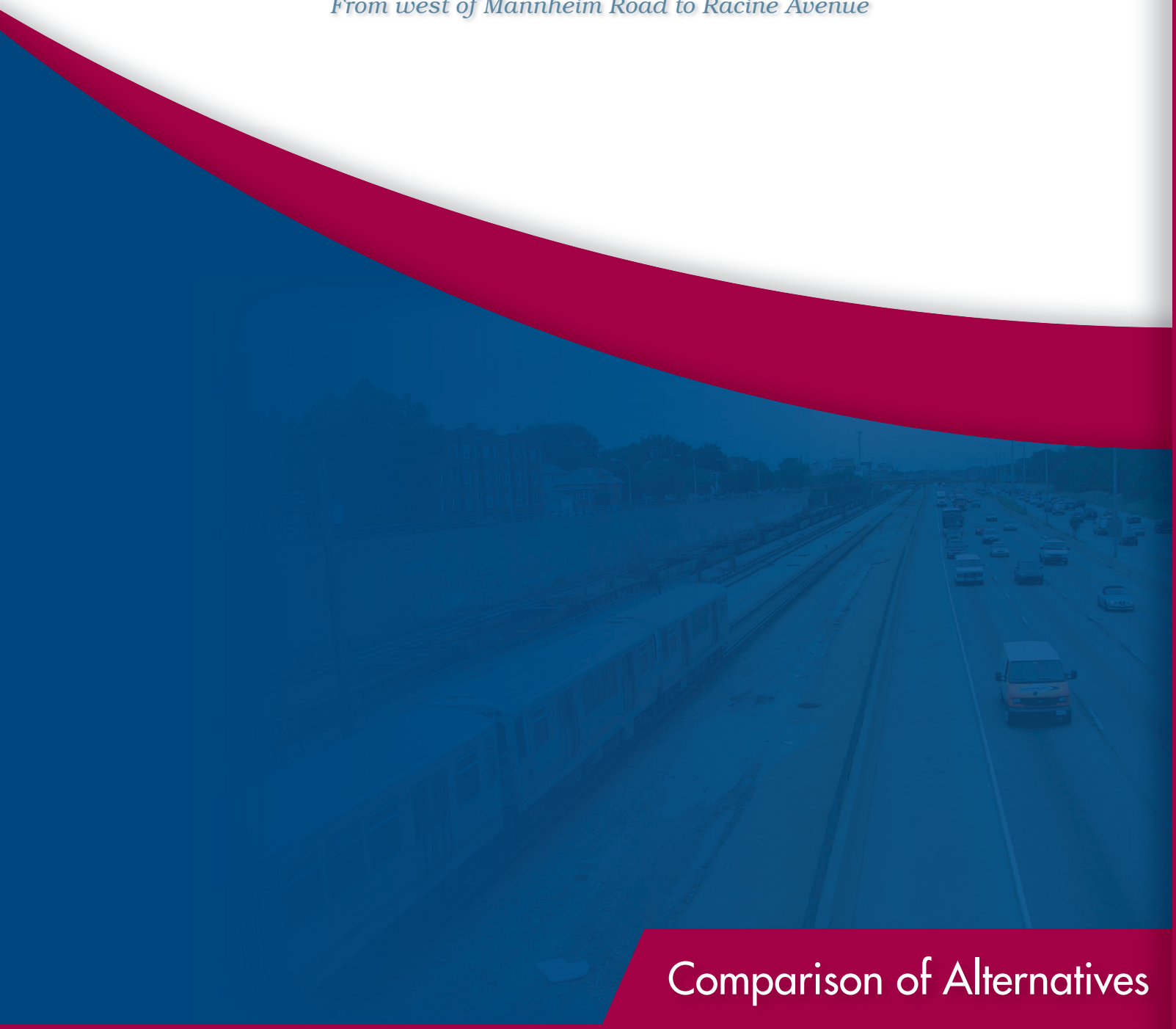
Eisenhower expressway

I-290 | Eisenhower Expressway

From west of Mannheim Road to Racine Avenue



Comparison of Alternatives

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5.0 Comparison of Alternatives Summary

This section summarizes the results of the alternatives development and analysis contained in Sections 2.0, Alternatives; 3.0, Environmental Resources, Impacts and Mitigation; and 4.0, Public Comments and Agency Coordination. Based on the comparison of socioeconomic and environmental impacts, travel performance, and other factors including stakeholder and agency input, the HOT 3+ & EXP and HCT Alternative (also referred to herein as the HOT 3+ Alternative) is the Preferred Alternative.

HCT - High Capacity Transit
A transit mode providing high person throughput. HCT can either use buses in a dedicated traffic lane (bus rapid transit or "BRT") or heavy rail transit such as the CTA Blue Line.

5.1 Alternatives Carried Forward

The development and evaluation of the alternatives was an iterative process guided by extensive stakeholder involvement as described in Section 4.0, Public Comments and Agency Coordination, combined with technical analysis and environmental impact avoidance/minimization efforts using field surveyed resource data and impact modeling. The alternatives development and evaluation process in Section 2.0, Alternatives concluded with the identification of a range of alternatives to be considered (including a No Build Alternative). The process included three rounds of identification, evaluation, and refinement that considered a wide range of suggested alternatives, single mode alternatives, and combination mode alternatives that resulted in the selection of four build alternatives carried forward for further refinement and analysis in Section 3.0, Environmental Resources, Impacts and Mitigation. These alternatives carried forward in Section 3.0 are as follows:

- GP & EXP & HCT (also referred to herein as GP Lane), consisting of adding one general purpose lane[1] in each direction between 25th Avenue and Austin Boulevard, and includes provisions for Express Bus (EXP) and High Capacity Transit (HCT);
- HOV 2+ & EXP & HCT (also referred to herein as HOV 2+), consisting of adding one High Occupancy Vehicle (HOV) 2+ (two or more occupants required for use) lane in each direction between 25th Avenue and Austin Boulevard, conversion of one existing general purpose lane in each direction west of 25th Avenue and east of Austin Boulevard to HOV use, and provisions for EXP and HCT;
- HOT 3+ & EXP & HCT (also referred to herein as HOT 3+), consisting of adding one High Occupancy Toll (HOT) 3+ (three or more occupants per vehicle required for

[1] "General purpose lanes (also referred to as "mixed use" or "mixed flow" lanes) are those where use is allowed by all vehicles (except certain small motorized vehicles, bicycles and pedestrians on limited access highways), without restriction on number of occupants or imposition of a toll. All lanes on I-290 are currently general purpose.

non-tolled use, or one/two occupants per vehicle paying a toll) lane in each direction between 25th Avenue and Austin Boulevard, conversion of one existing general purpose lane in each direction west of 25th Avenue and east of Austin Boulevard to HOT 3+ use, and provisions for EXP and HCT;

- HOT 3+ & TOLL & EXP & HCT (also referred to herein as HOT 3+ & TOLL), consisting of adding one High Occupancy Toll (HOT) 3+ lane in each direction between 25th Avenue and Austin Boulevard, conversion of one existing general purpose lane in each direction west of 25th Avenue and east of Austin Boulevard to HOT 3+ use, conversion of the remaining general purpose lanes to toll lanes (users of these lanes paying a toll), and provisions for EXP and HCT; and

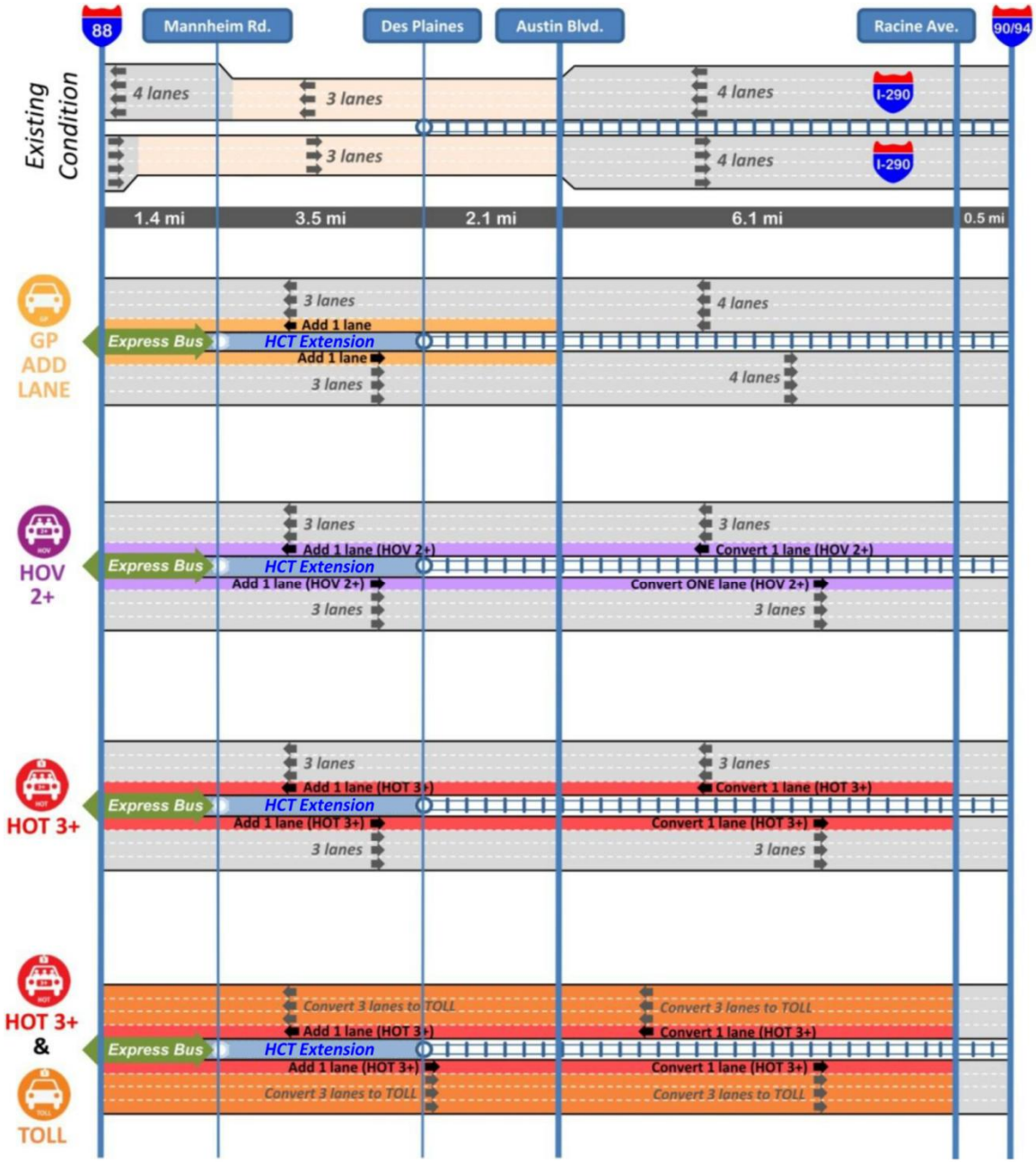
- The No Build Alternative is also carried forward to provide a baseline of comparison of travel benefits as well as environmental impacts. This alternative consists of planned improvements to existing roadway and transit facilities in the Study Area that are expected to be constructed by the design year (2040) with the exclusion of major improvements to I-290 or the CTA Forest Park Branch. The transportation conditions assumed to exist under the No Build Alternative include the existing transportation network plus major capital projects (excluding major capital projects in the Study Area) currently in the CMAP 2040 fiscally constrained plan referenced in Section 1.1 of this DEIS. The environmental conditions that would exist under the No Build Alternative are generally consistent with the existing conditions as described in Section 3.0, except to the extent that those existing conditions would be affected by other actions (e.g., other transportation or development projects) as described in Section 3.15, Indirect and Cumulative Impacts. The No Build Alternative would not satisfy the project's Purpose and Need.

Figure 5-1 shows a concept for each of the four build alternatives along with the existing condition.

The four build alternatives have identical footprints and therefore are very similar to one another; the differences between the alternatives are related to travel performance and social and economic and environmental impacts due to the manner in which traffic would be managed, and the differences in traffic volumes and patterns resulting from this management. Given the location of the project in a developed urban setting, the improvements proposed are almost entirely contained within existing I-290 right-of-way, with the exception of 2.79 acres located near five interchanges proposed for reconstruction and 2.65 acres for a 10-foot strip of right-of-way from the CTA Blue Line. Thus, as was desired by the communities, there are no residential or commercial displacements resulting from the build alternatives. In addition, the Austin Boulevard and Harlem Avenue interchanges would retain their center ramp termini (although converted to right hand on and off ramps), in response to community concerns.

All four build alternative improve safety for motorists and pedestrians. Primary safety improvements include the elimination of the expressway lane drops (westbound at Austin Boulevard and eastbound at 25th Avenue) which would help reduce congestion related rear end and side-swipe crashes that are prevalent with lane drops. As stated

Figure 5-1. Four Build Alternatives Evaluated in Round 3



previously, the left-hand ramps at the Austin Boulevard and Harlem Avenue interchanges are proposed to be converted to conventional right-hand ramps, which are consistent with driver expectations and with all other ramps in the corridor. The substandard interchange ramps spacing between 1st Avenue and 25th Avenue that resulted in higher crash rates is also addressed through reconfiguration and consolidation of the multiple existing interchange and slip ramps. The interchanges and crossroads are also designed to modern standards, including improved truck turning radii, improved vehicle storage, wider sidewalks, ADA ramps, pedestrian plaza areas,

modern pedestrian countdown signals, and pedestrian refuge islands in between the ramps at the Austin Boulevard and Harlem Avenue interchanges.

All four build alternatives improve access to both transit and non-motorized travel. This includes wider sidewalks on all cross bridges in the Reconstruction Section, including additional width for sidewalks serving CTA Blue Line stations. Increased pedestrian plaza space for CTA Blue Line station entrances provide space for bicycle parking and bus passengers, and bus passenger shelters. Access to CTA Blue Line stations in the Reconstruction Section would be ADA accessible, which is currently not the case in much of the corridor.

With regard to environmental resources, the four build alternatives have no impacts to wetlands, wildlife and agricultural resources. The four build alternatives each result in the same 12.94 acre-feet net decrease in floodplain fill volume, and water quality standards would continue to be met. There would be no direct use of adjacent Section 4(f) resources required by any of the build alternatives except for a *de minimis* impact to 0.031 acre of public park land in the Village of Forest Park, while temporary use is proposed of 0.137 acre of the same park land in the Village of Forest Park and temporary occupancy of 2.74 acres at Columbus Park. There are no distinguishing differences between the build alternatives with respect to potential uses of Section 4(f) resources.

Each of the four build alternatives would satisfy the Project Purpose and Need. However, the extent of impacts, the level of overall travel performance, and the economic benefits vary for each of these alternatives. Since the physical footprint on the land by each of the build alternatives is primarily confined within the existing I-290 right-of-way, and is the same for the four build alternatives, environmental mitigation is proposed to be identical for each of the alternatives.

A final *de minimis* impact determination for the Forest Park properties will be made pending public comments received from publication of this DEIS, as well as written concurrence from the Village of Forest Park.

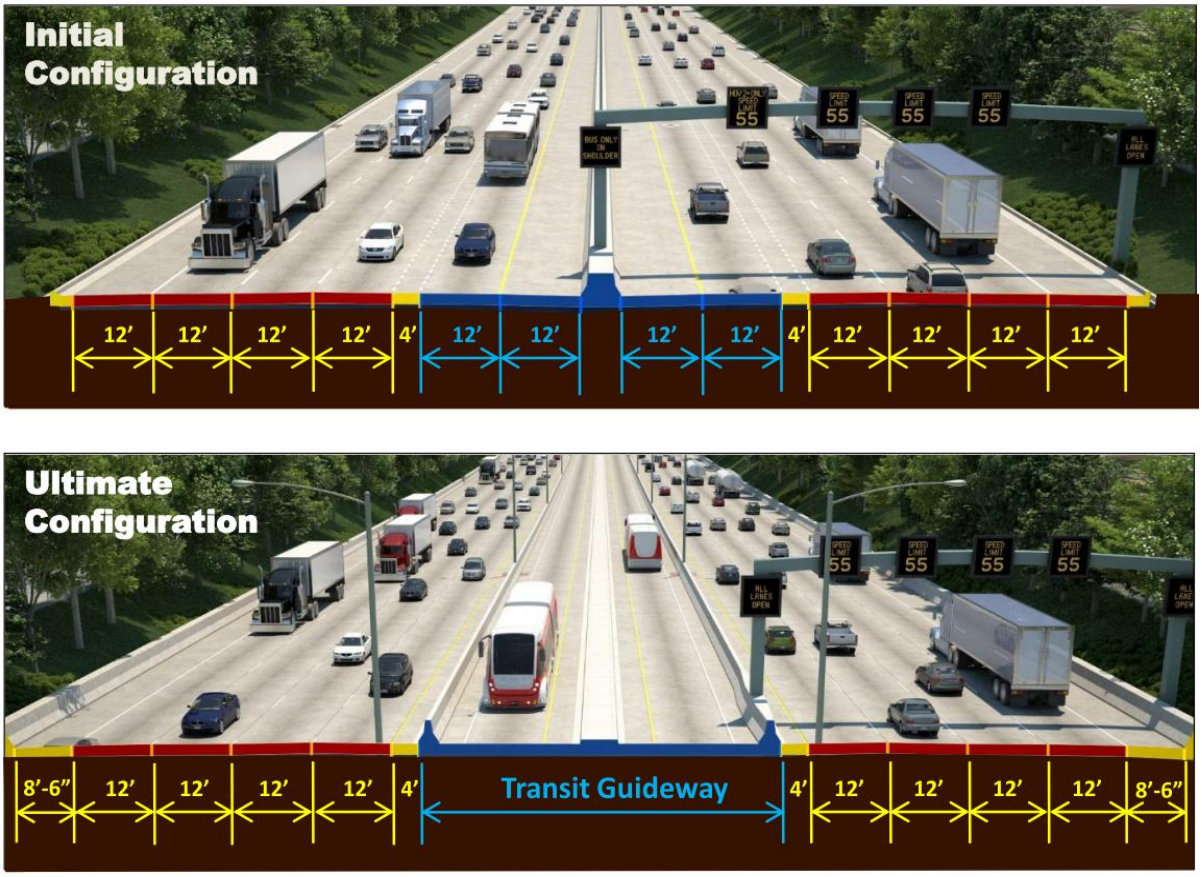
Regarding Columbus Park, the Chicago Park District and SHPO/IHPA have informally concurred that the scope of the improvements proposed would not adversely impact the park and, in fact, would provide additional opportunities to enhance the historic integrity of the park, while providing additional benefits to park visitors.

5.1.1 Accommodation for High Capacity Transit

As their names imply, each of the four build alternatives accommodates improvements to the existing HCT, the CTA Blue Line, where it exists today, and provides for a westward expansion of high capacity transit to Mannheim Road. West of the CTA Forest Park Terminal, an extension of HCT can be accommodated in the median of the expressway. Staged construction of I-290 is assumed such that the reconstructed expressway and overhead bridges would be configured to accommodate a subsequent HCT extension within the median without the need to reconstruct the expressway or

overhead bridges. Figure 5-2 illustrates this staged approach which utilizes an expressway typical section configured for future conversion of the inside lanes to HCT.

Figure 5-2. Convertible Expressway Section – Initial and Ultimate Configuration



In the initial configuration, EXP bus service would be accommodated along the expressway either in the inside managed lanes or along the inside shoulders. The accommodation of the EXP and HCT modes is similar between build alternatives and is not a distinguishing factor.

5.1.2 Comparison Matrix of Alternatives

The identification of the Preferred Alternative is based on a comparison of key factors with respect to travel performance, socioeconomic and environmental impacts for the alternatives carried forward, as well as stakeholder and agency input which is summarized below. A comparative table of overall performance, impacts, and costs/revenues is presented in Table 5-1. Note: for clarity, table values in red in the Transportation Performance (2040), Social /Economic, Air Quality, Traffic Noise and Natural Resources-Floodplains sections represent reduced performance or greater impacts than the No Build Alternative, and table values in green in these sections represent better performance or lesser impacts than the No Build Alternative.

Table 5-1. Comparison Matrix of Alternatives

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
1.0	Transportation Performance (2040)						
1.1	Regional vehicle miles traveled (VMT) (miles)	Quantitative	201,187,710	+151,380	+72,492	+52,211	+33,774
1.2	Regional vehicle hours traveled (VHT) (hours)	Quantitative	8,067,709	-9,840	-9,773	-16,161	-17,300
1.3	I-290 Travel Time (Min) (GP/ML)	Quantitative	30.7 / NA	21.2 / NA	23.2 / 13.7	23.0 / 13.5	14.8 / 12.6
1.4	Study Area Arterial VMT (miles)	Quantitative	4,294,011	-24,560	+6,944	-8,853	+147,834
1.5	Study Area Arterial VHT (Hours)	Quantitative	255,282	-1,996	-967	-1,643	+6,778
1.6	Person Throughput	Quantitative	459,122	+25,247	+31,871	+28,604	+25,294
1.7	Job Accessibility	Quantitative	5,151,539	+105,053	+364,948	+397,660	+326,499
1.8	Overall Safety (crashes per million person miles per year)	Quantitative	0.287	-4.86%	-6.44%	-6.21%	-4.65%
1.9	East-West Transit Trips	Quantitative	76,950	+4,375	+2,150	+4,425	+8,425
2.0	Social/Economic (including Environmental Justice)						
2.01	Traffic diversion to local roads (VMT)	Quantitative	--	-24,560	+6,944	-8,853	+147,834
2.02	Average change in travel time to job destinations from the 2040 No Build Alternative, Environmental Justice (EJ) Communities	Quantitative	--	-1 to -3 minutes	0 to -9 minutes	-2 to -10 minutes	-2 to -9 minutes
2.03	Average change in travel time to job destinations from the 2040 No Build Alternative, non-EJ Communities	Quantitative	--	-2 minutes	-2 to -5 minutes	-2 to -5 minutes	-4 to -6 minutes

Table 5-1. Comparison Matrix of Alternatives (continued)

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
2.04	Bicycle & Pedestrian accommodations	Qualitative	No change in existing condition	Provision of a new east-west separated shared path from Des Plaines Avenue to Austin Boulevard (approximately 2 miles); improved pedestrian crossings; new pedestrian refuge islands; improved pedestrian/bicycle safety with new/wider sidewalks; improved shared use path connectivity; improved pedestrian/bicycle accommodations at I-290 cross roads.			
2.05	Housing units displaced	Quantitative	0	0			
2.06	Public services displaced	Quantitative	0	0			
2.07	Businesses displaced	Quantitative	0	0			
2.08	Construction-related jobs created	Quantitative	--	18,904	18,904	18,980	18,980
2.09	Productivity (based on travel time savings)	Quantitative	--	+$1.6 B	+$1.6 B	+$2.7 B	+$2.8 B
2.10	Consistency with local and regional plans	Qualitative	No Effect	CMAP includes capacity improvements in the Project Corridor in its Go To 2040 plan and classifies improvements to the I-290 Eisenhower Expressway as one of the region's 'priority projects'. The local comprehensive plans for Oak Park, Maywood, Broadview, Hillside, and Bellwood all express a desire to improve access to I-290.			
2.11	Community Cohesion	Qualitative	No Effect	Improvements to roadways crossing the highway would improve community cohesion.			
2.12	Land use changes	Quantitative	No Effect	No major land use changes are expected as a result of the project, which mostly stays within existing right-of-way.			
2.13	Right-of Way acquisition	Quantitative	0	5.44 acres			

Table 5-1. Comparison Matrix of Alternatives (continued)

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
3.0	Historic Resources						
3.1	Historic properties impacted	Qualitative	No Adverse Effect to Historic Properties	No direct physical impacts to historic properties will occur with any of the build alternatives. Effects evaluation and finding to be documented in the FEIS. Due to the similarity of the build alternatives, no substantive differences are anticipated.			
3.2	Parks, Recreational Areas, Wildlife/Waterfowl Refuges						
3.3	Parkland impacts	Quantitative & Qualitative	No Effect	Improved access to the 51 parks and recreation areas along the Project Corridor by new or improved pedestrian and bicycle routes. Pedestrian access improvements require 0.031 acre of land and temporary use of 0.137 acre from Veterans Park, the Dog Park, and Park District of Forest Park Recreational Center (Roos property) within Village of Forest Park, at the request of the Village. Temporary occupancy of 2.74 acres at Columbus Park.			
3.4	Section 4(f)	Quantitative & Qualitative	*de minimis*	Proposed *de minimis* use including 0.031 acre of direct impacts to parks maintained by the Village of Forest Park to accommodate widened and new sidewalks. No other direct or constructive use of publicly owned parks and recreational areas is required by the four build alternatives.			

Table 5-1. Comparison Matrix of Alternatives (continued)

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
4.0	Visual Resources						
4.1	Visual Impacts/Benefits	Qualitative	No Effect	Proposed transportation improvements with respect to the visual environment are the same for all build alternatives. Aesthetic treatments will be evaluated for the Preferred Alternative. 46 of 63 eligible noise barriers were favored by "benefitted receptor" stakeholders and are likely to be built, pending future project coordination.			
5.0	Air Quality – *Provided as sensitivity test for informational purposes; not intended for Preferred Alternative selection.*						
	Pollutant Burden (annual burden –tons) - *Provided as sensitivity test for informational purposes; not intended for Preferred Alternative selection.*						
5.1	VOC (Hydrocarbon)	Quantitative	1,270	+0.10%	-0.01%	-0.14%	-0.02%
5.2	NOX (Nitrogen Oxide)	Quantitative	2,776	+0.21%	-0.12%	-0.07%	-0.60%
5.3	CO (Carbon Monoxide)	Quantitative	23,708	+0.73%	-0.51%	-0.34%	-0.35%
5.4	PM_{10} (Particulate Matter)	Quantitative	1,813	-0.06%	-0.03%	-0.31%	-0.43%
5.5	$PM_{2.5}$ (Particulate Matter)	Quantitative	326	+0.09%	-0.13%	-0.30%	-0.50%
	Greenhouse Gas Emissions (annual burden – million tons) - Provided as sensitivity test for informational purposes; not intended for Preferred Alternative selection.						
5.6	CO_2e (Carbon Dioxide Equivalents)	Quantitative	10.517	+0.24%	+0.03%	-0.01%	-0.10%
	Mobile Source Air Toxics (MSAT) (annual tons) - *Provided as sensitivity test for informational purposes; not intended for Preferred Alternative selection.*						
5.7	Acrolein	Quantitative	1.17	-0.08%	-0.07%	-0.17%	-0.62%
5.8	Benzene	Quantitative	16.55	+0.30%	-0.04%	-0.08%	+0.05%

Table 5-1. Comparison Matrix of Alternatives (continued)

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
5.9	1,3 Butadiene	Quantitative	0.07	-0.20%	-0.08%	-0.20%	-0.83%
5.10	Diesel PM	Quantitative	50.24	+0.10%	-0.13%	-0.16%	-1.11%
5.11	Formaldehyde	Quantitative	25.90	-0.07%	-0.07%	-0.17%	-0.60%
5.12	Naphthalene	Quantitative	2.19	-0.02%	-0.06%	-0.16%	-0.53%
6.0	Traffic Noise						
6.1	Receptors over the noise abatement criteria (NAC)	Quantitative	227	230	228	229	220
7.0	Hazardous Waste						
7.1	Hazardous Materials Recognized Environmental Condition (RECs) Sites affected	Quantitative	0	495 sites within Project Corridor; 13 sites within or directly adjacent to the proposed right-of-way acquisition			
8.0	Natural Environment						
8.1	Wildlife (number of species impacted)	Quantitative & Qualitative	0	0			
8.2	Wetlands (acres)	Quantitative	0	0			
8.3	Floodplains, volume change from existing (acre-feet)	Quantitative	0	-12.94 acre-feet, normal to 100 year flood elevation (overall flood storage capacity increased)			

Table 5-1. Comparison Matrix of Alternatives (continued)

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
8.4	Water Quality – Are Water Quality Standards Met (chlorides, metals, and TSS)? (yes/no)**						
	Salt Creek	Quantitative & Qualitative	Yes	Yes			
	Des Plaines River	Quantitative & Qualitative	Yes	Yes			
	South Branch of Chicago River	Quantitative & Qualitative	Yes	Yes			
9.0	Other						
9.1	Construction Cost	Quantitative	--	$2,558M	$2,558M	$2,571M	$2,571M
9.2	Toll Revenue (2040 Annual Revenue in 2014 $)	Quantitative	--	--	--	$20M	$100M

* Per policy, noise impacts are only identified for the build condition

** Increased concentration & loading for any build alternative would be offset with best management practices (BMP) and deicing practices

5.2 Performance Comparison

This section provides a summary comparison of travel performance characteristics for the four build alternatives as well as a baseline comparison with the No Build Alternative. Notable travel performance advantages and disadvantages of each build alternative, as compared to the No Build Alternative and to each other, are summarized below. Performance projections that are poorer than the No Build Alternative are shown in red, and performance in Table 5-2.

- GP Lane: The primary performance advantage of this alternative is that it would result in the greatest reduction in arterial VMT and VHT in the Study Area. Its performance disadvantages relative to the other build alternatives are that it would result in the highest increase in regional VMT, second lowest decrease in regional VHT, lowest person throughput, lowest increase in job accessibility, and second lowest reduction in crashes.

- HOV 2+: This alternative's performance advantages are that it would result in the highest person throughput, second highest increase in number of jobs accessible, and highest reduction in predicted crashes. Its performance disadvantages relative to the other build alternatives are that it would result in the second highest increase in regional VMT, lowest decrease in regional VHT, slowest GP lane travel time, second highest increase in arterial VMT, and lowest increase in east-west transit trips.

- HOT 3+: This alternative's performance advantages are that it would result in the second lowest increase in regional VMT, second highest reduction in regional VHT, second highest reduction in arterial VMT and VHT, second highest person throughput, highest increase in job accessibility, second highest reduction in crashes, and second highest increase in transit trips. Its performance disadvantage relative to the other build alternatives is that it would result in the second highest GP lane travel time compared to the other build alternatives, but is still an improvement compared to the No Build Alternative.

- HOT 3+ & TOLL: This alternative's performance advantages are that it would result in the lowest increase in regional VMT, its highest reduction in regional VHT, fastest travel time, and greatest inducement of east-west transit trips. Its performance disadvantages relative to the other build alternatives are that it would result in the highest increase in arterial VMT (diverting the most traffic to the arterial network), highest arterial VHT, second lowest person throughput, and lowest reduction in crashes.

Regional VMT
Regional VMT is vehicle miles traveled across the entire Chicago region.

It is noted that all of the build alternatives would increase regional VMT higher than the No Build Alternative, however this represents a regional increase of less than one tenth of a percent in regional miles travelled for each alternative. For all other performance

Table 5-2. Transportation Performance Comparison

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
1.0	Transportation Performance (2040)						
1.1	Regional VMT (miles)	Quantitative	201,187,710	+151,380	+72,492	+52,211	+33,774
1.2	Regional VHT (hours)	Quantitative	8,067,709	-9,840	-9,773	-16,161	-17,300
1.3	I-290 Travel Time (Min) (GP/ML)	Quantitative	30.7 / NA	21.2 / NA	23.2 / 13.7	23.0 / 13.5	14.8 / 12.6
1.4	Study Area Arterial VMT (miles)	Quantitative	4,294,011	-24,560	+6,944	-8,853	+147,834
1.5	Study Area Arterial VHT (Hours)	Quantitative	255,282	-1,996	-967	-1,643	+6,778
1.6	Person Throughput	Quantitative	459,122	+25,247	+31,871	+28,604	+25,294
1.7	Job Accessibility	Quantitative	5,151,539	+105,053	+364,948	+397,660	+326,499
1.8	Overall Safety (crashes per million person miles per year)	Quantitative	0.287	-4.86%	-6.44%	-6.21%	-4.65%
1.9	East-West Transit Trips	Quantitative	76,950	+4,375	+2,150	+4,425	+8,425

characteristics, the four build alternatives generally perform better than the No Build Alternative, with the HOV 2+ and HOT 3+ & TOLL Alternatives performing slightly worse than the No Build Alternative in one or more measures related to arterial traffic performance.

It is also noted that the HOT 3+ Alternative performs near the top in nearly all categories, and does not have a single "worst in category" ranking as is the case for each of the other build alternatives.

5.3 Social/Economic and Environmental Impacts Comparison

This section provides a summary comparison of social/economic and environmental impacts. There are few social/economic or environmental impacts that could be described as "distinguishing" among the build alternatives, even where there are slight differences in impacts. In the case of air quality, the differences in impacts between the No Build Alternative and the build alternatives are generally less than one percent (better or worse) for each of the pollutants studied. In the case of noise impacts, the number of receptors that would be above the Noise Abatement Criteria (NAC) varies slightly between the four build alternatives due to traffic volume variations; this

indicates that traffic noise mitigation for the four alternatives would be similar and would not be a differentiator between the alternatives. Noise barrier locations and heights are evaluated for the Preferred Alternative, at which time a 'viewpoints solicitation' is conducted. This solicitation is required by IDOT noise policy and requires that stakeholders who are benefitted by a proposed noise wall are provided an opportunity to vote on whether they would rather have the barriers or not. The results of the voting determine if the proposed noise walls are implemented.

5.3.1 Social/Economic Impacts (including Environmental Justice)

Environmental Justice (EJ): Within each build alternative there are no apparent accessibility differences in travel times between the EJ and non-EJ communities; average travel times to regional employment centers are reduced with the four build alternatives from the EJ communities of East Garfield Park, West Garfield Park, North Maywood, South Maywood and Bellwood, as well as the non-EJ communities of Oak Park and Forest Park (see items 2.02 and 2.03 of Table 5-3).

Table 5-3. Social/Economic Impact Comparison

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
2.0	Social/Economic (including Environmental Justice)						
2.01	Traffic diversion to local roads (VMT)	Quantitative	--	-24,560	+6,944	-8,853	+147,834
2.02	Average change in travel time to job destinations from the 2040 No Build Alternative, EJ Communities	Quantitative	--	-1 to -3 minutes	0 to -9 minutes	-2 to -10 minutes	-2 to -9 minutes
2.03	Average change in travel time to job destinations from the 2040 No Build Alternative, non-EJ Communities	Quantitative	--	-2 minutes	-2 to -5 minutes	-2 to -5 minutes	-4 to -6 minutes
2.04	Bicycle and Pedestrian changes	Qualitative	No change in existing condition	Provision of a new east-west separated shared-use path from DesPlaines Avenue to Austin Boulevard (approximately 2 miles); improved pedestrian crossings; new pedestrian refuge islands; improved pedestrian/bicycle safety with new/wider sidewalks; improved shared-use path connectivity; improved pedestrian/ bicycle accommodations at I-290 cross roads.			

Table 5-3. Social/Economic Impact Comparison (continued)

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
2.05	Housing units displaced	Quantitative	0	0			
2.06	Public services displaced	Quantitative	0	0			
2.07	Businesses displaced	Quantitative	0	0			
2.08	Construction-related jobs created[2]	Quantitative	--	18,904	18,904	18,980	18,980
2.09	Productivity (based on travel time savings)	Quantitative	--	+$1.6 B	+$1.6 B	+$2.7 B	+$2.8 B
2.10	Consistency with local and regional plans	Qualitative	No Effect	CMAP includes capacity improvements in the Project Corridor in its *Go To 2040* plan and classifies improvements to the I-290 Eisenhower Expressway as one of the regions 'priority projects'. The local comprehensive plans for Oak Park, Maywood, Broadview, Hillside, and Bellwood all express a desire to improve access to I-290.			
2.11	Community Cohesion	Qualitative	No Effect	Improvements to roadways and pedestrian facilities crossing the highway would improve community cohesion.			
2.12	Land use changes	Quantitative	No Effect	No major land use changes are expected as a result of the project, which mostly stays within the existing right-of-way.			
2.13	Right-of-Way acquisition	Quantitative	0	5.44 acres			

[2] NCHRP 08-36, Task 103 - Mining Recovery Act Data for Opportunities to Improve the State of Practice for Overall Economic Impact Analysis of Transportation Investments, Cambridge Systematics & Economic Development Research Group, 2012. 10.55 jobs/$1M construction cost in 2010 adjusted to 9.82 jobs/$1M construction cost for 2015 using CPI. 2015 cost estimates used as basis for estimating direct construction jobs.

All of the build alternatives have at least one non-toll travel option. Non-tolled general purpose lanes within the build alternatives offer lower overall travel time than those within the No Build Alternative condition. However, the HOT 3+ & TOLL Alternative is the most restrictive alternative for low-income populations, with a requirement of three or more occupants to qualify for toll-free access to the managed HOT 3+ lane, as all the general purpose lanes are tolled. The other alternatives offer a minimum of three non-tolled lanes in each direction and a fourth lane that can also be accessed with no toll (subject to minimum passenger requirements for the HOV 2+ and HOT 3+ alternatives).

Traffic diversion to and from arterial streets is most identifiable for the HOT 3+ & TOLL Alternative. This alternative is projected to result in an overall worsening of arterial traffic in the Project Corridor (with projected 2040 increases of 147,834 VMT and 6,778 VHT on Study Area arterial roads as compared to the No Build Alternative – Table 5-2), and would have a negative impact to the adjacent EJ communities since these are their neighborhood streets. Except for HOV 2+'s relatively higher arterial VMT, compared to the 2040 No Build and HOT 3+ & TOLL alternatives, the remaining three build alternatives show improved arterial operations which demonstrates a travel benefit to the adjacent EJ communities.

Four out of the five CTA Blue Line stations in the Reconstruction Section of the Project Corridor serve EJ communities. Each of the build alternatives would improve access to these four CTA stations, improve bicycle and pedestrian facilities, and enhance transportation options and connectivity for EJ communities. The HOV 2+, HOT 3+, and HOT 3+ & TOLL Alternatives offer the best accommodations for express bus service in a managed lane along I-290 which provides additional transportation options for EJ communities. The HOT 3+ & TOLL Alternative, which tolls all four lanes of I-290 in each direction, resulting in a greater auto diversion to transit; however, the benefits of the relatively minor increase in transit ridership is countered by the more restrictive conditions to low-income populations as stated above, including increases in regional and arterial VMT. The provision of a 'carpool lane' in the HOV 2+ Alternative provides more competition to transit, resulting in a relatively smaller increase in transit ridership compared to other build alternatives. However, the managed lane alternatives include free access for carpooling which offers a benefit to the EJ communities as they provide an additional low cost travel option.

The most safety benefits to EJ populations are associated with the HOV 2+ and HOT 3+ alternatives that result in very similar overall safety improvements for arterials, expressway and transit while not disproportionally favoring non-EJ populations. Compared to the No Build Alternative, the HOT 3+ & TOLL Alternative may disproportionately affect EJ populations should low-income users favor the arterial network (which has an inherently higher crash potential than limited access roads like I-290) to avoid the tolls imposed along the expressway.

Other Social/Economic Impacts: No business or residential displacements would be required for any of the build alternatives; furthermore, all build alternatives are projected to be compatible with local and regional planning, would improve community cohesion, and are not anticipated to result in major land use plan changes in this fully developed corridor (Table 5-3).

5.3.2 Section 4(f) Resources

Historic Properties: Effect finding for Section 106 properties will be included in the FEIS.

Parks, Recreational Areas, Wildlife/Waterfowl Refuges: No Section 4(f) use of historic properties, parks, wildlife/waterfowl refuges, recreation areas except for 0.031 acres of direct use and 0.137 acres of temporary use to parks maintained by Park District of Forest Park; Veterans Park, the Dog Park and the Recreational Center (Roos property). The areas are proposed by the Village to accommodate widened sidewalks and provide for access to the shared-use path proposed to from the Illinois Prairie Path to Central Avenue. Based on informal consultation with the Village, a *de minimis* impact under Section 4(f) is proposed. Formal written concurrence will be required by the Village.

Consultation with the Chicago Park District has been initiated regarding the extension of the proposed shared-use path through Columbus Park, along with the placement of small berms and trees. October 15, 2015 correspondence from the Chicago Park District indicated no adverse impact and a potential enhancement for the park. In addition, informal consultation with the SHPO/IHPA indicated that these improvements, as a national historic landmark, would not result in an adverse effect finding. It is intended that this would be processed by FHWA as a temporary occupancy, avoiding any Section 4(f) use of Columbus Park. Formal written concurrence will be required by the Chicago Park District and SHPO/IHPA.

Table 5-4. Section 4(f) Resources Impact Comparison

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
3.0	Historic Resources						
3.1	Historic properties impacted	Qualitative	No Historic Properties Affected	No direct physical impacts to historic properties will occur with any of the build alternatives. Effects evaluation and finding to be documented in the FEIS. Due to the similarity of the build alternatives, no substantive differences are anticipated.			
3.2	Parks, Recreational Areas, Wildlife/Waterfowl Refuges						
3.3	Parkland impacts	Quantitative & Qualitative	No impacts to parks	Improved access to the 51 parks and recreation areas along the Project Corridor by new or improved pedestrian and bicycle routes. Pedestrian access improvements require 0.031 acre of land and temporary use of 0.137 acre from Veterans Park, the Dog Park, and the Roos property in the Village of Forest Park, at the request of the Village. Temporary occupancy of 2.74 acres at Columbus Park.			
3.4	Section 4(f)	Quantitative & Qualitative	*de minimis*	Proposed *de minimis* use including 0.031 acre of direct impacts to parks maintained by the Village of Forest Park to accommodate widened and new sidewalks. No other direct, temporary or constructive use of publicly owned parks and recreational areas is required by the four build alternatives.			

5.3.3 Visual Resources

From the perspective of the expressway user, the alternatives would alter the visual character due to full reconstruction and replacement of existing bridges retaining walls, interchange/ramps that would include some new retaining walls and aesthetic treatments. Because the proposed design for the four build alternatives is the same, effects to visual resources from the expressway is the same for the build alternatives and is not a differentiator (Table 5-5).

Table 5-5. Visual Resources Impact Comparison

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
4.0	Visual Resources						
4.1	Visual Impacts/ Benefits	Qualitative	No Effect	Proposed transportation improvements with respect to the visual environment are the same for all build alternatives. Aesthetic treatments will be evaluated for the Preferred Alternative. 46 of 63 eligible noise barriers were favored by "benefitted receptor" stakeholders and are likely to be built, pending future project coordination.			

From the local street perspective, because the design of the alternatives is the same, the effect to visual resources is the same for the four build alternatives and is not a differentiator.

Noise walls would also have an effect on visual character from the expressway and local perspective. All four build alternative have similar noise impacts and would result in similar noise wall locations and heights, therefore noise walls are not a differentiator for visual impacts. Location and height of proposed noise barriers are evaluated for the Preferred Alternative and implementation of any noise barrier is determined through the noise wall solicitation process where benefitted residents vote for or against a wall installation (Section 5.4.6). Change to visual character with respect to noise walls is a factor that is considered by the voters.

5.3.4 Air Quality

For VOC, Nitrogen Oxide, Carbon Monoxide, and Particulate Matter$_{2.5}$, the GP Lane Alternative is projected to show a slight increase in these air pollutants over the No Build condition, while the other three build alternatives would show no change or a slight decrease in these pollutants (Table 5-6). All build alternatives, including the GP Lane Alternative, would show a slight decrease in PM_{10} as compared to the No Build Alternative condition. For greenhouse gas emissions, the GP Lane and HOV 2+ build alternatives exhibit a slight increase as compared to the No Build Alternative condition. Overall, the build alternatives are expected to show minor changes (generally less than one percent

Table 5-6. Air Quality Impact Comparison

	Resource	Analysis Level	No Build Alternative	Build Alternative			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
	Pollutant Burden (annual burden – tons)[1]						
5.1	VOC (Hydrocarbon)	Quantitative	1,270	+0.10%	-0.01%	-0.14%	-0.02%
5.2	NOX	Quantitative	2,776	+0.21%	-0.12%	-0.07%	-0.60%
5.3	CO	Quantitative	23,708	+0.73%	-0.51%	-0.34%	-0.35%
5.4	PM_{10}	Quantitative	1,813	-0.06%	-0.03%	-0.31%	-0.43%
5.5	$PM_{2.5}$	Quantitative	326	+0.09%	-0.13%	-0.30%	-0.50%
	Greenhouse Gas Emissions (annual burden – million tons)[1]						
5.5	CO_2e	Quantitative	10.517	+0.24%	+0.03%	-0.01%	-0.10%
	MSAT (annual tons)[1]						
5.6	Acrolein	Quantitative	1.17	-0.08%	-0.07%	-0.17%	-0.62%
5.7	Benzene	Quantitative	16.55	+0.30%	-0.04%	-0.08%	+0.05%
5.8	1,3 Butadiene	Quantitative	0.07	-0.20%	-0.08%	-0.20%	-0.83%
5.9	Diesel PM	Quantitative	50.24	+0.10%	-0.13%	-0.16%	-1.11%
5.10	Formaldehyde	Quantitative	25.90	-0.07%	-0.07%	-0.17%	-0.60%
5.11	Naphthalene	Quantitative	2.19	-0.02%	-0.06%	-0.16%	-0.53%

[1] Provided as sensitivity test for informational purposes; not intended for Preferred Alternative selection.

better or worse) in regional pollutants, greenhouse gas emissions, and MSATs as compared to the No Build Alternative, and no local impacts are currently identified. As such, no mitigation is proposed for operational impacts with any of the build alternatives.

5.3.5 Special Waste

There are 495 Recognized Environmental Condition (REC) sites affected by each of the build alternatives with 13 REC sites within or directly adjacent to the proposed right-of-way acquisition; therefore, there are no differentiating impacts among them (Table 5-7).

5.3.6 Natural Environment

There are no differentiating impacts to the natural environment among the build alternatives (Table 5-8). An improvement in floodplain storage capacity of 12.94 acre-feet is projected for each of the build alternatives.

Table 5-7. Special Waste Impact Comparison

	Resource	Analysis Level	No Build Alternative	Build Alternative			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
7.0	Special Waste						
7.1	Recognized Environmental Condition (RECs) Sites	Quantitative	0	495 sites within Project Corridor; 13 sites within or directly adjacent to the proposed right-of-way acquisition			

Table 5-8. Natural Environment Impact Comparison

	Resource	Analysis Level	No Build Alternative	Build Alternatives			
				GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
8.0	Natural Environment						
8.1	Wildlife (number of species impacted)	Quantitative & Qualitative	0	0			
8.2	Wetlands (acres)	Quantitative	0	0			
8.3	Floodplains, volume change from existing (acre-feet)	Quantitative	0	-12.94 acre-feet, normal to 100 year flood elevation (overall flood storage capacity increased)			
8.4	Water Quality – Are Water Quality Standards Met (chlorides, metals, and TSS)? (yes/no)*						
	Salt Creek	Quantitative &/ Qualitative	Yes	Yes			
	Des Plaines River	Quantitative & Qualitative	Yes	Yes			
	South Branch of Chicago River	Quantitative & Qualitative	Yes	Yes			

* Increased concentration & loading for any build alternative would be offset with BMP and deicing practices.

5.3.7 Traffic Noise

A traffic noise analysis using the FHWA Traffic Noise Model (TNM) was performed for the No-Build and four build alternatives to evaluate the number of receptors that would be over the Noise Abatement Criteria (NAC). Two hundred eighty-eight (288) individual representative receptors were identified and evaluated (Table 5-9).

Table 5-9. Traffic Noise Impact Summary Table

	No Build Alternative	Build Alternatives			
		GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
Total Receptors	288	288	288	288	288
Receptors over the NAC	227	230	228	229	220
% of Receptors over NAC	79%	80%	79%	80%	76%

In the No-Build condition, 79 percent of the studied receptors would exceed the NAC criteria, which indicates that the majority of the Study Area is already experiencing an adverse noise effect. For the build alternatives, the number of receptors exceeding the NAC is similar, varying between -7 and +3 receptors compared to the No-Build Alternative, and is not considered to be a differentiator between the build alternatives.

As described in Section 3.4, noise impacts for the four build alternatives is similar and would result in similar size and locations of walls needed for noise mitigation.

5.4 Other Considerations

This section outlines the implementation considerations of the project, such as policy changes needed relative to tolling and pricing policy, construction staging, and funding. Refer to Section 3.14, Construction Impacts, for a comprehensive discussion on construction impacts including staging.

5.4.1 Tolling Revenues

A factor in favor of the HOT 3+ and HOT 3+ & TOLL alternatives is their ability to provide revenue for initial construction and/or maintenance and operation of the improved I-290 facility. Projections show that the HOT 3+ Alternative may generate $20 million (2014 $) annually in the year 2040, and the HOT 3+ & TOLL Alternative may generate $100 million (2014 $) annually in the year 2040. It should be noted that actual toll rates for operation have not been determined, and toll revenue would vary depending on toll rate assumptions used.

5.4.2 Tolling and Pricing Policy and Strategies

Tolling and pricing strategies (includes both a fixed-price toll or varying the price of a toll based on the time of day or traffic volume) are increasingly emerging as useful tools to finance projects, manage congestion, and facilitate the creation of public-private partnerships. However, all tolling and pricing of Federal-Aid highway system facilities (includes any facility that has previously used Federal-Aid funds) requires legal authority from the Federal government, through the US Department of Transportation.

Tolling and pricing programs and provisions are available under Title 23 of the United States Code (23 U.S.C.), Fixing America's Surface Transportation (FAST) Act, the 5-year federal transportation reauthorization act signed into law in December 2015.

- Title 23 of the U.S. Code, Sections 129 and 301: Generally prohibits the imposition of tolls on facilities that have been constructed using Federal funds.

- Over time, several exceptions have been passed through special programs and provisions, including:

  - Section 129: Allows tolls on new facilities or new lanes on interstate and non-interstate highways, bridges, and tunnels. Tolling revenue may be used for debt service, private investment, operations, maintenance, public-private partnership (P3) payments, and other Title 23 eligible uses. There are no performance requirements and audits must be submitted annually.

  - Section 166: Allows tolls on single occupant vehicles (SOVs) on high occupancy vehicle (HOV) lanes on interstate and non-interstate highways, bridges, and tunnels. Tolling revenue may be used for debt service, private investment, operations, maintenance, P3 payments, and other Title 23 eligible uses. Performance requirements include operational performance, enforcement, automatic toll collection, and tolls varied to match demand. Audits must be submitted annually.

  - Value Pricing Pilot Program: Allows value pricing on interstate and non-interstate highways, bridges, and tunnels. Tolling revenue may be used for debt service, private investment, operations, maintenance, project implementation costs, mitigation measures for low income users, and other Title 23 eligible uses. Performance requirements include monitoring effects on driver behavior, traffic volume, transit ridership, air quality, availability of funds for transportation programs. Audits must be submitted annually and a toll agreement is required. There are 15 program slots authorized by Congress and they are currently encumbered. Illinois has a program slot through a previous Illinois State Toll Highway Authority pilot project and each state can have multiple projects.

  - Interstate System Reconstruction & Rehabilitation Pilot Program: Allows tolling on interstate highways, bridges, and tunnels being reconstructed or rehabilitated. Tolling revenue may be used for debt service, private investment, operations, and maintenance. There are no performance requirements, audits must be submitted annually, and toll agreement is required. There are three program slots authorized by Congress that are conditionally reserved for the states of Virginia, Missouri and North Carolina.

Implications for Build Alternatives:

GP Lane and HOV 2+ Alternatives: since no toll lanes would be proposed under either alternative, federal lane tolling policy would not apply.

HOT 3+ Alternative: The additional new HOT 3+ lane between 25th Avenue and Austin Boulevard on I-290 would be allowed in the HOT 3+ Alternative under current legislation.

West of 25th Avenue and east of Austin Boulevard, the conversion of the inner eastbound and westbound general purpose lanes directly to HOT 3+ lanes would be allowed under current legislation if these general purpose lanes were initially converted to a HOV lane, and subsequently to a HOT lane, or through the Value Pricing Pilot Program in which Illinois has a slot, in which a direct conversion of a general purpose lane to a HOT lane could be achieved. Of the two options, it is recommended that IDOT would achieve the lane conversion by initial conversion of the inner lanes to HOV lanes and then to HOT 3+ lanes.

HOT 3+ & TOLL Alternative: The additional new HOT 3+ lane between 25th Avenue and Austin Boulevard on I-290 would be allowed in the HOT 3+ & TOLL Alternative under current legislation.

The conversion of the remaining three existing general purpose lanes in each direction to toll lanes could only occur through the Value Pricing Pilot Program under current federal legislation, or a change in federal legislation granting states additional flexibility in converting non-tolled interstate highway lanes to tolled lanes.

5.4.3 Construction Staging

Construction staging and impacts would be the same for the four build alternatives due to the alternative sharing the same design. Therefore, there are no differences in construction staging and impacts between the four build alternatives.

5.4.4 Construction Cost

A project cost estimate for the build alternatives was developed based on 2015 unit costs escalated to a Year of Expenditure (YOE). All four build alternatives share the same geometric design and construction requirements, and therefore would have no appreciable differences in construction costs (Table 5-10).

The construction costs would vary based on future design refinements completed during the final phase of the project development. The procedure for cost estimating is discussed in Appendix L Cost Estimating Procedure for Roadway System Alternatives.

Table 5-10. Estimate of Implementation Cost Summary for Build Alternatives

Major Cost Category	Estimated Cost (YOE $)			
	GP Lane	HOV 2+	HOT 3+	HOT 3+ & TOLL
Construction	$1,748 million	$1,748 million	$1,756 million	$1,756 million
Environmental Mitigation	$58 million	$58 million	$58 million	$58 million
Construction Contingency*	$349 million	$349 million	$351 million	$351 million
Design and Engineering Services	$327 million	$327 million	$329 million	$329 million
Design and Engineering Services Contingency	$65 million	$65 million	$66 million	$66 million
Right-of-Way (Permanent)	$6 million	$6 million	$6 million	$6 million
Right-of-Way Contingency	$5 million	$5 million	$5 million	$5 million
Total	$2,558 million	$2,558 million	$2,571 million	$2,571 million

* Includes contingencies for construction, utilities, inflation, and unallocated risks.

All alternatives would incorporate an Intelligent Transportation System (ITS) system to monitor and manage traffic in the corridor and are assumed to be the same across each of the alternatives. The ITS system is proposed to be a flexible platform that would support, ATM signs, dynamic message signs (DMS), and standard traffic signs, as well as toll rate signs, toll readers. The incremental cost for adding tolling infrastructure on top of the ITS system is estimated at under $13 million (YOE$) for the HOT 3+ and HOT 3+ & TOLL alternatives. This cost represents a very small percentage of the overall construction cost and is not considered to be a differentiator.

5.5 Preferred Alternative

This section summarizes the rationale for identifying the HOT 3+ Alternative as the Preferred Alternative.

5.5.1 Achievement of Stakeholder Goals and Objectives

For this project, IDOT implemented its Context Sensitive Solutions (CSS) process for planning and design of major projects. At the outset of the study, through a workshop process with the CAG, goals were identified and a problem statement developed for the project. The initial project goals are listed below, followed by a qualitative description of how these initial goals and problem statement needs were achieved by the build alternatives.

Goal: Improve Mobility (Capacity and Efficiency)

- All four build alternatives add an additional lane in each direction between Austin Boulevard and Mannheim Road, reducing congestion and improving travel times along the corridor.

- The main difference among the four build alternatives is how the additional capacity is "managed".

  - The GP Lane Alternative does not manage the additional capacity as well as the other build alternatives, but provides additional truck capacity, although I-290 has relatively low truck usage (5 percent - 6 percent of total vehicles are truck) and improved Study Area arterial performance.

  - The HOV 2+ Alternative begins to manage the fourth lane in each direction, restricting its usage to carpools with two or more occupants and transit buses, providing improved I-290 mainline and managed lane speeds, and improved Study Area arterial performance.

  - The HOT 3+ Alternative manages the fourth lane in each direction by allowing carpools with three or more occupants and transit buses to use the lane for free, and using dynamic pricing to allow other automobiles to use the HOT 3+ lane through tolling. The toll rates would be adjusted based on demand, and would ensure average travel speeds of 45 mph or higher, providing improved travel time reliability, and improved Study Area arterial performance.

  - The HOT 3+ & Toll Alternative would toll all of the lanes on I-290, allowing carpools with three or more occupants and transit buses to use the HOT 3+ lane for free. Regionally, all four build alternative lessen the total time spent traveling on the roadway network, although the HOT 3+ & Toll Alternatives increases Study Area arterial travel times due to diversion of traffic off of I-290 because of tolling all of the lanes.

- All four build alternatives include a two mile east-west shared-use path that connects the Illinois Prairie Path to Columbus Park in Chicago. This connection does not currently exist, and would improve east-west non-motorized mobility in the Project Corridor and beyond.

Goal: Improve Safety to Motorists, Transit Users, Bicyclists, and Pedestrians

- All four build alternative improve overall safety.

- The elimination of the lane drop (westbound at Austin Boulevard and eastbound at 25th Avenue) would reduce congestion and weaving maneuvers that contribute to rear end and side-swipe crashes at those locations.

- The left-hand ramps at the Austin Boulevard and Harlem Avenue interchanges are relocated to right-hand ramps to help reduce the highest crash rates in the Project Corridor. Compared to the existing left-hand ramps, right-hand ramps are consistent with driver expectations, and would improve weaving and sight distance.

- Addition of a mainline auxiliary lane in each direction from 25th Avenue to 1st Avenue to provide improved weaving and safety performance between the ramp and mainline traffic in this section.

- The interchanges in the Reconstruction Section would be re-designed to safer, modern geometric design standards, including improved truck turning radii, improved vehicle storage, as well as modern pedestrian countdown signals, and pedestrian refuge islands in between the ramps at the Austin Boulevard and Harlem Avenue interchanges.

- All four build alternatives include the provision of an east-west multi-use path (off-road) that is adjacent to I-290 to improve bicycle and pedestrian safety.

- All four build alternatives include improved, wider sidewalks and pedestrian plazas for transit users at CTA stations.

Goal: Coordinate with Planned Land Uses and Area Developments

- The definition of the four build alternatives was closely coordinated with the Project Corridor municipalities, including accommodating potential future development and addressing access issues to businesses and residential areas.

- The potential for "caps" or decking over I-290, if desired by municipalities to provide additional recreational or commercial activities, can be accommodated where the proposed roadway profile and drainage allows, and subject to cost participation/maintenance, in the Reconstruction Section of the four build alternatives. The Village of Oak Park has coordinated with IDOT regarding expanded decking opportunities at Oak Park Avenue, East Avenue, Ridgeland Avenue and Lombard Avenue. Concepts have been developed at these locations that accommodate the proposed I-290 profile; the Department will continue to work with the Village during Phase II regarding design and funding opportunities.

- Close coordination also occurred with CTA (including the CTA Blue Line Forest Park Branch Feasibility/Vision Study) and Pace, who operate transit services in the Project Corridor, and the Illinois Tollway, whose I-88 Reagan Memorial Tollway ties directly into I-290.

Goal: Facilitate Economic Growth along the Route

- All four build alternatives would result in improved travel times on I-290 and improved interchange operations with reduced vehicle delay. This would result in improved accessibility to/from the Project Corridor, supporting economic growth.

- A full interchange at 25th Avenue is included in the four build alternatives to provide increased accessibility to this north-south corridor, supporting economic growth.

- A new interchange at 1st Avenue with significantly improved operations and reduced congestion is included in the four build alternatives that will provide increased accessibility to this north-south corridor and local economic zones, supporting economic growth.

- The four alternatives have the potential to provide between $1.6 and $2.8 billion in productivity savings as drivers spend less time traversing the Project Corridor.

Goal: Minimize Impacts to the Surrounding Environment

- The I-290 improvements for the four build alternatives are within the existing I-290 right-of-way, with the exception of 2.79 acres located near five interchanges proposed for reconstruction, and a 2.65 acres for a 10-foot wide strip of right-of-way from the CTA Blue Line.

- No displacements would result from the build alternatives.

- Environmental justice to communities adjacent the Project Corridor is addressed by:

  - Access and travel time improvements for the four build alternatives;

  - Managed lanes or express bus on shoulder which would offer free or inexpensive and reliable travel along the Corridor either by riding in a bus in a managed lane or shoulder, or by carpooling;

  - Forecast arterial traffic shows no disproportionate impacts to EJ populations for the Preferred Alternative; the HOT 3+ & TOLL Alternative has some potential impacts, increasing arterial traffic the greatest through EJ communities;

  - Public transit and pedestrian/bicycle improvements would provide benefits to both EJ and non-EJ populations;

  - Other environmental factors show no disproportionate impacts to EJ populations; and

  - It is also noted that serving EJ populations with better connectivity, or access, to jobs and essential services, is a primary goal of USDOT's "Ladders of Opportunity" initiative, which provides research and funding for projects that achieve greater connectivity for transportation system users. This initiative defines connectivity, or accessibility, as "the degree to which the transportation system provides access to essential services and other destinations."[3] The public

[3] USDOT "Ladders of Opportunity" website, https://www.transportation.gov/opportunity (accessed November 15, 2016)

transit and pedestrian/bicycle improvements included in this project would support this initiative.

- Air quality: The differences in air quality measures for the build alternatives would be minor, and indicate minor inputs in comparison to the No Build Alternative and are not distinguishing differences.

- Noise: The differences in affected noise receptors among the four build alternatives would be minor; a substantial length of the project is eligible for noise barriers as mitigation under the four build alternatives. Of the sixty-three (63) eligible noise barriers, forty-six (46) were favored by "benefitted receptor" stakeholders in the viewpoints solicitation process and are likely to be built, pending future coordination.

- No wetland impacts would result from the four build alternatives.

- Minor floodplain improvements would be provided for all four build alternatives.

- No wildlife impacts would result from the four build alternatives.

- There is a Section 4(f) *de minimis* use at three locations in Forest Park. There is a Section 4(f) temporary occupancy exception at Columbus Park in Chicago.

- No direct physical impacts to Section 106 properties from the four build alternatives. IDOT is exploring potential enhancements to the National Historic Landmark, Columbus Park, in coordination with the City of Chicago and the SHPO.

<u>Goal: Address I-290 Infrastructure Condition</u>

- All four build alternatives include full reconstruction from west of Mannheim Road to east of Cicero Avenue, which was originally constructed in the 1950s. The proposed improvements include:

  - Reconstructed pavement;

  - Reconstructed bridges and structures including pedestrian bridges;

  - Additional drainage capacity to accommodate 100-year storm events (instead of 10-year);

  - New efficient lighting; and

  - New signage, including ITS features.

Goal: Improve Community Cohesion

- All four build alternatives would improve community cohesion through several features:
  - Wider sidewalks on all cross bridges in the Reconstruction Section;
  - ADA accessibly on all crossroad sidewalks in the Reconstruction Section;
  - The existing pedestrian bridges at Home Avenue and Lavergne Avenue would be wider and ADA accessible;
  - A new east-west shared-use path adjacent to I-290 that would provide an improved connection from the Prairie Path's eastern terminus (including improvements at Maybrook Drive) to Columbus Park;
  - Maintaining "center" ramp terminals at Austin Boulevard and Harlem Avenue interchanges;
  - The potential for "caps" or decking over I-290, if desired by municipalities to provide additional recreational or commercial activities, can be accommodated in the Reconstruction Section of the four build alternatives; and
  - Opportunities for aesthetic enhancements and features.
- Improvements that address community cohesion also support the USDOT "Ladders of Opportunity" initiative, providing better access across I-290 and to nearby public transit stops.

Goal: Improved Public Transit Access

- Wider sidewalks are proposed on all cross bridges in the Reconstruction Section serving CTA Blue Line stations.
- Pedestrian plaza areas at CTA Blue Line station entrances would provide space for bicycle parking and bus transfer areas, including bus passenger shelters.
- Relocation of bus stops closer to CTA transit stations.
- A new bus pad and shelter area at 1st Avenue and VanBuren Street, near the Maywood Workforce Center.
- Additional and improved crosswalks are provided at the Austin Boulevard, Harlem Avenue and Cicero Avenue interchanges to improve access to either side of the bridge for transit passengers.
- CTA Blue Line stations in the Reconstruction Section would also be ADA accessible.

Goal: Improve Public Transit Options, Including Connectivity and Reverse Commute

- The alternatives all include additional east-west express bus service on I-290 either on a shoulder or in a managed lane.
- All four build alternatives are designed to accommodate a potential future HCT (Blue Line or BRT) extension from the existing Forest Park Blue Line station west to Mannheim Road.
- All four build alternatives include enhanced feeder bus service to proposed new HCT extension stations.

Goal: Improve Public Transit Infrastructure Condition

- The CTA Blue Line Forest Park Branch Feasibility/Vision Study, being conducted in close coordination with the I-290 Study, is recommending full reconstruction of the Forest Park Branch to bring its condition to a state of good repair.

Goal: Sustainable Solutions

The FHWA Infrastructure Voluntary Evaluation Sustainability Tool (INVEST) was used to measure the sustainability of the I-290 improvements. Based on a preliminary evaluation of the I-290 Study, it currently achieves a designation of "Bronze" based on current available information and based on the INVEST 1.2 criteria. For the modules used in the INVEST scoring, there is no apparent measure where any of the build alternatives would have more or less difficulty in achieving sustainability; therefore, there is no differentiation between these build alternatives regarding sustainability. For the complete INVEST evaluation of the I-290 Study, please refer to Appendix M.

5.5.2 Quantitative Comparison of Alternatives

With all four build alternatives utilizing the same design, the primary variables between the alternatives are related to the varying levels demand management, ranging from little to no management (GP Lane) to high levels of management (HOT 3+ & TOLL). Travel performance of the build alternatives includes the majority of the measurable differentiators; however, differentiators in social/economic impacts, environmental impacts, costs and revenues, where applicable, were considered in a quantitative comparison of alternatives as an aid in selecting a Preferred Alternative. Both rank (ordinal) scoring and ratio scoring were used as explained below.

Rank (Ordinal) and Ratio Scoring: To objectively evaluate and compare the performance and impacts of four build alternatives the Round 3 Travel performance results for the four build alternatives were scored two ways:

- Rank (Ordinal) Score: Sixteen performance and impact measures were given a numerical rank of 1 to 4 by alternative, with 1 being the worst and 4 being the best for each of the criteria, and with a maximum possible 64 points for each alternative. This was the same scoring approach as was used in Round 2.

- Ratio Score: The same sixteen measures were given a proportional score based on a scale of 0 to 100 by alternative, with 0 being the worst and 100 being the best for each of the criteria, and with a maximum 1,600 possible points for each alternative. Each criterion was scored between 0 and 100 in proportion to the worst performer (assigned 0) and best performer (assigned 100). For example, for the Regional VMT criterion, the worst performance was by the GP Lane Alternative at 151,380 miles (assigned a score of 0) and the best performance was by the HOT 3+ & TOLL Alternative at 33,774 miles (assigned a score of 100). For the purposes of project scoring, the HOT 3+ Alternative, with a Regional VMT performance of 52,211 miles, was assigned a proportional score of 84 for that criterion. The total score of the alternative is the sum of the individual criteria scores.

Environmental Factors: The differences in air quality measures for the build alternatives are generally under one percent, better or worse, than the No Build Alternative and are not distinguishing differences. The differences in affected noise receptors among build alternatives are slightly different, at 220 to 230 receptors exceeding the NAC criteria. It is noted that a substantial length of the project would be eligible for noise barriers as mitigation under the four build alternatives, and that "benefitted receptor" stakeholders participated in a viewpoints solicitation process favoring the building of noise barriers in forty-six (46) of sixty-three (63) potential locations. With the identical project footprints for the four build alternatives, there are virtually no differences between natural resource impacts. 0.031 acres of *de minimis* Section 4(f) direct impacts are anticipated for any of the build alternatives. Potential effects to Section 106 properties are anticipated to be minor, undifferentiated between the build alternatives, and generally limited to indirect impacts, which will be reported in the FEIS. Due to the lack of differentiation in environmental impacts for air quality, natural resources, park and recreation and historic resources among the build alternatives and in comparison to the 2040 No Build Alternative, the number of noise receptors was the only environmental factor included in the scoring.

The Chicago Park District has informally concurred with pedestrian access improvements, berm and tree planting at Columbus Park. It is intended as an enhancement activity planned cooperatively by IDOT and the CPD, not as a Section 4(f) impact but to be processed by FHWA as a temporary occupancy. Likewise, the SHPO/IHPA has informally concurred that any such improvements to the park, as a national historic landmark, would not result in an adverse effect finding.

Social/Economic Factors: For the purposes of scoring, travel diversion to local roads, average change in travel time to job for EJ and Non-EJ Communities, productivity, and construction related jobs (all measured as changes from the 2040 No Build Alternative) were used as social/economic criteria. As additional context, the HOT 3+ Alternative offers a mixture of travel benefits for the EJ populations. The HOT 3+ Alternative would retain the ability for low-income populations (i.e. EJ populations) to access all lanes without paying a toll. The GP Lane and HOV 2+ alternatives also offer this benefit, however with some differences. Without a managed lane, the GP Lane does not provide an opportunity for a reliable trip time on the expressway. Although the HOV 2+ and

HOT 3+ & TOLL alternatives offer a reliable trip option for EJ communities, they both result in increased traffic on the local arterials. The HOT 3+ & TOLL may discourage its use by a portion of the low income communities without some form of tolling relief for low-income populations. The HOT 3+ & TOLL represents tolling all lanes, so the only free option on I-290 for low-income trips is to use a 3+ person carpool. The tolling of all lanes on I-290 could shift some low-income travelers to use other (non-tolled) routes, including parallel arterials, or 3+ carpools.

Travel Performance: The HOT 3 + Alternative ranks in the top two for performance for the nine travel measures. The flexibility to manage/control the use of the added capacity, without over managing the general purpose lanes results in the best balance of regional and local travel performance related to expressway, arterial, and transit travel.

The HOT 3+ & TOLL Alternative offers the best expressway performance, but at the expense of diverting traffic to the local arterials due to diversions by motorists avoiding tolls on I-290. This alternative also results in the lowest safety performance, primarily due to its high diversion of traffic from the expressway to arterial streets, which generally have higher crash rates than expressways. This alternative limits toll-free access for EJ communities to persons in 3+ carpools.

The HOV 2+ Alternative would offer similar benefits as the HOT 3+, but to a lesser degree overall. This is due to its inability to fully utilize the capacity of HOV 2+ lane (only 2+ carpoolers can use it), and does not offer a reliable trip time option to non-HOV users. This alternative also results in the fewest public transit trips among the build alternatives due to the attractiveness of the HOV 2+ lanes to users who might otherwise use transit. HOV 2+ scores in the bottom two for six of the nine measures.

The GP Lane Alternative would offer the greatest local arterial improvement, but at the expense of expressway and regional travel, and job accessibility. This alternative is lowest performer for four measures and is the worst or second worst performer for all but two measures. Lacking a managed lane, the GP Lane also does not offer a reliable travel time option on the expressway.

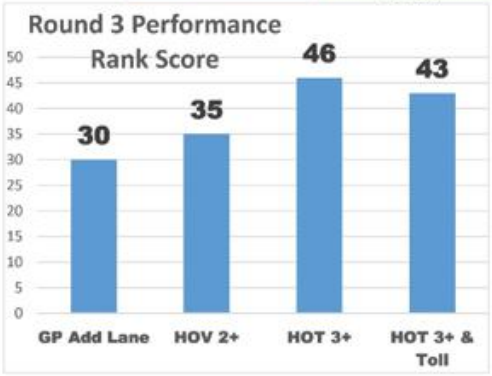
Of the four build alternatives, the HOT 3+ Alternative demonstrates the best overall travel performance with best or second-best performance scores for all performance criteria (Table 5-11).

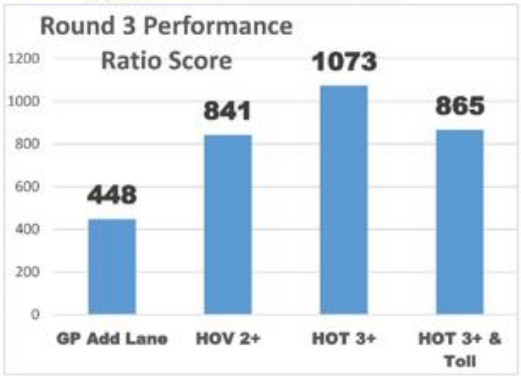
The HOT 3+ Alternative scores highest in both rank and ratio scoring, with 46 out of 64 possible points by rank (ordinal) scoring and 1,073 out of 1,600 possible points by ratio scoring.

Table 5-11. Rank and Ratio Scoring Comparison of Build Alternatives

#	Round 3 DEIS Performance Measure	Unit	No-Build	GP Add Lane	HOV 2+	HOT 3+	HOT 3+ & Toll
1.1	Regional vehicle miles traveled (VMT)	miles	201,187,710	151,380	72,492	52,211	33,774
1.2	Regional vehicle hours traveled (VHT)	hours	8,067,709	-9,840	-9,773	-16,161	-17,300
1.3	I-290 Travel Time (GP Lane / Managed Lane)		30.7/NA	21.2/NA	23.2/13.7	23/13.5	14.8/12.6
1.4	Study Area Arterial VMT	miles	4,294,011	-24,560	6,944	-8,853	147,834
1.5	Study Area Arterial VHT	hours	255,282	-1,996	-967	-1,643	6,778
1.6	Person Throughput	persons	459,122	25,247	31,871	28,604	25,294
1.7	Job Accessibility	# of jobs	5,151,539	105,053	364,948	397,660	326,499
1.8	Overall Safety (crashes per million person miles per year)	rate	0.287	-4.86%	-6.44%	-6.21%	-4.65%
1.9	East-West Transit Trips	# of trips	76,950	4,375	2,150	4,425	8,425
2.01	Traffic Diversion to Local Roads	VMT	4,294,011	-24,560	6,944	-8,853	147,834
2.02	Average Change in travel time to job destinations, EJ Communities	Min	-	-1 to -3	0 to -9	-2 to -10	-2 to -9
2.03	Average Change in travel time to job destinations, Non-EJ Communities		-	-2 to -2	-2 to -5	-2 to -5	-4 to -6
2.08	Construction related jobs created	#	-	18,904	18,904	18,980	18,980
2.09	Productivity (based on travel time savings)	$B	-	$ 1.6	$ 1.6	$ 2.7	$ 2.8
6.1	Noise Receptors exceeding noise abatement criteria (NAC)		227	230	228	229	220
9.1	Round 3 Construction Cost Difference ($ Millions)		$ -	$ -	$ -	$ 13	$ 13
		Rank Score (1 to 4)		30	35	**46**	43
		Ratio Score (0 to 100)		448	841	**1073**	865

Table Key: Highest Score | 2nd Highest Score | 2nd Lowest Score | Lowest Score





5.5.3 Implementation Flexibility

A Congestion Pricing Pilot Program was established by the U.S. Congress in 1991. In 1998 it was subsequently renamed the Value Pricing Pilot Program (VPPP) under Section 1216 (a) of TEA-21, and continued under subsequent Federal Surface Transportation Bills including the current FAST Act. The VPPP is intended as a mechanism to address congestion through application of congestion pricing strategies and to report on the magnitude of the impact of such strategies on driver behavior, traffic volumes, transit ridership, air quality and availability of funds for transportation programs. There are 12 State-led programs and 2 city-led programs participating in the VPPP, including the state of Illinois. As part of the VPPP, the Illinois Department of

Transportation has the ability to request authority to implement tolling on the inside lane (including a conversion of a general purpose lane in each direction in the eastern portion of the project).

5.5.4 Refinements to HOT 3+ Included in the Preferred Alternative

There are a small number of refinements to the HOT 3+ Alternative that are included in the Preferred Alternative. These include the following:

- A change from five designated managed lane access points, permitting drivers to move to and from the general purpose lanes to the managed lanes at restricted points at 25th Avenue, 17th Avenue, 1st Avenue, Central Avenue, and Cicero Avenue during the Round 3 evaluations - to a "continuous access" configuration, allowing drivers to cross into or out of the managed lanes at any point. This change created a slight change in the way traffic utilized the traffic lanes, and created a change of one additional affected receptor in the traffic noise analysis between the original HOT 3+ Alternative and the refined HOT 3+ Alternative (i.e., Preferred Alternative) (Section 5.2.7). This change did not affect the evaluation of any other environmental impact other than noise.

- Elimination of two flyover ramps on I-290 (which would have been located on existing public right-of-way) that were proposed to go over I-88 at the west end of the proposed project. These ramps were found to have little immediate benefit and were omitted; however, they could be installed in the future (and within existing public right-of-way).

- The noise impact analysis for the 288 representative noise receptors was updated for the Preferred Alternative. Of the 288 representative receptor locations, 228 (79 percent of these locations) would experience noise impacts and were then evaluated for abatement. As the physical constraints of the urbanized Study Area would prevent construction of earthen noise abatement berms in most locations, the most feasible approach to abating noise impacts in these areas would be to construct a noise barrier wall. The noise barrier study areas for the Preferred Alternative were the same areas that would have been considered for abatement for the four build alternatives, as shown in the Section 3.0 Map Set.

- The recommended locations and heights of noise barriers associated with the Preferred Alternative are provided in Appendix F. Noise barriers are determined "likely to be constructed" where they are supported by the public. Specifically, stakeholders determined to be benefited by these barriers have the opportunity to vote if they want the barrier to be constructed, in a process called "viewpoints solicitation." Votes are tabulated for each barrier location; barriers receiving at least 50 percent of votes indicating support for construction would be considered "barriers likely to be constructed," and reported as such in this EIS. Barriers that do not receive 50 percent of votes indicating support for construction would not be constructed, in accordance with IDOT policy. Benefitted receptor stakeholders favored the construction of forty-six (46) of sixty-three (63) eligible noise barriers

which would benefit 4,027 receptors. The results of the viewpoints solicitation voting are also included in Appendix F. It is noted that the results of the viewpoints solicitation are current for this DEIS, and that future local coordination may result in re-opening the viewpoints solicitation process where warranted; for example, by a change in who the affected stakeholders are, a change in the affected stakeholders' opinions, or a change in noise wall technology.

It is noted that the above refinements are compatible with the other three build alternatives (except the change in limited access points which would not apply to the GP Lane Alternative) and that the differences for comparison of alternatives are small to nonexistent and would not materially affect the identification of the Preferred Alternative.

The cost estimate for the Preferred Alternative was reviewed and adjusted by FHWA during a formal Cost Estimate Review (CER) held in September 2015, and is currently estimated at $2,630 million based on 2015 unit costs escalated to a Year of Expenditure (YOE).

5.5.5 Conclusion

In considering the key factors identified with respect to meeting project goals and objectives, travel performance, and social/economic and environmental impacts, the HOT 3+ Alternative provides the best balance of benefits, avoids social/economic and environmental impacts while providing travel benefits to environmental justice communities. The quantitative comparison of alternatives in Section 5.4.2 shows that the HOT 3+ Alternative scores higher than the other three build alternatives when measured by either rank (ordinal) or ratio scoring. Since the social and economic and environmental factors are indistinguishable among the build alternatives for most measures, travel performance becomes a principal factor in selecting a Preferred Alternative. The HOT 3+ Alternative demonstrates superior and balanced transportation performance when compared against the other alternative. It does so by providing a range travel options providing improved accessibility for all users, and by utilizing a managed lane strategy that optimizes throughput while providing a reliable trip time. With the potential contribution from anticipated toll receipts from the HOT lanes, the HOT 3+ Alternative also provides additional flexibility in funding to the initial construction cost as well as ongoing operation and maintenance. Based on these factors, the HOT 3+ Alternative is selected as the Preferred Alternative.

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