

Summary of Impacts and Costs for the I-93 Selected Alternative

I-93 Salem-Manchester 10418-C		Widening Options by Segment						All Segments	TOTAL IMPACTS
		Salem		Windham	Derry/ Londonderry	Londonderry/ Manchester			
See Figure 2.3-23 for Segment Locations.		A	B	C	D	E	F		
Resource		South of Cross Street	Exit 1	Exit 2	Exit 3	Exit 4	Exit 5		
			Relocate	Diamond	NH111: Full Relocation NB Ramp: Diamond SB Ramp: Diamond	Exit	Reconstruct NH 28	Park & Rides (New Facilities at Exits 2, 3, and 5)	
					Option 8				
Transportation	Interstate and Interchange Improvements (miles) (mainline and ramps)	1.0	3.6	3.6	7.3	5.9	6.0	NA	27.4
	Local Roadway Improvements (miles)	0.0	0.5	1.4	2.0	1.1	1.5	1.2	6.5
	Total Improvements (miles)	1.0	4.1	5.0	9.3	7.0	7.5	1.2	33.9
	Number of Signalized Intersections	0	0	5	4	2	3		17
Air Quality	Microscale CO Exceedances (2020)	No Exceedance of State and Federal CO Standards in 2020.						3	None
Surface Water Quality	Pollutant Contribution to Receiving Waters	With proposed measures 17 of 21 Streams expected to have either lower or no net increase in pollutant loading as compared to No Build. Four streams projected to have average annual chloride concentrations above the chronic						Minor Effects	NA
Aquatic Life	Number of Perennial Stream Crossings	2	1	3	7	4	5	1 at Exit 5	23
Groundwater Quality	Stratified Drift Under Roadway Area (acres)	9.9	16.4	7.2	None	33.8	10.7	6.5 at Exit 5	82
	Number of Public Wells where roadway crosses WHPA	None	None	None	Proposed roadway closer to 5 community wells, NB lanes 700 feet further from large community well.	Within 400 feet of small community well.	None	Exit 3 only	8
Floodplains	Floodway (Acres - Feet)	2.4	0	0	0	3.0	0.7	No Impacts	6
	100 Year Floodplain (Acres - Feet)	21.2	0.5	12.5	1.5	5.9	2.1		43
Farmlands	Prime Farmland Soils (Acres)	No Impacts	No Impacts	3.1	0.3	0.8	No Impacts	No Impacts	10
	Farmland Soils of Statewide Importance (Acres)	0	0.3	1.6	0.4	No Impacts	0.3	Negligible	
	Farmland Soils of Local Importance (Acres)	0.4	0.4	2.2	No Impacts	No Impacts	0.3		
	Active Farmland (Acres)	No Impacts	0.4	No Impacts	No Impacts	No Impacts	No Impacts		1
Wetlands	Palustrine Forested (Acres)	3.3	5.7	9.0	10.6	12.0	8.0	0.8	
	Palustrine Emergent (Acres)	0.6	2.1	1.4	4.3	5.2	7.0	0.8	
	Palustrine Scrub-shrub (Acres)	0.0	0.1	0.4	1.8	1.1	2.3	0.0	77
	Palustrine Open Water (Acres)	0.0	0.5	0.0	0.0	0.2	0.0	0.0	
Total Wetland Impacts (Acres)	3.9	8.4	10.7	16.5	18.4	17.3	1.6		
Vernal Pools	Number Impacted	No Impacts			1	2	No Impacts	No Impacts	3
Wildlife	Direct Impacts on Habitats (Acres)	Estimated 150 acres of Upland Habitat and 77 Acres of Wetland Habitat Affected.						Approx. 27 - 30 Acres Affected	260
Threatened and Endangered Species	Number Populations Impacted	No Impacts		One Population of Lupine Impacted	No Impacts			No Impacts	1
Noise	Number of Receptors Approaching or Exceeding FHWA Noise Abatement Criteria (1997/2020)	(75/96)		(22/32)	(31/23)	(58/72)	(48/56)	No Impacts	(265/316)
Visual	Impacts to Views from and to the Highway	Soundwall will screen High Ave. neighborhood.	Soundwall will screen neighborhoods east of NB off-ramp.	Buffer reduced between barrels and adjacent to Trolley Lane.	Buffer reduced between barrels. Vertical alignment change will be visible to adjacent neighborhoods.	Privacy fence used between highway and adjacent neighborhoods. Buffer reduced adjacent to Woodmont Orchards.	Reduced buffer between barrels.	Reduced Screening at Exit 2 Lot.	NA
Archaeological	Number of Potentially Eligible Sites - Prehistoric /	0	0	2	10	2	9	No Impacts	23
Historical	Number of Potentially Eligible Sites - Historic Properties	1	0	0	2	2	1	No Impacts	6
Right-of-Way Displacement	Number of Residential Total Property Acquisitions	1	4	3	2	3	0	8	21
	Number of Business Total Property Acquisitions	0	0	1	8	2	0	3	14
Economic	Change in Tax base	Estimated Loss of About \$11 Million from Tax Base with a \$20 Million Loss in Tax Revenue for the 5 Towns Combined.						Some Loss at Exit 5	\$11.0 million
Neighborhood and Community Facilities	Environmental Justice Issues and Effects on Public Facilities	No Effect on Populations of Low Income or Minorities. No Community Facilities Impacted.						No Effect	None
Land Use	Direct Change in Land Use	Small Direct Effect on Land Use Since Highway Widening Takes Place Largely within Existing Right-Of-Way.						Negligible	NA
Secondary Development	Stimulation of Growth	Potential Population Growth of <u>41,000</u> and <u>22,000</u> Additional Jobs by 2020.						No Effect	NA
Public Parks and Recreational Land	4(f) and 6(f) Properties (Other than Historical)	No Impacts to Either 4(f) or 6(f) Properties (Other than Historical).						No Impacts	None
Hazardous Materials	Potentially Contaminated Properties	No Impacts	1 Site	2 Sites	4 Sites	2 Sites	1 Site	3 Sites	13
Energy	Fuel Use Efficiency	Future Fuel Conservation with More Efficient Flow of Traffic and Emphasis on Multi-Modal Means of Travel						Both Promote Fuel Conservation	NA
Costs (Millions)	Total Segment Cost Including Right of Way, Design Engineering & Construction Costs (excluding Mitigation & Enhancement Costs)	\$11.4	\$35.4	\$59.2	126.2	\$81.1	\$72.8	\$9.0	\$395.1
Mitigation and Enhancement Costs (Millions) [1]	Wetland Creation, Enhancement, Preservation	\$7.2		\$4.5		\$1.8	\$6.3	NA	\$19.8
	NHDES Watershed Grants Program Technical Planning Assistance Program	\$3.5						NA	\$3.5
[*] Total Mitigation and Enhancement Costs = \$26.3 Million Total Project Cost = \$421.4 Million		Summary of Impacts and Costs for the I-93 Selected Alternative						Figure 2.7-23	

I-93 Salem-Manchester 10418-C
Summary of Costs for I-93 Three-Lane Alternative

Cost Factors	Options by Segment															Derry / Londonderry		Londonderry / Manchester			Segment Comparison Range		
	Salem					Windham										E		F					
	A*	B		C		D										Exit 4		Exit 5					
	Exit 1	Exit 2		Exit 3										Exit 4		Exit 5			Minimum	Maximum	Unit		
	Option 1	Option 2	Option 1	Option 2	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9	Option 1	Option 2	Option 1	Option 2	Option 3					
Transportation	Interstate & Interchange Length (miles) (mainline and ramps)	1.0	3.5	3.6	4.2	3.6	7.9	7.2	8.0	7.3	8.2	7.5	7.2	7.3	7.8	5.9	6.7	6.0	6.0	6.0	27.2	29.7	Miles
	Local Roadway Length (miles)	0	0.5	0.5	1.6	1.4	1.6	1.6	2.0	2.0	2.0	1.6	2.0	2.0	1.1	1.1	1.5	1.5	1.6	6.1	6.8	Miles	
	Total Length Improvements (miles)	1.0	4.0	4.1	5.8	5.0	9.5	8.8	10.0	9.3	10.2	9.5	8.8	9.3	9.8	7.0	7.8	7.6	7.5	7.6	33.3	36.5	Total Mt. Bridges
	Number of Bridges	0	6	6	8	7	7	6	7	6	8	7	6	6	7	10	10	10	10	10	39	42	Bridges
Mainline & Ramps	Cost Associated with I-93 (mainline and ramps)	\$0.4	\$12.5	\$13.9	\$25.9	\$24.5	\$52.1	\$52.1	\$52.5	\$54.3	\$54.6	\$58.2	\$58.3	\$61.4	\$44.6	\$49.6	\$33.0	\$33.0	\$33.6	\$33.6			
Local Roadways	Cost Associated with Local Roadways	\$0.0	\$0.4	\$0.4	\$3.1	\$2.3	\$5.4	\$5.4	\$8.8	\$8.8	\$8.8	\$5.4	\$8.8	\$8.8	\$2.9	\$4.6	\$4.6	\$4.4	\$4.7				
ITS	Cost Associated with Intelligent Transportation System (ITS) Measures	\$0.1	\$0.1	\$0.1	\$0.1					\$0.3					\$0.3						\$1.2		Millions
Bridges	Bridge Costs (includes all bridge costs)	\$0.0	\$13.4	\$14.6	\$20.8	\$20.1	\$16.4	\$15.1	\$16.4	\$15.1	\$17.9	\$16.6	\$17.0	\$17.3	\$18.8	\$16.0	\$16.0	\$20.2	\$20.2	\$20.2			
	Transportation Subtotal	\$9.5	\$26.4	\$29.0	\$49.9	\$47.0	\$74.3	\$73.3	\$77.6	\$76.6	\$81.3	\$80.3	\$80.9	\$84.7	\$89.3	\$63.7	\$68.7	\$58.0	\$57.9	\$58.8	\$277.8	\$305.2	Millions
Park-n-Ride	Cost Associated with Park and Ride	N/A	N/A		\$2.3				\$3.8				\$4.7			N/A		\$2.0 (1)		\$8.1	\$9.0	Millions	
	Total Transportation Construction Costs (includes Construction Engineering)	\$9.5	\$26.4	\$29.0	\$52.2	\$49.3	\$78.1	\$77.1	\$81.4	\$80.4	\$85.1	\$84.1	\$85.6	\$89.4	\$94.0	\$63.7	\$68.7	\$60.0	\$59.9	\$60.8	\$285.9	\$314.2	Millions
Preliminary Engineering	Cost Associated w/ Design Engineering Phase & Question Resolution	\$1.0	\$2.6	\$2.9	\$5.2	\$4.9	\$7.8	\$7.7	\$8.1	\$8.0	\$8.5	\$8.4	\$8.6	\$8.9	\$9.4	\$6.4	\$6.9	\$6.0	\$6.0	\$6.1	\$26.6	\$31.4	Millions
	Cost Associated w/Complete Property Acquisitions Requiring Relocation	\$0.3	\$1.2	\$1.7	\$7.1 (3)	\$4.8 (3)	\$3.9	\$3.9	\$6.4	\$6.4	\$7.2	\$7.2	\$5.5	\$8.1	\$8.9	\$1.3	\$1.4	\$3.3 (4)	\$1.2 (4)	\$1.2 (4)	\$12.7	\$20.6	Millions
Right of Way Costs (2)	Cost Associated w/Partial Acquisition or Vacant Complete Acquisitions	\$0.6	\$0.8	\$0.8	\$2.7	\$2.5	\$18.8 (5)	\$18.8 (5)	\$19.2 (5)	\$19.2 (5)	\$20.2 (5)	\$20.2 (5)	\$16.9 (5)	\$17.6 (5)	\$18.6 (5)	\$2.6	\$2.4	\$2.6	\$2.6	\$2.7	\$27.9	\$27.8	Millions
	Total Right of Way Cost	\$0.9	\$2.0	\$2.5	\$9.8	\$7.3	\$22.7	\$22.7	\$25.6	\$25.6	\$27.4	\$27.4	\$22.4	\$25.7	\$27.5	\$3.9	\$3.8	\$5.9	\$3.8	\$3.9	\$40.6	\$48.4	Millions
	TOTAL SEGMENT COST	\$11.4	\$31.0	\$34.4	\$67.2	\$61.5	\$108.6	\$107.5	\$115.1	\$114.1	\$121.0	\$119.9	\$116.6	\$124.1	\$130.8	\$74.0	\$79.4	\$66.0	\$65.9	\$66.9	\$355.1	\$394.0	Millions
Mitigation and Enhancement Costs	Wetland Creation, Enhancement, Preservation (incl. Right of Way & Const. Costs)				\$7.2					\$4.5					\$1.8			\$6.3		\$19.8		Millions	
	NHDES Watershed Grants Program																			\$3.0		Millions	
	Technical Planning Assistance Program									\$3.5										\$3.5		Millions	
	RANGE OF TOTAL COST																			\$381.4	\$420.3	Millions	

Notes:
 (1) Exit 5 Park & Ride evaluated @ site options. Construction Cost varies \$1.8M to \$5.2M. Cost shown for Selected Alternative
 (2) Does not include appraisal fee or administrative costs
 (3) Includes \$3.6 Million for Park and Ride
 (4) Includes \$1.2 Million Cost for Selected Alternative Park and Ride Alternative
 (5) Assumes complete acquisition of Parcels W101 and W102 for Park and Ride

Example: Lowest Cost Three Lane Alternative is a Combination of the following Segments & (Options):

A+(B-1)+(C-2)+(D-2)+(E-1)+(F-2) = Roadway & Bridges \$277.8

Park Ride Costs (w/Opt. 4 @ Exit 5) \$7.9

TOTAL CONSTRUCTION COST \$285.7

Design Engineering \$26.6

Right of Way (assoc. w/low const. Cost) \$40.6

Wetland Creation, Enhancement, Preservation \$19.8

NHDES Watershed Grants Program \$3.0

Technical Planning Assistance Program \$3.5

Total \$381.2 Million

The Total Cost of a Three Lane Alternative using the identical options for the Selected Alternative (Four Lane) is a combination of Segments:

A+(B-2)+(C-2)+(D-8)+(E-1)+(F-2) = Roadway & Bridges \$291.8

Park Ride (w/Opt. 2 Modified @ Exit 5) \$9.0

TOTAL CONSTRUCTION COST \$300.8

Design Engineering \$30.1

Right of Way (w/Selected Alt. Options) \$44.1

Wetland Creation, Enhancement, Preservation \$19.8

NHDES Watershed Grants Program \$3.0

Technical Planning Assistance Program \$3.5

Total \$401.2 Million

Park & Ride Option	Exit 5 Park & Ride Alternatives					
	Opt. 1 (NW Quadrant)	Opt. 2 (NW Quadrant)	Opt. 2 (Modified) (NW Quad., Sel. Alt.)	Opt. 3 (Perkins Rd.)	Opt. 4 (Sunoco Prop.)	Opt. 5 (Auburn Rd.)
Cost (Millions)	\$6.0	\$6.0	\$6.1	\$2.6	\$2.6	\$31.4
Construction	\$2.1	\$2.0	\$2.0	\$5.2	\$1.8	\$2.1
Right of Way						
Complete Acquisition	\$1.5	\$2.3	\$0.9	\$0.0	\$2.1	\$1.0
Partials and Vacant	\$0.0	\$0.7	\$0.3	\$1.2	\$0.4	\$1.0
Right of Way Total	\$1.5	\$3.0	\$1.2	\$1.2	\$2.5	\$2.0
Total Cost	\$3.6	\$5.0	\$3.2	\$6.4	\$4.3	\$4.1

Summary of Costs for I-93 Three Lane Alternative
Figure 2.8-1

I-93 Salem-Manchester 10418-C Summary of Costs for I-93 Four-Lane Alternative

Cost Factors	Salem			Options by Segment										Derry / Londonderry		Londonderry / Manchester			Segment Comparison Range						
	A*	B	C	D										E		F									
	Exit 1			Exit 2			Exit 3					Exit 4					Exit 5								
	South of Cross Street	Reconstruct Ramps	Relocate Ramps	Loop Ramps	Diamond Ramps	I-93 NB Shift					I-93 NB/SB Tight Shift					Easterly Mainline Shift	Westerly Mainline Shift	Relocate NH 28				Reconstruct NH 28	Relocate NB Ramps		
	Option 1	Option 2	Option 1	Option 2	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6	Option 7	Option 8	Option 9	Option 1	Option 2	Option 1	Option 2	Option 3	Minimum	Maximum	Unit				
Transportation	Interstate & Interchange Length (miles) (mainline and ramps)	1.0	3.5	3.6	4.2	3.6	7.9	7.2	8.0	7.3	8.2	7.5	7.2	7.3	7.8	5.9	6.7	6.0	6.0	6.0	27.2	29.7	Miles		
	Local Roadway Length (miles)	0	0.5	0.5	1.8	1.4	1.6	1.6	2.0	2.0	1.6	1.6	2.0	2.0	1.1	1.1	1.6	1.5	1.6	6.1	6.8	Miles			
	Total Length Improvements (miles)	1.0	4.0	4.1	5.8	5.0	9.5	8.8	10.0	9.3	10.2	9.5	8.8	9.3	9.8	7.0	7.8	7.6	7.5	7.6	33.3	36.5	Total Miles		
	Number of Bridges	0	6	6	8	7	7	7	7	8	7	6	6	7	10	10	10	10	10	10	39	42	Bridges		
Mainline & Ramp Costs	Cost Associated with I-93 (mainline and ramps)	\$9.4	\$13.2	\$14.5	\$25.9	\$24.5	\$54.9	\$55.3	\$54.9	\$55.3	\$57.1	\$57.5	\$61.0	\$61.2	\$64.2	\$47.7	\$52.7	\$35.1	\$35.2	\$35.8					
Local Roadway Costs	Cost Associated with Local Roadways	\$0.0	\$0.4	\$0.4	\$3.1	\$2.3	\$5.4	\$5.4	\$8.8	\$9.8	\$9.8	\$8.8	\$5.4	\$8.8	\$8.8	\$2.9	\$2.9	\$4.6	\$4.4	\$4.7					
ITS	Cost Associated with Intelligent Transportation System (ITS) Measures	\$0.1	\$0.1	\$0.1	\$0.1											\$0.3		\$0.3			\$1.2		Millions		
Bridges	Bridge Costs (includes all bridge costs)	\$0.0	\$13.6	\$15.0	\$20.8	\$20.1	\$19.3	\$18.0	\$19.3	\$18.0	\$20.8	\$19.5	\$20.4	\$20.7	\$22.2	\$19.3	\$19.3	\$22.7	\$22.7	\$22.7					
	Transportation Subtotal	\$9.5	\$27.3	\$30.0	\$49.9	\$47.0	\$80.0	\$80.0	\$83.4	\$82.4	\$87.0	\$86.0	\$87.1	\$91.0	\$95.5	\$70.2	\$75.2	\$62.7	\$62.5	\$63.5	\$295.5	\$323.5	Millions		
Park-n-Ride	Cost Associated with Park and Ride	N/A	N/A		\$2.3				\$3.8				\$4.7		N/A			\$2.0	(1)		\$8.1	\$9.0	Millions		
	Total Transportation Construction Costs (includes Construction Engineering)	\$9.5	\$27.3	\$30.0	\$52.2	\$49.3	\$83.8	\$82.8	\$87.2	\$86.2	\$90.8	\$89.8	\$91.8	\$95.7	\$100.2	\$70.2	\$75.2	\$64.7	\$64.5	\$65.5	\$303.6	\$332.5	Millions		
Preliminary Engineering	Cost Associated w/ Design Engineering Plans & Geotech Evaluation	\$1.0	\$2.7	\$3.0	\$2	\$4.9	\$4	\$3	\$7	\$6	\$7	\$9	\$2	\$6	\$10	\$7.0	\$7.5	\$6.5	\$6.5	\$6.5	\$30.4	\$33.2	Millions		
	Cost Associated w/Complete Property Acquisitions Requiring Relocation	\$0.3	\$1.2	\$1.7	\$7.1	(3)	\$4.8	(3)	\$3.9	\$3.9	\$6.4	\$6.4	\$7.2	\$5.5	\$8.1	\$1.3	\$1.4	\$3.3	(4)	\$1.2	(4)	\$12.7	\$20.6	Millions	
	Cost Associated w/Partial Acquisition or Vacant Complete Acquisitions	\$0.6	\$0.6	\$0.8	\$2.7	\$2.5	\$18.8	(5)	\$19.2	(5)	\$19.2	(5)	\$20.2	(5)	\$20.2	(5)	\$16.9	(5)	\$17.6	(5)	\$18.6	(5)	\$2.6	\$2.7	Millions
	Total Right of Way Cost	\$0.9	\$2.0	\$2.5	\$9.8	\$7.3	\$22.7	\$22.7	\$25.6	\$25.6	\$27.4	\$27.4	\$22.4	\$25.7	\$27.5	\$3.9	\$3.8	\$5.9	\$3.8	\$3.9	\$40.8	\$48.4	Millions		
	TOTAL SEGMENT COST	\$11.4	\$32.1	\$35.4	\$67.2	\$61.5	\$114.9	\$113.8	\$121.5	\$120.4	\$127.3	\$126.2	\$123.4	\$130.9	\$137.7	\$81.1	\$86.5	\$77.0	\$74.8	\$75.9	\$374.6	\$414.1	Millions		
Mitigation and Enhancement Costs	Wetland Creation, Enhancement, Preservation (incl. Right of Way & Const. Costs)				\$7.2					\$4.5					\$1.8			\$6.3			\$19.8		Millions		
	NHDES Watershed Grants Program																				\$3.0		Millions		
	Technical Planning Assistance Program												\$3.5									\$3.5		Millions	
	RANGE OF TOTAL COST																				\$400.9	\$440.4	Millions		

- Notes:**
- (1) Exit 5 Park & Ride evaluated @ site options, Construction Cost varies \$1.8M to \$5.2M. Cost shown for Selected Alternative
 - (2) Does not include appraisal fees or administrative costs
 - (3) Includes \$3.6 Million for Park and Ride
 - (4) Includes \$1.2 Million for Selected Alternative Park and Ride
 - (5) Assumes complete acquisition of Parcels W101 and W102 for Park and Ride

The Color shown for the various Segment /Option columns above identifies the Department's Selected Alternative Options.

Example: Lowest Cost Four Lane Alternative is a Combination of the following Segments & Options:

A* (B-1)+(C-2)+(D-2)+(E-1)+(F-2) = Roadway & Bridges

Park Ride Costs (w/Option 4 @ Exit 5)	\$7.9
TOTAL CONSTRUCTION COST	\$303.4
Design Engineering	\$30.4
Right of Way (assume w/low const. Cost)	\$40.6
Wetland Creation, Enhancement, Preservation	\$19.8
NHDES Watershed Grants Program	\$3.0
Technical Planning Assistance Program	\$3.5
Total	\$407.7 Million

The Total Cost of a Four Lane Alternative using Selected Alternative options is a combination of Segments:

A* (B-2)+(C-2)+(D-4)+(E-1)+(F-2) = Roadway & Bridges

Park Ride (w/Option 2 Modified @ Exit 5)	\$9.0
TOTAL CONSTRUCTION COST	\$319.1
Design Engineering	\$31.9
Right of Way (w/Selected Alt. Options)	\$44.1
Wetland Creation, Enhancement, Preservation	\$19.8
NHDES Watershed Grants Program	\$3.0
Technical Planning Assistance Program	\$3.5
Total	\$421.4 Million

Exit 5 Park & Ride Alternatives

Park & Ride Option	Opt. 1 (NW Quadrant)	Opt. 2 (NW Quadrant)	Opt. 2 (Modified) (NW Quad, Sit. Alt.)	Opt. 3 (Parkers Rd.)	Opt. 4 (Sunoco Prop.)	Opt. 5 (Auburn Rd.)
Cost (Millions)						
Construction	\$2.1	\$2.0	\$2.0	\$5.2	\$1.8	\$2.1
Right of Way						
Complete Acquisition	\$1.5	\$2.3	\$0.9	\$0.0	\$2.1	\$1.0
Partials and Vacant	\$0.0	\$0.7	\$0.3	\$1.2	\$0.4	\$1.0
Right of Way Total	\$1.5	\$3.0	\$1.2	\$1.2	\$2.5	\$2.0
Total Cost	\$3.6	\$5.0	\$3.2	\$6.4	\$4.3	\$4.1

**Summary of Costs for I-93 Four Lane Alternative
Figure 2.8-2**