An Economic Impact Analysis of Eighteen Blueprint Projects and Three Traffic Flow Analyses – Final Report

Prepared for: The Blueprint Intergovernmental Agency (BIA)

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Executive Summary

The Blueprint Intergovernmental Agency (BIA) was created by the Leon County Government and the City of Tallahassee, to govern the project management structure for the project planning and construction of the Blueprint 2000 and 2020 projects.[1] The Blueprint program has provided strategic investments in infrastructure that often lead to new growth opportunities. The Blueprint 2020 program, which is also referred as the 2020 Penny Sales Tax Extension Projects, is the second phase of the Blueprint Plan.[2] There are several components of the Blueprint Plan that link together and focus on numerous aspects and benefits to the community. As stated in the report "Blueprint 2000 and Beyond", a key to solving our local challenges is "first to view economic, environmental, and social values as complementary and interdependent. Then we can begin to design long-range solutions that have "synergy" – multiple benefits to our community that become greater than their sum." [3]

In 2022, the BIA commissioned the Florida State University Center for Economic Forecasting and Analysis (FSU CEFA) to conduct an economic impact analysis of 18 Blueprint 2020 construction projects in order to provide the economic impacts of those 18 projects in the market area. This report also includes an analysis of the economic impact of the traffic flow of three of those projects.

The FSU CEFA research team worked with the BIA team relating to the data collection effort. Data provided from previous traffic flow engineering studies comprised the lion's share of the data for each of the three projects. The construction cost, or input data for the economic impact analysis of the 18 projects were then categorized into primarily construction types of activities. Economic models were developed (using the input data) for each individual construction project activity, and generated the following economic impact results.

As shown in Table ES1, the projects generated total economic impacts of:

- 5,865 jobs;
- Over $310 million in income (wages);
- Over $992 million in total economic output (sales/revenues), and;
- State and local annual taxes generated are $8,221,350.

[1] http://blueprint2000.org/about-blueprint/history/
[2] http://www.leonpenny.org/
[3] http://blueprint2000.org/DocSearch/download_store/Performance%20Report%20final.pdf

Table ES1. The Direct, Indirect, and Induced Economic Output, Jobs Created, and Income Generated Based on the Construction Activities Relating to the Eighteen BIA Projects

Grand Total Economic Measure	Economic Output (Sales/Revenues)	Employment or Jobs	Income or Wages
Airport Gateway	$125,586,297	723	$38,609,964
NW Connector Tharpe St.	$107,162,851	628	$33,418,334
NE Corridor Connector Bannerman Rd.	$119,533,037	727	$38,423,896
NE Gateway Welaunee Blvd.	$146,753,722	855	$45,569,299
Capital Circle SW	$220,743,280	1,325	$70,159,392
Capital Cascades Trail-Segment 4	$34,779,917	230	$11,899,671
Orange Ave./Meridian Placemaking	$13,125,410	62	$3,631,096
Market District Placemaking	$19,152,602	126	$6,552,910
Lake Lafayette & St Marks Regional Park	$35,543,309	234	$12,160,860
Monroe-Adams Corridor Placemaking	$14,573,441	83	$4,036,104
Midtown Placemaking	$48,605,705	275	$13,461,317
Fairgrounds Beautification & Improvement	$19,813,481	109	$5,331,466
Northeast Park	$20,867,950	137	$7,139,804
College Ave Placemaking	$14,100,375	83	$4,397,149
Florida A&M Entry Points	$3,265,383	18	$843,850
Alternative Sewer Solutions	$4,838,892	40	$2,474,629
Tall. Leon County Animal Service Center	$6,131,879	32	$1,536,675
Magnolia Drive Trail	$37,662,174	178	$10,419,102
Grand Total	**$992,239,705**	**5,865**	**$310,065,518**

Economic Findings of the Three Traffic Flow Analyses by Project

The team was tasked with estimating the economic benefit to commuters of three Blueprint projects: Airport Gateway, Bannerman Road – NE connector, and Capital Circle SW. Table ES2 presents the maximum and minimum predicted annual economic benefits to all commuters for each route or segment under consideration and for each year for which the team has data. While each project is unique and requires unique assumptions, in general, this analysis involved several steps. The team used information from engineering reports to determine the nature of the construction proposed for each project. This allowed the team to determine how each project would affect average commute times. Due to uncertainty in this measure, the team estimated a range of differences in commute times based on different assumptions about average speeds and average wait times at traffic signals. Next, the team used data on the median wage in the Tallahassee area and the average cost per mile of operating a vehicle to determine how much commuters would benefit from reduce commuting times. Finally, the team used information from engineering reports to determine how many commuters would be affected by the commuters to calculate the total annual benefit to all Tallahassee commuters for each project.

Table ES2 shows the minimum and maximum benefits predicted for each route or segment under consideration in each project. The engineering reports used in each project chose different years for which to estimate traffic volumes. Therefore, the minimum and maximum benefits of each project are reported for different years in Table ES2. Nevertheless, it is possible to compare the annual minimum and maximum benefits of each project. Due primarily to the number of commuters expected to be affected, the Airport Gateway project is expected to have the greatest benefit to commuters, while Bannerman Road is expected to have the smallest benefit to commuters, although the benefit of Bannerman Road is still expected to be substantial.

Table ES2. Summary of the Minimum and Maximum Total Predicted Annual Benefits to Commuters from the Results of the Three Traffic Analyses

Min.and Max. Total Predicted Annual Benefits from the Results of the Three Traffic Analyses			
Airport Gateway			
Segment/Route	**Year**	**Minimum**	**Maximum**
Route 1 (Stuckey Avenue/Segment C)	2025	$495,399.91	$765,148.88
	2045	$425,393.28	$657,023.10
Route 2 (Pottsdamer Bypass)	2025	$603,054.44	$724,719.61
	2045	$517,834.78	$622,307.03
Bannerman Road			
Segment/Route	**Year**	**Minimum**	**Maximum**
Segment 1 (Meridian/Preservation)	2025	$16,590.26	$38,653.15
	2035	$20,079.30	$46,782.15
	2045	$24,261.52	$56,526.19
Segment 2 (Preservation/Tekesta)	2025	$33,727.64	$84,574.97
	2035	$41,564.77	$104,227.25
	2045	$51,256.21	$128,529.39
Capital Circle SW			
Segment/Route	**Year**	**Minimum**	**Maximum**
Segment 1 (Tennessee/Blountstown)	2035	$66,583.73	$215,705.04
Segment 2 (Blountstown/Orange)	2035	$49,017.25	$152,315.26
Segment 3 (Orange/Airport)	2035	$28,523.23	$93,100.20
Segment 4 (Airport/Springhill)	2035	$30,257.59	$96,476.57
Segment 5 (Springhill/Crawfordville)	2035	$33,553.81	$111,026.12

Introduction

The Blueprint Intergovernmental Agency (BIA) was created by the Leon County Government and the City of Tallahassee, Florida, to govern the project management structure for the project planning and the construction of the Blueprint 2000 and 2020 projects. The Blueprint projects aim to provide great strategic investments in infrastructure that often lead to new growth opportunities to benefit communities in the Leon County market[4] area. By improving and expanding local roads, reducing traffic congestion, building new sidewalks to local schools, commercial areas and recreational amenities, reducing neighborhood flooding, and expanding green spaces, parks and natural areas, Blueprint projects create and promote jobs. The areas of Blueprint 2020 projects include "Connectivity", "Getaways", "Community Enhancement", "Regional Mobility", and "Quality of Life". BIA's founding principle is holistic planning, an approach where economic, environmental, and social values are complimentary and interdependent. As stated in the report of "Blueprint 2000 and Beyond", a key to solving our local challenges is first to view economic, environmental, and social values as complementary and interdependent. Then we can begin to design long-range solutions that have "synergy" – multiple benefits to our community that become greater than their sum." In 2022, the BIA commissioned the Florida State University Center for Economic Forecasting and Analysis (FSU CEFA) to conduct a traffic flow analysis and an economic impact analysis of 18 Blueprint projects in order to provide the estimates of the individual and overall economic impacts in the Leon County market area.

The three traffic flow economic analyses included:

1. Airport Gateway: New 1 mile roadway and addition of over 12 miles of new trails and bike/ped facilities.
1. NE Connector - Bannerman Road: Adding two new vehicle lanes to 2.6 miles of corridor. New 10' trails added 4 miles along corridor.
2. Capital Circle SW: Adding four new vehicle lanes to 5.6 miles of corridor. New bike lanes, sidewalk, and 10' trails added 5.6 miles along corridor.

[4] The market area is defined as Leon, Jefferson, Gadsden, and Wakulla Counties (the Metropolitan Statistical Area, or MSA).

Blueprint Projects Summaries for Economic Impact Analysis

The 18 BIA project descriptions are summarized on the following pages[5].

Capital Circle SW

The Capital Circle Southwest project is the final segment of Capital Circle's total 16.5 miles of improvements, and it will widen the road to six lanes. The project will also include bike lanes, a multi-use trail, and sidewalks and will run from West Orange Avenue to Crawfordville Road. The project further targets stormwater improvements, water quality enhancements, and land acquisition for the Capital Circle Southwest Greenway. Currently, the project is managed along with the Florida Department of Transportation. As of June 2022, the Department will advertise construction services in the summer of 2022 for the Orange Avenue to Springhill Road segment, with construction for the Crawfordville to Springhill Road segment scheduled in FY 2029.

Capital Cascades Trail – Segment 4

The 1.7-mile Capital Cascades Trail Segment 4 project is the final part of the Capital Cascades Trail plan that includes greater connectivity, water quality, recreational enhancements, and stormwater treatment. The fourth stretch will link nearby areas to the Capital Cascades Trail and the St. Marks Trail, improving mobility for Southside residents. Blueprint is pursuing a leveraging opportunity with the City of Tallahassee to construct new connections between neighborhoods, the St Marks Trail, and the fourth segment. Community participation, technical research of water quality treatment options, and the development of stormwater models and concept plans are the project's next steps.

Airport Gateway

The Airport Gateway, a project connecting the Tallahassee International Airport and Downtown Tallahassee, is one of Blueprint's most significant investments, with construction set to begin in 2023. The project will improve seven miles of roads, build over 12 miles of additional walkways, trails, and bicycle lanes, and improve safety in the surrounding neighborhoods of the Southside. The Airport Gateway will also aid the growth of the area's high-tech sector by providing improved transit connectivity.

[5] Summarized from the following BIA project sheets: https://blueprintia.org/current-projects/

Magnolia Drive Trail

The Magnolia Drive Trail project, divided into five phases, targets increased connectivity between South Adams and Apalachee Parkway and utility improvements in the area.

Northwest Connector: Tharpe Street

The Northwest Connector Tharpe Street project provides funding to improve the Tharpe Street corridor between Ocala Road and Capital Circle Northwest. Additional planned improvements include increased connectivity and mobility by adding trails and sidewalks in northwest Leon County.

Northeast Connector: Bannerman Road

The Northeast Connector Bannerman Road project seeks to improve Bannerman Road by adding medians, widening the road to four lanes from Quail Common Drive to Preservation Road, and creating facilities to accommodate walking and biking. The project also includes the construction of two neighborhood sidewalk networks and the Orchard Pond Trail Extension and Meridian Greenways.

Northeast Gateway: Welaunee Blvd

The Northeast Gateway Welaunee Boulevard project, which leverages a Florida Department of Transportation State Infrastructure Bank loan, seeks to improve regional mobility and connectivity. These goals will be achieved through creating a new eight-mile Welaunee Greenway, extending Welaunee Boulevard to Roberts Road, and creating a two-lane extension of Shamrock Street to Welaunee Boulevard. By increasing mobility and connectivity, thus reducing transportation pressures, the project aims to protect canopy roads.

Orange Avenue/Meridian Placemaking

The Orange-Meridian Placemaking project consists of constructing a neighborhood park at the intersection of Orange Avenue and Meridian Street as well as improving the East Drainage Ditch between South Monroe and Meridian streets. Park design development and stormwater modeling for a segment replacement of the East Drainage Ditch are underway.

Market District Placemaking

The Market District Placemaking project targets the completion of a nine-acre Market District Park, including trails, gathering places, and recreational amenities, as well as the improvement of the general safety and connectivity of the Market District through roundabouts, streetscaping, multi-use trails, and landscaping.

Lake Lafayette and St. Marks Regional Park

The Lake Lafayette and St. Marks Park project will provide ecosystem restoration, incorporate flooding analysis provided by the Northwest Florida Water Management District, and improve the connectivity of public recreational lands east of Capital Circle Southeast.

Monroe-Adams Placemaking

The Monroe-Adams Corridor Placemaking project seeks to improve the appearance, comfort, and safety of public streets along the Monroe-Adams Corridor. To achieve this goal, preliminary surveying and concept design is being conducted, supported by engagement with relevant local stakeholders and residents. In addition, the project includes a leveraging opportunity with the Florida Department of Transportation.

Midtown Placemaking

The Midtown Placemaking project will fund the implementation of the Midtown Placemaking Action Plan, which includes streetscaping and intersections improvements. The first phase of improvements will target Thomasville Road from N. Monroe Street to 7th Avenue..

Fairgrounds Beautification and Improvements

The Fairgrounds Beatification and Improvements project, based on the findings of a late 2022 Fairgrounds Master Plan, will fund improvements to the current Tallahassee Fairgrounds. Upon completion of the current Master Plan process, the design of recommended improvements is planned to begin.

Northeast Park

The Northeast Park project involves constructing a fifty-acre park in Northeast Tallahassee adjacent to Montford Middle and Roberts Elementary schools.

College Ave Placemaking

The College Avenue Placemaking project will fund construction, stormwater improvements, streetscaping, and gateway enhancements along College Ave.

Florida A&M Entry Points

The Florida A&M Entry Points project will fund the development of Florida A&M University entry points, including road improvements and turn signals, at the intersections of Osceola Street and Adams Street, as well as Perry Street and Gamble Street.

Alternative Sewer Solutions Study

The Alterative Sewer Solutions project analyzes cost-effective options to improve water quality throughout Leon County by identifying alternatives to conventional septic systems. The project's first phase, which was divided into five tasks and is funded by Blueprint, began in November 2019. The first three reports have been completed, with the fourth task involving public engagement undertaken in August 2021. The final task involves Onsite Sewage Treatment & Disposal System (OSTDS) Retrofit Implementation Scenarios, which are currently underway.

Tallahassee-Leon County Animal Service Center

The Animal Service Center project seeks to improve animal health and well-being at the Animal Service Center through renovations to dog kennels and the shelter medicine area, and the addition of quarantine yards. These improvements are largely based on a 2021 Needs Assessment completed by Animal Arts Inc.

This report is organized as follows: the "Introduction" summarizes the genesis of the BIA and BIA projects. The next section, "Methodology and Data", provides the basic steps of model and data preparation. The next section "Economic Modeling Results" provides detail on the economic impact and traffic flow analysis findings. The last section outlines the study's summary conclusions. In addition, the "Literature Review" section discusses studies relating to the theories of traffic flow analysis and economic impact assessment, and the detailed results of the traffic flow analysis are included in Appendices A, B and C, respectively.

Methodology and Data – Traffic Flow Analysis

The team was tasked with determining the economic benefits of the new traffic patterns that would emerge following the completion of three infrastructure projects, Airport Gateway, Bannerman Road, and Capital Circle Southwest. Because the three projects differ in their scope and their expected impact on traffic patterns, there are differences in the methodological approach used for each project. However, some methodological assumptions are the same between the three projects and are highlighted here.

When making decisions about infrastructure spending, one important tool used by policymakers is a benefit cost analysis (BCA).[6] In this type of analysis, policymakers research and discover the costs associated with building a project as well as the benefits to both users and the governing bodies involved. As this report is focused on the benefits to commuters that will use the projects under consideration, the team used two common measures of the benefits to commuters of new roadway construction, the value of time spent in transit and maintenance costs associated with travel time.

The three projects rely on the same assumptions for the maintenance costs consumers incur by travelling. Maintenance costs per mile of travel are estimated by the Bureau of Transportation statistics.[7] Maintenance costs also include fuel costs. This figure was multiplied by the assumed average travel speed for each model in terms of miles per second to get the average annual cost per second as shown below:

$$\frac{cost\ of\ maintenance}{second} = \frac{cost\ of\ maintenance}{mile} * \frac{distance\ traveled\ (in\ miles)}{second}$$

The cost of car maintenance per second is then used to create the annualized cost of car maintenance per commuter as shown below.

$$\frac{annual\ vehicle\ maintenance\ cost}{commuter}$$

$$= amount\ of\ time\ delayed\ (in\ sec) * \frac{cost\ of\ maintenance}{second} * annual\ factor$$

The three projects also rely on the same assumptions for the cost of delays commuters incur by spending time commuting. To calculate the annual cost of delayed time per commuter FSU CEFA used the following equation from the University of Texas' 2021 Urban Mobility Report:[8]

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[6] Nathaniel Coley (2012). "Spotlight on Benefit-Cost Analysis." *Public Roads*. U. S. Department of Transportation Federal Highway Administration. https://highways.dot.gov/public-roads/marchapril-2012/spotlight-benefit-cost-analysis.

[7] Bureau of Transportation Statistics (2021). "Average Cost of Owning and Operating an Automobile." https://www.bts.gov/content/average-cost-owning-and-operating-automobilea-assuming-15000-vehicle-miles-year.

[8] https://mobility.tamu.edu/umr/

$$\frac{annual\ delay\ cost}{commuter}$$

$$= amount\ of\ time\ delayed\ (in\ sec) * value\ of\ personal\ time\ (in\ sec)^{9}$$

$$* vehicle\ occupancy^{10} * annual\ factor^{11}$$

Finally, the team calculates the total cost of delayed time per commuter as follows:

$$\frac{annual\ total\ cost}{commuter} = \frac{annual\ vehicle\ maintenance\ cost}{commuter} + \frac{annual\ delay\ cost}{commuter}$$

The methodologies, assumptions, and data that are unique to each project are outlined below. In particular, each project uses a similar methodology to *An Economic Impact Analysis of the Welaunee Boulevard Extension* (referred to as the Welaunee report) conducted previously by the research team.[12] However, due to data difference, changes to the methodology needed to be made.

Methodology and Assumptions - Airport Gateway Project

The research team used information from the traffic flow analysis conducted in 2021 by HAS Consulting Group and Halff Associates, Inc.[13] to estimate the benefits to commuters of the construction of a new roadway connecting Stuckey Avenue, Levy Avenue, Roberts Avenue, Pottsdamer Street, and Orange Avenue. The Blueprint Airport Gateway report refers to this new road as Segment C. While many other improvements are being considered in the Airport Gateway project, due to the preliminary state of planning and lack of data, the research team chose to focus on the impact of the construction of this segment. While some of the other

[9] Calculated as a per-second value of the median hourly wage of Tallahassee, $17.45. With rounding, the per second value of time comes out to be about $0.01.
[10] 1.5 as noted by the Urban Mobility Report, 2021. https://mobility.tamu.edu/umr/
[11] 365 for the number of days in the year
[12] Harrington, Julie and Shane Whitney. *An Economic Impact Analysis of the Welaunee Boulevard* (2021). FSU Center for Economic Forecasting and Analysis. https://negatewayhome.files.wordpress.com/2021/05/bia-final-draft-5-13-21.pdf
[13]HSA Consulting Group and Halff Associates, Inc. *Airport Gateway Stage I Traffic Report* (2021). https://blueprintia.org/wp-content/uploads/Airport-Gateway-Stage-I-Traffic-Report_Final.pdf

proposed improvements may impact traffic speed and flow (e.g., new medians, innovative intersection designs, etc.), it is not possible to determine their economic impacts at this time.

This study uses a similar methodology to *An Economic Impact Analysis of the Welaunee Boulevard Extension* (referred to as the Welaunee report) conducted previously by the research team.[14] However, due to data limitations, additional assumptions and modifications must be made. The Welaunee report used a traffic study that included estimates of travel times for peak hours in the study area.[15] As the Airport Gateway project has not entered the intersection design phase, travel time data has not yet been collected. In addition, proposed intersection designs have not yet been produced. Therefore, it is not possible to accurately model delay times at intersections that will be affected by the plans. Finally, the previous study used peak hour directional traffic volumes to calculate the benefits to consumers based on the reasoning that peak hour commuters would derive the most benefit from the road construction. In the current study, because levels of service on predicted routes are not expected to be different between the Build and No-Build scenarios, none of the expected benefits stem from differences in level of service. Instead, they are expected to stem from shorter distances travelled when commuting.

Taking into consideration these limitations and differences, the study team relies on the changes in predicted annualized average daily traffic (AADT) volumes and measured distances on existing and proposed roadway sections paired with assumptions about average travel speeds and estimates of average wait times at intersections. Because the benefits to consumers are expected to stem from shorter distances travelled when commuting, all commuters are expected to benefit from this project, regardless of the time of day they travel. Therefore, AADT volumes are more appropriate than peak-hour, peak directional flows as a measure of the number of commuters who will benefit from the project. To avoid over-reliance on one set of assumptions, the team produced estimates based on different travel speeds and wait times to produce a range of benefits to commuters. One way to interpret this range is as benefits to commuters in peak hours (slow average speed, long signal delay time) and benefits to commuters in off-peak hours (fast average speed, short signal delay time).

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[14] Harrington, Julie and Shane Whitney. *An Economic Impact Analysis of the Welaunee Boulevard* (2021). FSU Center for Economic Forecasting and Analysis. https://negatewayhome.files.wordpress.com/2021/05/bia-final-draft-5-13-21.pdf

[15] Kimley Horn. *Project Traffic Analysis Report: Northeast Gateway: Welaunee Boulevard* (2021). https://negatewayhome.files.wordpress.com/2021/12/ne-gateway-ptar_final_2021-12_ss.pdf

Data – Airport Gateway Project

The input data used for analysis is based on the Airport Gateway Stage I Traffic Report. The report makes two primary predictions concerning traffic flows. First, the construction of Segment C and the downgrading of Levy Street to a neighborhood street will reroute 80% of the traffic on Levy Street to Stuckey Avenue. Second, the construction of Segment C will reroute 40% of northbound and 75% of southbound traffic that currently uses Pottsdamer Street to Segment C. Therefore, the total benefits data for this analysis come from the difference in annual average daily traffic (AADT) volumes along Stuckey Avenue, Levy Street, Lake Bradford Road, Pottsdamer Street, and two sections of proposed Segment C. For ease of analysis, the new construction is grouped into two sections. "Route 1" refers to the route taken by traffic rerouted away from Levy Avenue and through Stuckey Avenue. "Route 2" refers to the route taken by traffic rerouted away from Pottsdamer Street and onto the new Segment C. Table 1 contains the predicted AADT volumes for the segments predicted to be affected by the new segment depending on if the proposed Segment C is constructed (the "Build" and "No Build" scenarios), as well as the difference in predictions. To calculate differences in average travel times, the team also needed measurements of each of the relevant sections. Lengths for each section were measured using the Google Maps© measuring tool. These measurements are provided in Tables 2-3, along with the difference in the length of each route under the Build and No-Build conditions.

Based on current speed limits on Stuckey Avenue and Levy Street (25 mph and 30 mph), the team determined that the average speed of motorists should be approximately 30 – 35 mph. Therefore, the team uses average speeds of 25, 30, 35, and 40 mph in its calculations to account for errors in this assumption. The team also determined that motorists using Stuckey Avenue as a through route rather than Levy Street would encounter one fewer signaled intersection on Lake Bradford Road. Using simulation results from a 2018 study,[16] the team estimates that the difference in delay times at this signal will be 12 seconds. However, as there is uncertainty in this measure, we also report the analysis with a delay of 7 seconds and a delay of 17 seconds.

[16] Andronov, R., & Leverents, E. (2018). Calculation of vehicle delay at signal-controlled intersections with adaptive traffic control algorithm. In *MATEC Web of Conferences* (Vol. 143, p. 04008). EDP Sciences.https://www.matec-conferences.org/articles/matecconf/abs/2018/02/matecconf_yssip2017_04008/matecconf_yssip2017_04008.html

Table 1. Airport Gateway Predicted AADT Volumes for the Build and No Build Scenarios[17]

Predicted AADT Volumes						
	2025			2045		
Segment	Build Model	No Build Model	**DIFFERENCES**	Build Model	No Build Model	**DIFFERENCES**
Stuckey Avenue, Lake Bradford to Segment C	7,932	3,120	4,812	7,487 [18]	3,355	4,132
Levy Avenue, Lake Bradford to Segment C	835	4,468	(3,633)	907	4,614	(3,707)
Lake Bradford Road, Stuckey to Levy	21,533	23,718	(2,185)	23,771	25,824	(2,053)
Pottsdamer Street, Orange Avenue to Segment C	1,235	2,000	(765)	1,543	2,500	(957)
Segment C, Orange to Pottsdamer	765	-	765	957	-	957

[17] HSA Consulting Group and Halff Associates, Inc. *Airport Gateway Stage I Traffic Report* (2021). https://blueprintia.org/wp-content/uploads/Airport-Gateway-Stage-I-Traffic-Report_Final.pdf

[18] The engineering report predicts that after 2025 some traffic will divert into McCaskill Avenue and Lake Avenue, reducing AADT's through Stuckey Avenue somewhat.

Table 2. Airport Gateway Route Distances for Route 1

Build and No-Build Routes and Distances, Route 1			
Route 1			
Segment	**Build**	**No-Build**	**Difference**
Stuckey Avenue, Lake Bradford to Segment C	0.4932	0.0000	
Segment C, Stuckey to Levy	0.3388	0.0000	
Levy Street, Lake Bradford to Segment C	0.0000	0.4932	
Lake Bradford Road, Stuckey to Levy	0.0000	0.2055	
Total Distance	0.8320	0.6986	0.1333

Table 3. Airport Gateway Route Distances for Route 2

Build and No-Build Routes and Distances, Route 2			
Route 2			
Segment	**Build**	**No-Build**	**Difference**
Pottsdamer Street, Orange Avenue to Segment C	0.4436	0.0000	
Orange Avenue. Segment C to Pottsdamer	0.2352	0.0000	
Segment C, Orange Avenue to Pottsdamer	0.0000	0.4686	
Total Distance	0.6788	0.4686	0.2102

Methodology and Assumptions – NE Connector – Bannerman Road Project

The research team used information from the traffic flow analysis conducted by RS&H, Inc.[19] to estimate the benefits to commuters of widening a section of Bannerman Road to four lanes and constructing turn lanes on another section. The traffic flow analysis concluded that without these improvements the level of service of Bannerman Road would degrade significantly between now and the design year of 2045. This section estimates the reduction in travel time for peak hour, peak direction commuters on Bannerman Road given the proposed construction takes place.

This study uses a similar methodology to *An Economic Impact Analysis of the Welaunee Boulevard Extension*.[20] However, some modifications were made to fit the unique circumstances of Bannerman Road. The Welaunee report used a traffic study that included estimates of travel times for peak hours in the study area.[21] As the Bannerman Road project has not entered the intersection design phase, travel time data has not yet been collected. In addition, proposed intersection designs have not yet been produced. Therefore, it is not possible to accurately model delay times at intersections or projected travel times at peak hour for peak directional traffic that will be affected by the plans.

Taking into consideration these limitations, the study team relies on the changes in predicted levels of service along sections of roadways paired with assumptions about average travel speeds and estimates of average wait times at intersections. To avoid over-reliance on one set of assumptions, the team produced estimates based on different travel speeds and wait times to produce a range of possible benefits to commuters.

Data– NE Connector – Bannerman Road Project

The data on which this analysis is based comes from the *Final Engineering Report: Northeast Connector Corridor (Bannerman Road)*. The report estimates the level of service provided by Bannerman Road along three segments under several construction scenarios as well as the scenario where no action is taken. The two segments under consideration are between North Meridian Road and Preservation Road (Segment 1), Preservation Road and Tekesta Drive

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[19]RS&H, Inc. *Final Engineering Report: Northeast Connector Corridor (Bannerman Road)* (2021). https://content.wearersandh.com/northeast-connector-corridor/fer-without-appendices.pdf
[20] Harrington, Julie and Shane Whitney. *An Economic Impact Analysis of the Welaunee Boulevard* (2021). FSU Center for Economic Forecasting and Analysis. https://negatewayhome.files.wordpress.com/2021/05/bia-final-draft-5-13-21.pdf
[21] Kimley Horn. *Project Traffic Analysis Report: Northeast Gateway: Welaunee Boulevard* (2021). https://negatewayhome.files.wordpress.com/2021/12/ne-gateway-ptar_final_2021-12_ss.pdf

(Segment 2). As Blueprint has selected one of the scenarios to move forward with, this report only uses the projected figures from the "No-Build" scenario where no action is taken and the "Build" scenario labelled "Build Alternative 1" in the Engineering Report. The Build scenario involves widening Segment 2 and a portion of Segment 3 to four lanes and building turn lanes in Segment 1. The report uses 2045 as the design year and predicts peak hour, peak direction volumes for 2025, 2035, and 2045.

Hagan Consulting Services used Bluetooth device tracking technology to calculate speeds along Bannerman Road between collection points near Tekesta Drive and Suda Trail. The results of this data collection provide good estimates of peak hour travel speeds along the segments being examined. Table 4 contains the results of this analysis. Peak hour travel times are very similar no matter which direction traffic is flowing, indicating that there is little difference in traffic volumes between the eastbound and westbound traffic along Bannerman Road. Therefore, the proposed construction is likely to impact both directions of travel equally.

Table 4. Bannerman Rd. Predicted Peak Hour, Peak Direction Volumes in the Build Scenario

Bannerman Road							
		Speed (mph)					
Date/Time	Direction	Median	85%ile	95%ile	Mean	Min	Max
2/11/2020 7 - 9 AM	Eastbound	38.55	41.42	42.41	38.47	34.67	42.69
	Westbound	39.43	43.04	44.61	40.45	37.43	46.96
2/11/2020 4 - 6 PM	Eastbound	40.20	43.40	47.84	40.81	34.43	49.19
	Westbound	39.58	42.44	43.04	39.73	36.89	43.04
2/12/2020 7 - 9 AM	Eastbound	41.99	44.71	49.64	42.09	34.67	52.17
	Westbound	39.43	42.69	44.61	39.51	34.21	46.53
2/12/2020 4 - 6 PM	Eastbound	39.89	43.04	45.19	40.67	37.16	49.19
	Westbound	39.13	39.86	44.74	38.55	32.28	49.19
2/13/2020 7 - 9 AM	Eastbound	41.17	43.06	44.80	40.99	36.63	47.39
	Westbound	42.69	45.95	49.71	42.55	36.89	51.65
2/13/2020 4 - 6 PM	Eastbound	38.55	43.40	43.40	39.62	36.89	43.40
	Westbound	39.58	43.81	48.61	40.34	34.21	51.14
Average AM	Eastbound	40.57	43.06	45.62	40.52	35.32	47.42
	Westbound	40.52	43.89	46.31	40.84	36.18	48.38
Average PM	Eastbound	39.55	43.28	45.48	40.37	36.16	47.26
	Westbound	39.43	42.04	45.46	39.54	34.46	47.79

This study used the number of peak hour, two-way commuters predicted in the Build Scenario as the number of individuals affected for calculating total benefits. As shown in Table 5, peak hour two-way volumes are predicted to increase significantly along Bannerman Road between now and the design year. While peak hour, peak direction volumes are not predicted to be significantly different between the Build and No-Build scenarios, the report predicts that the level of service provided by Segments 1 and 2 will degrade significantly without improvements. In particular, the volume-to-capacity ratio (V/C) is expected to be 1.18 for Segment 1 and 1.21 for Segment 2 for peak directional volumes at peak hours by 2045 if no action is taken. In contrast, the Build scenario is expected to keep an acceptable level of service, with V/C's of 0.80 and 0.51 for Segments 1 and 2, respectively.

Table 5. Bannerman Rd. Predicted Peak Hour, Peak Direction Volumes in the Build Scenario

	Peak Hour Peak Two-Way Volumes			
	Limits	**2025**	**2035**	**2045**
Segment 1	Meridian/Preservation	718	869	1050
Segment 2	Preservation/Tekesta	964	1188	1465

In addition to differences in traffic flows, this report needs estimates of the value to individuals and expected maintenance costs of time spent in transit and measurements of the road segments to be modified. For the value of time spent in transit, we use the median annual wage of all occupations in Tallahassee.[22] Expected maintenance costs come from the Bureau of Transportation Statistics.[23] Road segments were measured using the Google Maps measuring tool.

Based on current speed limits along Bannerman Road (45 mph), the team determined traffic should ordinarily be in free flow in the Build scenario and that the average speed of motorists should be approximately 50 mph. In the No-Build scenario, the roadway is expected to be operating over capacity, which means that traffic will not be in free-flow and average speeds

[22] Retrieved from JOBSeq: https://jobseq.eqsuite.com
[23] Bureau of Transportation Statistics (2020). *Average Cost of Owning and Operating an Automobile*. https://www.bts.gov/content/average-cost-owning-and-operating-automobilea-assuming-15000-vehicle-miles-year

will be slower. Without specific travel time data, the team cannot make an accurate prediction of how much slower traffic will be in the No-Build scenario. Therefore, the team assumes that travel speeds will be approximately 5 – 10 mph slower in the No-Build Scenario. For completeness, the team also calculates the case when average travel speeds are 15 mph slower. In addition, there are two existing signalized intersection along Bannerman Road. As intersection designs have not been completed, the research team only models signal delay at these intersections. Using simulation results from a 2018 study,[24] the average delay at these intersections will be about 12 seconds in the Build scenario. In the No-Build scenario, this intersection is expected to be operating over capacity. Estimating delays at intersections that are saturated is a developing science and beyond the scope of this analysis. Instead, to account for uncertainty in this measure, the team models the average additional delay at this signal as 5, 10, and 15 seconds more than in the Build scenario. As heavier traffic is associated with longer wait times at signalized intersections, the team creates three scenarios combining the longer signal delays with slower average speeds. Table 6 shows the difference in average travel times for peak hour, peak directional commuters under each case for each segment of Bannerman Road. The level of service provided by Segment 3 is not expected to change significantly between the Build and No-Build scenarios and therefore no analysis is conducted on this segment.

Table 6. Bannerman Rd. Reduction in Travel Times Between Build and No-Build Scenarios

Reduction in Average Travel Times			
	Difference in Average Speed and Signal Delay		
	15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
Difference in Travel Time, Segment 1 (seconds)	43	30	18
Difference in Travel Time Segment 2 (seconds)	21	36	53

[24] Andronov, R., & Leverents, E. (2018). Calculation of vehicle delay at signal-controlled intersections with adaptive traffic control algorithm. In *MATEC Web of Conferences* (Vol. 143, p. 04008). EDP Sciences.https://www.matec-conferences.org/articles/matecconf/abs/2018/02/matecconf_yssip2017_04008/matecconf_yssip2017_04008.html

Methodology and Assumptions – Capital Circle SW Project

The research team used information from the traffic flow analysis conducted by Kimley Horn & Associates, Inc.,[25] to estimate the benefits to commuters of widening Capital Circle Southwest (CCSW) to six lanes between Tennessee Avenue and Crawfordville Road. The team updated the projections made in this report to include traffic counts from 2019. Using these counts, the team determined that although traffic has not grown as much as anticipated along this road, the level of service of CCSW will still be unacceptably low by 2035 without the CCSW widening project. This section estimates the reduction in travel time for peak hour, peak direction commuters on CCSW given the proposed construction takes place.

When making decisions about infrastructure spending, one important tool used by policymakers is a benefit cost analysis (BCA).[26] In this type of analysis, policymakers research and discover the costs associated with building a project as well as the benefits to both users and the governing bodies involved. As this report is focused on the benefits to commuters that use CCSW, the team used two common measures of the benefits to commuters of new roadway construction, the value of time spent in transit and maintenance costs associated with travel time.

This study uses a similar methodology to *An Economic Impact Analysis of the Welaunee Boulevard Extension*[27] and *An Economic Impact Analysis of the Airport Gateway Project* conducted previously by the research team.[28] However, some modifications were made to fit the different circumstances of CCSW. The Welaunee report used a traffic study that included

[25]Kimley-Horn and Associates, Inc. *Design Traffic Memorandum and Capacity Analysis Report: Capital Circle Southwest (SR 263)*. (2021). https://content.wearersandh.com/northeast-connector-corridor/fer-without-appendices.pdf

[26] Nathaniel Coley (2012). "Spotlight on Benefit-Cost Analysis." *Public Roads*. U. S. Department of Transportation Federal Highway Administration. https://highways.dot.gov/public-roads/marchapril-2012/spotlight-benefit-cost-analysis.

[27] Harrington, Julie and Shane Whitney. *An Economic Impact Analysis of the Welaunee Boulevard* (2021). FSU Center for Economic Forecasting and Analysis. https://negatewayhome.files.wordpress.com/2021/05/bia-final-draft-5-13-21.pdf

[28] Harrington, Julie and Morgan Holland. *An Economic Impact Analysis of the Airport Gateway Project*. (2022). FSU Center for Economic Forecasting and Analysis. (not yet published)

estimates of travel times for peak hours in the study area.[29] No travel time data has been collected for CCSW, therefore, it must be estimated from the level of service of CCSW.

Taking into consideration these limitations, the study team relies on the changes in predicted levels of service along sections of roadways paired with assumptions about average travel speeds. To avoid over-reliance on one set of assumptions, the team produced estimates based on different travel speeds to produce a range of possible benefits to commuters.

Data – Capital Circle SW Project

The data on which this analysis is based comes from three sources, the *Design Traffic Memorandum and Capacity Analysis Report: Capital Circle Southwest (SR 263)* from Kimley-Horn, FDOT traffic counts from 2019,[30] and the FDOT *2020 Quality/Level of Service Handbook*.[31] The Kimley-Horn report projects the level of service provided by Capital Circle Southwest based on 2005 traffic counts. Because the traffic counts are old in this report, the team examined FDOT updated counts and determined that the traffic forecasts in the Kimley-Horn report were inaccurate and new forecasts should be made. To update the forecasts, the team used a linear trend between the Average Annual Daily Traffic (AADT) counts calculated by Kimley Horn and those supplied by FDOT and extrapolated to 2035, the design year of this project. In some cases, this linear trend predicted declining traffic counts. Because declining traffic counts are unlikely, the team used the current traffic counts as the 2035 estimates for these instances. To calculate peak-hour, peak-direction commuters, the team used the same assumptions as the Kimley-Horn report.[32]

The Kimley-Horn report also does not estimate the level of service of CCSW for a "no-build" scenario. Therefore, the team used the 2020 FDOT Quality/Level of Service Handbook Tables to approximate the level of service along Capital Circle Southwest in 2035 assuming no construction takes place. The team uses the difference in the predicted level of service as the basis for predicting differences in travel time, maintenance costs, and overall costs to consumers. Table 7 shows the segments under consideration, predicted peak hour, peak

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[29] Kimley Horn. *Project Traffic Analysis Report: Northeast Gateway: Welaunee Boulevard* (2021). https://negatewayhome.files.wordpress.com/2021/12/ne-gateway-ptar_final_2021-12_ss.pdf
[30] https://tdaappsprod.dot.state.fl.us/fto/
[31] FDOT. *2020 Quality/Level of Service Handbook*. (2020). https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/planning/systems/systems-management/document-repository/qlos/fdot_qlos_handbook_june-2020.pdf?sfvrsn=98f689a7_2
[32] Specifically, the team assumes the same K-factor and D-factor.

direction volumes for 2035, and their predicted level of service under the "build" and "no-build" scenarios.

Table 7. CCSW Predicted Peak Hour, Peak Direction Volumes in the Build Scenario

Segments, Volumes, and Levels of Service				
Segment	**Limits**	**Peak-hour, Peak Direction Volumes, 2035**	**Level of Service, No-Build**	**Level of Service, Build**
1	Tennessee Street/Blountstown Highway	1,941	F	B
2	Blountstown Highway/Orange Avenue	1,735	F	B
3	Orange Avenue/Airport	799	D	B
4	Airport/Springhill Road	955	D	B
5	Springhill Road/Crawfordville Road	868	E	B

In addition to differences in traffic flows, this report needs estimates of the value to individuals and expected maintenance costs of time spent in transit and measurements of the road segments to be modified. For the value of time spent in transit, we use the median annual wage of all occupations in Tallahassee.[33] Expected maintenance costs come from the Bureau of Transportation Statistics.[34] Road segments were measured using the Google Maps© measuring tool.

Based on current speed limits along CCSW (45 mph), the team determined traffic should ordinarily be in free flow in the Build scenario and that the average speed of motorists should

[33] Retrieved from JOBSeq: https://jobseq.eqsuite.com.
[34] Bureau of Transportation Statistics (2020). *Average Cost of Owning and Operating an Automobile*. https://www.bts.gov/content/average-cost-owning-and-operating-automobilea-assuming-15000-vehicle-miles-year

be approximately 50 mph. In the No-Build scenario, the level of service of the roadway is expected to be much lower, which means that traffic will not be in free-flow and average speeds will be slower. Without specific travel time data, the team cannot make an accurate prediction of how much slower traffic will be in the No-Build scenario. Therefore, the team assumes that travel speeds will be approximately 5 – 10 mph slower in the No-Build Scenario. For completeness, the team also calculates the case when average travel speeds are 15 mph slower. In addition, each segment has one existing signalized intersection. Therefore, the research team also includes expected signal delays along each segment to calculate differences in travel time between the build and no-build scenarios. Using simulation results from a 2018 study,[35] the team estimates that the average delay at each intersection will be about 10 seconds less in the Build scenario. To account for uncertainty in this measure, the team models the average additional delay at this signal as 5, 10, and 15 seconds. As heavier traffic is associated with longer wait times at signalized intersections, the team creates three scenarios combining the longer signal delays with slower average speeds. Table 8 shows the difference in average travel times for peak hour, peak directional commuters under each case for each segment of CCSW.

Table 8. CCSW Reduction in Travel Time Between Build and No-Build scenarios

Reduction in Travel Times			
	Difference in Average Speed and Signal Delay		
	15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
Difference in Travel Time, Segment 1 (seconds)	69	42	19
Difference in Travel Time Segment 2 (seconds)	50	31	14
Difference in Travel Time Segment 3 (seconds)	73	44	20
Difference in Travel Time Segment 4 (seconds)	61	37	17
Difference in Travel Time Segment 5 (seconds)	-82	-49	-22

[35] Andronov, R., & Leverents, E. (2018). Calculation of vehicle delay at signal-controlled intersections with adaptive traffic control algorithm. In *MATEC Web of Conferences* (Vol. 143, p. 04008). EDP Sciences.https://www.matec-conferences.org/articles/matecconf/abs/2018/02/matecconf_yssip2017_04008/matecconf_yssip2017_04008.html

Methodology and Data – Economic Impact Analysis

Economic Impact Analysis (IMPLAN)

The next step in this research study is the economic impact analysis. FSU CEFA used a well-established analytical tool known as the Impact Analysis for Planning, or IMPLAN® model. The theoretical framework is input–output (I/O), developed by Wassily Leontief, for which he received the Nobel Prize in 1973. IMPLAN, founded in 1993, is a widely accepted integrated I/O model that is used extensively by state and local government agencies to measure proposed legislative and other program and policy economic impacts across the private and public sectors. There are several advantages to using IMPLAN:

- It is calibrated to local conditions using a relatively large amount of local county level and state of Florida specific data;
- It is based on a strong theoretical foundation; and
- It uses a well-researched and accepted applied economics impact assessment methodology supported by many years of use across all regions of the U.S.

The basic assumption of the IMPLAN model is that the fundamental information in I/O analysis involves the flow of products from each industrial sector (producer) to each of the industrial sectors considered as consumers. Similar to REMI, IMPLAN assumes uses the Regional Purchase Coefficient (RPC) approach to regionalize the technical coefficients. The primary sources of employment and earnings data are County Business Patterns' data and Bureau of Economic Analysis (BEA) data.

The economic impact model used for this analysis was specifically developed for the counties of Florida, and includes 534 sectors, 25 institutional sectors, and most recent dataset[36] – year 2020 data. IMPLAN's principal advantage is that it may be used to estimate direct, indirect, and induced economic impacts for any static (point-in-time) economic stimulus. IMPLAN uses an economic multiplier approach to estimating impacts. Consistent with standard practice, the direct impacts, as well as the indirect and induced impacts, are calculated for the 18 BIA projects' Tallahassee market area. This study evaluates the 18 BIA projects' economic impacts, measured in terms of economic output (the value of industry production), local employment or jobs, income or wages, and taxes (federal, state & local).

[36] Florida 2020 data was released at the end of December 2021, and used in this study.

Data – Economic Impact Analysis

The FSU CEFA research team obtained the most recent BIA project construction cost/ expenditure data from the BIA team[37] in early April 2022. Table 9 displays the cost data.

It is expected that the 18 BIA projects will generate the following types of economic impacts in the Tallahassee market area:

- Direct Impacts. Direct impacts relate to: a) the short-term business activity associated with BIA-related construction, etc., and; b) the ongoing economic activity associated with the 18 BIA related-businesses or firms.
- Indirect Impacts. Indirect impacts will result when local firms directly impacted by the 18 BIA projects, in turn purchase materials, supplies or services from other firms.
- Induced Impacts. Induced impacts relate to the consumption and spending of employees of firms that are directly or indirectly affected by the 18 BIA projects. These would include all of the goods and services normally associated with household consumption (i.e., housing, retail purchases, local services, etc.).

[37] BIA data provided by: Ms. Megan Doherty, Planning Manager, BIA and Mike Alfano, Principal Planner, BIA.

Table 9. The Estimated Total Construction and Other Costs of the Eighteen Projects

Project	FY22-23 Cost Estimates	Construction Cost Estimates	Other Cost Estimates
Airport Gateway	$81,878,632	$73,910,000	$7,968,632
Northwest Connector: Tharpe Street	$68,819,874	$55,055,899	$13,763,975
Northeast Corridor Connector: Bannerman Rd	$74,219,381	$41,943,860	$32,275,521
Northeast Gateway: Welaunee Boulevard	$94,678,000	$78,708,000	$15,970,000
Capital Circle SW	$138,832,000	$91,000,000	$47,832,000
Capital Cascades Trail - Segment 4	$20,000,000	$16,000,000	$4,000,000
Orange Avenue/Meridian Placemaking	$8,209,611	$6,567,689	$1,641,922
Market District Placemaking	$11,013,598	$8,810,878	$2,202,720
Lake Lafayette and St. Marks Regional Park	$20,438,984	$16,351,187	$4,087,797
Monroe-Adams Corridor Placemaking	$8,532,961	$6,826,369	$1,706,592
Midtown Placemaking	$28,459,347	$22,767,478	$5,691,869
Fairgrounds Beautification and Improvement	$12,100,000	$9,800,000	$2,300,000
Northeast Park	$12,000,000	$10,500,000	$1,500,000
College Avenue Placemaking	$9,055,246	$7,244,197	$1,811,049
Florida A&M Entry Points	$1,940,410	$1,552,328	$388,082
Alternative Sewer Solutions	$2,475,295	$1,980,236	$495,059
Tallahassee-Leon County Animal Service Center	$3,800,000	$3,600,000	$200,000
Magnolia Drive Trail	$23,556,734	$18,845,387	$4,711,347

*** in 2022 $**

Economic Modeling Results – Traffic Flow Analysis

Before examining the results of each traffic flow analysis, it is important to note some differences between the analysis and how they affect the results. In addition, the team also highlights some important observations.

First, the three projects differ in the sources of the predicted economic benefits and the commuters expected to be affected by the Build scenarios. Traffic routes along Bannerman Road and Capital Circle SW will not change in length. Therefore, the benefits to commuters along Bannerman Road and Capital Circle SW stem from the improvement in the levels of service under the Build models. Since the Build models will have a higher capacity than the No Build models, commuters are expected to traverse Bannerman Road and Capital Circle SW more quickly due to the reduction in signal delays and increased average speeds. On the other hand, the Airport Gateway project predicts that average speeds will be the same under the Build and No Build scenarios. Therefore, the benefits to commuters of the Build scenario for Airport Gateway stem primarily from reduced travel distance and reduced signal delays.

Additionally, it is important to note that Bannerman Road and Capital Circle SW use a different measure of traffic flows than the Airport Gateway project. Improved levels of service are at their most useful during peak hours, therefore, the Bannerman Road and Capital Circle SW analyses use peak hour flows to measure of commuters who will benefit from the Build scenarios. In contrast, the Airport Gateway project predicts shorter commuting distances, which benefit commuters regardless of when the commute occurs. Therefore, the Airport Gateway project uses AADT flows as its measure of commuters who will benefit from the Build scenario. Since AADT flows are much larger than peak hour flows, many more commuters are expected to benefit from the Airport Gateway project than from Bannerman Road and Capital Circle SW. Finally, the travel time data provided by Blueprint indicate that for Bannerman Road there is no practical difference in travel times between eastbound and westbound traffic. Therefore, Bannerman road uses peak hour two-directional traffic while Capital Circle SW uses peak hour, peak directional traffic.

The team only calculates benefits for the years used in each engineering report, however, it is important to note that the benefits of each project operate over the life of the project, not just for a handful of years. Without predictions of traffic flows for other years, it is not possible to calculate the total benefit of the projects without making assumptions about the growth rates of traffic, changes in average speeds, and changes in average signal delays between years. Nevertheless, the total benefits over the life of the projects will be much greater than the annual benefits listed here. Finally, these analyses do not take construction costs into consideration and are therefore not full benefit cost analyses.

Airport Gateway Project Results

The results of the analysis are presented in Tables 10-11 and a more detailed breakdown of benefits is presented in Appendix C. Total benefits from the new construction in Route 1 are not predicted to exceed $0.44 per commuter, per day, or $159 per commuter, per year. Total benefits for Route 2 are not expected to exceed $0.41 per commuter, per day, or $150.61 per commuter, per year.

In addition to calculating the benefits to each individual driver, Tables 10-11 calculate the total benefit to all commuters expected to use the new routes in 2025 and 2045. The predicted total benefit in a year is between $495,399 and $765,148.88 for Route 1 in 2025 and between $425,393 and $657,023 for Route 1 in 2045. For Route 2, the predicted total benefit in a year is between $603,054 and $724,719 in 2025 and between $517,834 and $622,307 in 2045.

The benefits to commuters for stem from the predicted changes in traffic patterns from the study conducted by HAS Consulting Group and Halff Associates, Inc.[38] For Route 1, If Stuckey Avenue is upgraded to a through street and Levy Avenue is downgraded to a neighborhood street, the traffic analysis predicts that 80% of the traffic that currently uses Levy Avenue will shift to using Stuckey Avenue. Because the typical commuting route using Stuckey Avenue is expected to be slightly shorter than the Levy Avenue Route and will avoid one signalized intersection, commuters are expected to save some time using the new route. The team estimates the value of time savings to be between $0.28 and $0.44 per commuting based on maintenance costs and the value of productive time. Based on projected traffic volumes, total annual benefits to all commuters are expected to be between $495,399.91 and $765,148.88 in 2025 and between $425,393.28 and $657,023.10 in 2045.

[38] HSA Consulting Group and Halff Associates, Inc. *Airport Gateway Stage I Traffic Report* (2021). https://blueprintia.org/wp-content/uploads/Airport-Gateway-Stage-I-Traffic-Report_Final.pdf

Table 10. Airport Gateway Total Benefits to Commuters, Route 1

Total Benefits for Commuters				
Route 1 (Stuckey Avenue)				
7 Second Signal Delay				
	Average Speed			
	25 mph	**30 mph**	**35 mph**	**40 mph**
Average daily benefit per commuter	$0.32	$0.30	$0.29	$0.28
Average annual benefit per commuter	$116.31	$109.62	$105.49	$102.95
Annual benefit, all commuters, 2025	$559,687.13	$527,486.97	$507,596.63	$495,399.91
Annual benefit, all commuters, 2045	$480,595.85	$452,946.00	$435,866.43	$425,393.28
12 Second Signal Delay				
	Average Speed			
	25 mph	**30 mph**	**35 mph**	**40 mph**
Average daily benefit per commuter	$0.38	$0.36	$0.36	$0.35
Average annual benefit per commuter	$137.66	$132.58	$130.07	$129.15
Annual benefit, all commuters, 2025	$662,418.01	$637,992.27	$625,876.34	$621,454.05
Annual benefit, all commuters, 2045	$568,809.48	$547,835.42	$537,431.64	$533,634.28
17 Second Signal Delay				
	Average Speed			
	25 mph	**30 mph**	**35 mph**	**40 mph**
Average daily benefit per commuter	$0.44	$0.43	$0.42	$0.43
Average annual benefit per commuter	$159.01	$155.55	$154.65	$155.34
Annual benefit, all commuters, 2025	$765,148.88	$748,497.56	$744,156.06	$747,508.18
Annual benefit, all commuters, 2045	$657,023.10	$642,724.84	$638,996.85	$641,875.27

For Route 2, If Segment C is constructed, the traffic analysis conducted by HAS Consulting Group and Halff Associates, Inc. predicts that 40% of the traffic that currently uses Pottsdamer Street will shift to using the new segment. Because the new segment provides a shorter route into the Innovation Hub area, commuters are expected to save some commuting time by using the new route. The team estimates the value of this time savings to be between $0.34 and $0.41 per commuting trip based on maintenance costs and the value of productive time. Based on projected traffic volumes, total annual benefits to all commuters are expected to be between $603,054.44 and $724,719.61 in 2025 and between $517,834.78 and $622,307.03 in 2045.

Table 11. Airport Gateway Total Benefits for Commuters, Route 2

Total Benefits for Commuters				
Route 2 (Pottsdamer Bypass)				
	Average Speed			
	25 mph	30 mph	35 mph	40 mph
Average daily benefit per commuter	$0.41	$0.38	$0.36	$0.34
Average annual benefit per commuter	$150.61	$138.83	$130.88	$125.32
Annual benefit, all commuters, 2025	$724,719.61	$668,054.73	$629,801.08	$603,054.44
Annual benefit, all commuters, 2045	$622,307.03	$573,649.66	$540,801.76	$517,834.78

NE Connector – Bannerman Road Project Results

Tables 12-13 present the results of this analysis. The benefits from the Bannerman Road project primarily stem from the improved levels of service predicted in the Build Model. Improved levels of service mean that commuters are expected to traverse Bannerman Road at faster average speeds and spend less time waiting at traffic signals.

For Segment 1, the team finds that individual commuters will save between $0.09 and $0.21 per trip in time benefits, or between $23.11 and $53.83 annually. Because maintenance benefits primarily stem from reduced wait times, deceleration, and acceleration at traffic signals, there is not expected to be any savings in maintenance costs along Segment 1. Given the projected number of peak hour, two-directional commuters along Segment 1 for each year in the engineering report, the total annual benefits of between $16,590.26 and $38,653.15 in 2025, between $20,079.30 and $46,782.15 in 2035, and between $24,261.52 and $56526.19 in 2045.

Table 12. Bannerman Rd. Total Benefits to Commuters, Segment 1

Total Benefits for Commuters, Segment 1			
	Difference in Average Speed		
	15 mph	10 mph	5 mph
Average daily benefit per commuter	$0.21	$0.14	$0.09
Average annual benefit per commuter	$53.83	$37.30	$23.11
Average annual benefit for all peak hour, peak direction commuters, 2025	$38,653.15	$26,781.28	$16,590.26
Average annual benefit for all peak hour, peak direction commuters, 2035	$46,782.15	$32,413.55	$20,079.30
Average annual benefit for all peak hour, peak direction commuters, 2045	$56,526.19	$39,164.82	$24,261.52

Table 13. Total Benefits to Commuters, Segment 2

Total Benefits for Commuters, Segment 2			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
Average daily benefit per commuter	$0.34	$0.23	$0.13
Average annual benefit per commuter	$87.73	$60.89	$34.99
Average annual benefit for all peak hour, peak direction commuters, 2025	$84,574.97	$58,702.16	$33,727.64
Average annual benefit for all peak hour, peak direction commuters, 2035	$104,227.25	$72,342.49	$41,564.77
Average annual benefit for all peak hour, peak direction commuters, 2045	$128,529.39	$89,210.23	$51,256.21

Capital Circle SW Project Results

Tables 14-15 present the results of this analysis. The benefits from the Capital Circle SW project primarily stem from the improved levels of service predicted in the Build Model. Improved levels of service mean that commuters are expected to traverse Capital Circle SW at faster average speeds and spend less time waiting at traffic signals.

The team found the largest benefit for Segment 5, where individual commuters will benefit between $38.64 and $127.86 annually. Other segments are expected to have less benefits, with the smallest expected benefits going to Segment 2. Along this segment, commuters are expected to save between $0.11 and $0.34 per trip or $28.26 to $87.80 annually.

Adding up the benefits to individual commuters over all commuters expected to use each segment of Capital Circle SW gives the total benefit to commuters in 2035, the only year examined by the engineering report that is still in the future. Overall, the team expects commuters to benefit the least from the widening of Segment 3, where annual benefits to all commuters are expected to be between $28,523.23 and $93,100.20. Commuters are expected to benefit the most from the widening of Segment 2 due to the high volumes of traffic that use this segment. Annual benefits to all commuters are expected to be between $66,583.73 and $215,705.04 along Segment 2.

Table 14. CCSW Total Benefits to Commuters

Total Benefits for Commuters			
Segment 1			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	**10 mph, 10 second delay**	**5 mph, 5 second delay**
Average daily benefit per commuter	$0.43	$0.27	$0.13
Average annual benefit per commuter	$111.14	$70.72	$34.31
Average annual benefit for all peak hour, peak direction commuters, 2035	$215,705.04	$137,262.24	$66,583.73
Segment 2			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	**10 mph, 10 second delay**	**5 mph, 5 second delay**
Average daily benefit per commuter	$0.34	$0.22	$0.11
Average annual benefit per commuter	$87.80	$57.11	$28.26
Average annual benefit for all peak hour, peak direction commuters, 2035	$152,315.26	$99,070.56	$49,017.25
Segment 3			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	**10 mph, 10 second delay**	**5 mph, 5 second delay**
Average daily benefit per commuter	$0.45	$0.28	$0.14
Average annual benefit per commuter	$116.58	$73.90	$35.72
Average annual benefit for all peak hour, peak direction commuters, 2035	$93,100.20	$59,013.10	$28,523.23

Table 15. CCSW Total Benefits to Commuters, Cont.

Total Benefits for Commuters, Cont.			
Segment 4			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
Average daily benefit per commuter	$0.39	$0.25	$0.12
Average annual benefit per commuter	$101.02	$64.82	$31.68
Average annual benefit for all peak hour, peak direction commuters, 2035	$96,476.57	$61,904.02	$30,257.59
Segment 5			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
Average daily benefit per commuter	$0.49	$0.31	$0.15
Average annual benefit per commuter	$127.86	$80.48	$38.64
Average annual benefit for all peak hour, peak direction commuters, 2035	$111,026.12	$69,880.82	$33,553.81

Economic Modeling Results – Economic Impact Analysis

The economic impact findings of the 18 BIA projects are shown in Table 16 are estimated to be a total of 5,865 jobs, over $310 million in income or wages and over $992 million in total economic output. The project team estimated both the direct impact of a change in economic activity and the indirect and induced impacts as described in the methodology section. Tables 17 and 18 depict the total direct, indirect, and induced, and fiscal impacts associated with BIA's construction cost data. The fiscal impacts include the expected federal, in addition to state and local taxes collected within the Tallahassee market area. It includes income tax paid by employees, social insurance tax (including employee and employer paid contributions), corporate profit tax, property tax, sales tax, motor vehicle license taxes, fees, among others. The FSU CEFA research team estimates that state and local taxes generated by the additional economic activity will be about $8,221,350.[39]

[39] All impacts are presented as impacts to the Tallahassee market area, with monetary figures presented in current (2022) dollars. The economic impact analysis does not include any quality of life nor opportunity costs (alternative investment) valuation. Small differences in the estimates (and totals) may occur due to rounding.

Table 16. The Total Economic Impacts[40] Based on the Construction Activities Relating to the Eighteen BIA Projects

Grand Total Economic Measure	Economic Output (Sales/Revenues)	Employment or Jobs	Income or Wages
Airport Gateway	$125,586,297	723	$38,609,964
NW Connector Tharpe St.	$107,162,851	628	$33,418,334
NE Corridor Connector Bannerman Rd.	$119,533,037	727	$38,423,896
NE Gateway Welaunee Blvd.	$146,753,722	855	$45,569,299
Capital Circle SW	$220,743,280	1,325	$70,159,392
Capital Cascades Trail-Segment 4	$34,779,917	230	$11,899,671
Orange Ave./Meridian Placemaking	$13,125,410	62	$3,631,096
Market District Placemaking	$19,152,602	126	$6,552,910
Lake Lafayette & St Marks Regional Park	$35,543,309	234	$12,160,860
Monroe-Adams Corridor Placemaking	$14,573,441	83	$4,036,104
Midtown Placemaking	$48,605,705	275	$13,461,317
Fairgrounds Beautification & Improvement	$19,813,481	109	$5,331,466
Northeast Park	$20,867,950	137	$7,139,804
College Ave Placemaking	$14,100,375	83	$4,397,149
Florida A&M Entry Points	$3,265,383	18	$843,850
Alternative Sewer Solutions	$4,838,892	40	$2,474,629
Tall. Leon County Animal Service Center	$6,131,879	32	$1,536,675
Magnolia Drive Trail	$37,662,174	178	$10,419,102
Grand Total	**$992,239,705**	**5,865**	**$310,065,518**

*** in 2022 $**

[40] Including Direct, Indirect and Induced Impacts.

Table 17. The Direct, Indirect, and Induced Output Impacts Based on the Construction Activities Relating to the Eighteen BIA Projects

Output	Direct	Indirect	Induced	Total
Airport Gateway	$81,878,628	$20,127,614	$23,580,055	$125,586,297
NW Connector Tharpe St.	$68,819,870	$17,933,593	$20,409,388	$107,162,851
NE Corridor Connector Bannerman Rd.	$74,219,377	$21,847,278	$23,466,382	$119,533,037
NE Gateway Welaunee Blvd.	$94,677,995	$24,245,446	$27,830,281	$146,753,722
Capital Circle SW	$138,831,993	$39,063,271	$42,848,016	$220,743,280
Capital Cascades Trail-Segment 4	$20,000,000	$7,512,522	$7,267,396	$34,779,918
Orange Ave./Meridian Placemaking	$8,209,612	$2,697,971	$2,217,827	$13,125,410
Market District Placemaking	$11,013,598	$4,136,995	$4,002,009	$19,152,602
Lake Lafayette & St Marks Regional Park	$20,438,984	$7,677,416	$7,426,909	$35,543,309
Monroe-Adams Corridor Placemaking	$8,532,962	$3,575,602	$2,464,877	$14,573,441
Midtown Placemaking	$28,459,346	$11,925,439	$8,220,920	$48,605,705
Fairgrounds Beautification & Improvemt	$12,100,000	$4,457,563	$3,255,918	$19,813,481
Northeast Park	$12,000,000	$4,507,513	$4,360,437	$20,867,950
College Ave Placemaking	$9,055,247	$2,359,683	$2,685,445	$14,100,375
Florida A&M Entry Points	$1,940,411	$809,633	$515,339	$3,265,383
Alternative Sewer Solutions	$2,475,296	$852,255	$1,511,341	$4,838,892
Tall. Leon County Animal Service Center	$3,800,001	$1,393,446	$938,432	$6,131,879
Magnolia Drive Trail	$23,556,735	$7,741,584	$6,363,855	$37,662,174
Grand Total	**$620,010,055**	**$182,864,824**	**$189,364,827**	**$992,239,706**

*** in 2022 $**

Table 18. The Direct, Indirect, and Induced Jobs Impacts Based on the Construction Activities Relating to the Eighteen BIA Projects, Cont.

Employment	Direct	Indirect	Induced	Total
Airport Gateway	456	108	159	723
NW Connector Tharpe St.	393	97	138	628
NE Corridor Connector Bannerman Rd.	448	121	158	727
NE Gateway Welaunee Blvd.	536	131	188	855
Capital Circle SW	821	215	289	1,325
Capital Cascades Trail-Segment 4	137	44	49	230
Orange Ave./Meridian Placemaking	31	16	15	62
Market District Placemaking	75	24	27	126
Lake Lafayette & St Marks Regional Park	140	44	50	234
Monroe-Adams Corridor Placemaking	43	23	17	83
Midtown Placemaking	142	78	55	275
Fairgrounds Beautification & Improvemt	60	27	22	109
Northeast Park	82	26	29	137
College Ave Placemaking	52	13	18	83
Florida A&M Entry Points	9	5	4	18
Alternative Sewer Solutions	23	7	10	40
Tall. Leon County Animal Service Center	17	9	6	32
Magnolia Drive Trail	89	46	43	178
Grand Total	**3,554**	**1,034**	**1,277**	**5,865**

Table 19. The Direct, Indirect, and Induced Income Impacts Based on the Construction Activities Relating to the Eighteen BIA Projects, Cont.

Income	Direct	Indirect	Induced	Total
Airport Gateway	$25,081,377	$6,251,260	$7,277,327	$38,609,964
NW Connector Tharpe St.	$21,499,175	$5,620,371	$6,298,788	$33,418,334
NE Corridor Connector Bannerman Rd.	$24,217,144	$6,964,511	$7,242,241	$38,423,896
NE Gateway Welaunee Blvd.	$29,401,765	$7,578,494	$8,589,040	$45,569,299
Capital Circle SW	$44,557,795	$12,377,756	$13,223,841	$70,159,392
Capital Cascades Trail-Segment 4	$7,194,441	$2,462,354	$2,242,876	$11,899,671
Orange Ave./Meridian Placemaking	$2,000,409	$946,190	$684,497	$3,631,096
Market District Placemaking	$3,961,834	$1,355,969	$1,235,107	$6,552,910
Lake Lafayette & St Marks Regional Park	$7,352,353	$2,516,401	$2,292,106	$12,160,860
Monroe-Adams Corridor Placemaking	$2,077,881	$1,197,516	$760,707	$4,036,104
Midtown Placemaking	$6,930,202	$3,993,985	$2,537,130	$13,461,317
Fairgrounds Beautification & Improvemt	$2,902,356	$1,424,278	$1,004,832	$5,331,466
Northeast Park	$4,316,665	$1,477,413	$1,345,726	$7,139,804
College Ave Placemaking	$2,828,839	$739,522	$828,788	$4,397,149
Florida A&M Entry Points	$415,082	$269,725	$159,043	$843,850
Alternative Sewer Solutions	$1,660,436	$347,757	$466,436	$2,474,629
Tall. Leon County Animal Service Center	$804,590	$442,470	$289,615	$1,536,675
Magnolia Drive Trail	$5,739,993	$2,715,006	$1,964,103	$10,419,102
Grand Total	**$192,942,337**	**$58,680,978**	**$58,442,203**	**$310,065,518**

*** in 2022 $**

Table 20. The Fiscal Impacts Associated with the Construction Activities Relating to the Eighteen BIA Projects

State, Local & Federal Taxes	Airport Gateway	NW Connector Tharpe St.	NE Corridor Connector Bannerman Rd.	NE Gateway Welaunee Blvd.
State & Local Taxes	$580,296	$527,769	$667,915	$709,273
Federal Taxes	$8,098,928	$6,966,625	$7,906,414	$9,517,346
Grand Total	**$8,679,224**	**$7,494,394**	**$8,574,329**	**$10,226,619**

State, Local & Federal Taxes	Capital Circle SW	Capital Cascades Trail-Segment 4	Orange Ave/ Meridian Placemaking	Market District Placemaking
State & Local Taxes	$1,178,338	$244,005	$846,801	$134,368
Federal Taxes	$14,506,551	$2,385,501	$890,828	$1,313,647
Grand Total	**$15,684,889**	**$2,629,506**	**$1,737,629**	**$1,448,015**

State, Local & Federal Taxes	Lake Lafayette & St Marks Regional Park	Monroe-Adams Corridor Placemaking	Midtown Placemaking	Fairgrounds Beautification & Improvement
State & Local Taxes	$249,361	$79,618	$265,544	$50,750
Federal Taxes	$2,437,861	$833,273	$2,779,156	$1,093,405
Grand Total	**$2,687,222**	**$912,891**	**$3,044,700**	**$1,144,155**

Table 21. The Fiscal Impacts Associated with the Construction Activities Relating to the Eighteen BIA Projects, Cont.

State, Local & Federal Taxes	Northeast Park	College Ave Placemaking	Florida A&M Entry Points	Alternative Sewer Solutions
State & Local Taxes	$146,404	$69,443	$14,269	$18,579
Federal Taxes	$1,431,301	$916,661	$175,635	$483,071
Grand Total	$1,577,705	$986,104	$189,904	$501,650

State, Local & Federal Taxes	Tall. Leon County Animal Service Center	Magnolia Drive Trail	Grand Total
State & Local Taxes	$8,799	$2,429,818	$8,221,350
Federal Taxes	$317,598	$2,556,152	$64,609,953
Grand Total	$326,397	$4,985,970	$72,831,303

*** in 2022 $**

The FSU CEFA study team estimated the total jobs created for the economic impact analysis of the 18 individual projects. Figure 1 displays the number of jobs created for the 18 projects. Due to the highest estimated total cost, the "Capital Circle SW" project is expected to generate the most jobs: 1,325. The numbers of direct, indirect, and induced jobs created are 821, 215, and 289 jobs, respectively. The project of "Florida A&M Entry Points" creates the least job positions due to the lowest construction cost and the project being more specific to a reduced footprint. As can be expected, for each project, with the exception of the "Alternative Sewer Solutions Study", projects with higher total construction costs typically create a greater number of temporary jobs.

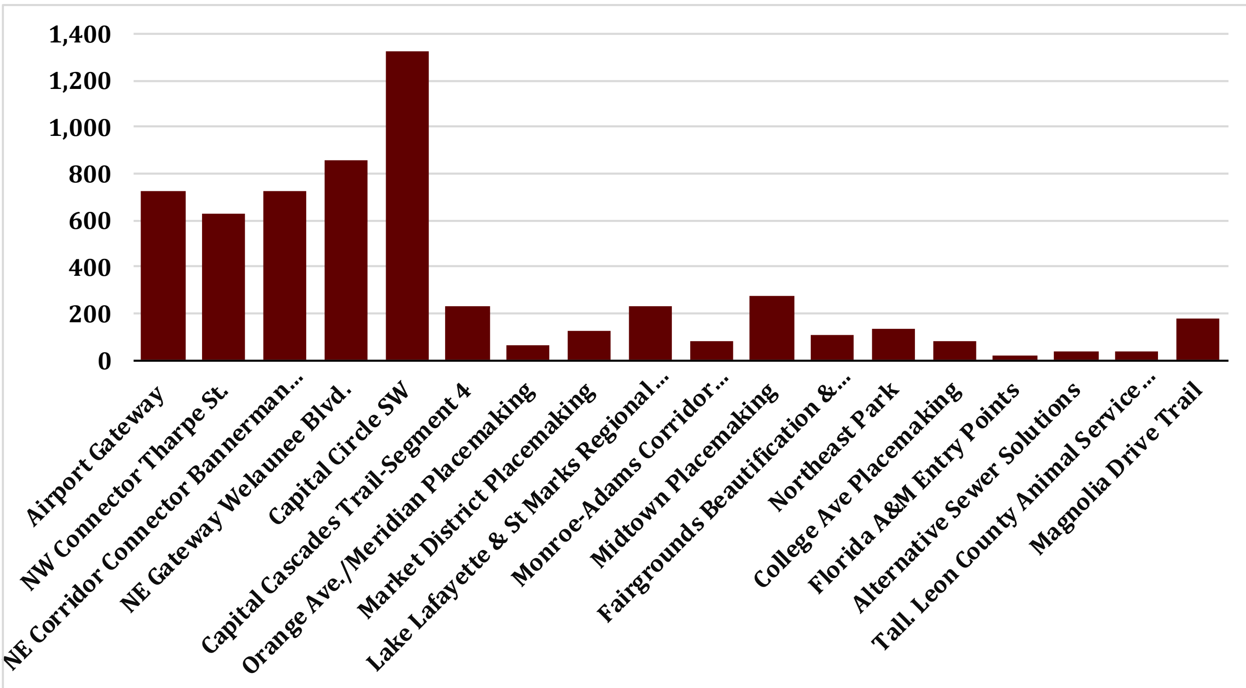

Figure 1. The Total Job Creation for Eighteen BIA Projects

Conclusions – Traffic Flow and Economic Impact Analysis

In 2022, the BIA commissioned the Florida State University Center for Economic Forecasting and Analysis (FSU CEFA) to conduct a traffic flow economic analysis for three projects, and an economic impact analysis of 18 BIA construction projects. This report represents the traffic flow economic analysis and economic impact results of all these 18 BIA projects' construction activities in the Tallahassee market area.

The FSU CEFA research team worked with the BIA team relating to the data collection effort. Data provided from previous traffic flow engineering studies comprised the lion's share of the data for each of the three projects. The construction cost, or input data for the economic impact analysis of the 18 projects were then categorized into primarily construction types of activities. Economic models were developed (using the input data) for each individual construction project activity, and generated the following economic impact results.

Economic Findings of the Three Traffic Flow Analyses by Project

Airport Gateway

The results of the analysis are presented earlier in the report. The team finds that the benefits to individual commuters from the new design will be minimal. At most, the time benefit to commuters using Route 1 (Stuckey Avenue) will gain $0.27 per trip in less delay time and $0.21 per trip in reduced vehicle costs. This translates to a maximum annual benefit per commuter of $98.84 in reduced delay time and $76.65 in maximum savings on maintenance costs per commuter. Total benefits from the new construction in Route 1 are not predicted to exceed $0.44 per commuter, per day, or $159 per commuter, per year. The results are similar for Route 2 (Pottsdamer Street bypass), with no more than $0.26 per trip in reduced delay time and $0.17 per trip in reduced maintenance per commuter, per day. This translates to $93.62 in annual reduction of delay time per commuter and $61.83 in reduced maintenance costs. Total benefits for Route 2 are not expected to exceed $0.41 per commuter, per day, or $150.61 per commuter, per year.

While the benefits to individual commuters are expected to be small, because of the number of commuters predicted to be using these routes the benefits to Tallahassee commuters overall may be substantial. In addition to calculating the benefits to each individual driver, the total benefits to all commuters expected to use the new routes in 2025 and 2045 were also calculated. The predicted total benefit in a year is between $495,399 and $765,148.88 for Route 1 in 2025 and between $425,393 and $657,023 for Route 1 in 2045. For Route 2, the predicted total benefit in a year is between $603,054 and $724,719 in 2025 and between $517,834 and $622,307 in 2045.

NE Connector – Bannerman Road Project

The research team found that the benefits to individual commuters from the new construction will be minimal. For Segment 1 (between North Meridian Road and Preservation Road), the team finds that individual commuters will save between \$0.09 and \$0.21 per trip in time benefits, or between \$23.11 and \$53.83 annually. Along Segment 2 (between Preservation Road and Tekesta Drive), the team finds that commuters will save between \$0.13 and \$0.34 per trip in in reduced maintenance cost and increased time benefits. Adding up the benefits to individual commuters over the total projected number of commuters on each segment, the team determined that the maximum total benefit for each segment per year for all commuters is \$56,526.19 for Segment 1 and \$128,529.39 for Segment 2.

Capital Circle SW Project

The research team found that the benefits to individual commuters from the new construction will be minimal. The team found the largest benefit for Segment 5, where individual commuters will save between \$0.15 and \$0.49 per trip in time benefits and reduced maintenance costs, or between \$38.64 and \$127.86 annually. Other segments are expected to have less benefits, with the smallest expected benefits going to Segment 2. Along this segment, commuters are expected to save between \$0.11 and \$0.34 per trip or \$28.26 to \$87.80 annually. Because of the high volumes of commuters that use CCSW daily, the aggregate benefits to all commuters are expected to be substantial. Adding the benefits to individual commuters over all commuters, the team expects the aggregate benefit to be the least from the widening of Segment 3, where annual benefits to all commuters are expected to be between \$28,523.23 and \$93,100.20. Commuters are expected to benefit the most from the widening of Segment 2 due to the high volumes of traffic that use this segment. Annual benefits to all commuters are expected to be between \$66,583.73 and \$215,705.04 along Segment 2.

Economic Impact Results of the 18 BIA Projects

As shown in Table 22, the projects generated total economic impacts of 5,865 jobs, over \$310 million in income or wages and over \$992 million in total economic output. The estimated state and local taxes generated are \$8,221,350. The total economic impacts of the 18 BIA projects are estimated to be a total of:

- 5,865 jobs;
- Over \$310 million in income (wages);
- Over \$992 million in total economic output (sales/revenues), and;
- State and local annual taxes generated are \$8,221,350.

Table 22. The Grand Total Direct, Indirect, and Induced Jobs Created Based on the Construction Activities Relating to the Eighteen BIA Projects

Grand Total Economic Measure	Economic Output (Sales/Revenues)	Employment or Jobs	Income or Wages
Airport Gateway	$125,586,297	723	$38,609,964
NW Connector Tharpe St.	$107,162,851	628	$33,418,334
NE Corridor Connector Bannerman Rd.	$119,533,037	727	$38,423,896
NE Gateway Welaunee Blvd.	$146,753,722	855	$45,569,299
Capital Circle SW	$220,743,280	1,325	$70,159,392
Capital Cascades Trail-Segment 4	$34,779,917	230	$11,899,671
Orange Ave./Meridian Placemaking	$13,125,410	62	$3,631,096
Market District Placemaking	$19,152,602	126	$6,552,910
Lake Lafayette & St Marks Regional Park	$35,543,309	234	$12,160,860
Monroe-Adams Corridor Placemaking	$14,573,441	83	$4,036,104
Midtown Placemaking	$48,605,705	275	$13,461,317
Fairgrounds Beautification & Improvement	$19,813,481	109	$5,331,466
Northeast Park	$20,867,950	137	$7,139,804
College Ave Placemaking	$14,100,375	83	$4,397,149
Florida A&M Entry Points	$3,265,383	18	$843,850
Alternative Sewer Solutions	$4,838,892	40	$2,474,629
Tall. Leon County Animal Service Center	$6,131,879	32	$1,536,675
Magnolia Drive Trail	$37,662,174	178	$10,419,102
Grand Total	**$992,239,705**	**5,865**	**$310,065,518**

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The Economic Impact of Home Building in a Typical Local Area - Income, Jobs, and Taxes Generated (2015), National Association of Home Builders (NAHB), Housing Policy Department.

Weisbrod, G. & Simmonds, D. (2011), Defining Economic Impact and Benefit Metrics from Multiple Perspectives: Lessons to Be Learned from Both Sides of the Atlantic, European Transport Conference, Glasgow.

Wikimedia Foundation. (2021). *Multi-attribute utility*. Wikipedia. Retrieved May 2022, from https://en.wikipedia.org/wiki/Multi-attribute_utility

Wikimedia Foundation. (2022). *Multiple-criteria decision analysis*. Wikipedia. Retrieved May 2022, from https://en.wikipedia.org/wiki/Multiple-criteria_decision_analysis

Wikimedia Foundation. (2021). *Weighted sum model*. Wikipedia. Retrieved May 16, 2022, from https://en.wikipedia.org/wiki/Weighted_sum_model

Appendix A: Literature Review – Traffic Flow Analysis

The economic costs of traffic delays and travel times have been studied for many years. Small (2012) reviews the different ways that travel time is valued in the economics literature and lays out future areas of research.[41] De Jong & Bliemer (2015) note that an important measure that is often omitted is the cost of travel unreliability.[42] As the current study does not have data on how travel times vary in the study area, the team cannot include this important measure in our analysis.

Traffic flow and travel time analyses are generally conducted to identify areas where infrastructure upgrades are needed and to examine the impacts of current upgrade plans. For recent examples of traffic flow and travel time analyses in Florida, see GOAL Associates (2014), [43] EP&R (2017)[44], and AECOM (2021).[45]

Travel Costs

Travel time is one of the highest transportation costs, and travel time savings are often a primary justification for transportation infrastructure improvements. Considering this, economic costs and benefits to consumers have been carefully considered in the transportation, urban planning, and economics literature. Various studies have developed estimates and comparisons of travel time values. For example, Small (2012) reviews the different ways that travel time is valued in the economics literature and lays out future areas of research. Fosgerau (2019) contributes to the transportation literature by exploring the fundamental principles of valuing travel time with an emphasis on in-vehicle productivity and congestion pricing. Meunier (2019) examines how these valuations might change with mobility patterns, while Goodwin (2019) explores how such valuations might change in light of behavioral choices. In a comprehensive economic cost-benefit analysis, Acampa et al. (2019) compare the values and methods for estimating the value of time, using Italy and the

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[41] Small, K. A. (2012). Valuation of travel time. *Economics of transportation*, *1*(1-2), 2-14.
[42] de Jong, G. C., & Bliemer, M. C. (2015). On including travel time reliability of road traffic in appraisal. *Transportation Research Part A: Policy and Practice*, *73*, 80-95.
[43] GOAL Associates (2014). *Traffic Study: Pedestrian Bridge Crossing over SW 8th Street/Tamiami Trail at SW 109th Avenue and Complete Street Improvements*. https://facilities.fiu.edu/projects/BT_904/Traffic_studies/FIU-UniversityCity-Traffic-Study.pdf
[44] EP&R (2017). *Rawson Lane Draft Design Traffic Technical Memorandum*. https://myescambia.com/docs/default-source/sharepoint-public-works/Transportation%20and%20Traffic/rawson-lane-draft-traffic-study.pdf?sfvrsn=fb18776d_2
[45] AECOM (2021). *US 1 Arterial Travel Time and Delay Study*. https://www.monroecounty-fl.gov/DocumentCenter/View/29910/2021ATTDS-wAppendix_2021-07-28?bidId=

United Kingdom as points of reference. According to Small (2012), areas for future research include studying the relationships between the transportation system and labor supply as a potential base for measuring the value of time, in addition to better understanding the effect of in-vehicle amenities and mobile communications devices on the value of time.

Travel Flow Reliability

In addition to travel costs, a significant benefit of improved traffic flow is reliability. Commuters and transporters can accurately predict the time that trips will take and plan accordingly. Unreliable travel time forces road users to plan for extra time to avoid late arrivals. Culotta et al. (2019) note that the value of the extra time road users plan to avoid late arrivals is generally greater than the average value of travel time. Given the difference, transportation and urban planners must incorporate the costs of unreliable travel in their analysis. "Assessing the Full Costs of Congestion on Surface Transportation Systems" (2009) provides an approach for estimating the costs of unreliability through developing a variability of travel time model. De Jong & Bliemer (2015) note that travel reliability has often been left out of traffic studies. With that being said, recent literature has increasingly focused on developing frameworks to assess and predict travel time reliability. For example, Appiah et al. (2021) quantify the factors influencing travel time reliability and investigate how to account for these factors in setting reliability targets and communicating progress. Additionally, Chen and Fan (2019) created a time series model, using vehicle data collected on roadways in Charlotte, North Carolina, to objectively predict time travel reliability under different days of week and weather conditions. The city of Tallahassee provided estimates of travel times for the Bannerman Road – Northeast Connector project, therefore these measurements were included in that analysis. However, for the Airport Gateway and Capital Circle SW projects, no estimates of travel time are available. Therefore, this measure was not included in those analyses.

Induced Demand Effects

A third important component to consider are the induced demand effects of infrastructure construction. When roadways become less congested following the construction of new infrastructure, this causes consumers to increase their usage of roadways, increasing congestion – often to the point where travel times return to where they were before the new construction. It is important to note that the size and significance of induced travel demand are likely to vary in different circumstances. According to the "Latest Evidence on Induced Travel Demand: An Evidence Review" (2018), induced demand is often most significant, following road infrastructure improvements, in urban areas and major road and highway networks.[46] Hymel (2019) examined the causal link between highway infrastructure improvement and volume of vehicle travel in United States urban areas. The author found that highway capacity expansion generated a proportional increase in vehicle travel, based on estimates from a dynamic panel model. The authors of the "Latest Evidence on Induced Travel Demand: An Evidence Review" (2018) suggested that further research should identify specific sources of induced traffic demand in the short or long run. These are important for transport appraisal, where induced road traffic may come from other modes or result from growth due to development associated with the transport investment.

Recent Examples

Traffic flow and travel time analyses are generally conducted to identify areas where infrastructure upgrades are needed and examine current upgrade plans' impacts. For recent examples of traffic flow and travel time analyses in Florida, see GOAL Associates (2014), EP&R (2017), and AECOM (2021). Because this study relies on estimates produced in the the engineering reports for each project, all the upstream assumptions in those reports apply to this one, as well.

[46] Latest evidence on induced travel demand: an empirical review. (2018). *Department for Transport,* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/762976/latest-evidence-on-induced-travel-demand-an-evidence-review.pdf

Appendix B: Literature Review – Economic Impact Analysis

The FSU CEFA project team examines the local economic impacts of 18 infrastructure investment projects of Blueprint 2020 program. There are two main topical areas discussed in the literature review. The first area discussed in the following literature review is relevant to the definition and types of infrastructure investment. The second area described in this literature review is related to the economics of infrastructure and investment.

The United Nations defines infrastructure as "*the system of public works in a country, state or region, including roads, utility lines and public buildings.*"[47] Some researchers define and interpret infrastructure based on its various impacts and incidence. For example, in Fourie (2006), the levels of infrastructure are identified as local, national, and transnational. Infrastructure emerges subject to market failures. Public works infrastructure investment can be divided into broad categories: economic infrastructure and social infrastructure, or into detailed categories, as infrastructure investment is part of the capital accumulation and referred to as capital goods, as opposed to consumption goods. Figure B1 describes how infrastructure is typically categorized. In the broad category, economic infrastructure promotes economic activity while social infrastructure promotes the quality of life, i.e. the health, education, and cultural standards of the population. In the detailed category, infrastructure can be divided into five groups: "Rural", "Urban", "Core", "Social", and "Land-Intensive".[48]

The 18 projects provided by the Blueprint 2020 program are at the regional or local level, as the purpose of this study considers the economic impacts associated with infrastructure investment in the Tallahassee market area. As described in the project highlights, "Beautification and Improvements to the Fairgrounds", "Lake Lafayette and St. Marks Regional Linear Park", "Northeast Park", and "Tallahassee-Leon Community Animal Service Center" can be identified as in the "Social Infrastructure" category. The five placemaking projects, which focus on community enhancement and the "Florida A&M Entry Points" project, can also be identified as in the "Social Infrastructure" category, as their purposes are

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[47] Handbook on Geographic Information Systems and Digital Mapping, Studies in Methods, Series F, No. 79, United Nations Department of Economic and Social Affairs, Statistics Division, New York, 2000, Annex VI - Glossary.
[48] See: http://nptel.ac.in/

to improve the sidewalks, crosswalks, lighting, and other living standards in residential, commercial, and university (educational) areas. The "Alternative Sewer Solution Study" is a project which includes a study to determine alternative methods of domestic wastewater treatment and disposal in the unincorporated areas. It is related to water supply, sanitation, and sewerage, but also concerns public health.[49]

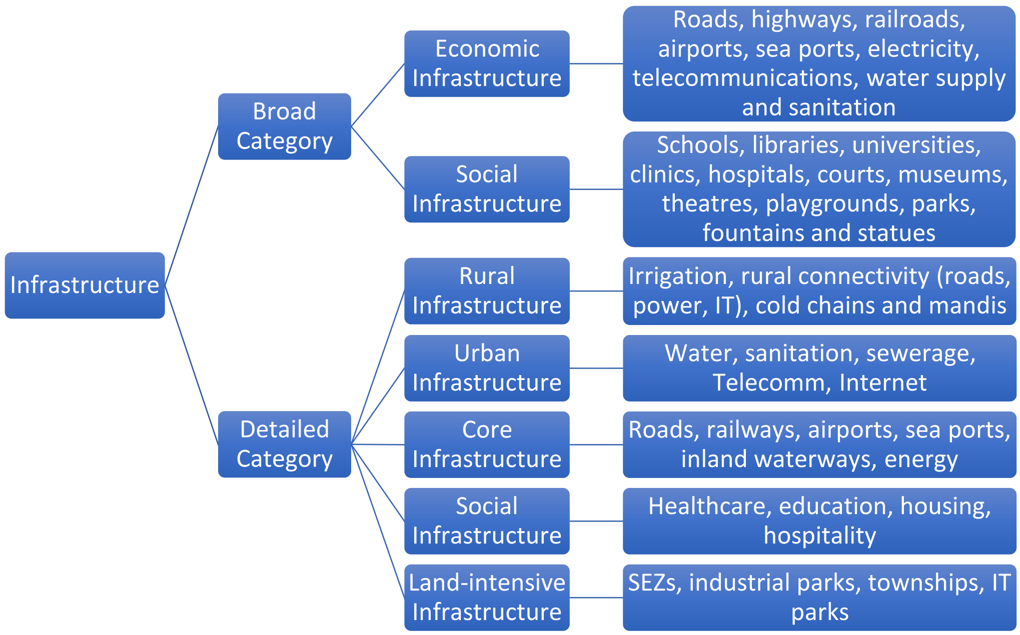

Figure B1. Standard Categorization of Infrastructure

The second subject area in the literature is related to the economics of infrastructure and investment. Infrastructure economics examines infrastructure from an economics perspective. Social infrastructure is the interdependent mix of facilities, places, spaces, programs, projects, services and networks that maintain and improve the standard of living and quality of life in a community. The representative literature concerning the economic impact analysis of social infrastructure includes: "Economic Benefits of Walkable and Bike Friendly Communities" (2013),[50] Bivens (2014), Fourie (2006), Fuller (2013), Perrine (2013), "The Economic Impact of Home Building in a Typical Local Area Income, Jobs, and

[49] The "Alternative Sewer Solution Study" is identified as in the "Social Infrastructure" category as well.
[50] Association of Pedestrian and Bicycle Professionals (APBP)

Taxes Generated (2015)",[51] and Schanzenbach, Nunn, and Nantz (2017). More recently, the literature has expanded through contributions from Glaeser, Poterba (2020),[52] Snelson & Collis (2021),[53] Kelsey & Kenny (2021),[54] and Gould-Werth & Abbott (2021).[55]

Economic Benefits of Walkable and Bike Friendly Communities (2013) reports the walking and cycling benefits category (economic value only). The improved active transport conditions and the walkable community design can be measured by improved local property values, project employment effects, and changes in household expenditures. Bivens (2014) estimates infrastructure investments' likely impact on overall economic activity, productivity, and the number and types of jobs, depending on how the investments are financed. Bivens indicates that infrastructure investments solve several pressing challenges in the U.S: how to simulate the short-run depressed labor market and how to provide satisfactory living standards growth for the vast majority of people in the long-run. The author also states that based on the building (residential and commercial, or private and publicly-owned) efficiency, the publicly owned buildings are the first place to start an infrastructure investment effort, which provides evidence to support the selection of commercial factors as criterion when ranking multiple projects. Fuller (2013) uses the investment amounts, jobs created directly and indirectly, and expenditures on housing, food, transportation, utilities, fuels and public services, apparels and services, and entertainment as indicators. Perrine (2013) presents that social infrastructure investment can assist economic development by providing opportunities for local ownership, entrepreneurship, employment and for partnerships and increase capacity to attract further investment. Snelson & Collis (2021) estimate the relationships between social infrastructure development and economic outcomes, conduct a return-on-investment analysis from an illustrative social infrastructure investment, and identify areas for further research.

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[51] National Association of Home Builders (NAHB)

[52] Glaeser, E. L., & Poterba, J. M. (2020). Economic Analysis and Infrastructure Investment. In *MIT Economics*. Massachusetts Institute of Technology. https://economics.mit.edu/files/20919

[53] Snelson, S., & Collis, J. (2021). The Impacts of Social Infrastructure Investment. In *Local Trust*. Frontier Economics. https://localtrust.org.uk/wp-content/uploads/2021/07/Frontier-Economics_the-impacts-of-social-infrastructure-investment.pdf

[54] Kelsey, T., & Kenny, M. (2021). *Townscapes 7. The Value of Social Infrastructure.* Bennett Institute for Public Policy. https://www.bennettinstitute.cam.ac.uk/wp-content/uploads/2020/12/Townscapes_The_value_of_infrastructure.pdf

[55] Gould-Werth, A. (2021, September 16). *Congressional investments in social infrastructure would support immediate and long-term U.S. economic growth*. Washington Center for Equitable Growth. https://equitablegrowth.org/congressional-investments-in-social-infrastructure-would-support-immediate-and-long-term-u-s-economic-growth/

According to the authors, further research should focus on investigating the effectiveness of social infrastructure development in different localized conditions and better understanding associated policy interdependencies to inform broader social infrastructure investments. Kelsey & Kenny (2021) study the economic value of social infrastructure, with an emphasis on its impact on the vitality of downtown areas, employment rates, and human capital accumulation. The authors conclude by providing key policy recommendations to create a more robust and evidentially informed understanding, within the central government, of the value of improved and restored social infrastructure. Gould-Werth & Abbott (2021) present an analysis of the impact of congressional investments in social infrastructure on short-term and long-term economic growth. The authors studied key programs and areas considered in the 2022 FY budget reconciliation process: care infrastructure, paid family and medical leave, early care, education, and income support.

The measurement of criteria in this study shares the features in Fourie (2006), and Schanzenbach, Nunn, and Nantz (2017). Fourie (2006) states two approaches to assessing the economic impacts: the micro-economic benefit cost analysis measured in net present value (NPV) and the theory of clubs. Benefits (or negative costs) are classified as internal and external, direct and indirect, tangible and intangible, expected and unexpected. However, not all returns are measurable. There is a distorted rate of return and difficulty in measuring externalities by benefit-cost analyses. The theory of clubs divides people into two or more groups, enjoying its own public goods but not the other's. This approach is usually pronounced in the field of utilities and infrastructure for pricing and assessing the optimal level. Schanzenbach, Nunn, and Nantz (2017) provide an economic framework for evaluation of infrastructure investments and their methods of funding and finance, which are applied to analyze and assess the gap between insufficient American infrastructure investment and the demand for additional spending to maintain and expand. Problems faced include infrastructure aging, infrastructure benefit and positive externality, which project should be undertaken by the public sector, and how the projects should be financed. Glaeser & Poterba (2020) expand on the research by describing the conditions that characterize an optimal infrastructure investment program. The authors emphasize the necessity of extending project-based microeconomic cost-benefit analysis to incorporate the value of economy-wide macroeconomic and other externalities. They also identify procurement, project management, and expenditure on externality mitigation, where further research could identify paths to efficiency improvement. A guide to the economics of infrastructure investment is provided – an economic impact analysis remains a very broad concept until the following questions can be answered to make it more specific:

- Why should we invest in infrastructure?
- What projects should be selected?
- Who should decide?
- How should infrastructure investment be paid for?

Table B2 summarizes the structure of the guide to the economics of infrastructure investment in Schanzenbach, Nunn, and Nantz (2017). The study conducted by FSU CEFA responds to the following first two questions by explaining the required specific factors in the guide.[56]

Table B2. The Structure of the Guide to the Economics of Infrastructure Investment in Schanzenbach, Nunn, and Nantz (2017)

Questions	Factors	Example Factors
Why should we invest in infrastructure?	• Productivity growth has diminished and interest rates have fallen • Infrastructure deficits have become large	▪ The magnitude of the economic returns to successful projects ▪ The share of spending that goes to less productivity projects ▪ Depreciation rate ▪ The share of spending that simply replaces previously planned by government ▪ The Fed. interest on borrowing ▪ The stimulus effects on the economy
What projects should be selected?	• A role of government • Benefits exceed costs	▪ Benefits including housing, transportation, health benefits ▪ Costs including costs to repair and maintain, and time span
Who should decide?	• A given level of government • Insulate decisions from political pressure where possible	▪ Local and/or state government
How should infrastructure investment be paid for?	• Implement user fees • Tax • Government debt • Public-Private Partnerships (PPPs)	

[56] In summary, the four economic indicators selected for evaluating the investments in economic development are investment cost (time adjusted), project employment, change in local average property values, and change in local commercial property values.

Appendix C: Detailed Results of Traffic Analysis

This appendix contains tables that provide more details of the results of the traffic analyses.

For each project, expected future commute times were developed based on the effects construction would have on commuters. For Bannerman Road, the primary effect is the reduced commute distances in the Innovation Hub area. For Bannerman Road and Capital Circle SW, the primary effect is the improved level of service of the segments under consideration. Based on differences between the expected commute times between the Build and No Build scenarios, the team calculated the expected benefits stemming from reduced maintenance costs and from reduced time spent commuting Maintenance costs are calculated by the Bureau of Transportation Statistics[57] and time is valued at the median wage for the Tallahassee area, $17.45 per hour. Tables C1 through C6 show the maintenance and time costs calculated for each project.

[57] Bureau of Transportation Statistics (2021). "Average Cost of Owning and Operating an Automobile." https://www.bts.gov/content/average-cost-owning-and-operating-automobilea-assuming-15000-vehicle-miles-year.

Table C1. Airport Gateway Time Benefits for Commuters – Route 1 (Stuckey Avenue) and Route 2 (Pottsdamer Bypass)

Time Benefits for Commuters				
Route 1 (Stuckey Avenue)				
7 Second Signal Delay				
	Average Speed			
	25 mph	30 mph	35 mph	40 mph
Average daily benefit per commuter	$0.20	$0.17	$0.16	$0.14
Average annual benefit per commuter	$72.30	$63.35	$56.95	$52.15
12 Second Signal Delay				
	Average Speed			
	25 mph	30 mph	35 mph	40 mph
Average daily benefit per commuter	$0.23	$0.21	$0.19	$0.18
Average annual benefit per commuter	$85.57	$76.62	$70.22	$65.43
17 Second Signal Delay				
	Average Speed			
	25 mph	30 mph	35 mph	40 mph
Average daily benefit per commuter	$0.27	$0.25	$0.23	$0.22
Average annual benefit per commuter	$98.84	$89.89	$83.49	$78.70

Route 2 (Pottsdamer Bypass)				
	Average Speed			
	25 mph	30 mph	35 mph	40 mph
Average daily benefit per commuter	$0.26	$0.22	$0.19	$0.17
Average annual benefit per commuter	$93.62	$80.23	$70.66	$63.49

Table C2. Airport Gateway Maintenance Benefits for Commuters

Maintenance Benefits for Commuters				
Route 1 (Stuckey Avenue)				
7 Second Signal Delay				
	Average Speed			
	25 mph	30 mph	35 mph	40 mph
Average daily benefit per commuter	$0.12	$0.13	$0.13	$0.14
Average annual benefit per commuter	$44.01	$46.27	$48.53	$50.80
12 Second Signal Delay				
	Average Speed			
	25 mph	30 mph	35 mph	40 mph
Average daily benefit per commuter	$0.14	$0.15	$0.16	$0.17
Average annual benefit per commuter	$52.09	$55.97	$59.84	$63.72
17 Second Signal Delay				
	Average Speed			
	25 mph	30 mph	35 mph	40 mph
Average daily benefit per commuter	$0.16	$0.18	$0.19	$0.21
Average annual benefit per commuter	$60.17	$65.66	$71.15	$76.65
Route 2 (Pottsdamer Bypass)				
	Average Speed			
	25 mph	30 mph	35 mph	40 mph
Average daily benefit per commuter	$0.16	$0.16	$0.16	$0.17
Average annual benefit per commuter	$56.99	$58.60	$60.22	$61.83

Table C3. Bannerman Rd. Time Benefits for Commuters

Time Benefits for Commuters			
Segment 1			
	Difference in Average Speed		
	15 mph	10 mph	5 mph
Average daily benefit per commuter	$0.09	$0.14	$0.21
Average annual benefit per commuter	$23.11	$37.30	$53.83
Segment 2			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
Average daily benefit per commuter	$0.10	$0.18	$0.26
Average annual benefit per commuter	$26.86	$45.79	$66.80

Table C4. Bannerman Rd. Maintenance Benefits for Commuters

Maintenance Benefits for Commuters			
	Difference in Average Signal Delay		
	15 sec	10 sec	5 sec
Average daily benefit per commuter	$0.08	$0.06	$0.03
Average annual benefit per commuter	$20.93	$15.11	$8.13
Note: The only expected difference in maintenance costs comes from the difference in the expected delay at two signalized intersections in Segment 2 between the build and the no-build scenario.			

Table C5. CCSW Time Benefits for Commuters

Time Benefits for Commuters			
Segment 1			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	**10 mph, 10 second delay**	**5 mph, 5 second delay**
Average daily benefit per commuter	$0.33	$0.20	$0.09
Average annual benefit per commuter	$86.97	$52.31	$23.95
Segment 2			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	**10 mph, 10 second delay**	**5 mph, 5 second delay**
Average daily benefit per commuter	$0.24	$0.15	$0.07
Average annual benefit per commuter	$63.63	$38.69	$17.90
Segment 3			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	**10 mph, 10 second delay**	**5 mph, 5 second delay**
Average daily benefit per commuter	$0.36	$0.21	$0.10
Average annual benefit per commuter	$92.41	$55.48	$25.36
Segment 4			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	**10 mph, 10 second delay**	**5 mph, 5 second delay**
Average daily benefit per commuter	$0.30	$0.18	$0.08
Average annual benefit per commuter	$76.86	$46.41	$21.33
Segment 5			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
Average daily benefit per commuter	$0.40	$0.24	$0.11
Average annual benefit per commuter	$103.69	$62.06	$28.28

Table C6. CCSW Maintenance Benefits for Commuters

Maintenance Benefits for Commuters			
	Difference in Average Speed and Average Signal Delay		
	15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
Average daily benefit per commuter, per segment	$0.09	$0.07	$0.04
Average annual benefit per commuter, per segment	$24.17	$18.41	$10.36

Note: Differences in maintenance cost come from idle time at signalized intersections. Because each segment has the same number of signalized intersections, maintenance costs are expected to differ by approximately the same amount for each segment.

Appendix D: Present Discounted Value of Traffic Analysis Results

This section provides an estimate of the cumulative benefit to commuters of the three traffic analysis projects. The general procedure for this estimation is the same for each project, with a few minor differences. The engineering reports for each project only contain traffic estimates for specific years, typically the opening year and the design year. However, the benefits of each project are not confined to only those years, but instead are expected to accrue across the life of the project. To limit this report to only the more relevant results, the net present values are calculated of the total benefits to all commuters.

The first step in the analysis is to estimate the benefit of each project in the years between the project's completion and an appropriate date in the future. To do this, the team used a linear growth rate between years. The team chose to only calculate benefits up to year 2045 because the assumption of a linear growth rate in benefits likely becomes less accurate further into the future as traffic growth becomes less predictable. Next, the team discounted the expected benefits for each year using a three percent discount rate per year. Discounting is necessary to accurately compare benefits that arrive in the distant future to current costs. One way to view discounted benefits is as an estimate of how much money a typical person would be willing to invest today to be guaranteed to receive the benefit in the year it arrives. The formula used for discounting each annual benefit is:

$$D_t = \frac{B_t}{1.03^{t-t_0}}$$

where t is the year in which the benefit arrives, t_0 is the current year (2022), B_t is the raw benefit in year t and D_t is the discounted benefit. The final step in the calculation is to sum the discounted amounts. The following Figure is the present discounted value of the project.

Airport Gateway

Given the Airport Gateway project uses several combinations of expected average speeds and signal delays, the team selected three representative combinations to use in present discounted value calculations: 40 mph/7 sec delay, 35 mph/12 sec delay, and 30 mph/17 sec delay. Table D1 contains the results of this analysis.

Table D1: Net Present Value of Annual Benefits, Airport Gateway

Net Present Value of Annual Benefits, Airport Gateway		
Route 1: Stuckey Avenue		
Average Travel Speed and Signal Delay		
40 mph/7 sec	35 mph/12 sec	30 mph/17 sec
$6,744,398	**$8,520,711**	**$10,190,082**
Route 2: Pottsdamer Bypass		
Average Travel Speed		
40 mph	35 mph	30 mph
$8,210,012	**$8,574,142**	**$9,094,929**

NE Connector - Bannerman Road

The Bannerman Road project has the most straightforward benefits calculation. The only difference in methodology comes from the fact that there are three years of traffic estimates in the engineering report: 2025, 2035, and 2045. Therefore, the team needed to calculate two linear growth trends for this project, one for 2025 – 2035 and one for 2035 – 2045. Table D2 presents the results of this analysis.

Table D2: Net Present Value of Annual Benefits, Bannerman Road

Net Present Value of Annual Benefits, Bannerman Road		
Segment 1: Meridian Road/Preservation Road		
Difference in Average Travel Speed		
15 mph	10 mph	5 mph
$671,962	**$465,577**	**$288,412**
Segment 2: Preservation Road/Tekesta Drive		
Difference in Average Travel Speed and Signal Delay		
15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
$1,497,883	**$1,039,657**	**$597,340**

Capital Circle Southwest

The engineering report for Capital Circle SW was produced in 2010, and therefore the completion date of this project was not in the report. Using information from personal correspondence with Clay Hunter, PE, the team uses a completion date of 2027 for Segments 1 – 4. Segment 5 has no estimated completion date as it is not part of FDOT's 5-year plan. However, this project is expected to take approximately 1,000 days to complete (2 ¾ years). Assuming the project begins immediately after Segments 1 – 4 are completed, the team estimates Segment 5 will be completed in 2030. The results of this analysis are in Table D3.

Table D3: Net Present Value of Annual Benefits, Capital Circle SW

Net Present Value of Annual Benefits, Capital Circle SW		
Segment 1: Tennessee St./Blountstown Hwy.		
Difference in Average Travel Speed and Signal Delay		
15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
$2,989,946	**$1,902,629**	**$922,935**
Segment 2: Blountstown Hwy./Orange Ave.		
Difference in Average Travel Speed and Signal Delay		
15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
$2,123,133	**$1,380,952**	**$683,255**
Segment 3: Orange Ave./Airport		
Difference in Average Travel Speed and Signal Delay		
15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
$1,310,159	**$830,466**	**$401,395**
Segment 4: Airport/Springhill Rd.		
Difference in Average Travel Speed and Signal Delay		
15 mph, 15 second delay	10 mph, 10 second delay	5 mph, 5 second delay
$1,349,640	**$865,994**	**$423,282**
Note: The completion time for Segment 5 (Springhill Rd to Crawfordville Rd) is not set, therefore, the completion date is estimated by the team to be in year 2030.		