
Illiana Corridor Expressway Benefit-Cost Analysis

Updated December 20, 2014

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EXECUTIVE SUMMARY

A benefit-cost analysis is conducted of the proposed Illiana Corridor Expressway Project for the Chicago region. A matrix summarizing the analysis is provided.

Current Status/ Baseline & Problem to be Addressed	Change to Baseline / Alternatives	Population Affected by Impacts	Economic Benefits	Economic Costs	Benefit-Cost Ratio (Discount Rate)
Congestion, travel delays on I-80/94, U.S. 30 & connecting arterials in Illinois & Indiana	Build a new 4- lane 47-mile E-W divided expressway	Heavy truck/ light vehicle traffic, local residents	Monetized value: reduced travel time, accidents (deaths/ injuries/property damage), truck travel distance/noise, some emissions; residual value	Monetized value: design /construction, upkeep/ operations; losses to crop production, ecolog- ical diversity; increased auto travel distance/ noise, some emissions	1.31 (3%) 0.95 (5%) 0.69 (7%)

INTRODUCTION

The Chicago metropolitan area is the crossroads for both rail and truck freight traffic in the United States. The Chicago Metropolitan Area for Planning (CMAP) long-range transportation plan (LRTP), GO TO 2040, estimates that about \$570 billion in goods move by truck annually within the region (1). More than 500,000 daily truck movements carry about 1.5 million tons which is expected to increase to more than 2.3 million tons by 2020. A significant portion of this consists of through traffic. In recent years the Texas Transportation Institute has ranked Chicago near the top in terms of highest travel delays in the country due to urban road congestion (2). The historic 1909 Daniel Burnham plan for Chicago sought to address travel congestion in part through a series of ring roads that would allow traffic to bypass the city. The Illiana Corridor Expressway has been studied in regional plans for many years to relieve congestion on route I-80/94 and enhance economic growth/development in the Chicago south suburban area.

The Illiana Corridor Expressway Project (the Project) would construct a new 47-mile east-west rural four-lane divided limited access highway linking I-65 in Lowell, Indiana (Lake County) and I-55 in Wilmington, Illinois (near the border of Will and Kankakee Counties). There could be up to eight additional interchanges. The expressway would be located about 45 miles south of the Chicago Loop and about 15-20 miles south of parallel I-80/94 between the Chicago, IL-IN and Kankakee, IL urbanized areas. The project sponsors are the Illinois Department of Transportation (IDOT) and the Indiana Department of Transportation (INDOT). The Federal Highway Administration (FHWA) is the lead agency for Tier I and Tier II Environmental Impact Statements (EIS). On January 17, 2013, FHWA issued a Record of Decision (ROD) for the Tier I EIS (3). On January 24, 2014, the project sponsors released the Tier II draft EIS (DEIS) for public comment (4).

A July 2009 Illiana Expressway Feasibility Study (IEFS) completed for INDOT analyzed three alignments in a shorter corridor extending west of I-65 only about 25-30 miles to I-57 in Illinois. That report addressed project purpose and need, environmental concerns, financial options and demographics in addition to the benefits and impacts (5). An April 2010 Illiana Economic Opportunities Analysis (IEOA) report completed for IDOT

focused on the benefits of the project in terms of jobs, development, income and gross domestic product (GDP). Also included in the analysis are user benefits relative to travel time, operating cost, and safety (6). While these two reports focused on economic impact analyses, neither included a comprehensive monetized benefit-cost analysis (BCA).

This paper summarizes methodologies used in a BCA to determine if the benefits of the Project are worth the costs, as shown by metrics including benefit-cost ratio and net present value (NPV). A benefit-cost ratio of more than one signifies that overall society, i.e. the United States, is better off due to the Project as benefits outweigh costs. A ratio of less than one is an indicator that implementation of the Project is questionable as costs to society on the whole outweigh benefits. The base case is the no-build alternative.

BENEFITS AND COSTS DEVELOPMENT/ASSUMPTIONS

The U.S. Department of Transportation (USDOT) TIGER Benefit-Cost Analysis Resource Guide (TIGER BCA Guide) provides support to applicants for the Transportation Investments Generating Economic Recovery funding. The Guide recommends using a discount rate of 7 percent, pursuant to the U.S. Office of Management and Budget A-4 and A-94 circulars, and an alternative analysis using 3 percent (7). Appendix 1 is an Excel spreadsheet detailing the benefits and costs identified for the Project through the year 2047 using discount rates of 3, 5 and 7 percent. The spreadsheet includes complete details on the assumptions and calculation methodologies.

The calculated discounted cost and benefit ranges for the 3 and 7 percent rates are expressed throughout the report for each of the measured elements. The year 2018 is the projected Project completion and operating start date. The BCA ending year is 2047. Input for the analysis is predominantly taken from impacts identified in the Tier II DEIS. The Tier II DEIS assumes tolling at a rate resulting in traffic retention of about 43 percent as opposed to a non-tolling scenario. Benefit and cost unit values are from a number of cited transportation economics guidance documents and empirical studies. All monetary figures are converted to 2013 dollars using the U.S. Department of Labor, Bureau of Labor Statistics, Consumer Price Index (CPI) on-line calculator.

Capital Costs

The Tier II DEIS (pages 2-132 and 3-49, Tables 2-26 and 3-10) lists the Project costs from the beginning through construction for the years 2011 through 2017. These costs are \$1.509 billion in year of expenditure (YOE) dollars and reflect an FHWA August 2013 cost estimate review. The discounted value for all three rates is near \$1.4 billion.

Operating and Maintenance Costs

The IEFS (page 10-2, Table 10.1), lists an estimated annual operating and maintenance (O&M) cost range of \$2.1-\$2.8 million (2008 \$), excluding period maintenance/reconstruction and tolling expenses. A midlevel amount of about \$2.7 million (2013 \$) is used. An assumption is made that toll operations will be about 38 percent of the total O&M costs based on a 2002 tollway project study for Illinois and Missouri (8).

Accordingly, the total estimated annual O&M cost is about \$4.3 million. Discounted total O&M cost ranges are about \$76.7 and \$43.3 million.

Agricultural Costs

Analysis in the Tier II DEIS (pages 3-131 to 3-132, Tables 3-41, 42 and 43), show estimated annual cash crop reductions valued at about \$2.3 million based on an average of three build options. The discounted total ranges are about \$50.4 and \$31.8 million in crops production costs.

Ecological Costs

The annual per acre ecological value of land lost to both the project itself and induced residential/industrial development is calculated using the values of \$4,141 and \$2,761, respectively. These are based on the study, *Monetization of the Environmental Impacts of Roads*, and are converted from Canadian dollars. The higher amount is a 50-50 blend of full value for conversion to pavement and one-half of this for non-pavement right-of-way (ROW) (9). The amount of land consumed by the project itself is calculated from the Tier II DEIS (pages S-15 and 3-126, Tables S-2 and 3-37) using the average of the three build options which is 3,035 farm acres. There is some acreage of wetlands, floodplains, water/natural resources impacted by the Project. These have higher monetary impacts, however, they are not used as double-counting may occur. Additionally, farmland is the predominant type of land converted to development.

The amount of land estimated to be consumed by the induced development caused by the project is 5,253 acres (2,885 residential and 2,368 industrial) according to the Tier II DEIS (pages S-15 and 3-126, Tables S-2 and 3-37). An assumption is made that induced development will start out at 175.1 acres in 2018 and grow incrementally by this amount to reach 5,253 acres in 2047. The combined total discounted ecological range value of the land lost to the direct/indirect development caused by the Project is about \$389.0 and \$225.5 million. These represent the highest costs.

Vehicle Miles Traveled Benefits and Costs

The value of vehicle miles traveled (VMT) changes in terms of cost per mile used for automobiles is a variable rate of \$0.26, based on total amount of \$0.68 from the American Automobile Association (AAA). This is an average for automobiles, sport utility vehicles (SUV), and light trucks (collectively, automobiles)(10). A cost per mile value of \$1.77 for heavy trucks is used based on information from the American Transportation Research Institute (11). In addition to estimated cumulative VMT changes for the period 2018-2047 due to the Project, the Tier II DEIS (page 3-51, Table 3-12) of provides expected average annual VMT changes of +11,337,973 for automobiles and -4,591,183 for heavy trucks (net average increase of 6,746,790) due to the Project. Accordingly, assumptions for incremental annual VMT increases are 731,482 for automobiles and 296,205 for heavy trucks. Total discounted automobile increased operating cost ranges are about \$118.4 and \$54.0 million. Total discounted heavy truck decreased operating cost ranges are about \$125.2 and \$57.1 million. Consequently, there is very little change in overall vehicle operating costs.

Noise Benefits and Costs

The Transportation Research Board (TRB) Transportation Benefit-Cost Analysis web site provides noise impact values per VMT for urban highways from several studies. Even though the Project is of rural design, it is appropriate to account for noise as the presumption is that the area will become urbanized. Dollar values for noise impacts in these cited studies show the following ranges per VMT: heavy trucks (\$0.035-\$0.26); and automobiles (\$0.001 and \$0.028) (12). Mid-levels of \$0.1475 for heavy trucks and \$0.0145 for automobiles are multiplied by the annual changes in VMT. The total discounted noise cost increase ranges for automobiles are \$2.5 and \$1.2 million. The total discounted noise reduction benefit ranges for heavy trucks are \$10.4 and \$4.8 million. Therefore, there is a relatively small overall noise reduction benefit.

Emissions Benefits and Costs

The TIGER BCA Guide provides values for several air quality emissions elements. The Tier II DEIS (page 3-177, Table 3-54), states that global CO₂ emissions are estimated to increase from about 29.7 billion metric tons (MT) in 2010 to 45.5 billion MT in 2040, a change of about 15.83 billion MT (annual growth rate of about 1.4 percent) based on the Energy Information Administration International Energy Outlook. The Tier II DEIS states that the project will increase CO₂ by 0.0001 percent of this change by 2040. Accordingly, incremental increases of about 688 MT are assumed to reach the 15,830 MT figure in 2040. These increases are assumed to continue through 2047. The data are then multiplied annually for each year by the TIGER BCA Guide social cost of carbon (SCC) values. This is a cumulative increase of 319,962 MT in CO₂ for the 30-year period. Pursuant to the Guide, CO₂ values are only discounted at the 3 percent rate, but these same amounts are used in the analysis for the other discount rates. The result is a total 30-year cost of about \$6.7 million.

Converted NO_x and PM annual MT values from the TIGER BCA Guide are \$7,890 and \$360,946, respectively. Estimated year 2040 changes for the build versus the no-build scenarios for NO_x, PM₁₀, and PM_{2.5} are from the Tier II DEIS, Appendix L, Air Quality Technical Report (page 2-3, Table 2-1). For NO_x, there is an increase of 122 MT in 2040 for the build scenario which projects to a cumulative 30-year total of 2,465 MT assuming an annual incremental increase of 5.3 MT. The total discounted NO_x cost ranges due to the Project are about \$10.0 and \$4.6 million.

The Project decreases PM₁₀ by about 4 MT in 2040. Annual incremental decreases of 0.173913 MT are assumed to reach this amount and continued to 2047 resulting in a cumulative 30-year total decrease of 80.87 MT in PM₁₀. The Project decreases PM_{2.5} by <1 MT by 2040. Annual incremental decreases of 0.028696 MT are assumed to reach 0.66 MT in 2040 and continued to 2047 for a cumulative 30-year total decrease of 13.34 MT in PM_{2.5}. The total discounted PM reduction benefit ranges due to the Project are about \$17.5 and \$8.0 million. Other emissions were not included in the BCA due either to lack of data in the Tier II DEIS or lack of a value from the TIGER BCA Guide.

Vehicle Hours Traveled Benefits

The Phase II DEIS (page 3-50, Table 3-11), states that cumulative vehicle hours traveled (VHT) savings for a 30-year period (2018-2047) will be 126,550,629 [automobile (93,082,367) plus heavy truck (33,468,262)]. Further, it is stated that this is an annual average VHT savings of 4,082,278 [automobile (3,002,657) and heavy truck (1,079,621)]. These annual averages multiplied by 30 are slightly less than the cumulative numbers. Annual incremental changes of 195,000 VHT for automobiles and 70,000 VHT for heavy trucks are used to closely replicate the DEIS data. The TIGER BCA Guide lists hourly values of time for all purposes (personal and business) for both local and intercity automobile travel. It is assumed for the Illiana BCA that local and intercity automobile travel will be split evenly, therefore the value used is \$16.56 per hour. The hourly truck travel time value used based on the TIGER BCA Guide is \$26.82. The total discounted travel time savings ranges due to the Project for automobiles is about \$771.2 and \$351.6 million while for trucks it is about \$448.4 and \$204.4 million.

Property Impacts

U.S. Department of Agriculture, Census of Agriculture 2012 data was used for the average estimated market value (EMV) of farmland for land and buildings that will be developed due to the project apart from the Illiana right-of-way. These values per acre are \$7,832 for Will County, IL; \$6,612 for Kankakee County, IL and \$5,673 for Lake County, IN (13). An average EMV of \$6,706 per acre is used as a baseline without Project implementation. The total residential and industrial acreage expected to be developed as a result of the project is 5,253 (2,885 +2,368) according to the Tier II DEIS (pages S-15 and 3-126, Tables S-2 and 3-37). Multiplied by \$6,706 the base total EMV of this property is \$35,226,618.

A real estate evaluation was conducted in an attempt to identify the EMV for residential and industrial land expected to be developed with project implementation (prior to any investment)(Appendix 2). This was conducted by collecting assessment and sales information from public records (Will and Lake County Assessor and Zillow) for a total of 12 randomly selected parcels of property (6 residential and 6 industrial)(14),(15),(16). These properties are located about 1,000 to 30,000 feet from either I-57 or I-65, which are existing expressways with similar features as the proposed Project (e.g. limited access, subdivided, four lanes). From this analysis, the average EMV for these properties with Project implementation and without improvements per acre is \$35,700 for residential and \$41,400 for industrial. The respective average EMV increase per acre for residential and industrial is \$28,994 (\$35,700-\$6,706) and \$34,694 (\$41,400-\$6,706). The total EMV improvement for land due to the Project and anticipated development is \$165,803,082 ($\$28,994 \times 2,885 = \$83,647,690$ for residential and $\$34,694 \times 2,368 = \$82,155,392$ for industrial). This is a total average property value increase of 470 percent.

The TIGER BCA Guide states the following: 1) The benefit of any property value increase can only be considered as a one-time stock benefit and cannot be treated as a stream of benefits accruing annually; 2) It cannot include any investment by developers; 3) Other benefits to land value already counted, such as travel time savings, must also be

netted out. The total discounted monetary travel time benefits for auto and heavy truck together is as follows for the noted discount rates: \$1,219,536,764 (3%); and \$555,972,904 (7%)(Table 1). Consequently, there is no net benefit from property value increases that isn't already counted due to travel time savings.

Safety Benefits

According to the Tier II DEIS (page 2-90), it is estimated that the Project would result in a reduction of 642 vehicle crashes annually in 2040. The IEFS (page 8-41, Table 8.11) states that the Project will reduce crashes annually, ranging from 350 to 384 by the year 2030+. According to the Minnesota Department of Transportation web site, Benefit-Cost Analysis for Transportation Projects, it is appropriate to interpolate/extrapolate crash data for other years in the analysis timeframe (17). Accordingly, the ratio of accidents reduced in 2040 divided by VMT change for that year is 0.00006412708. This ratio is used to determine a beginning year 2018 accident reduction of 27.913 which is used to estimate the incremental number of accidents to 363 in 2030 and 642 in 2040. Extrapolating to 2047, results in a cumulative 30-year accident reduction of 12,980.

Illinois and Indiana crash statistics for the year 2011 show the following combined totals in 2011 for the 10-county region: 215,524 crashes; 445 deaths; and 60,644 injuries (18)(19). The ratio of deaths per accident for 2011 is about 0.0021 (1 death every 484 accidents). The value of a statistical life (VSL) based on information in the TIGER BCA Guide is about \$9,233,293 million and increases 1.18 percent every year. The 2011 ratio of deaths per accident multiplied by VSL provides an estimated savings of about 27 lives from 2018-2047, an average of almost one per year. The total discounted reduced death benefits ranges due to the Project are \$157.1 and \$69.8 million.

The estimate of injuries and their severity is based on the TIGER BCA Guide. Accordingly, the data on number of accidents reduced is converted to the Abbreviated Injury Scale (AIS) to determine estimated level of injury by severity rates (none, minor, moderate, serious, severe, critical). The number of non-fatal accidents probability values in Table 4, column 8 on page 13 of the Guide are multiplied by the AIS unit value levels on page 3 of the Guide and then multiplied by the number of accidents. The resulting discounted reduced injuries benefits ranges are \$847.9 and \$386.5 million.

According to the TIGER BCA Guide, the value of property damage only (PDO) per vehicle crash is \$3,425. The result is discounted property damage reduction benefit ranges from the Project of about \$22.8 and \$10.4 million.

Residual Value

The expected life of each Project element was obtained from INDOT (20). As a result, the assumptions below are made with Illiana based on the original capital costs (totaling \$1.509 billion) and expected life at the end of the 2018-2047 period to determine residual value. The total undiscounted residual value of the Project infrastructure from the bullets below is about \$667.4 million which equates to discounted residual value ranges of \$251.6 and \$71.5 million.

- ROW, \$96 million, infinite life, or \$96 million;

- Earth Work, \$375 million, 100 years life (0.7), or \$262.5 million;
- Structural, \$313 million, 70 years life (0.5714), or \$178.8 million;
- Road Base, \$325 million, 50 years life (0.4), \$130.0 million;
- Road Surface, \$400 million, 30 years life, \$0.

RESULTS AND CONCLUSIONS

As shown in Table 1 below, at a 3 percent discount rate the benefit/cost ratio is small but positive at 1.31 with an NPV of about \$632.1 million. Using 5 and 7 percent discount rates results in the following respective measures: benefit/cost ratios of 0.95 and 0.69; and NPV of about (\$98.4) and (\$525.4) million. As should be expected, the vast majority of the Project benefits are from the estimated reductions in injuries from accidents in addition to travel time for both automobiles and heavy trucks. There are substantive benefits to reduced heavy truck VMT/operating costs due to more efficient routing. However, this is offset partially by the increase in these costs for automobiles which is likely caused by induced demand. After the project capital expenditures, other substantive costs in descending order are: the combined ecological value of land lost to both the Project and induced residential/industrial development; operating and maintenance costs; and farm crop production losses. Emissions and noise benefits/costs are mixed and relatively inconsequential due in part to the VMT differences for heavy trucks and automobiles.

DISCOUNTED COSTS	3%	5%	7%
Capital Costs	(\$1,439.1)	(\$1,396.1)	(\$1,355.6)
Operating & Maintenance	(\$76.7)	(\$56.8)	(\$43.3)
Crops Profits Loss	(\$50.4)	(\$39.4)	(\$31.8)
Ecological –ROW	(\$273.6)	(\$213.7)	(\$172.9)
Ecological – Induced Dev.	(\$115.5)	(\$76.8)	(\$52.6)
VMT Increase – Auto	(\$45.4)	(\$30.2)	(\$20.7)
Noise Increase – Auto	(\$2.5)	(\$1.7)	(\$1.2)
CO2 Increase	(\$6.7)	(\$6.7)	(\$6.7)
NOX Increase	(\$10.0)	(\$6.6)	(\$4.6)
TOTAL DISCOUNTED COSTS	(\$2,019.9)	(\$1,828.0)	(\$1,689.4)
DISCOUNTED BENEFITS	3%	5%	7%
VMT Reduction – Heavy Truck	\$125.2	\$83.3	\$57.1
Noise Reduction – Heavy Truck	\$10.4	\$6.9	\$4.8
PM Reduction	\$17.5	\$11.6	\$8.0
VHT Reduction - Auto	\$771.2	\$513.3	\$351.6
VHT Reduction – Heavy Truck	\$448.4	\$298.4	\$204.4
Fatalities Reduced	\$157.1	\$103.2	\$69.8
Injuries Reduction	\$847.9	\$564.3	\$386.5
Property Damage Reduction	\$22.8	\$15.2	\$10.4
Residual	\$251.6	\$133.4	\$71.5
TOTAL DISCOUNTED BENEFITS	\$2,652.0	\$1,729.6	\$1,164.0
NET PRESENT VALUE	\$632.1	(\$98.4)	(\$525.4)
BENEFIT/COST RATIO	1.31	0.95	0.69

TABLE 1 Illiana Benefit-Cost Analysis Summary (\$ in millions)

Cost effectiveness analysis shows discounted capital expenditures of about: \$51.3 million per life saved (\$1.4B/27.3); \$107,858 per accident reduced (\$1.4B/12,980); and \$11.36 per VHT saved (\$1.4B/123,225,000). Sensitivity analysis in Table 2 below shows that a 1 percent increase in the discount rate used reduces the benefit-cost ratio by about 0.13 to 0.18 and NPV \$311.9 to \$365.3 million. Increasing or decreasing construction costs up to 25 percent has a moderate impact while varying O&M costs up to 15 percent either way is negligible.

As mentioned earlier, the respective IEFS and Tier II DEIS documents state that the Project will reduce the number of crashes in the year 2030+ by about 350-384 and year 2040 by 642. Pursuant to this information, calculations for deaths and injuries assumed incremental annual increases of about 28 through the year 2047. As part of the sensitivity analysis, two alternatives were considered, one assuming the equivalent annual average of 433 crashes saved, and one assuming an average of 643 saved every year. Under the first, sensitivity analysis shows very small improvement in the metrics, while the latter option raises B/C ratio up to 0.37 and NPV as much as \$731.3 million.

	3%		5%		7%	
Scenario	B/C Ratio	NPV	B/C Ratio	NPV	B/C Ratio	NPV
<i>With Project</i>	<i>1.31</i>	<i>\$632.1</i>	<i>0.95</i>	<i>(\$98.4)</i>	<i>0.69</i>	<i>(\$525.4)</i>
<i>Increase in Construction Costs</i>						
15%	1.19	\$423.3	0.85	(\$300.8)	0.62	(\$721.7)
25%	1.12	\$284.0	0.80	(\$435.7)	0.58	(\$852.6)
-15%	1.46	\$841.0	1.06	\$104.0	0.78	(\$329.0)
<i>Increase in O&M Costs</i>						
15%	1.31	\$620.6	0.94	(\$106.9)	0.69	(\$531.9)
-15%	1.32	\$643.6	0.95	(\$89.9)	0.69	(\$518.9)
<i>Increase in Crashes Saved Assumptions</i>						
433 yr. avg.	1.39	\$790.8	1.05	\$95.2	0.81	(\$325.1)
642 yr. avg.	1.68	\$1,363.4	1.28	\$518.2	1.00	(\$3.1)

TABLE 2 Illiana Sensitivity Analysis (\$ in millions)

Based on the BCA, the no-build option is at least as attractive as the build alternative. Under the no-build scenario, travel time and accidents would not be reduced while heavy trucks would not realize reduced operating costs or be diverted from arterials. However, automobile operating costs and overall emissions would not increase while the productivity and ecological value of agricultural land and open space would be retained. As documented in the aforementioned economic impact analysis studies conducted for INDOT and IDOT, the primary benefits of the Project are reduced congestion from heavy truck traffic and increases in employment.

The Project will provide some connectivity to existing public transportation and intercity rail. However, information has not been developed to show that the Project will have any substantive impact on increasing ridership for these modes. Both of the CMAP and NIRPC LRTPs emphasize directing most of the region's population and employment growth to the existing urbanized area to improve accessibility and alternatives to single-occupancy vehicle (SOV) travel (21). Additionally, CMAP seeks to implement congestion pricing. Accordingly, analysis of alternatives to the Illiana Corridor

Expressway Project that more directly address the MPOs comprehensive goals, objectives and performance measures should be performed through BCA to see how they compare.

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ILLIANA CORRIDOR EXPRESSWAY
BENEFIT-COST ANALYSIS (2013 \$) - APPENDIX 1

Year	Calendar Year	Capital Costs (Design/Const) ¹	O&M Costs ²	Farm Crops Production Loss Costs ³	Ecological Acreage Loss (Project)	Ecological Value Per Acre	Ecological Land Loss Costs ⁴	Ecological Acreage Loss (Induced Development)	Ecological Value Per Acre	Ecological Land Loss Induced Development Costs ⁴	Auto VMT Increase	VMT Value	Auto VMT Costs ⁵	Heavy Truck VMT Decrease	VMT Value	Heavy Truck VMT Benefits ⁵
0	2011	(\$10,563,000)														
0	2012	(\$16,599,000)														
0	2013	(\$19,617,000)														
0	2014	(\$181,080,000)		(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)									
1	2015	(\$488,916,000)		(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)									
2	2016	(\$422,520,000)		(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)									
3	2017	(\$369,705,000)		(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)									
4	2018		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	175.1	(\$2,761)	(\$483,451)	731,482	(\$0.26)	(\$190,185)	296,205	\$1.77	\$524,283
5	2019		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	350	(\$2,761)	(\$966,902)	1,462,964	(\$0.26)	(\$380,371)	592,410	\$1.77	\$1,048,566
6	2020		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	525	(\$2,761)	(\$1,450,353)	2,194,446	(\$0.26)	(\$570,556)	888,615	\$1.77	\$1,572,849
7	2021		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	700	(\$2,761)	(\$1,933,804)	2,925,928	(\$0.26)	(\$760,741)	1,184,820	\$1.77	\$2,097,131
8	2022		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	876	(\$2,761)	(\$2,417,256)	3,657,410	(\$0.26)	(\$950,927)	1,481,025	\$1.77	\$2,621,414
9	2023		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	1,051	(\$2,761)	(\$2,900,707)	4,388,892	(\$0.26)	(\$1,141,112)	1,777,230	\$1.77	\$3,145,697
10	2024		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	1,226	(\$2,761)	(\$3,384,158)	5,120,374	(\$0.26)	(\$1,331,297)	2,073,435	\$1.77	\$3,669,980
11	2025		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	1,401	(\$2,761)	(\$3,867,609)	5,851,856	(\$0.26)	(\$1,521,483)	2,369,640	\$1.77	\$4,194,263
12	2026		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	1,576	(\$2,761)	(\$4,351,060)	6,583,338	(\$0.26)	(\$1,711,668)	2,665,845	\$1.77	\$4,718,546
13	2027		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	1,751	(\$2,761)	(\$4,834,511)	7,314,820	(\$0.26)	(\$1,901,853)	2,962,050	\$1.77	\$5,242,829
14	2028		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	1,926	(\$2,761)	(\$5,317,962)	8,046,302	(\$0.26)	(\$2,092,039)	3,258,255	\$1.77	\$5,767,111
15	2029		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	2,101	(\$2,761)	(\$5,801,413)	8,777,784	(\$0.26)	(\$2,282,224)	3,554,460	\$1.77	\$6,291,394
16	2030		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	2,276	(\$2,761)	(\$6,284,864)	9,509,266	(\$0.26)	(\$2,472,409)	3,850,665	\$1.77	\$6,815,677
17	2031		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	2,451	(\$2,761)	(\$6,768,315)	10,240,748	(\$0.26)	(\$2,662,594)	4,146,870	\$1.77	\$7,339,960
18	2032		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	2,627	(\$2,761)	(\$7,251,767)	10,972,230	(\$0.26)	(\$2,852,780)	4,443,075	\$1.77	\$7,864,243
19	2033		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	2,802	(\$2,761)	(\$7,735,218)	11,703,712	(\$0.26)	(\$3,042,965)	4,739,280	\$1.77	\$8,388,526
20	2034		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	2,977	(\$2,761)	(\$8,218,669)	12,435,194	(\$0.26)	(\$3,233,150)	5,035,485	\$1.77	\$8,912,808
21	2035		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	3,152	(\$2,761)	(\$8,702,120)	13,166,676	(\$0.26)	(\$3,423,336)	5,331,690	\$1.77	\$9,437,091
22	2036		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	3,327	(\$2,761)	(\$9,185,571)	13,898,158	(\$0.26)	(\$3,613,521)	5,627,895	\$1.77	\$9,961,374
23	2037		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	3,502	(\$2,761)	(\$9,669,022)	14,629,640	(\$0.26)	(\$3,803,706)	5,924,100	\$1.77	\$10,485,657
24	2038		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	3,677	(\$2,761)	(\$10,152,473)	15,361,122	(\$0.26)	(\$3,993,892)	6,220,305	\$1.77	\$11,009,940
25	2039		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	3,852	(\$2,761)	(\$10,635,924)	16,092,604	(\$0.26)	(\$4,184,077)	6,516,510	\$1.77	\$11,534,223
26	2040		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	4,027	(\$2,761)	(\$11,119,375)	16,824,086	(\$0.26)	(\$4,374,262)	6,812,715	\$1.77	\$12,058,506
27	2041		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	4,202	(\$2,761)	(\$11,602,826)	17,555,568	(\$0.26)	(\$4,564,448)	7,108,920	\$1.77	\$12,582,788
28	2042		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	4,378	(\$2,761)	(\$12,086,278)	18,287,050	(\$0.26)	(\$4,754,633)	7,405,125	\$1.77	\$13,107,071
29	2043		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	4,553	(\$2,761)	(\$12,569,729)	19,018,532	(\$0.26)	(\$4,944,818)	7,701,330	\$1.77	\$13,631,354
30	2044		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	4,728	(\$2,761)	(\$13,053,180)	19,750,014	(\$0.26)	(\$5,135,004)	7,997,535	\$1.77	\$14,155,637
31	2045		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	4,903	(\$2,761)	(\$13,536,631)	20,481,496	(\$0.26)	(\$5,325,189)	8,293,740	\$1.77	\$14,679,920
32	2046		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	5,078	(\$2,761)	(\$14,020,082)	21,212,978	(\$0.26)	(\$5,515,374)	8,589,945	\$1.77	\$15,204,203
33	2047		(\$4,276,000)	(\$2,315,582)	3,035	(\$4,141)	(\$12,567,935)	5,253	(\$2,761)	(\$14,503,533)	21,944,460	(\$0.26)	(\$5,705,560)	8,886,150	\$1.77	\$15,728,486
TOTALS		(\$1,509,000,000)	(\$128,280,000)	(\$78,729,788)			(\$427,309,790)			(\$224,804,762)	340,139,130		(\$88,436,174)	137,735,325		\$243,791,525
3% Discount		(\$1,439,131,942)	(\$76,699,467)	(\$50,400,495)			(\$273,551,160)			(\$115,455,761)			(\$45,419,259)			\$125,207,028
5% Discount		(\$1,396,079,417)	(\$56,781,432)	(\$39,370,220)			(\$213,683,801)			(\$76,839,863)			(\$30,228,112)			\$83,329,673
7% Discount		(\$1,355,619,053)	(\$43,312,032)	(\$31,847,125)			(\$172,851,837)			(\$52,634,965)			(\$20,706,122)			\$57,080,456

ILLIANA CORRIDOR EXPRESSWAY
BENEFIT-COST ANALYSIS (2013 \$) - APPENDIX 1

Year	Calendar Year	Auto Noise Value (per VMT)	Auto Noise Costs ⁶	Truck Noise Value (per VMT)	Truck Noise Benefits ⁵	CO2 Increase (MT)	CO2 Value (per MT)	Undiscounted CO2 Costs @ 3% Avg SCC	NPV CO2 Costs @ 3% Avg SCC [Undisc/(1.03^A)] ⁷	NOX Increase (MT)	NOX Value (per MT)	NOX Costs ⁸	PM10 Decrease (per MT)	PM2.5 Decrease (per MT)	PM Value (per MT)	PM Benefits ⁸
0	2011															
0	2012															
0	2013															
0	2014															
1	2015															
2	2016															
3	2017															
4	2018	(\$0.0145)	(\$10,606)	\$0.1475	\$43,690	687.74	(\$28.43)	(\$19,552)	(\$17,372)	5.30	(\$7,890)	(\$41,851)	0.173913	0.028696	\$360,946	\$73,131
5	2019	(\$0.0145)	(\$21,213)	\$0.1475	\$87,380	1,376	(\$28.99)	(\$39,883)	(\$34,403)	11	(\$7,890)	(\$83,668)	0.35	0.06	\$360,946	\$146,262
6	2020	(\$0.0145)	(\$31,819)	\$0.1475	\$131,071	2,064	(\$29.55)	(\$60,983)	(\$51,073)	16	(\$7,890)	(\$125,485)	0.52	0.09	\$360,946	\$219,393
7	2021	(\$0.0145)	(\$42,426)	\$0.1475	\$174,761	2,752	(\$30.34)	(\$83,488)	(\$67,883)	21	(\$7,890)	(\$167,302)	0.70	0.11	\$360,946	\$292,524
8	2022	(\$0.0145)	(\$53,032)	\$0.1475	\$218,451	3,440	(\$31.01)	(\$106,666)	(\$84,203)	27	(\$7,890)	(\$209,119)	0.87	0.14	\$360,946	\$365,654
9	2023	(\$0.0145)	(\$63,639)	\$0.1475	\$262,141	4,128	(\$31.80)	(\$131,262)	(\$100,601)	32	(\$7,890)	(\$250,936)	1.04	0.17	\$360,946	\$438,785
10	2024	(\$0.0145)	(\$74,245)	\$0.1475	\$305,832	4,816	(\$32.47)	(\$156,367)	(\$116,352)	37	(\$7,890)	(\$292,753)	1.22	0.20	\$360,946	\$511,916
11	2025	(\$0.0145)	(\$84,852)	\$0.1475	\$349,522	5,504	(\$33.26)	(\$183,054)	(\$132,242)	42	(\$7,890)	(\$334,570)	1.39	0.23	\$360,946	\$585,047
12	2026	(\$0.0145)	(\$95,458)	\$0.1475	\$393,212	6,192	(\$33.93)	(\$210,086)	(\$147,350)	48	(\$7,890)	(\$376,387)	1.57	0.26	\$360,946	\$658,178
13	2027	(\$0.0145)	(\$106,065)	\$0.1475	\$436,902	6,880	(\$34.72)	(\$238,864)	(\$162,655)	53	(\$7,890)	(\$418,204)	1.74	0.29	\$360,946	\$731,309
14	2028	(\$0.0145)	(\$116,671)	\$0.1475	\$480,593	7,568	(\$35.39)	(\$267,822)	(\$177,062)	58	(\$7,890)	(\$460,021)	1.91	0.32	\$360,946	\$804,440
15	2029	(\$0.0145)	(\$127,278)	\$0.1475	\$524,283	8,256	(\$36.07)	(\$297,784)	(\$191,137)	64	(\$7,890)	(\$501,838)	2.09	0.34	\$360,946	\$877,571
16	2030	(\$0.0145)	(\$137,884)	\$0.1475	\$567,973	8,944	(\$36.85)	(\$329,577)	(\$205,381)	69	(\$7,890)	(\$543,655)	2.26	0.37	\$360,946	\$950,702
17	2031	(\$0.0145)	(\$148,491)	\$0.1475	\$611,663	9,632	(\$37.53)	(\$361,479)	(\$218,701)	74	(\$7,890)	(\$585,472)	2.43	0.40	\$360,946	\$1,023,833
18	2032	(\$0.0145)	(\$159,097)	\$0.1475	\$655,354	10,320	(\$38.31)	(\$395,349)	(\$232,226)	80	(\$7,890)	(\$627,289)	2.61	0.43	\$360,946	\$1,096,964
19	2033	(\$0.0145)	(\$169,704)	\$0.1475	\$699,044	11,008	(\$38.99)	(\$429,192)	(\$244,762)	85	(\$7,890)	(\$669,106)	2.78	0.46	\$360,946	\$1,170,094
20	2034	(\$0.0145)	(\$180,310)	\$0.1475	\$742,734	11,696	(\$39.77)	(\$465,139)	(\$257,536)	90	(\$7,890)	(\$710,923)	2.96	0.49	\$360,946	\$1,243,225
21	2035	(\$0.0145)	(\$190,917)	\$0.1475	\$786,424	12,384	(\$40.45)	(\$500,922)	(\$269,270)	95	(\$7,890)	(\$752,740)	3.13	0.52	\$360,946	\$1,316,356
22	2036	(\$0.0145)	(\$201,523)	\$0.1475	\$830,115	13,072	(\$41.23)	(\$538,948)	(\$281,273)	101	(\$7,890)	(\$794,557)	3.30	0.55	\$360,946	\$1,389,487
23	2037	(\$0.0145)	(\$212,130)	\$0.1475	\$873,805	13,760	(\$41.91)	(\$576,671)	(\$292,194)	106	(\$7,890)	(\$836,374)	3.48	0.57	\$360,946	\$1,462,618
24	2038	(\$0.0145)	(\$222,736)	\$0.1475	\$917,495	14,448	(\$42.58)	(\$615,185)	(\$302,630)	111	(\$7,890)	(\$878,191)	3.65	0.60	\$360,946	\$1,535,749
25	2039	(\$0.0145)	(\$233,343)	\$0.1475	\$961,185	15,136	(\$43.37)	(\$656,437)	(\$313,518)	117	(\$7,890)	(\$920,008)	3.83	0.63	\$360,946	\$1,608,880
26	2040	(\$0.0145)	(\$243,949)	\$0.1475	\$1,004,875	15,830	(\$44.04)	(\$697,153)	(\$323,266)	122	(\$7,890)	(\$961,825)	4.00	0.66	\$360,946	\$1,682,011
27	2041	(\$0.0145)	(\$254,556)	\$0.1475	\$1,048,566	16,518	(\$44.72)	(\$738,685)	(\$332,548)	127	(\$7,890)	(\$1,003,642)	4.17	0.69	\$360,946	\$1,755,142
28	2042	(\$0.0145)	(\$265,162)	\$0.1475	\$1,092,256	17,206	(\$45.39)	(\$780,980)	(\$341,348)	133	(\$7,890)	(\$1,045,459)	4.35	0.72	\$360,946	\$1,828,273
29	2043	(\$0.0145)	(\$275,769)	\$0.1475	\$1,135,946	17,894	(\$45.95)	(\$822,229)	(\$348,910)	138	(\$7,890)	(\$1,087,276)	4.52	0.75	\$360,946	\$1,901,404
30	2044	(\$0.0145)	(\$286,375)	\$0.1475	\$1,179,636	18,582	(\$46.63)	(\$866,479)	(\$356,978)	143	(\$7,890)	(\$1,129,093)	4.70	0.77	\$360,946	\$1,974,534
31	2045	(\$0.0145)	(\$296,982)	\$0.1475	\$1,223,327	19,270	(\$47.30)	(\$911,471)	(\$364,577)	148	(\$7,890)	(\$1,170,910)	4.87	0.80	\$360,946	\$2,047,665
32	2046	(\$0.0145)	(\$307,588)	\$0.1475	\$1,267,017	19,958	(\$47.86)	(\$955,190)	(\$370,936)	154	(\$7,890)	(\$1,212,727)	5.04	0.83	\$360,946	\$2,120,796
33	2047	(\$0.0145)	(\$318,195)	\$0.1475	\$1,310,707	20,646	(\$48.54)	(\$1,002,157)	(\$377,839)	159	(\$7,890)	(\$1,254,544)	5.22	0.86	\$360,946	\$2,193,927
TOTALS			(\$4,932,017)		\$20,315,960	319,962			(\$6,716,227)	2,465		(\$19,445,934)	80.87	13.34		\$34,005,869
3% Discount			(\$2,532,997)		\$10,433,919				(\$6,716,227)			(\$9,987,175)				\$17,464,814
5% Discount			(\$1,685,799)		\$6,944,139				(\$6,716,227)			(\$6,646,862)				\$11,623,447
7% Discount			(\$1,154,765)		\$4,756,705				(\$6,716,227)			(\$4,553,106)				\$7,962,009

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BENEFIT-COST ANALYSIS (2013 \$) - APPENDIX 1

Year	Calendar Year	Auto Travel Time Saved (VHT)	Time Value (per hr)	Auto Travel Time Savings Benefits ⁹	Heavy Truck Travel Time Saved (VHT)	Time Value (per hr)	Heavy Truck Travel Time Savings Benefits ⁹	Accidents Reduced	Value of Statistical Life	Death/ Crash Ratio	Deaths Prevented Benefits	No Injury AIS 0 0.43676 * \$0	Minor AIS 1 0.41739 * \$27,700	Moderate AIS 2 0.08872 * \$433,965	Serious AIS 3 0.04817 * \$969,496	Severe AIS 4 0.00617 * \$2,456,056	Critical AIS 5 0.00279 * \$5,475,343
0	2011																
0	2012																
0	2013																
0	2014																
1	2015																
2	2016																
3	2017																
4	2018	195,000	\$16.56	\$3,229,200	70,000	\$26.82	\$1,877,400	27.913	\$9,233,293	0.002065	\$532,133	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
5	2019	390,000	\$16.56	\$6,458,400	140,000	\$26.82	\$3,754,800	56	\$9,342,246	0.002065	\$1,076,824	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
6	2020	585,000	\$16.56	\$9,687,600	210,000	\$26.82	\$5,632,200	84	\$9,452,484	0.002065	\$1,634,296	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
7	2021	780,000	\$16.56	\$12,916,800	280,000	\$26.82	\$7,509,600	112	\$9,564,024	0.002065	\$2,204,774	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
8	2022	975,000	\$16.56	\$16,146,000	350,000	\$26.82	\$9,387,000	140	\$9,676,879	0.002065	\$2,788,488	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
9	2023	1,170,000	\$16.56	\$19,375,200	420,000	\$26.82	\$11,264,400	167	\$9,791,066	0.002065	\$3,385,671	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
10	2024	1,365,000	\$16.56	\$22,604,400	490,000	\$26.82	\$13,141,800	195	\$9,906,601	0.002065	\$3,996,559	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
11	2025	1,560,000	\$16.56	\$25,833,600	560,000	\$26.82	\$15,019,200	223	\$10,023,499	0.002065	\$4,621,392	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
12	2026	1,755,000	\$16.56	\$29,062,800	630,000	\$26.82	\$16,896,600	251	\$10,141,776	0.002065	\$5,260,415	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
13	2027	1,950,000	\$16.56	\$32,292,000	700,000	\$26.82	\$18,774,000	279	\$10,261,449	0.002065	\$5,913,875	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
14	2028	2,145,000	\$16.56	\$35,521,200	770,000	\$26.82	\$20,651,400	307	\$10,382,534	0.002065	\$6,582,025	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
15	2029	2,340,000	\$16.56	\$38,750,400	840,000	\$26.82	\$22,528,800	335	\$10,505,048	0.002065	\$7,265,120	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
16	2030	2,535,000	\$16.56	\$41,979,600	910,000	\$26.82	\$24,406,200	363	\$10,629,008	0.002065	\$7,963,419	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
17	2031	2,730,000	\$16.56	\$45,208,800	980,000	\$26.82	\$26,283,600	391	\$10,754,430	0.002065	\$8,677,186	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
18	2032	2,925,000	\$16.56	\$48,438,000	1,050,000	\$26.82	\$28,161,000	419	\$10,881,332	0.002065	\$9,406,689	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
19	2033	3,120,000	\$16.56	\$51,667,200	1,120,000	\$26.82	\$30,038,400	447	\$11,009,732	0.002065	\$10,152,201	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
20	2034	3,315,000	\$16.56	\$54,896,400	1,190,000	\$26.82	\$31,915,800	475	\$11,139,647	0.002065	\$10,913,997	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
21	2035	3,510,000	\$16.56	\$58,125,600	1,260,000	\$26.82	\$33,793,200	502	\$11,271,095	0.002065	\$11,692,357	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
22	2036	3,705,000	\$16.56	\$61,354,800	1,330,000	\$26.82	\$35,670,600	530	\$11,404,093	0.002065	\$12,487,567	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
23	2037	3,900,000	\$16.56	\$64,584,000	1,400,000	\$26.82	\$37,548,000	558	\$11,538,662	0.002065	\$13,299,916	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
24	2038	4,095,000	\$16.56	\$67,813,200	1,470,000	\$26.82	\$39,425,400	586	\$11,674,818	0.002065	\$14,129,698	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
25	2039	4,290,000	\$16.56	\$71,042,400	1,540,000	\$26.82	\$41,302,800	614	\$11,812,581	0.002065	\$14,977,211	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
26	2040	4,485,000	\$16.56	\$74,271,600	1,610,000	\$26.82	\$43,180,200	642	\$11,951,969	0.002065	\$15,842,758	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
27	2041	4,680,000	\$16.56	\$77,500,800	1,680,000	\$26.82	\$45,057,600	670	\$12,093,003	0.002065	\$16,726,646	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
28	2042	4,875,000	\$16.56	\$80,730,000	1,750,000	\$26.82	\$46,935,000	698	\$12,235,700	0.002065	\$17,629,188	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
29	2043	5,070,000	\$16.56	\$83,959,200	1,820,000	\$26.82	\$48,812,400	726	\$12,380,081	0.002065	\$18,550,701	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
30	2044	5,265,000	\$16.56	\$87,188,400	1,890,000	\$26.82	\$50,689,800	754	\$12,526,166	0.002065	\$19,491,506	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
31	2045	5,460,000	\$16.56	\$90,417,600	1,960,000	\$26.82	\$52,567,200	782	\$12,673,975	0.002065	\$20,451,932	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
32	2046	5,655,000	\$16.56	\$93,646,800	2,030,000	\$26.82	\$54,444,600	809	\$12,823,528	0.002065	\$21,432,310	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
33	2047	5,850,000	\$16.56	\$96,876,000	2,100,000	\$26.82	\$56,322,000	837	\$12,974,845	0.002065	\$22,432,978	\$0	\$11,562	\$38,501	\$46,701	\$15,154	\$15,276
TOTALS		90,675,000		\$1,501,578,000	32,550,000		\$872,991,000	12,980			\$311,519,831						
3% Discount				\$771,183,981			\$448,352,783				\$157,062,727						
5% Discount				\$513,250,017			\$298,394,519				\$103,188,473						
7% Discount				\$351,573,983			\$204,398,921				\$69,763,149						

ILLIANA CORRIDOR EXPRESSWAY
BENEFIT-COST ANALYSIS (2013 \$) - APPENDIX 1

Year	Calendar Year	Injuries Prevented Benefits Accidents*Σ[Pr(AIS _x)*V alue (AIS _x)]	Property Damage Only \$3,425 per Accident	Total Accident Death/ Injury/PDO Benefits ¹⁰	Residual Value ¹¹	Discount Factor (3%)	Discount Factor (5%)	Discount Factor (7%)	NPV Costs (3% Discount)	NPV Benefits (3% Discount)	NPV Costs (5% Discount)	NPV Benefits (5% Discount)	NPV Costs (7% Discount)	NPV Benefits (7% Discount)
0	2011					1	1	1	(\$10,563,000)		(\$10,563,000)		(\$10,563,000)	
0	2012					1	1	1	(\$16,599,000)		(\$16,599,000)		(\$16,599,000)	
0	2013					1	1	1	(\$19,617,000)		(\$19,617,000)		(\$19,617,000)	
0	2014					1	1	1	(\$195,963,517)		(\$195,963,517)		(\$195,963,517)	
1	2015					0.9709	0.9524	0.9346	(\$489,138,951)		(\$479,818,660)		(\$470,851,029)	
2	2016					0.9426	0.907	0.8734	(\$412,296,555)		(\$396,724,990)		(\$382,028,232)	
3	2017					0.9151	0.8638	0.8163	(\$351,936,952)		(\$332,207,561)		(\$313,939,606)	
4	2018	\$3,550,360	\$95,602	\$4,178,095		0.8885	0.8227	0.7629	(\$17,685,738)	\$8,819,072	(\$16,377,264)	\$8,165,954	(\$15,188,105)	\$7,572,392
5	2019	\$7,100,720	\$191,204	\$8,368,748		0.8626	0.7835	0.713	(\$17,814,031)	\$17,134,821	(\$16,183,647)	\$15,563,566	(\$14,730,525)	\$14,163,143
6	2020	\$10,651,079	\$286,806	\$12,572,181		0.8375	0.7462	0.6663	(\$17,921,422)	\$24,970,308	(\$15,973,288)	\$22,248,172	(\$14,268,403)	\$19,865,930
7	2021	\$14,201,439	\$382,408	\$16,788,621		0.8131	0.7107	0.6227	(\$18,007,952)	\$32,344,660	(\$15,748,619)	\$28,271,246	(\$13,807,006)	\$24,770,656
8	2022	\$17,751,799	\$478,010	\$21,018,297		0.7894	0.6768	0.582	(\$18,074,512)	\$39,278,031	(\$15,508,374)	\$33,675,414	(\$13,347,897)	\$28,958,467
9	2023	\$21,302,159	\$573,612	\$25,261,442		0.7664	0.6446	0.5439	(\$18,123,195)	\$45,790,611	(\$15,258,958)	\$38,513,345	(\$12,890,905)	\$32,496,755
10	2024	\$24,852,518	\$669,214	\$29,518,291		0.7441	0.6139	0.5083	(\$18,154,802)	\$51,902,626	(\$14,998,498)	\$42,820,887	(\$12,438,545)	\$35,455,053
11	2025	\$28,402,878	\$764,816	\$33,789,086		0.7224	0.5847	0.4751	(\$18,169,148)	\$57,626,367	(\$14,731,050)	\$46,641,939	(\$11,994,554)	\$37,899,068
12	2026	\$31,953,238	\$860,418	\$38,074,071		0.7014	0.5568	0.444	(\$18,169,185)	\$62,988,110	(\$14,453,819)	\$50,002,537	(\$11,555,526)	\$39,872,713
13	2027	\$35,503,598	\$956,020	\$42,373,493		0.681	0.5303	0.415	(\$18,154,778)	\$67,998,213	(\$14,173,261)	\$52,950,738	(\$11,127,018)	\$41,437,971
14	2028	\$39,053,958	\$1,051,622	\$46,687,605		0.6611	0.5051	0.3878	(\$18,123,422)	\$72,663,054	(\$13,888,613)	\$55,516,727	(\$10,704,362)	\$42,624,009
15	2029	\$42,604,317	\$1,147,224	\$51,016,661		0.6419	0.481	0.3624	(\$18,082,347)	\$77,021,009	(\$13,597,698)	\$57,714,761	(\$10,292,047)	\$43,484,053
16	2030	\$46,154,677	\$1,242,826	\$55,360,922		0.6232	0.4581	0.3387	(\$18,027,861)	\$81,066,525	(\$13,306,276)	\$59,590,140	(\$9,891,636)	\$44,058,460
17	2031	\$49,705,037	\$1,338,428	\$59,720,651		0.605	0.4363	0.3166	(\$17,959,957)	\$84,814,047	(\$13,012,932)	\$61,164,246	(\$9,502,803)	\$44,383,681
18	2032	\$53,255,397	\$1,434,030	\$64,096,116		0.5874	0.4155	0.2959	(\$17,883,860)	\$88,293,079	(\$12,718,188)	\$62,454,501	(\$9,124,154)	\$44,477,225
19	2033	\$56,805,756	\$1,529,632	\$68,487,590		0.5703	0.3957	0.2765	(\$17,796,606)	\$91,505,122	(\$12,423,027)	\$63,490,403	(\$8,754,467)	\$44,364,661
20	2034	\$60,356,116	\$1,625,234	\$72,895,347		0.5537	0.3769	0.2584	(\$17,700,509)	\$94,464,717	(\$12,130,855)	\$64,301,520	(\$8,397,800)	\$44,084,672
21	2035	\$63,906,476	\$1,720,836	\$77,319,670		0.5375	0.3589	0.2415	(\$17,592,159)	\$97,168,358	(\$11,836,126)	\$64,881,347	(\$8,052,484)	\$43,657,969
22	2036	\$67,456,836	\$1,816,438	\$81,760,842		0.5219	0.3418	0.2257	(\$17,480,325)	\$99,665,791	(\$11,545,186)	\$65,272,595	(\$7,719,146)	\$43,101,301
23	2037	\$71,007,195	\$1,912,041	\$86,219,152		0.5067	0.3256	0.2109	(\$17,358,230)	\$101,934,477	(\$11,258,646)	\$65,502,004	(\$7,395,464)	\$42,427,435
24	2038	\$74,557,555	\$2,007,643	\$90,694,896		0.4919	0.3101	0.1971	(\$17,227,340)	\$103,986,027	(\$10,972,182)	\$65,554,110	(\$7,084,212)	\$41,666,286
25	2039	\$78,107,915	\$2,103,245	\$95,188,371		0.4776	0.2953	0.1842	(\$17,092,976)	\$105,854,241	(\$10,688,254)	\$65,449,660	(\$6,784,992)	\$40,825,694
26	2040	\$81,658,275	\$2,198,847	\$99,699,879		0.4637	0.2812	0.1722	(\$16,951,052)	\$107,530,672	(\$10,406,797)	\$65,209,456	(\$6,498,174)	\$39,932,676
27	2041	\$85,208,635	\$2,294,449	\$104,229,729		0.4502	0.2678	0.1609	(\$16,803,110)	\$109,027,016	(\$10,130,008)	\$64,854,365	(\$6,219,073)	\$38,965,897
28	2042	\$88,758,994	\$2,390,051	\$108,778,233		0.4371	0.2551	0.1504	(\$16,650,008)	\$110,355,001	(\$9,859,397)	\$64,405,309	(\$5,952,930)	\$37,971,613
29	2043	\$92,309,354	\$2,485,653	\$113,345,707		0.4243	0.2429	0.1406	(\$16,488,055)	\$111,500,105	(\$9,588,124)	\$63,830,722	(\$5,696,928)	\$36,947,713
30	2044	\$95,859,714	\$2,581,255	\$117,932,475		0.412	0.2314	0.1314	(\$16,327,403)	\$112,525,639	(\$9,326,775)	\$63,200,080	(\$5,450,458)	\$35,888,031
31	2045	\$99,410,074	\$2,676,857	\$122,538,863		0.4	0.2204	0.1228	(\$16,160,268)	\$113,389,830	(\$9,068,003)	\$62,477,796	(\$5,213,854)	\$34,810,678
32	2046	\$102,960,433	\$2,772,459	\$127,165,203		0.3883	0.2099	0.1147	(\$15,986,532)	\$114,101,419	(\$8,812,125)	\$61,678,825	(\$4,983,629)	\$33,704,437
33	2047	\$106,510,793	\$2,868,061	\$131,811,832	\$667,357,121	0.377	0.1999	0.1072	(\$15,812,728)	\$366,293,227	(\$8,562,015)	\$194,222,854	(\$4,766,752)	\$104,155,528
TOTALS		\$1,650,917,295	\$44,454,942	\$2,006,892,068	\$667,357,121				(\$2,019,894,484)	\$2,652,012,172	(\$1,828,031,733)	\$1,729,625,220	(\$1,689,395,233)	\$1,164,024,165
3% Discount		\$847,882,010	\$22,831,274		\$251,593,634	\$632,117,688			B/C Ratio:	1.31	B/C Ratio:	0.95	B/C Ratio:	0.69
5% Discount		\$564,295,248	\$15,195,015		\$133,404,688	(\$98,406,513)			NPV:	\$632,117,688	NPV:	(\$98,406,513)	NPV:	(\$525,371,068)
7% Discount		\$386,539,740	\$10,408,518		\$71,540,683	(\$525,371,068)								

**ILLIANA CORRIDOR EXPRESSWAY
BENEFIT-COST ANALYSIS (2013 \$) - APPENDIX 1**

Year	Calendar Year	Capital Costs (Design/Const) ¹	O&M Costs ²	Farm Crops Production Loss Costs ³	Ecological Acreage Loss (Project)	Ecological Value Per Acre	Ecological Land Loss Costs ⁴	Ecological Acreage Loss (Induced Development)	Ecological Value Per Acre	Ecological Land Loss Induced Development Costs ⁴	Auto VMT Increase	VMT Value	Auto VMT Costs ⁵	Heavy Truck VMT Decrease	VMT Value	Heavy Truck VMT Benefits ⁵	
		<p>1. Capital costs include right-of-way (ROW) acquisition, design, engineering and construction during the years 2011-2017 with actual construction occurring during the latter four years. Costs are based on year of expenditure (YOE) data in the 1/24/14 Illinois Department of Transportation (IDOT)/Indiana Department of Transportation (INDOT) Tier II Draft Environmental Impact Statement (DEIS), pages 2-132 and 3-49, Tables 2-26 and 3-10. They reflect an independent August 2013 Cost Estimate Review by FHWA.</p> <p>2. Operating and Maintenance (O&M) cost data is from the 7/31/09 INDOT Illiana Expressway Feasibility Study, Table 10.1, which lists annual maintenance costs \$2.1-2.8M (2008 \$). This estimate excludes period reconstruction/maintenance and toll operations. A mid-level of \$2.45M is used (\$2,651,000 in 2013 \$). A 2002 HNTB report, Missouri Toll Feasibility Study (p. 18), states that estimated Illinois toll operations were about 38% of the total O&M costs (http://modot.org/newsandinfo/documents/Legislative_Toll_Report_8-8-02.pdf). Using this assumption brings the total estimated annual O&M costs to \$4,276,000 in 2013 \$.</p> <p>3. Farm crops production losses are from the 1/24/14 Tier II DEIS, pages 3-131 to 3-132, Tables 3-41, 42 and 43. The three build alternatives show annual cash crop receipt losses of \$2,304,733; \$2,270,466; and \$2,371,547. The annual average of \$2,315,582 is used. Note that these amounts are more than shown in the 1/17/13 Tier I EIS/Record of Decision (ROD), Table 3-1, for alternative B3 which lists a range of \$1.35M-\$1.39M.</p> <p>4. Ecological acreage losses are calculated separately for the land that will be converted for the project itself and for induced development. According to the Tier II DEIS, pages S-15 and 3-126, Tables S-2 and 3-37, a total of 3,035 farm acres will be directly impacted while 5,253 acres will be for induced development (2,885 acres for residential and 2,368 for industrial). 3,035 acres of directly impacted farm land is used which is the average for the three build options (2,993; 2,978; 3,134). An assumption is made that the induced development will increase annually in increments of 175.1 acres per year to reach the year 2047 total of 5,253 acres. Annual cost values used per acre are \$4,141 for land ROW and \$2,761 for induced land development and are based on the Monetization of Environmental Impacts of Roads by Peter Bein, B.C. Ministry of Transportation and Highways (1997)(http://www.geocities.ws/davefergus/Transportation/4CHAP4.htm). Per Table 4.13 of the citation, the 1994 Canadian dollars value of pasture/farmland converted to pavement is \$12,000 and to settlement is \$6,000 per hectare. \$9,000 is used for pavement impact as only about one-half will be pavement and the other half will be ROW/land directly adjacent to pavement (median, ditch). Per http://www.oanda.com/currency/historical-rates/, the July 1994 Canadian/U.S. currency ratio was \$0.7233 which converted to 2013 \$ is \$10,233 (pavement) and \$6,822 (settlement) per hectare in U.S. dollars. One hectare is 2.47105 acres, therefore the value per acre is \$4,141 (pavement) and \$2,761 (settlement)(2013 US \$).</p> <p>5. Vehicle Miles Traveled (VMT) is calculated using the average annual change of +6,746,790 (+11,337,973 for auto; -4,591,183 for truck) and the 2018-2047 cumulative change of +202,403,701 (+340,139,197 for auto; -137,735,496 for truck) from the build scenario over the no-build scenario using data from the Tier II DEIS, page 3-51, Table 3-12. As explained in the related narrative of the Tier II DEIS, the data represents net changes and reflects travel demand modeling for the entire region (counties of Cook, Grundy, Kankakee, La Salle, Will, Lake/IN, La Porte, Porter and other locations in the CMAP area), including traffic entering and exiting this area. An assumption is made that annual auto will increase incrementally by 731,482 and truck VMT will decline incrementally by 296,205. This puts the annual average and cumulative VMT changes very close to the DEIS data in Table 3-12. The 2013 AAA per mile operating costs of average sedans, SUVs, and minivans is \$0.68. This is adjusted downward to include only variable costs, including for depreciation, which brings the cost per mile down to about 26 cents (weighted average for cars, SUVs, and light trucks). A September 2012 American Transportation Research Institute report, "An Analysis of the Operational Costs of Trucking" (http://www.glostone.com/wp-content/uploads/2012/09/ATRI-Operational-Costs-of-Trucking-2012.pdf), states that average carrier costs per mile for heavy trucks in 2011 was \$1.71 (\$1.77 in 2013 \$). The annual auto and truck reduced VMT changes are multiplied by the respective operating costs.</p> <p>Note that the Tier II DEIS does not explain why the travel demand model predicts an increase in auto VMT and a decrease in truck VMT. However, a possible explanation is that the primary purpose and need of the project is to facilitate more efficient heavy truck freight movement. Auto traffic volume is much higher than heavy truck volume. Accordingly, auto traffic may be experiencing a much larger proportion of the induced demand created by the project. Auto drivers on average will take advantage of the opportunity to reach work in the same amount of time but at farther distances. There may be some induced demand by heavy trucks. But it is perhaps more likely being offset by their tendency to seek more direct routes as they service proportionately more fixed origins and destinations than auto drivers.</p> <p>6. Noise: The TRB Transportation Benefit-Cost Analysis web site provides noise impact values per VMT for urban highways from several studies [bca.transportationeconomics.org, referencing: Todd Litman (2010), "Noise," Transportation Cost and Benefit Analysis, Victoria Transport Policy Institute (www.vtpi.org), available at www.vtpi.org/tca/tca0511.pdf]. Even though the highway is of rural design in a rural area, it is appropriate to account for noise as the presumption is that the area will become urbanized. Dollar values for noise impacts in these cited studies show the following ranges per VMT (converted to 2013 \$): heavy trucks (\$0.035-\$0.26); and auto (\$0.001 and \$0.028). Mid-levels of \$0.1475 for trucks and \$0.0145 for autos are used which when calculated by the annual average VMT results in annual noise cost increases for autos of \$164,401 and noise reduction benefits for heavy trucks of \$677,199.</p> <p>7. CO2: The Tier II DEIS states on page 3-177, Table 3-54, that global CO2 emissions are estimated to increase from 29,670 million metric tons (MMT)(29.67B) in 2010 to 45,500 MMT (45.5B) in 2040, a change of 15,830 MMT [(15.83B)(annual growth rate of 1.44%)(per EIA's International Energy Outlook)]. The Tier II DEIS states that the project will increase CO2 by 0.0001 percent (0.000001) of this change by 2040 which is 15,830 MT. Incremental increases of 680 MT are assumed to reach the 15,830 MT figure in 2040. These increases are assumed to continue through 2047. The data is then multiplied for each year by the 2013 \$ social cost of carbon (SCC) values converted from 2007 \$. SCC values are from the TIGER Benefit-Cost Analysis (BCA) Resource Guide (updated 5/22/13) (http://www.dot.gov/sites/dot.dev/files/docs/BCA_OnlineSupplement_May22_2013.pdf). Per the guidance, the CO2 values are only discounted at the 3 percent rate but are also used in the 5 and 7 percent benefit columns as costs.</p>															

ILLIANA CORRIDOR EXPRESSWAY
BENEFIT-COST ANALYSIS (2013 \$) - APPENDIX 1

Year	Calendar Year	Auto Noise Value (per VMT)	Auto Noise Costs ⁶	Truck Noise Value (per VMT)	Truck Noise Benefits ⁶	CO2 Increase (MT)	CO2 Value (per MT)	Undiscounted CO2 Costs @ 3% Avg SCC	NPV CO2 Costs @ 3% Avg SCC [Undisc/(1.03 ^A)] ⁷	NOX Increase (MT)	NOX Value (per MT)	NOX Costs ⁸	PM10 Decrease (per MT)	PM2.5 Decrease (per MT)	PM Value (per MT)	PM Benefits ⁸	
		<p>8. NOX, PM: Values in 2010 dollars from the TIGER BCA Resource Guide are \$7,385 (\$7,890 in 2013 \$) and \$337,858 (\$360,946 in 2013 \$), respectively. Travel demand modeling estimated changes for the build versus the no-build scenarios for NOX, PM10, and PM2.5 in metric tons (MT) are obtained from the Tier II DEIS, Appendix L, Air Quality Technical Report for the year 2040, page 2-3, Table 2-1. Appendix L shows the following increases by 2040 under the build scenario: NOX, 122MT or +3.3% (cumulative increase of 2,465 MT and assuming an incremental annual increase of 5.3 MT); PM10, -4MT or -1.9% (cumulative decrease of 80.87MT and assuming an annual average decrease of 0.173913MT); and PM2.5, <-1MT (assumed -0.66 in 2040) or -0.3% (cumulative decrease of 9.2MT and assuming an annual average decrease of 0.028696MT). Data is unavailable for VOC and SOX. Note that the Tier II DEIS does not provide an explanation of why CO2 and NOX decline while PM2.5 and PM 10 go up. Generally, CO2 increases proportionately to the increased fuel consumption brought about by the project (EPA, Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks, http://www.epa.gov/otaq/consumer/420f08024.pdf). Heavy diesel trucks are generally larger contributors of PM2.5 and PM10 than autos and light trucks (http://www.air-quality.org.uk/26.php). Consequently, the benefits of reduced VMT in terms of lower PM2.5 and PM10 for heavy trucks, appear to be more than compensating for the increased emissions from autos due to higher VMT.</p> <p>9. Travel Time Savings: Page 3-50, Table 3-11 of the Tier II DEIS states that, pursuant to travel demand modeling, cumulative VHT savings for a 30-year period (2018-2047) will be 126,550,629 [auto (93,082,367) plus truck (33,468,262)] and an average annual VHT savings of 4,082,278 [auto (3,002,657) and truck (1,079,621)]. Incremental annual change assumptions for VHT are 195,000 for auto and 70,000 to replicate these figures. Note that when the Phase II EIS annual average is multiplied by 30 years that the amount of VHT savings through 2040 is 93,892,394. The TIGER BCA Resource Guide uses 2009 dollars to depict hourly values of time for all purposes (personal and business) for both local (\$12.50) and intercity (\$18.00) travel. The average is \$15.25 which is \$16.56 in 2013 dollars. The guide shows hourly truck travel time value as \$24.70 which is \$26.82 in 2013\$.</p> <p>Property Value Increases: U.S. Department of Agriculture, Census of Agriculture 2012 data was used for the average estimated market value (EMV) of farmland for land and buildings that will be developed due to the project apart from the Illiana right-of-way. These values per acre are \$7,832 for Will County, IL; \$6,612 for Kankakee County, IL and \$5,673 for Lake County, IN. An average EMV of \$6,706 per acre is used as a baseline without project implementation. The total residential and industrial acreage expected to be developed as a result of the project is 5,253 [(2,885 +2,368) from no. 4 above (Tier II DEIS)]. Multiplied by \$6,706 the base total EMV of this property is \$35,226,618. A real estate evaluation was conducted in an attempt to identify the EMV for residential and industrial land expected to be developed with project implementation (prior to any investment). This was conducted by collecting assessment, sales and/or Zillow.com information for a total of 12 randomly selected parcels of property located about 1,000 to 30,000 feet from either I-57 or I-65 (comparable to proposed Illiana form of 4 lanes, limited access) in Will and Lake Counties, respectively (6 residential and 6 industrial). From this analysis, the average EMV for these properties with project implementation and without improvements per acre is \$35,700 for residential and \$41,400 for industrial. The average EMV increase per acre for residential and industrial is \$28,994 (\$35,700-\$6,706) and \$34,694 (\$41,400-\$6,706). The total EMV improvement for land due to the project and anticipated development is \$165,803,082 (\$28,994 X 2,885 = \$83,647,690 for residential and \$34,694 X 2,368 = \$82,155,392 for industrial). This is a total average property value increase of 470 percent. The 2013 USDOT TIGER BCA Guidance states the following: 1) The benefit of any property value increase can only be considered as a one-time stock benefit and cannot be treated as a stream of benefits accruing annually; 2) It cannot include any investment by developers; 3) Other benefits to land value already counted, such as travel time savings, must also be netted out. The total discounted monetary travel time benefits for auto and heavy truck together is as follows for the noted discount rates: \$1,219,536,764 (3%); \$811,644,536 (5%); and \$555,972,904 (7%). Consequently, there is no net benefit from property value increases at the 3%, 5% or 7% discount rates that isn't already counted due to travel time savings.</p> <p>10. Accident Reduction Benefits: According to the Tier II DEIS (page 2-90), it is estimated that the build scenario would result in a reduction of 642 vehicle crashes annually in 2040. According to the Minnesota Department of Transportation Benefit-Cost Analysis for Transportation Projects (http://www.dot.state.mn.us/planning/program/benefitcost.html), "It is important to remember that all numbers (VHT, VMT, number of crashes, etc.) are needed for each year in the study timeframe. VHT, VMT, and crash data are often generated only for one or two years (e.g., base year and final year of analysis) of the study timeframe and these results are then interpolated/extrapolated for other years in the analysis timeframe." Accordingly, the ratio of accidents reduced in 2040 divided by VMT change for that year is 0.00006412708. This ratio is used to determine a beginning year 2018 accident reduction of 27.913 which is used to estimate the incremental number of accidents to 642 in 2040. The result is a cumulative 30-year accident reduction of 12,980. Illinois and Indiana crash statistics for the year 2011 show the following combined totals in 2011 for the 10-county region: 215,524 crashes; 445 deaths; and 60,644 injuries (2011 Illinois Crash Facts, page 26, http://www.dot.state.il.us/travelstats/2011CF.pdf; 2011 Indiana Crash Facts, Table 92, page 120, http://www.in.gov/cji/files/T_Fact_Book_2011.pdf). The ratio of injuries per accident is about 0.281 (1 injury per 3.55 accidents). The ratio of deaths per accident is about 0.0021 (1 death every 484 accidents). According to the TIGER Resource Guide the value of a statistical life is \$9.1M in 2012 \$ (\$9,233,293 in 2013 \$) with annual increases of 1.18 percent. Multiplied by the 2011 crash/death ratio by VSL results in a savings of about 27 (27.258) lives for the period 2018-2047.</p> <p>The estimates of injuries and their severity is based on the TIGER BCA guidance, Section 3. Accordingly, the data on number of accidents reduced is converted to the Abbreviated Injury Scale (AIS) to determine estimated level of injury by severity rates (none, minor, moderate, serious, severe, critical) . The number of non-fatal accidents probability values in Table 4, column 8 on page 13 of the guidance are multiplied by the AIS unit value levels on page 3 of the guidance and then multiplied by the number of accidents. The resulting undiscounted average annual benefit from injury reductions is \$54,227,293. The value of property damage only (PDO) per vehicle crash is \$3,206 in 2010 \$ (\$3,425 in 2013 \$). This multiplied by the annual accident savings of 426 is an annual benefit of \$1,460,215. The grand total average annual accident reduction benefits for deaths, injuries and PDO is \$63,815,745.</p> <p>11. The expected life of the different Project elements were obtained from the INDOT 2003-2032 Indiana Statewide Long-Range Transportation Plan, Residual Value of Investments section [(p. 2-5)(http://www.in.gov/indot/files/Elreport.pdf)]. As a result, the assumptions below are made with Illiana on the original capital costs (totaling \$1.509 million), expected life based on the 30-year analysis period to determine residual value. The total undiscounted residual value of the</p> <ul style="list-style-type: none"> • ROW, \$96 million, infinite life, or \$96 million; • Earth Work, \$375 million, 100 years life, or \$262.5 million; • Structural, \$313 million, 70 years life, or \$178.8 million; • Road Base, \$325 million, 50 years life, or \$172.3 million; • Road Surface, \$400 million, 30 years life, or 0. 															

ILLIANA CORRIDOR EXPRESSWAY
BENEFIT-COST ANALYSIS - APPENDIX 2
PROPERTY MARKET ANALYSIS

County	Distance to I-57 or I-65 (Feet)	Address	PIN	Acres	Use	Sales Price	Sales Year	2012 Assessment Land	2012 Assessment Building	2012 Assessment Total	Zillow Value Estimate (R); FMV/Assess (I)	Parcel Land Value Estimate	Land Value Estimate Per Acre
Will	1,000	8912 W Cty Line Rd, Peotone	1720344000100000	2.45	Res.	\$152,000	08/02/94	\$18,806	\$50,518	\$69,324	\$222,557	\$60,375	\$24,643
Will	1,200	818 Oriole Drive, Peotone	1720261030160000	0.18	Res.	\$263,500	07/02/07	\$6,905	\$55,671	\$62,576	\$162,123	\$17,890	\$97,409
Will	1,600	6423 W. Spruce Ct, Monee	2114302030140000	2.53	Res.	\$305,121	01/31/14	\$15,089	\$76,352	\$91,441	\$348,362	\$57,484	\$22,764
Lake	3,700	17550 Mississippi St, Hebron	452022200015000000	5.00	Res.	NA	NA	\$29,700	\$191,000	\$220,700	\$214,223	\$28,828	\$5,766
Lake	3,200	17219 Utah St, Hebron	452013377004000000	1.20	Res.	NA	NA	\$21,500	\$166,600	\$188,100	\$227,325	\$25,983	\$21,653
Lake	14,000	17956 Buchanan St, Lowell	452021353003000000	0.82	Res.	NA	10/13/94	\$30,700	\$131,500	\$162,200	\$181,619	\$34,375	\$41,921
AVERAGE LAND VALUE PER ACRE RESIDENTIAL													\$35,693
Will	1,300	26200 Whiting Way, Monee	2114204010100000	2.54	Ind.	\$515,600	08/01/00	\$42,333	\$328,300	\$370,633	\$1,111,899	\$126,999	\$50,000
Will	1,300	Whiting Way, Monee	2114204010050000	6.34	Ind.	\$6,314,238	07/01/00	\$105,000	\$0	\$105,000	\$315,000	\$315,000	\$49,685
Will	1,300	Whiting Way, Monee	2114204010070000	2.16	Ind.	\$4,450,000	10/01/06	\$36,000	\$508,500	\$544,500	\$1,633,500	\$108,000	\$50,000
Will	1,600	26113 S RdgInd Ave, Monee	2114203040020000	2.20	Ind.	NA	NA	\$28,000	\$151,942	\$179,942	\$539,826	\$84,000	\$38,264
Lake	28,512	101 W Oakley St, Lowell	451926131006000000	14.66	Ind.	NA	NA	\$452,200	\$134,100	\$586,300	\$586,300	\$452,200	\$30,846
Lake	4,500	1300 E181st St, Lowell	452022477003000000	19.45	Ind.	NA	NA	\$575,700	\$3,633,700	\$4,209,400	\$4,209,400	\$575,700	\$29,599
AVERAGE LAND VALUE PER ACRE INDUSTRIAL													\$41,399

Notes:

- 1) Assessed value of land and improvements in Will County, IL are generally one-third of estimated market value (EMV). Assessed values in Lake County, IN are the same as EMV.
- 2) Residential property values are from zillow.com. Parcel land value estimates are based on the proportion of assessed value on land multiplied by the Zillow estimate.
- 3) Industrial property values, including the underlying land and building improvements, are based on the assessed values.