From the point of origin used in the analysis where I-80 enters the Project Corridor to the southeast, the Tollroad/Freeway Alternative improved travel to the north because it would provide a more direct route to the I-355/I-290 beltway for northbound I-57 and westbound I-80 travel. Travel time improvements of over 25 percent associated with the Tollroad/Freeway Alternative extended from the northern portion of the Project Corridor well into DuPage County, while improvements of 12 to 25 percent extend north into the northwest Cook and Lake Counties. In comparison, travel time improvements of the Lemont Bypass were considerably more compact. The 12 to 25 percent range extended only into central and western DuPage County. The areas of improved travel time exceeding 25 percent or greater extended only to the lower southeast portion of DuPage and the area around the I-55 corridor. Travel time improvements associated with the Enhanced Arterial were limited to the 12 to 25 percent range and extend only to the lower southeast portion of DuPage and the area around the I-55 corridor.

From the point of origin where I-294 and I-55 intersect to the northeast, the Tollroad/Freeway Alternative improved travel time within and to the south of the Project Corridor because it would provide a direct route connecting I-55 and I-80. Travel time improvements of over 25 percent for the Tollroad/Freeway Alternative extended well into the Project Corridor along the proposed alignment and south to Joliet, while improvements of 12 to 25 percent extend southeast to the northern fringe of the Kankakee metropolitan area and southwest to the Joliet Arsenal. The Joliet Arsenal is an 820 hectare (2,025 acre) former arsenal site being redeveloped for multiple use. Land use incorporated into the site includes 324 hectares (800 acres) of commercial/industrial development and 480 hectares (1,185 acres) for a rail intermodal facility, both significant regional traffic generators.

In comparison, travel time improvements of the Lemont Bypass Alternative from the point where I-294 and I-55 enter the Project Corridor were considerably more compact. Travel time improvements over 25 percent were confined to the north central portion of the alignment while the area of 12 to 25 percent improvement was localized to the alignment and along a line to the south. Travel time improvements associated with the Enhanced Arterial Alternative were limited to the 12 to 25 percent range in the vicinity of the southern terminus of the alignment.

As for the point of origin where I-80 and I-55 intersect to the southwest, the Tollroad/Freeway Alternative improved travel time to northern Will County because it would provide an opportunity to bypass congestion on IL Route 53. Travel time improvements of 12 to 25 percent for the Tollroad/Freeway Alternative extended along the Will/DuPage County line. Travel time improvement within the 12.5 to 25 percent range were considerably more localized for the Lemont Bypass and Enhanced Arterial Alternatives.

To conclude, the Tollroad/Freeway Alternative improved regional travel time up to 2.5 times more TAZ's than the Lemont Bypass and 23 times more TAZ's than the Enhanced Arterial Alternative. The Tollroad/Freeway Alternative optimized regional mobility by providing a north-south route through the Project Corridor that is consistent in design and function to I-55, I-355 and I-80, the interstate facilities for which it connects.

System Continuity

While additional capacity for north-south travel is needed to reduce travel times and improve regional mobility, adding capacity in a form that integrates into the existing highway network is also needed. This includes providing a highway facility that has continuity with, or matches, the functional design of the system for which it connects (AASTHO, 1990).

Maintaining continuity in facility type is an important consideration to improving regional mobility by optimizing safety and carrying capacity. Safety and carrying capacity are optimized when two connecting roadways are of the same type and provide continuity in travel speed, access control, roadway width and lane number. Connecting dissimilar roadway types, such as an arterial or lower-level facility to a freeway, forces a change in the driving condition and reduces safety and carrying capacity.

The Tollroad/Freeway Alternative optimized safety and carrying capacity due to the efficiencies of providing a continuous facility of comparable design and function to I-55, I-355 and I-80, the interstate facilities for which it connects.

The Lemont Bypass Alternative improved safety and carrying due to the efficiencies of providing a continuous arterial for north-south travel within the Project Corridor. However, the Alternative transitions from a tollroad/freeway to a principal arterial at 127th Street. Efficiencies were lost due to a reduction in operating speed as well as continuity in design and function with I-80, the interstate for which the Alternative connects to at the southern terminus.

The Enhanced Arterial Alternative would provide principal arterials throughout its alignment. These arterials would be subject to the same continuity deficiencies associated with the Lemont Bypass Alternative, but to a greater magnitude. Also, the Enhanced Arterial Alternative would place regional trips on local arterials. This would add to congestion and reduce safety along the arterial alignments. Additionally, the utility of this Alternative for regional trips passing through the Project Corridor would be constrained by reduced continuity in facility type between the principal arterials of the Alternative and the interstate facilities of I-355, I-55 and I-80, the interstate facilities for which it connects.

3.4.4 Address Local System Deficiencies

Addressing Local System Deficiencies, the final of the four principal needs for which the Alternatives were evaluated, addressed the need to improve local roadway deficiencies within the Project Corridor.

Local Roadway System Deficiencies

Local roadway deficiencies include the lack of a direct roadway for north-south travel, an inadequate number of bridge crossings over the Des Plaines River and a roadway network comprised of an outmoded functional mix of roadway types. These deficiencies constrained local mobility. For this reason, local mobility was the overall criteria used for ranking the Alternatives.

The performance of Alternatives in improving local mobility was quantified using safety and travel time measures. Safety assessed crash data provided by both the Illinois De-

partment of Transportation (IDOT) and the Illinois State Toll Highway Authority (ISTHA) to determine the safety impacts of each Alternative.

Table 3-7
Percent Change in Crashes within the Project Corridor over No-Action

Alternative	Percent Increase
Tollroad/Freeway	-1.25%
Lemont Bypass	-0.25%
Enhanced Arterial	+0.04%

The safety analysis used average daily traffic (ADT) along the major roadways, taking into account the mileage that each ADT covered to derive VMTs for each Alternative. The VMTs, which were computed by CATS, were then multiplied by standard crash rates by roadway type developed by IDOT and ISTHA. Table 3-7 presents 2020 percent change in crashes by Alternative. The crash analysis ranked the Tollroad/Freeway Alternative the safest of the Build Alternatives, with a percent reduction in crashes five times greater than the Lemont Bypass Alternative and 31 times greater than the Enhanced Arterial Alternative.

Table 3-8
Year 2020 Total Travel Time within Project Corridor during AM Peak

Alternative	Total Travel Time (hours)	Percent Difference
No-Action	10,253	--
Tollroad/Freeway	8,956	-13%
Lemont Bypass	9,214	-10%
Enhanced Arterial	9,561	-7%

Build and No-Action Travel Time Analyses

A travel time analysis was performed on the three Build and No-Action Alternatives. The analysis determined which Alternative performed best in terms of moving vehicles within the Project Corridor in the shortest amount of time. Travel time was quantified by summing CATS year 2020 travel times between all TAZ's within the Project Corridor. Table 3-8 summarizes total travel time during the AM peak throughout the Project Corridor along with the percent difference over the No-Action Alternative.

The travel time analysis ranked, the Tollroad/Freeway Alternative as having the lowest travel time throughout the Project Corridor, followed by the Lemont Bypass, Enhanced Arterial and the No-Action Alternatives.

Finally, a travel time cost analysis was run to determine which Alternative would have the greatest cost savings in terms of productivity. An average person time value of $13.76/hour was used as specified by the Bureau of Labor Statistics (August 2000) as the average hourly rate for a private employee. Table 3-9 presents the cost and savings for each Build Alternative compared with the No-Action Alternative (in

Table 3-9
Year 2020 Productivity Cost Savings within Project Corridor During AM Peak

Alternative	Travel Time	Cost (Daily)	Savings (Daily)	Savings (Yearly)
No-Action	10,253	$141,000	--	--
Tollroad/Freeway	8,956	$123,200	$17,800	$4,461,700
Lemont Bypass	9,214	$126,800	$14,300	$3,574,200
Enhanced Arterial	9,561	$131,600	$9,500	$2,380,500

year 2000 dollars). The cost analysis found the Tollroad/Freeway Alternative captured the greatest travel time cost savings at $4.4 million annually.

To conclude, the three separate analyses ranked the Tollroad/Freeway Alternative as the best Alternative for improving local mobility. The Tollroad/Freeway Alternative showed the greatest reduction in travel time (13%) and travel cost savings at $4.4 million over the No-Action Alternative. The Tollroad/Freeway Alternative also had the fewest crashes of the three Build Alternatives.

The Tollroad/Freeway Alternative achieved the greatest benefit to local mobility due to efficiencies gained by providing a direct route for north-south travel, and providing a facility that would remove longer distance regional traffic from local arterials and place it on a facility designed to accommodate it. The Tollroad/Freeway Alternative would also provide an additional bridge crossing over the Des Plaines River and would reduce traffic at the State Street/Lemont Road, 135th Street and IL Route 83 bridges over the Des Plaines River.

The Lemont Bypass Alternative improved local mobility due to the efficiencies of providing a continuous arterial for north-south travel and an additional bridge within the Project Corridor. However, efficiencies were lost because the Lemont Bypass Alternative would place regional trips on local arterials and increase congestion and reduce safety on the local roadway network.

The Enhanced Arterial Alternative improved local travel times by improving existing arterials and maximizing the use of three existing bridge crossings within the Project Corridor over the Des Plaines River. However, efficiencies were lost along the alignment due to lane reductions required to avoid impacts to existing schools, parks and cemeteries, as well as the need for numerous signalized and unsignalized intersections at street crossings due to the lack of access control. Efficiencies were further lost because the Alternative does not upgrade existing bridges nor does it provide a new bridge over the Des Plaines River.

3.5 Conclusions

The Alternatives analysis evaluated the performance of the No-Action and Build Alternatives in meeting the Purpose and Need for a Transportation System Improvement. Performance measures used included travel times, crash data and land use and transportation plan consistency.

The performance analysis ranked the Tollroad/Freeway as the Alternative that best met the Purpose and Need

Table 3-10
Alternative Analysis Summary Findings
(Scale 1-3: 1 = Best, 3=Worst)

Project Need/Alternative	Improve Residential Center/Job Center Access	Improve Regional Mobility	Achieve Planning Goals	Correct System Deficiencies
Tollroad/Freeway Alternative	1	1	1	1
Lemont Bypass Alternative	2	2	2	2
Enhanced Arterial Alternative	3	3	3	3

for a Transportation System Improvement. Table 3-10 summarizes the performance analysis ranking of Alternatives. Compared to the other Alternatives, the Tollroad/Freeway Alternative generated the greatest reductions in residential center to job center and regional travel times. It also generated the greatest improvement to local mobility. The Tollroad/Freeway Alternative also ranked as most consistent with the land use and transportation plans of local, county and regional government.

As a result, the Tollroad/Freeway Alternative is recommended as the Preferred Alternative and evaluated in detail as to environmental consequences along with the No-Action Alternative. The Enhanced Arterial, Lemont Bypass, Expressway and Mass Transit Alternatives did not satisfy the Purpose and Need and therefore were eliminated from further study.