

A Look at the
Economic Effects
of the
North Carolina State Ports

[Revised Draft–April 27, 2015]

*Ask not what North Carolina can do for the ports.
Ask only what the ports can do for North Carolina.*

RISINGWATER ASSOCIATES
SOUTHPORT, NORTH CAROLINA

Prepared for
Save the Cape, Inc.

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Synopsis

The North Carolina State Ports Authority has obtained from NC State University's Institute of Transportation Research and Education (ITRE) a study report entitled *Economic Contribution of the North Carolina Ports*. The report is misleading in the extreme, especially in the context of the Ports Authority's efforts to obtain appropriations from the North Carolina State Assembly.

The ITRE report includes this statement: "[T]here is approximately \$14 billion in annual economic contributions to the State's economy constituted by goods moving through North Carolina ports" And: "The ports directly and indirectly support over 76,700 jobs across North Carolina;" These statements strongly suggest, both in their original phrasing and even more strongly in variations propagated by the Ports Authority, that the State ports create or cause \$14 billion in annual economic activity and 76,700 jobs. But that is not true. That economic activity and those jobs are derived from commerce: manufacture, distribution, and sale of goods. Most of that economic activity would occur with or without the State ports, because North Carolina is served by large ports to the north and south. A similar study by the University of Georgia for the Georgia ports takes that into account.

In 2006, the NC State Ports Authority obtained from Martin Associates, an economic consulting firm serving the ports industry, an economic impact analysis determining that approximately \$427 million in annual economic activity and 4000 jobs in North Carolina were attributable to the State ports and would not exist without those ports. A very small fraction of the figures presented by ITRE.

But even the Martin Associates study results cannot be used for analysis for decisions. Economic impacts and jobs are not true measures of value added by a project or facility. Those figures are presented because they resonate with public officials. The economic worth of a project can only be determined by cost/benefit analysis, comparing the costs of a project over its lifetime with the true economic benefits-savings in transportation or other costs. And that can only be done for new projects, by comparison with the "base case," the situation without the project.

Cost/benefit analysis is a standard tool for engineers and economists engaged in project planning. It is used by the US Army Corps of Engineers for water resources projects, and by many state departments of transportation for transportation projects, regardless of mode. It should be used here.

A Look at the Economic Effects of the North Carolina State Ports

Occasionally words must serve to veil the facts. But let this happen in such a way that no one becomes aware of it; or, if it should be noticed, excuses must be at hand to be produced immediately.
~ Machiavelli

The North Carolina State Ports Authority released a brochure in March 2015 with these statements:

- North Carolina jobs provided directly or indirectly by the ports statewide
76,700 +
- Annual tax revenues gained through the ports for the statewide economy
\$707 million +
- Annual economic contribution to the state's economy associated with goods moving through the NC ports
\$14 billion +

Impressive figures. Stunning, really. They must be true, because they were produced by the Institute of Transportation Research and Education at North Carolina State University (ITRE). But are they? And what do they really mean?

They do not mean that the State ports create those effects. Those jobs and taxes and dollars are produced by international commerce, the goods moving through the ports. The production, distribution, and sale of those goods. And most of that commerce would occur *with or without the State ports*. The numbers propagated by the Ports Authority are bogus.

North Carolina is not an island; ports in neighboring states could handle most of our State's commerce quite handily. And do. Eighty percent of North Carolina's commerce moves through ports in other states now. Professor Woody Hall of UNCW, a participant in the ITRE study and a prior similar study, said exactly that to the *Star News* about an earlier ITRE study for the State ports: "It doesn't mean, however, that if the ports closed those ... jobs would necessarily go away." So what value do our ports add?

The State ports do provide some economic benefit relative to out-of-state ports: there are operational efficiencies for the 20% of the State's commerce the State Ports handle, and some commerce in the eastern part of the State would not exist but for proximity to the ports.

An earlier economic impact study by Martin Associates, a firm serving the ports industry generally, provides a more candid and accurate view of the actual economic effects of the State ports. Although that was done in 2006, the level of activity at the ports has not changed substantially. The next page shows differences between the two studies.

We compare the first tier of results of the ITRE study and the earlier Martin Associates study for both State ports, in Wilmington and Morehead City:

	<u>ITRE</u>	<u>Martin</u>
Direct economic activity	\$8.4 billion	\$427 million
Direct employment	40,400	4,045

Both studies also include further tiers, called “indirect” and “induced,” counting the same money over and over as the funds wash down through the economy, as employees spend earnings. These are calculated using “multipliers.” The process is very much like Confederate General Magruder, badly outnumbered in the Peninsula campaign, marching the same company of soldiers past the Union lines time after time to convince McClellan he was being reinforced by a superior force. That exercise in deception help stop the Union forces.

Here are the results with the multipliers, including the indirect and induced tiers:

	<u>ITRE</u>	<u>Martin</u>
Economic activity	\$14 billion	\$886 million
Employment	76,700	8,530

Both the ITRE and the Martin Associates reports also include in their presentations taxes collected by the State and by local governments attributable to activities at the ports. We do not include those here; economists regard taxes as “transfer payments,” money moving from one pocket to another. They do not add real economic value.

Turning back to economic activity and jobs, why does ITRE report 16 times as much economic activity and nine times as many jobs as Martin Associates? The Devil is in the details—details which, alas, are lost in the communication of these figures in various contexts.

The only valid figures in this collection are the direct economic activity and direct employment reported by Martin Associates: \$427 million and 4045 jobs. Martin derived those figures from maritime services at the State ports at Wilmington and Morehead City, inland transportation of cargo handled at the port, and activities that depend on proximity to the State ports, such as forest products moving through Wilmington and phosphates at Morehead City. This represents economic activity directly dependent on the ports, which would not exist without the ports. All of this is explained in the Martin report.

ITRE, on the other hand includes in its calculations economic effects of all of the goods moving through the State ports—their production, distribution, transportation, and sale—even the

goods that are not dependent on the State ports because they could and would be handled by ports in other states in the absence of the State ports. To that extent, these are effects that cannot properly be counted as effects of the State ports. But ITRE does not explain that. Here we note that Martin Associates counts those, too, but separately, labeled “related,” and does explain how they are derived. We also note that the similar study done for the Georgia ports specifically excludes effects from goods movements through Georgia ports that are not dependent on the Georgia ports.

This counting of the effects of goods movements, whether dependent on the State ports or not, is disclosed in the ITRE report in carefully-crafted statements, but without any qualification as to dependence. Even then, the reference to goods movement is somewhat subtle and the significance would be understood only by those familiar with economic impact studies and their limitations and built-in multiplier effects.

Further mischief in the ITRE report lies in the subtleties of certain terms, “support” and “contribute,” technical terms whose use in this context is understood only by the authors of the report—and not explained therein. Putting into circulation, within and without State Ports Authority, statements so narrowly crafted and dependent on subtle meanings that any deviation in the ordinary course, in speeches, press-releases, messages, written or oral, and conversations would easily result in misunderstanding. The statements in the brochure recited at the beginning of this section represent typical deviations from the statements of ITRE.

The ITRE report has the makings of a colossal hoax.

Deception is a common element of the military, political, and economic arenas, and may be intrinsic to all forms of human interaction. It worked for General Magruder in the Peninsula campaign. And while outright lies are universally abhorred, manipulation, the use of information, that while technically true, is presented out of context or in incomplete fashion so as to create a false implication, is more common. But even that would be improper for an agency of the State of North Carolina. Public agencies would be afforded a presumption of candor and credibility that makes any form of deception all the more effective. And reprehensible. And when the presentation of information is manipulated or distorted to induce public spending, the practice is must be considered abhorrent.

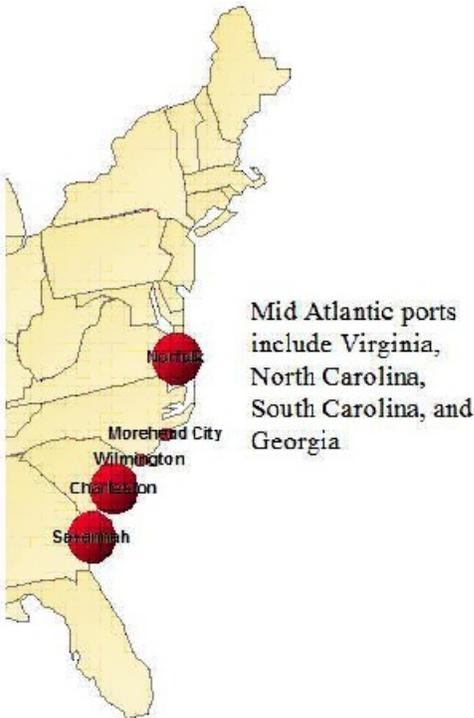
And that is the purpose of the ITRE study and report: to induce the North Carolina General Assembly to provide funds to the State ports for improvements that cannot be financed from revenues due to a debt burden from past excesses. Past excesses that were justified by economic impact studies.

So what are the economic benefits of our State ports, really? And what analysis should be used in making investment decisions?

The Essence of the Issue

The executive summary of the most recent ITRE report states: “The findings of the study show that there is approximately \$14 billion in annual economic contribution to the state’s economy constituted by goods moving through North Carolina ports “

The Devil is in the details. What does “contribution” mean? It does not mean “create” or “cause.” The usual study of this type uses the word “support.” ITRE does not. ITRE does not even call its study “economic impact,” the term typically used for reports based on the same software package, IMPLAN. A hint of dissimulation.



The operative words, carefully stated by the study reporters, are “economic contribution to the state’s economy constituted by *goods moving through* North Carolina ports...” (emphasis added). So the economic contribution, whatever that is, is attributable to the commerce moving through the ports, not to the ports. What is not said is that most of that commerce would occur anyway, with or without the State Ports, because North Carolina is not an island. Ports to the north and south serve about 80% of North Carolina’s commerce, and if our State ports were not there, most of the remaining 20% would move in and out of North Carolina through other ports, and provide most of the same economic effects. More about that later.

The report does invoke the word “support” in connection with jobs, saying that “The ports directly and indirectly support over 76,700 jobs across North Carolina; ...” Here again, “directly and indirectly support” do not mean “create,” “cause,” “produce,” or “generate,” although the ease with which that inference might be made is the reason the State Ports Authority and other ports authorities use these studies as tools to persuade their respective legislatures. Not only are the terms “contribute” and “support” very limited in the meanings held in the minds of the authors of the report, but any paraphrase destroys the intended limitation, creating gross and misleading overstatements.

The third element of the State Ports Authority’s claims derived from the ITRE report is the estimate of \$707 million in sales, property, corporate, and personal taxes received by state and local governments “due to activity supported by the Ports.” Again, these taxes are not caused by the ports (which do not pay taxes or make payments in lieu of taxes), but by the commerce moving through the ports—even though most of that commerce does not depend on State ports but would occur anyway through ports in neighboring states.

This illustration from a recent report prepared for the Ports Authority by Moffatt & Nichol shows a typical supply chain, the supply chain for export of wood pellets, an important new business for the port at Wilmington:



The first six steps, to and including the circled portion, would occur in North Carolina and would generate economic benefits, jobs, and tax revenues. And all would be counted in the method used by ITRE. But if instead of Wilmington, the wood pellet business would move through Norfolk (as it does now), the economic benefits, jobs, and tax revenues for the first five steps *would still occur in North Carolina*. Thus the only real economic impacts of the port at Wilmington would be derived from the activities at the port, and those are the only impacts that should be counted.

IMPLAN, the program used by ITRE, and similar programs used for economic impact analysis have been designed to measure the potential economic effects of proposed projects. But to be valid, that measurement must “net,” that is, the net change to the economic base of the State that would not otherwise be there without the State ports. The starting point must be the existing situation (the “base case”), so the program, properly used, would predict the effects of a facility, whether existing or planned, compared to the situation without it. Using IMPLAN here is improper use of an analytic technique for assessing the effect of change in a situation that does not change.

It would be possible to derive some utility from the exercise, by defining and confining the inquiry to two categories of economic benefits that would not occur if the State ports did not exist. Claims for these benefits would be entirely legitimate:

- jobs and other economic benefits directly dependent on activities at the port, which, in the absence of the State ports, would not occur in North Carolina, and
- jobs and other economic benefits from business activities depending on proximity to a port and which would not occur in North Carolina if the ports were not there. An example is PCS Phosphate near the port at Morehead City.

Those benefits have indeed been measured, not by ITRE, but by Martin Associates, in a report prepared for the State Ports Authority in 2006. We review both reports, after first providing some context.

The North Carolina State Ports

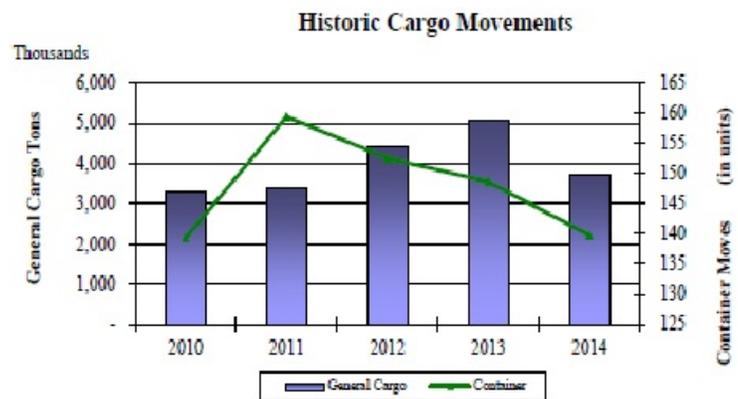
The North Carolina State Ports Authority operates two seaports—one at Wilmington on the Cape Fear River and one at Morehead City, two inland terminals for containers, and the marina at Southport. The State Port at Wilmington includes facilities for containers as well as bulk and breakbulk cargoes. The Port at Morehead City does not have container facilities.

The port of Wilmington, on the Cape Fear River, has an access channel recently dredged to a depth of 42 feet. This permits the largest vessels now able to transit the Panama Canal (called “Panamax”) to call at the port. The port is served by CSX Transportation, Inc., one of the two large railroads in the East, and is within a few miles of Interstate 40, which connects with Raleigh and points north, and US Routes 74/76, which connect to points east. All container movements are now handled by truck. CSXT does regard the container traffic as sufficient to offer special “double-stack” container trains, as it does in ports in other states.

The port of Wilmington is more than the State Port; several privately-owned bulk cargo terminals are located in the harbor and handle a major share of tonnage moving through the harbor. For example, the Carolina Marine Terminal, just downriver from the State Port, handles liquid and dry bulk cargo and some break-bulk. This tends to make statistics confusing, as compilations other than those of the State Ports Authority such as Federal sources include movements through those other facilities and the vessel calls to handle them. Those are substantial, and basing a study of State ports facilities on Federal-sourced statistics of activities in the entire harbors that they share would produce very misleading results.

The Port of Morehead City has an access channel 45 feet deep, and is relatively close to the ocean. Morehead City is the eastern terminus of the North Carolina Railroad, a State-owned line. Norfolk Southern Railway Company operates trains on the line, but does not offer container service. Morehead City is also the eastern terminus of US Route 70.

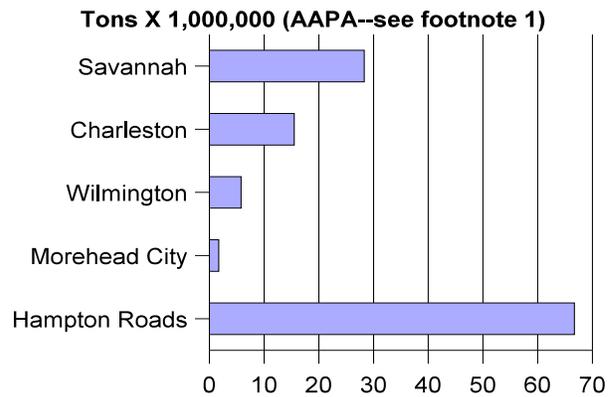
This chart, from the State Ports Authority financial statement for the fiscal year ending June 30, 2014, shows recent cargo movements through both ports.¹ Fiscal 2013 received a boost from grain imports due to drought in the American Midwest. Fiscal 2015 is receiving another boost due to labor problems and congestion at West Coast ports.



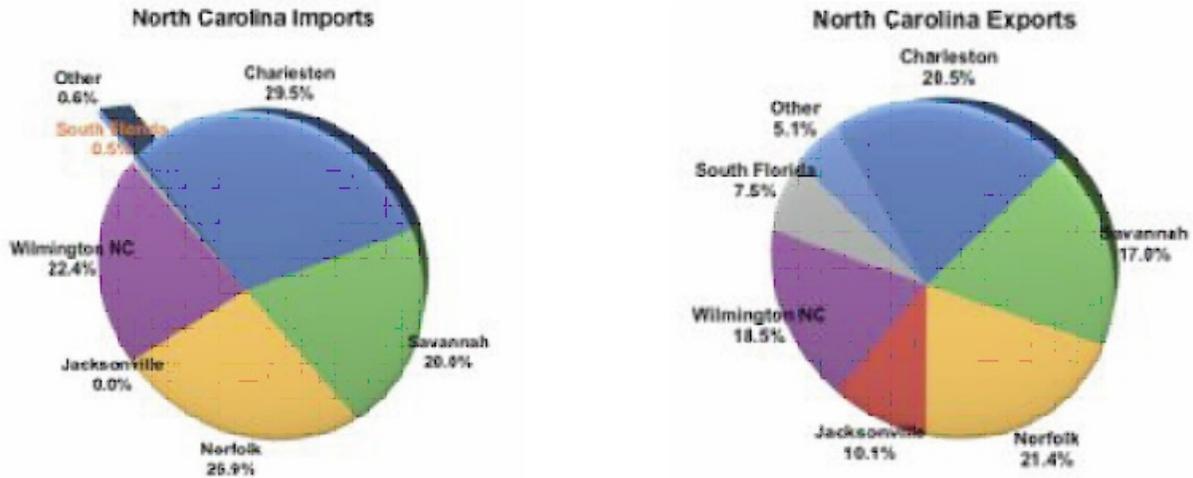
¹ The container moves are shown in units, regardless of size. The usual presentation is in twenty-foot equivalent units (TEU), although most containers are 40 feet long (2 TEU).

Both State Ports are relatively small in terms of physical size and cargo movements. The Association of American Port Authorities¹ ranked Wilmington 43rd among US ports in cargo volumes in 2013; Morehead City was 69th. Southeastern ports competing with North Carolina's ports for North Carolina's commerce at Hampton Roads, Savannah, and Charleston are much larger and busier, ranked 5th, 12th, and 23rd, respectively.

2013 Cargo Movements



The ports in other states regarded by the North Carolina State Ports Authority as competitors are larger and busier than the ports in North Carolina, due to proximity to large markets and good highway and rail connections. Four ports at Hampton Roads in Virginia, three ports in Charleston Harbor, and a large container terminal on the Savannah River above Savannah also serve North Carolina businesses. These out-of-state ports are closer by road to many areas of North Carolina in which industry is concentrated than are the ports operated by the North Carolina State Ports Authority. The presence of these ports creates a competitive environment which provides a range of shipping opportunities. North Carolina businesses can make a shipping decision considering availability of service, distance, cost, time, and scheduling convenience. Loyalty to the State ports is not a factor. The result is that about 80% of North Carolina's international commerce moves through ports in other states. These charts show the ports used for North Carolina imports and exports of containerized freight:



¹ American Association of Ports Authorities figures are considerably higher than those reported by the NC State Ports Authority and other state ports authorities. The AAPA figures appear to include tonnage through private facilities in the same harbors.

This map shows the area within 400 miles of each of the ports usually serving North Carolina. Four hundred miles is generally regarded as the most efficient range of trucks—greater distances would be served more efficiently by rail.

The blue arcs describe a distance of 400 miles from each of the ports at Hampton Roads, Charleston, and Savannah, the trucking service range of those ports. The red arc describes a distance of 400 miles from the Port of Wilmington.

The triangle on the map describes the area for which the Port of Wilmington is the closest port. Outside of the triangle, another port would be closer.

Nearly all of North Carolina is within the service area of at least three major ports in other states. Some of the State is also within truck range of the port at Jacksonville, Florida.



Economic Impacts

Economic Analysis of Transportation Projects

Decisions about investment in capital projects in the private sector are evaluated by return on investment—whether the economic benefit to the enterprise exceeds the cost by a sufficient margin to accommodate uncertainty. So also in the public sector, but the enterprise that receives the benefits is much larger and the universe of benefits is much broader, taking into account benefits accruing to the population to which the agency is accountable. Transportation system improvements—roads, railroads, bridges, airports and seaports—are public projects, means of improving economic opportunities by facilitating the movement of goods and people. Raw materials must be moved to manufacturing facilities, and finished products moved to the markets for consumption. Any means of reducing the cost of transportation improves the efficiency of those processes and enhances economic growth in the relevant jurisdiction.

Because resources are limited, particular projects must be analyzed for economic effects,

- (a) to determine whether the project returns more than its cost,
- (b) to determine where a project ranks with other projects competing for the same dollars, and
- (c) to maximize the economic effect of a given project.

In any such analysis, great care must be taken to avoid two pitfalls: double-counting and failure to take into account offsetting effects.

Double-counting occurs when indirect effects are considered. For example, the construction of the new bridge to the western end of Oak Island results in direct savings in travel time and cost from the western parts of Oak Island to Wilmington and other destinations. That may result in increases in property values in that part of Oak Island. But since one causes the other, they cannot both be counted.

Offsetting effects can result from locational shifts. Transportation enhancements in one region might result in traffic moving from one facility to the more efficient one, or even businesses moving from one region to the other to take advantage of the new facilities. One region's gain is another region's loss. An egregious example is that investment in port facilities may result in movement of manufacturing facilities offshore. A proper analysis must offset the loss against the gain to obtain a true measure of economic enhancement. To the extent the movement of traffic or business location produces a lower cost for products or greater overall economic effect, that can be counted. But it must only be the net effect.

Cost-Benefit Analysis

For decision purposes, the accepted method of determining the economic worth of a transportation project is cost-benefit analysis, a rigorous technique of comparing project costs to actual benefits. Often it is called benefit/cost analysis, because the result is expressed in a ratio of benefits to costs. Either way, the technique has been refined over many years, with safeguards against double-counting and the zero-sum trap. Such analyses follow accepted and rigorous methods of comparing costs and benefits over the life of a project, to determine *first*, whether the project is justified by a surplus of quantifiable benefits over costs, and *second*, where the project ranks with other projects competing for funds.

The procedure starts with definition of the “base case,” the situation without the project, and as complete a definition of the intended project as is feasible at that state of analysis. Then the cost of construction of the project and its maintenance during its lifetime would be estimated, and compiled.

Compilation of benefits for comparison is more complex. For transportation projects, the benefits would be savings in transportation costs—a bridge would produce savings in trucking costs and reduced travel time, a deeper channel would produce economies of scale from using larger ships. Only the direct transportation benefits would be counted—indirect effects would be a result of the direct effects, and inclusions would result in double-counting.

Some effects of the project may be negative—noise, pollution, environmental degradation. To the extent they can be quantified, those must be counted to offset the positive benefits. Such negative benefits are often called “disbenefits.”

A troublesome issue with the calculation is the discount rate applied to reduce future benefits and costs to present value for comparison. Most costs occur early in the project, and most benefits occur over the project lifetime. Thus the discount rate used to reduce future benefits to their present value can have a significant effect on the calculation. Use of a low discount rate may show significant benefits over time, but a higher rate would diminish the present value of the future benefits and may cause the project to fail the test.

Cost-benefit analysis is used by the US Army Corps of Engineers to evaluate proposed water resources projects—dams, navigation channels, flood-control projects. Such analysis, uniformly applied, facilitates selection of those projects most deserving of scarce funds.

Departments of transportation in many states have adopted cost-benefit analysis for highway and other projects. CalTrans, the California department, has developed (and shares) a method robust enough to extend across modal lines, being used for highways and public transportation projects. The North Carolina Department of Transportation must certainly include that in its engineers’ tool kits, but the results, if any, have not emerged in the planning process.

Economic Impact Studies

An increasingly common method of economic justification for public projects is the use of economic impact studies. These studies should not be confused with the true analysis inherent in cost-benefit analysis. Indeed, economists eschew the term “analysis” in this connection to avoid any implication that these studies provide bases for decisions. These studies instead are designed to measure effects of the changes related to a project on certain regional economic measures, particularly jobs and tax revenues—measures that resonate with public officials in affected communities. This method is particularly popular with ports authorities of the various states, because port projects do not typically return costs directly through revenues but must be justified by other benefits.

Thus the focus of economic impact study or assessment is these socio-economic effects. Where the support of local and regional stakeholders is necessary or sought for a project, simple concepts such as tax revenues and jobs are more easily understood than the complexities of benefit/cost ratios. Those are the things that have an impact on a community. If they are real.

This public-persuasion objective of economic impact studies has led to imaginative development of tiers of impacts—starting with direct impacts and moving on to indirect impacts and induced impacts. The totals can be impressive. There is also a variety of parameters that can be explored: jobs, business revenue, personal earnings, tax revenues. All have a certain seductive quality.

The complexity of such a calculation requires the use of a computer modeling system and a large data base. Two such systems are in common use: IMPLAN, developed and maintained by the Minnesota IMPLAN Group, and REMI PI+, a product of Regional Economic Modeling, Inc. IMPLAN is the most used in the context of port projects.

These excerpts from the IMPLAN materials explain the system.

IMPLAN’s Social Accounting Matrices (SAMs) capture the actual dollar amounts of all business transactions taking place in a regional economy as reported each year by businesses and governmental agencies. SAM accounts are a better measure of economic flow than traditional input-output accounts because they include “non-market” transactions. Examples of these transactions would be taxes and unemployment benefits.

Social Accounting Matrices can be constructed to show the effects of a given change on the economy of interest. These are called Multiplier Models. Multiplier Models study the impacts of a user-specified change in the chosen economy for 440 different industries. Because the Multiplier Models are built

directly from the region specific Social Accounting Matrices, they will reflect the region's unique structure and trade situation.

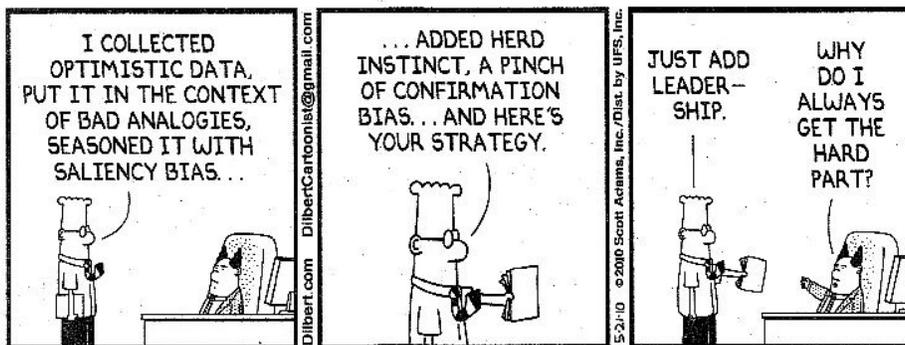
Multiplier Models are the framework for building impact analysis questions. Derived mathematically, these models estimate the magnitude and distribution of economic impacts, and measure three types of effects which are displayed in the final report. These are the direct, indirect, and induced changes within the economy. Direct effects are determined by the Event as defined by the user (i.e. a \$10 million dollar order is a \$10 million dollar direct effect). The indirect effects are determined by the amount of the direct effect spent within the study region on supplies, services, labor and taxes. Finally the induced effect measures the money that is re-spent in the study area as a result of spending from the indirect effect.

Got that? The IMPLAN system is very much a black box. Numbers are put in, and numbers come out, generously multiplied. What happens inside the box is known only to few.

Economic impact studies do share some characteristics with more traditional methods of cost-benefit analysis. Both are used to determine the effects of change—comparing a project's effects with the base case, or “do-nothing.” alternative. That is, the net effect—the difference between the economic effects of a proposed project and the economic situation if the project were not to be built. The “with” and “without” cases. Determining the economic effects of an existing situation is meaningless. And the user of both methods must consider the offsetting negative effect of locational changes, that is, what effects are simply moved from one place to another.

An economic impact study can be supplemental to cost-benefit analysis. It is not a substitute. It cannot be regarded as the basis for decision, as can cost-benefit analysis. An economic impact study is intended to persuade, not to analyze in any objective fashion. Reports of such studies must be read carefully, to determine what is said, exactly, and what is not said. And any further reporting or discussion of the study results must adhere to the exact language, with all if its subtleties and limitations. The Devil is in the details.

DILBERT By Scott Adams



The ITRE Report

The North Carolina State Ports Authority recently commissioned a team affiliated with the Institute for Transportation Research and Education (ITRE) at North Carolina State University to reprise its earlier study of the economic effects of the State's ocean ports. The project team used the IMPLAN software package and used data from fiscal year 2013, the most recent data available. As in the earlier report, in 2011, the team eschewed the term "economic impact," and instead used the term "economic contribution." This is the first signal that the study is something other than what it seems.

In response to a query, one of the authors of the 2011 ITRE report provided this explanation for the use of the term "contribution" instead of "impact."

The reason that the report is called a contribution is that this helps define current contributions based on current activity. An economic impact analysis determines the impacts for something that does not exist.

Thus the flaw: a properly-done economic impact study is project-specific: it measures changes—the effect of the project by comparison to the situation without the project, sometimes called the "base case." But the ITRE study applies the method to the situation with the ports as it exists, without comparing the results to a situation without the ports. It uses a system that measures the effect of changes even though a change does not occur. It violates the fundamental rule that measurement must be "net," that is, measuring the net change to the economic base of the State that would not otherwise be there without the State ports.

North Carolina is not an island. Eighty percent of North Carolina's international commerce moves through ports in other states. If the ports at Wilmington and Morehead City did not exist, most of the 20% of North Carolina commerce handled by the State ports would simply shift to those other ports, too. For the most part, that commerce would still occur. One of the authors of the ITRE report, Dr. Hall of the University of North Carolina Wilmington, pointed this out in a public statement after the release of the 2011 study and immediate misrepresentation of the study results. Regarding the claims made of 65,000 jobs supported by the State ports, Dr. Hall said "It doesn't mean, however, that if the ports closed those 65,000 jobs would necessarily go away."

Despite the qualification implicit in the title term "contribution" instead of "impact," the team used the IMPLAN system, an economic impact system designed to evaluate the effects of change. The objectives and purposes of the report, as stated therein, are quite clearly communication rather than decision, and the IMPLAN system has the ability to generate impressive and seemingly authentic numbers. There is a certain justification in the reference to the same thing having been done by ports authorities in other states. However, the study referred to by ITRE for validation, that done for the Georgia ports by the University of Georgia, does specifically exclude effects of commerce moving through Georgia's ports that

is not dependent on Georgia's ports, that is, could use ports in other states. Thus that study's application of the IMPLAN system is valid while ITRE's is not.

The ITRE study assessed four parameters: output (the total value of exports and value added to imports), the number of payroll employees, the total compensation for such workers, and tax receipts of state and local governments. The inclusion of taxes in this list is questionable. In rigorous economic analysis, taxes are regarded as "transfer payments." Money simply passes from one hand to another without any value added. Some regard taxes as a burden rather than a benefit.

Each of the parameters (except taxes) was assessed at three levels:

- Direct impacts result from firms that are directly engaged in the movement of goods through the NC Ports, which can include manufacturing, shipping, receiving, exporting, distributing, transporting, handling, or processing the goods which move through the ports, including all personnel employed by the ports.
- Indirect impacts represent the impacts of spending by port-related firms on products and services provided by support businesses (such as office supply companies, property maintenance, etc.).
- Induced impacts result from payroll expenditures of employees of directly-and indirectly-related firms that produce successive spending (which is money that is recirculated in an economy resulting in additional economic impact).

Tax totals were provided only for the total of the levels. For the other parameters, the tables in the report show the results for each level, but the summary has only the totals of direct, indirect, and induced.

The resulting figures are nothing less than stupendous. These are statements from the report's executive summary:

The findings of the study show that there is approximately \$14 billion¹ in annual economic contribution to the state's economy associated with goods moving through North Carolina ports (\$12.9 billion attributed to the Port of Wilmington and \$1.1 billion attributed to the Port of Morehead City). The ports directly and indirectly support over 76,700 jobs across North Carolina.

¹ In 2011, ITRE reported \$7.5 billion in this category. The difference is remarkable, considering that cargo movements through the ports did not change substantially.

In the study period, June 1, 2013 to May 1, 2014 (the latest full-year dataset available), the North Carolina ports supported over \$4.3¹ billion in employee compensation for North Carolina workers.

An estimate of approximately \$707² million in sales, property, corporate, and personal taxes was received by state and local governments due to activity supported by the Ports. The Port of Wilmington supported the collection of \$226 million in county property taxes, while the Port of Morehead City supported \$13 million. Together, the Ports resulted in the accumulation \$355 million in sales tax collections across the state. Additionally, state corporate and personal taxes of over \$113 million were collected due to activity supported by the Port of Wilmington and the Port of Morehead City.

All of this pretends that the international commerce on which these figures are based would not happen but for the State's ocean ports. But that ignores the proximity of the ports in neighboring states, which already handle 80% of the North Carolina's international commerce, have excess capacity, and are closer to North Carolina industrial and commercial centers. Should the State's ports close, most of that commerce would continue. The only thing that would not continue are the port facilities themselves and the immediately related activities.

The essence of IMPLAN and other economic impact programs is the use of multipliers applied to actual cash flows. But those multipliers count the same money over and over. For example, the North Carolina State Ports Authority's payroll, including benefits, was \$16.7 million in fiscal 2014. Payments to vendors and suppliers totaled \$12.7 million. The State Ports Authority pays no taxes, whether income, sales, or property. IMPLAN counts the effects of payroll and supplier payments being recycled as those employees and suppliers make payments and pay taxes. As that money is recycled, the amounts are multiplied and multiplied again. And again.

The multipliers are built into the programs, so the reader cannot appreciate the wonderful things a single dollar is presumed to do as it is used over and over.

The flaw of the process generally, and in the ITRE report specifically, is that those who use the report to persuade would see only the wonderful numbers and would not understand the derivation and the limitations, especially the part about the economic benefits being due to commerce, not the ports themselves. The report enables deception, however inadvertent.

¹ In 2011 ITRE reported \$2.4 billion for labor income (payrolls and self-employment incom) for the year 2009.

² The figure for total tax receipts presented by ITRE in 2011 was \$500 million, with correspondingly lower amounts for the components: property, sales, and income taxes.

Martin Associates

Prior to receiving the ITRE reports, the State Ports Authority had relied on a report from Martin Associates provided in 2006, *Economic Impact Study of the North Carolina State Ports Authority*. Martin Associates, led by Dr. John C. Martin, an accomplished economist, prepares economic impact studies for most of the ports authorities in the United States, and also does work for the American Association of Ports Authorities, a trade association. The Martin Associates report, although stale, is instructive in that the methods are more explicitly and candidly set forth and the qualifications in the results can be found with a careful review. Dr. Martin does say what the results are and what they are not.

Martin Associates did not use the IMPLAN system, but used its own model. The output parameters were similar: measures of business revenue impact, employment impact, personal earnings impact, and tax impact of the proposed container terminal. Martin Associates warns that those impacts overlap and adding the impacts would be double-counting.

Martin Associates also uses the same tiers of relationship to port activities: direct, indirect, and induced. However, these tiers are more narrowly defined than those used by ITRE. For example, “direct” jobs were those directly involved with activities at the marine terminals, including trucking companies and other supporting activities. Martin Associates makes clear that only the jobs that would be discontinued if the facilities were to close are included. However, Martin’s analysis includes the direct jobs with private companies operating terminals or other facilities in Wilmington and Morehead City harbors, as well as those operated by the State Ports Authority. Such private facilities handle as much bulk cargo as the Port Authority’s terminals, but do not handle containers. Tonnage, however, is comparable to that of the State Ports. Inclusion of these figures effectively doubles the results. Martin Associates does provide tables with separate figures for the State port and for the private terminals at Wilmington. At Morehead City, only figures for the State port are used.

These are the definitions of the tiers used by Martin Associates:

Direct impacts are jobs and revenues directly generated by the movement of cargo via the public and private marine terminals at Wilmington and Morehead City, and if such activities would cease, those jobs and revenues would be discontinued. This category is not limited to employees of the terminals, but includes employees of the railroads and trucking lines moving the freight, and various supporting activities.

Induced impacts are those generated by the purchases of the individuals directly employed in marine activities and included in the “direct” category. These result from individuals employed in the “direct” category spending wages on goods and services such as food, housing and clothing.

Indirect impacts are generated in the local economy as the result of local purchases by firms that are directly dependent on cargo and vessel activity at the public and private marine terminals at the two harbors. The firms in this category do business with the marine terminals, such as maintenance and repair, but are not engaged in the movement of cargo.

Related impacts are generated by shippers and consignees of cargo moving through the marine terminals in the State’s harbors. These impacts are classified as “related” because the firms using the terminals to move their cargo can and do use seaports and marine terminals in other states. Martin Associates emphasizes that the level of impacts from these firms is driven by the demand for the firm’s products, not because North Carolina’s ports are being used. Therefore, the degree of dependence of the related impacts on the State’s public and private port facilities is less than the other components of the economic impact.

The Martin Associates study results appearing in summaries and propagated by the State Ports Authority at the time include employment and economic impacts of the private terminals at Wilmington as well as the State ports at Wilmington and Morehead City. However, it is possible to go into the Martin Associates report and subtract the private terminal effects and determine the effects of just the State Ports. The ITRE report is based entirely on the State ports and does not include effects of private terminals.

We compare the results of both studies for direct, induced, and indirect employment (note that the two studies use different models and different definitions for each tier):

	<u>Martin Associates</u>	<u>ITRE</u>
Direct	4,046	40,400
Induced	4,200	19,000
Indirect	<u>285</u>	<u>17,300</u>
Total	8,531	76,700

Martin Associates uses a fourth tier, “related,” meaning employment generated by users of the port. That figure is 72,388 jobs. This is a separate tier because the users have available other ports and the “related” jobs are not dependent on the State ports. Adding all four tiers produces a total of 80,069. ITRE, on the other hand, included jobs with port users in all three of their tiers. And that is the fundamental flaw of the ITRE presentation, which ITRE excuses by using the term “contribution” a narrowly-defined term that usually vanishes when ITRE’s results are presented by the Ports Authority. We note that ITRE’s three-tier total of 76,700 and Martin’s four-tier total of 80,000 are close enough for government work.

Martin Associates is not free of guilt regarding facilitation of ports' puffery. The figure usually appearing in summaries and statements propagated by the Ports Authority at the time usually has the total of all four tiers, including "related." The sin is aggravated by inclusion in the total the figures for the private terminals as well as the State ports: 84,833, usually rounded to 85,000. All of the subtleties and limitations of the definitions vanish, just as ITRE's "contribution," and the impression is left that the jobs have been created by the State ports and would not exist without the ports.

The same discrepancy between the Martin Associates and ITRE reports appears in the economic effects:

	<u>Martin Associates</u> <u>(Economic Impacts)</u>	<u>ITRE</u> <u>(Economic Contribution)</u>
Direct	\$427 million	\$8.4 billion
Induced	448 million	2.7 billion
Indirect	<u>10.9 million</u>	<u>3.0 billion</u>
Total	\$886 million	\$14 billion
Related	<u>7.6 billion</u>	
Total	\$8.5 billion	

Here again, adding in the "related" category brings the Martin Associates and ITRE totals closer together. All three of the ITRE tiers include effects that Martin Associates terms "related," the effects of manufacture, use and sale of goods moving through ports, *even though most of that activity would occur with or without the State ports.*

It is too much to expect that Ports Authority officials would explain all this in public statements and private conversations. The magician does not explain how the rabbit got into that hat. The medicine man does say what is really in the bottle. A poker player does not show his cards.

Although here we regard the Martin Associates report as a workmanlike job, a model of its genre in its recitation of the process and its limitations, it is the very process of economic impact studies that we accuse, a marketing device masquerading as academic analysis. A dangerous thing.

Truth or Consequences

The magic of the mysterious multipliers is a main source of mischief in economic impact studies generally, and certainly in the ITRE study, but a far more significant distortion is introduced here by the failure to follow the cardinal rule of any economic analysis, that it must be narrowly confined to the net change to the economic base of the region that would not otherwise be there without the facility under analysis.

The key word is “net.” An economic analysis must take account of: 1) only the money brought into the region by the facility’s operations, or 2) the local dollars retained in the region that would otherwise be lost in absence of those operations.

Local dollars received, and then spent, by the facility are simply a reshuffling of local resources. There is no net effect, so those effects cannot be included. But the “net” rule in this context has been broken to smithereens by including the very substantial effects of the goods in the commerce handled by the ports, the manufacture, use, distribution, and sale of which would occur anyway, because other ports (albeit in other states) could and would handle that commerce in the absence of North Carolina’s State Ports.

Adherence to the “net” rule would permit some inclusion of the effects of the goods in commerce handled by the State ports, to the extent that commerce would not occur without the ports. In that category are activities in eastern North Carolina depending on proximity to a port, and that would not occur (at least not in North Carolina) if the ports were not there. The ITRE report makes no attempt to distinguish and separately account for those.

Martin Associates does follow the “net” rule in its analysis, but then includes in its separate “related” category and hence the totals those effects of commerce that are not caused by the State Ports. Dr. Martin can take comfort in his academic integrity being intact because the report does draw the distinction and the guilt for misstatement and misuse of that information would fall on the State Ports Authority.

The authors of the ITRE report can take no such comfort. By ignoring the “net” rule and including the effects of the commerce that would occur with or without the State Ports in all steps of their analyses, the ITRE group has provided a device that can only be used to deceive. Worse, the lack of clear exposition of the report’s limitations fosters misuse by those who understand neither the process nor report, which category includes nearly everyone at the Ports Authority. Thus otherwise forthright people unknowingly propagate a false story, and the good faith stemming from their ignorance lends credence to their tale. Maybe.

We have heard and seen bold and erroneous public statements made by Ports Authority officials, working without a script, such as “The economic impact of the North Carolina State Ports Authority is \$14 billion. Of that, \$12.9 billion is generated through the Port of Wilmington.” Forgive them, for they know not what they do.

Lest there be any doubt about the deliberate provision of tools for deception in the ITRE report, let us look at this table in the section headed “Opportunities for Increased Economic Growth.”

Exhibit 13 – Estimated Impact of Future Changes in Port Activity

Detail of Opportunity	Line of Business	Facility	Estimated Direct Impact (2014 dollars)
One new Far East super post-Panamax service	Containers	Wilmington	\$3.77 Billion
One new Far East Panamax service	Containers	Wilmington	\$ 1.95 Billion
One new Trans-Atlantic service	Containers	Wilmington	\$ 820 Million
New wood pellet exporting facility (1.5M tons)	Bulk/Breakbulk	Wilmington	\$ 780 Million
One new South Atlantic container service	Containers	Wilmington	\$ 560 Million
15% growth (or decline)	Bulk/Breakbulk	Wilmington	\$ 400 Million
15% growth (or decline)	Bulk/Breakbulk	Morehead City	\$ 100 Million

Source: NCSPA 2014

The accompanying text says that these stupendous figures are “The estimated direct impact (not including indirect and induced effects) of potential changes in port activity This analysis relies on previously described data and analysis methods which include estimates of commodity types and values.” That means the economic effects so presented are derived from the goods moving through the ports, the manufacture of exports and distribution, sale, and use of imports. Activities that would occur with or without the State ports.

The first opportunity described is “One new Far East super post-Panamax service.” The Port of Wilmington cannot now accommodate super post-Panamax vessels. The channel is not deep enough, those vessels could not safely navigate turns at the mouth of the river, and the vessels could not be turned around at the port. This “opportunity” would require a massive investment in channel dredging, perhaps \$700 million, as is being spent to dredge the Savannah River for such vessels. This item in the ITRE table is quite clearly intended to help the Ports Authority persuade the Federal and State legislatures to provide that \$700 million.

The next four opportunities should not require substantial additional investment but they share the fallacy of the first: any such impacts would not be created because new services cannot create the commerce on which the impact figures are based. They can only divert it from other ports. The effect on North Carolina’s economy, if any, would only be derived from a small reduction in land transportation costs.

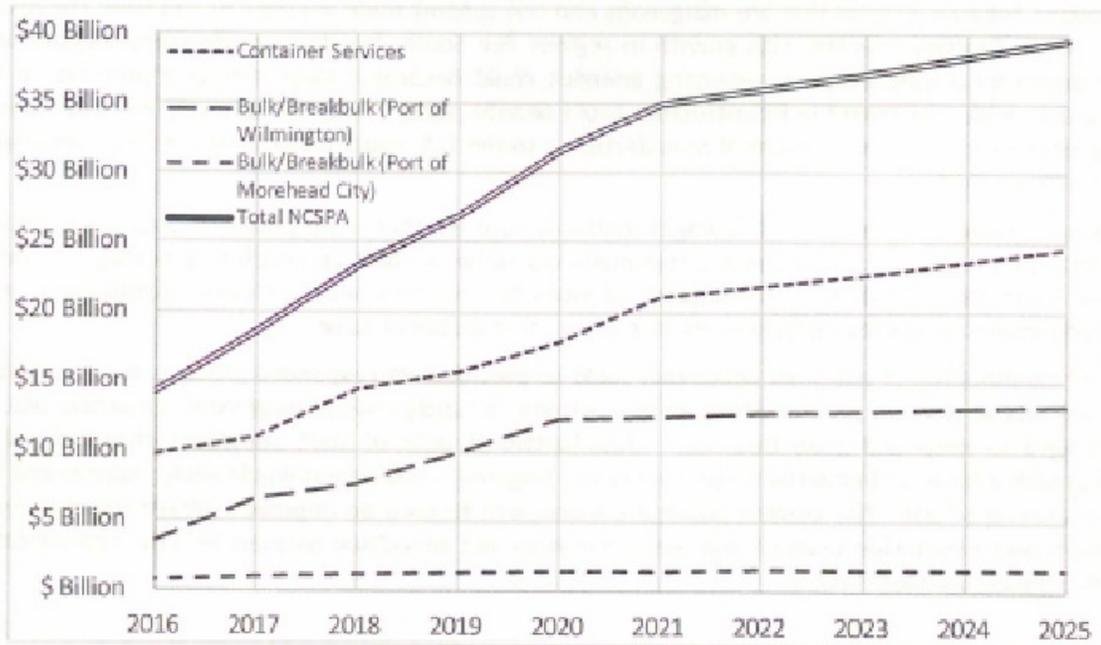
The distortions compound. On February 26, 2015, management of the State Ports Authority, provided to the Board of Directors the “2015 Strategic Plan.” The document included substantial excerpts from the ITRE report’s executive summary. Then the plan includes additional material obtained from ITRE based on projections of future freight movement developed by the Ports Authority staff.

That part was introduced by the statement: “The results of this plan will be monumental.” They certainly would, if any of it happened. The plan calls for doubling container traffic in five years, a compound annual growth rate (CAGR) of 13.4%. But the starting point is a historical annual growth rate, over the past five years, of 5.81%; for 30 years, 4.95%. More than doubling the annual growth rate would be accomplished, not with any physical improvements, but with “intensified marketing and outreach.”

The plan’s predicted results for bulk and breakbulk cargo growth would be even more monumental: a CAGR of 16.43%. The annual growth rate for the previous five years was 4.31%.

The strategic plan includes this chart, provided by ITRE, showing growth in economic contribution due to this monumental growth in cargo movements, reaching \$31 billion in five years, a CAGR of 17.23%. For the next five years, predicted annual growth would be at a more modest rate, 4.70%, reaching \$39 billion.

Figure 5. Projected Total Output Contribution of North Carolina Ports in 2014 Dollars



Source: North Carolina State University, ITRE, 2015

We respectfully suggest that use of these preposterous figures can only damage the credibility of the State Ports Authority. The method used by ITRE was first employed in a contract for the management of the State Ports Authority in effect in 2011, a management whose most visible activity was spending \$50 million on a plan to build a massive container terminal near Southport on the Cape Fear River. That plan, exhibiting a remarkable lack of due diligence before embarking on the spending spree, fell with a resounding clunk when the cost estimates (\$4.4 billion) and faulty business plan (based solely on poaching traffic from established ports) were exposed. But the \$50 million in debt remains.

Yet there are economic benefits from the State Ports that could be proudly displayed:

- Jobs and other economic benefits directly dependent on activities at the port, which, in the absence of the State ports, would not occur in North Carolina. These are the activities at and near each of the State ports in Wilmington and Morehead City.
- Jobs and other economic benefits from business activities depending on proximity to a port and which would not occur in North Carolina if the ports were not there. An example is PCS Phosphate near the port at Morehead City.

A conservative analysis of these benefits would present a much more credible story in Raleigh and Washington, doing much to build the confidence in the new management that, although essential, cannot be taken for granted.

But an economic impact study is, at best, a public relations device. It is not, and should not be regarded as, a decision tool. Yet wisdom and reason in decisions must be facilitated as the need for capital to improve and expand the ports emerges. In that respect, the interests of the State Ports and indeed, the State of North Carolina, would be much better served by analysis of proposed projects using rigorous techniques of cost/benefit analysis, as developed by the US Army Corps of Engineers and the departments of transportation in California and other states for large-scale public projects. Such analytical techniques can clearly and confidently show how public funds are most wisely and efficiently spent. Indeed, cost/benefit, or benefit-cost, analyses are fundamental at the Federal level for major navigation projects and grants under USDOT's TIGER program.

Needless to say, the private sector does not invest funds without rigorous analysis of benefits versus costs and consequent return on investment. Responsible corporate management would not attempt a snow job on its board of directors or stockholders using economic impact study results.

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