Chicago Eisenhower Expressway Reconstruction and Expansion Benefit-Cost Analysis

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Introduction

On December 31, 2016, the Illinois Department of Transportation (IDOT) released for public comment the proposed I-290 Eisenhower Expressway Reconstruction and Expansion Project (proposed Project) draft environmental impact statement (DEIS). The undertaking extends about 13 miles from Racine Avenue to west of Mannheim Road, traversing the Illinois municipalities of Chicago, Oak Park, Forest Park, Maywood, Broadview, Westchester, Bellwood and Hillside (IDOT, 2016). Benefit-cost analysis (BCA) is conducted to determine practicality using monetary values determined by market, stated preference, and revealed preference studies. Discount rates of 3, 5 and 7 percent are used in a comprehensive BCA with more than 20 monetized elements in addition to a conventional method with about one-half this number (2016 \$, 35-year useful life). Results are presented in the form of net present values (NPV) and benefit cost ratios. The contrasting outcomes demonstrate the importance of thoroughness, transparency, and support for the value assumptions to accurately inform decisionmakers.

Economic/Econometric Models

Highway expansion projects are typically proposed to relieve congestion while reducing travel time and accidents. Viability can be estimated using travel demand models and BCA. As discussed by Litman (2017a), increased roadway capacity often induces additional travel as some trips previously foregone at the margin become advantageous for some individuals. This is due to an increase in the good of roadway capacity without an increase in price. Congestion often will return in the long-run resulting in conditions similar to or worse than the original problem. In turn, environmental impacts such as air emissions and fuel consumption, which initially might be reduced in the short-run, may increase above original levels. BCA is beneficial in determining the best alternative to address this dilemma and maximize economic efficiency (Litman, 2017a).

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BCA is typically conducted using a discount rate(s) to put current and future benefits and costs into a shared form by means of various software products (Transportation Research Board, 2017). As outlined by Weisbrod et al. (2009), transportation project sponsors have traditionally monetized some of the benefits in terms of direct effects such as travel time savings, reduced accidents, and lower operating costs when using BCA. However, there often is not consideration given to potential values for indirect effects or impacts to human health and the environment. More specifically, these consist of human mortality/morbidity (non-accidents), and the quality of air, water, aesthetics, land and noise levels. Others are broader social goals such as conservation of natural resources and environmental justice. This may be due to confusion caused by the collection of methodologies available to calculate such values and concerns with double-counting. Further, funding programs may require differing approaches such as cost-effectiveness analysis, selective criteria analysis, or financial impact analysis (Weisbrod et al., 2009).

Linear regression econometric models can be used in concert with BCA to determine the predicted impacts of the proposed Project on dependent variables (DVs) such as criteria air pollutants, employment, travel time, accidents and income. This can be done via elasticities established by past research or in newly developed models utilizing various independent variables (IVs). For example, as discussed by Litman (2017b), the long-run price elasticity of automobile travel demand that can be used is -0.3 meaning that a 1 percent increase in fuel price such as emission charges will reduce vehicle miles traveled (VMT) 0.3 percent. In turn, air emissions reductions can be calculated at the rate of about 14-35 percent per 1-7 percent VMT reduction (Litman, 2017b). Alternatively, a new model can be developed from U.S. metropolitan statistical area data using IVs of population density, fuel price, and household income to predict estimates for the DV of VMT. Air emissions can then be estimated in similar fashion. Elasticities

from existing research can be used in the BCA spreadsheet for purposes of sensitivity analysis to determine whether variations in the assumptions will have substantive impacts on the BCA outcome.

Data Collection Techniques

According to Weisbrod et al. (2009), analytical quantification techniques consist of those outlining loss avoidances in terms of damage, prevention or control costs. Benefits can also be shown in terms of value gains through observed behavior (revealed preferences), contingent valuation (CV)(stated preferences), and expected growth to income. Regional economic impact and simulation or forecasting models have characteristics of revealed preference modeling using regression analysis through associations of observed land development form with localized metrics of agglomeration, multimodalism and market access. CV uses surveys of the public to determine willingness to pay (WTP) for improved transportation amenities and environmental quality, particularly values for clean air and water and undeveloped land. CV can also uncover stated values for pain, sorrow, and impaired quality of life. These are influenced by actual medical, legal and insurance costs which can vary geographically (Weisbrod et al., 2009).

According to the U.S. Environmental Protection Agency (USEPA, 2010), revealed preference methods are based on data obtained from observations of real choices. Various types include production or cost functions, travel cost models, hedonic models, averting behavior models, and cost of illness. The upside of revealed preference techniques is valuations are based on actual behavior. Their downside is that they cannot estimate non-use values such as those related to biological diversity. Stated preference techniques are surveys conducted to obtain responses to hypothetical scenarios. Their advantages are the development of non-use values based on situations comparable to actual policies. The downside is general bias that can be

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complicated to address. Revealed preference and stated preference methods can be combined by pooling data, using a jointly estimated mixed model, or by using both separately and testing for convergent validity between them (i.e., related and measuring the same thing). Alternative approaches consist of break-even analysis and bounding analysis (range value may be in) which can be useful if valuation estimates are not possible. However, they cannot be used in determining policy that is economically efficient (USEPA, 2010).

According to Maibach et al. (2008), measures of market price can be used to quantify effects in terms of losses or compensation if such resource costs are available. A revealed preferences example is hedonic pricing using the estimation of noise costs based upon home locational sales price differences or stated preferences. Environmental effects costing such as for habitat losses and long-term risks requires the use of alternative risk scenarios. Perhaps the best technique is the impact pathway approach (IPA) which uses a dose-response function or alternately the avoidance cost approach to quantify effects on human health and the environment. WTP for an improvement or alternatively willingness to accept compensation for nonimprovement can be used. Building damage from air pollution can be quantified using repair costs. IPA can be used for impacts to nature by quantifying crop losses at factor costs or using the compensation cost approach determined by actual repair costs. Climate change valuation can be addressed through the avoidance cost approach as determined by greenhouse gas avoidance costs, shadow prices of emissions trading, or costs for damages (Maibach et al., 2008).

Commonly accepted monetized values or value ranges have been assembled by transportation experts based upon meta-analysis. Of note, is the U.S. Department of Transportation's (USDOT) TIGER Benefit-Cost Analysis Resource Guide which provides support to applicants for the Transportation Investments Generating Economic Recovery funding (USDOT, 2016). Another is Victoria Transport Policy Institute's (VTPI) Transportation Benefit and Cost Techniques/Cost Analysis Spreadsheet and supporting documentation (Litman, 2016). <u>Vehicle Miles Traveled Costs</u>

Predicted VMT data are from the IDOT Draft Environmental Impact Statement (DEIS) Summary, Table S-2. VMT estimates, either directly or indirectly, are a factor in determining most of the benefits and costs for each of the measured criteria in the analysis of the proposed Project. Of note is that the DEIS with the proposed Project shows a small reduction of -8,853 in 2040 daily VMT in the study area, however, regional daily VMT increases by 52,211 (IDOT, 2016). Respective auto and heavy truck VMT operating cost unit values of \$0.27 (AAA, 2016) and \$1.83 (American Transportation Research Institute, 2012) are in *Appendix Table 1* along with all others used in the BCA. Research shows that personal vehicular travel is underpriced by up to 30 percent or more (Litman, 2011). Therefore, a conservative assumption is made in the comprehensive BCA of a \$0.50 fuel surcharge regionwide to measure the effect on economic efficiency as measured by NPV. The price elasticity of travel demand assumed in the BCA is -.2.

The aforementioned fuel price elasticity of travel demand is tested by conducting cross sectional linear regression (data in *Attachment 1*) on 2015 per capita VMT for the 50 largest U.S. urbanized areas against the average annual gasoline prices (Gas Buddy, n.d.) while controlling for a combined variable of weighted population density (Wilson et al., 2012) multiplied by per capita personal income (Bureau of Economic Analysis, n.d.). The results are in *Appendix Figure 1* and show that the model is strong in terms of the R^2 , F, and *Significance F* values. The controlling variable is statistically significant. A 1 percent increase in gas price can be expected to decrease per capita VMT by 0.1 percent. This price elasticity of demand is about the same as the empirical short-run citation, yet, it is not statistically significant based on the *t Stat* and *P-value*.

Opportunity Costs-Linear Park Construction

The estimated total capital costs of the proposed Project are about \$2,332.9 million according to the IDOT DEIS (IDOT, 2016). This cost is reduced in the BCA by the opportunity costs of removing I-290 and constructing an alternative project of a linear park with bicycle and pedestrian pathways. These alternate costs are from market-based rates of comparable projects. Locational differences could affect their reliability. Road removal costs are about \$31.4 million for excavation of lane pavement, replacement of topsoil, and debris disposal (EDR Companies, 2011). Estimated costs for building one pedestrian and one bicycle 13-mile granular linear pathway are about \$1.5 million (Northwestern Indiana Regional Planning Commission, 2010). Thus, the total linear park alternative capital costs are about \$32.9 million and subtracted from the I-290 capital costs resulting in a discounted range of \$1,827.0-\$2,076.5 million. Of note is that a third option of removing the thruway and restoring the street grid might cost about 93 percent of the full I-290 renewal cost based on the Syracuse, New York I-80 urban expressway cost analysis (N.Y. Department of Transportation, 2017). The implications of the linear park option are that the costs are comparatively small to I-290 retention.

Ecological Costs

Ecological impacts are opportunity costs for the value of I-290 land that could be converted back to a natural state from existing concrete. Bein (1997) provides values for categories of land using shadow pricing or estimates given the absence of a market. These are based on revealed preferences and stated preference surveys of wetlands, biodiversity, open space and recreation from several cited studies. One such stated preference study includes use and non-use values (such as bequest, option and existence) totaling \$653 per acre for increasing the acreage of Colorado wilderness by 50 percent (Walsh et al., 1984). Similarly, another cited

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use/non-use contingent valuation study resulted in a value of \$7,836 for one acre of riparian habitat in the Pacific Northwest (Buchanan, 1986).

Bein (1997) cites other revealed preference and stated preference studies that do not consider values for non-use, intangibles, or indirect economic benefits. However, the order of magnitude differences in values by land use type are useful. Bein (1997) summarizes these with a matrix of lower bound value estimates based on conversions between different land categories. Accordingly, the ecological costs value of converting the 236 acres of I-290 to the linear park are \$11,440 per acre and equate to a total discounted value range of about \$36.2-\$63.2 million. Note that value is higher than if the land were simply converted to farmland or road buffer but lower than if it transitioned to wetlands (Bein, 1997). This presumably is due to the higher value of greenspace in dense urban locations where such land is rare and accessible to large numbers of people. The implications of these ecological costs are that they are a very small part of the opportunity costs and not extensive compared to the travel time savings of implementing the proposed Project. Reliability of the values is moderate as there is a wide range of them in the different surveys.

Noise Costs

The Transportation Research Board (TRB) BCA web site provides noise impact values per VMT for urban highways from several studies. The research mainly uses the revealed preference methodology of hedonic pricing by documenting the change in home property values near traffic noise. Dollar values for noise impacts per VMT derived from these cited studies are in the following ranges: heavy trucks (\$0.037-\$0.27); and auto (\$0.001-\$0.029)(TRB, n.d.). Mid-ranges are used in the BCA. An alternate method is CV. However, stated preferences data may not have the same accuracy as they are not based on actual human decisions.

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The noise values from the TRB (n.d.), based on cited revealed preference or hedonic pricing method of home values near expressways, multiplied against the VMT changes from the proposed Project for cars and heavy trucks result in a total discounted cost range of \$1,067.9-\$1,896.8 million. The implications of these noise costs are that they depress housing values (Lu, 2011). Yet, the extent is a relatively small part of both the overall opportunity costs and the travel time savings of executing the proposed Project. Delucchi and Hsu (1996) find that in the U.S. the total annual external noise costs from motor vehicle usage could range widely from \$176-\$74,400 million but likely does not exceed \$8,800 million. This is due to doubts about appropriate decibel levels to assign costs, noise attenuation from various urban features, interest rate, vehicle speeds, and noise costs outside of houses (Delucchi & Hsu, 1996).

Emissions Costs

Per the USDOT (2016), social cost of carbon (CO₂) values increase by year and range from \$44-88 per metric ton (MT). The CO₂ values are only discounted at the 3 percent rate but are also used in the 5 and 7 percent BCA columns. Respective nitrous oxide (NO_X), particulate matter (PM), volatile organic compounds (VOC) values are \$7,389; \$338,031; and \$1,696 per MT (USDOT, 2016). These are based upon values the USDOT (2016) derived from a metaanalysis by USEPA of stated preferences, revealed preferences, and market cost studies related to the value of a statistical life based upon WTP to avoid health impacts (USEPA, n.d., 2011).

The CO₂, NO_x, PM₁₀, PM_{2.5} and VOC combined discounted emissions costs are \$2,399.7-\$2,807.0 million. The implications are that by building the proposed Project an opportunity would be lost to reduce carbon and the other harmful emissions that contribute to global warming, and human health/environmental degradation. Per Delucchi (2000), there is a fair level of uncertainty in the literature on cost analyses of motor vehicle usage. However, it is

generally agreed that there are higher risks from particulate emissions to human health/mortality as opposed to their impacts on forests, crops and other plant life (Delucchi, 2000). There is also consensus that the danger to human health is also significantly more severe than from noise, water pollution, and climate change (Delucchi, 2000). The risk from accruing carbon is potentially catastrophic to future generations but consensus is lacking on the likelihood that man's contributions will result in such a disaster (Tol, 2005).

Resource Consumption Costs

The VTPI Transportation Cost and Benefit Analysis web site provides substantial details on numerous monetized costs based on cited studies. Resource consumption costs are external costs of transport resource production (primarily petroleum). These include military security costs for foreign oil, environmental damages from oil extraction, oil company tax subsidies, and human health risks from injuries and pollution during extraction. Values derived from the VTPI Transportation Cost Analysis Spreadsheet for average travel by vehicle type are: auto \$0.045; light truck/van \$0.058; and diesel bus \$0.226. They are based on a multitude of studies that include: stated preferences via WTP to pay for oil spill cleanup and various compilations of identified direct/indirect government support to the energy industry (VTPI, 2009). A revealed preferences alternative that could be considered is analysis of data on consumer purchases of personal vehicles. This is based upon the WTP to pay more for an eco-friendly vehicle or one with higher miles per gallon (mpg) as opposed to conventional vehicles with low mpg ratings.

Based on the VTPI data, the combined car and truck resource consumption costs due to the proposed Project are a discounted range of about \$2,700.3-\$4,796.2 million. The implications are that the undertaking would exacerbate regional dependence on fossil fuels through induced traffic/incentivizing trips by failing to privatize social costs of congestion and underpriced/

subsidized fuel. Yet, the costs are relatively small and there is disagreement on the level of subsidies, if any, to motor-vehicle fuel (Delucchi & Murphy, 2008).

Other Elements

The element of human health is grounded on the concept that the amount of automobile travel or car accessibility/dependency has an impact on the level of exercise and cardiovascular well-being. Based upon three studies cited by Gotschi (2011), the annual medical care value for the cost of an inactive person and totally car-dependent is \$610. One of the studies estimated costs by associating a national health survey with a medical expenditure survey. Another was a cross-sectional stratified study with a medical expenditure survey. The third was a meta-analysis of scientific literature (Gotschi, 2011). These methods are legitimate approaches to estimating inactivity health costs subject to the accuracy of collected data. *Appendix Table 1* provides a summary for all the aforementioned environmental elements in addition to others used along with the unit values and supporting sources. A spreadsheet is provided for the complete BCA and includes more details on the assumptions, values and methodologies (*Attachment 1*).

<u>Results</u>

As shown in *Appendix Table 2* for the comprehensive BCA, at all three discount rates the net present values (NPVs) of the proposed Project are substantially negative and range from (\$58,368.9) to (\$34,417.1) million. Benefit-cost ratios range from 0.27 to 0.26. The benefits accrue predominantly from the travel time savings. The main drawbacks are the opportunity costs of not removing the 13-mile I-290 facility, implementing a \$0.50 per fuel gallon pricing surcharge on regional travel, and replacing the facility with a linear park. Specific underlying costs in order of magnitude come from increases in the following: VMT; health degradation;

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parking requirements; accidents; usage of non-renewable fuels; emissions; project capital; violent crime; noise; barrier effects; lack of transport diversity; and ecological impacts.

Cost effectiveness analysis at the mid-range 5 percent discount rate shows capital expenditures of about \$1,945.6 million to achieve the expected outcomes listed in *Appendix Table 3*. It takes less than \$1 in capital for a one-hour reduction in vehicle hours traveled (VHT). However, the amount of capital costs linked to increasing accidents, deaths and violent crime each by 1 unit is substantial. Sensitivity analysis was conducted to estimate changes in NPVs and benefit-cost ratios based upon variations in assumptions, including fuel price elasticity of travel demand and removal of several monetary elements. The results in *Appendix Table 4* show that the comprehensive BCA is not substantially impacted by these scenarios. The exception is a conventional BCA that does not consider the more inclusive opportunity costs. This alternate BCA method removes the following elements: pricing, park capital, ecological, violent crime, parking, resource consumption, health, barrier effects, and transport diversity. The results are ranges in NPV from \$10,648.3 to \$20,436.4 million and benefit-cost ratios from 6.43 to 9.88. <u>Conclusion</u>

The proposed Project rates poorly in comprehensive BCA due to the transport demand management (TDM) strategy of regional pricing and robust accounting for social costs, which brings into question the perceived need to rebuild/expand capacity of I-290. Conversely, the undertaking fares very well in the conventional BCA as many costs are not privatized. The analysis reveals the challenge in rational project selection when full accounting is not provided for all externalities. Caution is in order as the focus of BCA is on economic efficiency as opposed to economic impacts, there are substantive valuation uncertainties, the analysis may not address other social objectives such as equity, and it does not consider public transport impacts.

<u>Appendix</u>

Figure 1: Log-Log of 2015 Per Capita Vehicle Miles Traveled on Average Annual Gas Prices and Controlling for Weighted Population Density and Per Capita Income - 50 Largest U.S. Regions

SUMMARY OUTPU	Т							
Regression Sta	itistics							
Multiple R	0.734979							
R Square	0.540194							
Adjusted R Square	0.520628							
Standard Error 0.06402								
Observations 50								
ANOVA								
	df	SS	MS	F	ignificance	F		
Regression	2	0.226359	0.11318	27.60856	1.18E-08			
Residual	47	0.192674	0.004099					
Total	49	0.419033						
	Coefficients	andard Erro	t Stat	P-value	Lower 95%	Upper 95%	ower 95.0%	lpper 95.0%
Intercept 5.81505		0.264406	21.99287	2.21E-26	5.283138	6.346972	5.283138	6.346972
GASPRI15 log	-0.1	0.190231	-0.52569	0.601578	-0.4827	0.282693	-0.4827	0.282693
(PCPI15*WPD)LOG	-0.21737	0.035375	-6.14462	1.63E-07	-0.28853	-0.1462	-0.28853	-0.1462

Table 1: Unit Values and Sources Summary

Element	Val	ues*	Source
VMT	\$0.27 per VMT auto	\$1.83 per VMT truck	AAA, 2016; ATRI, 2012
Land/Ecological	\$2,615 per acre		Bein, 1997
Noise	\$0.015 per VMT auto	\$0.15 per VMT truck	TRB, n.d.
NOX	\$7,389 per MT		USDOT, 2016
PM	\$338,031 per MT		USDOT, 2016
CO2	\$48-\$88 per MT		USDOT, 2016
Resource Consumption	\$0.23		VTPI, 2009
Parking	\$0.144 per VMT		VTPI, 2009
Human Health	\$0.11 per VMT internal	\$0.11 per VMT external	Gotschi, 2011
Barrier Effect	\$0.02 per VMT auto	\$0.03 per VMT truck	VTPI, 2009
Transport Diversity	\$0.008 per VMT		VTPI, 2009
VHT/Time	\$14.36 per hour auto	\$27.80 per hour truck	USDOT, 2016
Statistical Life	\$9.78 million		USDOT, 2016
Injuries	\$10,714 per accident		USDOT, 2016
Property Damage	\$3,547 per accident		USDOT, 2016
Violent Crime	\$293,191 per incident		Arkell, 2016; McCollister, 2010
Construction	\$2.3 billion		IDOT,2016
Const. (park opp. costs)	\$32.9 million		NIRPC, 2010
O&M	\$1.0 million per year		WTFPC, n.d.; HNTB, 2002
O&M (park opp. costs)	\$1.92 million per year		NRPA, 2013; EDR Cos., 2011
Residual	To be determined		

* All values in 2016 U.S. dollars. MT = metric ton. O&M = operating and maintenance. AAA= American Automobile Association. ATRI=American Transportation Research Institute. NIRPC=Northwestern Indiana Regional Planning Commission. WTFPC=Wisconsin Transportation Finance and Policy Commission. NRPA=National Recreation and Park Association.

Appendix

Table 2: I-290 Eisenhower Expressway System Benefit-Cost Analysis Summary (2016 \$ in
millions; numbers may not add exactly due to rounding)

DISCOUNTED COSTS	3%	5%	7%
Capital	(\$2,076.5)	(\$1,945.6)	(\$1,827.1)
Ecological	(\$63.2)	(\$46.7)	(\$36.2)
VMT Increase – Auto	(\$19,324.8)	(\$14,153.9)	(\$10,880.1)
VMT Increase – Heavy Truck	(\$9,858.6)	(\$7,220.7)	(\$5,550.5)
Noise – Auto	(\$1,073.6)	(\$786.3)	(\$604.4)
Noise – Heavy Truck	(\$823.2)	(\$602.9)	(\$463.5)
CO ₂ Increase (3% only discount)	(\$1,875.4)	(\$1,875.4)	(\$1,875.4)
NO _X Increase	(\$477.1)	(\$349.5)	(\$268.6)
PM Increase	(\$346.7)	(\$253.7)	(\$194.9)
VOC Increase	(\$107.8)	(\$78.9)	(\$60.7)
Resource Consumption	(\$4,796.2)	(\$3,512.8)	(\$2,700.3)
Parking	(\$10,306.5)	(\$7,548.7)	(\$5,802.7)
Health – Internal	(\$7,873.1)	(\$5,766.4)	(\$4,433.6)
Health – External	(\$7,873.1)	(\$5,766.4)	(\$4,433.6)
Barrier Effect	(\$1,290.6)	(\$945.3)	(\$726.6)
Transport Diversity Loss	(\$572.6)	(\$419.4)	(\$322.4)
Fatalities Increased	(\$6,549.2)	(\$4,796.7)	(\$3,687.2)
Injuries Increased	(\$2,139.3)	(\$1,566.8)	(\$1,204.4)
Property Damage Increased	(\$708.2)	(\$518.7)	(\$398.7)
Violent Crime Increase	(\$2,162.9)	(\$1,570.3)	(\$1,197.9)
TOTAL DISCOUNTED COSTS	(\$80,298.4)	(\$59,725.1)	(\$46,666.8)
DISCOUNTED BENEFITS	3%	5%	7%
Vehicle Hours Traveled – Auto	\$19,126.5	\$13,949.6	\$10,685.1
Vehicle Hours Traveled – Heavy			
Truck	\$2,787.0	\$2,032.7	\$1,557.0
Operating & Maintenance	\$16.1	\$10.9	\$7.7
Value of Existing ROW(undiscounted)			
(opportunity costs negates)	\$0	\$0	\$0
TOTAL DISCOUNTED BENEFITS	\$21,929.6	\$15,993.2	\$12,249.7
NET PRESENT VALUE	(\$58,368.9)	(\$43,731.9)	(\$34,417.1)
BENEFIT-COST RATIO	0.27	0.27	0.26

Table 3: Table 2 I-90 Eisenhower Expressway Reconstruction/Expansion Project Cost-Effectiveness Summary (2016 \$)

	I-290 Proj	ect Alone	Net with Oppor	rtunity Costs
	Total Reduction or		Total Reduction	
Metric	Increase	Cost for One	or Increase	Cost for One
VHT Reduced	-24,609,729	\$79.05	-2,345,808,911	\$0.83
Accidents	-12,102	\$160,762	+317,842	\$6,121
Deaths	-41	\$47,452,458	+1,190	\$1,634,958
Violent Crime			+13,314	\$146,132

Table 4: Sensitivity Analysis (2016 \$ in millions)

	3%	/o	5%	/o	79	%							
Change	NPV	B/C Ratio	NPV	B/C Ratio	NPV	B/C Ratio							
No Change	(\$58,368.9)	0.27	(\$43,731.9)	0.27	(\$34,417.1)	0.26							
Removal of n	oise, all emission	ns, and resource	e consumption co	sts									
	(\$48,868.9)	0.31	(\$36,272.3)	0.31	(\$28,249.2)	0.30							
Removal of h	ealth impacts.												
	(\$42,622.8)	0.34	(\$32,191.1)	0.33	(\$25,551.9)	0.32							
Removal of la	oval of linear park and trail opportunity costs												
	(\$58,335.4)	0.27	(\$43,713.0)	0.27	(\$34,407.1)	0.26							
Removal of v	iolent crime cost	S											
	(\$56,206.0)	0.28	(\$42,161.6)	0.28	(\$33,219.2)	0.27							
Assumed cap	ital costs change	25											
+25%	(\$58,887.9)	0.27	(\$44,218.3)	0.27	(\$34,873.9)	0.26							
+50%	(\$59,407.1)	0.27	(\$44,704.6)	0.27	(\$35,330.6)	0.26							
Conventiona	l BCA analysis												
	\$20,436.4	9.88	\$14,396.1	7.80	\$10,648.3	6.43							
Assumed fuel	price elasticity of	of travel demand	d change from -0	.2 to -0.1									
	(\$24,879.6)	0.47	(\$18,983.6)	0.46	(\$15,303.0)	0.45							
Assumed fuel	price elasticity of	of travel deman	d change from -0	.2 to -0.3									
	(\$91,858.2)	0.19	(\$68,480.1)	0.19	(\$53,631.2)	0.19							

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		Capital Opportunity			O&M Opportunity	I-290 HOT 3+ 0&M					Ecological		Ecological Land				Chicago UZA
	Capital Costs I-290 HOT	Costs under Park/Trail	Capital Costs I-290		Costs under	Benefits	Farm Crops	Ecological	Ecological		Acreage Loss	Ecological	Loss Induced	Chicago UZA			Estimated Per
Calendar	3+ Alternative ¹	Alternative ¹	HOT3+ Alternative Net ¹	O&M Costs I-290	Park/Trail	Considering	Production Loss	Acreage Loss	Value Per	Ecological Land	Induced	Value Per	Development	Estimated	Chicago UZA Estimated	Study Area AVMT-No	Capita VMT-No
Tear ≻	(Design/Const)	(Design/Const)	(Design/Const)	HOT +3 Alternative	Alternative	Opportunity Costs ²	Costs ³	(Pavement)	Acre	Opportunity Costs ⁴	Development	Acre	Costs ⁴	Population	AVMT-No Build	Build	Build
1 2020	-\$388,397,782	\$5,490,620	(\$382,907,162)				\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	8,918,104	68,340,988,926	1,458,622,687	7,663
2 2021	-\$388,809,959	\$5,490,620	(\$383,319,339)				\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	8,950,209	68,587,016,486	1,463,873,729	7,663
3 2022	-\$388,942,219	\$5,490,620	(\$383,451,599)				\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	8,982,430	68,833,929,745	1,469,143,674	7,663
4 2023	-\$388,985,654	\$5,490,620	(\$383,495,034)				\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,014,767	69,081,731,893	1,474,432,592	7,663
5 2024	-\$388,942,861	\$5,490,620	(\$383,452,241)				\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,047,220	69,330,426,127	1,479,740,549	7,663
6 2025	-\$388,816,378	\$5,490,620	(\$383,325,758)				\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,079,790	69,580,015,661	1,485,067,615	7,663
7 2026				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,112,477	69,830,503,718	1,490,413,858	7,663
8 2027				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,145,282	70,081,893,531	1,495,779,348	7,663
9 2028				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,178,205	70,334,188,348	1,501,164,154	7,663
10 2029				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,211,247	70,587,391,426	1,506,568,345	7,663
11 2030				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,244,407	70,841,506,035	1,511,991,991	7,663
12 2031				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,277,687	71,096,535,457	1,517,435,162	7,663
13 2032				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,311,087	71,352,482,984	1,522,897,929	7,663
14 2033				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,344,606	/1,609,351,923	1,528,380,361	7,663
15 2034				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,378,247	/1,86/,145,590	1,533,882,530	7,663
16 2035				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0 ¢0	9,412,009	72,125,867,314	1,539,404,508	7,663
17 2036				-\$1,025,910	\$1,920,000	\$894,090	\$U	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$U	9,445,892	72,385,520,437	1,544,946,364	7,663
18 2037				-\$1,025,910	\$1,920,000	\$894,090	\$U	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$U	9,479,897	72,646,108,310	1,550,508,171	7,663
19 2038				-\$1,025,910	\$1,920,000	\$894,090	\$U \$0	(230)	\$11,440	(\$2,699,840)	0	\$2,845	\$U \$0	9,514,025	72,907,034,300	1,556,090,000	7,003
20 2039				\$1,025,910	\$1,920,000	\$894,090	30 \$0	(230)	\$11,440	(\$2,055,840)	0	\$2,045 \$2.045	0¢	9,546,275	73,170,101,784	1,501,091,924	7,003
21 2040				-\$1,025,910	\$1,920,000	\$894,090	30 \$0	(230)	\$11,440	(\$2,055,840)	0	\$2,045	30 \$0	9,562,049	73,433,514,130	1,507,514,015	7,003
22 2041				-\$1,025,910	\$1,920,000	\$894,090	50 \$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	ېر د د	9,651,768	73,057,874,801	1,572,550,545	7,003
23 2042				-\$1,025,910	\$1,520,000	\$894,090	\$0 \$0	(236)	\$11,440	(\$2,699,840)	0	\$2,045	0 \$0	9 686 515	74 229 454 624	1,570,010,500	7,663
25 2043				-\$1,025,910	\$1,920,000	\$894,090	\$0 \$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0 \$0	9 721 386	74 496 680 661	1,590,005,504	7,663
26 2045				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11 440	(\$2,699,840)	0	\$2,845	\$0 \$0	9 756 383	74 764 868 711	1,595,005,504	7,663
27 2046				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11 440	(\$2,699,840)	0	\$2,845	\$0	9 791 506	75 034 022 238	1 601 474 150	7 663
28 2047				-\$1.025.910	\$1.920.000	\$894.090	\$0	(236)	\$11.440	(\$2.699.840)	0	\$2.845	\$0	9.826.756	75.304.144.718	1.607.239.457	7.663
29 2048				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,862,132	75,575,239,639	1,613,025,519	7,663
30 2049				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,897,636	75,847,310,502	1,618,832,411	7,663
31 2050				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,933,267	76,120,360,820	1,624,660,208	7,663
32 2051				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	9,969,027	76,394,394,119	1,630,508,984	7,663
33 2052				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	10,004,915	76,669,413,938	1,636,378,817	7,663
34 2053				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	10,040,933	76,945,423,828	1,642,269,780	7,663
35 2054				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	10,077,080	77,222,427,354	1,648,181,952	7,663
36 2055				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	10,113,358	77,500,428,092	1,654,115,407	7,663
37 2056				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	10,149,766	77,779,429,633	1,660,070,222	7,663
38 2057				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	10,186,305	78,059,435,580	1,666,046,475	7,663
39 2058				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	10,222,976	78,340,449,548	1,672,044,242	7,663
40 2059				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	10,259,779	78,622,475,166	1,678,063,601	7,663
41 2060				-\$1,025,910	\$1,920,000	\$894,090	\$0	(236)	\$11,440	(\$2,699,840)	0	\$2,845	\$0	10,296,714	78,905,516,077	1,684,104,630	7,663
TOTALS	-\$2,332,894,853	\$32,943,720	(\$2,299,951,133)	-\$35,906,850	\$67,200,000	\$31,293,150	\$0			(\$110,693,440)			\$0		3,013,496,391,346	64,317,977,738	
3% Discount			(\$2,076,514,494)			\$16,088,559	\$0			(\$63,207,412)			\$0				
5% Discount			(\$1,945,550,789)			\$10,925,601	\$0			(\$46,694,813)			\$0				
7% Discount			(\$1,827,047,446)			\$7,713,583	\$0			(\$36,161,117)			\$0				

						Chicago UZA Estimated Por		Violant Crima	Chicago MSA									
			I-290 HOT 3+ Alt	Opportunity Cost of	UZA Pricing (+\$0.50 or	Canita VMT w/no	Daily Traffic ner	Reduction per	Total Annual					Total Annual Crime	Proportio			
	Calendar	I-290 HOT 3+ Alt	AVMT Increase in	Existing I-290 Induced	+20% per gal.) AVMT	Project, Induced &	Fwy Lane	100,000	Violent Crime				Aggravated Assault	Reduction Opportunity	n Auto			Auto VMT Project and
Year	Year	AVMT	Region	AVMT Excluding Project	Opportunity Cost ⁵	w/Pricing	Reduced	Population	Reduction	Murder Value	Rape Value	Robbery Value	Value	Cost ⁶	Traffic	Auto VMT Net Change	VMT Value	Opportunity Cost ⁷
1	2020	68,358,724,360	17,735,434	364,655,672	2,719,053,330	7,358	212,327	3.14	280	\$53,053,881	\$6,172,281	\$4,826,252	\$18,040,955	(\$82,093,370)	0.93	2,884,343,325	\$0.27	(\$778,772,698)
2	2021	68,604,815,768	17,799,282	365,968,432	2,728,841,922	7,358	213,092	3.15	282	\$53,436,557	\$6,216,802	\$4,861,064	\$18,171,083	(\$82,685,506)	0.93	2,894,726,961	\$0.27	(\$781,576,280)
3	2022	68,851,793,104	17,863,359	367,285,919	2,738,665,753	7,358	213,859	3.17	284	\$53,821,993	\$6,261,643	\$4,896,127	\$18,302,151	(\$83,281,913)	0.93	2,905,147,978	\$0.27	(\$784,389,954)
4	2023	69,099,659,560	17,927,667	368,608,148	2,748,524,950	7,358	214,629	3.18	286	\$54,210,209	\$6,306,808	\$4,931,442	\$18,434,163	(\$83,882,622)	0.93	2,915,606,511	\$0.27	(\$787,213,758)
5	2024	69,348,418,334	17,992,207	369,935,137	2,758,419,640	7,358	215,401	3.19	288	\$54,601,225	\$6,352,299	\$4,967,012	\$18,567,128	(\$84,487,664)	0.93	2,926,102,695	\$0.27	(\$790,047,728)
6	2025	69,598,072,640	18,056,979	371,266,904	2,768,349,950	7,358	216,177	3.20	291	\$54,995,061	\$6,398,118	\$5,002,839	\$18,701,052	(\$85,097,071)	0.93	2,936,636,664	\$0.27	(\$792,891,899)
7	2026	69,848,625,702	18,121,984	372,603,465	2,778,316,010	7,358	216,955	3.21	293	\$55,391,738	\$6,444,267	\$5,038,925	\$18,835,942	(\$85,710,872)	0.93	2,947,208,556	\$0.27	(\$795,746,310)
8	2027	70,100,080,754	18,187,223	373,944,837	2,788,317,948	7,358	217,736	3.22	295	\$55,791,277	\$6,490,750	\$5,075,270	\$18,971,805	(\$86,329,101)	0.93	2,957,818,507	\$0.27	(\$798,610,997)
9	2028	70,352,441,045	18,252,697	375,291,038	2,798,355,892	7,358	218,520	3.23	297	\$56,193,697	\$6,537,567	\$5,111,878	\$19,108,648	(\$86,951,790)	0.93	2,968,466,654	\$0.27	(\$801,485,997)
10	2029	70,605,709,833	18,318,407	376,642,086	2,808,429,974	7,358	219,306	3.25	299	\$56,599,020	\$6,584,722	\$5,148,750	\$19,246,478	(\$87,578,970)	0.93	2,979,153,134	\$0.27	(\$804,371,346)
11	2030	70,859,890,388	18,384,353	377,997,998	2,818,540,321	7,358	220,096	3.26	301	\$57,007,266	\$6,632,218	\$5,185,887	\$19,385,302	(\$88,210,673)	0.93	2,989,878,085	\$0.27	(\$807,267,083)
12	2031	71,114,985,993	18,450,537	379,358,790	2,828,687,067	7,358	220,888	3.27	303	\$57,418,457	\$6,680,056	\$5,223,293	\$19,525,127	(\$88,846,933)	0.93	3,000,641,646	\$0.27	(\$810,173,244)
13	2032	71,370,999,943	18,516,958	380,724,482	2,838,870,340	7,358	221,684	3.28	305	\$57,832,615	\$6,728,239	\$5,260,968	\$19,665,961	(\$89,487,783)	0.93	3,011,443,956	\$0.27	(\$813,089,868)
14	2033	71,627,935,543	18,583,620	382,095,090	2,849,090,273	7,358	222,482	3.29	308	\$58,249,759	\$6,776,769	\$5,298,915	\$19,807,811	(\$90,133,254)	0.93	3,022,285,154	\$0.27	(\$816,016,992)
15	2034	71,885,796,111	18,650,521	383,470,633	2,859,346,998	7,358	223,283	3.30	310	\$58,669,912	\$6,825,650	\$5,337,136	\$19,950,684	(\$90,783,382)	0.93	3,033,165,381	\$0.27	(\$818,954,653)
16	2035	72,144,584,977	18,717,662	384,851,127	2,869,640,647	7,358	224,086	3.32	312	\$59,093,096	\$6,874,883	\$5,375,633	\$20,094,587	(\$91,438,199)	0.93	3,044,084,776	\$0.27	(\$821,902,890)
17	2036	72,404,305,483	18,785,046	386,236,591	2,879,971,354	7,358	224,893	3.33	314	\$59,519,332	\$6,924,471	\$5,414,407	\$20,239,529	(\$92,097,739)	0.93	3,055,043,481	\$0.27	(\$824,861,740)
18	2037	72,664,960,982	18,852,672	387,627,043	2,890,339,251	7,358	225,703	3.34	317	\$59,948,642	\$6,974,417	\$5,453,461	\$20,385,516	(\$92,762,036)	0.93	3,066,041,638	\$0.27	(\$827,831,242)
19	2038	72,926,554,842	18,920,542	389,022,500	2,900,744,472	7,358	226,515	3.35	319	\$60,381,050	\$7,024,723	\$5,492,797	\$20,532,556	(\$93,431,125)	0.93	3,077,079,388	\$0.27	(\$830,811,435)
20	2039	73,189,090,439	18,988,656	390,422,981	2,911,187,152	7,358	227,331	3.36	321	\$60,816,576	\$7,075,392	\$5,532,416	\$20,680,656	(\$94,105,040)	0.93	3,088,156,874	\$0.27	(\$833,802,356)
21	2040	73,452,571,165	19,057,015	391,828,504	2,921,667,426	7,358	228,149	3.38	324	\$61,255,243	\$7,126,427	\$5,572,321	\$20,829,825	(\$94,783,816)	0.93	3,099,274,238	\$0.27	(\$836,804,044)
22	2041	73,717,000,421	19,125,620	393,239,086	2,932,185,429	7,358	228,970	3.39	326	\$61,697,075	\$7,177,829	\$5,612,514	\$20,980,070	(\$95,467,488)	0.93	3,110,431,626	\$0.27	(\$839,816,539)
23	2042	73,982,381,623	19,194,472	394,654,747	2,942,741,296	7,358	229,795	3.40	328	\$62,142,093	\$7,229,603	\$5,652,997	\$21,131,398	(\$96,156,091)	0.93	3,121,629,180	\$0.27	(\$842,839,878)
24	2043	74,248,718,197	19,263,573	396,075,504	2,953,335,165	7,358	230,622	3.41	331	\$62,590,322	\$7,281,750	\$5,693,772	\$21,283,818	(\$96,849,661)	0.93	3,132,867,045	\$0.27	(\$845,874,102)
25	2044	74,516,013,582	19,332,921	397,501,376	2,963,967,171	7,358	231,452	3.43	333	\$63,041,783	\$7,334,273	\$5,734,841	\$21,437,337	(\$97,548,234)	0.93	3,144,145,366	\$0.27	(\$848,919,249)
26	2045	74,784,271,231	19,402,520	398,932,381	2,974,637,453	7,358	232,285	3.44	335	\$63,496,501	\$7,387,174	\$5,776,206	\$21,591,964	(\$98,251,845)	0.93	3,155,464,289	\$0.27	(\$851,975,358)
27	2046	75,053,494,607	19,472,369	400,368,538	2,985,346,148	7,358	233,122	3.45	338	\$63,954,499	\$7,440,458	\$5,817,869	\$21,747,706	(\$98,960,532)	0.93	3,166,823,961	\$0.27	(\$855,042,469)
28	2047	75,323,687,188	19,542,470	401,809,864	2,996,093,394	7,358	233,961	3.46	340	\$64,415,800	\$7,494,126	\$5,859,833	\$21,904,571	(\$99,674,330)	0.93	3,178,224,527	\$0.27	(\$858,120,622)
29	2048	75,594,852,462	19,612,822	403,256,380	3,006,879,330	7,358	234,803	3.48	343	\$64,880,429	\$7,548,180	\$5,902,100	\$22,062,568	(\$100,393,277)	0.93	3,189,666,135	\$0.27	(\$861,209,857)
30	2049	75,866,993,931	19,683,429	404,708,103	3,017,704,096	7,358	235,648	3.49	345	\$65,348,409	\$7,602,625	\$5,944,672	\$22,221,704	(\$101,117,410)	0.93	3,201,148,933	\$0.27	(\$864,310,212)
31	2050	/6,140,115,109	19,754,289	406,165,052	3,028,567,831	7,358	236,497	3.50	348	\$65,819,764	\$7,657,463	\$5,987,550	\$22,381,989	(\$101,846,766)	0.93	3,212,673,070	\$0.27	(\$867,421,729)
32	2051	76,414,219,523	19,825,404	407,627,246	3,039,470,675	7,358	237,348	3.51	350	\$66,294,519	\$7,712,695	\$6,030,738	\$22,543,429	(\$102,581,382)	0.93	3,224,238,693	\$0.27	(\$870,544,447)
33	2052	76,689,310,714	19,896,776	409,094,704	3,050,412,769	7,358	238,203	3.53	353	\$66,772,699	\$7,768,327	\$6,074,238	\$22,706,034	(\$103,321,298)	0.93	3,235,845,952	\$0.27	(\$873,678,407)
34	2053	/6,965,392,232	19,968,404	410,567,445	3,061,394,255	7,358	239,060	3.54	355	\$67,254,328	\$7,824,359	\$6,118,051	\$22,869,812	(\$104,066,550)	0.93	3,247,494,997	\$0.27	(\$876,823,649)
35	2054	77,242,467,644	20,040,291	412,045,488	3,072,415,275	7,358	239,921	3.55	358	\$67,739,431	\$7,880,796	\$6,162,180	\$23,034,771	(\$104,817,178)	0.93	3,259,185,979	\$0.27	(\$879,980,214)
36	2055	//,520,540,528	20,112,436	413,528,852	3,083,475,970	7,358	240,784	3.56	360	\$68,228,033	\$7,937,640	\$6,206,628	\$23,200,920	(\$105,573,220)	0.93	3,270,919,049	\$0.27	(\$883,148,143)
37	2056	//,799,614,474	20,184,840	415,017,556	3,094,576,483	7,358	241,651	3.58	363	\$68,720,159	\$7,994,894	\$6,251,396	\$23,368,267	(\$106,334,716)	0.93	3,282,694,357	\$0.27	(\$886,327,477)
38	2057	78,079,693,086	20,257,506	416,511,619	3,105,716,958	7,358	242,521	3.59	366	\$69,215,834	\$8,052,561	\$6,296,487	\$23,536,821	(\$107,101,704)	0.93	3,294,512,057	\$0.27	(\$889,518,255)
39	2058	78,360,779,981	20,330,433	418,011,061	3,116,897,539	7,358	243,394	3.60	368	\$69,715,085	\$8,110,644	\$6,341,903	\$23,706,591	(\$107,874,224)	0.93	3,306,372,301	\$0.27	(\$892,720,521)
40	2059	/8,642,878,789	20,403,622	419,515,900	3,128,118,371	7,358	244,270	3.62	371	\$70,217,938	\$8,169,145	\$6,387,647	\$23,877,586	(\$108,652,316)	0.93	3,318,275,241	\$0.27	(\$895,934,315)
41	2060	/8,925,993,152	20,477,075	421,026,158	3,139,379,597	7,358	245,150	3.63	374	\$70,724,417	\$8,228,069	\$6,433,721	\$24,049,814	(\$109,436,021)	0.93	3,330,221,032	Ş0.27	(\$899,159,679)
TO	TALS		132,604,937	16,079,494,434	119,896,675,876				13,314	\$2,520,555,723	\$293,241,115	\$229,292,137	\$857,114,126	(\$3,900,203,101)		127,185,139,393		(\$34,339,987,636)
3%	Discount													(\$2,162,858,238)				(\$19,324,776,798)
5%	Discount													(\$1,570,264,446)				(\$14,153,861,607)
7%	Discount													(\$1,197,894,631)				(\$10,880,053,191)

	Proportio				Auto Noiso		Truck Noiso		Combined					NPV CO ₂ Project and	I-290 Project NO	Opportunit			I-290 Project	Opportuni ty Costs
Calendar	n Heavy	Heavy Truck VMT Net		Heavy Truck VMT Project	Value (per	Auto Noise Project and	Value (per	Truck Noise and Project	Auto/Light Truck &	I-290 Project CO ₂	Opportunity Costs	CO ₂ Value	Undiscounted CO ₂	3% Avg SCC ⁹	Decrease	Increase	NO _x Value	NO _x Project and	Decrease	Increase
Year	1k	Change	VMT Value	and Opportunity Cost	VMI)	Opportunity Costs	VMI)	Opportunity Costs	Heavy Truck MPG	Decrease (MT)	CO ₂ Increase (MT)	(per M1)	Costs @ 3% Avg SCC	[Undisc/(1.03*A)]	(MI)	(MI)	(per MT)	Opportunity Costs	(per MI)	(per MI)
1 2020	0.07	217,101,111	\$1.83	(\$397,295,032)	\$0.0150	(\$43,265,150)	\$0.1528	(\$33,173,050)	20.36	-0.001	1,353,959	\$48.00	\$64,990,016	(\$63,097,103)	-1.76	3,250	\$7,399	(\$19,227,629)	-5.10	42
2 2021	0.07	217,882,675	\$1.83	(\$398,725,294)	\$0.0150	(\$43,420,904)	\$0.1528	(\$33,292,473)	20.54	-0.001	1,346,923	\$49.00	\$65,999,237	(\$62,210,611)	-1.76	3,262	\$7,399	(\$19,296,886)	-5.10	42
3 2022	0.07	210,007,032	\$1.05	(\$400,160,703)	\$0.0150	(\$43,577,220)	\$0.1528	(\$33,532,610)	20.72	-0.001	1,340,027	\$50.00	\$67,001,502	(\$60,414,123)	-1.76	3,274	\$7,399	(\$19,300,393)	-5.10	42
5 2023	0.07	219,494,294	\$1.83	(\$403,047,049)	\$0.0150	(\$43,734,038)	\$0.1528	(\$33,552,010)	20.90	-0.001	1,333,207	\$52.00	\$68,985,266	(\$59 507 296)	-1.70	3,203	\$7,399	(\$19,430,143)	-5.10	42
6 2025	0.07	221 037 168	\$1.83	(\$404,498,018)	\$0.0150	(\$44,049,550)	\$0.1528	(\$33,774,479)	21.00	-0.001	1 320 141	\$53.00	\$69 967 498	(\$58,596,678)	-1.76	3 309	\$7 399	(\$19,576,417)	-5 10	43
7 2026	0.07	221,037,100	\$1.83	(\$405,954,211)	\$0.0150	(\$44,208,128)	\$0.1528	(\$33,896,067)	21.20	-0.001	1 313 769	\$54.00	\$70 943 540	(\$57,683,590)	-1.76	3 321	\$7 399	(\$19,646,929)	-5 10	43
8 2027	0.07	222.631.501	\$1.83	(\$407,415,646)	\$0.0150	(\$44.367.278)	\$0.1528	(\$34.018.093)	21.62	-0.001	1.307.520	\$55.00	\$71.913.598	(\$56,769,259)	-1.76	3.333	\$7.399	(\$19,717.696)	-5.10	43
9 2028	0.07	223,432,974	\$1.83	(\$408,882,342)	\$0.0150	(\$44,527,000)	\$0.1528	(\$34,140,558)	21.80	-0.001	1,301,391	\$56.00	\$72,877,876	(\$55,854,824)	-1.76	3,345	\$7,399	(\$19,788,717)	-5.10	43
10 2029	0.07	224,237,333	\$1.83	(\$410,354,319)	\$0.0150	(\$44,687,297)	\$0.1528	(\$34,263,464)	21.98	-0.001	1,295,378	\$57.00	\$73,836,569	(\$54,941,341)	-1.76	3,357	\$7,399	(\$19,859,994)	-5.10	43
11 2030	0.07	225,044,587	\$1.83	(\$411,831,594)	\$0.0150	(\$44,848,171)	\$0.1528	(\$34,386,813)	22.16	-0.001	1,289,480	\$58.00	\$74,789,865	(\$54,029,789)	-1.76	3,369	\$7,399	(\$19,931,528)	-5.10	44
12 2031	0.07	225,854,748	\$1.83	(\$413,314,188)	\$0.0150	(\$45,009,625)	\$0.1528	(\$34,510,605)	22.34	-0.001	1,283,694	\$59.00	\$75,737,947	(\$53,121,073)	-1.76	3,381	\$7,399	(\$20,003,319)	-5.10	44
13 2032	0.07	226,667,825	\$1.83	(\$414,802,119)	\$0.0150	(\$45,171,659)	\$0.1528	(\$34,634,844)	22.52	-0.001	1,278,017	\$60.00	\$76,680,995	(\$52,216,026)	-1.76	3,393	\$7,399	(\$20,075,368)	-5.10	44
14 2033	0.07	227,483,829	\$1.83	(\$416,295,407)	\$0.0150	(\$45,334,277)	\$0.1528	(\$34,759,529)	22.70	-0.001	1,272,446	\$61.00	\$77,619,179	(\$51,315,422)	-1.76	3,406	\$7,399	(\$20,147,677)	-5.10	44
15 2034	0.07	228,302,771	\$1.83	(\$417,794,070)	\$0.0150	(\$45,497,481)	\$0.1528	(\$34,884,663)	22.88	-0.001	1,266,979	\$62.00	\$78,552,668	(\$50,419,968)	-1.76	3,418	\$7,399	(\$20,220,246)	-5.10	44
16 2035	0.07	229,124,661	\$1.83	(\$419,298,129)	\$0.0150	(\$45,661,272)	\$0.1528	(\$35,010,248)	23.06	-0.001	1,261,613	\$63.00	\$79,481,623	(\$49,530,319)	-1.76	3,430	\$7,399	(\$20,293,077)	-5.10	44
17 2036	0.07	229,949,509	\$1.83	(\$420,807,602)	\$0.0150	(\$45,825,652)	\$0.1528	(\$35,136,285)	23.24	-0.001	1,256,347	\$64.00	\$80,406,201	(\$48,647,074)	-1.76	3,442	\$7,399	(\$20,366,169)	-5.10	44
18 2037	0.07	230,777,328	\$1.83	(\$422,322,509)	\$0.0150	(\$45,990,625)	\$0.1528	(\$35,262,776)	23.42	-0.001	1,251,178	\$65.00	\$81,326,556	(\$47,770,780)	-1.76	3,455	\$7,399	(\$20,439,525)	-5.10	45
19 2038	0.07	231,608,126	\$1.83	(\$423,842,871)	\$0.0150	(\$46,156,191)	\$0.1528	(\$35,389,722)	23.60	-0.001	1,246,104	\$66.00	\$82,242,836	(\$46,901,940)	-1.76	3,467	\$7,399	(\$20,513,145)	-5.10	45
20 2039	0.07	232,441,915	\$1.83	(\$425,368,705)	\$0.0150	(\$46,322,353)	\$0.1528	(\$35,517,125)	23.78	-0.001	1,241,122	\$67.00	\$83,155,184	(\$46,041,009)	-1.76	3,480	\$7,399	(\$20,587,030)	-5.10	45
21 2040	0.07	233,278,706	\$1.83	(\$426,900,032)	\$0.0150	(\$46,489,114)	\$0.1528	(\$35,644,986)	23.96	-0.001	1,236,231	\$68.00	\$84,063,742	(\$45,188,404)	-1.76	3,492	\$7,399	(\$20,661,181)	-5.10	45
22 2041	0.07	234,118,509	\$1.83	(\$428,436,872)	\$0.0150	(\$46,656,474)	\$0.1528	(\$35,773,308)	24.14	-0.001	1,231,430	\$69.00	\$84,968,645	(\$44,344,498)	-1.76	3,505	\$7,399	(\$20,735,599)	-5.10	45
23 2042	0.07	234,961,336	\$1.83	(\$429,979,245)	\$0.0150	(\$46,824,438)	\$0.1528	(\$35,902,092)	24.32	-0.001	1,226,715	\$70.00	\$85,870,025	(\$43,509,633)	-1.76	3,517	\$7,399	(\$20,810,284)	-5.10	45
24 2043	0.07	235,807,197	\$1.83	(\$431,527,170)	\$0.0150	(\$46,993,006)	\$0.1528	(\$36,031,340)	24.50	-0.001	1,222,085	\$/1.00	\$86,768,011	(\$42,684,112)	-1./6	3,530	\$7,399	(\$20,885,239)	-5.10	46
25 2044	0.07	236,656,103	\$1.83	(\$433,080,668)	\$0.0150	(\$47,162,180)	\$0.1528	(\$36,161,053)	24.68	-0.001	1,217,538	\$72.00	\$87,662,728	(\$41,868,207)	-1.76	3,543	\$7,399	(\$20,960,463)	-5.10	46
26 2045	0.07	237,508,065	\$1.83	(\$434,639,759)	\$0.0150	(\$47,331,964)	\$0.1528	(\$36,291,232)	24.86	-0.001	1,213,073	\$73.00	\$88,554,299	(\$41,062,161)	-1.76	3,556	\$7,399	(\$21,035,959)	-5.10	46
27 2046	0.07	238,363,094	\$1.83	(\$436,204,462)	\$0.0150	(\$47,502,359)	\$0.1528	(\$36,421,881)	25.04	-0.001	1,208,687	\$74.00	\$89,442,841	(\$40,266,188)	-1.76	3,568	\$7,399	(\$21,111,726)	-5.10	46
28 2047	0.07	239,221,201	\$1.83 ¢1.92	(\$437,774,798)	\$0.0150	(\$47,073,308)	\$0.1528	(\$36,553,000)	25.22	-0.001	1,204,380	\$75.00	\$90,328,409	(\$39,480,474)	-1.76	3,581	\$7,399	(\$21,187,705)	-5.10	40
29 2048	0.07	240,082,597	\$1.05 ¢1.92	(\$439,550,787)	\$0.0150	(\$47,044,352)	\$0.1528	(\$36,004,550)	25.40	-0.001	1,200,149	\$70.00	\$91,211,297	(\$36,705,162)	-1.70	2,594	\$7,399	(\$21,204,073)	-5.10	40
31 2050	0.07	240,940,094	\$1.83	(\$440,532,450)	\$0.0150	(\$48,017,234)	\$0.1528	(\$36,949,195)	25.38	-0.001	1,195,995	\$78.00	\$92,091,433	(\$37,340,431)	-1.70	3,007	\$7,399	(\$21,340,007)	-5.10	47
32 2050	0.07	242,684,633	\$1.83	(\$444 112 878)	\$0.0150	(\$48,363,580)	\$0.1528	(\$37,082,212)	25.70	-0.001	1 187 899	\$79.00	\$93,844,055	(\$36 443 122)	-1.76	3 633	\$7 399	(\$21,417,531)	-5 10	47
33 2052	0.07	243 558 297	\$1.83	(\$445,711,684)	\$0.0150	(\$48,537,689)	\$0.1528	(\$37,215,708)	26.12	-0.001	1 183 959	\$80.00	\$94 716 746	(\$35,710,699)	-1.76	3 646	\$7 399	(\$21,572,090)	-5 10	47
34 2053	0.07	244,435,107	\$1.83	(\$447,316,246)	\$0.0150	(\$48,712,425)	\$0.1528	(\$37,349,684)	26.30	-0.001	1,180,088	\$81.00	\$95.587.155	(\$34,989,190)	-1.76	3.659	\$7.399	(\$21,649,787)	-5.10	47
35 2054	0.07	245.315.074	\$1.83	(\$448.926.585)	\$0.0150	(\$48,887,790)	\$0.1528	(\$37,484,143)	26.48	-0.001	1.176.285	\$82.00	\$96.455.379	(\$34.278.640)	-1.76	3.672	\$7.399	(\$21.727.764)	-5.10	47
36 2055	0.07	246.198.208	\$1.83	(\$450.542.721)	\$0.0150	(\$49.063.786)	\$0.1528	(\$37.619.086)	26.66	-0.001	1.172.548	\$83.00	\$97.321.512	(\$33.579.077)	-1.76	3.686	\$7.399	(\$21,806.022)	-5.10	48
37 2056	0.07	247,084,522	\$1.83	(\$452,164,674)	\$0.0150	(\$49,240,415)	\$0.1528	(\$37,754,515)	26.84	-0.001	1,168,877	\$84.00	\$98,185,646	(\$32,890,516)	-1.76	3,699	\$7,399	(\$21,884,561)	-5.10	48
38 2057	0.07	247,974,026	\$1.83	(\$453,792,467)	\$0.0150	(\$49,417,681)	\$0.1528	(\$37,890,431)	27.02	-0.001	1,165,269	\$85.00	\$99,047,869	(\$32,212,957)	-1.76	3,712	\$7,399	(\$21,963,383)	-5.10	48
39 2058	0.07	248,866,732	\$1.83	(\$455,426,120)	\$0.0150	(\$49,595,585)	\$0.1528	(\$38,026,837)	27.20	-0.001	1,161,724	\$86.00	\$99,908,269	(\$31,546,390)	-1.76	3,726	\$7,399	(\$22,042,489)	-5.10	48
40 2059	0.07	249,762,653	\$1.83	(\$457,065,654)	\$0.0150	(\$49,774,129)	\$0.1528	(\$38,163,733)	27.38	-0.001	1,158,241	\$87.00	\$100,766,932	(\$30,890,792)	-1.76	3,739	\$7,399	(\$22,121,879)	-5.10	48
41 2060	0.07	250,661,798	\$1.83	(\$458,711,090)	\$0.0150	(\$49,953,315)	\$0.1528	(\$38,301,123)	27.56	-0.001	1,154,817	\$88.00	\$101,623,939	(\$30,246,130)	-1.76	3,753	\$7,399	(\$22,201,555)	-5.10	48
TOTALS		9,573,075,008		(\$17,518,727,265)		(\$1,907,777,091)		(\$1,462,765,861)			36,969,114			(\$1,875,407,189)		143,314		(\$847,874,749)	-209.04	1,852
3% Discount				(\$9,858,637,626)		(\$1,073,598,711)		(\$823,169,306)						(\$1,875,407,189)				(\$477,136,714)		
5% Discount				(\$7,220,667,749)		(\$786,325,645)		(\$602,906,028)						(\$1,875,407,189)				(\$349,463,136)		
7% Discount				(\$5,550,516,980)		(\$604,447,400)		(\$463,453,003)						(\$1,875,407,189)				(\$268,630,782)		

		I-290 C Project PM _{2.5}	Dpportuni ty Costs PM _{2.5}			I-290 Project VOCs	Opportuni y Costs VOCs	it		Resource	Resource	Resource Consumption	Parking Internal		Annual Inactivity Health	Chicago UZA Per Capita VMT Project &	Per Capita VMT Proportion Reduction	Health Care Project and Opportunity Costs (Note: Not used in final		Health Internal Project and Opportunity Costs -		Health External Project		Barrier Effect
Caler	ndar I ar	Decrease (per MT)	Increase (per MT)	PM Value (per MT)	PM Project and Opportunity Costs ¹⁰	Decrease (MT)	Increase (MT)	VOCs Value (per MT)	Opportunity Costs ¹⁰	Externalities Value-Car	Externalities Value-Hvv Tk	Project and Opportunity Costs ¹¹	+ External Costs Value	Opportunity Costs ¹²	Care Costs Per Capita	Opportunity Cost	Project & Opp Cost	adiacent columns) ¹³	Health Value - Internal	Activity ¹³	Health Value - External	and Opportunity Costs - Reduced Life ¹³	Barrier Effect Value-Car	Value-Heavy Truck
1 20	20	-0.89	39	, \$373.117	(\$13.906.654)	-1.61	3.20	3 \$1.696	(\$4.343.770)	\$0.05	\$0.23	(\$193.282.017)	\$0.144	(\$415.345.439)	\$610	305	0.04	(216.440.652)	0.11	(\$317.277.766)	0.11	(\$317.277.766)	\$0.02	\$0.03
2 20	21	-0.89	39	\$373,117	(\$13,960,738)	-1.61	3,21	5 \$1,696	(\$4,359,415)	\$0.05	\$0.23	(\$193,977,833)	\$0.144	(\$416,840,682)	\$610	305	0.04	(217,219,839)	0.11	(\$318,419,966)	0.11	(\$318,419,966)	\$0.02	\$0.03
3 20	22	-0.89	39	\$373,117	(\$14,015,017)	-1.61	3,22	6 \$1,696	(\$4,375,117)	\$0.05	\$0.23	(\$194,676,153)	\$0.144	(\$418,341,309)	\$610	305	0.04	(218,001,830)	0.11	(\$319,566,278)	0.11	(\$319,566,278)	\$0.02	\$0.03
4 20	23	-0.89	39	\$373,117	(\$14,069,491)	-1.61	3,23	8 \$1,696	(\$4,390,875)	\$0.05	\$0.23	(\$195,376,987)	\$0.144	(\$419,847,338)	\$610	305	0.04	(218,786,637)	0.11	(\$320,716,716)	0.11	(\$320,716,716)	\$0.02	\$0.03
5 20	24	-0.89	39	\$373,117	(\$14,124,161)	-1.61	3,249	9 \$1,696	(\$4,406,690)	\$0.05	\$0.23	(\$196,080,344)	\$0.144	(\$421,358,788)	\$610	305	0.04	(219,574,269)	0.11	(\$321,871,296)	0.11	(\$321,871,296)	\$0.02	\$0.03
6 20	25	-0.89	39	\$373,117	(\$14,179,028)	-1.61	3,26	1 \$1,696	(\$4,422,562)	\$0.05	\$0.23	(\$196,786,233)	\$0.144	(\$422,875,680)	\$610	305	0.04	(220,364,736)	0.11	(\$323,030,033)	0.11	(\$323,030,033)	\$0.02	\$0.03
7 20	26	-0.89	39	\$373,117	(\$14,234,093)	-1.61	3,273	3 \$1,696	(\$4,438,491)	\$0.05	\$0.23	(\$197,494,664)	\$0.144	(\$424,398,032)	\$610	305	0.04	(221,158,049)	0.11	(\$324,192,941)	0.11	(\$324,192,941)	\$0.02	\$0.03
8 20	27	-0.89	40	\$373,117	(\$14,289,356)	-1.61	3,28	5 \$1,696	(\$4,454,478)	\$0.05	\$0.23	(\$198,205,644)	\$0.144	(\$425,925,865)	\$610	305	0.04	(221,954,218)	0.11	(\$325,360,036)	0.11	(\$325,360,036)	\$0.02	\$0.03
9 20	28	-0.89	40	\$373,117	(\$14,344,818)	-1.61	3,29	7 \$1,696	(\$4,470,522)	\$0.05	\$0.23	(\$198,919,185)	\$0.144	(\$427,459,198)	\$610	305	0.04	(222,753,253)	0.11	(\$326,531,332)	0.11	(\$326,531,332)	\$0.02	\$0.03
10 20	29	-0.89	40	\$373,117	(\$14,400,479)	-1.61	3,30	8 \$1,696	(\$4,486,624)	\$0.05	\$0.23	(\$199,635,294)	\$0.144	(\$428,998,051)	\$610	305	0.04	(223,555,165)	0.11	(\$327,706,845)	0.11	(\$327,706,845)	\$0.02	\$0.03
11 20	30	-0.89	40	\$373,117	(\$14,456,341)	-1.61	3,320	0\$1,696	(\$4,502,783)	\$0.05	\$0.23	(\$200,353,981)	\$0.144	(\$430,542,444)	\$610	305	0.04	(224,359,964)	0.11	(\$328,886,589)	0.11	(\$328,886,589)	\$0.02	\$0.03
12 20	31	-0.89	40	\$373,117	(\$14,512,404)	-1.61	3,333	2 \$1,696	(\$4,519,001)	\$0.05	\$0.23	(\$201,075,255)	\$0.144	(\$432,092,397)	\$610	305	0.04	(225,167,659)	0.11	(\$330,070,581)	0.11	(\$330,070,581)	\$0.02	\$0.03
13 20	32	-0.89	40	\$373,117	(\$14,568,669)	-1.61	3,34	4 \$1,696	(\$4,535,278)	\$0.05	\$0.23	(\$201,799,126)	\$0.144	(\$433,647,930)	\$610	305	0.04	(225,978,263)	0.11	(\$331,258,835)	0.11	(\$331,258,835)	\$0.02	\$0.03
14 20	33	-0.89	40	\$373,117	(\$14,625,137)	-1.61	3,35	6 \$1,696	(\$4,551,612)	\$0.05	\$0.23	(\$202,525,603)	\$0.144	(\$435,209,062)	\$610	305	0.04	(226,791,785)	0.11	(\$332,451,367)	0.11	(\$332,451,367)	\$0.02	\$0.03
15 20	34	-0.89	41	\$3/3,11/	(\$14,681,807)	-1.61	3,36	8 \$1,696	(\$4,568,006)	\$0.05	\$0.23	(\$203,254,695)	\$0.144	(\$436,775,815)	\$610	305	0.04	(227,608,235)	0.11	(\$333,648,192)	0.11	(\$333,648,192)	\$0.02	\$0.03
16 20	35	-0.89	41	\$3/3,11/	(\$14,738,682)	-1.61	3,38	0 \$1,696	(\$4,584,459)	\$0.05	\$0.23	(\$203,986,412)	\$0.144	(\$438,348,208)	\$610	305	0.04	(228,427,625)	0.11	(\$334,849,325)	0.11	(\$334,849,325)	\$0.02	\$0.03
17 20	30	-0.89	41	\$373,117	(\$14,795,701)	-1.01	3,39	5 \$1,090	(\$4,600,971)	\$0.05	\$0.23	(\$204,720,763)	\$0.144	(\$439,920,201)	\$010	305	0.04	(229,249,964)	0.11	(\$330,054,783)	0.11	(\$330,054,783)	\$0.02	\$0.03
18 20	37 20	-0.89	41	\$3/3,11/ \$272,117	(\$14,853,040)	-1.01	3,40	5 \$1,090 7 \$1,606	(\$4,017,542)	\$0.05	\$0.23	(\$205,457,758)	\$0.144	(\$441,509,990)	\$610	305	0.04	(230,075,204)	0.11	(\$337,204,580)	0.11	(\$337,204,380)	\$0.02	\$0.03
20 20	30	-0.89	41	\$373,117	(\$14,910,337)	-1.01	3,41	2 \$1,090	(\$4,654,175)	\$0.05	\$0.25	(\$206,197,400)	\$0.144 \$0.144	(\$445,095,452)	\$610	305	0.04	(230,903,555)	0.11	(\$339,697,256)	0.11	(\$339,697,256)	\$0.02	\$0.03
20 20	10	-0.89	41	\$373,117	(\$15,026,141)	-1.61	3 11	2 \$1,696	(\$4,657,615)	\$0.05	\$0.23	(\$207,684,700)	\$0.144	(\$446,295,490)	\$610	305	0.04	(232,569,033)	0.11	(\$340,920,166)	0.11	(\$340,920,166)	\$0.02	\$0.03
22 20	41	-0.89	42	\$373 117	(\$15,084,256)	-1.61	3 45	4 \$1.696	(\$4,684,426)	\$0.05	\$0.23	(\$208,432,364)	\$0.144	(\$447,902,154)	\$610	305	0.04	(233,406,282)	0.11	(\$342,147,479)	0.11	(\$342,147,479)	\$0.02	\$0.03
23 20	42	-0.89	42	\$373.117	(\$15.142.579)	-1.61	3.46	7 \$1.696	(\$4.701.298)	\$0.05	\$0.23	(\$209.182.721)	\$0.144	(\$449.514.602)	\$610	305	0.04	(234.246.544)	0.11	(\$343.379.210)	0.11	(\$343.379.210)	\$0.02	\$0.03
24 20	43	-0.89	42	\$373.117	(\$15.201.113)	-1.61	3.47	9 \$1.696	(\$4.718.231)	\$0.05	\$0.23	(\$209.935.779)	\$0.144	(\$451.132.854)	\$610	305	0.04	(235.089.832)	0.11	(\$344.615.375)	0.11	(\$344.615.375)	\$0.02	\$0.03
25 20	44	-0.89	42	\$373,117	(\$15,259,857)	-1.61	3,492	2 \$1,696	(\$4,735,224)	\$0.05	\$0.23	(\$210,691,548)	\$0.144	(\$452,756,933)	\$610	305	0.04	(235,936,155)	0.11	(\$345,855,990)	0.11	(\$345,855,990)	\$0.02	\$0.03
26 20	45	-0.89	42	\$373,117	(\$15,318,813)	-1.61	3,504	4 \$1,696	(\$4,752,279)	\$0.05	\$0.23	(\$211,450,037)	\$0.144	(\$454,386,858)	\$610	305	0.04	(236,785,525)	0.11	(\$347,101,072)	0.11	(\$347,101,072)	\$0.02	\$0.03
27 20	46	-0.89	42	\$373,117	(\$15,377,980)	-1.61	3,51	7 \$1,696	(\$4,769,395)	\$0.05	\$0.23	(\$212,211,257)	\$0.144	(\$456,022,650)	\$610	305	0.04	(237,637,953)	0.11	(\$348,350,636)	0.11	(\$348,350,636)	\$0.02	\$0.03
28 20	47	-0.89	42	\$373,117	(\$15,437,361)	-1.61	3,529	9 \$1,696	(\$4,786,573)	\$0.05	\$0.23	(\$212,975,218)	\$0.144	(\$457,664,332)	\$610	305	0.04	(238,493,450)	0.11	(\$349,604,698)	0.11	(\$349,604,698)	\$0.02	\$0.03
29 20	48	-0.89	43	\$373,117	(\$15,496,956)	-1.61	3,542	2 \$1,696	(\$4,803,812)	\$0.05	\$0.23	(\$213,741,929)	\$0.144	(\$459,311,923)	\$610	305	0.04	(239,352,026)	0.11	(\$350,863,275)	0.11	(\$350,863,275)	\$0.02	\$0.03
30 20	49	-0.89	43	\$373,117	(\$15,556,765)	-1.61	3,55	5 \$1,696	(\$4,821,114)	\$0.05	\$0.23	(\$214,511,399)	\$0.144	(\$460,965,446)	\$610	305	0.04	(240,213,694)	0.11	(\$352,126,383)	0.11	(\$352,126,383)	\$0.02	\$0.03
31 20	50	-0.89	43	\$373,117	(\$15,616,790)	-1.61	3,56	8 \$1,696	(\$4,838,478)	\$0.05	\$0.23	(\$215,283,641)	\$0.144	(\$462,624,922)	\$610	305	0.04	(241,078,463)	0.11	(\$353,394,038)	0.11	(\$353,394,038)	\$0.02	\$0.03
32 20	51	-0.89	43	\$373,117	(\$15,677,030)	-1.61	3,58	1 \$1,696	(\$4,855,904)	\$0.05	\$0.23	(\$216,058,662)	\$0.144	(\$464,290,372)	\$610	305	0.04	(241,946,345)	0.11	(\$354,666,256)	0.11	(\$354,666,256)	\$0.02	\$0.03
33 20	52	-0.89	43	\$373,117	(\$15,737,488)	-1.61	3,59	3 \$1,696	(\$4,873,393)	\$0.05	\$0.23	(\$216,836,473)	\$0.144	(\$465,961,817)	\$610	305	0.04	(242,817,352)	0.11	(\$355,943,055)	0.11	(\$355,943,055)	\$0.02	\$0.03
34 20	53	-0.89	43	\$373,117	(\$15,798,163)	-1.61	3,60	6 \$1,696	(\$4,890,945)	\$0.05	\$0.23	(\$217,617,084)	\$0.144	(\$467,639,280)	\$610	305	0.04	(243,691,495)	0.11	(\$357,224,450)	0.11	(\$357,224,450)	\$0.02	\$0.03
35 20	54	-0.89	44	\$373,117	(\$15,859,057)	-1.61	3,619	9 \$1,696	(\$4,908,561)	\$0.05	\$0.23	(\$218,400,506)	\$0.144	(\$469,322,781)	\$610	305	0.04	(244,568,784)	0.11	(\$358,510,458)	0.11	(\$358,510,458)	\$0.02	\$0.03
36 20	55	-0.89	44	\$3/3,11/	(\$15,920,169)	-1.61	3,63	2 \$1,696	(\$4,926,239)	\$0.05	\$0.23	(\$219,186,747)	\$0.144	(\$471,012,343)	\$610	305	0.04	(245,449,232)	0.11	(\$359,801,095)	0.11	(\$359,801,095)	\$0.02	\$0.03
37 20	56	-0.89	44	\$3/3,11/	(\$15,981,502)	-1.61	3,64	5 \$1,696	(\$4,943,982)	\$0.05	\$0.23	(\$219,975,820)	\$0.144	(\$472,707,987)	\$610	305	0.04	(246,332,849)	0.11	(\$361,096,379)	0.11	(\$361,096,379)	\$0.02	\$0.03
38 20	5/ 50	-0.89	44	\$3/3,11/ \$272 117	(\$16,043,056)	-1.61	3,05	3 \$1,696	(\$4,961,788)	\$0.05 60.05	\$U.23	(\$220,707,733)	\$0.144 \$0.144	(\$4/4,409,/36)	\$610	305	0.04	(247,219,647)	0.11	(\$362,396,326)	0.11	(\$362,396,326)	\$0.02 \$0.02	\$0.03
40 20	50	-0.89	44	\$373,117	(\$16,166,939)	-1.01	3,07	2 \$1,090 5 \$1,606	(\$4,575,058)	\$0.05 \$0.05	\$0.23 \$0.22	(\$222,302,497)	\$0.144	(\$470,117,011)	\$610	305	0.04	(240,103,038)	0.11	(\$365,010,353)	0.11	(\$365,700,953)	\$0.02	\$0.03 \$0.03
41 20	60	-0.89	44	\$373 117	(\$16,229,049)	-1.61	3,08	8 \$1.696	(\$5.015.592)	\$0.05	\$0.23	(\$223,160,618)	\$0.144	(\$479,551,829)	\$610	305	0.04	(249,899,243)	0.11	(\$366.324 313)	0.11	(\$366.324 313)	\$0.02	\$0.03
TOTALS		-36.38	1.699	, C, LL,	(\$616,670.242)	-66.13	141.24	0	(\$191,545.335)	J	Ψ0.2J	(\$8.522.771.921)		(\$18,314.660.073)	7010	505	0.04	(\$9,543.952.104)		(\$13,990.365.333)	0.11	(\$13,990.365.333)	φ0.0Z	
3% Disco	ount		_,		(\$346.651.858)				(\$107,791,110)			(\$4,796,177,181)		(\$10,306,547,626)				(+-,:)=• 1)		(\$7,873,057,214)		(\$7,873,057,214)		
5% Disco	ount				(\$253,729,288)				(\$78,948,088)			(\$3,512,818,221)		(\$7,548,726,190)						(\$5,766,388,062)		(\$5,766,388,062)		
7% Disco	ount				(\$194,930,953)				(\$60,687,066)			(\$2,700,298,347)		(\$5,802,695,035)						(\$4,432,614,263)		(\$4,432,614,263)		

Γ													Chicago UZA 20%			
												I-290 Removal	Pricing Increase &			Auto VHT Benefits of I-
									Region VHT			Additional Travel	Travel Time			290 Project and
				Transport Diversity	Uncompensate		Uncompensated	Annual Region Base	Reduction Outside		Project Corridor	Time (Opportunity	(Opportunity Cost of			Additional Benefits from
	Calendar	Barrier Effect Project and	Transport	Project and Opportunity	d Moving Costs	Number of	HH Displacement	VHT Excluding	Corridor w/I-290	Annual Corridor	AVHT Reduction	Cost of Removal is	I-290 Removal is	Proportion	Time Value	Opportunity Costs of
	Year	Opportunity Costs ¹⁴	Diversity Value	Costs ¹⁵	Value per HH	HHs	Moving Costs ¹⁶	Corridor	Project	VHT Base	w/I-290 Project	Project Benefit)	Benefit)	Auto Traffic	(per hr)	Removal/Pricing 17
Г	1 2020	(\$52,011,223)	\$0.008	(\$23,074,747)	\$1,990	0	\$0	2,468,020,327	4,931,586	86,716,163	558,107	14,216,079	36,946,331	0.93	\$14.36	\$756,577,510
	2 2021	(\$52,198,464)	\$0.008	(\$23,157,816)	\$1,990	0	\$0	2,476,905,200	4,949,340	87,028,341	560,116	14,267,257	37,079,338	0.93	\$14.36	\$759,301,189
	3 2022	(\$52,386,378)	\$0.008	(\$23,241,184)	\$1,990	0	\$0	2,485,822,059	4,967,157	87,341,643	562,133	14,318,619	37,212,824	0.93	\$14.36	\$762,034,673
	4 2023	(\$52,574,969)	\$0.008	(\$23,324,852)	\$1,990	0	\$0	2,494,771,018	4,985,039	87,656,073	564,156	14,370,166	37,346,790	0.93	\$14.36	\$764,777,998
	5 2024	(\$52,764,239)	\$0.008	(\$23,408,822)	\$1,990	0	\$0	2,503,752,194	5,002,985	87,971,635	566,187	14,421,899	37,481,238	0.93	\$14.36	\$767,531,199
	6 2025	(\$52,954,190)	\$0.008	(\$23,493,093)	\$1,990	0	\$0	2,512,765,702	5,020,996	88,288,333	568,226	14,473,818	37,616,171	0.93	\$14.36	\$770,294,311
	7 2026	(\$53,144,825)	\$0.008	(\$23,577,668)	\$1,990	0	\$0	2,521,811,658	5,039,072	88,606,171	570,271	14,525,923	37,751,589	0.93	\$14.36	\$773,067,371
	8 2027	(\$53,336,147)	\$0.008	(\$23,662,548)	\$1,990	0	\$0	2,530,890,180	5,057,212	88,925,153	572,324	14,578,217	37,887,495	0.93	\$14.36	\$775,850,413
	9 2028	(\$53,528,157)	\$0.008	(\$23,747,733)	\$1,990	0	\$0	2,540,001,385	5,075,418	89,245,284	574,384	14,630,698	38,023,890	0.93	\$14.36	\$778,643,475
	10 2029	(\$53,720,858)	\$0.008	(\$23,833,225)	\$1,990	0	\$0	2,549,145,390	5,093,690	89,566,567	576,452	14,683,369	38,160,776	0.93	\$14.36	\$781,446,591
	11 2030	(\$53,914,253)	\$0.008	(\$23,919,025)	\$1,990	0	\$0	2,558,322,313	5,112,027	89,889,006	578,527	14,736,229	38,298,154	0.93	\$14.36	\$784,259,799
	12 2031	(\$54,108,345)	\$0.008	(\$24,005,133)	\$1,990	0	\$0	2,567,532,274	5,130,430	90,212,607	580,610	14,789,279	38,436,028	0.93	\$14.36	\$787,083,134
	13 2032	(\$54,303,135)	\$0.008	(\$24,091,552)	\$1,990	0	\$0	2,576,775,390	5,148,900	90,537,372	582,700	14,842,521	38,574,397	0.93	\$14.36	\$789,916,633
	14 2033	(\$54,498,626)	\$0.008	(\$24,178,281)	\$1,990	0	\$0	2,586,051,781	5,167,436	90,863,307	584,798	14,895,954	38,713,265	0.93	\$14.36	\$792,760,333
	15 2034	(\$54,694,821)	\$0.008	(\$24,265,323)	\$1,990	0	\$0	2,595,361,568	5,186,039	91,190,415	586,903	14,949,579	38,852,633	0.93	\$14.36	\$795,614,271
	16 2035	(\$54,891,722)	\$0.008	(\$24,352,678)	\$1,990	0	\$0	2,604,704,869	5,204,708	91,518,700	589,016	15,003,398	38,992,502	0.93	\$14.36	\$798,478,482
	17 2036	(\$55,089,332)	\$0.008	(\$24,440,348)	\$1,990	0	\$0	2,614,081,807	5,223,445	91,848,167	591,137	15,057,410	39,132,875	0.93	\$14.36	\$801,353,004
	18 2037	(\$55,287,654)	\$0.008	(\$24,528,333)	\$1,990	0	\$0	2,623,492,501	5,242,250	92,178,821	593,265	15,111,617	39,273,754	0.93	\$14.36	\$804,237,875
	19 2038	(\$55,486,690)	\$0.008	(\$24,616,635)				2,632,937,074	5,261,122	92,510,665	595,401	15,166,019	39,415,139	0.93	\$14.36	\$807,133,132
	20 2039	(\$55,686,442)	\$0.008	(\$24,705,255)				2,642,415,648	5,280,062	92,843,703	597,544	15,220,616	39,557,034	0.93	\$14.36	\$810,038,811
	21 2040	(\$55,886,913)	\$0.008	(\$24,794,194)				2,851,535,855	5,299,070	93,177,930	599,695	15,275,409	42,693,552	0.93	\$14.36	\$852,940,701
	22 2041	(\$56,088,106)	\$0.008	(\$24,883,453)				2,861,801,384	5,318,147	93,513,371	601,854	15,330,400	42,847,249	0.93	\$14.36	\$856,011,288
	23 2042	(\$56,290,023)	\$0.008	(\$24,973,033)				2,872,103,869	5,337,292	93,850,019	604,021	15,385,590	43,001,499	0.93	\$14.36	\$859,092,928
	24 2043	(\$56,492,667)	\$0.008	(\$25,062,936)				2,882,443,443	5,356,506	94,187,879	606,195	15,440,978	43,156,304	0.93	\$14.36	\$862,185,663
1	25 2044	(\$56,696,041)	\$0.008	(\$25,153,163)				2,892,820,239	5,375,790	94,526,955	608,377	15,496,565	43,311,667	0.93	\$14.36	\$865,289,531
	26 2045	(\$56,900,146)	\$0.008	(\$25,243,714)				2,903,234,392	5,395,142	94,867,252	610,568	15,552,353	43,467,589	0.93	\$14.36	\$868,404,574
	27 2046	(\$57,104,987)	\$0.008	(\$25,334,592)				2,913,686,036	5,414,565	95,208,774	612,766	15,608,341	43,624,072	0.93	\$14.36	\$871,530,830
	28 2047	(\$57,310,565)	\$0.008	(\$25,425,796)				2,924,175,306	5,434,057	95,551,526	614,972	15,664,531	43,781,119	0.93	\$14.36	\$874,668,341
	29 2048	(\$57,516,883)	\$0.008	(\$25,517,329)				2,934,702,337	5,453,620	95,895,511	617,185	15,720,924	43,938,731	0.93	\$14.36	\$877,817,147
	30 2049	(\$57,723,944)	\$0.008	(\$25,609,191)				2,945,267,265	5,473,253	96,240,735	619,407	15,777,519	44,096,910	0.93	\$14.36	\$880,977,289
Ľ	31 2050	(\$57,931,750)	\$0.008	(\$25,701,385)	-			2,955,870,227	5,492,957	96,587,202	621,637	15,834,318	44,255,659	0.93	\$14.36	\$884,148,807
	32 2051	(\$58,140,304)	\$0.008	(\$25,793,910)				2,966,511,360	5,512,731	96,934,916	623,875	15,891,322	44,414,979	0.93	\$14.36	\$887,331,743
E	33 2052	(\$58,349,609)	\$0.008	(\$25,886,768)	-			2,977,190,801	5,532,577	97,283,881	626,121	15,948,530	44,574,873	0.93	\$14.36	\$890,526,137
	34 2053	(\$58,559,668)	\$0.008	(\$25,979,960)				2,987,908,688	5,552,495	97,634,103	628,375	16,005,945	44,/35,343	0.93	\$14.36	\$893,732,031
E	35 2054	(\$58,770,483)	\$0.008	(\$26,073,488)	-			2,998,665,159	5,572,484	97,985,586	630,637	16,063,567	44,896,390	0.93	\$14.36	\$896,949,466
	36 2055	(\$58,982,056)	\$0.008	(\$26,167,352)				3,009,460,354	5,592,544	98,338,334	632,907	16,121,395	45,058,017	0.93	\$14.36	\$900,178,484
E	37 2056	(\$59,194,392)	\$0.008	(\$26,261,555)				3,020,294,411	5,612,678	98,692,352	635,186	16,179,432	45,220,226	0.93	\$14.36	\$903,419,127
	38 2057	(\$59,407,492)	\$0.008	(\$26,356,096)	-			3,031,167,471	5,632,883	99,047,645	637,473	16,237,678	45,383,019	0.93	\$14.36	\$906,671,436
-	39 2058	(\$59,621,359)	\$0.008	(\$26,450,978)				3,042,079,674	5,653,162	99,404,216	639,768	16,296,134	45,546,398	0.93	\$14.36	\$909,935,453
ľ	40 2059	(\$59,835,995)	\$0.008	(\$26,546,202)				3,053,031,161	5,673,513	99,762,071	642,0/1	16,354,800	45,/10,365	0.93	\$14.36	\$913,211,221
Ľ	+1 2060	(\$60,051,405)	\$0.008	(\$26,641,768)		2	40	3,064,022,073	5,693,938	100,121,215	644,382	16,413,6//	45,874,922	0.93	\$14.36	\$916,498,781
	UTALS	(\$2,293,435,256)		(\$1,017,481,115)		0	\$0				24,609,729	626,858,079	1,694,341,103			\$34,231,921,183
1	% Discount	(\$1,290,627,268)		(\$572,585,979)			\$0									\$19,126,453,131
ľ	% Discount	(\$945,281,797)		(\$419,373,677)			\$0									\$13,949,597,402
12	'% Discount	(\$726,636,766)		(\$322,371,946)	1		\$0									\$10,685,053,907

						Reduced	I-290 Induced						No Injury				Severe	Critical
		Proportio				Accidents I-	Accidents and					Deaths Project, Induced	AIS 0	Minor AIS 1	Moderate AIS 2	Serious AIS 3	AIS 4	AIS 5
-	Calendar	n Heavy	Time Value	Heavy Truck Travel Time	Accidents No-	290 Corridor	Pricing	Net Increased	Value of	Death/ Crash	Deaths	Traffic and No Pricing	0.43676 *	0.41739 *	0.08872 *	0.04817 *	0.00617 *	0.00279 *
Yea	Year	IK	(per nr)	Benefits	build	HUT 3+ Alt.	Opportunity Costs	Accidents	Statistical Life	Ratio	Increased	Opportunity Costs	\$0	\$2,144	\$38,078	\$84,718	\$190,799	\$423,999
1	2020	0.07	\$27.80	\$110,244,993	184,393	-274	8,320	8,046	\$9,780,000	0.003354	26.99	(\$263,923,326)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
2	2021	0.07	\$27.80	\$110,641,875	185,057	-275	8,350	8,075	\$9,780,000	0.003354	27	(\$264,873,450)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
3	2022	0.07	\$27.80	\$111,040,186	185,723	-276	8,380	8,104	\$9,780,000	0.003354	27	(\$265,826,994)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
4	2023	0.07	\$27.80	\$111,439,931	186,391	-2//	8,410	8,133	\$9,780,000	0.003354	27	(\$266,783,972)	\$0 \$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
5	2024	0.07	\$27.80	\$111,841,114	187,063	-278	8,441	8,163	\$9,780,000	0.003354	27	(\$267,744,394)	\$0 ¢0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
	2025	0.07	\$27.80	\$112,243,742	187,/30	-2/9	8,471	8,192	\$9,780,000	0.003354	27	(\$208,708,274)	\$U ¢0	\$895 ¢805	\$3,378	\$4,081	\$1,177	\$1,183
-	2020	0.07	\$27.80	\$112,047,820	188,412	-280	8,502	8,222	\$9,780,000	0.003354	28	(\$209,075,024)	50 \$0	\$895	\$3,378 \$2,279	\$4,081	\$1,177 \$1,177	\$1,183
0	2027	0.07	\$27.80	\$113,055,552	189,090	-201	8,552	8 281	\$9,780,000	0.003354	28	(\$271,620,783)	30 \$0	\$895	\$3,378	\$4,081	\$1,177	\$1,103
10	2020	0.07	\$27.80	\$113,468,801	190 454	-283	8,505	8 311	\$9,780,000	0.003354	20	(\$272 598 618)	\$0 \$0	\$895	\$3,378	\$4.081	\$1,177	\$1 183
11	2025	0.07	\$27.80	\$114,278,729	191 140	-284	8 625	8 341	\$9,780,000	0.003354	28	(\$273,579,973)	\$0	\$895	\$3,378	\$4 081	\$1 177	\$1 183
12	2031	0.07	\$27.80	\$114.690.132	191.828	-285	8.656	8.371	\$9.780.000	0.003354	28	(\$274,564,861)	\$0	\$895	\$3.378	\$4.081	\$1.177	\$1.183
13	2032	0.07	\$27.80	\$115,103,017	192,518	-286	8,687	8,401	\$9,780,000	0.003354	28	(\$275,553,294)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
14	2033	0.07	\$27.80	\$115,517,388	193,211	-287	8,718	8,431	\$9,780,000	0.003354	28	(\$276,545,286)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
15	2034	0.07	\$27.80	\$115,933,250	193,907	-288	8,750	8,461	\$9,780,000	0.003354	28	(\$277,540,849)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
16	2035	0.07	\$27.80	\$116,350,610	194,605	-289	8,781	8,492	\$9,780,000	0.003354	28	(\$278,539,996)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
17	2036	0.07	\$27.80	\$116,769,472	195,306	-290	8,813	8,522	\$9,780,000	0.003354	29	(\$279,542,740)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
18	2037	0.07	\$27.80	\$117,189,842	196,009	-291	8,844	8,553	\$9,780,000	0.003354	29	(\$280,549,094)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
19	2038	0.07	\$27.80	\$117,611,726	196,714	-292	8,876	8,584	\$9,780,000	0.003354	29	(\$281,559,071)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
20	2039	0.07	\$27.80	\$118,035,128	197,422	-293	8,908	8,615	\$9,780,000	0.003354	29	(\$282,572,683)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
21	2040	0.07	\$27.80	\$124,286,594	198,133	-294	8,940	8,646	\$9,780,000	0.003354	29	(\$283,597,063)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
22	2041	0.07	\$27.80	\$124,734,026	198,846	-295	8,972	8,677	\$9,780,000	0.003354	29	(\$284,618,012)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
23	2042	0.07	\$27.80	\$125,183,068	199,562	-296	9,005	8,708	\$9,780,000	0.003354	29	(\$285,642,637)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
24	2043	0.07	\$27.80	\$125,633,727	200,281	-297	9,037	8,740	\$9,780,000	0.003354	29	(\$286,670,950)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
25	2044	0.07	\$27.80	\$126,086,009	201,002	-298	9,070	8,771	\$9,780,000	0.003354	29	(\$287,702,966)	\$0 ¢0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
20	2045	0.07	\$27.80	\$126,539,918	201,725	-300	9,102	8,803	\$9,780,000	0.003354	30	(\$288,738,697)	\$0 ¢0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
2/	2046	0.07	\$27.80	\$120,995,402	202,452	-301	9,135	8,834	\$9,780,000	0.003354	30	(\$289,778,150)	50 \$0	\$895	\$3,378 ¢2,279	\$4,081	\$1,177 \$1,177	\$1,183
20	2047	0.07	\$27.80	\$127,432,040	203,180	-302	9,108	8,800	\$9,780,000	0.003354	30	(\$291,868,314)	30 \$0	\$895	\$3,378	\$4,081	\$1,177	\$1,103
30	2040	0.07	\$27.80	\$128 371 956	203,512	-304	9 234	8 930	\$9,780,000	0.003354	30	(\$292,919,040)	\$0 \$0	\$895	\$3,378	\$4.081	\$1 177	\$1 183
31	2050	0.07	\$27.80	\$128,834.095	205,383	-305	9,267	8,962	\$9,780,000	0.003354	30	(\$293.973.549)	\$0	\$895	\$3,378	\$4.081	\$1,177	\$1,183
32	2051	0.07	\$27.80	\$129.297.898	206.122	-306	9.301	8,995	\$9,780,000	0.003354	30	(\$295.031.853)	\$0	\$895	\$3.378	\$4.081	\$1.177	\$1,183
33	2052	0.07	\$27.80	\$129,763,371	206,864	-307	9,334	9,027	\$9,780,000	0.003354	30	(\$296,093,968)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
34	2053	0.07	\$27.80	\$130,230,519	207,609	-308	9,368	9,060	\$9,780,000	0.003354	30	(\$297,159,906)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
35	2054	0.07	\$27.80	\$130,699,349	208,356	-309	9,402	9,092	\$9,780,000	0.003354	30	(\$298,229,682)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
36	2055	0.07	\$27.80	\$131,169,866	209,106	-310	9,435	9,125	\$9,780,000	0.003354	31	(\$299,303,309)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
37	2056	0.07	\$27.80	\$131,642,078	209,859	-312	9,469	9,158	\$9,780,000	0.003354	31	(\$300,380,801)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
38	2057	0.07	\$27.80	\$132,115,989	210,615	-313	9,503	9,191	\$9,780,000	0.003354	31	(\$301,462,172)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
39	2058	0.07	\$27.80	\$132,591,607	211,373	-314	9,538	9,224	\$9,780,000	0.003354	31	(\$302,547,435)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
40	2059	0.07	\$27.80	\$133,068,937	212,134	-315	9,572	9,257	\$9,780,000	0.003354	31	(\$303,636,606)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
41	2060	0.07	\$27.80	\$133,547,985	212,897	-316	9,606	9,290	\$9,780,000	0.003354	31	(\$304,729,698)	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
то	TALS			\$4,988,118,027	8,130,805	-12,077	366,881	317,842			1,190	(\$11,637,855,910)						
3%	Discount			\$2,787,018,734								(\$6,549,161,569)						
5%	Discount			\$2,032,671,140								(\$4,796,729,322)						
1/%	uscount			\$1,556,976,885								(\$3,687,232,215)						

R. Arkell, AICP 7/27/2018

		Traffic and No Pricing												
		Opportunity Costs	Property Damage Only	Total Accident Death/		Discount		Discount						
	Calendar	Accidents*∑[Pr(AIS _x)*Val	\$3547 per Accident	Injury/PDO Opportunity		Factor	Discount	Factor						
Year	Year	ue (AIS _x)] ¹⁸	Opportunity Costs ¹⁸	Costs ¹⁸	Residual Value	(3%)	Factor (5%)	(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)
1	2020	(\$86,209,248)	(\$28,540,041)	(\$378,672,615)		0.9709	0.9524	0.9346	(\$3,417,193,416)	\$841,597,968	(\$3,353,282,836)	\$825,561,752	(\$3,291,790,494)	\$810,132,311
2	2021	(\$86,519,601)	(\$28,642,785)	(\$380,035,836)		0.9426	0.9070	0.8734	(\$3,329,627,221)	\$820,008,332	(\$3,206,223,835)	\$789,038,359	(\$3,089,753,224)	\$759,808,272
3	2022	(\$86,831,072)	(\$28,745,899)	(\$381,403,965)		0.9151	0.8638	0.8163	(\$3,243,952,668)	\$798,950,804	(\$3,065,535,801)	\$754,162,063	(\$2,900,334,999)	\$712,691,007
4	2023	(\$87,143,664)	(\$28,849,384)	(\$382,777,020)		0.8885	0.8227	0.7629	(\$3,160,737,458)	\$778,519,630	(\$2,931,135,572)	\$720,864,490	(\$2,722,470,028)	\$668,466,658
5	2024	(\$87,457,381)	(\$28,953,242)	(\$384,155,017)		0.8626	0.7835	0.7130	(\$3,079,319,977)	\$758,546,557	(\$2,802,404,624)	\$688,988,207	(\$2,555,596,377)	\$626,992,459
6	2025	(\$87,772,227)	(\$29,057,474)	(\$385,537,975)		0.8375	0.7462	0.6663	(\$3,000,082,486)	\$739,125,620	(\$2,679,416,630)	\$658,549,895	(\$2,398,790,104)	\$588,035,105
7	2026	(\$88,088,208)	(\$29,162,081)	(\$386,925,912)		0.8131	0.7107	0.6227	(\$2,611,193,182)	\$720,902,006	(\$2,289,609,881)	\$630,113,216	(\$2,013,249,232)	\$552,091,599
8	2027	(\$88,405,325)	(\$29,267,064)	(\$388,318,845)		0.7894	0.6768	0.5820	(\$2,545,014,584)	\$702,406,427	(\$2,190,091,321)	\$602,215,188	(\$1,891,274,933)	\$517,862,352
9	2028	(\$88,723,584)	(\$29,372,426)	(\$389,716,793)		0.7664	0.6446	0.5439	(\$2,480,533,904)	\$684,393,597	(\$2,095,192,161)	\$575,626,452	(\$1,776,605,022)	\$485,701,563
10	2029	(\$89,042,989)	(\$29,478,166)	(\$391,119,773)		0.7441	0.6139	0.5083	(\$2,417,773,762)	\$666,869,476	(\$2,004,333,659)	\$550,183,001	(\$1,669,008,966)	\$455,543,280
11	2030	(\$89,363,544)	(\$29,584,288)	(\$392,527,804)		0.7224	0.5847	0.4751	(\$2,356,438,156)	\$649,750,123	(\$1,917,565,465)	\$525,898,252	(\$1,568,252,125)	\$427,320,437
12	2031	(\$89,685,253)	(\$29,690,791)	(\$393,940,905)		0.7014	0.5568	0.4440	(\$2,296,866,256)	\$633,130,884	(\$1,834,297,745)	\$502,605,184	(\$1,473,455,919)	\$400,784,306
13	2032	(\$90,008,120)	(\$29,797,678)	(\$395,359,092)		0.6810	0.5303	0.4150	(\$2,238,759,884)	\$616,927,257	(\$1,754,894,745)	\$480,406,056	(\$1,384,691,358)	\$375,954,202
14	2033	(\$90,332,149)	(\$29,904,950)	(\$396,782,384)		0.6611	0.5051	0.3878	(\$2,181,816,223)	\$601,053,484	(\$1,679,081,198)	\$459,222,682	(\$1,301,063,131)	\$352,576,828
15	2034	(\$90,657,345)	(\$30,012,607)	(\$398,210,801)		0.6419	0.4810	0.3624	(\$2,126,698,146)	\$585,696,270	(\$1,606,253,904)	\$438,884,415	(\$1,222,632,481)	\$330,668,840
16	2035	(\$90,983,711)	(\$30,120,653)	(\$399,644,360)		0.6232	0.4581	0.3387	(\$2,072,779,548)	\$570,678,687	(\$1,536,774,337)	\$419,492,790	(\$1,149,136,407)	\$310,155,442
17	2036	(\$91,311,252)	(\$30,229,087)	(\$401,083,080)		0.6050	0.4363	0.3166	(\$2,020,076,546)	\$556,005,023	(\$1,470,357,286)	\$400,966,928	(\$1,080,307,521)	\$290,960,645
18	2037	(\$91,639,973)	(\$30,337,912)	(\$402,526,979)		0.5874	0.4155	0.2959	(\$1,968,932,394)	\$541,771,830	(\$1,406,712,984)	\$383,224,711	(\$1,015,546,949)	\$272,915,023
19	2038	(\$91,969,877)	(\$30,447,128)	(\$403,976,076)		0.5703	0.3957	0.2765	(\$1,919,038,720)	\$527,891,892	(\$1,345,875,329)	\$366,275,331	(\$954,574,778)	\$255,939,169
20	2039	(\$92,300,968)	(\$30,556,738)	(\$405,430,390)		0.5537	0.3769	0.2584	(\$1,870,411,887)	\$514,369,598	(\$1,287,878,437)	\$350,128,050	(\$897,436,051)	\$240,045,339
21	2040	(\$92,635,577)	(\$30,667,512)	(\$406,900,151)		0.5375	0.3589	0.2415	(\$1,822,743,124)	\$525,740,244	(\$1,232,098,895)	\$351,047,765	(\$843,847,873)	\$236,216,315
22	2041	(\$92,969,065)	(\$30,777,915)	(\$408,364,992)		0.5219	0.3418	0.2257	(\$1,776,698,039)	\$512,317,605	(\$1,178,888,358)	\$335,524,348	(\$793,515,210)	\$221,556,013
23	2042	(\$93,303,753)	(\$30,888,715)	(\$409,835,106)		0.5067	0.3256	0.2109	(\$1,731,636,243)	\$499,185,683	(\$1,128,281,735)	\$320,771,380	(\$746,146,108)	\$207,772,371
24	2043	(\$93,639,647)	(\$30,999,915)	(\$411,310,512)		0.4919	0.3101	0.1971	(\$1,687,570,756)	\$486,348,161	(\$1,079,641,518)	\$306,600,050	(\$701,775,711)	\$194,875,427
25	2044	(\$93,976,750)	(\$31,111,515)	(\$412,791,230)		0.4776	0.2953	0.1842	(\$1,644,850,299)	\$473,907,975	(\$1,032,991,766)	\$293,017,222	(\$660,103,763)	\$182,776,066
26	2045	(\$94,315,066)	(\$31,223,516)	(\$414,277,279)		0.4637	0.2812	0.1722	(\$1,603,154,887)	\$461,770,350	(\$988,356,693)	\$280,029,809	(\$621,162,156)	\$171,483,404
27	2046	(\$94,654,600)	(\$31,335,921)	(\$415,768,677)		0.4502	0.2678	0.1609	(\$1,562,497,770)	\$449,939,056	(\$945,760,674)	\$267,644,778	(\$584,306,751)	\$160,806,739
28	2047	(\$94,995,357)	(\$31,448,730)	(\$417,265,444)		0.4371	0.2551	0.1504	(\$1,522,892,274)	\$438,417,890	(\$905,228,244)	\$255,869,146	(\$549,901,739)	\$150,853,468
29	2048	(\$95,337,340)	(\$31,561,945)	(\$418,767,600)		0.4243	0.2429	0.1406	(\$1,484,011,172)	\$427,110,017	(\$866,102,837)	\$244,508,657	(\$517,635,237)	\$141,531,153
30	2049	(\$95,680,554)	(\$31,675,568)	(\$420,275,163)		0.4120	0.2314	0.1314	(\$1,446,547,957)	\$416,220,254	(\$829,085,541)	\$233,770,308	(\$487,190,515)	\$132,745,974
31	2050	(\$96,025,004)	(\$31,789,600)	(\$421,788,154)		0.4000	0.2204	0.1228	(\$1,409,833,661)	\$405,550,797	(\$793,515,041)	\$223,458,489	(\$458,589,108)	\$124,504,095
32	2051	(\$96,370,694)	(\$31,904,043)	(\$423,306,591)		0.3883	0.2099	0.1147	(\$1,373,878,129)	\$395,104,465	(\$759,408,891)	\$213,578,231	(\$431,508,266)	\$116,709,972
33	2052	(\$96,717,629)	(\$32,018,898)	(\$424,830,495)		0.3770	0.1999	0.1072	(\$1,339,036,972)	\$384,986,216	(\$726,784,763)	\$204,134,601	(\$406,311,698)	\$109,470,882
34	2053	(\$97,065,812)	(\$32,134,166)	(\$426,359,884)		0.3660	0.1904	0.1002	(\$1,304,977,007)	\$375,097,530	(\$695,660,448)	\$195,132,704	(\$382,674,380)	\$102,690,635
35	2054	(\$97,415,249)	(\$32,249,849)	(\$427,894,780)		0.3545	0.1813	0.0937	(\$1,269,061,364)	\$364,659,602	(\$665,705,582)	\$186,474,829	(\$360,614,572)	\$96,374,470
36	2055	(\$97,765,944)	(\$32,365,948)	(\$429,435,201)		0.3450	0.1/2/	0.0875	(\$1,239,590,443)	\$356,123,642	(\$637,283,897)	\$1/8,268,270	(\$339,451,525)	\$90,321,214
3/	2056	(\$98,117,902)	(\$32,482,465)	(\$430,981,168)		0.3350	0.1644	0.0705	(\$1,208,286,712)	\$347,045,024	(\$609,711,813)	\$170,311,050	(\$319,897,706)	\$84,741,143
38	2057	(\$98,4/1,126)	(\$32,599,402)	(\$432,532,700)		0.3252	0.1566	0.0765	(\$1,1/7,455,168)	\$338,104,429	(\$583,704,133)	\$162,814,125	(\$301,619,566)	\$/9,535,636
39	2058	(\$98,825,622)	(\$32,/10,/60)	(\$434,089,818)		0.3158	0.1491	0.0715	(\$1,147,809,158)	\$329,512,399	(\$558,572,288)	\$155,574,093	(\$284,278,461)	\$74,604,612
40	2059	(\$99,181,394)	(\$32,834,541)	(\$435,052,541)		0.3006	0.1420	0.0008	(\$1,118,053,427)	\$321,003,024	(\$554,081,706)	\$148,098,743	(\$207,005,391)	\$65,551,240
41 TO	2000	(\$2,901,447) (\$2,901,449,025)	(\$32,332,745)	(\$457,220,890)	ćo	0.2976	0.1300	0.0624	(\$1,003,334,493) (\$0,208,425,473)	\$21 020 560 425	(\$50,725,059,000)	\$143,558,521	(\$252,451,432)	\$12 240 744 274
20/	ALJ	(\$3,001,448,025) (\$3,120,251,209)	(\$1,238,490,062)	(210,037,733,396)	\$U \$0	10-0	200 007 077		(200,298,423,472) P/C Pation	ş21,329,300,425	(333,725,058,900) R/C Pation	ş15,593,194,143	(340,000,837,200) R/C Pation	\$12,249,744,374
5%	Discount	(\$2,133,251,208)	(\$708,210,757)		\$0 ¢0	(\$58,	308,865,047)			U.2/		U.27		U.20
5% 7%	Discount	(\$1,000,027,889)	(\$200 720 522)			(\$43,	/31,804,/5/)		INF V.	(300,000,000,047)	INF V.	(343,/31,004,/3/)	INF V.	(204,417,052,092)
1 /0	Discount	(71,204,410,131)	(2220,720,323)	1	ŞU	(234,	+11,032,092)							

Year	Calendar Year	Capital Opportunity Capital Costs I-290 HOT 3+ Alternative ¹ Alternative ¹ (Design/Const) (Design/Const)	Capital Costs I-290 HOT3+ Alternative Net ¹ (Design/Const)	O&M Costs I-290 HOT +3 Alternative	O&M Opportunity Costs under Park/Trail Alternative	I-290 HOT 3+ O&M Benefits Considering Opportunity Costs ²	Farm Crops Production Loss Costs ³	Ecological Acreage Loss (Pavement)	Ecological Value Per Acre	Ecological Land Opportunity Costs ⁴	Ecological Acreage Loss Induced Development	Ecological Value Per Acre	Ecological Land Loss Induced Development Costs ⁴	Chicago UZA Estimated Population	Chicago UZA Estimated AVMT-No Build	Study Area AVMT-No Build	Chicago UZA Estimated Per Capita VMT-No Build
		Benefit-cost analysis of the Eisenhower Expressw	ay (I-290) 13-mile recons	truction in the Chicago	o urbanized area (UZA) through a useful lif	e period of 35 year	s after complet	tion. All figure	are in 2016 dollars. T	he assumption is	the HOT+3 bui	d alternative.	ii		İ	
		1. Capital Costs: Includes right-of-way (ROW) acc according to the document are \$2,571,000,000.	quisition, design, enginee These costs are then defl	ering and construction ated to 2016 dollars.	from 2020-2025 base	ed on the following d	ocumentation: Illir	ois Departmen	it of Transport	tion (IDOT) Eisenhowe	r Expressway, Dra	aft Environmen	tal Impact Statem	ent (DEIS) Summr	nary, dated December 2016.	The year of expenditure (YOE) costs
		A rough estimate of the cost to remove the 13-m - \$18,224,173 (2016 \$) for excavation of lane paw Growth Through Ecological Restoration of the Nia - Estimated costs for building one pedestrian and http://infpc.org/media/3539/appendix_b_trail - Thus the total bicycle/pedestrian pathway/linea - Of note is that a third alternative of removing the - of note is that a third alternative of removing the - of the bitter/(wave data wave/lite appendix)	ile I-290 expressway can rement to a depth of 24 ii agra Gorge Rim, Part II R one bicycle 13-mile gran loosts.pdf. Ir park alternative capital re expressway and reests with (remeriter u/ 21 C	be calculated as follow nches and replacemeni obert Moses Parkway, J ular linear pathway, ex cost is \$32,943,723 (2 ablishing the street gric rideo Etuku adf)	vs: t of topsoil. \$13,219,1 tts Current Purpose a ach 5-feet wide are al 016\$). d might cost about 93	550 for concrete debi nd Future Prospects. bout \$1.5 million (20 percent of the full e	ris disposal @264,3 Available via: http 16 \$). Source: Noi xpressway reconst	91 cubic yards //niagara.nypa thwestern Indi uction cost bas	(CY) X \$50 per .gov/Relicensii ana Regional P sed on an analy	CY assuming concrete gGreenwayFunds/Ecol anning Commission. (2 sis of the Syracuse, Ne	thickness of 1 foo ogicalGreenway/ 010). NIRPC Ped w York I-80 urbar	nt, 104 feet wid NGR_Part02.pi and Pedal 2010	le (8 lanes @13 fea if.), Appendix B, Trai ost analysis (New Y	et), 68,640 feet lo l Cost Analysis. A ork State Departr	ng (13 miles). Source: EDR C vailable via ment of Transportation. (201	ompanies. (2011). Region 7). The I-81 Corridor Stud	al Economic y. pp. 39-44.
		 Operating and Maintenance (O&M) Costs: Call Indiana of 31 states which found the average per (http://modot.org/newsandinfo/documents/Legi 	culations are based on da lane mile maintenance c islative_Toll_Report_8-8-	ata in Wisconsin Transp costs to be \$5,818 (\$6,3 02.pdf). Using this assu	portation Finance and 116 in 2016 \$). \$6,11 umption brings the to	l Policy Commission. 6 is multiplied by the tal estimated annual	(n.d.). State Highw 104 Iane miles res O&M costs to \$1,0	ay Maintenanc ulting in an anr 125,910.	e Policy Issue F nual cost of \$63	aper. Available via http 6,064. A 2002 HNTB re	o://www.dot.wiso port, Misouri Tol	consin.gov/abo I Feasibility Stu	ut/tfp/docs/state- dy (p. 18), states t	nighway-maint.po hat estimated Illir	If. The document cites an inf nois toll operations were abo	formal 2012 survey by the ut 38% of the total O&M (State of costs
		Operating costs for maintaining the 13-mile I-290 amount per acre is relatively low as the Chicago P database-report-2013-NRPA.pdf. Thus, annual ma	ROW as converted park Park District has more tha aintenance costs for a pa	dand. The total square an 8,000 acres in its sys rk are \$1,920,000 (384	e footage is 20,592,00 stem. Source: Nationa acres X \$5,000).	0 (300 feet wide X 1: I Recreation and Par	3 miles X 5,280) w k association. (201	nich equates to 3). Parks & Reci	473 acres. Thi reation Nation	s is reduced by 25% to Il Database Report. Fig	384 acres to acco ure 18. Available	ount for the CTA via https://ww	A rail ROW. Annua w.nrpa.org/upload	operational cost ledFiles/PageBuil	s to maintain one acre of land der_Proragis/Content/comm	d are assumed @\$5,000 (: on_elelments/PRORAGIS-	2016 \$). The -national-
		3. Farm Crops Production Costs: N/A.															
		4. Ecological Acreage Costs: Losses are calculated (1997)(http://www.geocities.ws/davefergus/Tran was \$0.7233 which translates to \$17,359 (1994 \$)	d for the land that is used hsportation/4CHAP4.htm) or \$28,270 (2016 \$). Of	l for pavement. The es). Per Table 4.13 of the ne hectare is 2.47105 a	stimated amount of c e citation, the 1994 (acres, therefore the v	oncrete for the expre Canadian dollars valu alue per acre is \$11,4	essway is 236 acres e of pavement con 140 (2016 US \$). Tl	. Annual cost v verted to urbar iis is multiplied	alues used per n greenspace is by 236 acres f	acre are based on the \$24,000 per hectare. I or a total annual monet	Monetization of I Per Oanda Histori tized value of \$2,	Environmental ical Exchange R 669,840.	Impacts of Roads b ates (http://www.	oy Peter Bein, B.C oanda.com/curre	. Ministry of Transportation a ncy/historical-rates/), the Jul	and Highways Iy 1994 Canadian/U.S. cur	rency ratio
		5. Vehicle Miles Traveled: Chicago UZA populatic travel time and automobile operating costs can in is due to induced demand from 1-290. Opportunit decrease VMT by 4% (-0.2 elasticity). This is based Institute. Available via http://www.vtpi.org/sotp	on is estimated for 2020 ncrease VMT by up to 1 p ty costs for further poten d upon research showing m.pdf. Accordingly, calc	based upon the 2010 C ercent. Source: Litman tial VMT reductions re that personal vehicula ulations are provided fi	Census population of n, T. (2014). Generate gionwide are calculat ar travel is underprice or the VMT increases	8,608,208 and the 3. ed Traffic and Induce ed based upon assur d by up to 30 percen under the HOT+3 alt	6% increase from 2 d Travel. Victoria T nptions of a \$0.50 t or more and that cernative and for th	000-2010. A 0. ransportation f ncrease in pric the price elasti e opportunity o	.36% annual in Policy Institute ing per gallon o icity of demand costs of not ad	rease is assumed. An April. Available via htt of fuel (via fuel tax or of l is up to -0.1 in the sho dressing induced dema	nual vehicle miles p://www.vtpi.org ther means) whic rt-run and -0.3 ir nd or implement	s traveled data s/gentraf.pdf. h represents al the long-run. ing the regionw	(AVMT) is derived A conservative ass bout a 20% increas Source: Litman, T. ride pricing mecha	from the IDOT D umption is made e over a price of 9 (2011). Socially O nism.	EIS 2040 estimates. Studies h that 25 percent of the corric \$2.50. A realistic assumption ptimal Transport Prices and I	have shown that 1 percent dor VMT, apart from popu is that the 20% pricing in Markets. Victoria Transpo	t decreases in Ilation growth, crease will rt Policy
		6. Crime: Average daily traffic per freeway lane r due to retention of the 13-mile segment of I-290. Segregation and Urban Form with Crime. Unpubli McCollister KE, French MT, & Ganf H. (2010). The of 55,642,000 is divided by the number of freewa crime, a reduction in violent crime rate per 100,0 2016 5.	mile data is obtained fro Various research shows ished Manuscript. Availa Cost of Crime to Society ay lane miles which is 3,1 00 population of betwee	n the Federal Highway a statistically significa ble via https://docs.wi : New Crime-Specific E 54 and results in ADTFI n 3 and 4 is calculated.	Administration (FHW nt positive correlation xstatic.com/ugd/6fd/ stimates for Policy & L of 17,641. The prop . This is adjusted for	VA) 2014 statistics, ar n between increasing 23c_97aef081476645 Program Evaluation. vortion of ADTFL red the total population	nnualized (ADTFL), population disper 50c9b11972188f6f Drug and Alcohol I iced from the rem and then monetize	and an increase sement and cri 8e.pdf. Calcula <i>Dependence</i> . 10 wal of the 13-n d by the violent	e is calculated I me. In particul tions for the vi 18: 1-2, pp. 98- nile I-290 segm t crime categor	ased upon the opportu r, one study shows that olent crime categories .09. The estimates for ent is then calculated b ies for murder, rape, ro	unity costs of not at an increase of 2 of murder, rape, each type of crim y multiplying the obbery and aggra	removing the : L in AATFL is as aggravated ass le are based up previous figure vated assault u	L3-mile segment or sociated with an in ault, and robbery a on 2015 Chicago N e by (104/3,154). 1 sing the Chicago c	f I-290. The result crease in violent are then estimate /ISA data from the 04 is 8 lane miles rime rate proport	is then used to calculate the crime by 0.0000148. Source: d using monetized values base e Uniform Crime Reporting S multiplied by 13. Using the ions and the aforementioned	opportunity costs of incr. Arkell, R. (2017). The Assised upon additional resea tatistics. Total Chicago fr aforementioned AATFL el d McCollister et al. values	eased crime ociation of rch. Source: eeway DVMT asticity of converted to
		7. Vehicle Miles Traveled: The 2016 AAA per mile content/uploads/2012/09/ATRI-Operational-Cost	e operating costs of aver ts-of-Trucking-2012.pdf),	age sedans, SUVs, and states that average ca	minivans is about \$0 rrier costs per mile fo	.62. The variable rate or heavy trucks in 201	e (non-fixed) of thi 1 was \$1.71 (\$1.83	cost assumed in 2016 \$). The	is \$0.27 (2016 e annual VMT (\$). A September 2012 Iollar values represent	American Transp the opportunity o	ortation Resea costs of retainir	rch Institute repor ng I-290 with the H	t, "An Analysis of OT+3 alternative	the Operational Costs of True and not implementing the re	cking" (http://www.glosto gionwide pricing mechan	one.com/wp- ism.
		8. Noise: The TRB Transportation Benefit-Cost Ar www.vtpi.org/tca/tca0511.pdf]. Dollar values for	nalysis web site provides r noise impacts in these c	noise impact values pe ited studies show the f	er VMT for urban high following ranges per '	ways from several st VMT (converted to 20	udies [bca.transpo 016 \$): heavy truc	rtationeconom s (\$0.037-\$0.2	ics.org, referer 7); and auto (\$	cing: Todd Litman (201 0.001 and \$0.029). Mic	.0), "Noise," Tran d-levels of \$0.152	sportation Cost 8 for trucks an	and Benefit Analy d \$0.015 for autos	sis, Victoria Trans are used.	sport Policy Institute (www.v	tpi.org), available at	_
		9. CO ₂ : Assumptions for vehicle miles per gallon (https://www.transportation.gov/sites/dot.gov/fil columns. Generally, CO ₂ increases proportionalte the DEIS Summary, Table S-2 (p. S-24), and conve	(MPG) are 6.5 for heavy the formation of the second	trucks and 21.4 for auto ce%20Guide%202016.p consumption brought a 17 tons no-build*-0.02	os with annual increa odf. The data is then about by the project (1%*0.907185). Incre	ses of 0.18 for the co multiplied for each y EPA, Average Annua cases are calculated b	ombined average. ear by the social co I Emissions and Fue pased upon the opp	Social cost of ca ost of carbon (S I Consumption ortunity costs o	arbon (SCC) val CC) values con for Gasoline-F of I-290's existe	ues are obtained from 1 verted from 2015 \$ to 2 ueled Passenger Cars a ence and not implement	the U.S. Departm 2016 \$. Per the g nd Light Trucks, F ting the 20% incr	ent of Transpo guidance, the C http://www.epa ease in pricing	rtation (USDOT) TH O ₂ values are only a.gov/otaq/consur	GER Benefit-Cost discounted at the ner/420f08024.pd	Analysis (BCA) Resource Guid 3 percent rate but are also o df). Reductions are calculated	de (updated 3/1/16) availa used in the 5 and 7 percer I from the I-290 HOT 3+ p	able via nt benefit project data in
		10. NOX, PM, VOCs: Values converted to 2016 do passenger cars is as follows: NOX - 0.693 g (0.000	llars from the TIGER BCA 0000693 MT; PM10 - 0.00	Resource Guide are \$7 044 g (0.0000000044 N	7,399; \$338,486; and 1T); PM2.5 - 0.0041 g	\$1,696 respectively. (0.0000000041MT);	According to the 0 and VOC - 1.034 g	0ctober 2008 El 0.000001034N	PA Emission Fa /IT). According	cts Sheet, "Average An to the October 2008 EP	nual Emissions ar A Emission Facts	nd Fuel Consum Sheet, "Averag	ption for Gasoline e In-Use Emission	-Fueled Passenge from Heavy-Dut	r Cars and Light Trucks,", the y Trucks," the average emissi	average emissions per m ions per mile for these vel	ile for hicles is as

Year	Calendar Year	I-290 HOT 3+ Alt AVMT	I-290 HOT 3+ Alt AVMT Increase in Region	Opportunity Cost of Existing I-290 Induced AVMT Excluding Project	UZA Pricing (+\$0.50 or +20% per gal.) AVMT Opportunity Cost ⁵	Chicago UZA Estimated Per Capita VMT w/no Project, Induced & w/Pricing	Average Annua Daily Traffic per Fwy Lane Reduced	Violent Crime Reduction per 100,000 Population	Chicago MSA Total Annual Violent Crime Reduction	Murder Value	Rape Value	Robbery Value	Aggravated Assault Value	Total Annual Crime Reduction Opportunity Cost ⁶	Proportic n Auto Traffic) Auto VMT Net Change	VMT Value	Auto VMT Project and Opportunity Cost ⁷
	Calendar Year	I-290 HOT 3+ Alt AVMT 11. Resource Const pollution during ex VMT as follows in 2 12. Parking Costs: goods costs and set that there was an a pricing to calculate care reductions. N \$0.095 (internal); \$ 14. Barrier Effects: car/pickup/van \$0. 15. Transport Diver value measures the alternative of remo corridor I-290 96.2 18. Accident Reduc then multiplied by crashes/104.760.8(not implementing a The TIGER BCA Guil Guide, Section 3. A	I-290 HOT 3+ Alt AVMT Increase in Region Imption Costs: These traction. Depletion o 007 \$ for average tra traction. Depletion o 007 \$ for average tra the VTPI, Transportal vices that includes fr eference is made to nnual average increa potential per capita to the this calculatit outs that this calculatit extent disadvantage U/A. ings: VHT is calculatit existing I-290 corrid ving I-290. Another s lane miles/3,154 Chi tion Benefits: Calcula 1.59 to convert VMT 4,356 VMT) is calcula regional pricing syst deid hutho d1 cmb t	Opportunity Cost of Existing I-290 Induced AVMT Excluding Project are external costs of transif f non-renewable resources wel: average car \$0.039 (\$C tion Cost Analysis Spreadsh ee/reduced cost parking. // "Costs and Estimates of Bicy se of 4.2 percent in these co- vMT reductions not realized on is in the spreadsheeet bi- total of \$0.19 or \$0.22 (20 s to non-motorized travel c and diesel bus \$0.023 (\$0. e VTPI Transportation Cost d oppulations (elderly, low ed in separate columns for t or are then calculated in an eparate column is used to c cago UZA freeway lane mile attors in the I-290 corridor for to per million person miles. atted from total Illinois accid en is integrated into the ca- e of a statistical life as abou on number of accidents red into line lands.	UZA Pricing (+\$0.50 or +20% per gal.) AVMT Opportunity Cost ⁵ port resource production for future generations is a 0.045 in 2016 \$); light truc eet has default parking co A calculation is then made ycling Investments in Portl osts from 1991-2008. Thi d. An assumption is made ut not used in the BCA due 16 \$). The bicycling value: aused by motorized travel 027 in 2016 \$). It is assum Analysis Spreadsheet, the income, minority) are una calculate VHT changes for s) and reduces free-flow V from the project are deter This is then multiplied by lent and VMT data for the solculation based upon the t \$9.4 million in 2013 doll uced is converted to the <i>A</i>	Capita VMT w/no Project, Induced & w/Pricing (primarily petroleum an externality as well k/van \$0.05 (\$0.058 st values per VMT ar for the total estima and, Oregon" by This cost increase is not that the average pe to the availability or to the availabil	Daily Traffic per Fwy Lane Reduced of the social be l although it is no in 2016 \$); and d s follows in 2007 ? ted undiscounted omas Gotschi, in t continued in the rsson reduces hea of the following he servative. Interno: sportation Cost ar as and heavy truck ransportation diw reduced accessib r the I-290 corridd me amount but reduced accessib f the state of the state state and by a f the I-290 corridd me amount but reduced accessib af the state of the state state and by a f the I-290 corridd me amount but reduced accessib at the I-290 corridd me amount but reduced accessib at the I-290 corridd me amount but reduced accessib at the I-290 corridd me amount but reduced accessib reduced accessib at the I-290 corridd me amount but reduced ac	Reduction per 100,000 Population Population lessel bus \$0.194 (\$ \$ for average trave parking costs per lessel bus \$0.194 (\$ \$ for average trave parking costs per calculations. Dec tht care costs prop- lath cost values. T il cost reduction is d Benefit Analysis have the same vi- ersity is \$0.007 in lity brought about por alone using estiti- ssuming 1-290 pro- por due to the oppord duced by 1/2 due reduction from th n Table \$-2 of the Trends, 2010-201 of demand. ssumed death/cra- mine estimated le	Total Annual Violent Crime Reduction Conservation. The TPI Transportatio \$0.226 in 2016 \$). al: car/pickup/var induced auto/ligh sical Activity and + sical Activity and + ennial Census pop portionately by red fne VTPI Spreadsh sr effected through s II - Barrier Effect alues. 2007 \$ (\$0.008 in t by lower mode con mated 2040 data ai wides a 0.33 redu portunity costs of th to peak period co to DEIS summary. 14, Table 1). By no ash ratio of 0.0033 evel of injury by se	Murder Value ese include military sect on Cost and Benefit Anal . 0.052 in 2016 \$ is used in \$0.064 (internal); \$0.0 ht truck VMT from the e Health, 2011. Three stuc pulation data is used to o ducing driving and press neet has default health of h improved health while : publication (http://www 2016 \$). This represents choice. from the IDOT DEIS Sum totion in travel time duri he 20% pricing increase ongestion. VHT is separe or VMT, both of which a The final result is used fo to tremoving the I-290 ex 354 (948 fatalities/282,6 everity rates (none, minc end orgidated to the to were	Rape Value rity costs for foreign ysis II - Resource Con for combined cars/li 50 (external) for a tot ypressway system pri- lies are cited in this p external cost reduct the costs of declinin mary, Table S-2. Dat ng free-flow condition not realized (also pro- ted out by auto and re from Table S-2 of to or the year 2040. Est pressway, it is assum 59 crashes) is based r, moderate, serious	Robbery Value oil, trade deficits fro sumption External Cc ght truck/van. It is as al of \$0.124 or \$0.14 oject. waper for annual per of tion by year. Per cap rdiovascular activity. s follows in 2007 \$ fc ion is via employer bi .3.pdf). The VTPI, Tra g transportation opti as for non-2040 years ns that is reduced to posed Project VHT be heavy truck using tim he DEIS Summary. Th imates for other year ted that there is an o	Aggravated Assault Value mits import, environr sts (http://www.tpi issumed that diesel bu 4 in 2016 \$. Internal of capita health care cost ita VMT increases due The unrealized per ca r average reductions: enefits from healthier insportation Cost Ana ons brought about by are calculated using 1 an average of 0.16 du enefits). This calculati ie values from the USI he result is multiplied rs are determined by t poportunity cost of 0.2 oned 2010-2014 Illino lues are converted to	Total Annual Crime Reduction Opportunity Cost ⁶ inental damages from oil org/tca/tca0512.pdf). Th ses and heavy trucks have costs are paid directly by is s per inactive person, with to the project are in add upita VMT change is about walking at \$0.24 (interna- employees and reduced li tysis Spreadsheet has defi- the expressway system p he average 0.36% annual e to peak period congesti- on uses an assumption th 20T HGER guidance (\$14 by the average 1-290 crass he assumed population g 5 in induced traffic for the is crash data document. 2016 5. The number of r	Proportion n Auto Traffic extraction, lev TPJ, Tra- e the same users while the avera- tilion to the t 0.04 whice all; \$0.24 (i- health care ault barrier project that population ion. This re- nat the 1-29 .36 and \$2 .56 and \$2 .56 and \$2 .50 cm The estimation of 1 the estimation of 1 th	Auto VMT Net Change oil company tax subsidie insportation Cost Analysis values. external costs are paid to age being \$544 in 2008 \$ e opportunity costs of ind th is multiplied by \$610 to external) for a total of \$0: costs. effect cost values per VM traise overall transportat in growth rate which occu presents opportunity cos 0 removal reduces regior 7.80 in 2016 \$). .905/1M VMT (page S-4, . A crash rate per VMT o ridor which adds to the V tes of injury severity is biz cidents probability value	VMT Value s, and human he Spreadsheet he y non-users three (\$610 in 2016 \$ uced demand an calculate oppod 48 or \$0.58 (20: AT as follows in ion costs for the intered in the Chick ts (VHT benefits expressway cap Figure S-5, DEIS f 0.000026981 WT totals. Furth ased in part on t is in Table 4, colo	Auto VMT Project and Opportunity Cost ⁷ ealth risks from injuries and as default cost values per ough increased bundled). The paper also notes and lack of comprehensive rtunity costs of lost health 16 \$); and bicycling at 2007 \$ for average travel: public. Additionally, the ago UZA from 2000-2010.) of not realizing the pacity by about 3% (project Summary). The result is 3 (282,659 ter, the opportunity cost of he TIGER BCA Resource mm 8 on page 13 of the The table of the converted
		proposed Project a 19. "The residual va area land value per roughly 384 acres a path and park. No a For the convention costs (totaling \$2,3 life*0.5=\$241.9 mil Not included are ar	nd opportunity costs ilue can be approxim acre is estimated ba- fter subtracting the (titempt is made to es al BCA, the methodol 32.9 million), expecte lion; • Road Base, (0 ny transit capital/oper	for accident increases throu ated as the difference in co sed on the following data fc CTA rail/station land area. A timate differences in these logy for determining expect d life based on the 35-year .2154)=\$502.5 million 50 yer rating costs possibly necess	ugh 2060 range from abou st between rebuilding the or Chicago: \$37,633,000 (i .ssigning value to the Proji values by the alternatives ed useful lifes of the diffe useful life period to deter ears life*0.3=\$150.8 millio ary to provide additional s	rt \$5.3-9.4 billion. road at the end of t central); \$663,000 (e ect area property at s. Thus, no residual a rent Project elemen mine residual value n; • Road Surface, (service for associated	he period using ti average) and ratic incremental dista mount is include ts were obtained . The total undisc 0.265)=\$618.2 mi d increases in trar	he structure remain of central to 10-n nces results in a te d in the comprehe from the INDOT 2 Jounted residual va Ullion 30 years life* hsit use or the cost	ining and the cons nile value of 35.1 d tal value of rougl snsive BCA. 0003-2032 Indiana alues are as follow 0.0=0. Thus, the t ts incurred by pub	struction cost if the initia (Source: Albouy D, Ehrlin hly \$5.9 billion. Earthwo a Statewide Long-Range s: • ROW, (0.0636)=514 total undiscounted resid plic transportation patro	I project was not imŋ h G, & Shin M. (2017 rk that was originally Transportation Plan, .8.4 million infinite li ual value is \$917.9 m ns that switch from d	olemented." Source:). Metropolitan Land done for the highwa Residual Value of Inv. ie*1=\$148.4 million; illion. riving.	Thagesen B. (1996). Values. Table A2, p. v y/CTA corridor has va estments section (38) • Earth Work, (0.248)	Highway and Traffic Engini iii. Available via http://da lue both for the proposed Accordingly, the assump o)=\$579.7 million 100 yea	neering in E vidalbouy. I Project ar otions belo rs life*0.65	Developing Countries. Nev net/landvalue_index.pdf. ad the opportunity costs a w are made with the Proj =\$376.8 million; • Struct	v York, NY: Chap). The 13-mile I- liternative of a l ect on the origin ural, (0.2074)=\$	oman & Hall. Chicago urban 290 Project segment is inear bicycle/pedestrian hal undiscounted capital 4483.8 million 70 years

Year	Calendar Year	Proportio n Heavy Tk	Heavy Truck VMT Net Change	VMT Value	Heavy Truck VMT Project and Opportunity Cost ⁷	Auto Noise Value (per VMT)	Auto Noise Project and Opportunity Costs ⁸	Truck Noise Value (per VMT)	Truck Noise and Project Opportunity Costs ⁸	Combined Auto/Light Truck & Heavy Truck MPG	I-290 Project CO; Decrease (MT)	• Opportunity Costs CO ₂ Increase (MT	; CO ₂ Value (per MT)	Undiscounted CO ₂ Costs @ 3% Avg SCC	NPV CO ₂ Project and Opportunity Costs @ 3% Avg SCC ⁹ [Undisc/(1.03 ^A A)]	I-290 Project NO _x Decrease (MT)	Opportunit y Costs NO _x Increase (MT)	NO _x Value (per MT)	NO _x Project and Opportunity Costs ¹⁰	I-290 Project PM ₁₀ Decrease (per MT)	Opportun ty Costs PM ₁₀ Increase (per MT)

	Year	Calendar Year	I-290 Opportun Project ty Costs PM _{2.5} PM _{2.5} Decrease Increase (per MT) (per MT)	i PM Value (per MT)	PM Project and Opportunity Costs ¹⁰	I-290 Project VOCs Decrease (MT)	Opportunit y Costs VOCs Increase VC (MT) ((DCs Value per MT)	VOCs Project and Opportunity Costs ¹⁰	Resource Externalities Value-Car	Resource Externalities Value-Hvy Tk	Resource Consumption Project and Opportunity Costs ¹¹	Parking Internal + External Costs Value	Total Parking Project and Opportunity Costs ¹²	Annual Inactivity Health Care Costs Per Capita	Chicago UZA Per Capita VMT Project & Opportunity Cost	Per Capita VMT Proportion Reduction Project & Opp Cost	Health Care Project and Opportunity Costs (Note: Not used in final calculations as covered in adjacent columns) ¹³	Health Value - Internal	Health Internal Project and Opportunity Costs - Reduced Cardivascular Activity ¹³	Health Value External	Health External Project and Opportunity Costs - Reduced Life ¹³	Barrier Effect Value-Car	Barrier Effect Value-Heavy Truck
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Year	Calenda Year	- Barrier Effect Project and Opportunity Costs ¹⁴	Transport Diversity Transport Project and Opportunity Diversity Value Costs ¹⁵	Uncompensate d Moving Costs Value per HH	Number of HHs	Uncompensated HH Displacement Moving Costs ¹⁶	Annual Region Base VHT Excluding Corridor	Region VHT Reduction Outside Corridor w/I-290 Project	Annual Corridor VHT Base	Project Corridor AVHT Reduction w/l-290 Project	I-290 Removal Corridor Additional Travel Time (Opportunity Cost of Removal is Project Benefit)	Chicago UZA 20% Pricing Increase & VHT Additional Travel Time (Opportunity Cost of I-290 Removal is Benefit)	Proportion Auto Traffic	Time Value (per hr)	Auto VHT Benefits of I- 290 Project and Additional Benefits from Opportunity Costs of Removal/Pricing ¹⁷
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Year	Calendar Year	Proportio n Heavy Tk	Time Value (per hr)	Heavy Truck Travel Time Benefits ¹⁷	Accidents No- build	Reduced Accidents I- 290 Corridor HOT 3+ Alt.	I-290 Induced Accidents and Pricing Opportunity Costs	Net Increased Accidents	Value of Statistical Life	Death/ Crash Ratio	Deaths Increased	Deaths Project, Induced Traffic and No Pricing Opportunity Costs ¹⁸	No Injury AIS 0 0.43676 * \$0	Minor AIS 1 0.41739 * \$2,144	Moderate AIS 2 0.08872 * \$38,078	Serious AIS 3 0.04817 * \$84,718	Severe AIS 4 0.00617 * \$190,799	Critical AIS 5 0.00279 * \$423,999
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Year O	Calendar Year	Injuries Project, Induced Traffic, and No Pricing Opportunity Costs Accidents*∑[Pr(AIS _x)*Val ue (AIS _x)] ¹⁸	Property Damage Only \$3547 per Accident Opportunity Costs ¹⁸	Total Accident Death/ Injury/PDO Opportunity Costs ¹⁸	Residual Value	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)

		Capital Opportunity			0&M Opportunity	I-290 HOT 3+ 0&M					Ecological		Ecological Land				Chicago UZA
	Capital Costs I-290 HOT	Costs under Park/Trail	Capital Costs I-290		Costs under	Benefits	Farm Crops	Ecological	Ecological		Acreage Loss	Ecological	Loss Induced	Chicago UZA			Estimated Per
Calendar	3+ Alternative ¹	Alternative1	HOT3+ Alternative Net ¹	O&M Costs I-290	Park/Trail	Considering	Production Loss	Acreage Loss	Value Per	Ecological Land	Induced	Value Per	Development	Estimated	Chicago UZA Estimated	Study Area AVMT-No	Capita VMT-No
va Arrear	(Design/Const)	(Design/Const)	(Design/Const)	HOT +3 Alternative	Alternative	Opportunity Costs ²	Costs	(Pavement)	Acre	Opportunity Costs [*]	Development	Acre	Costs [*]	Population	AVMT-No Build	Build	Build
1 2020	-\$388,397,782		(\$388,397,782)				\$0	(236)	\$11,440		0	\$2,845	\$0	8,918,104	68,340,988,926	1,458,622,687	7,663
2 2021	-\$388,809,959		(\$388,809,959)				\$0	(236)	\$11,440		0	\$2,845	\$0	8,950,209	68,587,016,486	1,463,873,729	7,663
3 2022	-\$388,942,219		(\$388,942,219)				\$0	(236)	\$11,440		0	\$2,845	\$0	8,982,430	68,833,929,745	1,469,143,674	7,663
4 2023	-\$388,985,654		(\$388,985,654)				\$0	(236)	\$11,440		0	\$2,845	\$0	9,014,767	69,081,731,893	1,474,432,592	7,663
5 2024	-\$388,942,861		(\$388,942,861)				\$0	(236)	\$11,440		0	\$2,845	\$0	9,047,220	69,330,426,127	1,479,740,549	7,663
6 2025	-\$388,816,378		(\$388,816,378)				\$0	(236)	\$11,440		0	\$2,845	\$0	9,079,790	69,580,015,661	1,485,067,615	7,663
7 2026				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,112,477	69,830,503,718	1,490,413,858	7,663
8 2027				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,145,282	70,081,893,531	1,495,779,348	7,663
9 2028				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,178,205	70,334,188,348	1,501,164,154	7,663
10 2029				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,211,247	/0,58/,391,426	1,506,568,345	7,663
11 2030				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,244,407	70,841,506,035	1,511,991,991	7,663
12 2031				-\$1,025,910		(\$1,025,910)	\$0 \$0	(236)	\$11,440		0	\$2,845	\$0 ¢0	9,277,687	71,096,535,457	1,517,435,162	7,663
13 2032				-\$1,025,910		(\$1,025,910)	\$0 \$0	(230)	\$11,440		0	\$2,845	\$U	9,311,087	71,352,482,984	1,522,897,929	7,003
14 2033				-\$1,025,910		(\$1,025,910)	\$0 \$0	(230)	\$11,440		0	\$2,845	\$U \$0	9,344,000	71,009,351,923	1,528,380,301	7,003
16 2025				-\$1,025,910		(\$1,025,910)	\$0 \$0	(230)	\$11,440		0	\$2,645	30 \$0	9,378,247	71,007,145,590	1,555,002,550	7,005
17 2026				-\$1,025,910		(\$1,025,910)	0Ç \$0	(230)	\$11,440		0	\$2,845	0Ç ()	9,412,009	72,123,807,314	1,535,404,508	7,003
17 2030				-\$1,025,910		(\$1,025,910)	50 \$0	(236)	\$11,440		0	\$2,845	ېر د د	9,443,832	72,383,320,437	1,544,540,304	7,003
19 2037				-\$1,025,910		(\$1,025,910)	\$0 \$0	(236)	\$11,440		0	\$2,845	0Ç \$0	9 514 025	72,040,100,310	1,556,090,000	7,663
20 2039				-\$1,025,910		(\$1,025,910)	\$0 \$0	(236)	\$11,440		0	\$2,845	\$0 \$0	9 548 275	72,507,054,500	1,550,050,000	7,663
21 2040				-\$1 025 910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0 \$0	9 582 649	73,433,514,150	1,567,314,015	7,663
22 2041				-\$1 025 910		(\$1.025.910)	\$0	(236)	\$11 440		0	\$2,845	\$0	9 617 147	73 697 874 801	1 572 956 345	7,663
23 2042				-\$1.025.910		(\$1.025.910)	\$0	(236)	\$11,440		0	\$2.845	\$0	9.651.768	73.963.187.150	1.578.618.988	7,663
24 2043				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,686,515	74,229,454,624	1,584,302,017	7,663
25 2044				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,721,386	74,496,680,661	1,590,005,504	7,663
26 2045				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,756,383	74,764,868,711	1,595,729,524	7,663
27 2046				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,791,506	75,034,022,238	1,601,474,150	7,663
28 2047				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,826,756	75,304,144,718	1,607,239,457	7,663
29 2048				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,862,132	75,575,239,639	1,613,025,519	7,663
30 2049				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,897,636	75,847,310,502	1,618,832,411	7,663
31 2050				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,933,267	76,120,360,820	1,624,660,208	7,663
32 2051				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	9,969,027	76,394,394,119	1,630,508,984	7,663
33 2052				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	10,004,915	76,669,413,938	1,636,378,817	7,663
34 2053				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	10,040,933	76,945,423,828	1,642,269,780	7,663
35 2054				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	10,077,080	77,222,427,354	1,648,181,952	7,663
36 2055				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	10,113,358	77,500,428,092	1,654,115,407	7,663
37 2056				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	10,149,766	77,779,429,633	1,660,070,222	7,663
38 2057				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	10,186,305	78,059,435,580	1,666,046,475	7,663
39 2058				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	10,222,976	78,340,449,548	1,672,044,242	7,663
40 2059				-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0	10,259,779	/8,622,475,166	1,6/8,063,601	7,663
41 2060	¢2,222,004,052	40	(62.222.004.052)	-\$1,025,910		(\$1,025,910)	\$0	(236)	\$11,440		0	\$2,845	\$0 \$0	10,296,/14	/8,905,516,077	1,684,104,630	7,663
10TALS	-\$2,332,894,853	\$0	(\$2,332,894,853)	-\$35,906,850	Ş0	(\$35,906,850)	\$0						\$0 \$0		3,013,496,391,346	64,317,977,738	
5% Discount			(\$2,106,258,281)			(\$18,460,573)	\$0						\$0				
5% Discount			(\$1,973,418,980) (\$1,953,219,497)			(\$12,535,415)	\$0 ¢0						\$U				
770 Discount			(71,033,210,487)			(20,000,033)	ŞU						ŞU				

						Chicago UZA Estimated Per	Average Annual	Violent Crime	Chicago MSA								
			I-290 HOT 3+ Alt	I-290 Induced AVMT	UZA Pricing (+\$0.50 or	Capita VMT w/no	Daily Traffic per	Reduction per	Total Annual				Total Annual C	ime Propo	tio		
	Calendar	I-290 HOT 3+ Alt	AVMT Increase in	Excluding Project	+20% per gal.) AVMT	Project, Induced &	Fwy Lane	100,000	Violent Crime				Aggravated Assault Reduction Oppo	unity n Au	o		Auto VMT Project and
Year	Year	AVMT	Region	Opportunity Cost	Opportunity Cost ⁵	w/Pricing	Reduced	Population	Reduction	Murder Value	Rape Value	Robbery Value	Value Cost ^o	Traff	c Auto VMT Net Change	VMT Value	Opportunity Cost'
1	. 2020	68,358,724,360	17,735,434	364,655,672	2,718,343,913	7,315	212,327	3.14	280	\$53,053,881	\$6,172,281	\$4,826,252	\$18,040,955	0.	16,493,954	\$0.27	(\$4,453,367)
2	2021	68,604,815,768	17,799,282	365,968,432	2,728,129,951	7,315	213,092	3.15	282	\$53,436,557	\$6,216,802	\$4,861,064	\$18,171,083	0.	93 16,553,332	\$0.27	(\$4,469,400)
3	2022	68,851,793,104	17,863,359	367,285,919	2,737,951,219	7,315	213,859	3.17	284	\$53,821,993	\$6,261,643	\$4,896,127	\$18,302,151	0.	93 16,612,924	\$0.27	(\$4,485,489)
4	2023	69,099,659,560	17,927,667	368,608,148	2,747,807,843	7,315	214,629	3.18	286	\$54,210,209	\$6,306,808	\$4,931,442	\$18,434,163	0.	16,672,730	\$0.27	(\$4,501,637)
5	2024	69,348,418,334	17,992,207	369,935,137	2,757,699,951	7,315	215,401	3.19	288	\$54,601,225	\$6,352,299	\$4,967,012	\$18,567,128	0.	16,732,752	\$0.27	(\$4,517,843)
6	2025	69,598,072,640	18,056,979	3/1,266,904	2,767,627,671	7,315	216,177	3.20	291	\$54,995,061	\$6,398,118	\$5,002,839	\$18,701,052	0.	16,/92,990	\$0.27	(\$4,534,107)
	2026	69,848,625,702	18,121,984	372,603,465	2,777,591,131	7,315	216,955	3.21	293	\$55,391,738	\$6,444,267	\$5,038,925	\$18,835,942	0.	16,853,445	\$0.27	(\$4,550,430)
	2027	70,100,080,754	18,187,223	373,944,837	2,787,590,459	7,315	217,736	3.22	295	\$55,791,277	\$6,490,750	\$5,075,270	\$18,971,805	0.	16,914,117	\$0.27	(\$4,566,812)
10	2028	70,352,441,045	18,252,097	375,291,038	2,797,025,785	7,315	218,520	3.23	297	\$50,193,097	\$0,537,507	\$5,111,878 ¢E 149 7E0	\$19,108,048	0.	17,026,118	\$0.27 ¢0.27	(\$4,583,252)
11	2029	70,003,709,633	10,510,407	277.007.009	2,007,097,237	7,515	219,500	3.25	299	\$50,599,020	\$0,564,722	\$5,146,750 ¢E 10E 007	\$15,240,478	0.	17,050,118	\$0.27	(\$4,555,752)
11	2030	70,839,890,388	18,364,333	379 358 790	2,817,804,947	7,515	220,090	3.20	303	\$57,007,200	\$6,632,218	\$5,105,007	\$19,585,502	0.	17,097,448	\$0.27	(\$4,610,511)
12	2031	71,114,985,995	18,430,337	380 724 482	2,827,949,043	7,315	220,888	3.27	305	\$57,418,437	\$6,728,239	\$5,223,293	\$19,525,127	0.	17,138,333 17,220,771	\$0.27	(\$4,632,530)
14	2032	71 627 935 543	18 583 620	382 095 090	2,838,125,002	7,315	221,004	3.20	308	\$58 249 759	\$6,776,769	\$5,200,500	\$19,807,811	0.	17 282 766	\$0.27	(\$4,666,347)
1	2033	71 885 796 111	18,555,525	383 470 633	2,858,600,977	7,315	222,402	3 30	310	\$58 669 912	\$6,825,650	\$5,230,315	\$19,950,684	0.	17 344 984	\$0.27	(\$4,683,146)
16	2035	72.144.584.977	18,717,662	384.851.127	2,868,891,941	7,315	224.086	3.32	312	\$59.093.096	\$6.874.883	\$5,375,633	\$20.094.587	0.	17.407.426	\$0.27	(\$4,700,005)
17	2036	72,404,305,483	18,785,046	386.236.591	2,879,219,952	7,315	224,893	3.33	314	\$59,519,332	\$6.924.471	\$5,414,407	\$20,239,529	0.	17.470.093	\$0.27	(\$4,716,925)
18	2037	72.664.960.982	18.852.672	387.627.043	2.889.585.144	7.315	225.703	3.34	317	\$59.948.642	\$6.974.417	\$5.453.461	\$20.385.516	0.	17.532.985	\$0.27	(\$4,733,906)
19	2038	72,926,554,842	18.920.542	389.022.500	2.899.987.650	7.315	226.515	3.35	319	\$60.381.050	\$7.024.723	\$5,492,797	\$20.532.556	0	17.596.104	\$0.27	(\$4,750,948)
20	2039	73.189.090.439	18.988.656	390.422.981	2.910.427.606	7.315	227.331	3.36	321	\$60.816.576	\$7.075.392	\$5.532.416	\$20.680.656	0.	17.659.450	\$0.27	(\$4,768,051)
21	2040	73,452,571,165	19,057,015	391,828,504	2,920,905,145	7,315	228,149	3.38	324	\$61,255,243	\$7,126,427	\$5,572,321	\$20,829,825	0.	17,723,024	\$0.27	(\$4,785,216)
22	2041	73,717,000,421	19,125,620	393,239,086	2,931,420,404	7,315	228,970	3.39	326	\$61,697,075	\$7,177,829	\$5,612,514	\$20,980,070	0.	17,786,827	\$0.27	(\$4,802,443)
23	2042	73,982,381,623	19,194,472	394,654,747	2,941,973,517	7,315	229,795	3.40	328	\$62,142,093	\$7,229,603	\$5,652,997	\$21,131,398	0.	17,850,859	\$0.27	(\$4,819,732)
24	2043	74,248,718,197	19,263,573	396,075,504	2,952,564,622	7,315	230,622	3.41	331	\$62,590,322	\$7,281,750	\$5,693,772	\$21,283,818	0.	17,915,123	\$0.27	(\$4,837,083)
25	2044	74,516,013,582	19,332,921	397,501,376	2,963,193,855	7,315	231,452	3.43	333	\$63,041,783	\$7,334,273	\$5,734,841	\$21,437,337	0.	3 17,979,617	\$0.27	(\$4,854,497)
26	2045	74,784,271,231	19,402,520	398,932,381	2,973,861,352	7,315	232,285	3.44	335	\$63,496,501	\$7,387,174	\$5,776,206	\$21,591,964	0.	18,044,344	\$0.27	(\$4,871,973)
27	2046	75,053,494,607	19,472,369	400,368,538	2,984,567,253	7,315	233,122	3.45	338	\$63,954,499	\$7,440,458	\$5,817,869	\$21,747,706	0.	93 18,109,303	\$0.27	(\$4,889,512)
28	2047	75,323,687,188	19,542,470	401,809,864	2,995,311,695	7,315	233,961	3.46	340	\$64,415,800	\$7,494,126	\$5,859,833	\$21,904,571	0.	93 18,174,497	\$0.27	(\$4,907,114)
29	2048	75,594,852,462	19,612,822	403,256,380	3,006,094,817	7,315	234,803	3.48	343	\$64,880,429	\$7,548,180	\$5,902,100	\$22,062,568	0.	18,239,925	\$0.27	(\$4,924,780)
30	2049	75,866,993,931	19,683,429	404,708,103	3,016,916,759	7,315	235,648	3.49	345	\$65,348,409	\$7,602,625	\$5,944,672	\$22,221,704	0.	18,305,589	\$0.27	(\$4,942,509)
31	2050	76,140,115,109	19,754,289	406,165,052	3,027,777,659	7,315	236,497	3.50	348	\$65,819,764	\$7,657,463	\$5,987,550	\$22,381,989	0.	93 18,371,489	\$0.27	(\$4,960,302)
32	2051	76,414,219,523	19,825,404	407,627,246	3,038,677,659	7,315	237,348	3.51	350	\$66,294,519	\$7,712,695	\$6,030,738	\$22,543,429	0.	18,437,626	\$0.27	(\$4,978,159)
33	2052	76,689,310,714	19,896,776	409,094,704	3,049,616,898	7,315	238,203	3.53	353	\$66,772,699	\$7,768,327	\$6,074,238	\$22,706,034	0.	93 18,504,002	\$0.27	(\$4,996,080)
34	2053	76,965,392,232	19,968,404	410,567,445	3,060,595,519	7,315	239,060	3.54	355	\$67,254,328	\$7,824,359	\$6,118,051	\$22,869,812	0.	93 18,570,616	\$0.27	(\$5,014,066)
35	2054	77,242,467,644	20,040,291	412,045,488	3,071,613,663	7,315	239,921	3.55	358	\$67,739,431	\$7,880,796	\$6,162,180	\$23,034,771	0.	93 18,637,470	\$0.27	(\$5,032,117)
36	2055	77,520,540,528	20,112,436	413,528,852	3,082,671,472	7,315	240,784	3.56	360	\$68,228,033	\$7,937,640	\$6,206,628	\$23,200,920	0.	18,704,565	\$0.27	(\$5,050,233)
37	2056	77,799,614,474	20,184,840	415,017,556	3,093,769,089	7,315	241,651	3.58	363	\$68,720,159	\$7,994,894	\$6,251,396	\$23,368,267	0.	18,771,901	\$0.27	(\$5,068,413)
38	2057	/8,079,693,086	20,257,506	416,511,619	3,104,906,658	7,315	242,521	3.59	366	\$69,215,834	\$8,052,561	\$6,296,487	\$23,536,821	0.	18,839,480	\$0.27	(\$5,086,660)
39	2058	/8,360,779,981	20,330,433	418,011,061	3,116,084,322	7,315	243,394	3.60	368	\$69,715,085	\$8,110,644	\$6,341,903	\$23,706,591	0.	18,907,302	\$0.27	(\$5,104,972)
40	2059	/8,642,8/8,/89	20,403,622	419,515,900	3,127,302,226	/,315	244,270	3.62	3/1	\$70,217,938	\$8,169,145	\$6,387,647	\$23,877,586	0.	18,975,369	\$0.27	(\$5,123,350)
4		/8,925,993,152	20,477,075	421,026,158	3,138,560,514	7,315	245,150	3.63	3/4	\$70,724,417	\$8,228,069	\$0,433,/21	\$24,049,814 \$957,114,126	<u>ćo</u>	727 201 004	ŞU.27	(\$5,141,/94)
20	Discourt		132,604,937	10,079,494,434	119,865,394,113				13,314	şz,520,555,723	\$293,241,115	\$229,292,137	Şŏ57,114,12b	50 ¢0	/2/,301,004		(\$196,371,271)
37 E0	Discount													şu ¢n			(\$110,507,640)
57 79	Discount													\$0			(\$62,216,955)
r /															1	1	(+

ear	Calendar Year	Proportio n Heavy Tk	Heavy Truck VMT Net Change	VMT Value	Heavy Truck VMT Project and Opportunity Cost ⁷	Auto Noise Value (per VMT)	Auto Noise Project and Opportunity Costs ⁸	Truck Noise Value (per VMT)	Truck Noise and Project Opportunity Costs ⁸	Combined Auto/Light Truck & Heavy Truck MPG	I-290 Project CO ₂ Opportunity Costs Decrease (MT) CO. Increase (MT)	CO ₂ Value (per MT)	Undiscounted CO ₂ Costs @ 3% Avg SCC	NPV CO ₂ Project and Opportunity Costs @ 3% Avg SCC ⁹ [Undisc/(1.03 [^] A)]	I-290 Project NO _X Decrease (MT)	Opportunit y Costs NO _x Increase (MT)	NO _x Value (per MT)	NO _x Project and Opportunity Costs ¹⁰	I-290 Op Project ty PM ₁₀ Decrease In (per MT) (p	pportuni ty Costs PM ₁₀ Increase [per MT)
<u>چّ</u>	2020	0.07	1 241 480	\$1.83	(\$2 271 909)	, \$0.0150	(\$247.409)	, \$0.1528	(\$189,698)	20.36	-0.95	\$48.00	(\$46)	\$44	-1.76	. ,	\$7 399	\$10.435	-5 10	
2	2020	0.07	1 245 950	\$1.83	(\$2,280,088)	\$0.0150	(\$248,300)	\$0.1528	(\$190,381)	20.50	-0.95	\$49.00	(\$47)	\$44	-1.76		\$7 399	\$10,435	-5 10	
3	2022	0.07	1,250,435	\$1.83	(\$2,288,296)	\$0.0150	(\$249,194)	\$0.1528	(\$191.066)	20.72	-0.95	\$50.00	(\$48)	\$44	-1.76		\$7,399	\$10,435	-5.10	
4	2023	0.07	1.254.937	\$1.83	(\$2,296,534)	\$0.0150	(\$250.091)	\$0.1528	(\$191.754)	20.90	-0.95	\$51.00	(\$49)	\$43	-1.76		\$7.399	\$10.435	-5.10	
5	2024	0.07	1,259,454	\$1.83	(\$2,304,802)	\$0.0150	(\$250,991)	\$0.1528	(\$192,445)	21.08	-0.95	\$52.00	(\$50)	\$43	-1.76		\$7,399	\$10,435	-5.10	
6	2025	0.07	1,263,989	\$1.83	(\$2,313,099)	\$0.0150	(\$251,895)	\$0.1528	(\$193,137)	21.26	-0.95	\$53.00	(\$51)	\$42	-1.76		\$7,399	\$10,435	-5.10	
7	2026	0.07	1,268,539	\$1.83	(\$2,321,426)	\$0.0150	(\$252,802)	\$0.1528	(\$193,833)	21.44	-0.95	\$54.00	(\$52)	\$42	-1.76		\$7,399	\$10,435	-5.10	
8	2027	0.07	1,273,106	\$1.83	(\$2,329,783)	\$0.0150	(\$253,712)	\$0.1528	(\$194,531)	21.62	-0.95	\$55.00	(\$52)	\$41	-1.76		\$7,399	\$10,435	-5.10	
9	2028	0.07	1,277,689	\$1.83	(\$2,338,170)	\$0.0150	(\$254,625)	\$0.1528	(\$195,231)	21.80	-0.95	\$56.00	(\$53)	\$41	-1.76		\$7,399	\$10,435	-5.10	
10	2029	0.07	1,282,288	\$1.83	(\$2,346,588)	\$0.0150	(\$255,542)	\$0.1528	(\$195,934)	21.98	-0.95	\$57.00	(\$54)	\$40	-1.76		\$7,399	\$10,435	-5.10	
11	2030	0.07	1,286,905	\$1.83	(\$2,355,036)	\$0.0150	(\$256,462)	\$0.1528	(\$196,639)	22.16	-0.95	\$58.00	(\$55)	\$40	-1.76		\$7,399	\$10,435	-5.10	
12	2031	0.07	1,291,538	\$1.83	(\$2,363,514)	\$0.0150	(\$257,385)	\$0.1528	(\$197,347)	22.34	-0.95	\$59.00	(\$56)	\$39	-1.76		\$7,399	\$10,435	-5.10	
13	2032	0.07	1,296,187	\$1.83	(\$2,372,022)	\$0.0150	(\$258,312)	\$0.1528	(\$198,057)	22.52	-0.95	\$60.00	(\$57)	\$39	-1.76		\$7,399	\$10,435	-5.10	
14	2033	0.07	1,300,853	\$1.83	(\$2,380,562)	\$0.0150	(\$259,241)	\$0.1528	(\$198,770)	22.70	-0.95	\$61.00	(\$58)	\$38	-1.76		\$7,399	\$10,435	-5.10	
15	2034	0.07	1,305,536	\$1.83	(\$2,389,132)	\$0.0150	(\$260,175)	\$0.1528	(\$199,486)	22.88	-0.95	\$62.00	(\$59)	\$38	-1.76		\$7,399	\$10,435	-5.10	
16	2035	0.07	1,310,236	\$1.83	(\$2,397,733)	\$0.0150	(\$261,111)	\$0.1528	(\$200,204)	23.06	-0.95	\$63.00	(\$60)	\$37	-1.76		\$7,399	\$10,435	-5.10	
17	2036	0.07	1,314,953	\$1.83	(\$2,406,364)	\$0.0150	(\$262,051)	\$0.1528	(\$200,925)	23.24	-0.95	\$64.00	(\$61)	\$37	-1.76		\$7,399	\$10,435	-5.10	
18	2037	0.07	1,319,687	\$1.83	(\$2,415,027)	\$0.0150	(\$262,995)	\$0.1528	(\$201,648)	23.42	-0.95	\$65.00	(\$62)	\$36	-1.76		\$7,399	\$10,435	-5.10	
19	2038	0.07	1,324,438	\$1.83	(\$2,423,721)	\$0.0150	(\$263,942)	\$0.1528	(\$202,374)	23.60	-0.95	\$66.00	(\$63)	\$36	-1.76		\$7,399	\$10,435	-5.10	
20	2039	0.07	1,329,206	\$1.83	(\$2,432,447)	\$0.0150	(\$264,892)	\$0.1528	(\$203,103)	23.78	-0.95	\$67.00	(\$64)	\$35	-1.76		\$7,399	\$10,435	-5.10	
21	2040	0.07	1,333,991	\$1.83	(\$2,441,204)	\$0.0150	(\$265,845)	\$0.1528	(\$203,834)	23.96	-0.95	\$68.00	(\$65)	\$35	-1.76		\$7,399	\$10,435	-5.10	
22	2041	0.07	1,338,793	\$1.83	(\$2,449,992)	\$0.0150	(\$266,802)	\$0.1528	(\$204,568)	24.14	-0.95	\$69.00	(\$66)	\$34	-1.76		\$7,399	\$10,435	-5.10	
23	2042	0.07	1,343,613	\$1.83	(\$2,458,812)	\$0.0150	(\$267,763)	\$0.1528	(\$205,304)	24.32	-0.95	\$70.00	(\$67)	\$34	-1.76		\$7,399	\$10,435	-5.10	
24	2043	0.07	1,348,450	\$1.83	(\$2,467,664)	\$0.0150	(\$268,727)	\$0.1528	(\$206,043)	24.50	-0.95	\$/1.00	(\$68)	\$33	-1.76		\$7,399	\$10,435	-5.10	
25	2044	0.07	1,353,305	\$1.83	(\$2,476,547)	\$0.0150	(\$269,694)	\$0.1528	(\$206,785)	24.68	-0.95	\$72.00	(\$69)	\$33	-1./6		\$7,399	\$10,435	-5.10	
26	2045	0.07	1,358,176	\$1.83	(\$2,485,463)	\$0.0150	(\$270,665)	\$0.1528	(\$207,529)	24.86	-0.95	\$73.00	(\$70)	\$32	-1.76		\$7,399	\$10,435	-5.10	
27	2040	0.07	1,303,000	\$1.85	(\$2,494,410)	\$0.0150	(\$271,640)	\$0.1528 ¢0.1528	(\$208,276)	25.04	-0.95	\$74.00	(\$71)	\$32	-1.70		\$7,399	\$10,435	-5.10	
28	2047	0.07	1,307,973	\$1.83 ¢1.02	(\$2,503,390)	\$0.0150	(\$272,017)	\$0.1528 \$0.1528	(\$209,026)	25.22	-0.95	\$75.00	(\$72)	\$31	-1.70		\$7,399	\$10,435	-5.10	
29	2040	0.07	1,372,090	\$1.05 ¢1.02	(\$2,512,403)	\$0.0150	(\$273,555)	\$0.1520 \$0.1520	(\$205,775)	25.40	-0.95	\$70.00	(\$73)	\$20	-1.70		\$7,599	\$10,435	-5.10	
21	2049	0.07	1,377,640	\$1.05 ¢1.02	(\$2,521,447)	\$0.0150	(\$275 572)	\$0.1528	(\$210,554)	25.36	-0.95	\$72.00	(\$73)	\$30	-1.70		\$7,399	\$10,435	-5.10	
32	2050	0.07	1 387 778	\$1.83	(\$2,539,634)	\$0.0150	(\$276,564)	\$0.1528	(\$212,053)	25.70	-0.95	\$79.00	(\$74)	\$30	-1.76		\$7 399	\$10,435	-5.10	
33	2051	0.07	1 392 774	\$1.83	(\$2,548,777)	\$0.0150	(\$277,560)	\$0.1528	(\$212,816)	26.12	-0.95	\$80.00	(\$76)	\$29	-1.76		\$7 399	\$10,435	-5 10	
34	2053	0.07	1.397.788	\$1.83	(\$2,557,953)	\$0.0150	(\$278,559)	\$0.1528	(\$213.582)	26.30	-0.95	\$81.00	(\$77)	\$28	-1.76		\$7,399	\$10,435	-5.10	
35	2054	0.07	1.402.820	\$1.83	(\$2,567,161)	\$0.0150	(\$279,562)	\$0.1528	(\$214.351)	26.48	-0.95	\$82.00	(\$78)	\$28	-1.76		\$7.399	\$10.435	-5.10	
36	2055	0.07	1.407.870	\$1.83	(\$2,576,403)	\$0.0150	(\$280,568)	\$0.1528	(\$215.123)	26.66	-0.95	\$83.00	(\$79)	\$27	-1.76		\$7.399	\$10.435	-5.10	
37	2056	0.07	1,412,939	\$1.83	(\$2,585,678)	\$0.0150	(\$281,579)	\$0.1528	(\$215,897)	26.84	-0.95	\$84.00	(\$80)	\$27	-1.76		\$7,399	\$10,435	-5.10	
38	2057	0.07	1,418,025	\$1.83	(\$2,594,986)	\$0.0150	(\$282,592)	\$0.1528	(\$216,674)	27.02	-0.95	\$85.00	(\$81)	\$26	-1.76		\$7,399	\$10,435	-5.10	
39	2058	0.07	1,423,130	\$1.83	(\$2,604,328)	\$0.0150	(\$283,610)	\$0.1528	(\$217,454)	27.20	-0.95	\$86.00	(\$82)	\$26	-1.76		\$7,399	\$10,435	-5.10	
40	2059	0.07	1,428,254	\$1.83	(\$2,613,704)	\$0.0150	(\$284,631)	\$0.1528	(\$218,237)	27.38	-0.95	\$87.00	(\$83)	\$25	-1.76		\$7,399	\$10,435	-5.10	
41	2060	0.07	1,433,395	\$1.83	(\$2,623,113)	\$0.0150	(\$285,655)	\$0.1528	(\$219,023)	27.56	-0.95	\$88.00	(\$84)	\$25	-1.76		\$7,399	\$10,435	-5.10	
тот	ALS		54,743,086		(\$100,179,848)		(\$10,909,515)		(\$8,364,744)		0			\$1,429		0		\$427,819	-209.04	0
3% I	Discount				(\$56,376,060)		(\$6,139,313)		(\$4,707,247)					\$1,429				\$244,290		
5% I	Discount				(\$41,290,979)		(\$4,496,559)		(\$3,447,684)					\$1,429				\$180,471		
7% [Discount				(\$31,740,316)		(\$3,456,498)		(\$2,650,230)					\$1,429				\$139,759		

Calendar	I-290 Project PM _{2.5} Decrease	Opportuni ty Costs PM _{2.5} Increase	PM Value (per	PM Project and	I-290 Project VOCs Decrease	Opportunit y Costs VOCs Increase VOCs Value	VOCs Project and	Resource Externalities	Resource Externalities	Resource Consumption Project and Opportunity	Parking Internal + External Costs	Total Parking Project and	Annual Inactivity Health Care Costs	Chicago UZA Per Capita VMT Project & Opportunity	Per Capita VMT Proportion Reduction Project & Opp	Health Care Project and Opportunity Costs (Note: Not used in final calculations as covered in	Health Value -	Health Internal Project and Opportunity Costs - Reduced Cardivascular	Health Value -	Health External Project and Opportunity Costs -	Barrier Effect	Barrier Effect Value-Heavy
Year	(per MT)	(per MT)	MT)	Opportunity Costs ¹⁰	(MT)	(MT) (per MT)	Opportunity Costs ¹⁰	Value-Car	Value-Hvy Tk	Costs ¹¹	Value	Opportunity Costs ¹²	Per Capita	Cost	Cost	adjacent columns) ¹³	Internal	Activity ¹³	External	Reduced Life ¹³	Value-Car	Truck
1 2020	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
2 2021	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
3 2022	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
4 2023	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
5 2024	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
6 2025	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
7 2026	-0.09		\$3/3,11/	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
8 2027	-0.09		\$3/3,11/	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05 ¢0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
9 2028	-0.09		\$3/3,11/ \$272,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05 \$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02 \$0.02	\$0.03
10 2029	-0.09		\$373,117 \$272,117	\$967,749	-\$1.01	\$1,090	\$2,100	\$0.05	\$0.25		\$0.144		\$610	2/9	0.05		0.11		0.11		\$0.02	\$0.05
12 2030	-0.09		\$373,117	\$967,749	-\$1.01	\$1,090	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
13 2032	-0.09		\$373 117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
14 2033	-0.09		\$373.117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
15 2034	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
16 2035	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
17 2036	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
18 2037	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
19 2038	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
20 2039	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
21 2040	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
22 2041	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
23 2042	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
24 2043	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
25 2044	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
26 2045	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
27 2046	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
28 2047	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
29 2048	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
30 2049	-0.09		\$3/3,11/	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
31 2050	-0.09		\$3/3,11/	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05 ¢0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
32 2051	-0.09		\$3/3,11/	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05 ¢0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
33 2052	-0.09		\$3/3,11/ \$272 117	\$967,749	-\$1.01	\$1,090	\$2,188	\$0.05 \$0.05	\$0.23 \$0.23		\$0.144		\$610	2/9	0.05		0.11		0.11		\$0.02	\$0.03 \$0.02
34 2053	-0.03		\$373,117	\$967,749	-\$1.01	\$1,090	\$2,100	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
36 2055	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,100	\$0.05	\$0.23		\$0.144		\$610	3/8	0.05		0.11		0.11		\$0.02	\$0.03
37 2056	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,100	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
38 2057	-0.09		\$373.117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
39 2058	-0.09		\$373,117	\$967,749	-\$1.61	\$1.696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
40 2059	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
41 2060	-0.09		\$373,117	\$967,749	-\$1.61	\$1,696	\$2,188	\$0.05	\$0.23		\$0.144		\$610	348	0.05		0.11		0.11		\$0.02	\$0.03
TOTALS	-3.64	0		\$39,677,701			\$89,728			\$0		\$0						\$0		\$0		
3% Discount				\$22,656,490			\$51,236			\$0		\$0						\$0		\$0		
5% Discount				\$16,737,603			\$37,851			\$0		\$0						\$0		\$0		
7% Discount				\$12,961,834			\$29,312			\$0		\$0						\$0		\$0		

									CHANGED TO				Chicago UZA 20%							
									REGION AS			I-290 Removal	Pricing Increase &			Auto VHT Benefits of I-				
									WHOLE! Region			Additional Travel	VHT Additional			290 Project and		Auto VHT Alternate	Auto VHT Alternate	
		Dennies Offerst Durington and		Transport Diversity	Uncompensate		Uncompensated	Annual Region Base	VHT Reduction		Project Corridor	Time (Opportunity	Travel Time			Additional Benefits from		Benefits using Rule of	Benefits using Rule of	Auto VHT Alternate
F	Calendar	Opportunity Costs ¹⁴	Transport Diversity Value	Costs ¹⁵	d Moving Costs	Number of	Moving Costs ¹⁶	VHT Excluding	Outside Corridor	Annual Corridor	AVHT Reduction	Cost of Removal is Project Report	Opportunity Cost	Proportion T	Fime Value	Pomoval /Pricing 17	Auto MPG	Half Methodology: Trips	Half Methodology:	Benefits using Rule of
ě, 1	2020	Opportunity costs		COSIS	\$1 000	0	¢0	2 468 020 227	5 /80 602	96 716 162	558 107	14 216 079	26 927 960		(per m)	\$762 010 116	21.40	\$1 484 594 060	(\$4.260.681)	\$1 /90 222 279
2	2020		\$0.008		\$1,990	0	30 \$0	2,408,020,327	5 509 456	87 028 241	560 116	14,210,079	27 070 926	0.95	\$14.50	\$765,515,110	21.40	\$1,484,594,000	(\$4,200,081)	\$1,460,555,576
2	2021		\$0.008		\$1,990	0	0Ç ¢0	2,470,303,200	5,505,450	87,028,341	500,110	14,207,237	27 204 202	0.93	\$14.30	\$760,005,225	21.40	\$1,405,530,350	(\$4,270,020)	\$1,483,002,373
1	2022		\$0.008		\$1,990	0	0Ç ()	2,483,822,039	5 540 105	87,541,043	564 156	14,318,019	27 229 227	0.93	\$14.30	\$703,423,234	21.40	\$1,495,502,577	(\$4,291,413)	\$1,491,010,504
5	2023		\$0.008		\$1,990	0	0Ç \$0	2,404,771,018	5 569 172	87,030,075	566 187	14,370,100	37,330,327	0.55	\$14.30	\$774 979 096	21.40	\$1,506,087,933	(\$4,322,367)	\$1,450,576,665
6	2024		\$0.008		\$1,990	0	\$0 \$0	2,503,752,154	5 589 222	88 288 333	568 226	14 473 818	37,607,647	0.55	\$14.30	\$777,769,021	21.40	\$1,500,007,555	(\$4,322,507)	\$1,501,705,500
7	2025		\$0.008		\$1,990	0	\$0 \$0	2,512,703,702	5 609 343	88 606 171	570 271	14 525 923	37 743 035	0.93	\$14.36	\$780,568,990	21.40	\$1,516,951,285	(\$4 353 544)	\$1,512,597,741
8	2027		\$0.008		\$1,990	0	\$0	2 530 890 180	5 629 536	88 925 153	572 324	14 578 217	37 878 910	0.93	\$14 36	\$783,379,038	21 40	\$1 522 412 310	(\$4 369 217)	\$1,518,043,093
9	2028		\$0.008		\$1,990	0	\$0	2,540,001,385	5.649.803	89.245.284	574.384	14.630.698	38.015.274	0.93	\$14.36	\$786,199,203	21.40	\$1.527.892.994	(\$4,384,946)	\$1,523,508,048
10	2029		\$0.008		\$1.990	0	\$0	2.549.145.390	5.670.142	89.566.567	576.452	14.683.369	38.152.129	0.93	\$14.36	\$789.029.520	21.40	\$1.533.393.409	(\$4,400,732)	\$1.528.992.677
11	2030		\$0.008		\$1.990	0	\$0	2.558.322.313	5.690.554	89.889.006	578.527	14.736.229	38.289.476	0.93	\$14.36	\$791.870.026	21.40	\$1.538.913.625	(\$4,416,574)	\$1.534.497.051
12	2031		\$0.008		\$1.990	0	\$0	2.567.532.274	5.711.040	90.212.607	580.610	14.789.279	38.427.318	0.93	\$14.36	\$794.720.758	21.40	\$1.544.453.714	(\$4,432,474)	\$1.540.021.240
13	2032		\$0.008		\$1,990	0	\$0	2,576,775,390	5,731,600	90,537,372	582,700	14,842,521	38,565,657	0.93	\$14.36	\$797,581,753	21.40	\$1,550,013,748	(\$4,448,431)	\$1,545,565,317
14	2033		\$0.008		\$1.990	0	\$0	2.586.051.781	5.752.234	90.863.307	584,798	14.895.954	38,704,493	0.93	\$14.36	\$800,453,047	21.40	\$1,555,593,797	(\$4,464,445)	\$1.551.129.352
15	2034		\$0.008		\$1,990	0	\$0	2,595,361,568	5,772,942	91,190,415	586,903	14,949,579	38,843,829	0.93	\$14.36	\$803,334,678	21.40	\$1,561,193,935	(\$4,480,517)	\$1,556,713,418
16	2035		\$0.008		\$1,990	0	\$0	2,604,704,869	5,793,725	91,518,700	589,016	15,003,398	38,983,667	0.93	\$14.36	\$806,226,683	21.40	\$1,566,814,233	(\$4,496,647)	\$1,562,317,586
17	2036		\$0.008		\$1,990	0	\$0	2,614,081,807	5,814,582	91,848,167	591,137	15,057,410	39,124,008	0.93	\$14.36	\$809,129,099	21.40	\$1,572,454,764	(\$4,512,835)	\$1,567,941,929
18	2037		\$0.008		\$1,990	0	\$0	2,623,492,501	5,835,515	92,178,821	593,265	15,111,617	39,264,855	0.93	\$14.36	\$812,041,964	21.40	\$1,578,115,601	(\$4,529,081)	\$1,573,586,520
19	2038		\$0.008					2,632,937,074	5,856,522	92,510,665	595,401	15,166,019	39,406,208	0.93	\$14.36	\$814,965,315	21.40	\$1,583,796,818	(\$4,545,386)	\$1,579,251,432
20	2039		\$0.008					2,642,415,648	5,877,606	92,843,703	597,544	15,220,616	39,548,071	0.93	\$14.36	\$817,899,190	21.40	\$1,589,498,486	(\$4,561,749)	\$1,584,936,737
21	2040		\$0.008		-			2,851,535,855	5,898,765	93,177,930	599,695	15,275,409	42,684,556	0.93	\$14.36	\$860,829,376	21.40	\$1,595,220,681	(\$4,578,172)	\$1,590,642,509
22	2041		\$0.008					2,861,801,384	5,920,001	93,513,371	601,854	15,330,400	42,838,221	0.93	\$14.36	\$863,928,362	21.40	\$1,600,963,475	(\$4,594,653)	\$1,596,368,822
23	2042		\$0.008		-			2,872,103,869	5,941,313	93,850,019	604,021	15,385,590	42,992,438	0.93	\$14.36	\$867,038,504	21.40	\$1,606,726,944	(\$4,611,194)	\$1,602,115,750
24	2043		\$0.008					2,882,443,443	5,962,701	94,187,879	606,195	15,440,978	43,147,211	0.93	\$14.36	\$870,159,842	21.40	\$1,612,511,161	(\$4,627,794)	\$1,607,883,366
25	2044		\$0.008					2,892,820,239	5,984,167	94,526,955	608,377	15,496,565	43,302,541	0.93	\$14.36	\$873,292,418	21.40	\$1,618,316,201	(\$4,644,454)	\$1,613,671,747
26	2045		\$0.008		-			2,903,234,392	6,005,710	94,867,252	610,568	15,552,353	43,458,430	0.93	\$14.36	\$876,436,270	21.40	\$1,624,142,139	(\$4,661,174)	\$1,619,480,965
27	2046		\$0.008		-			2,913,686,036	6,027,331	95,208,774	612,766	15,608,341	43,614,881	0.93	\$14.36	\$879,591,441	21.40	\$1,629,989,051	(\$4,677,955)	\$1,625,311,096
28	2047		\$0.008					2,924,175,306	6,049,029	95,551,526	614,972	15,664,531	43,771,894	0.93	\$14.36	\$882,757,970	21.40	\$1,635,857,011	(\$4,694,795)	\$1,631,162,216
29	2048		\$0.008		-			2,934,702,337	6,070,805	95,895,511	617,185	15,720,924	43,929,473	0.93	\$14.36	\$885,935,899	21.40	\$1,641,746,097	(\$4,711,696)	\$1,637,034,400
30	2049		\$0.008		-			2,945,267,265	6,092,660	96,240,735	619,407	15,777,519	44,087,619	0.93	\$14.36	\$889,125,268	21.40	\$1,647,656,383	(\$4,728,659)	\$1,642,927,724
31	2050		\$0.008		-			2,955,870,227	6,114,594	96,587,202	621,637	15,834,318	44,246,335	0.93	\$14.36	\$892,326,119	21.40	\$1,653,587,946	(\$4,745,682)	\$1,648,842,264
32	2051		\$0.008					2,966,511,360	6,136,606	96,934,916	623,875	15,891,322	44,405,621	0.93	\$14.36	\$895,538,493	21.40	\$1,659,540,862	(\$4,762,766)	\$1,654,778,096
33	2052		\$0.008					2,977,190,801	6,158,698	97,283,881	626,121	15,948,530	44,565,482	0.93	\$14.36	\$898,762,432	21.40	\$1,665,515,209	(\$4,779,912)	\$1,660,735,297
34	2053		\$0.008					2,987,908,688	6,180,870	97,634,103	628,375	16,005,945	44,725,917	0.93	\$14.36	\$901,997,976	21.40	\$1,671,511,064	(\$4,797,120)	\$1,666,713,944
35	2054		\$0.008					2,998,665,159	6,203,121	97,985,586	630,637	16,063,567	44,886,931	0.93	\$14.36	\$905,245,169	21.40	\$1,677,528,504	(\$4,814,389)	\$1,672,714,114
36	2055		\$0.008					3,009,460,354	6,225,452	98,338,334	632,907	16,121,395	45,048,524	0.93	\$14.36	\$908,504,052	21.40	\$1,683,567,607	(\$4,831,721)	\$1,678,735,885
37	2056		\$0.008					3,020,294,411	6,247,864	98,692,352	635,186	16,179,432	45,210,698	0.93	\$14.36	\$911,774,666	21.40	\$1,689,628,450	(\$4,849,115)	\$1,684,779,334
38	2057		\$0.008					3,031,167,471	6,270,356	99,047,645	637,473	16,237,678	45,373,457	0.93	\$14.36	\$915,057,055	21.40	\$1,695,711,112	(\$4,866,572)	\$1,690,844,540
39	2058		\$0.008					3,042,079,674	6,292,929	99,404,216	639,768	16,296,134	45,536,801	0.93	\$14.36	\$918,351,261	21.40	\$1,701,815,672	(\$4,884,092)	\$1,696,931,580
40	2059		\$0.008					3,053,031,161	6,315,584	99,762,071	642,071	16,354,800	45,700,734	0.93	\$14.36	\$921,657,325	21.40	\$1,707,942,209	(\$4,901,675)	\$1,703,040,534
41	2060		\$0.008					3,064,022,073	6,338,320	100,121,215	644,382	16,413,677	45,865,256	0.93	\$14.36	\$924,975,291	21.40	\$1,714,090,801	(\$4,919,321)	\$1,709,171,480
TOT	TALS	\$0		\$0		0	\$0				24,609,729	626,858,079	1,693,971,957			\$34,555,649,325				\$65,275,310,819
3%	Discount	\$0		\$0			\$0									\$19,308,630,666				
5%	Discount	\$0		\$0			\$0									\$14,083,027,956				
7%	Discount	\$0		\$0			\$0									\$10,787,621,784				

Γ																						
						Truck VHT Altornato	Truck V/HT Altornato			Poducod	1-290 Induced						No Iniuny				Soucro	Critical
		Proportio				Benefits using Rule of	Benefits using Rule of	Truck VHT Alternate		Accidents I-	Accidents and					Deaths Project, Induced	AIS 0	Minor AIS 1	Moderate AIS 2	Serious AIS 3	AIS 4	AIS 5
Ι.	Calendar	n Heavy	Time Value	Heavy Truck Travel Time	Heavy	Half Methodology:	Half Methodology:	Benefits using Rule of	Accidents No-	290 Corridor	Pricing	Increased	Value of	Death/ Crash	Deaths	Traffic and No Pricing	0.43676 *	0.41739 *	0.08872 *	0.04817 *	0.00617 *	0.00279 *
Year	Year	Tk	(per hr)	Benefits ¹⁷	Truck MPG	Trips Retained	Trips Forgone	Half Methodology	build	HOT 3+ Alt.	Opportunity Costs	Accidents	Statistical Life	Ratio	Increased	Opportunity Costs ¹⁸	\$0	\$2,144	\$38,078	\$84,718	\$190,799	\$423,999
	1 2020	0.07	\$27.80	\$111,314,778	6.50	\$367,894,442	(\$2,176,411)	\$365,718,031	184,393	-275		-275	\$9,780,000	0.003354	-0.92	\$9,005,130	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
	2 2021	0.07	\$27.80	\$111,715,511	6.50	\$369,218,862	(\$2,184,246)	\$367,034,616	185,057	-276		-276	\$9,780,000	0.003354	-1	\$9,037,549	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
3	3 2022	0.07	\$27.80	\$112,117,687	6.50	\$370,548,050	(\$2,192,109)	\$368,355,941	185,723	-277		-277	\$9,780,000	0.003354	-1	\$9,070,084	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
4	4 2023	0.07	\$27.80	\$112,521,311	6.50	\$371,882,023	(\$2,200,001)	\$369,682,022	186,391	-278		-278	\$9,780,000	0.003354	-1	\$9,102,736	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
2	5 2024	0.07	\$27.80	\$112,926,388	6.50	\$373,220,798	(\$2,207,921)	\$371,012,877	187,063	-279		-279	\$9,780,000	0.003354	-1	\$9,135,506	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
(5 2025	0.07	\$27.80	\$113,332,923	6.50	\$374,564,393	(\$2,215,869)	\$372,348,524	187,736	-280		-280	\$9,780,000	0.003354	-1	\$9,168,394	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
	7 2026	0.07	\$27.80	\$113,740,921	6.50	\$375,912,825	(\$2,223,846)	\$373,688,979	188,412	-281		-281	\$9,780,000	0.003354	-1	\$9,201,400	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
	3 2027	0.07	\$27.80	\$114,150,388	6.50	\$377,266,111	(\$2,231,852)	\$375,034,259	189,090	-282		-282	\$9,780,000	0.003354	-1	\$9,234,525	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
-	9 2028	0.07	\$27.80	\$114,561,330	6.50	\$378,624,269	(\$2,239,887)	\$376,384,382	189,771	-283		-283	\$9,780,000	0.003354	-1	\$9,267,770	\$0	\$895	\$3,378	\$4,081	\$1,1//	\$1,183
10	J 2029	0.07	\$27.80	\$114,973,751	6.50	\$379,987,316	(\$2,247,950)	\$377,739,366	190,454	-284		-284	\$9,780,000	0.003354	-1	\$9,301,133	\$0 ¢0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
1	1 2030	0.07	\$27.80	\$115,387,656	6.50	\$381,355,271	(\$2,256,043)	\$379,099,228	191,140	-285		-285	\$9,780,000	0.003354	-1	\$9,334,618	\$0 ¢0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
1:	2 2031	0.07	\$27.80	\$115,803,052	6.50	\$382,728,150	(\$2,204,105)	\$380,403,985	191,828	-280		-280	\$9,780,000	0.003354	-1	\$9,308,222	\$0 \$0	\$895 \$805	\$3,378 \$2,279	\$4,081	\$1,177	\$1,183
1	1 2022	0.07	\$27.80	\$116,629,225	6.50	\$384,103,371	(\$2,272,310)	\$381,853,055	102,010	-207		-207	\$9,780,000	0.003354	-1	\$9,401,548	30 \$0	\$805 \$805	\$3,378	\$4,081	\$1,177	\$1,103
1	+ 2033 5 2034	0.07	\$27.80	\$117,058,333	6.50	\$386,876,512	(\$2,280,490)	\$383,208,230	193,211	-200		-200	\$9,780,000	0.003354	-1	\$9,455,755	30 \$0	\$895	\$3,378	\$4,081	\$1,177	\$1,103
16	5 2034	0.07	\$27.80	\$117,030,233	6.50	\$388 269 267	(\$2,200,700)	\$385 972 322	194 605	-290		-290	\$9,780,000	0.003354	-1	\$9 503 855	\$0 \$0	\$895	\$3,378	\$4,001	\$1,177	\$1,103
1	7 2036	0.07	\$27.80	\$117,902,569	6 50	\$389 667 037	(\$2,256,545)	\$387,361,823	195 306	-291		-291	\$9,780,000	0.003354	-1	\$9,538,069	\$0	\$895	\$3,378	\$4,001	\$1 177	\$1,103
18	3 2037	0.07	\$27.80	\$118.327.018	6.50	\$391.069.838	(\$2,313,513)	\$388,756,325	196.009	-292		-292	\$9,780,000	0.003354	-1	\$9,572,406	\$0	\$895	\$3.378	\$4.081	\$1.177	\$1,183
19	2038	0.07	\$27.80	\$118,752,995	6.50	\$392,477,689	(\$2.321.842)	\$390,155,848	196.714	-293		-293	\$9,780,000	0.003354	-1	\$9,606,866	\$0	\$895	\$3.378	\$4.081	\$1.177	\$1,183
20	2039	0.07	\$27.80	\$119.180.506	6.50	\$393.890.609	(\$2.330.200)	\$391,560,409	197.422	-294		-294	\$9.780.000	0.003354	-1	\$9.641.451	\$0	\$895	\$3.378	\$4.081	\$1.177	\$1.183
2:	1 2040	0.07	\$27.80	\$125,436,095	6.50	\$395,308,615	(\$2,338,589)	\$392,970,026	198,133	-295		-295	\$9,780,000	0.003354	-1	\$9,669,892	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
22	2 2041	0.07	\$27.80	\$125,887,665	6.50	\$396,731,726	(\$2,347,008)	\$394,384,719	198,846	-296		-296	\$9,780,000	0.003354	-1	\$9,704,704	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
23	3 2042	0.07	\$27.80	\$126,340,861	6.50	\$398,159,961	(\$2,355,457)	\$395,804,503	199,562	-297		-297	\$9,780,000	0.003354	-1	\$9,739,641	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
24	4 2043	0.07	\$27.80	\$126,795,688	6.50	\$399,593,336	(\$2,363,937)	\$397,229,400	200,281	-298		-298	\$9,780,000	0.003354	-1	\$9,774,704	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
25	5 2044	0.07	\$27.80	\$127,252,152	6.50	\$401,031,872	(\$2,372,447)	\$398,659,426	201,002	-299		-299	\$9,780,000	0.003354	-1	\$9,809,893	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
26	5 2045	0.07	\$27.80	\$127,710,260	6.50	\$402,475,587	(\$2,380,988)	\$400,094,599	201,725	-300		-300	\$9,780,000	0.003354	-1	\$9,845,208	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
2	7 2046	0.07	\$27.80	\$128,170,017	6.50	\$403,924,499	(\$2,389,559)	\$401,534,940	202,452	-301		-301	\$9,780,000	0.003354	-1	\$9,880,651	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
28	3 2047	0.07	\$27.80	\$128,631,429	6.50	\$405,378,627	(\$2,398,162)	\$402,980,466	203,180	-302		-302	\$9,780,000	0.003354	-1	\$9,916,221	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
29	2048	0.07	\$27.80	\$129,094,502	6.50	\$406,837,991	(\$2,406,795)	\$404,431,196	203,912	-303		-303	\$9,780,000	0.003354	-1	\$9,951,920	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
30	2049	0.07	\$27.80	\$129,559,243	6.50	\$408,302,607	(\$2,415,460)	\$405,887,148	204,646	-304		-304	\$9,780,000	0.003354	-1	\$9,987,747	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
3:	1 2050	0.07	\$27.80	\$130,025,656	6.50	\$409,772,497	(\$2,424,155)	\$407,348,342	205,383	-306		-306	\$9,780,000	0.003354	-1	\$10,023,703	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
32	2 2051	0.07	\$27.80	\$130,493,748	6.50	\$411,247,678	(\$2,432,882)	\$408,814,796	206,122	-307		-307	\$9,780,000	0.003354	-1	\$10,059,788	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
33	3 2052	0.07	\$27.80	\$130,963,526	6.50	\$412,728,169	(\$2,441,641)	\$410,286,529	206,864	-308		-308	\$9,780,000	0.003354	-1	\$10,096,003	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
34	4 2053	0.07	\$27.80	\$131,434,994	6.50	\$414,213,991	(\$2,450,430)	\$411,763,560	207,609	-309		-309	\$9,780,000	0.003354	-1	\$10,132,349	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
3	2054	0.07	\$27.80	\$131,908,160	6.50	\$415,705,161	(\$2,459,252)	\$413,245,909	208,356	-310		-310	\$9,780,000	0.003354	-1	\$10,168,825	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
36	5 2055	0.07	\$27.80	\$132,383,030	6.50	\$417,201,700	(\$2,468,105)	\$414,733,594	209,106	-311		-311	\$9,780,000	0.003354	-1	\$10,205,433	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
3	2056	0.07	\$27.80	\$132,859,609	6.50	\$418,703,626	(\$2,476,990)	\$416,226,635	209,859	-312		-312	\$9,780,000	0.003354	-1	\$10,242,172	\$0	\$895	\$3,378	\$4,081	\$1,177	\$1,183
38	s 2057	0.07	\$27.80	\$133,337,903	6.50	\$420,210,959	(\$2,485,908)	\$417,725,051	210,615	-313		-313	\$9,780,000	0.003354	-1	\$10,279,044	\$0	\$895	\$3,378	\$4,081	\$1,1//	\$1,183
39	2058	0.07	\$27.80	\$133,817,920	6.50	\$421,723,718	(\$2,494,857)	\$419,228,861	211,3/3	-315		-315	\$9,780,000	0.003354	-1	\$10,316,049	\$0	\$895	\$3,378	\$4,081	\$1,1//	\$1,183
4	1 2059	0.07	\$27.80	\$134,299,004	6.50	\$423,241,924	(\$2,503,838)	\$420,738,085	212,134	-310		-310	\$9,780,000 \$0,780,000	0.003354	-1	\$10,353,187	\$0 ¢0	\$895 ¢00E	\$3,3/8 \$2,270	\$4,081	\$1,1// \$1 177	\$1,183
H-		0.07	ş27.60	\$5,035,200,202	0.50	Ş424,705,595	(\$2,312,852)	\$422,252,742	8 130 805	-517	0	-517	,760,000	0.005354	-1	\$20,350,458	ŞU	2692	\$5,378	Ş4,081	\$1,1//	Ş1,183
20	6 Discourt			\$2 813 564 806			1	\$10,120,333,10Z	3,130,803	-12,102	0	-10,041			-41	\$222 101 656						
50	6 Discount			\$2,052 114 027												\$163 633 190						
79	6 Discount			\$1.571.922.604												\$125,790,553						
1 ·									1								1	1	1	1	1	1

					http://www.artba.org/about/ fag/ I-290 13-mile Residual									
		Injuries Project, Induced			Value (Assume 3 times									
		Traffic, and No Pricing			reconst. cost to replicate									
		Opportunity Costs	Property Damage Only	Total Accident Death/	difference to const. from	Discount		Discount						
	Calendar	Accidents*∑[Pr(AIS _x)*Val	\$3547 per Accident	Injury/PDO Opportunity	scratch. (190 Acres	Factor	Discount	Factor						
Yea	Year	ue (AIS _x)] ¹⁶	Opportunity Costs**	Costs	Pavement Area Only)*'	(3%)	Factor (5%)	(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)
1	2020	\$2,941,481	\$973,793	\$12,920,405		0.9709	0.9524	0.9346	(\$384,049,365)	\$863,260,897	(\$376,731,502)	\$846,811,905	(\$369,690,531)	\$830,985,308
2	2021	\$2,952,071	\$977,299	\$12,966,918		0.9426	0.9070	0.8734	(\$373,267,835)	\$841,112,212	(\$359,170,302)	\$809,345,192	(\$345,864,765)	\$779,362,836
3	2022	\$2,962,698	\$980,817	\$13,013,599		0.9151	0.8638	0.8163	(\$362,522,598)	\$819,509,515	(\$342,199,782)	\$773,568,267	(\$323,382,359)	\$731,030,074
4	2023	\$2,973,364	\$984,348	\$13,060,448		0.8885	0.8227	0.7629	(\$352,046,508)	\$798,549,468	(\$325,974,859)	\$739,410,973	(\$302,280,564)	\$685,665,047
5	2024	\$2,984,068	\$987,892	\$13,107,466		0.8626	0.7835	0.7130	(\$341,769,833)	\$778,059,482	(\$310,429,706)	\$706,711,811	(\$282,496,975)	\$643,121,281
6	2025	\$2,994,811	\$991,448	\$13,154,653		0.8375	0.7462	0.6663	(\$331,740,966)	\$758,136,004	(\$295,576,250)	\$675,487,868	(\$263,927,171)	\$603,159,434
7	2026	\$3,005,592	\$995,018	\$13,202,010		0.8131	0.7107	0.6227	(\$6,784,832)	\$738,695,125	(\$5,930,366)	\$645,665,514	(\$5,196,058)	\$565,718,192
8	2027	\$3,016,412	\$998,600	\$13,249,537		0.7894	0.6768	0.5820	(\$6,607,868)	\$719,742,861	(\$5,665,322)	\$617,078,759	(\$4,871,775)	\$530,643,975
9	2028	\$3,027,271	\$1,002,195	\$13,297,235		0.7664	0.6446	0.5439	(\$6,435,605)	\$701,285,271	(\$5,412,828)	\$589,833,626	(\$4,567,231)	\$497,689,285
10	2029	\$3,038,169	\$1,005,802	\$13,345,105		0.7441	0.6139	0.5083	(\$6,268,094)	\$683,328,461	(\$5,171,325)	\$563,762,059	(\$4,281,780)	\$466,786,543
11	2030	\$3,049,107	\$1,009,423	\$13,393,148		0.7224	0.5847	0.4751	(\$6,104,538)	\$665,786,420	(\$4,940,924)	\$538,877,804	(\$4,014,765)	\$437,867,024
12	2031	\$3,060,083	\$1,013,057	\$13,441,363		0.7014	0.5568	0.4440	(\$5,945,828)	\$648,756,844	(\$4,720,041)	\$515,009,719	(\$3,763,826)	\$410,675,861
13	2032	\$3,071,100	\$1,016,704	\$13,489,752		0.6810	0.5303	0.4150	(\$5,791,162)	\$632,153,148	(\$4,509,623)	\$492,262,585	(\$3,529,122)	\$385,232,844
14	2033	\$3,082,156	\$1,020,364	\$13,538,315		0.6611	0.5051	0.3878	(\$5,639,732)	\$615,887,455	(\$4,308,922)	\$470,556,284	(\$3,308,256)	\$361,278,423
15	2034	\$3,093,251	\$1,024,038	\$13,587,053		0.6419	0.4810	0.3624	(\$5,493,283)	\$600,151,077	(\$4,116,325)	\$449,715,959	(\$3,101,364)	\$338,829,663
16	2035	\$3,104,387	\$1,027,724	\$13,635,966		0.6232	0.4581	0.3387	(\$5,350,149)	\$584,762,721	(\$3,932,772)	\$429,845,649	(\$2,907,727)	\$317,809,923
17	2036	\$3,115,563	\$1,031,424	\$13,685,056		0.6050	0.4363	0.3166	(\$5,210,366)	\$569,726,780	(\$3,757,492)	\$410,862,480	(\$2,726,615)	\$298,141,337
18	2037	\$3,126,779	\$1,035,137	\$13,734,322		0.5874	0.4155	0.2959	(\$5,074,834)	\$555,142,187	(\$3,589,707)	\$392,682,304	(\$2,556,424)	\$279,650,296
19	2038	\$3,138,035	\$1,038,864	\$13,783,765		0.5703	0.3957	0.2765	(\$4,942,730)	\$540,919,576	(\$3,429,490)	\$375,314,540	(\$2,396,396)	\$262,255,433
20	2039	\$3,149,332	\$1,042,604	\$13,833,387		0.5537	0.3769	0.2584	(\$4,814,091)	\$527,063,441	(\$3,276,920)	\$358,768,679	(\$2,246,634)	\$245,969,304
21	2040	\$3,158,622	\$1,045,679	\$13,874,194		0.5375	0.3589	0.2415	(\$4,688,080)	\$538,102,055	(\$3,130,329)	\$359,302,016	(\$2,106,365)	\$241,770,524
22	2041	\$3,169,994	\$1,049,444	\$13,924,141		0.5219	0.3418	0.2257	(\$4,566,476)	\$524,363,684	(\$2,990,653)	\$343,413,515	(\$1,974,811)	\$226,765,460
23	2042	\$3,181,406	\$1,053,222	\$13,974,268		0.5067	0.3256	0.2109	(\$4,447,570)	\$510,922,874	(\$2,857,961)	\$328,313,586	(\$1,851,179)	\$212,657,675
24	2043	\$3,192,859	\$1,057,013	\$14,024,575		0.4919	0.3101	0.1971	(\$4,331,389)	\$497,783,392	(\$2,730,563)	\$313,808,977	(\$1,735,550)	\$199,457,443
25	2044	\$3,204,353	\$1,060,818	\$14,075,064		0.4776	0.2953	0.1842	(\$4,218,848)	\$485,050,596	(\$2,608,513)	\$299,906,715	(\$1,627,118)	\$187,073,554
26	2045	\$3,215,889	\$1,064,637	\$14,125,734		0.4637	0.2812	0.1722	(\$4,109,096)	\$472,627,480	(\$2,491,865)	\$286,613,874	(\$1,525,957)	\$175,515,336
27	2046	\$3,227,466	\$1,068,470	\$14,176,587		0.4502	0.2678	0.1609	(\$4,002,165)	\$460,517,903	(\$2,380,675)	\$273,937,584	(\$1,430,361)	\$164,587,605
28	2047	\$3,239,085	\$1,072,317	\$14,227,623		0.4371	0.2551	0.1504	(\$3,898,083)	\$448,725,752	(\$2,274,997)	\$261,885,026	(\$1,341,276)	\$154,400,279
29	2048	\$3,250,745	\$1,076,177	\$14,278,842		0.4243	0.2429	0.1406	(\$3,795,987)	\$437,151,914	(\$2,173,098)	\$250,257,378	(\$1,257,874)	\$144,858,751
30	2049	\$3,262,448	\$1,080,051	\$14,330,246		0.4120	0.2314	0.1314	(\$3,697,693)	\$426,006,023	(\$2,076,811)	\$239,266,503	(\$1,179,313)	\$135,866,990
31	2050	\$3,274,193	\$1,083,939	\$14,381,835		0.4000	0.2204	0.1228	(\$3,601,440)	\$415,085,622	(\$1,984,394)	\$228,712,191	(\$1,105,642)	\$127,431,307
32	2051	\$3,285,980	\$1,087,842	\$14,433,609		0.3883	0.2099	0.1147	(\$3,507,250)	\$404,393,597	(\$1,895,884)	\$218,599,591	(\$1,036,007)	\$119,453,911
33	2052	\$3,297,809	\$1,091,758	\$14,485,570		0.3770	0.1999	0.1072	(\$3,416,051)	\$394,037,375	(\$1,811,323)	\$208,933,889	(\$971,355)	\$112,044,600
34	2053	\$3,309,682	\$1,095,688	\$14,537,718		0.3660	0.1904	0.1002	(\$3,326,966)	\$383,916,117	(\$1,730,749)	\$199,720,310	(\$910,825)	\$105,104,925
35	2054	\$3,321,596	\$1,099,633	\$14,590,054		0.3545	0.1813	0.0937	(\$3,233,086)	\$373,232,708	(\$1,653,293)	\$190,858,845	(\$854,460)	\$98,640,244
36	2055	\$3,333,554	\$1,103,591	\$14,642,578		0.3450	0.1727	0.0875	(\$3,156,142)	\$364,495,988	(\$1,579,900)	\$182,459,310	(\$800,471)	\$92,444,655
37	2056	\$3,345,555	\$1,107,564	\$14,695,292		0.3350	0.1644	0.0818	(\$3,074,455)	\$355,203,856	(\$1,508,777)	\$174,314,981	(\$750,718)	\$86,733,380
38	2057	\$3,357,599	\$1,111,551	\$14,748,195		0.3252	0.1566	0.0765	(\$2,994,059)	\$346,052,997	(\$1,441,788)	\$166,641,770	(\$704,322)	\$81,405,476
39	2058	\$3,369,686	\$1,115,553	\$14,801,288		0.3158	0.1491	0.0715	(\$2,916,815)	\$337,258,901	(\$1,377,128)	\$159,231,496	(\$660,394)	\$76,358,511
40	2059	\$3,381,817	\$1,119,569	\$14,854,573		0.3066	0.1420	0.0668	(\$2,840,904)	\$328,611,432	(\$1,315,748)	\$152,194,480	(\$618,958)	\$71,595,727
41	2060	\$3,393,992	\$1,123,599	\$14,908,049	\$917,865,815	0.2976	0.1366	0.0624	(\$2,766,339)	\$593,269,396	(\$1,269,765)	\$272,313,856	(\$580,039)	\$124,395,216
тс	TALS	\$129,660,058	\$42,924,668	\$569,529,537	\$917,865,815				(\$2,302,449,114)	\$22,738,838,608	(\$2,116,128,670)	\$16,512,257,870	(\$1,962,133,331)	\$12,610,433,654
3%	Discount	\$72,973,045	\$24,158,124		\$273,156,867	\$20,	436,389,495		B/C Ratio:	9.88	B/C Ratio:	7.80	B/C Ratio:	6.43
5%	Discount	\$53,449,971	\$17,694,904		\$125,380,470	\$14,	396,129,200		NPV:	\$20,436,389,495	NPV:	\$14,396,129,200	NPV:	\$10,648,300,323
7%	Discount	\$41,088,861	\$13,602,691		\$57,274,827	\$10,	648,300,323							

Year	Calendar Year	Capital Costs I-290 HOT 3+ Alternative ¹ (Design/Const)	Capital Opportunity Costs under Park/Trail Alternative ¹ (Design/Const)	Capital Costs I-290 HOT3+ Alternative Net ¹ (Design/Const)	O&M Costs I-290 HOT +3 Alternative	O&M Opportunity Costs under Park/Trail Alternative	I-290 HOT 3+ 0&M Benefits Considering Opportunity Costs ²	Farm Crops Production Loss Costs ³	Ecological Acreage Loss (Pavement)	Ecological Value Per Acre	Ecological Land Opportunity Costs ⁴	Ecological Acreage Loss Induced Development	Ecological Value Per Acre	Ecological Land Loss Induced Development Costs ⁴	Chicago UZA Estimated Population	Chicago UZA Estimated AVMT-No Build	Study Area AVMT-No Build	Chicago UZA Estimated Per Capita VMT-No Build
		Conventional or limited b benefit cost elements. Fu crime; parking, resource o	enefit-cost analysis (BC urther, this does not inc consumption, health, ba	A) of the Eisenhower Expr lude opportunity cost con arrier effects, transport di	ressway (I-290) 13-mil siderations of alterna versity, and VMT (inclu	e reconstruction in th tives such as regional udes changes to all ot	he Chicago urbanized pricing, removal of the ther elements that oc	area through a use he I-290 13-mile se cur without consid	ful life period of gment and creat ering the pricing	35 years afte ting a linear p and I-290 ree	r completion. All figure ark with bicycle and pe moval options).	es are in 2016 dol destrian pathway	lars. The assu s. Thus, the be	nption is the HOT+ nefit-cost elemen	-3 build alternative ts deleted under t	e. This is BCA under the conv his methodology are: capita	ventional methodology us I for the park and pathway	ing limited ys; ecological;
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Year	Calendar Year	I-290 HOT 3+ Alt AVMT	I-290 HOT 3+ Alt AVMT Increase in Region	I-290 Induced AVMT Excluding Project Opportunity Cost	UZA Pricing (+\$0.50 or +20% per gal.) AVMT Opportunity Cost ⁵	Chicago UZA Estimated Per Capita VMT w/no Project, Induced & w/Pricing	Average Annual Daily Traffic per Fwy Lane Reduced	Violent Crime Reduction per 100,000 Population	Chicago MSA Total Annual Violent Crime Reduction	Murder Value	Rape Value	Robbery Value	Aggravated Assault Value	Total Annual Crime Reduction Opportunity Cost ⁶	Proportio n Auto Traffic	Auto VMT Net Change	VMT Value	Auto VMT Project and Opportunity Cost ⁷
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Year	Calendar Year	Proportio n Heavy Tk	Heavy Truck VMT Net Change	VMT Value	Heavy Truck VMT Project and Opportunity Cost ⁷	Auto Noise Value (per VMT)	Auto Noise Project and Opportunity Costs ⁸	Truck Noise Value (per VMT)	Truck Noise and Project Opportunity Costs ⁸	Combined Auto/Light Truck & Heavy Truck MPG	I-290 Project CO ₂ Decrease (MT)	Opportunity Costs CO ₂ Increase (MT)	CO ₂ Value (per MT)	Undiscounted CO ₂ Costs @ 3% Avg SCC	NPV CO ₂ Project and Opportunity Costs @ 3% Avg SCC ⁹ [Undisc/(1.03^A)]	I-290 Project NO _x Decrease (MT)	Opportunit y Costs NO _x Increase (MT)	NO _x Value (per MT)	NO _x Project and Opportunity Costs ¹⁰	I-290 Project PM ₁₀ Decrease (per MT)	Opportuni ty Costs PM ₁₀ Increase (per MT)
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Year	Calendar Year	I-290 Project PM _{2.5} Decrease (per MT)	Opportuni ty Costs PM _{2.5} Increase (per MT)	PM Value (per MT)	PM Project and Opportunity Costs ¹⁰	I-290 Project VOCs Decrease (MT)	Opportunit y Costs VOCs Increase (MT)	VOCs Value (per MT)	VOCs Project and Opportunity Costs ¹⁰	Resource Externalities Value-Car	Resource Externalities Value-Hvy Tk	Resource Consumption Project and Opportunity Costs ¹¹	Parking Internal + External Costs Value	Total Parking Project and Opportunity Costs ¹²	Annual Inactivity Health Care Costs Per Capita	Chicago UZA Per Capita VMT Project & Opportunity Cost	Per Capita VMT Proportion Reduction Project & Opp Cost	Health Care Project and Opportunity Costs (Note: Not used in final calculations as covered in adjacent columns) ¹³	Health Value - Internal	Health Internal Project and Opportunity Costs - Reduced Cardivascular Activity ¹³	Health Value - External	Health External Project and Opportunity Costs - Reduced Life ¹³	Barrier Effect Value-Car	Barrier Effect Value-Heavy Truck

Year	Calendar Year	Barrier Effect Project and Opportunity Costs ¹⁴	Transport Diversity Value	Transport Diversity Project and Opportunity Costs ¹⁵	Uncompensate d Moving Costs Value per HH	Number of HHs	Uncompensated HH Displacement Moving Costs ¹⁶	Annual Region Base VHT Excluding Corridor	CHANGED TO REGION AS WHOLE! Region VHT Reduction Outside Corridor w/I-290 Project	Annual Corridor VHT Base	Project Corridor AVHT Reduction w/I-290 Project	I-290 Removal Additional Travel Time (Opportunity Cost of Removal is Project Benefit)	Chicago UZA 20% Pricing Increase & VHT Additional Travel Time Opportunity Cost Reduction	Proportion Time Value Auto Traffic (per hr)	Auto VHT Benefits of I- 290 Project and Additional Benefits from Opportunity Costs of Removal/Pricing ¹⁷	Auto MPG	Auto VHT Alternate Benefits using Rule of Half Methodology: Trips Retained	Auto VHT Alternate Benefits using Rule of Half Methodology: Trips Forgone	Auto VHT Alternate Benefits using Rule of Half Methodology
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Year	Calendar Year	Proportio n Heavy Tk	Time Value (per hr)	Heavy Truck Travel Time Benefits ¹⁷	Heavy Truck MPC	Truck VHT Alternate Benefits using Rule of Half Methodology: Trips Retained	Truck VHT Alternate Benefits using Rule of Half Methodology: Trips Forgone	Truck VHT Alternate Benefits using Rule of Half Methodology	Accidents No- build	Reduced Accidents I- 290 Corridor HOT 3+ Alt.	I-290 Induced Accidents and Pricing Opportunity Costs	Increased Accidents	Value of Statistical Life	Death/ Crash Ratio	Deaths Increased	Deaths Project, Induced Traffic and No Pricing Opportunity Costs ¹⁸	No Injury AIS 0 0.43676 * \$0	Minor AIS 1 0.41739 * \$2,144	Moderate AIS 2 0.08872 * \$38,078	2 Serious AIS 3 0.04817 * \$84,718	Severe AIS 4 0.00617 * \$190,799	Critical AIS 5 0.00279 * \$423,999

Year	Calendar Year	Injuries Project, Induced Traffic, and № Pricing Opportunity Costs Accidents*∑[Pr(AIS _x)*Val ue (AIS _x)] ¹⁸	Property Damage Only \$3547 per Accident Opportunity Costs ¹⁸	Total Accident Death/ Injury/PDO Opportunity Costs ¹⁵	http://www.artba.org/about/ faq/1-29013-mile Residual Value (Assume 3 times reconst. cost to replicate difference to const. from scratch. (190 Acres Pavement Area Only) ¹⁷	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