APPENDIX A:

Benefit Cost Analysis

WABASH RIVER GREENWAY PHASE TWO

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

Memorandum

DATE: April 13, 2022

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SUBJECT: Wabash River Greenway Phase Two – North River Road/North 9th Street Road Active Transportation System Loop Development Project

Introduction

This memorandum summarizes the assumptions, methodologies, and results of the benefit-cost analysis (BCA) completed for the Wabash River Greenway Project FY 2022 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 2020 dollars.

The Wabash River Greenway 2022 RAISE funds will be used to develop an 8+ mile active transportation loop connecting Lafayette, West Lafayette, and Purdue University to each other, Prophetstown State Park and the Wabash River Greenway. This project will comprise a combination of trails, signed bike routes, side paths, and bridge crossings to create a network of looping active transportation routes along the Wabash River.

When completed, this segment of the WRG will include 4.4 miles of side paths, 0.5 mile of boardwalk, 2.0 miles of new trail facilities along existing roadways and through various parks. It will incorporate 1.2 miles of upgrades to the existing trail and provide connections to and through several Lafayette, West Lafayette, and Tippecanoe County parks as well as 1.0 mile of on street signed bicycle route along Swisher Road to provide a connection within Indiana's very popular Prophetstown State Park.

The project includes a proposed, sustainable timber pedestrian bridge, a shared-use path, and roadway improvements. The shared-use path 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 economic competitiveness (pedestrian and bicyclist travel time savings and improved health

outcomes, tourism and state park revenue, and economic output), crash reduction, emissions reduction, residual construction value, and property value increase. The substantial positive impacts of the project in 2020 dollars and assuming a 7% discount rate are monetized at $83.4M in benefits, compared to a discounted project cost of $49.9M. As a result, the project has a benefit-cost ratio (BCR) of 1.67 (at a 7% discount), which represents a very favorable investment of federal funds and a significant benefit to the region.

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:

Memorandum **1**
Introduction **1**
Contents **3**
BCA Detailed Summary **4**
Alternatives **5**
No-Build Alternative 5
Build Alternative 5
BCA Methodology **5**
Analysis Period 6
Output Table – Tab B 6
Summary – Tab C 6
Cost Estimate – Tab D 6
Construction and Residual – Tab E 7
Maintenance Cost – Tab F 7
Safety – Tab G 7
Vehicle Travel Time – Tab H 7
Pedestrian Travel Time – Tab I 8
Operating Costs – J 8
Bridge Strike Delay Savings – Tab K 9
Environmental Impacts – Tab L 9
Pedestrian – Tab M 10
Bicycle – Tab N 10
Property Value Increase – Tab O 10
External Highway Costs – Tab P 11
Factors Not Quantified 11
BCA Results **12**

BCA Detailed Summary

Table 1: Benefit Cost Analaysis Summary

Possible Societal Benefits for Consideration	Key Benefits Quantified	Total Benefits	Present Value (7% Discount Rate)
Economic Competitiveness			
Travel Time Savings	Reduced driving distance and associated reduced travel time	$22,147,020	$8,051,932
Tourism Spending	Increased value of tourism spending related to multimodal amenities	$57,044,486	$20,739,509
State Park Revenue	Revenue incurred related to multimodal amenities	$7,323,766	$2,662,682
Safety			
Crash Savings	Reduction in injury and PDO crashes	$104,402,745	$37,147,675
Environmental Sustainability			
Peak Hour Vehicle Emissions	CO2, VOC, NOx, PM2.5 reductions	$335,858	$36,574
Quality of Life			
Bicycle Benefits	Mortality reduction and revealed preference benefits associated with the addition of shared-use path	$9,209,150	$3,320,030
Pedestrian Benefits		$18,730,805	$6,752,722
State of Good Repair			
External Highway Costs (Noise, Congestion, Pavement Maintenance)	Reduction in external highway mitigation costs due to personal VMT-related Noise, Congestion, and Pavement Impacts	$845,498	$307,395
Other		**$307,395**	
Residual Value	Residual value of assets at the end of the analysis period	$20,215,065	$4,562,806
Maintenance Costs	Cost of regular maintenance and inspection of assets	-$38,220	-$13,896
Operating Costs	Reduction in VMT due to increased active modes in the Build Scenario	$1,244,599	$452,496
Property Values	Estimated real estate tax assessment of Tippecanoe properties	$6,114	$2,223
Total Benefits		**$241,774,281**	**$84,022,148**
Total Costs		**-$77,484,486**	**-$49,966,914**
Benefit / Cost Ratio		**3.12**	**1.68**
		$164,289,795	**$34,055,234**

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 doing nothing at the project location to completing the proposed improvements.

No-Build Alternative

The Wabash River Enhancement Corporation is seeking to redevelop a 90-river-mile stretch of the Wabash river to be a significant recreational amenity and active transportation resource to become a more established destination area with amenities and attractions.

Currently, there is only a limited active transportation network connecting the cities of Lafayette and West Lafayette to Purdue University, Prophetstown State Park and other amenities in the area to one another.

The No-Build Alternative considers the future where auto dependence remains the norm and active transportation crossings across the Wabash River are limited.

Build Alternative

The Wabash River Greenway Phase Two will establish roughly 9 miles of bicycle and pedestrian facilities throughout the region. The project will connect to several existing plans for active transportation, thus furthering an area where car dependence is minimal. Projects that will connect to the Wabash River Greenway include:

- INDOT US 52/Wabash River Bridge Replacement project
- Tippecanoe county Hwy Dept./INDOT N. 9th St Road Wabash River Bridge Deck Replacement

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.

BCA Methodology

The BCA was developed using the updated 2022 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
- Maintenance and inspection costs
- Residual capital value at the end of the BCA period
- Safety benefits associated with changes in congestion
- User & non-user benefits, including reduced travel time
- Travel time savings associated with decreased Scott Road bridge strikes

- Environmental benefits of improved air quality
- Economic benefits generated by surrounding area development

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.

The BCA spreadsheet included in this application begins with an Inputs tab containing key information about the project. This tab also includes many of the inputs and assumptions discussed below and provides source information, as appropriate. The next tab is the Summary, which includes all of the costs and benefits, annualized, and also calculates the BCA results. The following tabs calculate the individual costs and benefits including construction costs and residuals, maintenance, safety impacts, travel time, and others. These individual tabs reference information from the main Inputs tab and include additional inputs and sources as necessary.

Analysis Period

The BCA analysis was completed for a 20-year period starting in 2022 and covering the two-year design and construction of the project as well as a 14-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 2020 dollars. 20 years is an appropriate operating period because the project is "primarily at capacity expansion or to address other operating deficiencies".

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 uses the current project schedule and construction duration assumptions. This assumes funds will be obligated in 2023, with construction beginning in 2027. Construction is scheduled to be completed in 2029, with the project opening for use in 2029. 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. A 40-year project life span is assumed. Based on this schedule, the project costs in 2020 dollars will be $77.4M undiscounted and $49.9M using a 7% discount rate. 2029 is the first full year that benefits from the project will begin.

Construction and Residual – Tab E

Many of the components of the project have service lives beyond the analysis period, so the residual capital value is calculated for the Build Alternative. This residual value is applied as a benefit in the BCA. All trailhead/segment components are assumed to have a 40-year life span. The total benefit associated with the residual values was roughly $20.2M undiscounted, or roughly $4.5M at a 7% discount.

To be conservative, soft costs associated with construction such as engineering costs and mobilization are given no residual values.

Maintenance Cost – Tab F

There will be additional maintenance and inspection costs associated with maintaining the newly constructed trails, lanes, and paths. Average maintenance repair costs were based on INDOT trail construction guidance.

The total cost of maintenance and inspection over the analysis period was roughly $10K, or roughly $3.5K at a 7% discount. In the BCA, the maintenance and inspection costs are treated as a negative benefit (a disbenefit).

Safety – Tab G

2015-2021 crash data in the study area was downloaded using the Tippecanoe Area Plan Commission Data Viewer, including location and number of crashes and severity of each crash according to the KABCO scale. 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 7-year crash history revealed 1 fatal crashes, 216 injury crashes, and 52 PDO crashes within 500ft of the project area. 1 of the fatal crashes involved a pedestrian. Average crash rates per year were calculated based on these values and applied to the baseline no-build alternative. The Build Alternative improves area safety by installing shared use facilities throughout the project area (0.75).

Based on the Build and No-Build predicted crash values for each segment, the annual monetized value of crashes was calculated for each year of project use. The change in the monetized value of crashes was then calculated over the analysis period.

The total safety benefit of the project in terms of the monetized value of decreased crashes was $104.4M, or $37.1M discounted at 7%.

Pedestrian Travel Time – Tab H

The proposed layout of the new trail paths will present a benefit to Purdue University students commuting to class in the Build alternative. For those students commuting to campus from northwest Lafayette, the existing network requires a 2.9-mile walk to campus in the No-Build

condition. The Build condition shortens this distance to 2.3 miles, resulting in a 0.6-mile distance savings for pedestrian commuter students. Publications from Purdue University and the Sustainability Tracking, Assessment & Rating System (STARS), of the 49,600 students enrolled at the university, roughly 5% commute to class by walking or biking. Assuming 25% of these students will travel along the project path and multiplying by the number of school days per year produces an estimate of 130,200 college-based walking trips per year along the project path.

Assuming an average walking speed of 3.2 mph and valuing walking travel time at $32.40 (both of which are prescribed by USDOT), and applying to the Build and No-Build alternative pedestrian travel paths yields the monetary value of pedestrian travel time in each alternative. The difference between the two represents the pedestrian travel time benefit of the project.

The total safety benefit of the project was $22.1M undiscounted, or $8.1M at a 7% discount rate.

Operating Costs – Tab I

The 13,200 college-based walking trips calculated in the Pedestrian Travel Time tab produce benefits associated with a reduction in vehicle operating costs for every vehicle-mile of travel that is replaced by walking. Assuming a passenger vehicle occupancy of 1.67 per USDOT guidelines and multiplying against the 2.4-mile comparable vehicle travel path produces an annual value of 187,144 vehicle-miles traveled (VMT) that are removed from the network and replace by walking. Assuming a vehicle operating cost of $0.45 per VMT (per USDOT guidelines) presents a benefit of the project as operating cost savings in the Build alternative.

The same benefit applies to other commuter trips along the trail network that are non-college-related. An FHWA case study reports that of 22% of pedestrians are commuters, and 78% are walking for recreation. The commuter pedestrian using the project were estimated by applying this ratio to the recreational pedestrians using the project. The project recreational pedestrians were estimated by determining an average annual visitors-per-trail-mile rate from comparable riverwalks and multiplying against the 9.2-mile project length. The result was an estimate of 33,026 annual Wabash Trail visitors, 22% of whom (7,266) were assumed to be commuters. These 7,266 commuter pedestrians were combined with the previously described Purdue University pedestrians along the parallel vehicle path to the trail project to represent the total VMT converted to active transportation modes in the Build alternative. Monetizing at $0.45 per VMT produces the total operating cost benefit of the project.

The total operating cost benefit of the project was $1.24M undiscounted, or $452K at a 7% discount rate.

External Highway Costs – Tab J

External Highway Use benefits represent the congestion and noise mitigation and pavement maintenance cost savings realized by jurisdictions due to reduced VMT. Similar to operating cost savings, USDOT-provided values for congestion, noise, and pavement savings for passenger

vehicles were applied to the annual VMT converted to non-vehicle modes in the Build alternative.

The total external highway use benefit of the project was $845K undiscounted or $307K at a 7% discount.

Environmental Impacts – Tab K

An overall reduction in vehicle miles traveled in the Build alternative will result in mobile-source emissions reductions. Similar to the operating cost and external highway use calculations, the vehicle emissions saved in the Build alternative were claimed as a benefit of the project on a per-VMT basis as they are converted to active transportation modes.

In order to calculate the projected emissions of each alternative, average in-use emission rates for both passenger cars and heavy-duty trucks from the California Life-Cycle Benefit/Cost Analysis (Cal-B/C) Model (updated 2022) were used for carbon monoxide (CO), carbon dioxide (CO_2), nitrogen oxides (NOx), sulfur oxides (SOx), and volatile organic compounds (VOCs). Damage costs for these pollutant emissions from the Cal-B/C model were used to calculate the relative environmental costs of the Build and No-Build alternatives. Note that CO_2 emissions were discounted at a 3-percent discount rate per USDOT guidance, while the remainder of pollutants were discounted at a 7-percent rate.

The total environmental benefit of the project was $336K or $37k at a 3% / 7% discount rate.

Pedestrian – Tab L

The project constructs 4.4 miles of side paths, 0.5 miles of boardwalk, 2.0 miles of new trail facilities along existing roadways and incorporates 1.2 miles of upgrades to the existing trail network creating 9.1 miles of bicycle and pedestrian facilities. The project's active transportation network additions are anticipated draw commuter and recreational cyclists alike, thereby producing benefits associated with reduced mortality and the "revealed preference" for cycling and walking over other modes of transportation. These reduced mortality and revealed preference benefits have been described in the 2022 USDOT BCA Guidance and assigned values of $7.08 and $1.03 per new pedestrian, respectively.

In order to estimate the number of new pedestrians added to the network in the Build alternative, pedestrians were broken into commuter and recreational populations and assumptions were made for each group respectively. The existing population of commuter pedestrians in Tippecanoe was taken as a percentage of the general working population as stated in Tippecanoe census data. According to a study USDOT, there is a strong correlation between walking distance and the willingness to walk for the trip. To be conservative, the increase in future commuter pedestrians was scaled down in accordance with the ratio of existing commuter pedestrians in the Henrico County working populations. Research conducted by USDOT suggests that recreational

pedestrians account for 22 percent of the pedestrian population, so the number of recreational pedestrians was extrapolated accordingly.

The combined respective commuter and recreational pedestrian populations were assumed to grow proportionally with the general population, whose growth was estimated using historical census data. In each year, the number of new recreational and commuter pedestrians was multiplied by the monetary values associated with mortality reduction and revealed preference benefits, which combined represent the Pedestrian benefit of the project.

The total benefit of pedestrians using the new active transportation network is $18.7M undiscounted or $6.7M at a 7% discount rate.

Bicycle – Tab M

The same methodology used to quantify pedestrian benefits was implemented for the induced bicycle benefits due to the development of an active transportation network.

In order to estimate the number of new cyclists added to the network in the Build alternative, cyclists were broken into commuter and recreational populations and assumptions were made for each group respectively. The existing population of commuter cyclists in Tippecanoe was taken as a percentage of the general working population as stated in Tippecanoe census data. According to a survey conducted by Breakaway Research Group for People for Bikes, 46 percent of respondents report they would bike more often if they had safe facilities separated from vehicle traffic. The survey also reported that 14 percent of respondents biked at least twice a week, and this value was assumed to represent commuter cyclists in the survey population. To be conservative, the increase in future commuter cyclists was scaled down in accordance with the ratio of existing commuter cyclists in the survey and Tippecanoe County working populations. Research conducted by Forbes suggests that recreational cyclists account for 17 percent of the cyclist population, so the number of recreational cyclists was extrapolated accordingly.

The total benefit of bicyclists using the new active transportation network is $9.2M undiscounted or $3.3M at a 7% discount rate.

Property Value Increase – Tab N

As previously described, the multimodal regional connectivity provided by this project will drastically increase property values in the surrounding area. Information from Tippecanoe County Assessor's Sales and Records estimates average residential property values within 500ft of the proposed project to be $283,859. To be conservative, only 2.0% of this value was claimed as a benefit of the Wabash River Greenway project, and the benefits were assumed to begin in 2029, after the completion of construction

Based on these assumptions, the BCA resulted in a total property value benefit of $6.1K in 2020 dollars, or roughly $2.2KM at a 7% discount rate.

Tourism Spending – Tab O

Visitors and tourists to the Wabash Trail are anticipated to stimulate the local economy by shopping dining at establishment adjacent to the project. A literature review of comparable Riverwalk trails was used to estimate the amount of tourism spending associated with the project. The Katy Trail in Missouri generates an estimate $355 annually per non-local project user. This value was normalized to the Wabash Trail using the respective median household incomes in the populations adjacent to the Katy and Wabash Trails, resulting in a Wabash Trail tourism spending rate of $308 annually per non-local project user.

This rate was applied to the estimated number of annual Wabash Trail visitors previously calculated in the Environmental tab with the assumption that only 45% of them are non-local. The resulting non-local annual tourism spending is claimed as a benefit of the project.

The total tourism spending benefit of the project was $57.0M undiscounted, or $20.7M at a 7% discount rate.

State Park Revenue – Tab P

Another project benefit, similar to local business tourism spending, is the revenue generated by Indiana State Parks as visitors are drawn to the area via the Wabash Trail. According to the Indiana Department of Natural Resources (DNR), the average visitor to Indiana State Parks generates $31.68 in revenue for the DNR.

Assuming that 50% of Wabash Trail users will also visit the Prophetstown State Park during their visit, the previously estimated annual number of Wabash Trail visitors was scaled accordingly to represent the number of increased visitors to Indiana State Parks. Multiplying by $31.68 per visitor represents the state park revenue benefit of the project.

The total state park revenue benefit of the project was $7.3M undiscounted, or $2.6M at a 7% discount rate.

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:

- **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 project are presented in terms of a benefit-cost ratio (BCR) and a net present value (NPV). A BCR greater 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 Magellan Parkway Extension.

	Undiscounted	7% discount
Benefits	$241,466,886	$84,106,144
Costs	$77,484,486	$49,966,914
BCR	3.12	1.68
NPV	$163,982,400	$34,139,230

Project Information

Project	WABASH River Greenway
Grant	RAISE 2022

Project Schedule

Base Year	2020	
Project Start	2023	
Construction Start	2027	
Construction Years	2	
Project Use Start	2029	
Years of Operations	14	
Total Analysis Period	20	years
Days / year	261	(weekdays only)
Discount Rate	7%	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022

Guidance Source

Primary Guidance Source	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022

Costs and Other Inputs

	Value	Note	Source
In-Vehicle Travel Time: All	$17.80	per hour	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Commercial Vehicle Operators Travel Time: Truck Drivers	$32.00	per hour	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Non-commercial vehicle occupants	1.67		USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022. Passenger vehicles (all travel).
Commercial vehicle occupants	1		USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022. Assume 1 driver per truck.
Operating Cost (Non-Commercial Vehicles)	$0.45	per mile	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Operating Cost (Commercial Trucks)	$0.94	per mile	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022

Possible Societal Benefits for Consideration	Key Benefits Quantified	Total Benefits	Present Value (7% Discount Rate)
Economic Competitiveness			
Travel Time Savings	Reduced driving distance and associated reduced travel time	$22,147,020	$8,051,932
Tourism Spending	Increased value of tourism spending related to multimodal amenities	$57,044,486	$20,739,509
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Pedestrian Benefits		$18,730,805	$6,752,722
State of Good Repair			
External Highway Costs (Noise, Congestion,	Reduction in external highway mitigation costs due to personal VMT-related Noise, Congestion, and Pavement	$845,498	$307,395
Other		$307,395	
Residual Value	Residual value of assets at the end of the analysis period	$20,215,065	$4,562,806
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Total Costs		-$77,484,486	-$49,966,914
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	Undiscounted	7% discount
Benefits	$241,466,886	$84,106,144
Costs	$77,484,486	$49,966,914
BCR	3.12	1.68
NPV	$163,982,400	$34,139,230

		Costs		
Calendar Year	Project Year	Construction	Total Costs	Present Value (7% Discount Rate)
2023	1	$4,222,118	$4,222,118	$3,446,506
2024	2	$4,222,118	$4,222,118	$3,221,034
2025	3	$4,222,118	$4,222,118	$3,010,312
2026	4	$15,662,477	$15,662,477	$10,436,570
2027	5	$30,521,215	$30,521,215	$19,007,079
2028	6	$18,634,439	$18,634,439	$10,845,413
2029	7	$0	$0	$0
2030	8	$0	$0	$0
2031	9	$0	$0	$0
2032	10	$0	$0	$0
2033	11	$0	$0	$0
2034	12	$0	$0	$0
2035	13	$0	$0	$0
2036	14	$0	$0	$0
2037	15	$0	$0	$0
2038	16	$0	$0	$0
2039	17	$0	$0	$0
2040	18	$0	$0	$0
2041	19	$0	$0	$0
2042	20	$0	$0	$0
Total		$77,484,486	$77,484,486	$49,966,914

		Benefits													
Calendar Year	Project Year	Residual Value	Maintenance	Safety	Travel Time	Operating Costs	External Highway Costs	Environmental	Pedestrian	Bicycle	Property Value	Tourism Spending	State Park Revenue	Total Benefits	Present Value (7% Discount Rate)
2023	1	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2024	2	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2025	3	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2026	4	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2027	5	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2028	6	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2029	7	$0	-$2,730	$6,535,818	$1,581,930	$88,900	$60,393	$22,124	$1,271,428	$625,108	$437	$4,074,606	$523,126	$14,781,139	$8,039,960
2030	8	$0	-$2,730	$6,666,534	$1,581,930	$88,900	$60,393	$22,514	$1,281,341	$629,981	$437	$4,074,606	$523,126	$14,927,032	$7,588,146
2031	9	$0	-$2,730	$6,799,865	$1,581,930	$88,900	$60,393	$22,762	$1,291,331	$634,893	$437	$4,074,606	$523,126	$15,075,512	$7,162,267
2032	10	$0	-$2,730	$6,935,862	$1,581,930	$88,900	$60,393	$23,010	$1,301,399	$639,843	$437	$4,074,606	$523,126	$15,226,775	$6,760,870
2033	11	$0	-$2,730	$7,074,579	$1,581,930	$88,900	$60,393	$23,257	$1,311,545	$644,832	$437	$4,074,606	$523,126	$15,380,875	$6,382,516
2034	12	$0	-$2,730	$7,216,071	$1,581,930	$88,900	$60,393	$23,505	$1,321,771	$649,859	$437	$4,074,606	$523,126	$15,537,867	$6,025,853
2035	13	$0	-$2,730	$7,360,392	$1,581,930	$88,900	$60,393	$23,752	$1,332,076	$654,926	$437	$4,074,606	$523,126	$15,697,809	$5,689,608
2036	14	$0	-$2,730	$7,507,600	$1,581,930	$88,900	$60,393	$24,248	$1,342,462	$660,032	$437	$4,074,606	$523,126	$15,861,004	$5,372,671
2037	15	$0	-$2,730	$7,657,752	$1,581,930	$88,900	$60,393	$24,495	$1,352,929	$665,178	$437	$4,074,606	$523,126	$16,027,016	$5,073,743
2038	16	$0	-$2,730	$7,810,907	$1,581,930	$88,900	$60,393	$24,743	$1,363,477	$670,364	$437	$4,074,606	$523,126	$16,196,153	$4,791,857
2039	17	$0	-$2,730	$7,967,125	$1,581,930	$88,900	$60,393	$24,991	$1,374,108	$675,591	$437	$4,074,606	$523,126	$16,368,476	$4,526,020
2040	18	$0	-$2,730	$8,126,468	$1,581,930	$88,900	$60,393	$25,238	$1,384,821	$680,858	$437	$4,074,606	$523,126	$16,544,047	$4,275,296
2041	19	$0	-$2,730	$8,288,997	$1,581,930	$88,900	$60,393	$25,486	$1,395,618	$686,167	$437	$4,074,606	$523,126	$16,722,929	$4,038,806
2042	20	$20,215,065	-$2,730	$8,454,777	$1,581,930	$88,900	$60,393	$25,733	$1,406,499	$691,516	$437	$4,074,606	$523,126	$37,120,253	$8,378,530
Total		$20,215,065	-$38,220	$104,402,745	$22,147,020	$1,244,599	$845,498	$335,858	$18,730,805	$9,209,150	$6,114	$57,044,486	$7,323,766	$241,466,886	$84,106,144

D - Cost Estimate

Detailed Cost Estimate

Pay Item	Description	Total Amount ($2021)	Total Amount ($2020)	Lifespan	Cost Year
Segment/Trailhead/Bridge					
S 01	River Road Sidepath - North of Mascouten Park	$1,364,000	$1,274,766	40 Year Life Span	All
S 02	River Road Boardwalk - South of Sagamore	$2,137,672	$1,997,824	40 Year Life Span	All
S 03	River Road Sidepath - North of Sagamore	$1,087,000	$1,015,888	40 Year Life Span	All
S 04	River Road Boardwalk - North of Sagamore	$584,520	$546,280	40 Year Life Span	All
S 05	River Road Sidepath - North of Sagamore	$489,000	$457,009	40 Year Life Span	All
S 06	River Road Boardwalk - South of Tecumseh	$3,162,008	$2,955,148	40 Year Life Span	All
S 07	River Road Sidepath - South of Tecumseh	$212,000	$198,131	40 Year Life Span	All
TH 01	Tecumseh Park	$2,820,000	$2,635,514	40 Year Life Span	All
S 08	River Road Sidepath - North of Tecumseh	$256,000	$239,252	40 Year Life Span	All
BR 01	Tippecanoe Park Bridge 1	$1,511,000	$1,412,150	40 Year Life Span	All
S 09	Tippecanoe Park Trail - West	$1,658,000	$1,549,533	40 Year Life Span	All
TH 02	Amphitheater Park	$86,000	$80,374	40 Year Life Span	All
BR 02	Tippecanoe Park Bridge 2	$1,288,000	$1,203,738	40 Year Life Span	All
S 10	Tippecanoe Park Trail - East	$812,000	$758,879	40 Year Life Span	All
S 11	Trail Connection - Tippecanoe Park to 9th Street	$223,000	$208,411	40 Year Life Span	All
S 12	9th Street Sidepath - North of Wabash River	$480,000	$448,598	40 Year Life Span	All
BR 03	Wabash River Bridge - Tippecanoe County Project	$0	$0	40 Year Life Span	All
TH 03	Davis Ferry Trailhead	$947,000	$885,047	40 Year Life Span	All
S 13	Swisher Road Sharrows & Signs	$45,000	$42,056	40 Year Life Span	All
S 14	9th Street Sidepath - South of Wabash River to Harner Lake Park	$1,465,000	$1,369,159	40 Year Life Span	All
TX 01	9th Street Crossing at Harner Lake Park	$133,000	$124,299	40 Year Life Span	All
S 15	9th Street Sidepath - North of Sagamore Parkway to Harner Lake Park	$1,404,000	$1,312,150	40 Year Life Span	All
S 16	9th Street Sidepath - South of Sagamore Parkway	$442,000	$413,084	40 Year Life Span	All
S 17	Trail Connection - Wabash River to 9th Street	$444,000	$414,953	40 Year Life Span	All
BR 04	Wabash River Bridge - South	$10,000,000	$9,345,794	40 Year Life Span	All
TH 04	Mascouten Park	$3,000,000	$2,803,738	40 Year Life Span	All
Construction Price		$36,050,200	$33,691,776		
Contract Requirements and Contigency					
Admin and Legal Expenses		$643,000	$600,935	No residual	All
Land, Structures, Rights-of-Way, Appraisals, Etc.		$525,000	$490,654	ROW	Pre-construction
Relocation expenses and payments		$200,000	$186,916	No residual	Start
Architectural and Engineering fees		$5,830,000	$5,448,598	No residual	Pre-construction
Other architectural and engineering fees		$0	$0	No residual	Pre-construction
Project Inspection fees		$2,194,000	$2,050,467	No residual	All
Site Work		$0	$0	No residual	Start
Demolition and removal		$230,000	$214,953	No residual	Start
Construction		$26,428,200	$24,699,252	No residual	All
Equipment		$0	$0	No residual	All
Miscellaneous		$0	$0	No residual	All
Contingencies (10%)		$3,610,000	$3,373,832	Contingency	End
Total Contingency		$39,660,200	$37,065,607		
Total Construction + Contigency		$75,710,400	$70,757,383		
Preliminary Engineering					
Project Design and Engineering		$4,278,000	$3,998,131	No residual	Pre-construction
Design		$2,920,000	$2,728,972	No residual	Pre-construction
Total Preliminary Engineering		$4,278,000	$6,727,103		
Total Price		$80,000,000	$77,484,486		

Cost Breakdown by Asset Lifespan & Residual Value

	Initial Costs (Exc. Contingency)	Contingency	Total	
No residual	$39,928,224	$1,817,702	$41,745,927	
40 Year Life Span	$33,691,776	$1,533,793	$35,225,568	
ROW	$490,654	$22,337	$512,991	
Total	$74,110,654	$3,373,832	$77,484,486	*TRUE*

Cost Breakdown by Year of Expenditure

Annual Construction Costs	Total cost ($2020)	% pre-construction	% start	% end	% all	Construction Costs
2023	$4,222,118	33%	0%	0%	0%	$0
2024	$4,222,118	33%	0%	0%	0%	$0
2025	$4,222,118	33%	0%	0%	0%	$0
2026	$15,662,477	0%	100%	0%	25%	$15,662,477
2027	$30,521,215	0%	0%	0%	50%	$30,521,215
2028	$18,634,439	0%	0%	100%	25%	$18,634,439
Total	$77,484,486	100%	100%	100%	100%	$64,818,131
Check	*TRUE*	*TRUE*	*TRUE*	*TRUE*	*TRUE*	*TRUE*

Cost Estimate Inputs

	Escalation Year	2021	WABASH construction cost estimate
	Base Year	2020	
1	Discount Rate	7%	
2			
3			
4			

Residual Calculation	40 year lifespan
Construction Cost	$33,691,776
Design Service Life (years)	40
Operating Age (years)	16
Residual ratio at end of analysis (linear depreciation)	0.600
Residual Value at end of analysis	$20,215,065

Construction Costs (Cost)				Residual Value (Benefit)			Benefit	
Calendar Year	Project Year	Project Cost	Present Value (7% Discount Rate)	Calendar Year	Project Year	40 Year Lifespan	Total Benefit	Present Value (7% Discount Rate)
2023	1	$4,222,118	$3,446,506	2023	1	$0	$0	$0
2024	2	$4,222,118	$3,221,034	2024	2	$0	$0	$0
2025	3	$4,222,118	$3,010,312	2025	3	$0	$0	$0
2026	4	$15,662,477	$10,436,570	2026	4	$0	$0	$0
2027	5	$30,521,215	$19,007,079	2027	5	$0	$0	$0
2028	6	$18,634,439	$10,845,413	2028	6	$0	$0	$0
2029	7	$0	$0	2029	7	$0	$0	$0
2030	8	$0	$0	2030	8	$0	$0	$0
2031	9	$0	$0	2031	9	$0	$0	$0
2032	10	$0	$0	2032	10	$0	$0	$0
2033	11	$0	$0	2033	11	$0	$0	$0
2034	12	$0	$0	2034	12	$0	$0	$0
2035	13	$0	$0	2035	13	$0	$0	$0
2036	14	$0	$0	2036	14	$0	$0	$0
2037	15	$0	$0	2037	15	$0	$0	$0
2038	16	$0	$0	2038	16	$0	$0	$0
2039	17	$0	$0	2039	17	$0	$0	$0
2040	18	$0	$0	2040	18	$0	$0	$0
2041	19	$0	$0	2041	19	$0	$0	$0
2042	20	$0	$0	2042	20	$20,215,065	$20,215,065	$4,562,806
Total		$77,484,486	$49,966,914			$20,215,065	$20,215,065	$4,562,806

Action	Cost			
Maintenance	$	54,600	per mile per year	Source: https://www.in.gov/indot/files/INDOT_TrailsCostCalculator_Memo.pdf

			Cost (Disbenefit)		Total Benefit (-Cost)	
Calendar Year	Project Year	Project Use Year	No-Build Maintenance Costs (Cost)	Build Maintenance Costs (Cost)	Total Benefit	Present Value (7% Discount Rate)
2023	1	0	$0	$0	$0	$0
2024	2	0	$0	$0	$0	$0
2025	3	0	$0	$0	$0	$0
2026	4	0	$0	$0	$0	$0
2027	5	0	$0	$0	$0	$0
2028	6	0	$0	$0	$0	$0
2029	7	1	$0	$2,730	-$2,730	-$1,485
2030	8	2	$0	$2,730	-$2,730	-$1,388
2031	9	3	$0	$2,730	-$2,730	-$1,297
2032	10	4	$0	$2,730	-$2,730	-$1,212
2033	11	5	$0	$2,730	-$2,730	-$1,133
2034	12	6	$0	$2,730	-$2,730	-$1,059
2035	13	7	$0	$2,730	-$2,730	-$989
2036	14	8	$0	$2,730	-$2,730	-$925
2037	15	9	$0	$2,730	-$2,730	-$864
2038	16	10	$0	$2,730	-$2,730	-$808
2039	17	11	$0	$2,730	-$2,730	-$755
2040	18	12	$0	$2,730	-$2,730	-$705
2041	19	13	$0	$2,730	-$2,730	-$659
2042	20	14	$0	$2,730	-$2,730	-$616
			$0	$38,220	-$38,220	-$13,896

G - Safety

Years of Crash Data	7
Assumed Annual Traffic Growth	2%

Historical Crash Data by Roadway Segment

		Crashes per Group			Avg. Crashes Per Year			Crash Probability			
Crash Group #	Crash Group Description	Fatal Crash	Injury Crash	PDO Crash	Fatal Crash	Injury Crash	PDO Crash	Fatal Crash	Injury Crash	PDO Crash	CMF/Reduction
1	Bicycle Crashes	0	99	35	0.00	14.14	5.00	0	0.74	0.26	0.75
2	Pedestrian Crashes	1	117	17	0.14	16.71	2.43	0.01	0.87	0.13	0.75
							Monetized value ($2020)	$12,837,400	$302,600	$4,600	

Average Monetized Value per Crash (by Crash Group)

Crash Group #	**Monitized Value (2020 $)**
1	$225,120
2	$392,234

			Crashes - No Build		**Crashes - Build**		**No Build - Monetized Value**			**Build - Monetized Value**	
Calendar Year	Project Year	Project Use Year	Crash Group #1	Crash Group #2	Crash Group #1	Crash Group #2	Crash Group #1	Crash Group #2	Total	Crash Group #1	Crash Group #2
2023	1	0	19.14	19.28	19.14	19.28	$4,308,797	$7,562,272	$11,871,068	$4,308,797	$7,562,272
2024	2	0	19.52	19.67	19.52	19.67	$4,394,973	$7,713,517	$12,108,490	$4,394,973	$7,713,517
2025	3	0	19.91	20.06	19.91	20.06	$4,482,872	$7,867,787	$12,350,659	$4,482,872	$7,867,787
2026	4	0	20.31	20.46	20.31	20.46	$4,572,530	$8,025,143	$12,597,673	$4,572,530	$8,025,143
2027	5	0	20.72	20.87	20.72	20.87	$4,663,980	$8,185,646	$12,849,626	$4,663,980	$8,185,646
2028	6	0	21.13	21.29	21.13	21.29	$4,757,260	$8,349,359	$13,106,619	$4,757,260	$8,349,359
2029	7	1	21.55	21.71	16.17	8.14	$4,852,405	$8,516,346	$13,368,751	$3,639,304	$3,193,630
2030	8	2	21.99	22.15	16.49	8.30	$4,949,453	$8,686,673	$13,636,126	$3,712,090	$3,257,502
2031	9	3	22.43	22.59	16.82	8.47	$5,048,442	$8,860,406	$13,908,849	$3,786,332	$3,322,652
2032	10	4	22.87	23.04	17.16	8.64	$5,149,411	$9,037,614	$14,187,026	$3,862,058	$3,389,105
2033	11	5	23.33	23.50	17.50	8.81	$5,252,399	$9,218,367	$14,470,766	$3,939,299	$3,456,888
2034	12	6	23.80	23.97	17.85	8.99	$5,357,447	$9,402,734	$14,760,181	$4,018,085	$3,526,025
2035	13	7	24.27	24.45	18.21	9.17	$5,464,596	$9,590,789	$15,055,385	$4,098,447	$3,596,546
2036	14	8	24.76	24.94	18.57	9.35	$5,573,888	$9,782,605	$15,356,493	$4,180,416	$3,668,477
2037	15	9	25.25	25.44	18.94	9.54	$5,685,366	$9,978,257	$15,663,623	$4,264,024	$3,741,846
2038	16	10	25.76	25.95	19.32	9.73	$5,799,073	$10,177,822	$15,976,895	$4,349,305	$3,816,683
2039	17	11	26.28	26.47	19.71	9.93	$5,915,055	$10,381,378	$16,296,433	$4,436,291	$3,893,017
2040	18	12	26.80	27.00	20.10	10.12	$6,033,356	$10,589,006	$16,622,362	$4,525,017	$3,970,877
2041	19	13	27.34	27.54	20.50	10.33	$6,154,023	$10,800,786	$16,954,809	$4,615,517	$4,050,295
2042	20	14	27.88	28.09	20.91	10.53	$6,277,103	$11,016,802	$17,293,905	$4,707,827	$4,131,301
Total									**$288,435,737**		

Crash Modification Factors

Description	Applicable Crashes	% of Applicable Crashes	Source:
Reduction due to installation of shared use facilities		50% 50%	https://www.cmfclearinghouse.org/results.cfm

	Benefit Adjustment	**Benefit**	
Total	Benefits Realized	Total Benefits	Present Value (7% Discount Rate)
$11,871,068	100%	$0	$0.00
$12,108,490	100%	$0	$0.00
$12,350,659	100%	$0	$0.00
$12,597,673	100%	$0	$0.00
$12,849,626	100%	$0	$0.00
$13,106,619	100%	$0	$0.00
$6,832,934	100%	$6,535,818	$3,555,051.67
$6,969,592	100%	$6,666,534	$3,388,927.76
$7,108,984	100%	$6,799,865	$3,230,566.65
$7,251,164	100%	$6,935,862	$3,079,605.60
$7,396,187	100%	$7,074,579	$2,935,698.79
$7,544,111	100%	$7,216,071	$2,798,516.61
$7,694,993	100%	$7,360,392	$2,667,744.80
$7,848,893	100%	$7,507,600	$2,543,083.83
$8,005,871	100%	$7,657,752	$2,424,248.14
$8,165,988	100%	$7,810,907	$2,310,965.51
$8,329,308	100%	$7,967,125	$2,202,976.47
$8,495,894	100%	$8,126,468	$2,100,033.64
$8,665,812	100%	$8,288,997	$2,001,901.23
$8,839,128	100%	$8,454,777	$1,908,354.44
$184,032,992		**$104,402,745**	**$37,147,675**

Monetized Values per Crash Type

Severity	Monetized value ($2019)	Note
Fatal Crash	$12,837,400	
Injury Crash	$302,600	
PDO Crash	$4,600	per vehicle
USDOT Benefit-Cost Analysis Guidance for Discretionary Grant		
Avg. number of vehicles in PDO	2.05	derived from historical crash data analysis

H - Pedestrian Travel Time

Pedestrian Travel Time Calculation Inputs

No-Build Walking distance	2.90	miles	
Build walking distance	2.30	miles	
Average walking speed	3.20	mph	Source: USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Value of Walking Travel Time	$32.40	per person-hour	Source: USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Purdue student population	49,600	students	Source: https://www.admissions.purdue.edu/academics/enrollment.php
Purdue walking/biking community	5%	of students	Source: https://reports.aashe.org/institutions/indiana-university-purdue-university-indianapolis-in/report/2019-10-31/OP/transportation/OP-16/
Assumed portion traveling N/S on Lafayette	25%		
Weeks per school year	30		
Days per week	7		
College-based walking trips per year	130,200		

		Roundtrip Travel Distance (miles)		Total Travel Time (hours)		Total Travel Time (2020 $)		Benefit	
Calendar Year	Project Year	No Build	Build	No Build	Build	No Build	Build	Total	Present Value (7% Discount Rate)
2023	1	5.80	5.80	235,988	235,988	$7,645,995	$7,645,995	$0	$0
2024	2	5.80	5.80	235,988	235,988	$7,645,995	$7,645,995	$0	$0
2025	3	5.80	5.80	235,988	235,988	$7,645,995	$7,645,995	$0	$0
2026	4	5.80	5.80	235,988	235,988	$7,645,995	$7,645,995	$0	$0
2027	5	5.80	5.80	235,988	235,988	$7,645,995	$7,645,995	$0	$0
2028	6	5.80	5.80	235,988	235,988	$7,645,995	$7,645,995	$0	$0
2029	7	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$860,465
2030	8	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$804,173
2031	9	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$751,564
2032	10	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$702,396
2033	11	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$656,445
2034	12	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$613,500
2035	13	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$573,364
2036	14	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$535,854
2037	15	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$500,799
2038	16	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$468,036
2039	17	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$437,417
2040	18	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$408,801
2041	19	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$382,057
2042	20	5.80	4.60	235,988	187,163	$7,645,995	$6,064,065	$1,581,930	$357,062
Total								$22,147,020	$8,051,932

I - Operating Costs

Operating Cost Calculation Inputs - Vehicles

Congestion Cost of light-duty vehicles (Urban) $0.45 per VMT Source: USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022

Operating Cost Benefits

Calendar Year	Project Year	Annual VMT Converted to Active Modes in the Build Scenario	Operating Cost Cost Benefit	Benefit	
				Total	Present Value (7% Discount Rate)
2023	1	197,555	$0	$0	$0
2024	2	197,555	$0	$0	$0
2025	3	197,555	$0	$0	$0
2026	4	197,555	$0	$0	$0
2027	5	197,555	$0	$0	$0
2028	6	197,555	$0	$0	$0
2029	7	197,555	$88,900	$88,900	$48,356
2030	8	197,555	$88,900	$88,900	$45,192
2031	9	197,555	$88,900	$88,900	$42,236
2032	10	197,555	$88,900	$88,900	$39,473
2033	11	197,555	$88,900	$88,900	$36,890
2034	12	197,555	$88,900	$88,900	$34,477
2035	13	197,555	$88,900	$88,900	$32,221
2036	14	197,555	$88,900	$88,900	$30,113
2037	15	197,555	$88,900	$88,900	$28,143
2038	16	197,555	$88,900	$88,900	$26,302
2039	17	197,555	$88,900	$88,900	$24,582
2040	18	197,555	$88,900	$88,900	$22,973
2041	19	197,555	$88,900	$88,900	$21,470
2042	20	197,555	$88,900	$88,900	$20,066
Total		3,951,108	$1,244,599	$1,244,599	$452,496

J - External Highway Use

Operating Cost Calculation Inputs - Vehicles

Congestion Cost of light-duty vehicles (Urban)	$0.124	per VMT	Source: USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Noise Cost of light-duty vehicles (Urban)	$0.0017	per VMT	Source: USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Pavement costs	$0.18	per VMT	Source: USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022 (Highway Allocation Study, scaled with CPI to 2020 costs)

Operating Cost Benefits

Calendar Year	Project Year	Annual VMT Converted to Active Modes in the Build Scenario	Congestion Cost Benefit	Noise Cost Benefit	Pavement Cost Benefit	Benefit	
						Total	Present Value (7% Discount Rate)
2023	1	197,555	$0	$0	$0	$0	$0
2024	2	197,555	$0	$0	$0	$0	$0
2025	3	197,555	$0	$0	$0	$0	$0
2026	4	197,555	$0	$0	$0	$0	$0
2027	5	197,555	$0	$0	$0	$0	$0
2028	6	197,555	$0	$0	$0	$0	$0
2029	7	197,555	$24,497	$336	$35,560	$60,393	$32,850
2030	8	197,555	$24,497	$336	$35,560	$60,393	$30,701
2031	9	197,555	$24,497	$336	$35,560	$60,393	$28,692
2032	10	197,555	$24,497	$336	$35,560	$60,393	$26,815
2033	11	197,555	$24,497	$336	$35,560	$60,393	$25,061
2034	12	197,555	$24,497	$336	$35,560	$60,393	$23,421
2035	13	197,555	$24,497	$336	$35,560	$60,393	$21,889
2036	14	197,555	$24,497	$336	$35,560	$60,393	$20,457
2037	15	197,555	$24,497	$336	$35,560	$60,393	$19,119
2038	16	197,555	$24,497	$336	$35,560	$60,393	$17,868
2039	17	197,555	$24,497	$336	$35,560	$60,393	$16,699
2040	18	197,555	$24,497	$336	$35,560	$60,393	$15,607
2041	19	197,555	$24,497	$336	$35,560	$60,393	$14,586
2042	20	197,555	$24,497	$336	$35,560	$60,393	$13,631
Total		3,951,108	$342,956	$4,702	$497,840	$845,498	$307,395

K - Environmental

Environmental Calculation Inputs - Purdue University Mode Split

College walking trips per year	130,200	
Assumed passenger vehicle occupancy	1.67	Source: USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Driving round-trip length	2.4	miles
Average driving speed	35	mph
Grams to Metric Tons	1,000,000	1 metric ton is equal to 1,000,000 grams

Environmental Calculation Inputs - Other Trail Users

Comparable Riverwalks

	Length (miles)	Annual Visitors	Annual Visitors per Mile
Katy Trail	240	400,000	1,667
Great Allegheny	150	1,000,000	6,667
Weighted Average (Visitors Per Mile)			3590

Wabash Trail Length	9.2	miles
Estimated Wabash Trail Visitors (Annually)	33,026	
Proportion of Commuter Pedestrians	0.22	https://safety.fhwa.dot.gov/ped_bike/docs/case1.pdf
Proportion of Recreational Pedestrians	0.78	https://safety.fhwa.dot.gov/ped_bike/docs/case1.pdf
Estimated Wabash Trail Commuters (Annually)	7,266	

Emissions Savings - Purdue University Mode Shift

		VMT Savings (Car)		Emissions Saved (Metric Tons)												Damage Costs for Emissions per metric ton					
				Car						Truck											
				2	3	4	6	7	8	2	3	4	6	7	8	7	6	2	4	3	5
Calendar Year	Project Year	Car	Truck	CO	CO2	NOX	PM2.5	SOX	VOC	CO	CO2	NOX	PM2.5	SOX	VOC	CO	CO2	NOX	PM2.5	SOX	VOC
2023	1	187,114	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$101	$54	$16,000	$774,700	$43,100	$1,415
2024	2	187,114	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$103	$55	$16,200	$788,100	$44,000	$1,415
2025	3	187,114	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$105	$56	$16,500	$801,700	$44,900	$1,415
2026	4	187,114	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$107	$57	$16,800	$814,500	$45,700	$1,415
2027	5	187,114	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$109	$58	$17,100	$827,400	$46,500	$1,415
2028	6	187,114	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$113	$60	$17,400	$840,600	$47,300	$1,415
2029	7	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$114	$61	$17,700	$854,000	$48,200	$1,415
2030	8	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$116	$62	$18,100	$867,600	$49,100	$1,415
2031	9	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$118	$63	$18,100	$867,600	$49,100	$1,415
2032	10	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$120	$64	$18,100	$867,600	$49,100	$1,415
2033	11	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$122	$65	$18,100	$867,600	$49,100	$1,415
2034	12	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$124	$66	$18,100	$867,600	$49,100	$1,415
2035	13	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$126	$67	$18,100	$867,600	$49,100	$1,415
2036	14	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$129	$69	$18,100	$867,600	$49,100	$1,415
2037	15	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$131	$70	$18,100	$867,600	$49,100	$1,415
2038	16	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$133	$71	$18,100	$867,600	$49,100	$1,415
2039	17	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$135	$72	$18,100	$867,600	$49,100	$1,415
2040	18	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$137	$73	$18,100	$867,600	$49,100	$1,415
2041	19	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$139	$74	$18,100	$867,600	$49,100	$1,415
2042	20	187,114	0	0.2	54.0	0.0	0.0	0.0	0.0	0.1	180.0	0.2	0.0	0.0	0.0	$141	$75	$18,100	$867,600	$49,100	$1,415
Total																					

Emissions Savings - Other Trail Users

		VMT Savings		Emissions Saved (Metric Tons)												Damage Costs for Emissions per metric ton					
				Car						Truck											
				2	3	4	6	7	8	2	3	4	6	7	8	7	6	2	4	3	5
Calendar Year	Project Year	Car	Truck	CO	CO2	NOX	PM2.5	SOX	VOC	CO	CO2	NOX	PM2.5	SOX	VOC	CO	CO2	NOX	PM2.5	SOX	VOC
2023	1	10,442	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$101	$54	$16,000	$774,700	$43,100	$1,415
2024	2	10,442	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$103	$55	$16,200	$788,100	$44,000	$1,415
2025	3	10,442	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$105	$56	$16,500	$801,700	$44,900	$1,415
2026	4	10,442	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$107	$57	$16,800	$814,500	$45,700	$1,415
2027	5	10,442	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$109	$58	$17,100	$827,400	$46,500	$1,415
2028	6	10,442	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	$113	$60	$17,400	$840,600	$47,300	$1,415
2029	7	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$114	$61	$17,700	$854,000	$48,200	$1,415
2030	8	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$116	$62	$18,100	$867,600	$49,100	$1,415
2031	9	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$118	$63	$18,100	$867,600	$49,100	$1,415
2032	10	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$120	$64	$18,100	$867,600	$49,100	$1,415
2033	11	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$122	$65	$18,100	$867,600	$49,100	$1,415
2034	12	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$124	$66	$18,100	$867,600	$49,100	$1,415
2035	13	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$126	$67	$18,100	$867,600	$49,100	$1,415
2036	14	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$129	$69	$18,100	$867,600	$49,100	$1,415
2037	15	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$131	$70	$18,100	$867,600	$49,100	$1,415
2038	16	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$133	$71	$18,100	$867,600	$49,100	$1,415
2039	17	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$135	$72	$18,100	$867,600	$49,100	$1,415
2040	18	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$137	$73	$18,100	$867,600	$49,100	$1,415
2041	19	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$139	$74	$18,100	$867,600	$49,100	$1,415
2042	20	10,442	0	0.0	3.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	$141	$75	$18,100	$867,600	$49,100	$1,415
Total																					

Build Savings		Total Environmental Benefit - Purdue University Mode Shift		
Total Non CO2 Savings	Total cO2 Savings	Total	Present Value (3% Discount Rate)*	Present Value (7% Discount Rate)*
$0	$0	$0	$0	$0
$0	$0	$0	$0	$0
$0	$0	$0	$0	$0
$0	$0	$0	$0	$0
$0	$0	$0	$0	$0
$0	$0	$0	$0	$0
$6,682	$14,273	$20,955	$10,939	$3,634
$6,817	$14,507	$21,324	$10,794	$3,466
$6,818	$14,741	$21,559	$10,649	$3,239
$6,819	$14,975	$21,793	$10,503	$3,028
$6,819	$15,209	$22,028	$10,356	$2,830
$6,820	$15,443	$22,262	$10,209	$2,645
$6,820	$15,677	$22,497	$10,062	$2,472
$6,821	$16,145	$22,966	$10,061	$2,311
$6,822	$16,379	$23,201	$9,909	$2,160
$6,822	$16,613	$23,435	$9,758	$2,019
$6,823	$16,847	$23,670	$9,607	$1,887
$6,824	$17,081	$23,904	$9,457	$1,763
$6,824	$17,315	$24,139	$9,307	$1,648
$6,825	$17,549	$24,373	$9,158	$1,540
$95,356	**$222,750**	**$318,107**	**$140,773**	**$34,641**

Total Environmental Benefit		
Total	Present Value (3% Discount Rate)*	Present Value (7% Discount Rate)*
$0	$0	$0
$0	$0	$0
$0	$0	$0
$0	$0	$0
$0	$0	$0
$0	$0	$0
$22,124	$11,549	$3,837
$22,514	$11,397	$3,659
$22,762	$11,243	$3,420
$23,010	$11,089	$3,196
$23,257	$10,934	$2,988
$23,505	$10,779	$2,792
$23,752	$10,624	$2,610
$24,248	$10,622	$2,440
$24,495	$10,462	$2,280
$24,743	$10,303	$2,131
$24,991	$10,144	$1,992
$25,238	$9,985	$1,862
$25,486	$9,827	$1,740
$25,733	$9,670	$1,626
$335,858	**$148,628**	**$36,574**

Build Savings		Total Environmental Benefit - Other Trail Users		
Total Non CO2 Savings	Total cO2 Savings	Total	Present Value (3% Discount Rate)*	Present Value (7% Discount Rate)*
$0	$0	$0	$0	$0
$0	$0	$0	$0	$0
$0	$0	$0	$0	$0
$0	$0	$0	$0	$0
$0	$0	$0	$0	$0
$0	$0	$0	$0	$0
$373	$796	$1,169	$610	$203
$380	$810	$1,190	$602	$193
$380	$823	$1,203	$594	$181
$381	$836	$1,216	$586	$169
$381	$849	$1,229	$578	$158
$381	$862	$1,242	$570	$148
$381	$875	$1,255	$562	$138
$381	$901	$1,282	$561	$129
$381	$914	$1,295	$553	$121
$381	$927	$1,308	$545	$113
$381	$940	$1,321	$536	$105
$381	$953	$1,334	$528	$98
$381	$966	$1,347	$519	$92
$381	$979	$1,360	$511	$86
$5,321	**$12,430**	**$17,752**	**$7,856**	**$1,933**

Damage Costs for Emissions per metric ton*

	2	3	4	5	6	7
Year	NOX	SO2	PM2.5	VOCs	CO2	CO
2021	$15,600	$41,500	$748,600	$1,415	$52	$98
2022	$15,800	$42,300	$761,600	$1,415	$53	$99
2023	$16,000	$43,100	$774,700	$1,415	$54	$101
2024	$16,200	$44,000	$788,100	$1,415	$55	$103
2025	$16,500	$44,900	$801,700	$1,415	$56	$105
2026	$16,800	$45,700	$814,500	$1,415	$57	$107
2027	$17,100	$46,500	$827,400	$1,415	$58	$109
2028	$17,400	$47,300	$840,600	$1,415	$60	$113
2029	$17,700	$48,200	$854,000	$1,415	$61	$114
2030	$18,100	$49,100	$867,600	$1,415	$62	$116
2031	$18,100	$49,100	$867,600	$1,415	$63	$118
2032	$18,100	$49,100	$867,600	$1,415	$64	$120
2033	$18,100	$49,100	$867,600	$1,415	$65	$122
2034	$18,100	$49,100	$867,600	$1,415	$66	$124
2035	$18,100	$49,100	$867,600	$1,415	$67	$126
2036	$18,100	$49,100	$867,600	$1,415	$69	$129
2037	$18,100	$49,100	$867,600	$1,415	$70	$131
2038	$18,100	$49,100	$867,600	$1,415	$71	$133
2039	$18,100	$49,100	$867,600	$1,415	$72	$135
2040	$18,100	$49,100	$867,600	$1,415	$73	$137
2041	$18,100	$49,100	$867,600	$1,415	$74	$139
2042	$18,100	$49,100	$867,600	$1,415	$75	$141
2043	$18,100	$49,100	$867,600	$1,415	$77	$144
2044	$18,100	$49,100	$867,600	$1,415	$78	$146
2045	$18,100	$49,100	$867,600	$1,415	$79	$148
2046	$18,100	$49,100	$867,600	$1,415	$80	$150
2047	$18,100	$49,100	$867,600	$1,415	$81	$152
2048	$18,100	$49,100	$867,600	$1,415	$82	$154
2049	$18,100	$49,100	$867,600	$1,415	$83	$156

L - Pedestrian

Pedestrian Calculation Inputs

Input		Unit	Source
Mortality Reduction Benefit (Ages 20-74)	$7.08	per induced trip (2020 $)	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
% of population aged 20-74	68%		USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Revealed Preference Benefit for Expanded Sidewalk	$0.10	per foot of added width per person-mile walked	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Project Length	9.1	miles	
Width of Shared-Use Path	12.0	feet	
Weekdays in a Year	261		
Weekend Days in a Year	104		
Revealed Preference Benefit	$1.03	per project user	
% Tippecanoe County population that walks to work	6.0%		https://censusreporter.org/profiles/05000US18157-tippecanoe-county-in/
% Tippecanoe County population of working age (18-64)	68%		https://censusreporter.org/profiles/05000US18157-tippecanoe-county-in/
Average Annual Trail Visitors	3,590	people per square mile	WABASH Economic Benefits Draft
Average walking trip length	0.86	miles	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Area of induced walking trips	7.826	square miles	
Project area working population	19,105	people	
Tippecanoe County Population (2010)	172,780	people	https://www.census.gov/quickfacts/tippecanoecountyindiana
Tippecanoe County Population (2020)	186,251	people	https://www.census.gov/quickfacts/tippecanoecountyindiana
Annual Growth	0.78%	per year	
% population future walk to work	7.7%		https://safety.fhwa.dot.gov/ped_bike/docs/case1.pdf
Proportion of Commuter Pedestrians	0.22		https://safety.fhwa.dot.gov/ped_bike/docs/case1.pdf
Proportion of Recreational Pedestrians	0.78		https://safety.fhwa.dot.gov/ped_bike/docs/case1.pdf

Pedestrian Network Improvement Benefits

			No-Build		Build		Difference		Benefits				
Calendar Year	Project Year	Project Area Working Population	Number of Commuter Pedestrians	Number of Recreational Pedestrians	Number of Commuter Pedestrians	Number of Recreational Pedestrians	**New Commuter Pedestrians**	New Recreational Pedestrians	Mortality Reduction Benefit	Revealed Preference Benefit	Benefits Realized	Total Pedestrian Benefits	Present Value (7% Discount Rate)
2023	1	19,105	1,146.29	4,064.12	1,146.29	4,064.12	0.00	0.00	$0	$0	100%	$0	$0
2024	2	19,254	1,155.23	4,095.81	1,155.23	4,095.81	0.00	0.00	$0	$0	100%	$0	$0
2025	3	19,404	1,164.23	4,127.74	1,164.23	4,127.74	0.00	0.00	$0	$0	100%	$0	$0
2026	4	19,555	1,173.31	4,159.92	1,173.31	4,159.92	0.00	0.00	$0	$0	100%	$0	$0
2027	5	19,708	1,182.46	4,192.35	1,182.46	4,192.35	0.00	0.00	$0	$0	100%	$0	$0
2028	6	19,861	1,191.68	4,225.04	1,191.68	4,225.04	0.00	0.00	$0	$0	100%	$0	$0
2029	7	20,016	1,200.97	4,257.98	1,546.31	5,482.38	345.34	1,224.40	$1,046,997	$224,431	100%	$1,271,428	$691,573
2030	8	20,172	1,210.33	4,291.18	1,558.37	5,525.12	348.04	1,233.94	$1,055,160	$226,181	100%	$1,281,341	$651,369
2031	9	20,329	1,219.77	4,324.64	1,570.52	5,568.20	350.75	1,243.56	$1,063,387	$227,944	100%	$1,291,331	$613,502
2032	10	20,488	1,229.28	4,358.35	1,582.76	5,611.61	353.48	1,253.26	$1,071,677	$229,721	100%	$1,301,399	$577,837
2033	11	20,648	1,238.86	4,392.33	1,595.10	5,655.37	356.24	1,263.03	$1,080,033	$231,513	100%	$1,311,545	$544,245
2034	12	20,809	1,248.52	4,426.58	1,607.54	5,699.46	359.02	1,272.88	$1,088,454	$233,318	100%	$1,321,771	$512,606
2035	13	20,971	1,258.26	4,461.09	1,620.07	5,743.89	361.82	1,282.80	$1,096,940	$235,137	100%	$1,332,076	$482,806
2036	14	21,134	1,268.07	4,495.87	1,632.70	5,788.68	364.64	1,292.80	$1,105,492	$236,970	100%	$1,342,462	$454,738
2037	15	21,299	1,277.95	4,530.93	1,645.43	5,833.81	367.48	1,302.88	$1,114,111	$238,817	100%	$1,352,929	$428,303
2038	16	21,465	1,287.92	4,566.25	1,658.26	5,879.29	370.35	1,313.04	$1,122,798	$240,679	100%	$1,363,477	$403,404
2039	17	21,633	1,297.96	4,601.85	1,671.19	5,925.13	373.23	1,323.28	$1,131,552	$242,556	100%	$1,374,108	$379,952
2040	18	21,801	1,308.08	4,637.73	1,684.22	5,971.33	376.14	1,333.60	$1,140,374	$244,447	100%	$1,384,821	$357,864
2041	19	21,971	1,318.28	4,673.89	1,697.35	6,017.88	379.08	1,343.99	$1,149,265	$246,353	100%	$1,395,618	$337,060
2042	20	22,143	1,328.55	4,710.33	1,710.59	6,064.80	382.03	1,354.47	$1,158,225	$248,274	100%	$1,406,499	$317,465
Total							5,088	18,038	$15,424,464	$3,306,341		$18,730,805	$6,752,722

M - Bicycle

Bicycle Calculation Inputs

Input		Unit	Source
Mortality Reduction Benefit (Ages 20-64)	$6.31	per induced trip (2020 $)	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
% of population aged 20-64	59%		USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Revealed Preference Benefit	$1.78	per cycling mile	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Project Length	9.1	miles	
Weekdays in a Year	261		
Weekend Days in a Year	104		
% Tippecanoe County population that bikes to work	1.0%		https://censusreporter.org/profiles/05000US18157-tippecanoe-county-in/
% Tippecanoe County population of working age (18-64)	68%		https://censusreporter.org/profiles/05000US18157-tippecanoe-county-in/
Average population density of project-adjacent neighborhoods	3,590	people per square mile	https://www.newborhood.com/moving-guide/population_density/VA/henrico
Length of bike trip	2.40	miles	Project Info
Average Bicyle Trip Length	2.38	miles	USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs 2022
Area of induced bicycle trips	21.658	square miles	
Project area working population	52,872	people	
Tippecanoe County Population (2010)	172,780	people	https://www.census.gov/quickfacts/tippecanoecountyindiana
Tippecanoe County Population (2020)	186,251	people	https://www.census.gov/quickfacts/tippecanoecountyindiana
Annual Growth	0.78%	per year	
% population future bike to work	1.5%		https://usa.streetsblog.org/2015/03/04/survey-100-million-americans-bike-each-year-but-few-make-it-a-habit/
Proportion of Commuter Cyclists	0.83		https://www.forbes.com/sites/michelinemaynard/2013/08/27/whos-out-there-on-the-roads-the-4-types-of-cyclists/?sh=1bc6d6807c55
Proportion of Recreational Cyclists	0.17		https://www.forbes.com/sites/michelinemaynard/2013/08/27/whos-out-there-on-the-roads-the-4-types-of-cyclists/?sh=1bc6d6807c55

Bicycle Network Improvement Benefits

			No-Build		Build		Difference		**Benefits**				
Calendar Year	Project Year	Project Area Working Population	Number of Commuter Cyclists	Number of Recreational Cyclists	Number of Commuter Cyclists	Number of Recreational Cyclists	**New Commuter Cyclists**	New Recreational Cyclists	Mortality Reduction Benefit	Revealed Preference Benefit	Benefits Realized	Total Bicycle Benefits	Present Value (7% Discount Rate)
2023	1	52,872	528.72	108.29	528.72	108.29	0.00	0.00	$0	$0	100%	$0	$0
2024	2	53,284	532.84	109.14	532.84	109.14	0.00	0.00	$0	$0	100%	$0	$0
2025	3	53,699	536.99	109.99	536.99	109.99	0.00	0.00	$0	$0	100%	$0	$0
2026	4	54,118	541.18	110.84	541.18	110.84	0.00	0.00	$0	$0	100%	$0	$0
2027	5	54,540	545.40	111.71	545.40	111.71	0.00	0.00	$0	$0	100%	$0	$0
2028	6	54,965	549.65	112.58	549.65	112.58	0.00	0.00	$0	$0	100%	$0	$0
2029	7	55,394	553.94	113.46	830.90	170.18	276.97	56.73	$291,087	$334,020	100%	$625,108	$340,017
2030	8	55,825	558.25	114.34	837.38	171.51	279.13	57.17	$293,357	$336,625	100%	$629,981	$320,251
2031	9	56,261	562.61	115.23	843.91	172.85	281.30	57.62	$295,644	$339,249	100%	$634,893	$301,633
2032	10	56,699	566.99	116.13	850.49	174.20	283.50	58.07	$297,949	$341,894	100%	$639,843	$284,098
2033	11	57,141	571.41	117.04	857.12	175.55	285.71	58.52	$300,272	$344,560	100%	$644,832	$267,582
2034	12	57,587	575.87	117.95	863.80	176.92	287.93	58.97	$302,613	$347,246	100%	$649,859	$252,027
2035	13	58,036	580.36	118.87	870.54	178.30	290.18	59.43	$304,972	$349,954	100%	$654,926	$237,375
2036	14	58,488	584.88	119.80	877.33	179.69	292.44	59.90	$307,350	$352,682	100%	$660,032	$223,576
2037	15	58,944	589.44	120.73	884.17	181.09	294.72	60.36	$309,746	$355,432	100%	$665,178	$210,578
2038	16	59,404	594.04	121.67	891.06	182.51	297.02	60.84	$312,161	$358,203	100%	$670,364	$198,337
2039	17	59,867	598.67	122.62	898.01	183.93	299.34	61.31	$314,595	$360,996	100%	$675,591	$186,807
2040	18	60,334	603.34	123.58	905.01	185.36	301.67	61.79	$317,048	$363,810	100%	$680,858	$175,947
2041	19	60,804	608.04	124.54	912.06	186.81	304.02	62.27	$319,520	$366,647	100%	$686,167	$165,718
2042	20	61,278	612.78	125.51	919.17	188.26	306.39	62.75	$322,011	$369,505	100%	$691,516	$156,084
Total							4,080	836	$4,288,327	$4,920,823		$9,209,150	$3,320,030

Tippecanoe County estimated property value	$	283,859	Source: Tippecanoe County Assesor's Sales and Records
Portion of claimed benefit		2.0%	
Trail opening year		2029	

				Total Benefit	
Calendar Year	Project Year	Benefit	% Benefits Realized	Adjusted Benefit	Present Value (7% Discount Rate)
2023	1	$0	0%	$0	$0
2024	2	$0	0%	$0	$0
2025	3	$0	0%	$0	$0
2026	4	$0	0%	$0	$0
2027	5	$0	0%	$0	$0
2028	6	$0	0%	$0	$0
2029	7	$406	100%	$437	$238
2030	8	$406	100%	$437	$222
2031	9	$406	100%	$437	$207
2032	10	$406	100%	$437	$194
2033	11	$406	100%	$437	$181
2034	12	$406	100%	$437	$169
2035	13	$406	100%	$437	$158
2036	14	$406	100%	$437	$148
2037	15	$406	100%	$437	$138
2038	16	$406	100%	$437	$129
2039	17	$406	100%	$437	$121
2040	18	$406	100%	$437	$113
2041	19	$406	100%	$437	$105
2042	20	$406	100%	$437	$99
		$5,677		$6,114	$2,223

O - Tourism Spending

Tourism Spending Calculation Inputs

Comparable Riverwalks

	Length (miles)	Annual Visitors	Annual Visitors per Mile
Katy Trail	240	400,000	1,667
Great Allegheny	150	1,000,000	6,667
Weighted Average (Visitors Per Mile)			3590

Wabash Trail Length	9.2	miles
Estimated Wabash Trail Visitors (Annually)	33,026	
Katy Trail Non-local visitor spending (Annually)	$355	per trail user
Katy edian household income	$61,000	
Wabash median household income	$53,000	
Wabash Trail non-local visitos spending (annually)	$308	per trail user
Assumed portion of Wasbash trail users that are non-local	40%	

Operating Cost Benefits

Calendar Year	Project Year	Annual Non-Local Trail Users (Tourists)	Annual Non-Local Tourism Spending (2020 $)	Tourism Spending Benefit	
				Total	Present Value (7% Discount Rate)
2023	1	13,210	$0	$0	$0
2024	2	13,210	$0	$0	$0
2025	3	13,210	$0	$0	$0
2026	4	13,210	$0	$0	$0
2027	5	13,210	$0	$0	$0
2028	6	13,210	$0	$0	$0
2029	7	13,210	$4,074,606	$4,074,606	$2,216,316
2030	8	13,210	$4,074,606	$4,074,606	$2,071,323
2031	9	13,210	$4,074,606	$4,074,606	$1,935,816
2032	10	13,210	$4,074,606	$4,074,606	$1,809,174
2033	11	13,210	$4,074,606	$4,074,606	$1,690,817
2034	12	13,210	$4,074,606	$4,074,606	$1,580,203
2035	13	13,210	$4,074,606	$4,074,606	$1,476,825
2036	14	13,210	$4,074,606	$4,074,606	$1,380,210
2037	15	13,210	$4,074,606	$4,074,606	$1,289,916
2038	16	13,210	$4,074,606	$4,074,606	$1,205,529
2039	17	13,210	$4,074,606	$4,074,606	$1,126,663
2040	18	13,210	$4,074,606	$4,074,606	$1,052,956
2041	19	13,210	$4,074,606	$4,074,606	$984,071
2042	20	13,210	$4,074,606	$4,074,606	$919,692
Total		264,205	$57,044,486	$57,044,486	$20,739,509

P - State Park Revenue

Tourism Spending Calculation Inputs

Comparable Riverwalks

	Length (miles)	Annual Visitors	Annual Visitors per Mile
Katy Trail	240	400,000	1,667
Great Allegheny	150	1,000,000	6,667
Weighted Average (Visitors Per Mile)			3590

Wabash Trail Length	9.2	miles
Estimated Wabash Trail Visitors (Annually)	33,026	
Indiana State Parks spend rate	$31.68	per trail user
Assumed portion of Wasbash trail users that will visit state park	50%	

Operating Cost Benefits

Calendar Year	Project Year	Annual State Park Visitors from Wabash	Annual State Park Spending (2020 $)	State Park Revenue Benefit	
				Total	Present Value (7% Discount
2023	1	16,513	$0	$0	$0
2024	2	16,513	$0	$0	$0
2025	3	16,513	$0	$0	$0
2026	4	16,513	$0	$0	$0
2027	5	16,513	$0	$0	$0
2028	6	16,513	$0	$0	$0
2029	7	16,513	$523,126	$523,126	$284,546
2030	8	16,513	$523,126	$523,126	$265,931
2031	9	16,513	$523,126	$523,126	$248,533
2032	10	16,513	$523,126	$523,126	$232,274
2033	11	16,513	$523,126	$523,126	$217,079
2034	12	16,513	$523,126	$523,126	$202,877
2035	13	16,513	$523,126	$523,126	$189,605
2036	14	16,513	$523,126	$523,126	$177,201
2037	15	16,513	$523,126	$523,126	$165,608
2038	16	16,513	$523,126	$523,126	$154,774
2039	17	16,513	$523,126	$523,126	$144,649
2040	18	16,513	$523,126	$523,126	$135,186
2041	19	16,513	$523,126	$523,126	$126,342
2042	20	16,513	$523,126	$523,126	$118,076
Total		330,256	$7,323,766	$7,323,766	$2,662,682