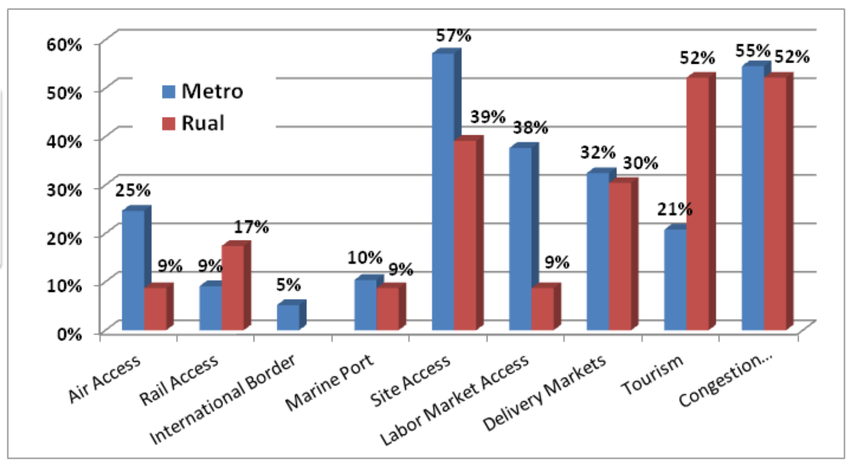
Tool Demonstration

Applying C11 tools to TPICS cases

Three TPICS case studies with project motivations related to **Accessibility**, **Reliability**, or **Connectivity** were selected and SHRP C11 tools were applied to estimate **Wider Economic Benefits**.

C11 Tools Address C03 Project Motivations

Each CO3 case study indicated one or more "project motivation."



Results from the wider benefit tools complement traditional impact analysis within the middle-stages of the planning process.

Match Models to Planning Needs

1. Policy / Funding Stage
2. Planning/Strategy Stage
3. Programming Stage
4. Prioritization Stage
5. Project Development/ EIS Stage
6. Operations Stage

Screening Tool (TPICS)

Wider Benefit Tools (C11)

Economic Model (*REMI, TREDIS*)

Ref: SHRP2 Collaborative Decision-Making Framework

I-15 Widening: Improved *RELIABILITY* 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.

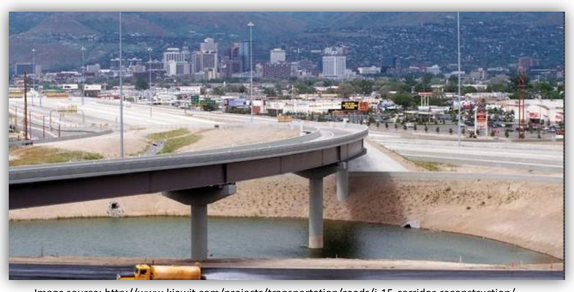


Image source: http://www.kiewit.com/projects/transportation/roads/i-15-corridor-reconstruction/

1) Tool 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	← Select time of day (AM peak, Midday, PM peak, all day)
Highway type	Freeway	Freeway	
Beg. Milepoint	0	0	
End Milepoint	17	17	
# lanes- one way	3	5	← Interstate widening to expand capacity
Free flow speed	65	65	
Current AADT	155,994	155,994	← 2001 AADT (end of construction)
Estimated annual growth rate	2.97%	2.97%	← 1991-2001 historic growth rate
Percent trucks	9%	9%	
Peak Capacity	6300	10500	

2) Tool Outputs

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.

Future year	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

← Reliability measure available for the present and future year

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**

I-476 Blue Route – Improved *LABOR MARKET ACCESS* in the Philadelphia Metro 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 and the Pennsylvania Turnpike in the north.

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

1) Tool Inputs

Parameter Values

1. Constant Decay Factor, α =	1
2. Base Year (No-Build Year) =	1994
3. Reference Year (Build Year) =	1994
4. Productivity Elasticity	0.05
5. **CALCULATE**	EFFECTIVE DENSITY

Zonal Activity Data

← Assessing labor market access, using population data

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

Base & Build Impedance Matrices (minutes)

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

Base

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

Build

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

2) Tool 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**

Logistics Park, Alliance Texas – Improving *ACCESS TO AN INTERMODAL TERMINAL*

Project Overview

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, master planned 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.

1) Tool Inputs

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)
County	Denton

Clear Facility 1

1d. Unit Lift Capacity: 600,000

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

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

2) Tool Outputs

Facility 1

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

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**