

Appendix A

Benefit-Cost Analysis Memorandum

Greenfield Louisiana Project

2021 PIDP Grant Application

Prepared for Port of South Louisiana by AECOM



2021 PIDP GRANT Greenfield APPLICATION

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Attachment A - BCA Excel Workbook (locked and unlocked)

Executive Summary

A benefit-cost analysis (BCA) was conducted by AECOM for Greenfield Louisiana (i.e., the Project) to support the grant application of the Port of South Louisiana (POSL) for the U.S. Department of Transportation (USDOT) Maritime Administration 2021 Port Infrastructure and Development Program (PIDP).

Located in a Qualified Opportunity Zone in a rural area on the West Bank of the Mississippi River in St. John the Baptist Parish, Louisiana, the Project is a newbuild grain export elevator being developed by POSL and its private sector partner, Greenfield Louisiana LLC. The Project will include:

- A barge dock for unloading grain from barges
- A ship dock capable of loading high capacity Post-Panamax and Neopanamax bulk carriers with grain
- A trestle over the Mississippi River levee for accessing the dock
- A grain elevator

The principal benefit of the Project in the BCA is lowering the cost and increasing the efficiency of transporting grain from U.S. farmers to foreign markets. Additionally, the newbuild grain elevator will reduce grain dust emissions through best-in-class design and construction technology.

The methodology used for the BCA follows the guidelines of the Notice of Funding Opportunity (NOFO) for the PIDP, and the 2021 USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs. Estimates of the expected benefits for each of the long-term outcomes specified in the NOFO are presented for the full completion of the Project (alternative case) net of the baseline (base case). All costs and benefits are discounted using a 7 percent discount rate, as required by the BCA guidance, and all values are in 2019 dollars and discounted to 2021. To compute the final BCA score, total benefits of the Project are compared to the total costs of the Project, including costs assumed to be paid by state, local, the private partner, and the Federal government.

The main components of the project have a lifecycle of 50 years; therefore, the analysis incorporated the associated residual value of those components.

As the POSL will have a long-term lease agreement with Greenfield Louisiana, the private sector will perform maintenance on the asset at no cost to the port. The revenue generated by the Project is more than sufficient to cover all O&M costs. The Project is assumed to be maintained at the highest quality, based upon leases with other POSL tenants where the tenants bears all maintenance responsibilities for the facilities, including what is expected from Greenfield Louisiana.

The benefit-cost ratio (BCR) is **1.87** following the implementation of the Project. A 30-year life cycle of the Project was used to calculate the BCR and the benefits are estimated starting on March 1, 2024.

Table 1 presents the **Impact Matrix** as specified in the NOFO. The impact matrix describes the baseline, the Project, and the estimated project impacts.



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Table 1: Impact Matrix

Project Matrix		
Current Status/Baseline & Problem to be Addressed	Change to Baseline or Alternative	Types of Impacts
Grain elevators on the lower Mississippi River are at least 40 years old and were built without the latest technology for quickly loading large bulk carriers.	The Project will enable loading of multiple holds quickly on large Post-Panamax and Neopanamax bulk carriers.	Reduced grain transportation costs from reducing the time needed to fully load bulk carriers by up to 40%.
Most grain elevators on the lower Mississippi River do not have sufficient dock depth to service the larger bulk carriers that can transit the River after completion of the Mississippi River Deepening Project.	The Project will be designed to allow efficient loading of larger Post-Panamax and Neopanamax bulk carriers.	Lower transportation costs to major markets in Asia by shipping grain in larger bulk carriers.
Grain elevators on the lower Mississippi River are at least 40 years old and were built without the latest technology for reducing grain dust emissions.	The Project will result in 80% less grain dust emissions compared to the existing 11 grain export elevators.	Reduced PM2.5 emissions.
Existing grain elevators on the lower Mississippi River are located in metropolitan Baton Rouge or metropolitan New Orleans or on the east bank of the Mississippi River.	The Project will be located on the west bank of the Mississippi River, in a rural area without traffic congestion.	Reduced truck traffic while transporting grain from central and south-central Louisiana; reduced transportation costs for Louisiana farmers; reduced accidents and reduced emissions from trucks.

1. Introduction

The Board of Commissioners of POSL requests funding from the USDOT under the 2021 PIDP Discretionary Grants program to be used for the construction of a new barge unloading and a ship loading dock. The docks will be used solely for the benefit of a newbuild grain elevator being constructed in St. John the Baptist Parish, Louisiana. Over the life of the asset, the Project will provide significant improvements in transportation efficiency and reliability of the U.S. agriculture supply chain. Additionally, the Project will reduce emissions from grain dust and from trucks and improve safety outcomes. The Project is expected to be operational in March 2024, which is the first year of benefits recognized in the BCA. The Project is expected to export over 11 million metric tons of grain per year.

Figure 1. Project Site



Note: Coordinates are latitude 30.027589 N, longitude -90.656577 W

2. Benefit Analysis Framework

The benefit analysis was conducted using the 2021 Benefit-Cost Analysis Guidance for Discretionary Grant Programs as a guide for preferred methods and monetized values. The parameters of the benefits analysis follow the protocols set by the Office of Management and Budget (OMB) Circular A-94, as well as the recommended benefit quantification methods by the USDOT. Generally, standard factors and values accepted by federal agencies were used for the benefits calculation except in cases where more Project-specific values or prices were available. In all such cases, modifications are noted and references are provided for data sources.

3. Analysis Assumptions

A list of assumptions for the Project is provided in the BCA workbook (see Input tab in the file App A BCA.xls).

Input	Value	Source
Discount Rate	7%	BCA Guidance for Discretionary Grant Programs - January, 2020
Discount Year	2021	
Dollar Year	2019	
Analysis Period (years)	30	Projects involving the initial construction or full reconstruction of highways or similar facilities should use an analysis period of 30 years.
Project Completion / Scheduled Opening	3/1/2024	
Analysis Period Begin - Benefits Realized (year)	2024	
Analysis Period End (year)	2054	
First Year Adjustment	83%	March 1 2024
Last Year Adjustment	17%	February 28 2054



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Input	Value	Source
Total O&M Cost Compared with Construction Cost (Period of Analysis)	5%	Greenfield
Conversion Rate for Metric tons to Short Tons	1.1015	
Conversion Rate for grams per metric ton	1,000,000	
Conversion Rate for kg per metric ton	1,000	
Conversion - pounds per short ton	2,000	
Total annual grain exports	11,089,000	Greenfield
Truck annual inbound grain	1,000,000	Greenfield
No Build Vessel Loading Rate (bushels/hour)	70,000	Greenfield and Table 14-11 USDA RTI Report
Project Vessel Loading Rate (bushels/hour)	100,000	
Bushels/metric ton - Corn	39.3680	https://grains.org/markets-tools-data/tools/converting-grain-units/
Bushels/metric ton - Soybeans	36.7437	
Bushels/metric ton - average	38.0559	
No Build Vessel Loading Rate (metric tons/hour)	1,839	
Project Vessel Loading Rate (metric tons/hour)	2,628	
In Port Vessel Operating Cost per Hour (\$2004)	\$399	http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.225.486&rep=rep1&type=pdf
In Port Vessel Operating Cost per Hour (\$2019)	\$530	
Maximum truck load (metric tons)	25.0	
Vehicle Operating Cost per mile (2019\$), commercial truck	\$0.93	BCA Guidance for Discretionary Grant Programs - February 2021
Value of Time - Truck Driver (2019\$)	\$30.80	
Fuel-Oil Costs	\$15.62	https://truckingresearch.org/wp-content/uploads/2020/11/ATRI-Operational-Costs-of-Trucking-2020.pdf
Truck/Trailer Lease or Purchase Payments	\$10.21	
Repair and Maintenance	\$5.62	
Truck Insurance Premiums	\$2.68	
Tires	\$1.42	
Licensing and Permits	\$0.90	
Driver Benefits	\$6.31	
Total (excluding Driver Pay) (2019\$)	\$42.76	
Truck Operating Costs/hour (2019\$)	\$73.56	
Truck Hours Saved per Trip	1.0	Assumption



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Input	Value	Source
Baseline grain elevator PM emissions (lb per ton loaded/unloaded)	0.00055	
Project PM2.5 emission reduction	80%	POSL/Greenfield
Project Useful Life (years)	50	Dock and grain elevator components
Fatalities in Large Truck Crashes, per 100M VMT by Large Trucks, 2017	1.6	Source: Tables 4, 7, and 10 (https://www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus-crash-facts-2017)
Persons Injured in Large Truck Crashes, per 100M VMT by Large Trucks, 2017	49.7	
Large Trucks Involved in PDO Crashes, per 100M VMT by Large Trucks, 2017	122.1	
O - No Injury	\$3,700	BCA Guidance for Discretionary Grant Programs - February 2021
C - Possible Injury	\$72,500	
B - Non-incapacitating	\$142,000	
A - Incapacitating	\$521,300	
K - Killed	\$10,900,000	
U - Injured (Severity Unknown)	\$197,600	
# Accidents Reported (Unknown if Injured)	\$150,200	
Property Damage Only (PDO) Crashes (per vehicle)	\$4,300	
Truck Emissions Rate g per mile VOC (average of gasoline and diesel)	1.0165	EPA (2008). "Average In-Use Emissions from Heavy-Duty Trucks"
Truck Emissions Rate g per mile Nox (average of gasoline and diesel)	5.7635	
Truck Emissions Rate g per mile PM2.5 (average of gasoline and diesel)	0.123	
Diesel Fuel kg CO2 per gallon	10.21	
Motor gasoline kg CO2 per gallon	8.89	https://www.eia.gov/environment/emissions/co2_vol_mass.php
Heavy Duty Trucks, average MPG	6.5	A SURVEY OF FUEL ECONOMY AND FUEL USAGE BY HEAVY-DUTY TRUCK FLEETS (2016). https://truckingresearch.org/wp-content/uploads/2016/10/2016.ATRI-UMTRI.FuelEconomyReport.Final_.pdf



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4. Construction Costs

Benefits of the ship dock and the barge dock are dependent upon use of the entire grain elevator, which will be the sole user of the dock. Therefore, full costs for the Project (docks and the grain elevator) are shown below and used for the BCA in Table 3 and Table 4. Table 2 describes the Project construction schedule differentiating by Project component. Constant spending has been applied over the Project construction development period. The land purchase cost is estimated in \$39 million (in 2019\$). The capital costs for the Project (including land cost) discounted at 7 percent total to \$400 million (in 2019\$).

Table 2: Project Construction Schedule

Activities	2021	2022	2023	2024
Design Finalization	Package #1 – Dock Package July 2021			
		Package #2 – Landside Package June		
Local Permitting and Environmental Approvals	Completed by November			
U.S. Army Corps of Engineers	Permit in June	Issuance in March		
Construction Bidding	Package #1 – Dock Package commences August			
		Package #2 – Landside Package commences January		
Project Construction		Construction Commencement March		
		Construction Commencement April		
Opening Date				Mar-24

Docks
Grain Elevator

Source: POSL and Greenfield Louisiana, June 2021

Note: Please refer to our separate document containing confidential business information for more information.

Table 3: Grain Elevator Construction Costs (2019\$)

Description	Cost (\$2019)
Design (Program, PE, QAQC)	\$21,774,755.42
Construction	\$287,389,867.14
Other Expenses	\$98,729,376.29
Total	\$407,893,998.84

Source: Greenfield Louisiana, June 2021

Note: Please refer to our separate document containing confidential business information for more information.



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Table 4: Docks Construction Costs (2019\$)

Description	Quantify	Units	Unit Price	Total (2019\$)
Mobilization/Demobilization	1	LS	\$ 264,183	\$ 261,646
Ship Dock	1	LS	\$ 12,163,881	\$ 12,047,060
Barge Dock	1	LS	\$ 5,211,924	\$ 5,161,869
CBU Dock	1	LS	\$ 5,676,147	\$ 5,621,634
Breasting Dolphins	6	EA	\$ 772,690	\$ 4,591,615
Mooring Dolphins	5	EA	\$ 512,249	\$ 2,536,647
Barge Haul Platforms	4	EA	\$ 844,260	\$ 3,344,607
Approach way	1	LS	\$ 15,343,326	\$ 15,195,969
Pipe Bridges	5	EA	\$ 136,460	\$ 675,747
Levee Abutment	1	LS	\$ 79,741	\$ 78,975
Protection Piles	1	LS	\$ 5,034,065	\$ 4,985,718
Barge Fender System	1	LS	\$ 7,714,595	\$ 7,640,504
Barge Divider Piles	1	LS	\$ 1,103,835	\$ 1,093,234
Conveyor Supports (Piles & Jackets Only)	2	EA	\$ 1,211,909	\$ 2,400,540
Total				\$ 65,635,765

Source: POSL, June 2021

Note: Analysis assumes soft cost (design, construction manager, insurance) is 15 percent of total cost. CBU stands for Continuous Barge Unloader.

5. Operation and Maintenance Costs

The Project requires annual and periodic operating and maintenance (O&M) costs to keep the docks and the grain elevator in good condition; and maintenance of the Project begins in March 2024. The Project O&M cost is estimated to be 5 percent of total construction cost during the 30-year period of analysis. Therefore, annual O&M cost is 0.167 percent of total construction cost per year, which is nearly \$745,000 per year (in 2019\$). The total annual O&M savings over the analysis period and discounting at 7 percent is \$8 million.

The POSL will have a long-term lease agreement with Greenfield Louisiana LLC. The private sector operator will maintain the docks and the grain elevator at no cost to POSL. The revenue generated by the asset is more than sufficient to cover all O&M costs.

6. Benefits

The methodology used to estimate the benefits of the Project is described in the following pages.



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Achieving Safety, Efficiency, and Reliability Improvements

The export grain elevators adjacent to the lower Mississippi River export most of the grain exported from the U.S. The Greenfield elevator will be the first grain new grain elevator built in the region in 40 years. During this time the worldwide demand for grain has increased and is forecast to continue increasing. The Greenfield elevator will use the latest technology to efficiently load larger bulk carriers and lower the cost of shipping grain from the U.S. to overseas markets. The Project is expected to increase the worldwide market share for U.S. grain exports and is not expected to negatively impact other U.S. export grain elevators.

The Project will reduce the cost of exporting grain from the central United States to foreign markets generating greater demand for US grain market. The lower Mississippi River is the largest port for grain exports in the United States with the POSL handling over 50 percent of U.S. grain exports each year.¹ The Project will reduce shipping costs by allowing the use of larger bulk carriers, by reducing the lay time in the Mississippi River, and by more efficiently storing and transferring grain from trucks, railcars, and barges to the elevator and from the elevator to bulk carriers (over 40 percent faster vessel load times compared to an average elevator).

The last grain elevator built on the lower Mississippi River was completed in 1979. Grain exports from the U.S., primarily soybeans and corn, have increased during the past 40 years. However, during this timeframe grain exports from Brazil and Argentina have greatly increased and these nations have made large investments in transportation including port facilities and channel deepening.² To maintain a competitive position for U.S. agriculture, the Army Corps of Engineers has started deepening the lower Mississippi River from 45 feet to 50 feet in September 2020. This will allow larger, more efficient bulk carriers to load U.S. grain for export. The docks design and construction by Greenfield Louisiana LLC and POSL specifically takes this deepening into account. The new docks will serve to efficiently load the larger bulk carriers that will transport grain to countries around the world.

The U.S. Department of Agriculture (U.S.D.A.) conducts annual research on the transportation costs of grain from the U.S. Gulf Coast to Asia and from grain ports in Brazil and Argentina to Asia.³ Although U.S. production and exports of grains, primarily soybeans and corn, have increased, the overall worldwide market share of the U.S. has declined because of the rapidly increasing grain exports from Brazil. The BCA refers to that research.

Table 5 shows the forecast of annual grain shipments to Asia from the Project from 2024 to 2054; the per ton reduction equals the reduction in shipment costs from a Post-Panamax or Neopanamax bulk carrier with 68,000 metric ton capacity rather than a 58,000 metric ton capacity Panamax bulk carrier,

¹ POSL website Facts-at-a Glance, and POSL Cargo Statistics and U.S.D.A. Grain export statistics

² U.S.D.A. Economic Research Service, "A Deeper Look into the U.S.D.A. Crop Baseline Projections to 2028, With a Focus on Trade," November 2019.

³ U.S.D.A. Grain Transportation Report (2019)



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and the reduced storage and handling costs provided by an efficient new grain elevator. The reduction in shipping costs is significant compared to the overall estimated cost of shipping grain from the U.S. Gulf Coast to Asia, which is also shown in Table 5.

Table 5: Grain Exports and Transportation Cost Savings per Ton

	Inputs
Annual Project Tonnage Shipped Overseas (metric tons) *	11,089,000
Vessel Savings per Ton -- from POSL to China (A)**	\$4
Project Savings per Ton Storage/Handling (efficiency gain) (B)***	\$2
Total Export Transportation Savings per Metric Ton (C=A+B)	\$6
U.S.D.A. Estimated Freight Rate per Ton Panamax****	\$44.90
U.S.D.A. Estimated Freight Rate per Ton Neopanamax or Post-Panamax****	\$40.14

Source: *Greenfield; ** U.S.D.A. Agricultural Marketing Service; *** U.S.D.A. Study of Transportation Issues; ****2020 U.S.D.A. Update on Ocean Freight Spreads , <https://www.ams.U.S.D.A..gov/sites/default/files/media/OceanGrainFreightSpreadsUpdate.pdf>

Table 6 shows the hours saved loading Post-Panamax or Neopanamax bulk carriers for the Project, compared to the average loading rate of existing lower Mississippi River grain elevators. The U.S.D.A. estimates 15 days of lay time for a bulk carrier loading and unloading during a round trip from the U.S. Gulf to China.⁴

Table 6: Neopanamax / Post-Panamax Bulk Carrier Loading Time Savings

Scenario	(metric tons/hour)
No Build Vessel Loading Rate (lower Mississippi River average)	1,839
Project Vessel Loading Rate	2,628
Hours Saved per Neopanamax or Post-Panamax Bulk Carrier	10.8
In Port Cost per Hour (2019\$)	\$530
Project Neopanamax or Post-Panamax Vessel Calls per Year	163

Source: U.S.D.A. Economic Research Service, “A Deeper Look into the U.S.D.A. Crop Baseline Projections to 2028, With a Focus on Trade,” November 2019.

The Project will be in a rural area of St. John Parish on the West Bank of the Mississippi River with an excellent mainline rail connection to the Union Pacific (UP) Railroad, as well as excellent highway connections. Fewer sites in the region have UP connections versus Canadian National (CN) Railway. The new facility will provide farmers who service to the UP and not the CN an ability to better access the export market.

Additionally, the Project will be on a less congested section of the Mississippi River, which will facilitate barge transportation. The Project will be the closest export elevator to some of the major grain crop areas of south-central Louisiana and the easiest to access by truck.

⁴ U.S.D.A. Agricultural Marketing Service (2020)

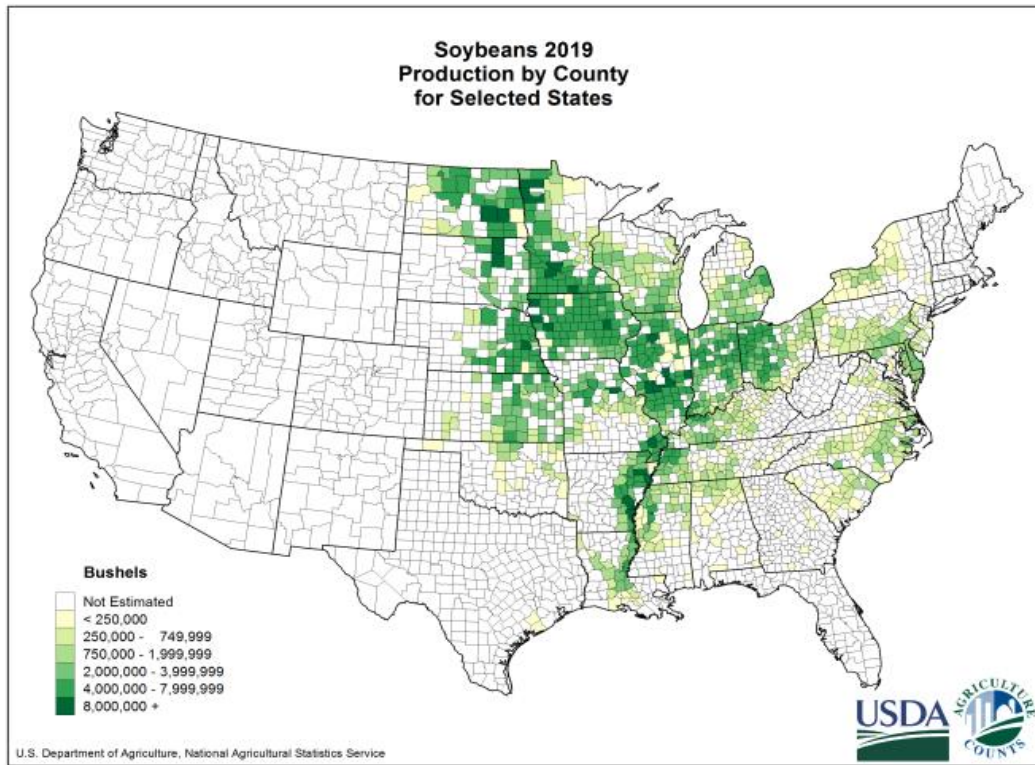
Louisiana currently produces about 2 million tons of soybeans and 2 million tons of corn annually and these grains are generally shipped by truck as rail and barge are not efficient for distances less than 300 miles. The truck transportation benefits are based upon the Project facilitating the export of an additional 25 percent of the 4 million tons produced annually in Louisiana. Table 7 shows the transportation cost savings from inbound tonnage shipped by truck from central Louisiana farmers.

Table 7: Inputs Inbound Grain Transportation Cost Savings

Round Trip Truck Mileage Saved	40
Maximum Truck Load (MT)	25
Truck Cost per Mile (2019\$)	\$0.93
Truck Savings per Ton (2019\$)	\$1.49
Truck Operating Costs/hour (2019\$)	\$73.56
Truck Hours Saved per Trip	1.0
Inbound Tonnage Shipped by Truck	1,000,000

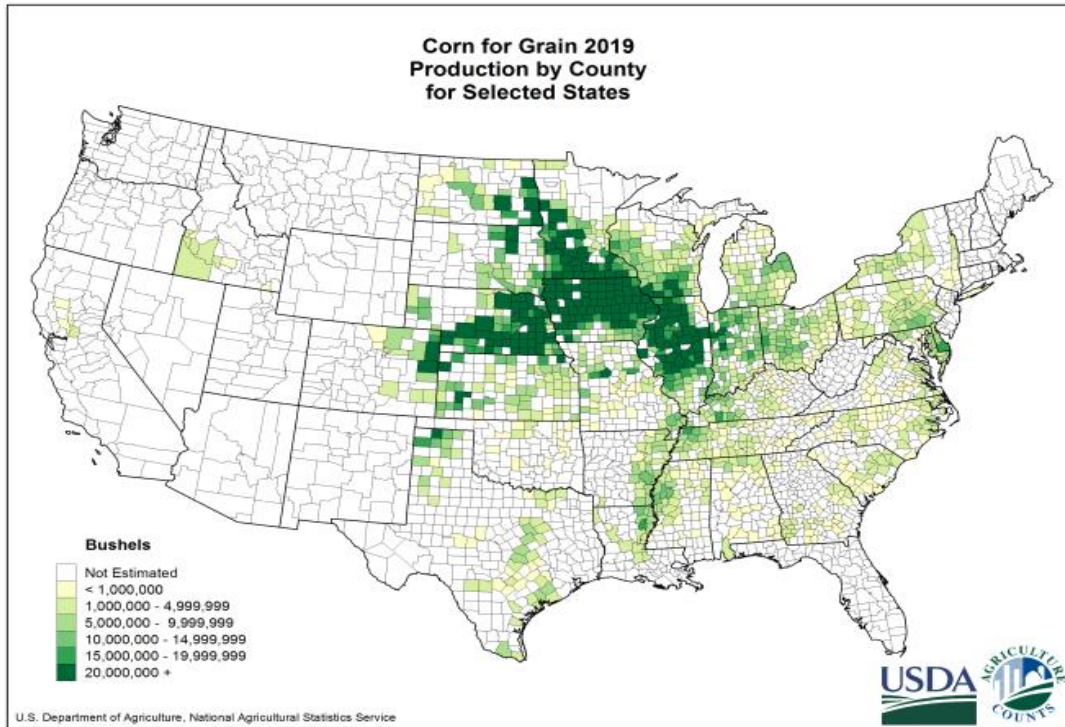
Figure 2 shows the production of soybeans in the U.S. and in Louisiana. The Project will facilitate additional load of 50 percent soybeans and additional load of 50 percent corn onto bulk carriers for export that are shipped by barge and rail from the Midwest and by truck from Louisiana. Calculations are based upon 36.7 bushels of soybeans per metric ton.

Figure 2: U.S. Soybean Production



Source: U.S. Department of Agriculture, National Agricultural Statistics Service,
https://www.nass.U.S.D.A..gov/Charts_and_Maps/Crops_County/cr-pr.php

Figure 3: U.S. Corn Production



Source: U.S. Department of Agriculture, National Agricultural Statistics Service,
https://www.nass.U.S.D.A..gov/Charts_and_Maps/Crops_County/cr-pr.php

Table 8 shows the estimated transportation cost saving provided by the Project, discounted at 7 percent per USDOT guidance.

Table 8: Annual Transportation Cost Savings (2019\$, in thousand)

Year	Annual Transportation Cost Savings
Total Export Shipping Cost Savings	\$66,534
Total Inbound Savings per Ton	\$4,430
Total in Port Ship Savings	959
Total Transportation Cost Savings	\$71,924



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Supporting the economic competitiveness benefits of investing in and constructing a newbuild grain export elevator in the POSL, the two quotes below are from the author of a 2019 U.S.D.A. commissioned study.⁵

'The U.S. is in direct competition with Brazil for agricultural export business, particularly for corn and soybeans—two of our largest exports, therefore, infrastructure investments can have a tremendous impact upon a farmer's profitability,' said Ken Eriksen, senior vice president of Agribusiness Intelligence's consulting business and lead author of the study.

'Multinational corporations, including Chinese companies, are making significant investments in the Brazilian grain and soybean transportation and handling systems,' Erickson said. 'If not addressed, U.S. infrastructure problems will make U.S. grain and soybeans less competitive in global markets.'

Congestion Reduction (Trucks)

The Project will reduce truck transportation for grain grown in Louisiana and shipped by truck by an estimated 40 miles round trip as the Project is located closer to Louisiana production than other exporting grain elevators. These benefits were not quantified.

Additionally, the Project is located by a less congested area of the Mississippi River where the ship dock and the barge dock will not be impacted by passing vessel traffic.

Residual Value (Docks, Grain Elevator and Land)

The docks and the grain elevator will have a design life of 50 years. This guidance appears to be based on judgement/experience only and not specifically a reference or code. The design life depends a lot on operation and maintenance. A well maintained structure (regular inspections, timely repairs, re-coating of paint, etc.) will be much more likely to reach its intended service life. Many of the current functioning grain elevators along the lower Mississippi River are over 50 years old. The first 30 years of depreciation were excluded from the residual estimation as they are the basis of the benefits estimated elsewhere in the analysis; while, the remaining 20 years were discounted at 7 percent. The residual value after the 30-year period of analysis is included as a state of good repair benefit. Since right of way does not depreciate, the undiscounted value of the right of way acquired for the Project was included in the residual analysis. The sum of the remaining discounted value of the Project discounted at 7 percent is \$15.3 million.

Reduced Roadway Fatalities and Crashes (Trucks)

There are safety benefits and safety costs avoided expected from the Project. The reduction in truck transportation will decrease the number, rate, and consequences of transportation-related accidents, serious injuries, and fatalities. The safety benefits are qualitative.

⁵ U.S.D.A.'s Agricultural Marketing Service (2020) "Importance of Inland Waterways to U.S. Agriculture"



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Lighting during Night Hours

Lighting will be provided for workers on the dock as well as on the ship loading arms and associated conveyor bridges such that the operation of loading the ship can continue through the night.

Addressing Climate Change and Environmental Justice Impacts

Emissions Reduction (Dust)

The Project will use the latest technology to reduce grain dust for the health and safety of workers and the neighboring community.

Based upon current design and the air permit application under preparation, the Project will reduce grain dust emissions (PM_{2.5}) by up to 80 percent from average existing grain elevator emissions. These benefits are quantified based upon scientific research of PM_{2.5} emissions from operating grain elevators.

The tons of reduced emissions were monetized using the recommended value of emissions as shown in Table 9. In total, the Project results in dust emissions cost of \$43.3 million discounted at 7 percent

Table 9 - Emission Values per Metric Ton

Emission Type	PM _{2.5}
2020	\$729,300
2021	\$742,300
2022	\$755,500
2023	\$769,000
2024	\$782,700
2025	\$796,600
2026	\$807,500
2027	\$818,600
2028	\$829,800
2029	\$841,200
2030	\$852,700
2031	\$852,700
2032	\$852,700
2033	\$852,700
2034	\$852,700
2035	\$852,700
2036	\$852,700
2037	\$852,700
2038	\$852,700
2039	\$852,700



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Emission Type	PM _{2.5}
2040	\$852,700
2041	\$852,700
2042	\$852,700
2043	\$852,700
2044	\$852,700
2045	\$852,700
2046	\$852,700
2047	\$852,700
2048	\$852,700
2049	\$852,700
2050	\$852,700
2051*	\$852,700
2052*	\$852,700
2053*	\$852,700
2054*	\$852,700

Source: 2021 Benefit-Cost Analysis Guidance for Discretionary Grant Programs. Note * Assumption

Emissions Reduction (Trucks)

The Project facilitates the movement of grain via rail and barge, which directly reduces the available alternative of truck transportation. Keeping trucks off the road has clear environmental benefits in the form of reduced congestion and climate-change causing emissions. These benefits were qualitatively listed in the BCA.

Advancing Racial Equity and Reducing Barriers to Opportunity

Training

Greenfield Louisiana will invest in secondary and post-secondary education and training in neighboring communities and the region. These educational opportunities will be critical to the area in terms of its sustainable development. Additionally, Greenfield will host job fairs and in-house training programs on the St. John the Baptist West Bank to train job candidates and employees.

Within the census area, nearly 27 percent people live below the poverty line, and the median household income of \$34,224 is only two-thirds of the amount of the rest of the state. Prior to the COVID-19 pandemic, the regions unemployment rate was over 5 percent, compared to ~3.9 percent nationally, with St. John Parish at ~5.5 percent and neighboring St. James Parish near 6 percent. Following the pandemic, the unemployment rate in the region reached over 17 percent in early 2021. Most of the jobs at this facility will be sourced locally, thus providing employment for underserved and minority populations. 58.4 percent of the population of St. John the Baptist Parish is African American, and



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minority groups make up a total of about two-thirds of the population. African Americans make up 48.8 percent of nearby St. James Parish. The training benefits are qualitative.

7. BCA Results

The Project provides benefits for a wide variety of parties, including but not limited to U.S. farmers, the food and agriculture supply chain, and the general public. It will also provide a source of non-federal revenue for the Port of South Louisiana. The Project benefits cover the key benefit categories: safety, state of good repair, economic competitiveness, and environmental sustainability.

Table 10 summarizes long term outcomes of the Project. Taken in total, the Project provides \$822 million in benefits—from lowering transportation costs and emissions reductions—over the analysis period, (2024 – 2054) using a 7 percent discount rate. The net benefits of the Project are \$382 million in 2019\$. The BCA results in a BCA ratio of **1.87** when discounted at a rate of 7 percent.

Table 10 - Costs & Benefits Delivered by Long-Term Outcomes (2023 - 2052; in thousands of 2019\$)

BCA Summary	7% Discount Rate
Docks Cost	\$57,139
Grain Elevator Cost	\$344,348
Land Purchase	\$38,846
Total Costs Present Value	\$440,334
Achieving Safety, Efficiency, and Reliability Improvements	
Transportation Cost Savings	\$771,048
Residual Value (Docks)	\$2,258
Residual Value (Grain Elevator)	\$8,865
Residual Value (Property)	\$4,166
Congestion Reduction (Trucks)	Qualitative
Reduced Roadway Fatalities and Crashes (Trucks)	Qualitative
Lighting during Night Hours	Qualitative
<i>Sub-Total</i>	\$786,336
Addressing Climate Change and Environmental Justice Impacts	
Emissions Reduction (Dust)	\$43,716
Emissions Reduction (Trucks)	Qualitative
<i>Sub-Total</i>	\$43,716
Advancing Racial Equity and Reducing Barriers to Opportunity	
Training	Qualitative
<i>Operations and Maintenance Cost</i>	\$7,920
Total Benefits Present Value	\$822,132
Net Benefits Present Value	\$381,798
Benefit-Cost Ratio	1.87

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