

Northwest Tennessee Regional Port Authority

Statement of Revenues and Expenses (Operational)

D

\$2,750,000
 Lake County, Tennessee
 General Obligation Bonds, Series 2006 (Taxable)
 Industrial Park

Debt Service

Date	Principal	Coupon	Interest	Total P+I
06/01/2006	-	-	-	-
06/01/2007	-	-	165,000.00	165,000.00
06/01/2008	-	-	165,000.00	165,000.00
06/01/2009	-	-	165,000.00	165,000.00
06/01/2010	-	-	165,000.00	165,000.00
06/01/2011	45,000.00	6.000%	165,000.00	210,000.00
06/01/2012	50,000.00	6.000%	162,300.00	212,300.00
06/01/2013	50,000.00	6.000%	159,300.00	209,300.00
06/01/2014	55,000.00	6.000%	156,300.00	211,300.00
06/01/2015	60,000.00	6.000%	153,000.00	213,000.00
06/01/2016	60,000.00	6.000%	149,400.00	209,400.00
06/01/2017	65,000.00	6.000%	145,800.00	210,800.00
06/01/2018	70,000.00	6.000%	141,900.00	211,900.00
06/01/2019	75,000.00	6.000%	137,700.00	212,700.00
06/01/2020	80,000.00	6.000%	133,200.00	213,200.00
06/01/2021	85,000.00	6.000%	128,400.00	213,400.00
06/01/2022	90,000.00	6.000%	123,300.00	213,300.00
06/01/2023	95,000.00	6.000%	117,900.00	212,900.00
06/01/2024	100,000.00	6.000%	112,200.00	212,200.00
06/01/2025	105,000.00	6.000%	106,200.00	211,200.00
06/01/2026	110,000.00	6.000%	99,900.00	209,900.00
06/01/2027	120,000.00	6.000%	93,300.00	213,300.00
06/01/2028	125,000.00	6.000%	86,100.00	211,100.00
06/01/2029	130,000.00	6.000%	78,600.00	208,600.00
06/01/2030	140,000.00	6.000%	70,800.00	210,800.00
06/01/2031	150,000.00	6.000%	62,400.00	212,400.00
06/01/2032	160,000.00	6.000%	53,400.00	213,400.00
06/01/2033	165,000.00	6.000%	43,800.00	208,800.00
06/01/2034	175,000.00	6.000%	33,900.00	208,900.00
06/01/2035	190,000.00	6.000%	23,400.00	213,400.00
06/01/2036	200,000.00	6.000%	12,000.00	212,000.00
Total	\$2,750,000.00	-	\$3,409,500.00	\$6,159,500.00

Date And Term Structure

Dated.....	6/01/2006
First Coupon Date.....	12/01/2006
Frequency of Interest Payments.....	2 Per Year
First Serial Maturity Date.....	6/01/2011

Yield Statistics

Average Coupon.....	6.0000000%
Average Life.....	20.664 Years
Bond Yield for Arbitrage Purposes.....	6.0000000%
Bond Year Dollars.....	\$56,825.00

\$2,750,000
Lake County, Tennessee
Bond Anticipation Notes, Series 2006 (Taxable)
Industrial Park

Debt Service

Date	Principal	Coupon	Interest	Total P+I
06/01/2006	-	-	-	-
06/01/2007	-	-	137,500.00	137,500.00
06/01/2008	2,750,000.00	5.000%	137,500.00	2,887,500.00
Total	\$2,750,000.00	-	\$275,000.00	\$3,025,000.00

Date And Term Structure

Dated.....	6/01/2006
First Coupon Date.....	12/01/2006
Frequency of Interest Payments.....	2 Per Year
First Serial Maturity Date.....	6/01/2008

Yield Statistics

Average Coupon.....	5.0000000%
Average Life.....	2.000 Years
Bond Yield for Arbitrage Purposes.....	5.0000000%
Bond Year Dollars.....	\$5,500.00

\$2,750,000

Lake County, Tennessee
Bond Anticipation Notes, Series 2006 (Taxable)
Industrial Park

Debt Service

Date	Principal	Coupon	Interest	Total P+I
06/01/2006	-	-	-	-
06/01/2007	-	-	137,500.00	137,500.00
06/01/2008	2,750,000.00	5.000%	137,500.00	2,887,500.00
Total	\$2,750,000.00	-	\$275,000.00	\$3,025,000.00

Date And Term Structure

Dated.....	6/01/2006
First Coupon Date.....	12/01/2006
Frequency of Interest Payments.....	2 Per Year
First Serial Maturity Date.....	6/01/2008

Yield Statistics

Average Coupon.....	5.0000000%
Average Life.....	2.000 Years
Bond Yield for Arbitrage Purposes.....	5.0000000%
Bond Year Dollars.....	\$5,500.00



ECONOMIC IMPACT

Younger Associates has performed an analysis of the probable economic impact on Dyer, Lake and Obion Counties in Tennessee from the construction of a slackwater port and the development of a 1,000-acre industrial park at Cates Landing. Based upon a model of the local economy, which uses RIMS II input-output multipliers, the potential economic impact, jobs and new local tax revenues have been projected.

The development of the industrial park is estimated to create 3,000 new jobs directly and would result in the creation of another 2,604 jobs indirectly for a total of 5604 jobs. Wages and benefits paid to these new jobs will result in an annual economic impact of \$206.4 million generating \$4 million in new local tax revenues annually.

New capital investments for the industrial park estimated at \$100 million will create a one-time impact of \$558,173 in new local tax revenues during the construction and set-up period.

Real and personal property taxes paid directly by the park could exceed \$1.5 million over a ten-year period, not considering tax incentives.

The investment of \$41 million for the construction of the port will generate a one-time impact of \$715,762 in local taxes.

Cates Landing Port Economic Impact Analysis Assumptions

- Cost to construct port facility, rail extension and utilities is projected at \$41 million.
- 1,000 acres of land surrounding the port will be acquired and developed as an industrial park
- For each acre of industrial land, 3 jobs will be created and \$100,000 of capital investments will be made by private industry. These are conservative projections based on the low end of the range of historic development in Tennessee.

See endnotes for sources and other factors used in calculations.

**Industrial Park Development
in Conjunction with
the Proposed Northwest Tennessee Port
Economic Impact Analysis**

Annual Impact of Operations

Employment, Direct		3,000
Wages & Benefits, Direct	\$	121,830,000
Employment Multiplier ¹		1.8680
Total Employment		5,604
Employment, Indirect		2,604
Annual Average Wage ²	\$	32,488
Wages, Indirect	\$	84,598,752
Total Wages	\$	206,428,752
Sales Tax Revenue ³	\$	1,986,877
Other Tax Revenue ⁴	\$	566,260
Residential/Commercial Property Tax Revenue ⁵	\$	1,494,363
Total Tax Revenue	\$	4,047,499

**Industrial Park Development
in Conjunction with
the Proposed Northwest Tennessee Port
Economic Impact Analysis**

<u>Property Taxes Generated by Industrial Park</u>	<u>10 Year</u>
Real Property	\$ 50,000,000
Assessment Rate	0.40
Tax Rate	0.0240
Annual Tax	\$ 480,000
10-Year Total Tax - Real Property	4,800,000
Personal Property	50,000,000
Assessment Rate	0.30
Tax Rate	0.0240
Annual Tax <small>(before depreciation)</small>	\$ 360,000
10-Year Total Tax - Personal Property <small>(after depreciation)</small>	\$ 1,508,400

**Industrial Park Development
in Conjunction with
the Proposed Northwest Tennessee Port
Economic Impact Analysis**

One Time Construction Impact

Construction And Site Work	\$	50,000,000
Economic Impact Multiplier ⁶		1.4115
Economic Impact	\$	70,575,000
Equipment Purchase/Set-up	\$	50,000,000
Economic Impact Multiplier ⁷		1.4911
Economic Impact	\$	74,555,000
Total Economic Impact	\$	145,130,000
Sales Tax Revenue ³	\$	434,376
Other Tax Revenue ⁴	\$	123,797
Total Tax Revenue	\$	558,173

Notes for Northwest Tennessee Port and Industrial Park Development Economic Impact Analysis:

1. US Bureau of Economic Analysis, RIMS II direct-effect employment multiplier for Dyer County, Tennessee. Number of Indirect Jobs Created Per Direct Job, average of aggregate multipliers for manufacturing.
2. Projection based upon data from Tennessee Department of Labor; Annual Average Wage/Salary for Manufacturing in Dyer County, 1998 based upon an assumption of 4.5% average wage increase for 1999 and 2000.
3. US Department of Labor, "Consumer Expenditure Survey, Southern US" 1997; factor applied to determine the rate of indirect or "downstream" expenditures on sales and taxable goods and services at the local option tax rate of .0275. It is assumed all purchases associated with construction and equipment will be sales tax exempt.
4. Based upon June 1995, July 1996 collections of Business, Alcohol, Motor Vehicle and other taxes compared to sales tax.
5. U.S. Bureau Data for median value of housing in Dyer County, Tennessee. This ratio indicates the new property value created within Dyer County per each new job created in the local workforce based upon historical trend. The new property value may be new single family home, new rental property, expansions or improvements to existing property. A portion of commercial property value would also be included, however, for the sake of conservatism only the residential rate of assessment is used. Also based upon an assessment rate of 25% and Dyer County tax rate of \$2.40 per \$100 of assessed value.
6. US Bureau of Economic Analysis, RIMS II final-demand aggregate multiplier for Dyer County, Tennessee for construction.
7. US Bureau of Economic Analysis, RIMS II final-demand aggregate multiplier for Dyer County, Tennessee for wholesale trade.

*All calculations are in constant 2000 dollars. No tax rate increases are assumed.

**A Review of Proposed
State Funding of the
Northwest Tennessee Regional
Port and Industrial Park**

by
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and
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Forecast Director

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The University of Memphis

June 2004

EXECUTIVE SUMMARY

This report provides a brief review of Younger Associates' economic impact study of the proposed Northwest Tennessee Regional Port and Industrial Park and a brief analysis of the Corps of Engineers' study of the same facility. Findings of our analyses show that:

- Though optimistic, the Younger Associates economic impact study is basically correct in its findings.
- There is evidence of demand for completion of the port and industrial park.
- The construction of the port and industrial park will bring jobs, income, and tax revenue to the citizens of Northwest Tennessee, though perhaps not as much as Younger estimated.
- Prospective major employers for the industrial park are likely to seek incentives and other government assistance that will be in addition to the initial costs of the port and the industrial park.
- While the site is remote, the Corps of Engineers' cost/benefit cushion of 1.89 indicates that the port will strengthen the area's economy more than enough to justify the initial national, State, and local investments in the area.
- A recommendation for the State to invest in the project is supported by the "regret criterion." While it is uncertain how large the benefits of the project may be, it is certain that if the project is not completed, there will be no benefits to the citizens of Northwest Tennessee.

The proposed Northwest Tennessee Regional Port and Industrial Park has the potential for bringing jobs, income, and tax revenue to the citizens of Northwest Tennessee.

**PART I. PROPOSED STATE FUNDING OF THE
NORTHWEST TENNESSEE REGIONAL
PORT AND INDUSTRIAL PARK: A
CRITIQUE OF YOUNGER ASSOCIATES'
ECONOMIC IMPACT ANALYSIS**

This section concentrates on the economic impact analysis by Younger Associates of the proposed Northwest Tennessee Regional Port and Industrial Park at Cates Landing. Of particular interest in this review is the projected economic impact from ongoing port and industrial park operations.

Primary Assumptions

The one-time impact of construction of the port and the associated industrial park appears accurate. The analysis appears to be straightforward and uses standard economic impact methodology (RIMS II methodology of the U.S. Bureau of Economic Analysis). The influx of millions of dollars in construction money will undoubtedly produce a positive economic impact on the area. However, the size of the impact is a function of the number of dollars introduced into the local economy.

The estimated impact from ongoing operations of the port and the industrial park, particularly the industrial park, is a bit more speculative. While the use of the RIMS II methodology is not in question, one of the critical assumptions deserves more scrutiny: \$100,000 in capital investment and three jobs created per acre for the 1,000-acre industrial park. There is no guarantee that 3,000 jobs and \$100 million (1,000 acres x \$100,000) in capital investment will materialize over time. According to the Younger report, these estimates are based upon the historical experiences of other developments in Tennessee. The jobs and tax revenue listed are not likely to materialize in the absence of the port and the industrial park, particularly the industrial park.

Yet, there is support for the estimate of \$100,000 of capital investment per acre in a March 22nd presentation to the Governor. In the first section of the report under the caption “They Came”–“They Saw”–“They Left” [sic], the last bullet point on the page states:

In the last ten years over \$1 billion in direct capital investment has been lost. Missed projects include: American Yeast, Excalibar Minerals, IPSCO, ConAgra, NUCOR, Grain Processing Inc.

While some announced intentions do not materialize, some do. Had the port been in existence when the businesses were looking, it is likely that at least some of them would have followed through with capital investment and jobs. If only 10.0 percent of the \$1 billion had materialized, that would amount to \$100 million in capital investment, which is equal to \$100,000 per acre for 1,000 acres. Because of this, Younger Associates’ estimate of \$100,000 of capital investment per acre appears to be reasonable.

One thing that is clear from both the Younger Associates report and the March 22nd presentation to the Governor is that the bulk of the economic benefits of this project stem from industrial park development and not from the port component. However, the two components are inseparable: without the port, there probably would be no industrial park development.

Without the industrial park, the port would add little to the local economy, even if all of the letters of commitment to use the port came to fruition (but, these commitments may be dependent upon completion of the industrial park). This is demonstrated in Tables 1 and 2. Table 1 presents five years of estimated port operating revenue (per Younger Associates). The total operating revenue from the last column in Table 1 was used in Table 2¹ to determine the with an estimated economic impact from port operations alone.

¹ It should be noted that Memphis MSA multipliers were used instead of Lake County multipliers since the Bureau did not have immediate access to the Lake County multipliers. Even so, the use of Memphis multipliers is acceptable since the two sets of multipliers do not have enough variation to impact the conclusions presented here. Whether Memphis multipliers or Lake County multipliers are used, the conclusion that the port alone will create few jobs remains the same.

Table 1. Estimated Operating Revenue of the Northwest Tennessee Port at Cates Landing

	Tonnage	Wharves	Other Fees	Land Leases	Total
Year 1	960,000	\$192,000	\$48,000.00	\$ 26,000	\$266,000
Year 2	998,400	\$199,680	\$53,913.60	\$ 79,560	\$333,154
Year 3	1,038,336	\$207,667	\$62,300.16	\$216,400	\$486,367
Year 4	1,079,869	\$215,974	\$69,111.64	\$331,080	\$616,166
Year 5	1,123,064	\$224,613	\$78,614.50	\$365,820	\$669,047

Source: *Overview & Projected Budget (Cates Landing Northwest Tennessee Port & Industrial Park)*, Younger Associates, April 2001.

Table 2. Estimated Economic Impact of Cates Landing Port Exclusive of Industrial Park

	Total Port Revenue (1)	Multiplier and Multiplier Models		
		Output (2)	Earnings (3)	Employment (4)
		(\$ Billions)	(\$ Billions)	(1,000 Jobs)
Year 1	\$266,000	\$ 488,536	\$ 90,147	3.2
Year 2	\$333,154	\$ 611,870	\$112,906	4.1
Year 3	\$486,367	\$ 893,262	\$164,830	5.9
Year 4	\$616,166	\$1,131,650	\$208,818	7.5
Year 5	\$669,047	\$1,228,772	\$226,740	8.2

(1) Entries in this column were derived in Table 1.

(2) Each entry in this column represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

(3) Each entry in this column represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

(4) Each entry in this column represents the total change in number of jobs that occurs in all industries for each additional \$1 million of output delivered to final demand by the industry corresponding to the entry.

NOTE: Multipliers are based on the 1998 Benchmark Input-Output Table for the Nation and 2000 regional data and are for the water transportation industry for the Memphis MSA.

As shown in Table 2, port revenue rises from \$266,000 in year one to nearly \$670,000 by year five. Accordingly, the economic impact rises from less than \$500,000 in output, \$90,147 in earnings, and 3.2 jobs in year one to over \$1.2 million in output, \$226,740 in earnings, and 8.2 jobs in year five. While the benefits from the port alone may be insufficient to justify further investment, the port and the industrial park are linked together and will support the investment in the port facility.

In the Younger Associates estimate of the annual impact of operations of the proposed industrial park, total direct wages and benefits of the 3,000 direct employees are cited as being \$121,830,000. This equates to approximately \$40,610 per job and may be slightly high. No source could be found for the estimate. Using the year 2000 U.S. Bureau of Labor Statistics estimate of 27.0 percent as the percentage of total compensation equal to benefits allows a breakdown of Younger's estimate into the separate components of wages and benefits: Wages per job would equal \$29,645, while benefits per job would be \$10,965. Note that the wage figure of \$29,645 per direct job is less than the estimated wage per indirect job of \$32,488 used by Younger.

The wage per indirect job used by Younger is cited as the annual average manufacturing wage of \$32,488 (in 2000 dollars) for Dyer County and may be slightly high. In 2000, the average wage for all production occupations² for Dyer, Gibson, Lake, and Obion counties was approximately \$11.28 per hour, or approximately \$23,462 annually, and is over \$9,000 (or 27.8 percent) less than the Younger figure. It is possible that the Younger figure represents a more specific type of manufacturing, perhaps durable goods manufacturing. However, regardless of the type, most potential tenants are likely to be involved in some form of production-related employment.

With regard to Younger's direct and indirect wage and benefit estimates, both appear to be somewhat optimistic. Accordingly, all sales and other tax revenue estimates based on Younger's wage estimates are also optimistic. Adjusting the sales tax revenue estimates downward by the 27.8 percent difference results in estimated annual sales tax revenue of \$1,434,525 and other tax revenue of \$408,840, still positive but lower than Younger's estimates.

² 2000 average hourly wage for all production occupations in Non-MSA Region 3 (Dyer, Gibson, Lake, and Obion counties) from Tennessee Department of Labor and Workforce Development.

Other Points to Consider

- The Nissan automotive assembly plant in Canton, Mississippi, required a total of \$1.4 billion in capital investment by Nissan and \$363 million in direct incentives (excluding interest on the \$363 million over 20 years) provided by the state of Mississippi. The plant is projected to provide about 4,000 direct jobs³ when fully functional by 2005 (currently employs around 3,000). The multiplier impact of Nissan in Canton is estimated to result in a total of 16,212 jobs (which includes the 4,000 direct jobs). Much of the economic impact of the Nissan plant comes from suppliers who have moved to or are expected to move to the Canton area. The plant is located on approximately 1,200 acres, which equates to almost \$1.5 million in capital investment and 3.3 direct jobs per acre of development.
- Birmingham Steel constructed and operated (briefly) a mini-mill in Memphis in the late 1990s. Built at a cost of around \$215 million,⁴ the plant employed⁵ 250 persons on a total of 500 acres (equivalent to one-half of a job and \$430,000 of capital investment per acre). Note that the cost cited here does not include public dollars that were spent on infrastructure improvements, tax abatements, and job training. Aside from the construction impact, the plant's operation was so brief that it had little impact on the Memphis economy.
- Prospective major employers for the proposed industrial park are likely to seek government-provided incentives and assistance including tax abatements, job-training programs for employees, and infrastructure improvements. The cost of these incentives will be in addition to the initial costs of the port and the industrial park.

³ See "The Economic Impact of Nissan in Mississippi," at <www.madison-co.com/nissan/theeconomicimpactofnissaninmississippi.htm>.

⁴ See "Birmingham Steel Greenfield SBC Billet Mini Mill, USA," at <www.steel-technology.com/projects/birmingham/>.

⁵ See "Steelmaking Plants Shutdown or Idled Since 2000," at <www.uswa.org/uswa/program/adminlinks/doc>.

Conclusion

While the Younger Associates estimates of wages and tax revenues generated appear to be optimistic, there is evidence of demand for the completion of the port and the industrial park. In the absence of firm commitments for the industrial park, it may take many years for the State and local governments to recoup their investments in the project. Yet, if the port and industrial park are fully developed, it is possible that Northwest Tennessee could benefit substantially in jobs, income, and tax revenue that may more than cover the project's development costs.

The vast majority of the benefits of the port and industrial park will stem from development of the industrial park, and the development of the industrial park effectively hinges on completion of the port. Realizing the full potential benefit of Northwest Tennessee Port at Cates Landing would require completion of all phases of the planned development. While full development may open the door to opportunity, it will not guarantee it. On the other hand, failure to develop the port and industrial park will guarantee zero benefits for the citizens of Northwest Tennessee.

**PART II. PROPOSED STATE FUNDING OF THE
NORTHWEST TENNESSEE REGIONAL
PORT AND INDUSTRIAL PARK: AN
ANALYSIS OF THE CORPS OF
ENGINEERS' ASSESSMENT**

Feasibility and the Corps Analysis

The fiscal feasibility of the port project relies on funding from federal sources. From the Corps of Engineers' perspective, since the site is located largely above the flood plain, it has topographical advantages over alternative sites within 100 miles. The location is rated as Tennessee's second most attractive port site on the Mississippi River in terms of this topography, the location of rail service, and the availability of interstate access. (Tennessee's number one port site is in Memphis, which would compete against the proposed site.)

Estimates of transportation cost savings that would make the project cost effective by Corps of Engineers standards are reasonably accurate, even if some of the analysis dates back to 1999. The changes in the Northwest Tennessee industrial economy over the last few years work against the demand for port facilities. However, the Corps' estimate of an 89.0 percent cost/benefit cushion (with the 1.89 ratio) should be adequate to suggest that the area's economy would be strengthened by the port more than enough to justify the initial national, State, and local investments in the area. While some recent job losses in manufacturing are permanent, there is likely to be some rebound in manufacturing from a business cycle recovery. Thus, the near-term prospects for the need for the port may be close to those estimated by the Corps.

Apparently, the Corps of Engineers is focusing its efforts on developing all economically-feasible improvements to the Mississippi River's transportation capacity. The Corps has determined that the proposed port meets its feasibility standards. However, the Corps often has to ration funds among feasible projects, leaving some attractive opportunities untaken.

While the proposed port site has valuable topographical assets and proximity to rail and highway access, it has one obvious weakness: In economic terms, its location is relatively remote. If the site were ten miles north of Memphis, it would already have been exploited for its economic potential. If the site had been developed years ago, the area would already have benefitted from industrial investments.

Decision Alternatives

Suppose the decision is made to deny funding for the proposed project. In the future, an economic report is likely to conclude that there is just enough industrial activity in the area to justify federal spending to save on transportation costs. There will be little proven ability to attract new industry because of the improved transportation. State officials will face the same qualitative decision factors as today and will probably wish that the 2005 choice had been to do the project.

The economic development payoffs to the State will not follow the pattern that could be anticipated from investment in infrastructure for a metropolitan area. There will be no smooth path of growing economic benefits. The State's investment will almost certainly deliver sizable fiscal payoffs sometime in the future. Once the park starts growing, the benefits may be very large relative to the investment. The main aspect of the risk is how long the State will have to wait for the benefits. In addition, the project is not an all-or-nothing risk since there are immediate, highly probable transportation cost savings detailed by the Corps of Engineers.

A recommendation that the State invest in the project can be supported by the "regret criterion" for decision making under risk and uncertainty. This criterion has been in and out of favor since the 1940s. While it has flaws, economists believe that many people follow the criterion's thought patterns, and it is certainly appropriate if outsiders are active in second-guessing decisions. The assumption is that the decision maker has to commit to a course of action before knowing some important fact. That fact is not known now, but will be apparent over time. When the uncertainty is resolved, then anyone can compare the benefit that the chosen course delivered versus the benefit that a different course would have delivered. Regret exists if there is a big

difference between the payoff from the best choice possible, given how the uncertainty resolved itself, and the payoff to the decision maker because of his actual commitment. Logically, people try to “minimize the maximum regret possible,” which is nothing more than trying not to look bad if things don't go just right.

In this case, the uncertain factor is whether there will be heavy demand for industrial space at the proposed port. There is no way to make that determination now; only time will tell. One may hypothesize about the State's benefits under alternative choices and alternative business environments. Suppose there is no great future demand for industrial space in Northwest Tennessee. If the State invests in the project, then the State will receive relatively small annual benefits from the transportation cost savings. If the State does not invest in the project, then there will be no transportation cost savings.

Suppose there is demand for the industrial space that is eventually realized. If the State invests in the project, then the State will get relatively large benefits. If the State does not invest in the project, then there will be no benefits.

While it cannot be said how the issue will be resolved, there can be a best choice to avoid regrets. If the decision is made to withhold State funds, then the level of regret will be very large (if demand is good) or moderate (if only transportation cost savings are foregone). If the decision is made to proceed with State funding, then regrets are minimized regardless of how the industrial market demand develops since regrets would be zero in either market condition. The best choice is clear: Invest enough in the port and industrial park to make the project go.

Recommendation

Assuming that federal funds are used to partially support the port's construction, it is recommended that Tennessee meet minimum standards for matching funds. Additionally, Tennessee should be ready to make added investments in the area's infrastructure contingent upon prospects that arise in the

future. For example, the future Interstate 69 may be within 20 miles of the port. The State of Tennessee would find it cost effective to improve highways from the port to the interstate.

ECONOMIC ANALYSIS

INTRODUCTION

The purpose of this part of the special investigation of the proposal for Northwest Tennessee Harbor is to provide the decision-makers with economic insight into the economic feasibility of constructing the project. There are three major parts to this economic analysis section. Part 1 is designed to discuss the project setting, project conditions, and project benefits. The project benefits developed in this section are used to establish federal interest in the project investment and are developed with respect to National Economic Development (NED). Part 2 focuses on regional economic impact analysis. The purpose of this section is to provide the local decision-makers with some insight when examining the impacts of the public investment with respects to the local economy and local fiscal impacts. Part 3 The Economic Base Study. The three parts are:

Part 1.

- Introduction;
- Project (NED) Costs and Benefits Analysis;

Part 2.

- Regional Economic Impact Analysis (of the Capital Investment Spending);
- Local Public Finance Impact Analysis (of the Capital Investment Spending);

Part 3.

- Economic Base Study.

The Project Conditions section establishes the benchmark condition from which the project benefits are measured. The four project conditions with respect to the project benefit categories are:

- Present without Project conditions;
- Present with Project conditions;
- Future without Project conditions;
- Future with Project conditions;

The first two project conditions define the with and without project conditions with respect to the present period when the project is implemented. The latter two project conditions describe the future conditions for the with and without project conditions. The without project conditions: both present (existing) and future are expected to remain, at best, the same and, at worst, somewhat diminished due to declining population and industry base. The Cates Landing area will be used for agricultural production and have a potential harbor location site that remains without development and the current modes of transportation (truck & rail) will also be the future mode. Lake County, which has the highest poverty rate, and lowest per capita income in the state of Tennessee remains one of the economically depressed counties in state. The 1990 through 2000 trend has seen a declining population and industry base. The with project conditions: both present (existing) and future are expected to reflect some moderate growth in economic activity

Location Description

The project area is located on the Westside of Lake County, Tennessee adjacent to Cates Landing at Mississippi River Mile 900. (See Plate 1) This landing is elevated and is not subject to flooding. An old chute of the Mississippi River connects Cates Landing to the Mississippi River. In the past, the U.S. Army Corps of Engineers used this site to cast and store concrete mat used in stabilizing the Mississippi River. On December 15, 1992, the U.S. Army Corps of Engineers gave this site to Lake County, for their use because of the reduced need for concrete mat on this region of the Mississippi River.

Cates Landing and the adjacent land is an area that Lake, Dyer and Obion Counties want to develop into an industrial park. These counties formed a Port Authority that has taken over sponsorship of the development of a harbor project from the Lake County Government.

Cates Landing is adjacent to Tiptonville, Tennessee and is near state Highway 78 and 22. State Highway 78 runs to Dyersburg, Tennessee connecting with U.S. Highway 51, while Highway 22 runs into Union City, Tennessee, connecting U.S. Highway 51. Additionally, the area has a regional airport at Reelfoot Lake with a 3,500-foot concrete airstrip that is all-weather and lighted. The TennKen Railroad that operates from Dyersburg, Tennessee to Hickman, Kentucky serves the area. Finally, truck transportation service is provided by many carries throughout the area.

Appendix II ALTERNATIVE SOLUTIONS

During the feasibility process different alternatives were analyzed to achieve the optimum plan that has both a Federal interest and is acceptable by the local sponsor. Factors considered during the study were as stated below:

1. compatibility with existing or planned use of the surrounding area;
2. impacts to economic development in the community;
3. ease of acquiring land and disposal of dredged material;
4. access to the harbor; and
5. environmental impacts.

Alternatives Considered

Six alternatives were considered to provide river access to the proposed industrial park to be located at Cates Landing, Lake County, Tennessee, River Mile 900. All alternatives were located in an old chute of the Mississippi River and would be within the navigational servitude and fast lands would not be created. (Ordinary High Water Mark elevation at River Mile 900 is 285.0 National Geodetic Vertical Datum. These alternatives are described in Table 1. Alternative 6 is the future without Federal action.

Table B
Detailed Analysis for Alternatives 4 and 5

<u>Items</u>	4 with Berthing Area	5 with Berthing Area
Top Elevation, ft NGVD	285.0	285.0
Bottom Elevation, ft NGVD	250.0	250.0
Harbor Area, acres	33	64
Canal Length, ft	5,000	9,000
Canal Bottom-Width, ft	130-225	130-225
Canal Depth, ft	9	9
Diameter Turning Basin, ft	300	300
Canal Side Slopes	1V:5H	1V:5H
Canal Excavation, cy	195,000	1,020,000
Riprap, tons	5,600	30,600
Filter Gravel, tons	2,800	15,300
Dredge Material Disposal Area, acres	16	86
Environmental Protection, ft	1,950	11,800
Estimated Clearing, acres	14	51
Areas where mitigation may be impacted, acres	NA	28
Estimated Average Maintenance Dredging, cy	111,000	122,000
Impact, acres	20 wet, 2 FW	60 wet, 14 FW
Impact Habitat, AHUV	9	27
Mitigation (acres)	47	134
GNF Parametric Costs	\$1,360,751	\$4,265,496
Total Present Value O&M	\$2,663,828	\$2,941,636
Associated Site Development Costs	\$19,331,800	\$14,056,000
Total Costs	\$23,356,379	\$21,263,132
Annual Average Equivalent Costs	\$1,404,849	\$1,278,944
Benefits	\$2,506,950	\$2,506,950
Benefit/Cost Ratio	1.78	1.96
Excess Benefits	\$1,102,101	\$1,228,006

Notes:

FW – Farmed Wetland

AHUV – Annualized Habitat Unit Value

Mitigation would include purchasing prior converted farmland within the batture land of the Mississippi Main Line Levee.

Appendix VII Table D
Appendix VIII NORTHWEST TENNESSEE REGIONAL HARBOR
Appendix VIII MCACES ESTIMATED PROJECT FIRST COSTS
(\$000)

Item	Quantity	Unit	Contract	Contingency	Total
LERR*	239.05	AC	\$435.0	\$89.0	\$524.0
Land, Project Disposal	85.5	AC	158.0	40.0	198.0
Land, Mitigation	118.0	AC	142.0	35.0	177.0
Land Acquisition Cost			64.0		64.0
Project Subtotal			364.0	75.0	439.0
Land, Berth. Area Disp.	19.5	AC	36.0	9.0	45.0
Land, Mitigation	16.0	AC	19.0	5.0	24.0
Land, Acquisition Cost			16.0		16.0
Berthing Area Subtotal			71.0	14.0	85.0
Relocations			0.0		0.0
Harbor Construction			2,738.7	392.7	3131.4
Project (Non-Dredge)					
Mob/Demob	1	JB	29.1	5.9	35.0
Clearing	51.0	AC	137.9	27.5	165.4
Excavation	187,100	CY	232.6	46.4	279.1
Filter Mat./Crushed Stone	15,300	TN	196.5	39.2	235.7
Riprap	30,600	TN	424.4	84.9	509.3
Environmental Protection	11,800	LF	24.7	4.9	29.6
Environmental Restoration	134.0	AC	67.3	13.5	80.8
Turfing	10.0	AC	7.5	1.6	9.1
Subtotal			1,120.0	223.9	1,343.9
Berthing Area					
Excavation	47,600	CY	68.9	13.8	82.7
Non-Dredge Subtotal			1,188.9	237.7	1426.6
Project (Dredge)					
Mob/Demob	1	JB	350.9	35.0	385.9
Dredging	872,900	CY	1,027.0	101.6	1,128.6
Subtotal			1,377.9	136.6	1,514.5
Berthing Area					
Dredging	147,100	CY	171.9	18.4	190.3
Dredge Subtotal			1,549.8	155.0	1,704.8
E & D	1	JB	328.7	65.7	394.4
Project			299.7	59.9	359.6
Berthing Area			29.0	5.8	34.8
S & A	1	JB	273.8	54.8	328.6
Project			249.7	49.9	299.6
Berthing Area			24.1	4.9	29.0
Total			\$3,776.2	\$602.3	\$4,378.5
Project			3,411.3	545.4	3,956.7
Berthing Area			364.9	56.9	421.8

*LERR-Lands, easements, rights-of-way, and relocations.

WATERBORNE COMMODITIES THROUGH THE HARBOR

Calcium carbonate, petroleum, paper, natural rubber, steel coils, and soybean meal will be the incoming cargo for Northwest Tennessee Harbor. Barge shipment of these commodities is expected to continue to be an important component of future traffic at the port. Among transportation modes, barge rates are the lowest and rail rates are the next most economical.

Location Quotient Analysis was used to determine the key export industries in Lake County, and the Dyer, Lake, and Obion Counties Region. Then using this data to survey, local interests identified firms that would use barge transportation if new harbor facilities existed. Such a shift in transportation mode could result in new cost savings generated by the additional traffic. The following assumptions were made:

- (1) Location quotients can be used to determine which industries in Lake, Dyer, and Obion Counties, Tennessee are export oriented; and,
- (2) Industries that have presumably found a location advantage in Lake, Dyer, and Obion Counties, Tennessee are potential future users of the proposed expanded harbor.

BENEFITS

According to Section 7a of the 1966 Transportation Act, Public Law 89-670, the primary direct navigation benefit of a water resource project is defined as the product of the transportation savings to shippers using the waterway and the estimated traffic that would use the waterway. The calculated navigation benefits by commodity group are described below. Due to confidentiality, we did not present a detailed computation of benefits here but aggregated estimates of cost savings that would accrue to future port users.

Benefits are based on inter-modal transportation shifts from rail or truck to barge as revealed from surveys with potential shippers and estimates provided by traffic management specialists. The computed the difference between barge and rail rates to estimate transportation cost savings for each commodity. Where applicable, handling charges are neither separately identified per mode nor part in this study due to the following reasons.

1. There are no separate handling charges for overland movements by rail or truck. Shippers are furnished empty equipment at origin that is loaded by consignors and unloaded at destination by consignees. Carriers do not perform loading/unloading services and neither publishes nor charge separate handling rates.
2. Barges loaded or unloaded at private terminals, such as Bunge or Conagra, within a port do not incur any separate handling charges.

$$[1] \quad PV = \sum \frac{S_i}{(1+r)^n}$$

where S_i represents transportation cost savings in year i , r is the discount rate, and n is the number of years in which benefits will be realized. Transportation cost savings result from differences between freight line-haul rates among alternative modes, net of additional handling charges. Thus,

$$[2] \quad S_i = F_i - H_i$$

where F_i is freight line-haul savings in year i and H_i is defined as the additional handling charges associated with selecting barge transportation over the next best alternative in year i . Let R_i denote the difference (measured in dollars per ton mile) in freight rates between barge transportation and the next most economical alternative in year i . T_i is defined as total traffic to and from the various points in year i (measured in ton miles). Thus, freight savings can be computed as:

$$[3] \quad F_i = R_i \times T_i$$

Let X_i denote additional handling charges (measured in dollars per ton) incurred by using barge transportation rather than the next most economical alternative in year i . C_i is defined as total cargo handled at the harbor in year i (measured in tons). Thus,

$$[4] \quad H_i = X_i \times C_i$$

By substitution have:

$$[5] \quad PV = \sum \frac{[(F_i \times T_i)] - [(X_i \times C_i)]}{(1+r)^n}$$

Barge rates were obtained for each port. Barge rates are stated in dollars and cents per net ton based on a minimum charge of 1,400 net tons per rake barge and 1,600 net tons per box barge. Source data for rail rates are published tariffs and circulars. Rail

cost is a Non-Federal responsibility. Estimates of financial first costs are based on October 2004 prices. Total construction costs are divided into Federal and Non-federal costs. This is cost-shared by the Federal Government and the Non-Federal sponsor.

Economic Cost. The economic cost of a water resource project is the value foregone in alternative uses of the goods and services (and ultimately the factors of production) required for construction operation and maintenance of the project. From the national perspective, the economic costs of a water resource project are the values foregone in alternative uses of resources. In addition, this cost is the value of resources destroyed or otherwise adversely affected by the project. Specific economic costs detailed in this analysis include the initial investment, operation and maintenance and site development. These costs are also the National Economic Development (NED) cost, which include all costs directly related to the Federal project that are necessary to achieve the claimed benefits. Specific economic costs detailed in this analysis include the initial investment cost and operation and maintenance (O&M) costs to continue use of the channel.

TABLE 2
Northwest Tennessee Harbor
Annual Benefits Using Rail vs. Barge Transportation Costs

	<u>Transportation Cost (\$)⁴</u>		Transportation Savings (\$)
	By Rail	By Barge	
Inbound Shipments:			
Commodity			
Calcium Carbonate	\$2,325,000	\$1,464,000	\$ 861,000
Natural Rubber	\$1,140,000	\$ 746,700	\$ 393,300
Paper	\$8,272,727	\$7,681,818	\$ 590,909
Petroleum (Gasoline)	\$ 897,750	\$ 792,000	\$ 105,750
Petroleum (Diesel)	\$1,136,250	\$ 688,500	\$ 447,750
Soybean Meal	\$ 610,000	\$ 563,250	\$ 46,750
Steel Coils	\$ 473,600	\$ 412,200	\$ 61,400
Transportation Savings:			\$2,506,950

Initial Investment Cost. The initial investment cost at the time the project becomes operational or begins to produce benefits is the sum of construction cost and other initial costs plus interest during construction. Interest during construction (sinking fund) accounts for the cost of capital incurred during the construction period.

Operation & Maintenance (O&M) Cost. Future use of the harbor requires operations and maintenance, including dredging to be done on an annual basis. Continued use of the channel will require operations and maintenance (O&M) costs, which will not begin until the project is completed.

Associated Development Cost. Associated costs are for measures, over and above the Federal project measures, which are required for the benefits to be realized. Like the other NED costs discussed above, these are included in benefit-cost ratios. To achieve full use of the harbor, there is \$14,056,000 in Associated Site Development Cost (non-GNF) features needed. Associated Site Development costs are all non-Federal and are requirements to make the harbor operational. Some of these site development requires are as follow: \$1,549,000 in roadway improvements, \$4,215,692 in railroad construction, \$56,750 in utilities and wastewater construction, \$5,373,334 in port facility with dolphins and winch system construction, \$5,000 in Administration Building cost, \$50,000 in parking areas construction, \$55,000 in Warehouse, Storage Tanks, Storage Areas construction and \$460,000 in land acquisition. Appendix II contains the complete list of Alternative 5 Associated Site Development costs.

⁴ Include associated shipping and handling charges

SENSITIVITY ANALYSIS

IMPACT OF FUEL TAX PHASE-IN

Phasing in the future increase in user charges (fuel tax) and the corresponding impact on the cost of doing business for barge operators could have a negative impact on benefits. Prescribed by Public Law 99-662, the Inland Waterways Tax authorized a tax on fuel used in commercial transportation for inland waterways. The fuel tax became effective on 1 October 1980, with an initial tax rate of 4 cents per gallon. It was allowed to increase to barge operators from 10 cents per gallon in 1990 to a maximum of 20 cents per gallon in 1994. Consequently, average fuel prices rose from 70 to 80 cents per gallon (other things being equal).

The consequences of increased fuel taxes are outlined in a study conducted by the Bureau of Economic and Business Research at the former Memphis State University entitled, Impacts of a Waterway Users Charge on the Economy of Tennessee⁵, dated May 1978. This study indicated that demand for barge transportation is highly price elastic (price sensitive). Therefore, an increase of over 12 percent in shipping rates would precipitate a movement of about 15 percent of barge shippers to other modes of transportation. A consequence of this highly elastic demand is that the barge operators will incur the better part of the new tax burden from the increase in their cost of doing business and lower profit margins. Additional increases in fuel taxes could lead to a reduced supply of barges, causing higher barge transportation charges and lower benefits. Barge operators have already factored the current user charge into their freight rates, with no appreciable bearing upon project feasibility.

BREAK-EVEN YEAR

In a break-even year, the annual benefits exceed the costs assuming no further growth in benefits. Using 5.625 percent interest rate, the break-even analysis indicates that annual benefits after the first year exceed costs in the second year to cover the GNF first cost, and the eighth year to cover both first cost and associated site development costs.

⁵ Impacts of a Waterways User Charge on The Economy of Tennessee. Prepared for the Bureau of Waterways and Rail, Tennessee Department of Transportation, by the Bureau of Economic Research at Memphis State University, May 1978, pages 74-88.

for an input variable and specifies the statistical distribution of likely outcomes over the chosen range. In the case where a normal distribution is assumed, 68 percent of the occurrences of a particular outcome would fall within (plus or minus) one standard deviation, on either side of the mean, and 95 percent within two standard deviations on either side of the mean. The variables chosen and the amounts they were allowed to vary are: commodity tonnages and project benefits. The assumed boundaries for variation were commodity tonnage 15 percent, Land (freight rates) 10 percent, water freight rates 10 percent. All distribution functions are assumed to be normal.

The @Risk simulation was performed utilizing 10,000 iterations, or different combinations, of the chosen variables. The 68 and 95 percent confidence bands around the mean results are plus/minus one and two standard deviations, respectively. A sensitivity analysis was employed to identify which variable(s) contributed the most to uncertainty. The simulation was run again, varying each variable individually while holding the remaining variables constant. The most important variable was the calcium carbonate tonnage, variation in stage frequency followed by the 10 percent variation in freight rates. The results of the individual simulations and their ranking are presented in Table 4.

Table 4
Risk Analysis Sensitivity Analysis Tonnage & Benefits
(October 2004 Price Levels, 5.625%)

Item	Mean Value	Standard Deviation	
Tonnage	418,750	28,882	
Benefits	\$2,505,662	\$888,760	
Sensitivity Analysis:	Tonnage	Tonnage	
	Regression	Rank Correlation	
Commodities	Coefficient	Coefficient	Rank
Calcium Carbonate	0.779	0.757	1
Petroleum Products	0.390	0.365	2
Petroleum Products	0.390	0.357	3
Paper	0.260	0.230	4
Soybean Meal	0.130	0.112	5
Natural Rubber	0.123	0.114	6
Steel Coils	0.104	0.112	7

Results

The economic impact associated with an \$18,434,480 (first cost + associated site development cost) investment for Northwest Tennessee Harbor in Lake County, Tennessee are shown in Table 4 and are separated out into three major economic categories:

- Sales Volume: both direct and induced impacts;
- Employment: both direct and induced impacts;
- Income: both direct and induced impacts.

Tables 5, 6, 7, and 8 display the impacts associated with Northwest Tennessee Harbor region: Dyer, Lake, and Obion Counties in Tennessee. Tables 7 and 8 display the impact of both construction and site development expenditures. These impacts are for the same three major economic categories as above. These impacts are considered separately and not part of the feasibility study. Table 9 displays an example of the EIFS Local Public Fiscal Impact Model, Standard Model section output for Northwest Tennessee showing the regional economic impacts upon sales volume, income, and employment within the Dyer, Lake, and Obion Counties Tennessee region of influence.

Local Public Finance Impact Model:⁶

The Local Public Finance Impact Model output displayed in Table 9 reflects the impacts of public investments in a region predicated upon the region's capacity to raise the level of public services as new workers move into an area. Public investments in infrastructure projects generate many effects throughout their construction and operation. Initially, the project requires the employment of workers. In the case of larger investments the capacity to create employment opportunities may precipitate new workers who might migrate into the region bringing their families. Along with these effects, these projects are also expected to alter the need for public services. These broad revenue and expenditure effects are an important in the initial stages of planning, when program managers are making their initial budget allocations. The LPFI model estimates the local government revenue and expenditure consequences of a change in the economic and demographic character of a local economy.

⁶ Local Public Finance Impact Model: User's Guide and Technical Documentation. Federal Infrastructure Strategy Program IWR, Dennis P. Robinson, and Harry H. Kelejian, Report 94-FIS-10 Institute for Water Resources, WRSC, USACE. June 1994.

**EIFS REPORT
Appendix III Table 7**

PROJECT NAME Northwest Tennessee Harbor: Dyer, Lake, & Obion Counties

STUDY AREA
47045 Dyer, TN
47095 Lake, TN
47131 Obion, TN

FORECAST INPUT

Change In Local Expenditures	\$18,434,480	
Change In Civilian Employment	0	
Average Income of Affected Civilian	\$0	
Percent Expected to Relocate	0	
Change In Military Employment	0	
Average Income of Affected Military	\$0	
Percent of Military Living On-post	0	

FORECAST OUTPUT

Employment Multiplier	2.15	
Income Multiplier	2.15	
Sales Volume - Direct	\$9,860,304	
Sales Volume - Induced	\$11,339,350	
Sales Volume - Total	\$21,199,650	1.11%
Income - Direct	\$1,593,085	
Income - Induced)	\$1,832,048	
Income - Total(place of work)	\$3,425,132	0.22%
Employment - Direct	49	
Employment - Induced	56	
Employment - Total	105	0.24%
Local Population	0	
Local Off-base Population	0	0%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	10.21 %	10.79 %	4.67 %	1.89 %
Negative RTV	-7.08 %	-6.02 %	-5.34 %	-0.85 %

EIFS REPORT
Appendix III Table 8

PROJECT NAME

Northwest Tennessee Harbor: Dyer Lake Obion

STUDY AREA

47045 Dyer, TN
 47095 Lake, TN
 47131 Obion, TN

FORECAST INPUT

Change In Local Expenditures	\$18,434,480
Change In Civilian Employment	0
Average Income of Affected Civilian	\$0
Percent Expected to Relocate	0
Change In Military Employment	0
Average Income of Affected Military	\$0
Percent of Military Living On-post	0

FORECAST OUTPUT

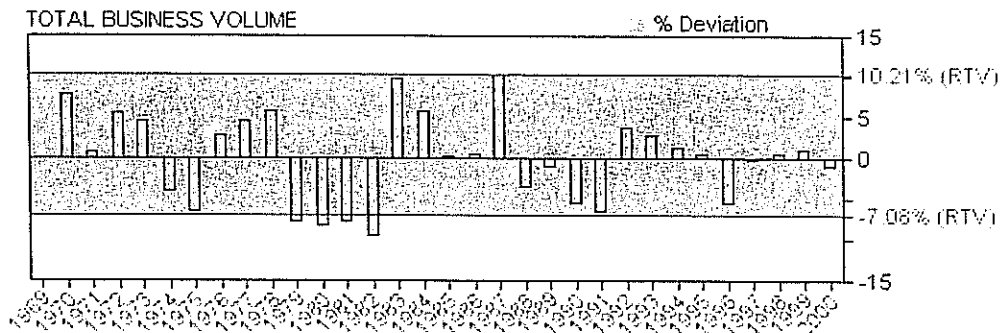
Employment Multiplier	2.15	
Income Multiplier	2.15	
Sales Volume - Direct	\$9,860,304	
Sales Volume - Induced	\$11,339,350	
Sales Volume - Total	\$21,199,650	1.11%
Income - Direct	\$1,593,085	
Income - Induced)	\$1,832,048	
Income - Total(place of work)	\$3,425,132	0.22%
Employment - Direct	49	
Employment - Induced	56	
Employment - Total	105	0.24%
Local Population	0	
Local Off-base Population	0	0%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	10.21 %	10.79 %	4.67 %	1.89 %
Negative RTV	-7.08 %	-6.02 %	-5.34 %	-0.85 %

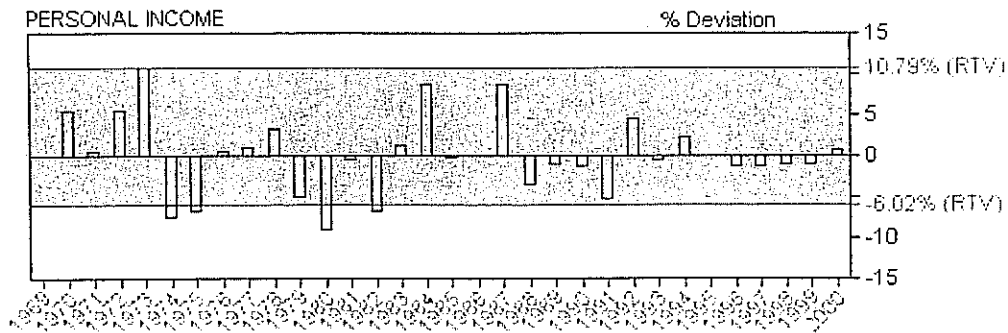
RTV DETAILED

SALES VOLUME



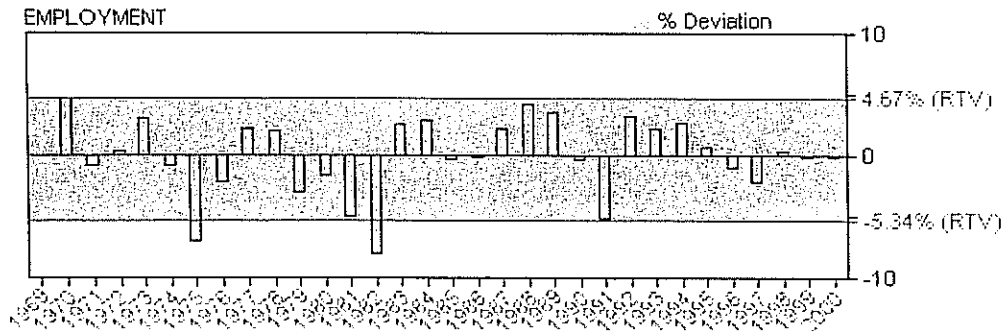
Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	135146	590588	0	0	0
1970	159921	660474	69886	51436	7.79
1971	172763	684141	23668	5218	0.76
1972	194248	743970	59828	41378	5.56
1973	221032	797925	53956	35506	4.45
1974	241624	785278	-12647	-31097	-3.96
1975	253359	755010	-30268	-48718	-6.45
1976	281727	794470	39460	21010	2.64
1977	322617	851709	57239	38789	4.55
1978	374818	922052	70343	51893	5.63
1979	394694	872274	-49779	-68229	-7.82
1980	424290	823123	-49151	-67601	-8.21
1981	444109	781632	-41491	-59941	-7.67
1982	440388	731044	-50588	-69038	-9.44
1983	516246	831156	100112	81662	9.83
1984	585543	901736	70580	52130	5.78
1985	619758	923439	21703	3253	0.35
1986	647668	945595	22156	3706	0.39
1987	692711	1073702	128107	109657	10.21
1988	776002	1055363	-18339	-36789	-3.49
1989	824879	1064094	8731	-9719	-0.91
1990	833590	1025316	-38778	-57228	-5.58
1991	830062	979473	-45843	-64293	-6.56
1992	909744	1037108	57635	39185	3.78
1993	978676	1086330	49222	30772	2.83
1994	1037066	1120031	33701	15251	1.36
1995	1090120	1144626	24595	6145	0.54
1996	1080891	1102509	-42117	-60567	-5.49
1997	1117840	1117840	15331	-3119	-0.28
1998	1166112	1142790	24950	6500	0.57
1999	1223144	1174218	31428	12978	1.11
2000	1269872	1180981	6763	-11687	-0.99

INCOME



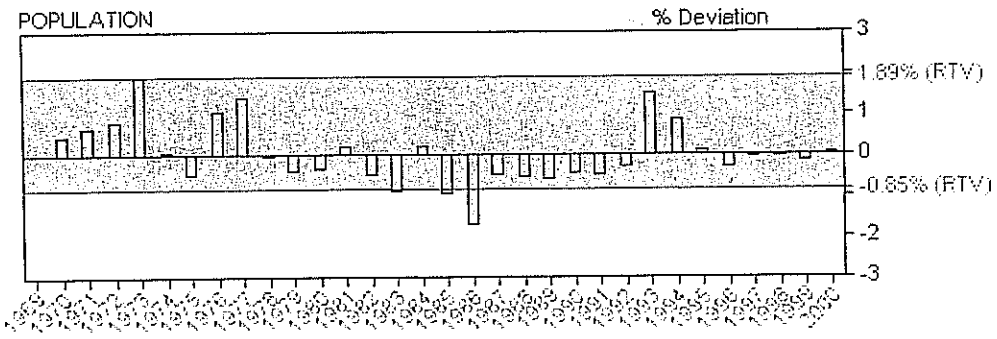
Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	173859	759764	0	0	0
1970	201779	833347	73583	46814	5.62
1971	218359	864702	31354	4585	0.53
1972	246194	942923	78221	51452	5.46
1973	301100	1086971	144048	117279	10.79
1974	318585	1035401	-51570	-78339	-7.57
1975	333555	993994	-41407	-68176	-6.86
1976	364168	1026954	32960	6191	0.6
1977	403641	1065612	38659	11890	1.12
1978	459017	1129182	63570	36801	3.26
1979	497923	1100410	-28772	-55541	-5.05
1980	533074	1034164	-66246	-93015	-8.99
1981	600479	1056843	22679	-4090	-0.39
1982	611452	1015010	-41833	-68602	-6.76
1983	654686	1054044	39034	12265	1.16
1984	769820	1185523	131478	104709	8.83
1985	812542	1210688	25165	-1604	-0.13
1986	846696	1236176	25489	-1280	-0.1
1987	893746	1385306	149130	122361	8.83
1988	1003491	1364748	-20558	-47327	-3.47
1989	1067682	1377310	12562	-14207	-1.03
1990	1127018	1386232	8922	-17847	-1.29
1991	1138765	1343743	-42490	-69259	-5.15
1992	1258211	1434361	90618	63849	4.45
1993	1311375	1455626	21266	-5503	-0.38
1994	1402468	1514666	59039	32270	2.13
1995	1467040	1540392	25726	-1043	-0.07
1996	1518222	1548586	8194	-18575	-1.2
1997	1555778	1555778	7192	-19577	-1.26
1998	1599084	1567102	11324	-15445	-0.99
1999	1643529	1577788	10685	-16084	-1.02
2000	1738048	1616385	38597	11828	0.73

EMPLOYMENT



Year	Value	Change	Deviation	%Deviation
1969	34867	0	0	0
1970	36935	2068	1724	4.67
1971	36985	50	-294	-0.79
1972	37438	453	109	0.29
1973	38919	1481	1137	2.92
1974	38927	8	-336	-0.86
1975	36706	-2221	-2565	-6.99
1976	36266	-440	-784	-2.16
1977	37452	1186	842	2.25
1978	38582	1130	786	2.04
1979	37797	-785	-1129	-2.99
1980	37496	-301	-645	-1.72
1981	36063	-1433	-1777	-4.93
1982	33720	-2343	-2687	-7.97
1983	34925	1205	861	2.47
1984	36284	1359	1015	2.8
1985	36514	230	-114	-0.31
1986	36786	272	-72	-0.2
1987	37982	1196	852	2.24
1988	40014	2032	1688	4.22
1989	41857	1843	1499	3.58
1990	42081	224	-120	-0.29
1991	40334	-1747	-2091	-5.18
1992	42011	1677	1333	3.17
1993	43327	1316	972	2.24
1994	44851	1524	1180	2.63
1995	45479	628	284	0.62
1996	45371	-108	-452	-1
1997	44780	-591	-935	-2.09
1998	45312	532	188	0.41
1999	45580	268	-76	-0.17
2000	45870	290	-54	-0.12

POPULATION



Year	Value	Change	Deviation	%Deviation
1969	68216	0	0	0
1970	68832	616	318	0.46
1971	69585	753	455	0.65
1972	70442	857	559	0.79
1973	72100	1658	1360	1.89
1974	72443	343	45	0.06
1975	72375	-68	-366	-0.51
1976	73435	1060	762	1.04
1977	74765	1330	1032	1.38
1978	75023	258	-40	-0.05
1979	75011	-12	-310	-0.41
1980	75050	39	-259	-0.35
1981	75503	453	155	0.21
1982	75440	-63	-361	-0.48
1983	75048	-392	-690	-0.92
1984	75497	449	151	0.2
1985	75100	-397	-695	-0.93
1986	74137	-963	-1261	-1.7
1987	74067	-70	-368	-0.5
1988	73973	-94	-392	-0.53
1989	73835	-138	-436	-0.59
1990	73817	-18	-316	-0.43
1991	73752	-65	-363	-0.49
1992	73836	84	-214	-0.29
1993	75244	1408	1110	1.48
1994	76208	964	666	0.87
1995	76601	393	95	0.12
1996	76666	65	-233	-0.3
1997	76935	269	-29	-0.04
1998	77206	271	-27	-0.03
1999	77407	201	-97	-0.13
2000	77753	346	48	0.06

Appendix III Table 9

LOCAL PUBLIC FINANCE IMPACT MODEL

Project name: Northwest Tennessee Harbor (Dyer, Lake & Obion Counties TN) Total

Dollar volume of construction project: \$18,434,480

LOCAL PUBLIC FINANCE IMPACT MODEL

STANDARD IMPACT FORECAST FOR NORTHWEST TENNESSEE HARBOR (TN)

Change in local	impact	% change
Export income multiplier.....:	2.15	
Employment multiplier	2.15	
Sales volume		
.....direct:	\$ 9,860,304	
.....indirect:	\$ 11,339,350	
.....total:	\$ 21,199,650	1.11%
Employment.....direct:	49	
.....total:	105	0.22%
Income.....direct:	\$ 1,593,085	
.....total by place of work:	\$ 3,425,132	0.24%
.....total by place of residence		
Population.....:	0	0.000

developed by Dennis P. Robinson and Harry H. Kelejian in
 LOCAL PUBLIC FINANCE IMPACT MODEL: USER'S GUIDE AND TECHNICAL
 DOCUMENTATION. Alexandria, VA: U.S. Army Institute for Water

Location Quotient (LQ):

$$LQ = \frac{\frac{Employment_{Industry, local}}{Employment_{Total, local}}}{\frac{Employment_{Industry, national}}{Employment_{Total, national}}}$$

The measure is designed to identify key export industries placing emphasis on industries with a LQ coefficient with a value greater than one (identified as basic or export industries) vis-a-vis those industries with a LQ value of one or less (identified as non-basic non exporting industries). Export industries are presumed to be prime movers of the local economy. If employment serving the export market rises or falls, employment serving the non-basic local market is presumed to move in the same direction. In the economic base analysis is the tacit recognition that firms within industries sell their products to both basic and non-basic markets. A simplifying assumption is that over the long run the proportion of basic to non-basic jobs will remain the same.

Export Industries and Regional Competitive Advantage

The identification of the key export industries ($LQ > 1$) indicates the region's source of comparative or competitive advantage in that employment growth in the export (basic) industries will precipitate increased employment in the non-basic industries. For example, if a community's total employment were 100,000, and 40,000 were in basic and 60,000 in non-basic employment then given a new plant opens in the community and increases employment by 400 jobs, the long run consequences would be an increase of 600 jobs in the non-basic sector (6 non-basic jobs for each 4 basic jobs) new jobs created in the basic industry, then 1000 new jobs would be added to the economy. Table 14 displays the location quotients for the three Northwest Tennessee counties for two periods: 1998 and 2001.

Industry by Employment and Structure

The industrial structure of an area characterizes the relative employment shares (importance) of an industry in that area to total employment for the same area. There has been a significant shift in employment away from farming to the manufacturing sector. This shift in part has been caused by technical changes in farming since 1950. Other reasons include unpredictability in the weather, higher costs with no offsetting increase in prices received by farmers resulting in lower profits, and the emergence of corporate farming (economies of scale).

Comparative Advantage and Growth

Two analytical measures of a region's employment / economic base and its relative well being are: the **Location Quotient Analysis** and the **Shift-Share Analysis**. The Location Quotient is a measure of an area's comparative advantage (competitive advantage gained from region's industrial specialization).¹⁰ Those industries which are more productive in the region than the surrounding regions will be the export industries. Table 12 and Figure 1 displays the Location Quotients or actual comparative advantages of and the Dyer, Lake and Obion Counties for selected years. If the Location Quotient for a particular industry is greater than one, the industry is considered an export based industry, and as such, parts of the region's comparative advantage. If the number is less than one, the region is weak in the industry. If the LQ is equal to one, the region is at unity with the national average. This measure is a benchmark for regional planning decision-making.

Table 12 and Figure 1. display there is a comparative advantage in agriculture, construction, manufacturing and retail trade. While its comparative advantage in wholesale has been declining it still holds its some comparative advantage in wholesale. Data were not available for mining and finance for the selected years. The Dyer, Lake and Obion counties has comparative advantages in construction, manufacturing, retail, wholesale, health care, and accommodation and food service.

The second measure, Shift-Share Analysis, is used primarily to identify the growth components of employment in a region between three dynamic effects: industry mix effect (structure), regional competitive effect (regional competition) and national growth. Table 13 and Figure 2 displays 1998 to 2001 data shift-share analysis for the three-county Northwest Tennessee area: Dyer, Lake and Obion Counties. It should be noted that the sign in front of the numerical values for each of the three is important to the interpretation of the effects. Also, the magnitude of the measure is important to the interpretation of the relative contribution of each measure to the change in the region's employment.

Table 13 and Figure 2. displays the negative influence of the industry mix effect on manufacturing industry. While there is a negative effect of the regional competitive effect upon construction, wholesale, administration, and healthcare industries. While all components had a positive effect upon: finance, and accommodation and food service industries, who also displayed positive absolute growth. The Dyer, Lake and Obion counties area has comparative advantages in construction, transportation, wholesale, retail and service.

¹⁰ Richardson H. W. *Elements of Regional Economics*. Penguin Books Baltimore Maryland (1969) pages 27-44. Also see Webber, Michael, J. *Impact of Uncertainty on Location*. The M.I.T Press, Cambridge, Massachusetts and London, England. (1972): pages 73-80.

Table 12
LOCATION QUOTIENT ANALYSIS

Industry Employment	Regions						Location Quotient					
	Lake, Dyer, Obion Co		United States		United States		Regional		National			
	1998	2001	1998	2001	Employ Factor	Employ Factor	Employ Factor	Employ Factor	Employ Factor	Employ Factor		
Total	31009	30809	108117731	115061184								
Forestry, Agriculture etc	43	19	187133	183476	0.14	0.2	0.8012	0.06	0.16	0.3867		
Utilities	33	25	682217	654484	0.11	0.6	0.1687	0.08	0.57	0.1427		
Construction	1775	1471	5798261	6491994	5.72	5.4	1.0674	4.77	5.64	0.8462		
Manufacturing	13347	13293	16945834	15950424	43.04	15.7	2.7462	43.15	13.86	3.1124		
Wholesale trade	1517	1265	5884946	6142089	4.89	5.4	0.8988	4.11	5.34	0.7692		
Retail trade	4178	4149	14240726	14890289	13.47	13.2	1.0229	13.47	12.94	1.0406		
Transportation & warehousing	587	501	3462472	3750663	1.89	3.2	0.5911	1.63	3.26	0.4989		
Information	254	311	3141957	3754698	0.82	2.9	0.2819	1.01	3.26	0.3093		
Finance & insurance	815	1010	5770209	6248400	2.63	5.3	0.4925	3.28	5.43	0.6037		
Real estate & rental & leasing	212	195	1812621	2013673	0.68	1.7	0.4078	0.63	1.75	0.3617		
Professional, scientific	319	329	6051636	7156579	1.03	5.6	0.1838	1.07	6.22	0.1717		
Management of companies	73	0	2703798	2879223	0.24	2.5	0.0941	0.00	2.50	0.0000		
Administrative, support,	1924	1805	7774610	9061987	6.20	7.2	0.8629	5.86	7.88	0.7439		
Educational services	31	0	2323744	2612430	0.10	2.1	0.0465	0.00	2.27	0.0000		
Health care and social assistance	2760	2667	13757996	14534726	8.92	12.7	0.7010	8.66	12.63	0.6853		
Arts, entertainment & recreation	107	135	1583783	1780362	0.35	1.5	0.2356	0.44	1.55	0.2832		
Accommodation & food services	1884	2318	9466088	9972301	6.08	8.8	0.6939	7.52	8.67	0.8681		
Other services (except public admin.)	1007	971	5037866	5370479	3.25	4.7	0.6969	3.15	4.67	0.6752		
Auxiliaries (exc corporate)	0	0	916349	1022114	0.00	0.8	0.0000	0.00	0.89	0.0000		
Unclassified establishments	0	19	77642	105228	0.00	0.1	0.0000	0.06	0.09	0.6743		

Figure 1
Location Quotients: Dyer, Lake & Obion Counties 1998 & 2001

□ Location Quotient 1998
 ▨ Location Quotient 2001
 ■ Location Quotient Benchmark

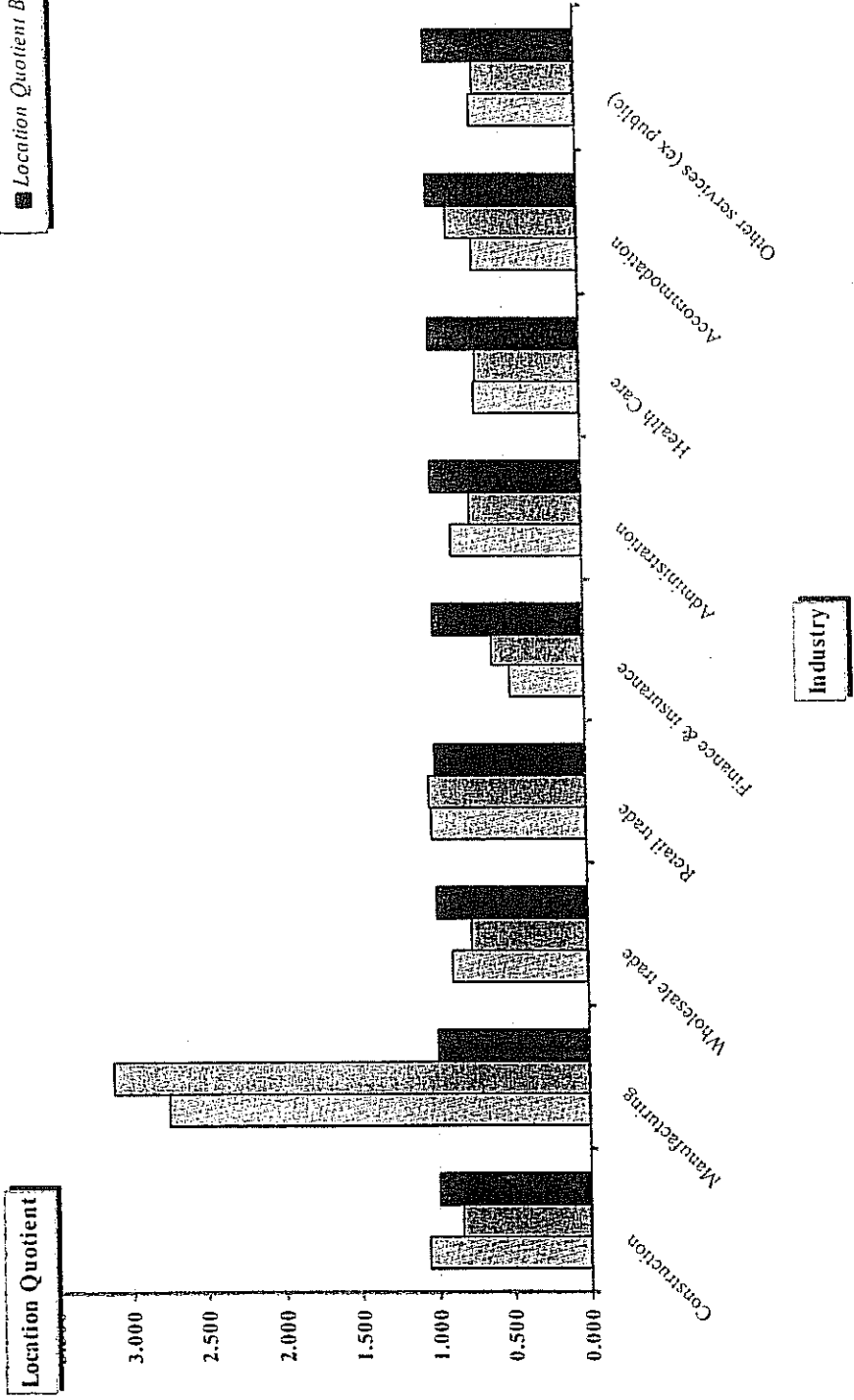
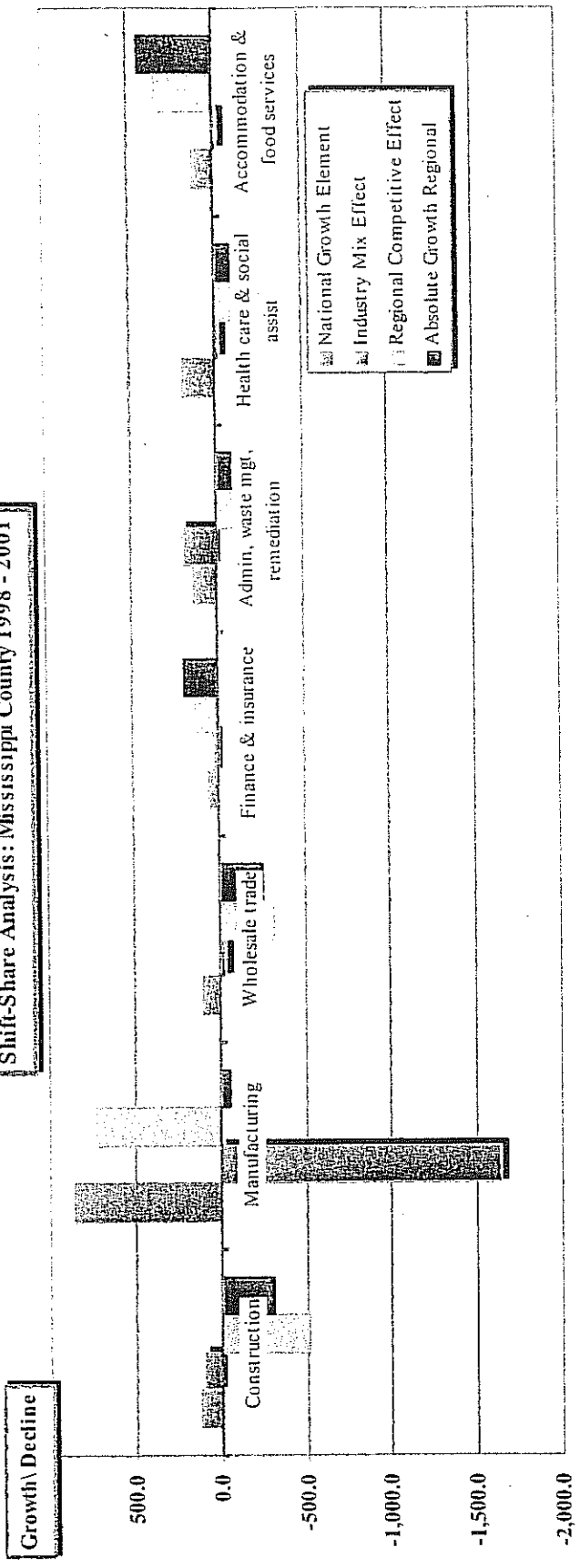


Figure 2
Shift-Share Analysis: Mississippi County 1998 - 2001



Industry

