

EVALUATING FORECAST RISK IN MARITIME RELATED INFRASTRUCTURE PROJECTS

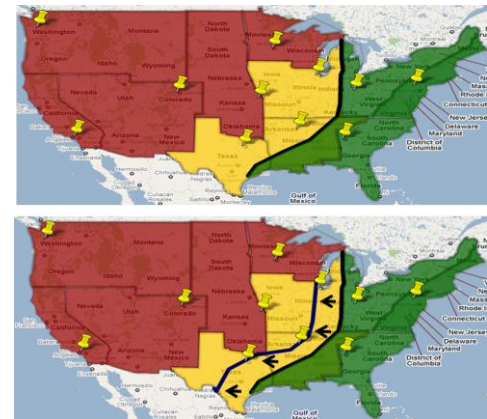
Bruce Lambert

MARITIME CORRIDORS ARE COMPETITIVE TOOLS

No longer one port but a system

Examples:

- Panama Canal
- Freight Fluidity
- Performance Measures
- Logistics Comparisons
- Inland Connectivity
- LATTS Study



WHY DOES THIS INTEREST ME

What is a maritime corridor?

Are BCA – points or areas

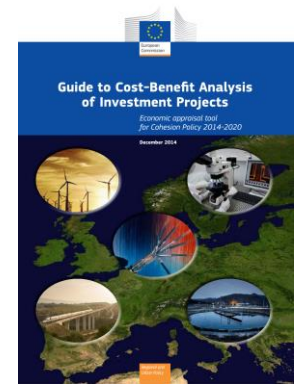
BCA are decision tools, but have some explicit biases

Ports, and port users exist as both a local monopoly while in a purely competitive market

Sensitivity discussions are not bounded by known actions, where appropriate

Do we understand which parts of the BCA may generate the most risk for reviewers

BCA becoming more requested for project review



RISK ASSESSMENT IN BCA —

GUIDE TO COST-BENEFIT ANALYSIS OF INVESTMENT PROJECTS

COMMON MISTAKES

- ✘ Risks that are out of the control of the project promoter or other stakeholders (i.e. change of legislation) are neglected in the analysis, although they may substantially contribute to the success/failure of the project.
- ✘ Too aggregated variables (e. g. benefits as a whole) are taken into account in the sensitivity and risk analysis. As a consequence, it is not possible to identify which parameters the prevention/mitigation measures have focused on.
- ✘ Independently from the type of analysis, risk prevention/mitigation measures are not identified.
- ✘ A too generic discussion on risk causes and prevention measures is carried out with no mention of their likelihood of occurrence and/or identification of impacts.
- ✘ There is no identification of the risk 'manager', i.e. the function responsible for the implementation of the identified risk prevention/mitigation measures.

THE RESEARCH QUESTION

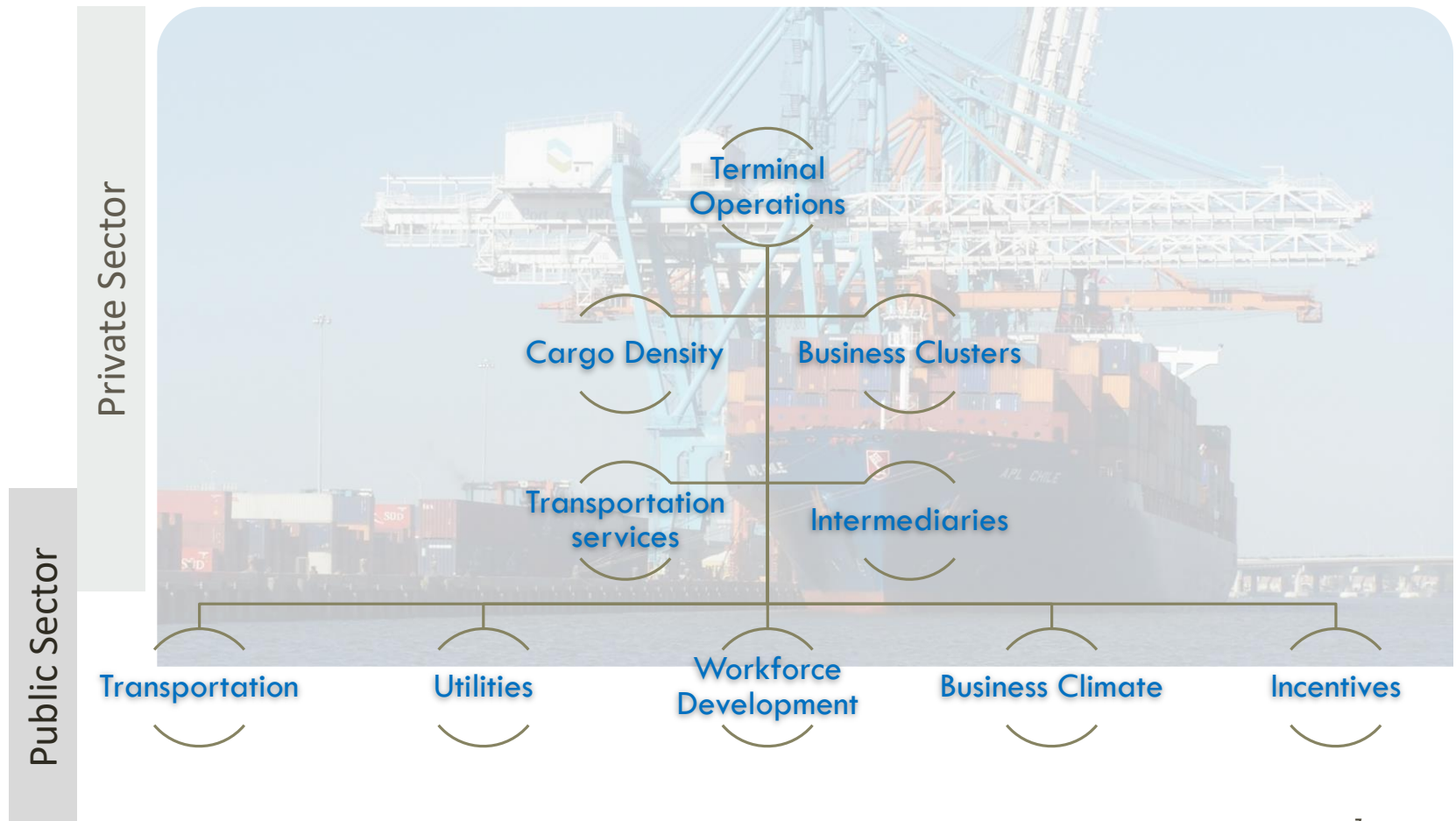
Does the Presence of a “Super-Individual” Change The Evaluation of Potential Benefits for Public Sector Participation in Multimodal Freight (Maritime) Corridors?

IF I GAVE ANY PORT ONE DOLLAR...



What would that Port buy?
Will it be a good investment?

WHO IS RESPONSIBLE FOR WHAT?



PORTS REQUIRE MULTIMODAL INVESTMENT

What do Ports Spend Money on

Highways – roads, parking,

Bridges-Bayonne Bridge

Railroads – On-dock rail, intermodal facilities

Dredging – Federal Channel, non Federal Channels

AAPA-Marad U.S. Port Spending 2007-2011

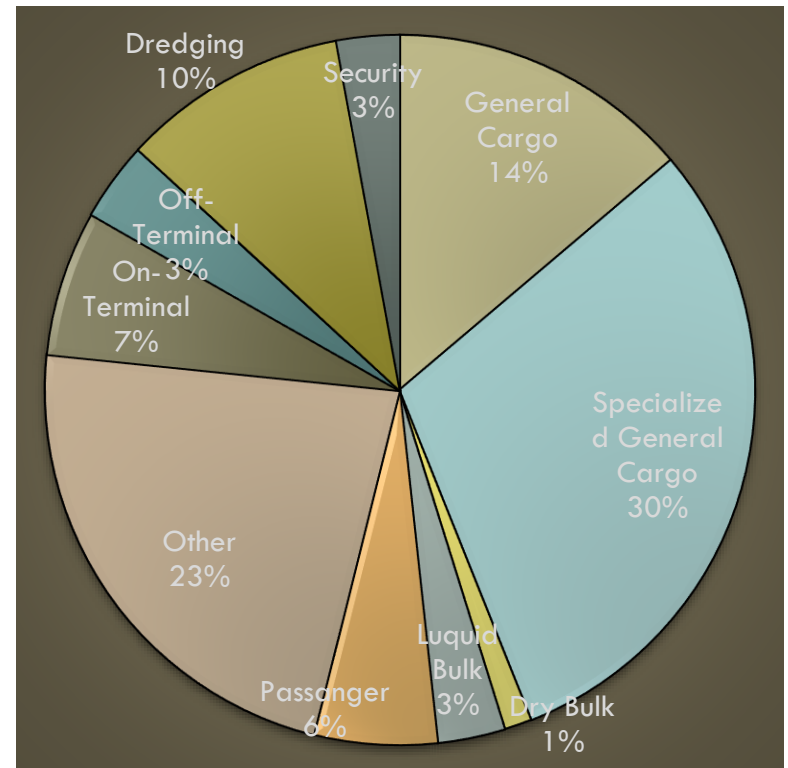
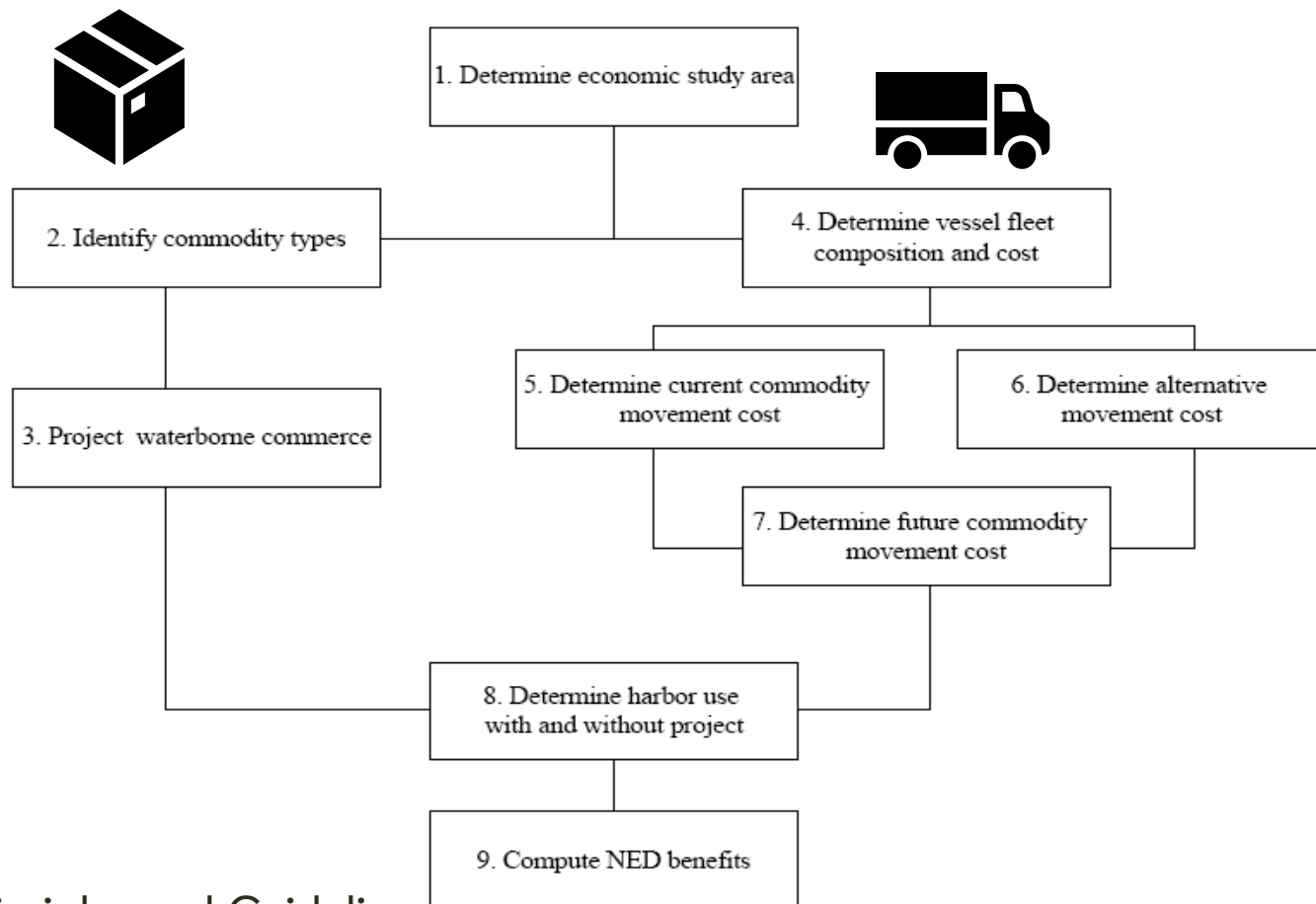
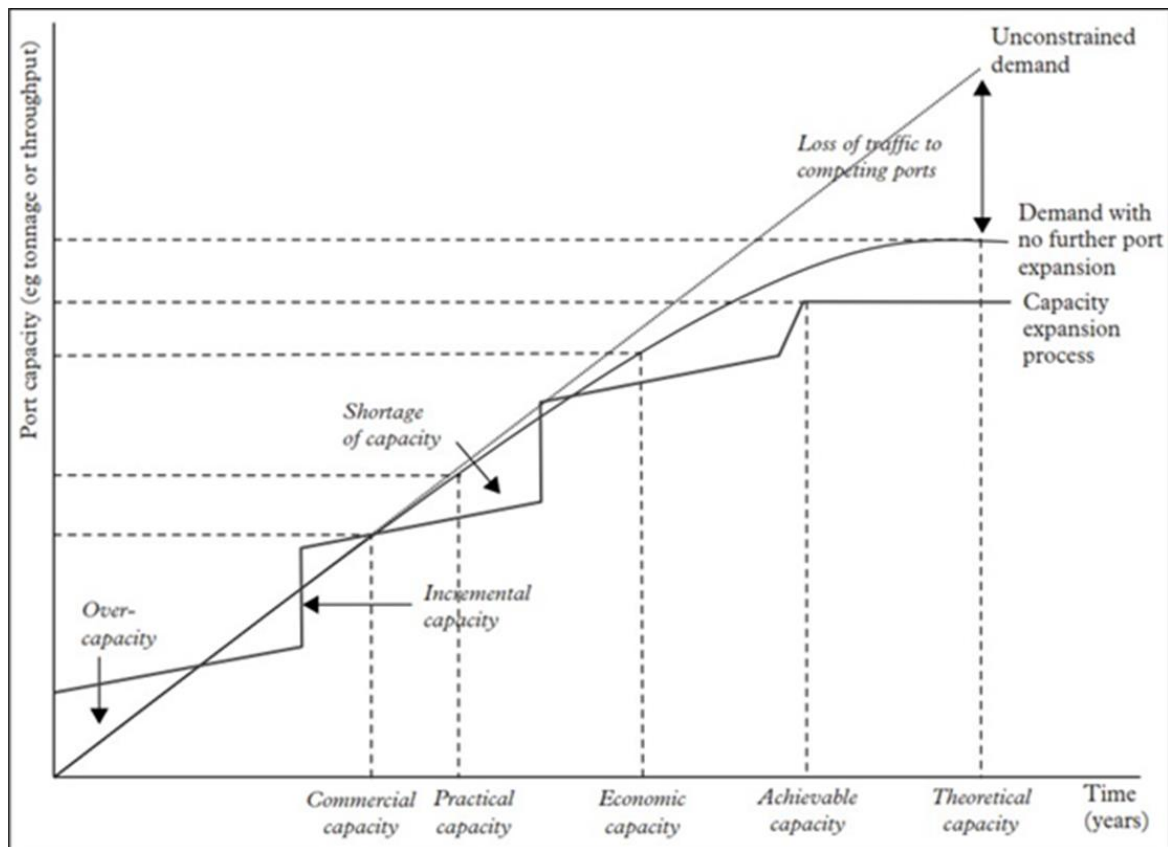


FIGURE 2.7.4 - FLOW CHART OF DEEP DRAFT - NAVIGATION BENEFIT EVALUATION PROCEDURES



Source: Principles and Guidelines

PORT CAPACITY NEEDS



PLENTY OF REVIEWS/TRAINING ON BCA APPLICATIONS

USDOT training webinars

USACE Planning Associates Program

Anthony C. Homan, Role of BCA in TIGER grant reviews: common errors and influence on the selection process

USDOT, Use of Benefit-Cost Analysis by State Departments of Transportation: Report to Congress

Trend- more applications in transportation

- Easy to do, review and provide a clear need

SOME SENSITIVITY TO RISK IS EMBEDDED IN REVIEW PROCESS

Some people will provide alternative forecast scenarios

Alternatives could be identified in planning process

USDOT requires a writeup on implementation challenges

Corps addresses different concerns in the Chief's report

SO WE BUILD THE PROJECT AND WAIT...



WHAT OUTCOMES MAY OCCUR FROM INFRASTRUCTURE PROJECTS?

Improved commercial operations (cost savings, reliability)

Change Routings (move equipment around)

Change Capacity or Scale of Services (Bigger equipment expand plant)

Induced Service or Calls (new players)

Nothing, or even worse, declining traffic

PORT-MARITIME FORECASTS

No national maritime forecasts consistently developed beyond the Freight Analysis Framework

All projects are on a case by case basis

- Limited application to supply chain costs
- Mostly driven by vessel forecasts

Some factor costs exist for certain elements, but not all

Forecasts do not address market concentration

Forecasts do not address network elements

Trade forecasts ignore transportation relationships (assume as a given)

PORTS ARE

Economic Clusters

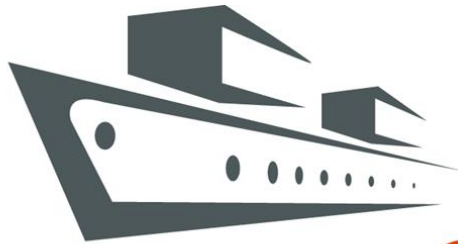
Geographically fixed

Landlords

Political Entities

Expensive to develop and expand

PORTS IN LOUISIANA



2,800
Miles of Navigable
Waterways

500 million tons per year **#1**

DID YOU KNOW?

Freight travels
33%
by water

1 in **5** jobs supported
by Louisiana Ports

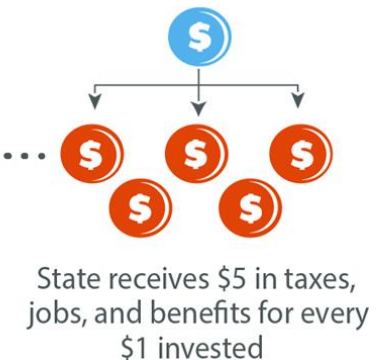
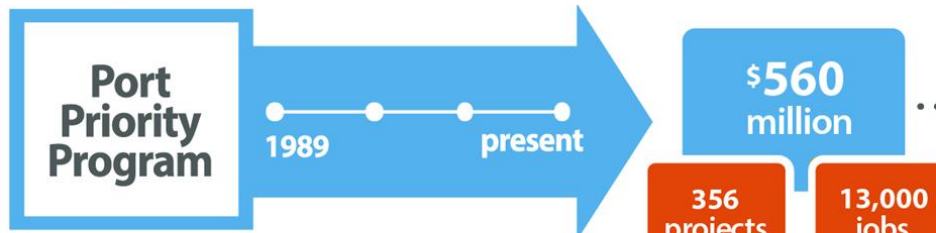
8 Deep Draft Ports

2 Deep Draft Waterways
Mississippi & Calcasieu

27 Locks

31 Shallow Draft Ports

3 Marine Highways
M-55 Mississippi River
M-49 Red/Atchafalaya
M-10 Gulf Intracoastal Waterway



THE LOUISIANA PORT PRIORITIZATION PROGRAM

The Port Construction & Development Priority Program

Created by Act 452 of the 1989 Regular Session

Primary goal is to improve the infrastructure of LA ports and harbors

Funded by the LA Transportation Trust Fund

344 Completed projects in 2018

To insure that adequate land side facilities are available to meet a definite market need by providing guidance and public funds to build land side infrastructure

Provide jobs, minimize congestion, improve safety

MORE PROGRAM GOALS

Feasibility studies of proposed projects similar to a business plan must be conducted

Must have an immediate market need

Project must be maritime related

Projects must have a B/C ratio of at least one

Must have a Rate of Return on the state's investment of 2.375

Must have a public port willing to

- pay for engineering costs
- pay 10% of cost of construction

RELATIONSHIP TO BCA

Issues report guidance

Reviews project after completion

Track projects based on program outcomes

Also have projects that were withdrawn, or never started

| Port Projects Completed FY 2000-Present | | | | | | | | | | | | | | | | | | | | |
|---|--------------|---|--------------------------------------|------------|-------------------|--------------------|--------------|--|---------------------|-------------------------|----------------------|------------------------|------------------------------------|-------------------------------------|-------------------------|---------------------------|--------------------------------------|-------------------------------|--------------|-----------------------------|
| State Project Number | Phase Number | Project Name | Sponsor | Parish | DOTD Expenditures | Final Construction | FY Completed | Recordation of Substantial Completion dd-mm-yy | Clear Lien dd-mm-yy | O & M Approval dd-mm-yy | Pay Request dd-mm-yy | Final Payment dd-mm-yy | Resolution Accepting Work dd-mm-yy | Original Contract Amount in Dollars | Number of Change Orders | Total Change Order Amount | Percentage Change of Contract Amount | Contractor | Time in Days | Comments |
| H-013022 | | Access Road Improvements | Abbeville Harbor & Terminal District | Vermillion | \$339,000.00 | \$613,298.52 | 19-20 | 06-Feb-18 | 02-Apr-18 | 21-Aug-18 | 25-Apr-18 | 21-Aug-18 | 27-Feb-18 | \$767,152.44 | 1 | -\$153,893.92 | -20.06% | Glenn Lage Construction, Inc. | 198 | Held up on O&M and As-Built |
| 578-05-0002 | 321 | Liquid Fertilizer Unloading Facility, Landside | Avoyelles Parish Port Commission | Avoyelles | \$203,454.74 | \$1,690,678.92 | 12-13 | 25-Jan-10 | 15-Mar-10 | 07-Jul-10 | 16-Mar-10 | 11-Dec-12 | 17-Feb-10 | \$1,690,678.92 | 1 | \$0.00 | 0.00% | Trek, Inc. | 1051 | Held up on As-Built |
| 578-05-0002 | 322 | Liquid Fertilizer Unloading Facility, Marine-Side | Avoyelles Parish Port Commission | Avoyelles | \$296,545.26 | \$1,179,671.00 | 12-13 | 10-Feb-10 | 01-Feb-10 | 07-Jul-10 | 26-Feb-10 | 11-Dec-12 | 17-Feb-10 | \$1,179,671.00 | 0 | \$0.00 | 0.00% | F. Miller Construction, LLC | 1035 | Held up on As-Built |
| 578-09-0008 | 302 | N. Spur Road & Rail Extension | Caddo-Bossier Port Commission | Caddo | \$900,347.99 | \$1,056,674.75 | 00-01 | 01-May-00 | 20-Jun-00 | 14-Jul-00 | 14-Jul-00 | 20-Jul-00 | 20-Apr-00 | \$809,753.00 | 3 | \$246,921.75 | 30.49% | L.J. Earnst Inc. | 80 | Held up on O&M |
| 578-09-0011 | 320 | S. Road & Rail Extension | Caddo-Bossier Port Commission | Caddo | \$1,207,385.68 | \$1,348,391.64 | 00-01 | 08-Jun-00 | 25-Jul-00 | 13-Sep-00 | 23-Aug-00 | 5-Oct-00 | 21-Sep-00 | \$1,178,735.00 | 4 | \$169,656.64 | 14.39% | Bbunt Bros Constr. | 119 | Held up on O&M |

SO WHAT DO TO WITH FORECASTS

Discuss relationship of forecasts to submission

Different type of forecasts as land based (bridge, terminal, access)

Review forecast methodologies used for benefits/costs

Apply two different analytical tools:

- Monte Carlo Application in Infrastructure forecasts
- Factor Analysis to identify which variables are most at risk for changing benefit cost equilibrium

WHY APPLY MONTE CARLO TO BENEFIT COST ANALYSIS

Used in other project studies, such as flood plain estimates

Boundaries could be used to estimate impacts from non-BCA activities

Provide a range of Benefit Cost Analysis, based in part on quality of the application

Can framework be adopted for other surface transportation forecasts?

RESEARCH METHODOLOGY

Review the Louisiana Port Prioritization Program

Develop a timeseries of traffic through each port to compare anticipated versus observed outcomes (traffic, jobs, etc.)

Develop a matrix of submitted BCA project elements

Factor Analysis of completed BCA

Identify specific markets/agents for each project (terminal, leaseholder)

Develop a Monte Carlo application to test the forecasted variables

AND WHAT ABOUT THE AGENT?

Review the Port Prioritization Program to identify agents, markets, and cargo/fleet concentration.

Estimate factors by agent regarding the project's success

Compare agent ownership to BCA elements

Recognize there is a bias in the process

SO WHAT...



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RETURNING TO THE RESEARCH QUESTION

Does the Presence of a “Super-Individual” Change The Evaluation of Potential Benefits for Public Sector Participation in Multimodal Freight (Maritime) Corridors?

- Review Louisiana Port Program
- Develop matrix to apply Monte Carlo to compare forecast to observed
- Identify if the presence of agent influenced the difference



THANK YOU

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