Transportation Commission of Colorado
Transportation Asset Management Committee
Meeting Agenda
Thursday, August 21, 2014
4201 East Arkansas Avenue

William Johnson, Branch Manager
Transportation Performance Branch

Les Gruen, Chair
District 9, Colorado Springs

Kathy Connell
District 6, Steamboat Springs

Heather Barry
District 4, Westminster

Sidny Zink
District 8, Durango

Steven Hofmeister
District 11, Haxtun

Scott McDaniel
Acting Chief Engineer

Debra Perkins-Smith, Director
Division of Transportation Development

All commissioners are invited to attend this Committee meeting.

1. **Report Out from Commissioner Gruen – 5 minutes**
- **Approval of June, 2014 Minutes p02**
2. **Geohazards Project Modification Memo, Ty Ortiz,**
   Q & A if needed..... p04
3. **Performance Metrics, William Johnson, 20 minutes..... p06**
4. **Project Selection Process, William Johnson, 20 minutes..... p24**

<u>THE AGENDA MAY BE ALTERED AT THE CHAIR'S DISCRETION</u>

ASSET MANAGEMENT COMMITTEE
DRAFT MINUTES

Date: June 19, 2014

Committee Members Attending: Commissioners Gruen, Connell, Barry, and Zink.

Others Attending: Commissioner Aden, Commissioner Gifford, Debra Perkins-Smith, Scott Richrath, Josh Laipply, Scott McDaniel, Tony DeVito, Kerrie Neet, Dave Eller, Johnny Olson, Tom Wrona, William Johnson, John Vetterling, Robert Haley, Ty Ortiz, and others.

Minutes:

- The minutes from the February meeting were approved, with a request that improvements be made.
- Report Out from Commissioner Gruen.
- Commissioner Gruen informed attendees that the Project Status Report was discussed at the Program Management Workshop, and was removed from the agenda.
- **Delphi Workshop:** Commissioner Gruen requested clarification on the upcoming August Delphi meeting where FY 17 and FY 18 budget recommendations will be made. Specifically, are we relying too much on the Delphi approach instead of the Asset Investment Management System (AIMS) tool? Region Director DeVito asked if the TC could focus concerns with the Delphi process. Commissioner Gruen stated that Transportation Asset Management (TAM) focuses on process and tools, and that Delphi does not necessarily do that. The concern is that continued use of the Delphi method is taking our focus away from development of tools.

  William Johnson explained that the current version of AIMS produces budget and optimized trade-off recommendations based on asset condition alone, and does not consider CDOT goals and objectives (e.g. safety, mobility, and economic development). Staff will be using the Delphi method in August while AIMS development continues, which will include adding goals and objectives to output recommendations. Commissioner Gruen requested that a scope and timeline for development of AIMS be delivered to the Committee. Commissioner Gilliland reiterated that we need to have all assets in common tool, and that we need to be able to objectively see the impacts of the TC's investment decisions. Additionally, Commissioners Gruen, Gilliland, and Connell spoke to the willingness of the TC to engage in prioritizing CDOT objectives and goals for use in enhancing tools.
- **Rockfall Program Spending Plan Moving to a Geohazard Management Plan:** Ty Ortiz presented the FY 15 Geohazard Management Plan. The plan contains two primary components, corridor risk reduction ($6.8M) and emergency response ($2.3M), and is designed to more effectively manage geohazards. The plan details how emergency response projects require flexibility in use of funds, and that use of funds will be in accordance with Policy Directive 703. Changes to the budget in excess of 10% would be made by formal request to the TC, and that individual emergency response projects do not need to go to the TC for budget approval. Commissioner Gruen stated that staff can assume the TC is comfortable with the plan.
- **Policy Directive 14 Refinement:** William discussed asset performance metrics and targets as they related to the Risk-Based Asset Management Plan (RB-AMP) and Policy Directive 14 (PD 14). Currently, three asset programs have performance targets in PD 14 – bridge, pavement, and MLOS. PD 14 also has language referring to the RB-AMP for other performance targets. The RB-AMP

lacks complete performance targets for five (walls, tunnels, rockfall/geohazards, signals, and a fiscally constrained target for road equipment) of the eleven asset programs. Commissioner Gruen requested that staff develop a level of effort analysis and timeline for development of missing performance targets.

- **CDOT Staff TAM Workshop:** William discussed the TAM Workshop conducted June 10-11 for CDOT staff. Highlights included 2 panel sessions that included Executive Managers and Asset Managers, as well as continued connections between Cash and Program Management initiatives. William also presented the "Cliff's Notes" to the RB-AMP pamphlet requested by the TC during the February meeting. Commissioner Gilliland requested that the pamphlet be posted to CDOT external website.
- **10th National Conference on Transportation Asset Management:** William discussed staff participation and highlights from the conference that occurred in April. 6 CDOT staff, and 1 FHWA Colorado Division staff, attended – all gave presentations. Two highlights were the Change Management presentation from Gary Vansuch and Michelle Malloy, and a workshop on National Cooperative Highway Research Program (NCHRP) project 08-91 Cross-Asset Optimization tools.

Note: Due to timelines for PD 14 refinement more frequent meetings of the TC Asset Management Committee may be required.

COLORADO
Department of Transportation
Division of Transportation Development

Division of Transportation Development
4201 E. Arkansas Ave. Shumate Bldg
Denver, CO 80222-3400

DATE: August 21, 2014
TO: Transportation Commission
FROM: Scott McDaniel, Project Support Division
Bill Schiebel, Materials and Geotechnical Branch Manager
Ty Ortiz, Geotech Program
SUBJECT: FY15 GEOHAZARD SPENDING PLAN MODIFICATION

Purpose
The Geohazards Program is submitting this memo as information regarding a revision to its FY15 Spending Plan.

Action
Request that the Commission approve this revision to the Geohazards Management Plan.

Background
Policy Directive 703.0 provides the following guidelines for asset management project approvals:

Initial Project Funding:

A) Projects that are on an approved asset management list do not require separate Transportation Commission approval and as such the initial budget action can be approved by OFMB staff immediately, or

B) Projects that are not on an approved list require budget action approval by the Transportation Commission. As such, the region shall submit a budget action no later than the 25th day of the preceding month in order to be included.

Funding adjustments such as bid adjustments or CMOs:

A) Less than 10% or less than $250,000 above the original approved amount does not require TC approval.

B) Between 10%-15%, or between $250,000-$500,000, above the original approved amount requires 2 of 3 Signatures from Executive Director or Designee, Chief Engineer, CFO

C) Greater than or equal to 15% and greater than or equal to $500,000 or greater than or equal to $5,000,000 above the original approved amount requires TC approval

The revision presented below falls into Initial Project Funding category B, where the project was not on an approved list.

There are two main components of the Geohazards Spending Plan; 1) Risk Reduction and 2) Emergency Response and Geohazard Management. The Geotech Program proposes revising the Risk Reduction site list. The revised site list is presented in Table 1 below.

Table 1:

Type of work	Location
Construction	R1 Clear Creek Canyon Corridor (US6, SH119)
Construction	R2 Raton Pass Corridor (I-70)
Construction	R2 Ute Canyon Corridor (US24) – moved to FY17
Construction	R3 DeBeque Canyon (I-70) – moved to FY16
Construction	R3 Glenwood Canyon
Construction	R5 – Ridgeway (US550) – added
Const / Design	Geohazard Management System Development
Design	Clearances and Design (Statewide)
Operations	Internal operating costs
TOTAL Allocation = $6.8M	

The changes are:

- Construction for the DeBeque Canyon corridor (I-70 R3) will be moved to FY16,
- Construction of the Ute Canyon corridor (US24 - R2) will be moved to FY17,
- US550 R5 – Ridgeway near mile post 106.3, a High Risk Outlier site originally scheduled for FY14 construction will be moved to FY15. The site was removed from the FY14 list because the time required to obtain right-of-way clearance did not allow the TAM requirement of spending TAM funds within 18 months of the fiscal year received to be fulfilled.

Key Benefits

This change accommodates time needed for right-of-way and other clearances required for the DeBeque Canyon and Ute Canyon corridor work. The revision is in line with the working draft of the Geohazard Management Plan and, we believe it is in the spirit and intent of CDOT's Asset Management Program.

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Division of Transportation Development

Transportation Performance Branch
4201 E. Arkansas Ave. Shumate Bldg
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DATE: August 21, 2014
TO: Transportation Commission
FROM: Debra Perkins-Smith, Director, Division of Transportation Development
William Johnson, Transportation Performance Branch, DTD
SUBJECT: Asset Management Performance Metrics and Targets

Purpose

This memorandum provides Commissioners with an update on performance metrics and targets for those assets not listed in Table 4.1 of the Risk-Based Asset Management Plan (RB-AMP). These metrics and targets are needed to develop the FY 17 and FY 18 asset program budget recommendations.

Action

Commission approval of performance metrics and targets.

Performance Metrics Development Background

Policy Directive 14 has historically included performance goals for pavement, bridges and maintenance. During the course of developing the Risk-Based Asset Management Plan (RB AMP) last fall, the current performance, fiscally constrained target and aspirational performance targets for each asset category was included if available, and if not, Table 4.1 in the document showed 'TBD'. The Commission requested during the June Asset Management Committee Meeting that performance metrics and targets be identified for those assets with a 'TBD' designation on Table 4.1 of the RB-AMP. The result is a revised Table 4.1, included as an attachment to this memorandum.

Details

To develop performance metrics, each asset program went through the same fundamental process which included:

- Understanding the investment decisions their asset program needed to make to maintain and extend the life of their assets.
- Understanding the data needed to support their investment decisions.
- Developing a metric, or set of metrics, that could demonstrate a link between investment and performance.
- Developing a fiscally contrained performance target that allows CDOT to maintain a balanced budget, and an aspirational target that describes the desired level of of performance an asset could reasonably achieve given an unconstrained budget.
- Understanding of how the performance metric and target, along with performance data, informs project selection.

Note: Walls and Traffic Signals are new asset asset programs that were not part of the RB AMP document. Traffic Signals has developed some metrics; however, walls metrics are still under development at this time, and estimated to be complete in September 2014. The Rockfall program recently changed to a Geohazards program, and the associated metric is still under development and estimated to be complete in September 2014. And

pending data collection, the current condition for the Tunnels fire/life safety metric will be updated at a later time.

Staff requests Commission approval of the updated performance metrics and targets. These performance metrics and targets will be used within the asset management systems and programs, and for asset program budget recommendations.

Next Steps

Staff will use the performance metrics and targets in the process to develop the FY 17 and FY18 asset budget recommendations. Two sets of budget recommendations for the FY 17 and FY 18 asset programs will be developed on August 22nd. One will be a budget recommendation from the Asset Investment Management System (AIMS) based on best use of existing asset models. The other will be using the Delphi method since all asset classes do not have models in AIMS yet. The staff asset management budget recommendations will be presented to the Commission in September 2014.

Attachments

RB AMP Table 4.1 Version 2

All CDOT Asset Management Metrics and Performance Targets (Developed by Staff, Including PD14)

Asset	Measure	Current Performance	Aspirational Target	Fiscally Constrained Target	Performance Gap[b]
Bridges	Percentage of deck area on structurally deficient CDOT-owned bridges	6%	5%	10% [a]	5%
	Percentage of deck area on structurally deficient bridges on the NHS	5%	5%	10% [a]	5%
	Percentage of CDOT-owned bridges over waterways that are scour critical	6%	1%	5%	4%
	Percentage of bridge crossings over Interstates, U.S. routes and Colorado state highways with a vertical clearance less than the statutory maximum vehicle height of 14 feet-6 inches	1%	0%	1%	1%
	Percentage of bridge crossings over Interstates, U.S. Routes and Colorado state highways with a vertical clearance less than the minimum design requirement of 16 feet-6 inches	8%	2%	7%	5%
	Percentage of CDOT-owned bridges posted for load	0%	0%	0%	0%
	Percentage of CDOT-owned bridges with a load restriction	3%	1%	3%	2%
	Percentage of leaking expansion joint by length on CDOT-owned bridges	18%	5%	15%	10%
	Percentage of CDOT-owned bridge deck area that is unsealed or otherwise unprotected	41%	5%	30%	25%
Pavement	Percentage high-moderate drivability life for Interstates based on condition standards and treatments set for traffic volume categories	86%	90%	80% [a]	10%
	Percentage high-moderate drivability life for CDOT-owned NHS, excluding Interstates based on condition standards and treatments set for traffic volume categories	83%	90%	80% [a]	10%
	Percentage high-moderate drivability life for the State highway system based on condition standards and treatments set for traffic volume categories	82%	90%	80% [a]	10%
Maintenance	Statewide Letter Grade	B-	B-	B- [a]	None
Buildings	Statewide Letter Grade	86% C or Better	100% C or Better	90% C or Better	10%
ITS	Average Percent Useful Life	143%	80%	104%	24%
Fleet	Average Percent Useful Life	96%	60%	70%	10%
Culverts	Percentage Critical Culverts	4.4%	2%	5%	3%
Geohazards	TBD	TBD [c]	TBD [c]	TBD [c]	TBD [c]
Tunnels	Key components of fire/life safety must not exceed 100% of useful life, based on manufacturer's specification, condition inspections and maintenance history.	TBD [d]	100%	100%	0%
Traffic Signals	Average Percent Useful Life Overall Signal Infrastructure	124%	100%	113%	24%
Walls	TBD	TBD	TBD	TBD	TBD

[a] These objectives and targets are from PD 14, adopted by the Transportation Commission. Others are staff recommended, and subject to available funding.
[b] CDOT defines the performance gap as the difference between aspirational and fiscally constrained targets.
[c] To be completed December 2014 with incorporation into AIMS.
[d] Target pending data collection.

Highlighted Items are New Metrics and Targets.

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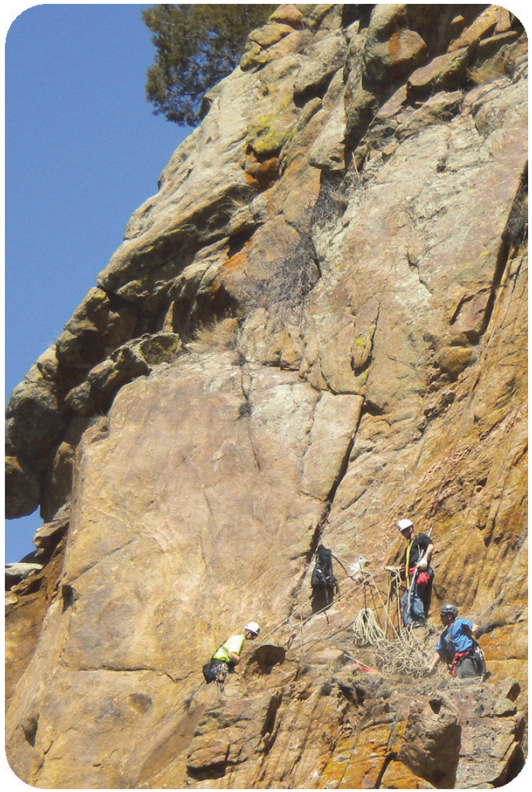

Transportation Asset Management Committee
August 2014

TAM Performance Metrics and Targets

All CDOT Asset Management Metrics and Performance Targets (Developed by Staff, Including PD14)

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Highlighted Items are New Metrics and Targets.

AIMS - Analysis

- Each asset is analyzed independently of any other asset.
- AIMS generates alternative strategies for each asset and then optimizes the “what-if” scenarios to maximize the key performance indicator.
- Once strategies are generated and optimized the **AIMS slider tool** can be used to compare outcomes for different investment levels.
- Once strategies are generated, the **AIMS Cross Asset Analysis** and Optimization functionality can be used to allow assets to compete for the same funding.

AIMS – Trade-off Analysis

- AIMS includes Two Approaches to Strategic Trade-Off Analysis
  - Slider Based Tools
  - Cross Asset Analysis and Optimization

AIMS – Slider Tool

- **Leverages the individual asset "what-if" scenarios to display impacts to key performance measures for different levels of investment.**

- **No limit to the number of "what-if" scenarios.**

- **Each tick of the slider tool is a separate "what-if" scenario and interpolation can be used between tick marks to judge investment.**

- **Outputs:**
    - Optimized Program for each budget scenario

    - Slider Tool for demonstrating the effects of moving funding from one asset or classification to another on each Key Performance Index (KPI)

    - All other dTIMS CT Charts, Graphs, Reports and Exports are available for any of the "what-if" scenarios used on the slider tool.

AIMS – Slider Tool

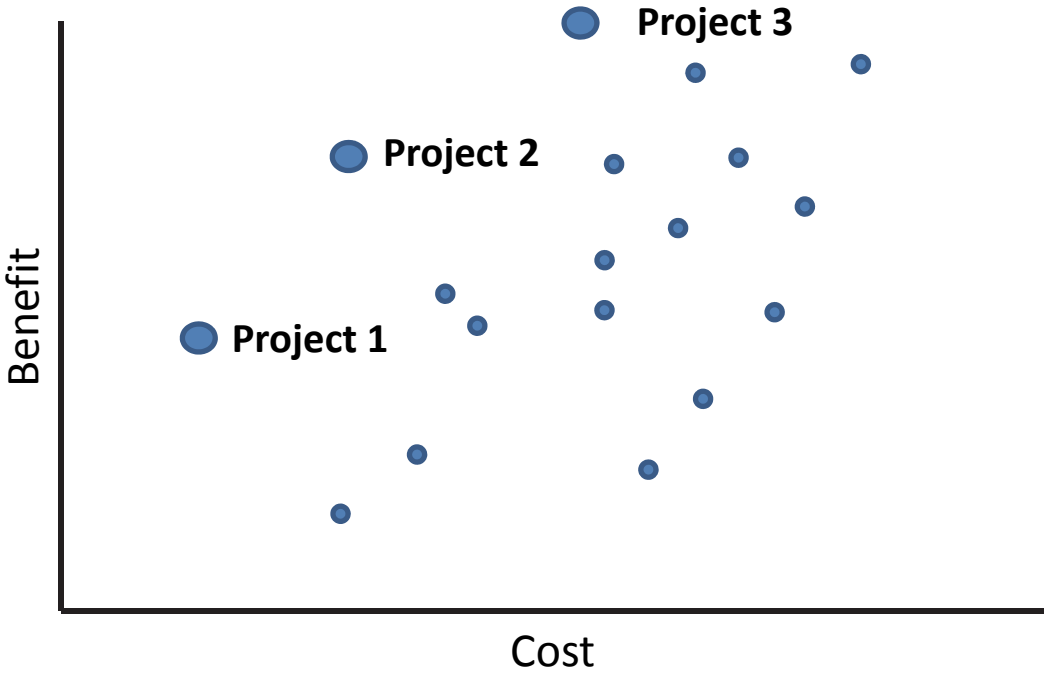
- **Slider tool displays key performance indices for each asset based on the budget scenarios created.**
- **Slider tool provides a mechanism for viewing the resulting condition for any of the generated scenarios.**
- **All lines and graphs are generated prior to the slider tool being executed and the slider tool just displays the results in an easy to use manner.**

AIMS – Cross-Asset Analysis and Optimization

- **Allows strategies from different assets to be optimized together in one optimization**
- **Projects compete against one another for the same funding.**
- **Unlimited number of "assets"**
- **Input Parameters:**
    - Minimum Funding Levels for each asset
    - Additional Funding Levels to be optimized within user defined limits
    - Key Performance Measures (KPIs) for each item being optimized
- **Outputs:**
    - Optimized Distribution of the Additional Funding
    - Funding Level Report
    - All other dTIMS CT Charts, Graphs, Reports and Exports

AIMS – Cross-Asset Analysis and Optimization

- Project 1, Project 2 and Project 3 would be selected first if money was available then the other projects may be selected if funding permits.



- Funding is allocated from the dedicated minimum budget first for any asset and then from the unallocated budget once the dedicated budget exhausted**. Dedicated minimum budgets can be set to $0.**

AIMS – Cross-Asset Analysis and Optimization

- **Example Analysis using AIMS:**
  - **FY 15 $400 M was recommended for bridge and pavement**

Pavement Assets – $0 minimum dedicated funding

Bridge Assets - $115 million annual minimum funding

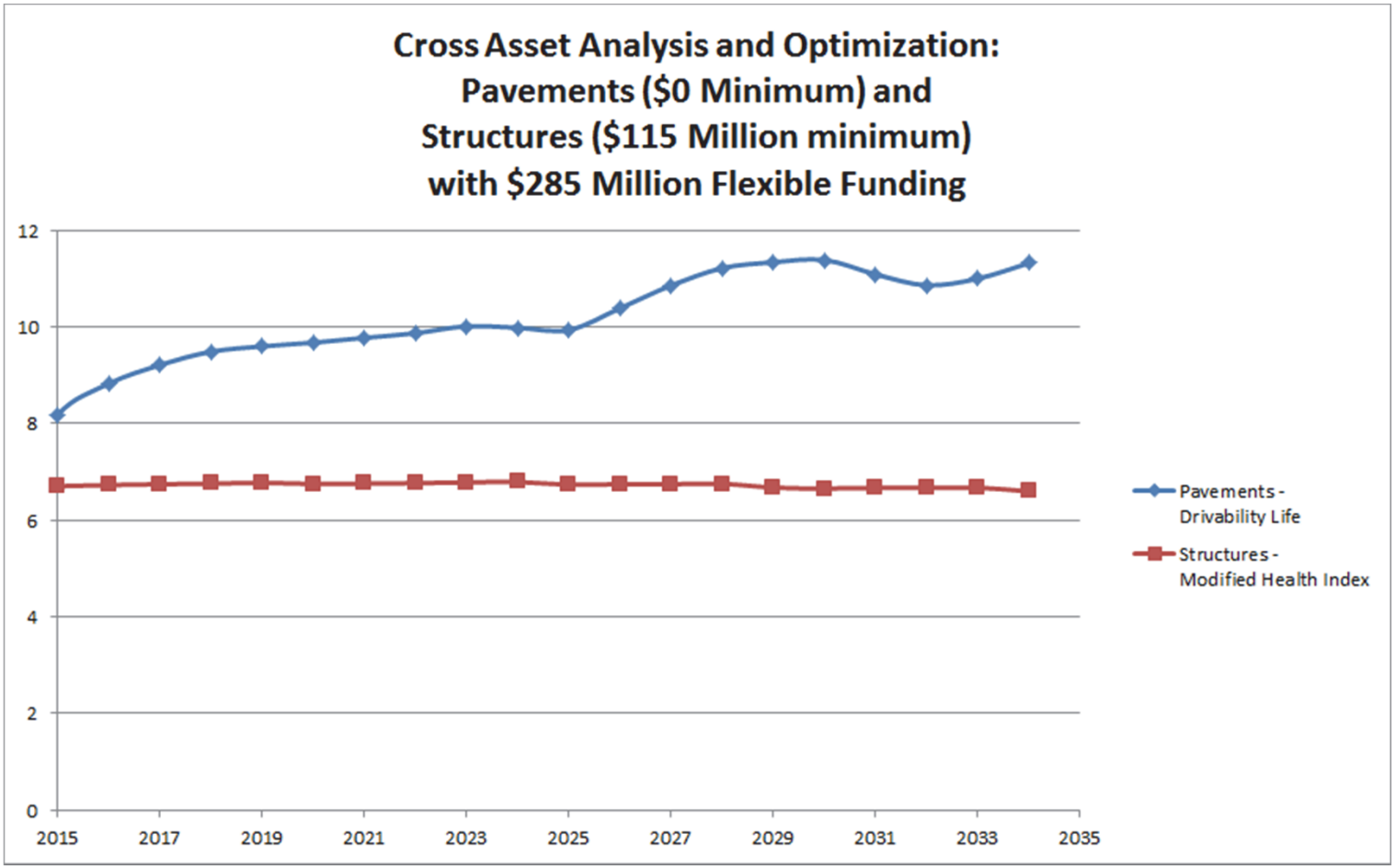
Unallocated Funds - $285 million available for either asset

Optimization based on Condition only :
- DL for pavements
- Modified Health Index for bridges

AIMS – Cross-Asset Analysis and Optimization

	Pavements		Bridges			
Year	% of Additional	Expenditure	% of Additional	Minimum	Additional	Total
2014	0.00	$0.00	0	$0.00	$0.00	$0.00
2015	82.88	$236,211,269.82	17.11	$115,000,000.00	$48,761,032.74	$163,761,032.74
2016	100.00	$284,999,054.16	0	$114,981,605.05	$0.00	$114,981,605.05
2017	99.99	$284,984,474.96	0	$114,965,250.33	$0.00	$114,965,250.33
2018	99.99	$284,961,677.70	0.01	$115,000,000.00	$35,103.00	$115,035,103.00
2019	99.83	$284,518,047.02	0.14	$115,000,000.00	$390,151.29	$115,390,151.29
2020	99.96	$284,873,618.98	0.03	$115,000,000.00	$93,479.53	$115,093,479.53
2021	99.93	$284,793,764.65	0.06	$115,000,000.00	$178,736.51	$115,178,736.51
2022	99.91	$284,741,944.96	0.06	$115,000,000.00	$171,098.51	$115,171,098.51
2023	99.90	$284,718,809.17	0.03	$115,000,000.00	$75,427.84	$115,075,427.84
2024	94.35	$268,896,390.40	5.65	$115,000,000.00	$16,092,470.08	$131,092,470.08
2025	54.18	$154,417,770.03	45.82	$115,000,000.00	$130,579,326.21	$245,579,326.21
2026	95.48	$272,123,706.51	4.5	$115,000,000.00	$12,834,885.43	$127,834,885.43
2027	99.97	$284,908,809.39	0.03	$115,000,000.00	$84,271.28	$115,084,271.28
2028	91.60	$261,057,144.48	8.4	$115,000,000.00	$23,937,597.21	$138,937,597.21
2029	97.50	$277,873,935.68	2.49	$115,000,000.00	$7,105,428.35	$122,105,428.35
2030	88.97	$253,556,161.17	11.01	$115,000,000.00	$31,380,909.51	$146,380,909.51
2031	99.91	$284,736,660.27	0.09	$115,000,000.00	$256,166.96	$115,256,166.96
2032	99.41	$283,332,595.63	0.58	$115,000,000.00	$1,653,958.26	$116,653,958.26
2033	96.10	$273,871,330.77	3.9	$115,000,000.00	$11,115,365.67	$126,115,365.67
2034	99.97	$284,928,744.32	0	$114,972,468.29	$0.00	$114,972,468.29

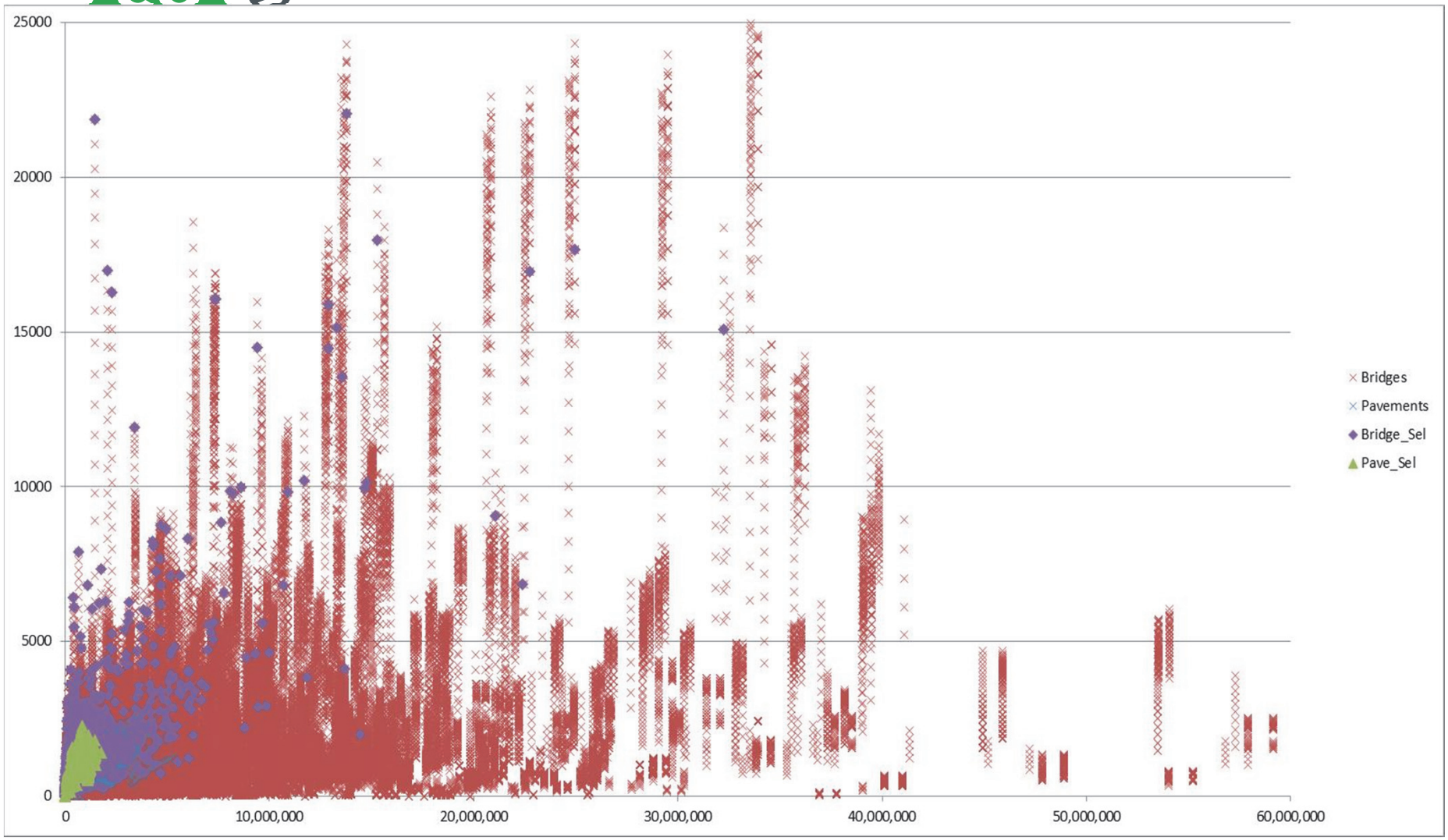
AIMS – Cross-Asset Analysis and Optimization



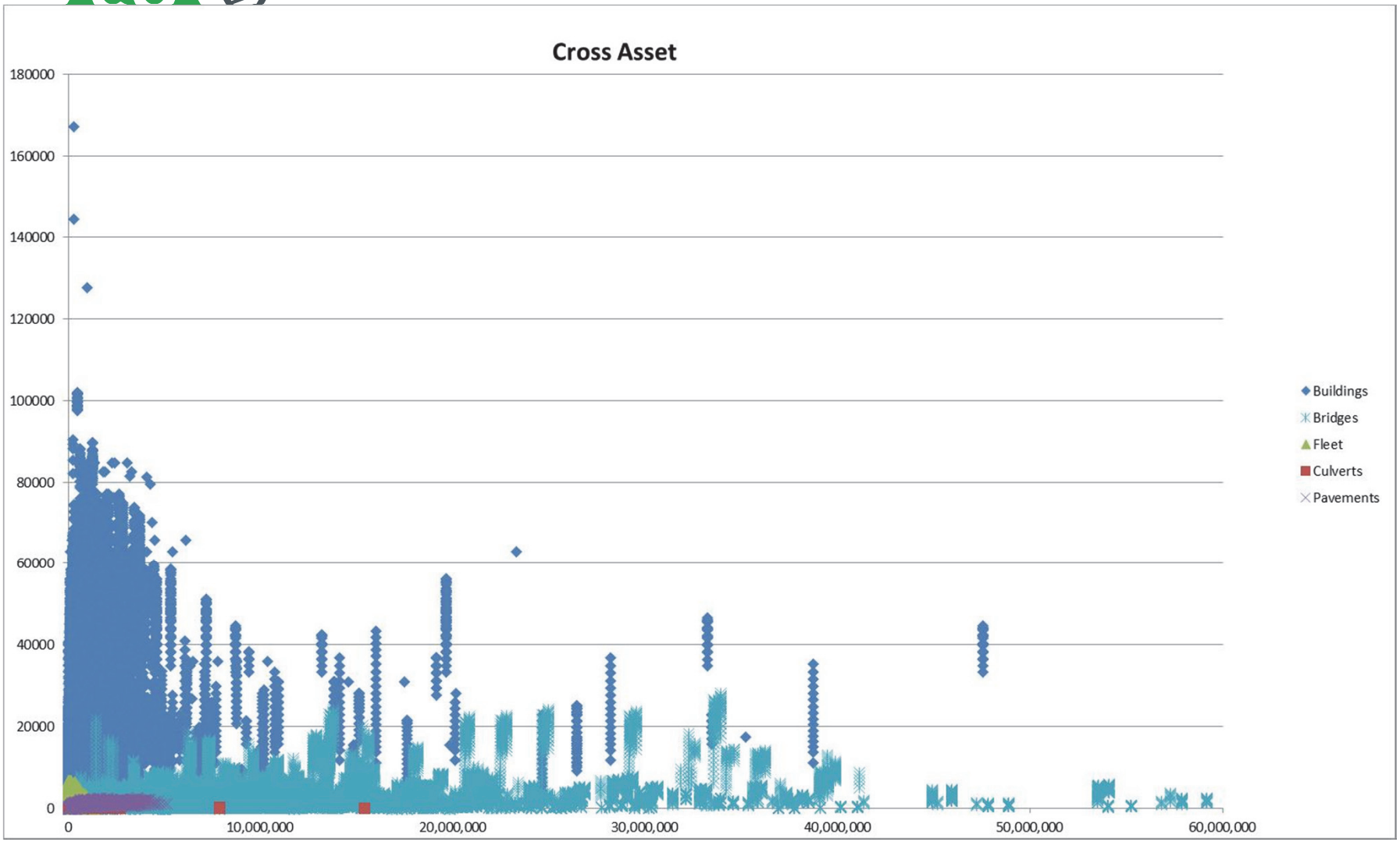
AIMS – Cross-Asset Analysis and Optimization

- Results are based upon a mathematical optimization using in which no changes to either the pavement strategies or the bridge strategies to equalize benefits or to apply a “value matrix” to project prioritization.
- Results can be explained by investigating all the possible strategies and the selected strategies.
- Bridge strategies are selected first (higher benefit, less cost) and then the pavement strategies are selected.
- Once pavement strategies are selected, higher cost / higher benefit bridge strategies are selected with the remaining funds.
- When other assets are added to the analysis, picture gets even more cloudy.
- Without equalizing the benefits and accounting for a CDOT value matrix, the cross asset analysis and optimization will not be effective.

AIMS – Cross-Asset Analysis and Optimization



AIMS – Cross-Asset Analysis and Optimization



AIMS – Cross-Asset Analysis and Optimization

Cross Asset Analysis and Optimization:

- Needs to move from “condition based” to “impact based”
    - Impacts to the Economy?
    - Impacts to Society?
    - Impacts to the Environment?

- Should be implemented at the tactical asset management level when alternative strategies are generated and not after the fact at the strategic level once individual assets recommendations have been made.

- CDOT needs to value matrix and then AIMS can be used for this type of analysis.

- Transport New Zealand (National Highway Agency) has implemented a value matrix that may be of interest to CDOT.

COLORADO
Department of Transportation
Division of Transportation Development

Division of Transportation Development
4201 E. Arkansas Ave. Shumate Bldg
Denver, CO 80222-3400

DATE: August 21, 2014
TO: Transportation Commission
FROM: Debra Perkins-Smith, Director, Division of Transportation Development
William Johnson, Transportation Performance Branch, DTD
SUBJECT: Asset Project Selection Processes

Purpose

To conform with PD 703 on Cash Management, project selection processes for assets are being documented for Commission approval. This memorandum provides an overview of the project selection process used by the CDOT asset managers with an example of a process summary from the Surface Treatment Program.

Action

Provide input on the content and format for documenting project selection processes for asset management, as illustrated by the Surface Treatment Program example.

Background

In the past, the Commission reviewed and approved asset program project lists. In recent years, the processes used to develop project lists have been refined and documented. Current project selection processes use information from the asset management system to ensure that investments are pointed to projects that best maximize life-cycle in a fiscally constrained environment to achieve performance targets. It is also recognized by staff that they should be continually improving their asset programs, tools, data, and processes.

Details

Attached for your review and comment is an example from the Surface Treatment Program. All summaries would contain:

- An introduction of the asset
- A performance metric and target overview
- A project selection process diagram
- A project selection process narrative

Projects lists will be managed by a collaboration between the asset managers, the Program Management Office, and OFMB – Cash Management under PD 703 guidelines, which state:

- Initial Project Funding
  a) Projects from programs where the Commission has accepted the prioritization model/process, and staff have approved the asset program project list, do not require separate Transportation

Commission approval and as such the initial budget action can be approved by OFMB staff immediately, or

b) Projects from programs where the Commission has not accepted the prioritization model/process, require budget action approval by the Transportation Commission. As such, the region shall submit a budget action no later than the 25th day of the preceding month in order to be included for Commission approval.

- Funding adjustments such as bid adjustments or CMOs
  a) Less than 10% or less than $250,000 above the original approved amount do not require TC approval
  b) Between 10%-15% or between $250,000-$500,000 above the original approved amount requires 2 of 3 Signatures from Executive Director or Designee, Chief Engineer, CFO
  c) Greater than or equal to 15% and greater than or equal to $500,000 or greater than or equal to $5,000,000 above the original approved amount require TC approval

Key Benefits

Approval of the project selection process eliminates the need for Commission review of individual project lists, and requires asset managers to use their asset management programs and systems to make data driven project selections.

Next Steps

In September, staff will present processes for the remaining asset programs (bridge, buildings, road equipment, ITS, signals, geohazards, tunnels, walls, and culverts). MLOS does not have traditional projects, thus no project selection process is available.

Attachments

Surface Treatment Asset Program Project Selection Process

Surface Treatment Project Selection Process
8/3/2014

Introduction

CDOT is responsible for over 9,100 centerline miles of highways system, accounting for over 23,000 lane miles of pavement. Of this total, approximately 18 percent of the State's lane miles are on the Interstate system, and over half of the lane miles CDOT is responsible for are not included as part of the National Highway System.

Performance Metric and Target

CDOT's main measure of pavement condition is "Drivability Life" (DL). DL is an indication, in years, of how long a highway will have acceptable driving conditions. An acceptable driving condition is a function of smoothness and safety, as determined by the measured roughness and amount of pavement distress. Unacceptable pavement condition does not mean impassable; it means that drivers must reduce speeds to compensate for less than desirable driving conditions, navigate around potholes, or endure rough rides. Drivability standards for condition assessment vary between highway classifications, with Interstates having the highest CDOT drivability standards. To determine DL for a segment of highway (0.5-5.0 miles in length), CDOT conducts a trend analysis using the following distresses:

• International Roughness Index (IRI);
• Rutting;
• Transverse cracking;
• Longitudinal cracking;
• Fatigue cracking (for asphalt only); and
• Corner break (for concrete only).

The predicted future point at which any one of these distresses surpasses a predefined drivability threshold defines the DL of that segment. DLs are then grouped into three categories:

• High DL – Greater than 10 years;
• Moderate DL – From 4 to 10 years; and
• Low DL – 3 or fewer years.

Performance Target

• Maintain 80 percent High/Moderate Drivability Life for Interstates based on condition standards and treatments set for traffic volume categories.
• Maintain 80 percent High/Moderate Drivability Life for the National Highway System (NHS), excluding Interstates, based on condition standards and treatments set for traffic volume categories.
• Maintain 80 percent High/Moderate Drivability Life for the State highway system based on condition standards and treatments set for traffic volume categories.

Project Selection Process

As illustrated in the below process diagram, Division of Project Support staff runs a statewide pavement analysis to optimize treatments to segments over many years for the entire pavement system. That statewide analysis generates a list of recommended statewide project segments. The cost associated with all recommended work in each Region is totaled and used to determine the percentage of the statewide surface treatment budget directed by the PMS to each Region. Those percentages are used to establish statewide planning budget distributions per

Chief Engineer Policy Memo (PM) 19. The planning budgets assigned to each Region are then used to run a second more refined PMS project analysis in each Region to generate a specific regional PMS list of recommendations. Chief Engineer Policy Memo 10 states that a minimum of 70 percent of surface treatment projects shall match model recommendations. Chief Engineer Policy Memo 7 constrains surface treatment funding expenditures to bid items that are deemed essential to improving pavement surface condition. Policy Memo 18 details preventive maintenance requirements. The Pavement Design Manual establishes the allowed treatment types for each traffic-based pavement category. All of these controlling documents establish rules to be satisfied during the regional planning process. The goal of the regional planning process is a three- to five-year surface treatment plan. The regional planning over this longer period facilitates the complex design, clearance, and delivery of construction projects.

All proposed projects from the regional planning process are gathered into a statewide portfolio for the Surface Treatment Program. Before the surface treatment portfolio is finalized, the proposed list of construction projects and the PMS-recommended project locations are reviewed by Division of Project Support staff to ensure that at least 70 percent of the statewide projects match. Budgeting of individual approved projects is made from a single statewide surface treatment pool.

There are also funds assigned to pavement maintenance activities as part of the Maintenance Levels of Service program (MPA 150).

Process: CDOT – Surface Treatment Asset Management
Sub-Process: Surface Treatment Asset Program Development
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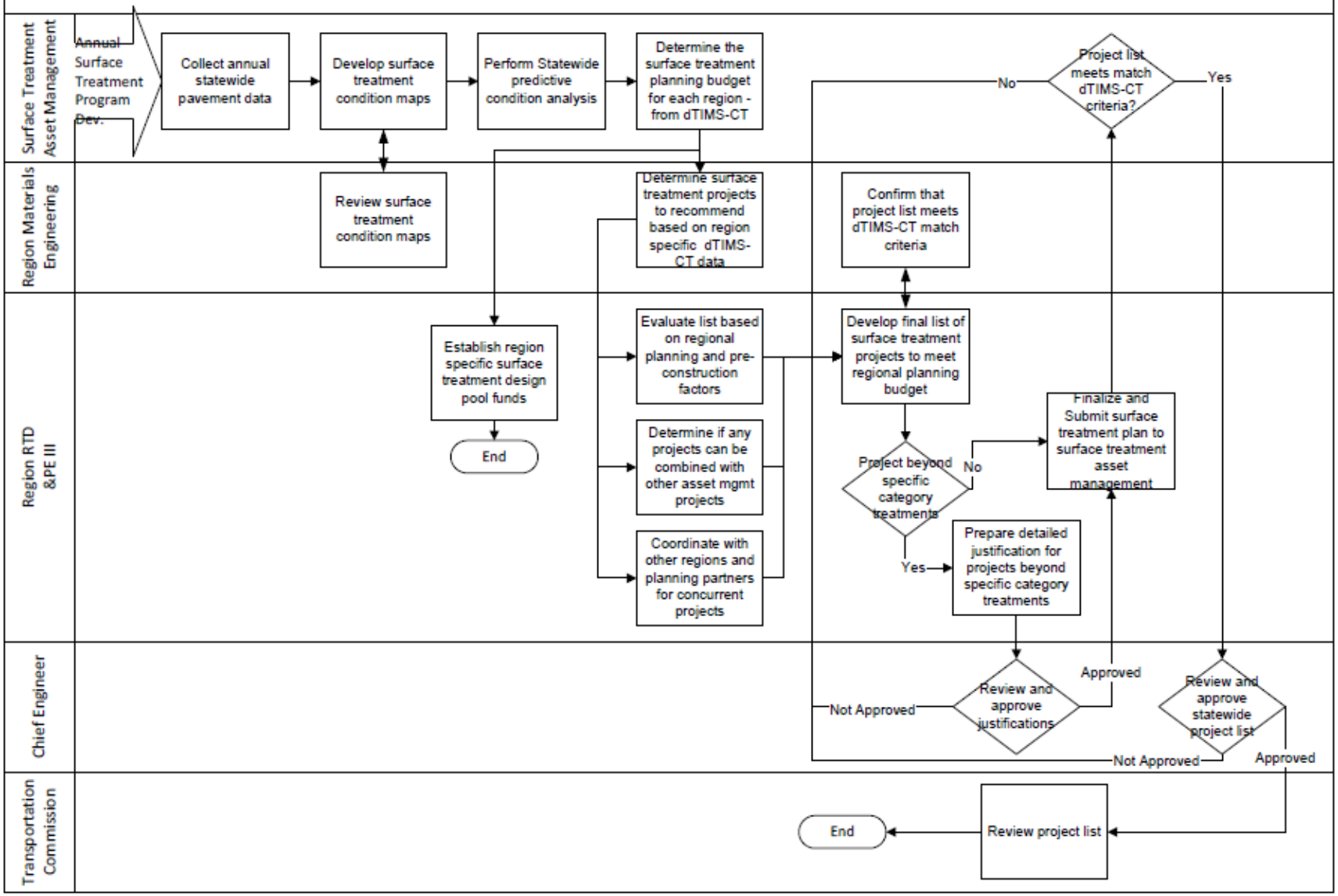
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