenues by \$24.9 billion, and revenues account for approximately 46 percent of the projected needs. The average annual funding gap is \$996 million.

In the initial years (2016 to 2025) of this Statewide Transportation Plan, highway expansion is the category where the largest average annual unmet need will be experienced accounting for \$795.9 million of the \$887.2 million funding gap total. Highway asset management is the second largest average annual area with a funding gap at \$207.9 million. There is a flexible revenue stream indicated above that may be applied to any of the categories that will help but not resolve the overall funding gap as shown in Table 2.

**Table 2: Gap Analysis 2016 - 2025**

Category	Needs	Revenue	Gap	Annual
Highway Asset Management	\$ 5,840,780,000	\$ 3,761,544,700	\$ (2,079,235,300)	\$ (207,923,530.03)
Highway Maintenance	\$ 2,745,610,000	\$ 2,544,000,000	\$ (201,610,000)	\$ (20,161,000.00)
Highway Expansion	\$ 8,620,080,000	\$ 661,517,754	\$ (7,958,562,246)	\$ (795,856,224.65)
Highway Operations	\$ 321,640,000	\$ 257,978,544	\$ (63,661,456)	\$ (6,366,145.63)
Highway Safety	\$ 1,203,000,000	\$ 1,013,710,723	\$ (189,289,277)	\$ (18,928,927.69)
Transit	\$ 384,177,826	\$ 384,177,826	\$ -	\$ -
Flexible	\$ -	\$ 1,720,616,554	\$ 1,720,616,554	\$ 172,061,655.38
<b>Total</b>	<b>\$ 19,115,287,826</b>	<b>\$ 10,343,546,100</b>	<b>\$ (8,771,741,726)</b>	<b>\$ (877,174,172.63)</b>

The last half (2026 to 2040) of this Statewide Transportation Plan, highway expansion continues to be the category where the largest average annual unmet need will be experienced accounting for \$777.0 million of the \$1,075.3 million funding gap total. Highway asset management is the second largest average annual funding gap at \$304.4 million. There is a flexible revenue stream indicated above that may be applied to any of the categories, which will help but not resolve the overall funding gap as shown in Table 3.

**Table 3: Gap Analysis 2026 - 2040**

Category	Needs	Revenue	Gap	Annual
Highway Asset Management	\$ 8,761,180,000	\$ 4,194,435,732	\$ (4,566,744,268)	\$ (304,449,618)
Highway Maintenance	\$ 4,118,410,000	\$ 3,037,010,686	\$ (1,081,399,314)	\$ (72,093,288)
Highway Expansion	\$ 11,654,780,000	\$ -	\$ (11,654,780,000)	\$ (776,985,333)
Highway Operations	\$ 388,130,000	\$ 269,063,046	\$ (119,066,954)	\$ (7,937,797)
Highway Safety	\$ 1,604,000,000	\$ 1,326,366,330	\$ (277,633,670)	\$ (18,508,911)
Transit	\$ 308,294,740	\$ 308,294,740	\$ -	\$ -
Flexible	\$ -	\$ 1,570,661,577	\$ 1,570,661,577	\$ 104,710,772
<b>Total</b>	<b>\$ 26,834,794,740</b>	<b>\$ 10,705,832,111</b>	<b>\$ (16,128,962,629)</b>	<b>\$ (1,075,264,175)</b>

Over the life of this Statewide Transportation Plan, highway expansion is a category where the largest average annual unmet need will be experienced accounting for \$784.5 million (nearly 80 percent) of the \$996 million funding gap total. Highway asset management is the second largest average annual funding gap at \$265.8 million, over 25 percent of the total. There is a flexible revenue stream indicated above that may be applied to any of the categories that will help but not resolve the overall funding gap as shown in Table 4.

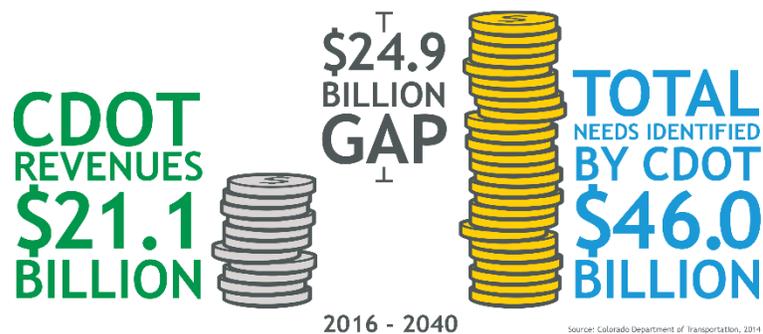


Table 4: Gap Analysis 2016 - 2040				
Category	Needs	Revenue	Gap	Annual
Highway Asset Management	\$ 14,601,960,000	\$ 7,955,980,432	\$ (6,645,979,568)	\$ (265,839,183)
Highway Maintenance	\$ 6,864,020,000	\$ 5,581,010,686	\$ (1,283,009,314)	\$ (51,320,373)
Highway Expansion	\$ 20,274,860,000	\$ 661,517,754	\$ (19,613,342,246)	\$ (784,533,690)
Highway Operations	\$ 709,770,000	\$ 527,041,589	\$ (182,728,411)	\$ (7,309,136)
Highway Safety	\$ 2,807,000,000	\$ 2,340,077,053	\$ (466,922,947)	\$ (18,676,918)
Transit	\$ 692,472,567	\$ 692,472,567	\$ -	\$ -
Flexible	\$ -	\$ 3,291,278,131	\$ 3,291,278,131	\$ 131,651,125
<b>Total</b>	\$ 45,950,082,567	\$ 21,049,378,212	\$ (24,900,704,355)	\$ (996,028,174)

## Conclusion

CDOT faces a significant funding challenge for the present and the future with declining purchasing power, rising construction costs, and decreasing revenue. Due to these funding challenges, CDOT only has enough money to maintain the infrastructure in its current condition for the next 10 years, in which time the system will be maintained, but expansion projects will be very limited. With growing population and travel demand, this means CDOT will not have sufficient funding to achieve all of its goals and objectives outlined in the Statewide Transportation Plan.