Benefit-Cost Analysis Report

CONTENTS

EXECUTIVE SUMMARY

Current Status/ Baseline & Problem to be Addressed	Change to Baseline	Type of Impacts	Affected Population	Economic Benefits	Summary of Results
TASD Interchange Yard, which is central to the operations of the Port, suffers flooding issues and is not adequate to support the growth of intermodal freight.	Raising the profile of TASD Interchange Yard 6-12" to ensure Resilient operations. Adding additional capacity to operations by reconfiguring and adding tracks.	Economic, environmental, quality of life, and competitive benefits. Inland rail movement substitutes for truck.	Mobile, State of Alabama, and trading partners outside of Alabama.	Monetized values of reduced highway use and subjective benefits relating to lifting the economy of historically disadvantaged Port community.	Investment Cost $52.5 million ($46.9 m discounted), including $10.5 million non-federal match for a 20% match.
Creates very significant safety and environmental benefits.	Reduces adverse impact of truck highway use versus railroad intermodal which is safer, with fewer emissions, and fewer adverse externalities.	Accident reductions. Social benefits of reduced air emissions.	External and regional communities are affected by air emissions, accidents, and road use.	Monetized value of reduced accidents, fuel consumption, and emissions.	$155.9 million in these categories' undiscounted benefits ($105.3 million discounted in 2022 $).
Creates significant travel time, operating expense, shipper savings, and highway maintenance benefits.	Port expects to significantly eliminate truck drayage and facilitate forecast increased throughput.	Improves traffic flow and reduces delays and maintenance.	Less highway wear, reduced travel time, and transport savings for shipper users. Savings for external users.	Monetized value of competitive benefits, reduced highway maintenance, net consumer benefit.	$339.0 million in these categories' undiscounted benefits ($211.0 million discounted in 2022 $) Project BCR 6.75 (BCR inclusive of all related invest. 2.65)

1. Summary Project Description

Background: The Port of Mobile is a key element in transforming the Southeastern automotive, manufacturing, and consumer supply chains. In addition to the steel and automobile plants served by the Port of Mobile, the Port serves new inland logistic centers of Walmart and Amazon. The Port is engaged in a multi-year planned effort to accelerate its intermodal container business to one million TEU's (twenty-foot equivalent unit cargo container), approximately doubling today's level.

In all respects, substitution of intermodal rail for truck for inland transportation has beneficial social effects. And Mobile is well endowed with rail connections with five Class I rail systems entering the port area. Intermodal traffic growth registered to date has been 142%. To be clear, current trainload rail intermodal movements include only those of CN Rail and the Terminal Railway Alabama State Docks (TASD) as the switching carrier for the Mobile Intermodal Container Transfer Facility (ICTF). Additionally, the Port is constructing an inland port at Montgomery, AL, and plans an inland port at Decatur, AL, near Huntsville in the north of the state, both linked by CSX railroad to Mobile.

The Port operates its own port switching railroad, the TASD. In addition to providing intra-port rail switching, including at the intermodal terminal in Mobile, TASD provides industrial switching and car storage services for Mobile.

Figure 1 – Intermodal Train Loading at ICTF Mobile

Figure 2 – Montgomery ICTF Rendering

Interchange Yard Project: Central to the TASD's functioning is the Interchange Yard where rail cars are interchanged with all the railroads entering the area, as the name implies. This proposal is for raising the elevation of the Interchange Yard by six to twelve inches above its present level to combat flooding issues that can occur when lunar tides coincide with rain events or hurricanes in the Gulf Coast region. The project has two phases referred to as the East Yard phase which calls for raising the track structure and installing new switches where required. The West Yard phase involves the reclamation of land currently occupied by marginal industrial tenants and conversion to a storage yard for rail cars – effectively surge capacity for temporarily storing rail cars, including those that will be needed for the expanded intermodal container operations and those at the inland ports.

East Yard: Lies east of Industrial Canal Road. Work includes 24,280 feet of new/reconstructed track and preparation work including: earthwork, erosion control, drainage remediation/reinstall, removal and replacement of utilities, partial relocation of roadways, and reinstalling trackwork.

West Yard: Lies west of Industrial Canal Road. Work includes 18,052 feet of new track and preparation work including: earthwork, erosion control, drainage installation, and installing trackwork.

For Cost and Benefit calculations, these two projects have been combined. Note that the Rail Traffic Control (RTC) passenger rail study that is included in the New Horizons Project is not included as part of this benefit-cost analysis, as its purpose is for research only.

Problems Solved by this Investment.

Resiliency: The Port of Mobile is in an area prone to hurricanes and severe weather. In 2020 and 2021, two major hurricanes (Sandy and Zeta) hit the Alabama Gulf Coast, causing hundreds of millions of dollars in damage. Because of the Port's location and its importance to the region and country, damage to Port infrastructure has the potential to have significant, negative impacts on every component of the State of Alabama's and region's economy.

The TASD's Interchange Yard tracks are prone to periodic flooding, particularly during high tides combined with severe rain events. This creates the need to move trains to higher ground in Africatown, a disadvantaged neighboring neighborhood, and/or suffer possible property losses due to water ruining cargoes and freight car roller bearings and damaging traction motors on locomotives. The preferred solution is to raise the yard tracks by depositing more ballast under the ties and raising the entire track structure, which is the purpose of this investment.

- Raising the current and restored existing tracks by six inches (indicative) in the middle of the Interchange Yard to 12 inches or more at the ends of tracks to create a "bowl" effect (for safe handling of rolling cars) would mitigate the problem.
- Situating the proposed nine tracks of new capacity next to the Industrial Canal with a similar raised profile would further mitigate the flooding problem and provide the desired "flexible track capacity."

Resolving Resiliency Issues will also remove Intermodal Capacity constraints due to lack of track capacity.

- Mobile Intermodal Container Transfer (Rail) Facility (ICTF) has only limited capacity to hold empty container flat (well) cars awaiting loading.
- Individual railroads are coping with current operations (Canadian National is running one or two daily trains), but do not have the excess yard track capacity to store more trains that will accommodate train starts needed for the growth planned by the Port.
- As neutral switching carrier for the Mobile ICTF, it will become necessary for TASD to have flexible capacity to store rail cars to the extent of up to three or four additional 2,500 to 3,500-foot intermodal train segments on behalf of all carriers as needed for use at Mobile ICTF.

- Additionally, as stated before, the smooth functioning of TASD Interchange Yard is critical to the operations of the Port and Mobile's railroads.

Investment Needs

Project Investments including engineering require a total $56.6 million as budgeted or $52.6 million expressed in 2022 dollars. Of this, matching funding in the amount of $11.3 million ($10.5 in 2022 dollars) will be provided by non-federal matching investment. Counting the elapsed construction period, the discounted value of the investments for NPV purposes will be $46.9 million. These are combined investment numbers for both the East and West Interchange Yard Projects.

Inclusive Investments: Having made the necessary project investments in the Interchange Yard, the Port will be well prepared to execute its container-oriented growth plans in several different directions including directing traffic to planned rail-served inland ports as more fully explained in sections below. But we take note of the following admonition in the Department's guidelines:

> *The scope of the estimated benefits and costs should also be large enough to encompass a project that has independent utility, meaning that it would be expected to produce the projected benefits even in the absence of other investments. In some cases, this will mean that the costs included in the BCA may need to incorporate other related investments that are not part of the grant request, but which are necessary for the project to deliver its expected benefits.*

In the Methodology section we discuss conceptually linking the Port to its planned inland ports including the one at Montgomery, AL whose construction will be contemporaneous with the project envisioned in this application. While we believe independent utility of the Interchange Yard project can be demonstrated and full funding for the Montgomery project has already been obtained, in the interests of comprehensive analysis we present an **alternative**, inclusive calculation of BCR based on including the Montgomery project with the current project in total investments.

Residual Value: With periodic replacement of crossties accounted for as an operating expense, the service life of yard track assets is expected to greatly exceed the 20 years discounting period provided in USDOT Guidance for capacity enhancement and improvement-type projects.[1] The installed cost of depreciable investment will be $40.1 million or $37.3 million in 2022 dollars and in 20 years the undepreciated residual value would be approximately $7.0 million.

[1] USDOT, Office of the Secretary, "Benefit-Cost Analysis Guidance for Discretionary Grant Programs." December 2023.

2. Demographically Quantifiable Benefits Discussion

Below From: Pier D2 Dock Extension (Project) FY 2024 Port Infrastructure Development Program (PIDP) Grant Request

a. Urban or Rural Designation? The project location lies within Census Tact 12 and is considered Rural under the 2010 Census designated urbanized area.

b. Demographic Qualifier: Poverty The census track is also located within a Persistent Poverty Tract, as indicated in the U.S. Department of Transportation Grant Project Location Verification tool. The Port of Mobile is adjacent to multiple historically disadvantaged communities. The project is in the Federally designated CDZ Opportunity Zone: 01097001200, and Empowerment Zone for Census Tract 001203 as an Urban Renewal Community. According to EPA EJScreen, the population below poverty level for this tract is 367 of 3,354.

c. Demographic Qualifier: Economic Equity

The project location (Census Tract 12) and the surrounding community has a per capita income in 2021 was just $27,432, well below the national average of $70,480+. At the end of 2022, the unemployment rate for Alabama was 2.8%. However, in Mobile County the unemployment rate over the same period was 5.7% which is 2.3 points higher than the U.S. average of 3.4%. In general, the unemployment rate has been historically high in the region.

The Port of Mobile is a significant employment generator, including a substantial number of minority-held jobs. Over the last decade, Black employee hours for direct ASPA employees have averaged approximately 30% of total employee hours, compared with a Mobile County population that is approximately 36% Black. Black International Longshoremen's Association (ILA) employment on the container terminal or the rail intermodal facility is even stronger. Black employee hours in the container terminal and rail intermodal facilities averaged 41% of total employee hours, compared with a Mobile County population that is approximately 36% Black.

d. Demographic Qualifier: Ethnicity and Race

The City of Mobile, Alabama has a population that is 41.5% White and 52.5% Black, making up 97% of the population1. Other races include Asian (1.8%) and those who identify as some other race (0.9%). There is 2.6% of the population who are Hispanic or Latino.[2]

e. How does the Port's Business Expansion Impact Equity Issues?

The results of EPAs Environmental Justice Screening Tool (EJSCREEN) show that Census Tract 12 have the following seven categories that meet the criteria that identifies it as disadvantaged:

[2] ACS 2021 5-Year Estimates

Climate change, energy, health, legacy pollution, transportation, water and wastewater, and workforce development. See Resiliency section following.

This project will reduce the long-term emissions compared to current operations because trains will replace hundreds of trucks which today cross through the affected neighborhoods.

A large part of the Port's labor force is drawn from those demographic groups most disadvantaged by today's technology centric and education focused economy. To secure a good paying job as an operations worker typically does not require higher education in the form of a completed college or graduate degree.

Thus, the Port's expansion provides an excellent source of employment for those populations frequently facing the lack of sustained employment and falling into poverty. ASPA for many years maintained a policy of equal opportunity hiring from the local population and, along with that, a policy of training and promoting from within on the basis on merit. Current demographics of ASPA's labor force demonstrate that commitment.

Upon completion of construction, the Port of Mobile will have additional capacity to continue to grow the economic impact it has on increasing incomes for those living in the surrounding APP and HDC communities. The largest impact on near and midterm jobs will be directly related to the project construction contract. Long-term benefits will be related to the increased economic output of the related businesses in the community.

3. Resiliency

This project advances objectives in the National Climate Resilience Framework. This project incorporates nature-based solutions / natural infrastructure, including use of natural materials, and, as applicable, avoids fragmenting lands with high conservation value, avoids barriers to fish and wildlife migration, and incorporates mitigation measures to address unavoidable impacts.

The project will benefit communities most vulnerable to climate change impacts, such as those in FEMA-designated Community Disaster Resilience Zones (CDRZ). While Mobile has not yet been designated a CDRZ, the Census Tract where the yard work will take place, 001200, is rated "very high" in the FEMA National Risk Index.[3]

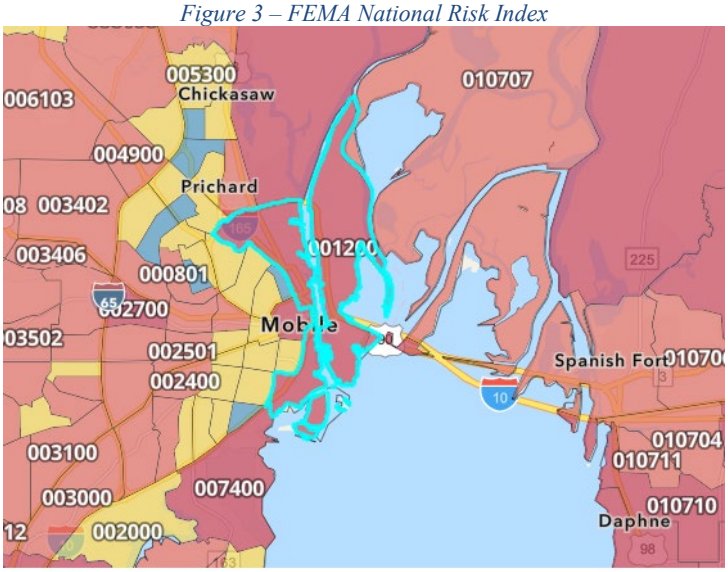
Further to this point, on a local level, Mobile has indeed taken steps toward climate resilience. On February 2, 2023, the city of Mobile released a comprehensive Five-Year Plan for Capital Improvement Projects (CIP).

This plan focuses on several key areas, including:

[3] https://hazards.fema.gov/nri/report/viewer?dataLOD=Census%20tracts&dataIDs=T01097001200

- Public Infrastructure Renovation: The city aims to enhance and improve its infrastructure to withstand climate-related challenges.[4]
- Climate Resilience: Mobile is actively working on initiatives to enhance its resilience in the face of climate change impacts.
- Community Revitalization Efforts: The plan also includes efforts to revitalize the community through strategic projects and investments.

Figure 3 – FEMA National Risk Index



4. Methodology for Computing Monetized Benefits

Directly Monetizable Benefits are Driven by Rail-for-Truck Substitution

Along with the obvious benefit of TASD Interchange Yard weather resilient tracks in good repair, there are significant collateral benefits associated with the remedy for resiliency issues by virtue of ensuring sufficient capacity to support intermodal operations.

The Port of Mobile has a very aggressive plan to expand its intermodal footprint to 1 million TEU capacity. So far it has constructed a new intermodal container loading area that accommodates and loads up to 6,000-foot-long trains. It plans to begin construction of inland port at Montgomery, AL, to receive some of those trains and disperse containers to and receive containers from Hyundai Motors, its suppliers, and others in the area. It also announced prospective plans to construct a similar facility in Decatur, AL, to perform the same tasks on behalf of shippers in Northern Alabama. A contemporaneous plan will enlarge the surface stacking area of the containership docking area and the dock-side container handling area at McDuffie Island.

[4] https://revitalization.org/article/mobile-alabama-reveals-their-new-5-year-plan-for-community-revitalization-climate-resilience-and-infrastructure-renovation/

An enabling factor for all this expansion is having adequate capacity and operating continuity at its TASD Railway Interchange Yard that will become a critical link in this logistics chain.

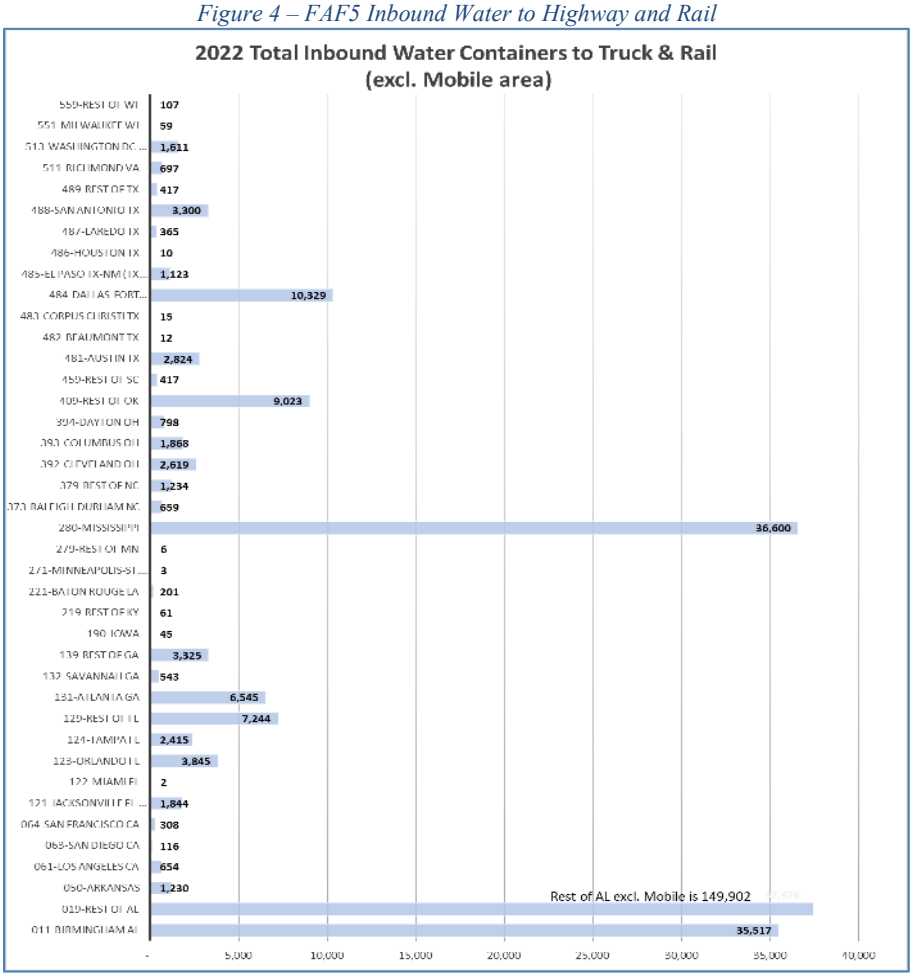
In this circumstance, the preferred methodology for monetizing demonstrated benefits is to calculate the number of truck miles potentially saved by diverting truck trips to rail. Comparing the "No Build" truck effects on operating costs, quality of life, highway wear-and-tear and safety, monetized according to the Department's Guidelines, to a "Build" case including rail's superior effects, again monetized, yields the difference or "net benefit" of rail substitution.

Summary of Traffic Volume Findings

Location will dictate what portion of Mobile's planned growth to 1 million TEU can be attributed to rail. While not all traffic is likely to be susceptible, we the used Bureau of Transportation Statistics' *Freight Analysis Framework* (FAF5) data to measure the historical flow of inbound containerized maritime freight with subsequent truck or rail inland transport to help predict traffic between Mobile and the hinterland.

As shown by Figure 4 below, Mobile's inbound container traffic (as of 2022) forwarded onward from Mobile by truck **and** rail is highly concentrated in the State and surrounding areas.

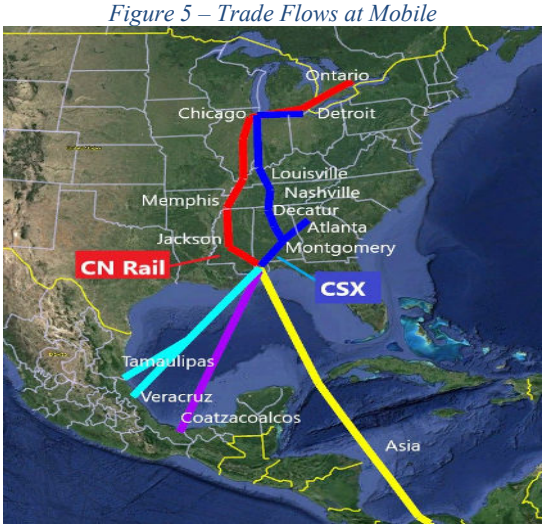
Figure 4 – FAF5 Inbound Water to Highway and Rail



The established rail container service is that of CN Rail, indicated on the map in Figure 5.[5] The fact that CN traverses Mississippi explains the presence of a large block of rail traffic to Mississippi destinations and traffic forwarded on westward and southward via Jackson and Memphis.

As also can be seen in Figure 4, "019-Rest of Alabama" excepting Mobile and Birmingham is very large compared to the other destinations, amounting to some 580 truck or train trips per workday, only about 10% of which are by rail today. Within this category will be found a lot of traffic for Montgomery in the south and for Northern Alabama destinations that could be served by the inland ports to be situated along the tracks of CSX railroad at Montgomery and prospectively at Decatur.

Figure 5 – Trade Flows at Mobile



a. Alabama Inland Ports:

A viable way to look at quantifying zone 019-Rest of Alabama **rail susceptible** traffic is to look at the role of the inland ports as an impetus for switching from truck to rail.

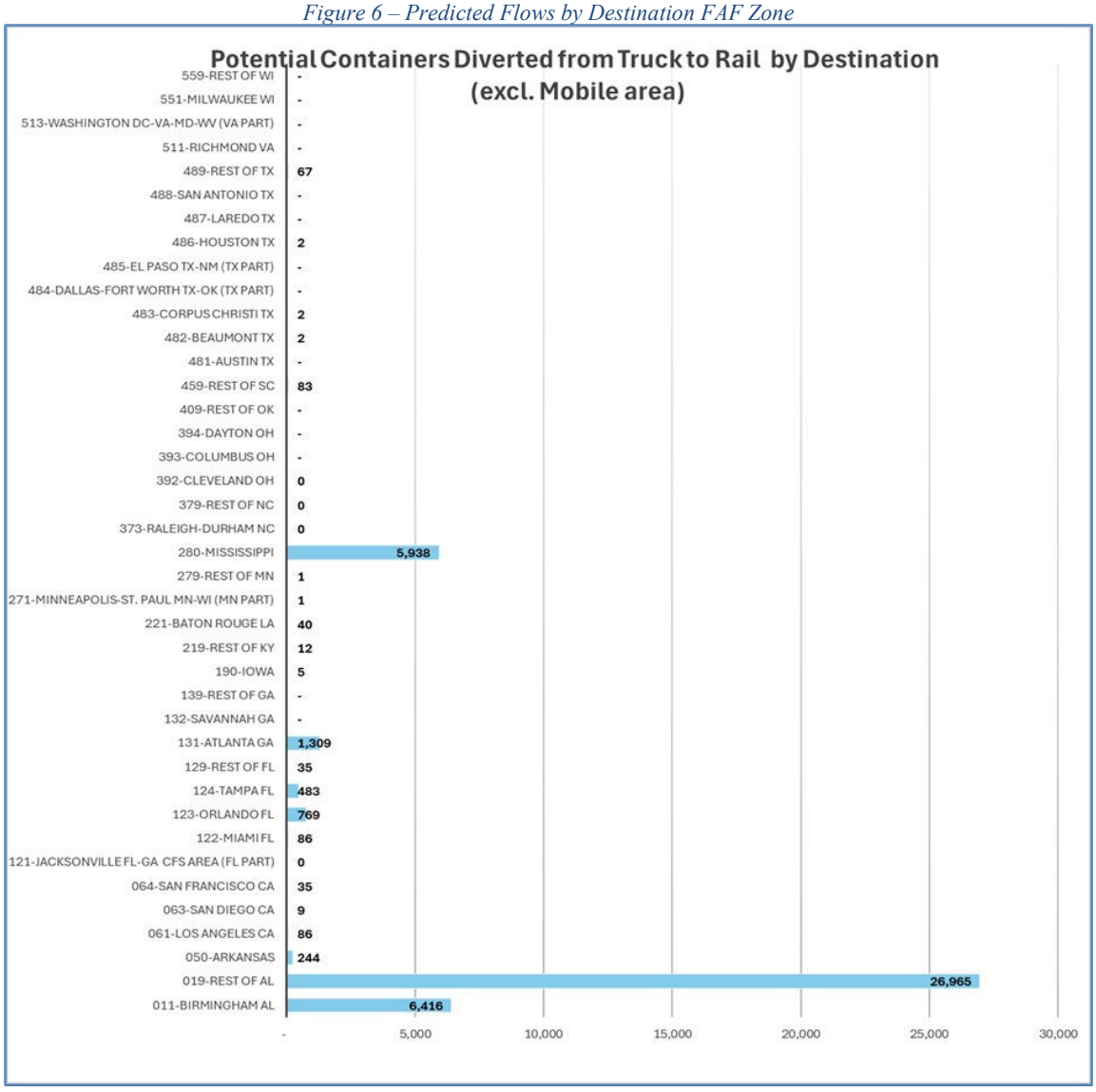
The inland ports are being designed for a level of traffic which should be reachable due to the typically demonstrable cost savings of using rail and the support of an "anchor tenant." Moreover, from a benefits perspective, the traffic between Mobile and the Alabama inland ports is likely to be classic drayage traffic with the tractor moving a container inland and a filled export or empty container outbound so that vehicle miles travelled (or saved) double. Although

[5] The CN service is operating an average of two trains per day each carrying between 50-70 containers on 25 to 35 well cars having a maximum train/track length of approximately 2,500 feet each. ICTF has one loading and one parallel loading/storage track each having a length of 3,000 feet.

FAF5 does not include such specificity, we can envision that many if not most of the early on diversions to rail would be to Montgomery inland port, which is soon to be under construction.[6]

A conservative approach to assessing longer term prospects without yet having any inland ports in place is to apply generalized (naive) probabilities to the **existing** traffic volumes already occurring in the FAF5 data above. The concept embedded in this BCA analysis is that the inland ports would capture a sizable portion of that traffic already predicted to flow to those zones by highway mode and convert it to rail hauled containers, forming an example for the bulk of the weighted miles computed by FAF5 analysis.

Figure 6 – Predicted Flows by Destination FAF Zone



[66] The corresponding twenty-foot equivalent total is 48,537 TEUs (containers x 1.8), well under the design specification for the Montgomery inland port at 60,000 annual TEUs even if all the containers moved to Montgomery.

In the example used here, the truck to rail conversion is **constrained to a one-in-five probability** of diversion to rail. That would result in 26,965 additional annual containers being diverted from highway to rail-based transport within the "019-Rest of Alabama" FAF5 category – see Miles Analysis in the included Excel file. The mileage attributable to each of these containers traveling one-way is approximately 200 miles, being the average miles registered for each truckload replaced by rail according to the total ton miles assigned to the Water to Truck category by FAF5 divided by tons transported in the category.[7]

Additionally, we **constrained the miles traveled on rail** to the 165 rail miles between Mobile and the Montgomery inland port and to attribute an additional 35 miles (200 – 165 miles) of today's typical truck journey to truck drayage from the inland port. The result is 943,000 miles of drayage added back to truck miles.

In total, the rail diversions would save 4.5 million annual one-way highway miles[8] or an average savings of more than 9 million highway miles[9] per year based on round trip rail miles per container movement, offset in part by the above-mentioned added drayage miles from inland port to receivers.

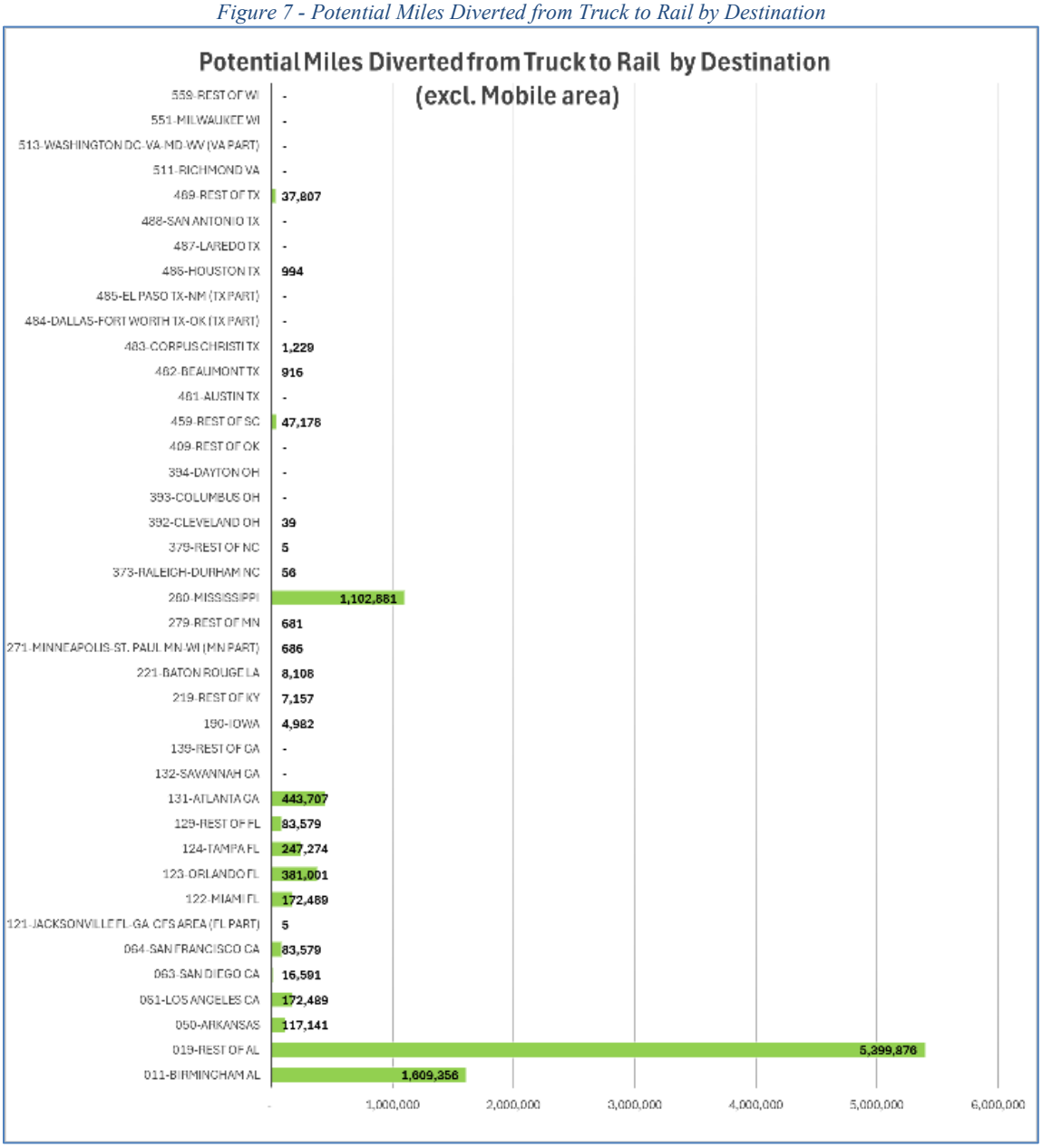
We assumed savings would phase in over five years based on a similar experience at the Greer, South Carolina inland port which is linked by rail to the Port of Charleston. Greer has expanded in three phases (so far) and, like the planned Montgomery facility and Hyundai, is anchored by a nearby major auto manufacturing plant (BMW) and its suppliers near or adjacent to its facility.

[7] . One-way miles are indicated because the selected data set is Imports from Water to Truck or Rail. The indicated one-way mileage of the category is slightly higher than the Montgomery mileage at 200 miles versus 165 miles because it includes destinations more distant than Montgomery such as Decatur, which is 346 miles distant.

[8] Unconstrained mileage diverted from truck to rail calculated directly from FAF5 is 5.4 million miles or approximately 200 miles per container.

[99] Typical drayage vehicle miles are doubled because the tractor delivering the container will nearly always return with a loaded or empty container to the port or inland port.

Figure 7 - Potential Miles Diverted from Truck to Rail by Destination



5. Benefit-Cost Analysis

A quantitative benefit-cost analysis (BCA) was performed using available information about current truck drayage practices and current and proposed rail operations, USDOT guidance, and supported by documentable costs and industry research data.

This BCA is not a comprehensive measure of the project's total potential economic impact as many likely regional benefits related to increased competitiveness of Mobile area and Alabama firms and products and their employment and multiplier effects are not used in this type of analysis.[10]

Identifiable future years' costs and benefits have been projected, in constant 2022 dollars, for a period extending 20 years beyond construction. Per federal guidance, the monetized value of these quantified future benefits and costs are discounted to Present Value at a discount rate of 3.1%, except for carbon emissions savings, which are discounted at 2.0%.

Table 1 – Benefit Cost Summary

Benefit or Cost Category (in millions of present value dollars)		Present Value @3.1%
Tot. Project Cost including O&M and Match-- PV @ 3.1%		**$46.9 million**
Quantified Benefits--PV @ 7%:		
Accident Reduction		**$34.9 million**
Non-Carbon Emissions Reduction		**$12.8**
Social Cost of Carbon @ 2%	*	**$57.6**
Additional Savings:		
Road Wear Savings		**$10.0**
Operating Cost Savings		**$148.9**
Travel Time Savings		**$2.1**
Inventory Carrying Costs		**($2.4)**
Truck Externalities Cost		**$52.4**
O&M Costs (minus) plus Residual Value		**$0.6**
Total Quantified Benefits		**$316.9**
Benefit Cost Ratio (BCR)		**6.75 (2.65 inclusive of all relevant assets)**

Figures are presented in NPV of 2022 dollars.

[10] USDOT, Office of the Secretary, "Benefit-Cost Analysis Guidance for Discretionary Grant Programs. December 2023.

6. Project Benefits

Quantified project benefits are estimated through 2046, 20 years after the project is fully functioning. Abbreviated summaries of analysis methods and authorities are presented below. The BCA Matrix spreadsheet is provided in the Appendix and an unlocked Excel workbook containing all calculations will be provided with the grant application.

a. Accident Reduction

Safety benefits are calculated based on the estimated number of accidents that will be eliminated or avoided because of the Project. The accident data used for the analysis are based on experienced rates for National highways as found in *Crash Statistics* published by the National Highway Transportation and Safety Administration[11] and Table A-1 of the BCA Guidance. Such rates were applied to avoided truck vehicle miles traveled to generate direct avoided accident cost related to reduced truck mileage.

Rail Accident data was obtained from the Federal Railroad Administration Office of Safety.[12]

An undiscounted sample of these calculations for trucks is shown below.

Table 2 – Accident Savings (partial capture of full table)

Year	Operational Year #	Truck 100MVMT	Fatal Crashes	Injury Crashes	PDO Crashes	Killed Cost	Injured Cost	PDO Cost	Total Truck Accident Cost
			1.00	79.00	125.00	$ 14,022,900	$ 313,000	$ 9,100	
			Per 100MVMT	Per 100MVMT	Per 100MVMT	Per Accident	Per Accident	Per Accident	
2025									
2026									
2027	1	0.014	0.01	1.11	1.75	$ 180,390	$ 240,774	$ 15,950	$ 437,114
2028	2	0.028	0.03	2.22	3.51	$ 360,780	$ 481,549	$ 31,899	$ 874,228
2029	3	0.042	0.04	3.32	5.26	$ 541,170	$ 722,323	$ 47,849	$ 1,311,342
2030	4	0.056	0.06	4.43	7.01	$ 721,560	$ 963,097	$ 63,799	$ 1,748,456
2031	5	0.070	0.07	5.54	8.76	$ 901,950	$ 1,203,872	$ 79,749	$ 2,185,571
2032	6	0.107	0.11	8.43	13.34	$ 1,373,331	$ 1,833,043	$ 121,427	$ 3,327,801
2033	7	0.107	0.11	8.43	13.34	$ 1,373,331	$ 1,833,043	$ 121,427	$ 3,327,801

b. Fuel Consumption and Emissions Reduction

Fuel consumption drives both fuel saving and emissions effects to the extent that hundreds of lengthy dray truck trips are diverted to intermodal rail movements, with a shorter drayage movement to the destination, which are more fuel efficient[13]. This is contrasted with the same calculations for a heavy-duty diesel truck which in this service moves approximately 19 tons with 7.1 miles per gallon of diesel or 135 ton-miles per gallon versus rail which moves 520 ton-miles per gallon of fuel.[14]

11 https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813527 and

[12] https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/AccidentByRegionStateCounty.aspx

[13] In the case of Montgomery, the Hyundai automobile plant and suppliers are situated less than 4 miles from the intermodal ramp.

[14] https://truckingresearch.org/atri-research/operational-costs-of-trucking/

Table 3 – Truck Fuel and Emissions Calculation (partial table undiscounted)

Year	Operational Year #	Truck VMT	Fuel Use	Carbon Emissions	Unit Cost for SCC by Year	Social Cost of Carbon	NOx Emissions	Unit Cost of NOx by Year	Value of NOx	PM Emissions	Unit Cost of PM by Year	Value of PM	SO_x Emission
		miles (000)	activity inputs	metric tons	per metric ton		metric tons	per metric ton		metric tons	per metric ton		metric tons
2025													
2026													
2027	1	1,402	197,489	2,338	$ 245	$ 572,855	4	$ 21,000	$ 83,384	0.083	$ 1,011,900	$ 83,922	0.022
2028	2	2,804	394,978	4,676	$ 250	$ 1,169,092	8	$ 21,300	$ 169,151	0.166	$ 1,030,600	$ 170,946	0.044
2029	3	4,207	592,467	7,015	$ 253	$ 1,774,682	12	$ 21,700	$ 258,491	0.249	$ 1,049,600	$ 261,146	0.066
2030	4	5,609	789,956	9,353	$ 257	$ 2,403,653	16	$ 22,000	$ 349,419	0.332	$ 1,069,000	$ 354,631	0.089
2031	5	7,011	987,445	11,691	$ 262	$ 3,063,021	20	$ 22,000	$ 436,774	0.415	$ 1,069,000	$ 443,288	0.111
2032	6	10,675	987,445	17,801	$ 265	$ 4,717,230	30	$ 22,000	$ 665,043	0.631	$ 1,069,000	$ 674,961	0.169
2033	7	10,675	987,445	17,801	$ 270	$ 4,806,235	30	$ 22,000	$ 665,043	0.631	$ 1,069,000	$ 674,961	0.169
2034	8	10,675	987,445	17,801	$ 274	$ 4,877,438	30	$ 22,000	$ 665,043	0.631	$ 1,069,000	$ 674,961	0.169

The fuel and emissions savings resulting from decreased truck miles are mirrored by increased fuel usage by trains in most respects (rail fuel is compared to prior usage levels, negative numbers are to be netted from savings achieved for trucks.)

Table 4 – Rail Fuel and Emissions Calculation (partial table undiscounted)

Year	Operational Year #		Fuel Use (Gallons)	Carbon Emissions	Unit Cost for SCC by Year	Social Cost of Carbon	NOx Emissions	Unit Cost of NOx by Year	Value of NOx	PM Emissions	Unit Cost of PM by Year	Value of PM	Sox Emission
				metric tons	per metric ton		metric tons	per metric ton		metric tons	per metric ton		metric tons
2025					$ 237								
2026					$ 241								
2027	1		(32,513)	(330)	$ 245	$ (80,853)	(0.68)	$ 21,000	$ (14,202)	(0.010)	$ 1,011,900	$ (9,957)	(0.003)
2028	2		(65,027)	(660)	$ 250	$ (165,005)	(1.35)	$ 21,300	$ (28,809)	(0.020)	$ 1,030,600	$ (20,282)	(0.006)
2029	3		(97,540)	(990)	$ 253	$ (250,478)	(2.03)	$ 21,700	$ (44,026)	(0.030)	$ 1,049,600	$ (30,984)	(0.009)
2030	4		(130,054)	(1,320)	$ 257	$ (339,251)	(2.71)	$ 22,000	$ (59,512)	(0.039)	$ 1,069,000	$ (42,075)	(0.012)
2031	5		(162,567)	(1,650)	$ 262	$ (432,314)	(3.38)	$ 22,000	$ (74,391)	(0.049)	$ 1,069,000	$ (52,594)	(0.015)
2032	6		(162,567)	(1,650)	$ 265	$ (437,264)	(3.38)	$ 22,000	$ (74,391)	(0.049)	$ 1,069,000	$ (52,594)	(0.015)
2033	7		(162,567)	(1,650)	$ 270	$ (445,515)	(3.38)	$ 22,000	$ (74,391)	(0.049)	$ 1,069,000	$ (52,594)	(0.015)
2034	8		(162,567)	(1,650)	$ 274	$ (452,115)	(3.38)	$ 22,000	$ (74,391)	(0.049)	$ 1,069,000	$ (52,594)	(0.015)

Factors applied in these calculations are shown in the table below with sources.

Table 5 – Truck Emission Factors

Truck fuel consumption rate (diesel)		7.1	mile/gallon	https://truckingresearch.org/atri-research/operational-costs-of-trucking/
CO2	T7 Tractor Class)	0.001667545	MT/Mile	https://arb.ca.gov/emfac/emissions-inventory/d9dba224c118bc73002838c7e1faac3122646e3e
SOx	T7 Tractor Class)	0.02	G/Mile	https://arb.ca.gov/emfac/emissions-inventory/d9dba224c118bc73002838c7e1faac3122646e3e
Nox	T7 Tractor Class)	2.832	G/Mile	https://arb.ca.gov/emfac/emissions-inventory/d9dba224c118bc73002838c7e1faac3122646e3e
PM2.5	T7 Tractor Class)	0.059	G/Mile	https://www.bts.gov/archive/publications/national_transportation_statistics/table_04_-GA152:K157

Table 6 – Emissions Analysis Factors

Truck fuel consumption rate (diesel)		7.1	mile/gallon	https://truckingresearch.org/atri-research/operational-costs-of-trucking/			
CO2	T7 Tractor Class)	0.001667545	MT/Mile	https://arb.ca.gov/emfac/emissions-inventory/d9dba224c118bc73002838c7e1faac3122646e3e		Non-CO_2	CO_2
SOx	T7 Tractor Class)	0.02	G/Mile	https://arb.ca.gov/emfac/emissions-inventory/d9dba224c118bc73002838c7e1faac3122646e3e	Freight Train Idling	749	28
Nox	T7 Tractor Class)	2.832	G/Mile	https://arb.ca.gov/emfac/emissions-inventory/d9dba224c118bc73002838c7e1faac3122646e3e	Freight Train Hauling	2,202	280
PM2.5	T7 Tractor Class)	0.059	G/Mile	https://www.bts.gov/archive/publications/national_transportation_statistics/table_04_43			

Table 7 - Rail Emissions Per Hour (Tier 4, Linehaul)

	Grams/Gallon	
CO_2	10,150.00	Source:
Nox	20.8	https://www.epa.gov/system/files/documents/2023-01/2020_NEI_Rail_062722.pdf
$PM_{2.5}$	0.30264	
SO_x	0.09390	

Emissions reductions are estimated for carbon and for non-carbon emissions. For the purposes of calculating fuel consumption and emissions benefits, heavy-duty combination (tractor-trailer) drayage trucks are assumed.

- Mileage and ton-mile savings for trucks are calculated based on the assumption that one loaded container averaging 19 tons in weight is today driven from Port of Mobile to destination in the Montgomery area. We assumed 100% "deadhead" or empty-return movements for this dray movement although it is known that some export containers are re-loaded for export at Hyundai.
- Carbon emissions are estimated based on estimated reduction of fuel consumption using an assumed 1.7 KG of CO_2 per mile for heavy trucks.
- Unit costs for the social cost of carbon per year as presented in the 2023 BCA Guidance Table A-6, are applied to net savings in metric tons to calculate carbon-based emissions avoided.[15]
- Non-carbon emission quantities were estimated based on EPA metrics. The appropriate unit price for each type of emission was sourced from USDOT's BCA Guidance.

Table 8 reflects an estimated annual reduction of fuel use *averaging* 742,000 gallons from 2027 onward. Total forecasted fuel savings and emissions reductions are summarized in the table below.

Table 8 – Summary Fuel Savings and Emissions Reduction ***Undiscounted***

	Fuel consumption (gallons)	Carbon Tonnes	NOx Tonnes	PM Tonnes	SOX Tonnes
Total savings over 20 years	**17.8m**	**272,385**	**452**	**9.8**	**2.59**
Average annual savings	**888.7m**	**13.619**	**22.6**	**0.49**	**0.13**
Average Annual Value of Emissions Savings		**$3.96m**	**$1.03m all non-Carbon emissions**		

[15] Social Cost of Carbon has been discounted at a 2% cost of capital, per USDOT's BCA Guidance, which has been used here.

c. Road Wear Savings

Trucks impart significantly more wear on highway pavement and bridges than do autos. When truck traffic is shifted to rail this wear is eliminated and counted as a public benefit.

Table 9 below illustrates the long-run marginal or fully costed road wear alternative cost of 8.88 cents per mile, which we used in this analysis. Even though the route is rural in nature a weighting of 20/80% urban/rural was assigned. The reasoning is that State Docks Road and other service roads used by draymen within the Port are maintained by the Port Authority on its budget which must pay the full cost of incrementally expanding and keeping the roadways in a state of good repair and I-65 leading to Montgomery is likewise a heavy maintenance highway. Cost authorities are derived from the May 2000 Federal Highway Administration Publication, *Addendum to the 1997 Federal Highway Cost Allocation Study Final Report.*

Table 9 – Cost Authorities Used for Road Wear

https://www.fhwa.dot.gov/policy/hcas/addendum.cfm			
From Table 13. "2000 Pavement, Congestion, Crash, and Noise Costs			
for Illustrative Vehicles Under Specific Conditions."			
		Cents Per VMT	Weighting
60kip 5-axle SU Truck Rural Intersta		3.3	80%
60kip 5-axle SU Truck Urban Interst		10.5	20%
Weighted Average		5.54	
Inflation 2000 to 2022		1.60102621	
2022 Value		8.88	

d. Roadway Congestion/Operating Cost Savings/Travel Time Savings/External Truck Savings

Vehicle operating cost savings for trucks were computed using per-mile figures from Table A-5 of USDOT's BCA Guidance. Travel time savings were computed using Table A-3 of the BCA Guidance. Per-hour values for commercial truck drivers were applied to truck operations and forklift operations in the analysis. DOT's BCA Guidance provides unit costs per vehicle mile traveled for external congestion, noise, and safety. Net benefits from reduced external effects were computed for trucks based on a rural/urban weighting of 80/20 percent.

Table 10 – Operating, Travel Time, and Truck Externalities Authorities

Vehicle Operating Cost Per Mile (Commercial Trucks)				
	BCA Guidance, Table A-4			$1.32
External Highway Cost per Mile for Buses and Trucks				
	BCA Guidance, Table A-14		Urban	Rural
		Congestion	$ 0.3450	$ 0.0750
		Noise	$ 0.0437	$ 0.0037
		Safety	$ 0.0160	$ 0.0270
		CO_2 Emissions	$ 0.3030	$ 0.2990

e. Operational Expense Reduction & Competitiveness Benefits

According to USDOT's BCA Guidance, "*The primary benefits from a proposed project will typically arise in the "market" for the transportation facility or service that the project would improve and would be experienced directly by its users*." In this case the operating cost reduction by reducing the cost of truck drayage also supports the enhancement of the resiliency of the Port against flooding.

It is generally conceded that rail is more economical for the shipper than truck transport if rail can be employed for the same purposes. In this case, the central thesis is that new inland port facilities to be constructed will make it very practical for shippers to place their goods on an intermodal train in Mobile and receive their shipment reliably and time-effectively at their business in Montgomery. The avoided economic costs of trucking are significant after taking account of the rail costs of service.

Table 11 – Operational Expense Comparison (partial table undiscounted)

Year	Operational Year #	Truck-Miles (000)	Road Wear	Truck Op. Cost	Inventory Carrying Cost	External Truck Costs	Truck Travel Time	Train Operating Cost
		1/	$.1387/truck-mile 2/	$1.32/truck-mile 3/	4/	5/	6/	7/
2025								
2026								
2027	1	1,402	$ 124,458	$ 1,850,867	$ (41,910)	$ 779,888	$ 25,494	$ (353,898)
2028	2	2,804	$ 248,916	$ 3,701,734	$ (83,820)	$ 1,559,776	$ 50,988	$ (707,797)
2029	3	4,207	$ 373,374	$ 5,552,601	$ (125,731)	$ 2,339,664	$ 76,482	$ (1,061,695)
2030	4	5,609	$ 497,832	$ 7,403,468	$ (167,641)	$ 3,119,552	$ 101,976	$ (1,415,594)
2031	5	7,011	$ 622,290	$ 9,254,335	$ (209,551)	$ 3,899,440	$ 127,470	$ (1,769,492)
2032	6	10,675	$ 947,514	$ 14,090,867	$ (209,551)	$ 5,937,379	$ 194,089	$ (1,769,492)
2033	7	10,675	$ 947,514	$ 14,090,867	$ (209,551)	$ 5,937,379	$ 194,089	$ (1,769,492)

Authorities for the above calculations not discussed elsewhere above are found in the Excel file and as follow:

- Truck operating cost is taken from Table A-4 of the Benefit-Cost Guidance.
- Inventory carrying cost calculated from the value of contents per the "Value of Containerized Trade: 2020" inflated to 2022 dollars per forty-foot equivalent (FEU) container and a financial holding cost of ownership is assigned based on annualized interest equivalent.

- Truck Externalities in terms of noise, congestion and quality of life considerations are taken from Table A-14 of the Benefit Cost Guidance.
- Travel time costs are taken from Table A-2 of the Benefit Cost Guidance for Commercial Truck Drivers on the one hand and General Travel Time, All Purpose in the case of motorists.

7. Project Investment Costs

Project investment costs are arrayed in Table 12 below to show the project elements, sequence, and year of expenditure.

As noted in the Investment Needs Section, this BCA presents an alternative, more inclusive calculation of the BCR including the budgeted costs of the inland port at Montgomery which would be the earliest beneficiary of the Interchange Yard capacity and resiliency improvements. These are found at the bottom of the investment table.

Capital recovery years or service life amortization years are also shown. The BCA assumes the project investment phase will be executed from 2025 to 2026, while maintaining present operational continuity. and will be functionally complete with benefits beginning in 2027.

Operations & Maintenance Costs: The project is expected to generate lower average $292,000 annual maintenance costs (discounted) for miscellaneous maintenance than those associated with present operations. That is mainly a reflection of the fact that the installed crossties, rails, and switches will have a 40-year expected service life versus the shorter remaining life of assets in place.

Service Life: In service, as contemplated here, rail yard tracks have very long service lives, more than 40 years, and require only periodic maintenance. Notwithstanding, per the Guidance, a discounting period of 20 years and a service life of 25 years is assumed here for this improvement of an existing asset, and at the end of the discounting period a residual value is credited.

Table 12 – Summary of Proposed Investments and O&M Expense (undiscounted 2022 dollars)

Capex & Maintenance																											
Combined 30% Cost Estimate																											
Capital Recovery Year	24 Budget	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Discounting Year	Year	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
NPV of $1.00	Forward Calc.	3.10%	0.970	0.941	0.912	0.885	0.858	0.833	0.808	0.783	0.760	0.737	0.715	0.693	0.672	0.652	0.633	0.614	0.595	0.577	0.560	0.543	0.527	0.511	0.496	0.481	
Fiscal Year	Dollars	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	
E&P and Capiital Expenditure:	x Deflator	0.929																									
Earthwork	7,843,144	7,286,281			7,286,281																						
Erosion Control	2,700,000	2,508,300			1,254,150	1,254,150																					
Roadway	68,646	63,772			63,772																						
Civil Site (Drainage)	4,259,470	3,957,048			3,957,048																						
Utilities	6,000,000	5,574,000				5,574,000																					
Trackwork & Switches	19,276,311	17,907,693				17,907,693																					
Tot. Depreciable(excl. Intang.)	40,147,571	37,297,093																									
Remediation	700,000	650,300			650,300																						
Right of Way	-	-																									
Subtotal Construction Cost	40,847,571	37,947,393																									
Contingency 25%	10,211,893	9,486,848				9,486,848																					
General Conditions 3%	1,531,784	1,423,027				1,423,027																					
Construction Admin. 5%	2,552,973	2,371,712			711,514	1,660,198																					
Permits & Fees 1%	510,595	474,342			474,342																						
Bonding & Insurance 1.8%	919,070	853,816			853,816																						
Total CapEx plus E&P	56,573,886	52,557,140	-	-	15,251,223	37,305,917	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NPV of CapEx Dollars		*46,933,871*		-	*13,916,457*	*33,017,414*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Annual Maintenance																											
Tie and Rail Replacement ($300 per tie replacement)			42,332	Track Fee	40 Year Life		211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660	211,660
Electical							-	-	30,000	-	-	30,000	-	-	30,000	-	-	30,000	-	-	30,000	-	-	30,000	-	-		
Periodic Inspections							-	-	-	-	-	40,000	-	-	-	-	40,000	-	-	-	-	40,000	-	-	-	-		
Pavement Maintenance							-	-	-	-	-	-	-	-	10,000	-	-	-	-	-	-	-	10,000	-	-	-	
Annual Maintenace							211,660	211,660	241,660	211,660	211,660	281,660	211,660	211,660	251,660	211,660	251,660	241,660	211,660	211,660	241,660	251,660	221,660	241,660	211,660	211,660	
Discounted Annual Maintenance							*181,696*	*176,233*	*195,161*	*165,794*	*160,809*	*207,558*	*151,284*	*146,735*	*169,220*	*138,044*	*159,197*	*148,274*	*125,963*	*122,175*	*135,298*	*136,660*	*116,750*	*123,457*	*104,879*	*101,726*	
Discounted Maintenace Total							*2,966,912*	*Average*	*148,346*																		
No Build or Base Case 20 year maintenance plan																											
Tie and Rail Replacement ($300 per tie replacement)			18,052	Track Fee	20 Year Life		423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320	423,320
Electical							-	-	30,000	-	-	30,000	-	-	30,000	-	-	30,000	-	-	30,000	-	-	30,000	-	-		
Periodic Inspections							-	-	-	-	-	40,000	-	-	-	-	40,000	-	-	-	-	40,000	-	-	-	-		
Pavement Maintenance							-	-	-	-	-	-	-	-	20,000	-	-	-	-	-	-	-	20,000	-	-	-	
Annual Maintenace							423,320	423,320	453,320	423,320	423,320	493,320	423,320	423,320	473,320	423,320	463,320	453,320	423,320	423,320	453,320	463,320	443,320	453,320	423,320	423,320	
Discounted Maintenace Total							*8,806,400*	Average	*440,320*																		
Average Incremental Maintenance under Build Scenario								Average	*(291,974)*																		

Additional Information Pertaining to Montgomery Indland Port	2024 Budget	2022$ 0.929	2025	2026
Demolition	$ 123,000	$ 114,267	$ 114,267	
Site Prep.	7,976,003	7,409,707	7,409,707	
Erosion Control	3,326,250	3,090,086	3,090,086	
Drainage	2,117,500	1,967,158	1,967,158	
Paving and Signage	18,127,430	16,840,382		16,840,382
Gates and Guard Rails	1,012,800	940,891		940,891
Electric	11,240,000	10,441,960		10,441,960
Water Service	688,900	639,988	639,988	
Sanitary Sewer	240,000	222,960	222,960	
Yard Trackwork	4,591,600	4,265,596	4,265,596	
Yard Leads Trackwork	8,640,600	8,027,117		8,027,117
Compressed Air System.	313,400	291,149		291,149
Buildings & Furnishings	2,963,500	2,753,092		2,753,092
Stot. Construction	$61,360,983	$ 57,004,353	$ 17,709,762	$ 39,294,591
Design, Permit/Survey	1,840,856	1,710,155	1,710,155	
Construction Management	1,840,856	1,710,155	855,078	855,078
Container Handling Equipment	10,360,000	9,624,440		9,624,440
Contingency on Construction	12,272,197	11,400,871		11,400,871
	87,674,892	81,449,974	20,274,995	61,174,979
NPV of CapEx Dollars		*72,643,163*	*18,500,555*	*54,142,608*

8. Appendix. BCA Spreadsheet

Summary tables of undiscounted and discounted cash flows from investments, maintenance, and net benefits are reproduced below.

		Project Costs		Nominal Benefits								
1	2	3	4	5	6	7	8	9	10	11	12	13
		Undiscounted Project Costs	Discounted Project Costs	Undiscounted Value of User Benefits in Base Year Dollars								
Project Life Year	Calendar Year	2022$ Investment and Engineering	2022$	Road Wear Savings	Operating Cost Savings	External Truck Cost Savings	Travel Time Savings	Inventory Carrying Cost	Social Cost of Carbon Savings	Non-Carbon Emission Savings	Accident Savings	Maintenance & Residual Value
	2022											
	2023											
	2024											
	2025	$15,251,223	$ 13,916,457									
	2026	$37,305,917	$ 33,017,414									
1	2027			$ 124,458	$ 1,850,867	$ 652,431	$ 25,494	$ (41,910)	$ 492,002	$ 144,243	$ 433,314	$ (211,660)
2	2028			$ 248,916	$ 3,701,734	$ 1,304,861	$ 50,988	$ (83,820)	$ 1,004,087	$ 293,246	$ 866,628	$ (211,660)
3	2029			$ 373,374	$ 5,552,601	$ 1,957,292	$ 76,482	$ (125,731)	$ 1,524,204	$ 448,069	$ 1,299,942	$ (241,660)
4	2030			$ 497,832	$ 7,403,468	$ 2,609,722	$ 101,976	$ (167,641)	$ 2,064,402	$ 607,158	$ 1,733,256	$ (211,660)
5	2031			$ 622,290	$ 9,254,335	$ 3,262,153	$ 127,470	$ (209,551)	$ 2,630,707	$ 758,947	$ 2,166,570	$ (211,660)
6	2032			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,279,966	$ 1,222,447	$ 3,308,800	$ (281,660)
7	2033			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,360,720	$ 1,222,447	$ 3,308,800	$ (211,660)
8	2034			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,425,323	$ 1,222,447	$ 3,308,800	$ (211,660)
9	2035			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,489,927	$ 1,222,447	$ 3,308,800	$ (251,660)
10	2036			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,554,530	$ 1,222,447	$ 3,308,800	$ (211,660)
11	2037			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,635,284	$ 1,222,447	$ 3,308,800	$ (251,660)
12	2038			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,683,736	$ 1,222,447	$ 3,308,800	$ (241,660)
13	2039			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,748,340	$ 1,222,447	$ 3,308,800	$ (211,660)
14	2040			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,829,094	$ 1,222,447	$ 3,308,800	$ (211,660)
15	2041			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,893,697	$ 1,222,447	$ 3,308,800	$ (241,660)
16	2042			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 4,974,451	$ 1,222,447	$ 3,308,800	$ (251,660)
17	2043			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 5,039,054	$ 1,222,447	$ 3,308,800	$ (221,660)
18	2044			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 5,119,808	$ 1,222,447	$ 3,308,800	$ (241,660)
19	2045			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 5,184,412	$ 1,222,447	$ 3,308,800	$ (211,660)
20	2046			$ 947,514	$ 14,090,867	$ 4,967,030	$ 194,089	$ (209,551)	$ 5,265,166	$ 1,222,447	$ 3,308,800	$ 7,247,759
Total		$ 52,557,140	$ 46,933,871	$ 16,079,574	$ 239,126,003	$ 84,291,916	$ 3,293,747	$ (3,771,922)	$ 79,198,911	$ 20,588,369	$ 56,131,712	$ 2,906,219
	Useful Life	25	Years							Total Undiscounted Benefits		$ 497,844,528
	Depreciation	$ 1,491,883.74	Per Year									

Discounted Benefits and Disbenefits

14	15	16	17	18	19	20	21	22	23	24
	3.1% discounted Value of User Benefits (and Disbenefits) in Base Year (2022) Dollars									
3.1% Discount Factor to 2022	Road Wear Savings	Operating Cost Savings	External Truck Cost Savings	Travel Time Savings	Inventory Carrying Cost	Non-Carbon Emission Savings	Accident Savings	Maintenance & Residual Value	2.0% Discount Factor to 2022	Social Cost of Carbon Savings @2.0%
1.000									1.00	
0.970									0.98	
0.941									0.96	
0.912									0.94	
0.885									0.92	
0.858	$ 106,839	$ 1,588,846	$ 560,068	$ 21,885	$ (35,977)	$ 123,823	$ 371,971	$ (181,696)	0.91	$ 445,622
0.833	$ 207,253	$ 3,082,146	$ 1,086,456	$ 42,454	$ (69,791)	$ 244,163	$ 721,574	$ (176,233)	0.89	$ 891,600
0.808	$ 301,532	$ 4,484,208	$ 1,580,683	$ 61,766	$ (101,539)	$ 361,855	$ 1,049,816	$ (195,161)	0.87	$ 1,326,911
0.783	$ 389,954	$ 5,799,170	$ 2,044,208	$ 79,878	$ (131,314)	$ 475,590	$ 1,357,667	$ (165,794)	0.85	$ 1,761,947
0.760	$ 472,786	$ 7,031,002	$ 2,478,428	$ 96,846	$ (159,207)	$ 576,612	$ 1,646,056	$ (160,809)	0.84	$ 2,201,258
0.737	$ 698,230	$ 10,383,674	$ 3,660,245	$ 143,026	$ (154,420)	$ 900,831	$ 2,438,282	$ (207,558)	0.82	$ 3,511,063
0.715	$ 677,236	$ 10,071,459	$ 3,550,189	$ 138,725	$ (149,777)	$ 873,745	$ 2,364,968	$ (151,284)	0.80	$ 3,507,166
0.693	$ 656,873	$ 9,768,631	$ 3,443,443	$ 134,554	$ (145,273)	$ 847,473	$ 2,293,858	$ (146,735)	0.79	$ 3,489,337
0.672	$ 637,122	$ 9,474,909	$ 3,339,905	$ 130,508	$ (140,905)	$ 821,992	$ 2,224,887	$ (169,220)	0.77	$ 3,470,859
0.652	$ 617,965	$ 9,190,019	$ 3,239,482	$ 126,584	$ (136,669)	$ 797,276	$ 2,157,989	$ (138,044)	0.76	$ 3,451,764
0.633	$ 599,384	$ 8,913,694	$ 3,142,077	$ 122,778	$ (132,559)	$ 773,304	$ 2,093,103	$ (159,197)	0.74	$ 3,444,084
0.614	$ 581,362	$ 8,645,678	$ 3,047,602	$ 119,086	$ (128,574)	$ 750,052	$ 2,030,168	$ (148,274)	0.73	$ 3,411,848
0.595	$ 563,882	$ 8,385,721	$ 2,955,967	$ 115,506	$ (124,708)	$ 727,500	$ 1,969,125	$ (125,963)	0.71	$ 3,391,086
0.577	$ 546,927	$ 8,133,580	$ 2,867,087	$ 112,033	$ (120,958)	$ 705,625	$ 1,909,917	$ (122,175)	0.70	$ 3,381,135
0.560	$ 530,482	$ 7,889,020	$ 2,780,880	$ 108,664	$ (117,321)	$ 684,408	$ 1,852,490	$ (135,298)	0.69	$ 3,359,184
0.543	$ 514,532	$ 7,651,814	$ 2,697,264	$ 105,397	$ (113,793)	$ 663,830	$ 1,796,790	$ (136,660)	0.67	$ 3,347,663
0.527	$ 499,061	$ 7,421,740	$ 2,616,163	$ 102,228	$ (110,372)	$ 643,870	$ 1,742,764	$ (116,750)	0.66	$ 3,324,646
0.511	$ 484,055	$ 7,198,584	$ 2,537,501	$ 99,154	$ (107,053)	$ 624,510	$ 1,690,363	$ (123,457)	0.65	$ 3,311,692
0.496	$ 469,501	$ 6,982,138	$ 2,461,204	$ 96,173	$ (103,834)	$ 605,732	$ 1,639,537	$ (104,879)	0.63	$ 3,287,725
0.481	$ 455,384	$ 6,772,199	$ 2,387,200	$ 93,281	$ (100,712)	$ 587,519	$ 1,590,240	$ 3,483,339	0.62	$ 3,273,467
	$ 10,010,362	$ 148,868,232	$ 52,476,052	$ 2,050,527	$ (2,384,756)	$ 12,789,710	$ 34,941,564	$ 618,153		$ 57,590,060

TotalDiscounted Benefits @3.1% (Except for Carbon@2%)	$ 316,959,903
BCR Tot. Discounted Benefits/Discounted Investment	6.75

Inclusive of Est. Montgomery:	2022$	NPV$	BCR
2025	$ 20,274,995	$ 18,500,555	
2026	$ 61,174,979	$ 54,142,608	
Montgomery	$ 81,449,974	$ 72,643,163	
Mobile	$ 52,557,140	$ 46,933,871	
Inclusive Total	134,007,114	119,577,034	2.65