

# City of Unalaska

Captains Bay Road Paving and Utility  
Extension Project

Draft Benefit Cost Analysis

City Council Presentation.

March 8, 2022

HDR Engineering

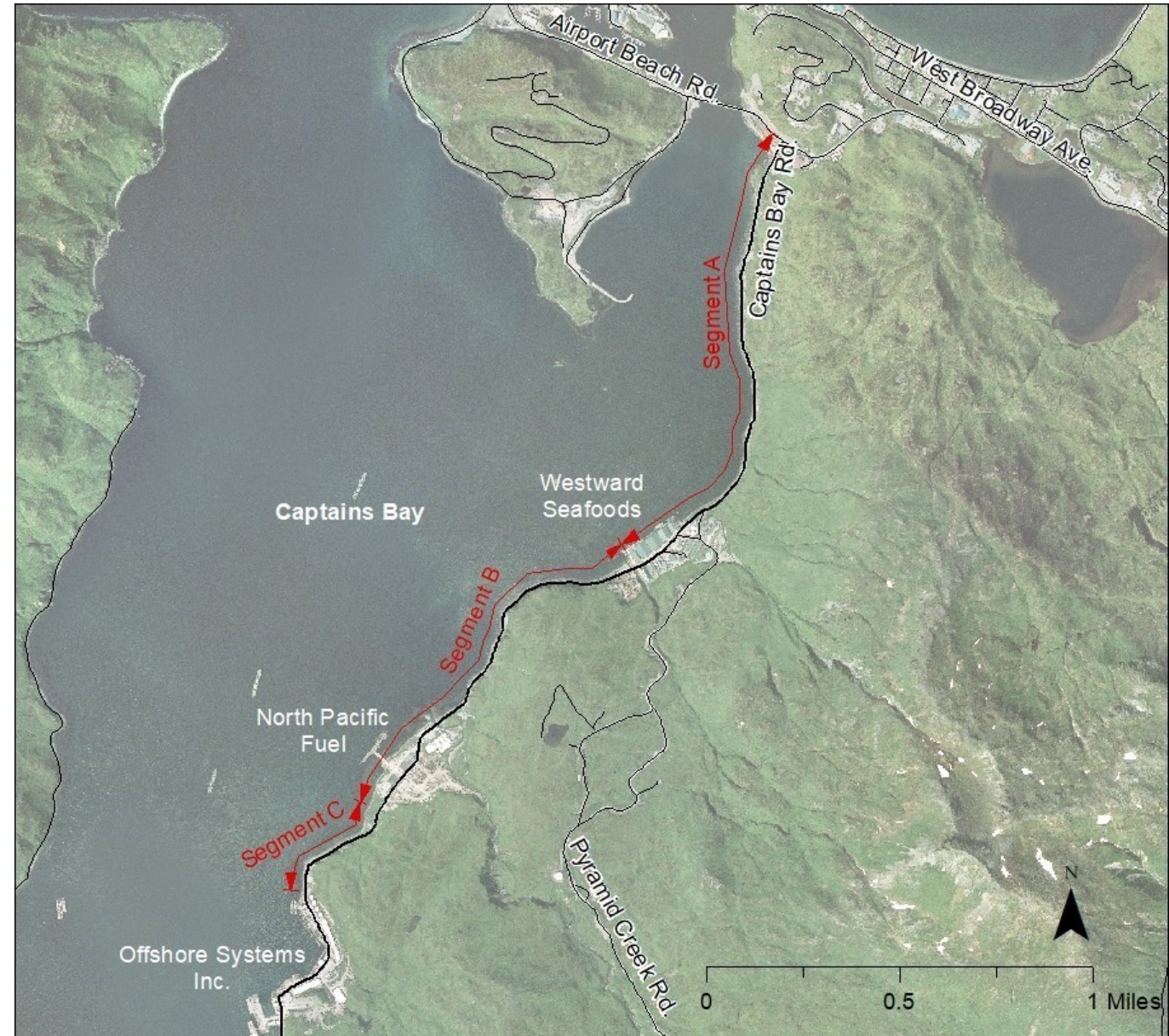




# Captains Bay Road

## Segments

- Segment A: Airport Beach Road to Westward Seafoods
- Segment B: Westward Seafoods to North Pacific Fuel
- Segment C: North Pacific Fuel to Offshore Systems, Inc.



# Captains Bay Road Paving and Utility Extension Project Scenarios, 2020 Dollars

Scenario	Scope: Assuming 3-year Construction Program	Segment A Costs	Segment B Costs	Segment C Costs	Total <sup>a</sup>
<b>1. Base Case HDL Full Design</b>	Realignment, utilities extension, separated pedestrian facilities, roadway lighting, Dead Man's Curve rock cut, design speed 45 mph	\$30.5 M	\$23.7 M	\$7.0 M	\$61.2 M
<b>2. HDL Baseline with Reduced Utilities</b>	Same as Scenario 1, except no sewer to Segments B and C and no water to Segment C	\$30.1 M	\$21.8 M	\$5.5 M	\$57.4 M
<b>3. Existing Alignment with Reduced Utilities</b>	Maintains current alignment and 30 mph design speed; same utility reductions as in Scenario 2; no rock cuts; separated pathway and roadway lighting included	\$16.6 M	\$12.1 M	\$3.3 M	\$32.1 M
<b>4. Existing Alignment with Slope Work</b>	Like Scenario 3, with the addition of selective bluff sloping between Dead Man's Curve and Pyramid Creek	\$16.6 M	\$16.7 M	\$3.3 M	\$36.6 M
<b>5. Combination of Scenarios 2 and 3</b>	Segment A, Scenario 3; Segments B and C, Scenario 2	\$16.6 M	\$21.8 M	\$5.5 M	\$43.9 M
<b>6. Roadway Paving and Selective Slope Work</b>	Scenario 4, with all utility improvements eliminated; pedestrian pathway and storm drains included	\$10.5 M	\$11.7 M	\$2.0 M	\$24.3 M
<b>7. Basic Roadway Paving</b>	Scenario 3, excluding water and sewer utilities; pedestrian facilities and storm drains included	\$10.5 M	\$7.2 M	\$2.0 M	\$19.7 M

# CBA Methodology and Assumptions

- Developed CBA results using guidelines consistent with USDOT protocols (from 2021 USDOT CBA Guidance)
  - Additional vetting required plus additional data collection
- Assumed 3 year project development cycle (2023-2025)
- Benefits accrue for 30 years (by segment)
  - *Segment A: Airport Beach Rd to Westward Seafoods*
  - *Segment B: Westward Seafoods to North Pacific Fuels*
  - *Segment C: North Pacific Fuels to Offshore Systems Inc.*
- Results discounted using appropriate USDOT discount rates
- Quantitative estimates based on transportation and utilities impacts
- CBA inputs based on project data, data provided by the City and stakeholder discussions

# Monetized Benefits

- Benefits from roadway improvements
  - Reduced maintenance costs for Captain's Bay Road
  - Reduced vehicle maintenance costs
  - Improved travel time due to change in speeds and reduced speed impediments
  - Improved roadway safety
  - Reduced vehicle emissions
- Benefits from utility upgrade
  - Reduced utility maintenance costs
  - Avoided water leakage

# CBA Quantified Benefits by Scenario

Benefit Category	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7
Roadway Speeds	40 mph	40 mph	30 mph	30 mph	30 mph	30 mph	30 mph
Reduced Road Maint. Costs	✓	✓	✓	✓	✓	✓	✓
Reduced Vehicle Maint. Costs	✓	✓	✓	✓	✓	✓	✓
Improved Safety	✓	✓	✓	✓	✓	✓	✓
Travel Time Savings	✓	✓	✓	✓	✓	✓	✓
Reduced GHG Emissions	✓	✓	✓	✓	✓	✓	✓
Reduced CAC Emissions	✓	✓	✓	✓	✓	✓	✓
Residual Value of Assets	✓	✓	✓	✓	✓	✓	✓
Reduced Utility Maint. Costs	✓	✓	✓	✓	✓		
Avoided Water Leakage	✓	✓	✓	✓	✓		

# CBA Results by Scenario

## Discounted 2020 Dollars

Evaluation Metrics	Scenario						
	1	2	3	4	5	6	7
Total Benefits	\$24.4 M	\$24.4 M	\$21.4 M	\$21.4 M	\$21.4 M	\$18.8 M	\$18.8 M
Total Costs	\$58.8 M	\$55.3 M	\$30.8 M	\$35.1 M	\$41.8 M	\$23.2 M	\$19.0 M
Net Present Value (NPV)	-\$34.4 M	-\$30.9 M	-\$9.4 M	-\$13.7 M	-\$20.3 M	-\$4.4 M	-\$0.1 M
Return on Investment (ROI)	-58%	-56%	-31%	-39%	-49%	-19%	-1%
Benefit-Cost Ratio (BCR)	0.4	0.4	0.7	0.6	0.5	0.8	1.0
Internal Rate of Return (IRR)	0.4%	0.7%	3.9%	2.9%	1.7%	5.1%	6.9%

# CBA Findings

- The Benefit-Cost Ratio (BCR) ranges from 0.4 (Scenario 1) to 1.0 (Scenario 7)
- Only Scenario 7 could reach BCR above 1
  - Based on either reduction in capital costs or an increase in vehicle volumes
- No other scenarios expected to reach above the 1.0 threshold



# Project Funding

# Funding Opportunities under the IIJA

- There are 3 current funding opportunities under the Infrastructure Investment and Jobs Act (IIJA)
  - Rebuilding American Infrastructure with Sustainability and Equity Grants Program (RAISE) – deadline April 14, 2022
  - Infrastructure for Rebuilding America Grants (INFRA) – NOFO to be released soon
  - Rural Surface Transportation Program – NOFO to be released soon
    - ***Safety improvement to improve high-risk rural road***
    - ***Increases access to commercial facilities that support a rural economy***
- USDOT requires a Benefit-Costs Ratio of at least 1
  - *unless there are substantial benefits that go to underserved or disadvantaged communities*

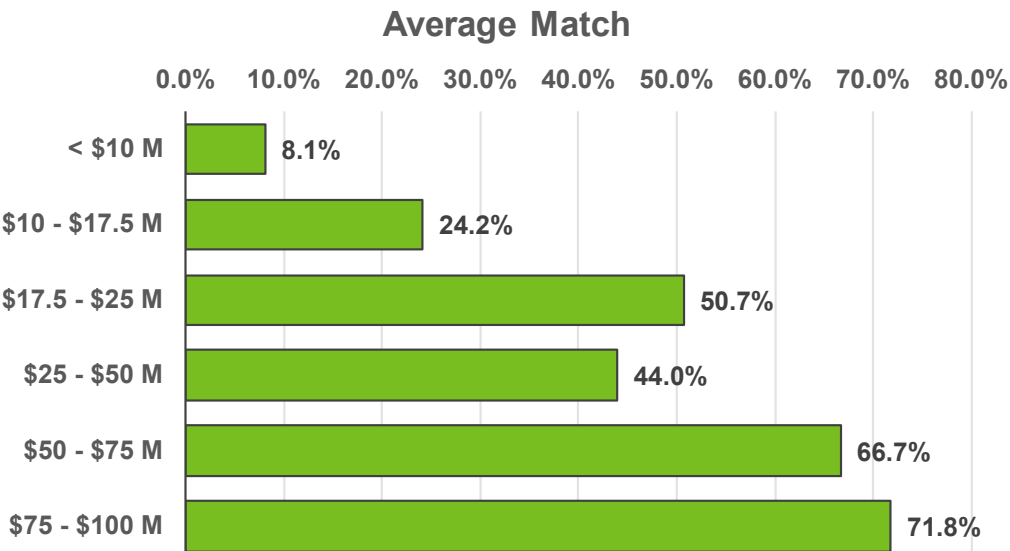
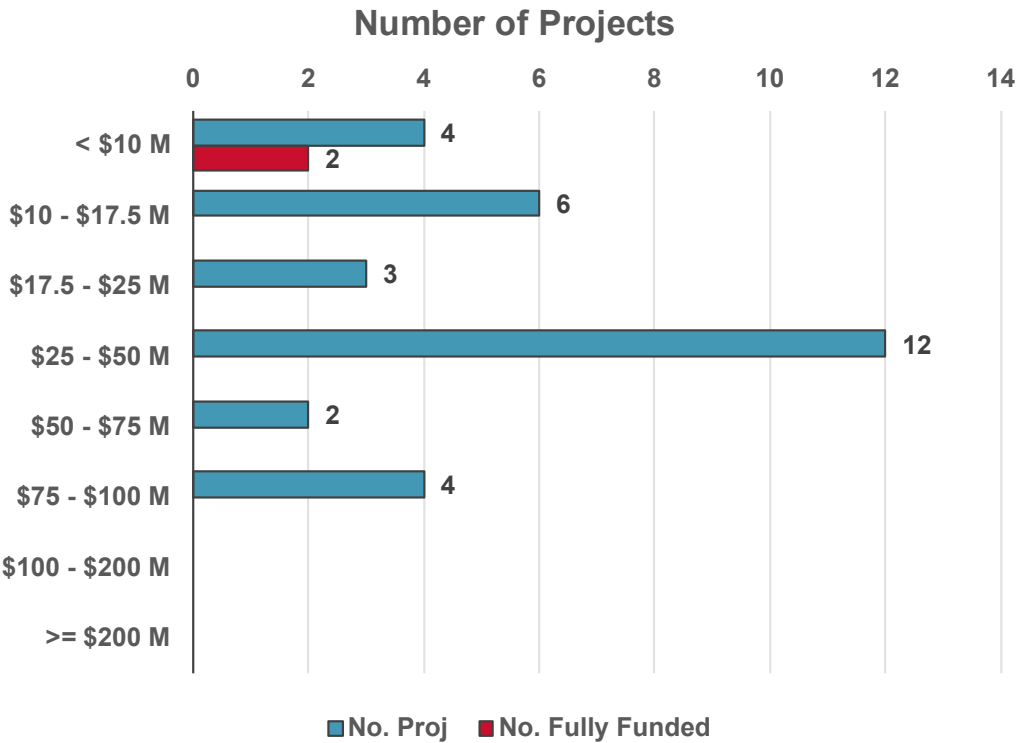
# Grant Program Summary by Program

Urban / Rural:	Rural
Project Type:	Capital
Program:	RAISE
Year:	All

Total Number of Projects:	31
Number of Fully Funded Projects:	2
Average Local Match:	53.5%
Average Project Costs:	\$33.0 M
Average Award:	\$15.3 M

## Statistics by Project Costs

Project Cost	No. Proj	Avg Match	No. Fully Funded	Avg Proj Cost	Avg Award
< \$10 M	4	8.1%	2	\$6.4 M	\$5.9 M
\$10 - \$25 M	6	24.2%	0	\$14.2 M	\$10.8 M
\$17.5 - \$25 M	3	50.7%	0	\$21.2 M	\$10.4 M
\$25 - \$50 M	12	44.0%	0	\$33.1 M	\$18.6 M
\$50 - \$75 M	2	66.7%	0	\$59.8 M	\$19.9 M
\$75 - \$100 M	4	71.8%	0	\$82.5 M	\$23.3 M



**Next Steps**

## **Next Steps: Scenario 7 Benefit and Estimate Review**

- Update CBA to reflect latest CBA guidance from USDOT (released last week)
- Review future development along Captains Bay Road to determine if traffic forecast volumes should be increased
  - Additional traffic would increase benefits estimates
- Conduct technical engineering review of cost estimate to determine if project cost estimates can be reduced



# Next Steps: Grant Preparation

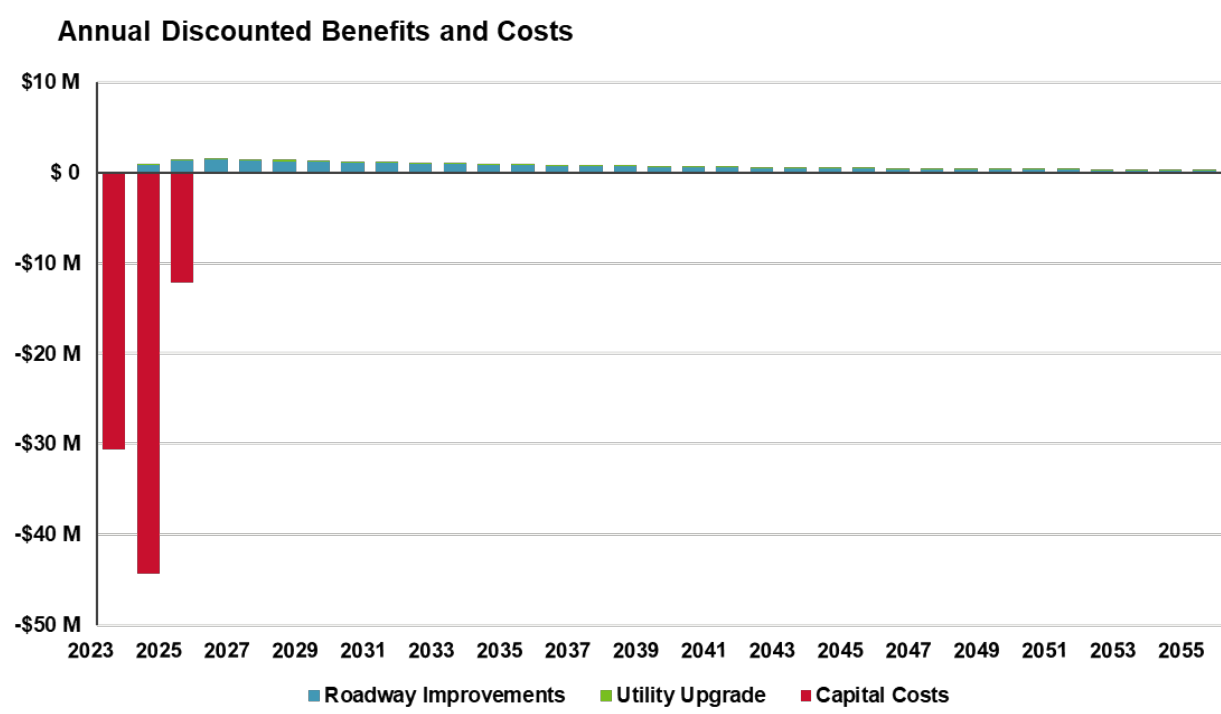
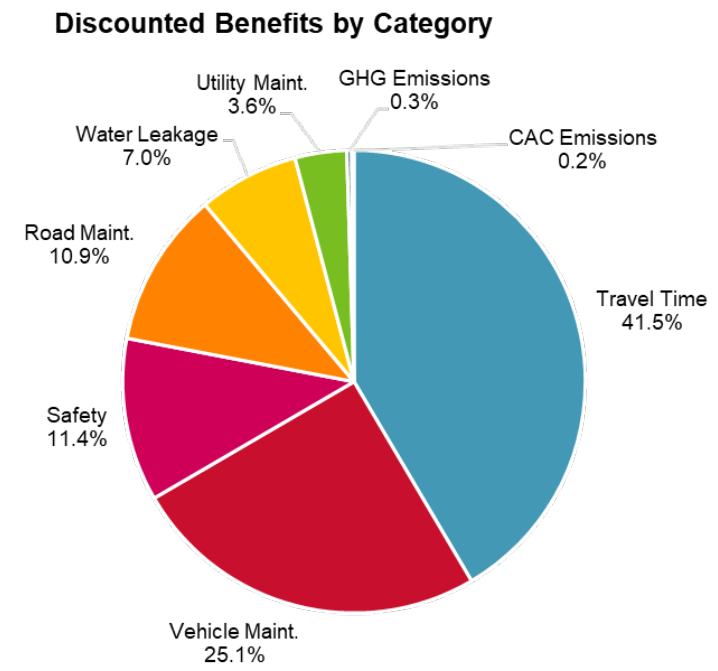
- Prepare grant application for a RAISE grant submission due 4/14/22
  - Under contract to prepare this grant application
- Suggest also submitting applications under INFRA & the Rural Surface Transportation Program
  - NOFO expected this month
  - Anticipate minor changes to RAISE Grant template
  - Can submit joint submission for these 2 opportunities

**Questions**  
**Thank You!**

# CBA Supporting Details

# Results – Scenario 1 (Base Case HDL Full Design)

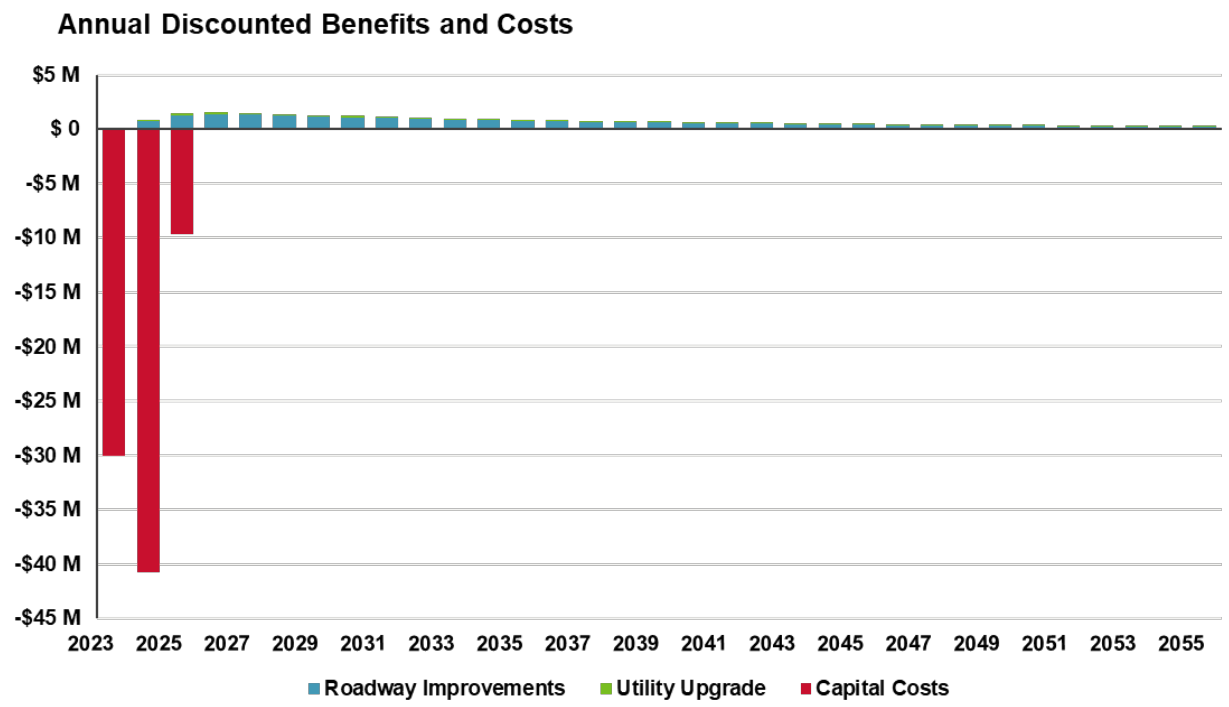
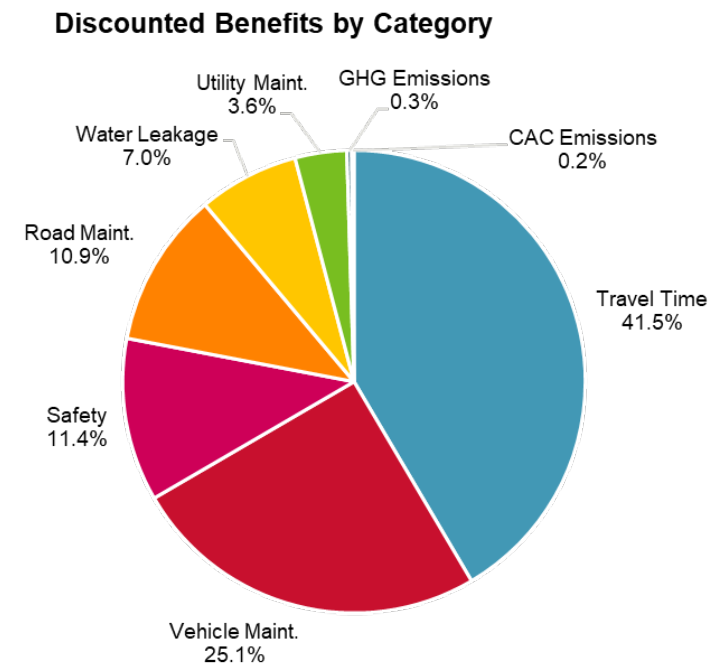
Values in 2020 dollars							
Discounted Total Benefits		Discounted Total Costs		Discounted Net Impact		Benefit-Cost Ratio	
\$24.4 M		\$58.8 M		-\$34.4 M		0.42	
Segment A	\$11.5 M	Segment A	\$30.5 M	Segment A	-\$19.0 M	Segment A	0.38
Segment B	\$10.0 M	Segment B	\$22.1 M	Segment B	-\$12.1 M	Segment B	0.45
Segment C	\$2.8 M	Segment C	\$6.1 M	Segment C	-\$3.3 M	Segment C	0.47



# Results – Scenario 2 (HDL Baseline with Reduced Utilities)

Values in 2020 dollars

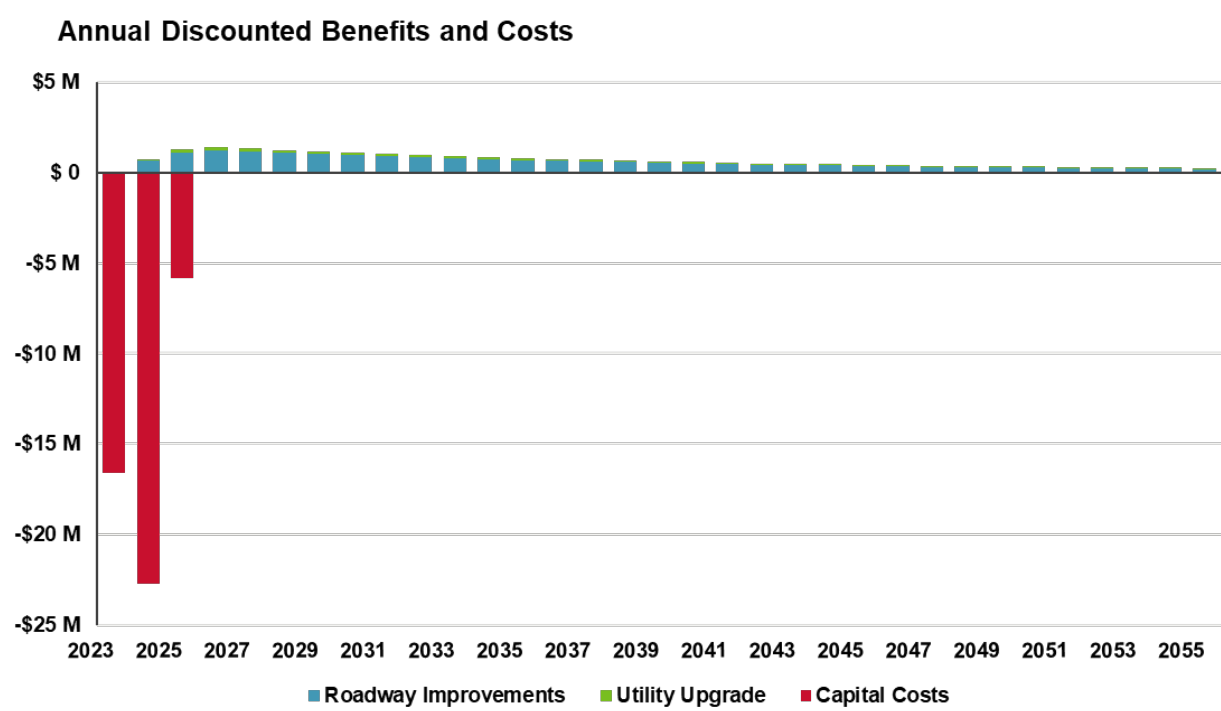
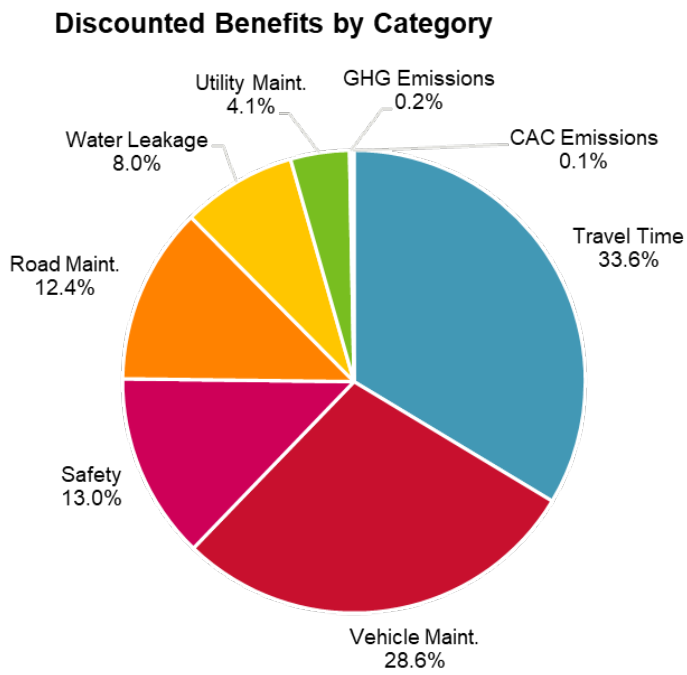
Discounted Total Benefits		Discounted Total Costs		Discounted Net Impact		Benefit-Cost Ratio	
\$24.4 M		\$55.3 M		-\$30.9 M		0.44	
Segment A	\$11.5 M	Segment A	\$30.1 M	Segment A	-\$18.6 M	Segment A	0.38
Segment B	\$10.0 M	Segment B	\$20.4 M	Segment B	-\$10.3 M	Segment B	0.49
Segment C	\$2.8 M	Segment C	\$4.8 M	Segment C	-\$2.0 M	Segment C	0.59





# Results – Scenario 3 (Existing Alignment, Reduced Utilities)

Values in 2020 dollars							
Discounted Total Benefits		Discounted Total Costs		Discounted Net Impact		Benefit-Cost Ratio	
\$21.4 M		\$30.8 M		-\$9.4 M		0.69	
Segment A	\$9.8 M	Segment A	\$16.6 M	Segment A	-\$6.7 M	Segment A	0.59
Segment B	\$8.9 M	Segment B	\$11.4 M	Segment B	-\$2.4 M	Segment B	0.79
Segment C	\$2.7 M	Segment C	\$2.9 M	Segment C	-\$0.3 M	Segment C	0.91

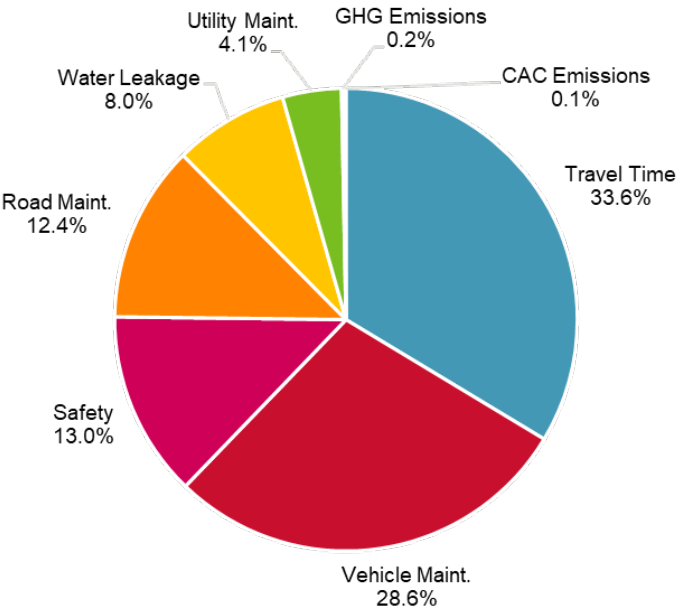


# Results – Scenario 4 (Existing Alignment with Slope Work)

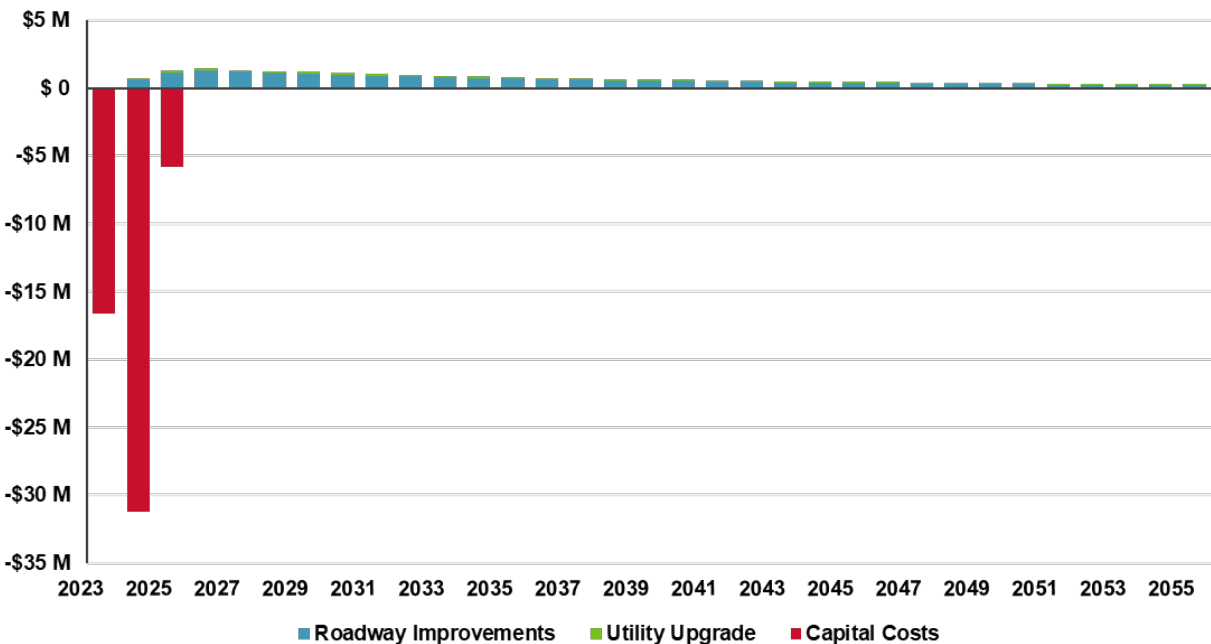
Values in 2020 dollars

Discounted Total Benefits		Discounted Total Costs		Discounted Net Impact		Benefit-Cost Ratio	
\$21.4 M		\$35.1 M		-\$13.7 M		0.61	
Segment A	\$9.8 M	Segment A	\$16.6 M	Segment A	-\$6.7 M	Segment A	0.59
Segment B	\$8.9 M	Segment B	\$15.6 M	Segment B	-\$6.7 M	Segment B	0.57
Segment C	\$2.7 M	Segment C	\$2.9 M	Segment C	-\$0.3 M	Segment C	0.91

Discounted Benefits by Category



Annual Discounted Benefits and Costs

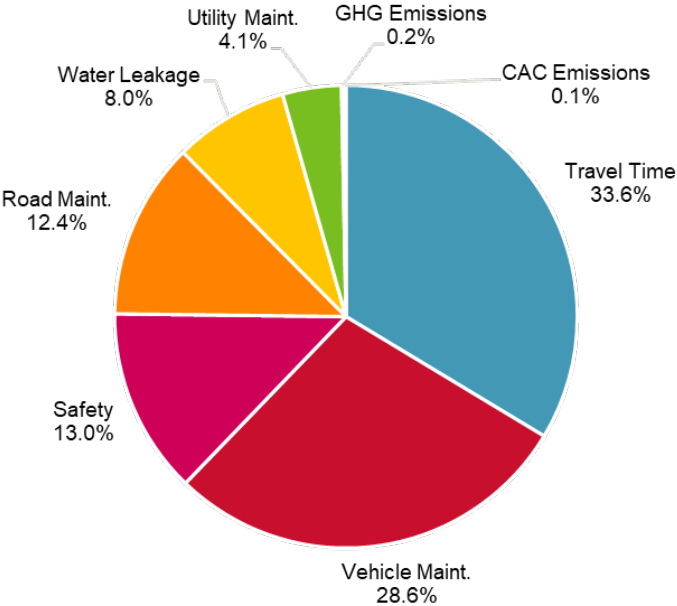


# Results – Scenario 5 (Combination of Scenarios 2 & 3)

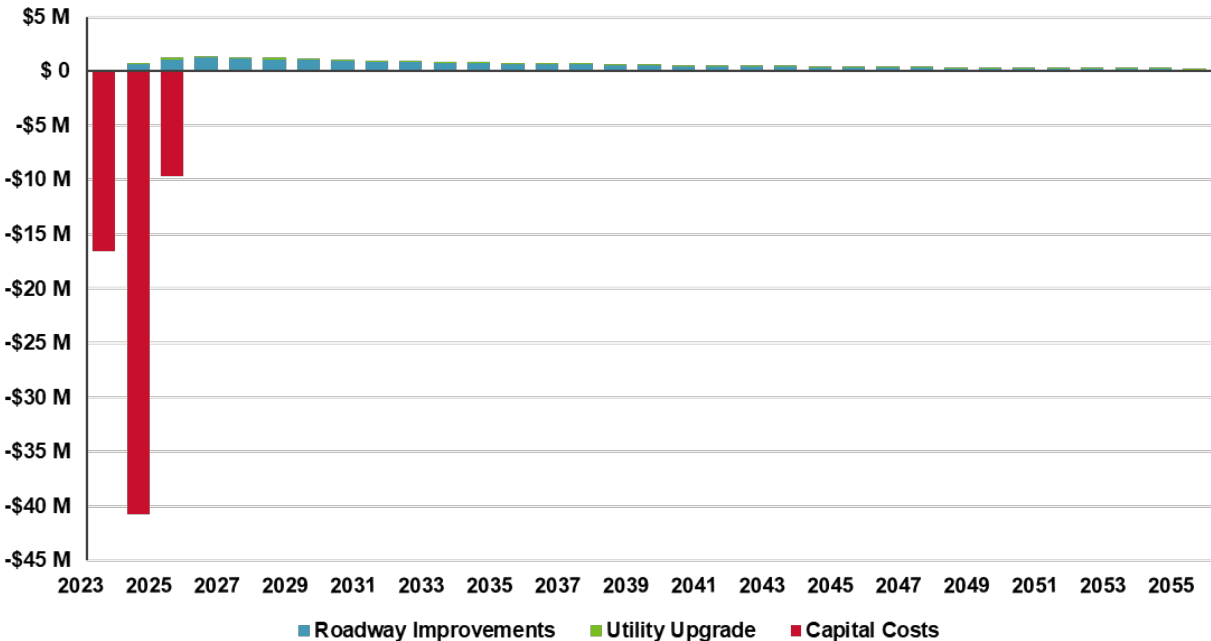
Values in 2020 dollars

Discounted Total Benefits		Discounted Total Costs		Discounted Net Impact		Benefit-Cost Ratio	
\$21.4 M		\$41.8 M		-\$20.3 M		0.51	
Segment A	\$9.8 M	Segment A	\$16.6 M	Segment A	-\$6.7 M	Segment A	0.59
Segment B	\$8.9 M	Segment B	\$20.4 M	Segment B	-\$11.4 M	Segment B	0.44
Segment C	\$2.7 M	Segment C	\$4.8 M	Segment C	-\$2.2 M	Segment C	0.55

Discounted Benefits by Category



Annual Discounted Benefits and Costs

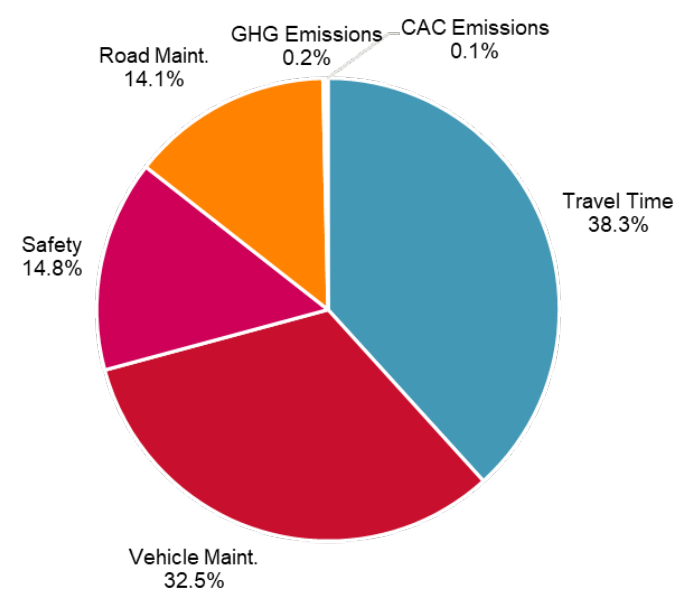


# Results – Scenario 6 (Roadway Paving, Select Slope Work)

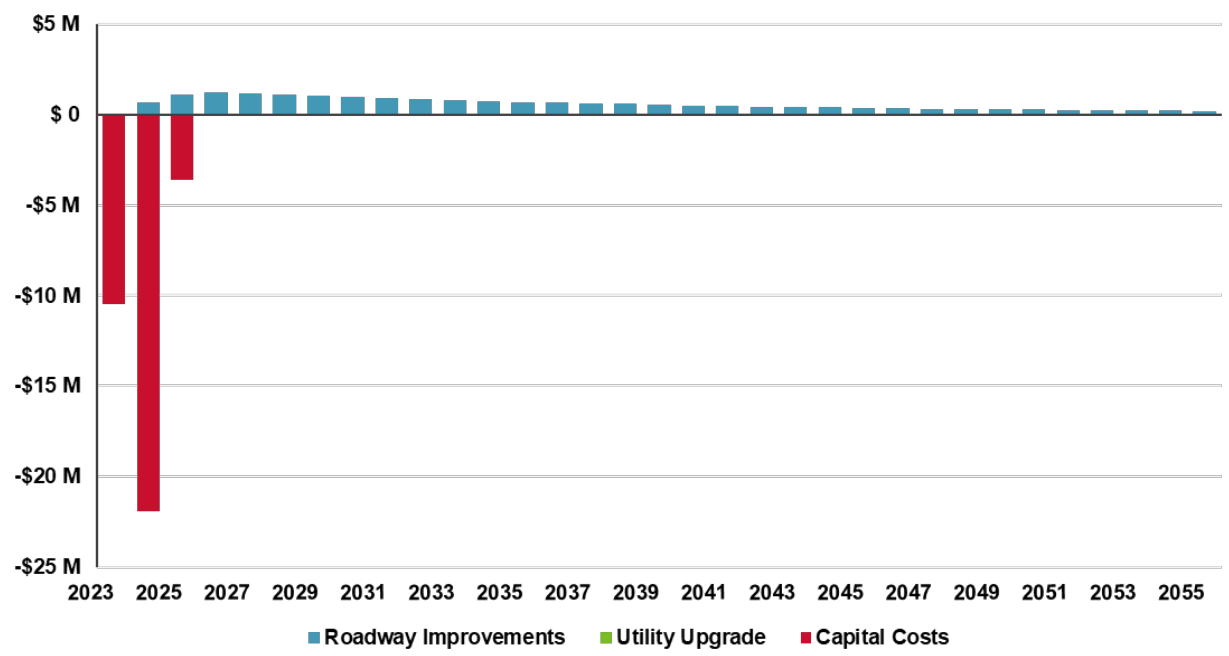
Values in 2020 dollars

Discounted Total Benefits		Discounted Total Costs		Discounted Net Impact		Benefit-Cost Ratio	
\$18.8 M		\$23.2 M		-\$4.4 M		0.81	
Segment A	\$9.3 M	Segment A	\$10.5 M	Segment A	-\$1.2 M	Segment A	0.89
Segment B	\$6.9 M	Segment B	\$11.0 M	Segment B	-\$4.1 M	Segment B	0.63
Segment C	\$2.7 M	Segment C	\$1.8 M	Segment C	\$0.9 M	Segment C	1.49

Discounted Benefits by Category



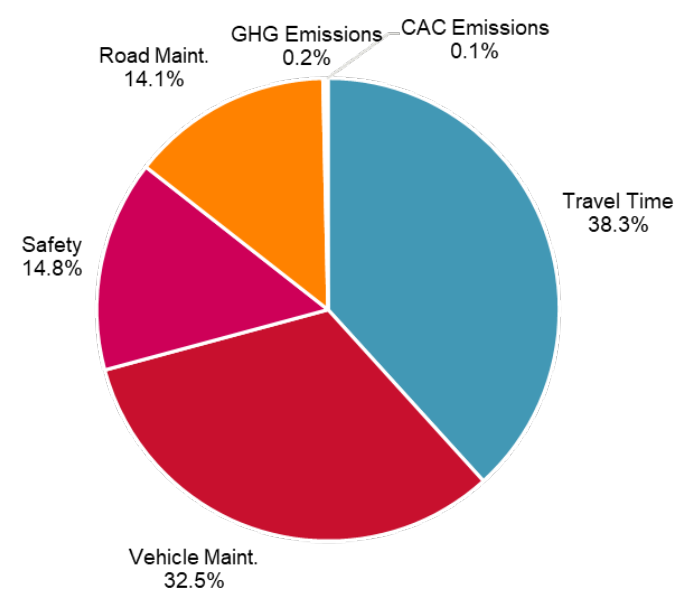
Annual Discounted Benefits and Costs



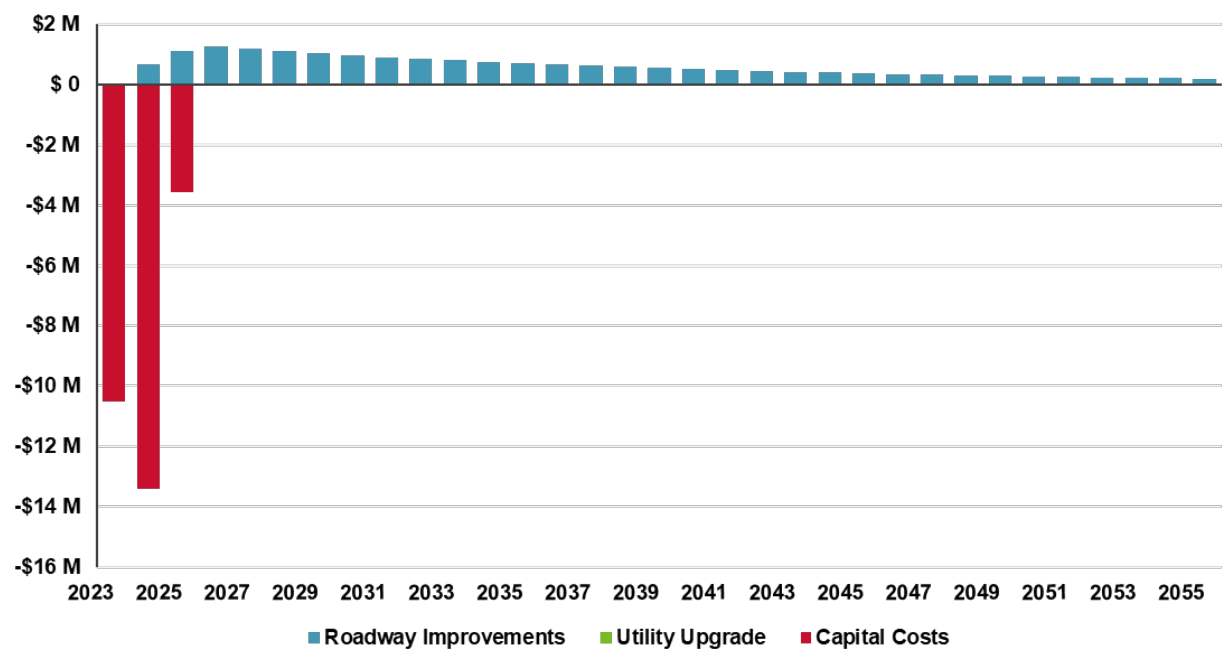
# Results – Scenario 7 (Basic Roadway Paving)

Values in 2020 dollars							
Discounted Total Benefits		Discounted Total Costs		Discounted Net Impact		Benefit-Cost Ratio	
\$18.8 M		\$19.0 M		-\$0.1 M		0.99	
Segment A	\$9.3 M	Segment A	\$10.5 M	Segment A	-\$1.2 M	Segment A	0.89
Segment B	\$6.9 M	Segment B	\$6.7 M	Segment B	\$0.2 M	Segment B	1.03
Segment C	\$2.7 M	Segment C	\$1.8 M	Segment C	\$0.9 M	Segment C	1.49

Discounted Benefits by Category



Annual Discounted Benefits and Costs





# Project Funding Supporting Details

# Rebuilding American Infrastructure with Sustainability and Equity Grants Program (RAISE)

- Federal funding program succeeding Transportation Investment Generating Economic Recovery (TIGER) and Better Utilizing Investments to Leverage Developments (BUILD) grant programs
- Up to \$3.0 billion in annual funding for the program for the next 5 years
- Features and requirements for eligible applicants and eligible projects:
  - Federal share of costs not exceeding 80 percent
  - Include prescribed forms, project narrative, and a CBA with model
  - Meet selection criteria
- Project is well aligned with RAISE program's general scope and objectives
  - Rural project with local important and with a value of less than \$100 million
  - Aligns with the selection criteria under RAISE (economic competitiveness and safety)
- BCR greater than 1 improves chances of an award

# Infrastructure for Rebuilding America Grants (INFRA)

- Current funding amounts for \$8 billion over 5 years with an additional \$6 billion authorized for future appropriations
- Set amount set-aside for small projects with total costs less than \$100 million
- Program features (for small projects):
  - *Cost-effectiveness of the project and the effect of the proposed project on mobility in the State and the region in which the project is carried out*
  - Meet selection criteria
  - INFRA may be used for up to 60 percent of the future eligible project costs and federal share may not exceed 80 percent of future eligible project costs
- While the Project less well suited for INFRA, it is well aligned with general program objectives
  - Certain projects costs (e.g., utility installation and repairs) may not be eligible for this funding

# Rural Surface Transportation Program

- \$2 billion in funding over the next 5 years, where funding for FY 2022 is set at \$300 million
- Goal to improve and expand the surface transportation infrastructure in rural areas
- Focused on projects that would:
  - Increase regional connectivity
  - Improve safety and reliability of people and freight movement
  - Generate regional economic growth
  - Improve quality of life
- Projects selected must be cost-effective, implying a CBA may be required
- Future NOFO will provide more insight on the detailed project requirements and cost eligibility

# Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT)

- Grants for resilience improvements through formula funding and competitive grants to projects that protect surface transportation assets and make them more resilient
- Encompasses three programs for capital improvement projects:
  - Resilience Improvement Grants (\$980 million over the next 5 fiscal years)
  - Community Resilient and Evacuation Grants (\$140 million over the next 5 fiscal years)
  - At-Risk Coastal Infrastructure Grants (\$140 million over the next 5 fiscal years)
- Project expected to improve the resiliency of Captain's Bay Road and may be a good candidate for the Resilience Improvement Grants
  - Project also well-aligned for the At-Risk Coastal Infrastructure Grants but funding for this program is relatively small
- Future NOFO will provide more insight on the detailed project requirements and cost eligibility



# Denali Commission

- Denali Commission's Transportation Program has two main components: rural roads and waterfront development
  - Roads component targets basic road improvement projects that connect rural communities to one another and the state highway system as well as to enhance rural economic development
- Roads program has been unfunded for several years but receiving \$15 million for DOT&PF's COVID Response Funds to fund its program for 2022
- Denali Commission designated to receive \$75 million to fund rural transportation projects over 5 years
- Program requirements currently being developed and NOFO will be issued once requirements are finalized
  
- Best approach is to leverage Denali Commission's Transportation Program as local match for federal funds
  - Can also target specific, lower-cost components of the Project

# Transportation Infrastructure Finance and Innovation Act Loans

- Federal credit program for eligible transportation projects of national or regional significance
- 3 forms of credit assistance: secured (direct) loans, loan guarantees, and standby lines of credit
- TIFIA Rural Project Initiative:
  - Eligible projects in a qualified rural areas can obtain a loan offering significant savings over traditional TIFIA loans and other commercial financing products, including:
    - Up to 49 percent of the project's eligible costs
    - Fixed interest rates equal to one half of the Treasury rate of equivalent maturity of the loan at the time of closing
    - Borrower fee may be waived if cost of the eligible project is under \$75 million
- While the Project matches will with the program, it is a financing mechanism
  - Loan will have to be repaid and long-term funding sources would still have to be identified

# Alaska Statewide Transportation Improvement Program (STIP)

- STIP is a staged, multi-year, statewide intermodal programs of transportation projects proposed for federal funding
- Alaska STIP is a 4-year program for transportation system preservation and development
- DOT&PF nominates projects on the NHS and the Alaska Highway System based on:
  - Need to upgrade sections that are below standards
  - Accomplish initial hard surfacing or pavement rehabilitation
  - Provide safety improvements of capacity increases
- Projects nominated by the public fall under the Community Transportation Program
  - For local road, transit development or technology uses to improve traffic flow or safety
- Alaska STIP approved funding of \$680 million for FY2022
- New federal-aid highway formula funding to provide \$3.5 billion in highway funding for Alaska over 5 years to construct, rebuild, and maintain its roads and highways
- Project suitable for the Community Transportation Program and recommendation for STIP