Transportation Commission of Colorado
Transportation Asset Management Committee
Meeting Agenda
Wednesday, February 19, 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. **Approve January Minutes – 5 minutes..... Page 2**
2. **Report Out from Commissioner Gruen – 5 minutes**
3. **Delphi Workshop and FY16 Budget Staff Recommendations, Asset Managers – 45 minutes..... Page 4**
4. **RB AMP Check In – 5 minutes**

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

ASSET MANAGEMENT COMMITTEE
DRAFT MINUTES

Date: January 16, 2014
Committee Members Attending: Commissioners Gruen, Barry, Connell, Hofmeister and Zink.
Others Attending: Commissioners Aden, Gifford, Gilliland, Peterson, Reiff, Thiebaut, Executive Director Hunt, Debra Perkins-Smith, Randy Jensen (FHWA), Vince Rogalski (for STAC), Scott Richrath, William Johnson, JoAnn Mattson, Scott McDaniel, Heidi Humpries, Tony DeVito, Ty Ortiz, Kerrie Neet, Dave Eller, Myron Hora, Maria Sobota, Michelle Scheuerman, Richard Zamora, Josh Laipply, and others.

Minutes:

- Commissioner Gruen welcomed attendees and shared that the agenda in the packet would be replaced by general discussion among the commissioners regarding the future of the committee and the risk-based asset management plan.
- The Asset Management committee agreed that the purpose of the committee, to oversee asset management activities at CDOT, is more critical than ever. The committee will meet on a quarterly basis to be informed by staff of progress and also be a venue for discussion on asset management related topics that do not need to go to the full commission.
- The committee overall feels that the document is a good resource, however some changes are needed before it's ready to be submitted to FHWA. The committee determined that the Chair, Commissioner Gruen, can lead staff in making changes to the document, which can then be distributed back to the Asset Management Committee members for review before the February meeting. The changes recommended by the committee are:
    - Rethink the organizational chart, so that it's clear the Asset Management committee is directing asset management efforts at CDOT
    - Prepare a 2-3 page cliff notes version of the plan as a resource for commissioners
    - Rewrite the Executive Summary, so that it clearly states what the plan includes and recommends
    - Address the program distribution page that currently says "draft" (staff will update when program distribution is final)
- The Committee and Executive Director also made the following suggestions for the next version of the plan, in two years:
    - Show a better connection with the statewide plan
    - The next version of the document should evolve into more of a strategic report
- Executive Director Hunt closed with a short overview of the asset management slides used in his Listening Tours across the state, and he suggested that the next plan should:
    - Describe the process for optimal allocation of capital maintenance dollars among assets more clearly.
    - There needs to be a feedback process from the regions on project tracking.

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

DATE: February 6, 2014
TO: Transportation Commission
FROM: Scott McDaniel, Interim Chief Engineer
Bill Schiebel, Materials and Geotechnical Branch Manager
SUBJECT: Minor Project Change to FY14 Surface Treatment Projects

Purpose
Per the January 27, 2014 discussion with Executive Director Hunt and Chief Financial Officer Richrath, this is an informational memorandum detailing a change to the FY14 Surface Treatment Program project list.

Action Requested
No action requested; informational only.

Background
The FY14 list of STP projects was finalized with input from the Transportation Commission in May 2013. During the iterative process used to ensure an effective FY14 STP list, there were minor project oversights and omissions that were subsequently determined critical to addressing existing STIP commitments across the state. Three low cost, low volume projects were identified and Director Hunt required regional directors to ensure early April advertisement. In addition, there was one regional change to the May 2013 FY14 list based on local planning partner input. That change is detailed here.

Details
The Region 2 Director and his staff have identified an important change to the intended multi-year schedule of project delivery based on planning partner input and DL PMS recommendations. The City of Pueblo recommended CDOT defer FY14 paving work planned for SH96 through the city until FY16 to allow for completion of city drainage, traffic signal, and intersection improvements prior to CDOT paving work. In addition, Otero and Las Animas County elected officials have shared numerous complaints regarding the rough and increasingly unacceptable condition of SH350. This SH350 segment was a past FY 16 STIPed project. The SH350 project is a match with the DL PMS system recommendations.

CDOT will deliver the $5.63M SH350 project in FY14 rather than the $5.50M SH96 project.

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

DATE: February 7, 2014
TO: Transportation Commission
FROM: Debra Perkins-Smith, Division of Transportation Development
William Johnson, Transportation Performance Branch, DTD
SUBJECT: Transportation Asset Management Committee

Purpose
This memorandum summarizes the discussion planned for the February meeting of the Colorado Transportation Commission Asset Management Committee. There is one attachment in support of this meeting:

- PowerPoint Presentation covering Delphi Workshop: Staff Recommendations for FY16 Budget for Asset Management

Action Requested
Committee approval of the FY16 Asset Management Budget.

Background
In September 2012 the Colorado Transportation Commission formed the Asset Management Committee 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 FY14 budget discussion.

Details

FY16 Delphi Workshop:
On January 30, staff met in a 7-hour workshop convened by Executive Director Hunt to review the projected performance and proposed FY2016 Asset Management funding for several assets. Committee guidance and material presented to the Committee in previous months informed the staff workshop.

Attendees included Director Hunt and other members of senior management, regional transportation directors, asset managers and staff from the Division of Transportation Development and the Office of Financial Management and Budget as well as the regions. The group reviewed information presented by each asset manager, and negotiated how much FY2016 funding each program should receive.

The group engaged in an activity – using the Wideband Delphi method – that allowed each individual to allocate FY2016 funding among assets. The Delphi method consists of a facilitator and participants working together through iterative rounds of discussion to come to consensus. The group completed three Delphi rounds for the FY16 budget of $738 Million (based on the FY15 baseline budget, and assuming RAMP asset management funding at $150M). It is important to note that the assumption for RAMP funding decreased from $165M to $150M from FY15 to FY16, and additional assets were added to the FY16 discussion, so the discussions were more challenging than in past Delphi workshops.

The resulting recommendations from staff appear in the table below.

(In Millions)	FY15 Budget (Baseline + RAMP)	FY16 Amount Requested (Baseline + RAMP)	FY16 Delphi Results (Baseline + RAMP)
Surface Treatment	$235.2	$240.0	$235.9
Bridge, BE & Bridge Fixed Costs	$168.2	$180.0	$164.1
MLOS	$251.3	$258.8	$254.4
Road Equipment	$20.9	$24.0	$18.4
ITS	$27.6	$35.1	$21.4
Rockfall Mitigation	$9.1	$12.3	$9.2
Buildings	$20.8	$15.7	$12.9
Tunnels	$12.4	$7.6	$5.2
Culverts	$9.6	$12.0	$8.2
Walls	$0.0	$4.0	$2.4
Traffic Signals	$0.0	$16.0	$5.7
Risk Mitigation	$0.0	$5.0	$0.0
TOTAL	$755.1	$810.5	$738.0

This Delphi workshop has occurred well in advance of CDOT's annual budget setting process, in order for statewide Asset Managers to better plan projects with the regions. Actual FY16 revenues available to asset management will be more firmly established through the FY16 budget process that occurs next fall through the following spring.

Next Steps

If the Committee recommends adoption of the FY16 Asset Management Budget to the full Transportation Commission, then staff will draft a Resolution for the March meeting for adoption by the Commission.

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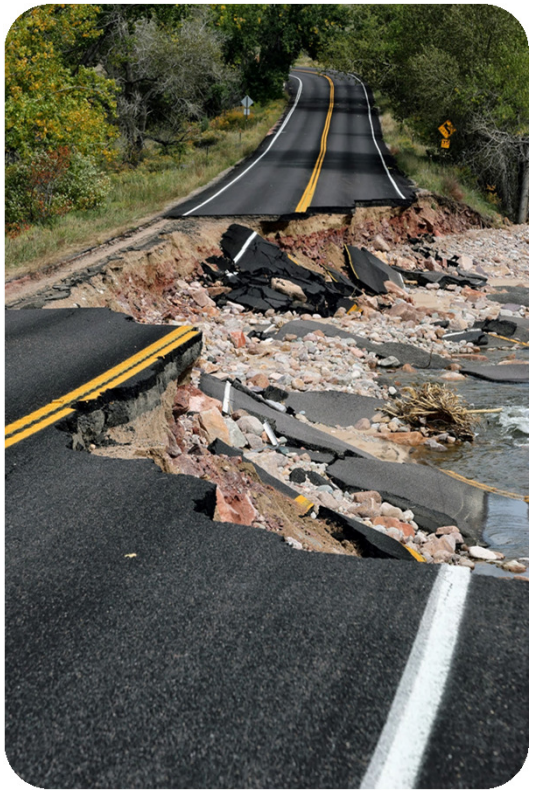

Transportation Asset Management Committee
February 2014

COLORADO
Department of Transportation

Agenda

Delphi Workshop: FY16 Staff Recommendations

RB AMP Check In

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Agenda

- Delphi Workshop: FY16 Staff Recommendations
- RB AMP Check In

Eligibility Criteria

FY15 Eligibility Criteria Still in Effect for FY16 Programs:

1. Be able to **demonstrate** with a **quantified performance measure** the **benefit of additional investment**.
2. Have an **existing asset management system** that has, among other features, the ability to establish a performance target (e.g. maximize life cycle otherwise optimize performance) and at the same time minimize cost in achieving that performance target.
3. Distinguish between annual maintenance activities and capital preservation, and replacement activities, and **fund only capital preservation and replacement**.
4. Be able to **expend its RAMP funding by the December following the fiscal year of advancement**. Ex: Fiscal Year 2015 RAMP must be spent by December 2015.

Additional Eligibility Criteria for FY16 Programs:

5. Demonstrate **progress in FY14 projects** through reporting percent of funds expended, both baseline and RAMP by January 15, 2014.
6. Deliver **FY15 project list by 12/31/13** to the Transportation Performance Branch Manager and Region Transportation Directors.

Past Staff Recommendations

FY14 and FY15 Budgets for Asset Management:

(In Millions)	FY14 Baseline Budget	FY14 RAMP (RAMP at $160M)	FY14 Total Funding (RAMP at $160M)	FY15 Baseline Budget	Delphi RAMP $165M:	FY15 Total Funding (RAMP at $165M)
Surface Treatment	$150.6	$88.2	$238.8	$149.5	$85.7	$235.2
Bridge, BE & Bridge Fixed Costs	$140.6	$33.3	$173.9	$139.5	$28.7	$168.2
MLOS	$249.0	$0.0	$249.0	$251.3	$0.0	$251.3
Road Equipment	$14.1	$6.8	$20.9	$14.0	$6.9	$20.9
ITS	$11.2	$10.3	$21.5	$14.8	$12.8	$27.6
Rockfall	$5.2	$3.8	$9.0	$5.1	$4.0	$9.1
Buildings & Buildings COPs	$6.9	$4.4	$11.3	$9.6	$11.2	$20.8
Tunnels	$0.0	$7.4	$7.4	$2.5	$9.9	$12.4
Culverts	$5.6	$5.9	$11.5	$3.6	$6.0	$9.6
Walls	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Total	$583.2	$160.1	$743.3	$589.9	$165.2	$755.1

Note: A risk mitigation pool, designed to proactively mitigate risk based on pre-determined criteria and a scoring system, was discussed as part of the workshop, and will be revisited at the FY16 Workshop.

Note: FY14 RAMP Dollars must be expended by December, 2014, and FY15 RAMP Dollars must be expended by December, 2015.

FY14 Baseline and RAMP Progress

Asset Category	FY14 Approved Budget (Millions)	Encumbered (Millions)	Expenditure as of Jan. 21, 2014 (Millions)	% Expended
FY14 Surface Treatment	$238.80	$25.45	$12.10	5.1%
FY14 Bridge Preventative Maintenance and Repair	$53.55	$7.33	$0.68	1.3%
FY14 Bridge Enterprise, Fixed Bridge Costs and Other	$120.35	Not Included		0.0%
FY14 Tunnels	$7.40	$1.42	$0.00	0.0%
FY14 Rockfall	$9.00	$1.60	$0.02	0.2%
FY14 Buildings	$11.30	$0.53	$0.62	14.7%
FY14 ITS	$21.50	$9.26	$2.34	11.0%
FY14 Culverts	$11.50	$0.23	$0.70	6.1%
FY14 Fleet	$20.90	$15.44	$6.26	29.9%
FY14 MLOS	$249.00	$41.15	$132.82	53.3%
Totals	$743.30	$102.40	$155.55	20.9%

Proposed TC Goals in Draft Policy Directive 14

Pavement:

Achieve 80% High/Moderate Drivability Life for Interstates based on condition standards and treatments set for traffic volume categories.
Achieve 80% High/ Moderate Drivability Life for NHS, excluding Interstates, based on condition standards and treatments set for traffic volume categories.
Achieve 80% High/Moderate Drivability Life for the state highway system based on condition standards and treatments set for traffic volume categories.

Bridge:

—Maintain the percent of NHS bridge total deck area that is not structurally deficient at or above 90%.
—Maintain the percent of state highway total bridge deck area that is not structurally deficient at or above 90%.
—Meet bridge goals in the Risk-Based Asset Management Plan.

Maintenance:

Maintain an LOS B grade for snow and ice removal.
Maintain an overall MLOS B- grade for the state highway system.

Overview and Ground Rules

Delphi Rounds:

Rounds One, Two, and Three (if needed): Each participant owns $738 million. Total (Baseline Budget + RAMP Combined)

Tabulate average allocation. Discuss.

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Budget Process & Overview

Maria Sobota

Program Management Overview

Program Management

Master schedule will contain all project schedules

Regulate and balance funding between project schedules

Portfolio Management

Level of project management based on risk

Grouping specific projects into portfolios

Project Management

On-time &

On-Budget

Scope
Schedule
Budget

Cash Management

Use known historical revenue

Changing from budget based to expenditure based budgeting

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Asset Presentations

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Surface Treatment

Bill Schiebel

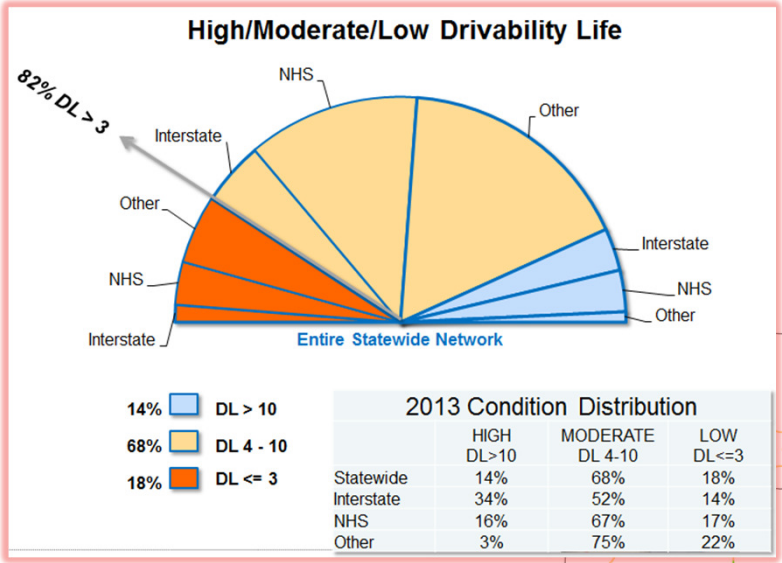
DL Capabilities

- DL method recognizes anticipated $240M annual fiscal constraint to sustain long-term pavement condition across the entire network
- Implement Transportation Commission's pavement asset policies from Policy Directive 14.

	Chip Seal	Ultra Thin Treatment	Preventive Maintenance	Minor Rehab	Major Rehab	Recon	Total Investment
Interstate	NA	NA	2%	9%	3%	5%	19%
High Volume	NA	NA	4%	14%	9%	15%	42%
Medium Volume	7%	9%	0%	13%	NA	NA	29%
Low Volume	5%	5%	NA	NA	NA	NA	10%

- This is a change in CDOT investment strategies on the lower volume portions of the network. It emphasizes frequent lower-cost preservation treatments and surgical repairs to stabilize condition over a larger portion of that part of the network.

Current Condition of Pavements



2013 Condition Distribution

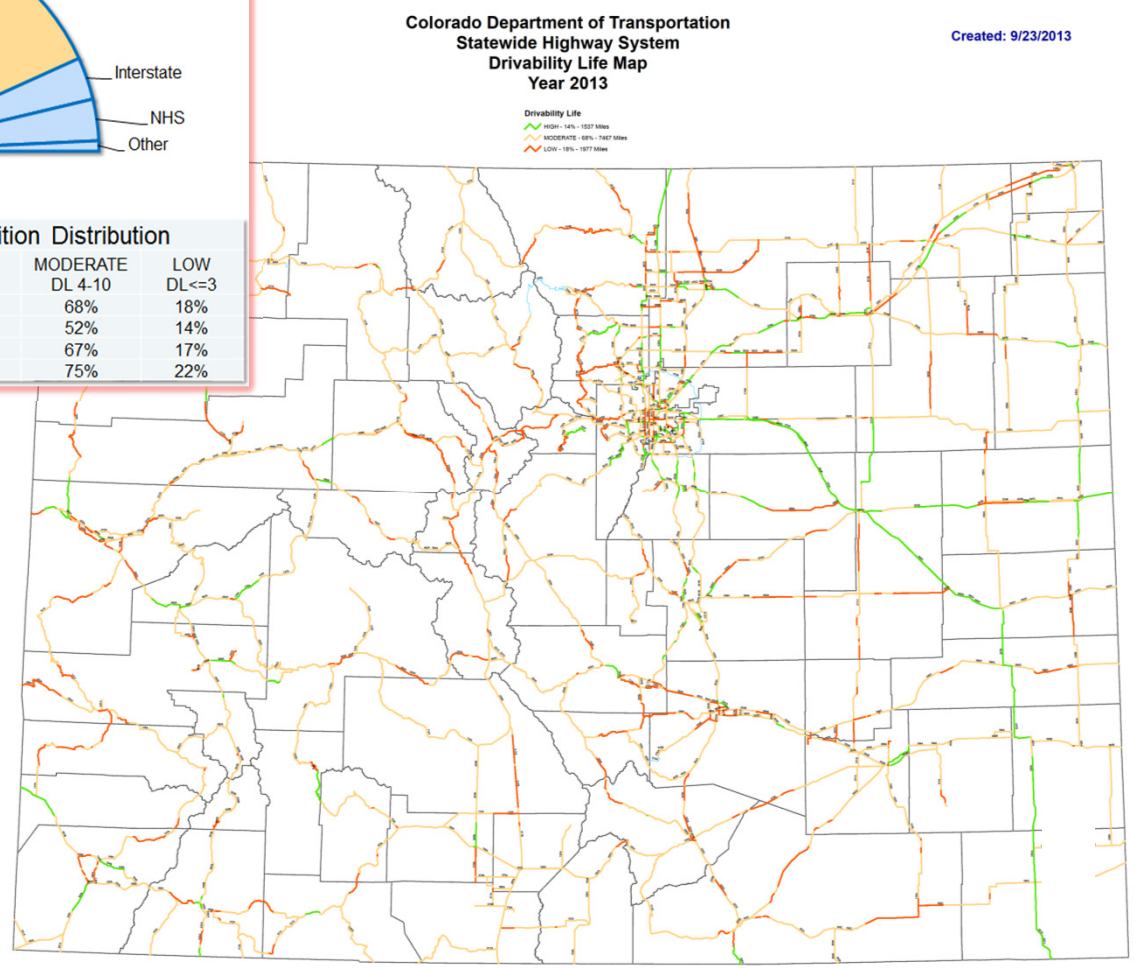
	HIGH DL>10	MODERATE DL 4-10	LOW DL<=3
Statewide	14%	68%	18%
Interstate	34%	52%	14%
NHS	16%	67%	17%
Other	3%	75%	22%

Drivability Life

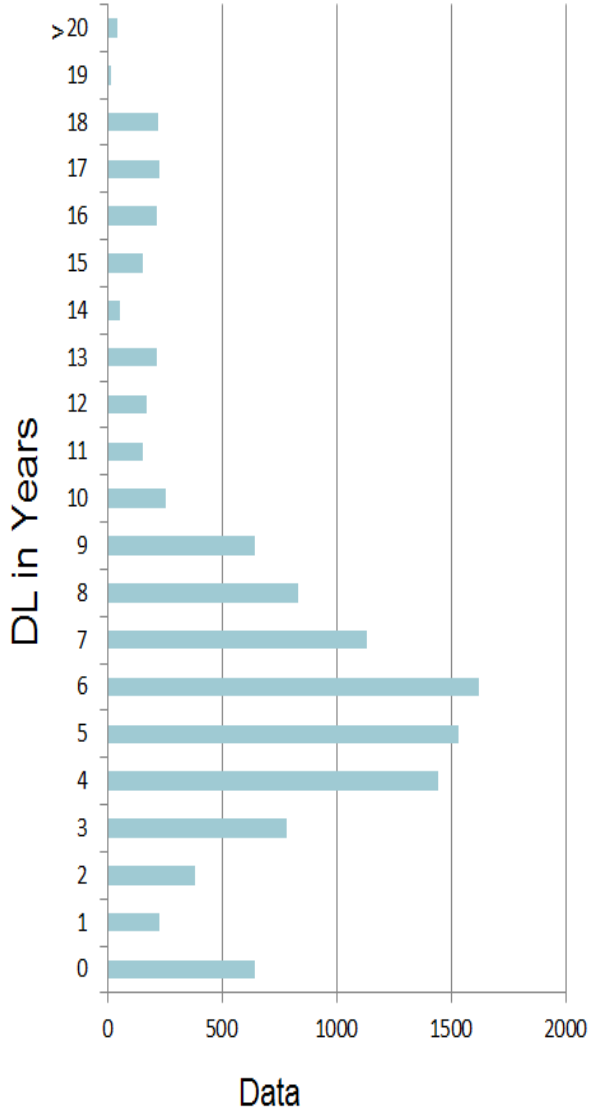
HIGH - 14% - 1537 Miles Data Collection Miles

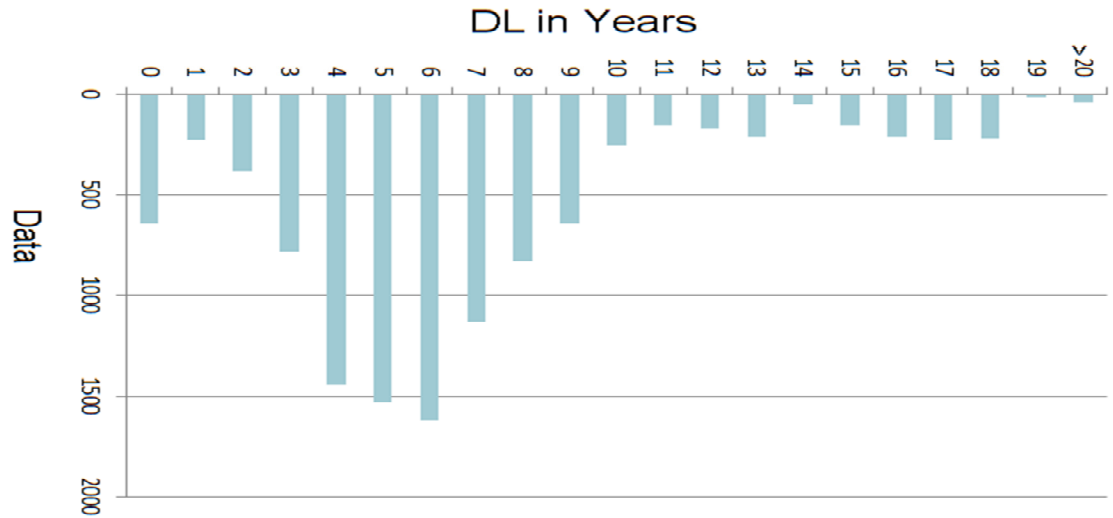
MODERATE - 68% - 7467 Miles Data Collection Miles

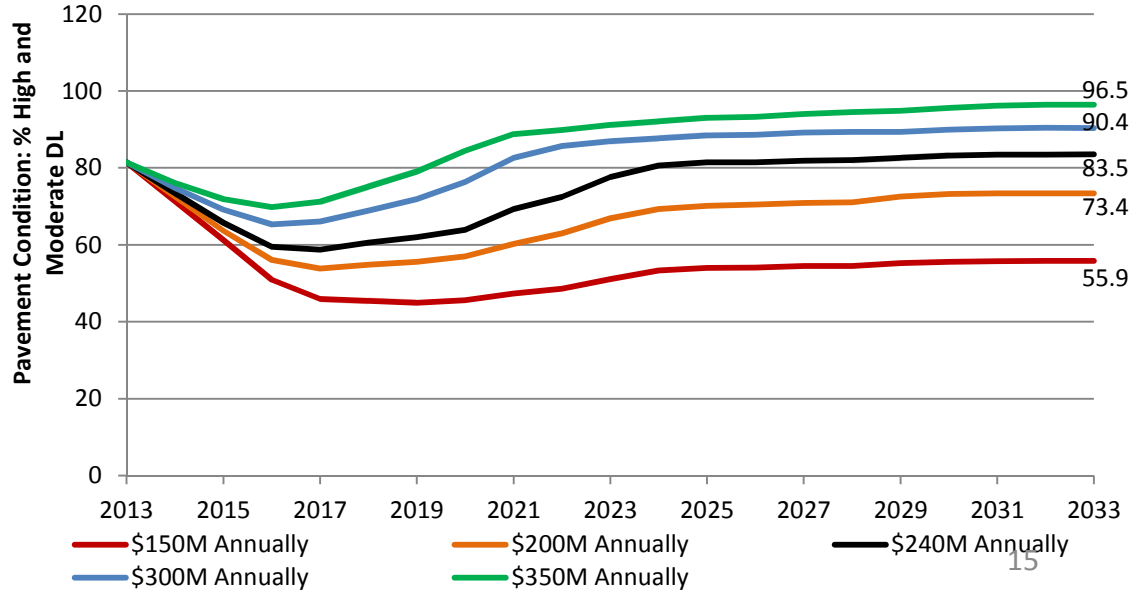
LOW - 18% - 1977 Miles Data Collection Miles



Distribution Impact on Performance







Pavement FY16 Funding Request

FY16 Budget Request: $240M

Staff Recommendation: $235.9M

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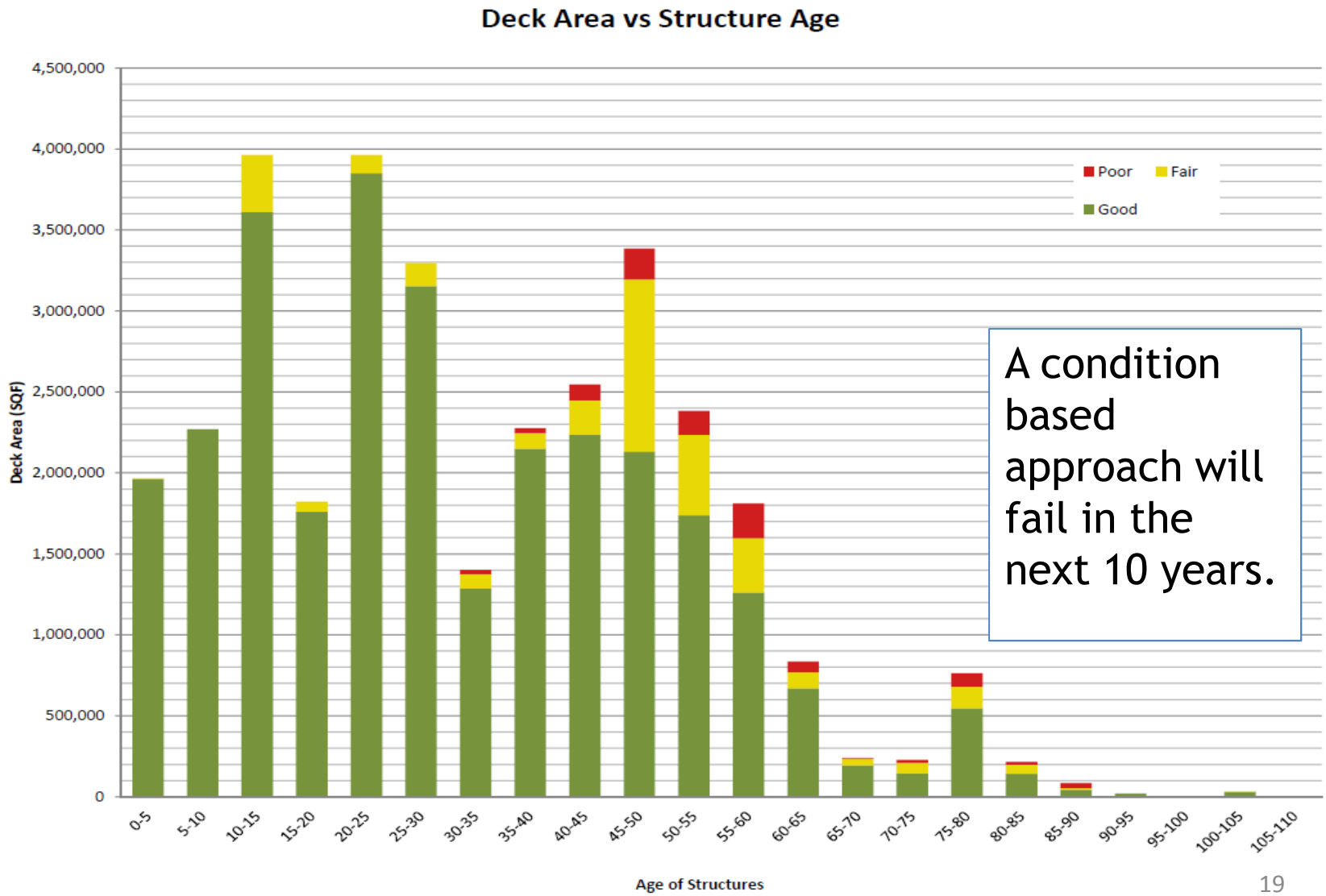
Bridge

Josh Laipply

FY16 Condition Investment Strategy Risks & Consequences

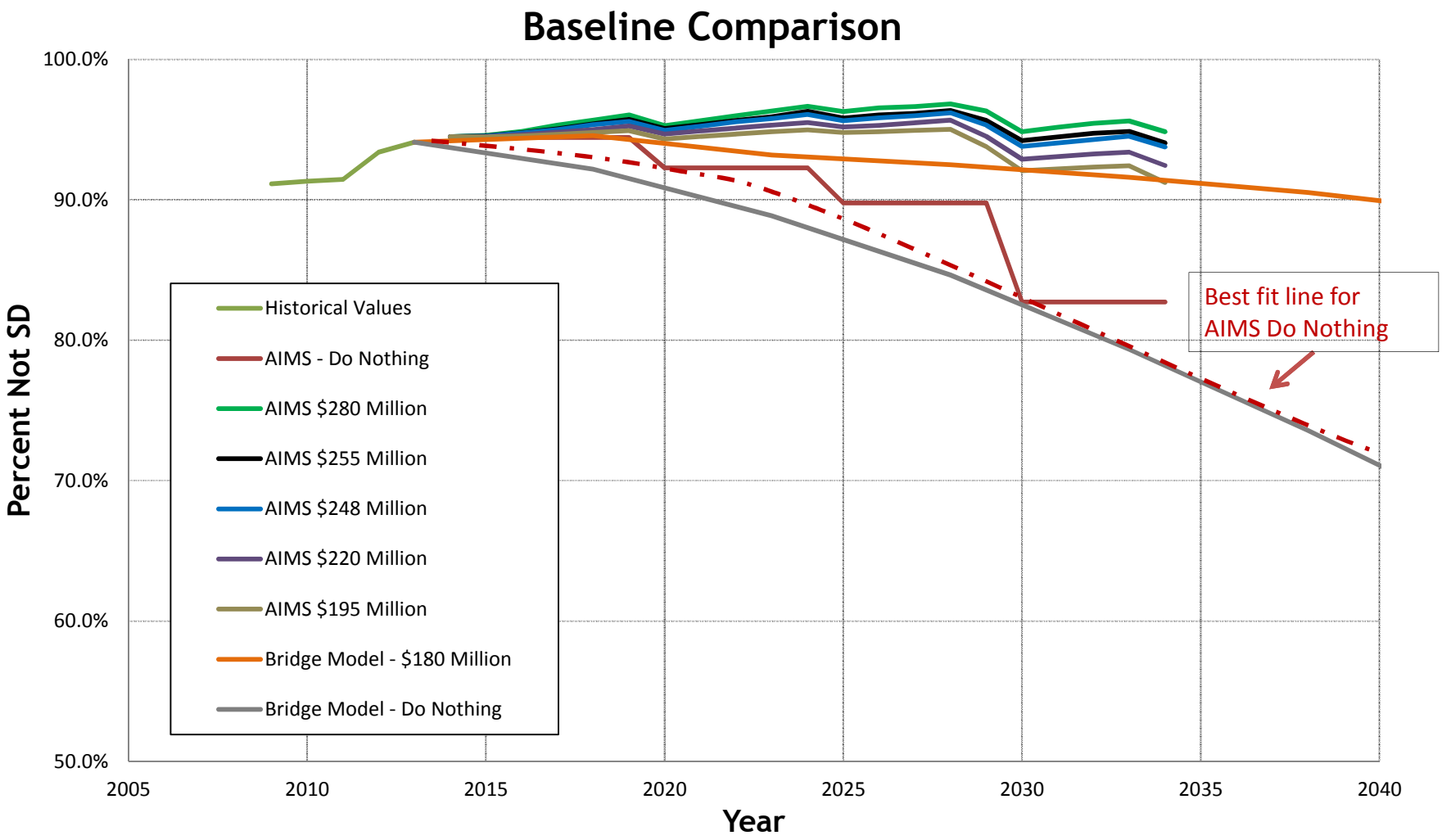
Risks	Likelihood	Consequence	Mitigation
Condition 96% not SD	201 Structures	Funding directed at 90% not SD	Maximize ROI for condition investment
Scour	153 Structures	Bridge Failure & possible injury	Mitigation measures average $535K
Bridge Strike	51 Structures	Road closure & possible injury	Bridge replacement or profile adj.
Load Restricted Bridges	87 Structures	Economic Impact & potential failure	Bridge Rehab or replacement
Essential repairs	Monthly	Lane closures & delays	Essential Repair Fund $5M

Why Preventative Maintenance?



A condition based approach will fail in the next 10 years.

Bridge Deterioration Model



Bridge FY16 Funding Request

FY16 Budget Request: $ 180M

Staff Recommendation: $164.1M

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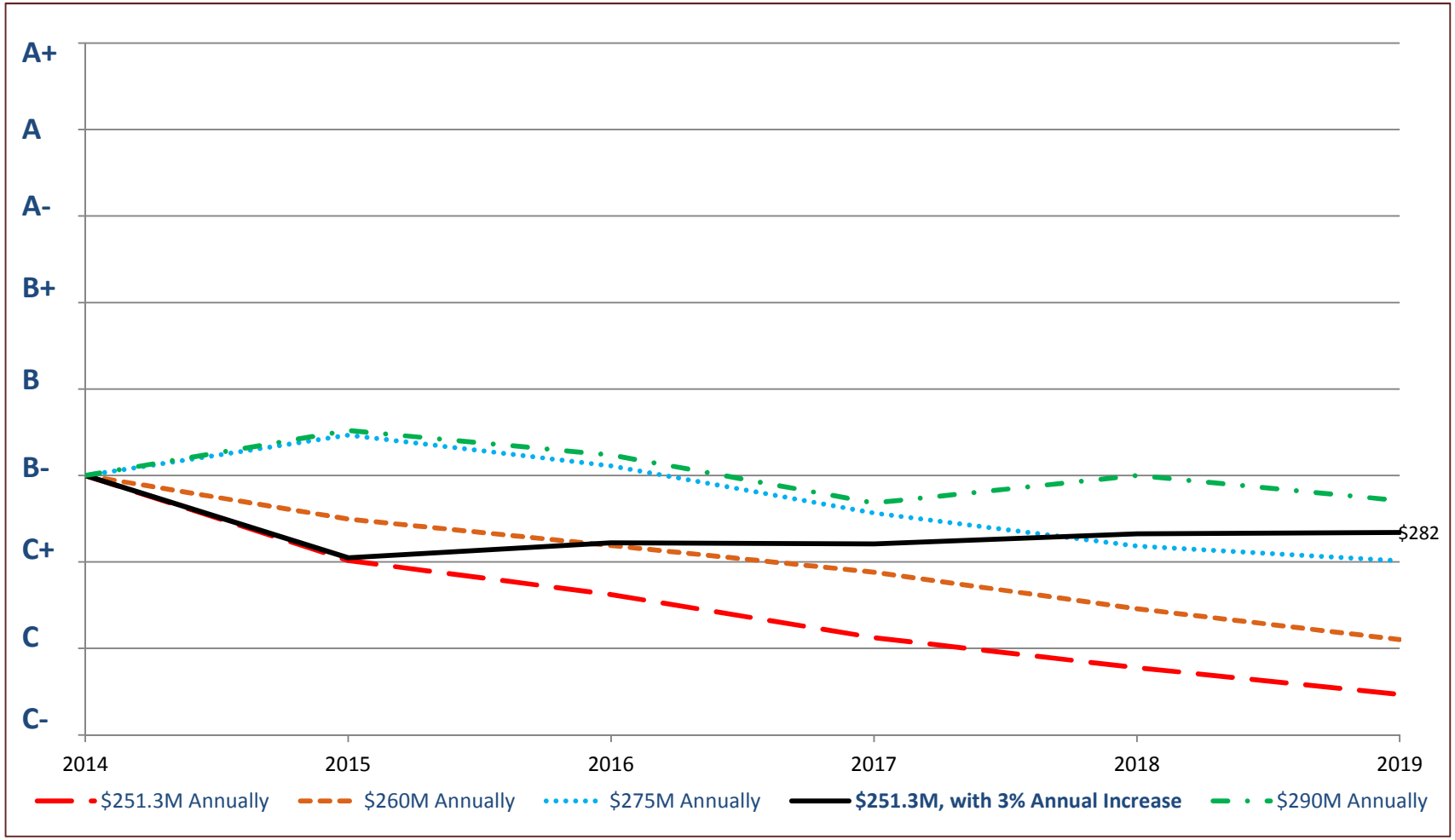
Maintenance Levels of Service

Dave Wieder

MLOS Overall Condition for 5 Years

- Timeframe: 5 years
- MPAs are Prioritized
- PD14 Goal: B- Overall
- PD14 Aspirational Goal: B Overall



MLOS FY16 Funding Request

FY16 Request: $ 258.8M

Staff Recommendation: $254.4M

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Fleet / Road Equipment

Dave Wieder

Road Equipment and LEAN

LEAN Process Takeaways:

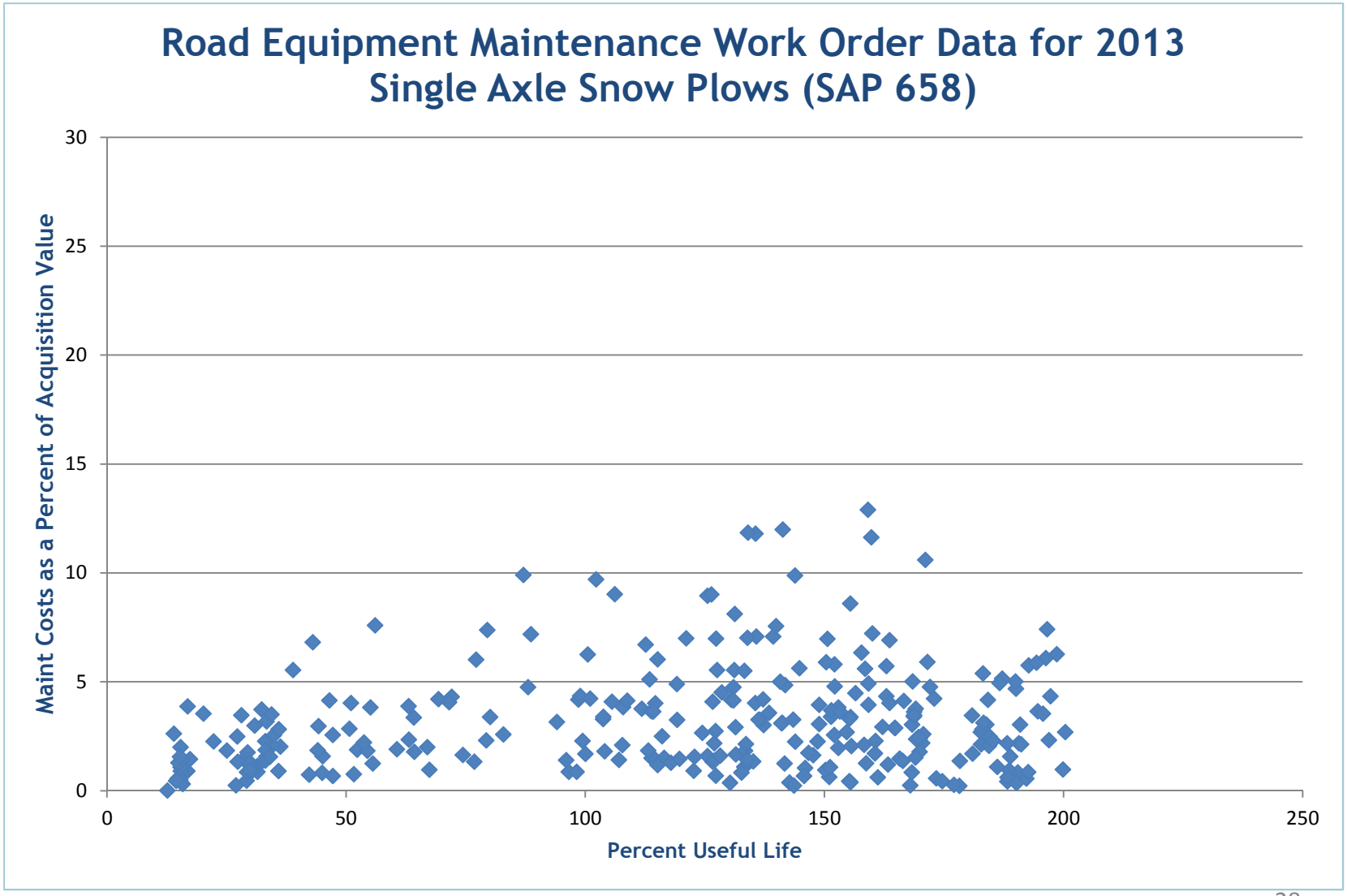
- Equipment list will be out August 15 for the fiscal year, with Final by Sept. 30
- All specs and plans will be received and bid no later than March 1 of the following calendar year. All orders from the regions will be on SharePoint by June 1
- Any order not placed by June 1 gets 30 day grace then move on to next equipment on list.
- This will give the vendors the full 18 months to complete the build of the truck.
- Vendors will be required to give 30 day status updates on all orders.
- Goal is to move to a 14.5 month order to build vs a current that may take 25 months.

Road Equipment and NPV

NPV methodology – This is a totally new way of determining the CDOT fleet replacement. It is based on net present value costs and the equipment to be replaced is prioritized based on these rules, applied in this order:

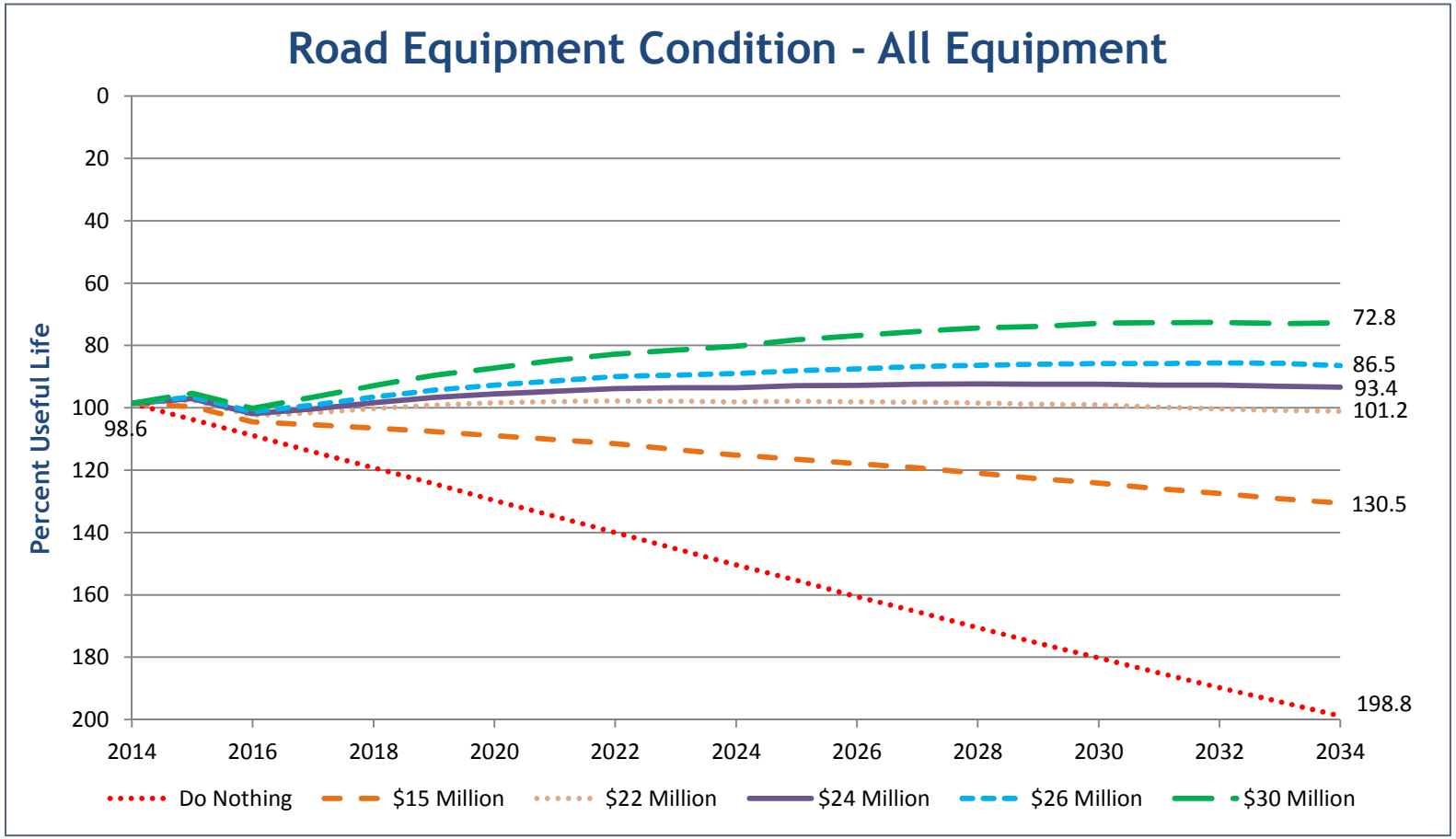
- **Replacement Rule 1:** The vehicle is currently over 120% UL and is requiring more than 30% of its replacement cost to maintain each year.
- **Replacement Rule 2:** If a vehicle is currently between 60 and 120% UL and it is requiring more than 40% of its replacement cost to maintain.
- **Replacement Rule 3:** If a vehicle is between 0-60% UL and is requiring more than 20% of its replacement cost to maintain each year. (Lemons)
- **Replacement Rule 4:** If a vehicle is currently over 120% UL and under 30% replacement cost to maintain then it should be replaced.

Road Equipment



Road Equipment

- Timeframe: 20 years
- Based on Net Present Value
- RB AMP Fiscally Constrained Goal: TBD
- RB AMP Aspirational Goal: 70% Useful Life



Road Equipment FY16 Funding Request

FY16 Budget Request: $24M

Staff Recommendation: $18.4M

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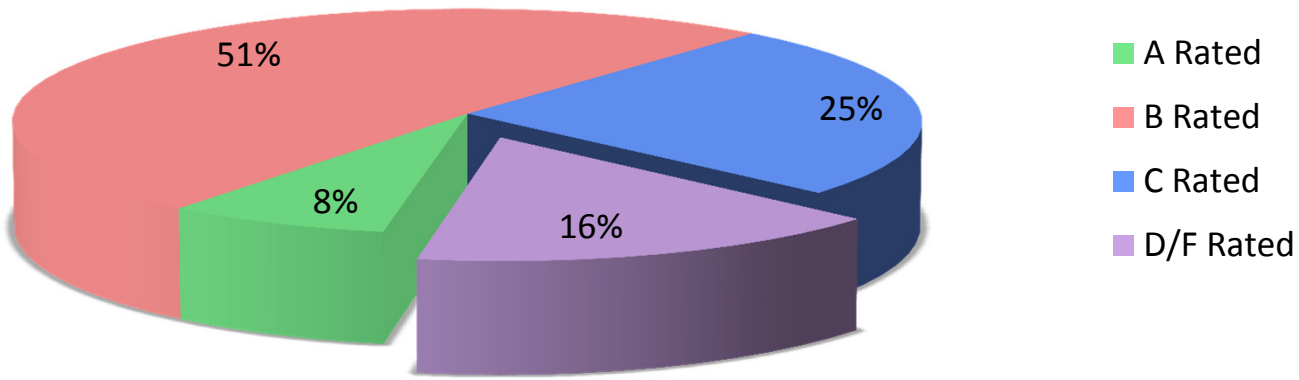
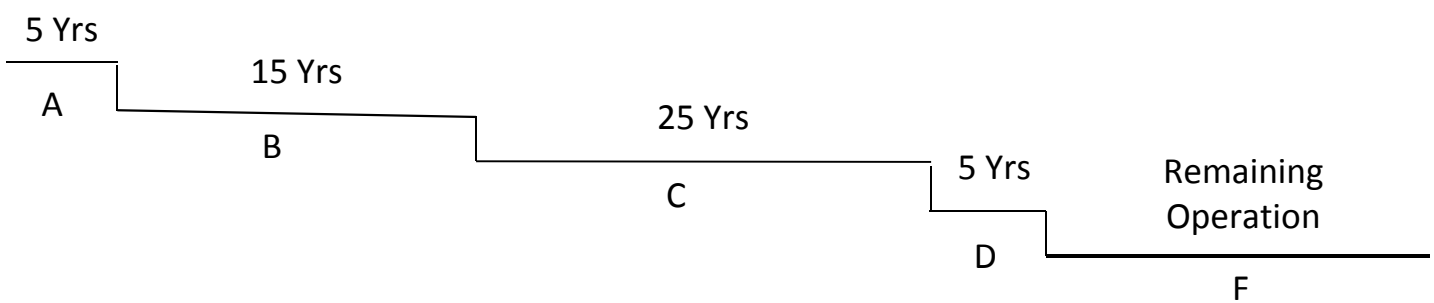
Property Management

Marcella Broussard

Existing Asset Management System

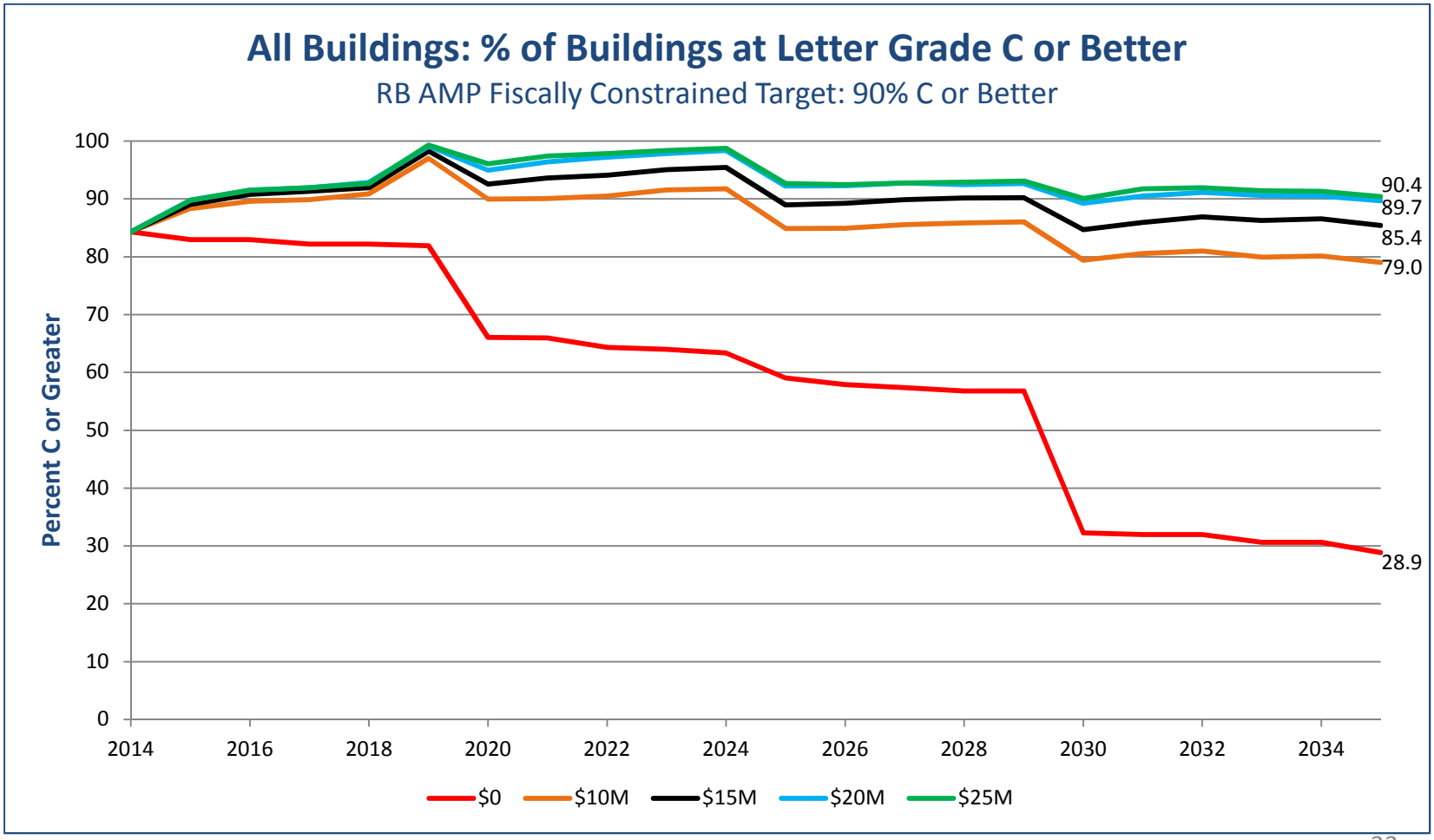


Existing Building Ratings	
A Rated	86
B Rated	589
C Rated	292
D/F Rated	**184**
Total Buildings	**1,151**



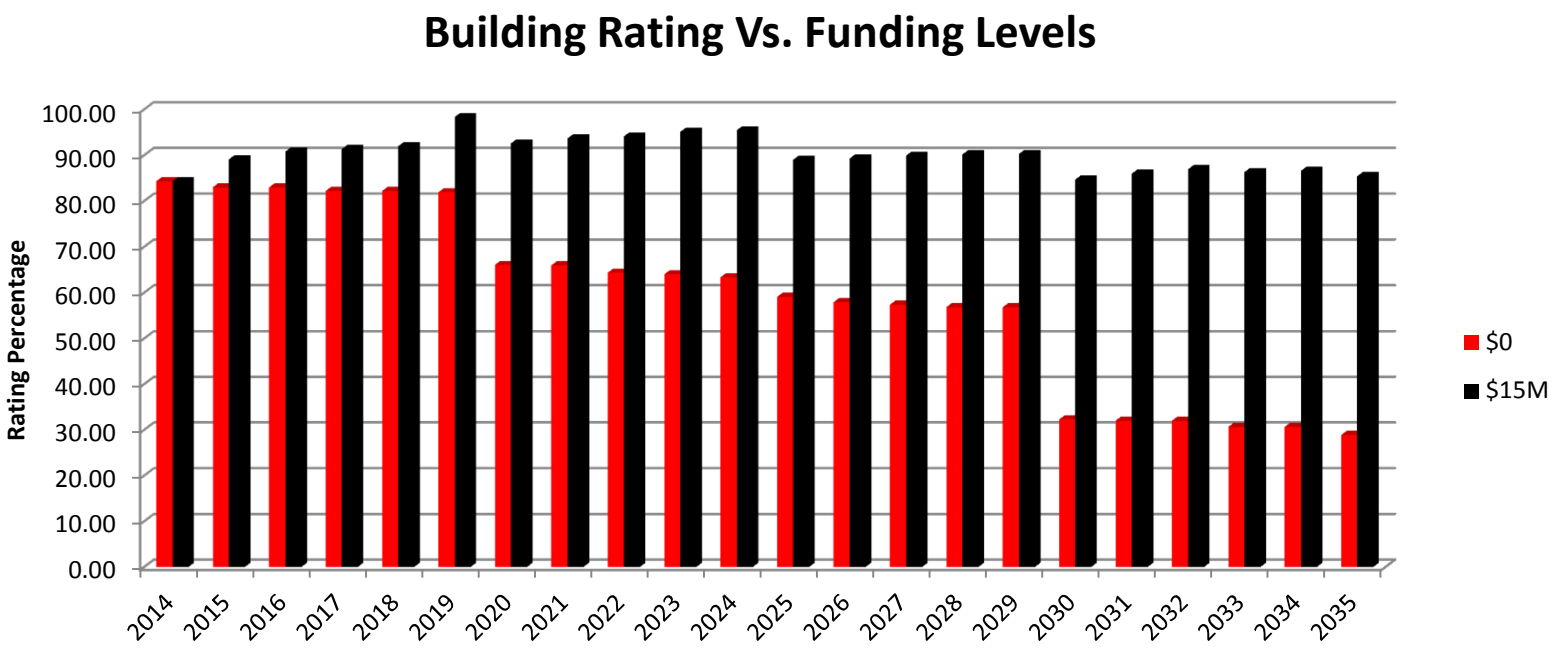
Property Management

- Timeframe: 20 years; A= 90 to 100, B= 80-90, etc…
- RB AMP Fiscally Constrained Target: 90% C or better



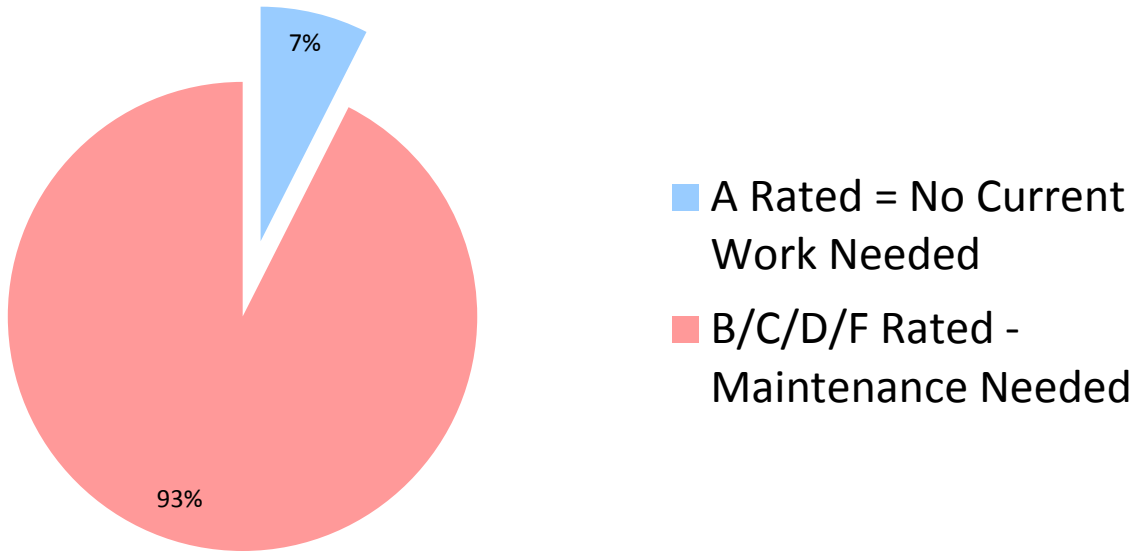
Property Management Goals

- 90% of Buildings a "C" or better
- Decrease Risk
- Increase Building Viability
- Increase Worker Safety



Existing Conditions

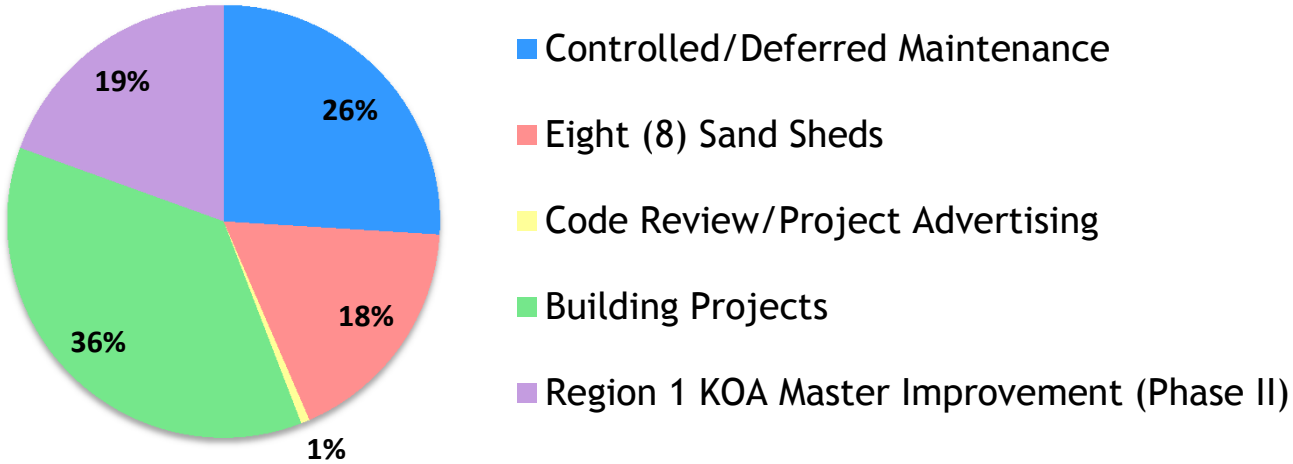
Buildings in Need of Maintenance



<u>Building Needs</u>

B Rated (589) = Minor Repairs
C Rated (282) = Substantial Work
D/F Rated (184) = Major Repairs & Replacement

FY16 Property Budget Allocations



Controlled/Deferred Maintenance	$4,000,000
Eight (8) Sand Sheds	$2,700,000
Code Review/Project Advertising	$100,000
Building Projects	$5,900,000
Region 1 KOA Master Improvement (Phase II)	$3,000,000
TOTAL FY16 BUDGET	$15,700,000

New projects will be identified based on RISK to CDOT

- Reduce D/F Inventory
- Prevent "C" Buildings from dropping to a "D" level
- Investments that do the most to increase life of the asset (Biggest Bang for the Buck)

Property Management FY16 Funding Request

FY16 Budget Request: $ 15.7M

Staff Recommendation: $12.9M

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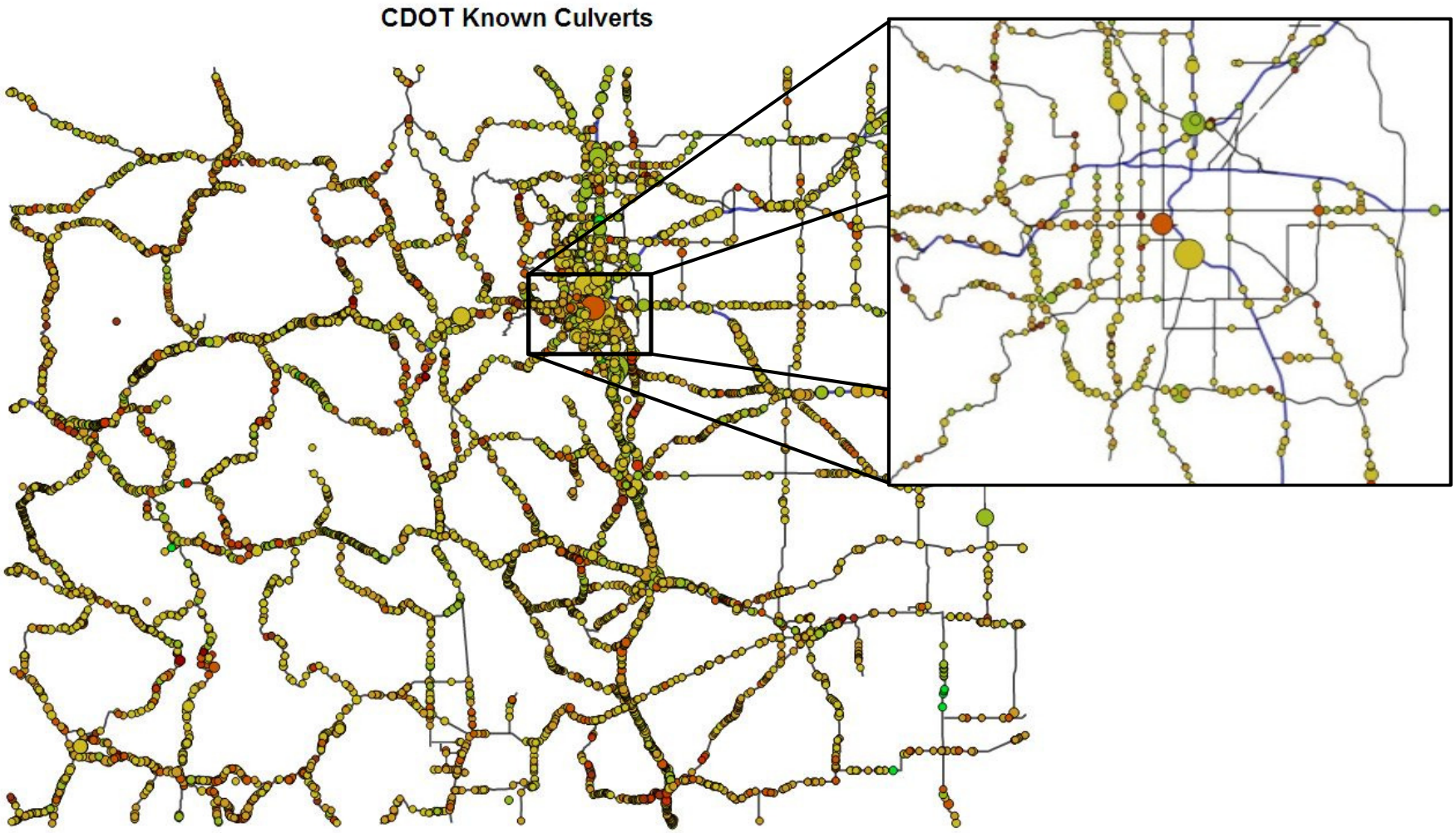
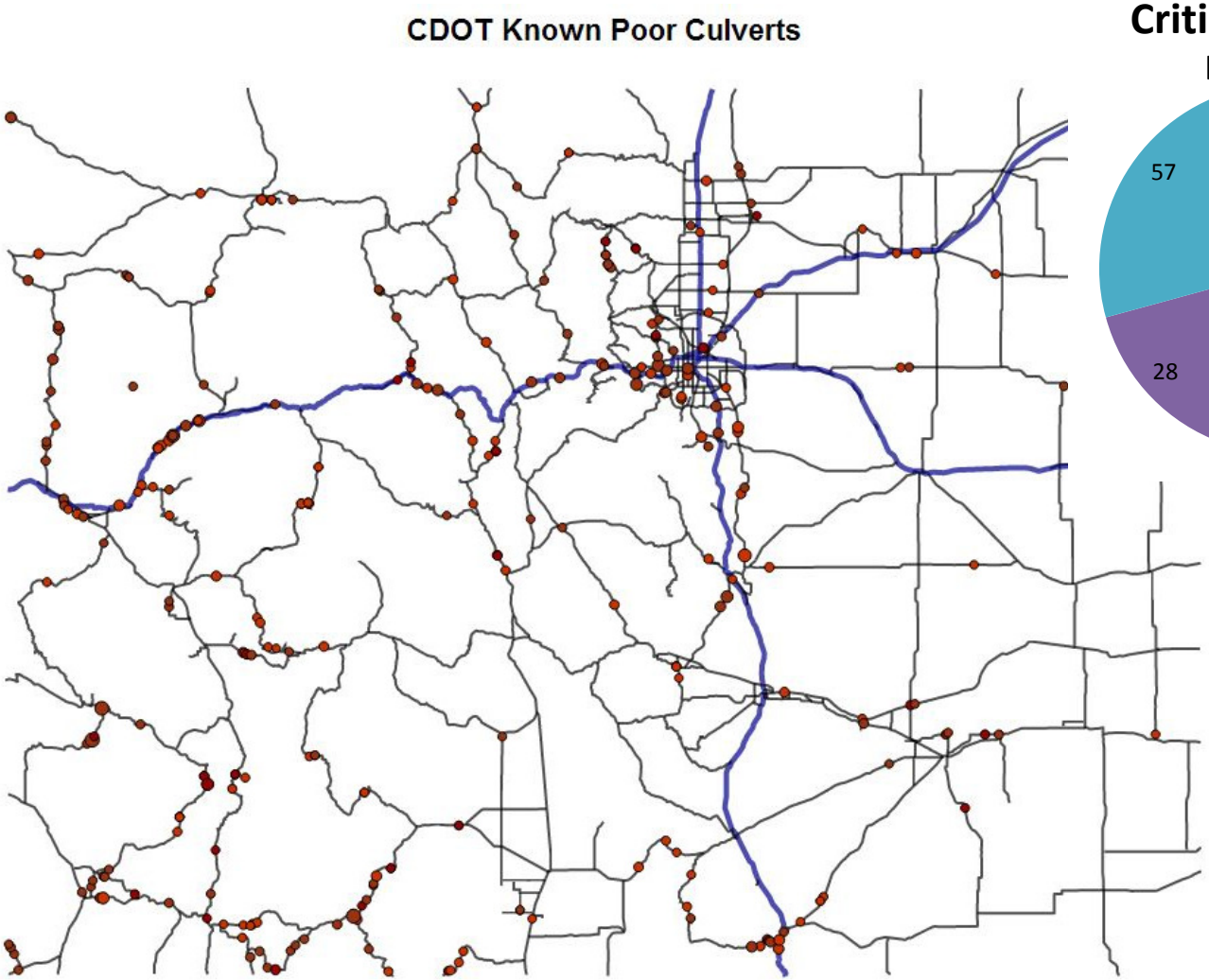
Culverts and Tunnels

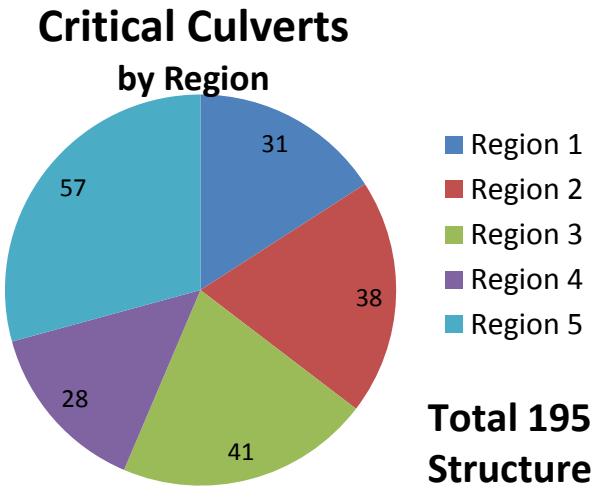
Josh Laipply

Culverts Map



Critical Culverts





Total 195 Structure

Culverts

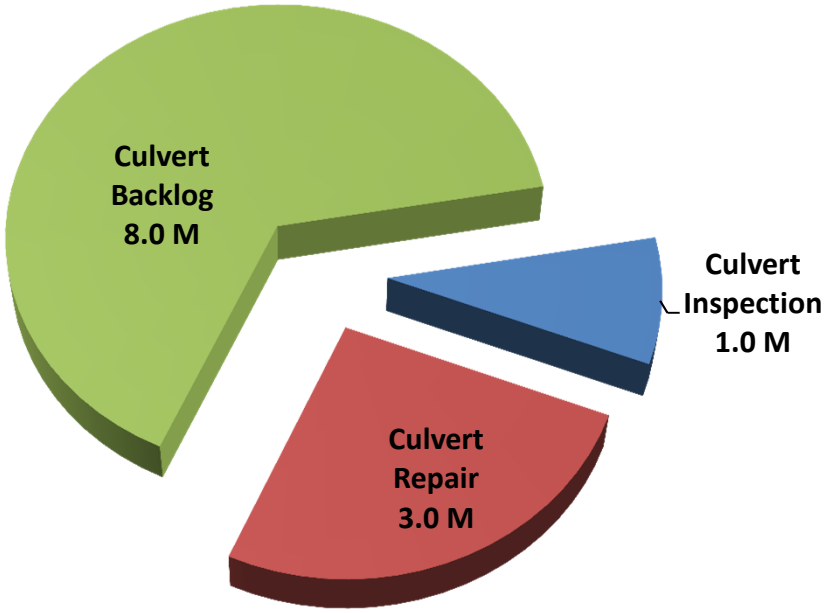
What are the costs of shutting down I-70?

Backlog of Culverts

- $80-million to replace all poor culverts
  - $6-million to replace all poor culverts on the Interstates
  - $17-million to replace all poor culverts on the NHS (non-interstate)

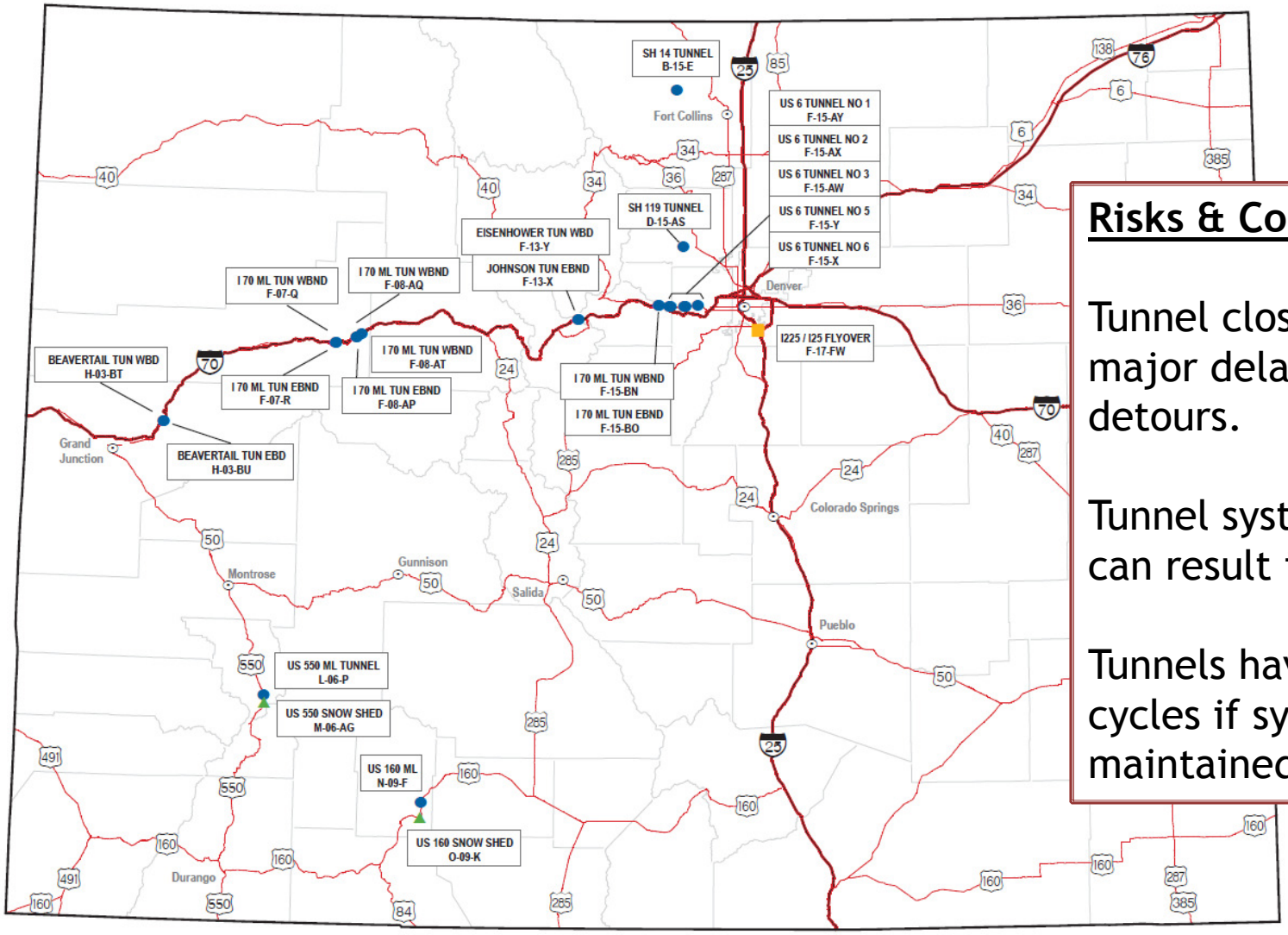
Culvert Investment Strategy

FY16 Culvert Investment = $11.6M



Culvert Revenues FY16		*$80M backlog*
Culvert Inspection	1.0 M	
Culvert Repair	3.0 M	*sustain after backlog*
Culvert Backlog	8.0 M	*eliminate backlog over 10 years*
Total	**12.0 M**	

Tunnels Map



Risks & Consequences

Tunnel closures result in major delays and detours.

Tunnel system failure can result in loss of life.

Tunnels have long life cycles if systems are maintained.

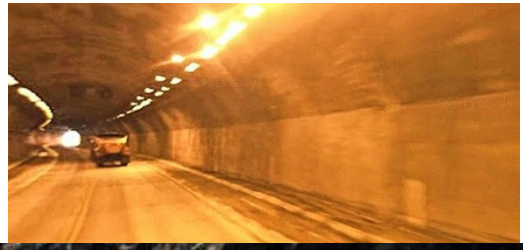
Tunnel Work

FY 16 Wolf Creek

Fiber optic system

- Design (10%) + indirects: $309,135
- Fiber Installation (Const.): $2,712,500
- Fiber Repeater (Const.): $50,000
- Fiber Completion - splicing, telemetry, and Ethernet (Const.): $23,000

Total for Const.: $2,785,500



Total = $3.1M

Tunnel Work

FY 16 Hanging Lake

- Linear Heat Detection (Fire System) ~ $308,000
- Transformer/High Voltage Cabinet replacement ~ $425,000
- Fire Control Panel Upgrade ~ $62,000
- Multilin/Fan Monitoring Relays replacement ~ $70,000
- Digital Voice Recorder replacement/upgrade ~ $74,000
- DCS Servers/Tunnel Control Servers with applicable software upgrade ~ $258,000
- PLC Ntron and Comtrol Upgrade(control room interface) ~ $142,000
- Upgrade Existing 63 Cameras to Digital Current Platform ~ $1,614,000

Total = $3.0M

Culverts and Tunnels FY16 Funding Request

Culverts:

FY16 Budget Request: $ 12M

Tunnels:

FY16 Budget Request: $ 7.6M

Culverts Staff Recommendation: $8.2M
Tunnels Staff Recommendation: $5.2M

Tunnels projects will include all in HLT, the Fiber Design project for Wolf Creek and funding the Tunnels Inspection program.

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Walls

Josh Laipply

Retaining Wall Program

Wall Program Needs

- Inspection program $1M
- Repair Program $3M

US40 Berthoud Pass – coping separation causing severe deterioration.

Information based upon our current contract to develop our wall asset program.

- 1,368 walls inventoried
- 21.1% of overall roadway
- $2.8M in repair identified

Walls FY16 Funding Request

FY16 Budget Request: $4M

Staff Recommendation: $2.4M

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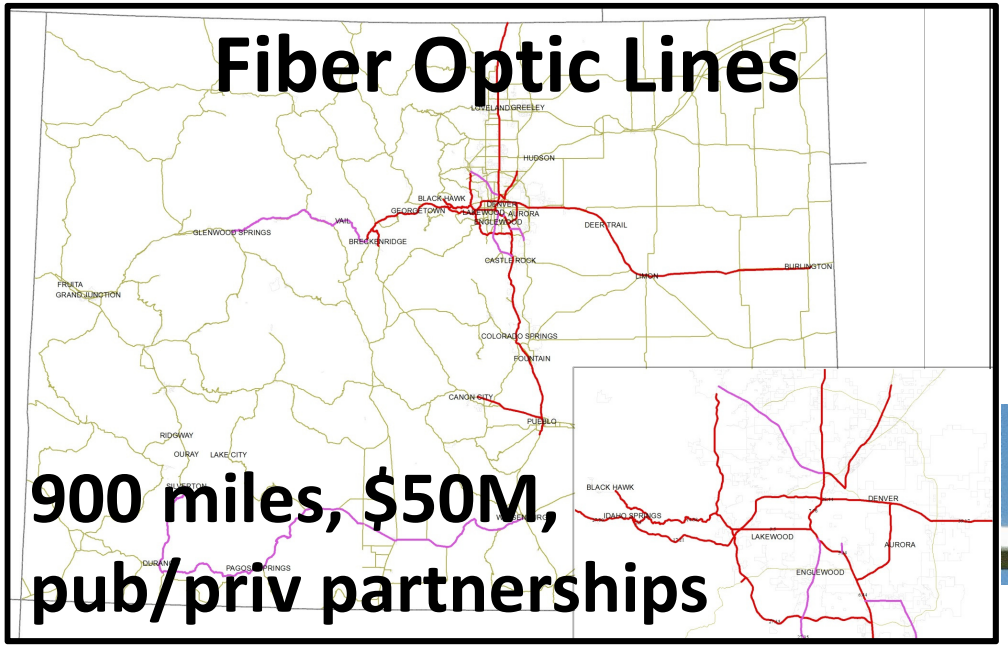
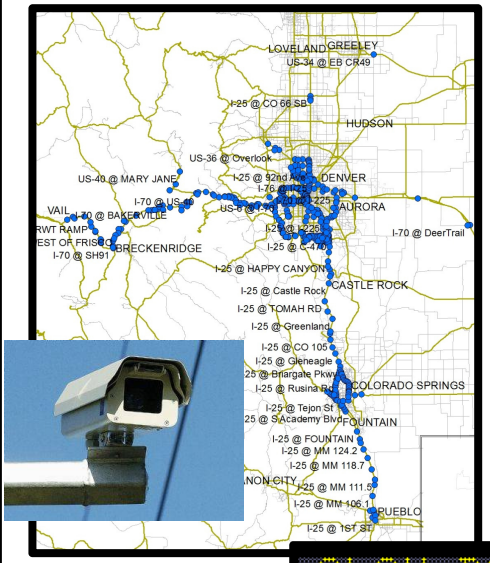
ITS

Ryan Rice

ITS System Features



359 CCTV

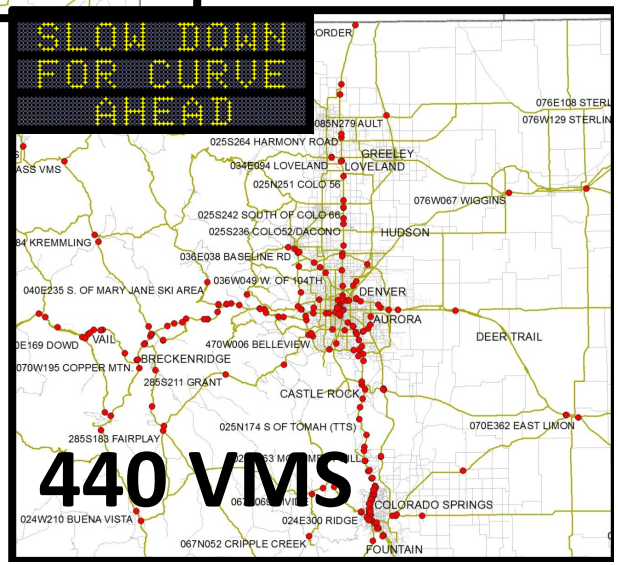


Other ITS Assets

- *Ramp Meters*
- *Weather Stations*
- *Travel Time Indicators*

Operation Centers
CTMC – EJT - HLT

ITS System is the foundation for Active Traffic Management



ITS Asset Backlog

Current backlog of assets that are >80% useful life

- $7.1M needed annually for next five years to address backlog of devices
- Key Examples: 111 VMSs, 320 CCTVs, 134 Travel Time Indicators, Networking Equip 246, Weigh-In-Motion 14

Ongoing $13.6M (in addition to $7.1M for backlog) needed annually to address additional devices that exceed their 80% UL

Risks & Consequences of Capital Replacement

- Inability to eliminate backlog can result in device failure
- Decreases safety, mobility and ability to detect and manage incidents and emergencies

FY16 Request

$20.7M Capital Replacement Request:

- Eliminate capital replacement backlog over next 5 years ($7.1M annually for 5 years)
- Capital replacement as additional devices exceed UL and upgrades for all devices and the fiber optic/communication network system ($13.6M annually-ongoing need)

$14.4M Baseline Budget Request:

Operations and Maintenance. Based on FY15 budget and addition of major new projects

$35.1M : Total

FY14 & FY15 Projects

FY14

- Network System Upgrades from Obsolescence/Unsupported Systems
  - Analog Video Distribution System to IP Video Distribution
  - Fiber Optic Switches and FO Lines & Gear to HQ that are at Capacity
- CTMC Systems for Increased Effectiveness of Information Delivery & Distribution
- VMS Replacement – 24 Statewide

FY15

- I-70 West Fiber Optic Upgrades – EJT to Empire at Capacity
- Continue CTMC Network/Server Upgrades for Efficiency and Info Distribution
- VMS Controller Upgrades due to Industry Obsolescence or or else No Support and Failure
- VMS Replacement – 22 Statewide

FY16 Projects

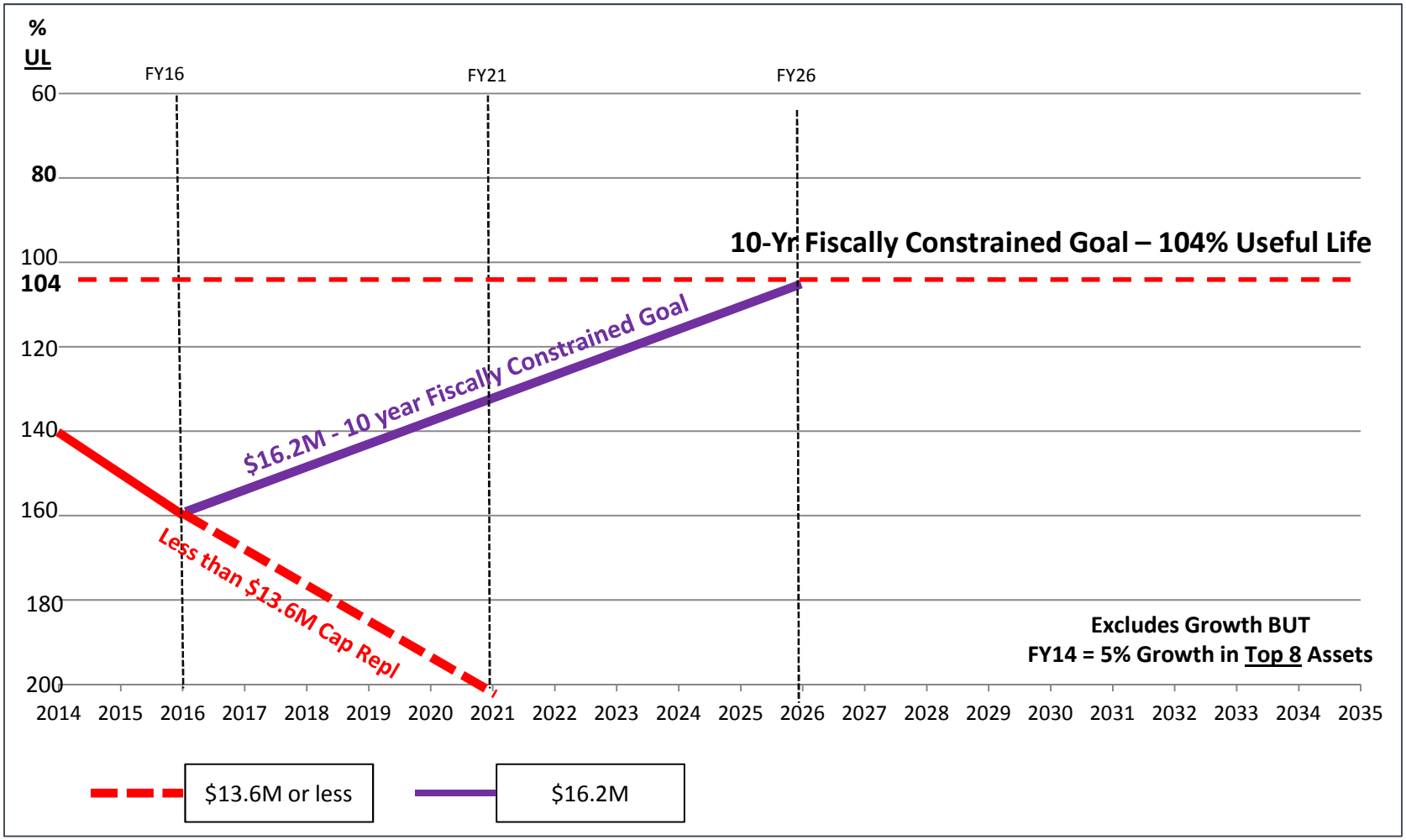
FY16

With Staff Recommendations Projects Would Include:

- **Complete VMS Controller Upgrades due to Industry Obsolescence or else No Support and Failure**
- **Fiber Optic Asset Upgrades**
- **Network Electronics Upgrades**
- **VMS Replacements**
- **Video Surveillance Cameras**

ITS Capital Replacement

- Current 10-Yr Fiscally Constrained RB AMP Goal: 104% UL
- RB AMP Aspirational Goal: 80% UL



ITS FY16 Funding Request

FY16 Budget Request: $35.1M

Staff Recommendation: $21.4M

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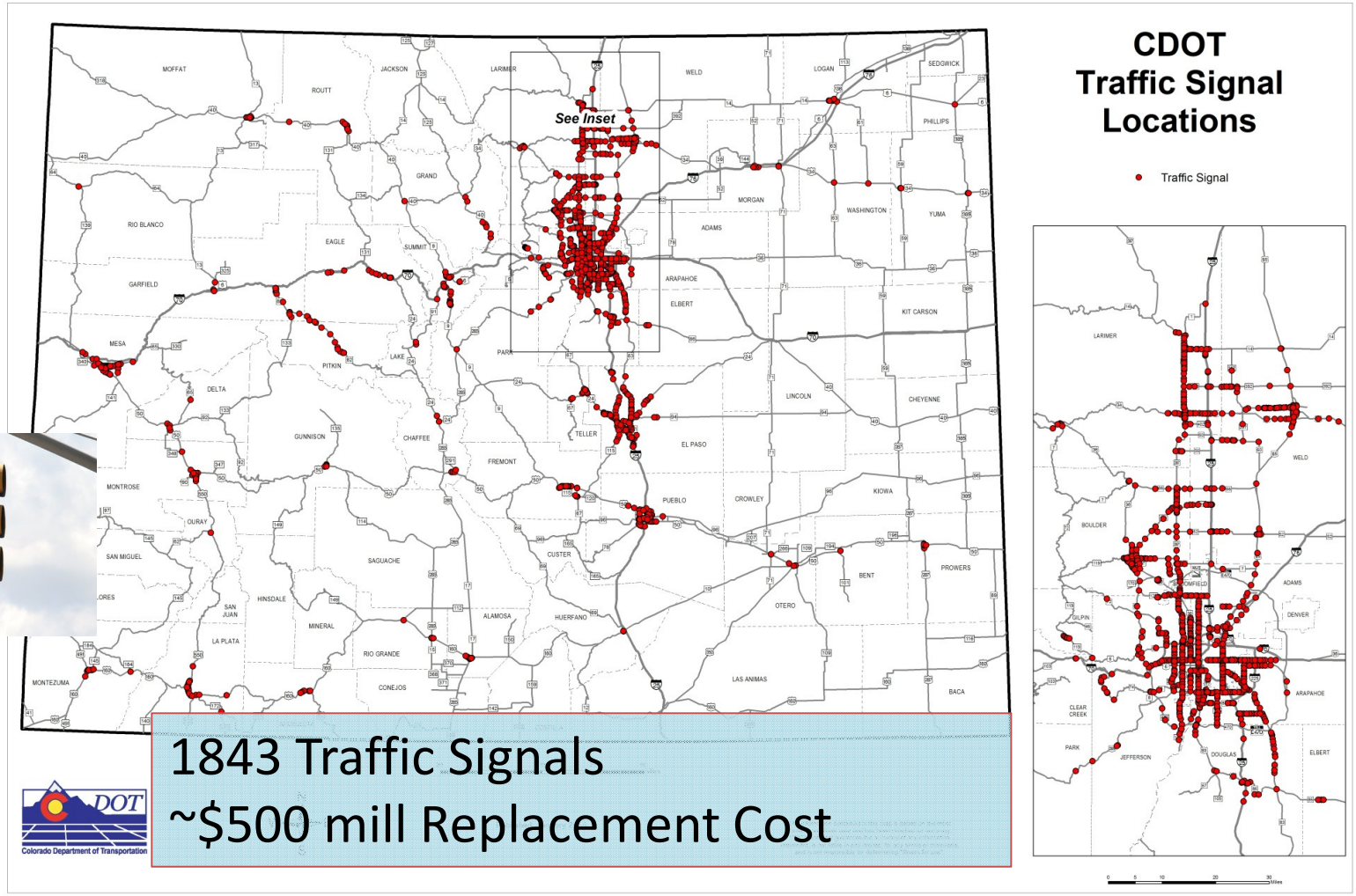
Traffic Signals

Ryan Rice

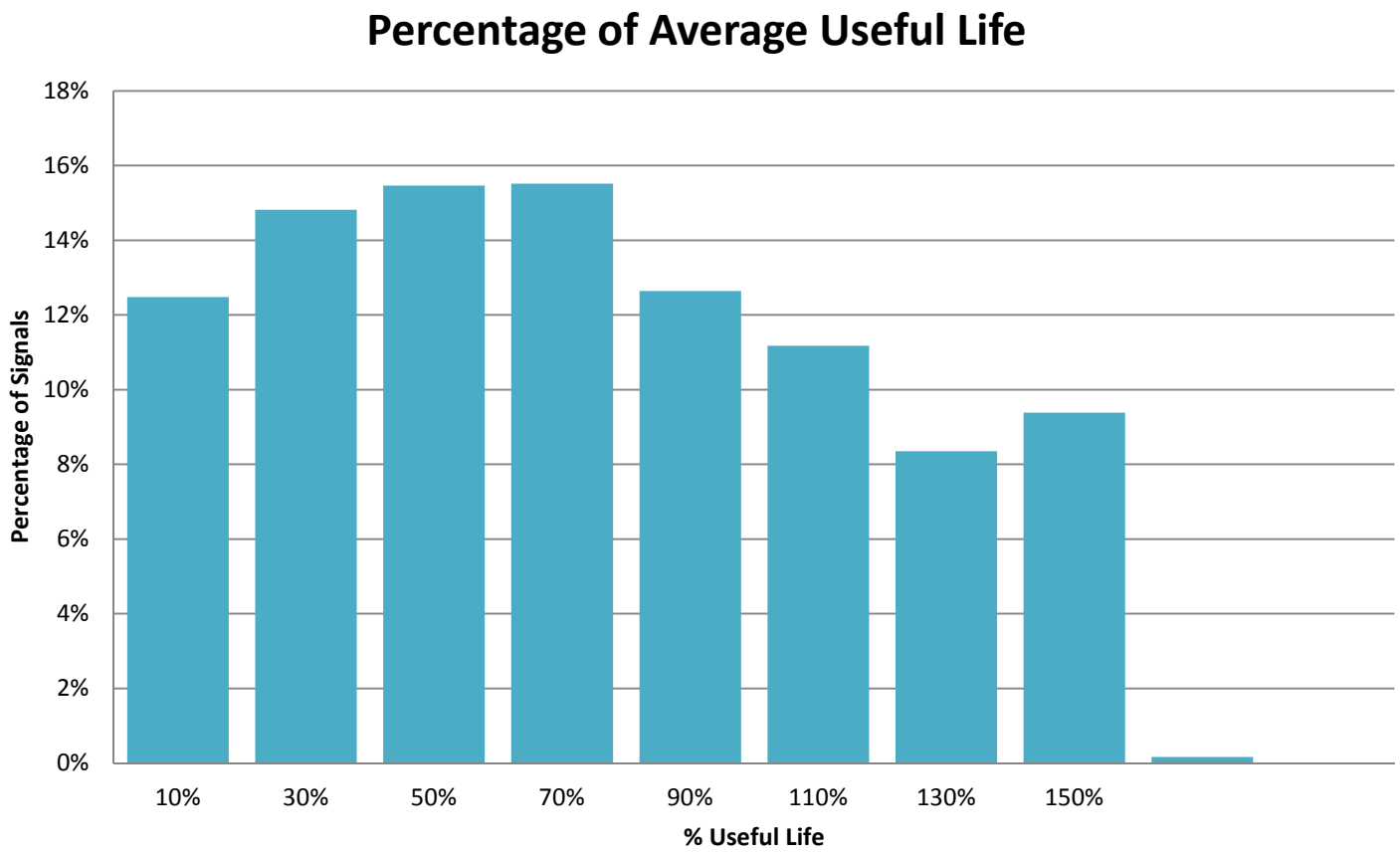
Traffic Signal Asset Map



1843 Traffic Signals
~$500 mill Replacement Cost

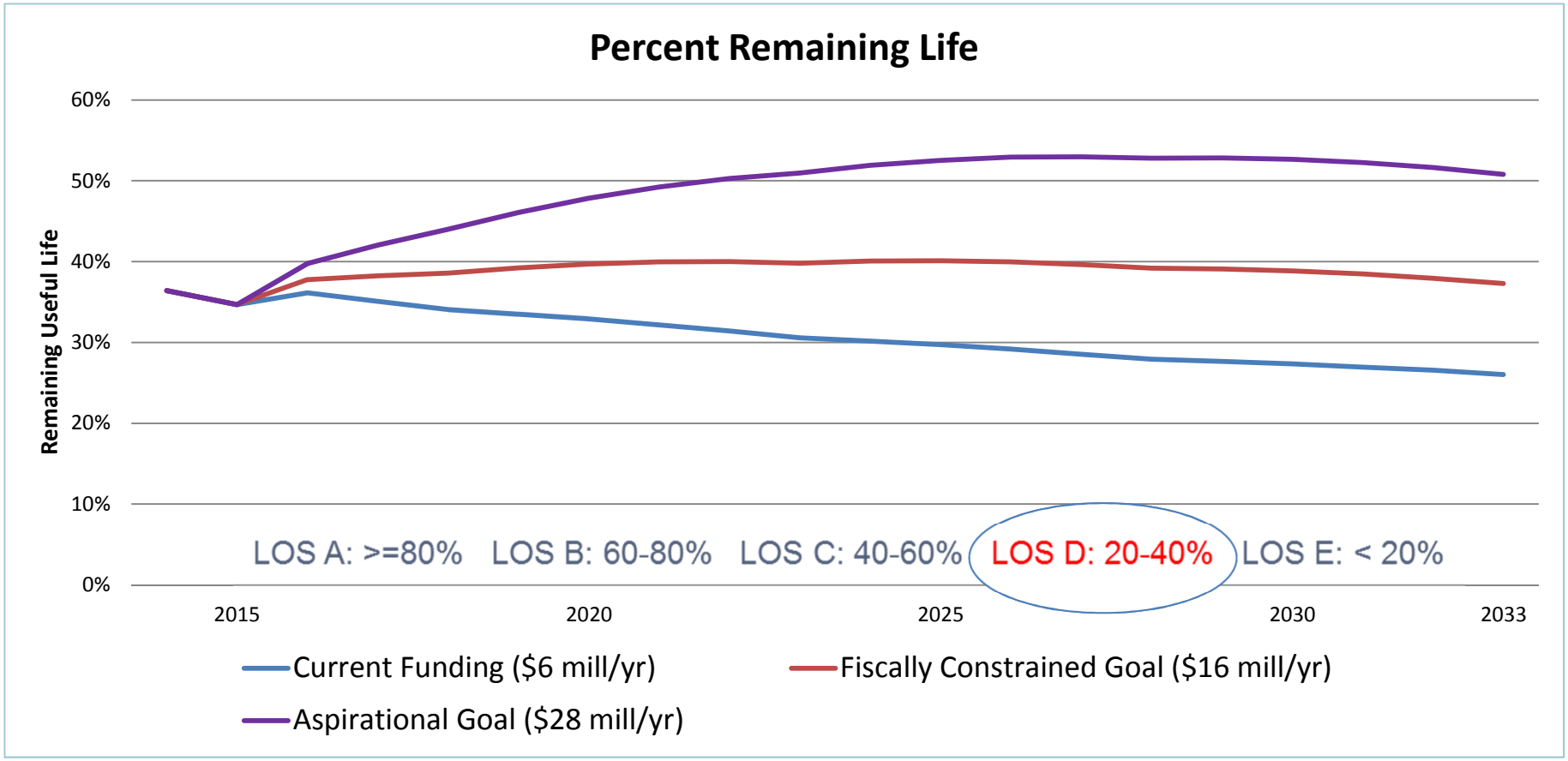
Current Condition

- Average useful life of a traffic signal is 25 years.
- 28% of traffic signals are beyond their expected useful life.
- On average the traffic signal system is at 73% of its useful life.



Traffic Signal Management

- 20 Year Timeframe
- Fiscally Constrained Goal: $16M per year to achieve a LOS D: 20-40% (replacing signals on average at 20 years old)



Traffic Signals FY16 Funding Request

FY16 Budget Request: $ 16M

Staff Recommendation: $5.7M

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Rockfall Mitigation

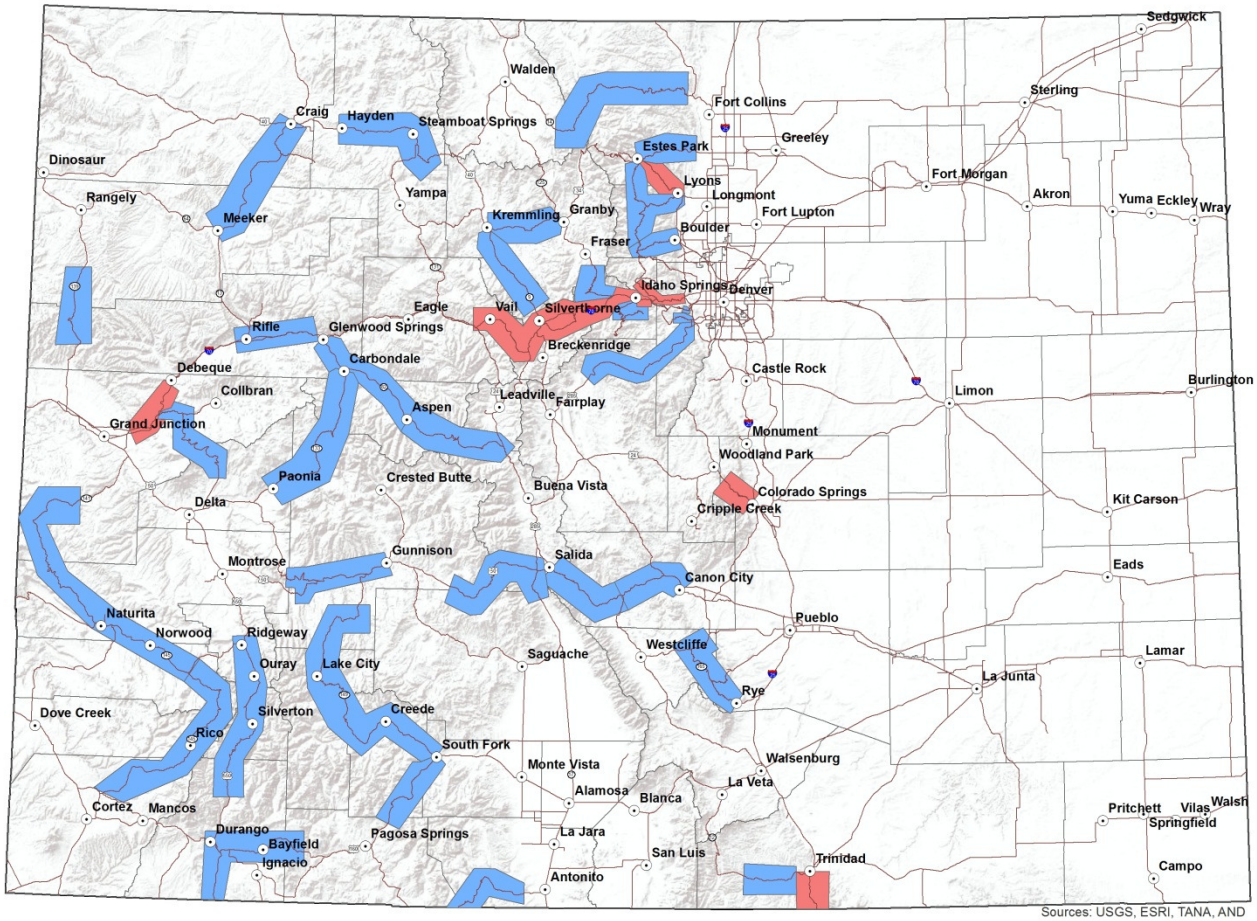
Ty Ortiz

Rockfall Mitigation

FY16 Project List:

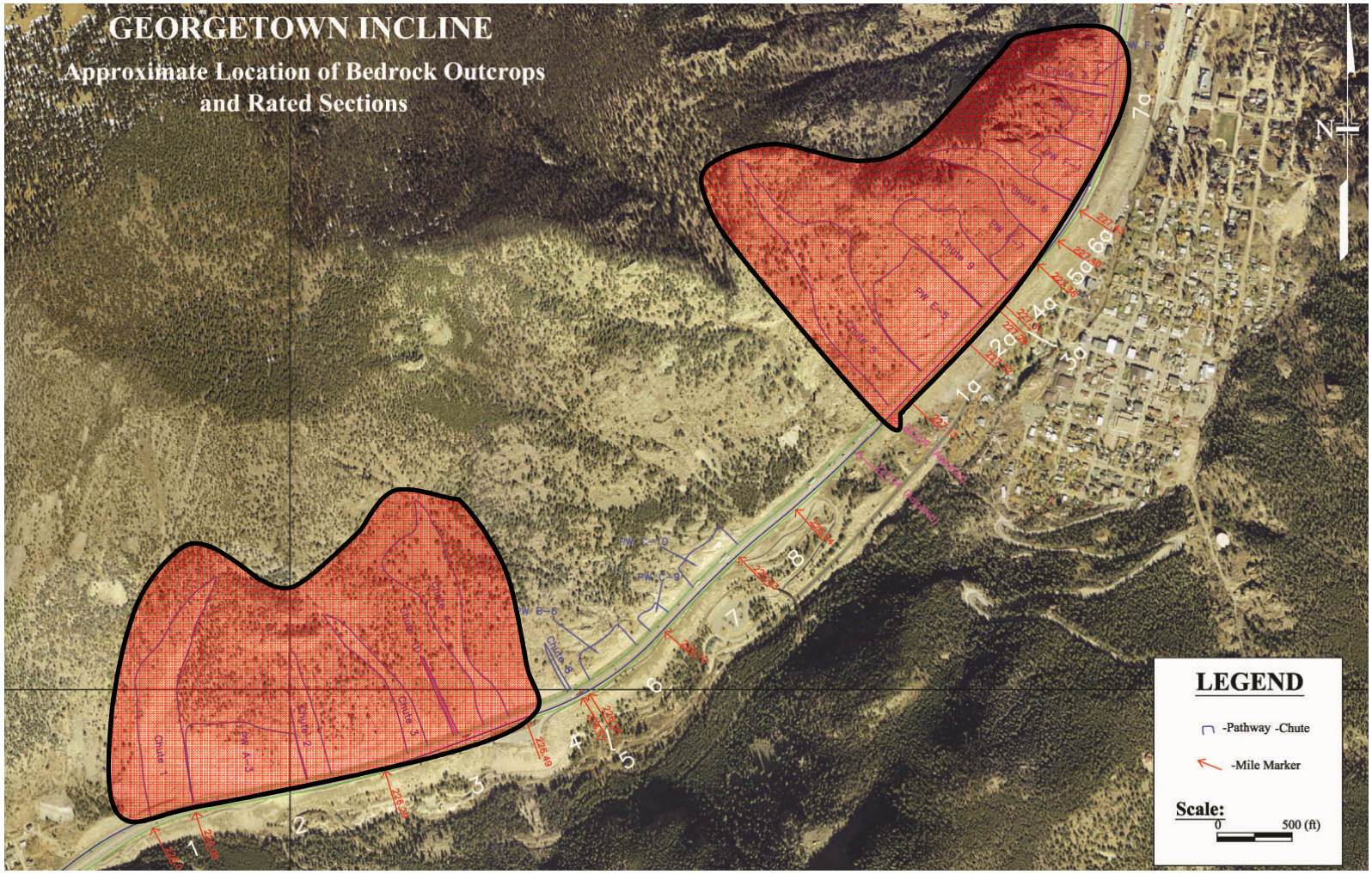
Project	≈ Allocation $Million
Corridor Projects	5
High Risk Outliers	1
Monitoring and warning systems	0.5
Scaling and catchment improvements	0.25
Project clearances and design	1.5
Geohazard Asset Management Plan preparation	2
Other Maint/Preservation	0.1
Emergency Response + Ops	1.9
	12.25

Rockfall Corridors – Risk Reduction

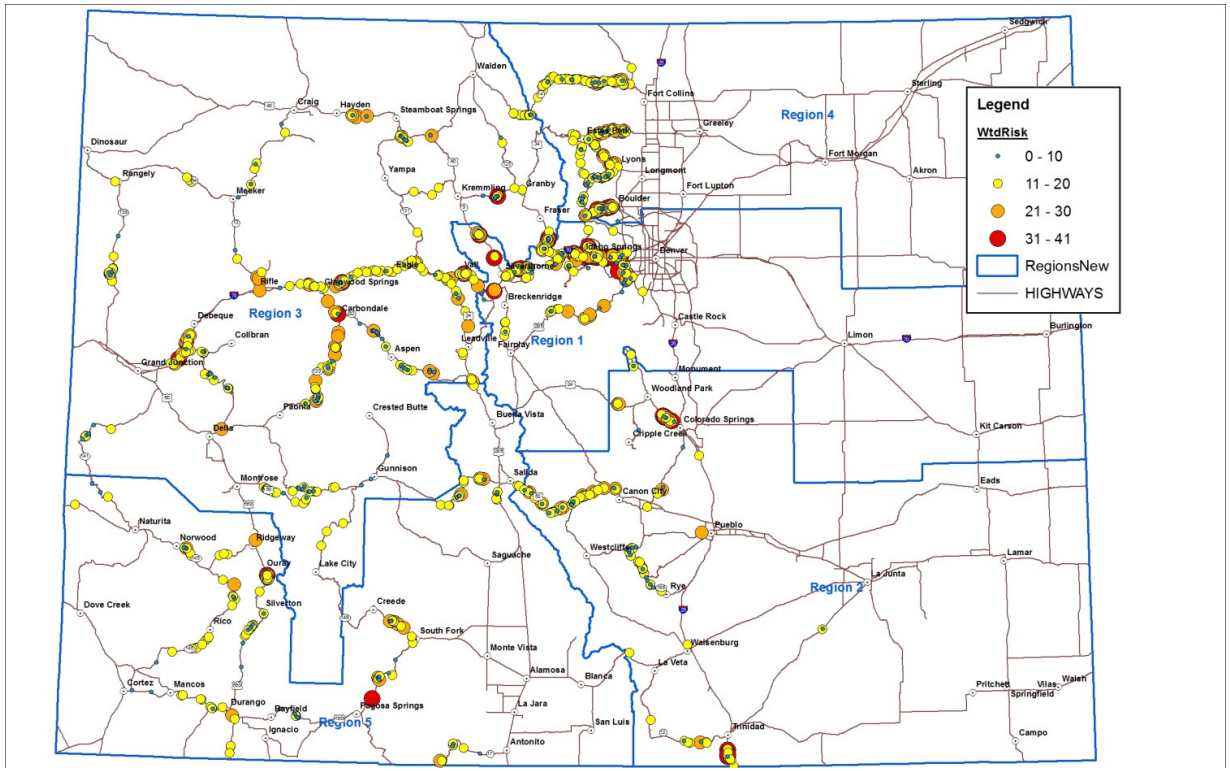


(Sight Dist + Ave Vehicle Risk) * Mitigation Reduction Factor

Project Clearances



Geohazard Risk Map



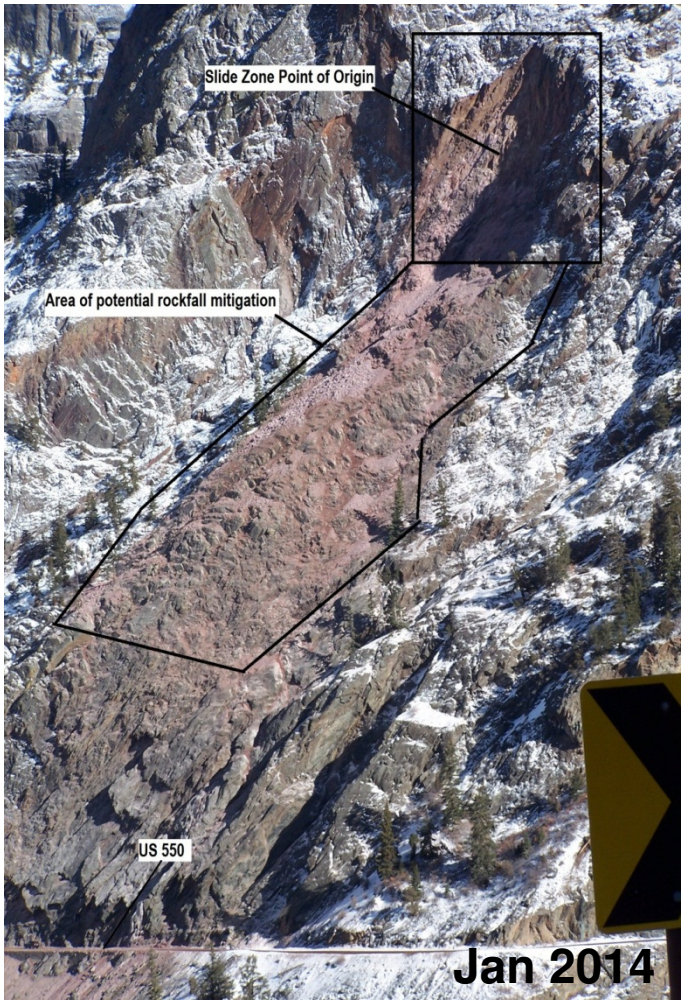
Consequence Factors

- Safety
- Mobility
- Maintenance
- Detour

Likelihood Factors

- Condition
- Length
- Volume

Need for Geohazard Asset Mgmt



Not captured in Rockfall Hazard Rating System

Rockfall FY16 Funding Request

FY16 Budget Request: $12.25M

Staff Recommendation: $9.2M

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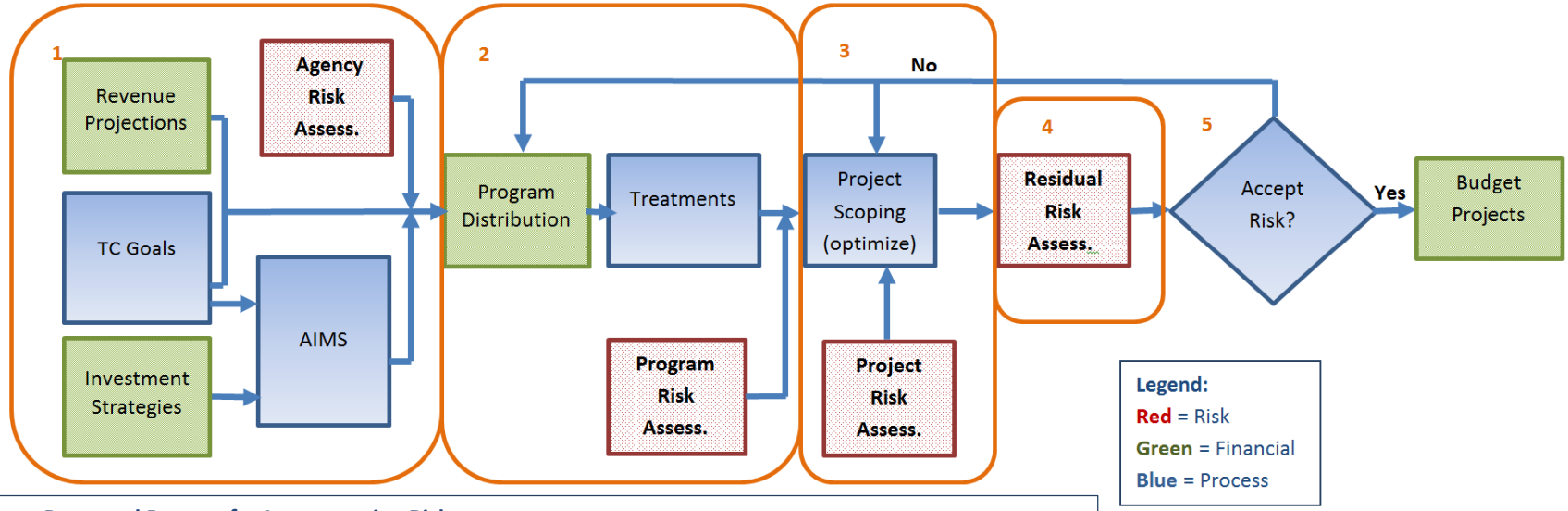
Risk Mitigation

John Vetterling

Process



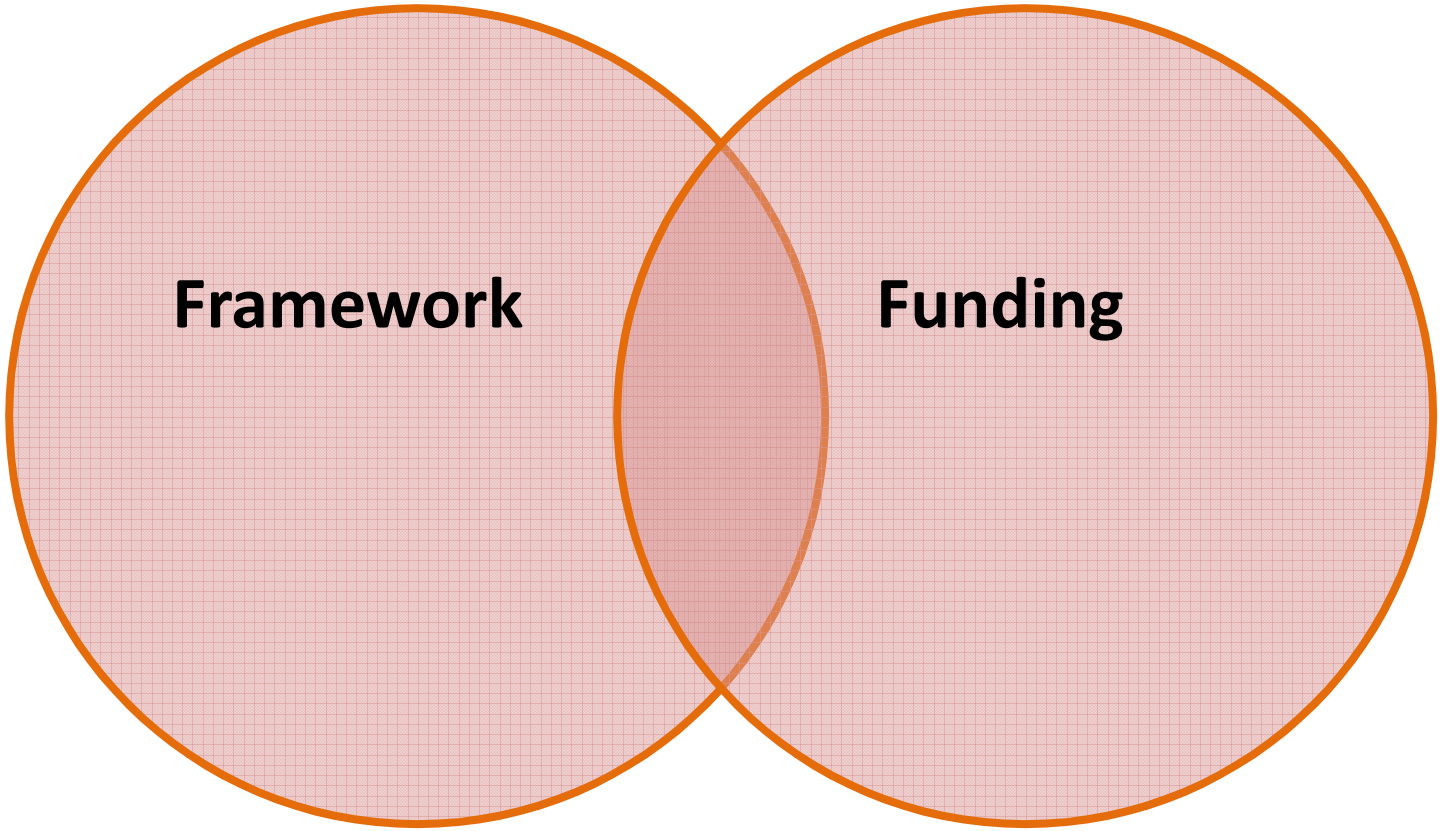
Proposed Process for Incorporating Risk:

1. OFMB revenue projections, Transportation Commission goals and asset investment strategies are inputs into funding scenarios for the Asset Investment Management System (AIMS) to develop asset program distributions, which are considered along with agency level risks.
2. Asset distributions are used by the individual asset management systems to develop a list of improvement actions (also known as treatments).
3. The lists of treatments are used with asset specific risk assessments to develop projects.
4. When the program of projects is developed a corridor based residual risk analysis is performed to forecast the remaining risks to the system after these projects are completed.
5. If the residual risk is acceptable, the projects proceed to budgeting; if the residual risk is unacceptable (too many important corridors with unmitigated risk) then the risks are first fed back into project scoping to address, or to asset program distribution if funding targets need to be adjusted.

Residual Risk

- Underserved assets
  - Guardrail
  - Overhead signs
  - Highway lighting
- Multi-asset risks
  - Flooding
  - Debris flow
  - Wildfire
- Gaps
  - Bridge rail

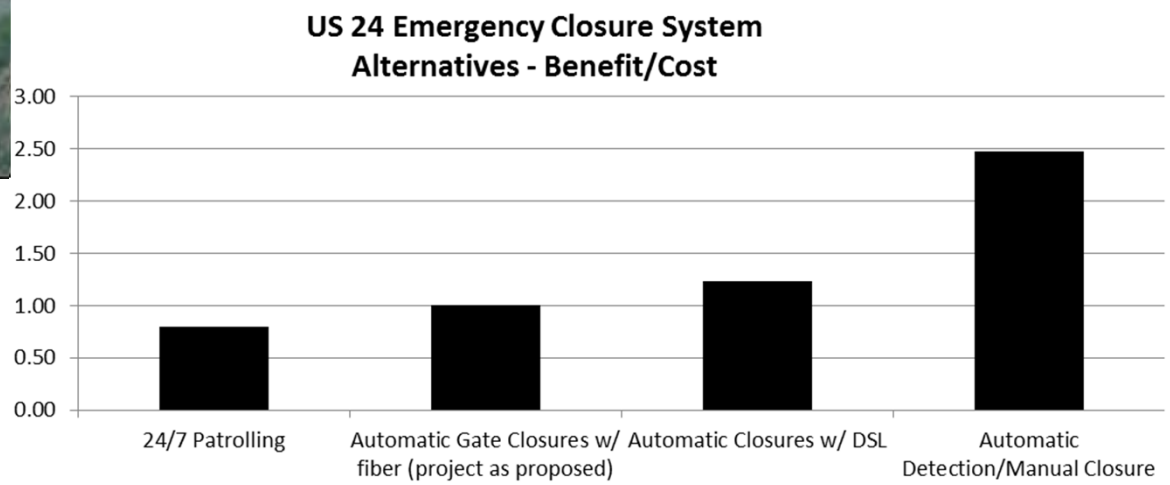
Asset Risk Management



Eligibility Criteria

- Must either be:
  1. not be part of current asset management system, e.g. guardrail;
  2. or, risk to multiple assets not addressed by asset management system, e.g. debris flow
- Measures to either reduce likelihood the impact of event
- Cost effectiveness based on Shannon-Wilson scoring system and Investment Analysis Toolkit.

Example – Waldo Canyon



Risk Mitigation FY16 Funding Request

FY16 Budget Request: $ 5M

Staff Recommendation: $0M

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Staff Recommendations for FY16 Asset Management Budget

Staff Recommendations

(In Millions)	FY15 Budget (Baseline + RAMP)	FY16 Amount Requested (Baseline + RAMP)	FY16 Delphi Results (Baseline + RAMP)
Surface Treatment	$235.2	$240.0	$235.9
Bridge, BE & Bridge Fixed Costs	$168.2	$180.0	$164.1
MLOS	$251.3	$258.8	$254.4
Road Equipment	$20.9	$24.0	$18.4
ITS	$27.6	$35.1	$21.4
Rockfall Mitigation	$9.1	$12.3	$9.2
Buildings	$20.8	$15.7	$12.9
Tunnels	$12.4	$7.6	$5.2
Culverts	$9.6	$12.0	$8.2
Walls	$0.0	$4.0	$2.4
Traffic Signals	$0.0	$16.0	$5.7
Risk Mitigation	$0.0	$5.0	$0.0
TOTAL	$755.1	$810.5	$738.0

Note: RAMP Asset Management Dollars for FY16 are assumed to be $150M.

Note: A risk mitigation pool to proactively address risk was discussed, along with potential funding options.

Staff determined that due to limited asset management funds, such a pool should seek an alternative source of funding.

Note: The FY16 Delphi Results are subject to adjustment by the Transportation Commission.

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Agenda

Delphi Workshop: FY16 Staff Recommendations

RB AMP Check In

RB AMP Check In

January Meeting Committee Guidance:

- Revise Executive Summary
- Revise Organizational Chart
- Provide Revised RB AMP to TC AM Committee members before February meeting for review
- Update Program Distribution Chart when numbers are finalized
- Develop 2-3 page cliff notes version (separate from the RB AMP)