



APPENDIX A
Benefit Cost
Analysis
Technical
Memorandum

draft final memorandum

RCP Grant Application: BCA Tech Memo

Reconnecting Independence Boulevard Project

prepared for

Chicago Department of Transportation (CDOT)

prepared by

Cambridge Systematics, Inc.
200 South Wacker, Suite 2575
Chicago, IL 60606

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Executive Summary

This benefit-cost analysis (BCA) was conducted for the development of the **Chicago Department of Transportation Reconnecting Independence Boulevard: I-290 Land Cap Project** for submission to the U.S. Department of Transportation (U.S. DOT) as a requirement of a discretionary grant application for the Reconnecting Communities Pilot (RCP). The analysis was conducted in accordance with the benefit-cost methodology as outlined by U.S. DOT in the Benefit-Cost Analysis Guidance for Discretionary Grant Programs, released in December 2023. The period of analysis corresponds to 20 years and includes 3 years of construction and 20 years of benefits after operations of the highway cap park begin in 2029.

The Chicago Department of Transportation (CDOT) is seeking grant funding for the **Reconnecting Independence Boulevard: I-290 Land Cap Project** (the Project), located in West Chicago at the intersection of Independence Boulevard with I-290 in Cook County, Illinois. This application seeks funding for the construction of a highway park cap to reconnect communities north and south of I-290 through providing a green space.

The capital cost for this Project is expected to be **\$20 million** (\$16.6 million in discounted 2022 dollars). With a service life of 60 years, the expected residual value that exceeds the 20-year project operating period is approximately **\$13.3 million** in undiscounted dollars and **\$5.8 million** in 2022 discounted dollars. The residual value is added to the total benefits of the project as per U.S. DOT guidance.

The Project offers qualitative and quantitative benefits that enhance its value and impact on West Chicago disadvantaged communities. The project will provide newly usable land, contribute to air quality improvements, stormwater filtration and management, and improved health outcomes measured in Quality Adjusted Life Years (QALYs). By reconnecting the North Lawndale, East Garfield Park, and West Garfield Park community areas divided by the highway through closing a gap in the Chicago Park Boulevard System with a highway cap park, the Project fosters community cohesion, and the potential for increased property prices. The creation of new green space connected with the existing and proposed community fabric and green space network will offer new recreational opportunities and improvements to pedestrian safety. Enhanced mobility for non-motorized users, noise reduction, and overall aesthetic improvements further contribute to a better quality of life. Together, these benefits support the goals of the RCP through sustainable urban development, equitable access to resources, and long-term economic growth.

The Project quantitative benefits are derived from the highway park cap construction in the “Build” scenario. Table 1 presents a summary of the Project impacts, benefits and costs. The discounted benefits include safety benefits tied to pedestrian injury reduction (**\$9.2 million** discounted), reduced CO₂ emissions costs (**\$1,713** discounted), stormwater and air quality enhancements (**\$5,964** discounted), value of land created by the highway cap park (**\$638,863** discounted), and health benefits related to quality adjusted life years (**\$15.6 million** discounted).

Using a 3.1 percent discount rate (2 percent for Carbon emissions), this leads to an overall discounted Net Present Value (including residual value of assets) of **\$5.1 million** and a Benefit Cost Ratio (BCR) of **1.31**.

**Table 1: Reconnecting Independence Boulevard Project Benefits & Costs Summary**

Benefits and Costs	Discounted Value (2022\$)
Safety—Pedestrian Injury Reduction	\$9,184,517
CO ₂ Emissions Cost Reduction	\$1,713
Stormwater and Air Quality Enhancements	\$5,964
Value of Land Created (Cap)	\$638,863
Improved Health—Quality Adjusted Life Years (QALY)	\$15,640,101
Residual Asset Value	\$5,847,292
O&M Costs	(\$9,523,617)
Total Benefits	\$21,794,834
Capital Costs	\$16,657,619
Benefit/Cost Ratio	1.31
Net Present Value	\$5,137,216

Source: Cambridge Systematics



1.0 Introduction

This appendix summarizes the approach used to conduct benefit-cost analysis (BCA) for the development of the **Reconnecting Independence Boulevard: I-290 Land Cap Project** for submission to the U.S. Department of Transportation (U.S. DOT) as a requirement of a discretionary grant program for the Reconnecting Communities Pilot (RCP). The analysis was conducted in accordance with the benefit-cost methodology as outlined by U.S. DOT in the Benefit-Cost Analysis Guidance for Discretionary Grant Programs, released in December 2023.¹ The period of analysis corresponds to 24 years and includes three years of construction and 20 years of benefits after project completion beginning in October 2029. This appendix is structured as follows:

- Section 2 contains the **Project Description**.
- Section 3 describes the **BCA Framework** including the methodology, its components and assumptions, and the study scenarios.
- Section 4 includes a detailed explanation and calculation of the **Project Benefits**, and a discussion of the quantitative and qualitative benefits analyzed.
- Section 5 contains a detailed explanation and calculation of the **Project Costs**.
- Section 6 contains a **Summary of Results** of the BCA.
- Section 7 documents the results of **Sensitivity Analyses** of critical variables' impacts on the Benefit Cost Ratio (BCR).

2.0 Project Description

The Chicago Department of Transportation (CDOT) is requesting funding for the construction of a highway cap over I-290, between South Independence Boulevard and West Congress Parkway (see Appendix B - Study Area Maps). The Reconnecting Independence Boulevard: I-290 Land Cap Project aims to create a new green space that enhances non-motorized transportation options, create public green space, and improve the connectivity between the previously separated neighborhoods. The cap will feature a pedestrian-friendly environment with amenities such as street furniture, pedestrian paths, ADA-compliant crosswalks, tree coverage, and landscaping. This project ties into larger transportation and community development efforts in Chicago, including the I-290 Eisenhower Expressway (Mannheim Road to Racine Avenue) Phase I Study² and the Boulevard Enhancement Program, aiming to revitalize and connect communities. Investing in the boulevards will provide the adjacent communities with a unique and valued resource for meet ups, recreational activities, studying or contemplation. The main goal of the Boulevard Enhancement project is to provide infrastructure improvements and enhancements that will draw people outside to an environment that

¹ U.S. DOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs, December 2023.

<https://www.transportation.gov/sites/dot.gov/files/2023-12/Benefit%20Cost%20Analysis%20Guidance%202024%20Update.pdf>

² I-290 Eisenhower Expressway Phase I Study

<https://idot.illinois.gov/transportation-system/transportation-management/featured-projects/cook-county-i-290-eisenhower-expressway/information-center.html>



is safe and inviting and to provide a system of trails connecting people to the neighborhood and the city beyond.

Key Project Details:

- Total Construction Cost: \$20 million (see Supplemental Budget Narrative for budget breakdown)
- Funding Request: \$10 million
- Life Expectancy of Cap: 60 years
- Scope:
 - Build a land cap in between the Independence Boulevard Bridges
 - Activate the greenspace by adding a pedestrian path, signage, plazas, lighting and landscaping.
 - Improve safety by slowing traffic, adding crosswalks, ADA ramps, bump outs, roadway lighting, and modernizing traffic signals
 - Incorporate the neighborhood and its history within the design of each Boulevard segment.
 - Create an identity for the Historic Boulevards by introducing distinctive light poles and a patterned stamped crosswalk.

3.0 Benefit Cost Analysis Framework

The main objective of the BCA summarized here was to compare the expected contributions (benefits) and costs of **the Project** to determine whether its contributions to the region's economic, as well as to the impacted communities, justify the costs from a national perspective. This BCA followed the USDOT's Benefit-Cost Analysis Guidance for Discretionary Grant Programs, December 2023. As per USDOT's Guidance, a BCA should define the baseline or "No-Build" scenario (the cap is not built) and the alternative or "Build" scenario (the cap is built). The benefits, disbenefits and additional costs are calculated by comparing the "Build" scenario against the "No-Build" scenario. Since the BCA calculates the anticipated benefits expected to accrue from the "Build" scenario over a specified period and compares them to the anticipated costs of the project, both calculations are discounted into the present to identify their present value.

Key Methodological Components

Following USDOT guidance, the key methodological elements of this analysis include:

- Defining existing and future conditions under both the "No-Build" scenario as well as under the "Build" scenario.
- Assessing the project benefits, quantitatively and qualitatively, with respect to selection criteria defined by the USDOT over the 20 years of operations beyond the project completion (2029 in this case) when benefits accrue and using USDOT recommended values to monetize benefits or disbenefits.



- Estimating the project capital costs, during project's construction, and the project's operation and maintenance costs over the 20 years of operations beyond the project completion when benefits accrue.
- Establishing 2022 as the base year and presenting all benefits and cost values in 2022 dollars.
- Discounting project benefits and costs using a real discount rate of 3.1 percent per year, except in the case of carbon dioxide (CO₂) emissions, where a 2.0 percent per year discount rate is applied.

Key Assumptions

To complete the BCA for the Project, the following assumptions were made:

- **Project Analysis Period**—This period includes the design and engineering and construction of the Project during which capital expenditures are undertaken, plus 20 years of operations beyond the Project completion within which to evaluate the ongoing Project benefits and costs.
- **Project Construction Period**—The project construction is assumed to begin in April 2027 and end in October 2029 at which point the project will be deemed complete.
- **Project Operating Period**—This period covers the 20-year operating period. The period starts in 2030, the calendar year immediately after the construction's completion and when the project opens to the public, and ends in 2049.
- **Service Life**—The cap is assumed to have a service life of 60 years. Therefore, the cap will have a 66.7 percent residual value of the cap costs in the year 2049.
- All Project benefits and costs are conservatively assumed to occur at the end of each calendar year for purposes of present value discounting.

“Build” and “No Build” Scenarios

The analysis of the **Project** considered how the balance of costs and benefits resulting from the construction of the Project would result in long-term benefits to its users and general society. This is accomplished by comparing the “Build” scenario relative to the “No-Build” scenario.

The **“Build”** scenario will create a 60,000 square foot park-like cap over I-290. The space created will be landscaped with 20 trees and potentially include a pedestrian pathway. In addition, adjacent intersections will have safety upgrades such as pedestrian-friendly signalization.

The **“No-Build”** scenario assumes that no capital expenditures are made, and no cap is built.

4.0 Project Benefits

The assessment of project benefits for Reconnecting Independence Boulevard: I-290 Land Cap Project was based on the findings of the U.S. Department of Transportation Federal Highway Administration (FHWA)

report on the benefits of highway cap parks, released in 2022.² According to FHWA's findings, highway cap parks can provide a range of benefits to local communities, which include, but are not limited to the benefits listed below:³

- **Transportation Benefits** tied to enhance safety, connectivity, mobility, and reduction of conflicts between vehicles and pedestrians;
- **Economic Benefits** linked to the increase of property values adjacent to the highway cap park and potential business opportunities;
- **Social Benefits** related to community connections, improved access to parks and green space, and public health benefits, and,
- **Environmental Benefits** such as noise reduction, air quality improvements, and carbon sequestration.

Based on the scope of the and the community characteristics of where the project is located, benefits were analyzed in alignment with the highway cap benefits indicated by FHWA and the RCP's grant evaluation criteria. Table 2 highlights the list of quantitative and qualitative benefits that were analyzed.

Table 2: Reconnecting Independence Boulevard Project Benefits Overview

	Benefit Category	Qualitative Benefit	Quantitative Benefit
Transportation Benefits	Enhance Safety (Pedestrian crash cost reduction)		Yes
	Enhance Connectivity for non-motorized road users	Yes	
	Increase Mobility	Yes	
	Enhance Connections to community facilities	Yes	
Economic Benefits	Residual asset value		Yes
	Land value of the newly created space		Yes
	Spur development - Boost local economies	Yes	
	Business opportunities	Yes	
	Temporary jobs during constructions	Yes	
	Operations & Maintenance (O&M) cost savings		Yes
Social Benefits	Reconnecting neighborhoods	Yes	
	Health Benefits - Quality Adjusted Life Years (QALY)		Yes
	Access to parks and historic sites	Yes	
	Offer recreational activities	Yes	
	Increase Park lands	Yes	

² U.S. DOT The Benefits of Highway Cap Parks: A Report to Congress, December 2022.

https://www.fhwa.dot.gov/planning/community_connections/research/benefits_highway_cap_parks_report_congress.pdf

³ Ibid.

	Improve Park equity	Yes	
	Benefit local health by providing opportunity for physical fitness	Yes	
	Aesthetic benefits	Yes	
Environmental Benefits	Noise reduction	Yes	
	Environmental Sustainability (CO ₂ sequestration)		Yes
	Environmental Sustainability (Stormwater and Air Quality)		Yes
	Decrease urban heat island effect / increase shades	Yes	

Section 4.1 discusses the quantified project benefits calculated for the project and Section 4.2 focuses on the discussion of qualitative benefits.

4.1 Quantified Project Benefits

The quantified BCA includes the following benefits:

- Safety – Pedestrian crash cost reduction
- Environmental Sustainability – CO₂ sequestration
- Environmental Sustainability – Stormwater and Air Quality
- Operations & Maintenance (O&M) cost savings – negative benefit
- Residual asset value
- Land value of the newly created space (approximately 1.4 acres)
- Health Benefits – Quality-Adjusted Life Years

Safety Benefits

Safety benefits stem from the potential reduction in crashes of vehicles into pedestrians. Table 3, below presents the pedestrian injuries over the period of 2013 through 2022 for the project site, the average annual pedestrian injuries and their monetized costs, the crash modification factor associated with improved signalization for pedestrian crossings, the post-treatment expected cost of pedestrian injuries, and the pedestrian crash cost reduction.

The annual cost of the pedestrian injuries at the project site is impacted by the Crash Modification Factor (CMF) obtained from the Crash Modification Factors Clearinghouse,⁴ which provides a searchable database of CMFs along with guidance and resources on using CMFs in road safety practice.

⁴ <https://cmfclearinghouse.fhwa.dot.gov/>

The safety improvements envisioned for the Independence Boulevard Project will improve safety by slowing traffic, adding crosswalks, ADA ramps, bump outs, roadway lighting, and modernizing traffic signals. For the project site, modernizing traffic signals with hybrid beacon signals is used for the safety calculations (CMF ID: 10591), enabling the percentage of the injuries to be reduced to 56.7% of historical levels. This is a 43.3% reduction.

This reduction in injuries and fatalities is valued by the USDOT-provided injury costs to yield an estimated annual injury reduction benefit of \$771,515. Over 20 years, the injury reduction equates to **\$15.4 million** undiscounted, **\$9.1 million** discounted to 2022.

Table 3: Historic Pedestrian Injuries with Vehicles on Project Site (2013-2022) and Crash Cost Reduction

Injury Severity	A Injury	B Injury	C Injury	Fatality	No Injuries	Total
10-Year Number	3	7	1	1	1	13
Cost each	\$1,188,200	\$233,800	\$111,700	\$12,500,000	\$5,000	-
10-YR Cost	\$3,564,600	\$1,636,600	\$111,700	\$12,500,000	\$5,000	\$17,817,900
Annual Cost	\$356,460	\$163,660	\$11,170	\$1,250,000	\$500	\$1,781,790
Crash Modification Factor (CMF) ID: 10591 (Pedestrian Hybrid Beacons)	0.567	0.567	0.567	0.567	0.567	0.567
Annual Cost after CMF	\$202,113	\$92,795	\$6,333	\$708,750	\$284	\$1,010,275
Annual Cost Reduction	\$154,347	\$70,865	\$4,837	\$541,250	\$217	\$771,515

Source: Illinois Department of Transportation GIS Server

Environmental Sustainability Benefits

CO₂ Sequestration

This analysis examined the potential of the 20 trees planned to be planted on the cap to sequester or absorb CO₂. “Although the carbon absorption capacity can vary, it is generally considered that a tree can store about 22 kg of CO₂ per year.⁵ This Project will see 20 trees planted, therefore it is estimated that the plantings will absorb 3.34 metric tons of CO₂ per year. Multiplied by the USDOT CO₂ recommended “Damage Costs for Emissions per Metric Ton, on average, \$122 of reduced CO₂ damage is possible due to the trees planted on the cap. The total 2022 discounted environmental benefit is **\$1,713**.

Stormwater and Air Quality

⁵ <https://onetreepanted.org/blogs/stories/how-much-CO2-does-tree-absorb>



The Chicago Region Trees Initiative study “24th Ward Urban Forestry Summary” estimates broken down to a per-tree basis show that the annual stormwater and air quality benefits other than CO₂ capture are \$25.05 for each tree. Given 20 trees to be planted, that equates to \$501 per year. The total 2022 discounted environmental benefit is **\$5,964**.

Health Benefits – Quality-Adjusted Life Years

This analysis is based on the results of a theoretical study of the impacts of parkland on top of highway capping on the mental and physical health of residents nearby the cap.⁶ The impact of the cap is expressed as a predicted change in the Quality-Adjusted Life Years for the residents within half mile of the cap.

The quality-adjusted life year (QALY) is a generic measure of disease burden, including both the quality and the quantity of life lived. It is used in economic evaluation to assess the value of medical interventions. A QALY uses a scale of 0.00 (dead) to 1.00 (perfect health) for each health status. It is the product of duration of life and a measurement of quality of life. For example, 2 years of perfect health = 2 QALYs. Therefore, 2 years in a status measured as 0.5 of perfect health followed by 2 years of perfect health = 3 QALYs.⁷ The study estimated that proximity to parkland over the highway cap provided an increase in QALYs of 0.16 per resident.

The number of residents potentially affected by the cap over I-290 in Chicago was calculated using 2022 population and area size for the 7th Congressional district in which the project lies. The population used is 732,352 and the area is 69.3 square miles. The population density is 10,568 per square mile or 2,642 residents within a half mile of the cap.

The benefit is calculated as:

$$\begin{aligned} & (\text{Change in QALYs per resident}) \times (\text{Number of residents}) \times (\text{value of QALY}) \\ & (0.16) \times (2,642) \times (\$62,160) = \$26,275,902 \end{aligned}$$

The \$26,275,902 QALY benefit is spread evenly over the 20-year life of the project at \$1,313,795 per year. The total discounted health/QALY benefit is **\$15.6 million**.

Cap Maintenance and Operation Costs

No operation and maintenance costs will be incurred in the No-Build scenario. Maintenance and operations of the **Project** is expected to cost 4 percent of total construction cost per which adds up to **\$16 million** in discounted dollars and **\$9.5 million** discounted. These values are negative benefits in its Benefit-Cost Analysis.

Project’s Residual Value

This BCA assumes that the Project will have a useful service life that exceeds the 20-year project operating period. Therefore, per USDOT guidance, assets with useful lives beyond the operating period are valued for

⁶ Cost-Effectiveness of Capping Freeways for Use as Parks: The New York Cross-Bronx Expressway Case Study; Sooyoung Kim MPH, Zafar Zafari PhD, MSc, Martine Bellanger PhD, and Peter Alexander Muennig MD, MPH; 2018; <https://ajph.aphapublications.org/doi/10.2105/AJPH.2017.304243>

⁷ <https://www.sciencedirect.com/topics/medicine-and-dentistry/quality-adjusted-life-year>

the remaining useful life and discounted at the 20-year discount value. Under the “Build” Scenario, the cap will have a useful life of 60 years and will depreciate linearly. Thus, the expected residual benefit that exceeds the 20-year project operating period is approximately **\$13.3 million undiscounted and \$5.8 million** discounted to 2022.

Quantitative Project Benefits Summary

Table 4 shows the **Project** long-term benefits.

Table 4: Project - Long Term Benefits

Benefits and Costs	Discounted Value (2022\$)
Safety – Pedestrian Injury Reduction	\$9,184,517
CO ₂ Emissions Cost Reduction	\$1,713
Stormwater and Air Quality Enhancements	\$5,964
Value of Land Created (Cap)	\$638,863
Improved Health – Quality Adjusted Life Years (QALY)	\$15,640,101
Operations and Maintenance Costs	(\$9,523,617)
Residual Value	\$5,847,292
Total Benefits	\$21,794,834

Source: Cambridge Systematics

4.2 Qualitative Project Benefits

In addition to the monetized benefits, the project is expected to generate benefits that are more difficult to quantify. This section provides an overview of these benefits and highlights how the expected impacts of the highway cap park over I-290 in West Chicago align with the evaluation criteria of the RCP grant. The alignment of the expected benefits of the project to Equity and Justice 40 is also discussed below.

Transportation Benefits

Transportation benefits from highway cap parks can promote equity and access in communities, particularly through improvements in non-motorized mobility, connectivity to community facilities and creating safer, more inclusive spaces for pedestrians, cyclists, and individual road users (i.e., micromobility users).⁸

The highway cap park project over I-290 in West Chicago seeks to enhance connectivity for these users by providing the missing link on a series of continuous green space facilities proposed along the median of Independence Blvd to the south I-290, connecting those facilities to Garfield Park to the north of I-290, through the construction of the highway cap park (see Appendix B – Study Area Maps). The addition of the highway park cap will support the establishment of 1.7 miles of connected green space in West Chicago along the length of Independence Blvd, connecting Douglass Park to Garfield Park, as part of Chicago’s

⁸ U.S. DOT The Benefits of Highway Cap Parks: A Report to Congress, December 2022.

https://www.fhwa.dot.gov/planning/community_connections/research/benefits_highway_cap_parks_report_congress.pdf



Boulevard Enhancement Program and the Independence Blvd Project (see Appendix B – Study Area Maps).⁹

Alignment with RCP grant merit criteria

- **#2 Access and #3 Facility Suitability:**

- The highway cap park over I-290 project will improve access and mobility for pedestrians and communities adjacent to Independence Blvd (south of I-290) and provide the missing link in a series of green space that connect these communities to Garfield Park (north of I-290). This green space connectivity further extends to Douglass Park to the southeast as part of Chicago's Boulevard Enhancement Program.¹⁰
- Garfield Park is a 172-acre anchor park in Chicago's westside, and home to schools, libraries, and recreational facilities, and the project can help strengthen access to these facilities for communities adjacent to and surrounding Independence Blvd.
- The project encompasses a new green space facility, connected with other green space proposed in the area, that improves mobility and provides transportation options suitable to the local community.

Economic Benefits

As indicated in Section 4.1, the cap has an estimated value of land created of \$721,843. This can spur economic development and increase property prices, providing a value capture opportunity that supports and preserves the fabric of adjacent communities.¹¹ The value capture potential is tied to the long-term economic impact of the highway cap park and the interconnected network of green space connecting Garfield Park to Independence Blvd and to Douglass Park.

The new green space created by the highway cap over I-290 can help boost local business opportunities and provide a space for gatherings and events taking place in Garfield Park or along Independence Blvd. With an estimated cost of \$20 million, the implementation of the highway cap park is also estimated to generate jobs, taxes, and value added to the local economy.¹²

- A total of up to 190 jobs will be created during the three-year construction, and annually six jobs tied to maintenance activities will also be created for the site's 20-year operational life, which in total will generate 320 job-years of employment, worth \$25 million in wages;

⁹ Boulevard Enhancement Program. 2024. Chicago.gov. July 17, 2024.

https://www.chicago.gov/city/en/depts/cdot/provdrs/future_projects_andconcepts/svcs/boulevard-enhancement-program-.html.

¹⁰ Boulevard Enhancement Program. 2024. Chicago.gov. July 17, 2024.

https://www.chicago.gov/city/en/depts/cdot/provdrs/future_projects_andconcepts/svcs/boulevard-enhancement-program-.html.

¹¹ U.S. DOT The Benefits of Highway Cap Parks: A Report to Congress, December 2022.

https://www.fhwa.dot.gov/planning/community_connections/research/benefits_highway_cap_parks_report_congress.pdf

¹² Calculations from IMPLAN model by Cambridge Systematics based on estimated project costs and the value of the new highway cap park.



- The construction and maintenance of the cap will increase regional GDP by \$41 million.;
- The increased activity of construction and maintenance will generate \$9 million in local, state, and federal taxes.

Overall, the Reconnecting Independence Boulevard project will help revitalize the area, connecting neighborhoods south and north of I-290 that can attract investment and support community growth.

Alignment with RCP grant merit criteria

- **#5 Equitable Development:**

- The highway cap park over I-290 can promote community restoration through a network of green space that link both sides of the highway providing opportunities for inclusive economic development, value capture, spaces for local businesses and events, among other benefits.
- The highway park cap over I-290 and pedestrian infrastructure support the implementation of greenspace or recreational spaces for residents and visitors, including trees, lighting, and other amenities.
- The Reconnecting Independence Boulevard project supports a local development plan to improve greenspace and access to nature in the City of Chicago.¹³

Social Benefits

The highway cap over I-290 in West Chicago offers major social benefits, particularly by improving Equity and Environmental Justice, Access, and Facility Suitability. This project will enhance connectivity between neighborhoods previously divided by the highway, strengthening community ties, and improving pedestrian access between Independence Boulevard and Garfield Park. By creating new parkland with seating areas and landscaping, the highway cap will grant residents –particularly those in the south of I-290- safe access to green space in the north (i.e., Garfield Park). This project not only adds essential green space but also enhances the aesthetic appeal of the area, transforming a concrete divide into a welcoming and vibrant public space that welcomes all residents, regardless of background.¹⁴ This highway cap will improve access to parks and recreational sites, increase parkland, and promote physical fitness opportunities, all while contributing to climate mitigation by expanding green areas and the number of trees.

Alignment with RCP grant merit criteria

- **#2 Access, #3 Facility Suitability and #6 Climate and Environment:**

- The highway cap park over I-290 project will reunite communities previously separated by I-290, providing essential links to parks and community spaces.

¹³ “Boulevard Enhancement Program.” 2024. Chicago.gov. July 17, 2024.

https://www.chicago.gov/city/en/depts/cdot/provdrs/future_projects_andconcepts/svcs/boulevard-enhancement-program-.html.

¹⁴ “INDEPENDENCE BOULEVARD IMPROVEMENTS PRELIMINARY CONCEPT PLAN -NORTH 0.” n.d. Accessed September 19, 2024. <https://www.chicago.gov/content/dam/city/depts/cdot/CDOT%20Projects/Boulevard-Enhancement/3B.6%20Open%20Blvds%20Independence%20Boulevard-Concept.pdf>.



- Residents will have improved access to Garfield Park and other recreational sites, promoting community engagement.
- The cap adds green space, mitigating urban heat and addressing environmental justice concerns by providing more opportunities that support healthier and more active lifestyle for residents in the community.

Environmental Benefits

The highway cap over I-290 in West Chicago will bring significant environmental benefits, especially in the areas of Equity and Environmental Justice and Climate and Environment. The trees and greenery planted on the cap will contribute to air quality improvement by filtering pollutants and reducing CO₂ emissions, creating a healthier environment for nearby residents. This increase in green space and vegetation will also help mitigate the urban heat island effect, offering much-needed shade for pedestrians, making non-motorized travel more appealing and comfortable. This change can potentially encourage a shift from vehicular trips to walking or cycling, reducing greenhouse gas emissions, and supporting broader climate adaptation goals. The highway cap will help buffer the surrounding neighborhoods from the constant highway noise. This will create a quieter and more peaceful environment for residents, enhancing the livability of the area and addressing the equity and environmental justice goals. These improvements will ensure that the highway cap park serves as both a functional and sustainable green space, providing long-lasting environmental and health benefits to the community.

Alignment with RCP grant merit criteria

- **#1 Equity and Justice40 Initiative and #6 Climate and Environment:**
 - Trees and green space on the highway cap will filter pollutants and improve local air quality, contributing to climate goals.
 - The added greenery will cool the area and offer shade, encouraging non-motorized trips and improving health outcomes for pedestrians, bicyclists, and nearby residents.
 - The cap will act as a barrier, reducing highway noise and improving neighborhood livability.

Equity and Justice 40 Benefits

As highlighted in Appendix H – EJ Screen Community Report, 100% of the census tracts around the project's area half mile ring show EJ and Supplemental Indexes upwards of the 90th percentile (excluding Lead Paint) compared to State and National Percentile categories.

Additionally, 100% of the census tracts are also considered Disadvantaged Census Tracts (see Appendix I – ETC Explorer Report), highlighting that communities in the area face particularly significant disadvantages tied to Health Vulnerability, Social Vulnerability, and Environmental Burden.

This highlights the alignment of the Reconnecting Independence Boulevard project, linking communities north and south of I-290 through green space, to the Justice 40 objectives. The construction of the highway cap park as the missing link in a series of continuous green space along Independence Blvd can provide transportation, economic, social, and environmental benefits to historically disadvantaged communities experiencing environmental, climate, and social burdens.



5.0 Project Costs

Capital Costs

The capital costs associated with the Project are primarily related to construction costs. These costs were derived from construction cost estimates provided by Chicago DOT (Departments of Transportation). Construction of the project is assumed to will occur in 2029 and cost \$20 million undiscounted and \$16.7 million discounted to 2022.

6.0 Summary of Results

Reconnecting Independence Boulevard: I-290 Land Cap Project offers a range of both quantitative and qualitative benefits that contribute to its overall value. Quantitatively, the project delivers a positive Net Present Value (NPV) and a favorable Benefit-Cost Ratio (BCR), reflecting its financial viability and potential for long-term economic returns. Qualitatively, the project enhances community cohesion, environmental sustainability, and public health by improving the connections between neighborhoods, creating green space, and improving non-motorized mobility. Together, these benefits promote equitable access, healthier living conditions, and sustainable urban growth. In the following, a summary of quantitative and qualitative BCA results are provided.

6.1 Summary of Quantitative BCA Results

This BCA converts potential gains (benefits) and losses (costs) from the **Project** into monetary units and compares them. The following common benefit-cost evaluation measures are included in this BCA:

- **Net Present Value (NPV):** NPV compares the net benefits (benefits minus costs) after being discounted to present values using the real discount rate assumption. The NPV provides a perspective on the overall dollar magnitude of cash flows over time in today's dollar terms.
- **Benefit Cost Ratio (BCR):** The present value of incremental benefits is divided by the present value of incremental costs to yield the BCR. The BCR expresses the relation of discounted benefits to discounted costs as a measure of the extent to which a project's benefits either exceed or fall short of the costs.

Table 5 present the evaluation results for the Project. Benefits and costs are presented in undiscounted and discounted values at 3.1 percent per year, except in the case of savings in CO₂ emission costs, where a 2.0 percent per year discount rate is applied.

Table 5: Reconnecting Independence Boulevard Evaluation Measures

Evaluation Measures	Value (discounted 2022\$)
Project Benefits = PB	\$21,794,834
Total Project Costs = PC	\$16,657,619
Benefit Cost Ratio = BCR = PB / PC	1.31
Net Present Value = PB - PC = NPV	\$5,137,216

Source: Cambridge Systematics

The total net benefits from the **Project** within the analysis period are **\$21.8 million** (including the asset residual value) in discounted 2022 dollars. The total project capital costs are calculated to be **\$16.7 million** in discounted 2022 dollars. The difference of the discounted project benefits and costs equal a NPV of **\$5.1 million**, resulting in a BCR of **1.31**.

6.2 Summary of Qualitative BCA Results

The highway cap project over I-290 in Chicago brings notable qualitative benefits that align with several key RCP Grant merit criteria. By enhancing the area with greener, more inviting spaces, the project significantly improves Equity and Justice by providing all residents with better access to recreational areas and creating a more inclusive environment. It also aligns with Access by offering safer and more convenient routes for pedestrians and cyclists, ensuring that mobility needs are met effectively. The project contributes to Facility Suitability through the development of functional and sustainable green space that meet the community's needs. According to the EJ Screen Report, 4 schools, 3 hospitals, and 16 places of worship are within the defined area (Appendix H – EJ Screen Community Report). In terms of Equitable Development, it supports local economic growth by increasing property values and fostering new opportunities. Additionally, it promotes Workforce Development and Economic Opportunity by generating jobs for ongoing maintenance and operations. Finally, the project addresses Climate and Environment by mitigating CO₂ emissions and the urban heat island effect, improving air quality, and delivering other environmental benefits, contributing to the area's resilience and overall sustainability.

7.0 Sensitivity Testing

A sensitivity analysis is used to examine the degree changes in key variables impact the BCA results. This allows for the assessment of the strength of the BCA, including whether the results reached using the preferred set of input variables are significantly different by reasonable departures from those values. Table 6 summarizes the key variables which have been tested for sensitivity and the results of this analysis.

- **Test 1.** A decrease of the pedestrian-injury reduction benefit by 25 percent yields a discounted BCR of 1.17, with a NPV of \$2.8 million.
- **Test 2.** A decrease of the health benefit by 25 percent yields a discounted BCR of 1.07, with a NPV of \$1.2 million.
- **Test 3.** An increase in the cost of the project by 25 percent yields a discounted BCR of 1.05 with a NPV of \$1 million.



The analysis shows that the BCA estimates are robust and demonstrate Project feasibility under extreme assumptions.

Table 6: Sensitivity Tests - Alternative Values for Key Parameters

Sensitivity Variable	Sensitivity Value	New BCR (Discounted)	New NPV (Millions of Discounted \$2022)
Decrease Pedestrian-Injury Reduction Benefit	-25%	1.17	\$2.8
Decrease Health Benefit	-25%	1.07	\$1.2
Increase Cost of the Cap	+25%	1.05	\$1.0

Source: Cambridge Systematics