

APPENDIX A: NEWPORT INTERNATIONAL TERMINAL BENEFIT-COST ANALYSIS

In accordance with TIGER Discretionary Grant BCA Resource Guide recommendations, this section highlights the Benefit-Cost findings for this project. **Table 1** describes the types of benefits included in the analysis. Please refer to the **Appendix Tables** for the detailed BCA forecasts for years 1-30.

Table 1: Benefit-Cost Analysis Overview

Topic	Description
Current Status/Baseline & Problem to be Addressed	This Export Terminal site will provide a strategic and cost-effective location for agricultural and seafood commodity shipping operations, and alleviate long-truck trip distances between the mid-Willamette Valley and far removed ports; thereby enhancing U.S. trade competitiveness and energy independence, and productivity within a rural distressed community.
Changes to Baseline/ Alternatives	<p>Alternatives in the BCA include:</p> <p>Alt. 1 – No Build, existing commodity shipments continue to travel between mid-Willamette Valley and far flung ports (including Astoria, Coos Bay and Tacoma, Washington)</p> <p>Alt. 2 – Build, with Construction as proposed at the Port of Newport</p> <p>It is important to note that no consideration of current port activity is included because the new investment will add to, and not alter current port activity. The numbers in the analysis also preclude the baseline level of activity already occurring by the companies.</p>
Type of Impacts/Benefits	<p>The impacts of this project are largely related to transportation of private sector materials by different means and across different distances. The main benefits of the project are the following:</p> <ul style="list-style-type: none"> ◆ Travel time savings ◆ Fuel cost savings ◆ Truck and vessel maintenance cost savings ◆ CO2 reductions ◆ Accident reductions ◆ Port lease and operating income increases ◆ Short-term job creation ◆ Permanent job creation (due to productivity increases related to travel time savings)
Population Affected by Impacts	Workers within Lincoln County, a rural distressed community. Existing and new private, non-profit, state and federal agencies engaged in shipping, agriculture, research and development.
Economic Benefit	Monetized value of reduced travel times, fuel costs, emissions and accident costs. Reported values comparing Alts. 1 and 2.
Summary of Results	The benefit for this project, because of the projected private sector activity, is highly positive based on direct impacts only. The TIGER grant will reduce overall travel and provide significant benefits in all measured benefit categories, which reflect life cycle costs and benefits over 30 years. Estimated BC ratio ranges from 72:1 (@7% NPV) to 118:1 (@3% NPV)

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Table 2 (BCA, Appendix A) summarizes the significant savings and reductions attributed to the project. The BCA indicates to total non-discounted benefit of \$240 M . Discounted benefits range from \$98.8 M (@7% discount rate) to \$156.7 M (@3% discount rate). This results in BC ratios ranging from 72:1 ((7% discount rate) to 118:1 (3% discount rate) based on TIGER funding requested (\$2M). These benefits do not reflect the additional direct and indirect/induced near-term and long-term job creation that is presented in this application.

Table 2. Benefit-Cost Analysis Summary

Benefit Cost Analysis of Port of Newport International Export Terminal			
Project Benefit and Cost Analysis Summary (30-year analysis)			
BCA Category	Zero Discount Rate	Discount Rate @3%	Discount Rate @7%
Personal Labor Income (construction wages)	\$ 11,883,805	\$ 11,400,972	\$ 10,811,608
Productivity Wages/Value of Travel Time Savings	\$ 145,027,286	\$ 91,610,482	\$ 54,908,486
Reduction in Truck Maintenance Cost	\$ 819,000	\$ 526,125	\$ 324,055
Reduction in Fuel Cost, Trucks	\$ 4,410,000	\$ 2,832,979	\$ 1,270,822
Reduction in Fuel Cost, Vessels	\$ 4,295,512	\$ 2,759,432	\$ 1,699,610
Reduction in Truck Operating Cost	\$ 819,000	\$ 526,125	\$ 324,055
Reduction in Vessel Operating Cost	\$ 38,918,000	\$ 25,000,880	\$ 15,398,728
Safety/Accident Avoidance Savings	\$ 4,989,531	\$ 3,205,269	\$ 1,974,213
Environmental: CO ₂ Reduction Social Cost Benefit	\$ 1,103,753	\$ 1,103,753	\$ 1,103,753
Port Operations: Lease Revenue Value	\$ 1,566,000	\$ 1,005,997	\$ 619,621
Port Operations: Tariff Revenue Value	\$ 26,100,000	\$ 16,766,611	\$ 10,327,016
Total Benefits	\$ 239,931,887	\$ 156,738,623	\$ 98,761,965
Total Cost of Tiger Grant Request for Project	\$ 2,000,000	\$ 2,000,000	\$ 2,000,000
Benefit-Cost Ratio	185:1	118:1	72:1

Source: please refer to assumptions provided in BCA Appendix A.

Selected annualized (not discounted) project impacts/benefits are summarized in **Table 3** and include: 283,000 miles of reduced VMT (trucks and vessels); \$1.3M in annual fuel cost savings (= +/- 370,000 gallons); \$300,000 in average truck/vessel O&M cost savings; 594 metric tons of reduced CO₂ emissions; and \$890,000 in annual Port operating revenues.

Table 3

Selected Project Impacts	
Reduced Vehicle Miles of Travel	283,000 miles of reduced annual vehicle and vessel miles of travel
Reduced Truck/Vessel Fuel Cost Per Year	\$1.37 million in avg. annual truck/vessel fuel cost savings
Reduced Truck/Vessel O&M Cost Per Year	\$300,000 in avg. annual truck/vessel maintenance savings
Reduced CO ₂ Emissions Per Year	594 metric tons of reduced CO ₂ emissions
Enhanced Port Operating Revenues	\$922,000 in annual avg. lease and tariff revenues

Source: See BCA appendix tables.

BIBLIOGRAPHY WITH REFERENCES

Bureau of Labor Statistics. "Fatal Occupation Injuries, total hours worked, and rates of fatal occupational injuries by selected worker characteristics, occupations, and industries, civilian workers, 2011." *Bls.gov*. http://www.bls.gov/iif/oshwc/foi/cfoi_rates_2011hb.pdf

Climate Leaders. "Optional Emissions from Commuting, Business Travel and Product Transport." Environmental Protection Agency. Accessed 22 May 2015. http://www.epa.gov/climateleadership/documents/resources/commute_travel_product.pdf

International Human Resources Development Corporation. "Measurement Units and Conversion Factors." *IHRDC.com*. Accessed 26 May 2015. http://www.ihrdc.com/els/po-demo/module01/mod_001_03.htm

Interviews and correspondence with Teevin Brothers and Port of Newport. May and June 2015.

- ◆ Used to determine the following:
 - Alternative analysis situations
 - Company outputs in each alternative
 - Project costs
 - All port operations revenue

Northwest Waterways Association

- ◆ Used to determine the following:
 - Fuel Consumption and Maintenance Costs of Truck and Vessels

SeaRates LP. "Distances and Time." *SeaRates.com*. Accessed 22 May 2015. <http://www.searates.com/reference/portdistance/>

- ◆ Used to determine the distances between ports, travel times, and inferred miles per hour for sea transportation.

State of Oregon Employment Department. "Employment and Wage by Industry." *qualityinfo.org*. Accessed 26 May 2015. <https://www.qualityinfo.org/ed-ewind/?at=1&t1=0~4101000000~00~5~1012~00~00000~2014~00>

- ◆ Used to determine the wage for construction workers. While the TIGER resource guide contains information on jobs created per dollar amount of capital investment, the actual wage of construction workers is from this source.

Texas Transportation Institute and Center for Ports and Waterways. *A Modal Comparison of Domestic Freight Transportation Effects on the General Public*. U.S. Maritime Administration and National Waterways Foundation. Prepared December 2007. http://www.marad.dot.gov/wp-content/uploads/pdf/Phase_II_Report_Final_121907.pdf

- ◆ Used to determine fuel efficiency measured in ton-miles per gallon of fuel used.

U.S. Army Corps of Engineers, Estimating Transportation Costs of Freight (by Cambridge Systematics)

U.S. Department of Transportation. "TIGER Benefit-Cost Analysis Resource Guide." *Dot.gov*. Accessed 22 May 2015. <http://www.dot.gov/tiger/guidance>

- ◆ Used to determine construction jobs per capital investment, the value of a statistical life, and the value of travel time.

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U.S. Energy Information Association

- ◆ Used to determine real costs of fuel prices

U.S. Environmental Protection Agency

- ◆ Used to determine CO₂ emissions per mile of truck travel

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APPENDIX TABLES

Long-term Economic Analysis of Port of Newport International Export Terminal

Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	Construction		Operation>>>													
Long Term Outcome																
Productivity Employment (FTEs from travel time savings)			145	145	145	145	145	145	145	145	145	145	145	145	145	145
Productivity Employment wages (travel time savings)			\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546
Construction Employment (direct person years FTE)		4	81	-												
Construction Labor Income (direct person years wages)	\$	\$ 335,213	\$ 6,369,046	\$ -												
Total Labor Income (permanent and construction related)	\$	\$ 335,213	\$ 6,369,046	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546
Total Employment (jobs retained or created)		4	81	145	145	145	145	145	145	145	145	145	145	145	145	145
Avg. Labor Income Per Job	\$	\$ 78,921	\$ 78,921	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693
Livability																
Miles Saved (truck and barge combined)			(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)
Economic Competitiveness																
Reduced Vessel Fuel Cost	\$	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121
Reduced Truck Fuel Cost	\$	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069
Total Annual Fuel Cost Savings	\$	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190
Reduced Truck O&M Cost	\$	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241
Reduced Vessel O&M Cost	\$	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000
Port Operating Income (new lease revenues)	\$	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000
Port Operating Income (new net tariff revenues)	\$	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000
Safety																
Annual Value of Accident Avoidance	\$	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053
Environmental Sustainability																
Annual CO ₂ Reduction (metric tons)			(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)
Social Cost of Carbon (3%)	\$	\$ 45	\$ 46	\$ 49	\$ 49	\$ 51	\$ 52	\$ 52	\$ 54	\$ 55	\$ 56	\$ 57	\$ 58	\$ 60	\$ 61	\$ 62
Annual Value of Social Cost of CO ₂ Reduction	\$	\$ 29,124	\$ 29,124	\$ 30,313	\$ 30,907	\$ 30,907	\$ 32,096	\$ 32,691	\$ 33,285	\$ 33,879	\$ 34,474	\$ 35,662	\$ 36,257	\$ 36,851	\$ 37,446	\$ 37,446
Total Benefits (constant 2015 dollars)	\$	\$ 335,213	\$ 6,369,046	\$ 5,179,546	\$ 8,004,560	\$ 8,005,749	\$ 8,006,343	\$ 8,006,343	\$ 8,007,532	\$ 8,008,126	\$ 8,008,721	\$ 8,009,315	\$ 8,009,910	\$ 8,011,098	\$ 8,011,693	\$ 8,012,287
Discounted Benefits (real dollars, @3% discount rate)	\$	\$ 335,213	\$ 6,183,540	\$ 4,882,219	\$ 7,325,306	\$ 7,113,004	\$ 6,906,342	\$ 6,705,186	\$ 6,510,856	\$ 6,321,689	\$ 6,138,018	\$ 5,959,683	\$ 5,786,529	\$ 5,618,823	\$ 5,455,573	\$ 5,297,066
Discounted Benefits (real dollars, @7% discount rate)	\$	\$ 335,213	\$ 5,779,009	\$ 4,264,319	\$ 5,979,632	\$ 5,426,477	\$ 4,924,126	\$ 4,467,949	\$ 4,054,634	\$ 3,679,281	\$ 3,338,675	\$ 3,029,600	\$ 2,749,138	\$ 2,494,825	\$ 2,263,869	\$ 2,054,293
Discount Factors		1														
3%		1	1.03	1.06	1.09	1.13	1.16	1.19	1.23	1.27	1.30	1.34	1.38	1.43	1.47	1.51
7%		1	1.07	1.14	1.23	1.31	1.40	1.50	1.61	1.72	1.84	1.97	2.10	2.25	2.41	2.58

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Long-term Economic Analysis of Port of Newport International Export Terminal

Year:	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Long Term Outcome															
Productivity Employment (FTEs from travel time savings)	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145
Productivity Employment wages (travel time savings)	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546
Construction Employment (direct person years FTE)															
Construction Labor Income (direct person years wages)															
Total Labor Income (permanent and construction related)	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546	5,179,546
Total Employment (jobs retained or created)	145	145	145	145	145	145	145	145	145	145	145	145	145	145	145
Avg. Labor Income Per Job	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693	\$ 35,693
Livability															
Miles Saved (truck and barge combined)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)	(283,035)
Economic Competitiveness															
Reduced Vessel Fuel Cost	148,121	148,121	148,121	148,121	148,121	148,121	148,121	148,121	148,121	148,121	148,121	148,121	148,121	148,121	148,121
Reduced Truck Fuel Cost	152,069	152,069	152,069	152,069	152,069	152,069	152,069	152,069	152,069	152,069	152,069	152,069	152,069	152,069	152,069
Total Annual Fuel Cost Savings	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190	\$ 300,190
Reduced Truck O&M Cost	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241
Reduced Vessel O&M Cost	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000
Port Operating Income (new lease revenues)	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000
Port Operating Income (new net tariff revenues)	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000
Safety															
Annual Value of Accident Avoidance	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053
Environmental Sustainability															
Annual CO ₂ Reduction (metric tons)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)	(594)
Social Cost of Carbon (3%)	\$ 63	\$ 65	\$ 66	\$ 67	\$ 68	\$ 69	\$ 71	\$ 72	\$ 73	\$ 74	\$ 76	\$ 77	\$ 78	\$ 79	\$ 80
Annual Value of Social Cost of CO ₂ Reduction	\$ 37,446	\$ 38,634	\$ 39,229	\$ 39,823	\$ 40,417	\$ 41,012	\$ 42,201	\$ 42,795	\$ 43,389	\$ 43,984	\$ 45,172	\$ 45,767	\$ 46,361	\$ 46,956	\$ 47,550
Total Benefits (constant 2015 dollars)	\$ 8,012,881	\$ 8,014,070	\$ 8,014,665	\$ 8,015,259	\$ 8,015,853	\$ 8,016,448	\$ 8,017,636	\$ 8,018,231	\$ 8,018,825	\$ 8,019,419	\$ 8,020,608	\$ 8,021,203	\$ 8,021,797	\$ 8,022,391	\$ 8,022,986
Discounted Benefits (real dollars, @3% discount rate)	\$ 4,993,363	\$ 4,848,644	\$ 4,707,771	\$ 4,570,990	\$ 4,438,184	\$ 4,309,236	\$ 4,184,344	\$ 4,062,771	\$ 3,944,731	\$ 3,830,119	\$ 3,719,114	\$ 3,611,058	\$ 3,506,141	\$ 3,404,273	\$ 3,305,364
Discounted Benefits (real dollars, @7% discount rate)	1,691,425	1,534,957	1,392,859	1,263,917	1,146,911	1,040,737	944,462	857,029	777,690	705,696	640,415	581,129	527,331	478,514	434,216
Discount Factors															
3%	1.60	1.65	1.70	1.75	1.81	1.86	1.92	1.97	2.03	2.09	2.16	2.22	2.29	2.36	2.43
7%	2.95	3.16	3.38	3.62	3.87	4.14	4.43	4.74	5.07	5.43	5.81	6.21	6.65	7.11	7.61

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Long-term Economic Analysis of Port of Newport International Export Terminal																
Benefit over 30 Years																
Year:	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No Discount Rate																
Category																
Personal Labor Income (construction and permanent jobs)	\$ 335,213	\$ 6,369,046	\$ 5,179,546													
Productivity Wages/Value of Travel Time Savings	\$ -	\$ -	\$ -	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546
Reduction in Truck Maintenance Cost	\$ -	\$ -	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241
Reduction in Fuel Cost, Trucks	\$ -	\$ -	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069
Reduction in Fuel Cost, Vessels	\$ -	\$ -	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121
Reduction in Truck Operating Cost	\$ -	\$ -	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241
Reduction in Vessel Operating Cost	\$ -	\$ -	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000
Safety/Accident Avoidance Savings	\$ -	\$ -	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053
Environmental: CO ₂ Reduction Social Cost Benefit	\$ -	\$ -	\$ 29,124	\$ 29,124	\$ 30,313	\$ 30,907	\$ 30,907	\$ 32,096	\$ 32,691	\$ 33,285	\$ 33,879	\$ 34,474	\$ 35,662	\$ 36,257	\$ 36,851	\$ 37,446
Port Operations: Lease Revenue Value	\$ -	\$ -	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000
Port Operations: Tariff Revenue Value	\$ -	\$ -	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000
Total Benefits	\$ 335,213	\$ 6,369,046	\$ 8,033,396	\$ 8,033,396	\$ 8,034,585	\$ 8,035,179	\$ 8,035,179	\$ 8,036,368	\$ 8,036,962	\$ 8,037,557	\$ 8,038,151	\$ 8,038,745	\$ 8,039,334	\$ 8,040,528	\$ 8,041,123	\$ 8,041,717
<i>* derived from assumptions stated in Appendix.</i>																
Benefit-Cost Ratio																
Discount Rate: 3%																
Category																
Personal Labor Income (construction and permanent jobs)	\$ 335,213	\$ 6,183,540	\$ 4,882,219	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Productivity Wages/Value of Travel Time Savings	\$ -	\$ -	\$ -	\$ 4,740,018	\$ 4,601,959	\$ 4,467,922	\$ 4,337,788	\$ 4,211,445	\$ 4,088,781	\$ 3,969,691	\$ 3,854,069	\$ 3,741,814	\$ 3,632,829	\$ 3,527,019	\$ 3,424,290	\$ 3,324,553
Reduction in Truck Maintenance Cost	\$ -	\$ -	\$ 26,620	\$ 25,845	\$ 25,092	\$ 24,361	\$ 23,652	\$ 22,963	\$ 22,294	\$ 21,645	\$ 21,014	\$ 20,402	\$ 19,808	\$ 19,231	\$ 18,671	\$ 18,127
Reduction in Fuel Cost, Trucks	\$ -	\$ -	\$ 143,340	\$ 139,165	\$ 135,111	\$ 131,176	\$ 127,355	\$ 123,646	\$ 120,045	\$ 116,548	\$ 113,154	\$ 109,858	\$ 106,658	\$ 103,552	\$ 100,536	\$ 97,607
Reduction in Fuel Cost, Vessels	\$ -	\$ -	\$ 139,618	\$ 135,552	\$ 131,604	\$ 127,771	\$ 124,049	\$ 120,436	\$ 116,928	\$ 113,522	\$ 110,216	\$ 107,006	\$ 103,889	\$ 100,863	\$ 97,925	\$ 95,073
Reduction in Truck Operating Cost	\$ -	\$ -	\$ 26,620	\$ 25,845	\$ 25,092	\$ 24,361	\$ 23,652	\$ 22,963	\$ 22,294	\$ 21,645	\$ 21,014	\$ 20,402	\$ 19,808	\$ 19,231	\$ 18,671	\$ 18,127
Reduction in Vessel Operating Cost	\$ -	\$ -	\$ 1,264,964	\$ 1,228,120	\$ 1,192,350	\$ 1,157,621	\$ 1,123,904	\$ 1,091,169	\$ 1,059,387	\$ 1,028,531	\$ 998,574	\$ 969,489	\$ 941,252	\$ 913,837	\$ 887,220	\$ 861,379
Safety/Accident Avoidance Savings	\$ -	\$ -	\$ 162,176	\$ 157,453	\$ 152,867	\$ 148,414	\$ 144,092	\$ 139,895	\$ 135,820	\$ 131,864	\$ 128,023	\$ 124,295	\$ 120,674	\$ 117,160	\$ 113,747	\$ 110,434
Environmental: CO ₂ Reduction Social Cost Benefit	\$ -	\$ -	\$ 27,452	\$ 26,653	\$ 26,933	\$ 26,661	\$ 25,885	\$ 26,097	\$ 25,806	\$ 25,510	\$ 25,209	\$ 24,905	\$ 25,013	\$ 24,689	\$ 24,363	\$ 24,035
Port Operations: Lease Revenue Value	\$ -	\$ -	\$ 50,900	\$ 49,418	\$ 47,978	\$ 46,581	\$ 45,224	\$ 43,907	\$ 42,628	\$ 41,387	\$ 40,181	\$ 39,011	\$ 37,875	\$ 36,771	\$ 35,700	\$ 34,661
Port Operations: Tariff Revenue Value	\$ -	\$ -	\$ 848,336	\$ 823,627	\$ 799,638	\$ 776,348	\$ 753,736	\$ 731,782	\$ 710,468	\$ 689,775	\$ 669,685	\$ 650,179	\$ 631,242	\$ 612,856	\$ 595,006	\$ 577,676
Total Benefits	\$ 335,213	\$ 6,183,540	\$ 6,723,910	\$ 6,528,068	\$ 6,338,986	\$ 6,154,868	\$ 5,975,600	\$ 5,802,520	\$ 5,633,984	\$ 5,470,343	\$ 5,311,455	\$ 5,157,181	\$ 5,007,806	\$ 4,862,352	\$ 4,721,123	\$ 4,583,996
<i>* derived from assumptions stated in Appendix.</i>																
Discount Rate: 7%																
Category																
Personal Labor Income (construction and permanent jobs)	\$ 335,213	\$ 5,952,379	\$ 4,524,016	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Productivity Wages/Value of Travel Time Savings	\$ -	\$ -	\$ -	\$ 4,228,052	\$ 3,951,451	\$ 3,692,945	\$ 3,451,350	\$ 3,225,561	\$ 3,014,543	\$ 2,817,330	\$ 2,633,019	\$ 2,460,765	\$ 2,299,780	\$ 2,149,327	\$ 2,008,717	\$ 1,877,306
Reduction in Truck Maintenance Cost	\$ -	\$ -	\$ 24,667	\$ 23,053	\$ 21,545	\$ 20,136	\$ 18,818	\$ 17,587	\$ 16,437	\$ 15,361	\$ 14,356	\$ 13,417	\$ 12,540	\$ 11,719	\$ 10,952	\$ 10,236
Reduction in Fuel Cost, Trucks	\$ -	\$ -	\$ 125,198	\$ 113,600	\$ 103,076	\$ 93,527	\$ 84,862	\$ 77,001	\$ 69,867	\$ 63,394	\$ 57,522	\$ 52,193	\$ 47,357	\$ 42,970	\$ 38,989	\$ 35,377
Reduction in Fuel Cost, Vessels	\$ -	\$ -	\$ 129,375	\$ 120,911	\$ 113,001	\$ 105,608	\$ 98,699	\$ 92,242	\$ 86,208	\$ 80,568	\$ 75,297	\$ 70,371	\$ 65,768	\$ 61,465	\$ 57,444	\$ 53,686
Reduction in Truck Operating Cost	\$ -	\$ -	\$ 24,667	\$ 23,053	\$ 21,545	\$ 20,136	\$ 18,818	\$ 17,587	\$ 16,437	\$ 15,361	\$ 14,356	\$ 13,417	\$ 12,540	\$ 11,719	\$ 10,952	\$ 10,236
Reduction in Vessel Operating Cost	\$ -	\$ -	\$ 1,172,155	\$ 1,095,472	\$ 1,023,805	\$ 956,827	\$ 894,231	\$ 835,730	\$ 781,056	\$ 729,959	\$ 682,205	\$ 637,575	\$ 595,864	\$ 556,882	\$ 520,451	\$ 486,403
Safety/Accident Avoidance Savings	\$ -	\$ -	\$ 150,278	\$ 140,446	\$ 131,258	\$ 122,671	\$ 114,646	\$ 107,146	\$ 100,136	\$ 93,585	\$ 87,463	\$ 81,741	\$ 76,394	\$ 71,396	\$ 66,725	\$ 62,360
Environmental: CO ₂ Reduction Social Cost Benefit	\$ -	\$ -	\$ 25,438	\$ 23,774	\$ 23,126	\$ 22,037	\$ 20,595	\$ 19,988	\$ 19,026	\$ 18,105	\$ 17,223	\$ 16,378	\$ 15,835	\$ 15,045	\$ 14,292	\$ 13,572
Port Operations: Lease Revenue Value	\$ -	\$ -	\$ 47,166	\$ 44,080	\$ 41,196	\$ 38,501	\$ 35,982	\$ 33,628	\$ 31,428	\$ 29,372	\$ 27,451	\$ 25,655	\$ 23,977	\$ 22,408	\$ 20,942	\$ 19,572
Port Operations: Tariff Revenue Value	\$ -	\$ -	\$ 786,095	\$ 734,668	\$ 686,606	\$ 641,688	\$ 599,708	\$ 560,475	\$ 523,808	\$ 489,540	\$ 457,514	\$ 427,584	\$ 399,611	\$ 373,468	\$ 349,036	\$ 326,201
Total Benefits	\$ 335,213	\$ 5,952,379	\$ 7,009,055	\$ 6,547,110	\$ 6,116,609	\$ 5,714,075	\$ 5,337,711	\$ 4,986,946	\$ 4,658,947	\$ 4,352,577	\$ 4,066,406	\$ 3,799,096	\$ 3,549,664	\$ 3,316,400	\$ 3,098,500	\$ 2,894,949

June 4, 2015
Port of Newport
TIGER Grant Benefit-Cost Analysis

Long-term Economic Analysis of Port of Newport International Export Terminal																
Benefit over 30 Years																
<i>Year:</i>	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
No Discount Rate																
Category																
Personal Labor Income (construction and permanent jobs)																
Productivity Wages/Value of Travel Time Savings	\$5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546	\$ 5,179,546
Reduction in Truck Maintenance Cost	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241
Reduction in Fuel Cost, Trucks	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069	\$ 152,069
Reduction in Fuel Cost, Vessels	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121	\$ 148,121
Reduction in Truck Operating Cost	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241	\$ 28,241
Reduction in Vessel Operating Cost	\$1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000	\$ 1,342,000
Safety/Accident Avoidance Savings	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053	\$ 172,053
Environmental: CO ₂ Reduction Social Cost Benefit	\$ 37,446	\$ 38,634	\$ 39,229	\$ 39,823	\$ 40,417	\$ 41,012	\$ 42,201	\$ 42,795	\$ 43,389	\$ 43,984	\$ 45,172	\$ 45,767	\$ 46,361	\$ 46,956	\$ 47,550	\$ 48,145
Port Operations: Lease Revenue Value	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000	\$ 54,000
Port Operations: Tariff Revenue Value	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000	\$ 900,000
Total Benefits	\$8,041,717	\$ 8,042,906	\$ 8,043,500	\$ 8,044,095	\$ 8,044,689	\$ 8,045,283	\$ 8,046,472	\$ 8,047,067	\$ 8,047,661	\$ 8,048,255	\$ 8,049,444	\$ 8,050,038	\$ 8,050,633	\$ 8,051,227	\$ 8,051,821	
<i>* derived from assumptions stated in Appendix.</i>																
Benefit-Cost Ratio																
Discount Rate: 3%																
Category																
Personal Labor Income (construction and permanent jobs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Productivity Wages/Value of Travel Time Savings	\$3,227,722	\$ 3,133,710	\$ 3,042,437	\$ 2,953,823	\$ 2,867,789	\$ 2,784,261	\$ 2,703,166	\$ 2,624,433	\$ 2,547,993	\$ 2,473,780	\$ 2,401,728	\$ 2,331,775	\$ 2,263,859	\$ 2,197,921	\$ 2,133,904	\$ 2,070,887
Reduction in Truck Maintenance Cost	\$ 17,599	\$ 17,086	\$ 16,589	\$ 16,106	\$ 15,637	\$ 15,181	\$ 14,739	\$ 14,310	\$ 13,893	\$ 13,488	\$ 13,095	\$ 12,714	\$ 12,344	\$ 11,984	\$ 11,635	\$ 11,295
Reduction in Fuel Cost, Trucks	\$ 94,764	\$ 92,004	\$ 89,324	\$ 86,723	\$ 84,197	\$ 81,745	\$ 79,364	\$ 77,052	\$ 74,808	\$ 72,629	\$ 70,514	\$ 68,460	\$ 66,466	\$ 64,530	\$ 62,650	\$ 60,820
Reduction in Fuel Cost, Vessels	\$ 92,304	\$ 89,616	\$ 87,006	\$ 84,471	\$ 82,011	\$ 79,622	\$ 77,303	\$ 75,052	\$ 72,866	\$ 70,743	\$ 68,683	\$ 66,682	\$ 64,740	\$ 62,855	\$ 61,024	\$ 59,293
Reduction in Truck Operating Cost	\$ 17,599	\$ 17,086	\$ 16,589	\$ 16,106	\$ 15,637	\$ 15,181	\$ 14,739	\$ 14,310	\$ 13,893	\$ 13,488	\$ 13,095	\$ 12,714	\$ 12,344	\$ 11,984	\$ 11,635	\$ 11,295
Reduction in Vessel Operating Cost	\$ 836,290	\$ 811,932	\$ 788,284	\$ 765,324	\$ 743,033	\$ 721,391	\$ 700,380	\$ 679,980	\$ 660,175	\$ 640,947	\$ 622,278	\$ 604,154	\$ 586,557	\$ 569,473	\$ 552,886	\$ 536,800
Safety/Accident Avoidance Savings	\$ 107,218	\$ 104,095	\$ 101,063	\$ 98,119	\$ 95,261	\$ 92,487	\$ 89,793	\$ 87,178	\$ 84,639	\$ 82,173	\$ 79,780	\$ 77,456	\$ 75,200	\$ 73,010	\$ 70,883	\$ 68,817
Environmental: CO ₂ Reduction Social Cost Benefit	\$ 23,335	\$ 23,374	\$ 23,043	\$ 22,711	\$ 22,378	\$ 22,046	\$ 21,714	\$ 21,384	\$ 21,054	\$ 20,724	\$ 20,394	\$ 20,064	\$ 19,734	\$ 19,404	\$ 19,074	\$ 18,744
Port Operations: Lease Revenue Value	\$ 33,651	\$ 32,671	\$ 31,719	\$ 30,795	\$ 29,898	\$ 29,028	\$ 28,182	\$ 27,361	\$ 26,564	\$ 25,791	\$ 25,040	\$ 24,310	\$ 23,602	\$ 22,915	\$ 22,247	\$ 21,599
Port Operations: Tariff Revenue Value	\$ 560,850	\$ 544,515	\$ 528,655	\$ 513,257	\$ 498,308	\$ 483,794	\$ 469,703	\$ 456,023	\$ 442,740	\$ 429,845	\$ 417,325	\$ 405,170	\$ 393,369	\$ 381,912	\$ 370,788	\$ 360,000
Total Benefits	\$4,450,482	\$ 4,321,576	\$ 4,196,054	\$ 4,074,177	\$ 3,955,841	\$ 3,840,942	\$ 3,729,690	\$ 3,621,360	\$ 3,516,176	\$ 3,414,047	\$ 3,315,159	\$ 3,218,869	\$ 3,125,375	\$ 3,034,597	\$ 2,946,456	
<i>* derived from assumptions stated in Appendix.</i>																
Discount Rate: 7%																
Category																
Personal Labor Income (construction and permanent jobs)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Productivity Wages/Value of Travel Time Savings	\$1,754,491	\$ 1,639,712	\$ 1,532,441	\$ 1,432,188	\$ 1,338,493	\$ 1,250,928	\$ 1,169,092	\$ 1,092,609	\$ 1,021,130	\$ 954,327	\$ 891,894	\$ 833,546	\$ 779,015	\$ 728,052	\$ 680,422	\$ 634,999
Reduction in Truck Maintenance Cost	\$ 9,566	\$ 8,940	\$ 8,356	\$ 7,809	\$ 7,298	\$ 6,821	\$ 6,374	\$ 5,957	\$ 5,568	\$ 5,203	\$ 4,863	\$ 4,545	\$ 4,248	\$ 3,970	\$ 3,710	\$ 3,460
Reduction in Fuel Cost, Trucks	\$ 32,100	\$ 29,126	\$ 26,428	\$ 23,980	\$ 21,758	\$ 19,742	\$ 17,913	\$ 16,254	\$ 14,748	\$ 13,382	\$ 12,142	\$ 11,017	\$ 9,997	\$ 9,071	\$ 8,230	\$ 7,480
Reduction in Fuel Cost, Vessels	\$ 50,174	\$ 46,891	\$ 43,824	\$ 40,957	\$ 38,277	\$ 35,773	\$ 33,433	\$ 31,246	\$ 29,202	\$ 27,291	\$ 25,506	\$ 23,837	\$ 22,278	\$ 20,820	\$ 19,458	\$ 18,190
Reduction in Truck Operating Cost	\$ 9,566	\$ 8,940	\$ 8,356	\$ 7,809	\$ 7,298	\$ 6,821	\$ 6,374	\$ 5,957	\$ 5,568	\$ 5,203	\$ 4,863	\$ 4,545	\$ 4,248	\$ 3,970	\$ 3,710	\$ 3,460
Reduction in Vessel Operating Cost	\$ 454,582	\$ 424,843	\$ 397,049	\$ 371,074	\$ 346,798	\$ 324,111	\$ 302,907	\$ 283,091	\$ 264,571	\$ 247,262	\$ 231,086	\$ 215,969	\$ 201,840	\$ 188,635	\$ 176,295	\$ 164,900
Safety/Accident Avoidance Savings	\$ 58,280	\$ 54,468	\$ 50,904	\$ 47,574	\$ 44,462	\$ 41,553	\$ 38,835	\$ 36,294	\$ 33,920	\$ 31,701	\$ 29,627	\$ 27,689	\$ 25,877	\$ 24,184	\$ 22,602	\$ 21,140
Environmental: CO ₂ Reduction Social Cost Benefit	\$ 12,684	\$ 12,231	\$ 11,606	\$ 11,011	\$ 10,445	\$ 9,905	\$ 9,525	\$ 9,027	\$ 8,554	\$ 8,104	\$ 7,778	\$ 7,365	\$ 6,973	\$ 6,600	\$ 6,246	\$ 5,910
Port Operations: Lease Revenue Value	\$ 18,292	\$ 17,095	\$ 15,977	\$ 14,931	\$ 13,955	\$ 13,042	\$ 12,189	\$ 11,391	\$ 10,646	\$ 9,949	\$ 9,299	\$ 8,690	\$ 8,122	\$ 7,590	\$ 7,094	\$ 6,630
Port Operations: Tariff Revenue Value	\$ 304,861	\$ 284,917	\$ 266,278	\$ 248,857	\$ 232,577	\$ 217,362	\$ 203,142	\$ 189,852	\$ 177,432	\$ 165,824	\$ 154,976	\$ 144,837	\$ 135,362	\$ 126,507	\$ 118,230	\$ 110,300
Total Benefits	\$2,704,597	\$ 2,527,163	\$ 2,361,218	\$ 2,206,190	\$ 2,061,361	\$ 1,926,057	\$ 1,799,784	\$ 1,681,679	\$ 1,571,337	\$ 1,468,248	\$ 1,372,035	\$ 1,282,040	\$ 1,197,958	\$ 1,119,398	\$ 1,045,998	

