TRAFFIC ANALYSIS METHODOLOGY REPORT

Northeast Gateway: Welaunee Boulevard
Project Development and Environment Study

From Fleischmann Road to Centerville Road at Shamrock Street

Leon County, Florida

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Prepared For:

BLUEPRINT INTERGOVERNMENTAL AGENCY

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INTRODUCTION

The purpose of this Traffic Analysis Methodology Report (TAMR) is to outline the project limits, assumptions, and methodologies that will be employed in the development of the Project Traffic Analysis Report (PTAR) for the Northeast Gateway: Welaunee Boulevard Project Development and Environment (PD&E) Study in Leon County, Florida. The PTAR for the Northeast Gateway: Welaunee Boulevard (hereinafter, referred to as “Northeast Gateway”) will serve to detail traffic characteristics in and around the PD&E study area in relation to the operational performance and the safety of the existing roadway network. An evaluation of existing and future traffic operations, both with and without the proposed Northeast Gateway, will be developed based on the assumptions and methodologies established in this TAMR.

Project Description

The objective of the Northeast Gateway: Welaunee Boulevard PD&E Study is to evaluate extending Welaunee Boulevard approximately 5-miles from Fleischmann Road, over I-10 to Centerville Road at Shamrock Street along with consideration of side street connections and an extension of the Miccosukee Greenway. A potential interchange at the crossing of Interstate 10 (I-10) may be evaluated in a future Interchange Justification Report and separate PD&E study, however is not within the scope of services for this study. The proposed typical section for this project is a four-lane, divided, arterial roadway, inclusive of sidewalks and multi-use trails. This typical section will be modified as necessary throughout the PD&E process to reflect study analyses and findings.

The project includes a new Welaunee Greenway that would connect with the Miccosukee Canopy Road Greenway and cross I-10 on a proposed pedestrian/bicycle bridge, which is included in the local government land use and transportation plans. With the exception of a portion of the Welaunee Greenway, the project is located inside the Urban Services Area on lands planned for urban development since 1990.

Community benefits from the Northeast Gateway: Welaunee Boulevard include, but are not limited to, those listed below.

- The Northeast Gateway will relieve congestion and potentially avoid costs for upgrades at Thomasville Road and U.S. 90.
- The Northeast Gateway will relieve congestion on Miccosukee Road and Centerville Road, two scenic and protected canopy roads.
- The mixed-use centers throughout the 7,000-acre Welaunee Critical Planning Area will become additional magnets for economic development.
- The Welaunee Greenway, with an iconic footbridge across I-10 and connected to the Miccosukee Canopy Road Greenway, will ultimately create a 17-mile trail loop.

The project location map is shown in Figure 1.
Figure 1. Project Location Map
TRAFFIC ANALYSIS OBJECTIVE

The purpose of the traffic analysis is to evaluate existing and future traffic operations on the roadway network adjacent to the PD&E study area as well as to analyze the anticipated future performance of the roadway network with and without the proposed Northeast Gateway. In addition, the traffic analysis serves to ensure that the future roadway network will provide sufficient capacity for the safe and efficient movement of traffic through the design year.

TRAFFIC ANALYSIS ASSUMPTIONS

Study Area

The proposed Northeast Gateway that will be analyzed in this study begins at the intersection of Welaunee Boulevard and Fleischmann Road and extends approximately 5-miles to the intersection of Centerville Road and Shamrock Street. The roadway network in and around the study area that will be analyzed as part of the traffic analysis includes five (5) segments, three (3) signalized intersections, and two (2) unsignalized intersections. The study area segments and intersections are listed below.

Study Area Segments:

- Northeast Gateway from Fleischmann Road to Centerville Road
- Welaunee Boulevard from Capital Circle NE to Fleischmann Road
- Fleischmann Road from Miccosukee Road to Centerville Road
- Centerville Road from Welaunee Boulevard to Shamrock Street
- Miccosukee Road from Capital Circle NE to Thornton Road

Study Area Intersections:

- Welaunee Boulevard and Fleischmann Road (Signalized)
- Welaunee Boulevard and Centerville Road (Signalized)
- Centerville Road and Capital Circle NE (Signalized)
- Centerville Road and Shamrock Street (Unsignalized)
- Miccosukee Road and Thornton Road (Unsignalized)

Analysis Years

The existing year for the traffic analysis in this study will be 2018, consistent with the data collection efforts. This PD&E study is anticipated to be complete in June 2020, after which the design and construction phases will occur. Therefore, the opening year analyzed in this study will be 2025 to allow adequate time for phases of the project to be completed. Traffic conditions will be evaluated over a 20-year horizon, with a design year of 2045.

Analysis Periods

Daily, AM peak, and PM peak traffic conditions of the roadway network will be evaluated for the analysis years listed above. The data collected will be adjusted as necessary to reflect any seasonal variations in traffic.
Project Alternatives

The opening year and design year operational analyses for this study will include an evaluation of a no-build alternative and a build alternative on the roadway network. The no-build alternative will reflect the existing roadway network without modifications while the build alternative will reflect the future roadway network with the addition of the Northeast Gateway. Transportation Systems Management and Operation (TSM&O) strategies will be taken into consideration and evaluated as an alternative throughout the study as well.

TRAFFIC ANALYSIS TOOLS

The operational performance of the study area segments and intersection will be analyzed according to methodologies provided in the Highway Capacity Manual, 6th Edition (HCM).

For the study area segments and intersections, daily and peak hour traffic volumes will be evaluated using Synchro 10 software.

DATA COLLECTION

To quantify the existing traffic volumes on the roadway network in and around the study area, segment volumes, vehicle classifications counts, and intersection turning movement counts (TMCs) will be collected.

72-hour bi-directional traffic counts will be collected along the segments listed below.

- Capital Circle NE – South of Welaunee Boulevard
- Welaunee Boulevard – North of Centerville Road
- Fleischmann Road – North of Welaunee Boulevard
- Centerville Road – North of Fleischmann Road
- Miccosukee Road – South of Thornton Road

Vehicle classification counts will also be collected along the following segments to quantify the volume of passenger vehicles and heavy vehicles.

- Capital Circle NE – North of Welaunee Boulevard
- Welaunee Boulevard – South of Centerville Road
- Welaunee Boulevard – North of Centerville Road
- Centerville Road – South of Shamrock Street
- Miccosukee Road – North of Fleischmann Road

12-hour TMCs will be collected at the three (3) signalized and two (2) unsignalized intersections. TMCs will include pedestrian, bicycle, and FHWA Vehicle Class 4 or higher banked and reported separately. Queue length data will also be collected at all five (5) intersections during the 15-minute period with the highest volume in the AM, midday, and PM peak hours. Data will be collected for the intersections listed below.

- Welaunee Boulevard and Fleischmann Road (Signalized)
- Welaunee Boulevard and Centerville Road (Signalized)
- Centerville Road and Capital Circle NE (Signalized)
TRAFFIC FORECASTING

The existing traffic volumes on the roadway network will be forecasted according to an annual growth rate to evaluate the operational performance of the roadway facilities in Opening Year 2025 and Design Year 2045. The annual growth rate will be estimated based on historical traffic growth within the study area, Leon County population projections, and consideration of the local travel demand model forecasts. Opening and design year volumes for the no-build and the feasible build alternatives will be developed in accordance with Project Traffic Forecasting Procedure Topic No. 525-030-120.

Due to the introduction of a new roadway facility, future traffic forecasting will include a redistribution of traffic along the roadway network. The methodology that will be employed for redistributing and reassigning future traffic volumes will be developed in conjunction with performing the traffic analysis.

Historical Traffic Growth

Traffic volumes along the roadway network within the study area have fluctuated over the past ten (10) years based on data collected from FDOT’s Florida Traffic Online web application. Seven (7) FDOT stations located in and around the study area were evaluated to determine growth within the study area. The average compound annual growth rate for the stations reviewed from 2012 to 2017 was 1.05%. Historical AADT data available from 2012 to 2017 along the study area roadway network is shown in Figure 2.
Figure 2. Study Area Roadway Network Historical AADT
Leon County Population Projections

The University of Florida’s Bureau of Economic and Business Research (BEBR) publishes population projections for each county in the state of Florida for five-year increments from 2020 to 2045. Population projections are published as a low estimate, medium estimate, and high estimate. The Leon County population growth estimates from the 2018 BEBR publication are summarized in Table 1.

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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2025</td>
<td>285,200</td>
<td>-0.12%</td>
<td>287,100</td>
<td>-0.02%</td>
<td>287,100</td>
<td>-0.02%</td>
<td>285,000</td>
<td>-0.04%</td>
<td>282,400</td>
<td>-0.07%</td>
<td></td>
</tr>
<tr>
<td>2030</td>
<td>309,900</td>
<td>0.92%</td>
<td>320,900</td>
<td>0.84%</td>
<td>330,000</td>
<td>0.76%</td>
<td>337,300</td>
<td>0.69%</td>
<td>344,100</td>
<td>0.64%</td>
<td></td>
</tr>
<tr>
<td>2035</td>
<td>333,300</td>
<td>1.85%</td>
<td>354,900</td>
<td>1.62%</td>
<td>374,600</td>
<td>1.47%</td>
<td>392,900</td>
<td>1.36%</td>
<td>411,400</td>
<td>1.28%</td>
<td></td>
</tr>
</tbody>
</table>

Travel Demand Model

In June 2015, a Welaunee Boulevard and I-10 Interchange Project Programming and Preliminary Concept Development project was conducted for the City of Tallahassee. As part of this project, the Capital Region Transportation Planning Agency (CRTPA) 2007 Model was used to model and test different land use and network scenarios, including the impacts of a proposed extension of Welaunee Boulevard and interchange with I-10. Through continued coordination with CRTPA, a subarea validation update will be made based on this previous project to evaluate growth along the roadway network. Subarea validation will include updating the ZData to reflect current and planned developments in and around the project area.

MEASURES OF EFFECTIVENESS

Level of Service

The primary measure of effectiveness for the traffic analysis portion of this PD&E study will be level of service (LOS). LOS will be utilized to determine how effective the proposed corridor will be in alleviating traffic along adjacent facilities within the study area roadway network. In addition, volume to capacity (v/c) ratios and control delay will be evaluated to measure performance of the study area roadway network.

For segment analyses, LOS will be determined for daily and directional design hour traffic volumes for existing and future traffic conditions using LOS service volumes provided in the 2013 FDOT Q/LOS Handbook.

For the intersection analyses, LOS will be determined using Synchro 10 software for AM and PM peak hour traffic volumes for existing and future traffic conditions based on intersection LOS criteria established in the HCM. LOS is defined by control delay for both signalized and unsignalized intersections.

The LOS criteria for signalized intersections is summarized in Table 2.
Table 2. Signalized Intersection LOS Thresholds (HCM 2010)

<table>
<thead>
<tr>
<th>Intersection Average Control Delay per Vehicle (sec)</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 10</td>
<td>A</td>
</tr>
<tr>
<td>&gt; 10 and ≤ 20</td>
<td>B</td>
</tr>
<tr>
<td>&gt; 20 and ≤ 35</td>
<td>C</td>
</tr>
<tr>
<td>&gt; 35 and ≤ 55</td>
<td>D</td>
</tr>
<tr>
<td>&gt; 55 and ≤ 80</td>
<td>E</td>
</tr>
<tr>
<td>&gt; 80 or if V/C ≥ 1.0</td>
<td>F</td>
</tr>
</tbody>
</table>

Note: For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

The LOS criteria for unsignalized intersections differs from the criteria for signalized intersections, primarily because user perceptions differ among transportation facility types. This criteria for unsignalized intersections is summarized in Table 3.

Table 3. Unsignalized Intersection LOS Thresholds (HCM 2010)

<table>
<thead>
<tr>
<th>Intersection Average Control Delay per Vehicle (sec)</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 10</td>
<td>A</td>
</tr>
<tr>
<td>&gt; 10 and ≤ 15</td>
<td>B</td>
</tr>
<tr>
<td>&gt; 15 and ≤ 25</td>
<td>C</td>
</tr>
<tr>
<td>&gt; 25 and ≤ 30</td>
<td>D</td>
</tr>
<tr>
<td>&gt; 35 and ≤ 50</td>
<td>E</td>
</tr>
<tr>
<td>&gt; 50 or if V/C ≥ 1.0</td>
<td>F</td>
</tr>
</tbody>
</table>

Note: For approach-based and intersection-wide assessments, LOS is defined solely by control delay.

Travel Time

A secondary measure of effectiveness for study area segments will be travel time, which is the time it takes to traverse a segment with a defined start and end point. Travel time will be evaluated utilizing Synchro 10 for segments within the study area roadway network for Existing Year 2018, Opening Year 2025, and Design Year 2045.

Queue Length

A secondary measure of effectiveness for study area intersections will be queue length, which is the distance between the stop line of an intersection and the back of queue, often expressed as number of vehicles. Queue lengths will be evaluated utilizing Synchro 10 for intersections within the study area roadway network for Existing Year 2018, Opening Year 2025, and Design Year 2045.
SAFETY ANALYSIS

Detailed crash data within the study area will be analyzed and documented in the PTAR as part of this study. Crash reports from 2013 to 2017 will be acquired from FDOT’s Crash Analysis Reporting System (CARS) and reviewed to determine any crash trends or patterns within the study area. Since 2018 crash data is not yet available in the CARS database, crash data from 2018 will be obtained from the University of Florida’s Signal Four Analytics to supplement the CARS data and identify continued crash trends or patterns within the study area. Any anticipated changes in crash trends or patterns that result from introducing the proposed facility to the roadway network will be documented in the PTAR.

DOCUMENTATION

The results of the traffic and safety analyses conducted for the Northeast Gateway: Welaunee Boulevard PD&E Study will be documented in the PTAR. The PTAR will summarize the results of the safety analysis and the traffic analyses for the study area roadway network under conditions for Existing Year 2018, Opening Year 2025, and Design Year 2045. All raw data and supporting information utilized in performing the analyses will be included within the appendix of the PTAR.