Benefit Cost Analysis

WABASH RIVER GREENWAY PHASE TWO

North River Road/North 9th Street Active Transportation System Connector Loop

Technical Memorandum

SUBJECT: Wabash River Greenway Phase Two – North River Road/North 9th Street Road Active Transportation System Loop Development Project RAISE Grant Application Benefit-Cost Memorandum

Introduction

This memorandum summarizes the assumptions, methodologies, and results of the benefit-cost analysis (BCA) completed for the Wabash River Greenway Phase Two FY 2023 RAISE grant program application. The BCA provides a means to measure a project's overall benefit by developing a uniform measurement of the impact the project has on society. This is accomplished by assigning a dollar value to benefits that can be compared to the construction costs and other related costs. In the BCA, the capital costs of constructing and maintaining the project are compared to the net monetary benefit the project provides to the region. The costs and benefits are discounted to compare all costs and benefits with a common measure such as using 2021 dollars.

The Wabash River Greenway Phase Two 2023 RAISE funds will be used to the North River Road/North 9th Street Road Connector Loop, a 4.9-mile active transportation loop connecting West Lafayette and Lafayette and providing access to several state and local parks along the Wabash River. The project is part of the larger 90-mile Wabash River Greenway[1] (WRG) Plan. The WRG, when developed, will provide Greater Lafayette and the state of Indiana with a world- class destination trail experience, develop a significant and sustainable regional economic driver, and provide essential active transportation infrastructure for the local community.

The 4.9-mile section of the project known as Wabash River Greenway Phase Two is the subject of this benefit-cost analysis. Wabash River Greenway Phase Two will include the following components:

- 2.1 miles of new sidepaths
- 0.5 miles of boardwalk
- 1.0 miles of new trail facilities along existing roadways and through various paths
- 1 dedicated bicycle-pedestrian bridge across the Wabash River
- 1 trail bridge
- 1.2 miles of upgrades to existing sidepath sections
- 20 new park/ride spaces for commuters
- 5 new bus stop connections

The project will enhance bicycle and pedestrian accessibility, increase tourism opportunities, and support economic growth. This project will contribute quantifiable benefits in several areas. These areas, which are the focus of this BCA, include pedestrian and bicyclist travel time savings, reductions in pedestrian- and bicyclist-involved crashes, health and recreation benefits for commuter induced to active transportation modes and recreational project users, increases to local property values, and economic growth spurred by tourism spending. The substantial positive impacts of the project in 2021 dollars and assuming a 7% discount rate are monetized at $39.5M in benefits, compared to a discounted project cost of $16.1M. As a result, the project has a benefit-cost ratio (BCR) of 2.46 (at a 7% discount), which represents a very favorable investment of federal funds and a significant benefit to the region.

1 Wabash River Greenway Homepage

Contents

This memorandum is organized to complement the BCA spreadsheet and to provide a tab-by-tab walkthrough of the methodology and results. The memorandum is organized as follows:

BCA DETAILED SUMMARY

Table 1: Benefit Cost Analysis Summary

Possible Societal Benefits for Consideration	Key Benefits Quantified	Total Benefits	Present Value (7% Discount Rate)	Spreadsheet Tab
Travel Time Savings	Reduced walking and biking distance and associated reduced travel time	$5,251,953	$1,619,128	E
Pedestrian Benefits	Mortality reduction and revealed preference benefits associated with the addition of shared-use path	$7,131,500	$2,162,663	F
Bicycle Benefits		$83,148,322	$25,215,146	G
VMT Reduction	Benefits due reduction in vehicle miles traveled (VMT) as drivers shift to active modes	$5,216,063	$1,618,340	H
Crash Reduction	Reduction in pedestrian- and bicyclist-involved crashes	$19,441,370	$5,737,335	I
Tourism Spending	Increased value of tourism spending related to multimodal amenities	$3,519,976	$1,067,451	J
Property Values	Estimated real estate tax assessment of Tippecanoe properties	$1,999,632	$1,087,667	K
Residual Value	Residual value of assets at the end of the analysis period	$6,807,805	$1,023,909	L
Maintenance Costs	Cost of regular maintenance and inspection of assets	-$165,465	-$51,011	M
	TOTAL BENEFITS	**$132,351,156**	**$39,480,627**	
	TOTAL COSTS	**-$24,884,532**	**-$16,069,753**	
	BENEFIT / COST RATIO	**5.32**	**2.46**	
	NET PRESENT VALUE	**$107,466,624**	**$23,410,874**	

ALTERNATIVES

Consistent with the direction provided by the US Department of Transportation (USDOT), the BCA compares a No-Build Alternative and a Build Alternative. These alternatives compare the benefits and costs of implementing the proposed construction at the project location and completing the improvements. The following is a description of the No-Build and Build scenarios used for comparison in the BCA.

No-Build Alternative

The No-Build alternative maintains the existing conditions in and around the project area in Lafayette and West Lafayette, Indiana. The project area lacks the critical connections needed

to accommodate the active transportation needs of residents. Narrow, unprotected pedestrian pathways on bridges that cross the Wabash River present significant safety challenges, as proven by crash and injury data. The Wabash River, while an important and vital resource in the region, also acts as a physical barrier between the Lafayette and West Lafayette communities. Without adequate and safe crossings, this barrier separates residents (particularly those without access to motor vehicles) in Lafayette from important educational, employment, and cultural opportunities provided by Purdue University in West Lafayette, and separates residents in West Lafayette from commerce, employment, and cultural opportunities in Lafayette. As such, auto-dependence is largely characteristic of the No-Build alternative.

The limited existing pedestrian and bicycle facilities of note within and around the project area include:

- An unpaved trail east of the Wabash River between Sagamore Parkway and North 9th Street. Bicycles are not permitted on this trail given that it is unpaved.
- Paved trails on both sides of the river south of Sagamore Parkway
- Paved trail along North 9th Street from Canal Road to Sagamore Parkway
- Pedestrian-accessible Wabash River crossings at:
  - Old US 231, a vehicular bridge with sidewalks and bike lanes, south of Sagamore Parkway
  - The John T. Myers dedicated pedestrian bridge, south of Old US 231

This No-Build Alternative establishes a standard from which to compare the benefits from implementing the project. The No-Build Alternative is consistent with USDOT BCA guidance.

Build Alternative

The Build alternative is defined by the complete construction of the North River Road/North 9th Street Road Connector Loop, a 4.9-mile active transportation loop connecting West Lafayette and Lafayette. In addition to providing increased accessibility and mobility for residents near the project, the trail will also provide direct access to several state and local parks along the Wabash River including Tippiecanoe Amphitheater Park, Tecumseh Trails Park, McAllister Park, Lake Harner, and Mascouten Park.

The Build alternative is characterized by greater and safer pedestrian and bicyclist activity in and around the project area and includes these specific components:

- 2.1 miles of new sidepaths
- 0.5 miles of boardwalk
- 1.0 miles of new trail facilities along existing roadways and through various paths
- 1 dedicated bicycle-pedestrian bridge across the Wabash River
- 1 trail bridge
- 1.2 miles of upgrades to existing sidepath sections
- 20 new park/ride spaces for commuters
- 5 new bus stop connections

The Build Alternative considers creating a robust network of dedicated bicycle/pedestrian paths, shared use paths, bike lanes, and access to recreational parks and amenities all while connecting communities and enhancing the quality of life and safety of active transportation. Detailed development of the Build alternative trail user projections is outlined in the Inputs – Tab A section of this memorandum.

BCA METHODOLOGY

The BCA was developed using the updated 2023 guidance provided by the USDOT. Analysis was completed as necessary to develop the benefits and costs of the No-Build and Build alternatives. Major components of the analysis include:

- Initial capital costs
- Travel time savings for commuters to Purdue University from east of the Wabash River
- Mortality reduction and revealed preference for pedestrian and cyclist trail users
- Reduction in vehicle emissions, noise costs, congestion costs, and more as commuters opt for active transportation modes
- Reduction in pedestrian- and bicycle-involved crashes as pedestrians and bicyclists relocate to separated facilities and/or utilize improved road crossings
- Increased tourism revenue in communities and parks adjacent to the trail
- Increased property values in communities adjacent to the trail
- Annual maintenance costs of new assets (applied as a disbenefit in the analysis)
- Residual capital value of assets at the end of the BCA period

In addition to the main quantifiable benefits, unquantified benefits were also identified. These benefits were not developed into monetized results but describe additional value of constructing the project beyond the quantified results of the BCA. These broader benefits are generally discussed in the project narrative.

BCA SPREADSHEET FORMAT

The BCA spreadsheet is designed to be a useful, intuitive tool for reviewers and is organized to facilitate a quick understanding of the methodologies that were employed for each calculation.

The spreadsheet is organized in tabs, that contain calculations for the individual costs and benefits including implementation costs, safety impacts, congestion impacts, and health and recreation impacts. These tabs are discussed below and both reference information from the Inputs tab and include additional inputs and assumptions, along with source information. In all tabs, efforts have been made to source, annotate, or otherwise explain the methodology used in order to ensure transparency and allow the reviewers to reproduce results or modify input parameters at their discretion.

Inputs – Tab A

The BCA spreadsheet included in this application begins with an Inputs tab (Tab A) containing key information about the project. The most significant inputs in this analysis that are used

to inform the benefit cost analysis consist of the analysis period, construction schedule, monetization factors, and active transportation user estimates.

ANALYSIS PERIOD

The BCA analysis was completed for a 27-year period starting in 2023 and covering the 7-year design and construction of the project as well as a 20-year operating period of benefits following completion of the project. This analysis period was used to capture the benefits of the project while staying within USDOT guidance. The present value of all benefits and costs was calculated using 2021 dollars.

The analysis uses the current project schedule and construction duration assumptions. This assumes NAPA, preliminary engineering, permitting, and right-of-way acquisition will occur throughout 2023-2026 and construction will begin in 2027. Construction is scheduled to be completed in 2029, meaning that full project use and benefits will begin in 2030. Any temporary net benefits or indirect costs caused by the construction of the project, including jobs created by the construction or travel time delays due to construction, are assumed to be minimal and were excluded from the analysis.

TRAIL USER PROJECTIONS

Many of the benefits quantified in this analysis are based on the population of active transportation users within the project area in the No-Build and Build alternatives. In each alternative, active transportation users were broken into four categories:

- Commuter pedestrians
- Recreational pedestrians
- Commuter bicyclists
- Recreational bicyclists

The difference in these projections between the No-Build and Build alternative represent the users induced to the project.

PEDESTRIAN PROJECTIONS

The existing population of commuter pedestrians was taken as a percentage of the population of the census tracts immediately adjacent to the project, the value of which was provided in Tippicanoe County census data. A case study conducted by FHWA[1] suggests that commuters account for only 22 percent of the pedestrian population, so the number of recreational pedestrians was extrapolated accordingly. These values, grown annually according to the historical population growth in Tippicanoe County, represents the No-Build commuter and recreational pedestrian projections.

A community attitudes survey[2] conducted in relation to the project suggests that the pedestrian activity level within the community is anticipated to increase by 40.6% with the pedestrian

1 FHWA National Bicycling and Walking Case Study
2 Wabash River Greenway Community Attitudes Survey

network improvements introduced in the Build alternative. Therefore, beginning in the project opening year of 2030, this increase was applied to the No-Build pedestrian projections to represent the projections for the Build alternative.

BICYCLIST PROJECTIONS

The existing population of commuter bicyclists was taken as a percentage of the population of the census tracts immediately adjacent to the project, the value of which was provided in Tippicanoe County census data. Research conducted by Forbes[3] suggests that commuter bicyclists account for 83 percent of the cyclist population, so the number of recreational bicyclists was extrapolated accordingly. These values, grown annually according to the historical population growth in Tippicanoe County, represents the No-Build commuter and recreational bicyclist projections.

The community attitudes survey conducted in relation to the project suggests that the bicyclist activity level within the community is anticipated to increase by 45.8% with the bicyclist network improvements introduced in the Build alternative. Therefore, beginning in the project opening year of 2030, this increase was applied to the No-Build bicyclist projections to represent the projections for the Build alternative.

Output Table – Tab B

The Output Table tab (Tab B) contains the high-level annualized BCA Detailed Summary and reports the undiscounted and discounted costs and benefits for each major merit criteria.

Summary – Tab C

The Summary tab (Tab C) includes the detailed costs and benefits by category and by year over the analysis period and calculates the BCA results.

Cost Estimate – Tab D

The analysis is based on the current project delivery schedule. Final design, right-of-way acquisition, and private utility adjustments are anticipated to occur from 2023 to 2026. Construction is anticipated to begin in 2027. Project opening, or the first year of project benefits, is anticipated to be 2030. Any temporary net benefits or indirect costs caused by the implementation of the project or travel time delays due to construction, are assumed to be minimal due to this being a road extension project and as such there are no new traffic impacts. As such, work zone and other temporary impacts were excluded from the analysis. The project costs were developed based on individual construction line items, with a 10% contingency applied to all project costs in every phase. Project costs were developed using year of expenditure dollars, discounted back to 2021 dollars assuming a 3% future inflation rate, and then further discounted by 7% per USDOT BCA guidelines.

Based on the delivery schedule, the project costs in 2021 dollars will be $24.9M undiscounted and $16.1M using a 7% discount rate.

3 Forbes, The 4 Types of Cyclists

Travel Time Savings – Tab E

The proposed layout of the new trail paths will present a benefit to off-campus Purdue University students actively commuting to class in the Build alternative. For students walking or biking to the university from northwest Lafayette, the proposed pedestrian bridge over the Wabash River will save students a 0.5-mile detour to the next bridge crossing to the south. Using the $34.00 per-person-hour value of travel time prescribed by USDOT, the value of time saved by these commuting students was calculated as the travel time savings benefit of the project.

The Purdue University Office of Undergraduate Admissions[4] lists the university's current enrollment at 50,884 students, and according to the US News and World Report[5], 59% of these students live off-campus in West Lafayette or Lafayette. A conservative 15% of these off-campus students were assumed to live in northwest Lafayette, and Replica analysis was used to determine the percentage of these students commuting to class via walking or biking. Replica analysis of trips starting in northwest Lafayette and ending at Purdue University among people under 25 years old indicates that 2.78% of students in this commuter group bike to class, and 1.11% walk. Students were assumed to make 8 round trips to and from campus during the week, accounting for a few mid-day return trips throughout the week.

The respective average biking and walking speeds prescribed by USDOT were applied to each user group and the 0.5-mile distance savings in the Build alternative to calculate the travel time savings introduced by the project.

The travel time savings benefit of the project was monetized at $5.3M undiscounted, or $1.6M at a 7% discount.

Pedestrian Benefits – Tab F

As previously described, a major benefit of the Wabash River Greenway Phase Two project is the increase in active transportation modes in the Build alternative such as walking and biking. The addition of safe and convenient facilities is anticipated to draw commuter and recreational pedestrians alike, thereby producing benefits associated with reduced mortality and the "revealed preference" for walking over other modes of transportation. These reduced mortality and revealed preference benefits have been described in the 2023 USDOT BCA Guidance and assigned values of $0.11 per foot of path width per person-mile walked and $7.20 per induced trip, respectively. These values were combined with the project specifications and pedestrian user projections calculated in the Inputs tab to represent the Pedestrian benefit of the project. Per USDOT guidance, all pedestrian benefits were restricted to an assumed walking trip length of 0.86 miles. Given that many recreational walking trips may be considerably longer than this, this is a conservative estimate of the pedestrian benefit of the project.

The total pedestrian benefit of the project is $83.1M undiscounted or $25.2M at a 7% discount rate.

4 Purdue University Undergraduate Admissions
5 US News and World Report

Bicyclist Benefits – Tab G

The same methodology used to quantify pedestrian benefits was implemented for the induced bicycle benefits due to the development of an active transportation network. Similar to pedestrian benefits, the USDOT prescribes value for the revealed preference and mortality reduction benefits enjoyed by bicyclist project users. These benefits have been assigned values of $1.49 per mile for a path with at-grade crossings and $6.42 per induced trip, respectively. These values were combined with the project specifications and bicyclist user projections calculated in the Inputs tab to represent the Bicyclist benefit of the project. Per USDOT guidance, all bicyclist benefits were restricted to an assumed biking trip length of 2.38 miles. Given that many recreational biking trips may be considerably longer than this, this is a conservative estimate of the bicyclist benefit of the project.

The total bicyclist benefit of the project is $7.1M undiscounted or $2.2M at a 7% discount rate.

VMT Reduction – Tab H

Some trips taken as passenger vehicle trips within the project area in the No-Build alternative are assumed to convert to active transportation trips in the Build alternative, resulting in an overall reduction in vehicle-miles traveled (VMT) and producing project benefits in several categories. These include:

- **Vehicle operating cost savings** as drivers reduce the wear-and-tear on their vehicles by driving less. Per USDOT guidance, vehicle operating cost savings are valued at $0.46 per VMT for passenger vehicles
- **External highway use impacts**, secondary benefits reaped by the general population when a driver chooses an alternative form of travel and reduced VMT. Per USDOT guidance, these include Congestion, Noise, and Safety benefits respectively valued at $0.130, $0.0018, and $0.015 per VMT for passenger vehicles in an urban setting
- **Pavement maintenance costs savings** realized by jurisdictions as there is less wear-and-tear on the roadway, valued at $0.19 per VMT according to the Highway Allocation Study
- **Water pollution cost savings** as less mitigation is required for dirty run-off water, valued at $0.014 per VMT according to the Victoria Transport Policy Institute
- **Transportation diversity benefits** as drivers experience flexibility and redundancy in their choices for mode of travel, valued at $0.007 per VMT according to the Victoria Transport Policy Institute
- **Emissions reductions benefits** for carbon monoxide (CO), carbon dioxide (CO2), nitrogen oxides (NOx), sulfur oxides (SOx), and volatile organic compounds (VOCs). Damage costs for these pollutant emissions from the California Life-Cycle Benefit/Cost Analysis (Cal-B/C) model were used to calculate the environmental costs savings introduced by the project. Note that CO2 emissions were discounted at a 3-percent discount rate per USDOT guidance, while the remainder of pollutants were discounted at a 7-percent rate.

Each of these benefits was applied on a per-VMT basis to the trips assumed to divert from passenger vehicles trips on in the No-Build to walking or biking trips in the Build alternative. Together, these benefits represent the “VMT Reduction” benefit of the project. VMT savings

were capped at 0.86 miles for induced walking trips, and 2.38 miles for induced biking trips, the assumed average walking and biking trip lengths per USDOT guidance.

The total combined VMT Reduction benefit of the project was monetized at $5.2M undiscounted, or $1.6M at a 7% discount.

Crash Reduction – Tab I

2015-2021 crash data (excluding 2020 data due to irregularities associated with the COVID-19 pandemic) in the study area was downloaded using the Tippecanoe Area Plan Commission Data Viewer[6], including location and number of crashes and severity of each crash. The raw data was analyzed to determine the proportion of each severity level of crash and monetized according to the guidance provided by USDOT.

The 6-year crash history revealed 1 fatal crash, 13 injury crashes, and 16 PDO crashes in areas where crashes will likely be avoided or reduced in the Build alternative, primarily on vehicular bridges crossing the Wabash River. Upon the introduction of a new pedestrian bridge in the Build alternative, pedestrians and bicyclists will no longer need to interact with vehicles on the existing vehicle-oriented bridge structures and approaches. While such pedestrian- and bicyclist-involved crashes could be assumed to be completely eliminated in these locations with the introduction of a separate facility in the Build alternative, they were conservatively assumed to be reduced by 50%.

The monetized value of crashes in the No-Build and Build alternatives were calculated as a weighted average based on historical crash severities and number of occurrences, and monetary values provided by USDOT in the 2023 BCA guidance. This value was assigned on a per-crash basis in each year of analysis. In the Build alternative only, future predicted crashes were assumed to be reduced by 50% after the project opening year of 2030. The difference in crash costs between the No-Build and Build alternatives represents the crash reduction benefit of the project.

The crash reduction benefit of the project was monetized at $19.4M undiscounted, or $5.7M at a 7% discount.

Tourism Spending – Tab J

In addition to the community connectivity and Wabash River crossing provided by the project in the Build alternative, the project will also provide direct access to several state and local parks and recreation areas, including the Tippiecanoe Amphitheater Park, Tecumseh Trails Park, McAllister Park, Lake Harner, and Mascouten Park. According to the Indiana Department of Natural Resources (DNR)[7], the average visitor to Indiana State Parks spends $31.68 in relation to their visit to the park, including park fees, food, drinks, and other tourism- and recreation-related expenses.

91% of respondents in the Community Attitudes Survey reported that they plan to use the trail to travel to parks. This value was applied to the increase in recreational trail users in the Build alternative to represent the population of park visitors induced by the trail. This population was

6 Tippiecanoe Area Plan Commission Data Viewer
7 Indiana Department of Natual Resources

assumed to visit parks 4 times per year, and the tourism revenue they generate in association with these visits represents the tourism spending benefit of the project.

The tourism spending benefit of the project was monetized at $3.5M undiscounted, or $1.1M at a 7% discount.

Property Value Increase – Tab K

The National Association of Realtors[8] has indicated that properties near trails such as the Wabash River Greenway can experience property value increases of up to 15%, with the average increase at about 4%. In order to estimate the value this would bring to the residents and business owners in the vicinity of the project location, property value increases were estimated using the Tippicanoe County Assessor Sales Research Tool[9].

For parcels within a half-mile of the proposed new section of trail in the Build alternative, the average sales prices was evaluated for properties sold in 2021. This average sales price was multiplied by the number of properties within the half-mile buffer from the trail to represent the total value of the property adjacent to the proposed project. This value was then increased by 4% to capture the value added by the trail in the Build alternative. This property value increase benefit was applied as a one-time benefit in the project opening year of 2030.

Property value increases were only those properties adjacent to the new sections of trail added in the Build alternative. No property value increase was assumed for properties adjacent to the exiting trail segments being upgraded in the Build alternative.

The total property value increase benefit of the project was monetized at $2.0M undiscounted or $1.1M at a 7% discount rate.

Residual Value – Tab L

Many of the components of the project have service lives beyond the analysis period, so the residual capital value was calculated for the Build Alternative. This residual value was calculated using linear depreciation over the respective lifespans of project assets and applied as a benefit in the BCA. Trailhead and boardwalk components were assumed to have a 30-year lifespan, and bridge components were assumed to have a 50-year lifespan. Given that sidepath segments would likely be due for significant repaving at the end of the 20-year analysis period, they were conservatively assigned to have no residual value. As an additional conservative measures, soft costs associated with construction such as engineering costs and mobilization were also assigned no residual value.

The total residual value benefit of the project was monetized at $6.8M discounted, or $1.0M at a 7% discount.

8 National Association of Realtors
9 Tippicanoe County Assessor Sales Research Tool

Maintenance Cost – Tab M

Separate from the initial capital costs of the project previously described are the continual costs of operating and maintain the shared-use path throughout the analysis period. The Rails to Trails Conservancy[10] published a trail maintenance guide in 2014 based on a survey of 200 trails analyzing the frequency, methodology, and cost of standard practices required to maintain and operate such facilities. The study accounted for ongoing maintenance such as litter pick-up, mowing, and trailhead maintenance and larger and less frequent trail surface maintenance elements such as sealcoating. A wide variety of trails were surveyed, including many that have similar components to the Wabash River Greenway Phase Two proposed trail, including sidepaths, pedestrian bridges, and boardwalks. All costs were normalized to an average annualized cost of $1,971 per mile. This cost was grown to 2021 dollars and applied for the 3.65-mile length of new trail added in the Build alternative. Given that the project includes upgrades to existing trail which will have to be maintained in the No-Build and Build alternative, the maintenance cost analysis was limited to only the newly added sections in the Build alternative. In each year of the analysis period the maintenance costs incurred in the Build alternative were applied as a "disbenefit" of the project, as they are separate from the initial capital costs of the project, but monetarily has a negative impact on the BCA ratio.

The total trail maintenance disbenefit of the project was monetized at -$165K undiscounted, or -$51K at a 7% discount.

Factors Not Quantified

Several factors were not quantified as part of the analysis but provide additional benefits beyond those quantified above. Some unquantified factors are:

- **Improved Regional Connectivity:** The project provides increased connectivity to the nearby CityBus Center in Lafayette, which is particularly important for non-motorized travelers. The project also connects to the Wabash Heritage Trail, designated as a National Recreation Trail by the National Park Service.
- **Impact on Underserved Communities:** A majority of the census tracts surrounding the project area are designated Areas of Persistent Poverty
- **Partnership and Integrated Project Delivery:** This project is a major public-private partnership, with some portions funded by private developers and some funded by the county, fostering cooperation and promoting job opportunities across multiple sectors.
- **Short Term Economic Impact:** Project construction creates temporary quality jobs during construction, increasing wages in the local economy and providing economic benefits to local suppliers and contractors.

BCA RESULTS

The results of the BCA conducted for the Wabash River Greenway Phase Two project are presented in terms of a benefit-cost ratio (BCR) and a net present value (NPV). A BCR greater

10 Rails to Trails Conservancy Maintenance Practices and Costs

than 1.0 and NPV greater than 0 mean that the project benefits outweigh the project costs. The larger the BCR and NPV, the greater the expected benefits of the project. The BCR provides the amount of benefit per unit cost, which can be useful for determining the highest dollar-for-dollar benefit when comparing projects.

The results of the BCA for the project, calculated using the methodology described above, are presented in the table below. The results are shown both without any discount applied and with a 7% discount. As can be seen in the table, there are substantial benefits associated with the Wabash River Greenway Phase Two project.

Table 2: BCR Summary

	UNDISCOUNTED	7% DISCOUNT
Benefits	$132,351,156	$39,480,627
Costs	$24,884,532	$16,069,753
BCR	5.32	2.46
NPV	$107,466,624	$23,410,874