



CONTRIBUTIONS OF PROPOSED INVESTMENT IN
THE NORTHWEST TENNESSEE REGIONAL PORT AT CATES LANDING
TO THE REGIONAL ECONOMY

FINAL REPORT

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
I. INTRODUCTION	7
a. Study Area	7
b. Project Background: NWTRP at Cates Landing	8
i. History	
ii. Proposed Improvement	
c. Study Goals and Research Questions	9
II. STUDY REGION AT A GLANCE: INDICATORS OF SOCIOECONOMIC DISTRESS	11
a. Employment and Unemployment	11
b. Population Growth	11
c. Income	12
d. Poverty	13
III. CONCEPTUAL FRAMEWORK, ASSUMPTIONS, AND DATA	15
a. Cargo Volume and Economic Impact	15
b. Benefit-Cost Analysis	20
c. Assumptions and Data	21
i. Construction	
ii. Port and Industrial Park	
iii. Industry Relocation	
iv. Cargo Basic Assumptions	
v. Transportation Cost Saving Assumptions	
IV. FINDINGS	29
a. Benefit-Cost Analysis	29
i. Efficiency: Transportation Saving	
ii. Safety: Fatality and Injury Reductions	
iii. Livability: Green House Emission and Hazardous Material Spill Reduction	
iv. Total Cost and Benefits: Benefit-Cost Ratio (BC)	
b. Economic Impact Analysis	32
i. Port and Industrial Park: Construction and Operation	
ii. What-If Scenario: Steel Mill Construction and Operation	
iii. Related Jobs	



c. Related-Jobs	37
i. Recent layoffs	
ii. Export-Dependency and Job Retention	
V. IMPLICATIONS OF PROPOSED INVESTMENT FOR THE REGIONAL ECONOMY: INDICATORS OF DISTRESS ARE REVISITED	40
a. Wage	
b. Employment, Unemployment, and Population	
c. Income	
d. Poverty	
VI. CONCLUSION	44
VII. WORKS CONSULTED AND DATA	46



EXECUTIVE SUMMARY

Located in northwest Tennessee, the proposed infrastructural development of the Port of Cates Landing will alter economic dynamics in the three-county region (Dyer, Lake, and Obion). Dyer, Lake, and Obion counties have long been affected by the flight of manufacturing companies. The proposed infrastructural investment of \$35 million in the Port at Cates Landing will create a truly intermodal transportation system in the region, connecting area businesses to the Mississippi River, the Canadian National Railroad via the Tenn-Ken Railroad, and local and interstate highway systems (future I-69). Furthermore, the proposed industrial park development adjacent to the Port at Cates Landing is expected to generate considerable business interest because the Port and the proposed industrial park are located above the 100-year floodplain.

The Business and Economic Research Center (BERC), Middle Tennessee State University, is retained by the Northwest Tennessee Regional Port Authority to assess the contributions of the proposed investment in the Port at Cates Landing to the economy of the three-county region (Lake, Dyer, and Obion) and its surrounding areas.

The BERC's estimates include the (1) benefit-cost ratio and (2) regional economic impact of the proposed investment. In the absence of survey data and given the time constraints, the BERC used several methods to estimate first cargo volume and then the benefit-cost ratio and regional economic impacts. Impact estimates were obtained using the IMPLANpro model.

Study Findings:

The Study Region. The basic characteristics of the study region (Dyer, Lake, and Obion counties) are:

- A per capita income equivalent to 71 percent of U.S. per capita income
- An unemployment rate 3.1 percentage points higher than that of the U.S.
- A declining population (down 1.8 percent from 2000 to 2008)
- A poverty rate 4.1 percentage points higher than that of the U.S.

Benefit-Cost Analysis. The proposed investment of \$35 million will generate the following public benefits over the life cycle of the port, which is 50 years:

- Transportation cost savings (in present value, in 2009\$) of \$60.4 million
- Fatality and injury reductions (in present value, in 2009\$) of between \$147 million (lower) and \$386 million (upper)
- An estimated benefit-cost ratio (BCR) of between 2.89 (lower) and 6.21 (upper)

Regional Economic Impact: The proposed \$35 million investment will create a variety of economic opportunities for the area's population—some short-term, most long-term.



Short-term economic impact:

- New jobs between 406 (the port) and 2,184 (the port and the steel mill)
- Business revenues between \$46 million and \$236 million
- Personal income between \$16.1 million and \$82.8 million

Long-term economic impact:

- New permanent jobs between 1,703 (the port and industrial park) and 2,355 (the port, the park, and the steel mill)
- Business revenues between \$259.2 million and \$463.6 million
- Personal income between \$59.7 million and \$87.3 million
- Retention of 2,293 related jobs in the region

Implications of Study Findings for the Region. The findings suggest that the proposed investment will

- boost the local payroll by \$45.2 million
- increase local government revenues by \$8.5 million
- reverse the declining population trends by creating employment opportunities in the region
- increase per capita income by 3.9 percent
- reduce the unemployment rate by 6.5 percentage points
- reduce the poverty rate by nearly half in the core region

Conclusion. The study indicates that benefits to both the general public and the regional economy outweigh the cost of proposed investment. Given the nature of investment and the extent of economic distress in the study region, the findings of this study strongly recommend the proposed investment.



EXHIBIT A: BENEFITS AND COST OF NORTHWEST TENNESSEE REGIONAL PORT AUTHORITY AT CATES LANDING PROPOSAL: A SUMMARY ANALYSIS

LONG TERM BENEFITS TO REGIONAL ECONOMY*

- I. Permanent Jobs: **1,703**
with Steel Mill: 2,355 jobs
- II. Business Revenue (Output): **\$259.2 million**
with Steel Mill: \$463.6 million
- III. Value-Added (GRP): **\$90.2 million**
with Steel Mill: \$133.0 million
- IV. Personal Income: **\$59.7 million**
with Steel Mill: \$87.3 million
- V. Retaining Export-Dependent Jobs: **2,293 jobs**

BENEFITS TO GENERAL PUBLIC

- I. Economic Competitiveness (Transportation Cost Savings to Producers) (50-Year Port Life Cycle/ Discounted to 2009): **\$60.4 Million**
- II. Fatality Reduction (50-Year Life Cycle/Discounted): **\$66.3 Million**
- III. Injury Reduction (50-Year Life Cycle/Discounted): **\$80.7 Million**
- IV. Emission Reduction: Not Monetized
- V. Hazardous Material Spill Reduction: Not Monetized
- VI. Highway Wear and Tear: Not Monetized
- Total Benefits (Lower/Upper Bound): **\$207.4 million/\$446.3 million**
- Benefit-Cost Ratio: **2.89 (Lower)/6.21 (Upper)**

Benefit-Cost Analysis:
 Total Cost (2009 \$): \$34,768,347
 with the foregone return to investment (2009\$): \$71,828,284
 Real Cost of Borrowing : 2.70%

SHORT TERM BENEFITS TO REGIONAL ECONOMY*

- I. Immediate Job Effects: **406 - 2,184 jobs**
 - II. Business Revenue (Output): **\$46 - \$236 million**
 - III. Value-Added (GRP): **\$20.2 - \$105.2 million**
 - IV. Personal Income: **\$16.1 - \$82.8 million**
- *These short-term regional benefits are based on two scenarios: (1) the Port and Industrial Park and (2) Major Industry Location. Impact lasts nearly three years.*

REVENUES

- SHORT TERM:**
- I. Local Revenues: **\$0.4 - \$1.4 million**
- II. State Revenues: **\$0.8 - \$4.4 million**
- III. Federal Revenues: **\$2.8 - \$17.1 million**
- LONG TERM:**
- I. Local Revenues: **\$1.0 - \$1.9 million**
- II. State Revenues: **\$4.5 - \$6.6 million**
- III. Federal Revenues: **\$8.3 - \$14.1 million**



I. INTRODUCTION

Located in northwest Tennessee, the proposed infrastructural development of the Port of Cates Landing will alter economic dynamics in the three-county region (Dyer, Lake, and Obion). Dyer, Lake, and Obion counties have long been affected by the flight of manufacturing companies. Currently, both the three-county region overall and the individual counties can be designated as “economically depressed areas” given the fact that (1) their historical unemployment rate has been higher than the U.S. average; (2) their annual average population growth rate is either zero (0) or below zero; (3) their per capita personal income is significantly lower than the U.S. average; and (4) their manufacturing base has significantly eroded over the past decade.

The proposed infrastructure investment of \$35 million in the Port at Cates Landing will create a truly intermodal transportation system in the region, connecting area businesses to the Mississippi River, the Canadian National Railroad via the Tenn-Ken Railroad, and local and interstate highway systems (future I-69). Furthermore, the proposed industrial park development adjacent to the Port at Cates Landing is expected to generate considerable business interest because the port and proposed industrial park are located above the 100-year floodplain.

The Business and Economic Research Center (BERC), Middle Tennessee State University, is retained by the Northwest Tennessee Regional Port Authority to assess the contributions of the proposed investment in the Port at Cates Landing to the economy of the three-county region (Lake, Dyer, and Obion) and its surrounding areas.

I. a. Study Area

The study area in this analysis consists of three counties in the northwest corner of Tennessee: Dyer, Lake, and Obion. Throughout this study, the following phrases are used interchangeably to denote the region that consists of these three counties:

- Three-County Region
- Study Region
- Core Study Area
- Core Study Region
- Core Region

These counties are labeled as “Three-County Region: Cates Landing” in Map 1. In addition, this study often refers to the “surrounding area,” “immediate neighbors,” or “surrounding region” interchangeably. This area, labeled “Immediate Neighbors” in Map 1, represents the counties (Crockett, Gibson, Lauderdale, and Weakley) within a 50-mile radius of the Port at Cates Landing.



At various stages of Phase I of the port's construction, several studies have been conducted indicating that once completed, Cates Landing will have a measurable effect on regional socioeconomic dynamics. The following studies highlight the critical role an intermodal port at Cates Landing will play in economic competitiveness of the region:

- *Northwest Tennessee Regional Harbor* (2004) by U.S. Army Corps Engineers, Memphis District, at http://www.mvm.usace.army.mil/environment/NW_TN_Harbor_Report.asp.
- *Cates Landing Port Economic Impact Analysis* (2004) by Younger Associates, LLC, at <http://www.portofcateslanding.com/documents/Feasibility%20Study%20Younger%20Assocates.pdf>.
- *A Review of Proposed State Funding of the Northwest Tennessee Regional Port and Industrial Park* (2004) by Sparks Bureau of Business and Economic Research, University of Memphis, at <http://www.portofcateslanding.com/documents/University%20of%20Memphis%20Feasibility%20Study%201.pdf>.

In addition, a study completed as recently as June 2009 by IHS Global Insights, Wilbur Smith Associates, and the University of Memphis, *The Memphis Regional Infrastructure Plan*, cited Cates Landing among the top five (5) of 25 infrastructure recommendations. The purpose of this section is not to repeat the findings of these studies but to highlight their common conclusion: if built, an intermodal port at Cates Landing will make the highly distressed counties of northwest Tennessee economically viable in the face of increasing global economic competitiveness.

I.b.ii. Proposed Improvement

As briefly summarized above, Cates Landing is ready for a complete build-out, which includes the loading dock and connecting intermodal rail and roadway freight facilities. Incorporating an open cell design, Cates Landing will use the latest innovative strategies to create a clean (conforming to the Clean Ports USA guidelines) and operationally efficient intermodal port. Meanwhile, the proposed \$35-million investment to complete Phase II of Cates Landing has the potential to touch many lives in this economically distressed corner of Tennessee. A review of the letters of interest sent to the Port Authority over the past 10 years suggests that the region has lost significant investment opportunities because of the lack of transportation infrastructure. What follows in the rest of this study is an assessment of the socioeconomic implications of the \$35-million investment in Cates Landing to create a truly intermodal transportation system in the region. More information about the letters from businesses expressing interest in relocating to the region that relocated elsewhere because of the absence of port infrastructure can be found at www.portofcateslanding.com.



I.c. Study Goals and Research Questions

This study has five major goals:

- I. Provide a brief assessment of socioeconomic conditions in the three-county region (Dyer, Lake, and Obion) from a comparative perspective
- II. Given the study time frame (July 2009–August 2009), provide a brief benefit-cost analysis of the proposed investment in Cates Landing
- III. Describe and analyze the short-term economic impact of the construction spending related to the proposed infrastructure investment in the Port of Cates Landing including but not limited to the basic and enhanced site development and infrastructure; terminal dock site development and infrastructure; rail system (port through industrial park and industrial park to short line); harbor and navigation lighting; and energy efficient “green technology”
- IV. Describe and analyze the long-term economic impact of the proposed development of the Port of Cates Landing and adjacent industrial park on the region’s economy. This section includes two scenarios: (1) baseline port operation and industrial park and (2) alternative scenario regarding a major industry relocating to the region.
- V. Provide a brief assessment of the implications of the port investment for the socioeconomic dynamics in the region

In line with these five goals, this study seeks answers to the following major questions:

- What are the indicators of economic distress and how the study region is faring compared to the U.S.?
- Do the benefits from the port justify the \$35-million investment?
- What are the regional impacts of the Port at Cates Landing?
- What are the implications of the Port at Cates Landing for the indicators of socioeconomic distress?

The rest of this study is organized as follows. The second section briefly introduces the indicators of socioeconomic distress in the region, highlighting primarily employment and unemployment, population growth, income, and poverty. The third section deals with the conceptual framework, study assumptions, and data. The fourth section provides the study findings, organized along three major themes: (1) benefit-cost analysis, (2) economic impact analysis, and (3) related jobs. The fifth section looks at the implications of the proposed investment for indicators of socioeconomic distress. The sixth section concludes the study.



II. STUDY REGION AT A GLANCE: INDICATORS OF SOCIOECONOMIC DISTRESS

The counties in northwest Tennessee have gone through significant socioeconomic transformation over the past two decades: first, manufacturing jobs started gradually moving out of the study region, and then outmigration followed. A review of commonly used socioeconomic indicators suggests that the study region and its surrounding counties are in economic distress. To illustrate the extent of the distress, this section deals with the following socioeconomic indicators: unemployment, population growth, per capita income, and poverty.

II.a. Employment and Unemployment

Table 1 presents the latest available data on labor force, employment, and unemployment. Compared to the U.S., all the counties in the core and surrounding region have an unemployment rate substantially higher than the U.S. average. The difference in unemployment rate between the area counties and the U.S. runs as high as 10 percentage points in Lauderdale County. At the regional level, the unemployment rate is 3.1 percentage points higher than the U.S. in the core region; 5.3 percentage points higher in the surrounding region; and 4.4 percentage points higher in the core and surrounding region combined.

Table 1: Unemployment Rate as of June 2009

Region	Labor Force	Employment	Unemployment	Unemployment Rate (%)	Percentage Point Difference from the U.S. Average
U.S.	155,921,000	140,826,000	15,095,000	9.7	
Core Region	36,478	31,491	4,649	12.8	+3.1
<i>Dyer</i>	18,177	15,148	2,691	14.8	+5.1
<i>Lake</i>	2,803	2,510	293	10.5	+0.8
<i>Obion</i>	15,498	13,833	1,665	10.7	+1.0
Surrounding Region	55,112	46,833	8,279	15.0	+5.3
<i>Crockett</i>	6,490	5,671	819	12.6	+2.9
<i>Gibson</i>	22,040	18,777	3,263	14.8	+5.1
<i>Lauderdale</i>	10,566	8,483	2,083	19.7	+10.0
<i>Weakley</i>	16,016	13,902	2,114	13.2	+3.5
Core and Surrounding Region	91,590	78,324	12,928	14.1	+4.4

Source: BEREC and BLS (www.bls.gov)

II.b. Population Growth

Used alone, unemployment rates may not reflect the true state of economic health. Unemployment rates should be used along with labor force or population data to make sense of a region's socioeconomic dynamics. For example, the unemployment rate in Lake County, where Cates Landing is located, is moderately higher than the U.S. average (+0.8 percentage point in Table 1). The primary reason for the relatively smaller unemployment rate for this county may be



explained by the massive outflow of the working age population in the county in search of employment opportunities elsewhere. Table 2 demonstrates the extent of the population flight from the core study region between 2000 and 2008. In this period, Lake County lost nearly 8 percent of its population. In contrast, the U.S. population grew by more than 8 percent in the same period.

Table 2: Population Estimates and Growth Rate

Region	2000	2008	Growth (2000-2008)
U.S.	281,421,906	304,059,724	8.04%
Core Region	77,683	76,298	-1.78%
<i>Dyer</i>	37,279	37,600	0.86%
<i>Lake</i>	7,954	7,323	-7.93%
<i>Obion</i>	32,450	31,375	-3.31%
Surrounding Region	124,680	123,510	-0.94%
<i>Crockett</i>	14,532	14,186	-2.38%
<i>Gibson</i>	48,152	49,257	2.29%
<i>Lauderdale</i>	27,101	26,692	-1.51%
<i>Weakley</i>	34,895	33,375	-4.36%
Core and Surrounding Region	202,363	199,808	-1.26%

Source: BERC and Census Bureau (www.census.gov)

II.c. Income

Per capita income is another indicator commonly used as a measure of economic distress in a community. The per capita income in the study region is far below the U.S. average as shown in Table 3. For example, per capita income in Lake County is equivalent to 45 percent of U.S. per capita income. In other words, per capita income in Lake County is 55 percent less than U.S. per capita income. Overall, the core study region has an average per capita income equivalent to 71 percent of U.S. per capita income in 2007. The surrounding region does not fare any better than the core region, as per capita income is 63.40 percent of U.S. per capita income. For the core and surrounding regions combined, per capita income remains at 66.4 percent of the U.S. average.



Table 3: Income

Region	Personal Income	Population	Per Capita Income	
	2007 (in thousands)	2007	2007	As Percent of U.S.
U.S.	\$11,894,100,000	301,737,000	\$39,419	100.00
Core Region	\$2,145,395	76,546	\$28,028	71.10
<i>Dyer</i>	\$1,088,239	37,642	\$28,910	73.34
<i>Lake</i>	\$132,036	7,407	\$17,826	45.22
<i>Obion</i>	\$925,120	31,497	\$29,372	74.51
Surrounding Region	\$3,062,530	122,549	\$24,990	63.40
<i>Crockett</i>	\$355,599	14,183	\$25,072	63.60
<i>Gibson</i>	\$1,282,060	48,511	\$26,428	67.04
<i>Lauderdale</i>	\$552,371	26,681	\$20,703	52.52
<i>Weakley</i>	\$872,500	33,174	\$26,301	66.72
Core and Surrounding Region	\$5,207,925	199,095	\$26,158	66.36

Source: BERC and BEA (www.bea.gov)

II.d. Poverty

Perhaps the poverty rate is the most telling indicator of socioeconomic distress in a community. In this respect, Lake County has the 15th highest poverty rate among more than 3,000 counties in the U.S. Table 4 shows both per capita transfer payments and poverty rate in the core and surrounding counties.



Table 4: Poverty and Transfer Payments (Northwest Tennessee Regional Port at Cates Landing)

Region	Transfer Payments 2007 (in thousands)	Population 2007	Per Capita Transfer Payments 2007	As percent of the U.S.	Percent of		
					Number of People below Poverty 2007	Population below Poverty 2007	Percentage Point Difference 2007
U.S.	\$127,454,000	301,737,000	\$422	100.00	38,052,247	13.00	
Core Region	\$45,315	76,546	\$592	140.15	13,093	17.10	+4.10
<i>Dyer</i>	23,493	37,642	\$624	147.75	6,207	16.70	+3.70
<i>Lake*</i>	\$5,394	7,407	\$728	172.40	1,940	39.20	+26.20
<i>Obion</i>	\$16,428	31,497	\$522	123.48	4,946	15.90	+2.90
Surrounding Region	\$73,501	122,549	\$600	141.99	22,592	18.44	+5.44
<i>Crockett</i>	\$8,284	14,183	\$584	138.28	2,504	18.00	+5.00
<i>Gibson</i>	\$29,132	48,511	\$601	142.17	7,799	16.50	+3.50
<i>Lauderdale</i>	\$20,369	26,681	\$763	180.74	6,391	26.80	+13.80
<i>Weakley</i>	\$15,716	33,174	\$474	112.16	5,898	18.90	+5.90
Core and Surrounding Region	\$118,816	199,095	\$597	141.28	35,685	17.92	+4.92

Source: BERC and Census Bureau (www.census.gov)

*Lake County has the 15th highest poverty rate among more than 3,000 counties in the U.S.

The per capita transfer payments reported in Table 4 refer to monetary transfers from the federal government that include food stamps, family assistance, and other income maintenance benefits. Supplemental Social Security benefits are not included.

Overall, Lake County receives twice as many per capita transfer payments as the U.S. average. This is clearly not surprising given the county's poverty rate. Nearly two-fifths (39.2 percent) of Lake County's population is below the poverty level. The poverty rate in Lake County is 26.2 percentage points higher than the U.S. average.

To summarize, the combined major indicators of economic distress paint the following regional picture. Once the hub of the manufacturing sector, the counties in the study region have gradually lost their competitive edge. In turn, this gradual erosion of the manufacturing base has put pressure on social dynamics leading to massive outmigration of the working-age population in search of better job opportunities. Reversing the current trend requires significant investment in infrastructure improvements that will (a) make the region more competitive and (b) attract new or retain existing businesses, thereby stabilizing socioeconomic dynamics.

Although major investment is necessary to make the study region globally competitive, it is not itself sufficient to generate large-scale intended outcomes. The nature of investment matters as much as the amount of investment in the region. The next sections analyze a particular investment in the amount of about \$35 million to construct a truly intermodal transportation system and industrial park. Once completed, the Port at Cates Landing is likely to have a profound impact across northwest Tennessee counties.



III. CONCEPTUAL FRAMEWORK, ASSUMPTIONS, AND DATA

Given the extent of socioeconomic distress in the study region, the proposed \$35-million investment in the port and industrial park is likely to transform regional socioeconomic dynamics in a positive way. However, measuring these socioeconomic contributions is a challenging task given the time frame of this study (July 2009-August 2009). The challenge comes from the lack of data regarding the operational phase of the port and industrial park build-out. Ideally, a survey of local businesses regarding the potential use of the port for cargo transportation is necessary to estimate the average volume of cargo the port will handle in a given year. Having information about the volume of cargo then will allow us to derive the marine-related employment figures. To overcome this challenge, the Business and Economic Research Center (BERC) has developed several assumptions using the existing port impact studies and regional impact assessment modals to calculate the average marine-related employment figures in the study region. Box 1 below summarizes the general assumptions and issues that will affect the BERC's benefit-cost analysis and economic impact estimates.

Box 1: General Assumptions and Issues

- I. The estimates of total cargo volume are model--driven. The IMPLAN regional model is used to extract commodity flows data for the core and surrounding region.
- II. A survey of potential port users is necessary to calculate the inbound/outbound cargo volume but was not available at the time of this study.
- III. Furthermore, the time frame for grant application does not allow us to conduct a comprehensive survey.
- IV. Anecdotal data from the previous Army Corps of Engineers study, the Northwest Tennessee Regional Port Authority, and a study by Younger Associates is used in making assumptions about the potential port use by sector.
- V. This study has two scenarios: (1) current cargo movement (baseline) and (2) cargo movement with the Port Authority.
- VI. The first scenario (current) assumes a "single modal" cargo movement (rail or truck), whereas the second scenario (with the port) assumes an "intermodal" cargo movement (barge to rail, or barge to truck, and vice versa)

III.a. Cargo Volume and Economic Impact

In the absence of survey data, the BERC has made several specific assumptions to derive total cargo volume systematically. Aiding our decisions were the databases, surveys, and studies highlighted below:



- IMPLANpro economic impact model (www.implan.gov) for the core and surrounding regions
- U.S. Census Bureau, 2002 Commodity Flow Survey (www.census.gov)
- BLS, CPI-U Transportation Cost Index (www.bls.gov)
- Congressional Budget Office, *The Economic Cost of Disruptions in Container Shipments* (2006), (www.cbo.gov)
- Northwest Tennessee Port Authority business plans and other official documents (www.portofcateslanding.com)
- MARAD PortKit, MARAD, A. Strauss-Wieder, Inc., and CUPR at Rutgers University (www.marad.dot.gov)

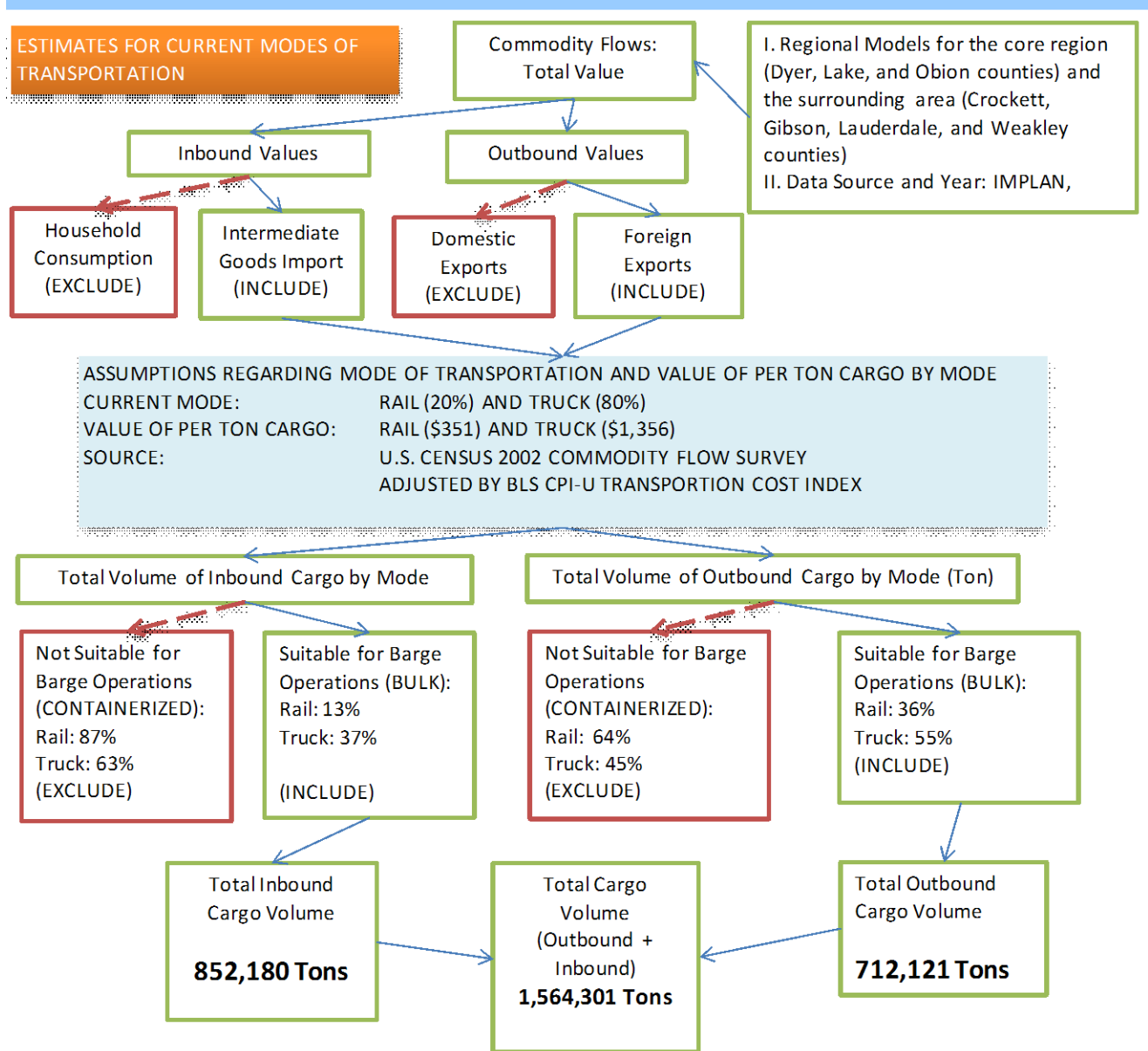
Based on the aforementioned data sources and studies, the BERC procedure includes the following six (6) steps to calculate the inbound and outbound cargo volumes the port is likely to handle.

- I. Extracting the value of total commodity flow from the regional IMPLAN model
- II. Separating foreign exports from domestic exports and intermediate goods imports from the goods imports for household consumption
- III. Estimating the share of each mode of transportation in cargo movement using 2002 commodity flow survey for Tennessee and then applying those shares to the regional export-import data
- IV. Converting the total value of freight transportation for the region to tonnage by using average value of per ton freight by mode (rail and truck) for Tennessee and then applying these average values to the regional data
- V. Further fine-tuning the data by estimating the freight cargo eligible for barge operations (containerized versus bulk), using national estimates from a Congressional Budget Office study to obtain freight volume by cargo type for each mode of transportation
- VI. Estimating total outbound and inbound freight volume likely to go through the port

These estimates are for the freight volume currently transported by truck and rail but likely to shift to the port once it becomes operational. Chart 1 provides a visual description of the six-step process.



Chart 1: Estimating Cargo Volume at Cates Landing: Conceptual Framework

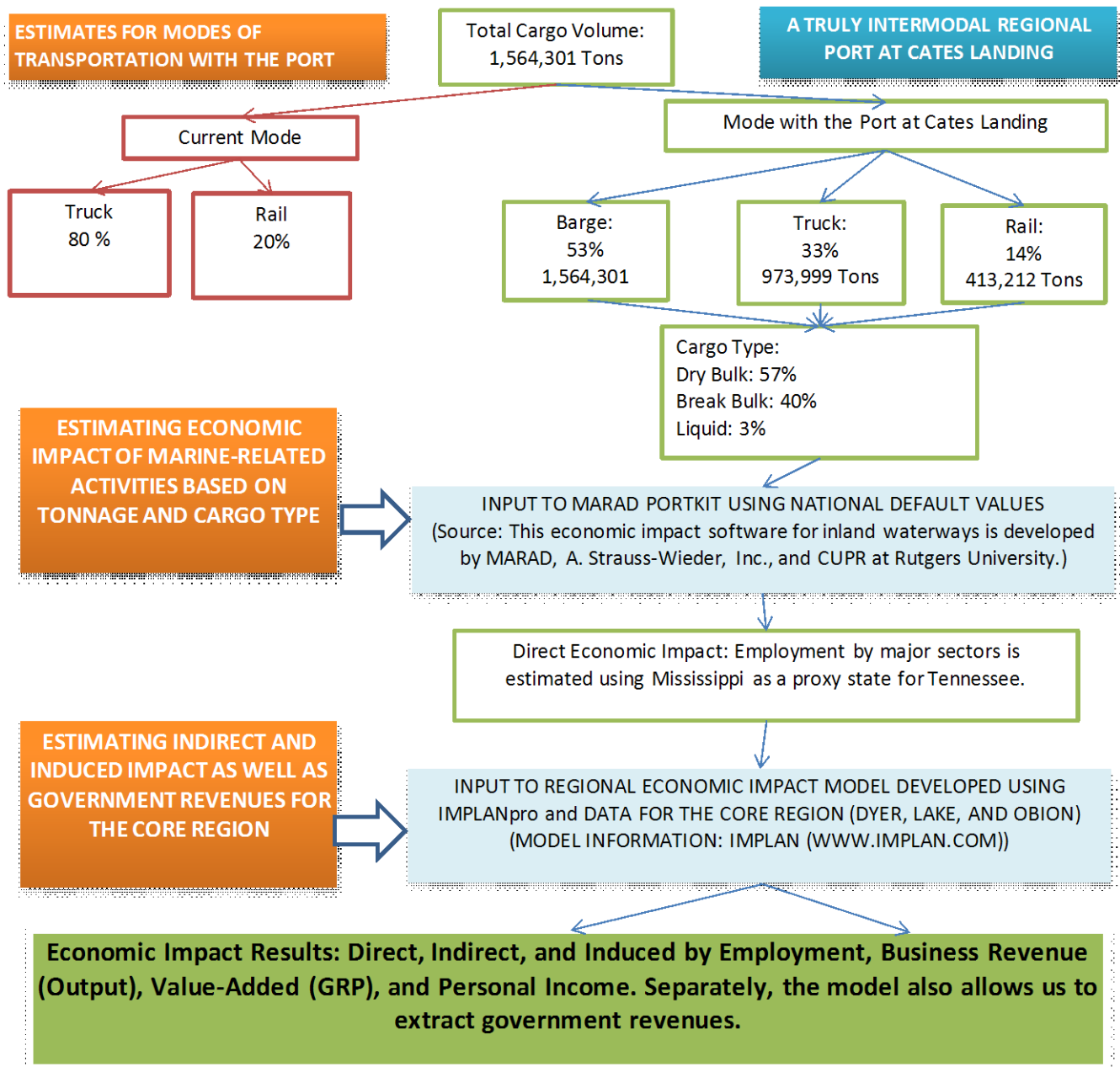


After calculating the current cargo volume by mode of transportation, the BERC then used the following steps (Chart 2) to calculate the economic impact of the port operation and marine-related economic activities.

- I. Identify the share of each mode of transportation in a truly intermodal transportation system similar to the one proposed at Cates Landing. This involves truck to barge, rail to barge, and vice versa. The trucks involved in the intermodal transportation system are short trucks as opposed to the long trucks in the current system of transportation. The port business plan is used to derive these estimates.
- II. Similarly, the port business plan is used to identify the port cargo volume by cargo type (dry bulk, break bulk, and liquid).
- III. The findings in steps I and II are then used as inputs to MARAD PortKit. The BERC used the national default values for cost per ton of handling cargo and Mississippi as a proxy state for Tennessee.
- IV. Step III allowed us to extract the direct employment necessary to handle nearly 1.6 million tons of cargo volume.
- V. The BERC then used direct employment figures identified in Step IV as inputs to the IMPLAN regional model to calculate indirect and induced employment as well as business revenue, value-added, personal income, and government revenues.



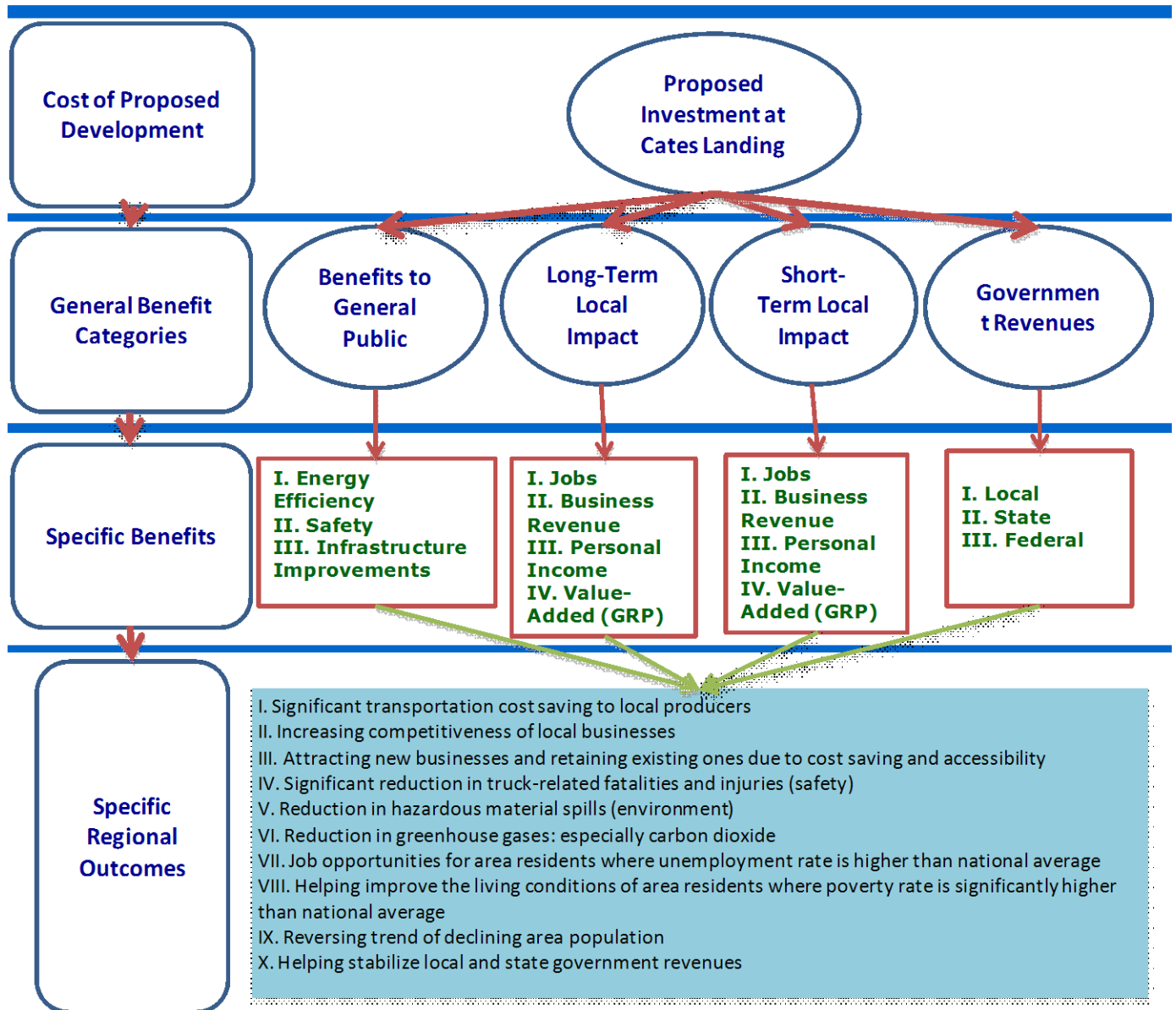
Chart 2: Estimating Cargo Volume at Cates Landing: Conceptual Framework



III.b. Benefit-Cost Analysis

A truly intermodal transportation system in northwest Tennessee will have a wide range of impact on the study region. Chart 3 provides a detailed view of benefit categories and expected regional outcomes as a result of constructing and operating the port and adjacent industrial park.

Chart 3: Analyzing the Benefits of the Proposed Investment in the NWTRP at Cates Landing



III.c. Assumptions and Data

In calculating benefit-cost analysis and economic impact figures, the BERC has developed several assumptions regarding cargo volume, marine-related employment, transportation cost savings, major industry relocation, fatality reduction, injury reduction, and “related jobs.” This section briefly reviews the assumptions made and the source of data.

III.c.i. Construction

Table 5 presents a breakdown of the proposed port-related construction spending in the core region. These figures are used as inputs in the IMPLAN regional model to generate short-term employment and other regional aggregate figures. A total of nearly \$35 million will be invested in the region to complete the final phase of the port’s construction. This is also the amount the Northwest Tennessee Regional Port Authority is requesting in its grant application.

Table 5:
Northwest Tennessee Regional Port at Cates Landing and Industrial Park
Construction Phase: Construction Spending by Major Sectors
(Data Source: Northwest Tennessee Regional Port Authority)

I.	Professional Services	\$1,652,685
II.	Construction	\$29,031,072
III.	Inspection & Testing	\$768,691
IV.	Government	\$142,155
V.	Real Estate	\$1,665,847
VI.	Legal	\$665,497
VII.	Water Transportation	\$315,900
VIII.	Banking/Insurance	\$526,500
IX.	Grand Total	\$34,768,347

Note: Contingency amount of \$1,750,000 is allocated across construction-related spending items based on their share in total proposed construction-related spending.

III.c.ii. The Port and Industrial Park

The build-out scenario involving the port and adjacent industrial park requires a series of assumptions regarding both marine-related employment and the tenants of the industrial park. As previously mentioned in the context of Chart 2, the marine-related direct employment figures are primarily driven by the total cargo volume that will flow through the port and estimated by using MARAD PortKit. However, the employment estimates for non-marine related but somewhat port-dependent industrial park tenants required a comprehensive assessment of several ports located along the inland waterways. The BERC emphasized among other factors the type of industries in



the industrial park, the number of jobs, industrial park occupancy rates, and total acreage of industrial parks.

Table 6 below presents the results of a review of several studies of industrial parks adjacent to an inland waterway port. The information in Table 6 allows us to develop scenarios regarding the likely occupancy rate of the proposed industrial park, the type of industrial park tenants, and the number of jobs involved. The estimates presented in the subsequent tables (especially Table 8) may be considered conservative, as we assigned lower-range employment figures to the potential industrial park tenants.

Table 6:
Northwest Tennessee Regional Port at Cates Landing and Industrial Park—
Industrial Park Background Assumptions
 (Data Source: Missouri Ports, International Port of Memphis, Colliers, and other Web sources)

<i>I. Assumptions and Background</i>		<i>Year</i>
IA. Industrial Occupancy Rate for Northwest Memphis	80%	2008
IB. New Madrid County and Pemiscot County Port Authorities		2007
1. Total acreage	163	
1. Percent of acreage occupied	71.78	
2. Average employment per occupied acre	1.72	
IC. Port of Shreveport-Bossier (Foreign Trade Zone)		2009
1. Industrial park acreage (estimated)	1000	
2. Percent of acreage occupied	50%	
3. Number of tenants	14	
ID. Duluth Seaway Port Authority (BERC estimates)		2009
1. Number of tenants	16	
2. Number of employees	394	
3. Average number of employees per tenant	24.63	
4. Estimated acreage	220	
5. Employment per acreage	1.79	
IE. Industries are downsizing to cut costs.		
1. Employment density per acre is likely to be less now than in 2007.		
IF. Foreign Trade Zone designation is likely to attract more businesses to the industrial park.		
II. The Port Authority and Industrial Park are not independent of each other.		
IIA. Industrial park is not likely to exist without the Port Authority.		
III. Likely businesses in the industrial park (based on review of businesses in similar port locations):		
1. Warehousing and Distribution		
2. Transportation (Truck and Rail)		
3. Packaging		
4. Paper and Packaging		
5. Petroleum Distribution		
6. Steel and Plastic Fabrication and Distribution		
7. Scrap Smelting		
8. Wood Treating		
9. Towing and Repair Services		



Based on a review of industrial park tenants across several inland waterway ports, the BERC estimated that once the port becomes operational, seven (7) to 10 companies will move to the industrial park, creating an estimated 203 jobs and occupying about 35 percent of the available industrial park space. Table 7 highlights the industrial park occupancy rate and employment by the type of industrial park tenants.

Table 7:
Northwest Tennessee Regional Port at Cates Landing and Industrial Park—
Industrial Park Employment Estimates

(Data Source: Missouri Ports, International Port of Memphis, Colliers, and other Web sources)

Based on the assumptions in Table 6, the BERC's employment projection for the industrial park in the medium term (three years after the port becomes operational) is presented below. It is important to bear in mind that these estimates are conservative and may be construed as an absolute minimum. As the port receives its Foreign Trade Zone designation, the interest in the industrial park is likely to increase.

Port-Dependent Industrial Park Tenants*	Estimated Employment	Industrial Park (Acreage) (Occupancy Rate)
<i>I. Packaging</i>	20	5% (two companies)
<i>II. Towing and Repair Services</i>	50	10% (one company)
<i>III. Scrap Metal Handling Facilities</i>	40	10% (two companies)
<i>IV. Steel and Plastic Fabrication and Distribution</i>	18	5% (two companies)
<i>V. In-Transit Warehousing/Distribution/Packaging</i>	75	5% (one company)
Total Employment	203	35% (Eight Companies)
Industrial Park Vacancy Rate		20%-30% Vacancy Rate

*Number, type, and size of companies in this section are based on a detailed analysis of the port tenants of two inland ports: Shreveport-Bossier and Duluth Seaway.

Duluth Seaway Port Authority

1. 45 million net tons annually
2. Principal Cargos: Coal (40%), Ore (40%), Grain (10%)
3. Foreign Trade

Shreveport-Bossier

1. Foreign Trade Zone and Enterprise Zone
2. Access to Red River, Mississippi River, and Gulf of Mexico
3. Multi-modal
4. Annual tonnage (2008): 800,000
5. Acres: 2,100



As highlighted as part of the procedural steps in estimating economic impact in Chart 2, the marine-related employment figures are obtained inputting the total cargo volume information to the MARAD PortKit using national default values for the cost of handling one (1) ton of cargo. Table 8 presents direct employment figures by industry type. A total of 783 direct permanent jobs will be created across more than 10 sectors in the region's economy. This magnitude of job creation not only benefits area residents but also increases much-needed economic diversity in the study area counties. These marine-related businesses are likely to occupy somewhere between 20 and 35 percent of the industrial park space.

Table 8:
Northwest Tennessee Regional Port at Cates Landing and Industrial Park
Port Operation/Marine-Related Employment Estimates

(Data Source: Direct employment figures extracted from the MARAD PortKit using 1.6 million tons of cargo volume)

Port Operation/Marine-Related	Estimated Employment	Industrial Park (Acreage) (Occupancy Rate)
<i>I. Agricultural Services</i>	1	
<i>II. Petroleum and Coal Production</i>	6	
<i>III. Railroad Transportation</i>	8	
<i>IV. Trucking and Warehousing</i>	159	
<i>V. Water Transportation</i>	310	
<i>VI. Electric, Gas, and Sanitary Services</i>	1	
<i>VII. Wholesale-Nondurable Goods</i>	9	
<i>VIII. Food Stores</i>	2	
<i>IX. Personal Services</i>	1	
<i>X. Business Services</i>	265	
<i>XI. Health Services</i>	1	
<i>XII. Government</i>	20	
Total Employment/Occupancy	783	20%-35%
Industrial Park		20%-30% Vacancy Rate

III.c.iii. Industry Relocation Assumptions

In addition to the industrial park tenants, the BEREC developed a “what-if” scenario based on the review of more than 10 letters of interest from major businesses indicating they seriously considered Cates Landing as their next home but chose elsewhere because the port is not operational. Given these letters of interest, the BEREC assumes that once the port becomes operational and receives Free Trade Zone designation, a major industry will relocate to the area with an average investment of \$550 million and 300 permanent jobs. Table 9 summarizes the



letters of interests from the selected companies, their proposed investment level, and the number of permanent jobs involved.

Table 9:
Northwest Tennessee Regional Port at Cates Landing and Industrial Park
What-if Scenario: Relocating a Major Industry to the Area

(Data Source: Based on the actual letters of interest sent to the Port officials between 1995 and 2008)

Name of Company	Type	Proposed Investment	Jobs Involved	Date	Reason for not choosing
I. Excalibar Minerals	Processor and Supplier of Industrial Mineral		50	5-Apr-02	The Port is not ready
II. LALLEMAND		\$250 million	48	4-Apr-02	The Port is not ready
III. Renewable Agricultural Energy, Inc.			250	8-Aug-06	
IV. River BioEnergy**	Food Grade Ethanol Plant	\$477 million	250	30-Jan-07	The Port is not ready
V. Reelfoot Ethanol	Food Grade Ethanol Plant	\$300 million	250	11-Oct-06	
VI. NucorSteel*	Steel Mill	\$800 million	300	18-Dec-97	The Port is not ready
VII. WARFAB	Steel Plate Mill	\$800 million	500	7-Sep-07	
VIII. IPSCO	Steel Mill	\$800 million	300		
IX. ConAgra	Starch Plant	\$155 million	275		The Port is not ready

Inquiries from Two Types of Businesses			Average	
	Investment	Employment	Investment	Employment
1. Steel Mill	\$800 million	370	\$550 Million	300
2. Agriculture/Renewable Energy	\$300 million	215		

* Employment range in current steel mills of Nucor across the U.S.: 250-499

**Employment range in ethanol plants: 20-59

In some instances, the range is between 50 and 99

A few of them employ between 100 and 250

III.c.iv. Basic Cargo Assumptions and Data

Following the steps discussed in Box 1 and Charts 1 and 2, the BERC estimated total tonnage of foreign exports suitable for the barge operation for the core and surrounding regions separately. Similarly, total tonnage of intermediate goods imports is estimated. Tables 10 and 11 below report the estimated data by region and type (exports/imports). To give a quick guide to the tables, global assumptions IA and IB apply to both foreign exports and intermediate goods imports. The label “CL Share (Tons)” in the last column of the data tables refers to the adjusted cargo volume suitable for Cates Landing. The adjustments were made to the manufacturing exports and imports data using bulk cargo ratios reported in Table 10 under the “II. Foreign Exports (Outbound—Manufacturing)” for the former and in Table 11 under the “III. Intermediate Goods Imports (Inbound)—Manufacturing” for the latter.



Table 10:
Foreign Exports- Cargo Assumptions
(Data Source: IMPLAN, 2002 Commodity Flow Survey, IHS et al.(2009),* Congressional Budget Office (2006), The Port Authority Business Plan)

I. Global Assumptions				CL core region foreign exports (FEX) (ton)				
IA. Cargo Transportation (Current)		With the Port		(80% Truck/20%Rail)	Truck	Rail	Tons	CL Share (Ton)
Mode	Share	Share						
Truck	80%	33%		Cotton	10,681	10,316	20,997	20,997
Rail	20%	14%		Forestry & Logging	1,128	1,089	2,217	2,217
Barge	0%	53%		Manufacturing	354,185	342,076	696,261	317,944
				Mining	0	0	0	0
				Scrap	3,426	3,309	6,735	6,735
				Grains and Oilseeds	28,081	27,121	55,203	55,203
				Grand Total	397,501	383,911	781,412	403,095
IB. Value per Ton (Current) (2007)				Surrounding region foreign exports (FEX) (ton)				
Mode	Value per Ton (\$)			(80% Truck/20%Rail)	Truck	Rail	Ton	CL Share (Ton)
Truck	\$1,356			Cotton	47,576	45,950	93,526	93,526
Rail	\$351			Forestry & Logging	756	730	1,486	1,486
				Manufacturing	147,515	142,471	289,986	132,422
				Mining	2,283	2,205	4,488	4,488
				Scrap	5,479	5,292	10,771	10,771
				Grains and Oilseeds	33,741	32,588	66,329	66,329
				Grand Total	237,350	229,235	466,585	309,021
II. Foreign Exports (Outbound)-Manufacturing								
Types of Cargo	Mode of Transportation (%)							
	Truck	Rail						
Bulk	55	36						
Containerized	45	64						

*IHS (2009): A study by IHS Global Insight, Wilbur Smith Associates, and the University of Memphis, entitled "The Memphis Regional Infrastructure Plan," for the Memphis Regional Chamber. The study cites Cates Landing several times as a port whose completion should be among the top priorities of the authorities for a better regional transportation system.

According to BERC estimates, total Cates Landing throughput is 1,564,301 tons. The type of throughput reported here includes foreign exports and intermediate goods imports, for which transportation cost saving is critically important for businesses to remain globally competitive.



Table 11:
Intermediate Goods Import- Cargo Assumptions
(Data Source: IMPLAN, 2002 Commodity Flow Survey, IHS (2009), Congressional Budget Office (2006), The Port Authority Business Plan)

III. Intermediate Goods Imports (Inbound)-Manufacturing				CL core region imports (intermediate goods) (ton)				
Types of Cargo	Mode of Transportation (%)		Tons	(80% Truck/20%Rail)	Truck	Rail	CL Share (Ton)	
	Truck	Rail						
Bulk	37	13						
Containerized	63	87						
Total (Inbound and Outbound) CL Throughput (Tons)								
Commodity	Core Surrounding		Total	Surrounding region imports (intermediate goods) (ton)				
Cotton	21,470	95,261	116,731	(80% Truck/20%Rail)	Truck	Rail	Tons	CL Share (Ton)
Forestry &	64,700	9,611	74,310	Cotton	883	852	1,735	1,735
Manufactu	719,216	461,411	1,180,627	Forestry & Logging	4,133	3,992	8,125	8,125
Mining	9,295	24,306	33,600	Manufacturing	663,880	641,183	1,305,063	328,989
Scrap	7,703	11,261	18,964	Mining	10,081	9,737	19,818	19,818
Grains and	61,717	78,351	140,068	Scrap	249	241	490	490
Total	884,101	680,200	1,564,301	Grains and Oilseeds	6,115	5,906	12,022	12,022
				Grand Total	685,342	661,911	1,347,253	371,179

III.c.v. Transportation Cost-Saving Assumptions

Transportation cost savings associated with the port operation are a critically important part of the benefit-cost analysis of the proposed investment. The assumptions and estimates regarding the transportation cost savings will be used to calculate the benefit-cost ratio. Table 12 below summarizes the cost-saving assumptions along with the calculations of average annual cost savings by the core and surrounding-area businesses. The calculations in the table are based on two scenarios:

- Current transportation system labeled as “Current Transportation Mode,” and
- Intermodal transportation system labeled as “Transportation Mode with the Port.”

The difference between the mode with the port and the current mode is used for all benefit types attributable to a shift in transportation mode from the current mode (single mode) to a truly intermodal transportation system.

Some general assumptions highlighted in the table are as follows:

- We assume that current cargo volume breakdown by mode for Tennessee holds for the study region: Truck – 80 percent; and Rail – 20 percent.
- We assume that share of each mode in the intermodal transportation system will be as follows: Truck – 33 percent; Rail – 14 percent; and Barge – 53 percent (estimated from the port business plan and tariff schedule).
- We assume that all trucks return 100 percent empty.



- Ton-miles per gallon figures used, presented in Box B, Table 12, are from a national study done by Center for Ports and Waterways, Texas Transportation Institute, College Station, Texas.
- Percentages of cargo types with the port are provided by the Northwest Tennessee Regional Port Authority and presented in Box C, Table 12.
- Box A includes the following calculations:
 - Tons = actual tons
 - Ton-miles = tons X distance (distance to/from Cates Landing)
 - Units = tons X tons per unit by mode
 - Vehicle Mile Traveled (VMT) = 2 X (distance to/from X tons)
 - Fuel (Gallon) = ton-miles/ton-miles per gallon
- Box D, Table 12, gives the dollar value of annual transportation savings due to modal shift.

Table 12: Cost Saving Assumptions and Societal Benefits					
Distance to CL (From Dyersburg and Union City): 27.5 miles					
Distance to Memphis (Dyersburg and Union City): 96.5 miles					
Distance to CL (From Weakley, Gibson, Crockett, and Lauderdale): 50 miles					
Distance to Memphis (From Weakley, Gibson, Crockett, and Lauderdale): 95 miles					
Current Transportation Mode		A			
Core Region	Tons	Ton-Miles	Units	VMT	Fuel (Gallons)
Truck	707,281	136,505,194	56,582	5,460,208	880,679
Rail	176,820	17,063,149	1,607		41,315
Barge	0	0	0		0
Transportation Mode with the Port		A			
Core Region	Tons	Ton-Miles	Units	VMT	Fuel (Gallons)
Truck	550,478	30,276,290	44,038	1,211,052	195,331
Barge	884,101	79,569,090	497		138,141
Rail	233,536	6,422,240	2,123		15,550
Current Transportation Mode		A			
Surrounding Region	Tons	Ton-Miles	Units	VMT	Fuel (Gallons)
Truck	544,160	103,390,400	43,533	4,135,616	667,035
Rail	136,040	12,923,800	1,237		31,292
Barge	0	0	0		0
Transportation Mode with the Port		A			
Surrounding Region	Tons	Ton-Miles	Units	VMT	Fuel (Gallons)
Truck	423,521	42,352,100	33,882	1,694,084	273,239
Barge	680,200	61,218,000	382		106,281
Rail	179,676	8,983,800	1,633		21,753
Average Decline in Per-Ton Transportation Cost of Local Businesses					
Region	Current \$/ton	With the Port \$/Ton	% Decline in Cost/Ton		
Core Region	2.66	1.01	-62.14		
Surrounding Region	2.61	1.50	-42.54		
Total	2.64	1.22	-53.69		
VMT= Vehicle Miles Travel		B			
Truck= 100 % empty return	Ton-Miles per Gallon	Tons per Unit	Ton-Miles/Gallon		
Truck		25	155		
Barge		1750 (Liquid=3935)	576		
Rail		110	413		
Cargo Type with the Port		C			
Dry Bulk	57%				
Break Bulk	40%				
Liquid	3%				
Energy Information Administration (Midwest Region)					
http://tonto.eia.doe.gov					
Diesel (cents per gallon) (week of August 3rd)					254.7
Annual Transportation Saving					
Region	Gallons Saved	Price per Gallon	Total Saved(Cents)		
Core Region	572,972	254.7	145,935,944		
Surrounding Region	297,054	254.7	75,659,701		
Total	870,026	254.7	221,595,645		
Annual Transportation Savings to Producers		D			
Region	Total Saved(\$)	\$/ton			
Core Region	\$1,459,359	\$1.65			
Surrounding Region	\$756,597	\$1.11			
Total	\$2,215,956	\$1.42			
Source: The BERC's calculations are based on national figures estimated by the Center for Ports and Waterways in a study titled "A Modal Comparison of Domestic Freight Transportation Effects on the General Public" (2009).					



IV. FINDINGS

This section of the report presents three types of findings: (1) benefits to the general public and benefit-cost ratio; (2) economic impact results; and (3) related jobs. Before presenting the results, a few context-specific assumptions are in order:

- All dollar values are adjusted to 2009 value.
- Life cycle of port is 50 years.
- Real discount (interest) rate is 2.7 percent, per Office of Management and Budget (OMB) Memorandum.
- The value of a statistical life (VSL) and injury severity levels as a fraction of VSL are from the U.S. Department of Transportation (DOT) memorandum dated February 5, 2008.
- Fatality rates per billion ton-miles by mode of transportation, injury rate per billion ton-miles by mode of transportation, gallon spills per million ton-miles by mode of transportation, and grams of CO₂ emission per ton-mile are obtained from a study titled “A Modal Comparison of Domestic Freight Transportation Effects on the General Public” in 2007 (amended in 2009) by the Center for Ports and Waterways, Texas Transportation Institute, Texas.
- As per the guidelines of the U.S. DOT, estimates for fatality reduction include lower and upper values of a VSL, and estimates for injury reduction include the application of the DOT relative disutility factors to the lower and upper VSL values.
- The BERC used state crash severity data to calculate the percent of crashes by severity, and the number of injuries reduced in the study region is redistributed across crashes by severity level.

IV.a. Benefit-Cost Analysis

Based on the total throughput of nearly 1.6 million tons, investment in the port is estimated to generate noteworthy benefits. Not all benefits in Tables 13 and 14, however, are monetized. According to BERC estimates,

- The port will increase efficiency in the transportation system and save local businesses \$2.2 million annually.
- The port will improve highway safety by saving about 37 lives and preventing 832 injuries during the life cycle of the port (50 years).
- The port will improve livability from an environmental perspective by reducing green house emissions (CO₂) by 8,760 tons annually and preventing 563 gallons of hazardous material spills annually.
- The Port will help reduce the life-cycle maintenance cost of highways by reducing the number of long trucks on highways about 22 percent and the number of vehicle miles traveled more than 69 percent.



Table 13: Intermodal Transportation System at Cates Landing: Benefits Summary

A. Efficiency: Transportation Saving (Annual 2009 \$)

Mode	Current (Baseline)	With the Port	Difference (Savings)
Barge	\$0	\$622,543	\$622,543
Railroad	\$184,933	\$95,011	-\$89,922
Truck	\$3,942,028	\$1,193,448	-\$2,748,580
Total	\$4,126,960	\$1,911,001	-\$2,215,959

B. Safety: Fatality Reduction (50-year life cycle, total number)

Mode	Current (Baseline)	With the Port	Difference (Lives Saved)
Barge	0.00	0.20	0.20
Railroad	0.97	0.50	-0.47
Truck	52.19	15.80	-36.39
Total	53.16	16.50	-36.66

B1. Safety: Injury Reduction (50-year life cycle, total number)

Mode	Current (Baseline)	With the Port	Difference (Injuries Prevented)
Barge	0.00	0.32	0.32
Railroad	8.72	4.48	-4.24
Truck	1,188.01	359.67	-828.34
Total	1,196.73	364.47	-832.26

C. Livability: Green House Emission Reduction (Carbon Dioxide (CO₂)) (Annual, Tons)

Mode	Current (Baseline)	With the Port	Difference (Tons Reduced)
Barge	0.00	2,460.96	2,460.96
Railroad	731.38	375.75	-355.63
Truck	15,583.62	4,717.94	-10,865.68
Total	16,315.00	7,554.65	-8,760.35

C1. Livability: Hazardous Material Spill Reduction (Annual, Gallons)

Mode	Current (Baseline)	With the Port	Difference (Gallons Prevented)
Barge	0.00	506.83	506.83
Railroad	115.75	59.47	-56.28
Truck	1,453.77	440.13	-1,013.64
Total	1,569.52	1,006.43	-563.09

Benefit-Cost Ratio (BCR). Table 14 presents the benefit-cost ratio for the proposed investment in intermodal transportation system at Cates Landing. The following assumptions have been made in calculating the benefit-cost ratio:

- All values are in constant 2009 dollars.



- A discount (real interest) rate of 2.7 percent is used.
- A life cycle of 50 years is used for the port.
- Cost figure includes cost of borrowing compounded at the end of the year for 50 years.
- Benefits for each benefit category are expressed in present value.
- Transportation cost-saving and underlying cargo assumption are assumed to be constant over the life cycle of the port (no growth assumption).

Based on these assumptions, the BERC estimated two BCRs:

- Lower Bound: **2.89**, suggesting that for every dollar (\$1) invested, the society will gain at minimum \$2.89 in return.
- Upper Bound: **6.21**, suggesting that for every dollar (\$1) invested, the society will gain a maximum of \$6.21 from this project.

Table 14: Northwest Tennessee Regional Port at Cates Landing and Industrial Park
Benefit-Cost Ratio

Assumption:

I. 50 year life cycle of the port

II. Fatality Reduction = 37 (in 50 years) with a VSL value ranging from \$3.3 million to \$8.7 million (2009)

III. Injury Reduction = 832 (in 50 years) // injury severity adjustment has been made // DOT relative disutility factors are applied to the lower and upper VSL value

A. Cost

Life Cycle	50 years
Base Year	2009 All values assumed to be in 2009 \$
Total Investment	\$34,768,347
Real Interest rate	2.70% OMB Circular No. A-94
With Cost of Borrowing	\$71,828,284 Compounding at the end of the year

B. Benefits

	Lower Bound (in 2009 \$)		Upper Bound (in 2009 \$)	
		Present Value		Present Value
Discount Rate	2.70%		2.70%	
Transportation Savings	\$2,215,956	\$60,411,610	\$2,215,956	\$60,411,610
Emission Reduction	Not Estimated		Not Estimated	
Fatality Reduction	\$2,431,317	\$66,282,802	\$6,382,208	173,992,380
Injury Reduction	\$2,960,638	\$80,713,203	\$7,771,674	211,872,136
Total		\$207.41 million		\$446.28 million

C. Benefit/Cost Ratio

2.89

6.21

IV.b. Economic Impact Analysis

In addition to societal benefits of the proposed port investment, critically important is job creation in the study region, where unemployment rate and poverty are significantly higher than for the U.S. Furthermore, investment in the port will increase economic diversity in the region. For



example, there are no manufacturing companies in Lake County, where Cates Landing is located. The port investment will attract several manufacturing companies to the area. Similarly, the region does not have any employment in water transportation. This will change with the port investment.

This section presents two types of impact results:

- Short-term economic impact
- Long-term economic impact

For short-term economic impact, there are two scenarios:

- Port construction spending
- What-if scenario: Steel Mill construction spending

The long-term economic impact includes three scenarios:

- Port operation (marine-related activities)
- Port operation + industrial park tenants
- Port operation + industrial park tenants + relocation of a steel mill company to the area

To estimate short- and long-term economic impact of the port operation, industrial park tenants, and steel mill relocation, the BERC constructed a regional economic impact model (for Dyer, Lake, and Obion) with the widely used economic impact software IMPLANpro. Economic impact figures generated by the IMPLAN model are divided into three sub-groups: direct, indirect, and induced:

- Direct impact—involves expenditures of businesses directly related to the operation of Cates Landing.
- Indirect Impact—involves business-to-business transactions in the regional economy triggered by the initial spending of businesses directly related to the port operation.
- Induced impact—involves the effect of employee spending on the regional economy.

IV.b.i. Port and Industrial Park: Construction and Operation

Short-run economic impact of the proposed investment. The proposed investment in the port will stimulate the regional economy by creating much-needed jobs. In the short run, the construction spending of **\$35 million will create 406 new jobs** in the region, total short-term business revenue created of \$45.9 million; gross regional product of \$20.2 million; personal income of \$16.1 million; and local and state taxes totaling \$1.1 million.

Medium- to long-term economic impact of the proposed investment. In the long run, the proposed investment in Cates Landing will be a boon to the regional economy. The proposed \$35 million investment **will create 1,703 new permanent jobs** in the region (Phase III, Table 15). Given the



nature of investment, the leverage ratio is very high: for every \$20,552, one (1) new permanent job is created.

Considering other regional economic aggregates, the return to the proposed investment is quite handsome: for example, total business revenue (output) generated as a result of the proposed investment is \$259.2 million with a business revenue/proposed investment ratio of 7.41, suggesting that for every dollar invested, \$7.41 in new revenue is generated in the region.

To summarize the findings of the long-term impact of the proposed investment in Cates Landing:

Every dollar of the proposed investment in Cates Landing will leverage:

- \$7.41 in business revenues (output)
- \$2.58 in gross regional product (value-added)
- \$1.71 in personal income
- \$0.15 in state and local revenues

In addition, every \$20,552 of the proposed investment will leverage:

- One (1) new permanent job



Table 15:
The Northwest Tennessee Regional Port at Cates Landing and Industrial Park
Short- and Long-Term Economic Impact of Port Construction, Operation, and Industrial Park Tenants

Horizon	Short Term (One-Time)		Medium-Long Term	
Economic Impact Categories	Phase I: Construction*	Phase II: Operation**	Phase III: Phase II + Industrial Park Tenants***	
<i>I. Employment (Number of Jobs)</i>				
Direct	296	783	986	
Indirect	46	457	496	
Induced	64	172	221	
Total	406	1,412	1,703	
<i>II. Business Revenue (in Million \$)</i>				
Direct	\$34.0	\$169.3	\$197.9	
Indirect	\$5.7	\$33.6	\$39.1	
Induced	\$6.3	\$17.4	\$22.2	
Total	\$45.9	\$220.3	\$259.2	
<i>III. Gross Regional Product (In Million \$)</i>				
Direct	\$13.8	\$45.7	\$56.8	
Indirect	\$2.9	\$18.3	\$20.8	
Induced	\$3.6	\$9.9	\$12.6	
Total	\$20.2	\$73.9	\$90.2	
<i>IV. Personal Income (In Million \$)</i>				
Direct	\$12.2	\$29.6	\$38.4	
Indirect	\$1.9	\$12.5	\$14.1	
Induced	\$2.0	\$5.6	\$7.1	
Total	\$16.1	\$47.7	\$59.7	
<i>V. Local and State Taxes (In Million \$)</i>				
Local	\$0.4	\$1.0	\$1.2	
State	\$0.8	\$3.5	\$4.2	
Total	\$1.1	\$4.5	\$5.4	

Notes: Sums may not be equal to the totals due to rounding.

*Construction breakdowns are provided in Table 5.

**Port operation and marine-related jobs are presented in Table 8. The BEREC utilized MARAD PortKit to translate the port cargo assumptions into direct jobs by sector. These direct jobs by sector then are used as inputs into the IMPLAN regional economic impact model.

***When the port becomes fully operational, the industrial park is likely to have a greater than 60 percent occupancy rate. Assumptions regarding the industrial park occupancy are presented in Table 7.



IV.b.ii. What-If Scenario: Steel Mill Construction and Operation

In the past 10 to 15 years, port officials have received several inquiries and letters of interest from different segments of industries across the U.S. expressing their decision to consider Cates Landing as their first choice for relocating their companies. However, none of these inquiries has materialized because the port is not up and running. The proposed investment of \$35 million in the port will open the door for fresh inquiries, and eventually a major industry is likely to relocate to the port. Table 9 in the previous chapter summarizes some of the inquiries received by port officials.

Based on the previous industry inquiries, this section develops a what-if scenario and measures the impact of that scenario on the regional economy. Given the overwhelming interest expressed by steel mills, we assume that Cates Landing will be able to accommodate a small steel mill with 300 jobs and \$550 million investment. The economic impact results are presented in Table 16.

Short-term impact of steel mill construction. Putting a small-scale steel mill operation in Cates Landing creates a significant short-term impact on the local economy. We assume in Table 16 that the construction phase of the steel mill will last three (3) years, generating an average of 2,184 new jobs. Other short-term impacts are (1) \$236 million in business revenue (output), (2) \$105.2 million in gross regional product (value-added), (3) \$82.8 million in personal income, and (4) \$4.6 million in local and state tax revenues.

Long-term impact of a steel mill operation. In the long run, since the relocation of a steel mill to Cates Landing will be contingent upon the realization of the proposed \$35 million investment, we added the impact of operating a steel mill to the long-term impact of the port operation and industrial park (Phase III, Table 15). The combined long-term impact then is presented as Phase IV in Table 16. We assume that the figures in Phase IV, Table 16, represent the upper bound of the long-term economic impact leveraged by the proposed \$35 million investment.

In the long run with a steel mill, the proposed \$35 million investment will leverage

- 2,355 new jobs
- \$463.6 million in business revenue (output)
- \$133 million in gross regional product (value-added)
- \$87.3 million in personal income
- \$8.5 in state and local government revenues

Revisiting some of the leverage ratios presented above, study findings indicate that the proposed \$35 million investment in Cates Landing will be instrumental in creating significant regional economic benefits in the study region. **Every dollar of the proposed investment will be instrumental in creating as much as**

- \$13.25 in business revenues
- \$3.8 in gross regional product



- \$2.49 in personal income
- \$0.24 in state and local government revenues

In addition, every \$14,862 invested will be instrumental in creating one (1) permanent job in the region.

Table 16:
Northwest Tennessee Regional Port at Cates Landing and Industrial Park
What-If Scenario Regarding Further Development of the Port Industrial Park

Horizon	Short Term (One-Time)			Medium-Long Term	
	Construction Stage: Steel Mill*			Steel Mill Starting Operation in Year 4	
Economic Impact Categories	Year 1: 2009	Year 2: 2010	Year 3: 2011	Steel Mill: Operation**	Phase IV: Phase III + Steel Mill Operation***
<i>I. Employment (Number of Jobs)</i>					
Direct	1,669	1,659	1,553	300	1,286
Indirect	265	173	246	239	735
Induced	342	328	318	113	334
Total	2,276	2,160	2,117	652	2,355
<i>II. Business Revenue (in Million \$)</i>					
Direct	\$181.0	\$177.5	\$169.3	\$155.1	\$353.0
Indirect	\$31.8	\$21.6	\$29.6	\$38.3	\$77.4
Induced	\$33.3	\$31.9	\$31.0	\$11.0	\$33.2
Total	\$247.1	\$231.0	\$229.9	\$204.5	\$463.6
<i>III. Gross Regional Product (In Million \$)</i>					
Direct	\$69.2	\$84.1	\$64.4	\$21.0	\$77.8
Indirect	\$16.7	\$11.8	\$15.5	\$15.5	\$36.3
Induced	\$19.0	\$18.2	\$17.7	\$6.3	\$18.9
Total	\$104.0	\$114.1	\$97.6	\$42.7	\$133.0
<i>IV. Personal Income (In Million \$)</i>					
Direct	\$64.3	\$64.4	\$59.8	\$14.0	\$52.4
Indirect	\$11.0	\$7.8	\$10.3	\$10.1	\$24.2
Induced	\$10.7	\$10.3	\$10.0	\$3.6	\$10.7
Total	\$86.0	\$82.5	\$80.0	\$27.6	\$87.3
<i>V. Local and State Taxes (In Million \$)</i>					
Local	\$1.0	\$1.0	\$0.9	\$0.7	\$1.9
State	\$3.8	\$3.4	\$3.6	\$2.4	\$6.6
Total	\$4.8	\$4.4	\$4.5	\$3.1	\$8.5

Notes: Sums may not be equal to the totals due to rounding.

*Assumes \$550 million investment that will be completed in three years.

**See Table 9 for assumptions.

***This represents the optimistic assumption that (1) the Port will be operational, (2) marine-dependent and other tenants will occupy the industrial park with about a 40 percent vacancy rate, and (3) a steel mill will be constructed that employs 300 people.



IV.c. Related Jobs

The proposed \$35 million investment in Cates Landing will have a measurable impact on the regional transportation system. The current single modal transportation system will shift to the intermodal transportation system. This modal shift will help the manufacturing companies whose line of business depends on foreign exports. With the presence of a relatively inexpensive alternative, the manufacturing companies will gradually divert a portion of their foreign exports and intermediate goods imports to the port to remain globally competitive. Although it is difficult to precisely determine the level of port dependency of the companies in the region without a survey, we nevertheless attempted to estimate the number of port-related jobs. It is important to bear in mind that **“related jobs” are not new jobs created or leveraged** by the proposed port investment. These are the jobs **retained in the region due to the increasing competitiveness of area business as a result of port-related transportation cost savings.**

IV.c.i. Recent Layoffs

A glance at recent layoff figures in the core and surrounding regions shows how important the “related jobs” are for the regional economy. Table 17 shows the extent of manufacturing flight between 2008 and January 2009. Manufacturing employment declined about 15 percent in the core region and 31 percent in the surrounding region in one year. **The proposed \$35 million port investment is expected to stabilize the manufacturing sector by retaining existing jobs and attracting new ones to the region.**

Table 17: Northwest Tennessee Regional Port Authority at Cates Landing
Recent Layoff Analysis of the Study Region

<i>Core Region</i>	<i>Number of Job Losses</i>	<i>Period</i>
<i>Dyer</i>	659	2008-2009
<i>Lake</i>	N/A	Manufacturing companies migrated from the county in the 1990s
<i>Obion</i>	800	2008-2009 Through Buy-Out
Subtotal	1,459	
<i>2008 Manufacturing Employer</i>	8,190	
<i>2007 Manufacturing Employer</i>	9,649	
<i>Percent Decline in One Year</i>	-15.12%	
<i>Surrounding Region</i>		
<i>Crockett</i>	10	2009
<i>Gibson</i>	2,048	2008-2009
<i>Lauderdale</i>	500	2008
<i>Weakley</i>	157	2008
Subtotal	2,715	
<i>2008 Manufacturing Employer</i>	6,149	
<i>2007 Manufacturing Employer</i>	8,864	
<i>Percent Decline in One Year</i>	-30.63%	

Source: Compiled from various regional sources including media reports



IV.c.ii. Export Dependency

Based on the layoff figures in Table 17, retaining existing manufacturing jobs is critically important to the region. Estimated transportation savings due to modal shift with construction of the port will increase competitiveness of the regional manufacturing companies in the global economy. According to our estimates, **the proposed \$35 million investment in the port will help the core and surrounding regions retain 2,293 manufacturing jobs.** Tables 18 and 19 show the process of estimating these figures.

Table 18:
Estimated Port-Related Jobs: Dyersburg, Obion, and Lake

Commodity	Employment	Foreign Exports (FE) (million \$)	Share of FE in Total Export	FE Dependent jobs	Cates Landing Related Jobs
Tire manufacturing	2,373	\$164.78	21.34%	506	192
Air conditioning/refrigeration/warm air	427	\$64.33	23.70%	101	38
Power-distribution and specialty transformers	288	\$35.30	67.70%	195	74
Switchgear and switchboard apparatus	279	\$25.50	35.27%	98	37
Oilseed farming	1,229	\$25.48	52.39%	644	245
Motor vehicle parts manufacturing	605	\$24.17	12.93%		
Grain farming	1,767	\$22.12	45.31%	801	304
Construction machinery manufacturing	105	\$19.25	55.33%	58	22
Cotton farming	308	\$18.10	85.69%	264	100
Other rubber product manufacturing	501	\$17.46	9.62%		
Rubber and plastics hoses and belting	280	\$16.24	28.03%	78	30
All other chemical product and preparation	136	\$10.40	22.18%	30	11
Surgical appliance and supplies manufacturing	102	\$8.67	19.93%	20	8
All other textile product mills	151	\$8.04	16.45%		
Heating equipment (except warm air furnaces)	279	\$8.00	11.64%		
Total	8,830	\$467.83		2,796	1,063
Foreign Exports as Percent of Region's Total FE		61.28%			
Criteria for Related Jobs	20 percent foreign export dependency Large amount of foreign export volume Jobs are proportional to foreign export share. Related jobs are proportional to the share of noncontainerized cargo exports. Noncontainerized is estimated at around 38% for total foreign exports.				
Total-Related Jobs	1,063				

Note: It is hard to measure the level of port dependency without a survey. These are the closest estimates the BERCC derived given the layoff figures in the region in recent years in Table 17.



**Table 19: Northwest Tennessee Regional Port Authority at Cates Landing
Estimated Port-Related Jobs: Crockett, Gibson, Lauderdale, and Weakley**

Commodity	Foreign Exports (FE) (million \$)	Employment	Share of FE in Total Export	FE Dependent jobs	Cates Landing Related Jobs
Cotton farming	80.64	1,422	86.19%	1,226	466
Motor vehicle parts manufacturing	44.22	1,131			
Grain farming	29.99	2,272	46.07%	1,046	398
Oilseed farming	27.20	1,272	52.39%	666	253
Other aircraft parts and auxiliary equipment	26.24	101	88.82%	90	34
Switchgear and switchboard apparatus	23.68	280	35.30%	99	38
Aluminum refining and primary aluminum products	16.89	223			
Ammunition manufacturing	13.80	561			
All other chemical products and preparation	11.82	142	24.98%	35	13
Power boiler and heat exchanger manufacturing	4.39	104	21.62%	22	9
Other plastics product manufacturing	4.18	160	31.98%	51	19
Mining and quarrying sand/gravel/clay	3.87	172			
Total	286.91	7,840		3,237	1,230
Foreign Exports as Percent of Region's Total FE	55.21%				
Criteria for Related Jobs	20 percent foreign export dependency Large amount of foreign export volume Jobs are proportional to foreign export share. Related jobs are proportional to the share of noncontainerized cargo exports. Noncontainerized is estimated at around 38% for total foreign exports.				
Total-Related Jobs	1,230				

Note: It is hard to measure the level of port dependency without a survey. These are the closest estimates the BERC derived given the layoff figures in the region in recent years in Table 17.



V. IMPLICATIONS OF PROPOSED INVESTMENT FOR THE REGIONAL ECONOMY: INDICATORS OF DISTRESS REVISITED

How does the short- and long-term impact of the proposed port investment affect the indicators of distress in the study region? This section briefly revisits some of the indicators of distress presented in section II of this study.

V.a. Wages

Tables 20 and 21 present the impact of the proposed port investment on area wages. Table 20 highlights the typical sectoral jobs the port will bring to the region: primarily (1) construction jobs, (2) transportation and warehousing jobs, and (3) manufacturing jobs. Table 20 shows actual average wages by county in 2008, average wages by specific port-related sectors by county, and the percent difference between average county wages and average county wages for port-specific sector jobs. The data shows that average wages for port-specific jobs are substantially higher than average wages for the study area counties.

Table 20: Wage Impact of Proposed Short- and Long-Term Investment Northwest Tennessee Regional Port and Industrial Park at Cates Landing

	Dyer County	Lake County	Obion County
Current Average Wage (2008)*	\$30,680	\$23,088	\$35,672
With the Proposed Investment**			
Short-Term Construction Jobs	\$35,672	\$30,108	\$35,152
Percent Difference from the Average Wage	16.27	30.41	-1.46
Long-Term Transportation and Warehousing Jobs	\$35,828	\$45,188	\$41,496
Percent Difference from the Average Wage	16.78	95.72	16.33
Long-Term Manufacturing Jobs***	\$37,596	\$37,596	\$49,088
Percent Difference from the Average Wage	22.54	62.84	37.61

Source: Tennessee Department of Labor and Workforce Development and BERC Estimates (ES 202 Data)

*Current average wage reflects average wages across all industries in these three counties.

**Three major types of direct jobs will be generated in the study area with the port: (1) transportation and warehousing, (2) short-term construction, and (3) manufacturing (including a steel mill)

***Lake County does not have manufacturing facilities. Average wage for Dyer County is used as a proxy.



Model-driven average wages and total payroll by horizon (short, medium, long) are presented in Table 21. We included only direct jobs that will be leveraged by the proposed investment in the study region. Of particular concern, medium- and long-term average wages are expected to be significantly higher than the regional average. Once the port becomes operational, total payroll for direct jobs is expected to be \$32.9 million with average annual wages of \$33,367. The total payroll will increase to \$45.2 million and average wages to \$35,146 with the addition of a steel mill. These wages are significantly higher than average wages in Lake County, where the port will be housed.

**Table 21: Wage Impact of Proposed Short- and Long-Term Investment *
Northwest Tennessee Regional Port and Industrial Park at Cates Landing**

	Short Term		Medium Term		Long Term	
	Construction	with Steel Mill	Operation	Operation +Tenants	Steel Mill	Steel Mill +Port+ Tenants
Direct Jobs**	296	1,923	783	986	300	1,286
Average Wage***	\$27,027	\$27,167	\$34,815	\$33,367	\$40,997	\$35,146.97
Total Payroll	\$8,000,000	\$52,243,000	\$27,260,000	\$32,900,000	\$12,299,000	\$45,199,000

*Results are extracted from the regional IMPLAN model.

**Only direct jobs are included. Indirect and induced jobs and their payrolls were excluded from this calculation.

***Average wages are compatible with the average wages in the region based on ES-202 data (as presented in Table 20).

V.b. Unemployment

The impact of the proposed project on the unemployment rate for the core region is noteworthy, ranging from a short-term reduction of unemployment rate between 1.2 percentage points (port construction) and 7.2 percentage points (port and steel mill construction) to a long-term (permanent) reduction of unemployment rate between 4.7 percentage points (port and industrial park operation) and 6.5 percentage points (port, industrial park, and steel mill). Table 22 presents new unemployment rates by horizon of impact associated with the proposed investment.



Table 22: Unemployment Rate with the Port at Cates Landing

Region	Current			With the Port at Cates Landing*			
	Unemployment Rates (%)			Unemployment Rates (%)			
	Labor Force	Unemployed	2009	Short-Term		Medium-Term	Long-Term
Only Port & Industrial Park				with Steel Mill	Port & Industrial Park Operation	Port, Industrial Park, & Steel Mill	
U.S.	155,921,000	15,095,000	9.7				
Core Region	36,478	4,649	12.8	11.6%	5.6%	8.1%	6.3%
Core and Surrounding Region	91,590	12,928	14.1	13.7%	11.3%	12.3%	11.5%

Source: BERC and BLS (www.bls.gov)

*The BERC does not assume an increase in population. *Ceteris paribus*, unemployed residents will have job opportunities; thereby the pool of unemployed will shrink.

V.c. Income

Per capita income will experience a 4.6 percent increase in the short term in the core region (Table 23). The long-term income effect of the project on the core region is estimated at around a 3.9 percent increase in per capita income. For the extended region (core and surrounding area), the increase in per capita income is 1.9 percent in the short run and 1.6 percent in the long run.

Table 23: Per Capita Income with the Port at Cates Landing

Region	Current			With the Port at Cates Landing*			
	Personal Income	Population	Per Capita Income	Per Capita Income			
				Short-Term	Medium-Term	Long-Term	
2007 (in thousands)	2007	2007	Only Port & Industrial Park	with Steel Mill	Port & Industrial Park Operation	Port, Industrial Park & Steel Mill	
U.S.			\$39,419				
Core Region	\$2,145,395	76,546	\$28,028	\$28,238	\$29,320	\$28,749	\$29,109
Core and Surrounding Region	\$5,207,925	199,095	\$26,158	\$26,239	\$26,655	\$26,435	\$26,574

Source: BERC and BEA (www.bea.gov)



V.d. Poverty

The critical impact of the proposed investment will be on poverty rates in the study region including Dyer, Lake, and Obion counties. According to our estimates presented in Table 24, the proposed development will reduce the poverty rate by nearly half in the core region. Given the fact that the port is housed in Lake County, we expect to see a decline in the poverty rate in this county from about 39 percent to at least the national average of 13 percent with the proposed investment.

Table 24: Poverty (NTRP at Cates Landing)

Region	Current		With the Port at Cates Landing**			
	Number of People below Poverty	Percent of Population below Poverty	Poverty Rate (%)			
			Percent of People below Poverty Short-Term	Percent of People below Poverty Medium-Term	Percent of People below Poverty Long-Term	
	2007	2007	Only Port & Industrial Park	with Steel Mill	Port & Industrial Park Operation	Port, Industrial Park & Steel Mill
U.S.	38,052,247	13.00				
Core Region	13,093	17.10	15.79	8.75	11.61	9.50
Core and Surrounding Region	35,685	17.92	17.42	14.71	15.81	15.00

Source: BEREC and Census Bureau (www.census.gov)

*Lake County has the 15th highest poverty rate among more than 3,000 counties in the U.S.

**Assuming an average household size of 2.47



VI. CONCLUSION

Cates Landing is located in the northwest corner of Tennessee along the Mississippi River. The terrain is well suited for yearlong barge operations because it is above the 100-year floodplain. Despite ongoing efforts and strong interest in the region, only Phase I of the port has been completed. Total public and private investment in the port has reached nearly \$15 million so far.

Why is the construction of the port important? The study region has lost its competitive edge in the manufacturing sector because of the relocation of companies overseas to reduce their cost of operation. Constructing an intermodal port in Cates Landing will change the business dynamics in the study region. It will not only retain existing manufacturing companies in the region but also attract new companies to the region. Marine-related businesses themselves will employ a sizeable number of people. This expected virtuous cycle will then dramatically affect the quality of life in the region by significantly reducing the poverty rate, increasing per capita income, and reducing the unemployment rate. In addition, the decline in population will be reversed, and government revenues will stabilize.

These regional benefits summarized in Table 25 will be in addition to the benefits to the general public. A shift in the transportation system from single modal to intermodal will create efficiency, reduce fatalities and injuries, and prevent hazardous material spills and a certain portion of greenhouse emissions.

These expected benefits will be derived from the proposed \$35 million investment. According to our estimates, **every dollar of the proposed investment will generate benefits ranging from \$2.89 (lower bound) to \$6.21 (upper bound).**

In addition, the local economy will benefit handsomely (Table 25):

- In the short run, the region will gain between 406 and 2,184 new jobs.
- In the medium term, the region will gain between 1,412 and 1,703 new permanent jobs.
- In the long run, new permanent jobs will increase to 2,355.

Given the extent of economic distress in the region, the proposed \$35 million investment is well-worth it. The findings of this study strongly recommend this level of investment in the port.



Table 25: Northwest Tennessee Regional Port Authority at Cates Landing and Industrial Park
Summary Economic Impact Results

Impact Categories	<i>Horizon/Likelihood</i>				
	Short-Term (One-Time)		Medium- to Long-Term		
			<i>Medium (I)</i>	<i>Medium to Long Term(II)</i>	<i>Long Term (III)</i>
	The Port and Industrial Park Construction	What-If Scenario: Steel Mill Construction (Three-Year Average)	The Port Operation	The Port Operation & Industrial Park Tenants	Port Operation + Industrial Park (II) + Steel Mill
Business Revenue (Output) (in Mil. \$)	\$46	\$236.0	\$220.3	\$259.2	\$463.6
Employment (Jobs)	406	2,184	1,412	1,703	2,355
Value-Added (Gross Regional Product) (in Mil. \$)	\$20.2	\$105.2	\$73.9	\$90.2	\$133.0
Personal Income (in Mil. \$)	\$16.1	\$82.8	\$47.7	\$59.7	\$87.3
Local and State Taxes (in Mil. \$)	\$1.1	\$4.6	\$4.5	\$5.4	\$8.5



VII. WORKS CONSULTED and DATA SOURCES

In preparation of this study, we consulted numerous works in a short period of time. What follows is a selected number of these works that benefited us substantially.

Bureau of Economic Analysis (www.bea.gov)

Bureau of Labor Statistics (www.bls.gov)

Census Bureau (www.census.gov)

Congressional Budget Office, *The Economic Costs of Disruptions in Container Shipments*, March 29, 2006

Center for Ports and Waterways, Texas Transportation Institute, *A Modal Comparison of Domestic Freight Transportation Effects on the General Public*, 2009, College Station, Texas

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Economic Development Research Group, *The Cost of Highway Limitations and Traffic Delay to Oregon's Economy*, March 20, 2007

HDL-HLB Decision Economics Inc., *Economic Assessment of a Roanoke Regional Intermodal Facility*, January 7, 2008

IHS Global Insight, Wilbur Smith Associates, and the University of Memphis, *The Memphis Regional Infrastructure Plan*, June 16, 2009, Memphis, TN

IMPLANpro, Economic Impact Model (www.implan.com)

MARAD Port Kit and Accompanying Manuals (2000)

Martin Associates, *The 2007 Economic Impact of the Port of Seattle*, February 10, 2009, and several other studies done by this company (www.martinassoc.net)

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