



**COLORADO**  
**Department of Transportation**  
Division of Transportation Development

Asset Management Branch  
4201 E. Arkansas Ave. Shumate Bldg.  
Denver, CO 80222-3400

**DATE:** April 8, 2015  
**TO:** Transportation Commission Asset Management Committee  
**FROM:** Debra Perkins-Smith, Director, Division of Transportation Development  
William Johnson, Asset Management Branch, DTD  
**SUBJECT:** Asset Management Budget Recommendation for FY19

Purpose

This memorandum summarizes the FY19 Asset Management Budget Workshop and provides the transportation asset management (TAM) budget recommendation to the Transportation Commission Asset Management Committee.

Action

Commission guidance on FY19 TAM budgets for planning purposes. The FY19 asset budget will be reviewed again by the Commission during the annual budget setting process around March 2018.

Background

In September 2012 the Colorado Transportation Commission formed the Asset Management Committee (TC-AM) to facilitate a more detailed discussion on asset management with a smaller group. The initial priorities of the group were to seek alternative surface treatment analysis, improve fleet equipment management and develop a budget tradeoff tool. Commissioners emphasized that asset management must be incorporated into the budget discussion.

The Asset Investment Management System (AIMS) was developed to forecast performance curves for asset programs based on investment, perform tradeoff analysis between multiple asset classes, and to perform cross-asset optimization; which optimizes funding in assets to get the greatest possible return on investments. AIMS has informed the asset program allocation recommendations since FY14.

The budget recommendations for FY17 and FY18 were approved by the committee in November 2014.

During the joint TC-AM and Commission Statewide Plan Committee (TC-SWP) meeting in January 2015, the performance metrics and targets for the 11 asset programs were approved by the TC-AM Committee. The TC-SWP Committee approved incorporating the performance metrics and targets as an attachment to Policy Directive 14.

In order to provide predictability to the regions and to the industry, the Chief Engineer will publish a 4-year program of asset management candidate projects. The budget recommendation is used to inform development of the 4-year program of candidate projects.

Details

On March 20, staff met in a budget setting workshop convened by Executive Director Bhatt to review the projected performance and proposed FY19 Asset Management funding for eleven asset classes. Committee guidance and material presented to the Committee in previous months informed the staff workshop. The total available budget is \$755 M for FY19,

and the total request from the asset managers was \$833 M.

Participants included Director Bhatt and other members of senior management, regional transportation directors and region staff, asset managers and staff from the Division of Transportation Development, the Office of Financial Management and Budget, and Office of Program Management. The group reviewed information presented by the Asset Management Branch Manager and asset managers which included data on the funds needed to meet performance targets, as well as status of the delivery of the 2014 and 2015 programs.

AIMS now has the ability to analyze 8 asset classes (not included are walls, tunnels, and MLOS). AIMS continues to be refined for future budget analyses. Participants reviewed information from the AIMS cross-asset optimization results before considering the requests from asset managers. After all information was presented, participants provided their individual budget recommendations on FY19 funding levels for each program. There was variation on staff recommended budgets for all asset programs in part because of the \$78 M shortfall between funding requests and available funding, and the AIMS budget recommendation versus the funding request. However, after 2 rounds of recommendations, there was little variation in the overall average for asset classes.

It is important to note that the AIMS results for geohazards and traffic signals represent a first attempt effort. Additionally, Since AIMS does not have the ability to model MLOS, tunnels, and walls it is difficult to accept the AIMS results without consideration of staff input to form the final recommendation.

The resulting recommendation is in the table below:

<b>FY19 Asset Mgmt Budget Setting Recommendation (Millions)</b>	<b>Asset Need</b>	<b>AIMS Results</b>	<b>Staff Workshop Recommendation</b>
<b>Surface Treatment</b>	<b>240</b>	<b>200.5</b>	<b>\$225.40</b>
<b>Bridge</b>	<b>155</b>	<b>137.1</b>	<b>\$142.50</b>
<b>MLOS*</b>	<b>286</b>	<b>271.8</b>	<b>\$272.80</b>
<b>Buildings / Prop. Mgmt.</b>	<b>24</b>	<b>24.7</b>	<b>\$20.20</b>
<b>Culverts</b>	<b>12.1</b>	<b>5.7</b>	<b>\$7.60</b>
<b>Tunnels*</b>	<b>10.3</b>	<b>6.4</b>	<b>\$8.40</b>
<b>ITS</b>	<b>35</b>	<b>28</b>	<b>\$23.50</b>
<b>Road Equipment</b>	<b>33.9</b>	<b>33.9</b>	<b>\$26.80</b>
<b>Geohazards</b>	<b>10</b>	<b>2.5</b>	<b>\$8.40</b>
<b>Walls*</b>	<b>6.2</b>	<b>4.6</b>	<b>\$4.60</b>
<b>Traffic Signals</b>	<b>20</b>	<b>39.8</b>	<b>\$14.80</b>
<b>TOTAL</b>	<b>\$832.5</b>	<b>\$755.0</b>	<b>\$755.0</b>
*Not currently modeled in AIMS, amount based on FY18			

Staff requests that, for planning purposes, the Committee approve the staff recommendation for FY19.

### Next Steps

If the Committee approves the budget recommendation for the asset management programs, staff will use for budgeting and project planning activities. The full Commission will review the budget recommendation again as part of the FY19 annual budget setting process around March 2018.

### Attachments

TC AM PowerPoint

**Meeting Agenda  
Wednesday, April 15, 2015  
4201 E. Arkansas Avenue  
Denver, Colorado**

**Debra Perkins-Smith, Director  
Division of Transportation Development**

**Asset Management Committee Members**

**Les Gruen, Chair  
District 9, Colorado Springs**

**Kathy Connell  
District 6, Steamboat Springs**

**Heather Barry  
District 4, Westminster**

**Sidny Zink  
District 8, Durango**

**Stephen Hofmeister  
District 11, Haxtun**

**All Commissioners are invited to attend this Committee Meeting.**

1. Report Out from Commissioner Gruen – 5 minutes
  - Approval of January, 2015 Meeting Minutes
2. AIMS Improvements – 5 minutes
3. FY19 Asset Management Budget Recommendations – 15 min
4. Notice of Proposed Rulemaking (NPRM) for MAP-21 – 5 minutes

## **JOINT ASSET MANAGEMENT AND STATEWIDE PLAN COMMITTEE MEETING**

**Date:** January 21, 2015

**Joint Committee Members Attending:** Commissioner Les Gruen, Commissioner Heather Barry, Commissioner Steven Hofmeister, Commissioner Kathy Connell, Commissioner Sidney Zink, Commissioner Kathy Gilliland, Commissioner Doug Aden, Commissioner Shannon Gifford

**Others Commissioners Attending:** Commissioner Gary Reiff, Commissioner Bill Thiebaut, Commissioner Ed Peterson.

**Others Attending:** CDOT HQ: Don Hunt, Debra Perkins-Smith, Jeff Sudmeier, Erik Sabina, Michelle Scheuerman, Gail Hoffman, Aaron Willis, Jason Wallis, William Johnson, Kavya Rajasekar, Richard Zamora, Scott McDaniel, Josh Laipply, Scot Cuthbertson, Maria Sobota, Herman Stockinger, Angie Drumm, Amy Ford, Barbara Gold, Bill Schiebel, Ryan Rice, Ty Ortiz, Saeed Sobhi, Mark Nord, Bob Group, Tromila Maile. CDOT Regions: Myron Hora, Dave Eller, Karen Rowe, Tony DeVito. Others: Vince Rogalski, STAC chair; Carla Perez; Charles Dwyer and Greg Mohrman, AECOM.

- *Meeting Minutes:* Minutes of the November 19, 2014 meetings of the Asset Management Committee and of the Statewide Plan Committee were approved.
- *Asset Management Metrics and Targets:* Debra Perkins-Smith, Director of the Division of Transportation Development, provided an overview of the purpose of the meeting, which was to approve transportation asset management metrics and targets and decide how to best include these metrics in Policy Directive (PD) 14.

**Recommendation:** Following the discussion, the Asset Management Committee agreed that the All CDOT Asset Management Metrics and Performance Targets (Developed by CDOT Staff) table updated from the Risk-Based Asset Management Plan in the meeting packet should be referred to in and attached to the final version of Policy Directive (PD) 14. The committee acknowledged that the objectives in the table will be refined and evaluated. Two revisions are already anticipated to the table.

William Johnson, manager of the Transportation Performance Branch, presented information on performance metrics and targets.

- Attachment B contained more detailed information on the meaning of the performance metrics and target, and how candidate project selection is informed by the metric and target.
- The table includes the Infrastructure Condition targets already in PD 14 for bridges, pavement and maintenance, as well as additional fiscally constrained and aspirational targets for bridges, buildings, Intelligent Transportation Systems (ITS), roadway equipment, culverts, geohazards, signals, walls and tunnels.
- Currently, CDOT exceeds the objectives in PD 14 for bridges, which pertain only to the percentage of bridge deck area that is not structurally deficient. For the other bridge objectives in the table, CDOT estimates that CDOT has a \$900 million backlog.
- CDOT is not meeting the 80% High/Moderate Drivability Life target for pavement condition on Interstates and National Highway System (NHS), but expects to by 2023.

- Regarding pavements, Commissioner Gary Reiff commented that CDOT's current requirement that only 70 percent of surface treatment projects in the CDOT Regions must match the model recommendations is a big variation. Chief Engineer Laippy suggested that CDOT update the Chief Engineer Policy Memo 10 to reflect the 80 percent target.
- CDOT is not meeting its roadway equipment target. CDOT is seeking a roadway equipment manager to get a better handle on needs and expenditures. CDOT Deputy Director Scot Cuthbertson said CDOT also is considering a buy-back lease method of acquiring roadway equipment.
- Geohazards are rock fall sites, rockslides, debris flows, landslides, embankments and engineered slopes, and sink holes. CDOT is one of the first state departments of transportation that is applying performance measures to geohazards.
- CDOT Executive Director Don Hunt praised the Asset Management program as coming a long way since it began as a formal program.
- Debra Perkins-Smith pointed out that the performance curves for some of the assets indicate that they may never reach their targets. She said CDOT could use different approaches than in the past, such as leasing rather than owning roadway equipment.
- William Johnson said that to achieve fiscally constrained targets, CDOT would need to fund at these annual levels: signals, \$34 million, buildings, \$29 million, and road equipment, \$42 million. He suggested that all asset programs could achieve performance targets at some point during the next 20 years, but not all concurrently. Additionally, asset programs are considering other approaches to achieve performance targets with no added investment.

- *Policy Directive 14*

Recommendations: The Statewide Plan Committee recommended to the full Transportation Commission that it adopt PD 14 in February after PD 14 is revised in response to comments from commissioners. The committee also agreed that the All CDOT Asset Management Metrics and Performance Targets (Developed by CDOT Staff) table (Table 4.1) in the meeting packet should be referred to in and attached to the final version of Policy Directive (PD) 14.

Before discussion began, Debra Perkins-Smith said PD 14 is typically revised before work on the Statewide Transportation Plan begins. The Transportation Commission has not formally adopted PD 14 because not all the measures or objectives were decided. The highlighted items in the asset management table are already in PD 14 and the other objectives in the table were recently developed. Jeff Sudmeier, manager of the Multimodal Planning Branch, reviewed PD 14 with the committees, highlighting the areas that are new or revised. Comments dealt with three sections of PD 14: Infrastructure Condition, System Performance, and Planning Principles.

- Infrastructure Condition – Chief Engineer Josh Laippy said that without more objectives in PD 14, it appears to some policy makers that CDOT is allocating too much money to bridges, for example. Don Hunt said the Risk-Based Asset Management Plan could simply be referenced in PD 14, as it is now. Some Commissioners, however, said they liked having all the objectives that guide distribution of funds in one place.
- System Performance – The Planning Time Index (PTI) measure was changed to reflect current data for traffic for the 90<sup>th</sup> percentile of Interstates, NHS (excluding Interstates), and Colorado

Freight Corridors centerline miles. For Interstates and Colorado Freight Corridors, the PTI is 1.25 or less; for NHS, it is 1.08 or less, reflecting that it doesn't include the congested segments of the Interstates. The higher the PTI number, the more congestion, said Erik Sabina, manager of the Information Management Branch. Concerning two different measures often used in assessing traffic flow, Erik Sabina said in layman's terms PTI compares a really bad day to an ordinary bad day, while Travel-Time Index (TTI) compares a typical bad day to free-flow conditions.

- Minutes of Delay Measure - The minutes of delay measure for congestion is recommended for deletion because it was based on an older methodology. The future statewide travel model should assist CDOT in developing a new metric for measuring congestion.
- Data - Don Hunt requested a map of the state with the PTI information based on analysis for performance measures in PD 14.
- Colorado Freight Corridors - The Colorado Motor Carriers Association worked with CDOT on identifying the Colorado Freight Corridors detailed in the Colorado Freight Plan. The Colorado Freight Corridors were selected based on average annual daily traffic for trucks, percentage of trucks to the rest of the traffic, functional class of highways, and input from the Project Management Office. Don Hunt requested a map of the freight network in the state.
- Rail - Commissioner Kathy Gilliland asked why CDOT isn't including rail in system performance since it is another mode of travel. Debra Perkins-Smith said PD 14 is to provide guidance on where CDOT money should be invested, and rail is owned and operated by the private sector. David Krutsinger of the Division of Transit and Rail said CDOT has a methodology of determining where limited funds for improvement of rail-highway crossings should be spent, and Josh Laipply outlined some recent steps that CDOT has taken to improve cooperation with the railroads. Freight Rail will be added to the Safety section of PD 14, in addition to Truck Freight, Debra said.
- Planning Principles – The planning principles are recommended for deletion because they are either adequately addressed in PD 14 or elsewhere, or will be later. One of those principles dealt with economic vitality. Commissioner Kathy Gilliland said she thought economic vitality should be in PD 14 because it helps build the case for more transportation investment. Debra Perkins-Smith said that while CDOT is using an Economic Toolkit to select projects based on the jobs created and the multiplier effect on the economy, it doesn't yet have the tools to measure how transportation investment impacts the economy statewide. She said Economic Vitality will be added as a goal area later.
- Implementation Plan – Although no commissioners commented on this section, it was mentioned that additional measures and objectives will be brought to the Transportation Commission for consideration for incorporation into PD 14 as they are developed. Potential new areas are Bike and Pedestrian (for system performance), Truck Freight and Freight Rail (for safety), and new goal areas for Economic Vitality and Environmental Sustainability.
- *Statewide Plan Update and Next Steps*: Michelle Scheuerman, manager of the Statewide Planning Section, reviewed comments received during the public comment period on the Regional Transportation Plans and the Statewide Transportation Plan website and Executive Summary. More than 2,000 individuals accessed the website ([www.coloradotransportationmatters.com](http://www.coloradotransportationmatters.com)) during the public review period, and 32 people submitted comments. None of the comments will require substantive changes to the Executive Summary or the Regional Transportation Plans. Commissioners said they want to see revisions to the Statewide Transportation Plan (SWP) on the website and in

the Executive Summary before recommending approval of the SWP to the full Commission. All changes in the Executive Summary will be reflected in the web-based Statewide Transportation Plan.

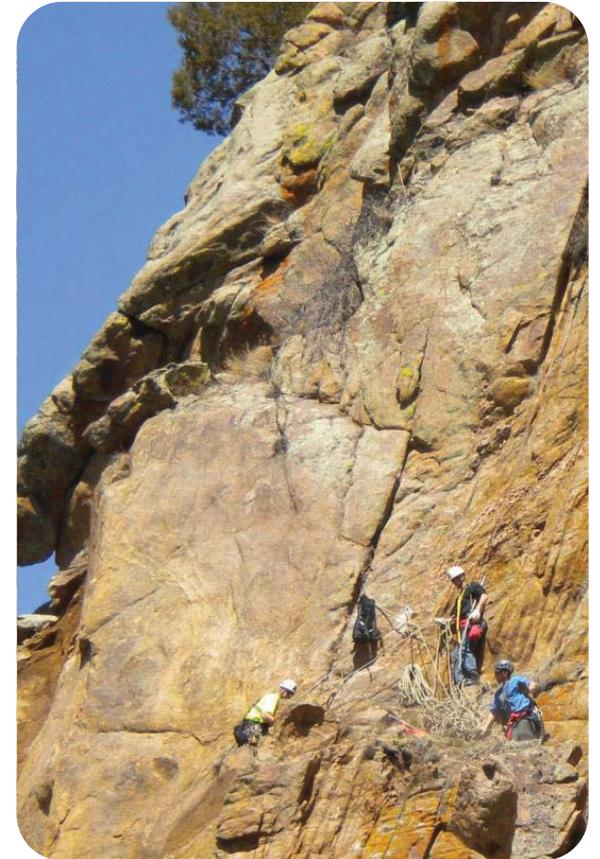
- Governor's State of the State Address – Don Hunt said that Governor John Hickenlooper stated in his State of the State address that he wanted to improve capacity for I-25 and I-70 (although he didn't say how he hoped to pay for it) and asked how that charge is reflected in the Statewide Transportation Plan. Debra Perkins-Smith said that expansion needs were included in the overall needs and gaps analysis section, but the two corridors were not called out specifically.
- Utilization of Statewide Plan Website – Commissioner Ed Peterson asked if the statewide planning website is being underutilized. Michelle Scheuerman said future town hall meetings on transportation issues will drive more people to the website, and the website also will be used to track progress on the Statewide Transportation Plan.
- Thanks to Staff – Commissioner Doug Aden commended all CDOT employees involved in public outreach on the plans, saying it was far more inclusive than for past plans.

DRAFT



**COLORADO**

Department of  
Transportation



# Transportation Asset Management Committee April 2015



# AIMS Refinements Over Time at CDOT

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**2010:** Understand Asset Management and Budget Trade-Off Concepts

**2011-2012:** incorporate 5 assets into AIMS:

- Define logic, treatments and treatment costs
- Determine analysis time horizon for all assets
- Determine inflation rate for all assets
- Generate individual asset performance curves

**2013-2015:**

- Incorporate additional assets into AIMS
- Refine individual asset analyses

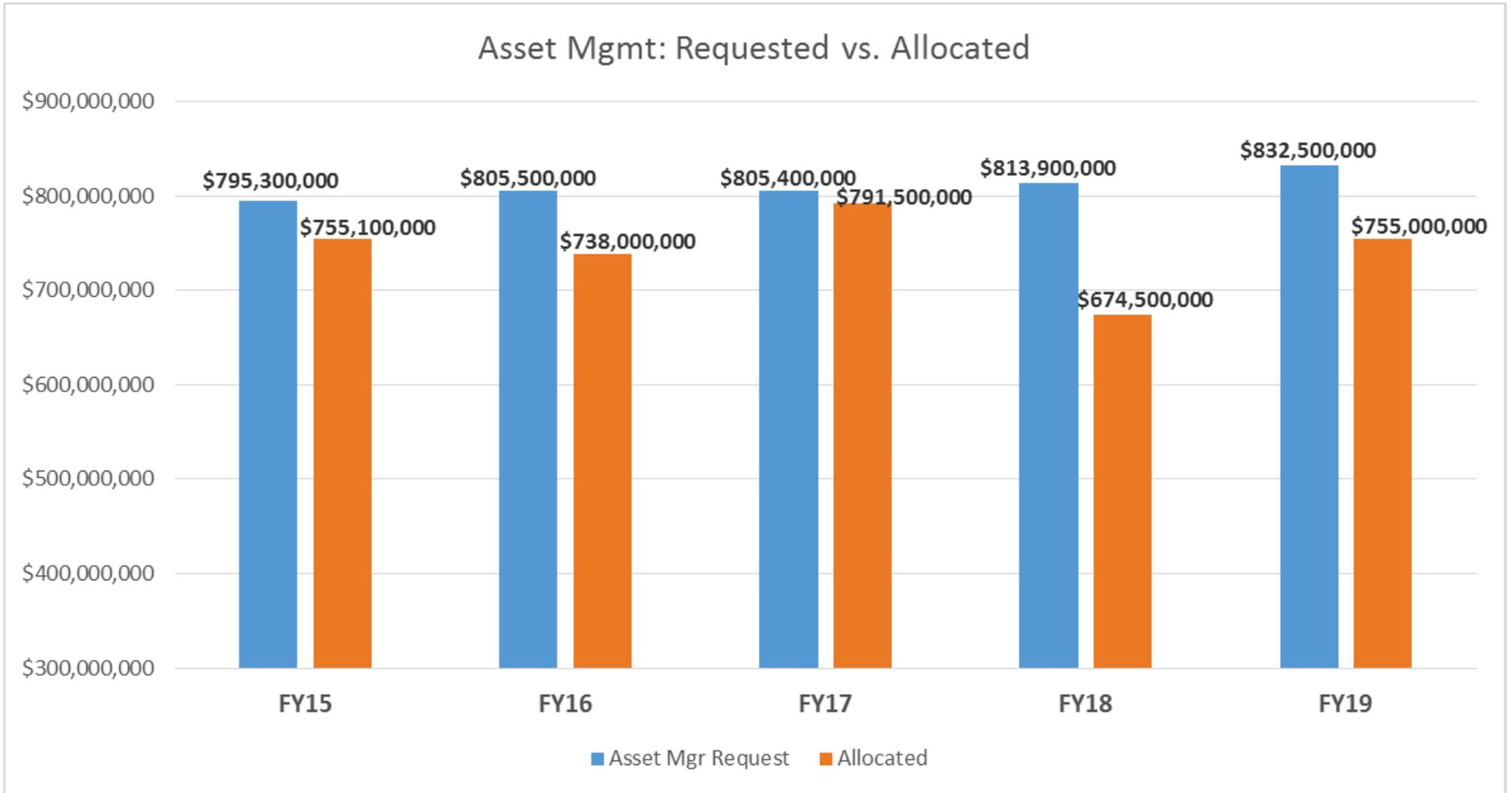
**2014:** Understand Cross-Asset Optimization Concepts  
Develop Initial Cross-Asset Optimization Modeling for CDOT

**2015:** Refine Cross-Asset Model



# Past TAM Requests and Budgets

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## \$755M Over Time...

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\$755M in Year of Expenditure Dollars  
Deflated at 3% per year





# FY19 TAM Budget Recommendations

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## **Budget Recommendations for Discussion:**

- A.** AIMS Cross-Asset Analysis Results
- B.** Staff Recommendation from Budget Setting Workshop

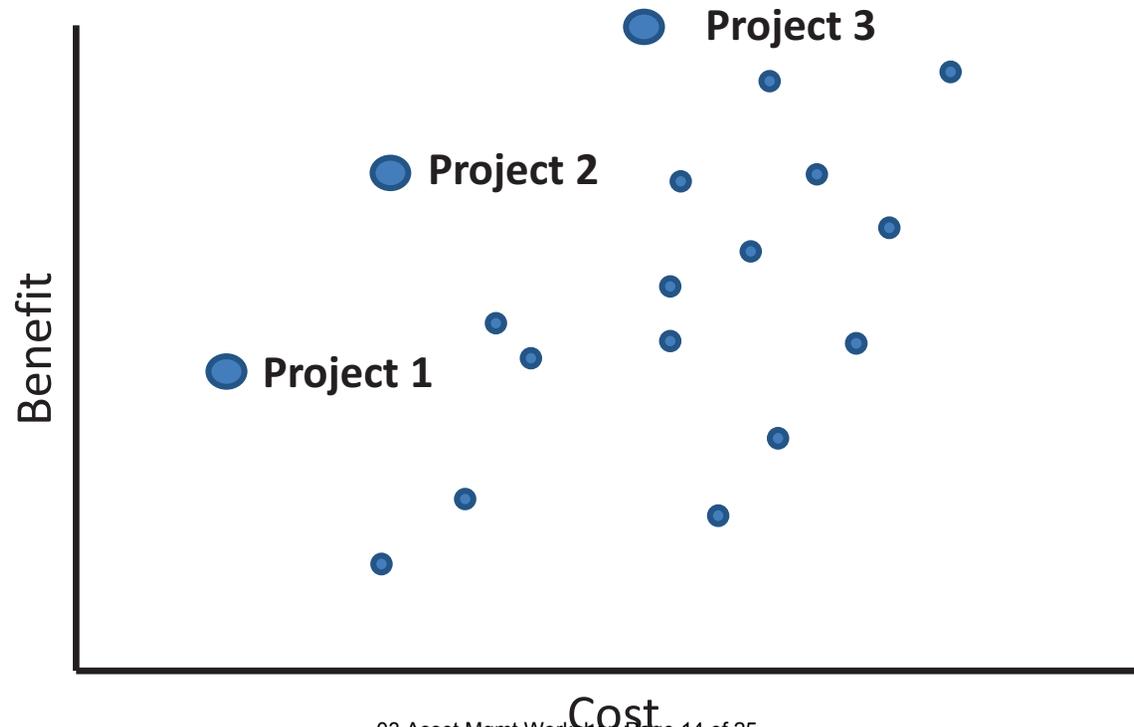


# AIMS Cross-Asset Analysis

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## Cross-Asset Analysis

- Treatment and replacement strategies from different assets are optimized together.
- Projects compete against one another for the same funding.





# FY19 Budget Recommendations

## All Results/Recommendations

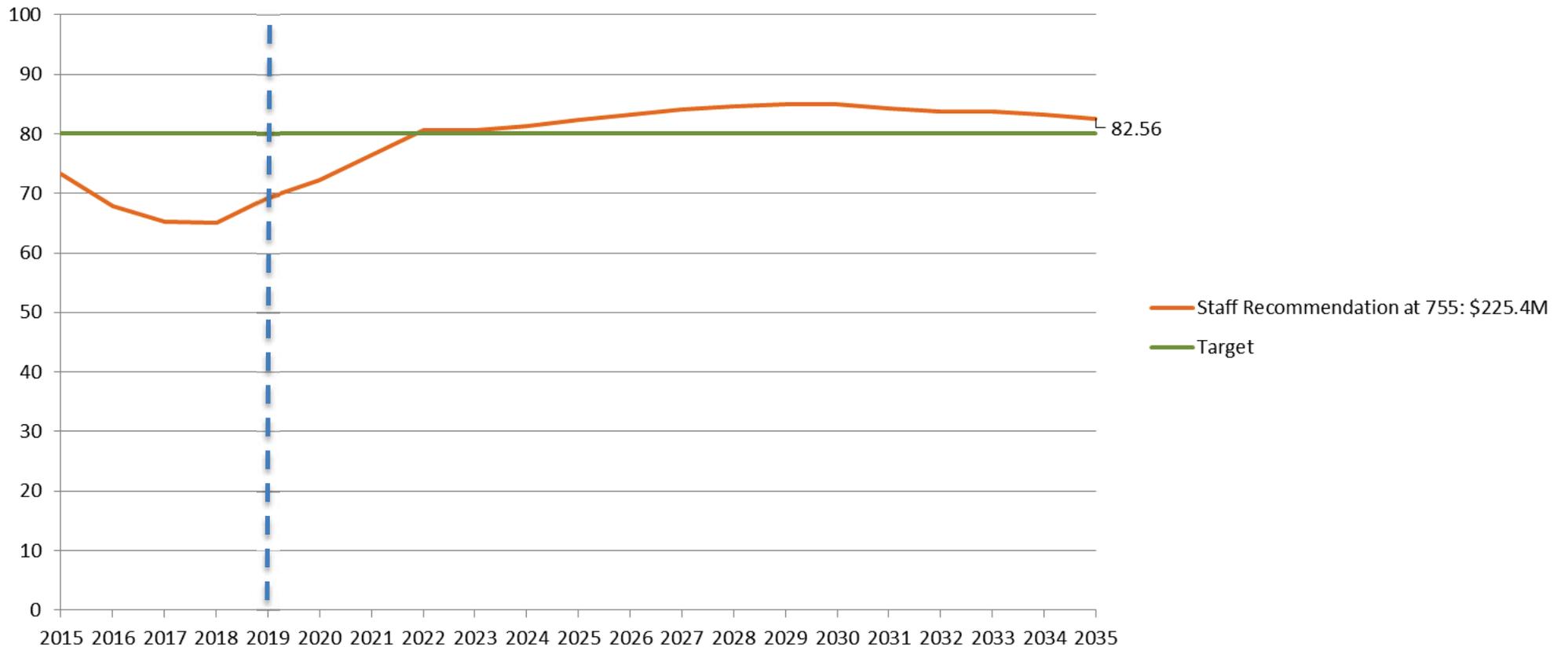
FY19 Asset Mgmt Budget Setting Recommendation (Millions)	Asset Need	AIMS Results	Staff Workshop Recommendation
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<b>TOTAL</b>	<b>\$832.5</b>	<b>\$755.0</b>	<b>\$755.0</b>
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# Surface Treatment

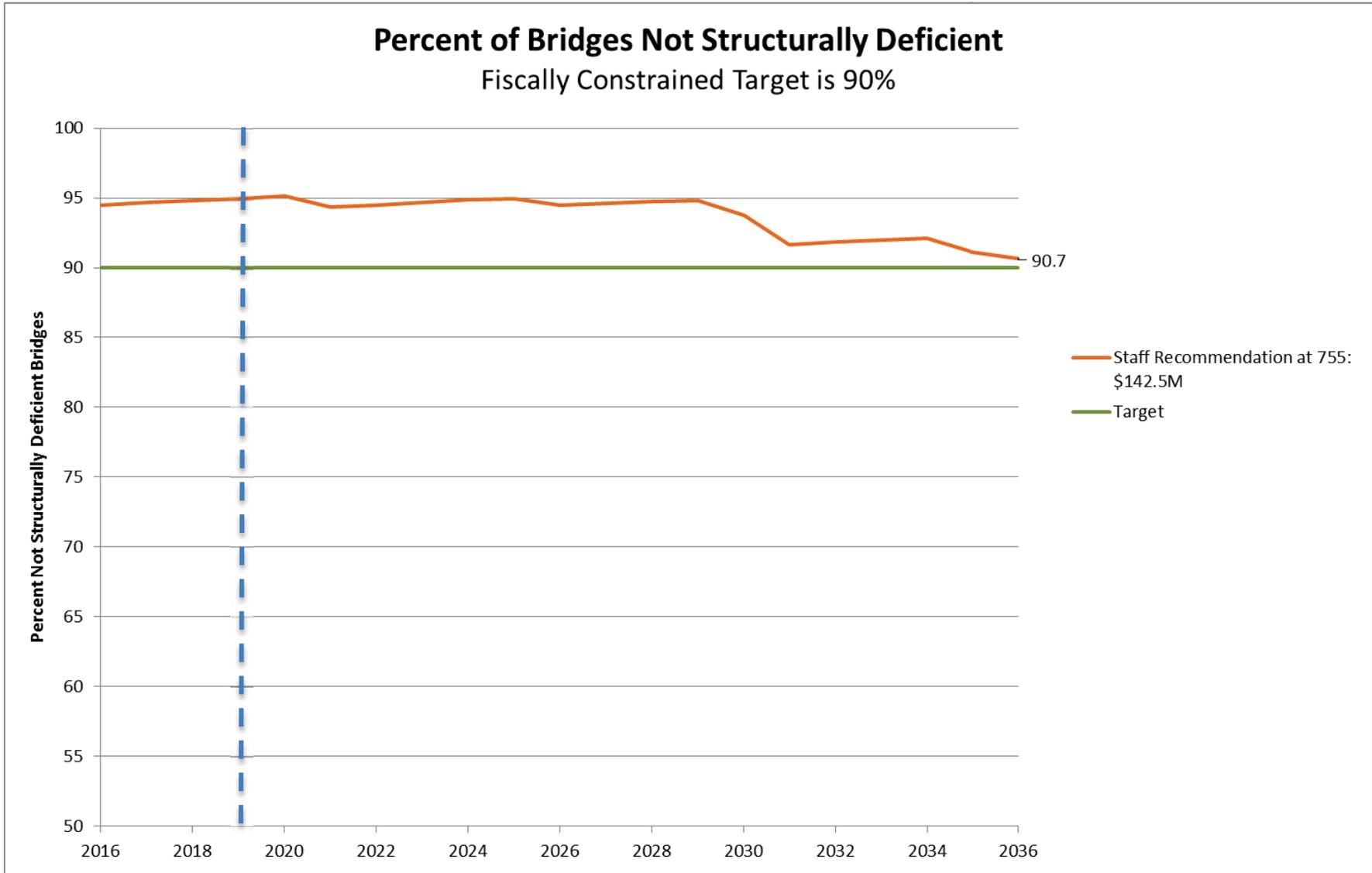
## Pavements - % High / Moderate Drivability Life

Fiscally Constrained Target is 80% DL



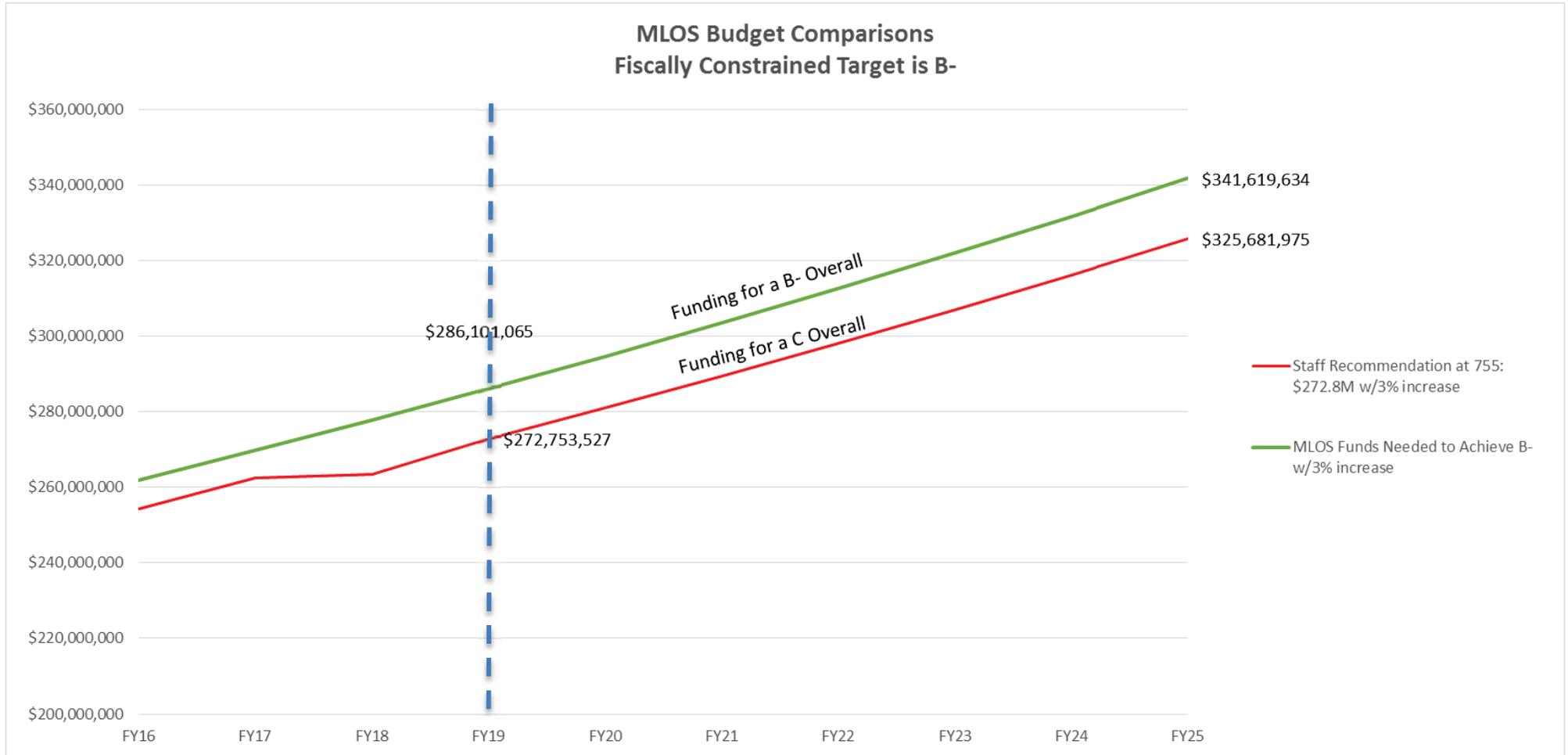


# Bridge





# MLOS

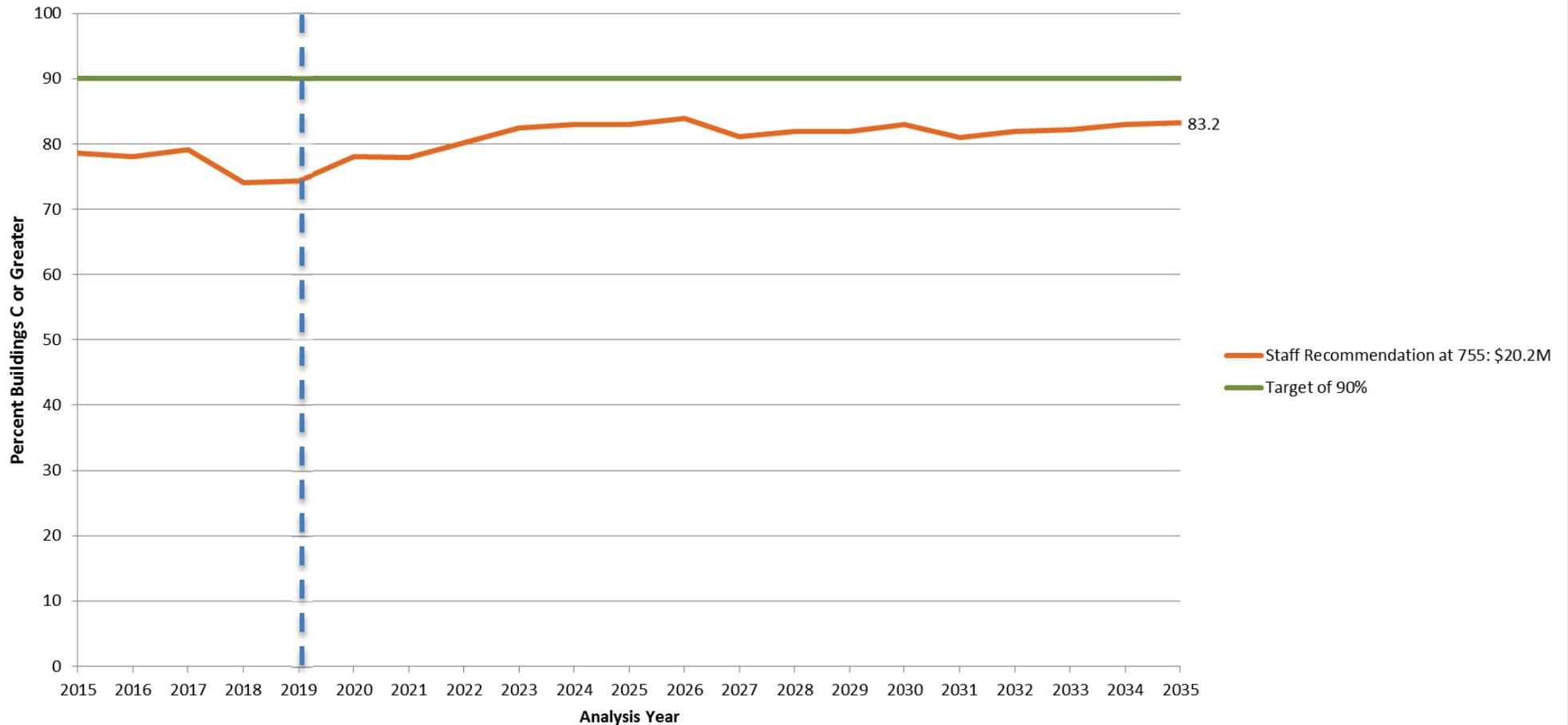


The Division of Highway Maintenance is currently looking at improvements to the MLOS model.



# Buildings

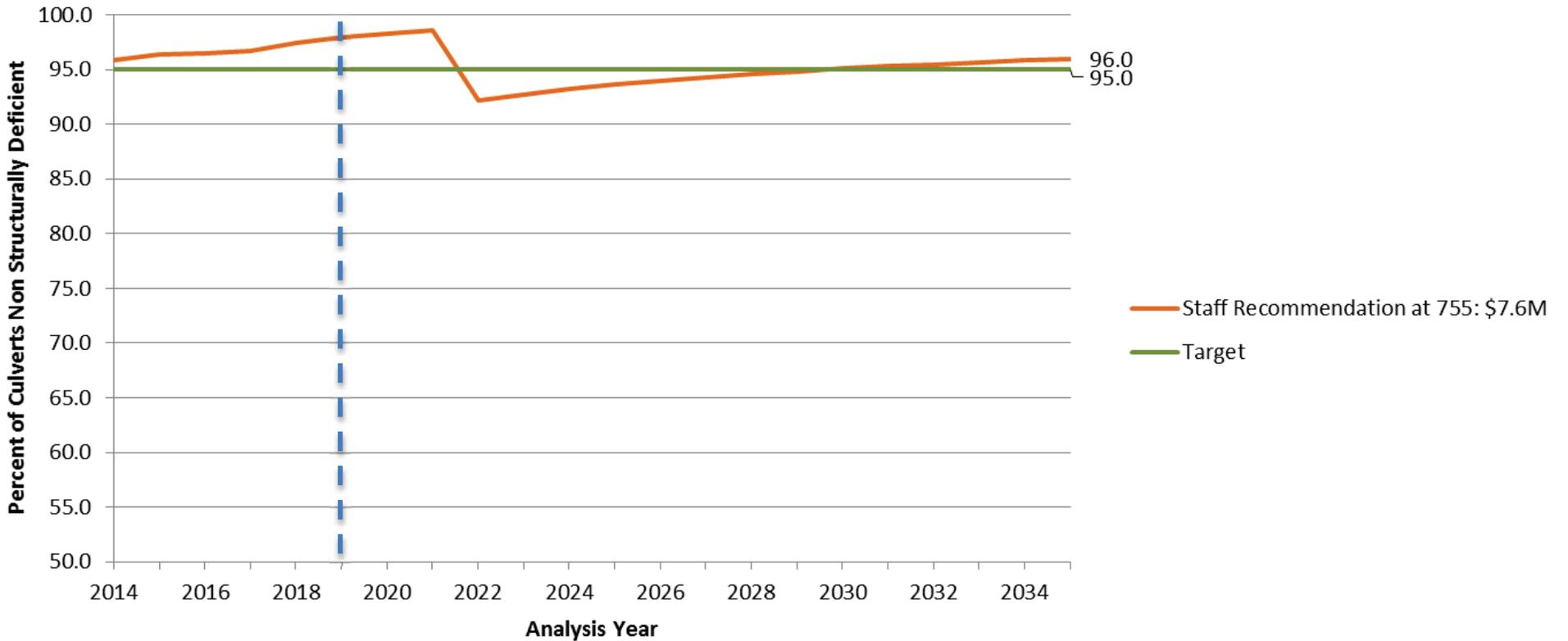
**Percent of Buildings with a Condition of C or Greater**  
Fiscally Constrained Target is 90%





# Culverts

**Percent of Culverts Which Are Not Structurally Deficient**  
Fiscally Constrained Target is 95%





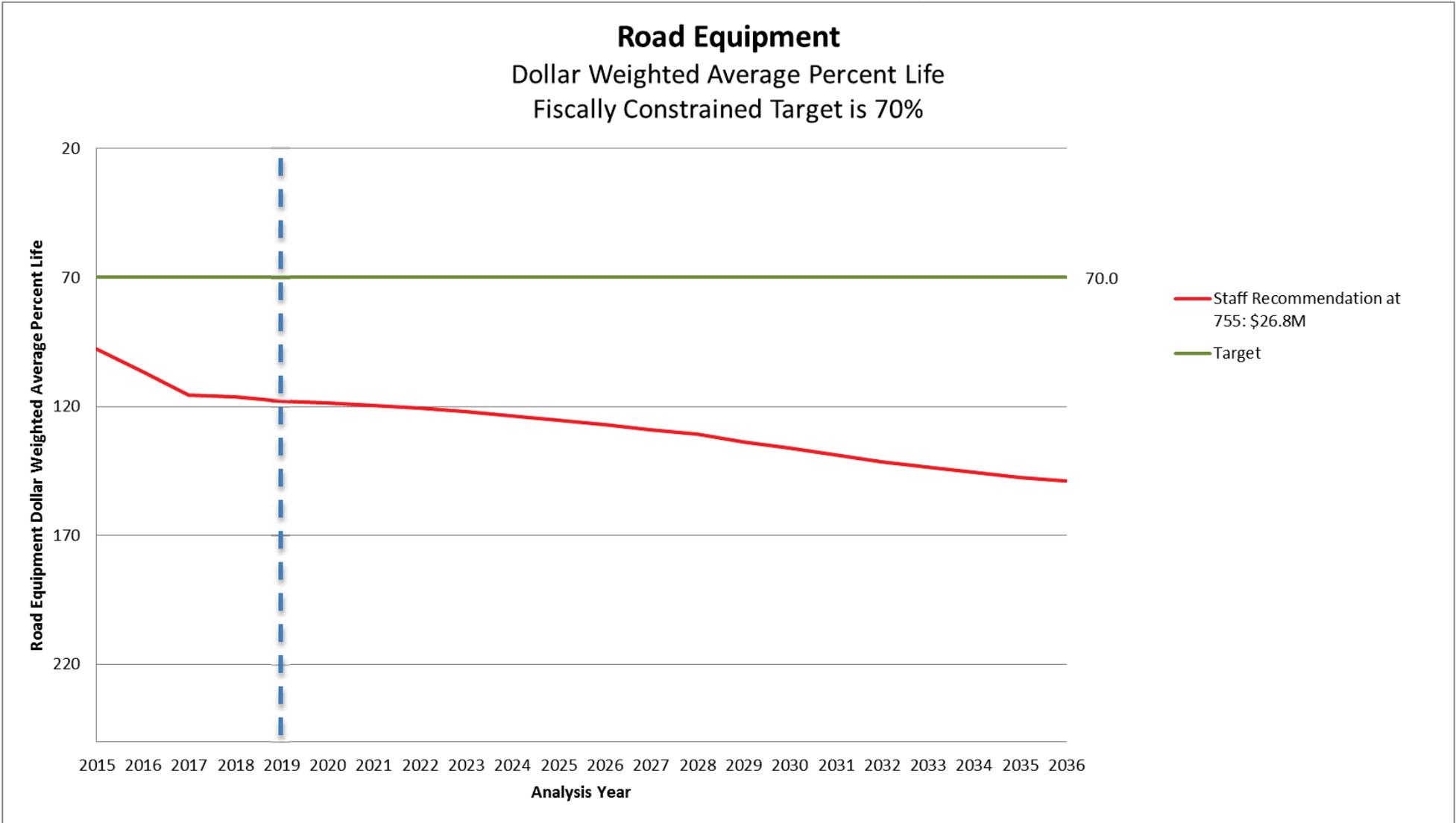
# ITS

**ITS Average Percent Useful Life**  
Fiscally Constrained Target is 90%





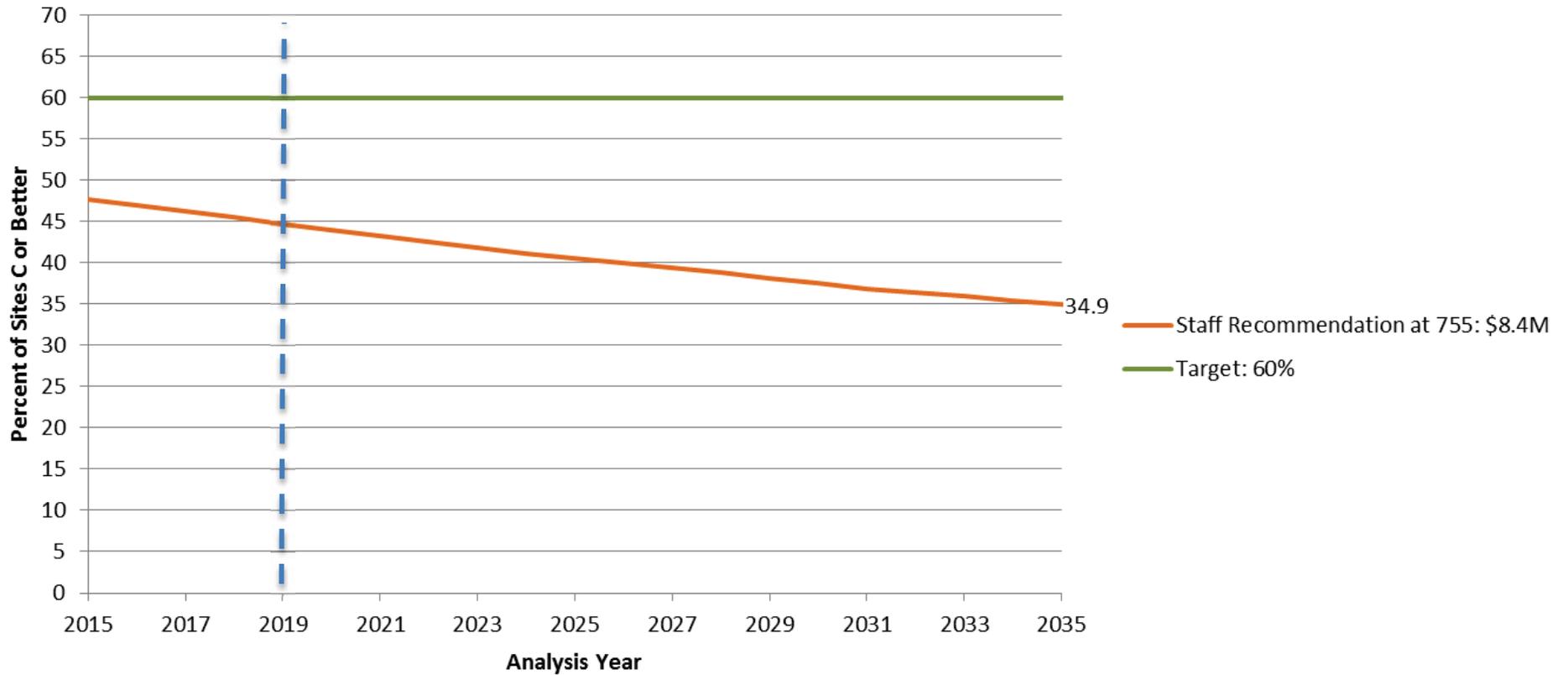
# Road Equipment





# Geohazards

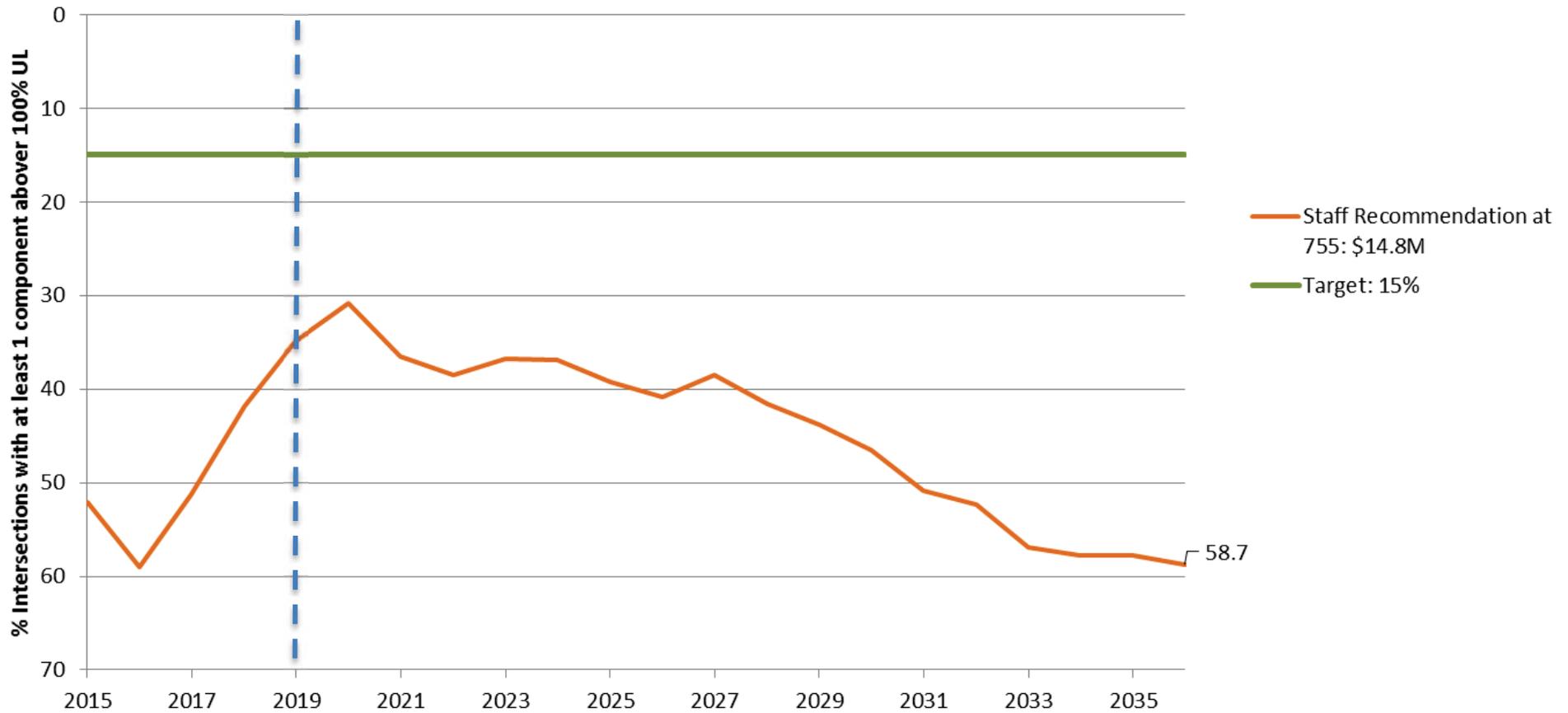
**Percent of Sites C or Better (1217 sites)**  
Fiscally Constrained Target is 60%





# Traffic Signals

**Percent of Intersections with At Least One Component Above 100% Useful Life**  
Fiscally Constrained Target is 15%





## Recommendations Going Forward

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### **Improvements to AIMS Cross-Asset Optimization and Budget Setting:**

- Continue improving AIMS
- Move ITS Maintenance and Operations to a separate budget line item, outside of Asset Management budget discussions
- Road Equipment developing a strategic plan
- Possible overhaul of MLOS
- Cross-asset optimization workshop (late-spring/early summer)
- Budget setting workshops should continue; staff input is critical to the budget setting process