

Incorporating Geotechnical Hazards into Agency Asset Management

**Subcommittee on Geotechnical Asset Management
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Outline

Outline

- Deighton
- Vermont Asset Management
- CDOT Asset Management

Deighton at a glance

PROPOSITIONS



Roads



Water / Wastewater



Bridges



Operations & Other



KEY STATISTICS

- Incorporated in 1986
- Offices in Canada, Austria, UK and Australia
- Team of International Experts in Asset Management Best Practice
- Developer of the dTIMS Platform, used in 23 US State DOTs for Asset Management
- Ranked in top 10 research firms in Europe

Vermont Asset Information Management System

- Multi-phase project to implement Asset Management Agency Wide for numerous assets
- Includes Inventory Management / Data Collection / Life Cycle Cost Analysis / Operations Management
- Enables Cross Asset Analysis for budget planning

The screenshot shows the VAMIS Hub website interface. At the top, there is a dark green header with the text "VERMONT OFFICIAL STATE WEBSITE" on the left and the "VERMONT" logo on the right. Below this is a light green navigation bar with "STATE OF VERMONT" on the left, "Agency of Transportation" in the center, and a dropdown menu labeled "VAMIS Hub" on the right. The main content area features a grid of 12 asset categories, each with an icon and a label: Pavements, Long Structures, Short Structures, Small Culvert, Signals, Stormwater, Rock Slopes, Guardrail, Retaining Wall, Pavement Markings, Signs, and OTHERS. A small "deighton" logo is visible in the bottom right corner of the grid.

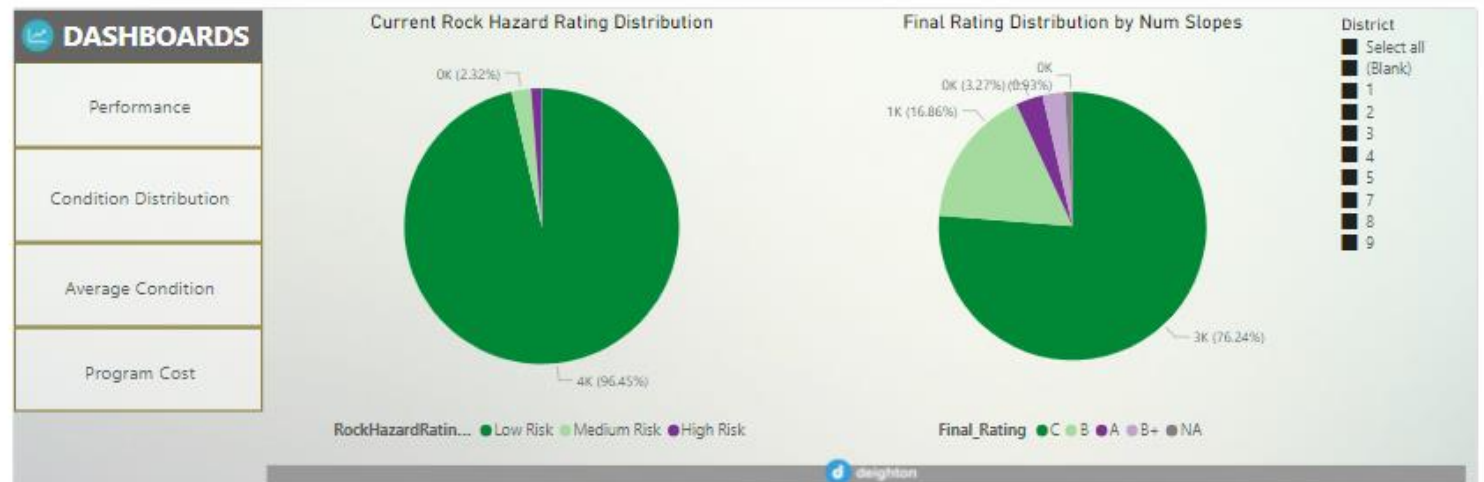
Vermont Asset Information Management System

- Includes Rock Slopes for LCC Analysis
- Includes Rock Slopes in the Cross Asset Analysis

VERMONT OFFICIAL STATE WEBSITE

STATE OF VERMONT
Agency of Transportation

Rock Slopes



Vermont Asset Information Management System

- Vermont uses a Rockfall Hazard Rating to classify locations
- A rated sites are the highest Risk, C rated sites are the lowest risk
 - Sites at present do not deteriorate in the LCC Analysis – future work
- Life Cycle Cost Analysis includes the following treatments:
 - Maintenance
 - Maintenance and Stabilization
 - Maintenance, Stabilization, and Protection
 - Removal
- Optimizations from \$1 Million per year to \$6 Million per year
- Goal of the LCC Analysis is to :
 - Establish a program with funding
 - Illustrate Reduction of Risk for increases in funding
 - Recommend initial set of projects for review by Geotechnical Management Team

Vermont Asset Information Management System



CDOT Asset Investment Management System

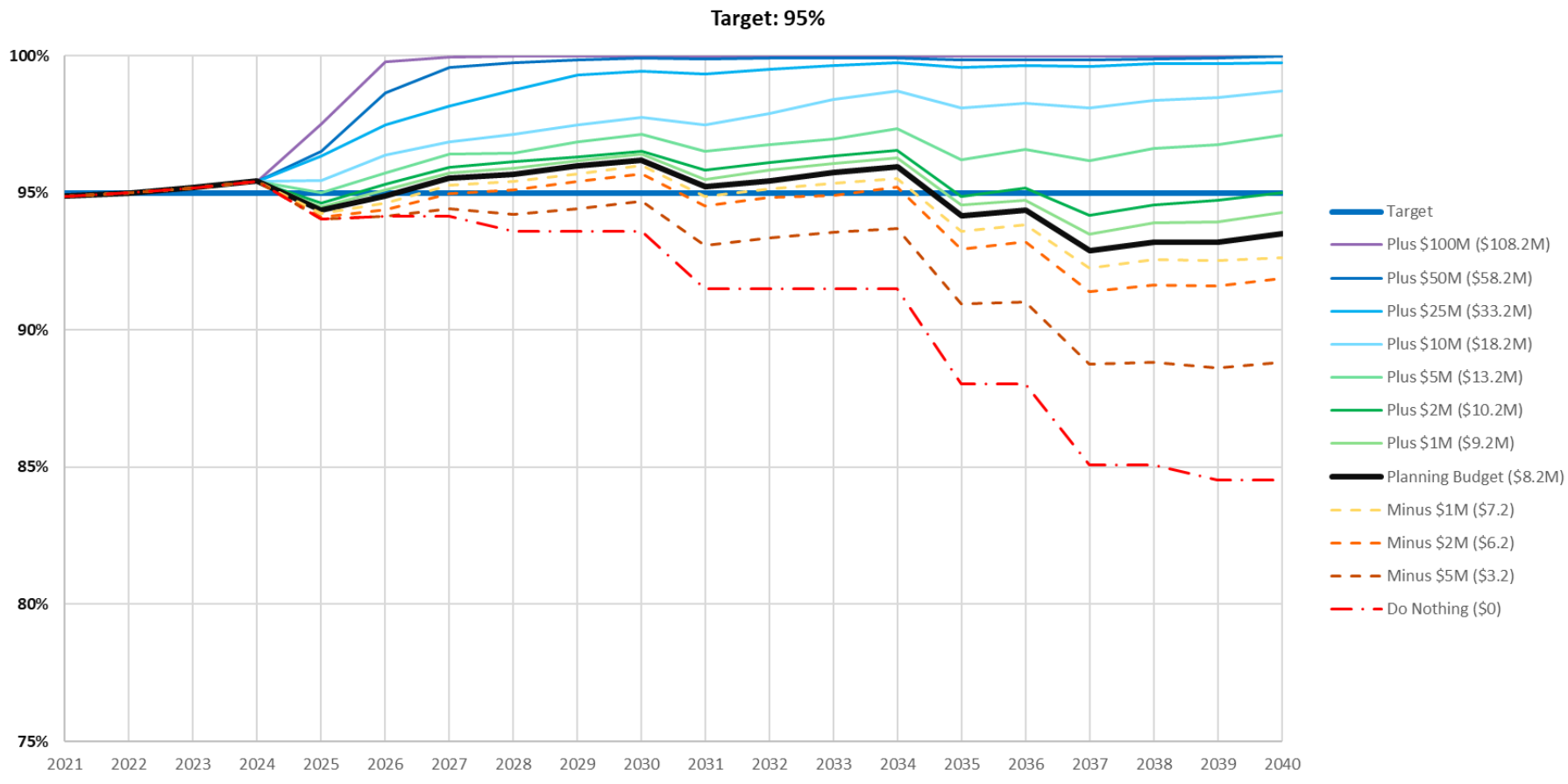
- 11 Assets:

- Pavements
- Bridges
- Culverts
- Walls
- Tunnels
- Geotechnical Hazards
- Fleet Equipment
- Traffic Signals
- ITS Devices
- Buildings
- Rest Areas

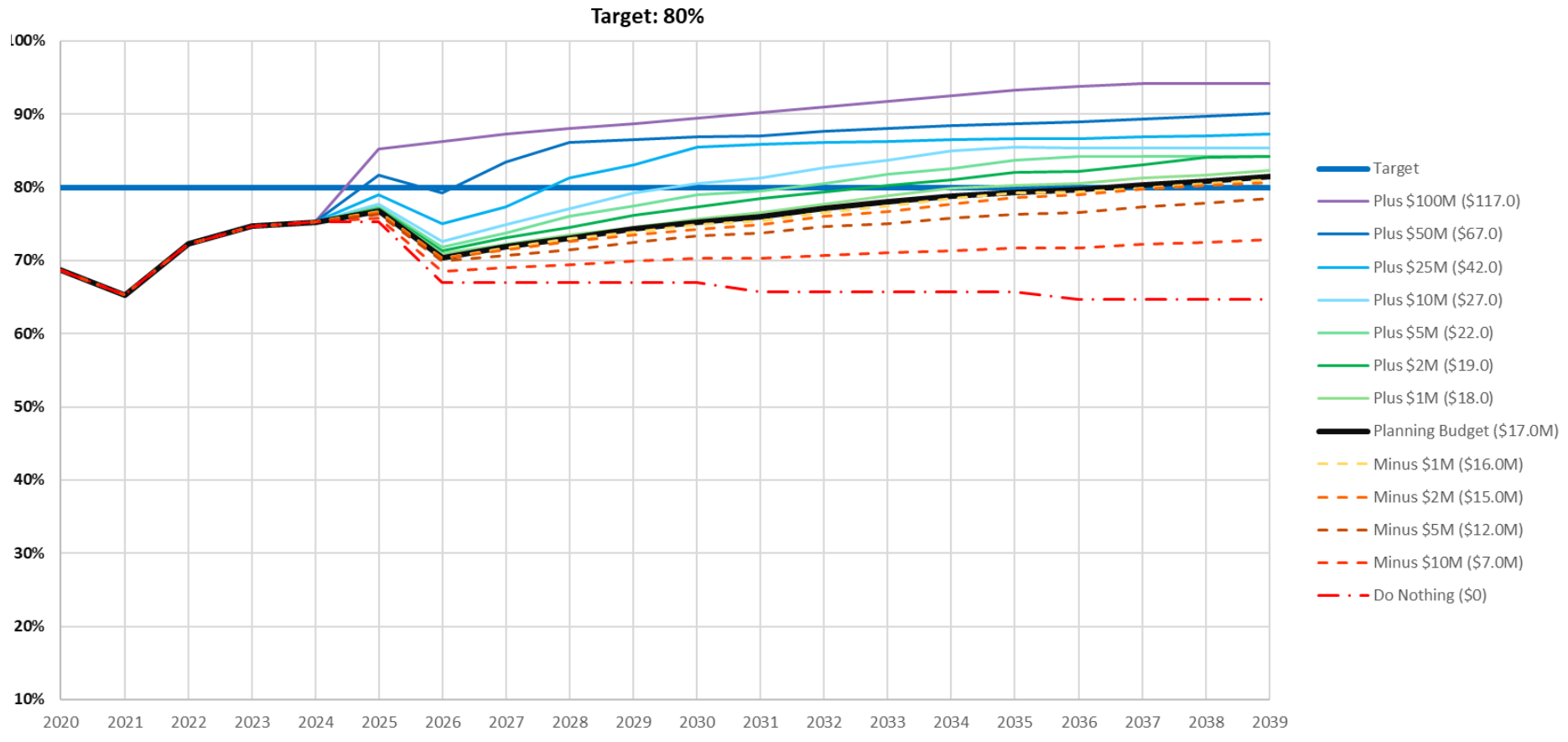
Life Cycle Analysis Results used for Budget Setting

- Same Analysis Software (dTIMS)
- Same Economic Parameters (discount / inflation)
- Same Analysis Periods
- 11 Investment Scenarios per asset
- Fixed dollar ranges (+1M,+2M,+5M, +10M, etc.)
- Must present analysis results and performance metrics to Asset Leaders and request funding.
- Asset Leaders, Performance and Asset Management Branch, and finally CDOT Executive make the final allocation decisions.

CDOT Asset Investment Management System



CDOT Asset Investment Management System



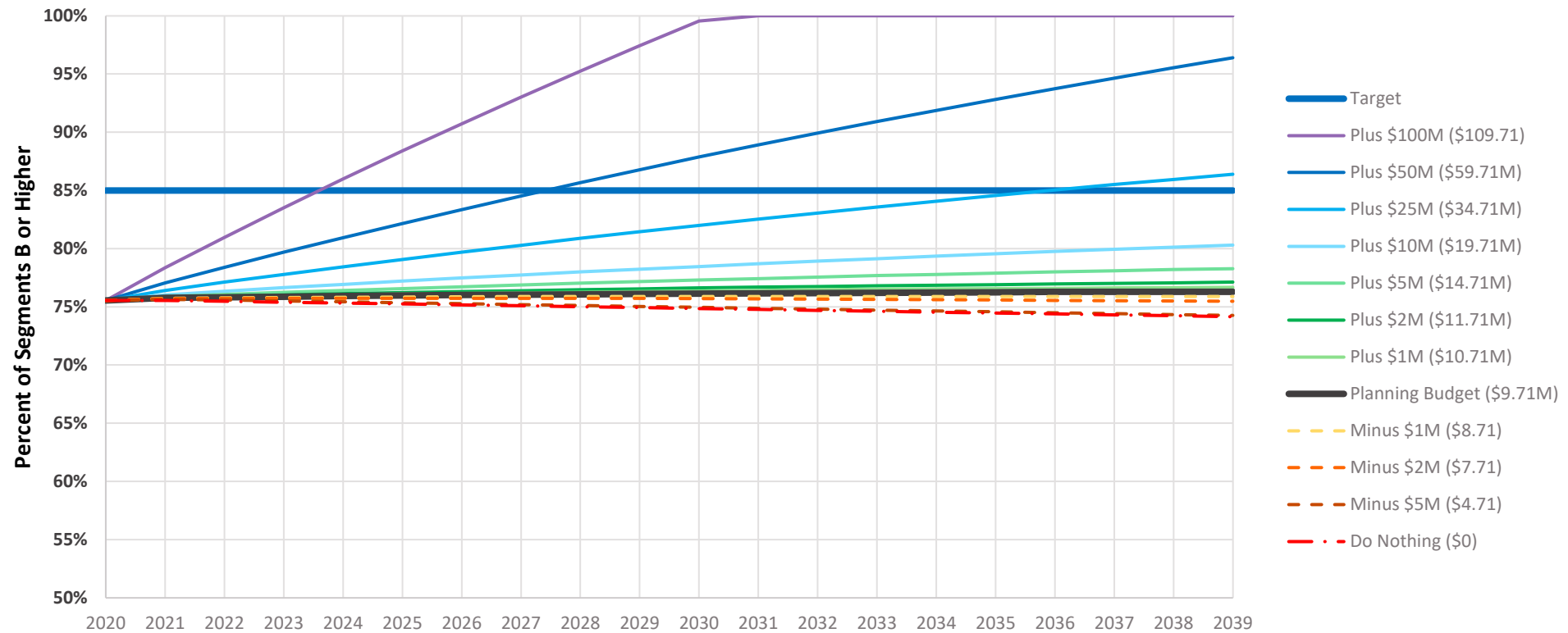
CDOT Asset Investment Management System

Geotechnical Hazards (Current Model)

- Managed by Segments
- Segments Assigned a Risk Grade based on Events:
 - Maintenance Risk
 - Safety Risk
 - Mobility Risk
- Segments are then classified as A through D and F with D and F being the highest risk
- Performance Metric is the number of segments with Risk Grade B or higher
- One Segment per year will deteriorate to the next highest category
- Treatments:
 - Active Mitigation
 - Passive Mitigation

CDOT Asset Investment Management System

GeoHazards - Percent of Segments Risk Grade B or Higher
Target: 85%



CDOT Asset Investment Management System

Geotechnical Hazards (New Model)

- Being developed by BCG Engineering (Scott Anderson, Mark Vessely) in conjunction with the CDOT Geotechnical Asset Management Team (Robert Group, Nicole Oester)
- Switching to a Total Annual Risk Exposure (TARE) model
- Has not yet been configured in AIMS.

Concluding Remarks

Geotechnical Hazards Into Agency Wide Asset Management

- Raises Awareness regarding Risk
- Gives a seat at the table when discussion resource allocation
- Can be used to prioritize treatments and recommend sites / segments to investigate based upon available funding
- Will not remove the need for a detailed study once candidate project sites have been recommended