



DATE: March 16, 2016
TO: Transportation Commission
FROM: Debra Perkins-Smith, Director, Division of Transportation Development
William Johnson, Performance and Asset Management Branch Manager
SUBJECT: Asset Management Workshop

Purpose

This presentation will familiarize the Transportation Committee members with six assets: buildings, signals, ITS, road equipment, geohazards and Maintenance Levels of Service (MLOS). It provides background on the program and sets the stage for more in-depth discussions in future months, ultimately preparing the Commission for approval of the FY20 asset management planning budget; thereby continuing the 4-year program of projects.

Action

Informational item. Provides information for future Transportation Commission action.

Background

Last month the Commission heard a general overview of the asset management program. This month six assets will be highlighted, providing information on inventory, condition, performance metrics and targets. Asset management programs must be able to demonstrate with a quantified performance measure the benefit of additional investment. Asset management distinguishes between annual maintenance activities and capital preservation, and replacement activities, and funds only capital preservation and replacement (no additional capital projects).

The six assets presenting in this workshop include buildings, signals, ITS, road equipment, geohazards and MLOS. Buildings includes the properties owned by CDOT, including office, vehicle storage facilities, sand sheds and more. Signals has recently been recognized as its own asset program after years of being funded through the MLOS budget. ITS is unique in that it is the only asset class that is rapidly increasing in size and maintenance requirements, due to the number of new devices being deployed in large projects. Road equipment is in the midst of an optimization study reviewing the number, type and location of each vehicle. The geohazards program sets aside funds for emergency repairs along with preventive maintenance work in high risk areas. The MLOS program funds maintenance throughout the state and is one of CDOT's largest programs.

Details

Each asset manager will provide a summary of their program status. In May, staff will present their FY20 asset management budget recommendation to Commission for review. The FY20 asset management budget will be finalized during the annual budget cycle in 2019.

Next Steps

During the April TC Workshop the remaining asset managers will present their asset programs to the Commission. In May William Johnson will present the CDOT Staff Recommendation for the FY20 Asset Management Budget to the Transportation Commission for approval. Additionally, staff expect to have a discussion with the Transportation Commission in subsequent months to discuss progress on metrics identified in Policy Directive 14 to start the budget process for FY18.

Summary of Presentations:

February: Overview - completed

March: Buildings, signals, ITS, road equipment, geohazards and MLOS

April: Bridge, walls, culverts, pavement, and tunnels

May: FY20 Planning Budget

Attachments

Attachment A: Asset Management Workshop Presentation





COLORADO

Department of
Transportation

Asset Management Workshop Part 1 of 2

March 16, 2016



Intro & Objectives

Workshop Purpose: To provide information in preparation for future TC action.

Asset Manager Presentations by:

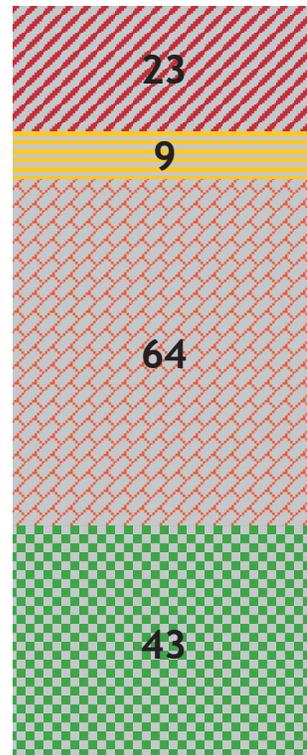
- Buildings
- Signals
- ITS
- Road Equipment
- Geohazards
- MLOS



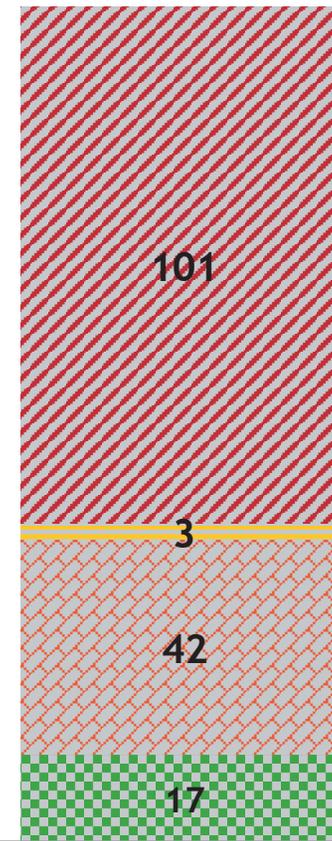
Asset Management Project Status

2015 Asset Management
(139 Total)

2016 Asset Management
(163 Projects Total)



As of Jan 15, 2016



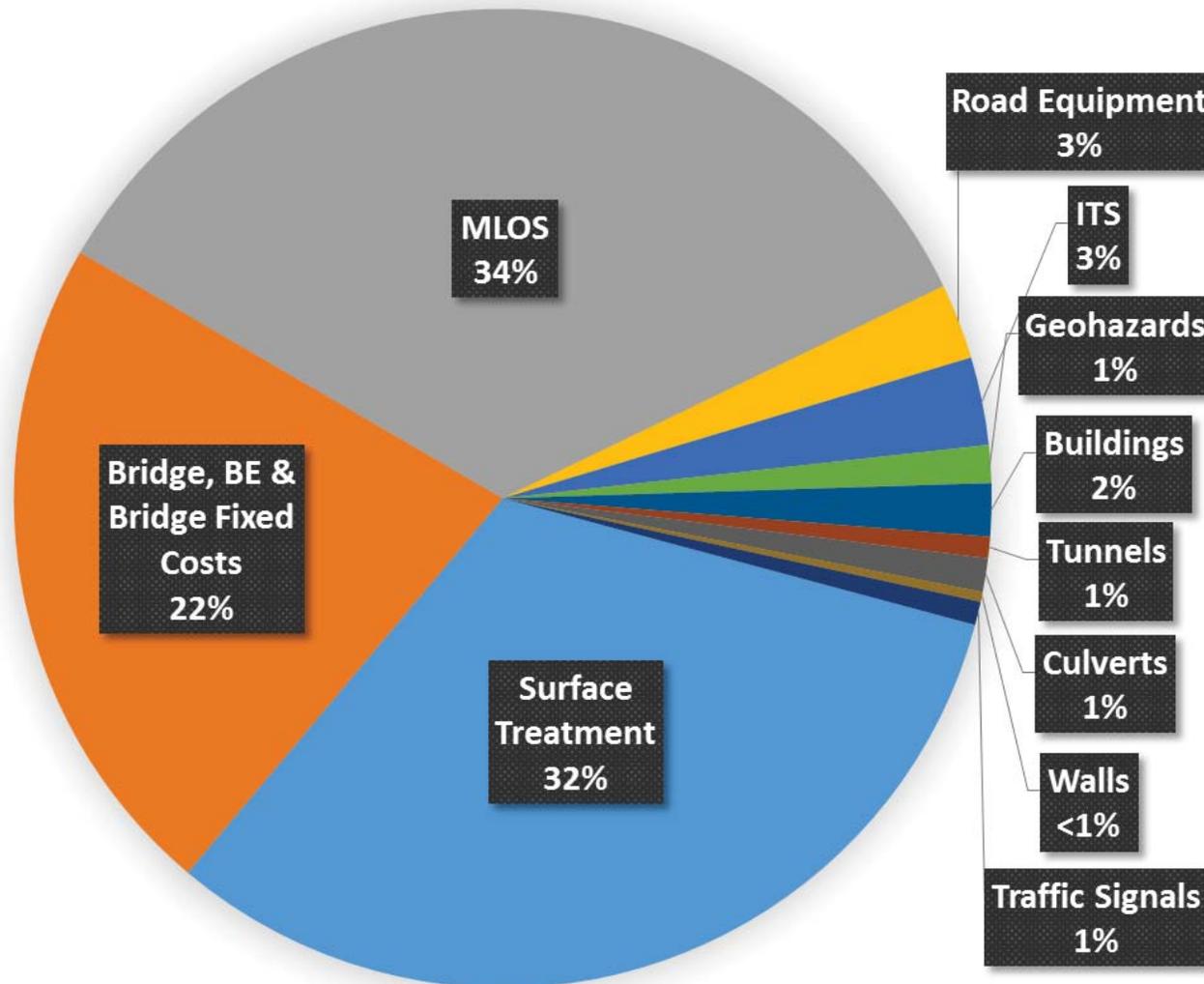
As of Jan 15, 2016

■ Completed ■ In Construction ■ In Bid/Award ■ In Design



Asset Management FY16 Budget Distribution

FY16 Asset Management Planning Budgets Distribution



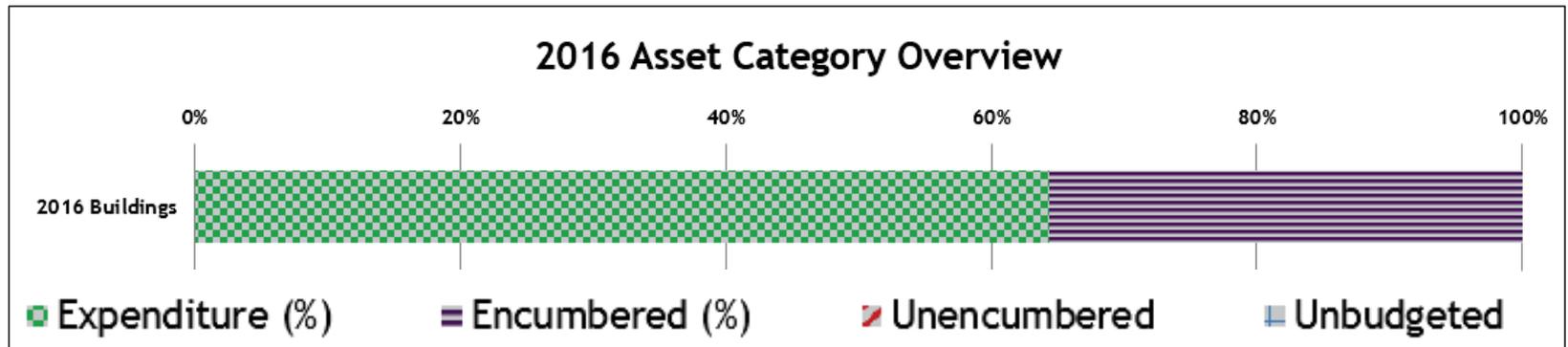
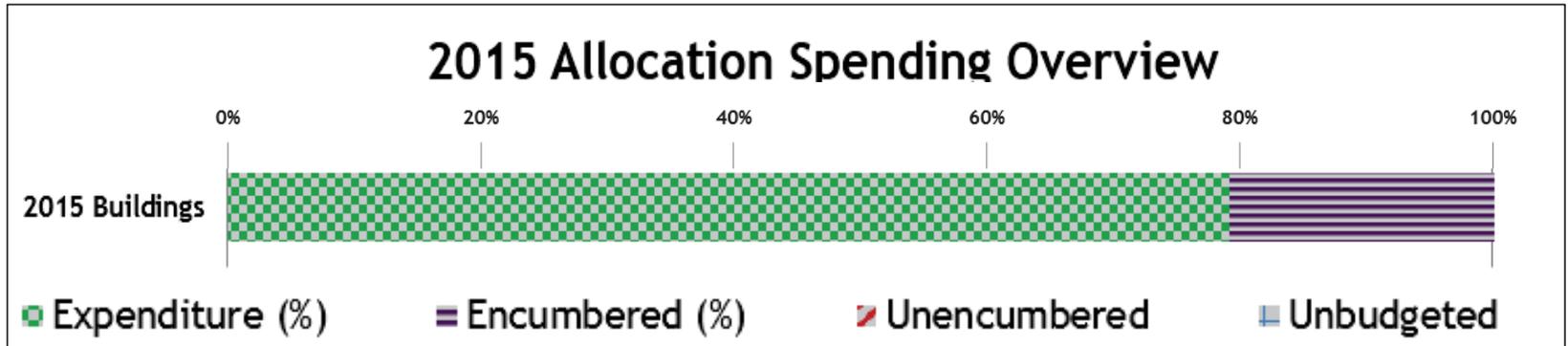


Buildings: Hope Wright

- The Property Management Program designs, constructs and provides annual funding to maintain structures owned by CDOT across the State, ensuring all facilities are constructed and managed in accordance with applicable laws and regulations.
- Asset Examples: Vehicle Storage Facilities, Sand Sheds and Office Space
- Asset Inventory Management System (AIMS) includes 376 buildings due to budgetary limitations and building use; total structures exceed 1200.
- Program Activities: Architectural and Engineering Design; New Construction/Remodel Project Management and Contract Management; Property Disposals and Leasing
- Most projects span multiple funding years and are new sites or realigned sites that consider State needs and provide improved operations for ensuring protection of other assets and the safety of workers and the traveling public



Buildings



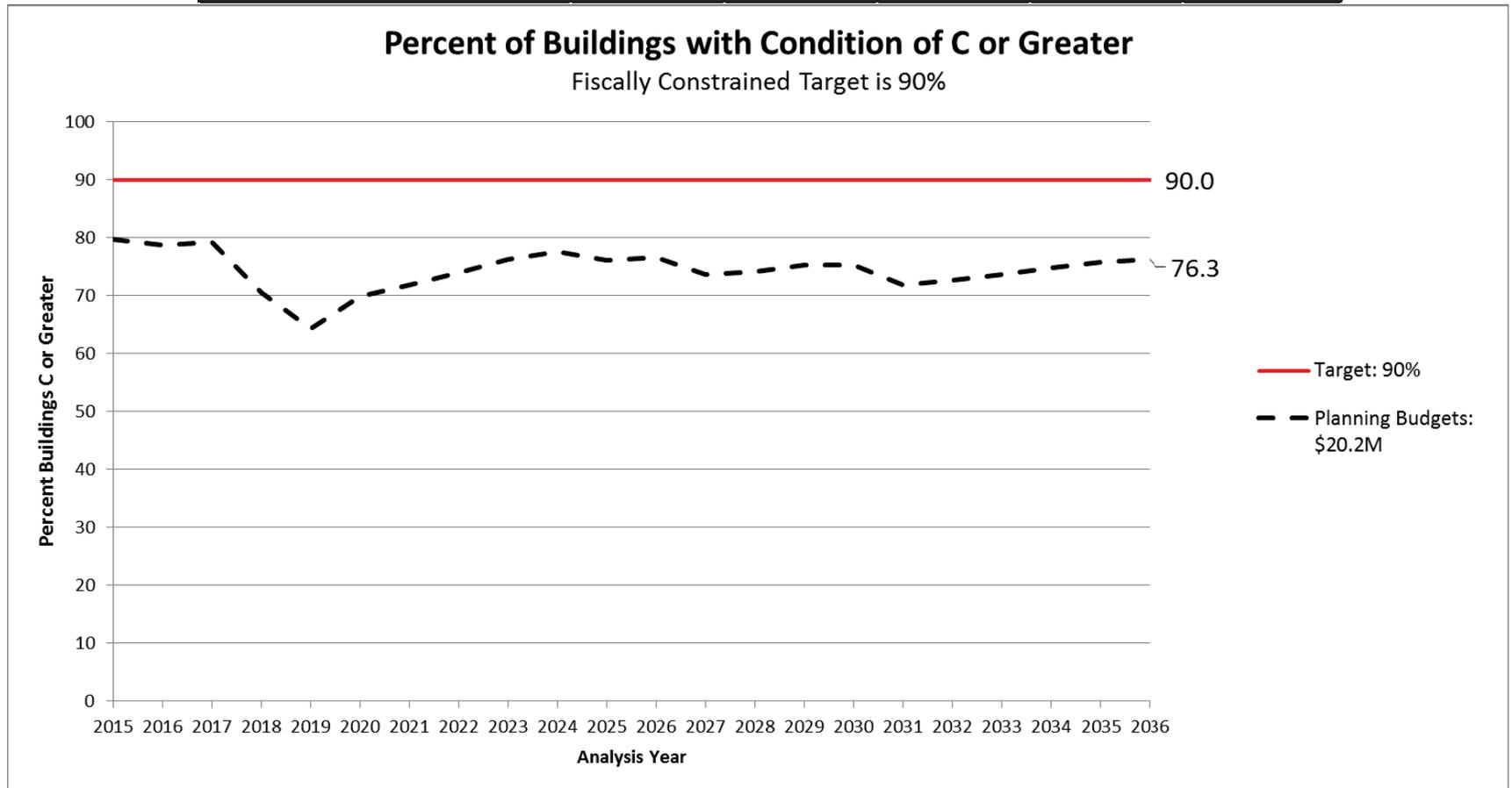
| Number of Approved Projects vs. Completed Projects, As of March, 2016 | | | |
|---|------------------------------|---|------------------------------|
| FY15 | | FY16 | |
| Number of Projects in Approved Project List | Number of Completed Projects | Number of Projects in Approved Project List | Number of Completed Projects |
| 10 | 5 | 11 | 3 |

Note: All data is current as of March, 2016



Buildings

| FY15-FY19 Asset Management Planning Budgets (in millions) | | | | | |
|---|--------|--------|--------|--------|--------|
| Asset Class: Buildings | FY15 | FY16 | FY17 | FY18 | FY19 |
| Requested | \$22.4 | \$15.7 | \$22.0 | \$20.0 | \$24.0 |
| Allocation | \$20.8 | \$12.9 | \$21.4 | \$17.5 | \$20.2 |



Metric Description: Statewide Letter Grade
Current Performance: 80% C or Better
Fiscally Constrained Target: 90% C or Better
Estimated Cost to Achieve Target: \$50M/yr



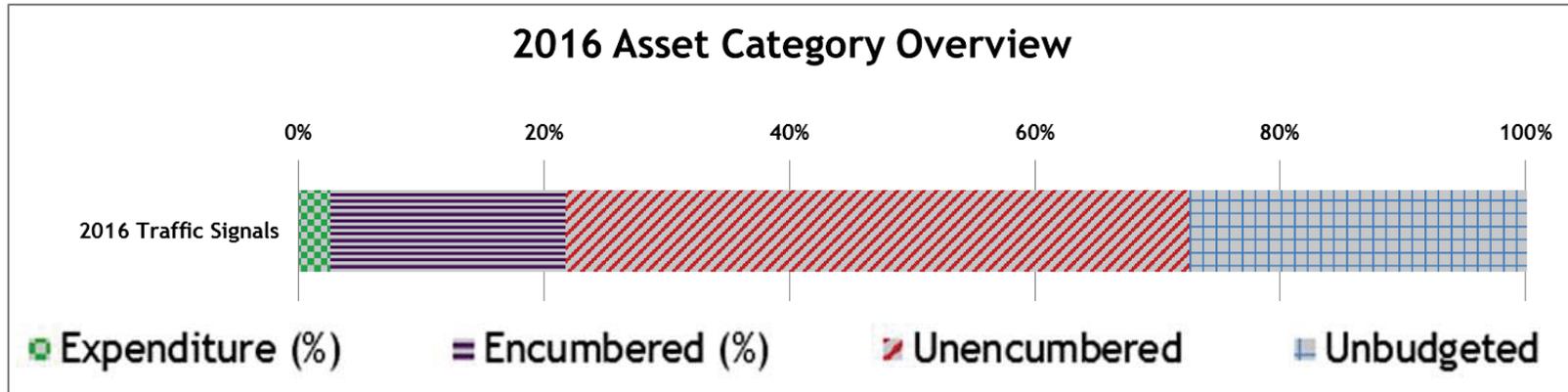
Traffic Signals: Nitin Deshpande

- Signal Asset Management Program works collaboratively with CDOT Regions in prioritization of capital replacement budget on statewide signal replacement projects.
- Key Components & Primary Reason for Replacement or Rehabilitation:
 - Traffic Signal Assembly: structural integrity, excessive deterioration
 - Cabinets & Controllers: structural integrity, functional or technological obsolescence
- CDOT owns approx. 1,850 signals statewide, \$850M replacement value
- Leverage inspection data from Staff Bridge & Maintenance History in SAP.



Traffic Signals

FY15: N/A (No Signals Program)



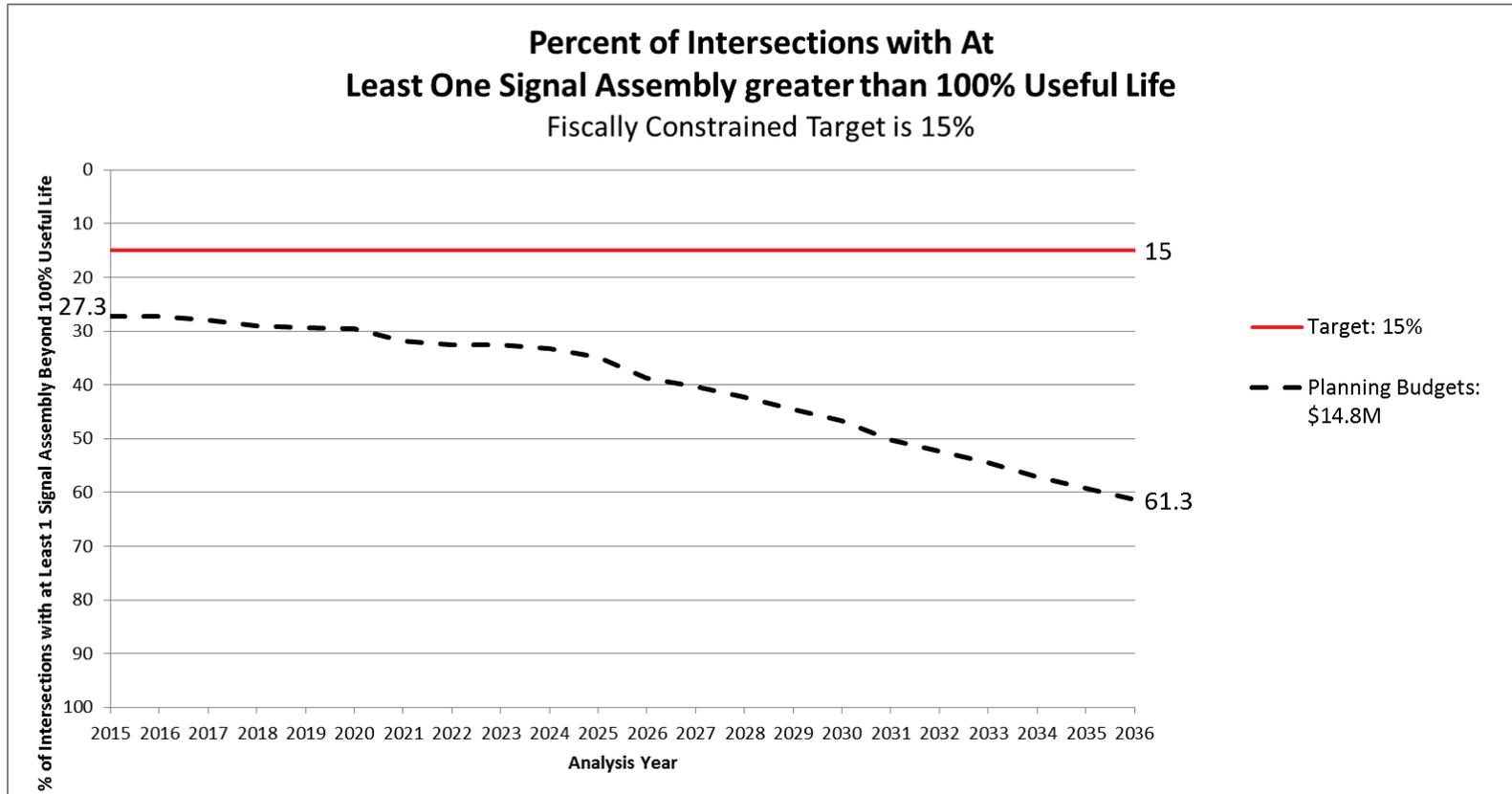
Note: Expenditure data is current as of February, 2016

| Number of Approved Projects vs. Completed Projects, As of March, 2016 | | | |
|--|------------------------------|---|------------------------------|
| FY15 | | FY16 | |
| Number of Projects in Approved Project List | Number of Completed Projects | Number of Projects in Approved Project List | Number of Completed Projects |
| N/A | N/A | 17 | 17 in design |



Traffic Signals

| FY15-FY19 Asset Management Planning Budgets (in millions) | | | | | |
|---|-------|--------|--------|--------|--------|
| Asset Class: Signals | FY15 | FY16 | FY17 | FY18 | FY19 |
| Requested | N/A | \$16.0 | \$22.0 | \$22.0 | \$20.0 |
| Allocation | \$0.0 | \$5.7 | \$16.9 | \$12.6 | \$14.8 |



Metric Description: Percent intersections with at least one signal assembly beyond 100% useful life.

Current Performance: 27%

Fiscally Constrained Target: 15%

Estimated Cost to Achieve Target: \$80M/yr



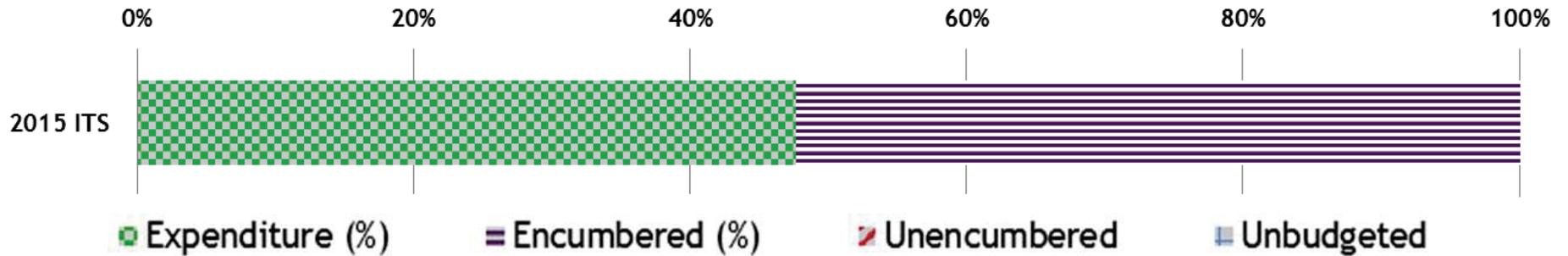
ITS: Saeed Sobhi

- The ITS Branch plans, designs, constructs, maintains and operates the statewide ITS assets
- The assets consist of 3,300 devices (VMS, CCTV, Sensors, RWIS..), nearly 1,000 miles of fiber optic and related network equipment, and complex systems such as PPSL, US 36 and I-25 managed lanes, the CTMS Control Software, video incident detection.... Appx. Total asset value of \$300 M.
- Number of assets expected to increase significantly by the year 2020 (I-70 central, C-470, connected vehicles, managed motorways...)
- In addition to delivering its own program of projects, the ITS Branch provides critical technical support to Region projects
- The ITS Branch also collects and compiles extensive data, and generates statistics and performance measures, such as those for the I-70 Mountain Corridor
- The ITS Branch develops and manages PPPs for fiber assets, data sharing, etc.
- The ITS Branch closely collaborates with the RoadX program

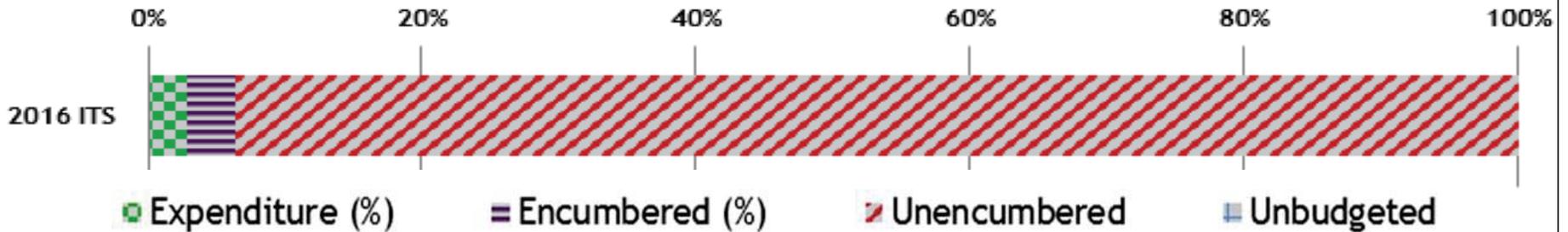


ITS

2015 Allocation Spending Overview



2016 Allocation Spending Overview



Note: Expenditure data is current as of January, 2016

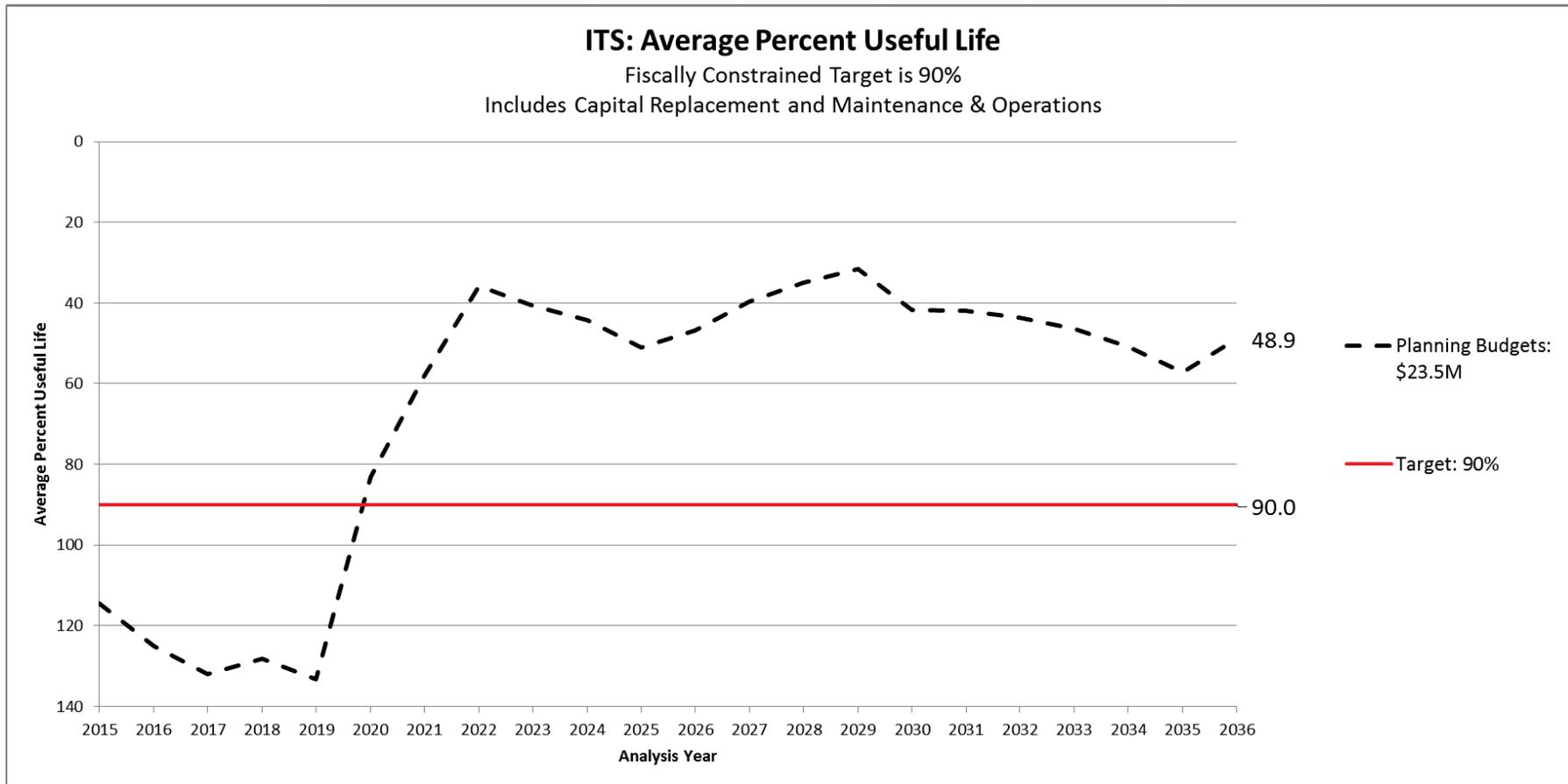
Number of Approved Projects vs. Completed Projects, As of March, 2016

| FY15 | | FY16 | |
|---|------------------------------|---|------------------------------|
| Number of Projects in Approved Project List | Number of Completed Projects | Number of Projects in Approved Project List | Number of Completed Projects |
| 4 | 1, Others at 50% | 3 | All 3 under design |



ITS

| FY15-FY19 Asset Management Planning Budgets (in millions) | | | | | |
|---|--------|--------|--------|--------|--------|
| Asset Class: ITS | FY15 | FY16 | FY17 | FY18 | FY19 |
| Requested | \$37.7 | \$35.1 | \$13.5 | \$13.5 | \$35.0 |
| Allocation | \$27.6 | \$21.4 | \$24.5 | \$23.0 | \$23.5 |



Metric Description: Average Percent Useful Life
Current Performance: 114%
Fiscally Constrained Target: 90%
Forecasted Year to Achieve Target: 2020



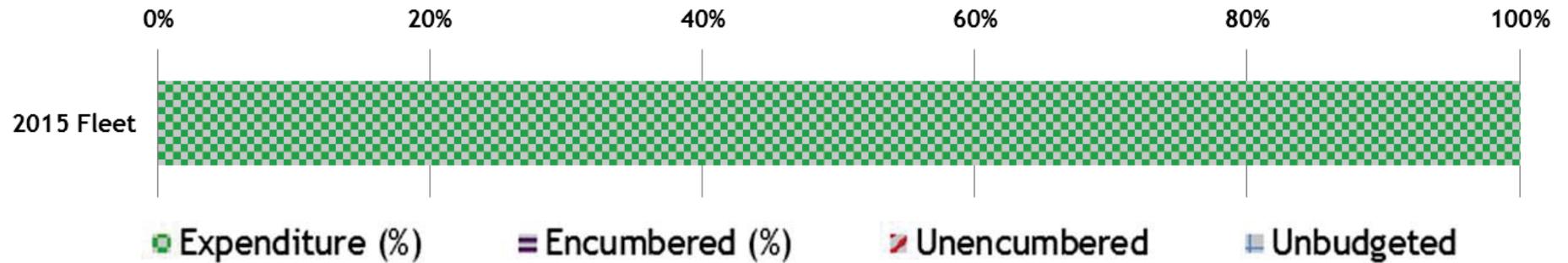
Road Equipment: Chris Volkert

- The Road Equipment program = the life-cycle management of CDOT's heavy fleet (procurement, maintenance, and replacement)
- Includes CDOT's equipment for support of snow-removal, highway maintenance, traffic, signal, and other activities
- Inventory – 4,648
- Success story: accelerated delivery

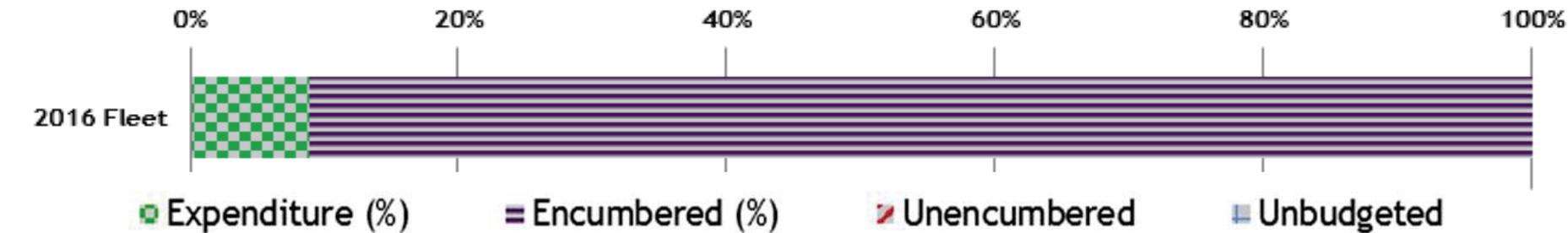


Road Equipment

2015 Allocation Spending Overview



2016 Allocation Spending Overview



Note: Expenditure data is current as of January, 2016

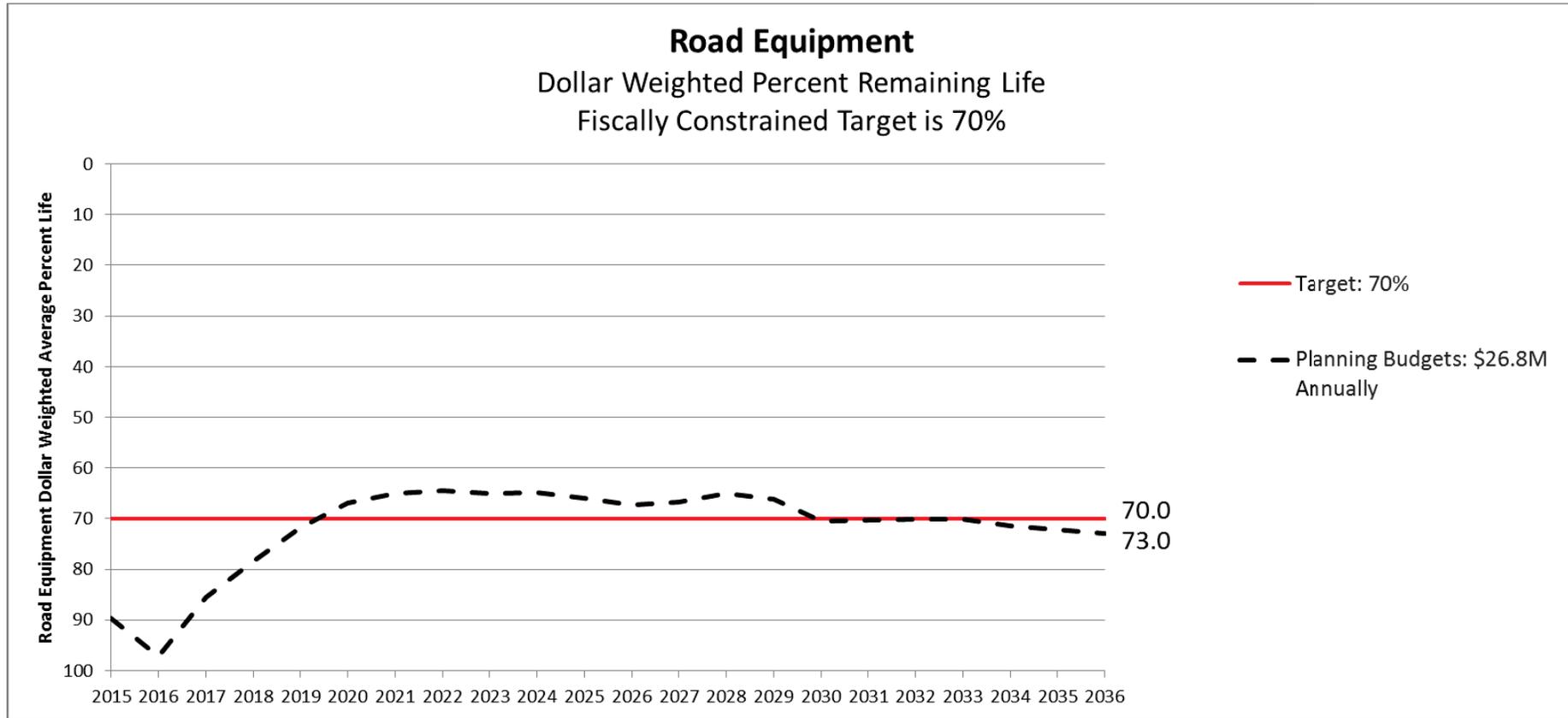
Number of Approved Projects vs. Completed Projects, as of February 29, 2016

| FY15 | | FY16 | |
|---|------------------------------|---|------------------------------|
| Number of Projects in Approved Project List | Number of Completed Projects | Number of Projects in Approved Project List | Number of Completed Projects |
| 191 | 191 | 126 | 92 |



Road Equipment

| FY15-FY19 Asset Management Planning Budgets (in millions) | | | | | |
|---|--------|--------|--------|--------|--------|
| Asset Class: Road Equipment | FY15 | FY16 | FY17 | FY18 | FY19 |
| Requested | \$21.6 | \$24.0 | \$30.0 | \$30.0 | \$33.9 |
| Allocation | \$20.9 | \$18.4 | \$26.4 | \$23.0 | \$26.8 |



Metric Description: Average Percent Useful Life
Current Performance: 90%
Fiscally Constrained Target: 70%
Forecasted Year to Achieve Target: 2020

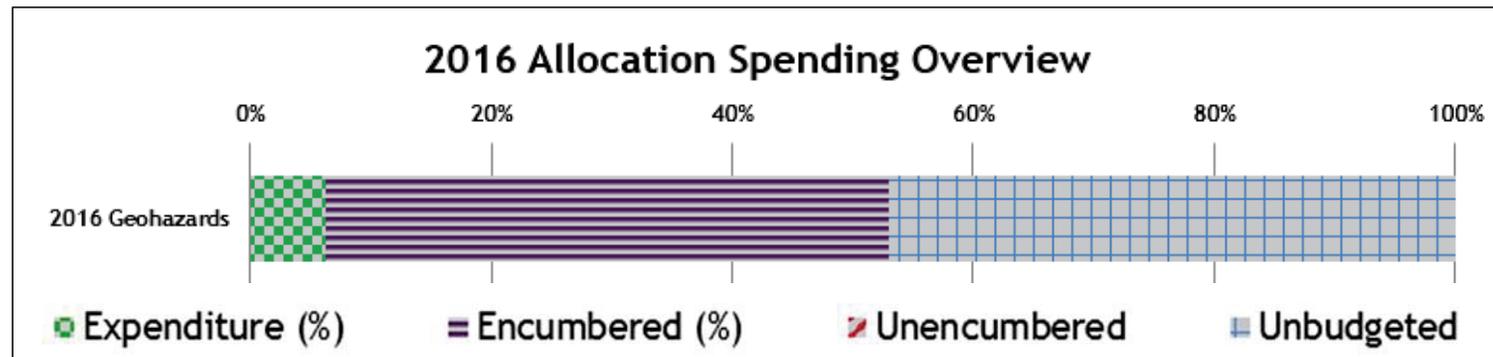
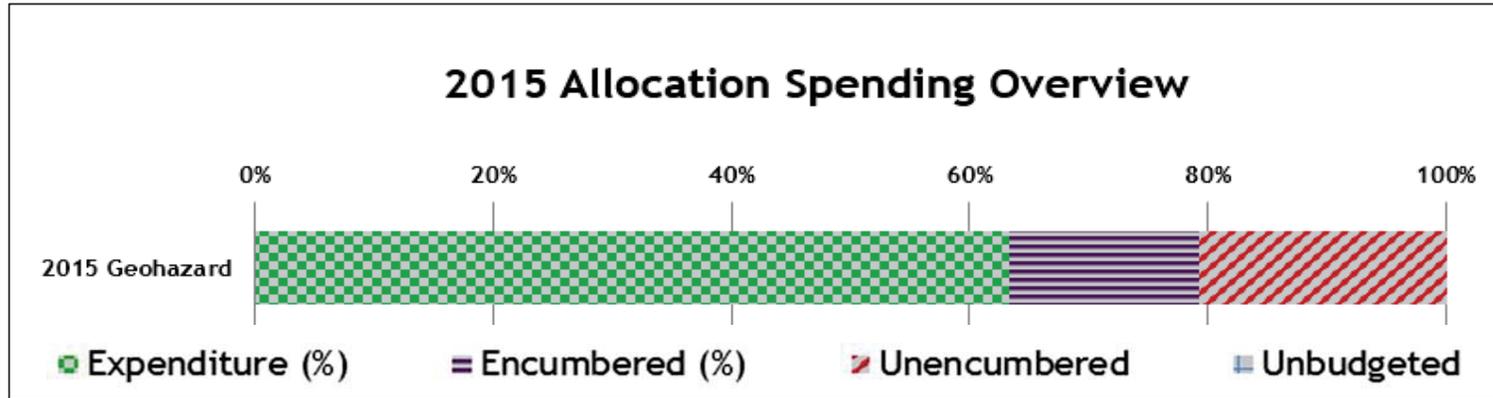


Geohazards: Ty Ortiz

- The Geohazards program implements a Risk Based Asset Management approach to measure the effect rockfall, rockslides, landslides, debris flow, sink holes, and embankments failures have on the system
- Metric: Cost associated with Safety - Mobility – Maintenance
- Geohazard Corridors are divided into 1600 segments (1/10 mile). Each segment measured has at least one geohazard.



Geohazards



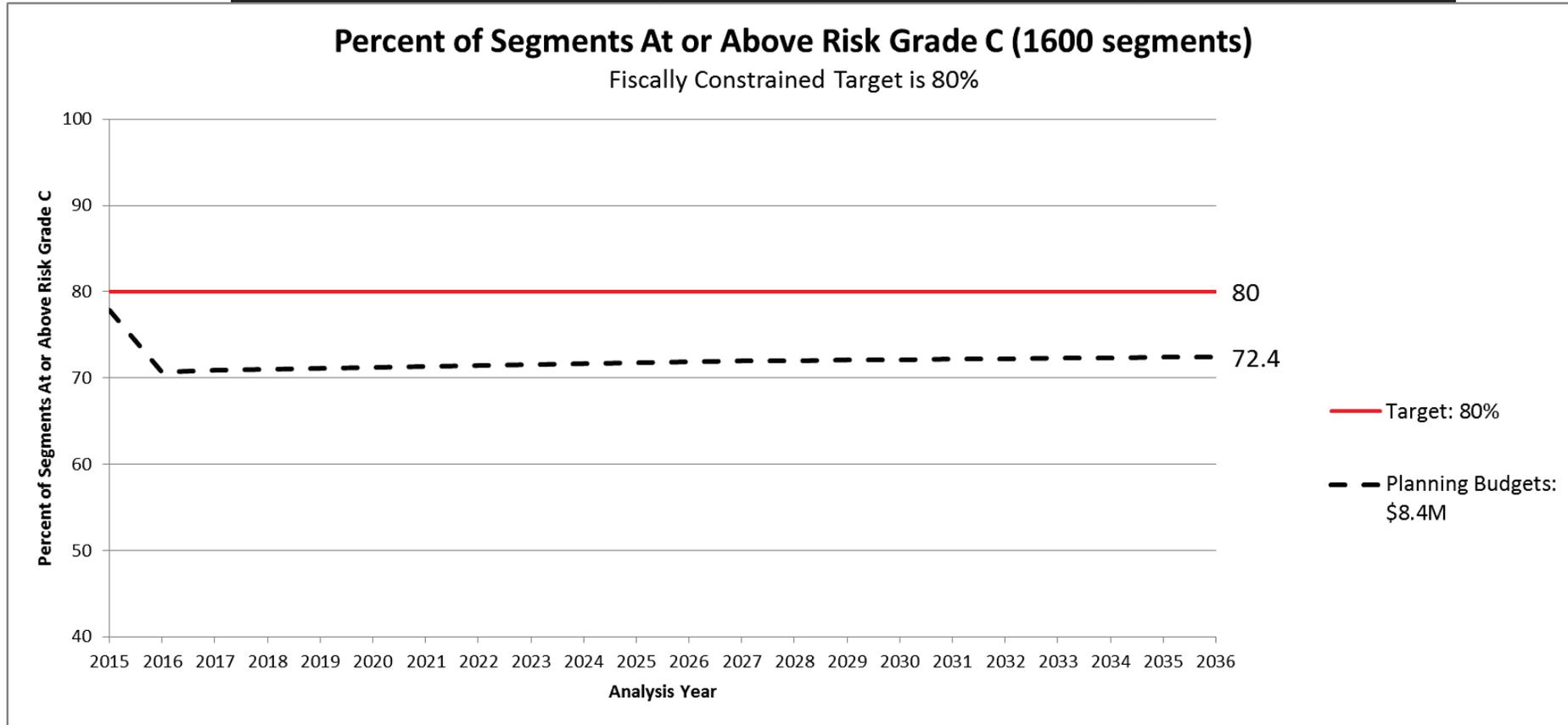
Note: Expenditure data is current as of January, 2016

| Number of Approved Projects vs. Completed Projects, As of March, 2016 | | | |
|---|------------------------------|---|------------------------------|
| FY15 | | FY16 | |
| Number of Projects in Approved Project List | Number of Completed Projects | Number of Projects in Approved Project List | Number of Completed Projects |
| 3 | 3 | 3 | 1 |



Geohazards

| FY15-FY19 Asset Management Planning Budgets (in millions) | | | | | |
|---|-------|--------|--------|--------|--------|
| Asset Class: Geohazards | FY15 | FY16 | FY17 | FY18 | FY19 |
| Requested | \$9.0 | \$12.3 | \$10.0 | \$10.0 | \$10.0 |
| Allocation | \$9.1 | \$9.2 | \$10.0 | \$8.5 | \$8.4 |



Metric Description: Percent of segments above risk grade C

Current Performance: 78%

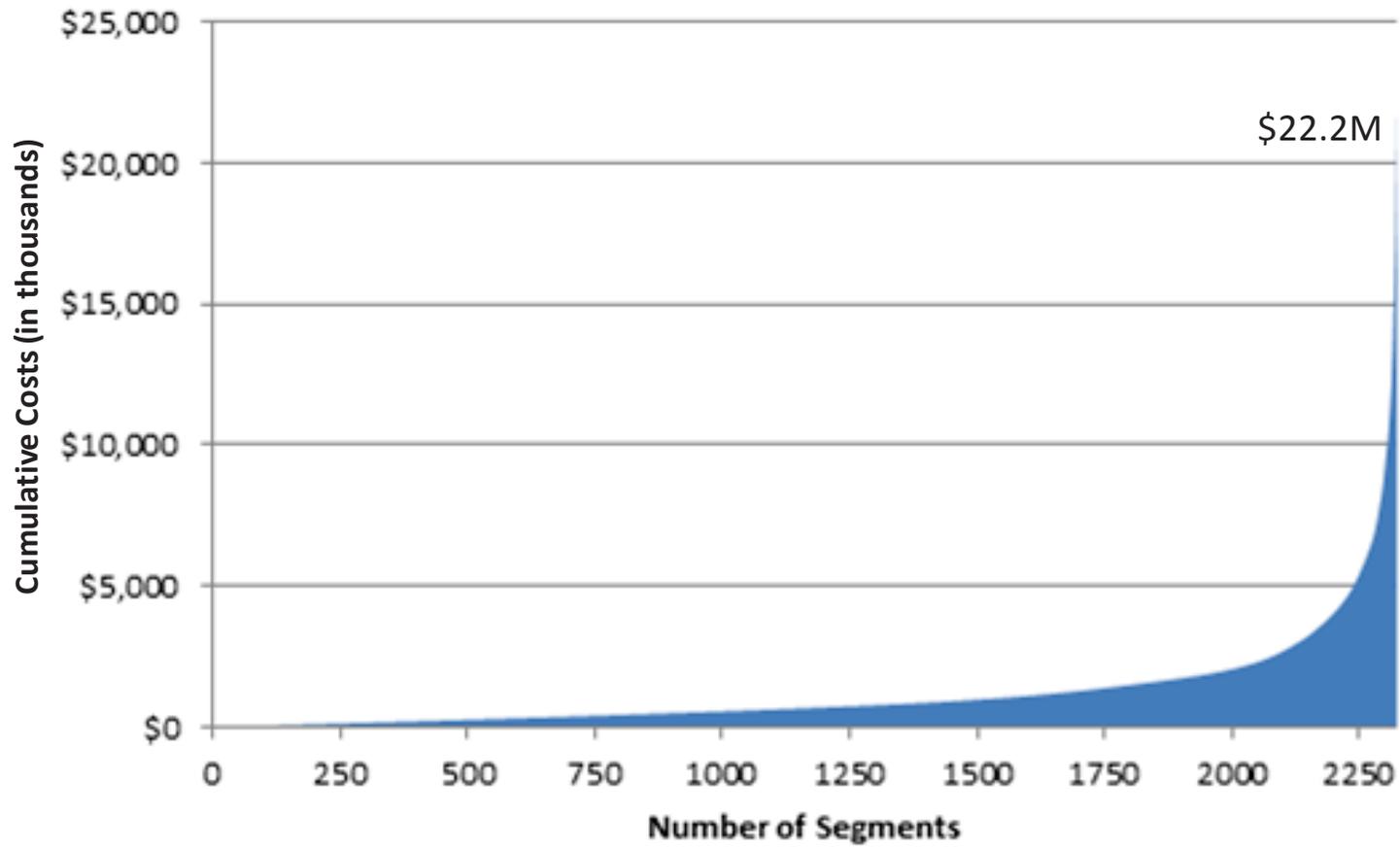
Fiscally Constrained Target: 80%

Estimated Cost to Achieve Target: \$30M/yr



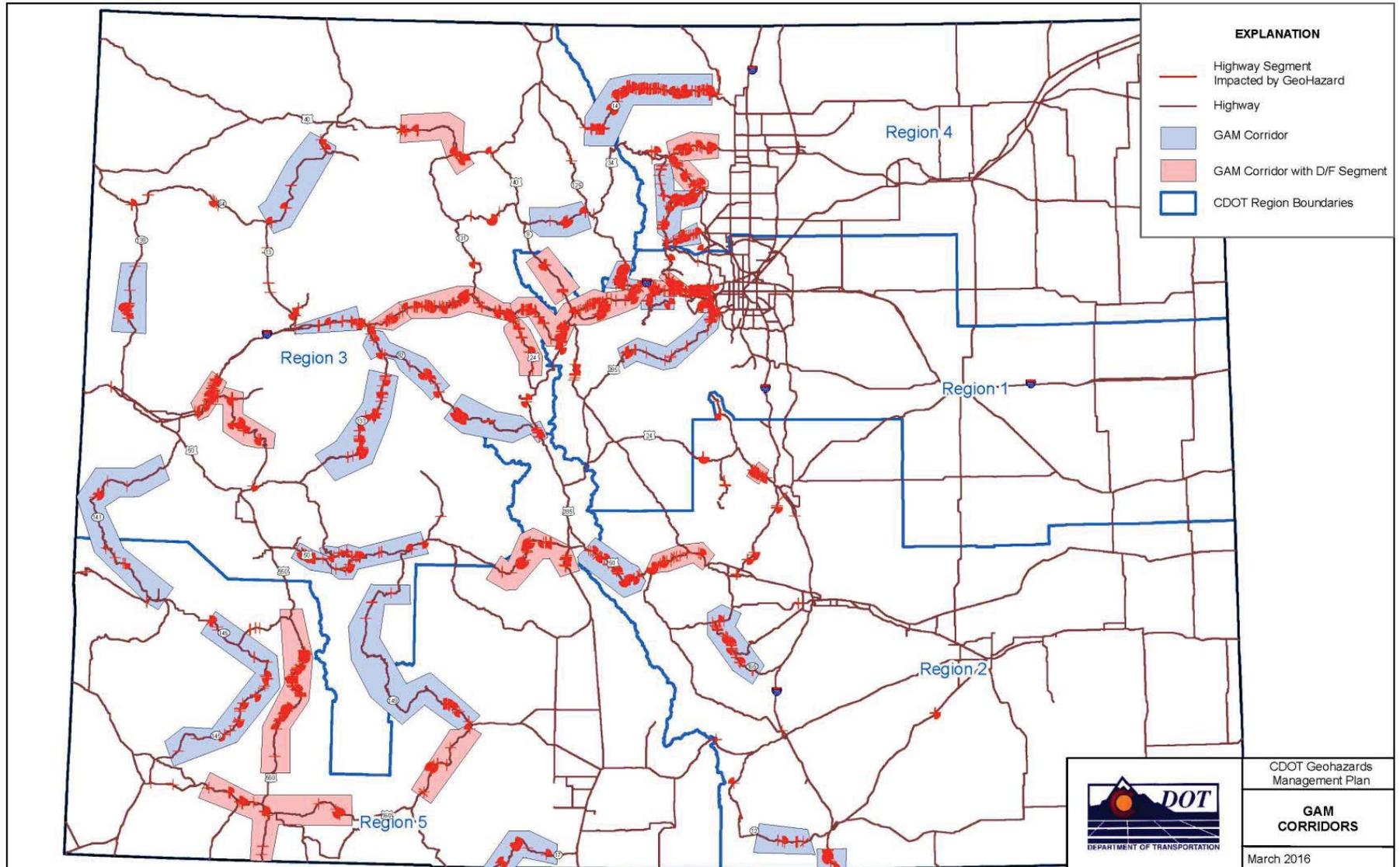
Geohazards

Cumulative Risk Costs





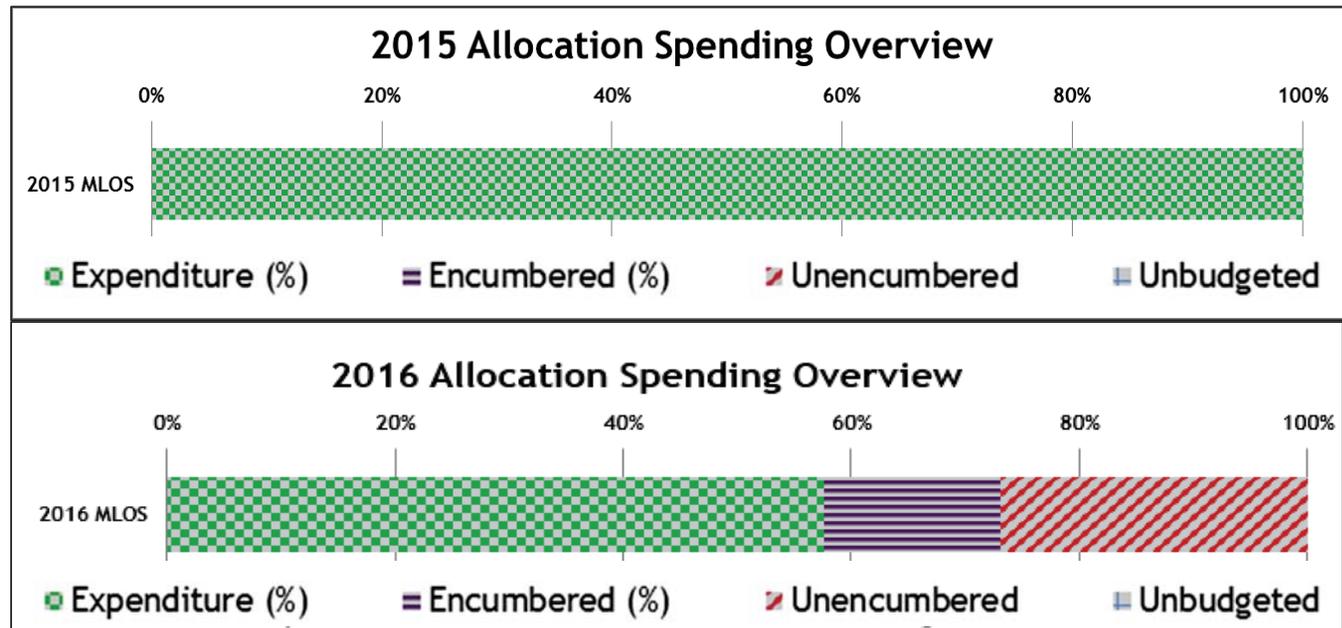
Geohazards





Maintenance Levels of Service (MLOS): Al Martinez

- Maintenance Levels of Services is the performance-based budgeting system used to allocate maintenance funds.
- Maintenance activities include, but are not limited to, snow removal, rock fall mitigation, bridge maintenance, rest area maintenance, roadway surface maintenance (filling potholes, thin overlays, crack filling, etc.), tunnel operation and maintenance, maintaining shoulders, roadway striping and pavement markings and guardrail maintenance.
- MLOS funds are used to maintain approximately 30,000 lane miles, 1.8M linear feet of fence, over 4,000 structures, and much more.



Note: Expenditure data is current as of January, 2016



Maintenance Levels of Service (MLOS)

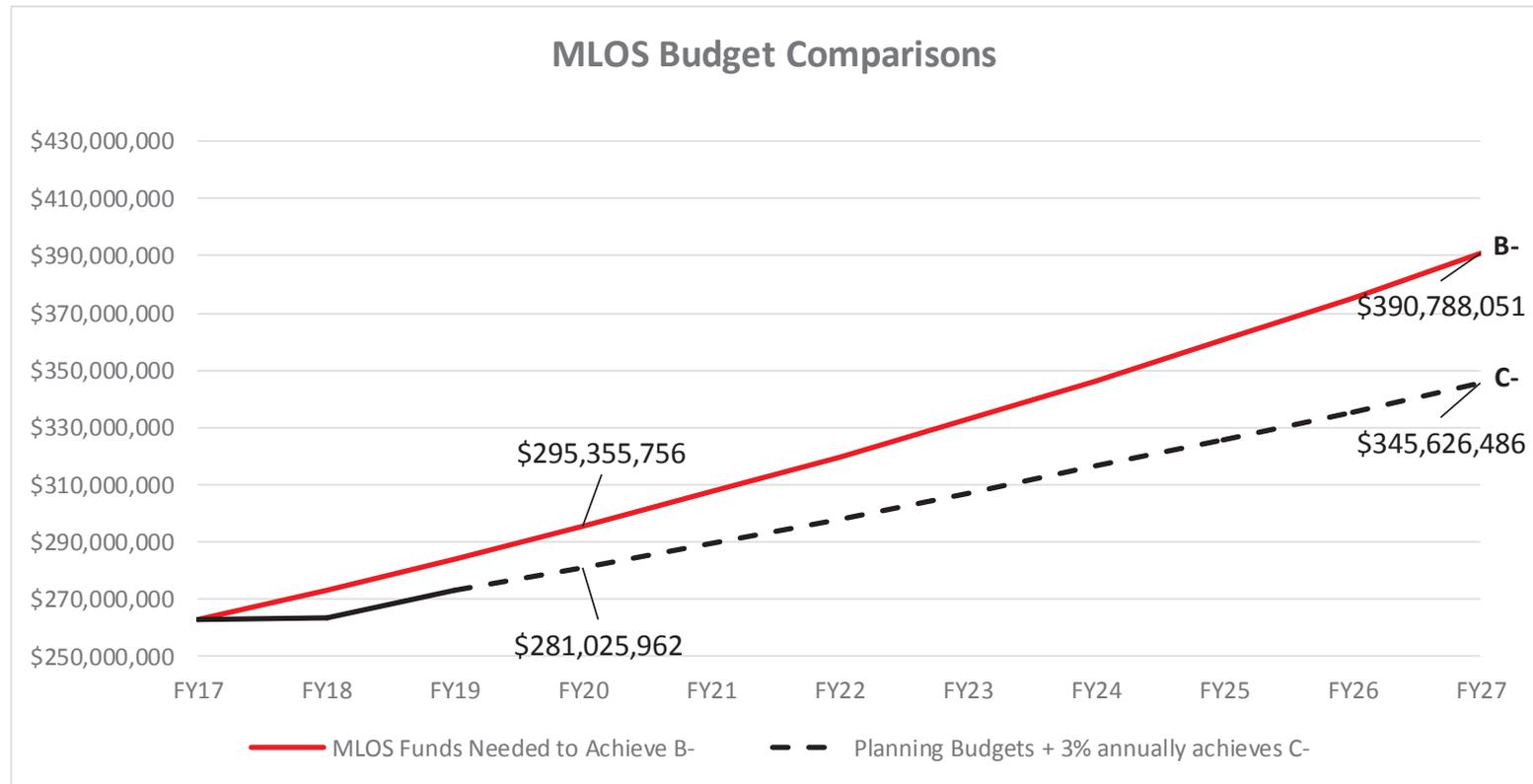
Asset Management Planning Budgets and Expenditures (in millions)

| Asset Class: MLOS | FY12 | FY13 | FY14 | FY15 | FY16 | FY17 | FY18 | FY19 |
|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Requested | N/A | N/A | N/A | \$256.5 | \$258.8 | \$262.2 | \$270.0 | \$286.0 |
| Allocation | \$242.4 | \$242.4 | \$249.0 | \$251.3 | \$254.4 | \$262.6 | \$263.5 | \$272.8 |
| Expended | \$248.8 | \$248.2 | \$262.1 | \$259.5 | □ | □ | □ | □ |

Metric Description:
Statewide Letter Grade across all 9 Maintenance Program Areas

Current Performance: B-

Fiscally Constrained Target: B-





Maintenance Levels of Service (MLOS)

Total Maintenance Contracting and Toll Lane Maintenance has been the focus of the Department to develop project and capacity improvements. The increased maintenance Level of Service of providing A LOS on these projects and/or the contract cost has been unfunded.

| Express Toll Lanes CDOT O&M, assumption of 3% inflation | | | | | |
|---|--------------------|--------------------|--------------------|--------------------|--------------------|
| Routes | 2016 | 2017 | 2018 | 2019 | 2020 |
| C470 | | | | | \$1,400,260 |
| I-25 North | | | \$1,010,256 | \$1,040,564 | \$1,071,781 |
| I-70 PPSL | \$1,286,510 | \$1,325,105 | \$1,364,859 | \$1,405,804 | \$1,447,979 |
| Total Maintenance Contracts, assumption of 8% inflation annually | | | | | |
| US-36 | \$0 | \$1,229,598 | \$1,327,966 | \$1,434,203 | \$1,548,940 |
| I-70 Central | | | | | \$2,000,551 |
| Total All | \$1,286,510 | \$2,554,703 | \$3,703,081 | \$3,880,572 | \$7,469,511 |



Status

In general, the Allocations are not sufficient to meet performance goals by 2025.

Continuous Improvement to mitigate limited funding:

Buildings

- Evaluating large realignment/replacement projects that consider State needs and provides greatest impact (e.g., along I-25 and I-70) to achieve cost savings.
- Stressing preventive maintenance work with Regions to increase building life.

Signals

- Becoming more sophisticated with age-based screening, risk and condition-based prioritization to fund critical needs first.

ITS

- Improving preventive maintenance activities to increase device life at least cost.

Road Equipment

- Standardizing equipment specifications to decrease costs and time for delivery.
- Implementing AVL Systems in Light and Heavy Fleets to enhance fleet management and improve vehicle deployment, which increases cost effectiveness.



Status

Geohazards

- Moving to risk reduction at the corridor (segment) level instead of the site level leading to achieving better risk reduction results at least cost.

MLOS

- Optimizing roadway surface with surface treatment model recommendations to align programs and improve cost effectiveness.
- Investigating new methods to manage striping to increase asset life at least cost.

AIMS: continuing to refine the model in the areas of cross asset optimization, trade-offs and treatment identification



Next Steps

April: Bridge, Walls, Culverts, Pavement, and Tunnels

May: FY20 Asset Management Planning Budget