

The TPICS Web Tool:

A Dataset of Transportation Project Impact Case Studies

www.tpics.us

Presented by:

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Economic Development Research Group, Inc.**

Presented at:

2012 Transportation Research Board Summer Meeting

*June, 2012
Irvine, CA*

Strategic Highway Research Program 2 – Project C03

- “Interactions Between Transportation Capacity, Economic Systems, and Land Use”
- Consulting Team:
 - Economic Development Research Group, Inc.
 - ICF International
 - Cambridge Systematics, Inc.
 - Wilbur Smith Associates, Inc.
 - Susan Jones Moses and Associates

Project Objectives

- Identify **LONG-TERM** Economic Impacts from New/Capacity-Enhancing Highway Investments
- Provide Findings that Illustrate the Interaction between Highway Infrastructure and Non-Highway Investments
- Develop Preliminary Assessment Guidance for Policy-makers and Practitioners
- Design Case-Based Web-Based Tool for Illustrating and Communicating Economic Impacts
- Create Flexible System for Adding New Cases

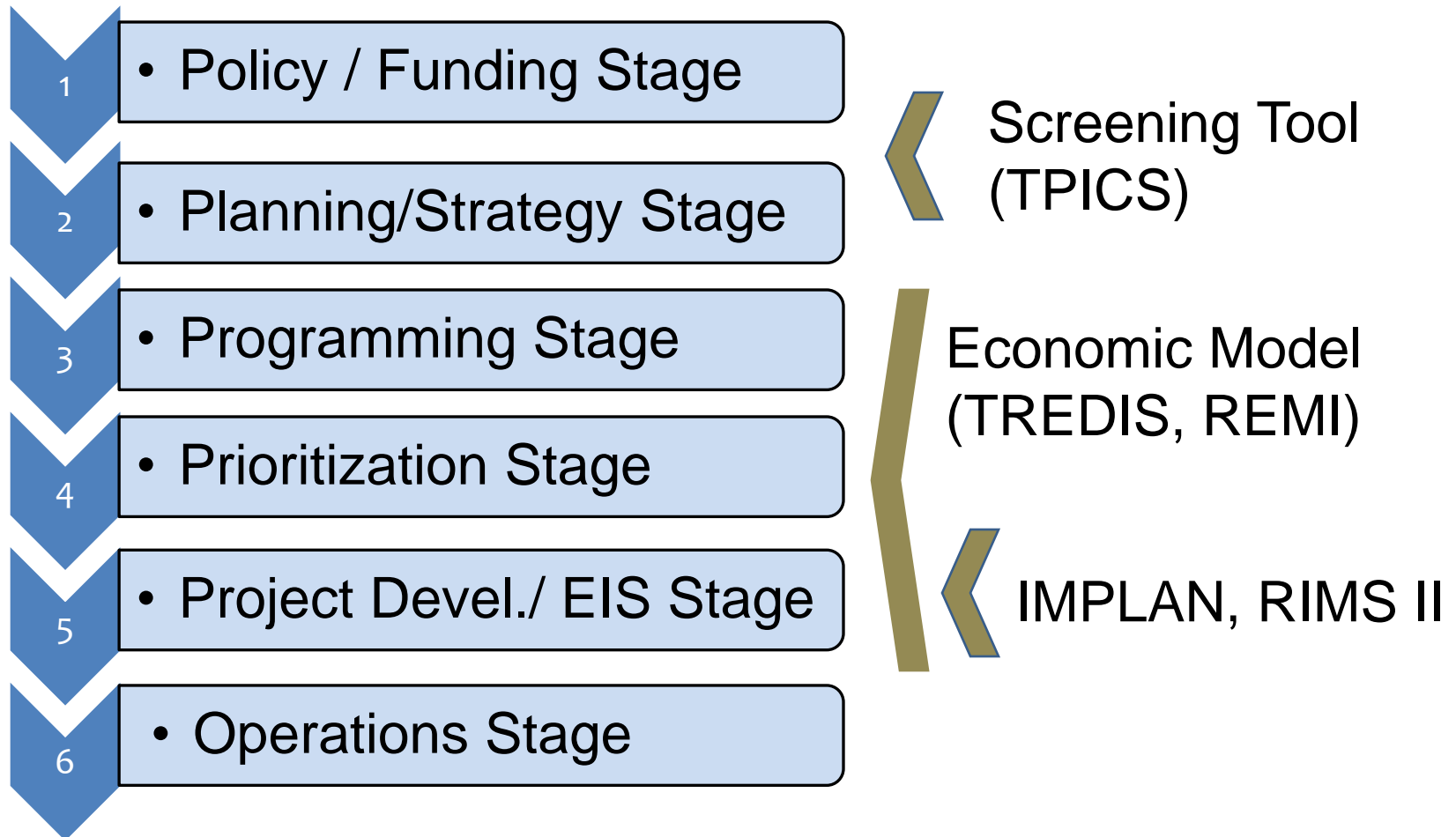
Project Work Products

- Research Reports
 - Study Design and Methodology
 - 100 Case Study Assessments
 - Meta-Analysis of Long-Range Project Impacts
 - Research Needs
- Transportation Project Impact Case Studies (TPICS) Web-Based Tool
 - Interactive Case Study Database
 - MyProject Impact Tool
- User's Guide
- Practitioner's Guide

Potential Uses of TPICS

- Compare Proposed Projects to Real-World Examples
 - Use case search to access outcomes of similar projects
- Evaluate Potential Range of Economic Impacts Associated with Proposed Highway Projects
 - Assess effects of key project characteristics
 - Identify potential effects of concurrent investments
- Prioritize Based on Long-Term Economic Development Potential
 - Decide which project types, settings and initiatives produce best overall results

Match Models to Planning Needs



Ref: SHRP2 Collaborative Decision-Making Framework

TPICS Web Tool Demonstration

www.tpics.us

Case Study Characteristics

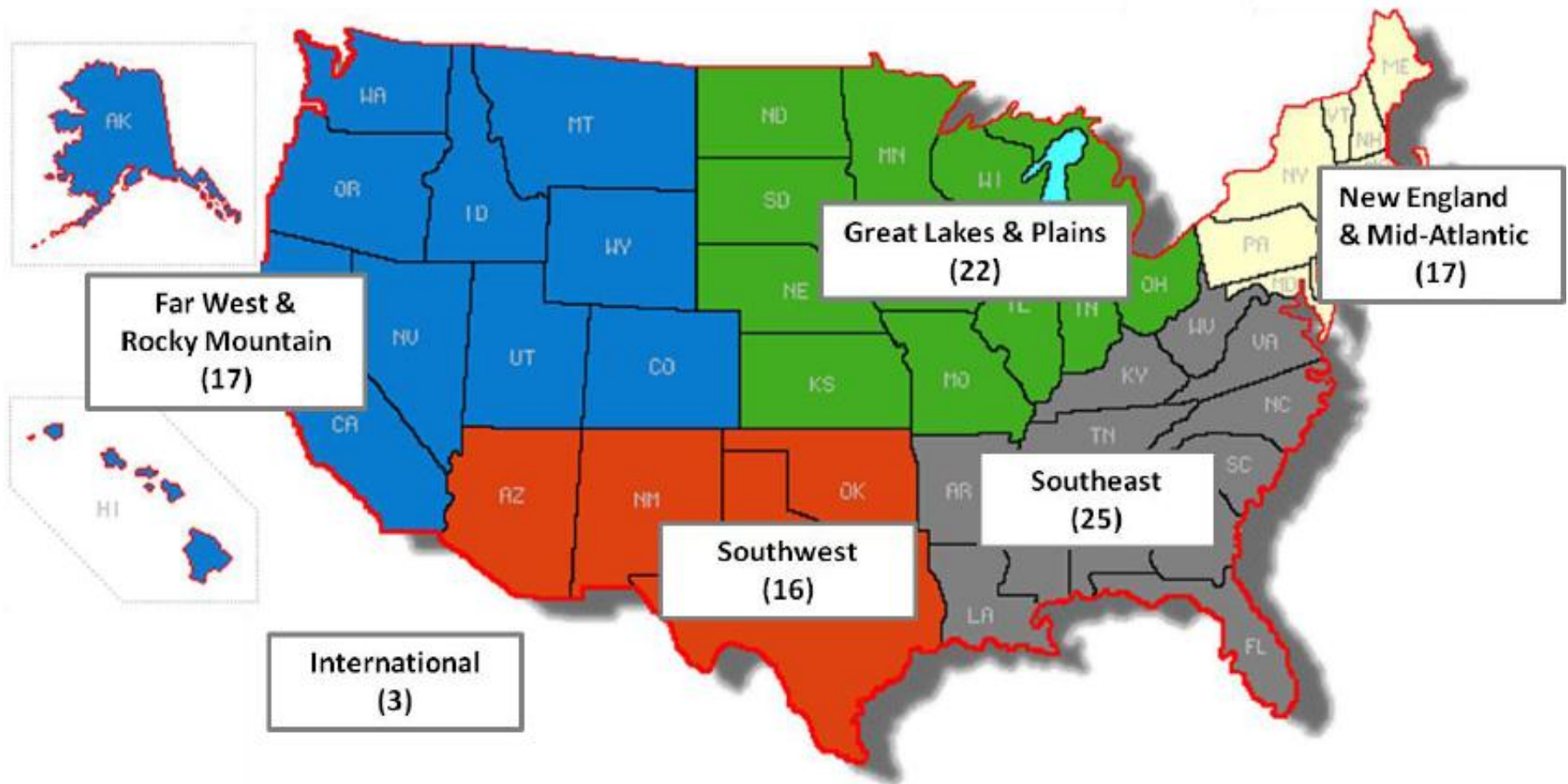
Current Case Characteristics

- Project Type
 - 10 types in current data
- Urban/Rural Setting
 - Directly affects level and type of economic impacts
- Degree of Economic Distress
 - Sets stage for leverage and potential factor interactions
- Intensity of Activity
 - Addresses traffic volume, market size and access to intermodal facilities (e.g., airport ports)

Cases by Project Type

Project Type	Total Cases
Beltway	8
Bridge	10
Bypass	13
Connector	8
Interchange	12
Industrial Access Road	7
Major Highway (Limited Access Route)	14
Widening	9
Freight Intermodal Terminal	10
Passenger Intermodal Terminal	9
Total	100

TPCIS Geographic Regions



Project Data

1. Description of project (short paragraph)
2. Project type (highways, widening, bypasses, connectors, interchanges, bridges, beltway, access road, passenger intermodal, freight intermodal)
3. Project motivation (e.g. access, site development, labor/delivery markets, tourism, congestion mitigation).
4. Project cost (planned if available)
5. Construction start and end years
6. Project Sponsor (if applicable)
7. Case study author
8. Post-construction study date
9. Project magnitude (length, lane-miles)
10. GIS latitude/longitude coordinates
11. Related Links

Location Classification

1. Region
2. Urban/Rural class (census designation)
3. Population density (population per square mile)
4. Economic distress (unemployment level relative to national average)
5. Employment growth rate (+/- percent annually)
6. Population growth rate (+/- percent annually)
7. Economic market size (population within 40 minutes)
8. Airport travel distance (minutes)
9. Travel distance to interstate (minutes)
10. Travel distance to major market
11. Extent of mountain terrain (Land surface rating: 1 to 21)

Impact Measures

1. Per capita income
2. Economic Distress (unemployment level relative to national average)
3. Number of Jobs in the area (direct and total jobs impacts)
4. Population
5. Wages and other income (per capita or per worker; direct and total wage impact)
6. Business sales (output; direct and total output impacts)
7. Population density
8. \$ Capital investment; direct and total investment
9. Property values (\$ aggregate total value change in study area)
10. State, local and federal tax revenues and costs (direct and total tax revenue)
11. Annual Average Daily Traffic count (AADT)

Project Types and Settings

Project Type	Economic Market Setting			Economic Distress		
	Metro	Rural	Mixed	High	Even	Low
Access Road	2	5	0	2	2	3
Beltway	8	0	0	2	3	3
Bridge	4	3	3	0	8	2
Bypass	4	8	1	6	2	4
Connector	4	2	2	3	0	5
Interchange	10	0	2	6	2	4
Major Highways	5	0	9	3	5	6
Widening	4	2	3	1	3	5
Intermodal	15	15	15	5	11	3
Total	56	23	21	28	36	35

Case Characteristics (US Projects)

Project Type	No. Cases	Median cost per mile (millions)	Median AADT
Access Road	7	\$1.61	5,502
Beltway	8	\$30.68	88,000
Bridge (includes 1 non-US)	9	\$39.22	23,600
Bypass (includes 2 non-US)	11	\$5.34	19,774
Connector	8	\$21.79	16,910
Interchange	12	\$14.05	53,450
Limited Access Road	14	\$11.05	46,150
Widening	9	\$46.17	24,000
Freight Intermodal	10	n/a	n/a
Passenger Intermodal	9	n/a	n/a
All Project Types (excluding 3 int'l)	97	\$14.98	28,856

Case Study Findings & Implications

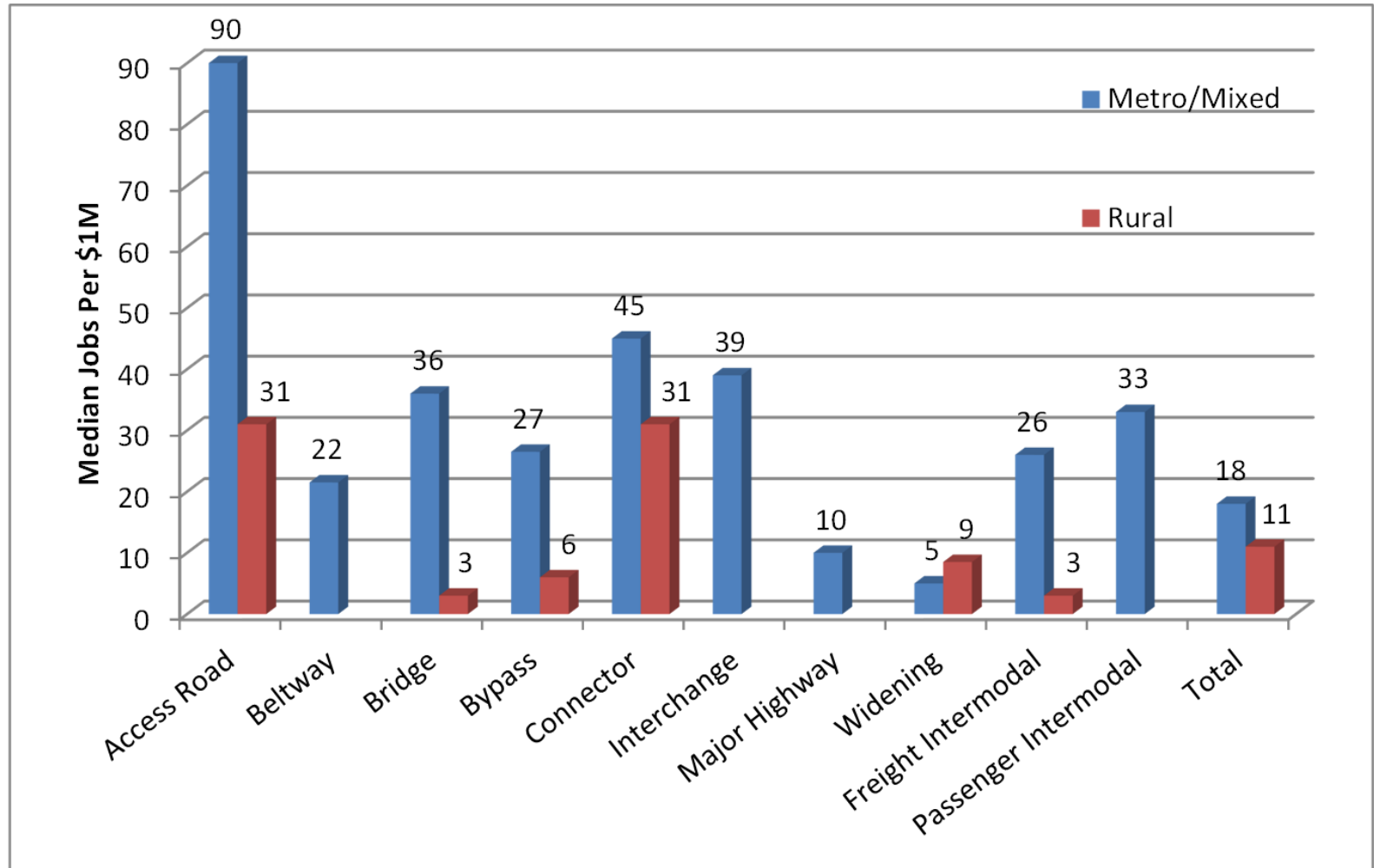
Range of Economic Effects

Measure of Impact	Min	Max*	Median	Mean
Employment (Jobs)	-48	50,505	1,290	5,782
Income (\$ millions)	\$0	\$2,332	\$53	\$267
Business Output (\$ millions)	\$0	\$8,830	\$142	\$840
Building Development (thousand sq.ft.)	4.2	50,000	1,003	-
Direct Private Investment (in \$ millions)	\$3.0	\$6,300	\$300	-
Property Values (in \$ millions)	\$0.15	\$85	\$16.0	-
Property Tax Revenue (in \$millions)	\$0.12	\$55	\$2.1	-

SHRP2 C03 – Findings

- Size of Investment (\$\$) is not the Primary “Driver” of Long-Term Economic Impacts
- Project Types and Economic Conditions Have Greatest Influence on Investment Outcomes
- Non-transportation Initiatives Matter
- Greatest Economic Effects Attributable to:
 - Regional setting
 - Current level of economic activity/distress
 - Location and intensity of use
 - Concurrent economic development policies

Jobs Created per \$1M Spent

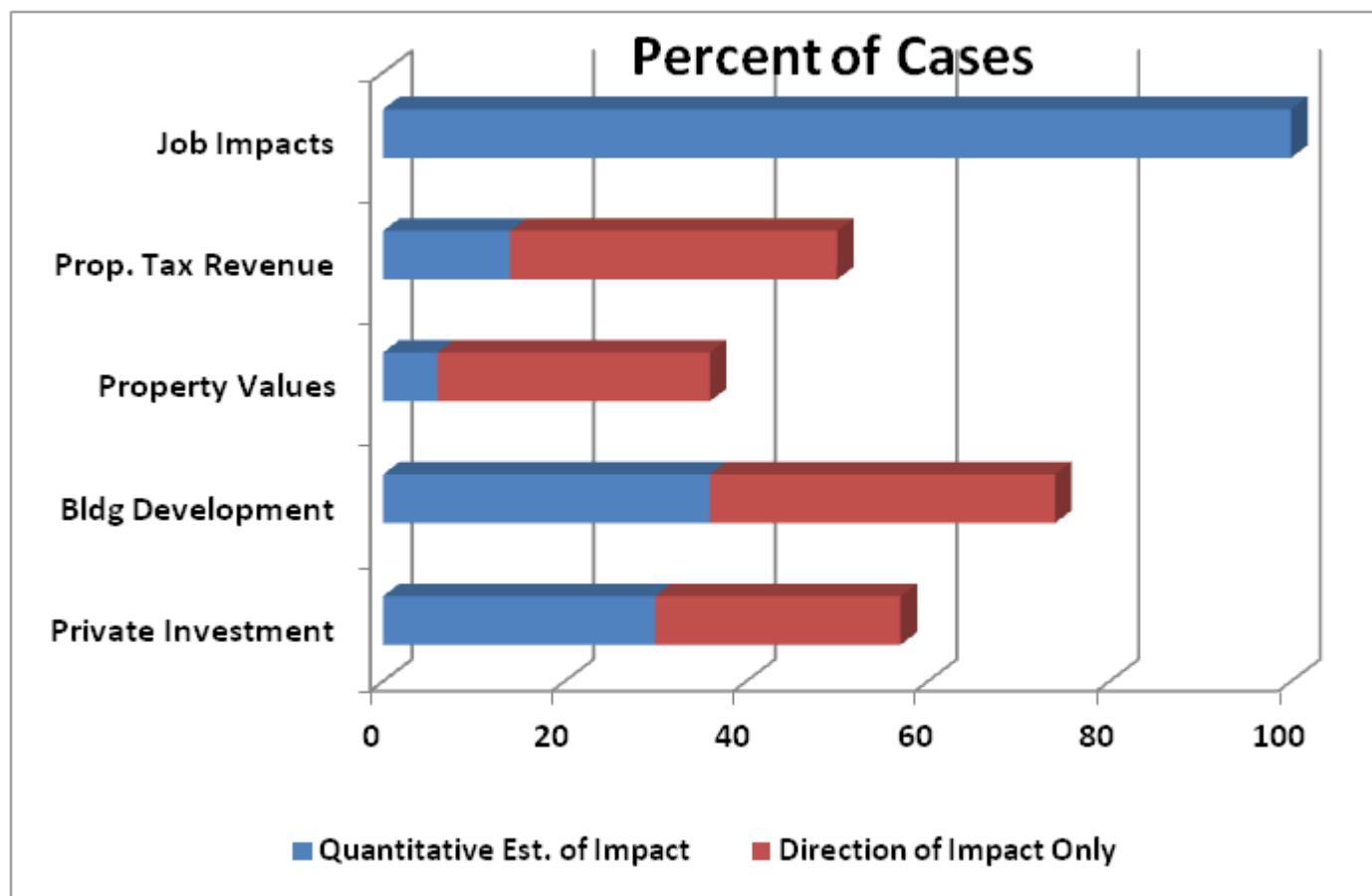


Differences in Metro/Rural Settings

	Metro/Mix Setting			Rural Setting		
	# Cases	Jobs Created Low	Jobs Created High	# Cases	Jobs Created Low	Jobs Created High
Access Road	2	478	3,195	5	7	680
Beltway	7	2,106	43,753	-	-	-
Bridge	6	0	11,771	3	0	319
Bypass	5	0	23,977	6	0	1,420
Connector	6	0	14,578	2	0	412
Interchange	12	0	23,520	-	-	-
Limited Access Road	13	90	50,505	-	-	-
Widening	6	14,989	15,484	2	3,785	4,080
All Project Types*	57	0	50,505	18	0	4,080

**Excluding Passenger and Freight Intermodal Jobs reflect total economic impacts*

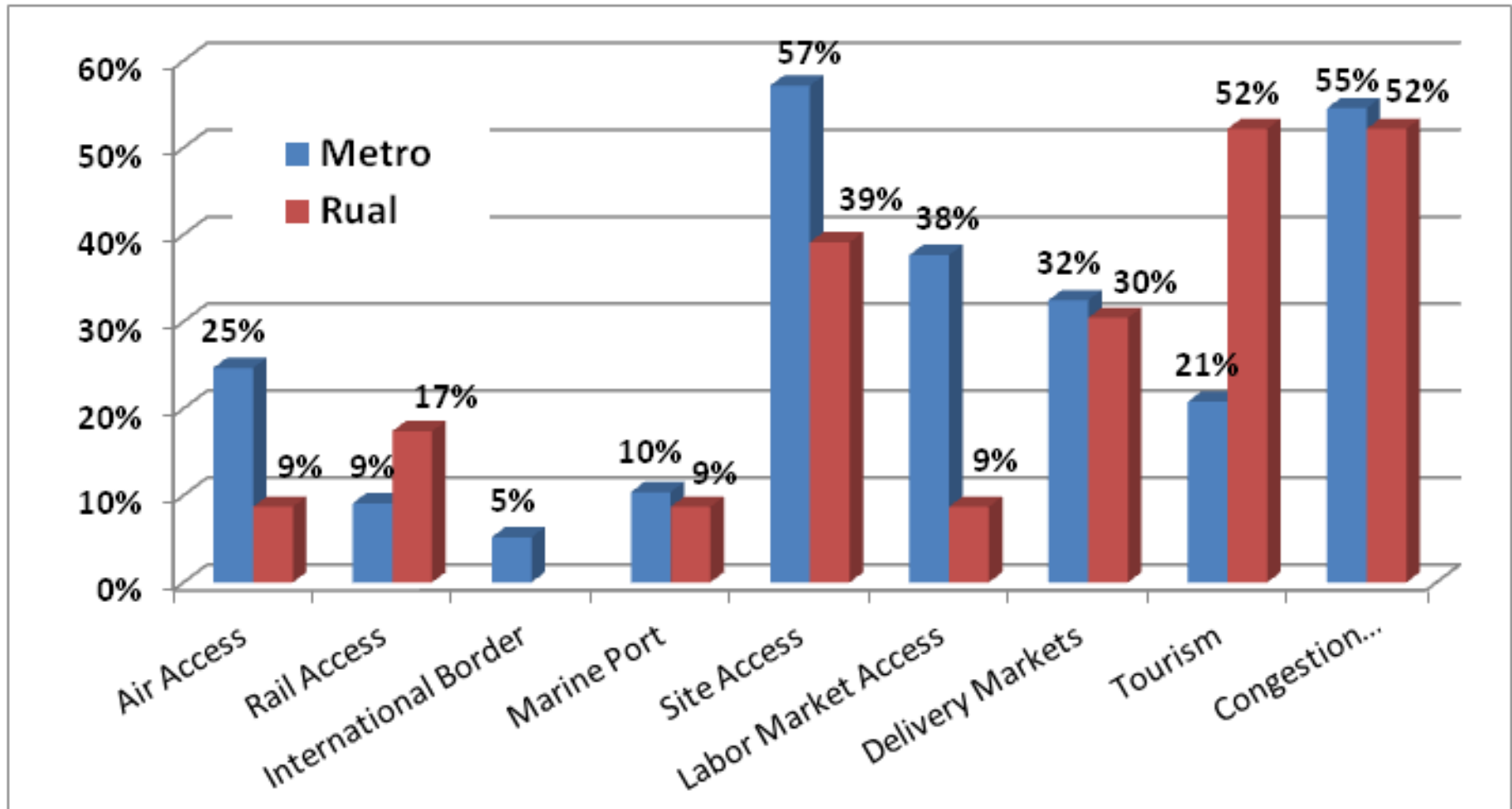
Cases with Quantitative and Qualitative Data



Key Interaction Factors

- Access to Alternative Modes
 - Airports
 - Rail Intermodal Facilities
 - Seaports
- Market Access
 - Labor Markets
 - Freight/Delivery Markets
- Congestion
 - Shifts spatial distribution of economic impacts

% of Projects by Stated Motivation

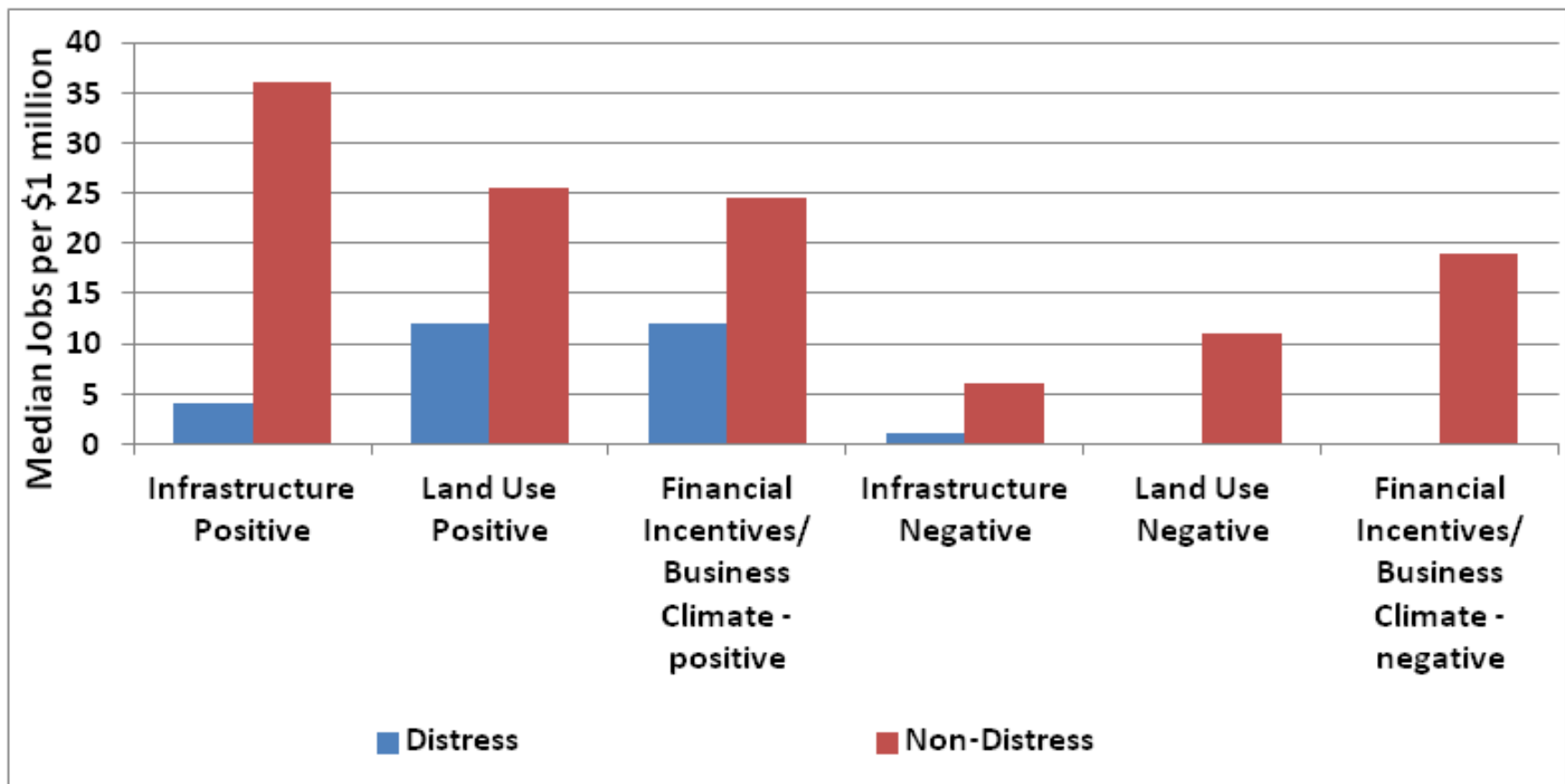


* Excluding Passenger and Freight Intermodal

Complementary Infrastructure and Policies

Non-Transportation Factors		Incidence
Positive Local Factors	Available Infrastructure (sewer, water, telecom)	33%
	Land Use Management	45%
	Financial Incentives/ Business Climate	46%
Negative Local Factors	Lack of Infrastructure (sewer, water, telecom)	10%
	Lack of Land Use Management	6%
	Lack of Financial Incentives/ Neg. Business Climate	5%
ALL PROJECTS		100%

Effects of Non-Transportation Factors and Economic Setting



Effects of Interactions

- Effects of Concurrent Infrastructure
 - Water, sewer, broadband, power, etc.
 - Range of effects: -40% to +31%
- Supportive Land Use Policies
 - Permitting, zoning, special districts, etc.
 - Range of effects: -34% to +24%
- Business Incentives
 - Tax increment financing, abatements, job training programs, etc.
 - Range of effects: -12% to +20%

Validation

Project Type	Percent of Cases Accurate Within 1 Std. Deviation	Total Cases
Access Road	100%	7
Beltway	63%	8
Bridge	78%	9
Bypass	100%	11
Connector	88%	8
Interchange	100%	12
Major highway	100%	13
Widening	100%	9
% within Range	92%	77*

Lessons Learned

- Best at capturing economic development benefits of investments on small, isolated geographic areas
- Impacts easiest to substantiate in immediate vicinity of the transportation investment
- Difficult to distinguish the impacts of a transportation investment from concurrent public policies
 - Economic development consequences of a transportation investment can be difficult to isolate
- Time frame for impacts varies considerably among case study projects
 - TPICS provides pre/post comparison for specific points in time
- Data for recent projects is easier to collect and more accurate than that collected for older projects

Additional Research

- Assess the effects of market access, productivity and reliability improvements for broader geographic regions
- Address some of the key issues related to benefit assessments required for environmental analysis
- Expand relationships between private sector investments and public investment and policy
- Develop case study methods and assessment processes
- Expand development to include more cases and fill in gaps

The T-PICS System

contains a database of case studies of built transportation projects and pre/post project data regarding their impacts on the economy of proposed new projects by providing information on the range of actual impacts observed from already-built projects. The system at this time contains information only for highway-related projects.

Case Search

(Screen and Select)

You define a set of project characteristics. The system screens available cases and selects those that meet your criteria. You can then view the selected cases.



My Project Tools

(Rate and Rank and Predict Impacts)

You describe a proposed project (not yet built). You set allowances for 'importance weights' for various criteria. The system rates and ranks cases by how well they match to your defined criteria. You then view and compare best-ranked matches. The system then uses findings from available case studies to estimate the most likely level and range of economic impacts for your proposed project.



Announcements

This is a draft version of the web site for Transportation Project Impact Case Studies (T-PICS). It provides access to a national database of case studies that can be used to assess the pre- and post-construction economic development and related effects of various kinds of transportation projects. The first sixty case studies are included in this release of T-PICS. Additional case studies and project types will be added in 2010. Click on the "About T-PICS" tab (above) for additional information.



Case Search

You enter data characteristics of your own project. Then you can view projects that are similar to yours, and use the data to estimate the likely impacts of your project.

[View Results](#)

Basic Criteria

Other Criteria

Potential Matches: 9

Project Type:

[De-Select All](#)

- | | | | |
|---|---|---|--------------------------------------|
| <input checked="" type="checkbox"/> Bypass | <input checked="" type="checkbox"/> Limited Access Road | <input checked="" type="checkbox"/> Beltway | <input type="checkbox"/> Interchange |
| <input type="checkbox"/> Bridges | <input type="checkbox"/> Access Road | <input type="checkbox"/> Bundled | <input type="checkbox"/> Widening |
| <input checked="" type="checkbox"/> Connector | <input type="checkbox"/> Intermodal Freight | <input type="checkbox"/> Intermodal Passenger | |

Region:

[De-Select All](#)

- | | | | |
|---|---|------------------------------------|--|
| <input type="checkbox"/> New England/Mid-Atlantic | <input checked="" type="checkbox"/> Southwest | <input type="checkbox"/> Southeast | <input type="checkbox"/> International |
| <input checked="" type="checkbox"/> Rocky Mountain/Far West | <input type="checkbox"/> Great Lakes/Plains | | |

Motivation:

[De-Select All](#)

- | | | | | |
|--|--|--|---|----------------------------------|
| <input checked="" type="checkbox"/> Air Access | <input checked="" type="checkbox"/> Labor Market | <input type="checkbox"/> Int'l Border Access | <input checked="" type="checkbox"/> Site Development | <input type="checkbox"/> Tourism |
| <input type="checkbox"/> Rail Access | <input type="checkbox"/> Delivery Market | <input type="checkbox"/> Marine Port Access | <input checked="" type="checkbox"/> Congestion Mitigation | |

Urban/Class Level:

- | | | |
|--------------------------------|---|---|
| <input type="checkbox"/> Rural | <input checked="" type="checkbox"/> Mixed | <input checked="" type="checkbox"/> Metro |
|--------------------------------|---|---|

Economic Distress:

- ☒ All
 ☐ Distressed Only
 ☐ Non Distressed Only

Keywords:

[Search Keywords](#)
[Clear](#)

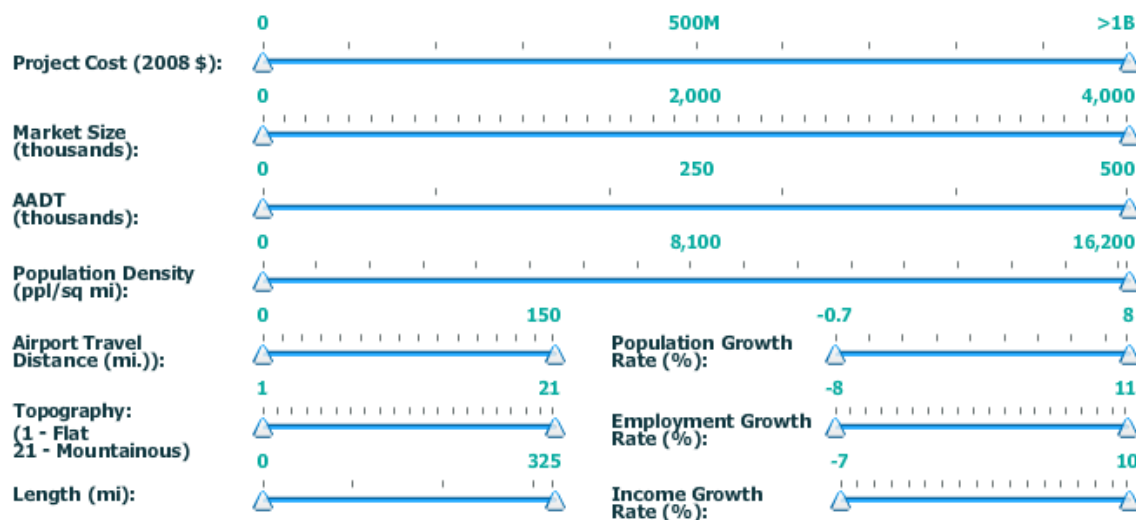


Case Search

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[View Results](#)
[Basic Criteria](#)
[Other Criteria](#)

Potential Matches: 9


[Reset Sliders](#)
☒ Include cases with missing data

Case Search Results

Matches:9

Click on a column table header (for example, 'Project Cost') to sort the results by that column. Click two or more checkboxes in the 'Compare' column and click 'Compare Projects' to compare project data. Click on a case study title to view detailed information about that case. Project Cost is in 2008 dollars.

Your case search parameters are:

Project Type: Bypass, Limited Access Road, Beltway, Connector
Urban Class: Mixed, Metro
Region: Southwest, Rocky Mountain/Far West
Motivation: Air Access, Labor Market, Site Development, Congestion Mitigation
Project Cost (2008): \$0 - >\$1,000,000,000
Economic Distress: All

Compare	Title	Description	Project Type	State	BEA Region	Project Cost (2008)	Enr
<input type="checkbox"/>	Interstate 27	Interstate 27 is a north-south highway, which traverses the northern panhandle and high plains of Texas.	Limited Access Road	TX	Southwest	\$980,104,218.88	199
<input type="checkbox"/>	Beltway 8 Houston ...	Beltway 8 is a toll facility owned and operated by the Harris County Toll Road Authority (HCTRA). The improved accessibility accelerated the growth of residential and commercial development in the western part of Houston.	Beltway	TX	Southwest	\$147,171,161.67	198
<input type="checkbox"/>	I-515 Henderson	I-515 was built both to relieve traffic traveling south from Las Vegas on Route 15, and to improve highway access into the southeastern part of Clark County to Henderson.	Limited Access Road	NV	Southwest	\$160,195,288.75	199
<input type="checkbox"/>	E470 Denver	E-470 is a private, 47-mile long toll road that forms an outer beltway around	Beltway	CO	Rocky	\$1,999,520,762.52	200



Case Search Results

Huntsville Alabama

The Huntsville, AL International Intermodal Center (IIC) consists of air and rail cargo operations and includes an access road connection to the highway. The runway was extended in 2004 and the nearby JetPlex Industrial park has 5.6 m square feet of space.

Related Websites:

[Port of Huntsville](#)

Attachments:

[Characteristics](#)
[Intermodal](#)
[Setting](#)
[Pre/Post Conditions](#)
[Narrative](#)
[Impacts](#)
[Images](#)

State:	AL	Length (mi):	0.87
City:	Huntsville	Impact Area:	Madison
AADT:	7000	Months Duration:	
Project Type:	Freight Intermodal	Actual Cost (YOE\$'s):	\$115,709,708
Planned Cost (YOE\$'s)	\$0	Actual Cost (\$2008):	\$115,709,708
Constr. Start Date:	1986	Constr. End Date:	2004
Initial Study Date:		Post Constr. Study Date:	2008
Region:	Southeast	GIS Lat/Long:	34.644841 - 86.759136

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Case Search Results

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Planned Cost (YOE\$'s) \$0

Freight Intermodal

Intermodal Project Actual Cost (YOE\$'s) \$0

General and Bulk Cargo Volume (Metric Tons): 0

Access improvement costs (YOE\$'s) \$7,839,708

Container Volume (Metric Tons): 73,569

Actual Cost YOE\$'s) \$115,709,70

Container Volume (TEU's): 0

Intermodal Project Actual Cost (2008\$'s) \$107,870,00

Passenger Intermodal

0

Access improvement costs (2008\$'s) Metro

Passenger Ridership per year: 0

Actual Cost (2008\$) \$115,709,70

Number of Parking Spaces: 0

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[Images](#)

Urban/Class Level: Metro

Economic Distress: 1.00

Population Density (ppl/sq mi): 381

Population Growth Rate (%): 1.7%

Employment Growth Rate (%): 2.2%

Market Size: 176,897

Airport Travel Distance (mi.) 20

Topography (1=Flat, 21=Mountainous): 6

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Case Search Results

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Pre/Post Conditions Scale: ☐ Local ☒ County ☐ State

Measure	Pre-Project	Post-Project	Change	% Change
Personal Income	\$29,447	\$41,488	\$12,041	40.90 %
Economic Distress	N/A	0.64	N/A	N/A
Total Num. of Jobs	135,553	228,640	93,087	68.68 %
Population	196,966	320,914	123,948	62.93 %
Property Value	N/A	\$160,196	N/A	N/A
Business Sales (\$M's)	N/A	N/A	N/A	N/A
Tax Revenue (\$M's)	N/A	N/A	N/A	N/A
Density	341.27	398.69	57.42	16.83 %

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Case Search Results

Huntsville Alabama

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Related Websites:

[Port of Huntsville](#)

Attachments:



[Back to results](#)

Characteristics

Intermodal

Setting

Pre/Post Conditions

Narrative

Impacts

Images

Port of Huntsville

1.0 SYNOPSIS

The International Intermodal Center (IIC), an inland port complex located in Northern Alabama, is located at the Port of Huntsville. The port complex also includes the Huntsville International Airport and the Jetplex Industrial Park, which are under the jurisdiction of Huntsville–Madison County Airport Authority. The IIC includes two distinct operations: rail cargo, which began in 1986, and air cargo, which began in 1987. The total construction cost of these two operations combined was \$53.11 million (\$2008). To accommodate the expected increases in freight truck traffic to and from the port, the Wall Triana highway was completed in 1987 connecting the port of Huntsville to I-565 at a cost of \$7.83 million (\$2008). In 2003, rail operations were expanded to include additional sidings and lift capacity, costing an additional \$21.06 million (\$2008). Between 2000 and 2003, the Port of Huntsville extended an existing 8,000 foot runway by 4,600 feet to 12,600 feet to meet the international cargo shipment needs of Panalpina, an existing air cargo firm at the airport. The new 12,600 foot runway opened in May of 2004 and cost \$33.7 million (\$2008). In response to the runway extension, Panalpina flights throughout the U.S. and abroad increased from 7 per day in 2000 to 15 per day in 2008 accommodating an increase of 13,000 tons of freight. (Because of the recession of 2008-2010, Panalpina volumes have decreased, but are expected to increase again

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Case Search Results

Huntsville Alabama

The Huntsville, AL International Intermodal Center (IIC) consists of air and rail cargo operations and includes an access road connection to the highway. The runway was extended in 2004 and the nearby JetPlex Industrial park has 5.6 m square feet of space.

[Characteristics](#)
[Intermodal](#)
[Setting](#)
[Pre/Post Conditions](#)
[Narrative](#)
[Impacts](#)
[Images](#)

Measure	Direct	Indirect	Total
Number of Jobs	514	294	808
Income/Wages (\$M's)	\$28	\$16	\$45
Output (\$M's)	\$70	\$40	\$110

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Related Websites:

[Port of Huntsville](#)

Attachments:



Case Search Results

Huntsville Alabama

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My Project Tools

You enter data characteristics of your own project. On the View Results Screen you can see the likely ranges of economic impacts from your project, and estimates of project cost and traffic volume. You will have the opportunity to adjust cost and traffic estimates, and to adjust complementary regional economic development factors to properly reflect your region. In turn, these adjustments will drive changes in expected economic impacts of your project.

[View Results](#)

Project Type:

- ☐ Bypass
 ☒ Limited Access Road
 ☐ Beltway
 ☐ Interchange
 ☐ Widening
☐ Bridges
 ☐ Access Road
 ☐ Bundled
 ☐ Connector

Region:

- ☐ New England/Mid-Atlantic
 ☐ Southwest
 ☒ Southeast
 ☐ International
☐ Rocky Mountain/Far West
 ☐ Great Lakes/Plains

Urban/Class Level:

- ☐ Rural
 ☒ Mixed
 ☐ Metro

Economic Distress:

- ☐ Distressed Only
 ☒ Non Distressed Only

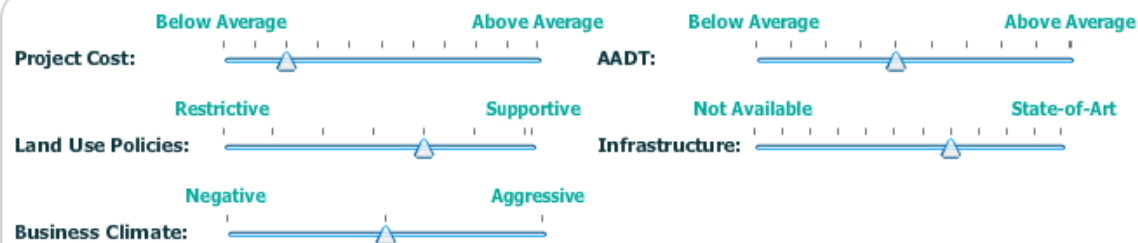
Length of your Project:

25 Miles

[Change Search Parameters](#)


My Project Tools

You can change the project cost and expected AADT of your project (the default location of the arrows for both represent the medians), and adjust the characteristics of your region to reflect local conditions. These changes will affect the economic impacts of your project.



	Jobs	Wages	Output
Direct Impacts	1,990 - 3,320	\$83,425,000 - \$139,042,000	\$265,225,000 - \$442,042,000
Supplier and Wage Impacts	1,200 - 1,990	\$50,055,000 - \$83,425,000	\$159,135,000 - \$265,225,000
Total Impacts	3,190 - 5,310	\$133,480,000 - \$222,467,000	\$424,360,000 - \$707,267,000

Estimated Project Cost (\$):

\$271 million

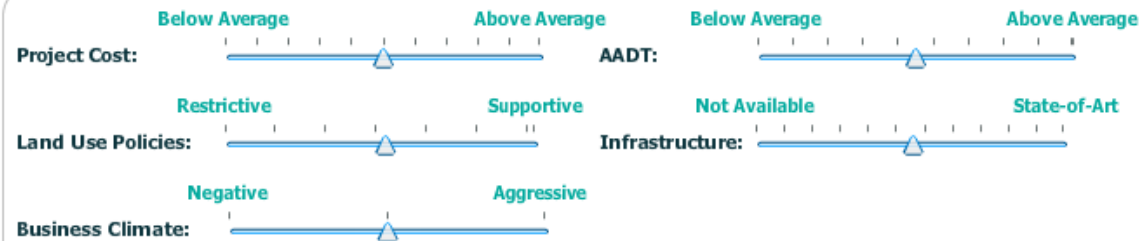
Estimated AADT:

61,000

[Change Search Parameters](#)


My Project Tools

You can change the project cost and expected AADT of your project (the default location of the arrows for both represent the medians), and adjust the characteristics of your region to reflect local conditions. These changes will affect the economic impacts of your project.



	Jobs	Wages	Output
Direct Impacts	2,850 - 4,750	\$119,408,000 - \$199,013,000	\$379,621,000 - \$632,701,000
Supplier and Wage Impacts	1,710 - 2,850	\$71,645,000 - \$119,408,000	\$227,772,000 - \$379,621,000
Total Impacts	4,560 - 7,600	\$191,052,000 - \$318,420,000	\$607,393,000 - \$1,012,321,000

Estimated Project Cost (\$):

\$474.2 million

Estimated AADT:

67,000

T-PICS Documents

[GO TO T-PICS WEB SITE](#)

User Guide:

[T-PICS User Guide](#)

Tasks:

[Working Paper on Stakeholder Needs and Future Research](#)

[Economic Impact Performance Metrics](#)

[Case Study Design](#)

[Meta Analysis Design](#)

[Case Study Development](#)

Presentations:

[Transportation Research Board Presentation \(Part 1 of 2\)](#)

[Transportation Research Board Presentation \(Part 2 of 2\)](#)