

The Economic and Fiscal Benefits of the Port of Muskegon

**A Study of the Current Port Benefits
and Potential for Increased
Economic Activity by 2020**

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Prepared for:



Prepared By:



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EXECUTIVE SUMMARY

Muskegon Lake is the largest natural deep-water port in west Michigan. Muskegon Lake has several commercial docking facilities and a thriving recreational industry with marinas, charter fishing operations, ferry, and cruises. Commercial port operations at Muskegon Lake handle over 1 million tons of cargo annually, with the majority comprised of coal for Consumers Energy's B.C. Cobb coal-fired generating plant. Commercial deep-water shipping activity at Muskegon Lake represents a significant part of the Muskegon County and the surrounding region economy, supporting business spending and employment.

Consumers Energy will decommission the B.C. Cobb plant in 2016. Closure of the B.C. Cobb plant will have repercussions on the county economy and could affect other commercial shipping activities at Muskegon Lake that rely on the deep-water channel to Lake Michigan. The U.S. Army Corps of Engineers facilitates deep-water access to Lake Michigan with periodic dredging that deepens the Muskegon Lake Channel. If the U.S. Army Corps of Engineers reduced or ended dredging operations, it would force companies that rely on deep-water dredging to alter operations, rely on smaller ships, and/or increase the frequency of shipments that will raise costs and affect shipping reliability and efficiency.

Muskegon area businesses and organizations would like to see Muskegon Lake continue substantial commercial shipping activity. This study estimates the current economic benefits to Muskegon County, the 13-county West Michigan Prosperity Alliance (Region 4), and the state of deep-water commercial activities at Muskegon Lake. Further, the study estimates the potential economic benefits the port could support given expanded commercial development activity and civic engagement.

CURRENT PORT ACTIVITY

Muskegon Lake is similar to many other ports on the Great Lakes in that it functions mainly for receiving freight and commodities. Freight is shipped from Muskegon to other areas on the Great Lakes occasionally, but it does not comprise a significant portion of business activity. The largest bulk commodities shipped into Muskegon include limestone, road salt, cement, and slag.

The goods shipped into Muskegon mainly serve regional industries in west Michigan. The market for goods shipped into Muskegon is roughly a 100-mile radius from Muskegon Lake, stretching from about Ludington in the north, east to Grand Rapids and Lansing, and south to St. Joseph. Limestone, cement, and slag are commodities used in the construction industry. Road salt is used by state and local governments in the region.

Current commercial deep-water port operations at Muskegon Lake involve four businesses, excluding Consumers Energy's B.C. Cobb plant. These businesses are Verplank, Andrie, Inc., LaFargeHolcim Cement, and the West Michigan Dock and Market Corporation. These businesses have a direct economic benefit of about \$20.9 million and employ about 120 workers. Further, companies at Muskegon Lake paid about \$351,700 in property tax in 2014 to all state and local districts serving them and \$91,000 in sales and use tax revenue to the state.

PORt EXPANSION AND ANCILLARY CONSTRUCTION ACTIVITY

The West Michigan Shoreline Regional Development Commission recently conducted several focus group sessions and public outreach to gain community input on the future of port activities on Muskegon Lake. These discussions are part of Vision 2020, a community planning process intended to identify commercial, residential, and recreational needs and expectations for Muskegon Lake during the next five years. Participants generally regarded commercial and industrial activities on the lake as a positive economic benefit and that an increase in volume at the port could improve its viability and position as an asset to the community.

EXECUTIVE SUMMARY

A container terminal at Muskegon Lake could expand the shipping opportunities for local businesses and create competitive options for selling goods in international markets. Reduced and competitive shipping costs and improved access to markets would likely induce manufacturers and agricultural producers in west Michigan to either relocate to the region or expand their existing operations. Construction of the container terminal and expanded manufacturing and agricultural facilities will provide significant, but temporary, benefits to the area.

Construction costs and initial capital investment is estimated to total about \$80.2 million and will support the temporary employment of about 200 workers. The majority of this spending will occur throughout Michigan, with lesser amounts in Region 4 and Muskegon County. In addition, the state of Michigan will receive about \$2.2 million in sales and use tax revenue related to construction materials and equipment purchases.

Reducing the initial capital investment to just the wholesale margin, the total economic and fiscal benefits to the three geographies are summarized in Table 10 from the report. As the table shows, the direct economic benefit of the port expansion and ancillary construction activity in Michigan is an estimated \$42.5 million produced by 201 full-time equivalent workers earning \$12.6 million. This activity would support an additional \$52.1 million in output in all industries in Michigan, produced by 227 indirect workers earning \$11.9 million. **Combined, the direct and indirect benefit in Michigan is valued at \$94.6 million produced by 428 direct and indirect workers earning a total of \$24.5 million over the construction period.**

Likewise, the direct and indirect benefit in Region 4 is valued at \$58 million produced by 265 direct and indirect workers earning a total of \$15.7 million. The construction impact in Muskegon County is valued at \$1.9 million produced by 13 workers earning \$712,000. These values are not additive, but rather the Muskegon County values are included within Region 4, which are included within the Michigan values.

Table 10: Total Economic Benefit of Commercial Deep-Water Port Construction Activity, 2020

	Direct Impact	Multiplier	Indirect & Induced Impact	Total Impact
Michigan				
Value of Output (\$M)	\$42.5	2.2258	\$52.1	\$94.6
Earnings (\$M)	\$12.6	1.9382	\$11.9	\$24.5
Employment	201	2.1279	227	428
Region 4				
Value of Output	\$29.0	2.0030	\$29.0	\$58.0
Earnings	\$9.0	1.7439	\$6.7	\$15.7
Employment	143	1.8554	122	265
Muskegon County				
Value of Output (\$M)	\$1.3	1.4860	\$0.6	\$1.9
Earnings (\$M)	\$0.5	1.3879	\$0.2	\$0.7
Employment	9	1.4753	4	13

Calculation Note: Direct x Multiplier = Total Impact

Total Impact - Direct Impact = Indirect & Induced Impact

Numbers may not add exactly due to rounding.

ON-GOING ANNUAL EXPANDED PORT ACTIVITIES

The introduction of container terminal operations, expanded manufacturing and agricultural production, and increased commodities tonnage will lead to increased business-to-business spending, employment, and worker earnings upon reaching a new stabilized level of operations, assumed to be in 2020.

The typical annual direct economic benefits are expected to increase to \$145.3 million and employment at port-related businesses is expected to increase to about 650 individuals. This means that expanded commercial activities and port revitalization could result in a \$124.4 million annual increase in direct economic benefits and 530 more jobs. In addition, these direct economic benefits have multiplicative effects on the area.

Report Table 13 and the following summary describe the increased level of total economic benefits in each of the three geographic areas, defined to be the expanded benefits less the current benefits. It is assumed that this same level of increased economic activity will continue each year, assuming similar business operating conditions.

Table 13: Net Annual Economic Benefit of Commercial Deep-Water Port Activity at Muskegon Lake

	Current Activity, 2015			Expanded Activity, 2020			Net Change		
	Direct Impact	Indirect & Induced Impact	Total Impact	Direct Impact	Indirect & Induced Impact	Total Impact	Direct Impact	Indirect & Induced Impact	Total Impact
Michigan									
Value of Output (\$M)	\$20.9	\$22.9	\$43.8	\$142.2	\$184.5	\$326.7	\$121.3	\$161.6	\$282.9
Earnings (\$M)	\$8.1	\$7.4	\$15.5	\$36.7	\$70.1	\$106.8	\$28.6	\$62.7	\$91.3
Employment	120	209	329	617	1,456	2,073	497	1,247	1,744
Region 4									
Value of Output	\$20.9	\$17.9	\$38.8	\$142.2	\$139.8	\$282.0	\$121.3	\$121.9	\$243.2
Earnings	\$8.1	\$5.6	\$13.7	\$36.7	\$47.1	\$83.8	\$28.6	\$41.5	\$70.1
Employment	120	162	282	617	1,013	1,630	497	851	1,348
Muskegon County									
Value of Output (\$M)	\$20.9	\$9.3	\$30.2	\$31.8	\$15.0	\$46.8	\$10.9	\$5.7	\$16.6
Earnings (\$M)	\$7.8	\$3.0	\$10.8	\$11.5	\$5.3	\$16.8	\$3.7	\$2.3	\$6.0
Employment	120	93	213	188	142	330	68	49	117

Numbers may not add exactly due to rounding.

Michigan

With expanded port operations, the annual direct economic benefit increases to \$142.2 million produced by 617 workers earning \$36.7 million. Expanded port activity would likely support an additional \$184.5 million of output in all industries in Michigan, produced by 1,456 indirect workers earning \$70.1 million each year.

The net effect of expanded port activity throughout Michigan is an additional \$282.9 million in direct and indirect output produced by an additional 1,744 direct and indirect workers earning an additional \$91.3 million each year.

The direct fiscal benefit of stabilized operations following a port expansion in Michigan is an estimated \$866,000 each year consisting of property tax and sales and use tax revenue, representing \$740,000 more in state revenue each year than the current level.

Region 4

With expanded port operations, the annual direct economic benefit increases to \$142.2 million produced by 617 workers earning \$36.7 million. Expanded port activity would likely support an additional \$139.8 million of output in all industries in Region 4, produced by 1,013 indirect workers earning \$47.1 million each year.

The net effect of expanded port activity throughout Region 4 is an additional \$243.2 million in direct and indirect output produced by an additional 1,348 direct and indirect workers earning an additional \$70.1 million each year.

Muskegon County

With expanded port operations, the annual direct economic benefit increases to \$31.8 million produced by 188 workers earning \$11.5 million. Expanded port activity would likely support an additional \$15 million of output in all industries in Muskegon County, produced by 142 indirect workers earning \$5.3 million each year.

The net effect of expanded port activity throughout Muskegon County is an additional \$16.6 million in direct and indirect output produced by an additional 117 direct and indirect workers earning an additional \$6 million each year.

The total direct fiscal benefit of stabilized operations following a port expansion in Muskegon County is an estimated \$146,000 each year consisting of property tax revenue, up from about \$38,300 currently.

BEYOND THE NUMBERS

Revitalization and expansion of the Port of Muskegon will result in many benefits that are not quantifiable, or are not estimated in the above analysis. These benefits include:

- reduced traffic congestion,
- increased shipping reliability by diversifying transportation options,
- reduced shipping costs,
- mitigation of trucker shortages, and
- greater exposure to international markets and business.

While expanded port activities at Muskegon Lake may benefit the economy in terms of increased business-to-business activity and greater employment and earnings, the benefits are likely greater than the numbers portray. The importance of alternative, reliable, cost-effective transportation options for companies needing to deliver their products to key markets across the globe is invaluable to the prosperity of Muskegon County, Region 4, and Michigan.

For centuries, the Muskegon area has been a conduit of commercial shipping activity, from the logging industry of the 1800s to the coal, limestone, salt, and other commodities shipped into west Michigan today. Muskegon Lake remains the largest natural deep-water port in west Michigan. The U.S. Army Corps of Engineers facilitates deep-water access to Lake Michigan with periodic dredging that deepens the Muskegon Lake Channel. Muskegon Lake has several commercial docking facilities and a thriving recreational industry with marinas, charter fishing operations, ferry, and cruises.

The largest freight operation on the lake is Consumers Energy's B.C. Cobb coal-fired generating plant. Consumers Energy utilizes access from Lake Michigan to Muskegon to bring roughly 650,000 tons of coal to the plant each year. Coal for the plant comprises the majority of the tonnage shipped into Muskegon. In total, commercial port operations at Muskegon Lake handle over 1 million tons of cargo annually. However, Consumers Energy will decommission the B.C. Cobb plant in 2016.

Closure of the B.C. Cobb plant will have repercussions on other commercial shipping activities at Muskegon Lake that rely on the deep-water channel to Lake Michigan. Unfortunately, dredging to an appropriate depth for commercial boats by the U.S. Army Corps of Engineers is contingent on maintaining a minimum amount of cargo from the port, about 1 million tons. Reduced dredging will force companies that rely on deep-water dredging to alter operations, rely on smaller ships, and/or increase the frequency of shipments that will raise costs and affect shipping reliability and efficiency. Ultimately, this could result in companies increasingly relying on other means of transportation to move cargo, to relocate, or downsize operations. Anecdotal evidence suggests that other ports in the region increasingly have become recreation-oriented ports.

Muskegon area businesses and organizations would like to see Muskegon Lake continue substantial commercial shipping activity. The intent of this study is to estimate the current economic benefits to the county, region, and state of deep-water commercial activities at Muskegon Lake, and to estimate the potential economic benefits the port could support given expanded commercial development activity and civic engagement in the future.

ECONOMIC AND FISCAL BENEFITS DEFINED

Economic Benefits

Economic impact analysis is the analytical approach used to assess the measurable direct and indirect benefits resulting from a project over a specific period. Only those benefits that can be measured or quantified are included. Intangible benefits, such as enhancement of community character or diversification of the job base, are not included. Further, economic impact analysis highlights that activity which occurs within a specified geographic area. This analysis estimates the benefits of commercial port activity on three geographic levels: the state of Michigan, the 13-county West Michigan Prosperity Alliance (Region 4), and Muskegon County.

The economic and fiscal benefits estimated in this analysis highlight two categories of impacts and activities, consisting of temporary benefits such as construction activity and capital investment, and on-going annual benefits as measured by stabilized business operations.

The direct economic benefits are estimated through the SiteStats™ model, a proprietary economic and fiscal impact model developed by Development Research Partners. The model values were derived from primary and secondary data source, including data from the U.S. Census Bureau, U.S. Bureau of Labor Statistics, U.S. Bureau of Economic Analysis, State of Michigan, and Muskegon County.

The spending patterns associated with investment and business operations have spin-off effects or multiplicative impacts in the county, region, and state. Therefore, multiplier analysis is used to trace the impacts on businesses, organizations, and individuals affected by the construction activity and on-going operations.

The multiplicative impacts are discussed in terms of "indirect" and "induced" economic benefits (often collectively referred to as simply indirect benefits). For example, when a commercial freight business purchases supplies from a local vendor, that local vendor provides payroll to its employees and makes purchases from other vendors. These other vendors in turn provide payroll to their employees and make purchases from other vendors and so on, providing the indirect benefit of the initial dollar spent. On a separate but similar spending track, when employees of the commercial freight business spend their paychecks at local businesses, these local businesses provide payroll to their employees, make purchases from other vendors, and so on, creating the induced benefit.

As a result, the initial dollars spent by the commercial freight business for construction, capital investment, business purchases, and employee compensation will be circulated throughout the local economy a number of times. The number of times that the initial dollars will be circulated throughout the local economy may be estimated using economic multipliers. An economic multiplier summarizes the total impact that can be expected within a specific geographic area due to a given industry's level of business activity. Generally, larger multipliers are associated with industries that (1) spend more dollars locally, (2) pay high salaries, and/or (3) sell their goods and services outside of the local area.

The indirect and induced jobs and income flows generated by the direct local spending patterns are estimated using the Regional Input-Output Modeling System II (RIMS II) multipliers developed by the Bureau of Economic Analysis of the U.S. Department of Commerce. The RIMS II multipliers are the most widely used and respected for economic impact analysis. These multipliers are geographic and industry specific, and are used to estimate the total benefits of a project.

Three types of economic benefits derived from the RIMS II multipliers are discussed for each study region. First, the direct and indirect impact of the construction and operations on the gross output of the region is estimated. This is the total value produced by local firms and residents resulting from the value of the output produced by an industry directly. Gross output consists of the value of both intermediate goods and final products, so this is a larger value than gross domestic product (GDP) for each region. Second, the total direct and indirect employment needed in the region to produce this level of output is determined. These employees may be full-time or part-time, local or non-local workers. It should be noted that the indirect employment supported might represent fractions of jobs, added to reflect whole positions. Third, the analysis presents an estimate for the typical direct and indirect earnings associated with this level of production.

Fiscal Benefits

Fiscal impact analysis estimates the direct public revenues and public costs resulting from a project over a specific time period. A project may generate a broad array of public revenues ranging from sales tax, use tax, property tax, franchise fees, licenses and permits, and other charges for services. In turn, local governments provide a variety of public services such as police protection, public works, community social and recreational programs, and community development services, to name a few.

This report includes a limited fiscal impact analysis, including estimates of direct public revenue generated from sales tax and property tax only. In other words, the analysis includes the governmental taxes paid by businesses located on Muskegon Lake for construction activity, capital investment, business spending, and operations. The sales tax revenue estimates are based on current sales and use tax rates and tax policies for the state of Michigan. Property tax estimates are based on the value of current and anticipated real and personal property and current tax policies.

METHODOLOGY

Geographic Interpretation

This analysis estimates the benefits of commercial shipping activity at Muskegon Lake on three geographic levels: the state of Michigan, Region 4, and Muskegon County. Region 4 is a 13-county region consisting of Allegan, Barry, Ionia, Kent, Lake, Mason, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, Osceola, and Ottawa Counties. The economic benefits in the three geographic areas described in this report are individual, non-additive impacts. For example, the economic benefits reported for Region 4 are not in addition to the state of Michigan benefits, but are a component of the economic benefits in the state. Similarly, the economic benefits reported for Muskegon County are not in addition to the regional benefits, but are a component of them. Thus, the economic benefits estimated from this study should specify the particular geography when reported.

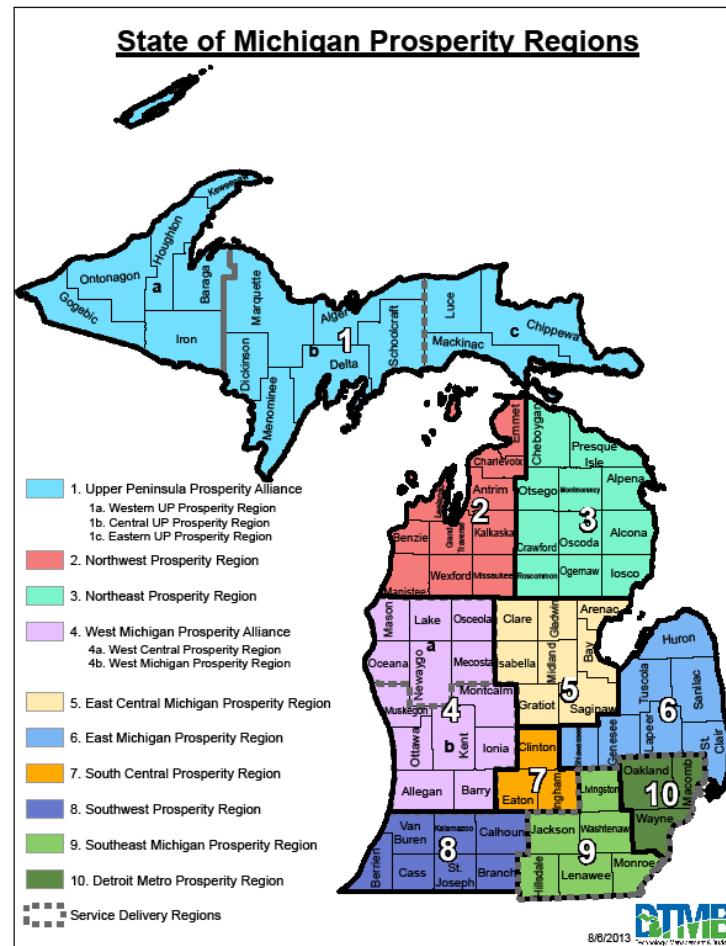
The fiscal benefits reported in this study are narrower in concept. The three geographic areas analyzed in this study either represent a single governmental entity or consist of several governmental entities. The fiscal benefits are discrete to each level of government. For example, a commercial freight business pays property tax. The property tax revenues benefit several different taxing entities that provide governmental services to the facility. While any property tax received by Muskegon County for county services benefits its residents, who are also residents of the state, Muskegon County property tax revenue is only counted as a direct fiscal benefit to the county, not the state of Michigan as a whole. Thus, the fiscal benefits estimated in this study should specify the particular governmental entity when reported.

The total output, employment, and earnings from Muskegon Lake businesses are estimated using the RIMS II multipliers at a state, regional, and county level.

Categories of Impacts

The economic and fiscal benefits for this analysis were calculated within the framework of two categories of impacts and activities, consisting of temporary benefits and stabilized on-going benefits of business operations.

Temporary impacts focus on the benefits of activities such as construction that include temporary spending on materials, labor, and other costs. Temporary benefits are one-time impacts, meaning that the benefit accrues only



in the years in which the activity occurs. If there is no construction activity or investment in a given year, there are no associated economic and fiscal benefits.

The impacts of on-going operations for this analysis are based on the potential, stabilized annual business operational benefits based on expanded lake activities and commercial activity. It should be noted that, in reality operating expenses are likely to vary from year to year.

Project Parameters and Study Variables

Development Research Partners estimated the economic and fiscal benefits described in this report based on primary data when available such as current property tax records and company data. When necessary, data from a variety of standard secondary sources was used, including the U.S. Bureau of Labor Statistics, U.S. Bureau of Economic Analysis, U.S. Census Bureau, state of Michigan, and others. Development Research Partners made every attempt to collect necessary additional or missing information and believe the information used in this report is from sources deemed reliable but is not guaranteed.

It should be noted that projections for economic activity at Muskegon Lake are aspirational in nature and depend entirely on economic development initiatives, civic engagement, and private business activity. While feasibility studies demonstrating the effectiveness of shipping activity from Muskegon Lake have been conducted, this does not guarantee a business will take the required risk of investing in the county or modifying their established supply chains. Changes in policy, actual development, and shipping activities will change the benefits reported in this study. The parameters used in this analysis were carefully considered and selected to accurately report economic potential and avoid overstating economic and fiscal benefits. However, the economic and fiscal benefits estimated in this report are entirely dependent on assumptions about future development and are not guaranteed.

Some numbers in the study may not add exactly due to rounding. In general, numbers reported in the text of the report are rounded to the nearest hundred thousand if over \$1 million. Figures that are less than \$1 million are rounded to the nearest thousand. This analysis considers the economic and fiscal benefits in current dollars.

REPORT ORGANIZATION

Following the Introduction, the first section of the report describes the economic and fiscal benefits of current port activity. This section establishes the baseline level of economic activity generated by deep-water commercial shipping activity in 2015. This section also describes port-related benefits for industries that utilize the port for commodities. The next two sections expand the analysis to project the benefits a port expansion could have. The first details the benefits of construction activity related to the port expansion scenario and projected ancillary development. The second describes the benefits of on-going operations assuming a stabilized level of business activity for the port following expansion.

Each section is divided into the direct economic and fiscal benefits of the project, followed by the total economic benefits once multiplier effects are considered. Multiplier effects include the indirect and induced impacts on output, employment, and earnings supported by the direct output from construction activity and operations for Michigan, Region 4, and Muskegon County.

Current port activity and the construction and operations for port expansion and ancillary development will have significant benefits on various local suppliers in the region. These categories of direct and indirect benefits are combined to establish the overall economic and fiscal benefits of the development. These final total values are included in the Summary section of the report.

INTRODUCTION

Lastly, a discussion of qualitative benefits of a port expansion is included. Revitalization and expansion of the Port of Muskegon will result in many benefits that are not quantifiable, or are not estimated in the above analysis. These benefits include such things as reduced traffic congestion, reduced shipping costs, mitigating the effects of trucker shortages, and greater exposure to international markets and business.

BENEFITS OF CURRENT PORT ACTIVITY

Muskegon Lake has a variety of uses. The north shore of the lake is comprised of mostly residential development. Muskegon State Park lies to the west of the lake on the north side of the Lake Michigan channel. The south side of the lake has a variety of recreational, commercial, and industrial uses, including the Melching (Sappi Paper) site, commercial docks, the Lake-Express ferry, and Port City Princess Cruises. The largest industrial lakeshore site is Consumers Energy's B.C. Cobb plant located at the far-east side of the lake. This study focuses on the commercial freight aspects of the lake, not the recreational uses.

Commercial deep-water shipping activity at Muskegon Lake represents a significant part of the Muskegon County and the surrounding region economy, supporting business spending and employment. This section estimates the typical annual economic and fiscal benefits associated with this activity under current conditions. This section establishes baseline economic activity for the port needed to estimate the economic benefits of expanded commercial activities and port revitalization.

Muskegon Lake is similar to many other ports on the Great Lakes in that it functions mainly for receiving freight and commodities. Freight is shipped from Muskegon to other areas on the Great Lakes occasionally, but it does not comprise a significant portion of business activity. The largest bulk commodities shipped into Muskegon include limestone, road salt, cement, and slag.

Table 1: Muskegon Freight Tonnage by Commodity Type

Commodity	Actual 2012	Projected 2016
Limestone	516,000	500,000
Salt	58,000	140,000
Cement	80,000	80,000
Slag	10,000	25,000
Total	664,000	745,000

Source: Muskegon Area First Feasibility Study

The goods shipped into Muskegon mainly serve regional industries in west Michigan. The market for goods shipped into Muskegon is roughly a 100-mile radius from Muskegon Lake, stretching from about Ludington in the north, east to Grand Rapids and Lansing, and south to St. Joseph. Limestone, cement, and slag are commodities used in the construction industry. Shipments of these goods are dependent on construction activity in the west Michigan region. Indeed, robust construction activity in Michigan in the past year has boosted shipments into Muskegon significantly based on company interviews conducted for this study.

Road salt is a steady source of shipments into Muskegon. The market for road salt is dependent on state and local governments responsible for road maintenance and plowing each winter. Salt shipments fluctuate based on projected weather patterns and stockpiles. The Michigan Department of Transportation reported in December 2014 that state and local agencies have used between 343,000 (2012) and 749,000 (2008) tons of salt each year since 2008. Based on Muskegon shipments, approximately one-sixth of the salt used in Michigan was shipped through Muskegon in 2012.

The businesses operating at Muskegon Lake occasionally ship specialty freight such as wind turbines, machinery, and other custom shipping orders. Companies predict that these types of freight will continue to be an opportunity in the area, but not a major source of growth and revenue. In 2012, Muskegon received a shipment of wind turbine components totaling about 8,500 tons. Logistically, the shipping businesses typically rent special equipment to handle custom shipments at the lake when the opportunity arises. However, basic infrastructure and logistics capabilities currently exist to support bulk commodity shipments.

BENEFITS OF CURRENT PORT ACTIVITY

ANNUAL DIRECT ECONOMIC AND FISCAL BENEFITS

Business Spending

Commercial deep-water port operations at Muskegon Lake involve four businesses, excluding Consumers Energy's B.C. Cobb plant. These businesses are Verplank, Andrie, Inc., LaFargeHolcim Cement, and the West Michigan Dock and Market Corporation. These deep-water shipping businesses are part of several industries, including truck transportation, water transportation, cargo handling services, management (headquarters operations), ship maintenance services, warehousing and storage, and dock leasing services.

The following estimates were derived from company interviews to determine business patterns and employment levels, along with property tax records and secondary data sources as needed to estimate business expenditures. Typical annual direct benefits of current commercial deep-water port activity in Muskegon total an estimated \$20.9 million. The direct economic benefits of commercial deep-water shipping activity at Muskegon Lake are included in Table 2 and detailed below.

- Based on existing personal property for Muskegon Lake's commercial shipping businesses as well as purchasing patterns estimated from economic census data for relevant industries, annual expenditures for equipment and materials for operation are an estimated \$1.2 million. These purchases generate benefits for state and local suppliers and sales and use tax revenue for Michigan.
- Commercial shipping operations require purchases of professional and technical services such as accounting, legal support, engineering, consulting, and other business services. Based on estimates of typical spending on business services for industries represented at Muskegon Lake from economic census data, annual expenditures are an estimated \$942,000. Many of these services likely are supplied regionally as professional and technical services comprise just 1.6 percent of Muskegon County's employment base according to 2014 estimates from the U.S. Bureau of Labor Statistics.
- Based on typical spending on utilities and telecommunications services for industries represented at Muskegon Lake from economic census data, annual expenditures are an estimated \$323,000. Most of this spending benefits state-based suppliers and generates sales and use tax revenue for Michigan.
- Based on the industry relationships established through the RIMS II multipliers from the U.S. Bureau of Economic Analysis, other direct benefits to the local, regional, and state economies from commercial shipping activities at Muskegon Lake are an estimated \$8.6 million. This direct output supports business spending on leasing services, regional taxes, and other miscellaneous business purchases.
- Based on company interviews, commercial port activity supports about 120 full-time employees. Based on data from the U.S. Bureau of Labor Statistics for Muskegon County, total annual wages and salaries is an estimated \$6.9 million. The estimated average annual wage of these employees is about \$57,200, nearly 45 percent higher than the average across all industries of \$39,500 in 2014. All of these employees live in Michigan and within Region 4. About 41 percent of the employees are also residents of Muskegon County.
- Employee benefits for the 120 employees comprise about 30 percent of compensation based on information from the U.S. Bureau of Labor Statistics, National Compensation Survey for relevant industries. Employee benefits include items such as paid leave, supplemental pay, insurance, and federally required benefits such as worker's compensation. Employee benefits benefit the local, regional, and state economies depending on the amount spent locally.

BENEFITS OF CURRENT PORT ACTIVITY

Table 2: Direct Annual Economic Benefit of Commercial Deep-Water Port Activity at Muskegon Lake, 2015

Direct Economic Benefits	
Equipment and Materials for Operations	\$1,233,000
Business Services	\$942,000
Utilities and Telecomm	\$323,000
Other Direct Benefits	\$8,608,000
Payroll	\$6,862,000
Employee Benefits	\$2,941,000
Total	\$20,909,000
Employees	120

Fiscal Benefits

- Port activity in Muskegon generates property tax revenue for many state and local districts. Based on the most recent property tax records, rates, and assessments for the companies at Muskegon Lake, estimated property tax revenue for all districts serving the companies totaled about \$351,700 in 2014.

Specifically, the fiscal benefit to the state was about \$34,600 from the state education tax and \$38,300 to Muskegon County based on the county mill levy.

Table 3: Property Tax Rates and Revenues for Commercial Deep-Water Port Activity at Muskegon Lake, 2014

District	Mill Levy	Revenue
State Education Tax	6.0000	\$34,600
Muskegon County	6.6557	\$38,300
Muskegon City	13.0875	\$75,400
Muskegon ISD	4.7580	\$27,400
School District (Non-Homestead)	18.0000	\$103,700
Muskegon Public School District Debt	7.6000	\$43,800
Muskegon Community College	2.5437	\$14,700
Hackley Library District	2.4000	\$13,800
Total (Muskegon School District)	61.0449	\$351,700

*Source: Muskegon Equalization Department, BS&A Software Internet Services
(accessed September 2015)*

- Purchases of equipment and operational materials for business operations at Muskegon Lake generate state sales and use tax revenue. Additionally, sales of electricity and telecommunications services to the port's businesses also generates sales tax revenue. Based on the six percent sales and use tax rate in Michigan, tax revenue totals an estimated \$91,000 each year.
- The total direct fiscal benefit of commercial deep-water port activity in Michigan is an estimated \$126,000 each year consisting of property tax and sales and use tax revenue. The estimated benefit to Muskegon County is \$38,300.

ANNUAL DIRECT, INDIRECT, AND INDUCED BENEFITS

Annual port activities and business operations have multiplier impacts in the state, regional, and local economies. Multiplicative impacts are based on the value of output of the various port businesses, including truck

BENEFITS OF CURRENT PORT ACTIVITY

transportation, warehousing and storage, management of companies and enterprises, and support activities for transportation. As noted in the Introduction, the economic benefits in the three geographic areas described below reflect individual, non-additive impacts. That is, the economic benefits for Region 4 are not in addition to the state of Michigan benefits, but are a component of the state benefits. Likewise, economic benefits for Muskegon County are a component of Region 4 and state of Michigan benefits.

Michigan

- **Value of Output:** Based on the RIMS II multipliers, \$20.9 million of port activity likely supports \$22.9 million in additional output in all industries throughout the state. This consists of the value of local spending of the employees (the induced benefit) and state-based supplier companies and their employees (the indirect benefit). Therefore, the total direct and indirect benefit of operations is \$43.8 million in total output (\$20.9 million direct output + \$22.9 million indirect and induced output), as shown in Table 4.
- **Employment:** Commercial deep-water port activities directly employ about 120 workers. Based on the RIMS II multipliers, the production of the \$22.9 million in indirect and induced output in all industries throughout the state will require about 209 employees. Therefore, annual port activities support employment of 329 workers (120 direct employees + 209 indirect employees).
- **Earnings:** The employees involved in commercial deep-water port activities have estimated earnings of \$8.1 million. This includes the value of wages and salaries for the employees as well as a portion of employee benefits.¹ Based on the relationships revealed through the RIMS II multipliers, the 209 indirect employees that produce the \$22.9 million in indirect and induced output have associated earnings of about \$7.4 million. In total, the direct and indirect employees have estimated earnings of \$15.5 million (\$8.1 million direct earnings + \$7.4 million indirect and induced earnings). All earnings values are included in the total value of output; earnings are not in addition to the value of output.

Region 4

- **Value of Output:** Based on the RIMS II multipliers, \$20.9 million of port activity likely supports \$17.9 million in additional output in all industries throughout Region 4. This consists of the value of local spending of the employees (the induced benefit) and regionally based supplier companies and their employees (the indirect benefit). Therefore, the total direct and indirect benefit of operations is \$38.8 million in total output (\$20.9 million direct output + \$17.9 million indirect and induced output), as shown in Table 4.
- **Employment:** Commercial deep-water port activities directly employ about 120 workers. Based on the RIMS II multipliers, the production of the \$17.9 million in indirect and induced output in all industries throughout Region 4 will require about 162 employees. Therefore, annual port activities support employment of 282 workers (120 direct employees + 162 indirect employees).
- **Earnings:** The employees involved in commercial deep-water port activities have estimated earnings of \$8.1 million. Based on the relationships revealed through the RIMS II multipliers, the 162 indirect employees that produce the \$17.9 million in indirect and induced output have associated earnings of about \$5.6 million. In total, the direct and indirect employees have estimated earnings of \$13.7 million (\$8.1 million direct earnings

¹ Earnings impacts are based on the portion of total compensation (including wages, salaries, and benefits) that is likely to be spent locally and include wages and salaries, paid leave, and supplemental pay. Some insurance benefits are an added benefit for the state and Region 4.

BENEFITS OF CURRENT PORT ACTIVITY

+ \$5.6 million indirect and induced earnings). All earnings values are included in the total value of output; earnings are not in addition to the value of output.

Muskegon County

- **Value of Output:** Based on the RIMS II multipliers, \$20.9 million of port activity likely supports \$9.3 million in additional output in all industries throughout the county. This consists of the value of local spending of the employees (the induced benefit) and county-based supplier companies and their employees (the indirect benefit). Therefore, the total direct and indirect benefit of operations is \$30.2 million in total output (\$20.9 million direct output + \$9.3 million indirect and induced output), as shown in Table 4.
- **Employment:** Commercial deep-water port activities directly employ about 120 workers. Based on the RIMS II multipliers, the production of the \$9.3 million in indirect and induced output in all industries throughout the county will require about 93 employees. Therefore, annual port activities support employment of 213 workers (120 direct employees + 93 indirect employees).
- **Earnings:** The employees involved in commercial deep-water port activities have estimated earnings of \$7.8 million based on a smaller local share of employee benefits than the region or state. Based on the relationships revealed through the RIMS II multipliers, the 93 indirect employees that produce the \$9.3 million in indirect and induced output have associated earnings of about \$3 million. In total, the direct and indirect employees have estimated earnings of \$10.8 million (\$7.8 million direct earnings + \$3 million indirect and induced earnings). All earnings values are included in the total value of output; earnings are not in addition to the value of output.

Table 4: Total Annual Economic Benefit of Commercial Deep-Water Port Activity at Muskegon Lake, 2015

	Direct Impact*	Multiplier	Indirect & Induced Impact	Total Impact
Michigan				
Value of Output (\$M)	\$20.9	2.0939	\$22.9	\$43.8
Earnings (\$M)	\$8.1	1.9118	\$7.4	\$15.5
Employment	120	2.7457	209	329
Region 4				
Value of Output	\$20.9	1.8577	\$17.9	\$38.8
Earnings	\$8.1	1.6950	\$5.6	\$13.7
Employment	120	2.3464	162	282
Muskegon County				
Value of Output (\$M)	\$20.9	1.4461	\$9.3	\$30.2
Earnings (\$M)	\$7.8	1.3827	\$3.0	\$10.8
Employment	120	1.7791	93	213

Calculation Note: Direct x Multiplier = Total Impact

Total Impact - Direct Impact = Indirect & Induced Impact

Numbers may not add exactly due to rounding.

PORt-RELATED BENEFITS

The logistics and cargo handling services for freight shipped into Muskegon Lake are a part of broader industry spending benefits. The freight handled at Muskegon, namely limestone, cement, slag, and salt, are materials used

BENEFITS OF CURRENT PORT ACTIVITY

in the construction industry and for state and local governments' winter maintenance operations. These inputs are significant, but are a small part of the materials, planning, and spending of larger projects. Construction companies and state and local governments that rely on shipping commodities into Michigan through Muskegon benefit from the port's location and activities and some level of employment benefit is attributed to the port. However, as other port economic impact studies point out, while facilities and services at ports are an important part of procuring materials in these industries, these jobs may not be displaced if marine activities ceased.² For example, if deep-water shipping ceased at Muskegon, state and local governments would still need salt, or substitute materials, to deice roads each winter. Procuring these materials from other sources may cost more and shipment may be less convenient, thereby challenging winter maintenance budgets. However, employees would still be needed to plow roads and distribute deicing materials.

This section describes the benefits and employment related to shipping activity at Muskegon Lake, but the benefits are not additive to those in the previous section.

Construction

- The value of equipment and materials typically comprises about 50 percent of the total value of construction activity. Limestone, cement, and slag represent a portion of these purchases, which varies depending on the type of construction, such as residential or street construction. The port-related benefits below are conservative, and represent just the employment and value of the projects related to the commodities, not the entire value of the project itself.
- The estimated value of construction associated with shipments of limestone, cement, and slag into Muskegon is \$24.3 million based on projected 2016 freight activity at the port. This construction spending benefits the western Michigan region, supporting businesses and employment in the region.
- \$24.3 million in construction spending supports an estimated 109 full-time equivalent employees in the west Michigan region earning \$8.5 million in wages, salaries, and employee benefits.

Winter Maintenance

- Since 2008, Michigan has used between 343,000 (2012) and 749,000 (2008) tons of salt each year. Based on Muskegon shipments, approximately one-sixth to one-fifth of the salt used in Michigan is shipped through Muskegon Lake. Accordingly, Muskegon's portion of salt tonnage is used to approximate the amount of salt and winter maintenance services spent in the west Michigan region.
- Michigan spent an estimated \$135 million for winter road maintenance during fiscal year 2014. This included about 650,000 tons of salt costing \$32 million. In addition to salt, winter maintenance costs included sand and other deicing materials, equipment procurement, repair and maintenance services, and labor.
- The estimated value of winter maintenance expenditures in the west Michigan region was an estimated \$28.9 million in fiscal year 2014.
- Research indicates about 40 percent of winter maintenance costs in the upper Midwest is comprised of labor. Based on this assumption, winter maintenance for fiscal year 2014 supported an estimated 179 full-time equivalent workers earning \$11.6 million in wages, salaries, and employee benefits.

² Reference Martin Associates, "The Economic Impacts of the Great Lakes – St. Lawrence Seaway System," 2011 methodology.

Port Expansion and Ancillary Construction Activity

The West Michigan Shoreline Regional Development Commission recently conducted several focus group sessions and public outreach to gain community input on the future of port activities on Muskegon Lake. These discussions are part of Vision 2020, a community planning process intended to identify commercial, residential, and recreational needs and expectations for Muskegon Lake during the next five years. Participants generally regarded commercial and industrial activities on the lake as a positive economic benefit. Comments submitted to officials recognized the contribution commercial and industrial port activity brought to the community, but highlighted challenges the port has and investment that is needed to make it viable for the long-term benefit of the community.

One point of consensus is the lack of collaboration and planning at the port. All of the lake's docks are privately owned and responders felt a lack of cohesion among various groups and public authorities for port development. One priority identified from the community discussions was to address the lack of consistent port organizational structure. Participants generally agreed that an increase in volume at the port could improve its viability and its position as an asset to the community.

Based on the community feedback and under the direction of economic development and community representatives, this report offers a preliminary estimate of the potential activity that could be conducted at the port. An increase in port activity would require investment in infrastructure, expanding port activity to include container shipping, expanded freight activity, and attracting new manufacturing and agricultural activity to the region. This section does not demonstrate the feasibility of these projects, nor does it examine the probability of investment and expansion of port activities. This section is calculated with the assumption that economic development goals, financing, and investments are realized.

DIRECT ECONOMIC AND FISCAL BENEFITS

Recent feasibility studies for the port have demonstrated the viability and cost savings associated with utilizing Muskegon for shipping west Michigan-based manufactured goods and agricultural products. The studies found companies could manage costs and reduce risk by utilizing the Port of Muskegon to diversify their shipping options. Researchers analyzed two promising trade routes, consisting of service to Europe through the Port of Cleveland and service to Asia via the ports of Milwaukee and Vancouver. The analysis indicated that reliable service and competitive pricing were feasible from Muskegon Lake.

A key feature of the analyses was the feasibility of container shipping from the Port of Muskegon. A container terminal in Muskegon could expand the shipping opportunities for local businesses and create competitive options for selling goods in international markets. In fact, a regular container service was recently introduced to the Great Lakes at the Port of Cleveland; the Cleveland-Europe Express commenced operations in 2013. The Cleveland-Europe Express recently announced it would double the frequency of its service. A strong container terminal in Cleveland is a factor that increases the viability of container service in Muskegon.

Reduced and competitive shipping costs and improved access to markets would likely induce manufacturers and agricultural producers in west Michigan to either relocate to the region or expand their existing operations. The region has a large manufacturing and agricultural base that already produces enough volume to sustain a substantial amount of container traffic. Indeed, manufacturing is a critical industry in Region 4, accounting for over one-fifth of the employment base, or 141,200 employees. An expanded manufacturing employment base would yield more earnings for the region, construction activity, local business purchases, and spending activity.

Port Expansion and Ancillary Construction Activity

Table 5: Muskegon County Employment by Sector, 2014

Industry	Employees		Percent of Total Jobs	Avg. Ann. Increase
	2009	2014		
Agriculture, Forestry, Fishing, and Hunting	ND	ND	ND	ND
Mining, Quarrying, and Oil and Gas Extraction	ND	ND	ND	ND
Utilities	ND	ND	ND	ND
Construction	1,529	1,749	2.8%	2.7%
Manufacturing	9,915	12,980	21.1%	5.5%
Wholesale Trade	1,086	1,461	2.4%	6.1%
Retail Trade	10,349	10,539	17.1%	0.4%
Transportation and Warehousing	ND	ND	ND	ND
Information	798	761	1.2%	-0.9%
Finance and Insurance	1,008	1,029	1.7%	0.4%
Real Estate and Rental and Leasing	734	631	1.0%	-3.0%
Professional, Scientific, and Technical Services	936	979	1.6%	0.9%
Management of Companies and Enterprises	110	108	0.2%	-0.4%
Administrative and Waste Services	1,770	2,742	4.5%	9.1%
Educational Services	950	760	1.2%	-4.4%
Health Care and Social Assistance	9,826	10,284	16.7%	0.9%
Arts, Entertainment, and Recreation	1,044	961	1.6%	-1.6%
Accommodation and Food Services	5,295	5,751	9.4%	1.7%
Other Services	1,601	1,782	2.9%	2.2%
Government	8,544	7,147	11.6%	-3.5%
Total All Industries	57,181	61,477	100.0%	1.5%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Note: ND indicates data is not disclosable.

Additionally, demand for existing commodities shipped into Muskegon are projected to expand statewide. From 2015 to 2020, the Michigan Department of Transportation (MDOT) expects freight movements for several commodity groups including clay, cement, glass, and stone products, nonmetallic ores and minerals, and waste or scrap material are all likely to increase. Based on current operations at the Port of Muskegon, expanded freight will result in more jobs and investment at the lake.

This section describes the potential economic benefits to Muskegon County, Region 4 and the state of Michigan based on investments that would accommodate increased shipping activity and a container terminal at Muskegon Lake, as well as the investment that would likely accompany an increase in the manufacturing and agriculture employment base in the region. Estimates in this section do not determine the feasibility of investment or project the shipment of additional tonnage to the port, but rather analyze the economic benefits these projects would bring to the region if realized.

Container Terminal Services

- A container terminal facility at Muskegon Lake would likely support 19,500 twenty-foot-equivalent units (TEU) each year, or about 375 containers per week. It is assumed that about 80 percent of this new shipping activity would be supported by existing shipments and export activity from west Michigan-based manufacturers and farmers. The shift of this existing activity to Muskegon rather than through Chicago, Detroit, or other locations would likely result in minimal regional and state benefits as jobs are reshuffled from one form of transportation to another. However, the presence of a container terminal in Muskegon could open opportunities for businesses to expand or relocate to west Michigan. An estimated 20 percent, or 3,900 TEUs, will come from new business activity in west Michigan.

Port Expansion and Ancillary Construction Activity

Table 6: Michigan Exports by Industry

Industry (\$ in millions)	2009	2014	Percent of Total	Avg. Ann. Increase
Total	\$32,655	\$55,929	100.0%	11%
Transportation Equipment	\$14,117	\$25,845	46.2%	13%
Machinery	\$3,163	\$4,908	8.8%	9%
Chemicals	\$3,456	\$4,714	8.4%	6%
Computer and Electronic Products	\$1,696	\$3,134	5.6%	13%
Primary Metals	\$2,112	\$2,608	4.7%	4%
Electrical Equipment and Appliances	\$655	\$2,145	3.8%	27%
Oil and Gas	\$1,459	\$2,126	3.8%	8%
Fabricated Metal Products	\$1,000	\$2,047	3.7%	15%
Plastics and Rubber Products	\$677	\$1,392	2.5%	16%
Food	\$764	\$1,388	2.5%	13%
Agricultural Products	\$363	\$548	1.0%	9%
All Other	\$3,193	\$5,072	9.1%	10%

Source: U.S. Department of Commerce, International Trade Administration

- Transportation equipment exports, including motor vehicle parts, comprised 46 percent of the total value of exports from Michigan in 2014. Exports of transportation equipment have increased at an average annual rate of 13 percent from 2009 to 2014. Agricultural products comprised about one percent of the total value of state exports in 2014, but have grown about nine percent annually from 2009 to 2014.
- A container terminal facility in Muskegon could cost as much as \$27 million, including all storage facilities, materials handling equipment, dock improvements, and other investment. Investment is comprised of an estimated \$15.3 million of construction-related activity and \$11.7 million for materials handling equipment and other personal property. Potential investment is based on construction and investment at several port expansions in the country in the past few years.

Manufacturing Activity

- About half of the containers supported by new business activity at a potential Muskegon terminal would come from manufacturing, most likely motor vehicle parts and equipment manufacturers, based on port feasibility studies. Assuming 1,950 containers, or about 50 percent of new shipping activity, is supported by an expansion of manufacturing activity, the associated employment is an estimated 330 manufacturing jobs. This estimate factors the value of waterborne transportation of motor vehicle parts in Michigan, and tonnage that would likely be shipped in 1,950 containers.

Port Expansion and Ancillary Construction Activity

Table 7: Employment by Sector, 2014

	Muskegon	Region 4	Michigan
Total All Industries	61,477	665,860	4,090,009
Manufacturing	12,980	141,203	576,576
Transportation Equipment	969	19,679	176,274
Motor Vehicle Parts	921	15,972	117,192
Fabricated Metal Products	2,855	19,041	79,843
Machinery	1,445	15,626	70,067
Food	458	13,368	33,327
Other Durable Goods	5,019	35,284	111,509
Other Nondurable Goods	2,123	25,691	105,556
Other Nondisclosable	111	12,514	0
Manufacturing Percent of Total	21.1%	21.2%	14.1%
Transportation Equipment Percent of Manufacturing	7.5%	13.9%	30.6%
Motor Vehicle Parts Percent of Transportation Equipment	95.0%	81.2%	66.5%

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages

Note: Sector categories do not include nondisclosable data.

- A large share of the employment base in Muskegon and in Region 4 is comprised of manufacturing, over 21 percent in both areas. The largest manufacturing subsector in Region 4 is transportation equipment, with nearly 19,700 employees. Based on known employment, motor vehicle parts comprised most of the employment in the regional transportation equipment subsector, at least 81 percent in 2014. As of 2014, there were about 16,000 workers employed at motor vehicle parts and equipment manufacturers in Region 4.
- Based on estimates of the utilization of industrial space, an additional 330 employees in the Region 4 would result in 163,500 square feet of new industrial space, or about 500 square feet per employee.
- Based on construction cost estimates for factory space, adjusted for the Muskegon and Grand Rapids area, construction of 163,500 square feet of new industrial would cost an estimated \$19.4 million.
- Based on the value of personal and real property for industrial space in Muskegon, equipment for the new space would total an estimated \$27.6 million, comprised of furniture and fixtures, computer equipment, and manufacturing equipment.

Agricultural Activity

- The west Michigan region produces many types of crops and livestock from dry bulk cargo and grains to asparagus, vegetables, and fruit. Assuming 1,950 containers are supported by new agricultural activity at a potential Muskegon terminal, and based on the weight of shipments that could be supported by containers, yields per acre of various crops, and estimates of hours of labor required for each acre and crop, the associated employment is an estimated 160 agricultural jobs in Region 4.
- The Census of Agriculture from the U.S. Department of Agriculture indicates that there were about 26,500 hired laborers on farms in Region 4 in 2012. Total farm acreage was about 1.9 million acres.
- Based on the market value of agricultural land in the region from the U.S. Census of Agriculture and the value of machinery and equipment, acreage that supports container traffic from Muskegon would require an estimated investment of \$3.2 million for machinery and farm equipment.

Port Expansion and Ancillary Construction Activity

Cement, Limestone, Salt, Slag, and other Bulk Commodities

- The existing base of waterborne freight in Muskegon, including cement, limestone, salt, and slag, is expected to continue to grow in the next several years. In addition, new products such as potash could drive an increase in bulk commodity shipments into and out of Muskegon. Based on the growth forecast for these types of waterborne freight in Michigan and the potential for an additional 49,000 tons of freight for the port, Muskegon tonnage could grow about 4 percent each year through 2020 for a total of 861,000 tons.

**Table 8: Projected Muskegon Freight
Tonnage by Commodity Type**

Commodity	Projected 2020
Limestone	553,000
Salt	144,000
Cement	88,000
Slag	27,000
Potash/Fertilizer Products	40,000
Custom Freight	9,000
Total	861,000

Source: Muskegon Area First Feasibility Study

- Assuming building improvements grow in proportion to existing shipping activity at the port, an increased level of tonnage would result in an additional 56,500 square feet of commercial and industrial space at the port. The estimated construction cost of this additional square footage is \$2.6 million based on construction cost estimates for warehouse type buildings.
- Based on the value of real and personal property for commercial uses in Muskegon County, personal property as a percent of real property is about 17.9 percent. Therefore, an estimated \$460,000 of equipment purchases will accompany an additional 56,500 square feet of space at the port.

Direct Economic and Fiscal Benefits

Table 9: Economic and Fiscal Benefits of New Construction Due to Port Expansion, 2020

	Total	Michigan	Region 4	Muskegon County
Direct Economic Benefits				
Construction Equipment and Materials	\$18,658,000	\$18,658,000	\$16,027,000	\$661,000
Soft Costs	\$5,597,000	\$5,597,000	\$2,832,000	\$91,000
Initial Personal Property*	\$42,923,000	\$5,555,000	\$1,684,000	\$24,000
Payroll	\$9,142,000	\$9,142,000	\$7,314,000	\$462,000
Employee Benefits	\$3,918,000	\$1,371,000	\$1,097,000	\$46,000
Total	\$80,238,000	\$40,323,000	\$28,954,000	\$1,284,000
Employees	168	168	134	8
Direct Fiscal Benefits				
Sales/Use Tax on Construction Purchases	\$1,119,000	\$0	\$0	\$0
Sales/Use Tax on Initial Personal Property	\$1,061,000	\$0	\$0	\$0
Total	\$2,180,000	\$0	\$0	\$0
Total Direct Economic and Fiscal Benefits	\$42,503,000	\$28,954,000	\$1,284,000	

*Reflects wholesale margin after subtracting the cost of goods sold. Based on total spending of \$33.2 million in Michigan, \$10.1 million in Region 4, and \$148,000 in Muskegon.

Port Expansion and Ancillary Construction Activity

Direct Economic Benefits and Local Spending

- The majority of the construction activity a port expansion could stimulate is attributable to buildings and equipment needed to support more manufacturing. Additionally, the development of a container terminal at the port would also bring significant investment. The construction of the facilities and related initial capital investment would provide significant, but temporary, benefits to the area. These benefits accrue only during the construction period.
- Construction equipment and materials purchases supported by new construction activity total an estimated \$18.7 million. Most of the purchases are likely to be sourced regionally, with 100 percent assumed to be sourced in state. Based on an analysis of regional sales and businesses, direct local spending benefits to suppliers and vendors will be an estimated \$18.7 million in Michigan, \$16 million in Region 4, and \$661,000 in Muskegon County.
- Soft costs include project management, design, engineering, architecture, financing costs, and other soft costs. Similar to construction equipment and materials, these purchases are likely to be sourced in state. A smaller share, an estimated \$2.8 million, will benefit Region 4-based businesses. A large metropolitan area like Grand Rapids that is in proximity to Muskegon increases the likelihood that many of the soft costs will be sourced regionally. Muskegon County captures a much smaller share of soft costs business and sales activity. The economic benefit to the county is an estimated \$91,000.
- Construction activity will require an estimated 168 full-time equivalent construction workers.³ Most of the construction labor for port expansion and ancillary construction activity will be sourced regionally. All of the construction laborers for the project are assumed to be state residents. Based on the supply of construction workers both regionally and in Muskegon County, about 134 workers will be from Region 4 and eight from Muskegon County.
- The economic benefit of wages and salaries for construction workers is an estimated \$9.1 million for Michigan, \$7.3 million for Region 4, and \$462,000 for Muskegon County based on wage and salary data for the construction industry from the U.S. Bureau of Labor Statistics.
- About 30 percent of the compensation for construction workers consists of employee benefits. Employee benefits include paid leave, supplemental pay, insurance benefits, retirement, and legally required benefits such as social security and unemployment insurance. Based on the likely amount that will benefit local areas, the economic benefit to the state is an estimated \$1.4 million, the economic benefit to the region is an estimated \$1.1 million, and the benefit to Muskegon County is an estimated \$46,000.

Direct Fiscal Benefits

- Based on the 6 percent sales and use tax rate in the state, sales and use tax revenue from construction materials purchases will generate an estimated \$1.1 million in revenue during the construction period.
- Purchases of furniture and fixtures, computers, and other equipment by port businesses and occupants of newly developed property will generate about \$1 million in sales and use tax revenue for the state once operations reach stabilization.

³ A full-time equivalent worker is defined as one person working full time for one year.

Port Expansion and Ancillary Construction Activity

DIRECT, INDIRECT, AND INDUCED BENEFITS

Michigan

- **Value of Output:** Based on the RIMS II multipliers, \$42.5 million of construction activity and equipment purchases likely supports \$52.1 million in additional output in all industries throughout the state. This consists of the value of local spending of the construction workers (the induced benefit) and state-based supplier companies and their employees (the indirect benefit). Therefore, the total direct and indirect benefit of port expansion activity and ancillary construction is \$94.6 million in total output (\$42.5 million direct output + \$52.1 million indirect and induced output), as shown in Table 10.
- **Employment:** Construction activity will support an estimated 168 full-time equivalent workers. In addition, state-based equipment and personal property purchases will support another 33 direct employees. Based on the RIMS II multipliers, the production of the \$52.1 million in indirect and induced output in all industries throughout the state will require about 227 employees. Therefore, port expansion and ancillary construction will support an estimated 428 workers (201 direct employees + 227 indirect employees).
- **Earnings:** Workers supported by the construction activity and equipment purchases will have estimated earnings of \$12.6 million. This includes the value of wages and salaries for the employees as well as a portion of employee benefits. Based on the relationships revealed through the RIMS II multipliers, the 227 indirect employees that produce the \$52.1 million in indirect and induced output have associated earnings of about \$11.9 million. In total, the direct and indirect employees have estimated earnings of \$24.5 million (\$12.6 million direct earnings + \$11.9 million indirect and induced earnings). All earnings values are included in the total value of output; earnings are not in addition to the value of output.

Region 4

- **Value of Output:** Based on the RIMS II multipliers, \$29 million of construction activity and equipment purchases likely supports \$29 million in additional output in all industries throughout Region 4. This consists of the value of local spending of the employees (the induced benefit) and regionally based supplier companies and their employees (the indirect benefit). Therefore, the total direct and indirect benefit of port expansion activity and ancillary construction is \$58 million in total output (\$29 million direct output + \$29 million indirect and induced output), as shown in Table 10.
- **Employment:** Construction activity will support an estimated 134 full-time equivalent workers. In addition, regionally based equipment and personal property purchases will support another nine direct employees. Based on the RIMS II multipliers, the production of the \$29 million in indirect and induced output in all industries throughout Region 4 will require about 122 employees. Therefore, port expansion and ancillary construction will support an estimated 265 workers (143 direct employees + 122 indirect employees).
- **Earnings:** Workers supported by the construction activity and equipment purchases will have estimated earnings of \$9 million. Based on the relationships revealed through the RIMS II multipliers, the 122 indirect employees that produce the \$29 million in indirect and induced output have associated earnings of about \$6.7 million. In total, the direct and indirect employees have estimated earnings of \$15.7 million (\$9 million direct earnings + \$6.7 million indirect and induced earnings). All earnings values are included in the total value of output; earnings are not in addition to the value of output.

Port Expansion and Ancillary Construction Activity

Muskegon County

- **Value of Output:** Based on the RIMS II multipliers, \$1.3 million of construction activity and equipment purchases likely supports \$624,000 in additional output in all industries throughout the county. This consists of the value of local spending of the employees (the induced benefit) and county-based supplier companies and their employees (the indirect benefit). Therefore, the total direct and indirect benefit of port expansion activity and ancillary construction is \$1.9 million in total output (\$1.3 million direct output + \$624,000 indirect and induced output), as shown in Table 10.
- **Employment:** Construction activity will support an estimated eight full-time equivalent workers. In addition, county-based equipment and personal property purchases will support one additional direct employee. Based on the RIMS II multipliers, the production of the \$624,000 in indirect and induced output in all industries throughout the county will require about four employees. Therefore, port expansion and ancillary construction will support an estimated 13 workers (nine direct employees + four indirect employees).
- **Earnings:** Workers supported by the construction activity and equipment purchases will have estimated earnings of \$513,000. Based on the relationships revealed through the RIMS II multipliers, the four indirect employees that produce the \$624,000 in indirect and induced output have associated earnings of about \$199,000. In total, the direct and indirect employees have estimated earnings of \$712,000 (\$513,000 direct earnings + \$199,000 indirect and induced earnings). All earnings values are included in the total value of output; earnings are not in addition to the value of output.

Table 10: Total Economic Benefit of Commercial Deep-Water Port Construction Activity, 2020

	Direct Impact	Multiplier	Indirect & Induced Impact	Total Impact
Michigan				
Value of Output (\$M)	\$42.5	2.2258	\$52.1	\$94.6
Earnings (\$M)	\$12.6	1.9382	\$11.9	\$24.5
Employment	201	2.1279	227	428
Region 4				
Value of Output	\$29.0	2.0030	\$29.0	\$58.0
Earnings	\$9.0	1.7439	\$6.7	\$15.7
Employment	143	1.8554	122	265
Muskegon County				
Value of Output (\$M)	\$1.3	1.4860	\$0.6	\$1.9
Earnings (\$M)	\$0.5	1.3879	\$0.2	\$0.7
Employment	9	1.4753	4	13

Calculation Note: Direct x Multiplier = Total Impact

Total Impact - Direct Impact = Indirect & Induced Impact

Numbers may not add exactly due to rounding.

On-Going Annual Benefits of Expanded Port Activities

Once the container terminal is open and companies begin to experience the convenience and cost-savings of water shipping, it is expected that the manufacturing and agricultural businesses will expand their operations as described in the previous section. It is likely that these operations will expand over time, with full buildout assumed to be reached in 2020. This section describes the on-going annual economic and fiscal benefits related to the container terminal, expanded manufacturing and agricultural business operations, and increases in commodities shipments based on the new, expanded level of operations.

ANNUAL DIRECT ECONOMIC AND FISCAL BENEFITS

Container Terminal Services

- A container terminal facility at Muskegon Lake would likely support 19,500 TEUs each year, or about 375 containers per week. A container terminal in Muskegon could open up opportunities for businesses to expand or relocate to west Michigan. An estimated 20 percent, or 3,900 TEUs, will come from new business activity in Region 4.
- Based on an estimate of TEUs per employee each year for other container terminals, a 19,500 TEU facility in Muskegon would employ an estimated 33 employees, or about 600 TEUs per employee per year.
- Based on business expenses data from the U.S. Census Bureau for industry sectors related to waterborne cargo handling and the economic life of the materials handling equipment, the container terminal will spend an estimated \$988,000 each year for equipment and materials for operations, business services, utilities, and telecommunications.
- The average annual wage for marine cargo handling services in Michigan is about \$44,100. Based on the number of employees estimated for the container terminal services, annual payroll for the operations will be an estimated \$1.5 million.
- Based on 30 percent of labor compensation for employee benefits, employee benefits will cost an estimated \$624,000 each year.
- A container terminal would largely represent an economic benefit to Muskegon County, rather than a regional or state level benefit. Most of the container traffic is projected to come from existing manufacturing and agricultural activity in Region 4. Transportation costs and supply-chain logistics for this existing economic activity would likely be displaced from other areas in Michigan to Muskegon County. For the purposes of this analysis, most of the benefits from the container terminal operations are assumed to impact the county and not the region and state.

Manufacturing Activity

- New manufacturing activity in Region 4 spurred by competitive container operations at Muskegon could support an estimated 1,950 TEUs and an estimated 330 manufacturing jobs, or about 10 percent of the 19,500 TEUs feasible for a Muskegon terminal facility. Most of the manufactured goods are assumed to be motor vehicle parts and equipment.
- Based on business expenses data from the U.S. Census Bureau for manufacturing activity and the value of personal property as a percent of real property for industrial facilities in Muskegon County, manufacturers would spend an additional \$12.4 million each year for equipment and material for operations, business services, utilities, and telecommunications.

On-Going Annual Benefits of Expanded Port Activities

- The average annual wage for motor vehicle parts manufacturing in Muskegon County is about \$76,100 and \$57,100 throughout Region 4. Based on the number of employees estimated for the new manufacturing activity, annual payroll will be an estimated \$19 million.
- Based on 35 percent of labor compensation for employee benefits, employee benefits will cost an estimated \$10.2 million each year.
- Based on the percentage of the motor vehicle parts manufacturing workforce in Region 4 that is located in Muskegon (5.8 percent), most of the new manufacturing activity is projected to benefit Region 4 and the state, with a portion of the new activity benefiting Muskegon County. It should be noted that the benefits to Muskegon County would increase significantly if a larger share of the estimated 330 new manufacturing jobs and associated investment activity were to locate directly in the county.

Agricultural Activity

- About 10 percent of the 19,500 TEUs feasible for a Muskegon based terminal facility, or 1,950 TEUs, could be supported by agricultural products and commodities. This new activity would support about 160 agricultural jobs in Region 4.
- Based on farm expenses data for Michigan from the U.S. Agricultural Census and the value of equipment anticipated for an increase in agricultural activity, farms would spend an estimated \$1.6 million each year for equipment and materials for operations (equipment replacement and maintenance, fertilizers, chemicals, and fuels), utilities, and telecommunications.
- The average annual wage for agricultural workers in Muskegon County is about \$22,000 and \$27,800 throughout Region 4. Based on the number of employees estimated for expanded agricultural operations in Region 4, annual payroll will be an estimated \$4.4 million.
- Based on 15 percent of labor compensation for employee benefits, employee benefits will cost an estimated \$784,000 each year.
- Based on Muskegon County's share of agricultural labor, acreage, and product value in Region 4 (average 4.5 percent), most of the new agricultural activity is projected to benefit Region 4 and the state, with a portion of the new activity benefiting Muskegon County. It should be noted that the benefits to Muskegon County would increase if a larger share of the estimated 160 new farm jobs and associated investment activity were to locate directly in the county.

Cement, Limestone, Salt, Slag and other Bulk Commodities

- The existing base of waterborne freight in Muskegon has the potential to increase by an estimated 116,000 tons. Based on existing employment for bulk commodity shipments at the port, the increased tonnage could bring nine jobs and an estimated \$3.1 million in building and equipment investment. These new jobs would be in addition to the 120 existing commercial deep-water port positions for a total of 129 jobs.
- Based on business expenses from the U.S. Census Bureau and the existing share of personal property at the port, port businesses would spend an estimated \$2.8 million each year for equipment and materials for operations, business services, utilities, and telecommunications, about \$335,000 more than the existing level of port activity.
- Based on average annual wages for industries engaged in bulk commodity shipping at the port, nine more port employees would boost annual payroll by an estimated \$343,000 to about \$7.2 million total.

On-Going Annual Benefits of Expanded Port Activities

- Based on the share of compensation for employee benefits, employee benefits will increase by an estimated \$147,000 to about \$3.1 million each year.
- All of the jobs expansion estimated from an increase in Muskegon's waterborne freight activity will be located in Muskegon County and represent a direct economic benefit to the area.

Table 11: Direct Annual Economic Benefit of Expanded Commercial Deep-Water Port Activity, 2020	
	Total
Direct Economic Benefits	
Equipment and Materials for Operations	\$13,564,000
Business Services	\$2,096,000
Utilities and Telecomm	\$2,101,000
Other Direct Benefits	\$81,181,000
Payroll	\$31,797,000
Employee Benefits	\$14,549,000
Total	\$145,288,000
Employees	650

Direct Economic and Fiscal Benefits

Direct Economic Benefits

- Based on existing personal property for Muskegon Lake's commercial shipping businesses as well as purchasing patterns estimated from economic census data for relevant expanding industries, annual expenditures for equipment and materials for stabilized operations after a port expansion are an estimated \$13.6 million, an increase of \$12.4 million over current port activity. These purchases generate benefits for state and local suppliers and sales and use tax revenue for Michigan.
- Port-related businesses purchase professional and technical services such as accounting, legal support, engineering, consulting, and other business services. Based on estimates of typical spending on business services from economic census data for industries benefiting from port expansion, annual expenditures are an estimated \$2.1 million, an increase of \$1.2 million over current port activity. Many of these services will be supplied regionally and represent a local opportunity to expand business services in Muskegon County.
- Based on estimates of spending on utilities and telecommunications services for industries benefiting from a port expansion, annual expenditures are an estimated \$2.1 million, an increase of about \$1.8 million over current port activity. Most of this spending will continue to benefit state-based suppliers and generates sales and use tax revenue for Michigan.
- Based on the industry relationships established through the RIMS II multipliers from the U.S. Bureau of Economic Analysis, other direct benefits to local, regional, and state economies from an expansion of commercial shipping activities at Muskegon Lake are an estimated \$81.2 million, an increase of \$72.6 million over current port activity. Most of this business activity will benefit state and regional suppliers based on projected increases in manufacturing and agricultural activity, but Muskegon County will also benefit from the terminal operations and increased freight activity.
- Stabilized port activity after an expansion would support an estimated 650 full-time employees in Region 4, an increase of 530 employees. Based on data from the U.S. Bureau of Labor Statistics, total annual wages and salaries for these employees is an estimated \$31.8 million, or an average annual wage of \$48,900. This

On-Going Annual Benefits of Expanded Port Activities

represents an increase of about \$24.9 million over current port activity. All of these employees are expected to live in Michigan and within Region 4. The anticipated portion of Muskegon County employment filled by county residents is an estimated 90 employees.

- Employee benefits for the 650 employees overall will comprise about 32 percent of compensation based on information from the U.S. Bureau of Labor Statistics, National Compensation Survey for relevant industries and the Census of Agriculture. Employee benefits will benefit the local, regional, and state economies depending on the amount spent locally, for instance the local benefit of overtime pay.
- Direct employment benefits at the state, regional, and local level will vary based on the location of firms and displaced transportation industry workers as existing supply routes shift in response to a container terminal. In addition, the direct employment associated with the container terminal is a part of the direct spending associated with new manufacturing and agricultural operations. Therefore, the direct employment benefit at the state and regional levels (617 workers) excludes the container terminal employment to avoid over-estimating benefits. Estimates for Muskegon County (188 workers) assume most of the manufacturing and agricultural employment will be located outside of the county.

Direct Fiscal Benefits

- An expansion of port activity, manufacturing, and agricultural activity in Region 4 will increase the property tax base in many property tax districts. This study estimates the potential benefit to the state and county based on current rates and tax structures. Ultimately, property tax benefits to local taxing entities will depend on where new manufacturing and agricultural businesses locate. This study estimates that only a small portion of this activity will occur in Muskegon County. However, the addition of a container terminal and development spurred by increased freight activity at the port will benefit Muskegon County directly. This analysis considers equipment used in industrial processing and agriculture is exempt from property taxation.

The estimated fiscal benefit to the state from a port expansion once operations are stabilized is about \$273,000 from the state education tax and \$146,000 to Muskegon County.

The actual buildout schedule of the port and ancillary businesses will affect the amount of tax revenue generated in any single year. The estimate in this study assumes all businesses begin operations at the same time. In reality, the timing of development will vary and so will taxes based on depreciation of assets and other factors of assessment and taxation.

- Purchases of equipment, operational materials, utilities, and telecommunications services for business operations from a port expansion will generate state sales and use tax revenue. Purchases of agricultural equipment and equipment used in industrial processing are exempt from state sales tax. Based on the six percent sales and use tax rate in Michigan, tax revenue totals an estimated \$593,000 each year.
- The total direct fiscal benefit of stabilized operations following a port expansion in Michigan is an estimated \$866,000 each year consisting of property tax and sales and use tax revenue. The estimated benefit to Muskegon County is \$146,000.

On-Going Annual Benefits of Expanded Port Activities

ANNUAL DIRECT, INDIRECT, AND INDUCED BENEFITS

Table 12: Total Economic Benefit of Annual Commercial Deep-Water Port Activity, 2020

	Direct Impact*	Multiplier	Indirect & Induced Impact	Total Impact
Michigan				
Value of Output (\$M)	\$142.2	2.2974	\$184.5	\$326.7
Earnings (\$M)	\$36.7	2.9082	\$70.1	\$106.8
Employment	617	3.3603	1,456	2,073
Region 4				
Value of Output	\$142.2	1.9830	\$139.8	\$282.0
Earnings	\$36.7	2.2820	\$47.1	\$83.8
Employment	617	2.6415	1,013	1,630
Muskegon County				
Value of Output (\$M)	\$31.8	1.4722	\$15.0	\$46.8
Earnings (\$M)	\$11.5	1.4599	\$5.3	\$16.8
Employment	188	1.7572	142	330

*Direct impacts adjusted to exclude container terminal operations at regional and state levels to avoid double counting economic benefits of companies utilizing port to ship goods.

Calculation Note: Direct x Multiplier = Total Impact

Total Impact - Direct Impact = Indirect & Induced Impact

Numbers may not add exactly due to rounding.

Michigan

- **Value of Output:** Based on the RIMS II multipliers, \$142.2 million of port and ancillary industrial activity likely supports \$184.5 million in additional output in all industries throughout the state. This consists of the value of local spending of the employees (the induced benefit) and state-based supplier companies and their employees (the indirect benefit). Therefore, the total direct and indirect benefit of operations is \$326.7 million in total output (\$142.2 million direct output + \$184.5 million indirect and induced output), as shown in Table 12.
- **Employment:** Port expansion and ancillary industrial activity will lead to direct employment of an estimated 617 state workers. Based on the RIMS II multipliers, the production of the \$184.5 million in indirect and induced output in all industries throughout the state will require about 1,456 employees. Therefore, expanded port operations will support the annual employment of 2,073 workers (617 direct employees + 1,456 indirect employees).
- **Earnings:** The direct employees will have estimated earnings of \$36.7 million. This includes the value of wages and salaries for the employees as well as a portion of employee benefits. Based on the relationships revealed through the RIMS II multipliers, the 1,456 indirect employees that produce the \$184.5 million in indirect and induced output have associated earnings of about \$70.1 million. In total, the direct and indirect employees have estimated earnings of \$106.8 million (\$36.7 million direct earnings + \$70.1 million indirect and induced earnings). All earnings values are included in the total value of output; earnings are not in addition to the value of output.

On-Going Annual Benefits of Expanded Port Activities

Region 4

- **Value of Output:** Based on the RIMS II multipliers, \$142.2 million of port and ancillary industrial activity likely supports \$139.8 million in additional output in all industries throughout the region. This consists of the value of local spending of the employees (the induced benefit) and regional supplier companies and their employees (the indirect benefit). Therefore, the total direct and indirect benefit of operations is \$282 million in total output (\$142.2 million direct output + \$139.8 million indirect and induced output), as shown in Table 12.
- **Employment:** Port expansion and ancillary industrial activity will lead to direct employment of an estimated 617 regional workers. Based on the RIMS II multipliers, the production of the \$139.8 million in indirect and induced output in all industries throughout the region will require about 1,013 employees. Therefore, expanded port operations will support the annual employment of 1,630 workers (617 direct employees + 1,013 indirect employees).
- **Earnings:** The direct employees will have estimated earnings of \$36.7 million. Based on the relationships revealed through the RIMS II multipliers, the 1,013 indirect employees that produce the \$139.8 million in indirect and induced output have associated earnings of about \$47.1 million. In total, the direct and indirect employees have estimated earnings of \$83.8 million (\$36.7 million direct earnings + \$47.1 million indirect and induced earnings). All earnings values are included in the total value of output; earnings are not in addition to the value of output.

Muskegon County

- **Value of Output:** Based on the RIMS II multipliers, \$31.8 million of port and ancillary industrial activity likely supports \$15 million in additional output in all industries throughout the county. This consists of the value of local spending of the employees (the induced benefit) and county-based supplier companies and their employees (the indirect benefit). Therefore, the total direct and indirect benefit of operations is \$46.8 million in total output (\$31.8 million direct output + \$15 million indirect and induced output), as shown in Table 12.
- **Employment:** Port expansion and ancillary industrial activity will lead to direct employment of an estimated 188 county-based workers. Based on the RIMS II multipliers, the production of the \$15 million in indirect and induced output in all industries throughout the county will require about 142 employees. Therefore, expanded port operations will support the annual employment of 330 workers (188 direct employees + 142 indirect employees).
- **Earnings:** The direct employees will have estimated earnings of \$11.5 million. Based on the relationships revealed through the RIMS II multipliers, the 142 indirect employees that produce the \$15 million in indirect and induced output have associated earnings of about \$5.3 million. In total, the direct and indirect employees have estimated earnings of \$16.8 million (\$11.5 million direct earnings + \$5.3 million indirect and induced earnings). All earnings values are included in the total value of output; earnings are not in addition to the value of output.

SUMMARY OF ECONOMIC AND FISCAL BENEFITS

A variety of residential, recreational, and commercial uses exist along the banks of Muskegon Lake. Commercial deep-water shipping activity at Muskegon Lake represents a significant part of the Muskegon County and the surrounding region economy, supporting business spending and employment. This study examined the potential temporary and on-going economic and fiscal benefits of expanded commercial activities and port revitalization to Muskegon County, the 13-county Region 4, and the state of Michigan.

ECONOMIC AND FISCAL BENEFITS OF PORT EXPANSION AND ANCILLARY CONSTRUCTION ACTIVITY

A container terminal at Muskegon Lake could expand the shipping opportunities for local businesses and create competitive options for selling goods in international markets. Reduced and competitive shipping costs and improved access to markets would likely induce manufacturers and agricultural producers in west Michigan to either relocate to the region or expand their existing operations. Construction of the container terminal and expanded manufacturing and agricultural facilities will provide significant, but temporary, benefits to the area.

Construction costs and initial capital investment is estimated to total about \$80.2 million and will support the temporary employment of about 200 workers. The majority of this spending will occur throughout Michigan, with lesser amounts in Region 4 and Muskegon County. In addition, the state of Michigan will receive about \$2.2 million in sales and use tax revenue related to construction materials and equipment purchases.

Reducing the initial capital investment to just the wholesale margin, the total economic and fiscal benefits to the three geographies are summarized as follows and detailed in Table 10 of the report:

- **Michigan:** The direct economic benefit of the port expansion and ancillary construction activity in Michigan is an estimated \$42.5 million produced by 201 full-time equivalent workers earning \$12.6 million. This activity would support an additional \$52.1 million in output in all industries in Michigan, produced by 227 indirect workers earning \$11.9 million. ***Combined, port expansion and ancillary construction activity could generate direct and indirect output in Michigan valued at \$94.6 million produced by 428 direct and indirect workers earning a total of \$24.5 million over the construction period.***
- **Region 4:** The direct economic benefit of the port expansion and ancillary construction activity in Region 4 is an estimated \$29 million produced by 143 full-time equivalent workers earning \$9 million. This activity would support an additional \$29 million in output in all industries in Region 4, produced by 122 indirect workers earning \$6.7 million. ***Combined, port expansion and ancillary construction activity could generate direct and indirect output in Region 4 valued at \$58 million produced by 265 direct and indirect workers earning a total of \$15.7 million over the construction period.***
- **Muskegon County:** The direct economic benefit of the port expansion and ancillary construction activity in Muskegon County is an estimated \$1.3 million produced by nine full-time equivalent workers earning \$513,000. This activity would support an additional \$624,000 in output in all industries in the county, produced by four indirect workers earning \$199,000. ***Combined, port expansion and ancillary construction activity could generate direct and indirect output in Muskegon County valued at \$1.9 million produced by 13 direct and indirect workers earning a total of \$712,000 over the construction period.***

SUMMARY OF ECONOMIC AND FISCAL BENEFITS

Table 10: Total Economic Benefit of Commercial Deep-Water Port Construction Activity, 2020

	Direct Impact	Multiplier	Indirect & Induced Impact	Total Impact
Michigan				
Value of Output (\$M)	\$42.5	2.2258	\$52.1	\$94.6
Earnings (\$M)	\$12.6	1.9382	\$11.9	\$24.5
Employment	201	2.1279	227	428
Region 4				
Value of Output	\$29.0	2.0030	\$29.0	\$58.0
Earnings	\$9.0	1.7439	\$6.7	\$15.7
Employment	143	1.8554	122	265
Muskegon County				
Value of Output (\$M)	\$1.3	1.4860	\$0.6	\$1.9
Earnings (\$M)	\$0.5	1.3879	\$0.2	\$0.7
Employment	9	1.4753	4	13

Calculation Note: Direct x Multiplier = Total Impact

Total Impact - Direct Impact = Indirect & Induced Impact

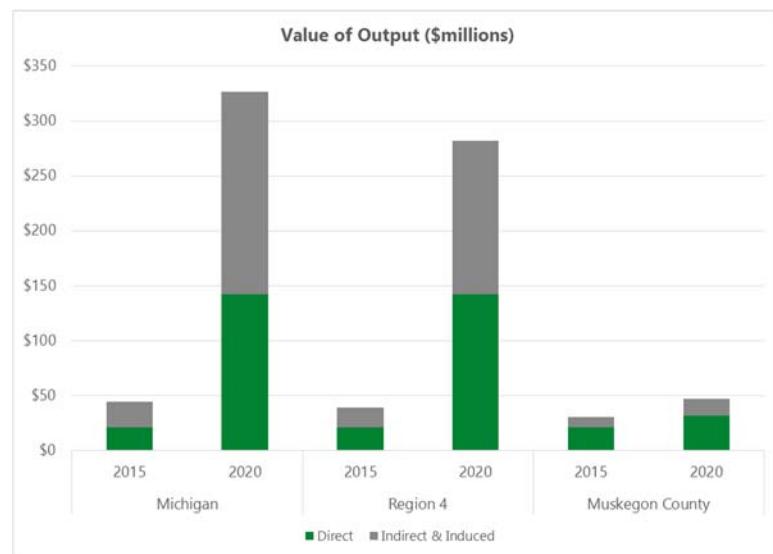
Numbers may not add exactly due to rounding.

ECONOMIC AND FISCAL BENEFITS OF ON-GOING ANNUAL EXPANDED PORT ACTIVITIES

Typical annual direct economic benefits of the current level of port activity total \$20.9 million, consisting of the current annual spending on equipment, business services, utilities, and compensation for about 120 employees. The introduction of container terminal operations, expanded manufacturing and agricultural production, and increased commodities tonnage will lead to increased business-to-business spending, employment, and worker earnings upon reaching a new stabilized level of operations, assumed to be in 2020.

The typical annual direct economic benefits are expected to increase to \$145.3 million and employment at port-related businesses is expected to increase to about 650 individuals. This means that expanded commercial activities and port revitalization could result in a \$124.4 million annual increase in direct economic benefits and 530 more jobs. In addition, these direct economic benefits have multiplicative effects on the area.

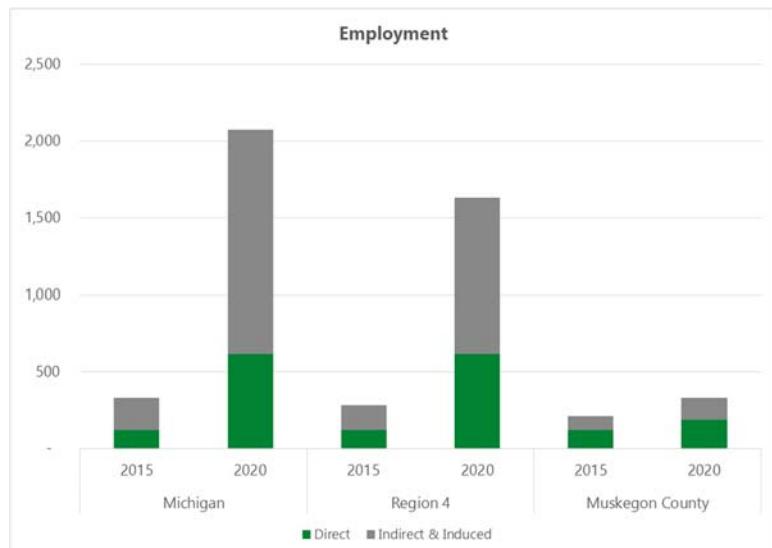
Table 13 and the following summary describe the increased level of total economic benefits in each of the three geographic areas, defined to be the expanded benefits less the current benefits. It is assumed that this same level of increased economic activity will continue each year, assuming similar business operating conditions.



SUMMARY OF ECONOMIC AND FISCAL BENEFITS

- **Michigan:** The annual direct economic benefit of current port activity in Michigan is an estimated \$20.9 million produced by 120 workers earning \$8.1 million. Current port activity likely supports an additional \$22.9 million of output in all industries in Michigan, produced by 209 indirect workers earning \$7.4 million each year.

With expanded port operations, the annual direct economic benefit increases to \$142.2 million produced by 617 workers earning \$36.7 million. Expanded port activity would likely support an additional \$184.5 million of output in all industries in Michigan, produced by 1,456 indirect workers earning \$70.1 million each year.

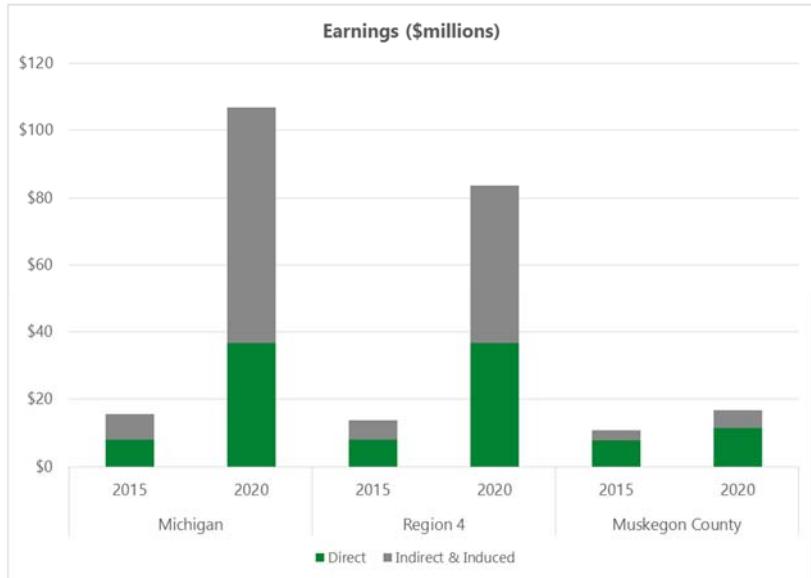


The net effect of expanded port activity throughout Michigan is an additional \$282.9 million in direct and indirect output produced by an additional 1,744 direct and indirect workers earning an additional \$91.3 million each year.

The direct fiscal benefit of stabilized operations following a port expansion in Michigan is an estimated \$866,000 each year consisting of property tax and sales and use tax revenue, representing \$740,000 more in state revenue each year than the current level.

- **Region 4:** The annual direct economic benefit of current port activity in Region 4 is an estimated \$20.9 million produced by 120 workers earning \$8.1 million. Current port activity likely supports an additional \$17.9 million of output in all industries in Region 4, produced by 162 indirect workers earning \$5.6 million each year.

With expanded port operations, the annual direct economic benefit increases to \$142.2 million produced by 617 workers earning \$36.7 million. Expanded port activity would likely support an additional \$139.8 million of output in all industries in Region 4, produced by 1,013 indirect workers earning \$47.1 million each year.



The net effect of expanded port activity throughout Region 4 is an additional \$243.2 million in direct and indirect output produced by an additional 1,348 direct and indirect workers earning an additional \$70.1 million each year.

SUMMARY OF ECONOMIC AND FISCAL BENEFITS

- **Muskegon County:** The annual direct economic benefit of current port activity in Muskegon County is an estimated \$20.9 million produced by 120 workers with local earnings of \$7.8 million. Current port activity likely supports an additional \$9.3 million of output in all industries in the county, produced by 93 indirect workers earning \$3 million each year.

With expanded port operations, the annual direct economic benefit increases to \$31.8 million produced by 188 workers earning \$11.5 million. Expanded port activity would likely support an additional \$15 million of output in all industries in Muskegon County, produced by 142 indirect workers earning \$5.3 million each year.

The net effect of expanded port activity throughout Muskegon County is an additional \$16.6 million in direct and indirect output produced by an additional 117 direct and indirect workers earning an additional \$6 million each year.

The total direct fiscal benefit of stabilized operations following a port expansion in Muskegon County is an estimated \$146,000 each year consisting of property tax revenue, up from about \$38,300 currently.

Table 13: Net Annual Economic Benefit of Commercial Deep-Water Port Activity at Muskegon Lake

	Current Activity, 2015			Expanded Activity, 2020			Net Change		
	Direct Impact	Indirect & Induced Impact	Total Impact	Direct Impact	Indirect & Induced Impact	Total Impact	Direct Impact	Indirect & Induced Impact	Total Impact
Michigan									
Value of Output (\$M)	\$20.9	\$22.9	\$43.8	\$142.2	\$184.5	\$326.7	\$121.3	\$161.6	\$282.9
Earnings (\$M)	\$8.1	\$7.4	\$15.5	\$36.7	\$70.1	\$106.8	\$28.6	\$62.7	\$91.3
Employment	120	209	329	617	1,456	2,073	497	1,247	1,744
Region 4									
Value of Output	\$20.9	\$17.9	\$38.8	\$142.2	\$139.8	\$282.0	\$121.3	\$121.9	\$243.2
Earnings	\$8.1	\$5.6	\$13.7	\$36.7	\$47.1	\$83.8	\$28.6	\$41.5	\$70.1
Employment	120	162	282	617	1,013	1,630	497	851	1,348
Muskegon County									
Value of Output (\$M)	\$20.9	\$9.3	\$30.2	\$31.8	\$15.0	\$46.8	\$10.9	\$5.7	\$16.6
Earnings (\$M)	\$7.8	\$3.0	\$10.8	\$11.5	\$5.3	\$16.8	\$3.7	\$2.3	\$6.0
Employment	120	93	213	188	142	330	68	49	117

Numbers may not add exactly due to rounding.

Revitalization and expansion of the Port of Muskegon will result in many benefits that are not quantifiable, or are not estimated in the above analysis. These benefits include reduced traffic congestion, increased shipping reliability by diversifying transportation options, reduced shipping costs, mitigating the effects of trucker shortages, and greater exposure to international markets and business. These benefits are critical factors for investment in port expansion and should be considered in the decision-making process.

- **Reduced traffic congestion:** Current shipping routes from west Michigan to domestic markets, as well as to Europe and Asia, often require truck shipments to intermodal rail facilities in Chicago and Detroit. From there, products are shipped by rail or water to coastal ports. Shipments to Mexico will often entail trucks via Chicago. Truck routes through Chicago in particular are subject to increasing congestion and delays. Companies are attempting to mitigate congestion issues in Chicago by increasingly utilizing Detroit, and in certain situations, even shipping to Asia via east coast ports.

The Texas Transportation Institute estimates the current commercial cost per hour for traffic delays is about \$94. In Chicago, the estimated annual hours of delay is the third highest among the largest metro areas in the country, behind only New York and Los Angeles. The delay is estimated by measuring the time a trip takes with free-flow traffic versus the same trip during peak traffic. The Chicago Metropolis 2020 planning document, *The Metropolis Freight Plan*, states that the number of trucks on Chicago area roads is expected to increase 80 percent from 2005 to 2030, and will account for over half of the additional vehicles on the region's roads.

An economic study of the effects of traffic congestion found congestion imposed three types of additional costs on businesses: (1) the travel cost, including the cost of compensating drivers, the cost of vehicle operating expenses, and increased accident costs; (2) business operating costs, or the additional cost due to congestion of storing inventory, reduced shipping reliability, and alternate routes; and (3) productivity costs such as limiting market areas for goods, additional labor costs to compensate for reduced productivity per worker, and other costs. A key finding of the study was that producers of agricultural products were more likely to be impacted by high transportation costs as purchasers of their products were more sensitive to cost and therefore more likely to find other, lower cost producers.

- **Trucker Shortage:** The American Trucking Associations (ATA) has documented a continuing, long-term trend in the national shortage of truck drivers over the past 15 years. In 2014, the shortage reached 38,000 positions and is projected to increase to about 48,000 drivers in 2015. Trucks handle the vast majority of tonnage moved in the U.S., over two-thirds based on ATA estimates. As a result, a shortage of truck drivers has broad implications for the reliability of shipping products, increasing delays and costs, and causing higher inventory carrying costs at stores and businesses. ATA Chief Economist Bob Costello has noted that the driver shortage has led to an inability for companies to increase truck load capacity, meaning trucking companies have not been able to meet demand.

An expansion of shipping opportunities from the Port of Muskegon could offer companies another alternative to current shipping routes. A cost competitive alternative would mitigate the reliance on trucks alone to move products from west Michigan. Competition in the transportation market would ensure reliable and competitive options for manufacturers and agricultural producers.

- **Transportation Reliability:** Studies examining the feasibility of international shipping routes from Muskegon to markets in Europe and Asia found companies often weigh service agility and reliability above cost when determining shipping options. Agility refers to the speed of transit and reliability includes delays or cancellations from weather and congestion, among other things. The studies found that in many cases transportation cost savings did not outweigh the missed sales or cost of holding inventory. A diversified shipping portfolio also allows companies to mitigate supply-chain risk.

Increased inventory creates additional costs to manufacturers and producers in several ways. In some cases, products can become obsolete before they are sold. Higher than necessary levels of inventory also come with higher costs of storage and maintenance. Many manufactured products become components in other products, and are inputs for manufacturers just as concerned with efficiency and supply reliability. Spotty transportation reliability could lead to lost market share as purchasers switch to other producers and more efficient shipping corridors.

- **Reduced Shipping Costs:** Studies examining the feasibility of water-based international shipping routes from Muskegon to markets in Europe and Asia found that costs were competitive with other transportation options. The route to Europe would entail shipping containers by water to Cleveland, and then by water from Cleveland to Antwerp. The total freight cost for this route was found to be about 70 percent of the cost of trucking freight to Cleveland, and then by water from Cleveland to Antwerp. The total freight cost of shipping by water from Muskegon to Antwerp via Cleveland was about 58 percent of the cost of shipping by truck to Chicago, by rail from Chicago to Norfolk, and then by water from Norfolk to Antwerp. Water bound freight from Cleveland was found to have comparable shipping times to the above options. Recent plans announced by the Port of Cleveland for more frequent container service from Cleveland to Europe likely increases the viability of waterborne freight from Muskegon to Europe via Cleveland in terms of both cost and transit times.

A lane analysis for water bound freight from Muskegon to Shanghai found an option of shipping via water to Milwaukee, then by rail to Vancouver,⁴ could cost about 93 percent of the cost of trucking the freight to Chicago, then shipping by rail to a container terminal in Long Beach, California. Asian markets are projected to dominate future growth in global trade. A Brookings Institution study published in July 2015 noted that the 100 largest metropolitan economies in the Asia-Pacific region accounted for 20 percent of global GDP and were some of the fastest-growing economies in the world. Rising incomes in Asia are projected to increase Asian demand for imported products.

While expanded port activities at Muskegon Lake may benefit the economy in terms of increased business-to-business activity and greater employment and earnings, the benefits are likely greater than the numbers portray. The importance of alternative, reliable, cost-effective transportation options for companies needing to deliver their products to key markets across the globe is invaluable to the prosperity of Muskegon County, Region 4, and Michigan.

⁴ The study notes that rail service is not currently offered from Milwaukee to Vancouver.

SELECT REFERENCES

- Chicago Metropolis 2020. *The Metropolis Freight Plan: Delivering the Goods*. 2004.
<http://www.metropolisstrategies.org/documents/MetropolisFreightPlan.pdf>
- Costello, Bob, and Rod Suarez. *Truck Driver Shortage Analysis*. American Trucking Associations, October 2015.
<http://www.trucking.org/ATA%20Docs/News%20and%20Information/Reports%20Trends%20and%20Statistics/10%206%2015%20ATAs%20Driver%20Shortage%20Report%202015.pdf>
- Cranson, Jeff. "Salt Prices Jump nearly 50 percent as Road Agencies Prepare for Winter." Michigan Department of Transportation, November 2014. <http://www.michigan.gov/mdot/0,4616,7-151--340721--,00.html>
- Google Maps. <http://maps.google.com>
- Hoovers. Market Analysis Profile. <http://www.hoovers.com/>
- Kloosterman, Stephen. "Port of Muskegon Container Shipping Could Start as Early as 2016, Officials Say." Mlive.com, October 2015.
http://www.mlive.com/news/muskegon/index.ssf/2015/10/port_of_muskegon_container_shi.html
- Martin Associates. *The Economic Impacts of the Great Lakes – St. Lawrence Seaway System*. October 18, 2011.
http://www.greatlakes-seaway.com/en/seaway/facts/eco_impact.html#Impacts
- Muskegon County. <http://www.co.muskegon.mi.us/>
- Muskegon County, Internet Services Website for Property Tax Information. BS&A Internet Services (Accessed November 2015).
- Port of Muskegon. <http://www.co.muskegon.mi.us/port/index/html>
- Port of Muskegon Market Utilization Study*. 2013.
- PureMichigan. *Michigan's Logistics and Supply Chain: Strategic Plan 2013-2020*. Michigan Economic Development Corporation, 2013. http://www.michiganbusiness.org/cm/files/reports/logistics_strategic_plan-12.pdf
- State of Michigan, Legislative Council. Michigan Compiled Laws (Accessed November 2015).
[http://www.legislature.mi.gov/\(S\(o1222bj1l2ihzazy3t1e4drb\)\)/mileg.aspx?page=chapterindex](http://www.legislature.mi.gov/(S(o1222bj1l2ihzazy3t1e4drb))/mileg.aspx?page=chapterindex)
- State of Michigan, Michigan Department of Transportation. *Michigan Freight Plan: Supplement to the 2035 Transportation Plan*. 2013. http://www.michigan.gov/mdot/0,4616,7-151-9621_68051-306924--,00.html
- Supply Chain Solutions. *Muskegon Area First Feasibility Study, Port of Muskegon Expansion, Port of Muskegon to Asia Competitive Analysis*. 2014.
- Supply Chain Solution. *Muskegon Area First Feasibility Study, Port of Muskegon Expansion, Port of Cleveland to Europe Express Competitive Analysis*. 2014.
- U.S. Army Corp of Engineers, Detroit District. Muskegon Harbor Fact Sheet, Great Lakes Harbors, 2015.
<http://w3.lre.usace.army.mil/OandM/factsheets/MuskegonHarbor.pdf>

SELECT REFERENCES

- U.S. Department of Agriculture, 2012 Census of Agriculture. <http://www.agcensus.usda.gov/>
- U.S. Department of Commerce, Bureau of the Census. 2012 Business Expenses Survey.
<http://www.census.gov/econ/bes/>
- U.S. Department of Commerce, Bureau of the Census. 2012 Economic Census.
<http://www.census.gov/econ/census/>
- U.S. Department of Commerce, Bureau of the Census. Longitudinal Employer-Household Dynamics, 2013.
<http://lehd.ces.census.gov/>
- U.S. Department of Commerce, Bureau of Economic Analysis. Regional Input-Output Modeling System II Multipliers. 2002 Annual Input-Output Table for the Nation and 2010 regional data.
- U.S. Department of Interior, U.S. Geological Survey. Mineral Commodity Summaries, 2015.
<http://minerals.usgs.gov/minerals/pubs/mcs/>
- U.S. Department of Labor, Bureau of Labor Statistics. National Compensation Survey, "Employer Costs for Employee Compensation," September 2015. <http://www.bls.gov/ncs/>
- U.S. Department of Labor, Bureau of Labor Statistics. Quarterly Census of Employment and Wages, Annual Average 2014. <http://www.bls.gov/cew/>

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