Benefit-Cost Analysis for the Marine Service Center Sheetpile Wall and Crane Replacement Sitka, Alaska

Prepared by:
Cordova Consulting
P.O. Box 1134
Chickaloon, AK 99674
(907) 957-0581

April 2022

Table of Contents

Introduction 1
Assumptions Used for this Analysis 2
Transportation Cost Differential 2
Avoided Travel 5
Vessel/Vehicle Avoided Travel 5
Vessel and Vehicle Emissions Avoided 7
Opportunity Cost of Time 10
Noise and Congestion 14
Avoided Cold Storage Replacement 15
Summary Benefits Calculations 17
Qualitative Considerations 20
Safety 20
Quality of Life 20
Community Cohesiveness 20
Vessel and Infrastructure Damage 20
Employment 20
Cost Estimates 21
Benefit-Cost Summary 23
Risk and Uncertainty 24
Interview Results 25

Table of Tables

Table 1 -MSC Seawall Users 1
Table 2 -Additional Transportation Costs Associated with Frozen Fish Product – Low and High Case 4
Table 3 -Avoided travel benefit calculation for F/V Eyak 6
Table 4 -Avoided travel benefit calculation for fishing vessels 7
Table 5 -Avoided Emissions for F/V Eyak 9
Table 6 -Avoided Emissions for fishing vessels 10
Table 7 -Opportunity Cost of Time for F/V Eyak 12
Table 8 -Opportunity Cost of Time for fishing vessels 13
Table 9 - Noise and Congestion benefits from avoided vehicle traffic 14

Table 10 – Avoided Travel Benefits Summary – Year One 15
Table 11 -Cold Storage Refrigerated Container Cost estimates 16
Table 12 -Cost Differential in Electric Utilities using Freezer Vans 17
Table 13 -Low Case Scenario Net Present Value Benefit Summary 18
Table 14 -High Case Scenario Net Present Value Benefit Summary 19
Table 15 – Sheetpile Wall and Crane Replacement Cost Estimate 21
Table 16 – Sheetpile Wall and Crane Replacement Residual Value 22
Table 17 – Net Present Value Sheetpile Wall and Crane Replacement 23
Table 18 -Seawall and Crane Replacement Benefit to Cost Summary 24

Introduction

The Marine Service Center bulkhead wall in Sitka is in danger of imminent failure. A 2011 PND Engineers report states that the wall had perhaps another five years of useful life. A 2021 update to that report by PND reveals that repair of the existing wall is not recommended and that a new wall to the seaward side of the existing structure should be built. The City and Borough of Sitka wishes to replace this more than 46-year-old seawall because if the seawall fails the upland cold storage facility which sits partially on the wall will need to be condemned. The tie-backs used for the seawall sit under the cold storage facility.

The Marine Service Center at Sitka serves a variety of customers. Passenger ships, fishing vessels, trampers, sailing vessels, government vessels, and barges can all use it. Many of these vessels can find workarounds using other harbors in Sitka though overcrowding conditions will get worse as a result. Table 1 describes some of the seawall users, whether they need cold storage or the crane, and the commodity typically coming over the seawall.

Table 1 -MSC Seawall Users

Users	Cold Storage	Commodity over wall	Crane/hoist
North Pacific Seafoods (previous Sitka Sound Seafoods)	yes	Bait	yes
Seafood Producers Cooperative (SPC)	yes	Fiber, salt, machinery, bait, ice, and inbound/outbound fish	yes
Eyak (supplies to outlying villages)	no	Fuel, groceries, mail, outbound fishfood for hatchery	yes
Passenger Ships	no	Passengers	no
Coast Guard	no	Crew changes, supplies	no
Fishing Vessels	yes	Fish, bait, ice, and supplies	yes

The Seafood Producers Cooperative mentioned in Table 1 is owned by over 500 members who fish the waters of the North Pacific. Each member is a small boat hook and line fisherman and owner of the cooperative, and therefore receives the benefits of ownership.[1]

North Pacific Seafoods (previously known as Sitka Sound Seafoods) is located .2 miles from the cold storage facility or a 4-minute drive. "The Sitka Sound Seafoods plant started processing in the late 1960s, with North Pacific Seafoods and its sister companies purchasing a majority interest in 1990. A full merger of Sitka Sound and North Pacific was completed in 1997. This plant location has access to northern harvesting areas of Southeast Alaska, from Yakutat to the south end of Baranof Island. The plant processes all species of salmon from all gear types,

[1] https://www.spcsales.com/co-op

halibut, sablefish, rockfish, herring, sea cucumbers, lingcod, Pacific cod, shrimp and Dungeness crab."[2]

Assumptions Used for this Analysis

- The seawall at the Marine Service Center is in danger of imminent failure.
- Once the seawall fails, the cold storage facility will be condemned and unusable as the building partially sits on the seawall.
- The crane used at the MSC is more than 20 years old and in need of replacement.
- Vessels delivering seafood product at this location will need to find alternate drop-off points for unloading their catch.
- Vessels with disembarking passengers may need to lighter passengers to shore on smaller vessels.
- The cold storage facility receives between 11 million (low case) and 18 million (high case) pounds of fish product annually.
- There is insufficient cold storage available in Sitka to replace the Marine Service Center 21,000 square foot facility.
- Refrigerated freezer vans can help fill that gap but at a much higher cost.
- Of the two main tenants at the cold storage facility, one would continue to operate out of Sitka with the freezer vans and the other would flash freeze product and immediately ship from town.
- The ability to consolidate product is an important component for keeping costs down in the export of frozen fish. Freezer vans will not allow for this activity.
- The loss of one of the cold storage users will result in the loss of 10-20 jobs for 4 months of the year as consolidation will need to take place in the Pacific Northwest (PNW) rather than in Sitka.

Transportation Cost Differential

Fish harvest arrives at the cold storage facility from the various seafood processing plants in Sitka. It is estimated that freezer vans can be used to supplement the loss of the cold storage facility once it is condemned. The cost of using freezer vans will be much higher and will put additional strain on the City's electrical system. Estimates of that additional cost to the electric utility company are not included in this assessment but could be substantial.

[2] https://www.northpacificseafoods.com/sitka-sound-seafoods.html

Additional costs to the seafood processers estimated in this analysis derive from the lack of storage space and capability to consolidate product using the cold storage facility. The capability to consolidate product in advance of transport cannot be accomplished with freezer vans. Consolidation is a necessary function of the fish harvest as lots of fish are purchased by fish type, quality, and size. So, a load of chum salmon, for instance, could have 16 different lots based on the fish's quality and size. The inability to consolidate product at Sitka means that all product is shipped to the Pacific Northwest, either Seattle or Bellingham, and consolidation must take place there. The challenge then becomes one of filling each cold storage container with the same lots of fish. Partial lots result in the shipper paying for the entire container, even if only partially full.

Interviews conducted with users of the MSC dock asked what they would do when the seawall fails, and the cold storage facility is condemned. All responses indicated that conducting their business in Sitka would get much harder. There are other docks in town where they might be able to deliver their catch, but the harbors are busy and there would undoubtedly be delays. Some said they would deliver to tenders who would then attempt to find dock space to offload the product. Some said they would lighter their catch by small vessel to other port locations. Those finding other port locations would then have to truck their catch to the processing plant.

Once the seafood product is in its finished state at the processing plant, the product would then need transport to another location for cold storage. The cost of cold storage in Sitka is about $0.043 per pound and the electric utility bill for the cold storage facility is shared by the two main tenants. One option is to store the product in freezer vans until transport can be arranged to a cold storage facility where consolidation and packaging can be completed. The cost of cold storage space on a per pound basis is higher in the Pacific Northwest by about $0.05 per pound.

Cold storage users reveal that 72.22 percent of their product gets shipped directly to customers once they have been able to consolidate. The inability to consolidate in Sitka requires that seafood processors must now pay for PNW storage space until consolidation can take place. Shippers give a discount to their customers for these through rates of about $0.01 per pound of product. So, the product can be consolidated in Sitka, put in a van for the customer, and then shipped directly to places like Japan without having to stopover in the Pacific Northwest. The inability to consolidate in Sitka adds this additional cost of product storage in the PNW to the processor to bear.

The inability to consolidate in Sitka also puts strain on the processor's financial cash flow as a bill of lading issued in Sitka can be 4 to 6 weeks ahead of a bill of lading issued in Seattle. Both seafood processors said that loss of cold storage capability would put financial strain on their organizations and would require a rethinking of their business model. Some product may no longer be viable. One processor who has cold storage space in PNW said it would add about $250,000 in annual costs to their bottom line. The other processor who does not currently have cold storge space in PNW said it would add between $400,000 and $800,000 in costs to their bottom line. Some of this cost has been captured with the additional storage fees and the loss of discount to their customers. Another portion of this cost is the additional labor requirements in the PNW. We have not estimated these costs as it is a transfer from one region to another.

The amount of product moving through the cold storage facility fluctuates from year to year given harvest success, regulatory environment, and sometimes weather and abilities of the fishing fleet. For this reason, this benefit analysis uses a low and high calculation to account for those fluctuations over time.

Equation 1 demonstrates the calculation for these additional transportation costs.

Equation 1: $TCD_{(year)} = [FP_{(year)} \times P \times CD] + [(1-P) \times (CD + TR)]$

Where:

$TCD_{(year)}$ is the value of the transportation cost differential for in a particular year

$FP_{(year)}$ is the pounds of frozen product for the given year

P is the percent of product shipped straight through to customers after consolidation in PNW

CD is the cost differential between Sitka and Pacific Northwest cold storage facilities

TR is the through rate differential for product which must now travel to PNW prior to shipping on to customer

Table 2 -Additional Transportation Costs Associated with Frozen Fish Product – Low and High Case

	Low Case	High Case
Year	**Add'l Transport Costs**	**Add'l Transport Costs**
2024	$ 437,490	$ 699,984
2025	$ 437,490	$ 699,984
2026	$ 437,490	$ 699,984
2027	$ 437,490	$ 699,984
2028	$ 437,490	$ 699,984
2029	$ 437,490	$ 699,984
2030	$ 437,490	$ 699,984
2031	$ 437,490	$ 699,984
2032	$ 437,490	$ 699,984
2033	$ 437,490	$ 699,984
2034	$ 437,490	$ 699,984
2035	$ 437,490	$ 699,984
2036	$ 437,490	$ 699,984
2037	$ 437,490	$ 699,984
2038	$ 437,490	$ 699,984
2039	$ 437,490	$ 699,984
2040	$ 437,490	$ 699,984
2041	$ 437,490	$ 699,984
2042	$ 437,490	$ 699,984
2043	$ 437,490	$ 699,984
Totals	**$ 8,749,800**	**$ 13,999,680**

Avoided Travel

The F/V Eyak provides a special service to Sitka and the surrounding villages as it delivers mail, groceries, building supplies, fuel, and other necessities. F/V Eyak made 80 trips to the MSC seawall in 2019 to complete these activities. If the MSC seawall were unavailable, deliveries would have to be made to the Gary Paxton Industrial Park dock, 7.7 miles away, and F/V Eyak would have to travel 5.3 nautical miles to reach that destination and pick up delivery items.

This benefit category estimates the number of vehicle trips and vessel trips that would have to be made as a result of the seawall failure. Mail and groceries would be delivered to the GPIP location when it is known that the Eyak will be arriving as there is no place to store product at the site. It is estimated that at least two vehicles would need to travel to GPIP for this purpose, one for the mail and one for groceries. It is further estimated that half of the annual trips would require a third vehicle to deliver fish food or construction materials for delivery to neighboring villages.

Vessel/Vehicle Avoided Travel

The F/V Eyak made 80 trips to the MSC seawall in 2019 in order to pick up groceries, mail, fuel, fish food, and construction supplies for the outlying villages. Fish food is delivered to the Port Armstrong Fish Hatchery. Once the seawall fails, all of these deliveries will need to go to the Gary Paxton Industrial Park dock as this dock can support these activities. It is 7.7 miles from the MSC seawall to the GPIP dock. The USPS and the grocery stores are each expected to meet the Eyak when it arrives for transport of mail and other purchases. Using the RAISE guidance for mileage at $0.94 per mile, both the mail delivery and the grocery deliveries add $1,158 in additional travel costs to the Eyak's business. It is estimated that about half of Eyak's trips include fish food for the fish hatchery and building materials for the outlying villages. Each of these trips add $579 annually in additional travel costs.

The F/V Eyak must travel from the MSC seawall to the GPIP dock to pick up these supplies. It is a distance of 5.3 nautical miles. Assuming a travel rate of 8.3 nautical miles per hour and a vessel hourly operating cost of $436, the round-trip cost of this additional travel is $44,572 annually. It could be expected that population growth would increase these trips over time. However, the population of Sitka and the surrounding villages has been mostly stable in recent years (in some cases declining) so the avoided travel is at a consistent rate over the 20-year period of analysis. There is no difference between the low and high case scenarios as it pertains to avoided travel for the Eyak and the supply vehicles.

Total avoided travel for both the Eyak and the vehicles supplying it is valued at $48,046 annually. See Table 3.

Table 3 -Avoided travel benefit calculation for F/V Eyak

Avoided Travel					
Eyak Transportation Calculations	**NM**	**# of annual trips**	**Hourly Operating Costs**	**Time for round trip (hrs)**	**Added Transport Cost**
		(a)	**(b)**	**(c)**	**(a * b * c)**
Vessel mileage reason					
Difference in travel from MSC to GPIP	5.3	80	$436	1.28	$44,572.01

Vehicle mileage reason	**Miles**	**# of annual trips**	**Mileage Rate (per mile)**	**Round Trip Miles**	**Added Transport Cost**
	(a)	**(b)**	**(c)**	**(a * b * 2 = d)**	**(c * d)**
MSC to GPIP for mail delivery	7.7	80	$0.94	1,232	$1,158.08
MSC to GPIP for grocery delivery	7.7	80	$0.94	1,232	$1,158.08
Travel from seafood processing plant to GPIP with fish food	7.7	40	$0.94	616	$579.04
Travel from downtown to GPIP with construction materials	7.7	40	$0.94	616	$579.04

Value of Additional Travel for Eyak pick-ups and deliveries	**$48,046.25**

In addition to the Eyak, fishing vessels currently delivering to the MSC for fish processing will need to modify their behavior once the MSC seawall fails. Telephone interviews with vessels currently using the MSC dock for seafood transport reveals that 65 percent of the vessels would travel to Silver Bay, the Gary Paxton Industrial Park, to offload their vessel and then transport their catch by vehicle to their respective fish processing plants, either Sitka Producers Cooperative (SPC) or the North Pacific Seafoods (previously Sitka Salmon Shares) locations. Other respondents thought they might deliver to a floating processor, one of the other docks in town, anchor out and lighter their catch to shore, and all said it would be harder to schedule and will put additional pressure on already crowded docks in town. This additional travel by vessels and vehicles can be avoided with improvements to the MSC seawall.

Avoided vessel traffic for the fishing vessels is valued at $13,705 and the avoided vehicle traffic is valued at $1,340 for a total avoided travel of fishing vessels of $15,045 annually. See Table 4.

Table 4 -Avoided travel benefit calculation for fishing vessels

Avoided Travel					
Fishing Vessel Transportation Calculations	**NM**	**Number of annual trips**	**Hourly Operating Costs**	**Time for round trip (hrs)**	**Added Transport Cost**
		(a)	**(b)**	**(c)**	**(a * b * c)**
Vessel mileage reason					
MSC to Silver Bay (GPIP)	5.3	43.55	$246	1.28	$13,656.70
MSC to NPS dock	0.17	4.69	$246	0.04	$48.23

Vehicle mileage reason	**Miles**	**Number of annual trips**	**Mileage Rate (per mile)**	**Round Trip Miles**	**Added Transport Cost**
	(a)	**(b)**	**(c)**	**(a * b * 2 = d)**	**(c * d)**
Travel from Silver Bay (GPIP) to NPS	5.9	108.88	$0.94	1,285	$1,207.64
Travel from Silver Bay (GPIP) to SPC	6.0	11.73	$0.94	141	$132.26

Value of Additional Travel for Fishing Vessel pick-ups and deliveries	**$15,044.83**

This additional time for fish product to get from fishing vessel to processing plant can lead to degradation of the fish product and a reduced price to the fishermen. There is no attempt made here to quantify this reduction in fish value. In addition, the local fishing fleet and the processing plants have learned that value-added seafood product has higher returns on the investment than the raw product. Fisheries throughout the State of Alaska have improved these value-added activities in recent years that have allowed fishermen to weather the ups and downs of the fishing industry.

Vessel and Vehicle Emissions Avoided

"Transportation infrastructure projects may also reduce the transportation system's impact on the environment by lowering emissions of air pollutants that result from production and combustion of transportation fuels. The economic damages caused by exposure to air pollution represent externalities because their impacts are borne by society as a whole, rather than by the travelers and operators whose activities generate those emissions. Transportation projects that reduce overall fuel consumption, either due to improved fuel economy or reduction in vehicle miles traveled, will typically also lower emissions, and may thus produce climate and other

environmental benefits. Conversely, projects that lead to increased vehicle miles traveled, such as through induced demand, may lead to an increase in emissions."[3]

Once the MSC seawall fails, the F/V Eyak will need to drop off and receive product at the GPIP dock and vehicles will need to travel the additional distance to get products to the dock when the Eyak is scheduled to arrive. Mileage, nautical miles, and number of trips are the same as the avoided travel calculations.

This analysis takes a conservative approach for vessel emissions and uses the 2010 total cost per cylinder for Stoichiometric Gasoline Direct Injections[4] and assumes at least one 8-cylinder engine for the Eyak. The 2010 cost per cylinder from the National Highway Transportation Safety Administration Final Regulatory Impact Analysis was $67.00. Updating this to 2020 dollars using deflator indexes from the Bureau of Economic Analysis results in $74.26 per cylinder in emissions reduction. (Calculation: $67 * 113.648(2020$) / 102.532(2010$) = $74.26)

The value of vessel emissions due to additional travel when the MSC dock is no longer useable is $11,987 annually. The avoided travel is comprised of activity for the F/V Eyak and the fishing vessels currently delivering product at the MSC dock. This amount rises slightly throughout the 20-year period of analysis as the damage costs of emissions per metric ton rise. See Table 5 for emissions calculations for the Eyak and Table 6 for emissions calculations for fishing vessels currently using the MSC dock.

Equation 2: $E_{(year)} = T_{(year)} \times H \times VE + M_{(year)} \times MT$

Where:

$E_{(year)}$ is the value of the emissions during a particular year

$T_{(year)}$ is the number of trips per year

H is hours of traveling for the given year for vessels

VE is the vessel emissions per hour

M is the miles of travel for vehicles in a given year

MT is the value of metric tons of emissions per mile traveled

The benefit/cost analysis guidance for the FY2022 RAISE grant applications provides an estimate of 0.01018 metric tons of CO_2 emissions for gas light-duty trucks which we use here for the emissions calculations. We also assume that these vehicles are getting about 10 miles to the gallon and that the speed for vehicles will average about 45 miles per hour. The value of a metric ton of CO_2 emissions is $55.00 for the 2024 and then rises to $77.00 by 2043. There is no

[3] Benefit-Cost Analysis Guidance for Discretionary Grant Programs – March 2022.
[4] https://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FRIA_2017-2025.pdf

difference between the low and high case for the Eyak and fishing vessels transportation benefit category.

Table 5 -Avoided Emissions for F/V Eyak

Emissions

Eyak Transportation Calculations	NM	# of annual trips	Time for round trip (hrs)	Vessel Emissions per Hour	Vessel Emissions
		(a)	(b)	(c)	(a * b * c)
Vessel mileage reason					
Difference in travel from MSC to GPIP	5.3	80	1.28	$74.26	$7,587.43

Vehicle mileage reason	Miles	# of annual trips	Total Miles Round Trip	Metric Tons of CO2 [1]	Vehicle Emissions
	(a)	(b)	(a * b * 2 = c)	(c /10 * .01018 = d)	(d * 1) thru 2030 then (d * 2)
GPIP with construction materials	7.7	80	1,232	1.25	$68.98
MSC to GPIP for grocery delivery	7.7	80	1,232	1.25	$68.98
MSC to GPIP for mail delivery	7.7	40	616	0.63	$34.49
Travel from seafood processing plant to GPIP with fish food	7.7	40	616	0.63	$34.49

Emissions Calculations for Eyak pickups and deliveries	**$7,794.37**

Notes: 1. Metric tons of CO2 assumes 10 miles to the gallon for gas and .01018 MT to the gallon per RAISE monetized values

In addition to the avoided travel for Eyak deliveries, fishing vessels will also have added transportation costs for their operations. Telephone interviews with fishermen delivering product at the MSC dock reveal that 65 percent of them would deliver their catch to Silver Bay, the Gary Paxton Industrial Park, and then truck the harvest to the Sitka Producers Cooperative where they have processing agreements. In addition, 7 percent of respondents said they would deliver to the Sitka Salmon Shares dock rather than the MSC dock. Both of these calculations form the avoided emissions calculations for the MSC seawall.

Table 6 -Avoided Emissions for fishing vessels

Emissions

Fishing Vessel Transportation Calculations	NM	Number of annual trips	Time for round trip (hrs)	Vessel Emissions per Hour	Vessel Emissions
		(a)	(b)	(c)	(a * b * c)
Vessel mileage reason					
MSC to Silver Bay (GPIP)	5.3	43.55	1.28	$74.26	$4,130.41
MSC to NPS dock	0.17	4.69	0.04	$74.26	$14.59

Vehicle mileage reason	Miles	Number of annual trips	Total Miles Round Trip	Metric Tons of CO2 [1]	Vehicle Emissions
	(a)	(b)	(a * b * 2 = c)	(c /10 * .01018 = d)	2023 values
Travel from Silver Bay (GPIP) to NPS	5.9	108.88	1,285	1.31	$71.93
Travel from Silver Bay (GPIP) to SPC	6.0	11.73	141	0.14	$7.88

Emissions Calculations for fishing vessel pickups and deliveries	**$4,224.81**

Notes: 1. Metric tons of CO_2 assumes 10 miles to the gallon for gas and .0108 MT to the gallon per RAISE monetized values

Total emissions avoided for the Eyak and the fishing vessels is $11,732 in the first year of the benefit calculations. These emissions avoided rise slightly in accordance with the RAISE damage costs per emissions for CO_2 greenhouse gases.

Opportunity Cost of Time

The opportunity cost of time measures the choice of the next best alternative to the thing chosen. In this case, vessel operators must stay on their vessel during travel to alternate harbors. Vessel operators would generally elect to continue with fishing activity, but they could elect to do something else with their time. For instance, being with family, visiting with friends, and enjoying all that Alaska has to offer. Given the absence of data supporting additional fishing effort, we assume that the leisure rate of 1/3 the hourly rate is the opportunity cost of time.

The vessel operator's opportunity cost of time is based on the leisure rate for captain, deckhand, and two mates operating the vessel and those hourly rates were obtained from the Alaska Department of Labor and Workforce Development.[5] Total value of the opportunity cost of time for the vessels – both Eyak and fishing vessels - is $8,709 annually.

[5] http://live.laborstats.alaska.gov/wage/index.cfm?at=01&a=000000#g53

The vehicle operator's opportunity cost of time uses the same numbers of trips and mileage as the avoided travel calculation. The hourly rate for the truck drivers is based on the values from the FY 2022 Benefit Cost Analysis Guidance from the US DOT site.[6] The hourly rate is $32.00, and we use the same time estimate as the avoided travel benefit. See Table 7 for OCT of Eyak crew and Table 8 for OCT for fishing vessel crews. We do not increase this benefit over time as the future is unknown for the demand for additional travel to the neighboring communities. Nor do we have data to support additional harvests of fishing vessels. Total opportunity cost of time for the vehicle operators is $3,077 annually.

Equation 3: $OCT_{(year)} = C_{(year)} \times H \times W \times R_{vessel} + C_{(year)} \times T \times R_{vehicle}$

Where: $OCT_{(year)}$ is the value of cost of time for workers on transported vessels and vehicles in a given year

$C_{(year)}$ is the number of trips for the year

H is the hours associated with travel to alternate ports

W is the number of workers in that particular position on the vessel

R_{vessel} is the wage rate from the State of Alaska Dept. of Labor and Workforce Development for May 2018 divided by 3 to determine the leisure rate

T is the travel time from MSC to GPIP dock

$R_{vehicle}$ is the wage rate for the truck driver

Total OCT for the added travel for the F/V Eyak as a result of loss of the MSC seawall is $5,632 annually. The OCT for vehicle drivers is $2,082 annually based on $32.00 hourly rate for light truck drivers. The opportunity cost of time for fishing vessel crew is $3,076[7] and the OCT for vehicle drivers associated with fishing vessels is $1,046. Total OCT for both the Eyak and fishing vessels is $11,837 annually. This amount remains consistent over the 20-year period of analysis as the change in vessel deliveries are not known at this time. The opportunity cost of time calculation is the same for the low and high case scenarios.

[6] https://www.transportation.gov/sites/dot.gov/files/2022-03/Benefit%20Cost%20Analysis%20Guidance%202022%20%28Revised%29.pdf

[7] Wage rates for fishing captain and crew based on March 2020 published hourly rates from the Alaska Department of Labor and Workforce Development. https://live.laborstats.alaska.gov/wage/index.html

Table 7 -Opportunity Cost of Time for F/V Eyak

Opportunity Cost of Time

Eyak Transportation Calculations	Leisure Rate Captain	Leisure Rate Deckhand	Leisure Rate Mate (2)	Number of annual trips	Time for round trip (hrs)	Added Transport Cost
	(a)	(b)	(c)	(d)	(e)	[(a + b + c) * d *e]
Vessel mileage reason						
MSC to GPIP	$17.94	$14.05	$23.13	80	1.28	$5,631.88

Vehicle mileage reason		Truck Driver Hourly Value	Number of annual trips	Time for round trip (hrs)	Added Transport Cost
		(a)	(b)	(c)	(a * b * c)
MSC to GPIP for mail delivery		$32.00	80	0.27	$694.04
MSC to GPIP for grocery delivery		$32.00	80	0.27	$694.04
Seafood processing plant to GPIP with fish food		$32.00	40	0.27	$347.02
Downtown to GPIP with construction materials		$32.00	40	0.27	$347.02

Opportunity Cost of Time for Eyak pickups and deliveries	**$7,714.01**

Similar to the F/V Eyak, fishing vessels must also engage in additional travel, both for their vessels and for vehicles that must now get product from one dock to another or to the processing plant. The Opportunity Cost of time for the fishing vessel operators is $3,076 annually and the vehicle drivers have an OCT of $1,029 annually.

Table 8 -Opportunity Cost of Time for fishing vessels

Opportunity Cost of Time

Fishing Transportation Calculations	Leisure Rate Captain	Leisure Rate Deckhand	Leisure Rate Mate (2)	Number of annual trips	Time for round trip (hrs)	Added Transport Cost
	(a)	(b)	(c)	(d)	(e)	[(a + b + c) * d *e]
Vessel mileage reason						
MSC to Silver Bay (GPIP)	$ 17.94	$14.05	$23.13	43.55	1.28	$3,065.85
MSC to NPS dock	$ 17.94	$14.05	$23.13	4.69	0.04	$10.83

Vehicle mileage reason		Truck Driver Hourly Value	Number of annual trips	Time for round trip (hrs)	Added Transport Cost
		(a)	(b)	(c)	(a * b * c)
Silver Bay (GPIP) to NPS		$32.00	108.88	0.27	$944.55
Silver Bay (GPIP) to SPC		$32.00	11.73	0.27	$101.72

Opportunity Cost of Time for fishing vessels pickups and deliveries	**$4,122.95**

Noise and Congestion

Noise and congestion, while admittedly low for rural areas, still have impact on the local population and can be quantified as per the BCA Guidance updated in 2022. Using the miles traveled for the vehicles serving both the F/V Eyak and the various fishing vessels delivering product to the seafood processing plants, we can estimate those benefits. See Table 9.

Table 9 - Noise and Congestion benefits from avoided vehicle traffic

Vehicle mileage reason	Round Trip Miles Annually		Noise	Congestion	Totals
	Eyak	Fishing			
Travel from MSC to GPIP for mail delivery	1,232		$0.0033	$0.0670	$86.61
Travel from MSC to GPIP for grocery delivery	1,232		$0.0033	$0.0670	$86.61
Travel from seafood processing plant to GPIP with fish food	616		$0.0033	$0.0670	$43.30
Travel from downtown to GPIP with construction materials	616		$0.0033	$0.0670	$43.30
Travel from Silver Bay (GPIP) to NPS		1,285	$0.0033	$0.0670	$90.32
Travel from Silver Bay (GPIP) to SPC		141	$0.0033	$0.0670	$9.89
Value of Noise and Congestion to Additional Travel for Eyak and fishing vessels					**$360.04**

Note: Noise and Congestion values use the rural bus and truck values from the updated Benefit Cost Analysis Guidance for 2022.

Table 10 summarizes Avoided Travel benefits for vessels. vehicles, and workers described so far.

Table 10 – Avoided Travel Benefits Summary – Year One

Benefit Category	First year of benefits	
Avoided vessel travel Eyak	$	44,572
Avoided vessel travel fishing vessels	$	13,705
Avoided vehicle travel Eyak	$	3,474
Avoided vehicle travel fishing vessels	$	1,340
Additional transport costs (low case)	$	437,490
Opportunity Cost of Time vessel operators -Eyak	$	5,632
Opportunity Cost of Time fishing vessel operators	$	3,077
Opportunity cost of time vehicle operators - Eyak	$	2,082
Opportunity cost of time vehicle operators - fishing vessels	$	1,046
Emissions reduced vessel operators - Eyak	$	7,587
Emissions reduced fishing vessel operators	$	4,145
Emissions reduced vehicle operators for Eyak	$	207
Emissions reduced vehicle operator for fishing vessels	$	80
Noise and Congestion vehicle operators	$	360
Total	**$**	**524,797**

Note: This table is showing the 2024 benefits prior to evaluating the net present value.

Avoided Cold Storage Replacement

Additional costs for cold storage in the PNW are not the only cold storage expenditure. Once the seawall fails and the cold storage facility is condemned, seafood processors must find temporary freezer space until they can ship the product. There will not be sufficient space to conduct consolidation of product in the freezer vans so that would still occur in the PNW and is estimated in the Additional Transportation Costs previously described. Seafood processors have suggested they would need refrigerated vans, or reefers, to keep product frozen. One seafood processor said they would just flash freeze product and ship it south on trampers or freighters to their facility in the PNW. It is estimated that the remaining cold storage user would need 25 to 40 vans to hold the product they currently process on an annual basis.

The cost to purchase these vans, if they were to find that many available, is $7,750 per van for a new insulated container. Container vans throughout the country are in short supply. We assume that there will be a need for both used and new equipment as empty vans are in high demand for other reasons. Both the used vans and the new vans will need new refrigeration units as the vans do not generally come equipped with that capability and used vans would no doubt need an upgrade. Costs for new reefer units is $14,427 to $16,174 depending on the age of the unit.[8]

[8] Quote from https://www.marketbook.ca/listings/trailers/for-sale/list/category/804/semi-trailers-reefer-unit-only

The City has sufficient land space to accommodate the freezer vans needed to replace the cold storage facility.

Refrigerated vans needed from the low case to the high case is assumed to be mostly new vans shipped from Seattle and delivered to Sitka. Estimates from Container Specialists of Alaska reveals they do not currently have containers in Seattle, but they have some coming in from overseas and expect to see them shortly. Container Specialists of Alaska also revealed that they have had only a handful of used vans in the past two months.[9] New vans cost $7,750 each and shipping is $1,829.30 per container.[10]

In addition to the cost of establishing a system of refrigerated vans to accommodate the frozen seafood product, there would be additional demands on the City's electric utilities to supply power to these storage units. The City's electric grid is fed primarily by the hydroelectric plant. It is estimated that the City would be able to accommodate this additional usage with current power generation. However, the charge to the customer would be significantly higher as each of the refrigerated vans would need to be tied to the grid. This would allow vans not in use to be shut down, but it would put additional expense on the power operators to service these units. The cold storage unit currently has a monthly electric bill of about $17,000. Customers in Sitka using refrigerated vans have an average monthly bill of about $2,300 per van according to the City's utility engineer.

The cost to supply alternate cold storage with the use of refrigerated vans is estimated between $258,675 and $456,868 depending on the number of vans. The existing seawall is in danger of imminent failure and has been for years, so the cost of replacement freezer capacity begins in the benefit begin year of 2024. The cost differential of electric utilities between the cold storage facility and the freezer vans is between $486,000 and $900,000 annually. See Table 11 and Table 12.

Table 11 -Cold Storage Refrigerated Container Cost estimates

	Low Case 25 Vans			High Case - 40 Vans		
	Number Vans	Cost Each	Total	Number Vans	Cost Each	Total
Refrigerator Vans - Used	2.5	$3,000	$7,500	4	$10,000	$40,000
Reefer units - Used	2.5	$14,427	$31,068	4	$16,174	$64,696
Refrigerator Vans - New	22.5	$7,750	$174,375	36	$7,750	$279,000
Shipping Seattle to Sitka	25	$1,829	$45,733	40	$1,829	$73,172
Total Cost			**$258,675**			**$456,868**

Note: Cost estimates for vans from Alaska Container Specialists of Alaska, cost estimates for reefer units from Marketbook CA, and shipping costs from Samson Tug and Barge.

[9] https://containerspecialtiesak.com/containers/index.htm

[10] Per Samson Tug and Barge which serves Sitka.

Table 12 -Cost Differential in Electric Utilities using Freezer Vans

Electric Utility Expense	Existing Cold Storage [1]	Reefer Vans low case [2]	Reefer vans high case [2]
Annual cost to consumer	$204,000	$690,000	$1,104,000
Total	$204,000	$690,000	$1,104,000
Differential (i.e. increased cost)		**$486,000**	**$900,000**

1. Existing cold storage electric utility bills run about $17,000 per month.
2. Reefer vans in Sitka at another location runs about $2,300 per month for 40-ft van.

Note: Electric utility engineer at City provided cost estimates.

Summary Benefits Calculations

The low case scenario has a net present value for benefits of $8.9 million over the 20-year period of analysis using a 7 percent discount rate for all categories. The net present value increases to $9 million when using the 3 percent discount rate for emissions and 7 percent for all other categories.

The high case scenario has a net present value for benefits of $14.5 million for the same period using the 7 percent discount rate for all categories. The net present value of benefits increases to $14.6 million when using the 3 percent discount rate for emissions and 7 percent discount rate for all other categories.

See Table 13 and Table 14.

Table 13 -Low Case Scenario Net Present Value Benefit Summary

Low Case

Year	Avoided Travel	Add'l Transport Costs	Cold Storage Alternative	OCT	Emissions Avoided	Noise & Congestion	Total	NPV Factor (3%)	NPV Factor (7%)	Net Present Value (3%)	Net Present Value (7%)
2024	$63,091	$437,490	$258,675	$11,837	$35,447	$360	$806,900	0.88849	0.76290	$620,032	$615,580
2025	$63,091	$437,490	$486,000	$11,837	$35,886	$360	$1,034,664	0.86261	0.71299	$743,071	$737,701
2026	$63,091	$437,490	$486,000	$11,837	$36,325	$360	$1,035,103	0.83748	0.66634	$695,950	$689,733
2027	$63,091	$437,490	$486,000	$11,837	$36,764	$360	$1,035,542	0.81309	0.62275	$651,881	$644,884
2028	$63,091	$437,490	$486,000	$11,837	$37,207	$360	$1,035,985	0.78941	0.58201	$610,669	$602,953
2029	$63,091	$437,490	$486,000	$11,837	$37,646	$360	$1,036,424	0.76642	0.54393	$572,122	$563,746
2030	$63,091	$437,490	$486,000	$11,837	$38,230	$360	$1,037,008	0.74409	0.50835	$536,175	$527,162
2031	$63,091	$437,490	$486,000	$11,837	$38,234	$360	$1,037,012	0.72242	0.47509	$502,133	$492,677
2032	$63,091	$437,490	$486,000	$11,837	$38,238	$360	$1,037,016	0.70138	0.44401	$470,289	$460,447
2033	$63,091	$437,490	$486,000	$11,837	$38,242	$360	$1,037,020	0.68095	0.41496	$440,498	$430,326
2034	$63,091	$437,490	$486,000	$11,837	$38,245	$360	$1,037,023	0.66112	0.38782	$412,628	$402,176
2035	$63,091	$437,490	$486,000	$11,837	$38,249	$360	$1,037,027	0.64186	0.36245	$386,554	$375,866
2036	$63,091	$437,490	$486,000	$11,837	$38,257	$360	$1,037,035	0.62317	0.33873	$362,161	$351,280
2037	$63,091	$437,490	$486,000	$11,837	$38,260	$360	$1,037,038	0.60502	0.31657	$339,336	$328,300
2038	$63,091	$437,490	$486,000	$11,837	$38,264	$360	$1,037,042	0.58739	0.29586	$317,979	$306,823
2039	$63,091	$437,490	$486,000	$11,837	$38,268	$360	$1,037,046	0.57029	0.27651	$297,994	$286,752
2040	$63,091	$437,490	$486,000	$11,837	$38,272	$360	$1,037,050	0.55368	0.25842	$279,293	$267,993
2041	$63,091	$437,490	$486,000	$11,837	$38,275	$360	$1,037,054	0.53755	0.24151	$261,793	$250,462
2042	$63,091	$437,490	$486,000	$11,837	$38,279	$360	$1,037,057	0.52189	0.22571	$245,415	$234,077
2043	$63,091	$437,490	$486,000	$11,837	$38,287	$360	$1,037,065	0.50669	0.21095	$230,089	$218,766
Total	**$1,261,822**	**$8,749,800**	**$9,492,675**	**$236,739**	**$754,876**	**$7,201**	**$20,503,112**			**$8,976,061**	**$8,787,705**

Note: The Net Present Value at 3% discount rate is 3% for Emissions only. All other categories are discounted at 7%. The Net Present Value at 7% is all categories discounted at that rate.

Table 14 -High Case Scenario Net Present Value Benefit Summary

	High Case										
Year	**Avoided Travel**	**Add'l Transport Costs**	**Cold Storage Alternative**	**OCT**	**Emissions Avoided**	**Noise & Congestion**	**Total**	**NPV Factor (3%)**	**NPV Factor (7%)**	**Net Present Value (3%)**	**Net Present Value (7%)**
2024	$63,091	$699,984	$456,868	$11,837	$35,447	$360	$1,267,587	0.88849	0.76290	$971,488	$967,036
2025	$63,091	$699,984	$900,000	$11,837	$35,886	$360	$1,711,158	0.86261	0.71299	$1,225,401	$1,220,032
2026	$63,091	$699,984	$900,000	$11,837	$36,325	$360	$1,711,597	0.83748	0.66634	$1,146,726	$1,140,509
2027	$63,091	$699,984	$900,000	$11,837	$36,764	$360	$1,712,036	0.81309	0.62275	$1,073,168	$1,066,170
2028	$63,091	$699,984	$900,000	$11,837	$37,207	$360	$1,712,479	0.78941	0.58201	$1,004,395	$996,678
2029	$63,091	$699,984	$900,000	$11,837	$37,646	$360	$1,712,918	0.76642	0.54393	$940,090	$931,714
2030	$63,091	$699,984	$900,000	$11,837	$38,230	$360	$1,713,502	0.74409	0.50835	$880,070	$871,058
2031	$63,091	$699,984	$900,000	$11,837	$38,234	$360	$1,713,506	0.72242	0.47509	$823,531	$814,074
2032	$63,091	$699,984	$900,000	$11,837	$38,238	$360	$1,713,510	0.70138	0.44401	$770,660	$760,819
2033	$63,091	$699,984	$900,000	$11,837	$38,242	$360	$1,713,514	0.68095	0.41496	$721,219	$711,047
2034	$63,091	$699,984	$900,000	$11,837	$38,245	$360	$1,713,517	0.66112	0.38782	$674,984	$664,532
2035	$63,091	$699,984	$900,000	$11,837	$38,249	$360	$1,713,521	0.64186	0.36245	$631,746	$621,059
2036	$63,091	$699,984	$900,000	$11,837	$38,257	$360	$1,713,529	0.62317	0.33873	$591,313	$580,431
2037	$63,091	$699,984	$900,000	$11,837	$38,260	$360	$1,713,532	0.60502	0.31657	$553,496	$542,461
2038	$63,091	$699,984	$900,000	$11,837	$38,264	$360	$1,713,536	0.58739	0.29586	$518,129	$506,974
2039	$63,091	$699,984	$900,000	$11,837	$38,268	$360	$1,713,540	0.57029	0.27651	$485,050	$473,808
2040	$63,091	$699,984	$900,000	$11,837	$38,272	$360	$1,713,544	0.55368	0.25842	$454,112	$442,812
2041	$63,091	$699,984	$900,000	$11,837	$38,275	$360	$1,713,548	0.53755	0.24151	$425,175	$413,844
2042	$63,091	$699,984	$900,000	$11,837	$38,279	$360	$1,713,551	0.52189	0.22571	$398,109	$386,771
2043	$63,091	$699,984	$900,000	$11,837	$38,287	$360	$1,713,559	0.50669	0.21095	$372,793	$361,470
Total	**$1,261,822**	**$13,999,680**	**$17,556,868**	**$236,739**	**$754,876**	**$7,201**	**$33,817,185**			**$14,661,656**	**$14,473,300**

Note: The Net Present Value at 3% discount rate is 3% for Emissions only. All other categories are discounted at 7%. The Net Present Value at 7% is all categories discounted at that rate.

Qualitative Considerations

Safety

This project will contribute to a reduction in crashes, fatalities, and injuries as vessel owners will be able to continue functioning as they have in the past. The need to travel to alternate ports for product delivery introduces new risks as vessels compete for limited space to conduct their business. The addition of several hundred vehicles on Sitka roads traveling between harbors, seafood processing plants, and competing with the summer tourist traffic will undoubtedly lead to more congestion and the potential for unwanted interactions between vehicles and pedestrians. Telephone interviews with fishermen using the MSC wall to conduct their business reveals that there would be serious inefficiencies to losing this access. Replacing the sheetpile wall at the MSC is an important solution to ensuring the safety of people and equipment working in the fish harvesting business and the many tourists that visit Sitka annually.

Quality of Life

The MSC and associated uplands infrastructure are important components to the Sitka fishing industry. Maintaining this infrastructure allows Sitkans to continue to work where they live and maintain active community ties. Telephone interviews with fishermen using the MSC dock reveals that their ability to continue living and working in this community without the seawall would be strained at the least when the seawall fails.

Community Cohesiveness

The MSC provides an important stopping point for vessels needing to offload product and onload supplies and cargo. It also is an active point of disembarkation for small passenger ship passengers, with almost 1,000 passengers disembarking annually. This location allows for easy access to many downtown activities for tourists.

Vessel and Infrastructure Damage

Vessel and infrastructure damage have not been qualified for this evaluation. The MSC seawall is already beyond its useful life and could fail at any time. Hopefully, that failure would not be catastrophic or involve ships moored at the location or passengers disembarking. There is the potential for vessel damages as vessels such as the Eyak must now traverse longer distances to complete their business.

Employment

There are three employees currently working at the MSC cold storage facility. The loss of the facility would result in the loss of these jobs. One seafood processor reveals that there would be a loss of 10 to 20 seasonal employees if they can no longer conduct consolidation activity in Sitka.

Cost Estimates

Initial cost estimates are $9.4 million in 2020 dollars spread over an 18-month construction season. Contingency is estimated at 25 percent, environmental and permitting at 5 percent, and engineering, design, and construction phase administration are estimated at 15 percent each. See Table 15.

Table 15 – Sheetpile Wall and Crane Replacement Cost Estimate

Description	Units	Qty	Unit Cost ($2021)	Amount ($2021)	Amount ($2020)
Budget as to Sheetpile wall repair and crane replacement:					
Mobilization	LS	1	575,000	575,000	550,000
Demolition & Disposal	LS	1	200,000	200,000	191,000
Misc Underground Utility mods/extensions	LS	1	30,000	30,000	29,000
Misc Site Work - grading, aggregate surfacing	LS	1	40,000	40,000	38,000
Steel Sheet Pile Wall (PZ35)	LF	400	3,700	1,480,000	1,415,000
Horizontal strong-back/water system	LF	800	650	520,000	497,000
Grouted tie-back anchors into bedrock - upper	EA	42	19,500	819,000	783,000
Grouted tie-back anchors into bedrock - lower	EA	42	14,000	588,000	562,000
Washed rock fill btwn original and new wall	CY	2050	110	225,500	216,000
Steel Sheet Pile Wall week holes	EA	320	100	32,000	31,000
Reinforced Concrete wall cap	CY	225	1,250	281,250	269,000
Steel Access Ladder coated	EA	4	4,000	16,000	15,000
Mooring Bollards	EA	5	6,500	32,500	31,000
Berthing Fenders (not used)	LF	0	500	-	-
Timber bull rail	LF	400	125	50,000	48,000
Timber Fender piles	EA	48	7,500	360,000	344,000
Riprap	TON	250	100	25,000	24,000
Cathodic Protection System	LS	1	500,000	500,000	478,000
2-ton Service Standalone Jib Crane	LS	1	35,000	35,000	33,000
Subtotal				**5,809,250**	**5,554,000**
Contingency @ 25%				1,452,313	1,388,500
Environmental & Permitting @5%				363,078	347,125
Design and Geotechnical Engineering @15%				1,089,234	1,041,375
Construction Phase Admin/Eng/Testing @15%				1,089,234	1,041,375
Total Budget Sheetpile Wall and Crane Replacement				***9,803,109***	***9,372,375***

Note: The 2020 cost column is derived using the GDP deflator from Bureau of Economic Analysis. The original cost estimate is from DOWL Engineers and dated July 2021.

At the end of the 20-year period of analysis, there is still value to the project components. See Table 16 for residual value calculations. Total discounted residual value at the end of the 20-year period of analysis is $479,528.

Table 16 – Sheetpile Wall and Crane Replacement Residual Value

Improvement Component	Expected useful life (years)	Residual value after 20 years
Sheetpile Wall	40	$ 1,651,500
Fill	40	$ 258,000
Timber Fenders	40	$ 208,000
Crane	25	$ 7,000
Total Residual Value of improved infrastructure		**$ 2,124,500**
Net Present value of Residual		**$ 479,528**

Periodic maintenance for the facility is assumed at 1 percent of initial construction cost every five years over the 20-year period of analysis. The expected useful life of the cathodic protection is estimated at 15 years so additional cathodic protection is incorporated to the total project cost at year 15. The net present value of the sheetpile wall and crane replacement and periodic maintenance is $8.2 million over the 20-year period of analysis.

The net present value of construction in 2020 dollars is $7,918,423 and the net present value of the periodic maintenance is $282,363. See Table 17.

Table 17 – Net Present Value Sheetpile Wall and Crane Replacement in 2020 dollars

Year	Construction	Periodic Maintenance	Total Cost ($2020)	NPV Factor (7%)	Net Present Value Construction	Net Present Value Periodic Maintenance
2020						
2021						
2022	$4,686,188		$4,686,188	0.87344	$4,093,098	$ -
2023	$4,686,188		$4,686,188	0.81630	$3,825,325	$ -
2024			$-	0.76290		$ -
2025			$-	0.71299		$ -
2026			$-	0.66634		$ -
2027			$-	0.62275		$ -
2028		$93,724	$93,724	0.58201		$ 54,548
2029			$-	0.54393		$ -
2030			$-	0.50835		$ -
2031			$-	0.47509		$ -
2032			$-	0.44401		$ -
2033		$93,724	$93,724	0.41496		$ 38,892
2034			$-	0.38782		$ -
2035			$-	0.36245		$ -
2036			$-	0.33873		$ -
2037			$-	0.31657		$ -
2038		$571,724	$571,724	0.29586		$ 169,152
2039			$-	0.27651		$ -
2040			$-	0.25842		$ -
2041			$-	0.24151		$ -
2042			$-	0.22571		$ -
2043		$93,724	$93,724	0.21095		$ 19,771
Totals	**$9,372,375**	**$852,895**	**$10,225,270**		**$7,918,423**	**$ 282,363**
Total Construction Cost and Maintenance						**$8,200,786**

Note: One percent of total construction cost is assumed at 5-year intervals for maintenance. Additional cathodic protection assumed in year 15 of project.

Benefit-Cost Summary

The low case scenario for the seawall and crane replacement has $3.15 million in net benefits with a benefit to cost ratio of 1.4 when using the 7 percent discount rate. Net benefits rise to $3.3 million with a benefit to cost ratio of 1.42 when using the 3 percent discount rate for emissions and 7 percent discount rate for all other categories.

The high case scenario has net benefits of $10 million with a benefit to cost ratio of 2.27 when using the 7 percent discount rate for all benefits. The high case net benefits rise to $10.2 million

with a benefit to cost ratio of 2.29 when using the 3 percent discount rate for emissions. The project period of analysis of 20 years and dollar value are based on the year 2020.

Table 18 -Seawall and Crane Replacement Benefit to Cost Summary in 2020 dollars

NPV Summary of Calculations	Low Case PV Emissions at 7%	Low Case PV Emissions at 3%	High Case PV Emissions at 7%	High Case PV Emissions at 3%
Benefit calculations - 2020 $$				
Vessel avoided travel	$546,000	$546,000	$546,000	$546,000
Additional Transport Cost	$3,783,000	$3,783,000	$6,053,000	$6,053,000
Opportunity Cost of time	$102,000	$102,000	$102,000	$102,000
Emissions reduced	$324,000	$512,000	$324,000	$512,000
Cold storage replacement	$4,029,000	$4,029,000	$7,445,000	$7,445,000
Noise and Congestion	$3,000	$3,000	$3,000	$3,000
Subtotal benefits summary	**$8,787,000**	**$8,975,000**	**$14,473,000**	**$14,661,000**
Residual Value	$480,000	$480,000	$480,000	$480,000
Repair and maintenance	$282,000	$282,000	$282,000	$282,000
PV Benefits summary	**$9,549,000**	**$9,737,000**	**$15,235,000**	**$15,423,000**
Cost Calculations - 2020 $$				
PV Cost of Project	$7,918,000	$7,918,000	$7,918,000	$7,918,000
PV Net benefits (benefits - costs)	**$1,631,000**	**$1,819,000**	**$7,317,000**	**$7,505,000**
Benefit/cost ratio (benefits/costs)	**1.21**	**1.23**	**1.92**	**1.95**

Note: All values have been rounded to the nearest 1,000th.

Risk and Uncertainty

Some assumptions were used in the evaluation of this project and so the question becomes one of risk if some assumptions are incorrect. Assumptions made in this evaluation are quite conservative to begin with, but we made the following changes to the model to determine the effects:

- If cold storage users changed their business model to flash freeze product and move it directly to market – say 90 percent and that decreases the need for reefer vans to 20 under the low case and 30 under the high case, then the BCR falls to 1.06 for the low case and 1.66 under the high case. It is unlikely that this scenario would happen as the consolidation of fish product by species, size, and quality is what sets the market price.
- If the cost of reefer vans increases – as it undoubtedly has done since our initial inquiry in 2020 – then the BCR under both the high and low cases rise significantly.
- Project costs can increase by 20 percent and the BCR falls to 1.0 for the low case and 1.62 for the high case scenarios.

Interview Results

Interview Protocol for Marine Service Center Wall and Crane - Summary

For the following, questions that need to be asked are in this font. *Background information for you to have handy as to why you are asking a question will be in italics. It might be handy to number these responses either on a hard copy of the questions or using the spreadsheet I've provided.* Responses from interviewees follow the questions in this orange font. There were 20 respondents in total.

Hello, my name is _____ and I'm assisting the City and Borough of Sitka in a Federal grant application for improvements at the Marine Service Center. The grant application is asking for funds to repair the seawall and purchase a new crane. My questions will take about 10 minutes of your time. Is this a good time to talk? *(If the answer is no, ask for a better time for you to connect with them.)*

1. Do you currently use the Marine Service Center facilities? __20____ yes __0____ no
    a. If no, why not? _____*(If no, thank them for their time.)*
2. What services do you use at the MSC? *(Choose all that apply.)*
    a. __15___Moorage *(answer Q3)*
    b. __6___Offloading seafood product *(answer Q4)*
    c. __5___Offloading equipment *(answer Q5)*
    d. __2___Offloading passengers *(answer Q6)*
    e. __1___Crane *(answer Q7)*
    f. __2___Mail delivery *(answer Q8)*
    g. __2___Grocery delivery *(answer Q9)*
    h. __1___Fish food *(answer Q10)*
    i. __2___Construction materials *(answer Q11)*
    j. __4___Other *(please describe)* Gear_____*(answer Q12)*
    k. __6___Other *(please describe)* Fuel_____*(answer Q13)*
    l. __1___Other *(please describe)* Offload Cargo_____*(answer Q12)*
    m. __1___Other *(please describe)* Wood_____*(answer Q13)*
    n. __2___Other *(please describe)* Laundry_____*(answer Q12)*
    o. __2___Other *(please describe)* Supplies_____*(answer Q13)*
    p. __2___Other *(please describe)* Groceries_____*(answer Q13)*

3. If **moorage** is selected as a service being used, how often to you moor at the MSC? __1 to 52 times annually from 19 respondents_____ *(need a number here so if they are having trouble ask for a range.)*

a. How long would you typically stay moored? __1 to 120 hours at a time from 17 respondents_____ (hours)

Summary of responses concerning moorage:

Q3 - Moorage	Low	High	Totals
Annual Moorage	1	52	339
Annual Hours	1	120	483

4. If **offloading seafood product** is selected as a service being used, what would you say is the average annual pounds of product offloaded? Some respondents provided a range. There was a low of 642,000 pounds and a high of 710,000 pounds from 5 respondents. All product was going to the seafood processing plant._____ (pounds)
    a. Of these pounds, what portion is salmon? ___80 to 100%_____ (percentage)
        i. Is this product headed to cold storage or seafood processing? __Processing_____
    b. What portion is Halibut? _____no responses_____ (percentage)
        i. Is this product headed to cold storage or seafood processing? _____
    c. What portion is crab? ____no responses_____(percentage)
        i. Is this product headed to cold storage or seafood processing? _____
    d. What portion is herring? ___no responses_____(percentage)
        i. Is this product headed to cold storage or seafood processing? _____
    e. What portion is other groundfish? __no responses_____(percentage)
        i. Is this product headed to cold storage or seafood processing? _____
    f. What portion is other shellfish? ___no responses_____(percentage)
        i. Is this product headed to cold storage or seafood processing? _____
    g. What portion is sablefish? _____5 to 20%_____ (percentage)
        i. Is this product headed to cold storage or seafood processing? __Processing_____
5. If **offloading equipment** is selected as the service being used, how often on average would you say that you do this annually? ___63 to 64 times annually from 4 respondents_____ times a year *(need a number here so if they are having trouble ask for a range.)*
6. If **offloading passengers** is selected as the service being used, how often would you say that you do this annually? __21 to 52 times annually from 2 respondents_____ times a year *(need a number here so if they are having trouble ask for a range.)*
    a. How many passengers would you say embark/disembark from this location annually? ___no answer provided_____*(this will probably be a range.)*

7. On average, how many times a year does your activity require the use of the **crane** at the MSC? __once every other year from one respondent____*(this might also be a range.)*
8. How often does **mail delivery** occur at the MSC dock? __4 to 5 times a week from 2 respondents_____ times a week
9. How often does **grocery delivery** occur at the MSC dock? __4 to 5 times a week from 2 respondents_____ times a week
10. How often does **fish food delivery** occur at the MSC dock? ___once a week from 1 respondent_____times a week
11. How often are **construction materials** delivered at the MSC dock? __54 times annually from 2 respondents_____times annually
12. How often does the **other** activity occur at the MSC dock? __Other gear was 18 to 20 times annually, Other laundry was 10 times annually_____
13. How often does the **other** activity occur at the MSC dock? __Other groceries was 6 to 8 times annually, and Other cargo/supplies was twice a year._____
14. What are the dimensions of your vessel?
    a. Length _____ (feet) Average length was 65.53 feet from 19 respondents
    b. Draft _____(feet) Average draft was 9.16 feet from 16 respondents
    c. Beam _____(feet) Average beam was 19.51 feet from 16 respondents.
15. The MSC dock is aged and in need of repair. If the MSC dock were no longer available for use, how would you conduct the business you just described in the previous questions? _____
    Responses that follow have not been edited.

Not sure. Need vehicle access. Tried the dock out the road but it didn't work well
Poorly, slowly, more cost. Possibly use a processor
Use Eliason harbor but it gets quite busy. There isn't much space
Anchor out which is very inconvenient.
Would use transient, but not much space
Has a slip in Eliason would use that, but not as convenient
Don't know. It would be a struggle to conduct business in Sitka.
May be able to use the walk down ramp at the end of the road. Possibly run freight across the processor's dock. But couldn't do it easily and would probably not be able to get the stuff off the semi-trailers.
Would have to use the drive down at Silver Bay
Possibly use SSS dock
It would be challenging. He is contracted with SPC to tender so would use SPC however, that creates a problem while they also try to service their fleet
Would use the processing plant but would be harder to schedule
It would suck. It would put more pressure on the harbor scene.
Transient float and at birth 9 or 10 but it's difficult to tie and untie when it's windy.
Would use Silver Bay or New Thompsen
Anchor out and have to do goofy stuff to get the gear to shore.
Would tie up to the fuel dock until they were kicked off
ANB or stall/transient at Eliason
Would have to deliver to tenders

(I think we need to leave this open-ended depending on how many activities were selected above. If multiple activities selected, you might need to ask about each one separately.)

16. Do you use the cold storage facility on the MSC dock? ___4___ yes __8____ no and 9 did not respond to this question.
    (If no, skip to Q19.)
17. As we just mentioned, the MSC dock is aged and needs repairs which may impact the cold storage facility. If cold storage were not available at the MSC dock, where would you store your product?
    a. __2___ another facility in Sitka *(skip to Q19.)*
    b. _____ would get a freezer van *(skip to Q19.)*
    c. _____ would ship to PNW storage facility
    d. _____ other _____
18. If you had to ship your frozen product to another area for storage, how would this impact your operations? There were no responses to this question.
    a. _____ would have to pay additional transportation fees.
        i. Cost estimate $_____
    b. _____ would have to pay for sorting of product at the new location.
        i. Cost estimate $_____
    c. _____ would have to pay higher storage fees.
        i. Cost estimate $ _____
    d. _____ would not be able to continue selling frozen seafood.
    e. _____ Other consequence
    _____
19. A portion of this grant application pertains to social equity and environmental justice. For that reason, we are asking respondents if they identify as a minority group. Do you identify as:
    a. __2___ White/Caucasian
    b. _____ Alaska Native
    c. _____ Black/African American
    d. _____ Asian or Pacific Islander
    e. _____ Other _____
20. Do you have other comments or suggestions that you would like to share with the City and Borough of Sitka as it pertains to the MSC dock and crane and the cold storage facility? _____
    The following responses have not been edited.

The facility is extremely important. It is always busy.
Preparing the sheet pile bulkhead is not a good answer. Build a pier, its less costly.
It is highly convenient. Larger vessels need it.
The CBS needs to come up with a better plan for transient moorage for the summer. It changed a few years ago.

Before the facility was available, he shipped his product to Bellingham and used freezer vans. Without the cold storage it would drastically change the way he does things. Spend the money wisely.
It is a great location.
It is a very important facility.
He really likes the facility. It is useful for his business.
It is a valuable asset for the public.
Would hate to see it become a non-public usage.
There is metal between the pilings that makes it difficult to tie up and not scratch the boat and the ladder is dangerous.
All for upgrading. Any harbor upgrades especially with federal dollars.
It's nice to have a separate place because New Thompsen gets crowded.
It is a great addition to the port facilities in Sitka especially when it gets crowded. Boats can stack up, it's a nice spot when there are no other places for boats to be.
Suggested having the pilings further away from the wall, right now they are so close it pinches the line and a better ladder is needed.
Appreciates the public use of the facility

Thank you for your time today.
We appreciate your assistance with the data for this grant application.