

## CHAPTER 5: EVALUATION AND COMPARISON OF ALTERNATIVES

### 5.1 Cost, Benefit and Impact Comparison

The previous chapters have presented a wide variety of information about the STC/BOH Project and the feasible alternatives – Null, Modified Improvement (Preferred Alternative), Boulevard, and Hybrid. The purpose of a FDR/FEIS/4(f) is to be a decision-making tool, focused on identifying the advantages and disadvantages of the alternatives. **Table 5.1-1** includes a summary of costs, benefits, and impacts of the alternatives, with reference to additional information contained in the report. Comparisons of alternatives are made for the designated future design year (2030) unless otherwise noted.

<b>Table 5.1-1 Comparison of Alternatives</b>					
	<b>FDR/FEIS/ 4(f) Reference Section</b>	<b>Null Alternative</b>	<b>Modified Improvement Alternative (Preferred Alternative)</b>	<b>Boulevard Alternative</b>	<b>Hybrid Alternative</b>
<b>Project Goals/Objectives</b>					
<b>1. Support Economic Development and Redevelopment</b>					
New/improved access to brownfields redevelopment sites	Section 4.3.3	None	Yes – new access to Union Ship and LTV/Republic Steel sites; simplified access to NFTA Outer Harbor and Bethlehem Steel sites.	Yes – new access to Union Ship and LTV/Republic Steel sites; simplified access to NFTA Outer Harbor and Bethlehem Steel sites.	Yes – new access to Union Ship and LTV/Republic Steel sites; simplified access to NFTA Outer Harbor and Bethlehem Steel sites.
Facilitate future development of waterfront areas by simplifying local access for multiple modes	Section 4.3.3	No	Yes – direct access from Route 5 to Union Ship Canal site; two-way Fuhrmann Boulevard for local access to NFTA Outer Harbor Lands.	Yes - access from Route 5 to Union Ship Canal site; Somewhat for Outer Harbor Lands – shared local/through access along Route 5.	Yes – direct access from Route 5 to Union Ship Canal site; two-way Fuhrmann Boulevard for local access to NFTA Outer Harbor Lands.



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	<b>FDR/FEIS/ 4(f) Reference Section</b>	<b>Null Alternative</b>	<b>Modified Improvement Alternative (Preferred Alternative)</b>	<b>Boulevard Alternative</b>	<b>Hybrid Alternative</b>
Promote private investment through improvement in local/regional “quality of life” aspects or amenities	Section 4.3.2	No	Yes – creation of waterfront pedestrian bicycle network. Somewhat reduces physical/psychological barrier created by Route 5/ Fuhrmann complex.	Yes – creation of waterfront pedestrian bicycle network. Totally removes physical/psychological barrier created by Route 5/ Fuhrmann complex.	Yes – creation of waterfront pedestrian bicycle network. Totally removes barrier created by Route 5/ Fuhrmann complex south of Ohio Street.
<b>2. Improve Regional and Local Transportation Service, Performance, and Efficiency</b>					
Maximize choice for movements among various existing/future activities centers	Section 4.2.2	No	Yes	Yes	Yes
Maintain adequate service for commuter/ commercial traffic	Section 3.3.3.2; Section 4.2.2 Appendix C	Route 5 traffic growth would continue; reaching peak-hour capacity on expressway segments and intersections by 2030	Provides acceptable traffic operations along Route 5 through the signalized intersections with the exception of Route 5 @ Ridge Road (new at-grade intersection) in 2030)	Route 5 traffic would be maintained at roughly existing (2001) conditions; no significant capacity impacts	Some growth on Route 5 through 2030; no significant capacity impacts
Avoid significant redistribution of peak-hour traffic to other roads or corridors	Section 3.3.3.2; Section 4.2.2 Appendix C	No significant diversion to other roads	Diversion of some traffic to the interstate system (I-90 and I-190); slightly more than null alternative but less than the boulevard and hybrid alternatives	Diversion of most of projected traffic growth in the corridor to the interstate system (I-90 and I-190); capacity impacts along all segments	Diversion of a portion of projected traffic growth in the corridor to the interstate system; capacity impacts along a portion of segments
Provide safe access for pedestrians, bicyclists, and transit users	Section 3.3.3	No	Yes	Yes	Yes



Table 5.1-1 Comparison of Alternatives					
	FDR/FEIS/ 4(f) Reference Section	Null Alternative	Modified Improvement Alternative (Preferred Alternative)	Boulevard Alternative	Hybrid Alternative
Minimize impact to existing active rail lines	Section 3.3.3	No effect	No effect	Potential removal of Beach Line spur to NFTA Outer Harbor Lands.	Potential removal of Beach Line spur to NFTA Outer Harbor Lands.
3. Improve Mobility, Access, and Safety in a Cost-Effective Manner					
Promote use of flexible funding mechanisms and phasing	Section 3.4.2	N/A	Yes	Yes	Yes
Minimize right-of-way acquisition costs	See cost/benefit comparisons below.				
Reasonable cost to benefit comparison	See cost/benefit comparisons below.				
4. Support Local and Regional Planning Policies and Strategies					
Promote ongoing development and redevelopment projects	Section 4.3.7; Appendix L	Null Alternative would not facilitate several on-going projects	Improves access to all redevelopment projects; does not fully take advantage of potential linkage between Tifft Nature Preserve and Planned State Park at Gallagher Beach	Removes barrier between Tifft Nature Preserve and Planned State Park at Gallagher Beach; could impede development at NFTA Outer Harbor Lands, due to internal road network requirements	Promotes all on-going efforts
Consistency with local and regional plans, policies, or programs	Section 4.2.7; Appendix L	Null Alternative would not advance objectives of several plans and policies	Consistent with all adopted plans and policies	Potentially inconsistent with NFTA Outer Harbor Development Plan	Consistent with all adopted plans and policies
5. Minimize Adverse Impacts on Communities and the Environment					
See social, economic & environmental impacts below.					



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<b>Cost/Benefit Ratio</b>					
Total Construction Cost - 2005 \$ Millions	Section 3.3; Appendix B	—	\$95.1	\$124.0	\$131.9
Annual transportation user benefits compared to 2030 Null Alternative \$ Millions	Appendix L	—	\$0	(\$3.48)	\$1.54
<b>Quantitative Benefits</b>					
Short term economic benefits (Construction impact to region based on January 2006 construction cost estimate)	Section 4.3.8; Table 4.3-4, 4.3-5, 4.3-6	None	\$99 Million in business sales; \$44 Million in household income; and \$1 million in local tax receipts	\$130 Million in business sales; \$61 Million in household income; and \$1.3 million in local tax receipts	\$138 Million in business sales; \$65 Million in household income; and \$1.4 million in local tax receipts
Construction jobs created		0	755	1,085	1,155
Non-standard geometric features retained	Section 3.3.3	1	1	1	1
Non-standard geometric features created	Section 3.3.3	N/A	3	3	3
2030 Expressway segments with deficient level of service (E or F)	Section 3.3.3	- Route 5 (I-190 to Ohio St);  - I-90 (I-190 to Ridge Rd.)	- Route 5 (Ohio St. to Tiff St.)  - I-90 (I-190 to Ridge Rd.)	- I-190 (Hamburg St. to I-90);  - I-90 (I-190 to Ridge Rd.)	- I-190 (Hamburg St. to Smith St.  - I-190 (Ogden St. to I-90)  - I-90 (I-190 to Ridge Rd.)



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2030 Intersections with deficient level of service (E or F)  (Note: Overall intersection level of service)	Section 3.3.3  Appendix C	6 intersections: - Route 5 @ Lake, Madison, Dona, and Odell Streets - Ohio St. @ Michigan Ave. - South Park Ave. @ Michigan Ave.	3 intersections: - Route 5 @ Ridge Road - Michigan Ave. - @ South Park Ave. - Michigan Ave. @ Ohio St.	2 intersections: - Ohio St. @ Michigan Ave. - South Park Ave. @ Michigan Ave.	2 intersections: - Ohio St. @ Michigan Ave. - South Park Ave. @ Michigan Ave.
Change in total travel time – for all road segments compared to Null (in minutes)	Section 4.3.2	–	No significant change from Null	+3.22 (peak) +1.31 (off peak)	+2.04 (peak) -0.21 (off peak)
Total travel cost change (vs. Null) (daily = d & annual = a)	Section 4.3.2	–	\$0 (d) \$0 (a)	\$24,749 (d) \$3,482,699 (a)	-\$6,144 (d) -\$1,535,931 (a)
<b>Qualitative Benefits</b>					
Improved Physical Access	Section 4.2.2	No	Yes	Yes	Yes
Positive impact on businesses and residences	Section 4.3.3-4.3.5	None	Expanded market; regional quality-of-life improvements as a site selection asset; better settings for neighborhood redevelopment	Expanded market; regional quality-of-life improvements as a site selection asset; better settings for neighborhood redevelopment	Expanded market; regional quality-of-life improvements as a site selection asset; better settings for neighborhood redevelopment



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<b>Social, Economic &amp; Environmental Impacts</b>					
Right of Way Impacts:					
<i>Number of Parcels Affected/Required</i>	4.3.6	0	77 (take) 3 (easements)	74	77
<i>Land Area Required hectares (acres)</i>	4.3.6	0	9.71 (23.99) (take) 0.43 (1.06) (easements)	9.17 (22.66)	10.55 (26.07)
<i>Residential Structures Displaced</i>	4.3.6	0	3	3	3
<i>Commercial Buildings Displaced</i>	4.3.6	0	3	3	3
<i>Mixed Residential/ Commercial Buildings Displaced</i>	4.3.6	0	1	1	1
<i>Businesses Relocated</i>	4.3.5	0	1	1	1
Wetland Impacts	4.4.1	None	None	None	None
Surface Water and Groundwater Quality Impacts	4.4.2	None	Localized minor increases in pollutant loads associated with the I-190/Tiftt Street Arterial; no impact to groundwater	Localized minor increases in pollutant loads associated with the I-190/Tiftt Street Arterial; no impact to groundwater	Localized minor increases in pollutant loads associated with the I-190/Tiftt Street Arterial; no impact to groundwater
Floodplain Impacts	4.4.2.10	None	No significant effects	No significant effects	No significant effects
General Ecology Impacts	4.4.3	None	No significant effects	No significant effects	No significant effects



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Cultural Resources	4.4.4	None	Adverse effect to one building (630 Ohio Street) that is eligible for inclusion on the National Register; would be mitigated by HABS recording and implementation of interpretative program along Ohio Street for Industrial Heritage Trail	Adverse effect to one building (630 Ohio Street) that is eligible for inclusion on the National Register; would be mitigated by HABS recording and implementation of interpretative program along Ohio Street for Industrial Heritage Trail	Adverse effect to one building (630 Ohio Street) that is eligible for inclusion on the National Register; would be mitigated by HABS recording and implementation of interpretative program along Ohio Street for Industrial Heritage Trail
<b>Visual Impacts:</b>					
<i>Average rating of visual simulations</i>	4.4.5	None	Moderate Impacts (Positive)	Moderate to Major Impacts (Positive)	Moderate Impacts (Positive)
<i>Scenic opportunities of unimpeded view of lake</i>	4.4.5	Maintains views of Lake Erie via elevated roadway	Maintains views of Lake Erie via elevated roadway.	Decreased from Route 5; Increased significantly from points east of Route 5.	Decreased from Route 5; Increased somewhat from points east of Route 5.
Parks and Recreational Facilities	4.4.6	No significant improvements. Recreational facilities would be substantially separated by Route 5/ Fuhrmann Blvd. complex.	Would result in new system of pedestrian and bicycle linkages among existing/planned facilities. Somewhat improves physical access between Tifft Nature Preserve and Gallagher Beach.	Would result in new system of pedestrian and bicycle linkages among existing/planned facilities. Creates visual/physical connection between Tifft Nature Preserve and Gallagher Beach.	Would result in new system of pedestrian and bicycle linkages among existing/planned facilities. Creates visual/physical connection between Tifft Nature Preserve and Gallagher Beach.



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<b>Air Quality Impacts:</b>					
<i>Microscale Impacts (2010 Max. 1-hour Carbon Monoxide [CO] Concentrations – parts per million [ppm])</i>	4.4.8	6.8 ppm (AM) 6.0 ppm (PM)	6.1 ppm (AM) 5.7 ppm (PM)	8.6 ppm (AM) 8.6 ppm (PM)	5.8 ppm (AM) 5.6 ppm (PM)
<i>Mesoscale Impacts (CO, Volatile Organic Compounds [VOCs], Nitrogen Oxides [NOx])</i>	4.4.8	No change	Minor decrease of CO and NOx; Minor changes in VOCs	Minor increase of CO and VOCs; Minor decrease of NOx.	Minor increase of VOCs; Minor decreases of CO and NOx.
<i>Conformity with 1990 Clean Air Act Amendments</i>	4.4.8	Yes	Yes	Yes	Yes
<b>Noise Impacts (16 sites monitored):</b>					
<i>Number of sites projected to reach FHWA “approach” level (66 dBA)</i>	4.4.9	133 (AM) 134 (PM)	171 (AM) 196 (PM)	136 (AM) 133 (PM)	134 (AM) 161 (PM)
<i>Number of sites with projected “substantial” increase (6 dBA higher than existing)</i>	4.4.9	0	22 (AM) 23 (PM)	23 (AM) 13 (PM)	19 (AM) 14 (PM)
<b>Hazardous Waste/ Contaminated Materials</b>	4.4.10	No impact	Would involve use of new right- of-way through LTV/Republic Steel site and near ExxonMobil facility, as well as portions of the Buffalo Outer Harbor site and Bethlehem Steel sites.	Would involve use of new right- of-way through LTV/Republic Steel site and near ExxonMobil facility, as well as portions of the Buffalo Outer Harbor site and Bethlehem Steel sites.	Would involve use of new right- of-way through LTV/Republic Steel site and near ExxonMobil facility, as well as portions of the Buffalo Outer Harbor site and Bethlehem Steel sites.
<b>Asbestos Impacts (Suspect ACM)</b>	4.4.11	None	17 bridges 4 buildings	17 bridges 4 buildings	17 bridges 4 buildings





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Coastal Zone Management Consistency	4.4.12	Inconsistent with waterfront access policies	Consistent with policies in Buffalo, Lackawanna, and Hamburg	Consistent with policies in Buffalo, Lackawanna, and Hamburg	Consistent with policies in Buffalo, Lackawanna, and Hamburg
Total Energy Consumed (Btu)	4.4.13	$1.076 \times 10^{10}$	$1.076 \times 10^{10}$	$1.08 \times 10^{10}$	$1.073 \times 10^{10}$
Section 4(f) Impacts	Chapter 6	None	Direct taking (use) of one Section 4(f) property (630 Ohio Street). Would be mitigated by HABS recording and implementation of interpretative program along Ohio Street for Industrial Heritage Trail.	Direct taking (use) of one Section 4(f) property (630 Ohio Street). Would be mitigated by HABS recording and implementation of interpretative program along Ohio Street for Industrial Heritage Trail.	Direct taking (use) of one Section 4(f) property (630 Ohio Street). Would be mitigated by HABS recording and implementation of interpretative program along Ohio Street for Industrial Heritage Trail.

## 5.2 Discussion

### 5.2.1 Null Alternative

The Null Alternative would not satisfy any of the five project objectives. It is included in **Table 5-1** to add context to the benefits and impacts of the Build Alternatives.

### 5.2.2 Modified Improvement Alternative (Preferred Alternative)

The Modified Improvement Alternative would provide a four-lane arterial highway (Route 5) from the Skyway to the Union Ship Canal. Access to the Outer Harbor would be provided through three interchanges. Route 5 would become a six-lane divided boulevard with bicycle/pedestrian access south of the Union Ship Canal. Fuhrmann Boulevard would convert to a two-way frontage road with a continuous bicycle/pedestrian trail system. This alternative would provide easy access to the waterfront and areas east of Route 5 in a cost-effective manner.



In addition, it would include the construction of the I-190/Tift Street Arterial and reconstruction of Ohio Street as alternative local routes through the corridor.

Total costs of the Modified Improvement Alternative would be the least of the three Build Alternatives. The short-term economic benefits would include 755 construction related jobs; \$99 Million in business sales; \$44 Million in household income; and \$1 million in local tax receipts. Long-term economic impacts would include facilitating local access to all targeted redevelopment sites and realizing regional quality-of-life improvements by creating a network of pedestrian and bicycle linkages among existing and planned recreational facilities along Lake Erie. This would be tempered somewhat by the fact that the Route 5 expressway segment would remain essentially in place as is today, although the visual effects of its embanked section would be reduced where feasible.

One existing non-standard geometric feature would remain under the Modified Improvement Alternative involving minimum stopping site distance on Ohio Street between the Ohio Street Bridge (BIN 2-26062-0) and Fuhrmann Boulevard. Three new non-standard geometric features would be created at the I-190/Tift Street Arterial – Ramp A (off-ramp) involving minimum stopping sight distance, grade, and horizontal curve radius.

Overall this alternative provides acceptable operating conditions along Route 5 through signalized intersections. Route 5 would maintain its roles as a major regional commuting corridor, but would experience capacity issues at the proposed at-grade intersection of Route 5 at Ridge Road in 2030.

Overall environmental impacts would be minor. For the most part, these impacts could be reasonably mitigated, with the exception of noise levels along Ohio Street.

### 5.2.3 Boulevard Alternative

The Boulevard Alternative would provide a single, six-lane at-grade divided boulevard (Route 5) with a narrow median transition to/from the Skyway and then becoming a divided boulevard with wide median just south of the NFTA Outer Harbor Lands.

Total costs of the Boulevard Alternative would be the second highest of three Build Alternatives. It would require a least amount of land acquisition. The short-term economic benefits would be similar to the Modified Improvement Alternative. Long-term economic impacts would include facilitating local access to most targeted redevelopment sites. It would somewhat affect redevelopment of the NFTA Outer Harbor Lands by assuming the construction of an internal roadway network, thus limiting flexibility in phased development of this site. However, it would realize regional quality-of-life improvements by creating a network of pedestrian and bicycle linkages among existing and planned recreational facilities and fully remove expressway facilities in the corridor.



One existing non-standard geometric feature would remain under the Boulevard Alternative involving minimum stopping site distance on Ohio Street between the Ohio Street Bridge (BIN 2-26062-0) and Fuhrmann Boulevard. Three new non-standard geometric features would be created at the I-190/Tifft Street Arterial – Ramp A (off-ramp) involving minimum stopping sight distance, grade, and horizontal curve radius.

Overall traffic impacts would be moderately different than under Null Conditions – Route 5 would maintain current traffic levels, however, its slower speed and configuration would cause diversion of projected traffic growth to I-90 and I-190 to access downtown Buffalo. This would result in capacity impacts to these expressways (rather than along Route 5) by 2030. Thus, the Boulevard Alternative would involve a public policy decision that future investments for capacity improvements for regional commuting/goods movement would be primarily centered on the interstate system.

Similar to the Modified Improvement Alternative, environmental impacts would be minor and for the most part, could be reasonably mitigated.

#### 5.2.4 Hybrid Alternative

The Hybrid Alternative provides elements from the Modified Improvement and Boulevard Alternatives including maintaining Route 5 and Fuhrmann as separate facilities north of Ohio Street, transitioning to a six-lane divided boulevard for the balance of the corridor.

Total costs of the Hybrid Alternative would be highest among the Build Alternatives. The short-term economic benefits would be similar to other Build Alternatives. Long-term economic impacts would include facilitating local access to all targeted redevelopment sites, including preserving flexibility in the redevelopment of the NFTA Outer Harbor Lands. While not fully eliminating the Route 5 expressway segments like the Boulevard Alternative, it would remove a critical portion of the Route 5 embankment south of Ohio Street. This would result in better visual connections between Tifft Nature Preserve and Gallagher Beach.

One existing non-standard geometric feature would remain under the Hybrid Alternative involving minimum stopping site distance on Ohio Street between the Ohio Street Bridge (BIN 2-26062-0) and Fuhrmann Boulevard. Three new non-standard geometric features would be created at the I-190/Tifft Street Arterial – Ramp A (off-ramp) involving minimum stopping sight distance, grade, and horizontal curve radius.

Overall traffic impacts would be somewhat less than under the Boulevard Alternative – Route 5 would experience some traffic growth, with some diversion to I-90 and I-190 to access downtown Buffalo. This would result in capacity impacts to some segments on these expressways, but to a lesser extent than under the Boulevard Alternative.

Similar to the other Build Alternatives, environmental impacts would be minor and for the most part, could be reasonably mitigated.



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