SHRP2 C11 Tools and Transportation Project Impact Case Studies (TPICS) Demonstration

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I-TED 2014
INTERNATIONAL TRANSPORTATION ECONOMIC DEVELOPMENT CONFERENCE
Economic Development Implications of Global Trade, Transport Investments, Climate Change, Environmental, and Urban and Rural Policies

"I would just invite some of these economists – who sit in front of their spreadsheets of inadequate data trying to figure out the world – I wish they would actually go out into the real world and talk to employers like I do all the time." - Jason Kenney, Canadian Minister of Employment and Social Development

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
- Texas Transportation Institute

Outline

Transportation Project Impact Case Studies (TPICS): SHRP2 C03

www.tpics.us

Wider Benefits Tools: SHRP2 C11

1. Reliability
2. Connectivity
3. Accessibility
4. Accounting Framework

www.tpics.us/tools

Match Models to Planning Needs

1 • Policy / Funding Stage

2 • Planning/Strategy Stage

3 • Programming Stage

4 • Prioritization Stage

5 • Project Devel./ EIS Stage

6 • Operations Stage

Screening Tool (TPICS)

Wider Benefit Tools (C11)

Economic Model *(REMI, TREDIS)*

Transportation Project Impact Case Studies (TPICS)

TPICS is a tool for planners to use in early-stage policy/strategy development, “sketch planning”, and public hearings processes. It contains 100 case studies documenting the before-and-after economic and development conditions associated with real-world highway & intermodal projects.

Case Search: Select relevant case studies based on project type, location setting & other criteria. Read about the nature of economic impacts and lessons learned regarding factors that affect project outcomes.

My Project Tools: Specify a given type of project and then see the range of expected impacts, based on experience with actual projects in the TPICS database.

TPICS Role in Meeting Planning Needs

1 • Policy / Funding Stage

2 • Planning/Strategy Stage

3 • Programming Stage

4 • Prioritization Stage

5 • Project Devel./ EIS Stage

6 • Operations Stage

Screening Tool (TPICS)

Wider Benefit Tools (C11)

Economic Model (*REMI, TREDIS*)

Ref: SHRP2 Collaborative Decision-Making Framework

Early Stage Question for TPICS

What is a reasonable range of economic impact expectations? *(for public & legislative discussion)*

What configurations and settings work best? *(for planning concept development)*

How can a mix of concurrent transportation and non-transportation policies work for each of several project types and settings? *(for policy)*

Make-up of Case Studies

- Economic data analysis and comparisons
- Site analysis via mapping
- Web-based research – project elements
- Interviews
  - *Spatial context of impacts*
  - *Public and private sector informants*
  - *Packaging with other investments & actions*
  - *Unique local impact factors & circumstances*
  - *Distributional impacts*

T-PICS
Transportation Project Impact Case Studies

www.tpics.us

Home | Case Search | My Project Tools | About T-PICs

The TPICS (Transportation Project Impact Case Studies) System

Contains: (1) a searchable database of past projects and their observed impacts on economic development, and (2) a predictive tool that estimates the range of likely impacts of proposed new projects, based on results from already-built projects. See buttons above.

Case Search (Past Projects)

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.

The Case Search feature allows you to search for specific types of projects in specific types of settings. So if a specific type of project has been proposed or suggested for your area, you can use this information to inform agency planners and public meeting attendees about past experiences with similar types of projects. The available information includes descriptions of project features and pre/post data pertaining to project impacts on the local or regional economy. It also includes detailed results from local interviews on project objectives, implementation issues and other factors affecting the nature of project impacts. Aerial photos and links to other reports are also provided. Lessons learned from these experiences can be used to improve project design and implementation processes.

My Project Tools (Predict Impacts of Future Projects)

You define a set of project characteristics. The system identifies case studies of past projects that meet your criteria. You can then view details of those cases.

The Project Tools feature is a form of expert system that draws from the case study database to estimate the range of economic impacts likely to results from a specific type of project in a defined setting. It provides a form of "analysis by analogy," in that it identifies a reasonable range for expected impacts of proposed projects, based on prior experiences. You can thus use it as a screening tool for early stage project assessment.

Users should note that neither the searchable database nor the project prediction tool provides information on the effects of changing traffic volumes, speeds, distances or safety, or effects of changing reliability, connectivity or accessibility. In real world situations, these factors can play a substantial role in determining whether the actual economic impact of a project will be at the low end, high end or outside of the normally expected range. To assess the impact of these additional factors, it is necessary to use economic impact models and tools that do measure these added factors affecting the wider economic impacts of projects.

Further Information

- Summary of TPICS
- Advice on TPICS Use
- Instructions for TPICS
- Analysis of TPICS Data
- Further Reports on TPICS
- Tools to Assess Wider Econ Impacts

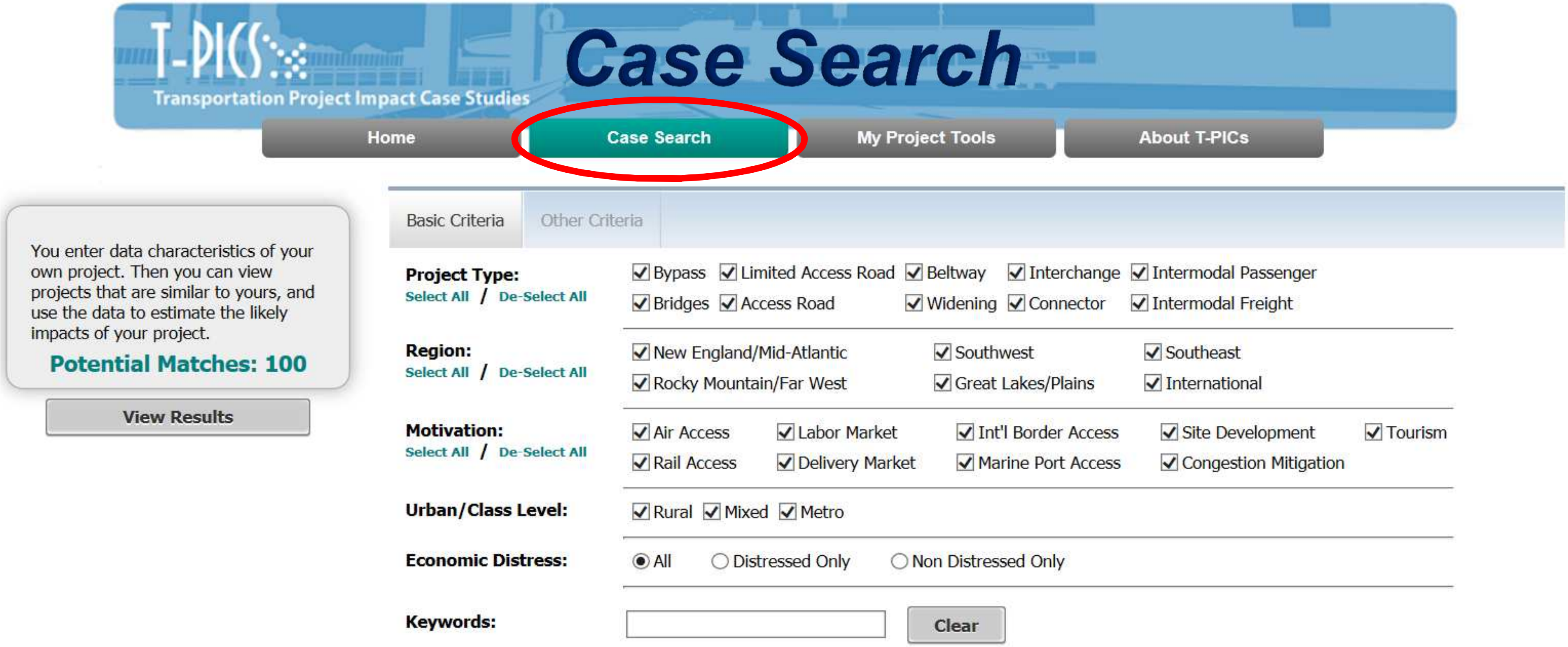
- Submit New Case
- Forum

We are very interested in your feedback. If you have any questions or comments about TPICS, please click the button below to let us know what you think.

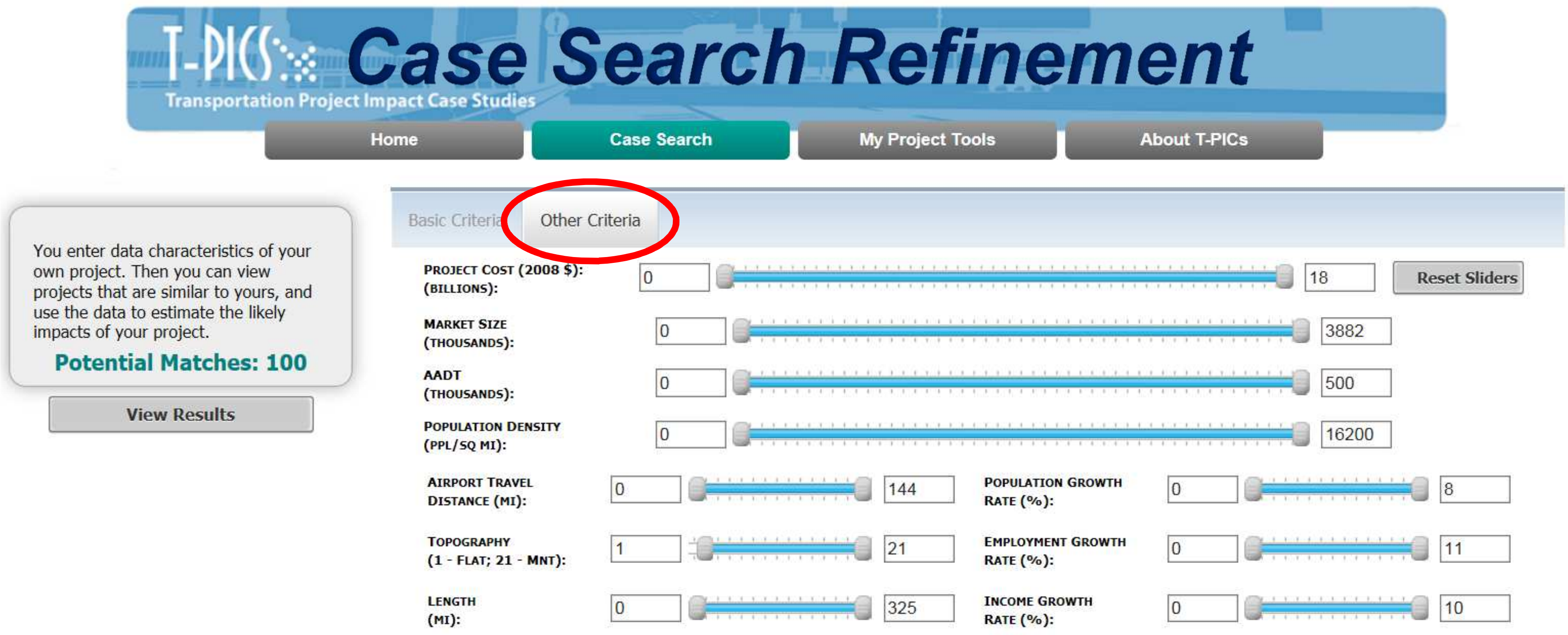
Feedback

http://tpics.us/

http://tpics.us/



T-PICS
Transportation Project Impact Case Studies
Case Search
Home
Case Search
My Project Tools
About T-PICs
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.
Potential Matches: 100
View Results
Basic Criteria
Other Criteria
Project Type:
Select All / De-Select All
Bypass
Limited Access Road
Beltway
Interchange
Intermodal Passenger
Bridges
Access Road
Widening
Connector
Intermodal Freight
Region:
Select All / De-Select All
New England/Mid-Atlantic
Southwest
Southeast
Rocky Mountain/Far West
Great Lakes/Plains
International
Motivation:
Select All / De-Select All
Air Access
Labor Market
Int'l Border Access
Site Development
Tourism
Rail Access
Delivery Market
Marine Port Access
Congestion Mitigation
Urban/Class Level:
Rural
Mixed
Metro
Economic Distress:
All
Distressed Only
Non Distressed Only
Keywords:
Clear



T-PICS
Case Search Refinement
Transportation Project Impact Case Studies
Home
Case Search
My Project Tools
About T-PICs
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.
Potential Matches: 100
View Results
Basic Criteria
Other Criteria
PROJECT COST (2008 $): (BILLIONS): 0 18
Reset Sliders
MARKET SIZE (THOUSANDS): 0 3882
AADT (THOUSANDS): 0 500
POPULATION DENSITY (PPL/SQ MI): 0 16200
AIRPORT TRAVEL DISTANCE (MI): 0 144
POPULATION GROWTH RATE (%): 0 8
TOPOGRAPHY (1 - FLAT; 21 - MNT): 1 21
EMPLOYMENT GROWTH RATE (%): 0 11
LENGTH (MI): 0 325
INCOME GROWTH RATE (%): 0 10

T-PICS Results: Cases Found

Transportation Project Impact Case Studies

Home | Case Search | My Project Tools | About T-PICs

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.

Potential Matches: 100

View Results

Download Search Results

Print Search Results

Compare Projects

Basic Criteria | Other Criteria

Project Type: Select All / De-Select All
☑ Bypass ☑ Limited Access Road ☑ Beltway ☑ Interchange ☑ Intermodal Passenger
☑ Bridges ☑ Access Road ☑ Widening ☑ Connector ☑ Intermodal Freight

Region: Select All / De-Select All
☑ New England/Mid-Atlantic ☑ Southwest ☑ Southeast
☑ Rocky Mountain/Far West ☑ Great Lakes/Plains ☑ International

Motivation: Select All / De-Select All
☑ Air Access ☑ Labor Market ☑ Int'l Border Access ☑ Site Development ☑ Tourism
☑ Rail Access ☑ Delivery Market ☑ Marine Port Access ☑ Congestion Mitigation

Urban/Class Level: ☑ Rural ☑ Mixed ☑ Metro

Economic Distress: ◉ All ○ Distressed Only ○ Non Distressed Only

Keywords: Clear

Compare	Title	Description	Project Type	State	BEA Region	Project Cost (2008)	End Date
☐	Hammondsport	The Hammondsport Industrial Access Road involved resurfacing of three adjoining streets on the village's industrial western flank, running a total length of about a mile.	Access Road	NY	New England/Mid-Atlantic	$1,609,742	2001
☐	Interstate 68	Interstate 68 is part of the Appalachian Development Highway System, a network of roads intended to foster economic development throughout the Appalachian region. The route followed by I-68 was first designated as Corridor E by the Appalachian Regional Development Act of 1965.	Limited Access Road	MD	New England/Mid-Atlantic	$1,708,257,711	1991
☐	Yass Bypass	A bypass in town of Yass, New South Wales (NSW) State by the Hume Highway - linking Sydney and Melbourne. The bypass includes 15 bridges and 18km of dual carriageway.	Bypass	New South Wales	International	$127,649,810	1995
☐	Interstate 29	I-29 was constructed to serve as a major north-south interstate through the upper Great Plains to Canada.	Limited Access Road	IA	Great Lakes/Plains	$604,309,905	1973
☐	US Highway 281, San Antonio (Extension)	US 281 is a new highway constructed from the downtown sector of San Antonio to the San Antonio International Airport and provides freeway access to fastest growing part of region.	Connector	TX	Southwest	$176,434,913	1978
☐	Richmond, Virginia, I-295	I-295, is a 53-mile bypass around the cities of Richmond and Petersburg, and provides north-south, east-west,					

T-PICS Transportation Project Impact Case Studies

Economic & Development Impacts

Home | Case Search | My Project Tools | About T-PICs

Characteristics | Setting | Pre/Post Conditions | Narrative | Impacts | Images

Hammondsport

The Hammondsport Industrial Access Road involved resurfacing of three adjoining streets on the village's industrial western flank, running a total length of about a mile.

Print Current Tab

Related Websites:

ARC | Research Reports

Attachments:

ARC Public Works 2007

Pre/Post Conditions Scale: ○ Local ◉ County ○ State

Measure	Pre-Project	Post-Project	Change	% Change
Personal Income	$35,971	$37,131.2	$1,160.2	3.23%
Economic Distress	1.35	1.15	-0.2	-14.62%
Total Num. of Jobs	41,195.3	45,322	4,126.7	10.02%
Population	98,907	98,236	-671	-0.68%
Property Value	$96,841.3	$74,971.6	-$21,869.7	-22.58%
Business Sales ($M's)	$7,612.51	$7,859.57	$247.06	3.25%
Tax Revenue ($M's)	N/A	N/A	N/A	N/A
Density (ppl/sq mi)	71	71	0	0%

Case Study Narratives

T-PICS Transportation Project Impact Case Studies

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Hammondsport

The Hammondsport Industrial Access Road involved resurfacing of three adjoining streets on the village's industrial western flank, running a total length of about a mile.

Print Current Tab

Related Websites:

ARC | Research Reports

Attachments:

ARC Public Works 2007

Characteristics | Setting | Pre/Post Conditions | Narrative | Impacts | Images

HAMMONDSPORT ACCESS ROAD

1.0 SYNOPSIS

Hammondsport is a town of 735 in the Finger Lakes region of New York State. The Industrial Access Road resurfaced and provided drainage improvements to an existing one-mile stretch of street serving the town's manufacturing and tourist industries. The project was intended to retain manufacturing jobs and to create new jobs in tourism. However, due to structural factors, the village has continued to lose jobs in manufacturing while winery tourism is stable to declining. The project has had no significant economic impacts. Its main impact was institutional in that it helped the village of Hammondsport retain its independence by enabling it to continue to resist annexation into the larger surrounding town of Urbana. The project supported 25 jobs at the winery, however, these jobs are seasonal and tend to fluctuate.

2.0 BACKGROUND

2.1 Location & Transportation Connections

Hammondsport, New York is located at the head of the Finger Lakes Champagne Trail in northwestern New York, 90 miles south of Rochester. The town is approximately 10 miles north of I-86 via State Route 54 and is 87 miles southeast of Rochester, where there is a regional airport.

2.2 Community Character & Project Context

Hammondsport, New York, is a quaint village of 735 people at the head of the Finger Lakes Champagne Trail in northwestern New York. Through creative grantsmanship and volunteerism, the village has worked to retain its independence from the larger town and county authorities. The village considers its independence fundamental to maintaining responsive, high level community services.

Hammondsport was an early center of excellence in manufacture of aircraft equipment, but much of this has migrated to Asia and Mexico. Losses in the village's industrial base have been offset by its expanding role as a popular stopover along the Wine Trail that crosses New York's Finger Lakes region, which includes ove 100 wineries.

In tandem with the exodus of jobs, the population of the village has dropped by about 30% since 1980. Unemployment in the region is relatively low, however, a 5.6%. Many of Hammondsport's residents work in Bath (10-minute commute) and Corning (35-minute commute) at such multi-national companies as Phillips, Mercury, and Corning, which have manufacturing plants and research labs in the region. Blue-collar jobs in the area pay $10 to $12 an hour. According to interview sources, there are an adequate number of both blue- and white-collar jobs within commuting distance and suited to the skills of the local workforce.

3.0 PROJECT DESCRIPTION & MOTIVES

The Hammondsport Industrial Access Road involved resurfacing a total of one mile of three adjoining streets on the village's industrial western flank. This area contains a mix of industrial and lower-income residential buildings. Existing roads were replaced and new water mains, hydrants, and storm drainage pipes were installed. Planning for the project started in 1997 and construction was completed in 2001. The project received $1.1 million in funding from ARC, state, and federal source. This reduced the local share to just $83,000, or 7% of the total cost (1997$).

T-PICS Economic Impacts and Resource Documents

Transportation Project Impact Case Studies

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Hammondsport

The Hammondsport Industrial Access Road involved resurfacing of three adjoining streets on the village's industrial western flank, running a total length of about a mile.

Print Current Tab

Characteristics | Setting | Pre/Post Conditions | Narrative | Impacts | Images

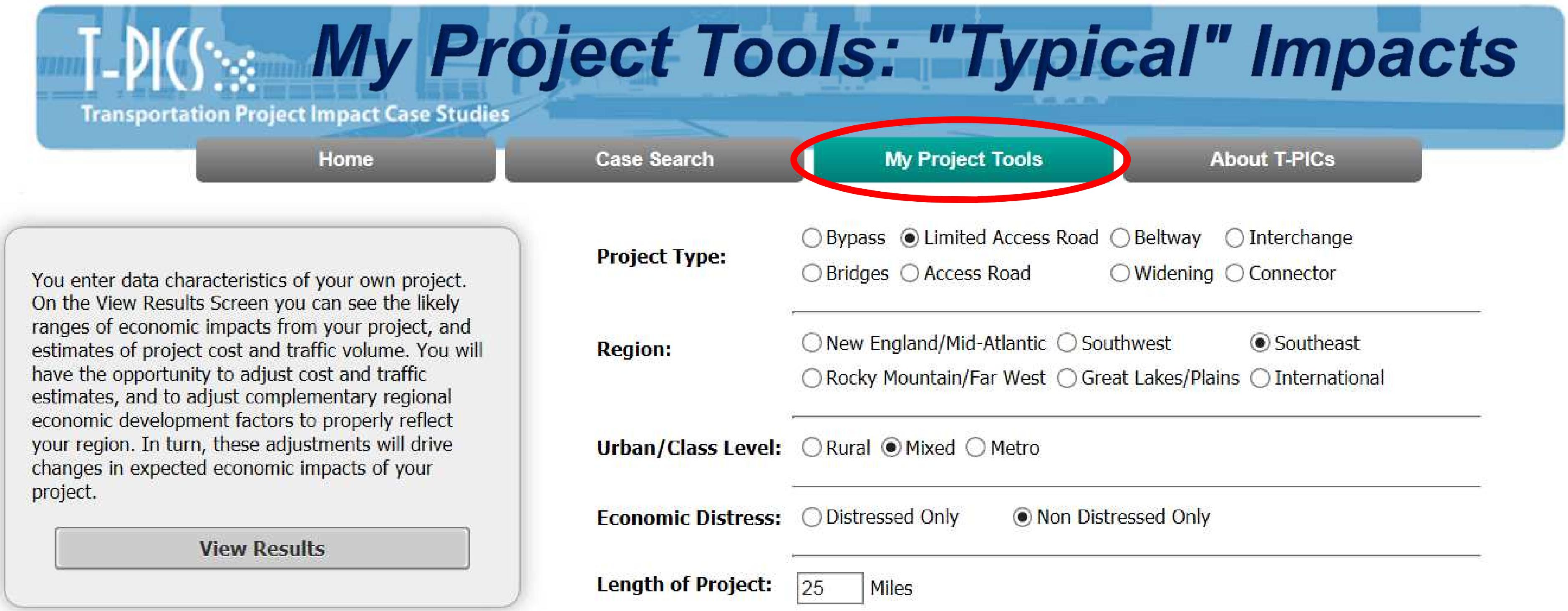
Measure	Direct	Indirect	Total
Number of Jobs	25	12	37
Income/Wages ($M's)	$1.39	$0.67	$2.06
Output ($M's)	$3.81	$1.83	$5.64

Related Websites:

ARC | Research Reports

Attachments:

ARC Public Works 2007


T-PICS
Transportation Project Impact Case Studies
My Project Tools: "Typical" Impacts
Home
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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
Bridges
Access Road
Widening
Connector
Region:
New England/Mid-Atlantic
Southwest
Southeast
Rocky Mountain/Far West
Great Lakes/Plains
International
Urban/Class Level:
Rural
Mixed
Metro
Economic Distress:
Distressed Only
Non Distressed Only
Length of Project:
25
Miles

Results: Range of Likely Impacts

based on actual observations in the database

T-PICS Transportation Project Impact Case Studies

Home | Case Search | My Project Tools | About T-PICs

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 ○ Bridges ○ Access Road ○ Widening ○ Connector

Region: ○ New England/Mid-Atlantic ○ Southwest ◉ Southeast ○ Rocky Mountain/Far West ○ Great Lakes/Plains ○ International

Urban/Class Level: ○ Rural ◉ Mixed ○ Metro

Economic Distress: ○ Distressed Only ◉ Non Distressed Only

Length of Project: 25 Miles

Project Cost: Below Average | Above Average

AADT: Below Average | Above Average

Land Use Policies: Restrictive | Supportive

Infrastructure: Not Available | State-of-Art

Business Climate: Negative | Aggressive

Estimated Project Cost ($): $292.3 million
Estimated AADT: 9,931.3

	Jobs	Wages (mil.)	Output (mil.)
Direct Impacts	1,221 - 2,035	$55.7 - $92.8	$178.2 - $296.9
Supplier and Wage Impacts	713 - 1,189	$32.1 - $53.5	$93.6 - $156.1
Total Impacts	1,934 - 3,224	$87.8 - $146.3	$271.8 - $453

Geographic Distribution

Project Type	Great Lakes/ Plains	New England /Mid-Atlantic	Rocky Mtn/ Far West	South - east	South-west	Inter-national	Total
Industrial Access Road	2	2		2	1		7
Beltway	2	1	1	2	2		8
Bridge	1	2	3	2	1	1	10
Bypass	4	1	3	2	1	2	13
Connector	1	1	2	3	1		8
Interchange	4	2	1	2	3		12
Intermodal Freight Terminal	2	2	1	3	2		10
Intermodal Passenger Terminal	2	1	3	2	1		9
Major Highway (Limited Access Road)	3	4	1	4	2		14
Widening	1	1	2	3	2		9
Total	**22**	**17**	**17**	**25**	**16**	**3**	**100**

Urban/Rural Composition

Project Type	Metro	Mixed	Rural	Total
Industrial Access Road	2		5	7
Beltway	8			8
Bridge	4	3	3	10
Bypass	4	1	8	13
Connector	4	2	2	8
Interchange	10	2		12
Intermodal Freight Terminal	6	1	3	10
Intermodal Passenger Terminal	9			9
Major Highway (Limited Access Road)	5	9		14
Widening	4	3	2	9
Total	**56**	**21**	**23**	**100**

Cases with Zero or Negative Job Impacts

Type of Project	Cases with Net Zero Job Impact	Cases with Net Negative Job Impact
Access Road		
Beltway		
Bridge	2	
Bypass	4	2
Connector	2	
Interchange	2	
Major Highway (Limited Access Road)		
Widening		
Intermodal Freight Terminal	1	
Intermodal Passenger Terminal	2	
Total Projects	**13**	**2**

Qualitative Factors Influencing TPICS Cases

Policy Factors	Factor	Number Reported
Positive Synergies	Infrastructure (sewer, water, broad band, transit, etc.) - positive	33
	Land Use Management - positive	45
	Financial Incentives/ Business Climate - positive	47
Lack of Appropriate Synergies	Financial Incentives/ Business Climate - negative	5
	Infrastructure (sewer, water, broad band, transit, etc.) - negative	10
	Land Use Management – negative	6

Insights from SHRP2 C03 Case Studies

- Size of Investment ($$) is not the primary "driver" of long-term economic impacts
- Job impacts vary tremendously by project size/type
- Project location matters
- Urban projects tend to be most expensive
- **Economic context of the area and wider benefit objective is a critical factor**
- **Economic impacts tend to be greatest when a project is part of a broader coordinated plan**

Lessons from TPICS – Research Needs

- Develop new case studies, broaden coverage
  - Explore using TIGER applications as projects are constructed and operating
- Expand TPICS from highways to other modes (e.g., transit, freight)
- Update meta-analysis and My Project Tools as new cases become available
- Continue to develop case study-based methods and processes for application to planning and evaluation of project performance

C11 Tool Demonstration

Tools for Assessing Wider Economic Benefits of Transportation

Naomi Stein

Economic Development Research Group, Inc.
www.edrgroup.com

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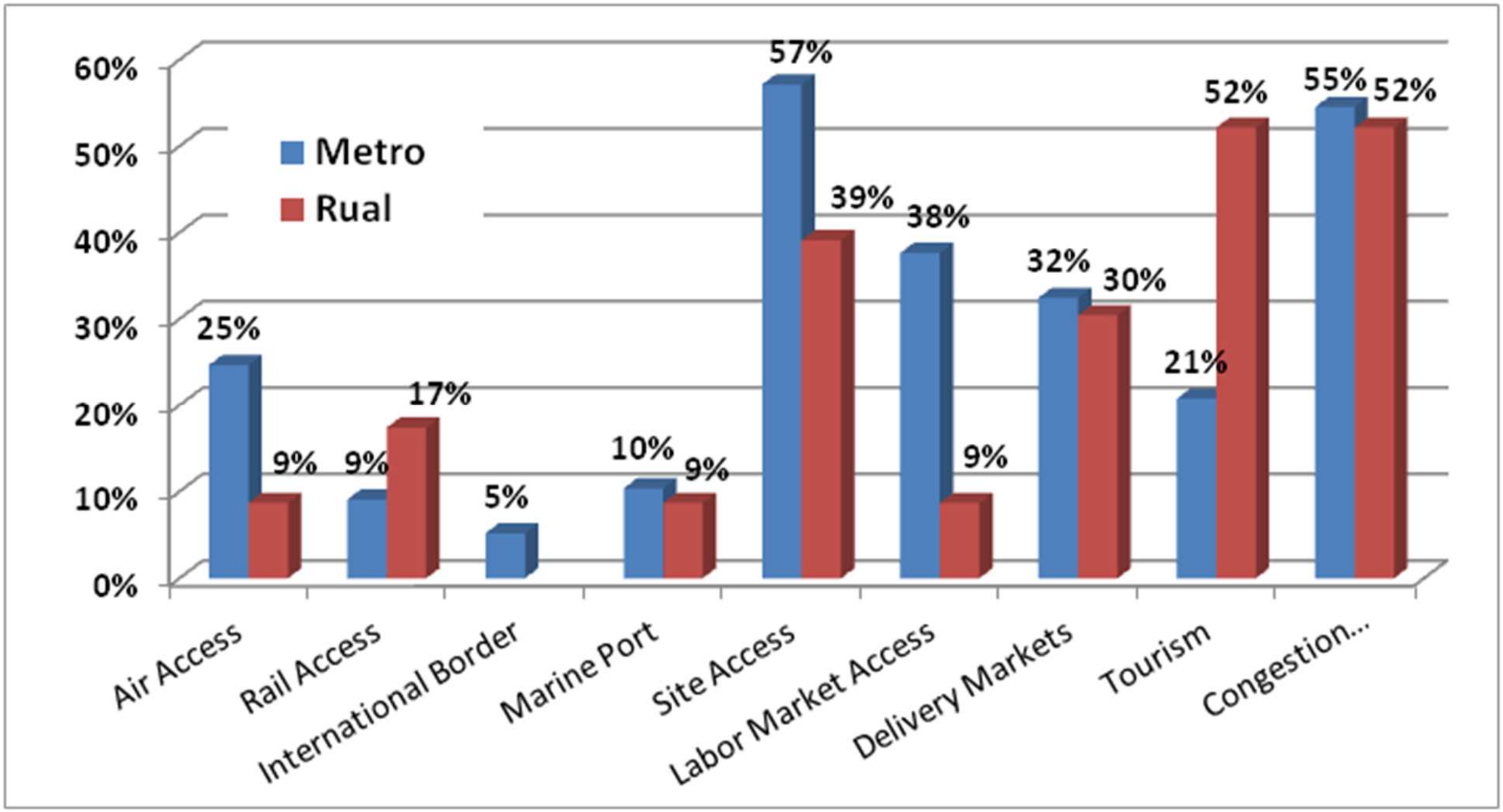
C11 Tools Address TPICS Project Motivations



Tools Meet "Middle Stage" Planning Needs

1
- Policy / Funding Stage

2
- Planning/Strategy Stage

3
- Programming Stage

4
- Prioritization Stage

5
- Project Devel./ EIS Stage

6
- Operations Stage

Screening Tool (TPICS)

Wider Benefit Tools (C11)

Economic Model *(REMI, TREDIS)*

Ref: SHRP2 Collaborative Decision-Making Framework

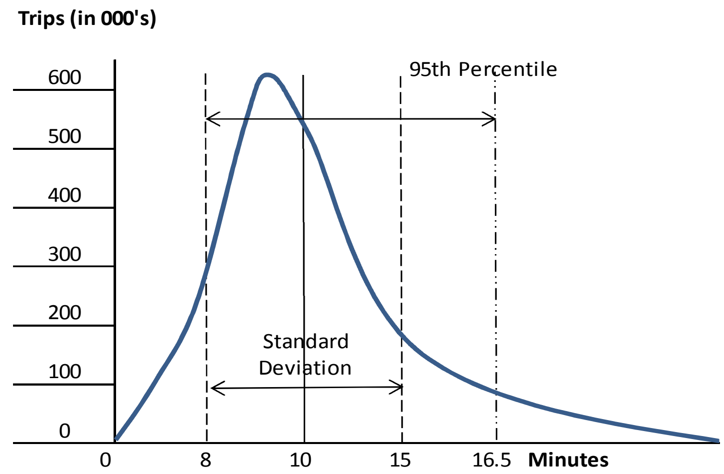
www.tpics.us/tools

RELIABILITY	CONNECTIVITY	ACCESSIBILITY	TPICS Tool & ACCOUNTING FRAMEWORK
CS & Weris	**ICF**	**TTI**	**EDRG**
Rich Margiotta Zongwei Tao	Larry O'Rourke	Sharada Vadali Shailesh Chandra	Glen Weisbrod Adam Winston

Travel Time RELIABILITY

- Estimating the impact of congestion reduction on **reducing “non-recurring” incident delays** that leads to wide variability in travel times

- Calculate the value of improving predictability and **reducing “buffer-time”**



Reliability Tool Case Study

I-15 Widening in Salt Lake City, UT

Project Overview

The $1.5 billion I-15 Reconstruction Project involved the rebuilding and widening of a deteriorated, congested 17 mile stretch of Interstate 15, running through Salt Lake City. The project was necessary to accommodate the rapid growth the region was experiencing.

Characteristics | Setting | Pre/Post Conditions | Narrative | Impacts | Images

State:	UT	**Length(mi):**	17
City:	SLC	**Impact Area:**	Salt Lake County
Project Type:	Widening	**Actual Cost (YOE$'s):**	$1,520,000,000
Constr. Start Date:	1996	**Constr. End Date:**	2001

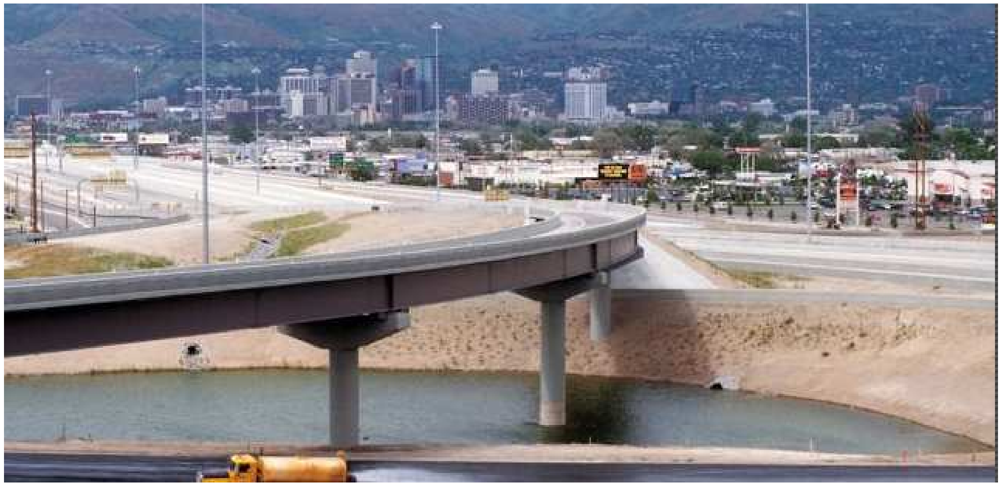


Image source: http://www.kiewit.com/projects/transportation/roads/i-15-corridor-reconstruction/

Reliability Case Study : Inputs

	BASE	BUILD
Time horizon	5 years	5 years
Analysis period	6:00 AM to 9:00 AM	6:00 AM to 9:00 AM
Highway type	Freeway	Freeway
Beg. Milepoint	0	0
End Milepoint	17	17
# lanes- one way	3	5
Free flow speed	65	65
Current AADT	155,994	155,994
Estimated annual growth rate	2.97%	2.97%
Percent trucks	9%	9%
Peak Capacity	6300	10500

Select time of day (AM peak, Midday, PM peak, all day)

Interstate widening to expand capacity

2001 AADT (end of construction)

1991-2001 historic growth rate

Reliability Case Study : Output

Scenario Inputs | Details

Results available in summary form or hourly

Result Summary

To view results on an hourly basis, select a Scenario by clicking in the corresponding column and then click Details.

Reliability measure available for the present and future year

Future year - 2019	BASE	BUILD
Congestion Metrics		
Overall mean TTI	1.78	1.03
TTI_{95}	2.79	1.12
TTI_{80}	2.19	1.04
Pct. trips less than 45 mph	49.49%	4.91%
Pct. trips less than 30 mph	32.64%	0.76%
Total Annual Weekday Congestion Costs ($)		
Passenger		
Cost of recurring delay	$24,715,862	$1,292,222
Cost of unreliability	$7,772,059	$78,161
Total congestion cost	$32,487,921	$1,370,383
Commercial		
Cost of recurring delay	$4,633,259	$279,441
Cost of unreliability	$1,997,080	$22,964
Total congestion cost	$6,630,339	$302,405

Wider Economic Benefit

Benefit from improved reliability:

Reliability Savings - AM Peak, annual

	2001	2006
Passenger	$1,565,897	$7,693,898
Commercial	$419,104	$1,974,116
Total	**$1,985,001**	**$9,668,015**

ACCESSIBILITY (market access)

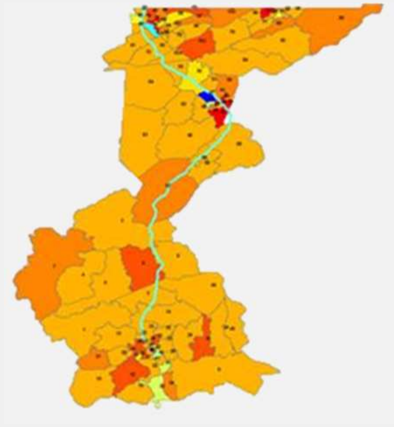
Estimate the value of improved **labor market access**

Estimate the value of improved **truck delivery access**

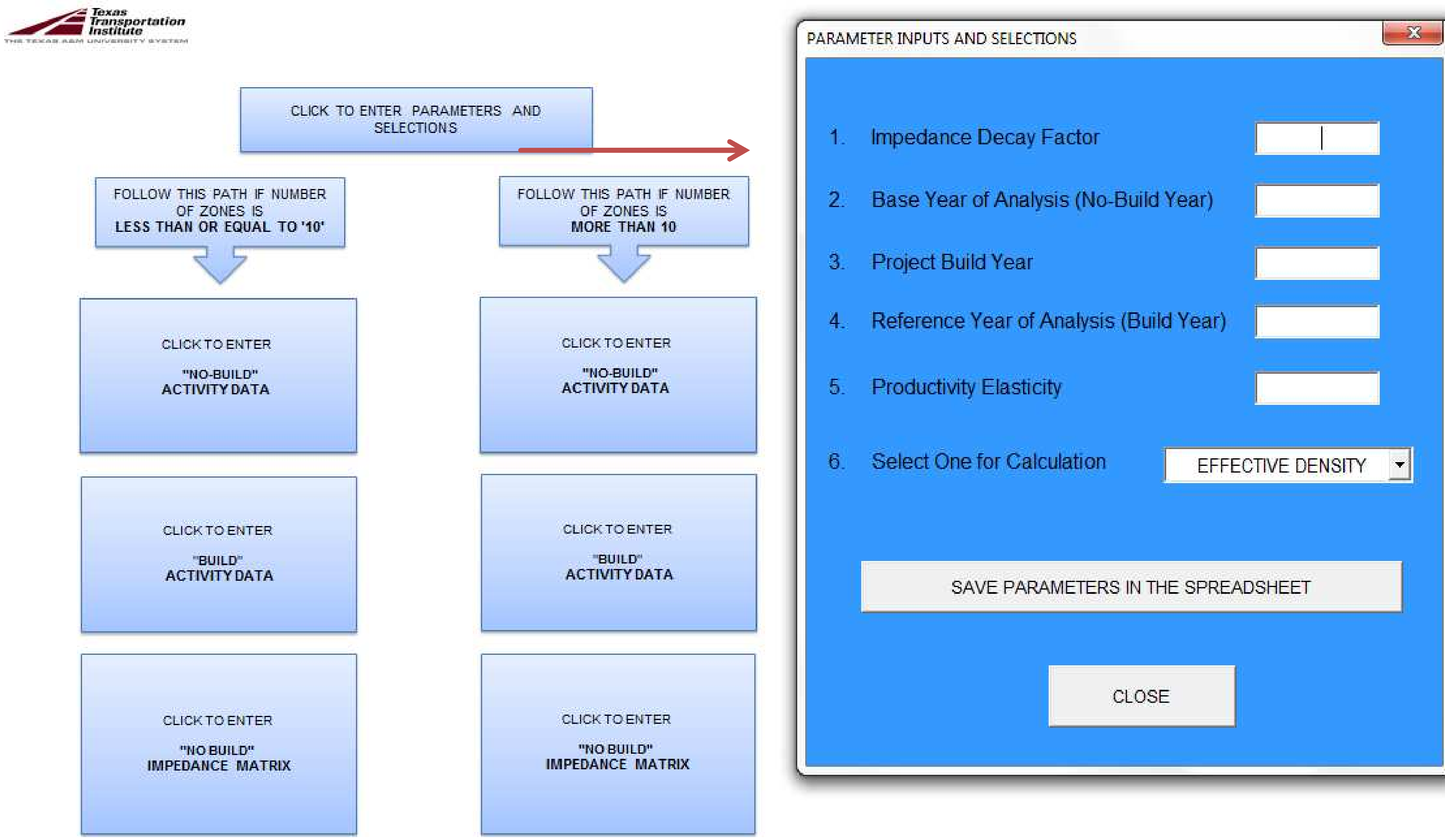
Estimate the value of enhanced **urban agglomeration**

- Methodological differences in tools
  - Based on defined threshold
  - **Based on effective density** (decay function)

Effective Density (decay function)



Accessibility Tool Overview



Accessibility Case Study

I-476 Blue Route – Expanded Labor Market Access in Philadelphia Area

Project Overview

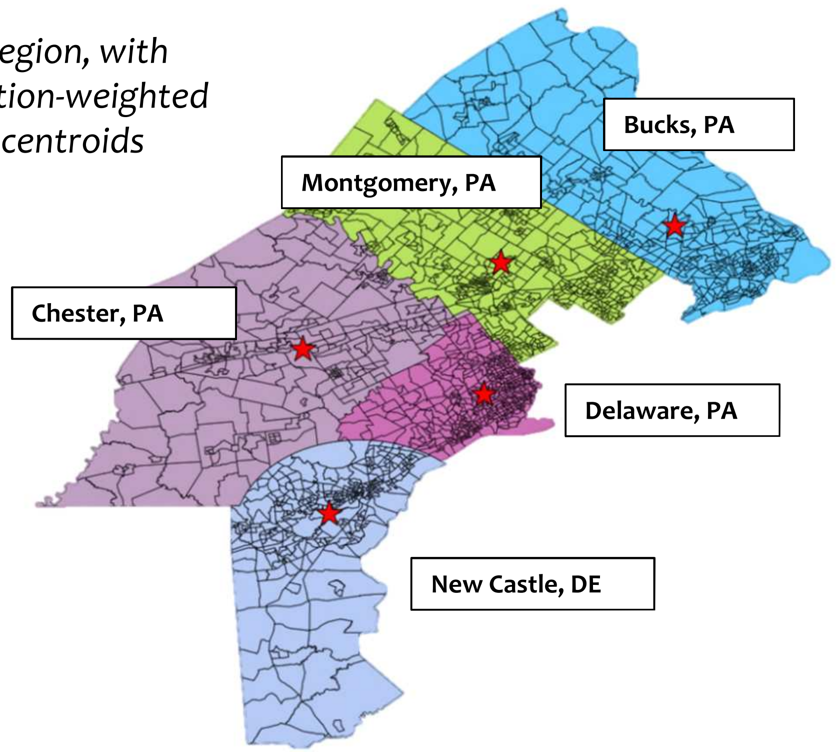
Between 1964 and 1992, 21.5 miles of Interstate 476, known as the Blue Route, was completed between Interstate 95 in the south at the Pennsylvania Turnpike in the north.

Accessibility Case Study

I-476 Blue Route – Expanded Labor Market Access in Philadelphia Area

The Blue Route **opened up substantial labor markets within the greater Philadelphia region**, improving access between Bucks, Montgomery, Delaware, Chester and New Castle Counties.

Study region, with population-weighted county centroids



Accessibility Case Study Input (1)

Parameter Values

1. Constant Decay Factor, α = 1

'α' (constant decay factor) .Typically, the parameter α is typically a postive number (mostly between 0 and 5) .

2. Base Year (No-Build Year) = 1994

Base Year for which analysis is to be performed (NO-BUILD year from the Travel Demand Model.

3. Reference Year (Build Year) = 1994

Reference (Forecast) Year for which analysis is to be performed (usually BUILD year from the Travel Demand Model)

4. Productivity Elasticity 0.05

Elasticities vary based on whether employment or population is used. Please review the user guide to see guidelines on this

5. **CALCULATE** EFFECTIVE DENSITY | ACCESS WITH NO ACTIVITY GROWTH

The values can be based on total population, employment or sectorial employment.

Evaluate Access alone or Access with Growth in Activity. It is recommended that "Access with No Activity Growth" be set as the default. This will alllow the user to evalute the effect of changes in access alone.

Zonal Activity Data

Activity: Population by Zone	
Bucks	563,088
Montgomery	706,037
Delaware	548,934
Chester	398,275
New Castle (DE)	464,410

Assessing labor market access, using population data

Accessibility Case Study Input (2)

Base Impedance (minutes)

ORIGINS	DESTINATIONS	Bucks	Montgomery	Delaware	Chester	New Castle (DE)
Bucks		22	39	69	57	94
Montgomery		39	18	48	36	74
Delaware		69	48	25	37	33
Chester		57	36	37	19	42
New Castle (DE)		94	74	33	42	18

Sketch-level estimates: **53% travel time improvement on subsections of county-to-county trips that use the Blue Route**

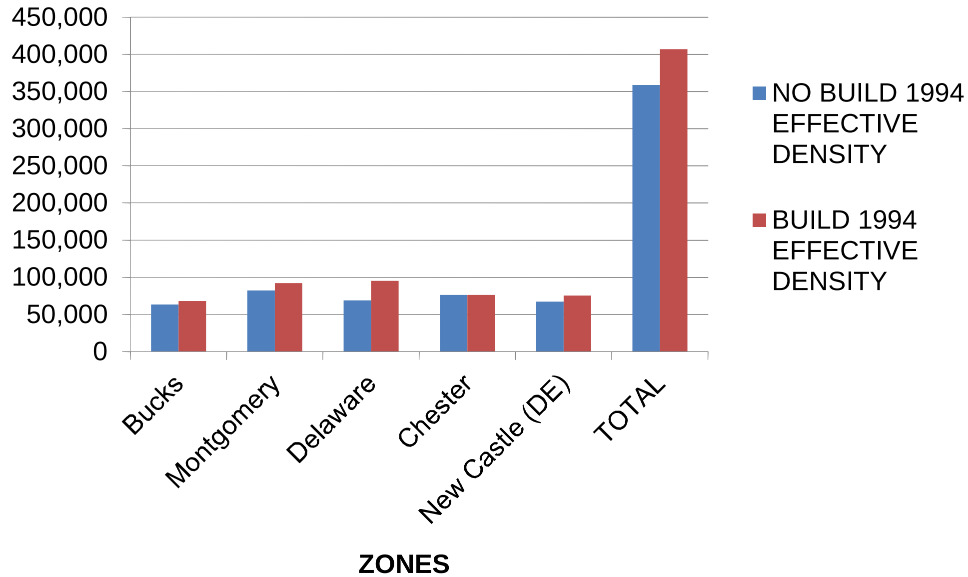
Build Impedance (minutes)

DVRPC Traffic Impact Study ('94):
53% time savings on the entire length of the corridor

ORIGIN	DESTINATION	Bucks	Montgomery	Delaware	Chester	New Castle (DE)
Bucks		22	39	50	57	71
Montgomery		39	18	30	36	51
Delaware		50	30	16	37	30
Chester		57	36	37	19	42
New Castle (DE)		71	51	30	42	18

Accessibility Case Study Output

	OUTPUTS	
	EFFECTIVE DENSITY/ POTENTIAL ACCESS 'SCORES'	
	NO BUILD	BUILD
	1994	1994
ZONES	EFFECTIVE DENSITY	EFFECTIVE DENSITY
Bucks	63578	68206
Montgomery	82449	92129
Delaware	69183	95349
Chester	76346	76346
New Castle (DE)	67330	75357
TOTAL	*358886*	*407387*



Wider Economic Benefit

Benefit Element	No Build Scenario	Build Scenario	% Diff	Elasticity Value	% Change in GDP (% Diff x Elasticity Value)	Value of Total Benefit (annual)
Effective Density for Labor Market Access	358,886	407,387	14%	0.05	**0.68%**	**$726,118,430**

Intermodal CONNECTIVITY

Estimate the value of enhancing access to an intermodal center:

- highway - rail
- highway - air
- highway - marine

Image source: FHWA

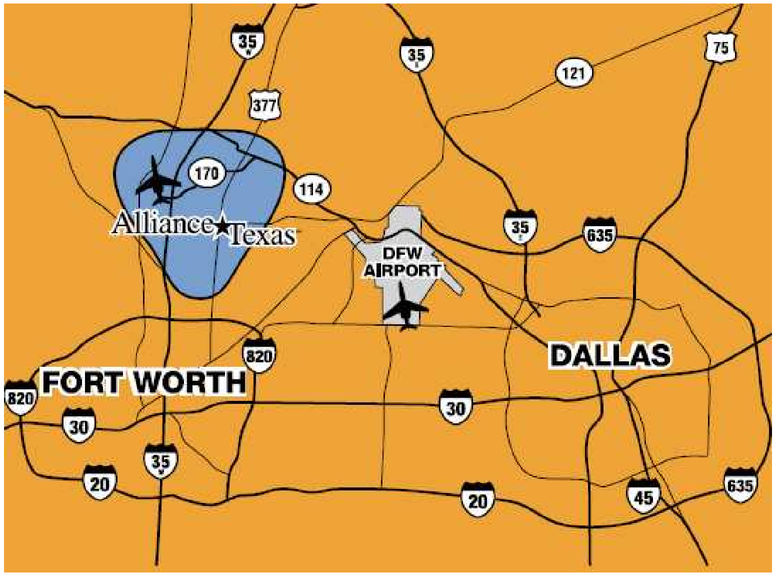
Estimate of benefit based on characteristics and access:

- Volume, Value of goods, and Origins & Destinations served
- Ground access (distance and time)

Connectivity Case Study

Logistics Park – Alliance Texas

The Alliance Global Logistics Hub is a multi-modal logistics parks that combines rail, trucking, and air freight facilities.



The Logistics Park is part of a 17,000 acre mixed-use development in the far northwest suburbs of the Dallas-Fort Worth area. Development has surged next to SH-170 which provides improved access to the facility.

Connectivity Case Study Input (#1)

For Rail freight projects, enter in facility information & Unit Lift Capacity

Facility 1

1a. State	TX		
1b. Facility Type	Rail Freight		
1c. Facility Name	Sanata Fe Railway Intermodal Facility (DFW)	1d. Unit Lift Capacity	600,000
County	Denton		

Clear Facility 1

Facility 2

2a. State	TX		
2b. Facility Type	Rail Freight		
2c. Facility Name	Sanata Fe Railway Intermodal Facility (DFW)	2d. Unit Lift Capacity	600,000
County	Denton		

Clear Facility 2

Contacts for rail intermodal facilities to determine Unit Lift Capacity can be found at www.loadmatch.com

Connectivity Case Study Input (#2)

Enter in distance to facility, # of trucks, **travel time per truck** and fraction of trucks associated with location (if applicable).

Facility 1

State	TX
Facility Type	Rail Freight
Facility Name	Sanata Fe Railway Intermodal Facility (DFW)
1a. Proposed Infrastructure Improvement Description	
1b. Distance of Improvement from Facility (miles)	13
1c. Number of trucks within study area	4,492
1d. Travel time (hrs) per truck	0.29
Default value per truck hour saved	$57
1e. User specified value per truck hour saved	

Fraction of trucks at infrastructure investment location associated with intermodal location

Default fraction	0.6
1f. User specified fraction	1.0

Connectivity Case Study Output

Facility 1

Facility Details	Container Connectivity Index	
Facility Type	Rail Freight	
Facility Name	Sanata Fe Railway Intermodal Facility (DFW)	
	Value	**Units**
Activity	600,000	containers
Value	$32,694	per container
Unique Origins/Destinations	122	
Facility Connectivity Raw Value	23.9	
Relative Activity		
Relative Value	7.1%	
Relative Origins and Destinations	51.5%	
Relative Facility Connectivity Index		
Project Summary		
Number of annual trucks	4,492	
Total truck hours (all trucks)	1,303	
Total Value	$74,159	
Number of trucks associated with the facility	4,492	
Truck hours - facility	1,303	
Value of time - facility	$74,159	
Weighted connectivity	**1,774,781**	

Facility Characteristics: Activity; Value; Unique Origins/Destinations; Facility Connectivity Raw Value

National Comparison: Relative Activity; Relative Value; Relative Origins and Destinations; Relative Facility Connectivity Index

Wider Economic Benefit

Weighted Connectivity	
Base	1,774,781
Project	1,285,186
% Improvement	28%
Elasticity	0.005
% Change GDP	0.138%
Productivity Benefit	**$58,719,653**

Accounting Framework Tool

Traditional Travel Benefits (example)

Benefit Category	Benefit Element	No Build Scenario	Build Scenario	Diff	Multiplier Value	Persons per Trip				Value of Total Benefit
Operating Cost	Vehicle-Miles (Passengers- Commute, Personal, or Business)	265,812,000	265,812,000	0	$0.44	--	--	--	--	$0
Operating Cost	Vehicle-Miles (Freight)	265,812,000	265,812,000	0	$0.95	--	--	--	--	$0
Value of time	Vehicle-Hours (Passengers- Commute, Personal, or Business)	15,288,500	14,054,600	-1,233,900	$22.90	1.2	--	--	--	$28,256,310
Value of time	Vehicle-Hours (Freight)	15,288,500	14,054,600	-1,233,900	$23.70	1.1	--	--	--	$29,243,430
Safety	Crash reduction (crashes) (Passengers & Freight)	710.0	620.0	-90.0	$3,285	--	--	--	--	$295,650
									Total ----->	$57,795,390

= Value of time ($) * Veh. Occupancy * Reliability Ratio

Wider Economic Benefits

Benefit Category	Benefit Element	No Build Scenario	Build Scenario	Diff	Multiplier Value	% Diff	Elasticity Value	% Change in GRP (% Diff x Elasticity Value)	GRP Value (Tab 4b) (in $M's)	Value of Total Benefit
Passenger Trips										
Reliability	Incident Delay hours (in veh-hrs)	2,704,760	2,561,950	-142,810	$21.98	--	--	--	--	$3,139,535
Accessibility	Effective Density value for Population (Labor Market)	1,257,747	1,312,552	--	--	4%	0.05	0.218%	$152,606	$332,482,820
Connectivity	Weighted Connectivity Score (Airport)	179,595	197,554	--	--	10%	0.015	0.150%	$152,606	$228,909,371
									Total ----->	$564,531,725
Commercial										
Reliability	Incident Delay hours (in veh-hrs)	2,704,760	2,561,950	-142,810	$28.68	--	--	--	--	$4,095,362
Accessibility	Effective Density for Employment (Buyer-Supplier	1,257,747	1,312,552	--	--	4%	0.04	0.174%	$152,606	$265,986,256
Connectivity	Weighted Connectivity Score (Airport, Rail, & Port)	179,595	197,554	--	--	10%	0.005	0.050%	$152,606	$76,303,124
									Total ----->	$346,384,742

Indicates results (used as inputs) from Wider Benefit tools

Indicates assumption values selected by user (see Tab 3-Forms & Tab 4b-GDP conversion)