

**PORTMIAMI COLD CHAIN PROCESSING AND FUMIGATION
CENTER AND CARGO YARD RESILENCY IMPROVEMENTS -
BENEFIT-COST ANALYSIS APPENDIX**

The logo for PortMiami, featuring the word "PORTMIAMI" in a blue, stylized, sans-serif font. The letters are spaced out, and the "I" at the end has a vertical line extending upwards.

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I. PROJECT DESCRIPTION

PortMIAMI is entering an application to apply for the DOT Port Infrastructure Development Program and is seeking funding assistance in constructing a Cold Chain Processing and Fumigation Center and investing in Cargo Yard Resiliency Improvements. PortMIAMI is the lead and primary point of contact and award recipient. The two components together will improve the safety, efficiency, and reliability of the movement of goods into, out of, around, and within the port, as well as the unloading, loading, and processing capacity of cargo at the port. It will also improve the port's economic competitiveness by providing more capacity for cargo phytosanitary treatment, cold processing, and processing to help capture a large portion of the perishable markets in a pivotal region that serves the southeast, Caribbean, and Latin American regions.

The PortMIAMI Fumigation and Cold Chain Processing Center will be built on a 14-acre site. The facility will be completed in one phase, building a 104,000 SF facility. The proposed building and installed fumigation treatment and cold processing equipment will provide advance technology-supported safety and design efficiency improvements by providing several services into one facility with the latest technology and spatial programming to optimize space. The proposed Fumigation and Cold Chain Processing Center will improve resiliency by reducing roadway depletion via roadway transport. It will adapt to sea level rise by designing and constructing a facility in accordance with expected sea level rise projections during its anticipated useful life, using regionally consistent unified sea level rise projections.

The Fumigation and Cold Chain Processing and Fumigation Center will provide for South Florida's need to handle exports of manufacturing, agriculture, and other goods by creating higher capacity and current technology to treat, store, and process perishables near the port. This will result in vehicle miles traveled savings by sourcing the growing treatment and processing needs locally. The multipurpose center's proposed size, advance technology, and innovative flexible layout will improve Miami's position as a key point of treatment at the US Port closest to the growing regions of Latin America and the Caribbean, thus saving on transportation length and cost, storing, and/or processing goods. PortMiami's position as a nexus of both N-S and E-W trade will also provide a transshipment point for perishables that are currently transshipped via nearby foreign ports in the Caribbean and S. America to support the safe flow of agricultural and food products, free of pests and disease, domestically and internationally.

The overall cost estimate for the PortMIAMI Cold Chain Processing and Fumigation Center is approximately \$57,032,410 of which the Seaport Department is seeking \$33,500,000, or a 58% match of federal funds.

PortMIAMI's Cargo Yard Resiliency Improvements – will provide for investments to supplement and bring to reality PortMiami infrastructure improvements to upgrade paving and drainage, and resiliency methods, along with the reorganization of cargo containers, which allow for the installation of additional refrigerated racks and an overall more efficient yard. These improvements will yield a higher capacity cargo yard, where land is currently at a premium. The increased cargo capacity is required to support the additional container traffic at PortMIAMI that will be generated by the new Cold Chain Processing and Fumigation Center

The overall cost estimate for the PortMIAMI Cargo Yard Resiliency Improvements is approximately \$21,725,820, of which the Seaport Department is seeking \$10,428,393, or a 48% match of federal funds.

Strict guidelines for measuring the merits of projects applying for the grants are outlined in The Notice of Funding Opportunity for the Department of Transportation's **National Infrastructure Investments Under the Consolidated Appropriations Act, 2018**. Furthermore, the benefit-cost guide lines to be applied to the project are set forth in the "Benefit-cost Analysis Guidance for Discretionary Grant Programs, U.S." Department of Transportation, December 2018. Martin Associates has followed these guidelines to assess the benefits of the

container yard expansion. These benefits are then combined with the costs of the project, as developed by PortMIAMI to estimate the benefit-cost ratio under a 3% and 7% discount rate.

The benefit criteria applied to the project are:

1. ***Determination of the Safety Benefits*** which result from the reduction in the truck travel distance and resulting vehicle miles traveled to serve the perishable products consumption markets in Florida, by attracting perishables that are currently moved into Florida from non-Florida ports. These new imports will be handled at PortMIAMI, which will require the additional yard storage capacity that will be provided under the Cargo Yard Resiliency Improvements.
2. ***Determination of Environmental Benefits*** by reducing the truck distance and corresponding vehicle miles traveled to serve the perishable products consumption markets in Florida, by attracting perishables that are currently moved into Florida from non-Florida ports. These new imports will be handled at PortMIAMI, which will require the additional yard storage capacity that will be provided under the Cargo Yard Resiliency Improvements.
3. ***Determination of External Trucking and National Infrastructure Benefits*** by reducing the truck distance and corresponding vehicle miles traveled to serve the perishable products consumption markets in Florida, by attracting perishables that are currently moved into Florida from non-Florida ports. These new imports will be handled at PortMIAMI, which will require the additional yard storage capacity that will be provided under the Cargo Yard Resiliency Improvements.
4. ***Determination of Economic Competitiveness Benefits*** to the perishable products consumers in Florida, by reducing the truck distance, and hence transportation costs over the without project case whereby these imports are moved via non-Florida ports.

These benefits are quantified over a 30-year period (2019 through 2049). It is assumed that the Projects will start with the award of the grant and will be completed by 2021, when the facility will begin handling perishables. The 30 year period is chosen as the useful life of the project. The detailed calculations are included in the attached Excel spreadsheet benefit-cost model.

II. KEY ASSUMPTIONS

The key target perishable import markets for the Cold Chain Processing and Fumigation Center consists of perishable products originating in Chile and Peru, as well as Central America. This market includes dates, figs, blueberries, apples, mangos, pears, seafood, pineapples, avocados, melons, papayas, grapes, and citrus fruit. Bananas are not included in the target market since the major importers such as Dole and Chiquita have established proprietary facilities at several seaports, and tend to use third party cold storage facilities to a lesser extent than the above noted commodities. In addition to these commodities, fresh flowers also represent a key target market, particularly for air cargo. Exports include Florida citrus, Florida seafood, and U.S. agricultural products such as beef, pork, poultry, soy and non-GMO wheat and corn.

The perishable import market consisting of the commodities identified above move into the Southeastern U.S. through a select number of ports, as shown in Exhibit 1. This market is dominated by the Delaware River ports of Philadelphia (PA), Wilmington (DE), Chester (PA), and Gloucester City (NJ).

Exhibit 1
Key Ports Handling Perishable Cargo from South America and Central America

Ports	TEUS
Philadelphia/Delaware River	137,137
Port Everglades	43,965
Miami	12,195
Savannah	4,439

Source: Piers, 2018

The benefits of the development of the Cold Chain Processing and Fumigation Center is to capture the perishable cargo that now moves into Florida via non-Florida ports by truck, resulting in increased environmental, safety, infrastructure costs to the nation, as well as increasing the cost of perishable foods to the Florida consumers while reducing shelf life. Using Piers data, Martin Associates estimated the share of imports from the West Coast of South America and Central America that are consumed in Florida and moving through various Atlantic Coast ports as well as the Florida ports. As shown in Exhibit 2, 40% of the Florida consumed imports from the West Coast of South America and Central America use ports other than Florida ports. As noted, the majority of these West Coast South American and Central American imports are perishable commodities, most likely moving into Florida from the Delaware River ports, as well as from Savannah. In addition, in the recent months, the Port of Wilmington, NC has entered into the perishable goods import market, and is also likely to serve certain Florida Markets in the near future.

Exhibit 2
Imports from West Coast South America and Central America Consumed in Florida by Port of Import

Ports	TEUS	Share
Non-Florida Ports	136,408	40.1%
Port Everglades	83,666	24.6%
Tampa/Manatee	84,739	24.9%
Miami	34,052	10.0%
Jacksonville	<u>1,609</u>	<u>0.5%</u>
Total	340,473	100.0%

Source: Piers, 2018

It is important to emphasize that the TEUs identified in Exhibit 2 underestimate the volume of perishables that move into Florida from out of state ports, since the Piers data only identifies cargo that moves from the port of entry to a final destination under an international bill of lading and clears customs at the point of destination. A large share of the imported perishables clear customs at the port of entry, and then move to near-port cold storage warehouses where they are re-loaded (transloaded) into domestic refrigerated trucks for the move to final consumption. Therefore, the Piers data does not include these international shipments that are transloaded at the port of entry, for the further trip to final consumption. As a result, the Piers data regarding

final consumption point, such as the state of Florida, underestimates the actual flow of perishable cargo that is discharged at the Delaware River ports and the other South Atlantic ports and ultimately consumed in Florida.¹

To develop a more comprehensive estimate of the volume of perishables that move from the port of import into the state of Florida, IHS Transearch data was used. This data base identifies the perishable cargo that is trucked from each import port BEA (Business Economic Area) into each BEA in the state of Florida. Focus was on the volume of domestic trucked perishable cargo (consisting of the commodities identified above) that was moved from each non-Florida port BEA into each Florida BEA for consumption. Exhibit 3 shows the domestic tonnage that was trucked from each non-Florida port BEA into each Florida BEA.

Exhibit 3
Domestic Perishable Cargo Trucked Between non-Florida Port BEA and Florida BEA (Tons)

Port BEA	Florida BEA								Total
	Fort Myers, FL	Jacksonville, FL	Miami, FL	Orlando, FL	Pensacola, FL	Sarasota, FL	Tallahassee, FL	Tampa, FL	
Philadelphia, PA	7,540	12,554	90,178	41,415	2,850	7,953	2,781	15,822	181,093
Savannah, GA	4,769	11,533	37,314	42,874	5,040	5,812	3,007	13,095	123,443
Wilmington, NC	3,658	5,120	21,718	11,052	967	3,347	1,036	7,070	53,968
Total	15,967	29,206	149,210	95,341	8,858	17,112	6,823	35,987	358,504

Source: HIS Transearch 2017 (most recent year data is available)

This 358,504 tons (18,000 full truckload equivalents) of domestic cargo trucked into Florida is used as a proxy for the transloaded international perishable cargoes, and also as a proxy for the ultimate destinations for perishables imported through non-Florida ports that are consumed in Florida. This is in addition to the TEUs trucked directly from each of the non-Florida ports into Florida.

The mileage cost savings of serving each Florida BEA through the proposed Cold Chain Processing and Fumigation Center (and using PortMIAMI) rather than using the current non-Florida ports were estimated by non-Florida port and Florida BEA of consumption. Exhibit 4 shows the mileage between each non-Florida port to each Florida BEA as well as the mileage to each Florida BEA should PortMIAMI and the Cold Chain Processing and Fumigation Center be used. A weighted mileage cost savings by using PortMIAMI was then computed (weights being perishables now consumed, by Florida BEA)

¹ In addition to not capturing the transloaded perishable cargo moving into Florida from out of state ports, the Piers data also under reports the final geographic destination of imports by state since a large percentage of imports do not indicate a final consignee, and its location, since the cargo is moved by freight forwarders, that don't reflect the actual point of consumption; or in some cases the headquarters location of an importer is reported on the shipping bill of lading rather than the ultimate geographic destination.

Exhibit 4

Mileage Savings to Florida Consumers due to Cold Chain Processing and Fumigation Center

Port BEA Now Used To Serve Florida Markets	Wilmington, NC	Savannah	Philadelphia	Wtd Avg Current Mileage	Mileage Via PortMIAMI	Mileage Savings Provided by PortMIAMI	Share Out of State Perishables Consumed from Out-of-State Ports	Wtd Mileage Savings	
Share by Port into Florida	15.05%	34.43%	50.51%	Miles	Miles	Miles	%	Miles	
BEAs	Miles	Miles	Miles						
Miami	755	458	1174	864	57	807	41.6%	336	
Orlando	610	309	1028	717	226	492	26.6%	131	
Tampa	632	424	1050	772	281	491	10.0%	49	
Jacksonville	436	139	855	545	354	191	8.1%	16	
Fort Myers	756	434	1175	857	155	702	4.5%	31	
Sarasota	684	408	1103	801	231	570	4.8%	27	
Tallahassee	597	299	1016	706	484	222	1.9%	4	
Pensacola	737	493	1111	842	678	164	2.5%	4	
Wtd Average Miles Saved Using Port Miami									598

As shown in Exhibit 4, the use of the Cold Chain Processing and Fumigation would result in a savings of 598 truck miles over the current without project situation in which the Florida perishable market is served by out of state ports, most notable the Delaware River ports, and to a lesser extent Savannah and Wilmington, NC.

This weighted average truck mileage savings will be critical in driving the savings in Vehicle Miles Traveled (VMT) and the resulting environmental, safety, infrastructure and economic competitiveness benefits of the Cold Chain Processing and Fumigation Center and the Cargo Yard Resiliency Improvements.

The proposed Cold Chain Processing and Fumigation Center will have 80 truck bays. Assuming about 2 trucks serviced per bay per day (based on interviews with current operators of similar Cold Chain Processing and Fumigation Facilities), and 360 days of operation annually. It is further assumed that 40% of the facility utilization will be accounted for by perishables that under the without project case are moved into Florida consumption markets from out of state ports, as indicated previously in Exhibit 2. Under the without project case it is also assumed that the trucks now serving the Florida consumption markets will return to the out of state port regions.

Exhibit 5 shows that that the facility will handle 23,040 trucks per year. This equates to 46,080 roundtrip truck trips per year at full facility utilization that will be saved as the result of the opening of the new Cold Chain Processing and Fumigation Center. These containers will move through PortMIAMI, and will utilize the additional storage capacity generated by the Cargo Yard Resiliency Improvements project. Assuming 1.7 TEUs per truck load, the 23,040 trucks per year equate to 39,168 TEUs at full facility utilization. This is about 23% of the 167,008 TEUs of perishable cargo now moving into Florida from non-Florida ports.²

² It is estimated that 136,408 TEUs of perishables from West Coast South America and Central America moved directly into Florida from non-Florida ports (see Exhibit 2), while another 30,472 TEUs of perishables (358,504 tons of trucked cargo divided by about 11.8 tons per TEU) moved into Florida after transloaded at the non-Florida port of entry, for a total 167,008 TEUs currently moving from out of state ports into Florida.

Exhibit 5
Truck Trips per Year Saved

Truck Trip Assumptions	
Number of Truck Bays	80
Truck Turns per Day per Bay	2
Days of Operation	360
Total Annual Throughput in Terms of Truck Trips	57,600
Share from Out of State Ports	40%
Trucks per Year from Out of State Ports (Containers)	23,040
Round Trip Truck Trips Saved Annually at Full Utilization	46,080

The reduced truck round trips multiplied by the average miles saved, 598 miles as shown in Exhibit 4, results in Vehicle Miles Traveled (VMT) savings due to the Cold Chain Processing and Fumigation Center and the Cargo Yard Resiliency Improvements projects. The VMT savings are the key drivers of the benefits that are quantified as the result of the Cold Chain Processing and Fumigation Center and the Cargo Yard Resiliency Improvements. It is further assumed that the project becomes operational in 2021, with a 75% facility utilization rate, growing to a 100% utilization rate in the year 2026. Based on these utilization assumptions, the VMT savings are estimated 20,682,513 VMT in 2021, growing to 27,576,683 VMT by 2026, and remaining at that level throughout the 30 year projection period.

III. BENEFITS ANALYSIS

1. Safety Benefits

Safety benefits are defined in terms of reduced accidents and associated injuries as the result of the reduced vehicle truck miles traveled due to the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements. Accidents per 100 million vehicle miles traveled were developed from *Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers*, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011. The value of an accident, a fatality, injury, or property damage only (PDO) was collected from *BTS Motor Vehicle Safety Data*, 2015 National Transportation Statistics, 2015. The values were inflated from 2015 values to 2018 values based on the consumer price index published by the U.S. Bureau of Labor Statistics, May 2018.

Exhibit 6
Accidents per 100 Million VMT

	Accident Probability/ 100 million VMT	Value per Accident, 2018\$
Fatal Accident Cost (K)	1.13369	\$10,011,917
Severe Injury Accident Cost (A)	78.92426	\$214,318
PDO Accident Cost (no injury)	203.40039	\$3,337

Sources: *Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers*, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011.

BTS Motor Vehicle Safety Data, 2015 National Transportation Statistics, 2015

The accident rates per 100 million VMT by type of accident were multiplied by the 100 million vehicle miles traveled savings to estimate the number of accidents by type (due to the reduced VMT). The estimated number of accidents by type were then multiplied by the value accidents (by type) to estimate the total annual value of accidents that would be avoided under the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements due to savings in VMT. These safety savings were estimated through 2049, and then discounted under a 3% and 7% discount rate. The present value of the savings benefits of the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements are:

NPV of Safety @3%	\$142,945,073.50
NPV of Safety@7%	\$86,544,142.08

2. Environmental Benefits

Environmental benefits are generated due to the reduced vehicle miles traveled with the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements. Emissions of air pollutants are generated per VMT, and the metrics used to estimate the volume of emissions per truck VMT are shown in Exhibit 7. These emission rates are measured in terms of short tons emitted per million VMT.

Exhibit 7
Short Tons of Emissions per Million VMT

Emissions	TONS EMITTED PER MILLION VMT
Nitrogen Oxides (Nox)	3.0193
Volatile Organic Compounds (VOC)	0.11
Fine Particulate (PM)	0.1191
Sulfur Dioxide (SO2)	0.0055

Source: *Surface Transportation, A Comparison of the Costs of Road, Rail and Waterways Freight Shipments that are not Passed on to Consumers*, GAO, Report to the Subcommittee on Select Revenue Measures, Committee on Ways and Means House of Representatives, January 2011

The cost per short ton of the emissions by type of emission were developed from NHTSA, *Final Regulatory Impact Analysis, CAFE for MY 2012-MY 2016 Passenger Cars and Light Trucks*, March 2010. The cost of carbon

dioxide has historically been based on the social costs of carbon and their costs per metric ton (converted to short ton) are prepared for future years by the IWGSCC, *Social Cost of Carbon for Regulatory Impact Analysis* Under Executive Order 12866, February 2011. As of June 2018, the cost of carbon dioxide emissions is no longer considered in the evaluation of emissions. These costs were updated using the May 2018 CPI and are shown in Exhibit 8.

Exhibit 8
Value per Short Ton of Emissions

Cost metrics	Cost/Short Ton Emitted
Nitrogen Oxides (Nox)	\$7,693.53
Volatile Organic Compounds (VOC)	\$1,952.32
Fine Particulate (PM)	\$351,938.69
Sulfur Dioxide (SO2)	\$45,470.79

Source: *Final Regulatory Impact Analysis, CAFE for MY 2012-MY 2016 Passenger Cars and Light Trucks*, March 2010. And IWGSCC, *Social Cost of Carbon for Regulatory Impact Analysis* Under Executive Order 12866, February 2011.

The net present value of the environmental cost savings of the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements are:

NPV of Emissions @3% with out co2	\$35,607,649.77
NPV of Emissions @7% without co2	\$21,558,165.14

3. External Truck Cost Savings Benefits

External truck cost savings consist of reduced costs of highway/pavement repair, highway congestion, and noise pollution, due to reduced truck vehicle miles traveled resulting for the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements. Metrics that measure highway/pavement degradation costs per truck mile, noise pollution costs per truck mile and highway congestion per ton mile are published by the *1997 Federal Highway Cost Allocation Study*, Final Report, USDOT, Federal Highway Administration, May 2000, Table 13. These cost metrics are shown in Exhibit 9 and updated to 2018 dollars using the CPI for May 2018. These metrics are applied to the vehicle miles travelled saved under the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements project. With the I-95 corridor at or above capacity in many segments between Philadelphia and Miami, the removal of thousands of trucks from this corridor will provide relief in an order of National significance.

Exhibit 9
External Truck Cost Savings

Combination Truck 4 Axel	Cost/VMT
Congestion	\$0.4730
Noise	\$0.0232
Pavement (Urban Interstate)	\$0.2623

Source: *1997 Federal Highway Cost Allocation Study*, Final Report, USDOT, Federal Highway Administration, May 2000

The present value of the External Truck Cost Savings benefits is:

NPV of External Truck Cost Savings @3%	\$374,613,226.19
NPV of External Truck Cost Savings @7%	\$226,804,460.48

4. Economic Competitiveness Benefits

The economic competitiveness benefits resulting from the Cold Chain Processing and Fumigation Center and Processing Facility and Cargo Yard Resiliency Improvements consists of the transportation cost savings to the nation’s importers as the result of lower truck costs due to the savings in miles traveled to the key consumption destinations in in Florida. After the project is completed, additional container volumes will move through PortMIAMI to the consumption markets at lower transportation costs. To estimate the transportation cost savings, the hourly trucking cost was estimated from interviews with key trucking companies engaged in port drayage, as well as information provided by American Transportation Research Institute (ATRI), *An Analysis of the Operational Costs of Trucking, 2018*. Based on these sources, it is estimated that the daily trucking costs are \$950. Using the 11 hours of daily service that are capped under the current hours of service regulation and enforced through the electronic logging devices (ELD), the current hourly operating cost per truck is estimated at \$86.36. The cost savings per container is presented in Exhibit 10.

Exhibit 10

Transportation Cost Savings Per Container Due to Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements

Savings in Hours of Truck Driving Time by Using PortMiami Over Use of Out of State Ports to Serve Florida Perishable			Cost Savings
	Miles Saved	Hours Saved	per Container
	598	14.96	\$1,292.11
Cost Savings per Container			\$1,292.11

The cost savings per truck trip multiplied by the number of containers utilizing the new Cold Chain Processing and Fumigation Center and the densified container yard was used to estimate the transportation cost savings to beneficial cargo owners that will be able to use PortMIAMI and the new Cold Chain Processing and Fumigation Center and the Cargo Yard Resiliency Improvements. It is to be emphasized that it is further assumed that the cost savings is applied to the number of containers that will be moved through PortMIAMI with the completed project. Under the without project, these containers would be moved into Florida from out of state ports. The present value of the transportation cost savings benefits of the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements, or the Economic Competitiveness Benefits are:

NPV of Economic Competitiveness @3%	\$533,150,866.75
NPV of Economic Competitiveness @7%	\$322,788,909.30

5. Summary of the Benefits

The total benefits projected to occur due to the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements are shown in Exhibit 11. Using a 3% discount rate over the period 2019 through 2049, the present value of the total benefits of the Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements is \$1.1 billion. Under a 7% discount rate, the total present value of the benefits of the project are \$657.7 million. The annual benefits calculations over the 30-year period are presented in the attached benefit-cost Excel Workbook.

Exhibit 11

Summary of Benefits of the PortMIAMI Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements

BENEFIT CATEGORIES	3% DISCOUNT	7% DISCOUNT
EMISSIONS	\$35,607,649.77	\$21,558,165.14
SAFETY	\$142,945,073.50	\$86,544,142.08
EXTERNAL TRUCK	\$374,613,226.19	\$226,804,460.48
ECONOMIC COMPETITIVENESS	\$533,150,866.75	\$322,788,909.30
TOTAL BENEFITS	\$1,086,316,816.20	\$657,695,677.00

IV. COSTS

The cost of the project is estimated at \$78,758,229. The federal grant request is \$43,928,393. The project costs are summarized in Exhibit 12.

Exhibit 12

Cost Summary of Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements

Fumigation & Cold Chain Processing Center - Opinion of Probable Construction Cost				
Description	Units	Area	Unit Cost	Subtotal
General Site Conditions (5%)				\$2,479,670
Contingency (10%)				\$4,959,340
Building Shell	SF	104,000	\$225	\$23,400,000
Permitting/Approvals/NEPA	LS		\$2,000,000	\$2,000,000
Concrete truck bay area	SF	65,700	\$12	\$788,400
Fumigation & Cold Chain Equip.	LS		\$15,000,000	\$15,000,000
Fumigation Gas Recovery System	LS		\$3,500,000	\$3,500,000
Landscape (Xeriscape)	SF	51,500	\$10	\$515,000
Civil/Site Improvements	LS		\$4,390,000	\$4,390,000
Cost of Fumigation & Cold Chain Processing Center				\$57,032,410
Cargo Yard Resiliency Improvements - Opinion of Probable Construction Cost				
Description	Units	Area	Unit Cost	Subtotal
Civil/Site Improvements	LS	75 acres	\$289,678	\$21,725,819
Cost of Cargo Yard Resiliency				\$21,725,819
Total Cost of Project				\$ 78,758,229

The benefit-cost analysis in the next section is based on a \$78,758,229 total project cost.

V. BENEFIT-COST CALCULATION

The Cold Chain Processing and Fumigation Center and Cargo Yard Resiliency Improvements has a very significant benefit-cost ratio, reflecting the strong merits of the project due the reduction in truck traffic on the nation’s highways, in turn resulting in significant environmental benefits, safety benefits, external truck benefits, and economic competitive benefits.

Using a 3% discount rate over the 30-year time horizon, the project has a benefit-cost ratio of 13.79, and with a 7% discount rate the benefit-cost ratio is 8.35. The annual benefits and costs are presented in the attached Excel spreadsheet file.

Total Present Value of Benefits @ 3% over 30 Years	\$1,086,316,816.20
Total Present Value of Benefits @ 7% over 30 Years	\$657,695,677.00
Total Cost	\$78,758,229.00
Benefit Cost Ratio with 3% Discount Rate	13.79
Benefit Cost Ratio with 7% Discount Rate	8.35