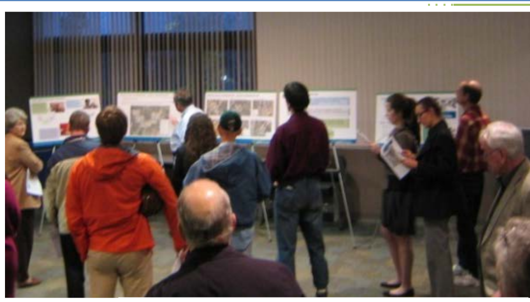
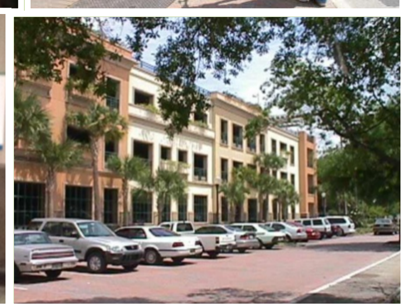
GO ENHANCE RTS STUDY
DETAILED DEFINITION/EVALUATION OF ALTERNATIVES REPORT





June, 2014

Revised

DETAILED DEFINITION/EVALUATION OF ALTERNATIVES REPORT

Prepared for:

RTS/City of Gainesville

Prepared by:

Parsons Brinckerhoff, Inc.

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Table of Contents

List of Figures

List of Tables

1.0 OVERVIEW

1.1 Purpose of the Report

The goal of the *GO Enhance RTS Study* is to determine whether a premium transit improvement should be pursued in a designated east-west corridor serving the City of Gainesville and Alachua County through a detailed evaluation of No-Build, Build and Transportation Systems Management (TSM) alternatives. The Build alternatives reflect a refined set of routing alternatives (Corridor A and B) that came out of a Tier 1 and 2 screening process. This report documents the data and methods used to evaluate the alternatives in support of a Locally Preferred Alternative (LPA). This detailed evaluation of alternatives is a critical part of the alternatives analysis process and of the environmental documentation phase and relates to the community's goals and objectives for the project.

This report details the operating plan, transit priority analysis, running-way plans, station location and concepts, capital and operating cost estimates, ridership projections, environmental screening, market and development potential, overall corridor evaluation, and potential funding sources that were used as a base for developing the draft recommended LPA. The approach used for the analysis was consistent with Federal Transit Administration (FTA) guidance, including their *Procedures and Technical Methods for Transit Project Planning* (1986, updated June 2007).

- The operating plan presents the future operating conditions for the proposed No-Build, TSM and Build alternatives. The latter two would provide enhanced public transit service for existing travel markets as well as emerging areas.

- The assessment of transit priority needs and opportunities along the Build alternatives was conducted for both existing and 2035 weekday peak hour conditions.

- The running-way and station concept plans visually illustrate the basic running-way and station components to support the development of conceptual-level capital cost estimates and an initial screening of potential environmental impacts. Operating cost estimates for the TSM and Build alternatives were based on the assumed operating plan and a derived Operations & Maintenance Cost Model. For the purposes of comparing the TSM and Build alternatives, capital costs were identified in existing dollars following the FTA Standardized Cost Categories (SCC).

- The travel demand forecasting efforts were conducted via the Metropolitan Transportation Planning Organization (MTPO) Regional Travel Demand Model and yield future (2035) ridership estimates.

- Readily available geospatial data from federal, state, regional and local agencies was used to conduct the environmental screening.

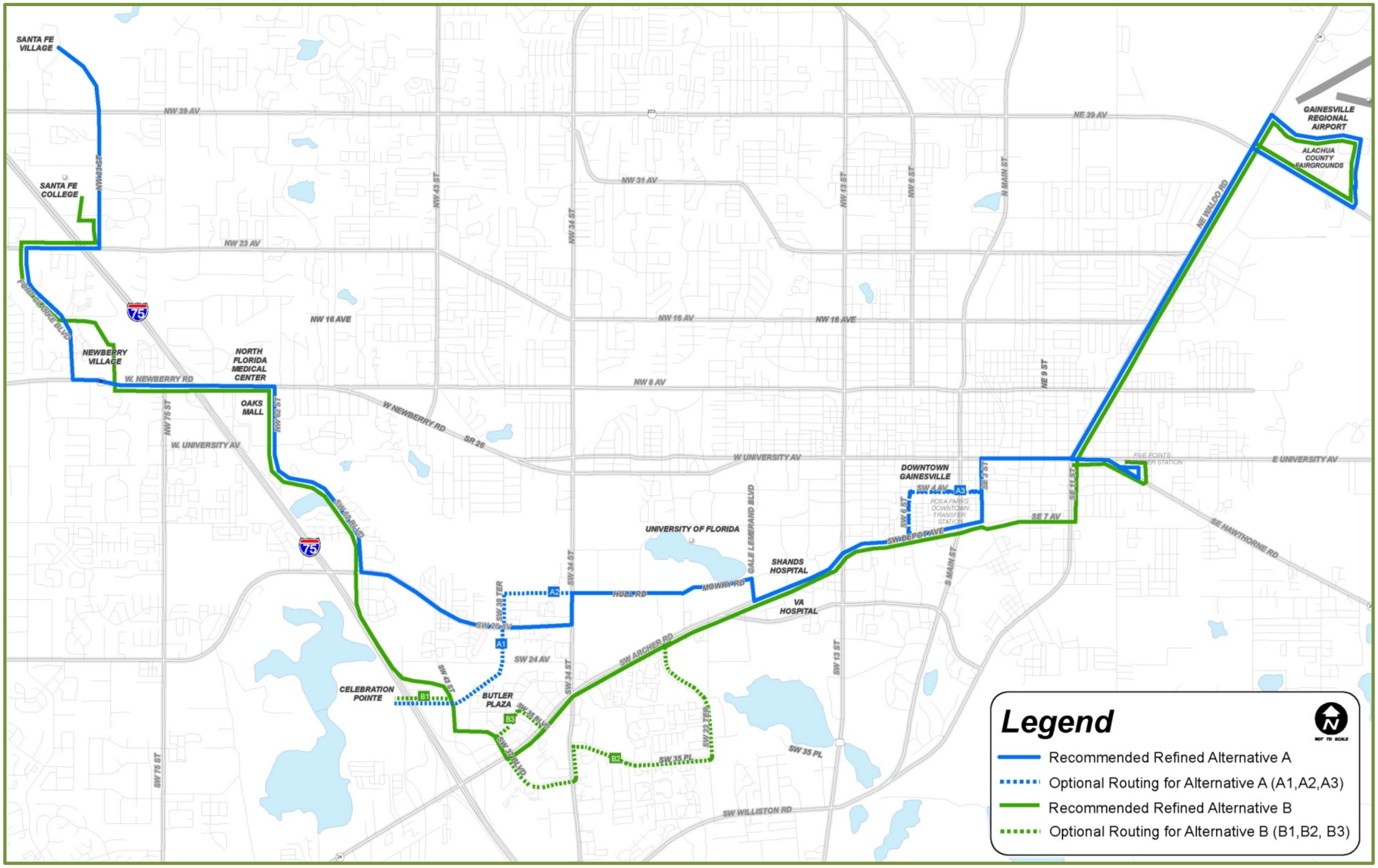
- Local Tier 3 performance measures tied to mobility, economic development, land use, environmental benefits, cost-effectiveness, and congestion relief were developed and evaluated for consistency with federal, state, regional and local program goals to perform a more detailed assessment of the refined set of corridor options.

- The potential federal, state, and local (public and private funding sources) that could be used for construction of the LPA were also evaluated.
- The draft LPA is presented in terms of phases with the level of service improvements and facility improvements identified on an annual basis.

1.2 Alternatives Evaluated

The alternatives evaluated in this report were refined for comparison purposes and in response to comments provided by RTS staff, stakeholders, and the community as shown in Figure 1-1. A tiered analysis was employed to identify segments, corridors, and stations that were consistent with the locally identified goals and objectives. Corridor A and Corridor B were evaluated for TSM and Build alternatives.

Figure 1-1. Recommended Refined Alternatives Evaluated



2.0 OPERATING PLAN

2.1 Overview

This chapter presents the Operating Plan assumed for the No-Build, TSM, and Build alternatives for the Go Enhance RTS Study. This chapter includes:

- Project background information
- Summary of current study recommendations
- Summary of current RTS route operations
- Recommended operational characteristics for the No-Build and TSM alternatives
- Recommended operational characteristics for the Refined Build Alternatives for Bus Rapid Transit (BRT) and supporting bus feeder routes

It is important to note that after this study was initiated, a new transportation funding bill, Moving Ahead for Progress in the 21st Century (MAP-21), was enacted. While a TSM alternative is not required under MAP-21, the project sponsor elected to employ a TSM alternative.

2.2 Alternatives Definition

FTA's "Procedures and Technical Methods for Transit Project Planning" (1986/2007), provides guidance for developing - the No-Build, TSM, and Build alternatives so that they may be evaluated and compared to each other. Formulating comparable alternatives provides a basis for local, state and federal decision makers to determine the efficacy of the alternatives in terms of addressing local transportation needs.

2.2.1 No-Build Alternative Purpose

The No-Build alternative is developed to illustrate local transportation conditions without any major improvements. In essence, the No-Build alternative reflects the existing funded plans for transportation improvements in the region. FTA guidance states that the No-Build Alternative includes items in the most recent 2035 Long Range Transportation Plan (LRTP) Cost Feasible Plan. The transit components for the current 2035 Plan for the Gainesville MTPO only includes the BRT route identified in the 2010 RTS Rapid Transit Feasibility Study (see Figure 2-1). This project was removed from the regional model for the purposes of evaluating the No-Build alternative because it is essentially the Build alternative. Running the model with this alternative would be ineffective for measuring the outcome of making no new major investments in the study corridor. It is important to note that RTS has identified a number of future improvements in their Transit Development Plan (TDP). These are not fully reflected in the LRTP for reasons that include the enhancement not being cost constrained or being paid for from service contracts with the University of Florida (UF) and Santa Fe College (SFC). RTS is in the process of providing a major update to their TDP which is coinciding with the 2040 update to the LRTP by the MTPO. Should the project advance into the Project Development and Environment (PD&E) phase, the regional travel demand model will need to be updated to reflect the project. For this reason, at this time the No-Build is an underestimate of planned service improvements.

2.2.2 TSM Alternative Purpose

The second alternative developed for comparison purposes is the TSM alternative. While the TSM alternative is no longer required, local agencies have the option of including it in the analysis of alternatives. FTA has developed planning guidance for the TSM alternative development including:

- *"Procedures and Technical Methods for Transit Project Planning" (1986, Updated 2007).*
- *"Appendix A, Definition of Alternatives" U.S. Department of Transportation Federal Transit Administration, Office of Planning and Environment, 2013.*
- *"Reporting Instructions for the Section 5309 New Starts Criteria" U.S. Department of Transportation Federal Transit Administration, Office of Planning and Environment, July 2008.*

These documents and other federal guidance were used during the development and refinement of the TSM alternative. While the Build alternative typically represents a major investment in infrastructure and significant changes to operations, the TSM alternative is developed to serve the same transportation problems and needs at a lower level of investment. This is not to suggest that the TSM alternative is a low-cost project just that it is a less costly infrastructure project that still seeks to improve the regional transportation network.

In Gainesville, the TSM alternatives tested for the *GO Enhance RTS Study* would serve the same transportation corridors as the Build alternatives with the same operating conditions, including transit signal priority (TSP), queue jump improvements, and other Intelligent Transportation System (ITS) enhancements such as "real-time passenger information," global positioning system (GPS) equipment, automatic vehicle location (AVL) technology, and computer-aided dispatch (CAD) software. It would not, however, use articulated buses, include exclusive bus lanes on arterials on separate right-of-way, and off-board fare collection.

2.2.3 Build Alternative Purpose

The Build alternative is the proposed New Starts/Small Starts major capital investment strategy. For the purposes of the *GO Enhance RTS Study*, BRT has been defined as the preferred premium transit mode for the Build alternative. Based upon the study Tier 1 and 2 screening analysis and input from the community, two basic alignments have been developed for detailed evaluation and are shown as the "Recommended Refined Alternatives A and B" on Figure 2-1 above. These alternatives for BRT consist of the various combinations of route segments and optional capital improvements described in Section 5.

2.3 No-Build Alternative Description

The No-Build alternative evaluated in this study reflects the existing plus committed projects as coded in the regional travel demand model. As discussed above, the RTS fixed bus service is coded in the regional model to reflect current transit investments. That is, the regional transit model is designed to be reflective of the existing RTS bus routes, stops, and transit priority signal treatments as well as the funded transit investments in bus service and equipment. It incorporates enhancements to operating characteristics made possible by funded service modifications and capital investments such as the new bus maintenance facility and new vehicles. The regional travel demand model was used and its transit network has been reviewed and approved by the region's stakeholders. Modifying the network can be expensive and time consuming. This expense can be justified when baseline results are inconsistent with ridership. While the service alignments and characteristics are similar but not identical to the current fixed route bus services offered by RTS in the study area (See Figure 2-2). However, these differences have not adversely impacted the modeling of existing conditions since the model calibrated closely with current RTS ridership (refer to Section 6.0 for details).

Table 2-1 includes the service characteristics for 32 bus routes.RTS also operates UF circulator routes, late-night specialty bus service Wednesday through Saturday, and is responsible for coordinating the provision of paratransit service. RTS routes serve the City of Gainesville, UF, SFC, and parts of Alachua County.

In 2012, RTS operated for 288,112 total annual revenue hours using 97 buses over a 232 mile network[1]. There were 10.6 million trips and 26 million passenger miles with an average trip length of 2.5 miles. RTS is highly effective and efficient with an operating expense per passenger trip of $1.94. Existing service characteristics including span of service, frequency, and arrival/departure locations are summarized in Table 2-1 for the existing fixed-route service. Based upon the service characteristics shown in Table 2-1, the average AM peak headway is 32 minutes.RTS city bus service begins at approximately 6:00 a.m. and end at approximately 3:00 a.m. The service-wide span of service is approximately 21 hours, with many routes operating for a span of 17 hours. The five routes with the highest average weekday ridership all serve the Reitz Union on UF campus (9, 12, 20, 21, and 35) with Route 20 serving the most passengers on average.

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[1] *The data presented in this paragraph was obtained from the 2013 Florida Transit Handbook. The format of the data is generally consistent with FTA National Transit Database (NTD) requirements.*

Figure 2-1. Existing Fixed Route Transit Service

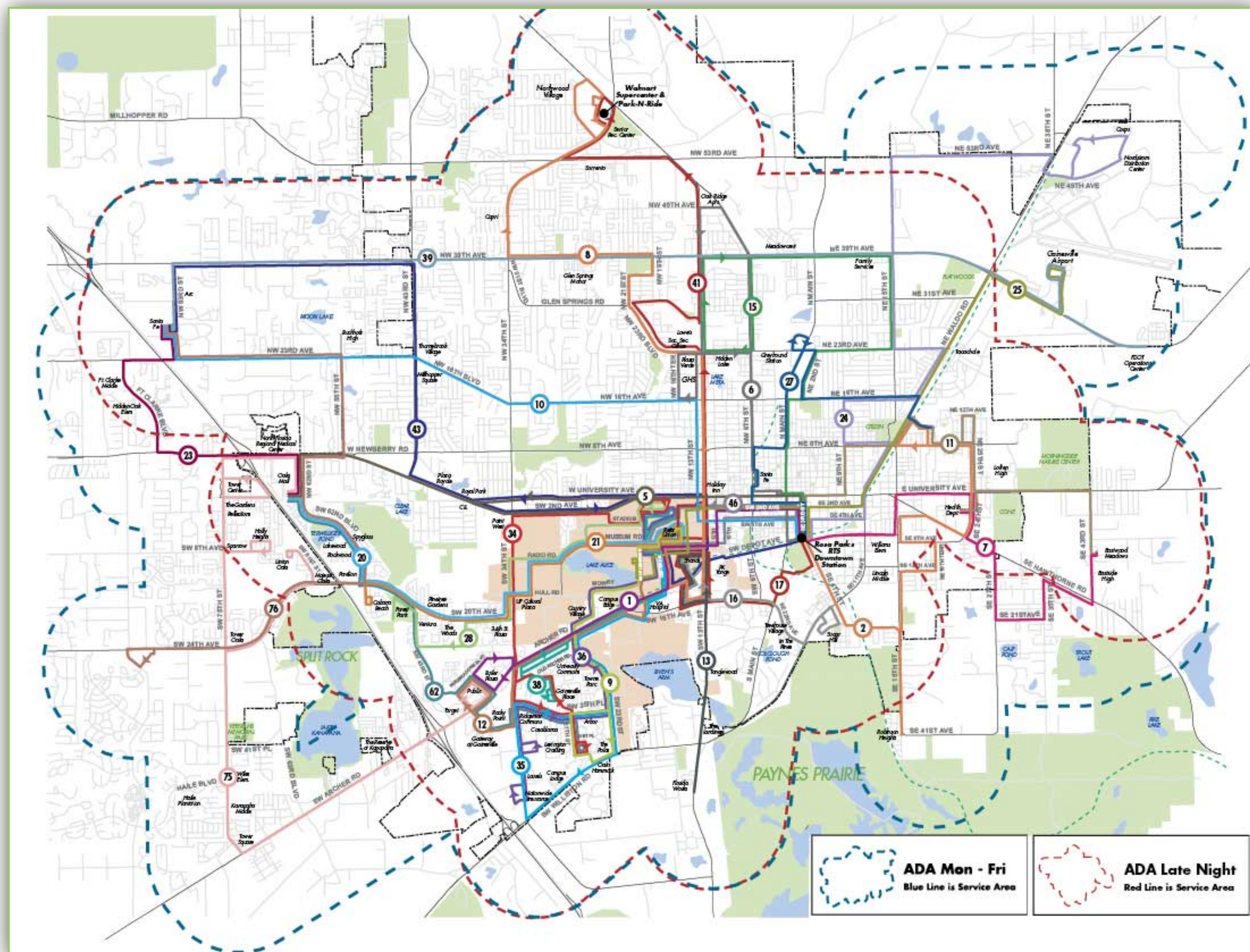


Table 2-1. Existing RTS Fixed-Route Service Characteristics

Route	Route Name	First Trip Departure Time	Departure Location	Route Headway by Time Period (min.)					Last Trip Departure Time	Departure Location	Service: R=Reduced S=Saturday U=Sunday
				6:00a-9:59a	10:00a-2:59p	3:00p-6:59p	7:00p-10:59p	11:00p-2:00a			
1	Downtown Station - Butler Plaza	6:03am	Downtown Station	15	15/18	15/18	60	---	**10:30pm**	Butler Plaza	R,S,U
2	Downtown Station - Walmart Supercenter	6:03am	Downtown Station	60	60	60	60	---	**7:32pm**	Walmart Supercenter	R,S
5	Downtown Station - Oaks Mall	6:03am	Downtown Station	20	20	20/24	30	30	2:00am	Oaks Mall	R,S,U
6	Downtown Station - Plaza Verde	6:03am	Downtown Station	60	60	60	60	---	**7:40pm**	Plaza Verde	R,S
7	Downtown Station - Eastwood Meadows	6:03am	Downtown Station	60	60	60	60	---	**7:30pm**	Eastwood Meadows	R
8	Shands Hospital - N. Walmart Supercenter	5:46am	Pine Ridge	30	30	30	45/60	---	**10:20pm**	Shands Hospital & North Walmart Supercenter	R,S,U
9	Reitz Union - Hunters Run	6:27am	Hunters Run	9	9	9	9/20	20	1:50am	Reitz Union	R,S,U
10	Downtown Station - Santa Fe	7:05am	Downtown Station	17/35	35	35/50	---	---	**7:00pm**	Santa Fe	R,S
11	Downtown Station - Eastwood Meadows	6:03am	Downtown Station	60	30/60	30/60	60	---	**10:30pm**	Eastwood Meadows	R,S,U
12	Reitz Union - Butler Plaza	6:20am	Butler Plaza	10/20	10/12	12/18	23	23	2:43am	Butler Plaza	R,S,U
13	Beaty Towers - FloridaWorks	6:28am	FloridaWorks	10	10	10/20/30	30	30	1:40am	Beaty Towers	R,S,U
15	Downtown Station - NW 13th Street	6:03am	Downtown Station	30	30/35	30/35	60	---	**10:30pm**	13th St Walmart	R,S,U
16	Beaty Towers - Sugar Hill	6:30am	Sugar Hill	24	24	24/30	30	30	2:01am	Beaty Towers	R,S,U
17	Beaty Towers - Downtown Station	6:42am	Downtown Station	24	24	24/30	30	30	1:46am	Beaty Towers	R
20	Reitz Union - Oaks Mall	6:00am	Oaks Mall	10	10	10/20	15/30	30	1:30am	Oaks Mall	R,S,U
21	Reitz Union - Cabana Beach	6:30am	Cabana Beach	20/10	10	10/20/30	20/30	---	**8:00pm**	Cabana Beach	
23	Oaks Mall - Santa Fe	7:15am	Oaks Mall	23/45	23	23/45	35	---	**10:00pm**	Santa Fe	R
24	Downtown Station - Job Corps	6:03am	Downtown Station	60	60	60	60	---	**7:30pm**	Job Corps	R
25	UF Commuter Lot - GNV Airport	7:15am	UF Commuter Lot	65	65	65	---	---	**6:35pm**	GNV Airport	R,S,U
27	Downtown Station - Walmart Supercenter	7:03am	Downtown Station	60	60	60	---	---	**12:30pm**	Walmart Supercenter	
28	The Hub - Forest Park	7:50am	Forest Park	15	15	15	---	---	**5:41pm**	The Hub	
34	The Hub - Lexington Crossing	6:45am	Lexington Crossing	20	20	20/40	25/50	50	1:30am	The Hub	R
35	Reitz Union - SW 35th Place	6:35am	The Polos	10	10	10/22	23	23	1:47am	Reitz Union	R,S,U
36	The Hub - Williston Plaza - Park Meadows	6:55am	Williston Plaza	15/30	15/30	30	---	---	**5:50pm**	The Hub	R
38	The Hub - Gainesville Place	6:55am	Gainesville Place	13/26	13	13/26/50	50	---	**8:55pm**	The Hub	
39	Santa Fe - GNV Airport	7:26am	FDOT	60	60	---	---	---	**3:00pm**	Santa Fe	
41	Beaty Towers - North Walmart Supercenter	7:15am	NW 29th Ave @ NW 13th St	30	30/60	30	---	---	**5:22pm**	Beaty Towers	
43	Downtown Station - Santa Fe	6:05am	Shands	35	35	35/105	105	---	**10:00pm**	Santa Fe	R
46	UF - Downtown Circulator	7:15am	Arlington Square	30/15	15	15/30	---	---	**5:45pm**	Reitz Union	
62	Oaks Mall - Lexington Crossing	7:30am	Lexington Crossing	60	60	60	---	---	**3:00pm**	Oaks Mall	
75	Oaks Mall - Butler Plaza	6:00am	Oaks Mall	35	53	35/53	35	---	**7:30pm**	Oaks Mall	R,S
76	Santa Fe - Haile Market Square	7:28am	Haile Market Square	60	60	60	---	---	**5:00pm**	Santa Fe	

2.4 TSM Alternative Description

The TSM alternatives developed for the *GO Enhance RTS Study* follows the same alignments as the Recommended Refined Alternatives (see solid lines on Figure 2-2). While the TSM alternatives would operate along the same basic roadway corridors as these alternatives, no significant roadway or infrastructure improvements would be implemented. Instead, bus operations would be modified to enhance service characteristics, improve the customer experience, and reduce transit travel time. The characteristics described below have been used to develop cost estimates presented in Sections 7.2.2 and Section 7.3.2. These operational enhancements reflect the "best that can be done" to improve bus service connectivity, travel times, and reliability without major capital investments in new infrastructure, such as a New Starts fixed guideway transit project.

The proposed TSM alternatives would be operated along Corridor A or Corridor B (not both) with the following basic hours of operation and frequencies:

- The span of service would be 18 hours per day on weekdays, 15 hours per day on Saturdays, and 12 hours per day on Sundays.
- The routes would be operated at 10 minute headways during peak weekday travel periods (assumed to be 7:30 to 11 AM and 3 to 6 PM), and 15 minute headways in off-peak weekday travel times.
- On weekends, service will be operated at 20-minute headways on Saturdays and 30-minute headways on Sundays.
- No BRT service would be provided on: New Year's Day, Martin Luther King, Jr.'s Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day.

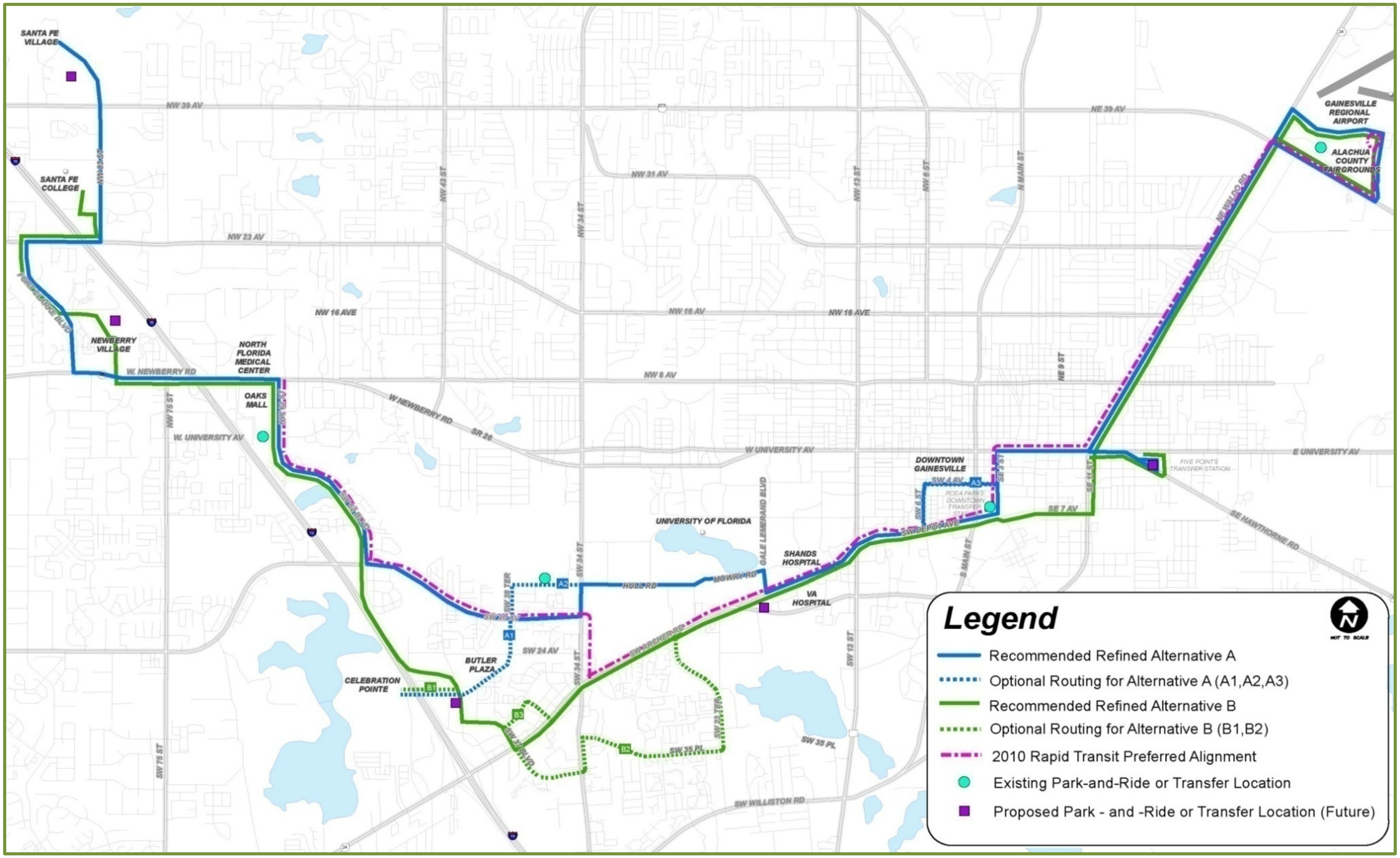
2.5 Recommended Refined Build Alternatives

2.5.1 Recommended Mode

The premium transit mode being assessed in the alternatives analysis for the *GO Enhance RTS Study* as part of the Build alternatives is BRT. Similar services are operated in many cities in the U.S. and overseas, including in university towns such as Eugene, Oregon (see inset on page 2-9). Depending upon the approval process required for the Recommended Refined Alternatives as well as funding considerations, operations could commence between 2018 and 2020. The main elements of this type of transit service that differentiate from the above are new low-floor BRT stylized vehicles or articulated buses and separated runways.

Passenger stations would include amenities such as benches, lighting, off-board fare collection and information kiosks that are of uniform design along the route. Illustrations of potential station layout concepts are included in Section 4.0.

Figure 2-2. Recommended Refined Alternatives A and B



2.5.2 General Operating Concept

BRT's operating concept offers rail-like convenience and speed at a cheaper rate. The Build alternatives would operate along one of the two possible corridors shown in Figure 2-1 with optional routing alternatives to various activity centers, educational uses, and residential areas; these routing alternatives are illustrated with dashed lines. The BRT system features would include advanced vehicle technology, off-board fare collection, station enhancements, dedicated lanes, queue jump lanes, and TSP to enhance bus travel times. These features are described and illustrated in detail in the plans. The proposed BRT service would operate with the same span and frequency as outlined for the TSM alternative.

2.5.3 Corridor Locations and Stations

The base option for Build Corridor A is 22 miles in length with 23 recommended stop locations. There are three sections along this route with subarea routing options (see dashed lines on Figure 2-3). Routing option A1 includes a connection to Celebration Pointe. Routing option A2 is the extension of Hull Road to SW 38th Terrace, west of SE 34th Street. Routing option A3 utilizes SE 6th Avenue and SE 4th Street to directly serve Innovation Square.

The base option for Build Corridor B is approximately 21 miles in length with 22 recommended stop locations. Routing option B1 includes a connection to Celebration Pointe. Routing option B2 serves the student housing area south of Archer Road and is about the same length with the same number of recommended stop locations as that segment along base Corridor B. Routing option B utilizes SW 35th Blvd. to connect to Archer Rd.

The proposed stop spacing distance along these corridors would be approximately one-mile apart to reduce overall transit travel time. Fewer stops would reduce total station dwell time along the total route. This premium transit stop service pattern is one of the most effective approaches to reducing travel time without significant investments in dedicated transit lanes.

If the project advances to the PD&E phase, an analysis of local RTS bus stops would be conducted in conjunction with the results of the currently ongoing Comprehensive Operational Analysis (COA) to examine which stops should be combined or served by the proposed new station locations. Local buses would continue to operate in these corridors stopping at existing stop locations as well as at designated premium stop locations. As appropriate, certain redundant stops could be removed, as necessary. In such a scenario, existing RTS City bus routes that operate in the same corridor or intersect it would operate in a modified manner to support BRT service. More specifically, intersecting RTS routes would operate in a "pulse" pattern to meet BRT service and create seamless transfers.

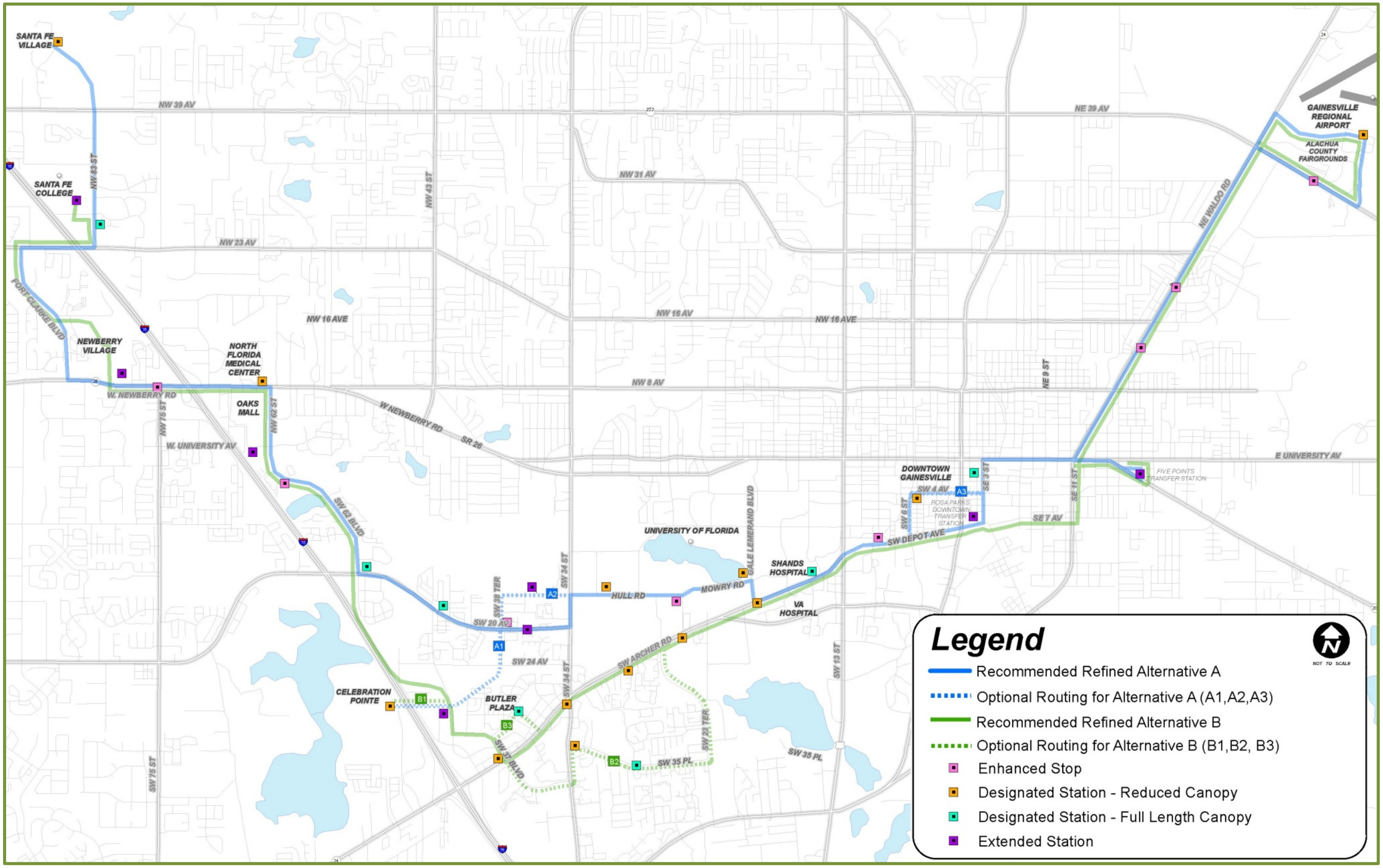
The project team recommends maximizing the use of planned facilities and existing, successful RTS stop locations, as appropriate.

- RTS existing anchors include:
    - Rosa Parks Downtown Station,
    - Oaks Mall,
    - Butler Plaza,
    - Reitz Union, and
    - UF Park-n-Ride.
- Planned Park-n-ride service areas include:
    - Newberry Village,
    - Butler Plaza (new),
    - Celebration Pointe,
    - Santa Fe Village, and
    - Five Points.

BRT in Eugene, Oregon

These existing and proposed stop locations will be incorporated into the operating concept as they are considered key linkages within the RTS system and they are circled in blue on Figure 2-3 below. These connection points provide transit passengers with the opportunity to use local RTS City routes in conjunction with the proposed BRT service.

Figure 2-3. Recommended Refined Alternatives with Proposed Station Designations



2.5.4 Underlying Local Bus Service

The existing RTS bus service would connect with the proposed corridors at key station locations to extend the reach of the proposed improvements. These locations include SFC, the Oaks Mall, Hull Park-and Ride, UF/Shands Hospital, downtown Gainesville, and the Five Points Transfer Center. These connection points have a number of routes already operating at 30-minute frequencies or less that would extend the service in north-south, east-west directions. Because of this, there is unlikely a need for immediate investments in the existing service. Rather, the focus would be on modifying schedules to allow for better transfers and moving funds from existing routes that would no longer be needed (or only at a lower frequency) to remaining routes to improve their frequency. For example, should Corridor A be implemented it would almost entirely duplicate route 25. Funding previously used for route 25 could be used to fund Corridor A operations, as well as increase the frequency of remaining east side routes like the 2 and 11.

While a number of passengers will continue to utilize local routes because they use all stops, many passengers will choose mobility over access and choose to ride the type of more frequent service proposed in the TSM and Build alternatives. Accordingly, concurrent with or in advance of implementation, local fixed-route bus service routing would be modified to enhance connectivity and/or interline local service along the same service corridors as illustrated in Figures 2-4 through 2-7.

2.6 Transit Operations Analysis

An analysis of the approximate annual operating hours based upon the recommended TSM and BRT operating characteristics described in this chapter is presented in Section 7.0.

2.7 Summary

The identified operating plan addresses the future operations for the proposed No-Build, TSM and Build alternatives as part of the *GO Enhance RTS Study*. The recommendations were input into the development of Sections 3.0 through 7.0 of this report.

Figure 2-4. Corridor A - Existing Bus Network

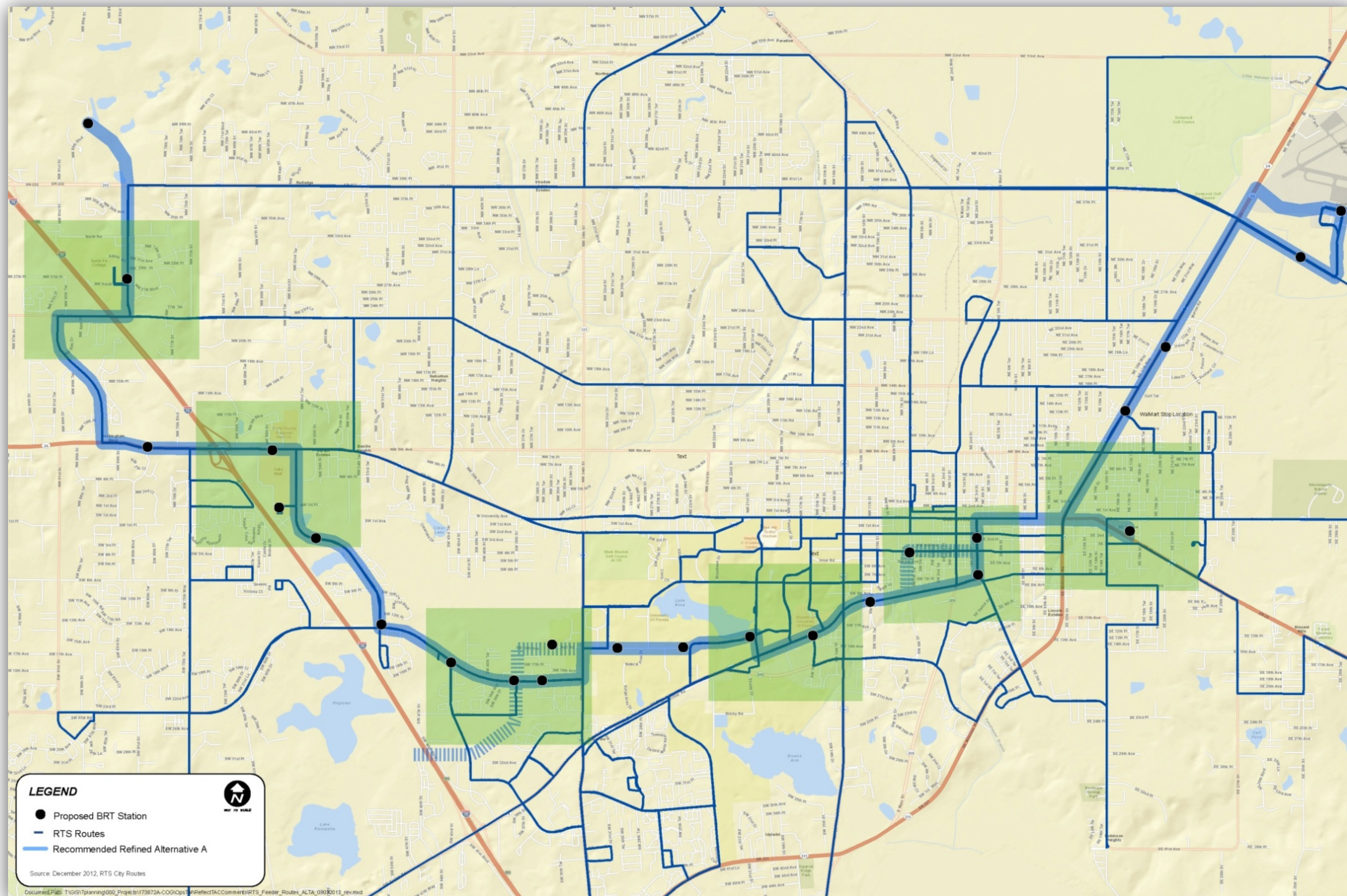


Figure 2-5. Corridor A Existing Bus Service to Major BRT Stations

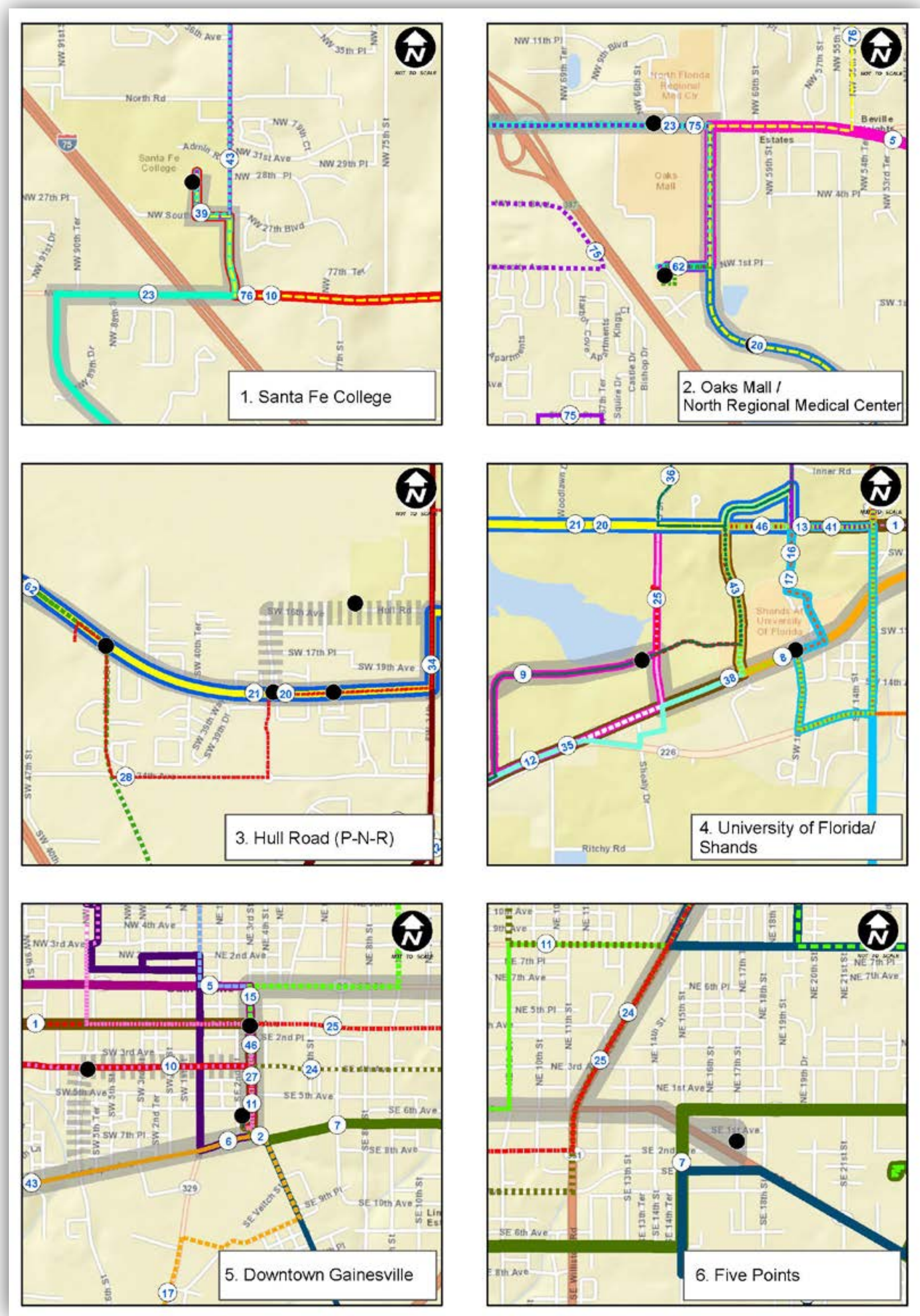


Figure 2-6. Corridor B - Existing Bus Network

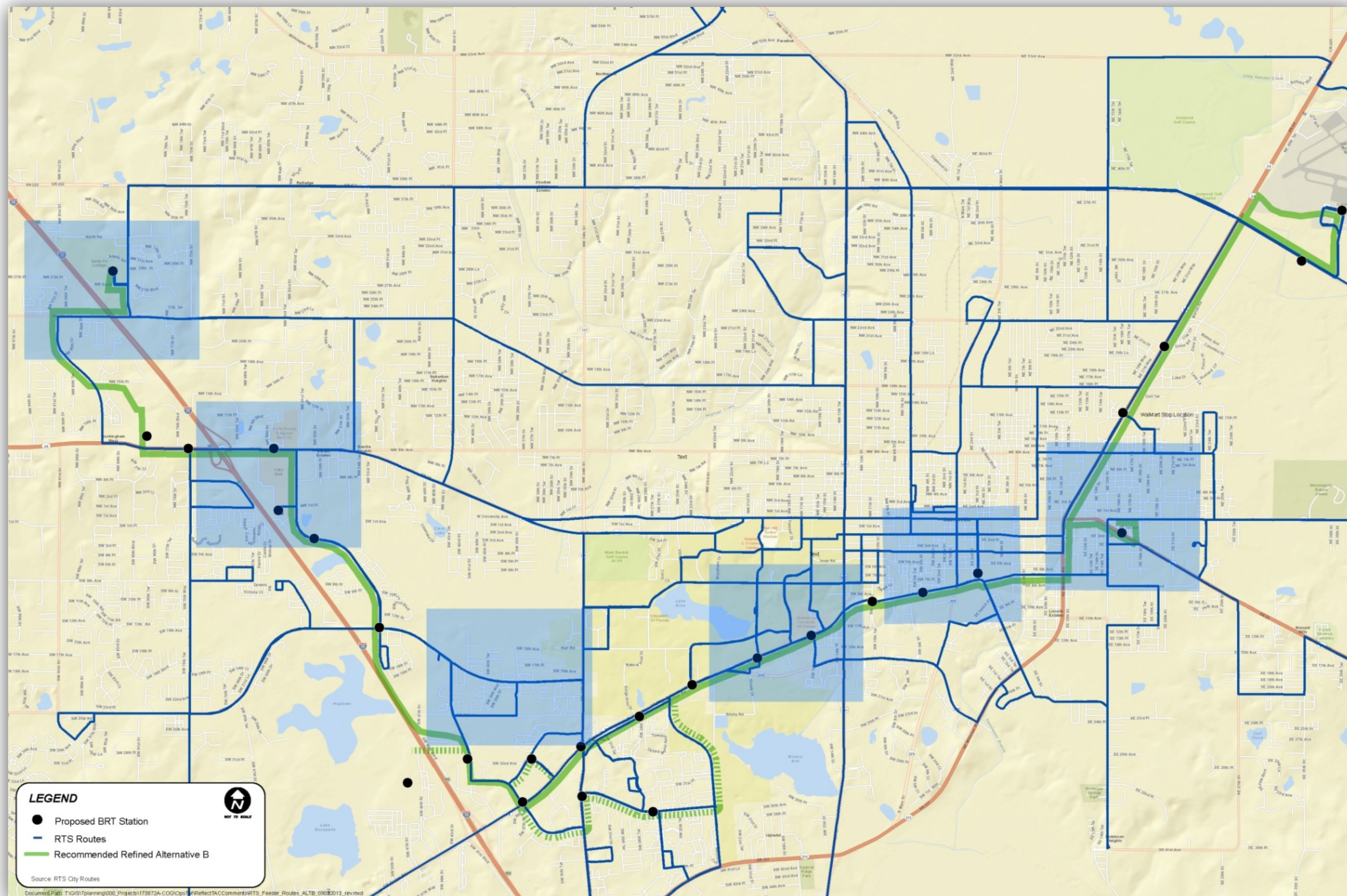
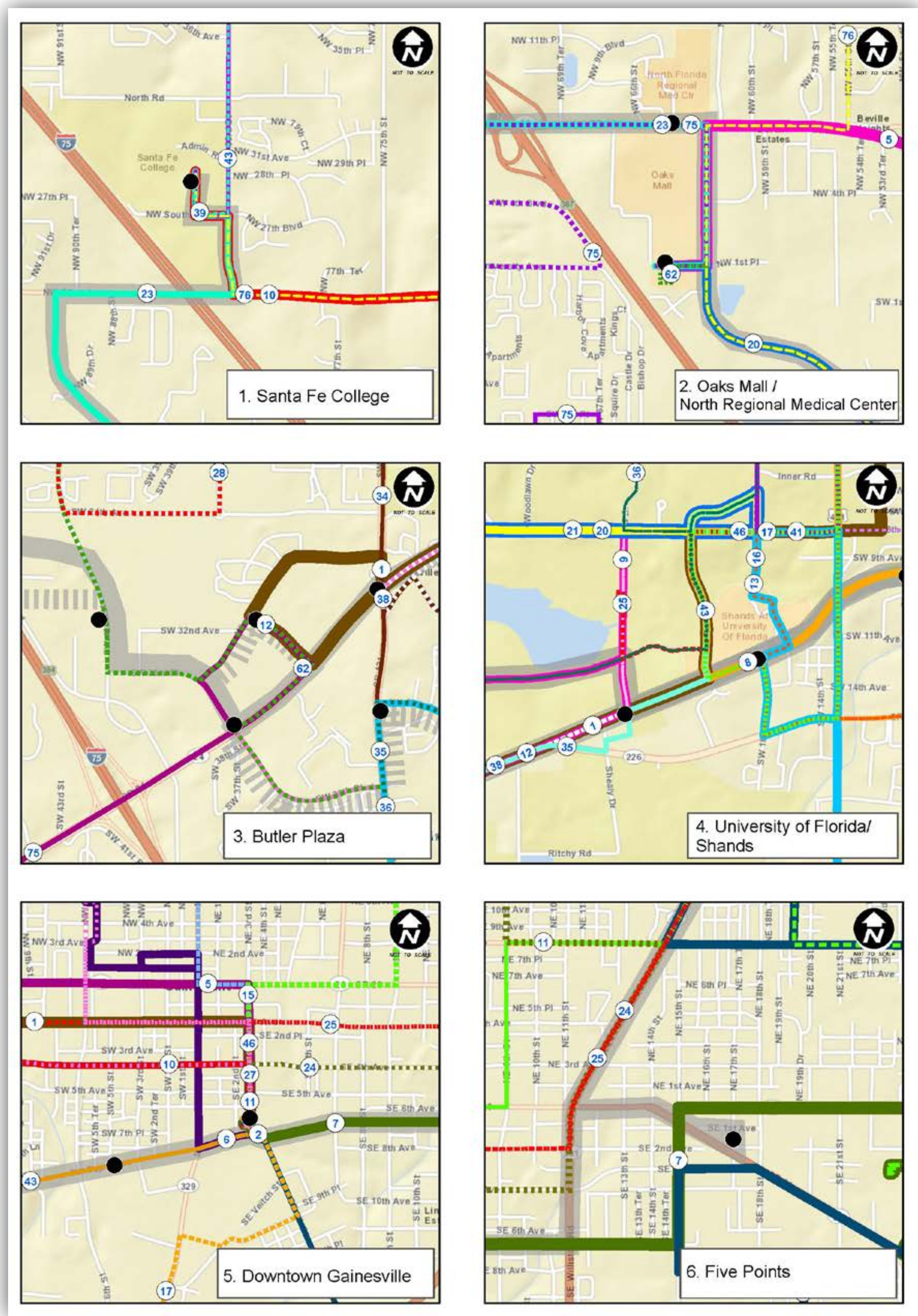


Figure 2-7. Corridor B Existing Bus Service to Major BRT Stations



3.0 TRANSIT PRIORITY ANALYSIS

3.1 Overview

A thorough assessment of transit priority needs and opportunities along the Recommended Refined Alternatives for the *GO Enhance RTS Study* was conducted. This included addressing the feasibility and location of Business Access and Transit (BAT) lanes for BRT and TSP and queue jumps at those signalized intersections along the alternate corridors where traffic counts were available (either existing or obtained in this study), addressing all major intersections. In total, 24 intersections were evaluated. Not all signalized intersections were evaluated (another 34) due to study budget limitations, but these intersections were considered minor and not to have a major operational impact on premium transit operations.

The assessment was conducted for both existing and 2035 weekday peak hour conditions. New and existing traffic data was collected as inputs to this analysis, as well as the development of an expanded SYNCHRO traffic operations model for the refined alternatives. The results of the analysis identify travel time savings along each corridor which could be achieved through reasonable transit priority treatments.

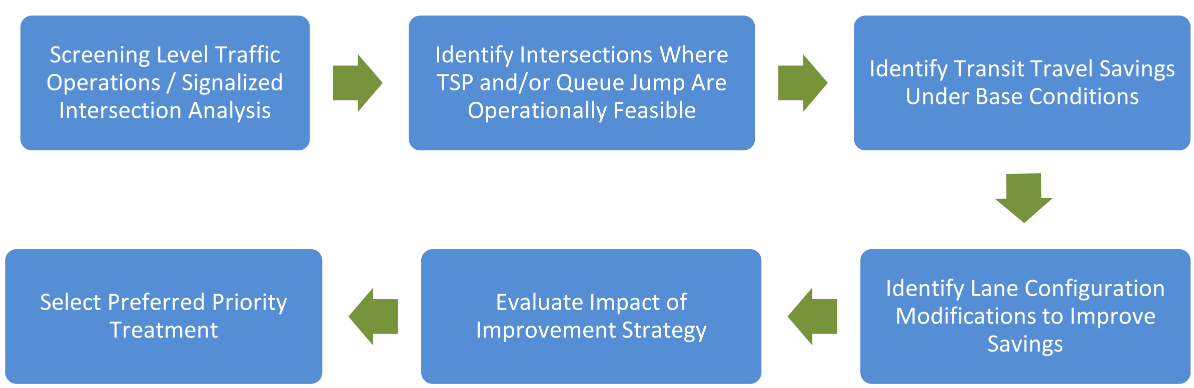
The travel time savings associated with different transit priority treatments and their overall application was input into the operating plan for the TSM and Build alternatives (presented in Section 2.0), the running-way plans for the Build alternatives (Section 4.0), the ridership projections for the TSM and Build alternatives (Section 6.0), and the capital and operating cost estimates for the TSM and Build alternatives (Section 7.0).

3.2 Methodology

3.2.1 Intersection Analysis

The process of evaluating the impacts of TSP implementation on traffic operations was based on the comparison of various treatment options for the alternatives evaluated. The effectiveness of the transit priority treatments was measured by the travel time savings for bus operations given in minutes per mile. The travel time savings is an important factor in determining the LPA for bus operations. The flow chart shown in Figure 3-1 illustrates the evaluation process applied in the assessment of signal priority applicability.

Figure 3-1. Transit Signal Priority Evaluation Process



To assure the effectiveness of implementing transit priority treatments, the following factors were evaluated *(TCRP Report 118, 2007):*

- Is the transit priority strategy feasible under the current and projected traffic conditions and bus volumes?
- Could the transit priority strategy be implemented without a significant increase in congestion on heavily traveled cross streets?
- Would the transit priority strategy provide added benefits to warrant the added cost?
- Could BRT stations be located (far side or near side) to allow effective operations depending on the applicability of the transit priority treatment?
- Is the existing traffic control system capable of handling the proposed transit priority treatment?

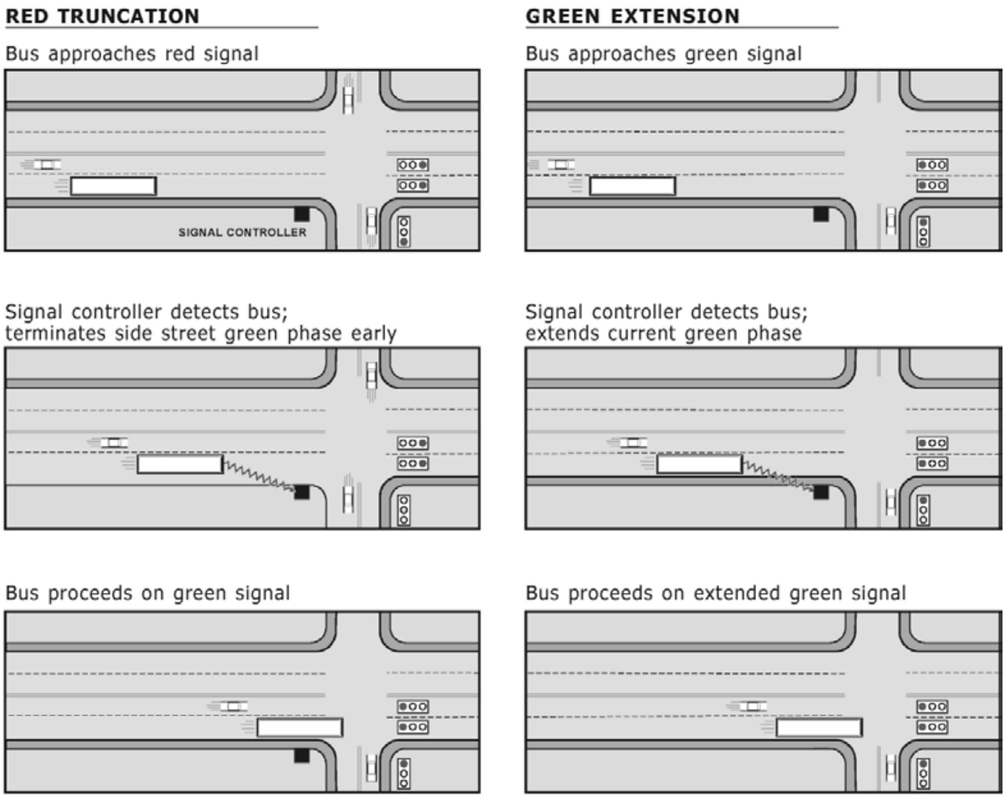
Priority Treatments Considered – TSP vs. Queue Jump

TSP in the through lanes was analyzed along the refined corridor streets by adjusting the existing signal timing to give priority to transit vehicles. It consisted of a minor modification of the phase split times that extended the green phase serving the approaching bus. The extra time for transit was accommodated by a slight reduction in green time for minor movements (minor street or major street left turns), with overall cycle length maintained to preserve corridor signal coordination. Figure 3-2 illustrates the implementation of TSP at a signalized intersection.

Table 3-1. Alternate TSP Treatments

Treatment		Description
Passive Priority	Adjust cycle length	Reduce cycle lengths at isolated intersections
	Split phases	Apply multiple phases while maintaining original cycle length
	Area-wide timing plans	Preferential progression for buses through signal offsets
	Bypass metered signals	Buses operate in exclusive lanes, special signal phases
Active Priority	Phase extension	Increase phase time
	Early start	Reduce other phase times
	Special phase	Addition of a bus phase
	Phase suppression	Skipped non-priority phases
Real Time Priority	Delay-optimizing control	Signal timing changes to reduce overall person delay
	Network control	Signal timing changes considering the overall system performance

Figure 3-2. TSP Concept



Source: Transit Capacity and Quality Service Manual, TCRP Report 118, 2007

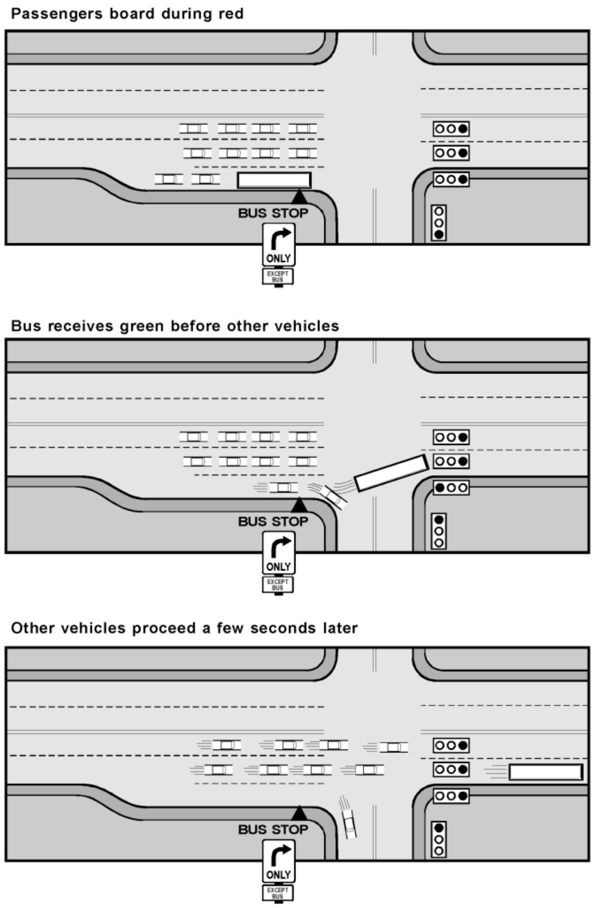
TSP can be manually triggered by the bus driver or, more typically, can be automatically controlled using on-board Automatic Vehicle Location (AVL). Table 3-1 summarizes the differences in TSP treatments. TSP is usually implemented with stops located on the far side to allow vehicles to activate the priority call and clear the intersection before reaching the stop. In this study, simple phase extension was assumed in the operations analysis to assess TSP feasibility. A refined Concept of Operations would be developed with potential added strategy identification before TSP is actually implemented at particular locations.

Queue jumps are an alternative to TSP and are preferable when there is a need for a near side bus stop or where TSP is not possible due to level of service (LOS) constraints. Queue jump treatments reduce delay at signalized intersections for bus transit by using a right-turn lane or a separate lane for buses only. This allows transit vehicles to avoid the queue in the adjoining through lanes. Buses are exempted from any right-turn requirements at the intersection.

For the purposes of analyzing traffic impacts, a bus signal phase was modeled to provide green time for a short period (3 to 4 seconds) before the green indication for adjacent traffic lanes, thereby allowing the bus to exit the auxiliary lane and merge into general traffic far-side of the intersection.

Queue jump treatments work most effectively at a bus stop when that stop is located at the nearside of an intersection to allow the bus to trigger the bus signal phase after it serves the stop. The green time for the general traffic movement is generally reduced to accommodate the bus signal phase. Figure 3-3 illustrates the queue jump signal concept for bus service.

Figure 3-3. Queue Signal Jump Concept



Source: TCRP Report 100, 2003

Initial Screening - LOS Analysis

Traffic analysis was performed by identifying major intersections along each corridor and determining the level of service (LOS) for existing traffic conditions using SYNCHRO 8.0. Once the LOS was identified, the signalized intersections with LOS C or D were selected. Implementation of TSP is most effective at signalized intersections operating under LOS C or D conditions with a volume to capacity (v/c) ratio between 0.80 and 1.0. TSP is not applicable for intersections operating with a v/c ratio greater than 1.0 due to the corresponding long vehicle queues that prevent buses from clearing the intersection soon enough to take advantage of the extended green time.

In addition to evaluating the signal timing and operations at these key intersections, the existing configuration of the signalized intersections was also examined to determine locations with exclusive right turn lanes. Exclusive right turn lanes provide the opportunity for queue jump implementation without major modifications to the existing lane configuration providing significant travel time savings for bus operations. The 95th percentile queue length was used to determine if the queue length in the adjacent through lane would extend past the auxiliary lane storage length, thus restricting buses from entering the right turn lane to perform the queue jump at the signalized intersection. The adjacent through lane 95th percentile queue length is the maximum back of queue with 95th percentile traffic volumes. The difference in the auxiliary lane storage length and the 95th percentile queue length provides an estimate of the required lane length for effective queue jump operations. The right turn traffic was also analyzed to determine if the existing traffic volumes combined with the added bus traffic volumes would be appropriate to allow buses to pass through the intersection within the proposed bus signal phase.

Use of Traffic Growth Factors

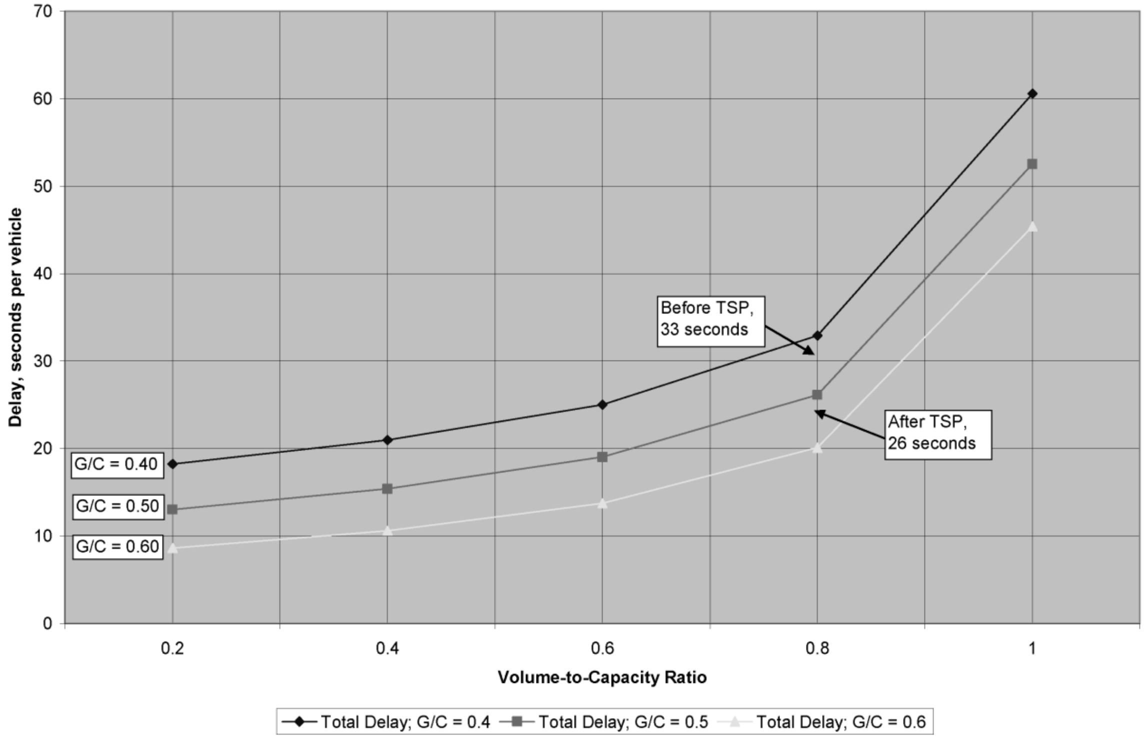
Future conditions analyses for selected intersections were performed by applying a growth factor from the MTPO Regional Travel Demand Model to estimate future (2035) traffic volumes. The results were compared to the existing conditions analysis to determine the feasibility of the transit priority treatments previously identified. The future year conditions analysis helped identify locations where the projected increase in traffic volumes would preclude transit priority implementation. It further allowed for identification of modifications that would be required to assure effective future traffic operations with TSP and/or queue jump implementation. Modifications to existing configurations will require cost-benefit analyses to determine if the travel time savings would justify the additional cost of modifying the intersection.

Detailed TSP vs. Queue Jump Travel Time Savings

The impacts of TSP implementation were next analyzed to determine the approach delay variation when the green time is extended for the approach that is serving bus traffic. The v/c ratio was also monitored for variations to make sure that the time assigned for the bus signal did not result in a v/c ratio approaching or greater than one, which would indicate a negative impact on general traffic operations. The difference in delay for the approach where a bus is operating translates in seconds of travel time savings for the transit service.

For the overall corridor analysis, the travel time savings resulting from transit priority treatments were calculated in minutes per mile and the analysis was performed by segment, between signalized intersections and then calculated for segments in between proposed stations for operating analysis purposes. Figure 3-4 illustrates a generalized estimation of delay or travel time savings in seconds per vehicle with and without TSP implementation at a representative signalized intersection under a particular g/C (green time/cycle length) conditions. The delay curves relate the g/C ratio to the v/c of the approach allowing the comparison of delays for the initial g/C and estimate the savings with TSP implementation.

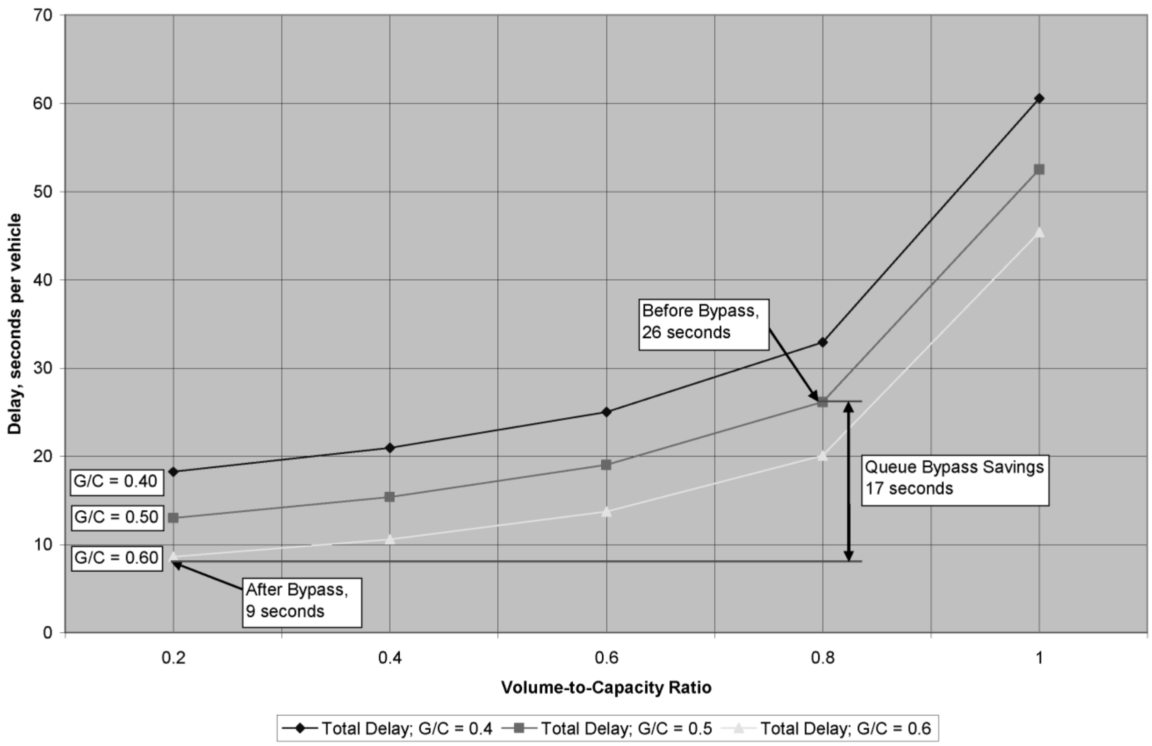
Figure 3-4. Effect of TSP on Signalized Intersection Delay (90-Second Cycle)



Source: Transit Capacity and Quality Service Manual, TCRP Report 118, 2007

Figure 3-5 shows the generalized travel time savings related to queue jump implementation at a signalized intersection, assuming that the storage lane has the appropriate length for effective operations and the assigned green time for the advance green is approximately 10% of the cycle length. As described above, signalized intersections with existing right turn lanes were selected for queue jump traffic operations analysis and BRT vehicles were assumed to use the right turn lane to avoid the queue in the through traffic. The difference in delay for the general traffic lane and the right turn lane were determined in minutes per mile in between signalized intersections.

Figure 3-5. Effect of Queue Jump with Advanced Green on Signalized Intersection Delay (90-Second Cycle)



Source: Transit Capacity and Quality Service Manual, TCRP Report 118, 2007

The transit priority strategies implementation analysis resulted in identification of signalized intersections where transit signal priority and queue jumps were both applicable based on the existing / projected LOS and the existence of exclusive right turn lanes. The travel time savings per approach were compared and the option that is estimated to give the highest travel time savings was identified as the preferred transit priority strategy to be implemented at a particular approach.

3.2.2 Roadway Segment Analysis

Dedicated bus lanes provide the highest type of BRT service by offering better travel speeds and service reliability thus attract the most passengers. The basic goal of implementing bus lanes is to give BRT vehicles an operating environment free from the delays caused by general traffic. Improved travel time provides consistency to regular transit users and reduces the amount of recovery time that needs to be built into schedules for transit operators, resulting in operation cost savings. Dedicated lanes were evaluated along the proposed SW 62nd Blvd. extension where space for a median transitway facility has been identified to be integrated into the roadway improvement; dedicated lanes were also evaluated along NW 83rd St. and Fort Clarke Blvd. to Newberry Village where a proposed transitway facility adjacent to the main access road has been identified.

Semi-exclusive lanes (BAT lanes) were considered for roadway segments where the existing lane configuration would allow bus operations to be facilitated in a lower volume lane and largely to only be shared with right turn and local driveway movements. Traffic impact analysis was conducted for segments of the corridor with existing right turn lanes and available right of way that would allow right turn lane extensions for BRT operations shared with right turn traffic as well as for segments with an existing frontage road that provides the opportunity to operate in a semi-exclusive lane.

Initial Screening

Roadway geometry along each corridor was evaluated to identify segments where BAT lanes were feasible; namely, where lanes of 11.5 to 12 feet wide and with vertical clearances of at least 13 to 14.5 feet could be accommodated.

Analysis of the travel time implications of developing BAT lanes was performed by determining the delays that would result from buses operating in a BAT lane. The analysis was conducted using SYNCHRO 8.0 and was performed at selected intersections where BAT lanes were being considered. The resulting variations in delay and LOS were identified and the travel time savings were calculated based on comparison with existing BRT systems and the relationships among design speed for bus lanes.

Use of Traffic Growth Factors

Future roadway segment conditions analysis was performed by adding a growth factor based on the projected MTPO travel demand model 2035 traffic volumes. The results were compared to the existing conditions analysis results to determine the feasibility of the BAT lanes on selected segments and the travel savings for bus operations with its implementation.

Detailed Travel Time Savings

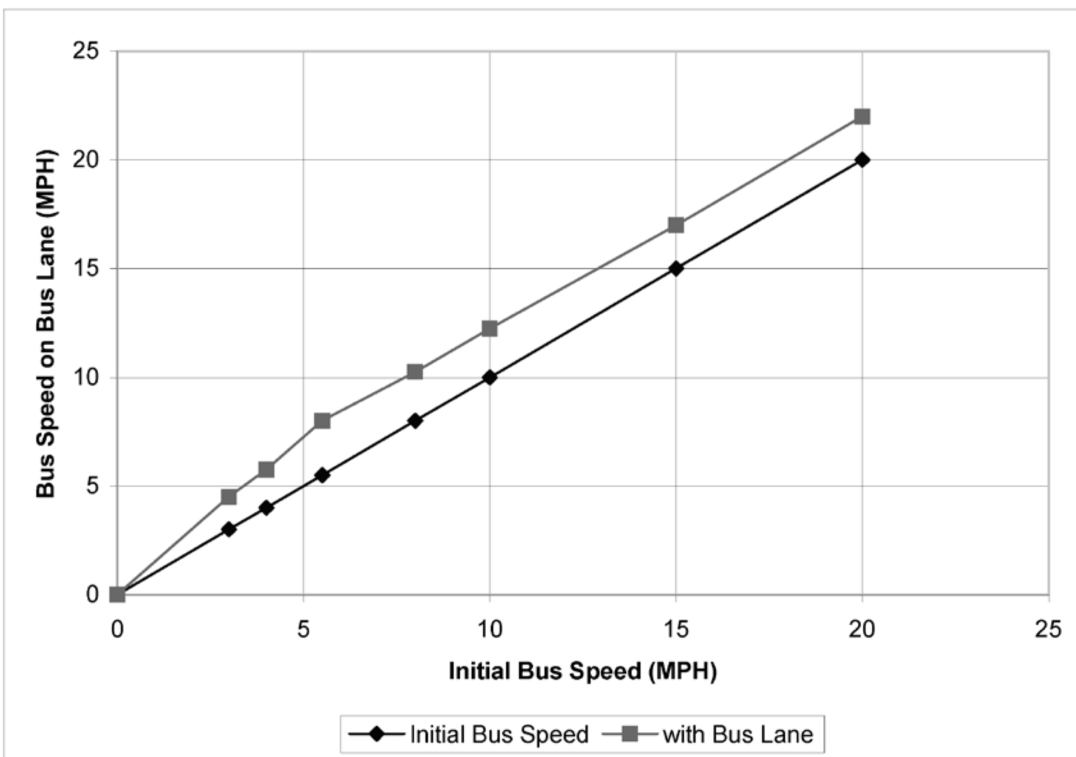
Estimated travel time reductions from implementation of dedicated and BAT lanes under various scenarios are shown in Table 3-2 along with the estimated speed changes resulting from their implementation. Figure 3-6 illustrates the difference in speed (MPH) of bus services operating in a bus lane. The initial speed for the segments analyzed in this study was calculated using the travel time for existing bus service operating along the selected segments of each corridor; the estimated initial speed was used to calculate the percent gain and minutes per mile gain to determine the travel time savings in minutes. The analysis was performed segment by segment in between proposed BRT stations.

Table 3-2. Estimated Time Rate Reduction with Arterial Bus Lanes – Based on Analogy

Item	Case A	Case B	Case C	Case D	Case E
Initial Speed (mph)	3.0	4.0	6.0	8.0	10.0
Speed with Curb Bus Lane (mph)	4.4	5.7	8.0	10.2	12.2
mph Gain	1.4	1.7	2.0	2.2	2.2
% Gain	47.0	42.0	33.3	27.5	22.0
Initial Minutes/Mile	20.0	15.0	10.0	7.5	6.0
Minutes/Mile with Bus Lane	13.5	10.5	7.5	5.9	4.0
Minutes/Mile Gain	6.5	4.5	2.5	1.6	1.1
% Gain	32.5	30.0	25.0	21.3	18.3

Source: Transit Capacity and Quality Service Manual, TCRP Report 118, 2007

Figure 3-6. Arterial Speeds with and without Curb Bus Lanes



Source: Transit Capacity and Quality Service Manual, TCRP Report 118, 2007

3.3 Analysis Results

3.3.1 Corridor A

Initial Intersection Screening

An analysis of transit priority treatments was performed for 19 intersections along Corridor A. LOS was determined at each location for existing and future traffic conditions using SYNCHRO 8.0 and traffic volumes for the weekday AM peak and PM peak hours. Existing counts were conducted in 2010 and 2013 for use in this analysis.

Thirteen signalized intersections with LOS C or D (under existing traffic conditions) were identified for potential implementation of transit signal priority (TSP). TSP impacts were analyzed by adjusting the signal timing to give priority to transit vehicles. The adjustment consisted of a minor modification of the phase split times to extend the green phase and serve the approaching bus, thus reducing the bus delay. The reduction in delay was used to calculate the directional travel time savings for segments between intersections.

Six signalized intersections with auxiliary lanes were selected for queue jump traffic operation analysis on Corridor A. Buses were assumed to use the right turn lane with bus signal phase that would provide advance green time for a short period of time (10 % of total cycle time). The adjacent through lane's 95th percentile queue length was also examined to determine if the queue length in the adjacent through lane would allow effective bus operations. The reduction in delay for the general traffic lane and the auxiliary lane was used to calculate the directional travel time savings for segments between signalized intersections.

The analysis for future conditions was performed by applying the traffic growth factors to year 2035 as previously discussed. The change in LOS allowed the identification of eight signalized intersections with LOS C or D where TSP is applicable under projected future traffic volumes but not under existing traffic volumes. Queue jump operations were also analyzed to determine the need to lengthen the storage lane for 2035 traffic volumes.

Initial Roadway Segment Screening

An analysis of traffic impacts for dedicated transitways and BAT lane implementation was performed for segments of the corridor with existing auxiliary lanes and available right-of-way. Future land uses and modifications to the existing roadway were also evaluated to determine the feasibility of these treatments. Segments along eastbound Archer Rd. and Newberry Rd. were identified for potential BAT lane implementation that would require extension of existing auxiliary lanes. Segments along SW 62nd Blvd. Extension (SW 1st Place to SW 20th Ave.), NW 83rd St., and Fort Clarke Blvd. were analyzed for dedicated transitway treatments.

Travel Time Savings

Table 3-3 shows the summary of travel time savings for Corridor A only along the base alignment, not the optional routing alternatives, with identified transit priority treatments under existing and 2035 traffic conditions. The difference in travel time savings if the existing storage length were to be extended for locations where queue jump implementation would give the highest savings is also shown for comparison (total min savings + queue jump). Tables A-1 and A-2 (in the appendix) break out the travel time savings by direction.

Two scenarios were evaluated for Corridor A: 1) a base scenario assessed travel time savings for BRT operations in mixed traffic with TSP and queue jump implementation where lengthening of auxiliary lanes to develop queue jumps was not required (consistent with the TSM alternative); and 2) the base plus improvements scenario which included the median transitway on SW 62nd Blvd. and the proposed transitway from Springhill along NW 83rd St. and Fort Clarke Blvd. to Newberry Village, proposed BAT lanes along Newberry Rd. and Archer Rd., and the added travel time savings for locations where queue jumps could be implemented with auxiliary lane extensions. Table 3-4 also shows the summary of travel time savings associated with each transit priority treatment analyzed and the applicability to the scenarios evaluated for Corridor A. Note that changes in time savings between current and 2035 conditions are partially due to changes in LOS at intersections and increases in queue length.

Comparison of TSP vs. Queue Jump

The transit priority strategies analysis resulted in identification of two signalized intersections (SW 62nd Blvd. and NW 1st Pl and SW Archer Rd. and Center Dr.) where TSP and queue jumps were both applicable based on LOS and the existence of auxiliary lanes under existing traffic volumes. Three signalized intersections (SW Archer Rd. and SW 16th St., Hull Rd. and SW 34th St., and Newberry Rd. and SW 66th St.) were identified where both strategies were applicable under future traffic volumes.

The travel time savings per approach were compared and the option with the highest projected savings was identified from an operational perspective as the preferred transit priority strategy to be implemented if the storage lane was appropriate for effective bus operations.

Table A-3 identifies those locations where if existing right turn lanes are extended added travel time savings associated with queue jump signals as opposed to TSP could be achieved. Queue length differences between current conditions and 2035 result from changes in the traffic volumes for other approaches which cause a change in the queue length for the adjacent lane.

Table 3-3. Corridor A Existing and 2035 Weekday Peak Travel Time Savings with Transit Priority Treatments

	Existing Weekday				2035 Weekday			
Two Directional Travel Time Savings	Corridor A Base		Corridor A Plus Improvements		Corridor A Base		Corridor A Plus Improvements	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Medium Transitway (min)	0.00	0.00	3.34	3.34	0.00	0.00	3.90	3.90
Semi-Exclusive (BAT) Lane (min)	0.00	0.00	0.97	1.34	0.00	0.00	1.15	1.51
TSP (min)	1.65	1.41	1.65	1.41	2.05	3.39	2.14	2.25
Queue Jump (min)	1.17	0.70	1.17	0.70	1.18	0.60	1.06	0.60
Total (Min)	2.83	2.11	7.13	6.79	3.23	3.99	8.24	8.26
Minutes per Mile Savings	0.14	0.10	0.35	0.33	0.16	0.19	0.40	0.40
Total Min Savings +Queue Jump	2.83	2.11	8.28	8.48	3.23	3.99	9.87	10.31
Total Min/Mile Savings + Queue Jump	0.14	0.10	0.40	0.42	0.16	0.19	0.48	0.50

Table 3-4. Corridor A Specific Transit Priority Treatments and Travel Time Savings

		Existing Weekday Travel Time Savings (min)		2035 Weekday Travel Time Savings (min)		Corridor A Base	Corridor A Plus Improvements
Priority Treatment	Location	AM Peak	PM Peak	AM Peak	PM Peak		
Medium Transitway	NW 83rd St (NW 39th Ave to NW 23rd Ave)	1.48	1.48	1.73	1.73		✓
	SW 62nd Blvd (NW 1st Pl to SW 20th Ave)	1.86	1.86	2.17	2.17		✓
BAT Lane	Archer Rd (Gale Lemerand to SW 13th St)	0.61	0.96	0.64	1.01		✓
	Newberry Rd (NW 66th St to SW 62nd Blvd)	0.36	0.36	0.51	0.51		
TSP	Newberry Rd/Tower Rd	0.38	0.38	1.10	1.10	✓	✓
	Newberry Rd/I-75 SB Ramp	0.07	0.07	0.14	0.14		
	Newberry Rd/I-75 NB Ramp	0.14	0.14	0.15	0.15		
	Newberry Rd/NW 66th St	0.00	0.00	0.00	0.05		
	SW 62nd Blvd/NW 1st Pl	0.04	0.24	0.00	0.00		
	SW 20th Ave/SW 43rd St	0.05	0.15	0.05	0.96		
	SW 20th Ave/SW 38th Terr	0.26	0.00	0.47	0.63		
	Hull Rd/SW 34th St	0.10	0.00	0.10	0.10		
	Archer Rd /SW 16th St	0.26	0.07	0.26	0.26		
	University Ave/Waldo Rd	0.35	0.36	0.00	0.00		
Queue Jump	SB - SW 62nd Blvd/NW 1st Pl	0.14	0.0	0.00	0.00	✓	✓
	EB - Hull Rd/SW 34th St	1.00	0.57	1.02	0.57		
	EB - Archer Rd/Newell Dr	0.03	0.13	0.03	0.03		
Extended Queue Jump	WB - Archer Rd/SW 16th St	0.47	0.28	0.47	0.47		✓
	WB - Archer Rd/Newell Dr	0.16	0.00	0.16	0.16		
	EB - Archer Rd/Center Dr	0.07	0.19	0.07	0.07		
	EB-Newberry Rd/NW 66th St (bypass)	0.22	0.22	0.24	0.21		
	WB-Newberry Rd/NW 66th St	0.25	0.25	0.44	0.24		
	SB - SW 62nd Blvd/NW 1st Pl	0.00	0.75	0.25	0.90		

3.3.2 Corridor B

Initial Intersection Screening

An analysis of transit priority treatments was performed on 20 intersections along Corridor B. Twelve signalized intersections with LOS C or D where identified for potential implementation of TSP. The difference in delay was used to calculate the directional travel time savings for segments between signalized intersections.

Eight signalized intersections with right turn lanes were selected for analysis of queue jump traffic operations in Corridor B. The difference in delay for the general traffic lane and the auxiliary lane was used to calculate the directional travel time savings for segments between intersections.

The future year conditions analysis allowed for identification of locations where the increase in traffic volumes would restrain transit priority implementation. Eight signalized intersections were identified for potential implementation of TSP under projected future conditions.

Initial Roadway Segment Screening

Semi-exclusive lanes were considered for segments where the existing lane configuration would allow bus operations in a BAT lane without substantial impact to general vehicle operations. Future land uses and modifications to the existing roadway were also considered to determine the feasibility of implementing BAT lanes and dedicated transitways. Semi-exclusive BRT operations on Old Archer Road were evaluated and segments along Archer Road (from SW 16th Avenue to SW 13th Street – Eastbound) and Newberry Road were identified for potential BAT lane implementation that would require extending existing auxiliary lanes. Dedicated transitway travel time savings were calculated for segments identified as part of the planned median transitway along SW 62nd Blvd. Extension (NW 1st Pl to Butler Plaza)and the transitway along NW 83rd St. (South Rd. to NW 23rd Ave.) continuing along Fort Clarke Blvd. to Newberry Village.

Travel Time Savings

Table 3-5 shows the summary of travel time savings in minutes for Corridor B only along the base alignment, not the optional routing alternatives, under existing and 2035 traffic conditions. The difference in travel time savings if the existing storage length were to be extended for locations where queue jump implementation would give the highest savings is also shown for comparison (“Total Min savings + Queue Jump”). Tables A-4 and A-5 break out the travel time savings by direction.

Two scenarios were evaluated for Corridor B: 1) a base scenario with BRT in mixed traffic with TSP and queue jump implementation where lengthening of existing right turn lanes is not required (consistent with the TSM alternative); and 2) the base plus median transitway on SW 62nd Blvd. and the proposed transitway from Springhill along NW 83rd St. and Fort Clarke Blvd. to Newberry Village, the BAT lanes on Newberry Rd., and eastbound BAT lane on Archer Rd.

The variation of the Archer Rd. operation was assessed based on the lengths of eastbound BAT lane operation:

- From SW 16th Ave.
- EB Old Archer Rd. from SW 34th St. to SW 16th Ave. and EB Archer Rd. along the BAT lane that would be developed by extending the existing right turn lanes from SW 16th Ave. to SW 13th St.
- WB BRT would operate in mixed traffic until SW 23rd Dr where BRT would operate along Old Archer Rd. to SW 28th Pl. At SW 28th Pl., BRT would exit Old Archer Rd. at the proposed traffic signal.

Table 3-6 shows the summary of travel time savings associated with each transit priority treatment analyzed and the applicability to the scenarios evaluated for Corridor B.

Comparison of TSP vs. Queue Jump

The transit priority strategies implementation analysis resulted in six signalized intersection locations (SW Archer Rd. and SW 16th St., SW Archer Rd. and SW 16th Ave., SW 20th Ave. and SW 62nd Blvd., NW 62nd Blvd. and NW 1st Pl., Newberry Rd. and NW 66th St., and SW Archer Rd. and Center Dr.) where TSP and queue jumps were both applicable based on the level of service and the existence of an exclusive right turn lanes for existing traffic volumes. Three signalized intersections were identified where both strategies were applicable under future traffic volumes (SW Archer Rd. and SW 16th St., Newberry Rd. and NW 66th St., and SW Archer Rd. and Gale Lemerand Dr.).

Table A-6 identifies those locations where if existing right turn lanes are extended added travel time savings associated with queue jump signals as opposed to TSP could be achieved; the number of intersections changed between the current period and 2035 due to changes in traffic volumes.

3.4 Summary

The analysis of transit priority treatments for Corridors A and B provide a basis for estimating travel time savings which in turn drives operating hours and costs for the TSM and Build alternatives (presented in Section 7.0), as well as ridership. The priority treatments also provide the major component of running-way capital costs (also presented in Section 7.0).

The evaluation identified multiple opportunities for implementing TSP and/or queue jumps under existing and future traffic conditions without modification to existing lane configurations. It is also showed that there are locations where the modifications to the right turn lane storage length would provide a substantial increase in travel time savings, these locations are assumed to be modified for BRT implementation.

Table 3-5. Corridor B Existing and 2035 Weekday Peak Travel Time Savings with Transit Priority Treatments

	Existing Weekday				2035 Weekday			
Two Directional Travel Time Savings	Corridor B Base		Corridor B Plus EB Extended Right Turn Lane with BRT to SW 16th Ave		Corridor B Base		Corridor B Plus EB Extended Right Turn Lane with BRT to SW 16th Ave	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Median Transitway (min)	0.00	0.00	4.68	4.68	0.00	0.00	5.46	5.46
Semi-Exclusive (BAT) Lane (min)	2.75	5.22	6.46	10.80	3.11	5.90	6.82	12.63
TSP (min)	1.70	2.23	1.70	2.23	1.97	1.98	1.97	1.98
Queue Jump (min)	0.51	0.37	0.51	0.37	0.03	0.03	0.03	0.03
Total (min)	4.96	7.82	13.35	18.08	5.11	7.90	14.28	20.10
Minutes per Mile Savings	0.24	0.38	0.64	0.87	0.25	0.38	0.69	0.97
Total Min savings +Queue Jump	4.96	7.82	14.81	19.77	5.11	7.90	16.24	22.02
Total Min/Mile savings +Queue Jump	0.24	0.38	0.72	0.97	0.25	0.38	0.78	1.06

Table 3-6. Corridor B Specific Transit Priority Treatments and Travel Time Savings

Priority Treatment	Location	Existing Weekday Travel Time Savings (min)		2035 Weekday Travel Time Savings (min)		Corridor B Base	Corridor B Plus EB Extended Right Turn Lane with BRT to SW 23rd Dr	Corridor B Base EB Extended Right Turn Lane with BRT to SW 16th Ave
		AM Peak	PM Peak	AM Peak	PM Peak			
Medium Transitway	NW 83rd St (South Rd to NW 23rd Ave)	0.38	0.38	0.42	0.42		✓	✓
	SW 62nd Blvd (NW 1st Pl to Butler Plaza)	4.3	4.3	5.04	5.04		✓	✓
BAT Lane	Archer Rd (SW 16th Ave to SW 13th St)	0.80	1.25	0.84	0.84			✓
	Archer Rd (SW 23rd Dr to SW 13th St)	1.04	1.64	1.12	1.12		✓	
	Old Archer Rd	4.84	4.84	5.47	5.47	EB ✓	✓	✓
	Newberry Rd (NW 66th St to SW 62nd Blvd)	0.37	0.37	0.5	0.5		✓	✓
TSP	Newberry Rd/Tower Rd	0.38	0.38	1.10	1.10	✓	✓	✓
	Newberry Rd/I-75 SB Ramp	0.07	0.07	0.14	0.14			
	Newberry Rd/I-75 NB Ramp	0.14	0.14	0.15	0.15			
	Newberry Rd/NW 66th St	0.00	0.00	0.00	0.05			
	SW 62nd Blvd/NW 1st Pl	0.04	0.24	0.00	0.00			
	SW 62nd Blvd/SW 20th Ave	0.017	0.42	0.00	0.00			
	SW 37th Blvd/Archer Rd	0.21	0.44	0.00	0.00			
	Archer Rd/SW 23rd Terr	0.11	0.00	0.00	0.00			
	Archer Rd/SW 16th Ave	0.00	0.10	0.26	0.26			
	Archer Rd/Gale Lemerand	0.06	0.00	0.00	0.00			
	Archer Rd /SW 16th St	0.26	0.07	0.26	0.26			
	University Ave/Waldo Rd	0.35	0.36	0.00	0.00			
Queue Jump	SB - SW 62nd Blvd/NW 1st Pl	0.14	0.0	0.00	0.00	✓	✓	✓
	SB - SW 62nd Blvd/SW 20th Ave	0.34	0.24	0.00	0.00			
	EB - Archer Rd/Newell Dr	0.03	0.13	0.03	0.03			
Extended Queue Jump	WB - Archer Rd/SW 16th St	0.47	0.28	0.47	0.47		✓	✓
	WB - Archer Rd/Newell Dr	0.16	0.00	0.16	0.16			
	EB - Archer Rd/Center Dr	0.07	0.19	0.07	0.07			
	EB - Archer/Gale Lemerand	0.19	0.00	0.24	0.24			
	EB-Newberry Rd/NW 66th St (bypass)	0.22	0.22	0.24	0.21			
	WB-Newberry Rd/NW 66th St	0.25	0.25	0.44	0.24			
	WB - Archer Rd/16th Ave bypass	0.12	0.00	0.08	0.13			
	SB - SW 62nd Blvd/NW 1st Pl	0.00	0.75	0.25	0.90			

Figure 3-7 shows the locations identified as opportunities for implementing TSP and/or queue jumps – at those locations where operations analysis was conducted. Added TSP implementation is also shown for intersections that were not assessed for traffic operations, given the desire to install the capability of implementing TSP at any signalized intersection. BAT lane and transitway locations are also identified. Tables 3-7 and 3-8 summarize the recommended priority treatment for Corridor A and Corridor B; TSP during off peak hours is recommended for other signalized intersections along both corridors.

Table 3-7. Corridor A Recommended Transit Priority Treatments

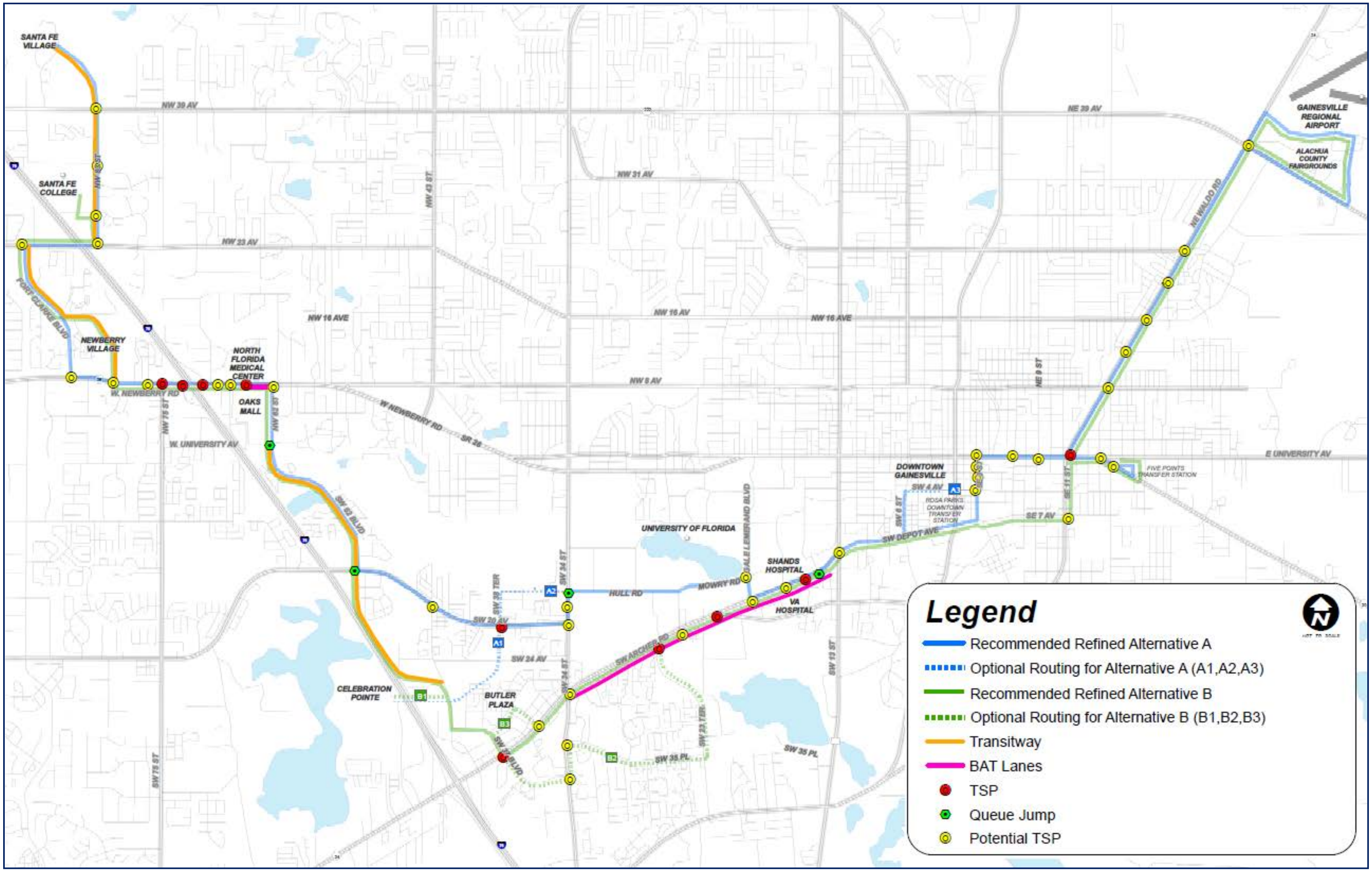
Intersection	Existing		2035	
	TSM	BRT	TSM	BRT
Waldo Rd. and University Ave.	TSP	TSP		
Archer Rd. and 16th St.	TSP	Extended Queue Jump	TSP	Extended Queue Jump
Archer Rd. and Center St.		Extended Queue Jump		Extended Queue Jump
Archer Rd. and Newell	EB -Queue Jump	WB-Extended Queue Jump	EB- Queue Jump	WB- Extended Queue Jump
Hull Rd. and 34th St.	Queue Jump	Queue Jump	Queue Jump	Queue Jump
SW 20th Ave. and 38th Ter.	TSP	TSP	TSP	TSP
SW 20th Ave and 43rd St.	TSP	TSP	TSP	TSP
NW 62nd Blvd. and 1st Pl.	Queue Jump	Extended Queue Jump		Extended Queue Jump
Newberry Rd. and NW 66th St.		Extended Queue Jump		Extended Queue Jump
Newberry Rd. and 75th St. NB	TSP	TSP	TSP	TSP
Newberry Rd. and 75th St. SB	TSP	TSP	TSP	TSP
Newberry Rd. and NW 75th St.	TSP	TSP	TSP	TSP

Note: *BAT lanes in Base Alternative B reflect the savings related to operations along Old Archer Road eastbound for the segment in which no modifications to the existing configuration is required.*

Table 3-8. Corridor B Recommended Transit Priority Treatments

Intersection	Existing		2035	
	TSM	BRT	TSM	BRT
Waldo Rd. and University Ave.	TSP	TSP		
Archer Rd. and 16th St.	TSP	Extended Queue Jump	TSP	Extended Queue Jump
Archer Rd. and Center St.		Extended Queue Jump		Extended Queue Jump
Archer Rd. and Newell St.	Queue Jump	Extended Queue Jump	Queue Jump	Extended Queue Jump
Archer Rd. and Gale Lemerand		Extended Queue Jump		Extended Queue Jump
Archer Rd. and SW 16th Ave.	TSP	Extended Queue Jump	TSP	Extended Queue Jump
Archer Rd. and SW 37th Blvd.	TSP	TSP		
NW 62nd Blvd. and 1st Pl.	Queue Jump	Extended Queue Jump	Queue Jump	Extended Queue Jump
NW 62nd Blvd. and SW 20th Ave.	Queue Jump	Queue Jump		
Newberry Rd. and NW 66th St.	TSP	Extended Queue Jump	TSP	Extended Queue Jump
Newberry Rd. and 75th St. NB	TSP	TSP	TSP	TSP
Newberry Rd. and 75th St. SB	TSP	TSP	TSP	TSP
Newberry Rd. and NW 75th St.	TSP	TSP	TSP	TSP

Figure 3-7. Refined Transit Priority Locations



4.0 RUNNING-WAY PLANS

4.1 Overview

Concept plans were developed for the BRT mode for the refined Build alternatives in Corridors A and B, including subarea route variations. The plans were laid out on 1" = 500' aerial photography for both corridors and 1" = 100' aerial photography to show details of the proposed BAT lanes along Archer Rd. and Newberry Rd. The layout plans were intended to visually illustrate the basic running-way components at sufficient detail to allow for the development of conceptual-level capital cost estimates and an initial screening of environmental impacts. Field review supplemented by aerial photos was used to review the configuration of existing streets and identify the specific alignment options for BRT operations as well as potential station locations.

Appendix B presents the running-way concept plans for the Corridor A and B alternatives. The following sections document more of the format and content of the running-way plans.

4.2 Running-Way Components

4.2.1 Route Refinement

The running-way concept plans for BRT operation were developed for the base route option and each variation in both Corridors A and B. The preferred type of lane treatment was identified in this stage of study. In some cases the BRT would operate in a BAT lane, shared with right turn traffic; at other locations the BRT would be operating in mixed traffic. For both corridors, associated with the future SW 62nd Blvd. Extension and widening, a median transitway facility as identified in the project PD&E study was also assumed. BRT service was also assumed to be operating in a dedicated transitway facility as identified in the planned developments for Springhill, Santa Fe Village and Newberry Village. Where BRT would operate in-street, it was only identified as being in a specific travel lane, without width or offset distances to general traffic lanes specified.

Figure 1-1identifies the base BRT route options addressed in the running-way concept plans, as well as the subarea routing options.

4.2.2 Potential Lane Configuration

Potential alternate lane configurations for BRT operation are identified on the running-way concept plans segment by segment for each corridor. The lane configurations are identified schematically, with the lane BRT would operate in highlighted. Field review and the transit priority analysis revealed only limited opportunity for BAT lanes along the two corridors.

4.2.3 Transit Priority Treatments

The results of the transit priority analysis presented in Section 3.0 are reflected in the running-way concept plans, where specific locations for BAT lanes, transit signal priority, and queue jump signals are identified. It is important to realize that even though only certain intersections are identified for TSP on the concept plans, the intent would be to install the capability of implementing TSP at most, if not all, intersections, given that priority could be instituted during non-peak periods if peak period actuation was not possible because of traffic congestion.

4.2.4 Station Locations

Potential locations for BRT stations along each route alternative were identified based on field review, a review of potential bus transfer locations, and input from the City of Gainesville and Alachua County on planned Park-n-Ride and Transit Center locations (see Figure 2-3). The objective was to identify station spacing at intervals of approximately one mile. All major intersections along each optional BRT route were evaluated as potential sites for BRT stations. In some cases, both farside and nearside options were considered in a particular direction.

4.3 Corridor A Running-Way Treatments

The running-way treatment assumed for Corridor A is identified in Appendix B.

Santa Fe Village - NW 83rd St.

Through the new Santa Fe Village development north of NW 39th Ave. the BRT would operate in a dedicated transitway facility adjacent to the main access road. This running-way concept has been incorporated into the overall development plan for Santa Fe Village, with a north terminus location still to be determined. South of NW 39th Ave. there is a wide utility easement on the west side of the roadway where a transitway facility could be developed between the two sets of overhead power lines. Such a transitway would function as a two-lane busway. Alachua County has indicated the extended busway to NW 23rd Ave. would be covered by developer contributions.

The BRT stop serving the college is shown to be along the transitway. The college has a master plan that identifies potentially moving the bus stop to the west side of campus associated with local street modifications. Further discussion with SFC is needed to refine the longer-term stop location and any routing modifications for BRT outside of a transitway. If a transitway were developed, the station serving SFC would most likely be along the transitway as noted, to preclude any bus diversion into the college and hence take away from the travel time savings associated with the transitway.

NW 23rd Ave.

BRT on this street would operate in mixed traffic, with the opportunity to institute TSP for the eastbound left turn at NW 83rd St. A project to provide double left turn lanes on the westbound NW 23rd Ave. approach to Fort Clarke Blvd. will provide added capacity and was assumed to preclude the need for supplemental TSP treatment for this movement.

Fort Clarke Blvd.

This street is currently a 2-3 lane facility, with plans by Alachua County to widen to a five-lane facility and develop a dedicated transitway facility on the eastside of the roadway that would connect to the Newberry Village access road (at NW 15th Pl.). BRT would operate in mixed traffic south of NW 15th Pl. As part of the LPA recommendation, it has been suggested that Corridor A would be modified to operate in a dedicated transitway facility adjacent to the main access road that would divert into the Newberry Village development to serve the station at the park-n-ride on the east side of the development's north-south access road. The route would then continue south to Newberry Rd. TSP for the southbound left turn onto Newberry Rd. would be provided.

Newberry Rd.

From Fort Clarke Blvd. east through the I-75 interchange to NW 66th St., BRT would operate in mixed traffic in the outside lanes. Newberry Village would be served with a stop at a proposed park-n-ride within the development off Newberry Rd. A preliminary location for a park-n-ride on the east side of the Newberry Village main access road has been identified and shown on the concept plans. To access this site, BRT would have to make a slight diversion off Newberry Rd. between NW 66th St. and NW 62nd St., the BRT is proposed to operate in BAT lanes on both sides of the street, which would require the extension of existing auxiliary lane area, shared with right turns. Eastbound at NW 66th St., the BRT would use the near side right turn lane to access a far side BRT stop. Westbound, BRT would have a near side stop (existing stop) at NW 66th St., and queue jump to re-enter Newberry Rd. west of the intersection. Given the interconnection of traffic signals in the area, transit priority treatments along this street would focus primarily on TSP treatments at the other existing signalized intersections including the traffic signals at the I-75 Interchange.

SW 62nd Blvd.

North of NW 1st Pl., the BRT would operate in mixed traffic in the right through lanes. South of NW 1st Pl. to SW 20th Ave., the BRT is proposed to operate in a two-directional transitway according to the Southwest 62nd Blvd. Connector PD&E Study 2010. Figure 4-1 illustrates the proposed cross section. Transit priority treatments along this street would focus primarily on TSP treatments at signalized intersections and a proposed southbound queue jump at the Oaks Mall access signal.

Specific station design treatments along the median transitway were not identified in the former PD&E study, only the location of stations. Station configuration could either include side platforms or a center platform configuration. In the current study, side platforms were assumed for cost estimating purposes. Stations would be accessed either at a signalized intersection (SW 20th Ave.) or through added pedestrian signals where full traffic signals do not exist (assumed for the other stations).

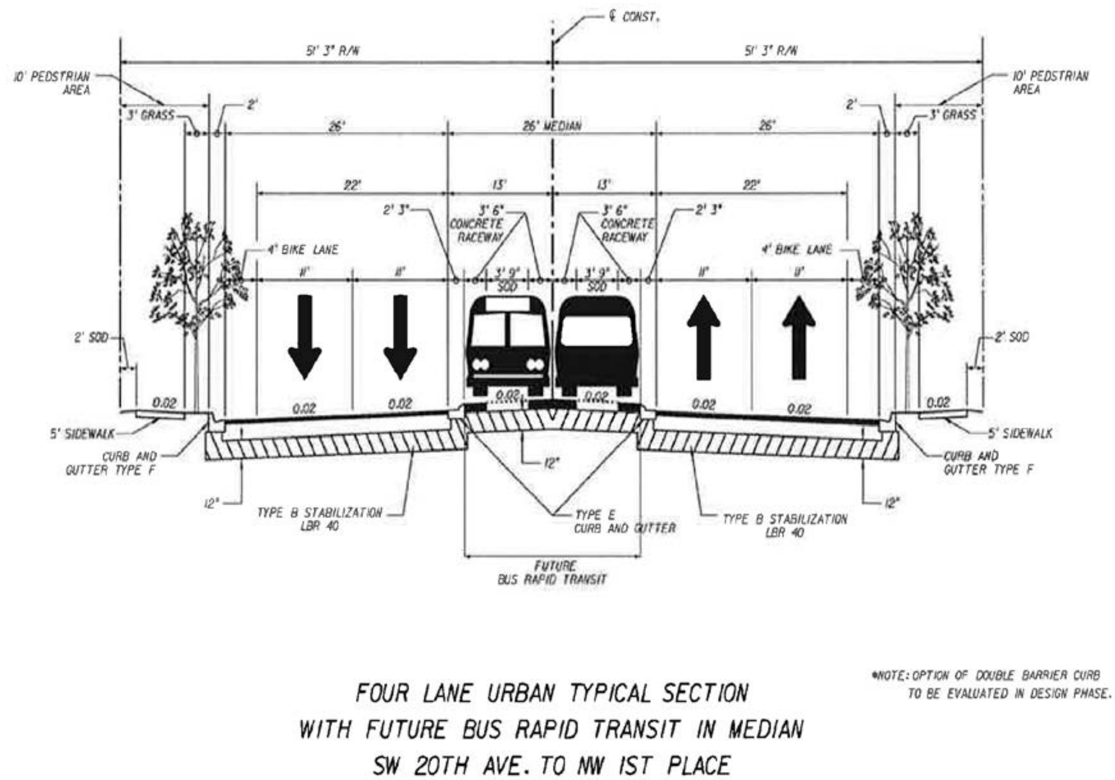
SW 20th Ave.

On SW 20th Ave., the BRT would operate in mixed traffic in the right through lanes; the optional routing corridor would provide a connection with the Hull Road Park-n-Ride with the potential of an eastbound queue jump at the signalized intersection of Hull Rd. and SW 34th St.

Hull Rd. /Mowry Rd. (Through UF Campus)

The base BRT routing would operate along Hull Rd. and Mowry Rd. to Gale Lemerand Dr., then south to Archer Rd. The BRT would operate in mixed traffic in this area on existing two-lane and four-lane roadways. TSP capability would be provided at signalized intersections. A transfer opportunity with RTS buses destined further north into the UF campus can be provided at this location, either on-street or by converting the adjacent small parking lot on the northwest corner of the Hull/Mowry/Gale Lemerand intersection to a small transfer location.

Figure 4-1. SW 62nd Blvd. Proposed Two-Lane Median Transitway Cross Section



Source: Southwest 62nd Boulevard Connector
Project Development and Environment Study (PD&E) 2010

Archer Rd.

From Gale Lemerand Dr. to SW 13th St., the base BRT operating configuration would be in mixed traffic. However, there is an option to operate eastbound in a BAT lane that would be developed by extending existing right turn lanes on the south side of the street. This BAT lane would tie into an extended eastbound through lane at the SW 13th St. intersection. Given the interconnection of traffic signals in the area, transit priority treatments along this street would focus primarily on TSP treatments at existing signalized intersections.

SW Depot Ave.

Along SW Depot Ave., BRT could operate in mixed traffic. The BRT would need to negotiate through new single-lane roundabouts to be developed at a realigned intersection with SW 10th St., at SW 6th St. and at SW Main St. (the ability of articulated buses to negotiate through these roundabouts has been confirmed through an Autoturn analysis). The route would connect with the Rosa Parks Transfer Station to provide transfer opportunities for the BRT line and local bus routes. Given the presence of existing and proposed roundabouts along this street, intersection TSP improvements were not identified.

SE 3rd St. (Through Downtown Gainesville)

The base BRT corridor would extend north from the Rosa Parks Transfer Station along NE 3rd St. to University Ave., then east to the Five Points Transfer Center. The BRT would operate in mixed traffic on this street, with stops just south of SE 2nd Ave.

SE University Ave. /SE Hawthorne Rd.

Along University Ave., the BRT would operate in the right through lanes, past NE Waldo Rd., to SE Hawthorne Rd. The route would then continue southeast on SE Hawthorne Rd. to SE 1st Ave., then make a clockwise movement using SE 17th St. and SE Hawthorne Rd. to serve a stop just south of 1st Ave. This would be the location for the new Five Points Transfer Station. Pending further evaluation, a portion or the entire triangular property on the north side of the street could be used for an extended transit passenger waiting area with shelter and other amenities. TSP would be developed along the University/Hawthorne corridor where operationally feasible, with particular focus on priority through the Waldo Rd. intersection and on westbound Hawthorne at University Ave.

NE Waldo Rd.

Along NE Waldo Rd., BRT could operate in mixed traffic. The route would provide access to the Gainesville Regional Airport and the Alachua County Fairgrounds. Given the interconnection of traffic signals in the area, transit priority treatments along this street would include TSP where possible, with particular opportunities at NE 8th Ave., NE 12th Ave., NE 16th Ave., and NE 23rd Ave. A pedestrian signal at UF East Campus is also proposed.

NE 39th Ave. (Serving Gainesville Airport)

To serve Gainesville Regional Airport, there are two route options for BRT. The first, which is how RTS local service accesses the airport terminal today, would be to use NE 39th Ave. and the main airport access road to serve the existing bus stop at the east end of the terminal building. This would be the BRT layover location. This route could then have a secondary two-directional stop at the County Fairgrounds access, before and after leaving the airport terminal. The optional route would be for northbound BRT to continue north on NE Waldo Road past NE 39th Ave. to the new airport access road, then use the new road to enter the airport property and swing around the loop road to serve the terminal stop, then head south on the major airport access road to NE 39th Ave., then west to NE Waldo Rd. Assuming the BRT layover at the airport terminal, this would only allow a westbound stop on NE 39th Ave. at the Fairgrounds. The option of using the new airport access road off NE Waldo Rd. to exit the airport is problematic because there is no near future opportunity according to FDOT to provide a traffic signal for BRT vehicles to make left turns onto southbound Waldo.

Route Options

There are three optional routing opportunities for Corridor A. The first would be to operate on SW 38thTer and the planned Hull Rd. Extension to serve the University park-n-ride lot, as opposed to using SW 20th Ave. and SW 34th St. and diverting back to serve the lot. Both SW 38th Ter. and the Hull Rd. Extension are being constructed associated with new development west of the park-n-ride, and would provide direct access to the park-n-ride and also eliminate the eastbound left turn off SW 20th Ave. to SW 34th St., and the Hull Rd. left turn to SW 34th St. For either route option, BRT would operate in mixed traffic.

As a second option, to directly serve the Innovation Square area, the BRT could divert off SW Depot Ave., and travel north along SE 6th St. to SW 4th Ave. The route would then continue east to SE 3rd St., divert to the south to serve the Rosa Parks Transfer Station, and then divert back north to serve downtown and University Ave.

Finally, the option of extending BRT service to Celebration Pointe, which is west of I-75 has been identified. Through the Celebration Pointe development agreement, both a park-n-ride transit facility and transitway lanes are being provided into the development. For Corridor A, the connection off the main route would be made via SW 38th Ter. and SW 30th Ave., which could also serve the Butler Plaza Transfer Station.

4.4 Corridor B Running-Way Treatments

The running-way treatment assumed for Corridor B is identified in Appendix B.

NW 83rd St.

With Corridor B, the BRT service would terminate at SFC using the south campus access road (NW South Rd.) off NW 83rdSt, either to the existing RTS stop or to a new designated stop location within campus. The service would use a more limited transitway on the west side of NW 83rd St. in the utility easement only between NW South Rd. and NW 23rd Ave.

NW 23rd Ave.

BRT would operate in mixed traffic similar to Corridor A, with similar transit signal priority treatments at NW 83rd St. and Fort Clarke Blvd.

Fort Clarke Blvd. /Newberry Village

The BRT route would operate in a dedicated transitway facility adjacent to the main access road that would divert into the Newberry Village development to serve the station at the park-n-ride on the east side of the development's north-south access road (same park-n-ride location as for Corridor A). The route would then continue south to Newberry Rd. TSP for the southbound left turn onto Newberry Rd. would be provided.

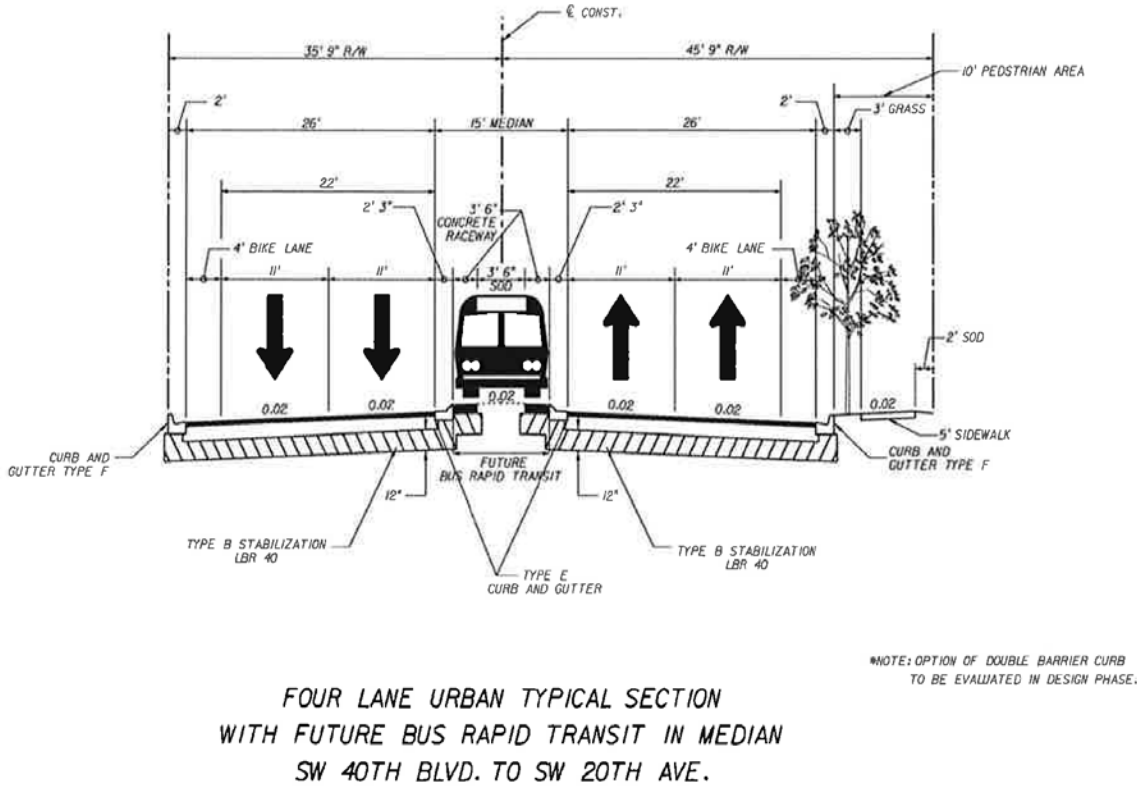
Newberry Rd.

East of the Newberry Village access, Corridor B would have the same treatments as Corridor A.

SW 62nd Blvd.

North of NW 1st Pl., the BRT would have to operate in mixed traffic in the right through lanes. South of NW 1st Pl. to SW 20th Ave. and from SW 40th Blvd. to SW 42nd St., the BRT is proposed to operate in a two-directional transitway, associated with the SW 62nd Blvd. extension project (see Figure 4-1). However, no transit stations are proposed in the segment with a transitway (proposed station locations are shown on Figure 2-3). Between SW 20th Ave. and SW 40th Blvd., BRT would operate in a single lane transitway again per the SW 62nd Extension project (see Figure 4-2). Transitions between the bidirectional and two-directional transitway operation at SW 20th Ave. and SW 40th Blvd. would be handled through provision of queue jump signals, with adequate backup line of sight provided.

Figure 4-2. SW 62nd Blvd. Proposed One Lane Median Transitway Cross Section



Source: Southwest 62nd Boulevard Connector
Project Development and Environment Study (PD&E) 2010

SW 42nd St. /SW 33rd Pl

The base route would turn south onto SW 42nd St. and operate in mixed traffic to provide direct access to the proposed transit center in the Butler Plaza area, on the southeast corner of the SW 42nd St./SW 30th Ave. intersection. South of the transit center, BRT would operate along SW 42nd St. to SW 33rd Pl in mixed traffic, where the route would turn east and continue to SW 37th Blvd.; this assumes that the 62ndtransitwaywould be shortened to 42nd Street from north, with direct access to Butler Plaza, and diversion back to 62nd not being cost-effective. TSP would be developed where operationally feasible associated with new signal installation along these streets.

SW 37th Blvd.

At SW 37th Blvd., the BRT would turn south and extend down to Archer Rd. operating in mixed traffic.

SW Archer Rd.

From SW 37th Blvd. to east of NW 34th St.., the BRT would have to operate in mixed traffic in the right through lanes. East of NW 34th St. eastbound, the BRT is proposed to use the existing slip ramp off Archer Rd. and operate along Old Archer Rd. to SW 16th Ave. This frontage road pretty much acts as a BAT lane facility with its very limited traffic volume. The BRT route would continue east of the frontage road to its end just west of the Archer Rd. /SW 16th Ave. junction. At SW 23rd Ter., the existing right-in, right-out treatment would be eliminated (at least for buses) to allow buses on Old Archer Rd. to go straight across 23rd Ter. This would require moving the stop bar for NW 23rdTer traffic further south, and/or creating a bus signal priority treatment to allow clear out of the northbound NW 23rdTer traffic queue prior to a bus arrival. East of SW 23rdTer, the route would extend to the east end of the frontage road. At the end of the frontage road, the route would use the existing right-out only driveway to turn into the right through lane oriented to SW 16th Ave. then merge into the existing gore area between the two roadways, which would be striped and signed as a bus-only lane. East of SW 16th Ave., the BRT route eastbound would operate in a BAT lane to SW 13th St., where the BAT lane (like in Corridor A) would be developed by widening the south side of Archer Rd. to provide a continuous acceleration/deceleration and right turn lane. This lane would be tied into an extension of the existing through lane on the eastbound approach to SW 13th St.

Westbound along Archer Rd. from SW 13th St. to SW 23rd Dr., the BRT would have to operate in mixed traffic in the right through lane. The BRT is proposed to enter Old Archer Rd. westbound at SW 23rd Dr. and operate along the frontage road and then exit Old Archer Rd. and back onto Archer Rd. at a proposed new signal at SW 28th Pl. West of SW 28th Pl., the BRT would have to operate in mixed traffic on Archer Rd. Given the interconnection of traffic signals in the area, transit priority treatments along this street would focus primarily on TSP treatments at existing signalized intersections.

SW Depot Ave.

Along SW Depot Ave., BRT could operate in mixed traffic along the same route as in Corridor A, interfacing with new roundabouts at SW 10th Ave., SW 6th Ave. and SW Main St. The route would connect with the Rosa Parks Transfer Station to provide transfer opportunities for the BRT line and local bus routes. Given the presence of existing and proposed roundabouts along this street, transit priority treatments were not identified.

SE 7th Ave. /SE 11th St.

As opposed to operating up SE 3rd St. into downtown Gainesville, Corridor B would have the BRT extending east along SE 7th Ave. to SE 11th St., then east along University Ave. to SE Hawthorne Blvd. and then the Five Points Transfer Station (with the turnaround and station location as in Corridor A). TSP capability would be provided at signalized intersections where possible.

NE Waldo Rd. /NE 39th Ave.

The BRT route would operate on NE Waldo Rd. and NE 39th Ave. with the same two options of serving the Gainesville Regional Airport and the County Fairgrounds as in Corridor A.

Route Options

For the Butler Plaza area, a route option to operating east on Archer Rd. would be to continue east of SW 33rd Pl along Windmeadows Blvd. to SW 35th Blvd. and then south to Archer Rd.

Another route option (an alternative to Archer Rd. between SW 37th Blvd. and SW 23rdTer.) would be to serve the student housing area south of Archer Rd. This route would stay on SW 37th Blvd. south of Archer Rd. to SW 34th St., then transition to SW 35th Pl., and then back to Archer Rd. via SW 23rd Pl. The BRT would operate in mixed traffic in this area. This corridor also has the option of serving the Celebration Pointe development.

4.5 Turning Maneuver and Roundabout Negotiation

4.5.1 Overview

With both Corridor A and B, there are several locations where BRT vehicles would need to make turns at intersections and in and out of off-street transfer stations. In some locations, the curb return today is too tight, and/or the stop bar is set up too close to the intersection, which would result in BRT vehicles encroaching into other traffic lanes to make their turning maneuver. To evaluate that impact, and potential curb return improvement and stop bar relocation needs, an Autoturn analysis was conducted at every location where BRT vehicle turns would be made, using a 60-foot articulated bus template.

There are also several existing and planned roundabouts along Corridors A and B which could pose some restriction to BRT operations. An Autoturn analysis was also conducted at these locations to verify vehicle maneuverability and any required geometric modifications to individual roundabouts.

The turning maneuver and roundabout negotiation analysis is summarized in Appendix C. Tables C-1 and C-2 summarize the analysis, identifying four basic scenarios:

1. BRT vehicle can maneuver turn with no problem
2. Maneuvering is tight, more detailed analysis required
3. BRT vehicle must use another lane to make the maneuver
4. Road needs reconstruction for BRT vehicle to maneuver

Key maps for this analysis for Corridors A and B are presented in Figures C-1 and C-2. Cost estimates for different locations were identified and reflected in the capital costs presented in Section 7.0 and in Appendix E.

4.5.2 Corridor A

The Autoturn analysis revealed that Corridor A only had four locations where BRT turning maneuvers would require some curb return and/or stop bar location modifications (condition C or D):

- NW South Rd to NW 83rd St – SB
- NW South Rd to SFC Bus Station-NB
- Rosa Parks Transfer Station to SE 3rd St – EB, NB
- SE 3rd St to SE 4th Ave – SB, WB

There are also four existing or proposed roundabout locations along Corridor A, all of which can accommodate a 60-foot articulated bus:

- SW Depot Ave. and SW 11th St.
- SW Depot Ave. and SW 6th St.
- SW Depot Ave. and Main St.
- SW 6th St. and SW 4th Ave.

4.5.3 Corridor B

The Autoturn analysis revealed that Corridor B with its optional routes had 10 locations where BRT turning maneuvers would require some curb return and/or stop bar location modifications (condition C or D):

- NW South Rd. to SFC Bus Station - NB
- NW South Rd. to NW 83rd St. – SB
- NW 15th Pl. to Fort Clarke Blvd. – NB
- SW 37th Blvd. to Windmeadows Blvd. – EB
- SW 34th St. to SW 39th Blvd. – WB
- SW 34th St. to SW 35th Pl. – EB
- SW Archer Rd. to Old Archer Rd. (at ramp) – EB
- Old Archer Rd. (at 23rd Dr) to SW Archer Rd. – EB
- SW Archer Rd. to Old Archer Rd (at 23rd Dr.) – WB
- Rosa Parks Transfer Station to SE 3rd St. – EB, SB

There are also six existing or proposed roundabout locations along Corridor B and its optional routes, all of which can accommodate a 60-foot articulated bus:

- SW 35th Pl. and SW 23rd Ter.
- SW Depot Ave. and SW 11th St.
- SW Depot Ave. and SW 6th St.
- SW Depot Ave. and Main St.
- SW Depot Ave. and SE 4th St.
- SE7th Ave. and SE 7th St.

5.0 STATION PLANS

5.1 Overview

This chapter presents the conceptual station plans associated with the refined BRT Build alternatives. The Plans are presented initially as a basic station classification scheme. Different levels of station development are based on station function, existing ridership at nearby stops, and the extent to which a proposed station would interface with local bus service. This analysis is followed by the presentation of conceptual design layouts for the different station types. With the type of station and design concepts identified, each proposed station site for Corridors A and B is classified. Finally, the location and configuration of on-line park-n-ride and bus transfer station facilities are reviewed.[2] Capital cost estimates for stations correspond to the number of station platforms at the location and are included in Section 7.0; the capital costs were derived from four recent BRT Station project cost estimates developed by Parsons Brinckerhoff and these estimates have been cross-checked against the FDOT item average unit costs for 2012 for reasonableness.

5.2 Station Classification Scheme/Design Concepts

Three types of stations have been created with differing platform lengths and number of bus bays and amenities. These include:

- Enhanced Stop,
- Designated Station (with reduced or full-length canopy [higher ridership]), and
- Extended Station.

Table 5-1 identifies the basic configuration and passenger amenities to be provided for each station type.

Eight basic design provisions applicable to all three station types and they include:

- Both BRT and local bus (where applicable) could use the station,
- Low-level platform throughout entire station area (standard 6" high curb, and 10-foot station depth from curb),
- Some provision for stylized passenger shelter, with permeable back art panels,
- Bench seating,
- Trash receptacle, and
- Special station identification signs and static schedule/information board.

Off-board fare collection machines (until full fleet of special BRT vehicles is implemented, fare boxes may remain at front of bus with goal of service to have all-door boarding and off-board fare collection with proof of payment).Real-time passenger information would also be provided at the larger designated and extended stations.

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2 *As discussed in the Physical Plans chapter, specific locations for BRT stations are identified on the running-way concept plans in Appendix B.*

Table 5-1. BRT Station Features

Station Features	Enhanced Stop	Designated Station	Extended Station
Accommodates Articulated Vehicle	✓	✓	✓
Accommodates Articulated Vehicle and Standard Vehicle			✓
Shelter, Cantilevered Canopy Structure, Reduced-Length Covering (40' to 60')	✓	✓	
Shelter, Cantilevered Canopy Structure, Full-Length Covering		✓	✓
Station Identification Sign Mounted to Front and Sides of Shelter Canopy	✓	✓	✓
Static Schedule/Notice Board	✓	✓	✓
Real-Time Passenger Information Monitor		✓	✓
Off-Board Fare Collection (Smaller Ticket Vending Machine)	✓	✓	✓
Emergency Blue Phone Column		✓	✓
Solar Powered Light System	✓	✓	✓
Lighting Integrated with Shelter	✓	✓	✓
Permeable Art Panels Across Back of Stop	✓	✓	✓
Fixed 6' Backed Bench Seating with Arm Rests	✓	✓	✓
Trash Receptacle	✓	✓	✓
Bicycle Docks		✓	✓
Shade Trees as R.O.W Allows		✓	✓

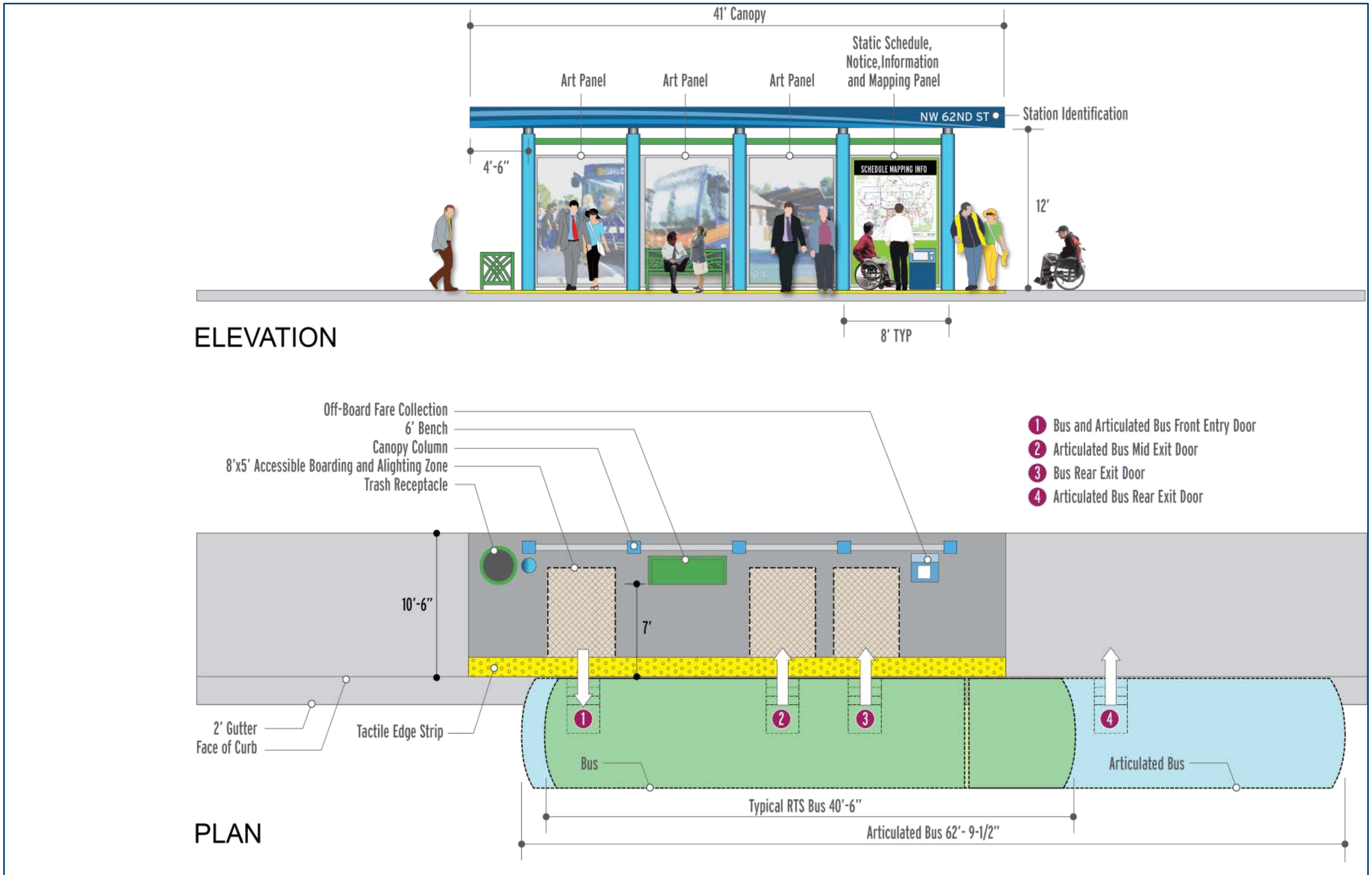
5.2.1 Enhanced Stop

The enhanced stop is designed to integrate well into existing developed areas with limited right-of-way availability. As such, this is the smallest of the three station types. The platform is designed to be the minimum length to accommodate one 60-foot articulated bus. This means that if both a BRT and local bus (if local service is provided at a stop) arrive at this type of stop at the same time, the second arriving vehicle would have to wait for the first arriving vehicle to depart. It should be noted the canopy extends the distance from the benches to the buses, providing a "full covering over the 10' sidewalk." This is not to be confused with the length of the canopy along the platform and sidewalk which varies between station types from 40 feet to 70 feet in length.

This stop has the least amount of passenger amenities, with a 41-foot shelter canopy and no provision for bike racks or emergency phones. The stop would be provided where there is restricted curb space to provide a station and/or where there is less existing/projected ridership (less than 400 boardings a day).

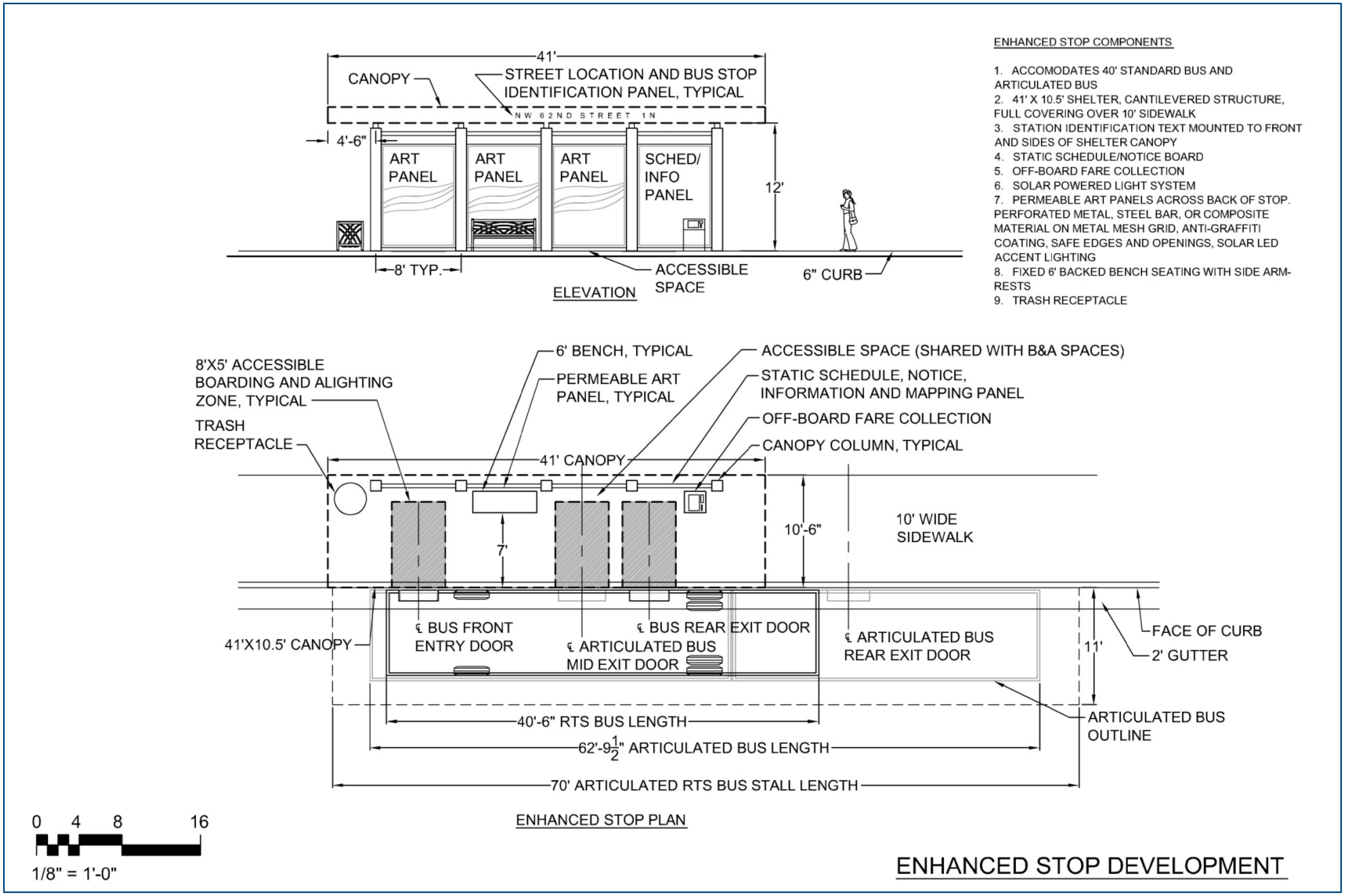
Figure 5-1 illustrates the enhanced stop graphically, with a more detailed station concept design plan and cross section layout presented in Figure 5-2.

Figure 5-1. Station Illustration - Enhanced Stop



Enhanced Stop Option

Figure 5-2. Station Concept Design - Enhanced Stop



5.2.2 Designated Station 3

The designated station is a medium level station that is reflective of a higher level of anticipated transit ridership. Two optional configurations have been developed with the principal difference being the length of the canopy over the platform.

Reduced Canopy

This station would have a 57-foot shelter canopy with the provision for more bench seating, and the addition of bike racks, real-time passenger information, and emergency blue phone for security. It is a more developed station as compared to the enhanced stop. The bus stop area would still accommodate one position, either for a 60-foot articulated BRT vehicle or 40-foot local bus. The stop would be applied where there are estimated 401 to 1,200 boardings a day.

Figure 5-3 illustrates the designated station with reduced canopy concept, with a more detailed plan and cross section layout presented in Figure 5-4. It should be noted the canopy extends the distance from the benches to the buses, providing a "full covering over the 10' sidewalk." This is not to be confused with the length of the canopy along the platform and sidewalk which would be 57 feet in length.

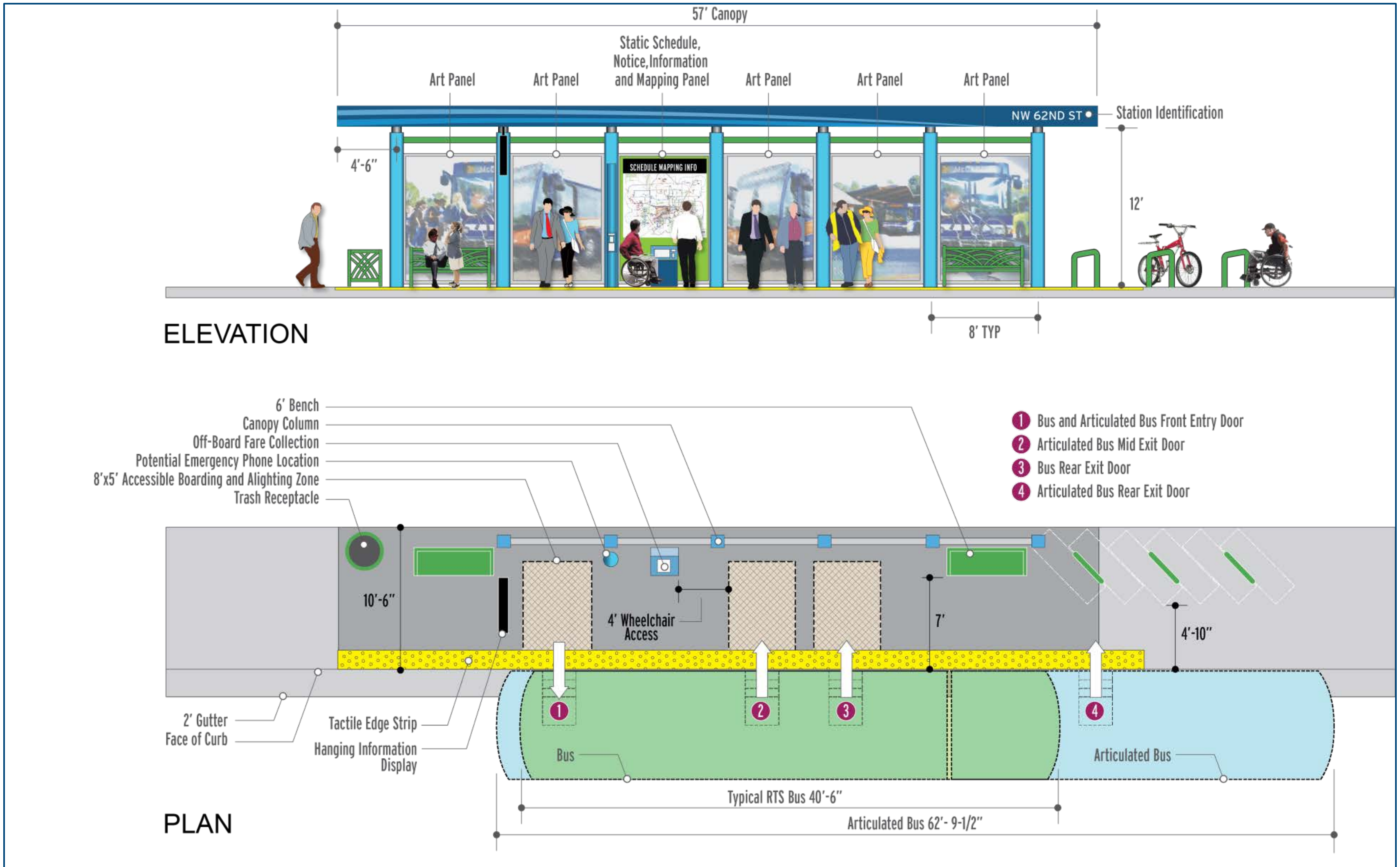
Full-length Canopy

When space is available, a full-length canopy can be provided that is 73-feet long. It would have the same features as the reduced canopy option (described above). The bus stop area would still accommodate one position, either for a 60-foot articulated BRT vehicle or 40-foot local bus.

Figure 5-5 illustrates the designated station with full-length canopy concept, with a more detailed plan and cross section layout presented in Figure 5-6. It should be noted the canopy extends the distance from the benches to the buses, providing a "full covering over the 10' sidewalk." This is not to be confused with the length of the canopy along the platform and sidewalk which would be 73 feet in length.

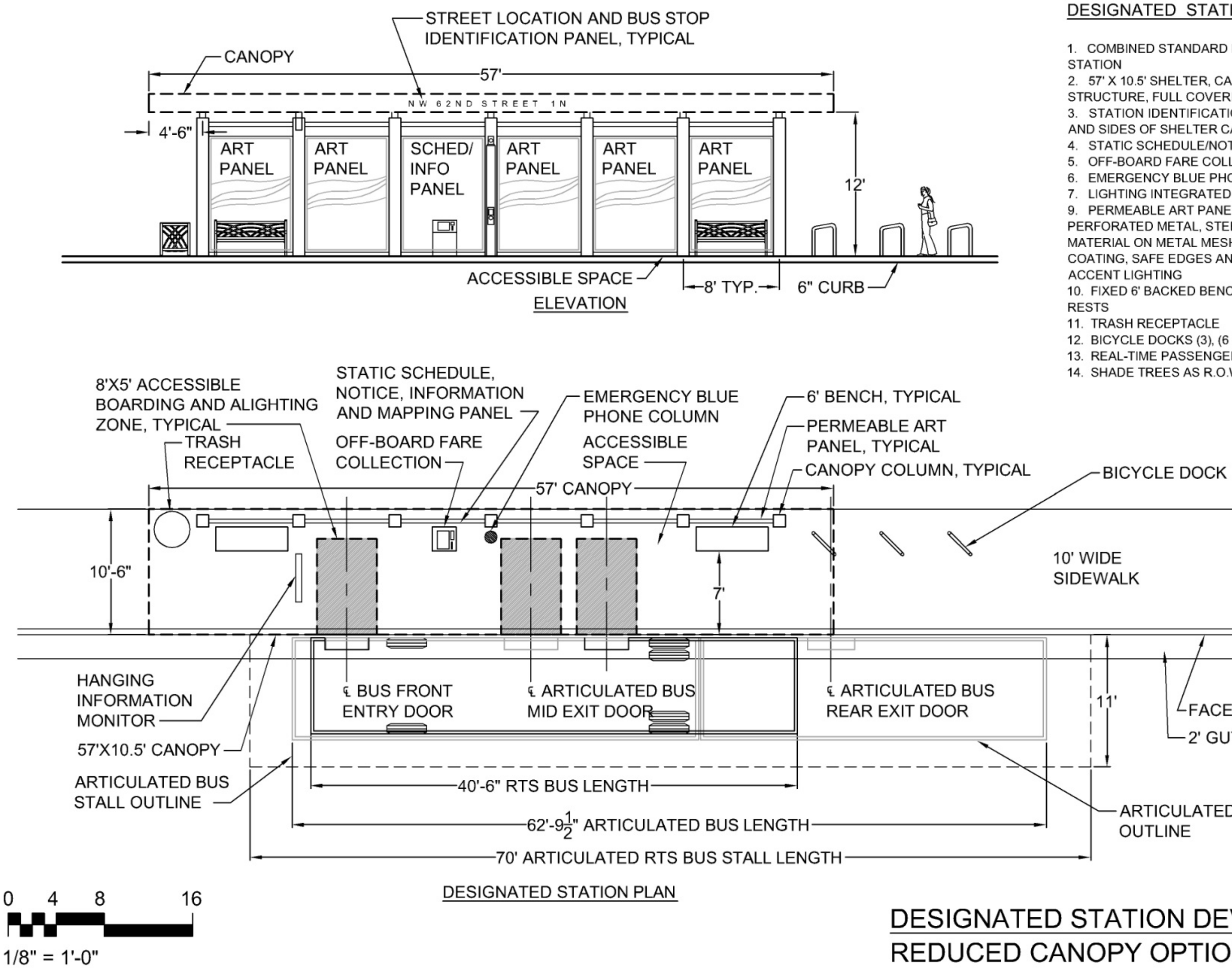
[3] As will be discussed in Section7.0, though the costs vary between these two variants guideway costs are the same since the length of the concrete pads for both stops are 70.'

Figure 5-3. Station Illustration - Designated Station/Reduced Canopy



Reduced Canopy Option

Figure 5-4. Station Concept Design - Designated Station/Reduced Canopy

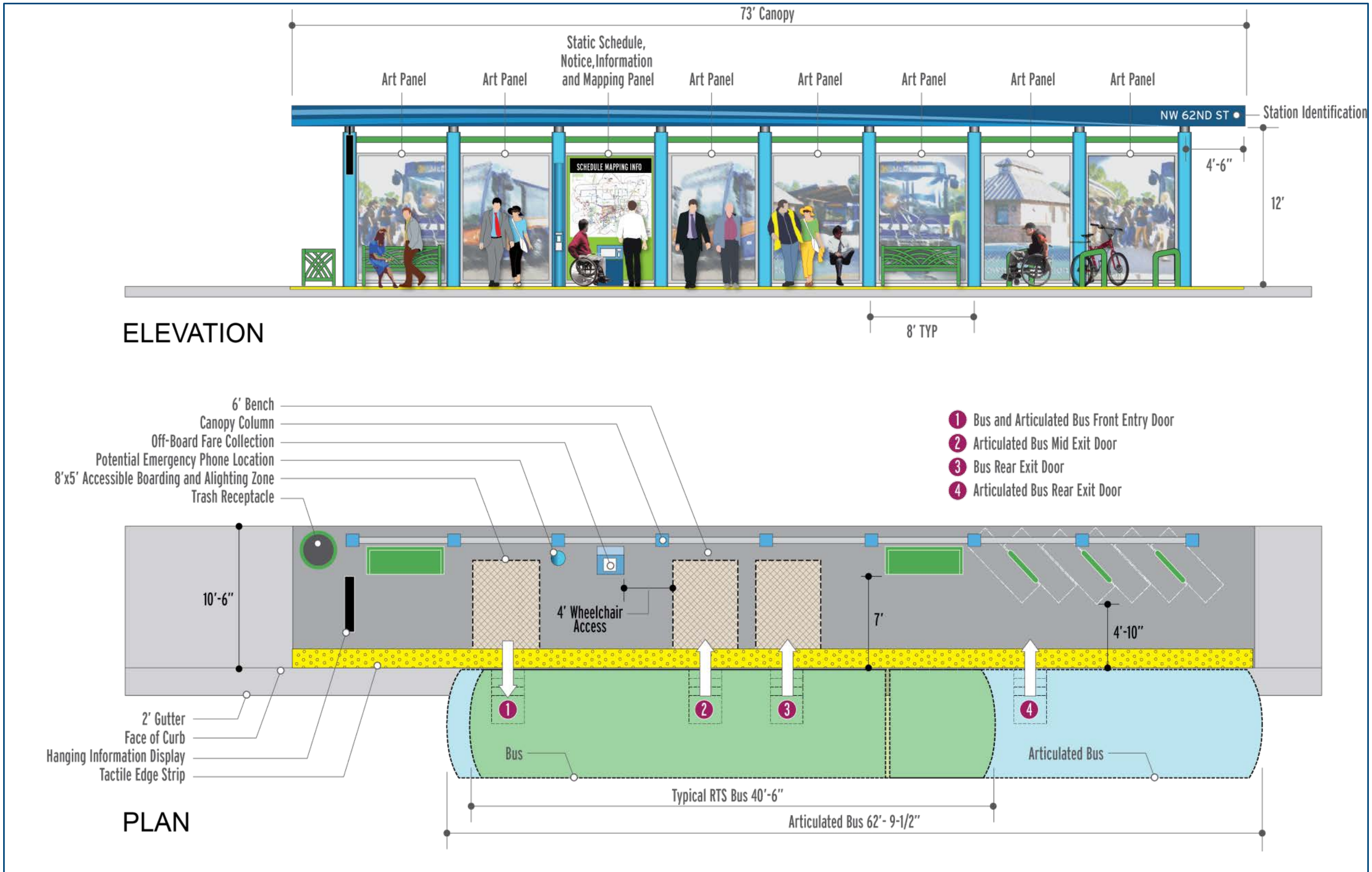


DESIGNATED STATION COMPONENTS

1. COMBINED STANDARD BUS AND ARTICULATED BUS STATION
2. 57' X 10.5' SHELTER, CANTILEVERED CANOPY STRUCTURE, FULL COVERING OVER 10' SIDEWALK
3. STATION IDENTIFICATION TEXT MOUNTED TO FRONT AND SIDES OF SHELTER CANOPY
4. STATIC SCHEDULE/NOTICE BOARD
5. OFF-BOARD FARE COLLECTION
6. EMERGENCY BLUE PHONE COLUMN
7. LIGHTING INTEGRATED WITH SHELTER
9. PERMEABLE ART PANELS ACROSS BACK OF STATION. PERFORATED METAL, STEEL BAR, OR COMPOSITE MATERIAL ON METAL MESH GRID, ANTI-GRAFFITI COATING, SAFE EDGES AND OPENINGS, SOLAR LED ACCENT LIGHTING
10. FIXED 6' BACKED BENCH SEATING WITH SIDE ARM-RESTS
11. TRASH RECEPTACLE
12. BICYCLE DOCKS (3), (6 BICYCLE SPACES)
13. REAL-TIME PASSENGER INFORMATION MONITOR
14. SHADE TREES AS R.O.W. ALLOWS

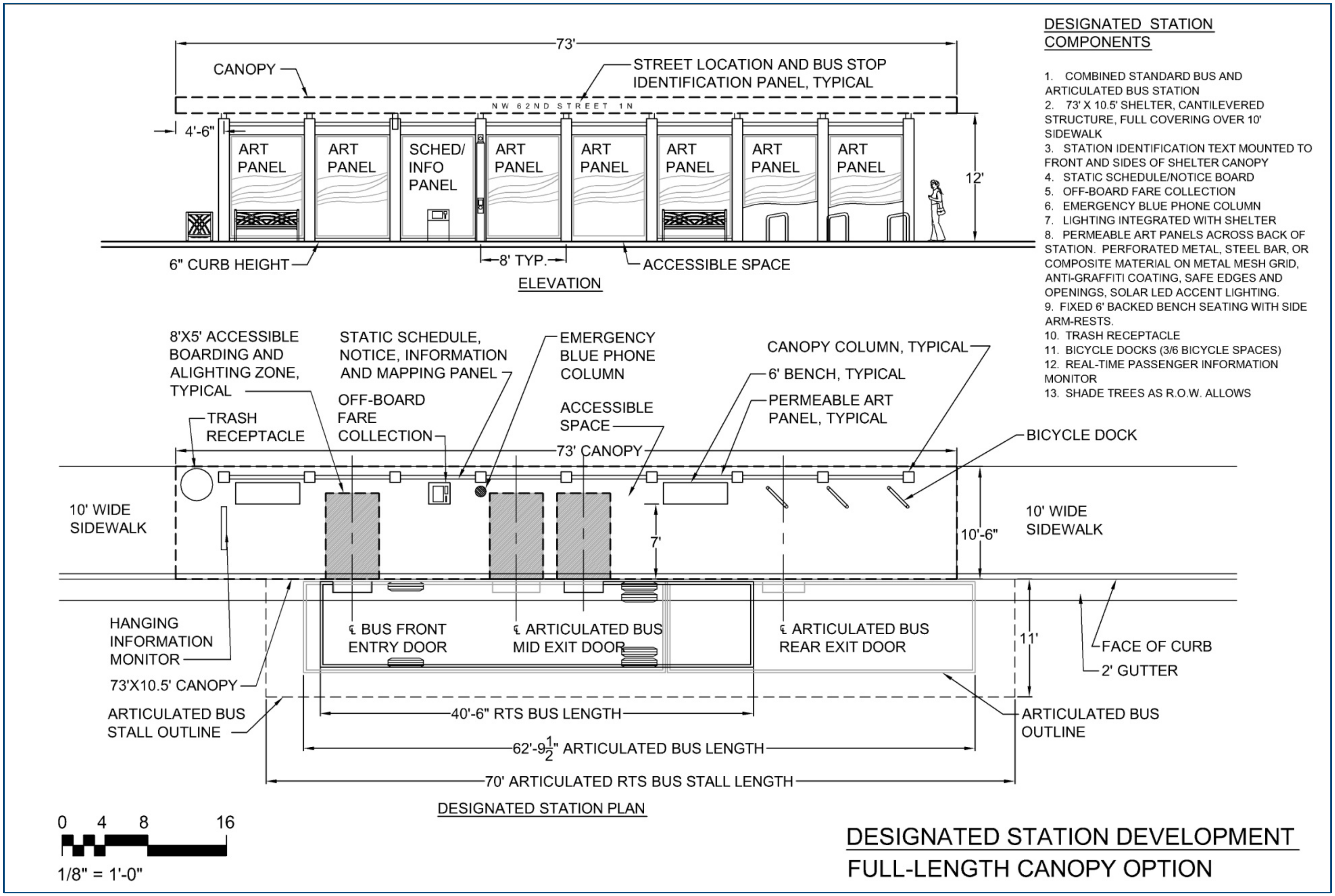
DESIGNATED STATION DEVELOPMENT
REDUCED CANOPY OPTION

Figure 5-5. Station Illustration – Designated Station/Full-Length Canopy



Full Length Canopy Option

Figure 5-6. Station Concept Design - Designated Station/Full-Length Canopy



5.2.3 Extended Station

The extended station is designed to serve the busiest station locations with high passenger activity due to bus transfers and end of the line locations. A 129-foot shelter canopy would be developed at these major bus transfer locations and terminus locations. Curb space for at least two buses would be provided with space for one 60-foot articulated bus and one 40-foot standard bus. For comparison purposes, the current Rosa Parks Transit Station platform is approximately 250 feet. This station would include multiple real-time information display panels, off-board fare collection ticket vending machines, and emergency blue phones for security. The stop would be provided where passenger activity exceeds 1,200 boardings a day.

Figure 5-7 illustrates the extended station design concept, with a more detailed plan and cross section layout presented in Figure 5-8.

Figure 5-7. Station Illustration - Extended Station

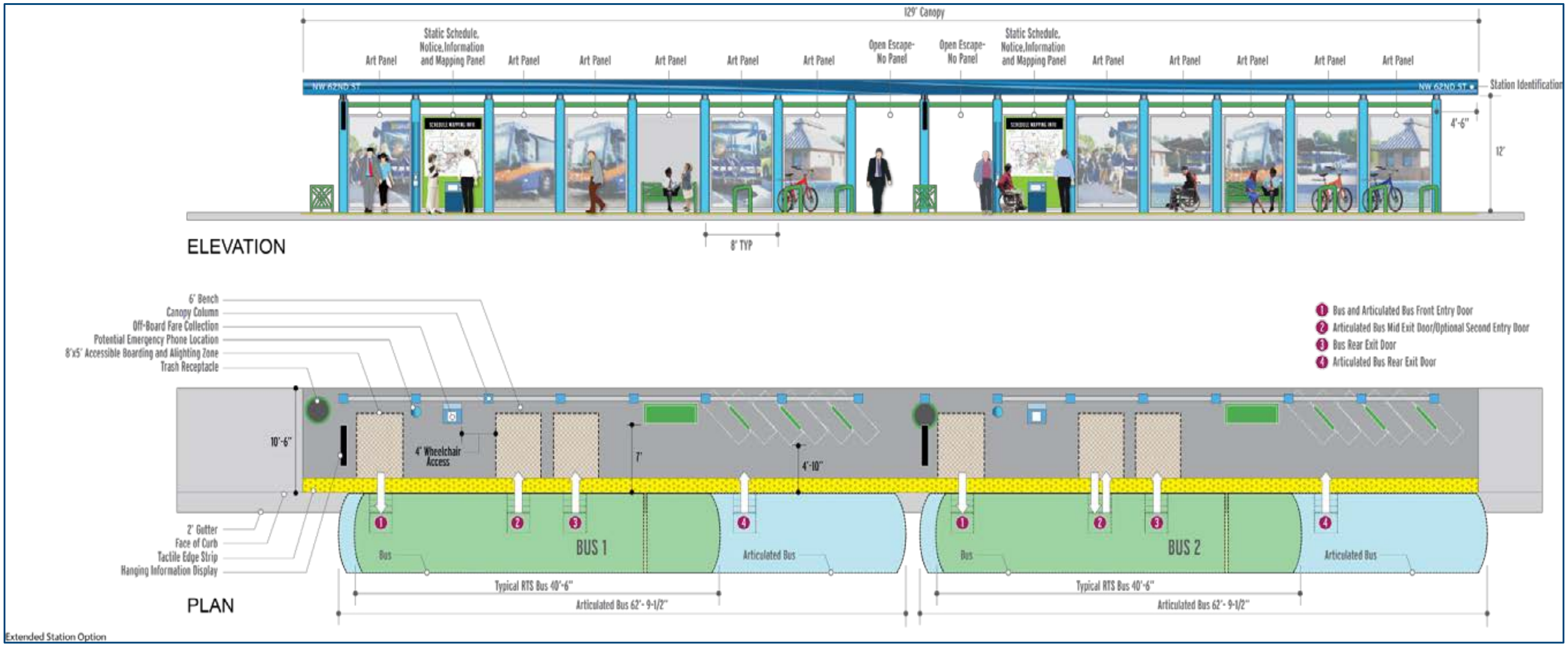
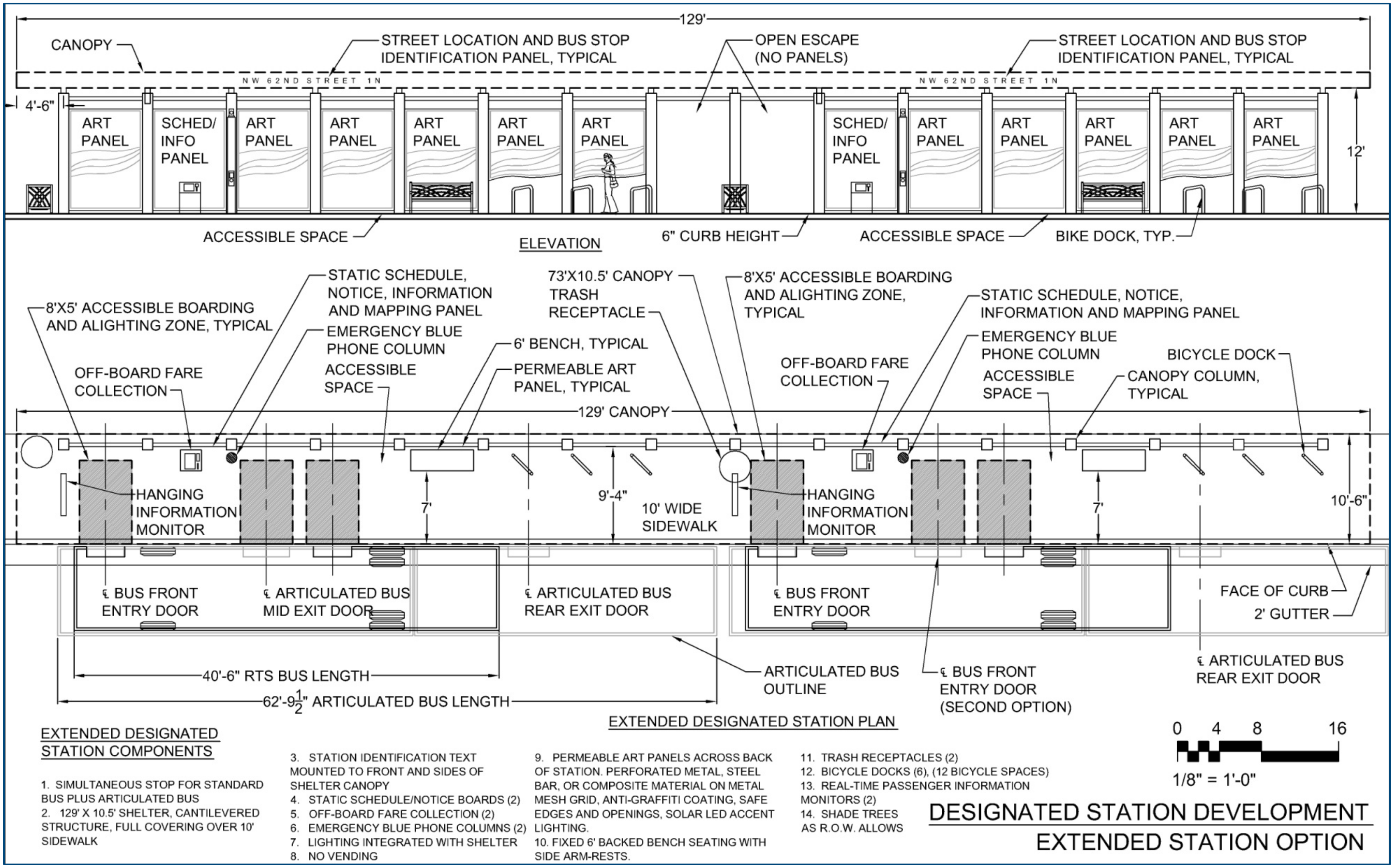


Figure 5-8. Station Concept Design - Extended Station



5.3 Specific Station Classification

Each proposed BRT station was assigned a particular station type based on an estimate of available curb space through field review and further review using Google Streetview and existing RTS ridership at bus stops within the vicinity (1/4 mile) of the proposed location; thresholds derived based on an approximation of ridership level frequencies and spread in the two corridors. These stops would most likely be combined with the adjacent BRT station. Table 5-2 shows the summary of the count of individual station platforms required for Corridors A and B. Note that there are some cases where stops are assigned a classification that does not coincide with ridership thresholds. This occurs in cases where, for example, stops are planned at currently undeveloped locations with the expectation that once developed ridership thresholds would be met or inadequate right-of-way exists to provide a properly sized stop.

As stated above, the assumed daily ridership level thresholds for each station classification type are:

- Enhanced Stop – 0 – 400,
- Designated Station/Reduced Canopy – 401 to 1,200, and
- Extended Station – 1,201 or more.

Tables 5-2, 5-3 and 5-4 show the classification assignments for specific stations. Figure 5-9 shows the proposed location for BRT stations. Also presented are assumptions with respect to if buses would stop on-street or in a pullout; for off-street stations, and where stations would now be next to BAT lanes, a concrete pad was designated as opposed to a pullout. A pullout was assumed for stations on higher speed facilities, such as Archer Rd. In some locations, buses were assumed to stop in a designated BAT lane or right turn lane (such as on Newberry Rd.).

Table 5-2. Station Count Summary

Station Type	Base Corridor A	Base Corridor B
Enhanced Stop	6	6
Designated Station- Reduced Canopy	7	8
Designated Station- Full Length Canopy	5	4
Extended Station	7	6

Figure 5-9. Station Classification Map

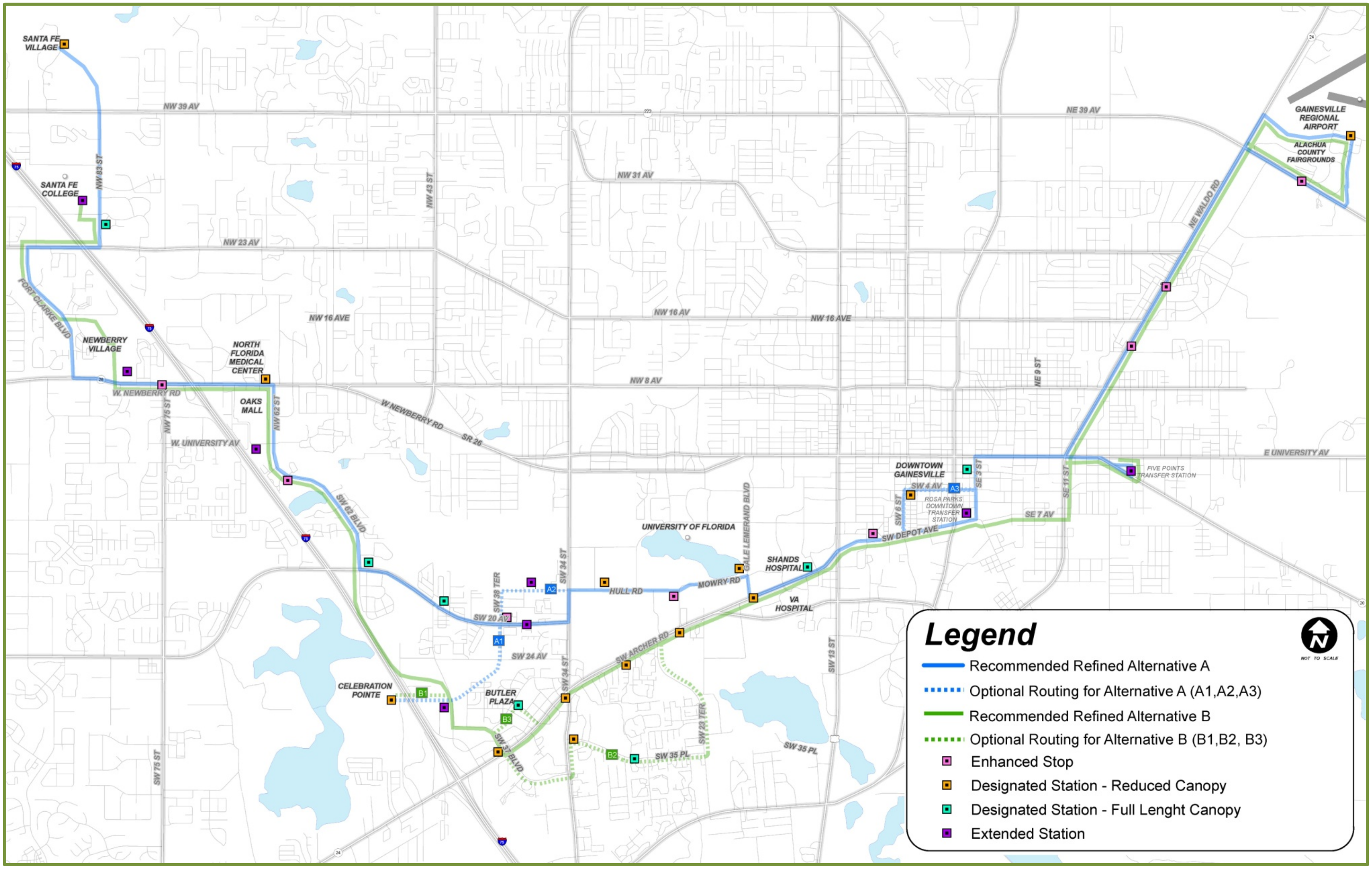


Table 5-3. Corridor A Station Classification

Proposed BRT Station Locations	Existing Stop Daily Ridership		Concrete Pad or Pullout[4]	Stop Length (feet)	Enhanced Stop	Designated Station		Extended Station
	At location	Within 1/4 mile				Reduced Canopy	Full-Length Canopy	
Santa Fe Village	N/A	N/A	Pullout	112				X
Santa Fe College On -Street	27	2306	Concrete Pad	70			X	
Newberry Village (P-n-R)	N/A	191	Pullout	112				X
Oaks Mall/N. Florida Regional Medical Center	21	143	Concrete Pad (In Right Turn Lane)	70		X		
Oaks Mall (Off-Street)	3986	4154	Concrete Pad	112				X
SW 20th Ave./Fairmont Oaks	34	330	Pullout	63	X			
SW 20th Ave./SW 62nd Blvd.	1608	2356	Concrete Pad	70			X	
SW 20th Ave./SW43rd St.	1013	1396	Concrete Pad	70			X	
SW 38th Ter.	19	260	Concrete Pad	63	X			
SW 20th Ave. mid block	373	1896	Concrete Pad	112				X
Hull Rd. (P-n-R)	62	473	Concrete Pad	112				X
UF Museum/Rec. Center	371	2878	Concrete Pad	70		X		
Hull Rd. / Mowry Rd.	93	738	Concrete Pad	70		X		
Gale Lemerand / Mowry Rd.	213	1021	Concrete Pad	70		X		
VA/Shands	329	4717	Concrete Pad	70			X	
SW 11th St./SW 9th Rd.	3	27	Concrete Pad	63	X			
Rosa Parks Transfer Center	5917	5944	Concrete Pad	112				X
SE 1st St. (Downtown)	411	1271	Concrete Pad	70			X	
Five Points Transfer Center	N/A	158	Pullout	112				X
Wal-Mart	44	141	Pullout	63	X			
UF-Eastside Campus	7	524	Pullout	63	X			
County Fairgrounds	20	22	Pullout	63	X			
Gainesville Airport	76	76	Concrete Pad	70		X (Use existing terminal overhang)		
A1- Celebration Pointe	N/A	N/A	Pullout	70		X		
A3-Innovation Square	97	901	Concrete Pad	70		X		

Corridor A- Optional Route

Common Station with Corridor B

[4] If an existing station has a pullout no modifications are planned and these are not reflected in station costs (as presented in Section 7.0).

Table 5-4. Corridor B Station Classification

Proposed BRT Station Locations	Existing Stop Daily Ridership		Concrete Pad or Pullout	Stop Length (feet)	Enhanced Stop	Designated Station		Extended Station
	At location	Within 1/4 mile				Reduced Canopy	Full-Length Canopy	
Santa Fe College Off -Street	2245	2306	Concrete Pad	112				X
Newberry Village (P-n-R)	N/A	191	Concrete Pad	112				X
Tower Rd.	26	217	Concrete Pad	63	X			
Oaks Mall/N. Florida Regional Medical Center	21	143	Concrete Pad (In Right Turn Lane)	70		X		
Oaks Mall (Off-Street)	3986	4154	Concrete Pad	112				X
SW 20th Ave./Fairmont Oaks	34	330	Pullout	63	X			
SW 20th Ave./SW 62nd Blvd.	1608	2356	Concrete Pad	70			X	
Archer Rd. /SW 23rd Dr.	192	515	Concrete Pad	70		X		
Gale Lemerand Dr./Archer Rd.	110	1036	Concrete Pad (In Right Turn Lane EB)/ Pullout WB	70		X		
VA/Shands	329	4717	Concrete Pad	70			X	
SW 11th St./SW 9th Rd.	3	27	Concrete Pad	63	X			
Rosa Parks Transfer Center	5917	5944	Concrete Pad	112				X
Five Points Transfer Center	N/A	158	Pullout	112				X
Wal-Mart	44	141	Pullout	63	X			
UF-Eastside Campus	7	524	Pullout	63	X			
County Fairgrounds	20	22	Pullout	63	X			
Gainesville Airport	76	76	Concrete Pad	70		X (Use existing terminal overhang)		
Butler Plaza Transfer Center	2	5	Concrete Pad	112				X
B3 -Windmeadows/SW 35th Ave.	2133	2602	Concrete Pad	70			X	
Archer Rd. /37th Blvd.	150	427	Concrete Pad (NB)/ Pull Out (EB)	70		X		
Archer Rd. /SW 34th St.	24	505	Concrete Pad (WB)/ Pull Out (EB)	70		X		
Archer Rd. /SW 28th Place	335	408	Pull Out	70		X		
B2-SW 34th St./SW 35th Place	28	625	Concrete Pad	70		X		
B2-SW 35th Place mid block	454	1416	Concrete Pad	70			X	

Corridor B- Optional Route (green)
Common Station with Corridor A (red)

5.4 Park-n-Rides/Transfer Stations

5.4.1 Park-n-Rides

Park-n-ride facilities along the refined BRT routes were assumed to be focused at four locations:

- Within or adjacent to Newberry Village,
- University park-n-ride,
- Butler Plaza (see section 5.4.2), and
- Celebration Pointe (see section 5.4.2).

The park-n-ride at Newberry Village is shown on the site development plan to be on the east side of the north-south site access road north of Newberry Rd. This would be a convenient location for Corridor B, where the BRT route would run through the development. For Corridor A, a diversion for west Newberry Rd. would be required to access this site.

The University park-n-ride off SW 34th St. at Hull Rd. would continue to be a major auto to bus transfer facility in the future. This park-n-ride would only be directly served by Corridor A, with site access for BRT either via SW 20thAve. and SW 34th St., or the new SW 38thTer. and Hull Rd. extension connection planned with new development south of the park-n-ride. This park-n-ride site abuts Hogtown Creek and thus is not envisioned to be expanded in the future.

5.4.2 Transfer Stations

The major bus transfer station serving both Corridors A and B would be the existing Rosa Parks Station. Autoturn analysis showed that no major modifications to the station platform would be needed to provide two articulated bus bays if 60-foot articulated buses are used, as shown in Figure 5-10. This analysis assumes that the existing island platform or a west side platform would be used for the articulated buses. If the service is provided using 40-foot standard buses, then the existing bus bays at the station could be used with no reconstruction.

Two new bus transfer stations are identified to interface with the new BRT service. For Corridor B, associated with the Butler Plaza development, a new transfer station on the southwest corner of SW 42nd St. and SW 30th Ave. is planned to be constructed (refer to Sheet 5 of 13 of the physical plans for Corridor B in Appendix B) at no cost to RTS. Access to the site will be via SW 42nd St. Two spaces for articulated buses have been incorporated into the design of this facility. The potential Celebration Pointe BRT service extension in Corridor A could also serve this transfer station via SW 30th Ave., as well as the transfer center and park-n-ride facility planned for this development as well.

The second transfer station would be the Five Points Station, which would be developed to better serve East Gainesville commuters. A review of potential sites for this facility identified a property on the north side of SE Hawthorne Rd. just southeast of SE 1st Ave., which would be ideal for a BRT turnaround (via SE 17th St.) as well as facilitate access by local bus routes (refer to Sheet 9 of 12 for Corridor A and Sheet 11 of 13 for Corridor B of the physical plans in Appendix B). This stop would be developed as an extended station treatment, with four spaces for buses, two articulated buses and two local buses, and the potential for a 30-space park-n-ride within the site interior. Figure 5-11 shows a potential concept design for the Five Points Station. The concept would have two bus bays in a pullout on SE Hawthorne Rd., and two bays along an internal bus drive on the east side of the site.

Figure 5-10. Articulated Bus Accommodation Options at Rosa Parks Station

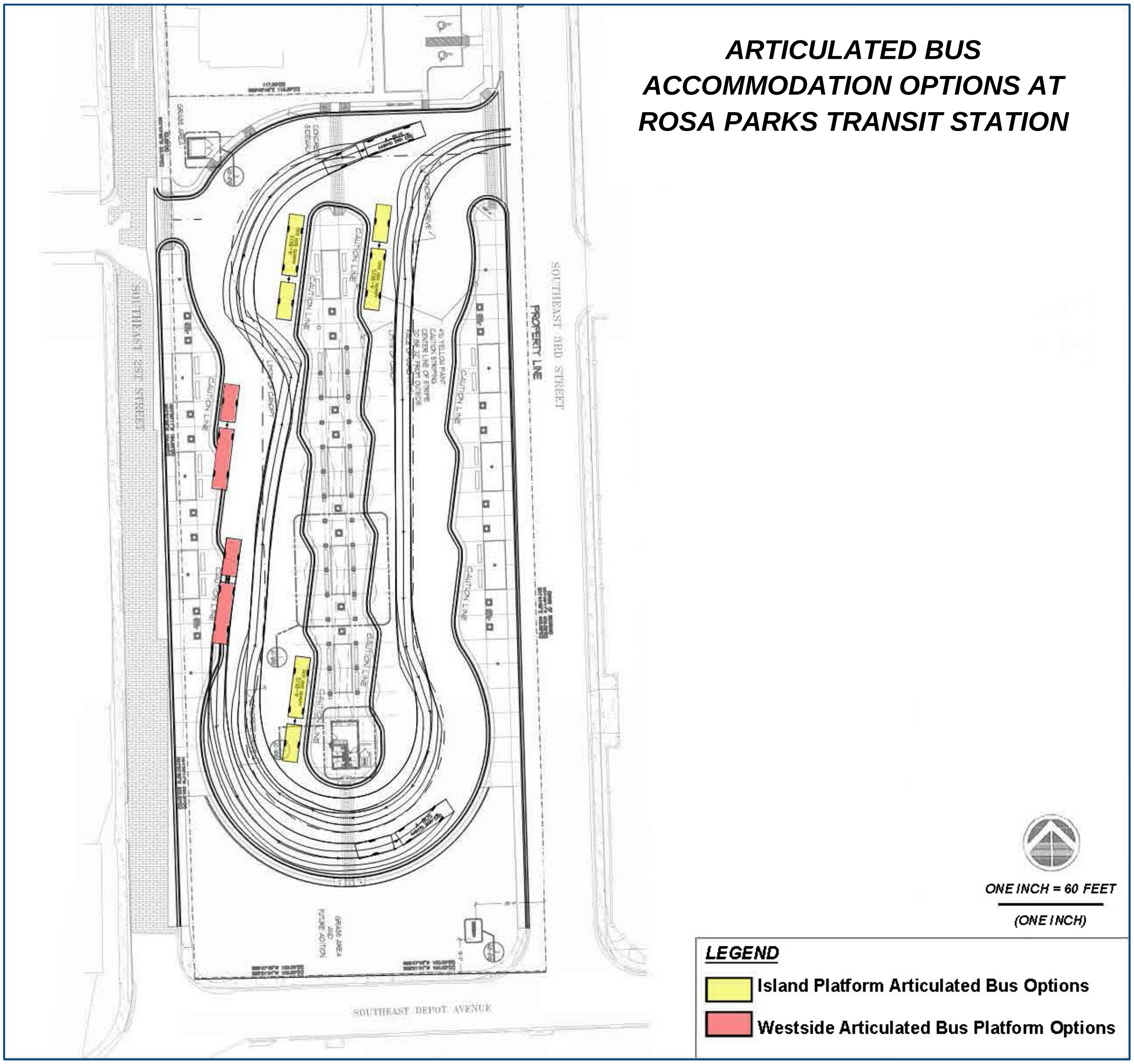
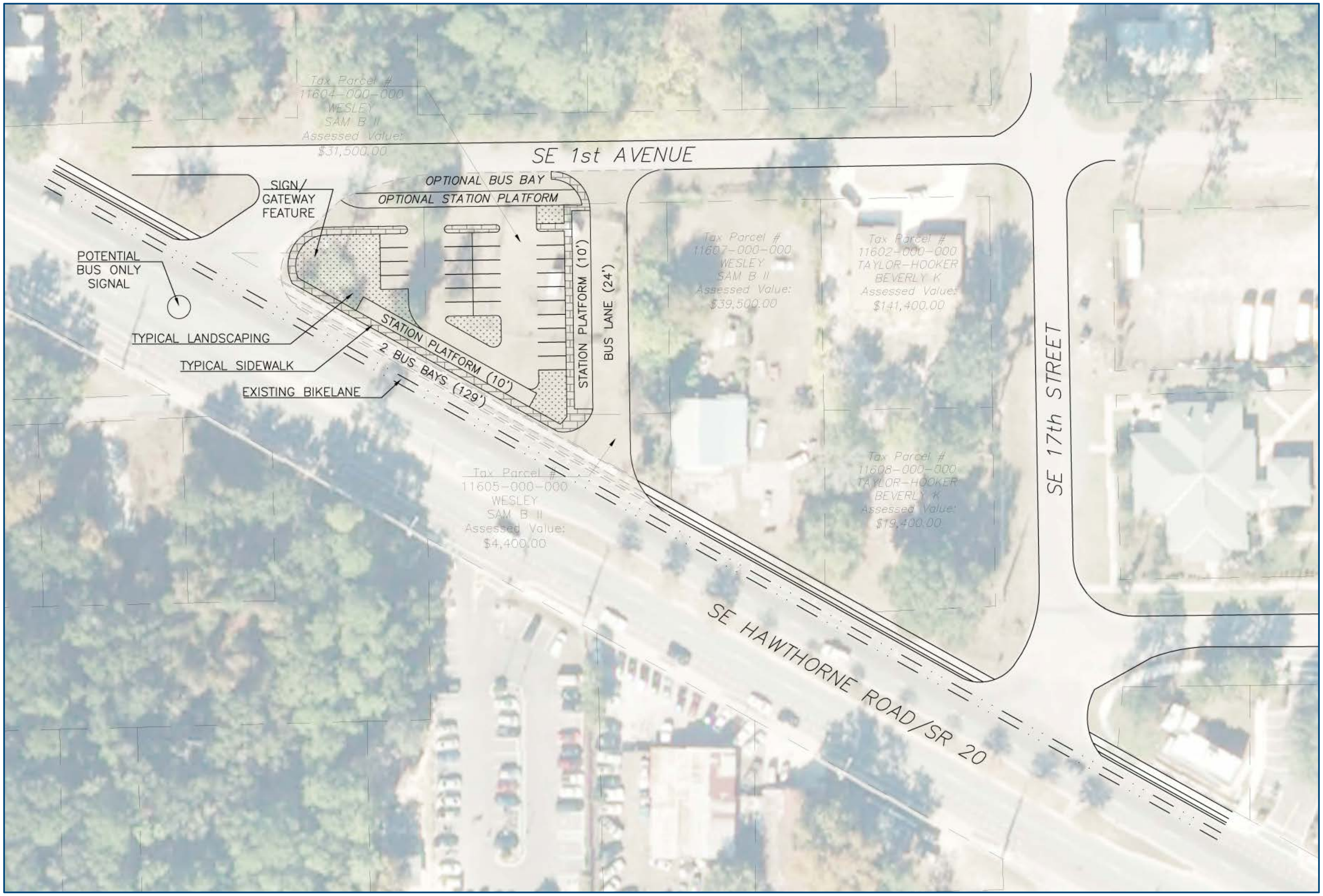


Figure 5-11. Concept Design for Five Points Transfer Station



6.0 RIDERSHIP PROJECTIONS

6.1 Overview

The ridership projections estimate ridership in a future horizon year for the No-Build, TSM and Build alternatives. The forecasting method for the *Go Enhance RTS Study* applied the Gainesville Area Regional Travel Demand Model, developed for use by the MTPO for the Year 2035 Regional Transportation Plan, herein referred to as the Gainesville MTPO Model. The regional travel demand model addresses system-wide ridership and net new ridership, as well as enables ridership to be summarized at the route level (between stops) and origin and destination level (between traffic analysis zones (TAZs).

6.2 Methodology

The modeling of the two BRT Build alternatives, Corridor A and Corridor B, assumed some level of dedicated transit ways, as well as TSP (see Section 3.0) and other BRT attributes, like limited stops, off-board fare collection and real-time passenger information. In the case of transit only lanes, speeds of 25 miles per hour were coded into the model to represent the vehicle bypassing general traffic traveling slowly or queued at congested intersections. The travel time savings for the alternatives were replicated in the model runs to forecast ridership estimates relative to real world conditions / travel times.

A TSM alternative also was modeled and focused on non-capital improvements to bus service as discussed on section 2.0. Ridership estimates were forecasted from the MTPO Base 2007 model scenario with modifications for 2012 conditions to reflect the last complete fiscal year that this data was available. The TSM and Build alternatives, including routings, stop locations, and operating characteristics (frequency, run-time, fare assumptions) were coded into the modified base year transit network and simulations were conducted using the 2007 and 2035 horizon year socioeconomic data forecasts.

The model has been developed with factors, called modal bias constants (which have been applied to the transit mode), representing characteristics of premium transit such as off system fare collection that influence ridership levels based on research and recorded travel tendencies. Sensitivity testing of the coefficients was conducted using existing local bus routes and converting them to premium transit. The coefficients, premium transit speeds, and headways enhanced ridership by 60-70 percent, which is within the acceptable range identified in Transportation Research Board (TRB) *-TCRP Report 118 Bus Rapid Transit Practitioners Guide.*

6.2.1 Performance Measurement

The focus of the ridership estimation was to analyze performance under the 2007 base model condition and a future 2035 horizon year condition with minor network modifications. The ridership estimates of the TSM alternatives and Build alternatives were analyzed at three geographic levels:

- Level 1 – System-wide by daily and peak periods,
- Level 2 - Route level by alignment and stop-to-stop, and
- Level 3 - TAZ level.

It should be noted that the system-wide ridership is not directly comparable to the route level ridership. That is, direct comparisons cannot be made. System-wide ridership an macro level analysis used to understand the changes that will occur throughout the region once the project is implemented. The route level ridership is examining small scale change to ridership within specific sub-areas.

6.2.2 Base Model

The model was developed for comparative purposes to determine the level of improvement in transportation conditions that could result from a given modal strategy or investment. The Gainesville MTPO Model includes a comprehensive transit component that generates a greater level of accuracy for transit forecasts than the standard model package by validating to defined standards based on existing transit ridership. More emphasis was placed on transit in this model than traditional models because funding for transit service is included in student fees at both UF and SFC. University trip purposes have a major influence on both auto and transit travel forecasts. University-related trips developed for the model were built upon an extensive student household travel survey conducted by UF.

The Base 2007 transit assignment model estimated 36,600 daily “unlinked” riders system-wide, while RTS reported 34,329 daily riders for this period. The model differs by only 6.2 percent from actual data, which is well within the preferred 15 percent validation standard established by FDOT.

6.2.3 Model Adjustments

Adjustments to the base year model were made to reflect changes in the RTS route network since 2007, as well as the addition of new segments proposed to be a part of the corridors such as the new alignment of SW 62nd Blvd.

After applying those changes to the model, the resulting ridership closely replicated the actual average weekday ridership on the RTS system in 2013 with less than a one percent difference between the forecasted ridership and the 2013 reported ridership (see Table 6-1).

Table 6-1. 2012 Base Model Transit Validation Results

Ridership Component	Gainesville MTPO 2013 Model	FY 2012 Average Weekday RTS Ridership
Total Unlinked Riders	41,083	40,802
Difference		0.70%

6.3 Ridership Projections

6.3.1 No Build Alternative

The assessment of the No-Build alternative for the *Go Enhance RTS Study* was based on the 2007 Model with adjustments for 2012 conditions. The No-Build alternative is the comparison point for TSM and Build alternatives. The changes in system-wide daily ridership between 2012 and 2035 (see Table 6-2) represent the increase from population and employment only. There were no projects listed in the LRTP that required modifications to be made to the transit network for the no build forecast.

Figure 6-1. Model Network Adjustments

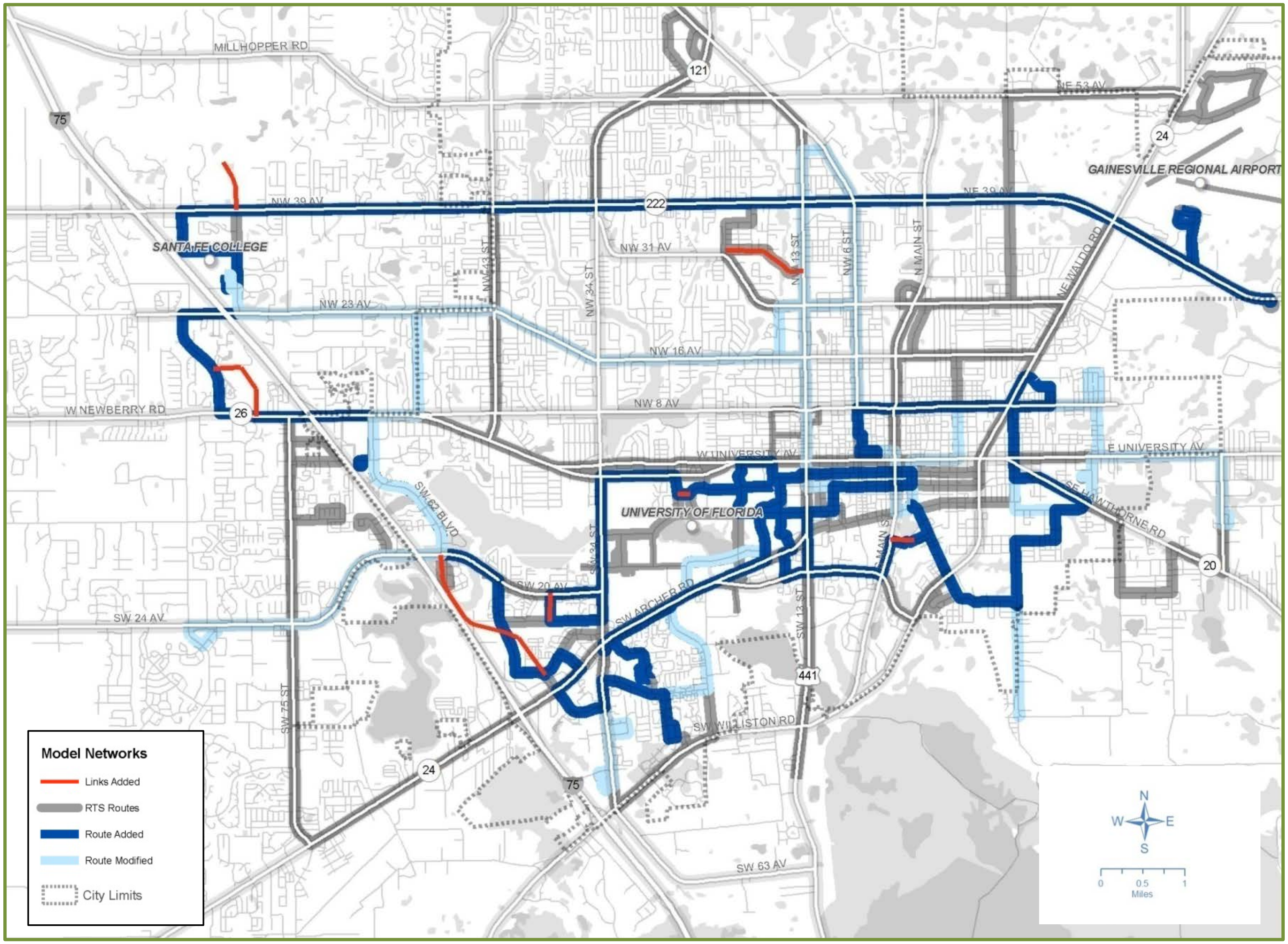


Table 6-2. No-Build Alternative Systemwide Daily Ridership Forecast

Ridership Component	System-wide 2012 Ridership Forecast	System-wide 2035 Ridership Forecast
Total Unlinked Riders	41,083	45,511
Peak Period	14,636	15,610
Off-Peak Period	26,447	29,901
Forecasted Future Ridership Change		4,428

6.3.2 TSM Alternatives

The TSM alternative included travel time savings from TSP and queue jumps at signalized intersections.

Figure 6-2 identifies the corridors and optional routes for the TSM alternative. Modeling assumptions for the TSM alternative were similar to the Build alternatives in Corridors A and B and included:

- 10 minute headways during the weekday peak period, and
- 15 minute headways during the weekday off-peak period.

Using the same operating characteristics for both TSM and Build alternatives allowed an assessment of the specific impact of added BRT infrastructure attributes on ridership.

Level 1 - Systemwide Ridership Forecasts

The Level 1 assessment presented in Table 6-3 summarizes the daily system-wide ridership for the TSM alternatives in Corridors A and B and compares it against the No-Build alternative.

The Level 1 assessment shows that the TSM alternative in Corridor B is forecasted to have a slightly higher future ridership impact than Corridor A. In 2035, Base Corridor B would generate 821 added daily trips and Base Corridor A would add 601 daily trips relative to the No-Build. For Corridor B, the optional Corridor B alignment that extends along SW 35th Blvd. would provide the highest system ridership of the Corridor B options (see Table 6-8). The forecasted percentage of net new ridership systemwide with the TSM alternative in 2035 over the No-Build alternative is less than 2 percent.

Figure 6-2. TSM Alternatives with Optional Routes

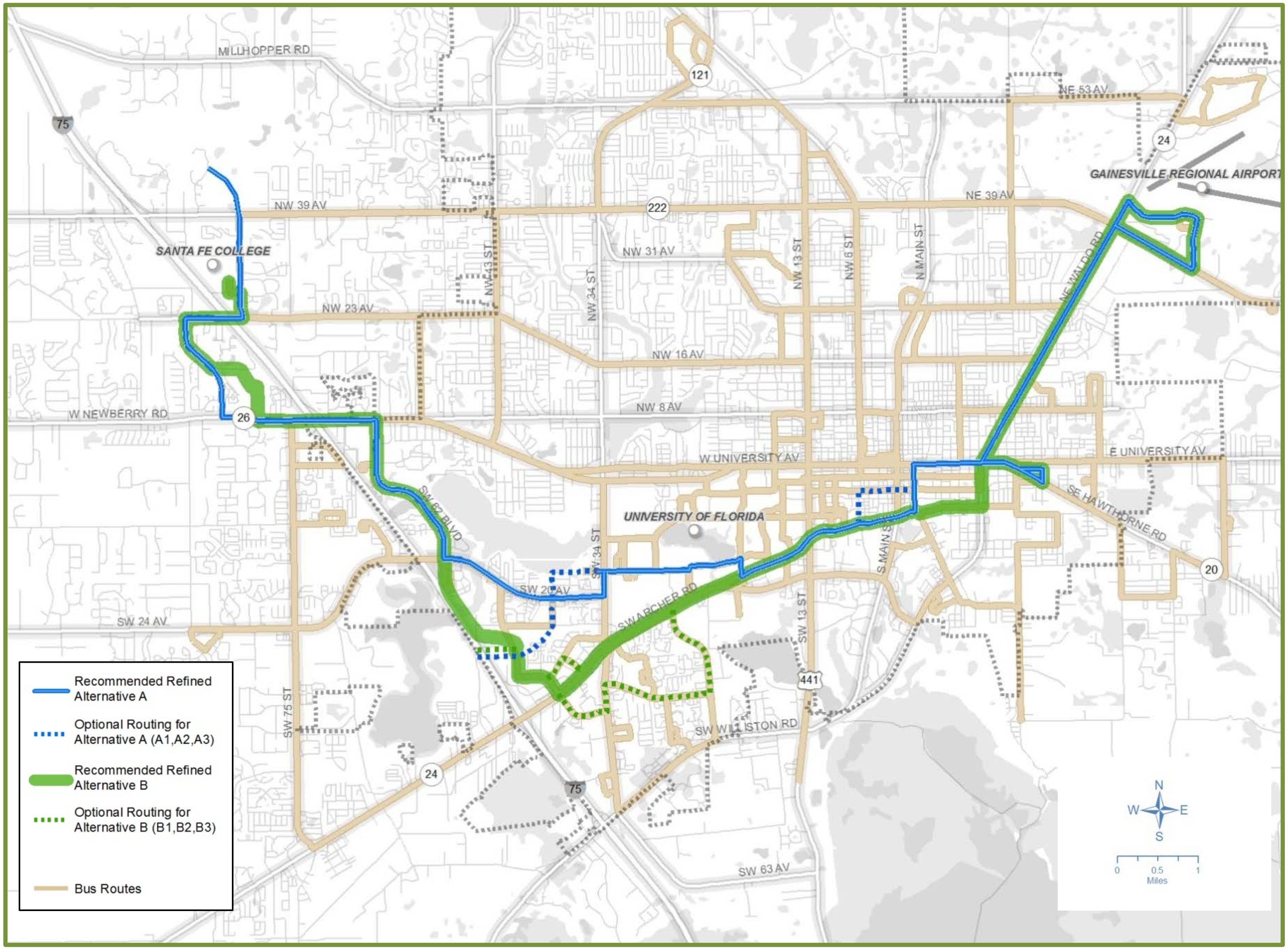


Table 6-3. TSM – Systemwide Daily Ridership Forecast

Alternative	System-wide 2013 Ridership Forecast	System-wide 2035 Ridership Forecast		2035 TSM Alternatives Ridership	
		Ridership	Change from 2013	Ridership	Change from 2013
No Build Alternative	41,083	45,511	4,428		
Corridor A (Base)				46,112	5,029
Celebration Pointe – A1				365*	
Corridor A w/A2 & A3 (Both Options)				46,574	5,491
New ridership					601 (1%)
Corridor B (Base)				46,332	5,249
Celebration Pointe – B1				365*	
Corridor B w/B2 (South of Archer)				46,015	4,932
Corridor B w/B3 (SW 35th Blvd.)				46,615	5,532
New ridership					821 (2%)

**Option A1 & B1 spur lines only*

Note: Systemwide ridership cannot be directly compared to route level ridership.

Level 2 - Segment Ridership Forecasts

The Level 2 assessment summarizes the 2035 ridership forecasts for the TSM alternatives in Corridors A and B at the route level. Table 6-4 summarizes the forecasted total ridership for the corridor alternatives as well as the peak and off-peak periods. The TSM alternative is forecasted to attract between 2,000 and 2,500 riders on the alternate corridors per day. Figures 6-3 and 6-4 identify the segments / links with the highest ridership among the alternatives, showing the best performing sections of the route alternatives. The routing options tested with the corridor alternatives had only minor deviations and the forecasted ridership on the segments are shown on the maps. Corridor B had an option that went south of Archer Rd. to access the high density residential areas, even though this option provided greater access to the residential area, the ridership is forecasted to be higher on the Archer Rd. segment. Based on these figures and the comparing to the Level 1 assessment, Corridor A will divert more riders from existing routes in the area than Corridor B. For example, more riders may make the switch from the Route 20 to the TSM alternative A than from the Route 1 to the TSM alternative B but alternative B will cause more individuals to move to transit from another mode.

Figure 6-3. TSM Corridor A - Route Level Daily Ridership

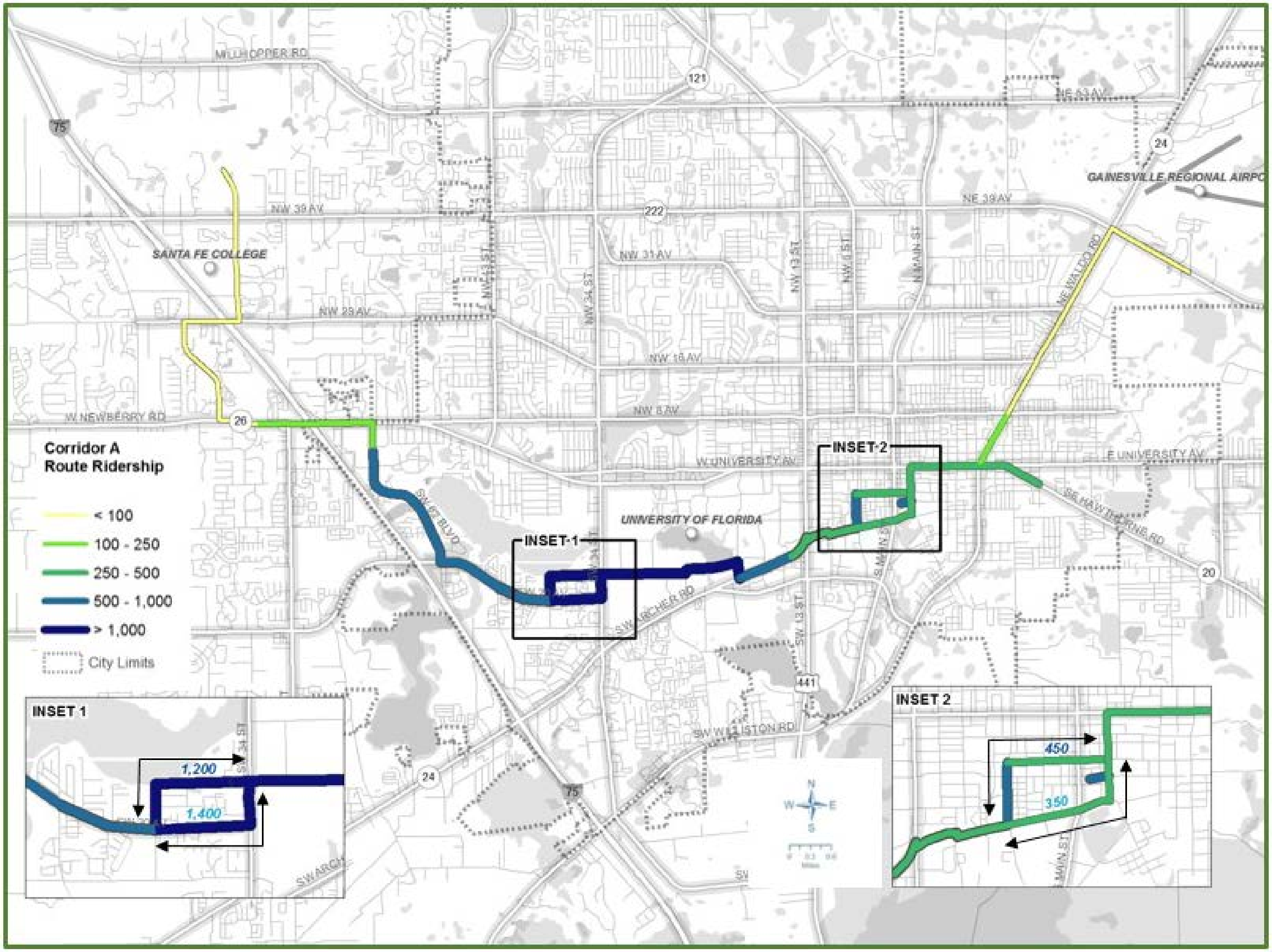


Figure 6-4. TSM Corridor B - Route Level (Stop-to-Stop) Daily Ridership Forecasts

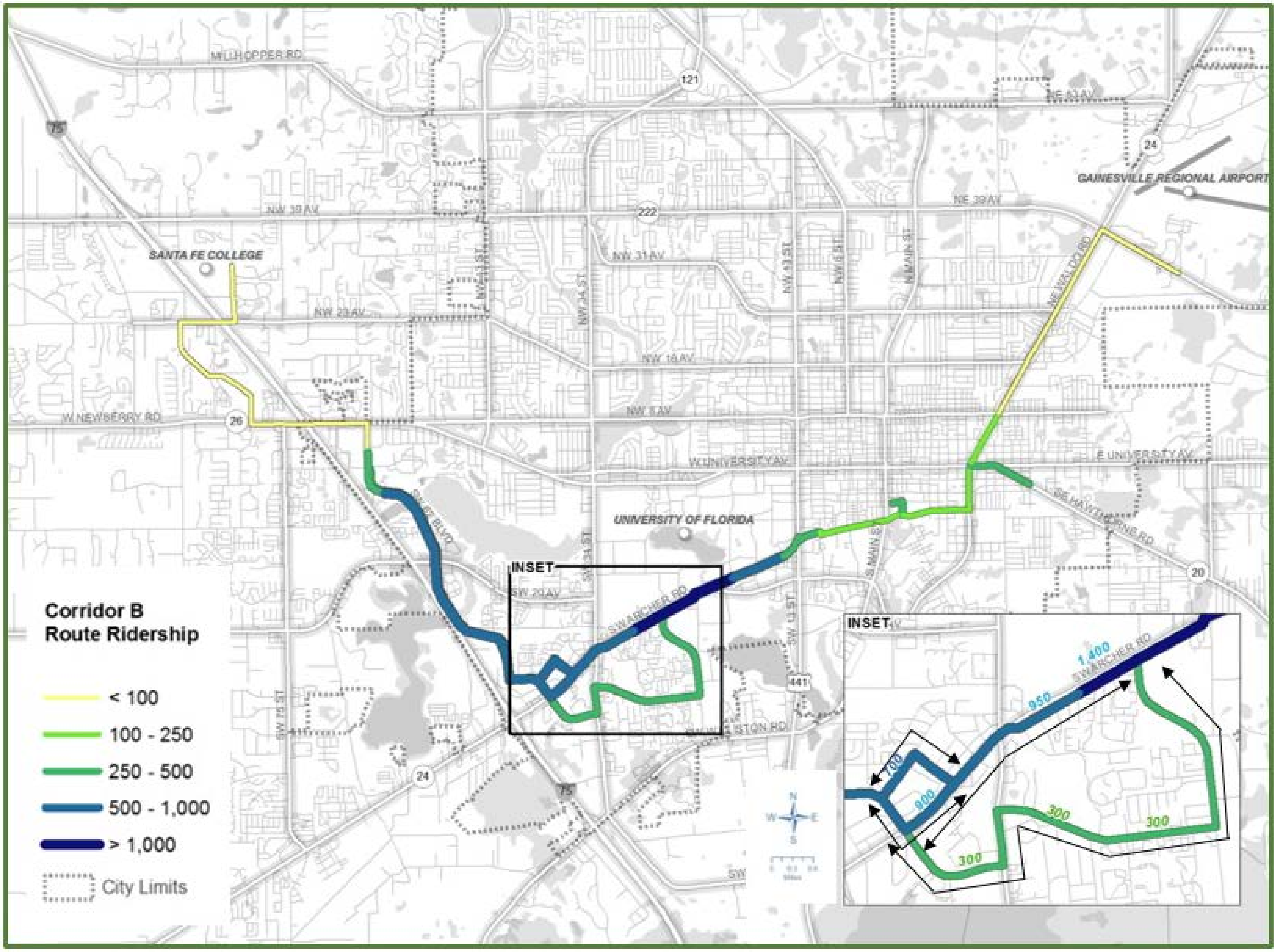


Table 6-4. 2035 TSM Route Level Daily Ridership Forecasts

TSM Alternatives	2035 Ridership		
	Peak	Off-Peak	Total
Corridor A (Base)	730	1,633	2,363
Celebration Pointe – A1	112	252	365
Corridor A w/A2 & A3 (Both Options)	944	1,412	2,356
Corridor B (Base)	679	1,351	2,030
Celebration Pointe – B1	112	252	365
Corridor B w/B2 (South of Archer)	559	548	1,107
Corridor B w/B3 (SW 35th Blvd.)	967	1,516	2,483

Level 3 - Neighborhood Level / TAZ Level Analysis

The Level 3 assessment focused on the primary corridors and summarizes the percentage of ridership change from the No-Build alternative by TAZ. As expected, the greatest changes are generally in those areas adjacent to the alternative and which currently do not have high frequency service (See Figures 6-5 and 6-6).

6.3.3 Build Alternatives

The principal distinction between the TSM and Build alternatives are the new stylized, articulated buses, dedicated and semi-exclusive (BAT) transit lanes, enhanced stations, and off-board fare collection include as modal bias coefficients for the Build alternative in the Gainesville MTPO model (these BRT features have been studied across the country to determine their attractiveness to passengers which is translated into modal bias coefficients in order to help predict future travel behavior). The TSM alternative would also involve new vehicles but they would be standard buses. Additionally, the travel times along each corridor incorporate transit travel time savings resulting from intersection-based TSP, queue jump improvements (TSM and Build), dedicated or semi-exclusive (BAT) transit lanes, and off-board fare collection. These travel times were integrated into the MTPO model through a mini-calibration by adjusting speeds to reflect project transit travel speeds for both the TSM and Build alternatives.

Figure 6-7 identifies the alternative Build corridors with assumed BRT station locations for modeling purposes.

Figure 6-5. TSM Corridor A – Daily Ridership Change by Neighborhood / TAZ

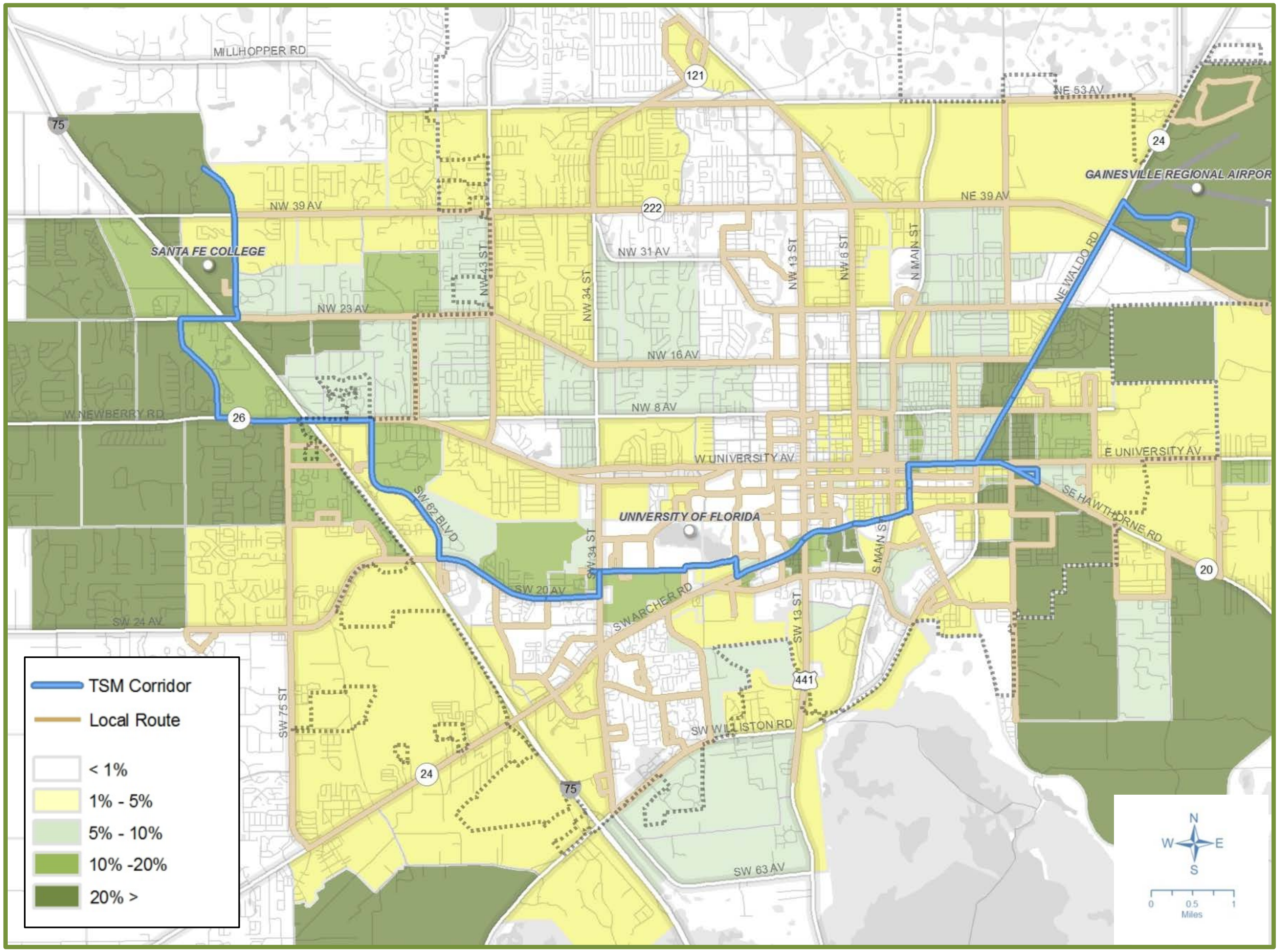


Figure 6-6. TSM Corridor B – Daily Ridership Change by Neighborhood / TAZ

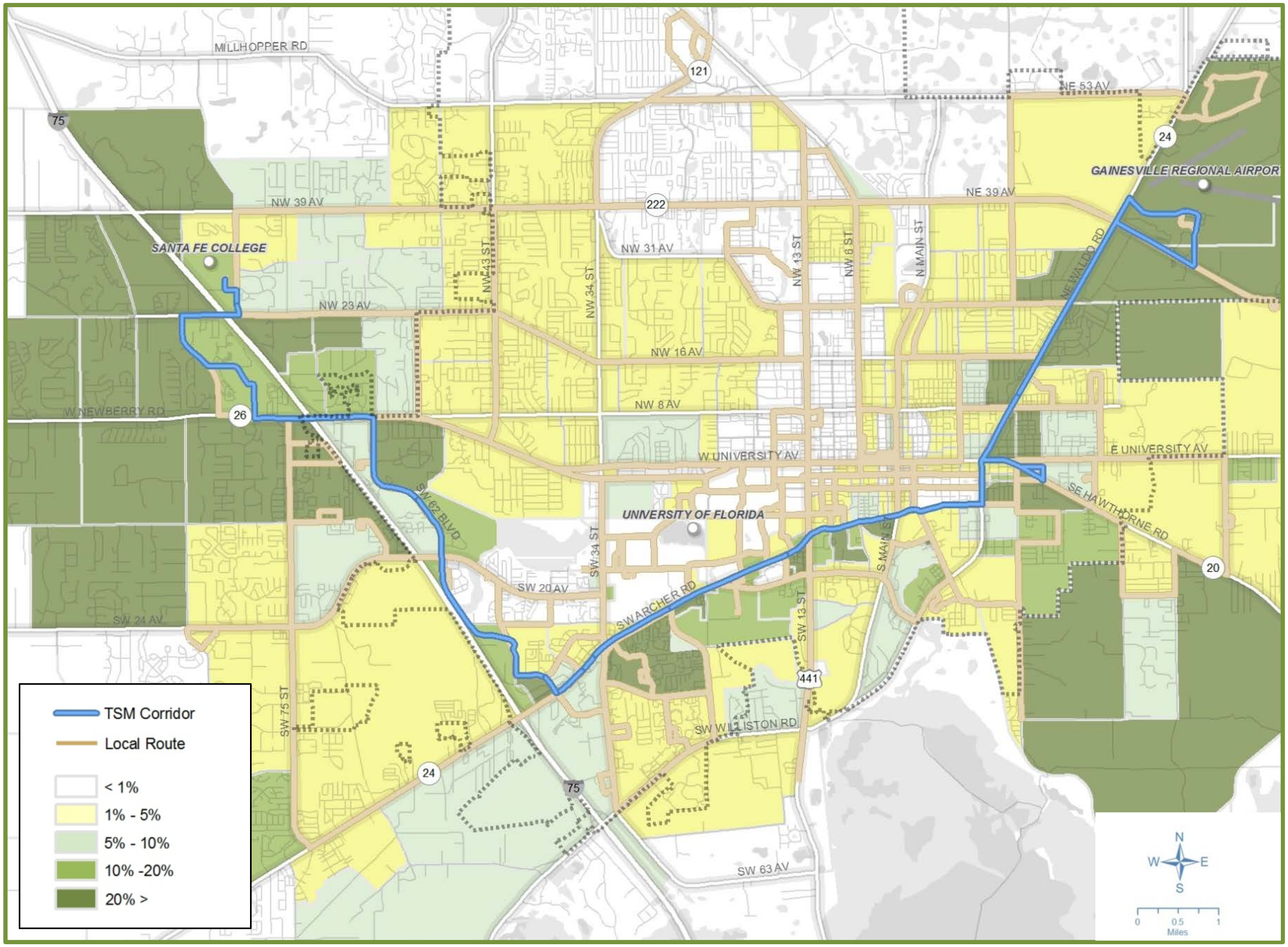
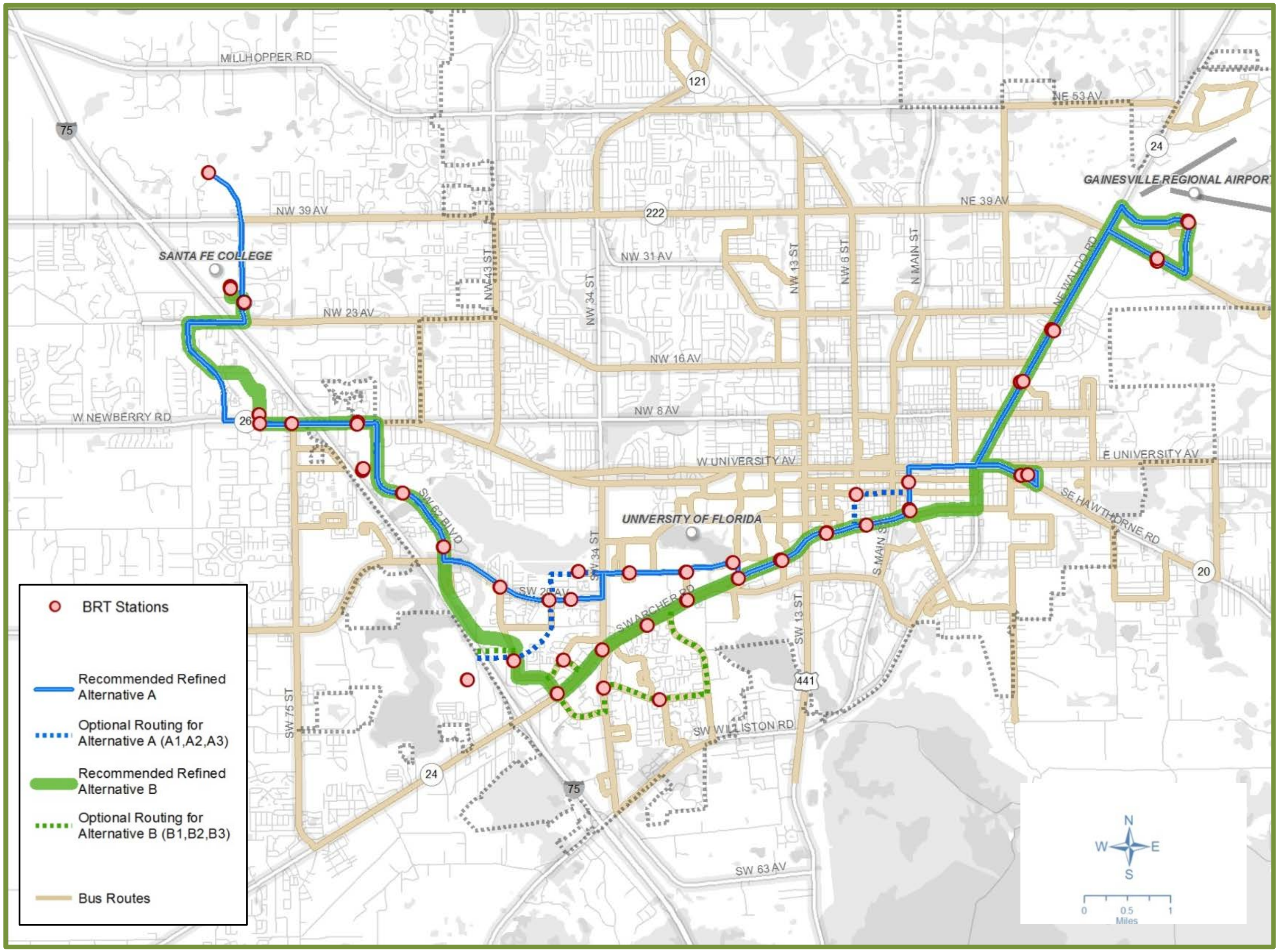


Figure 6-7. Build Alternatives with Optional Routes



June 2014

Level 1- Systemwide Ridership Forecasts

The Level 1 assessment summarizes the system-wide daily ridership and compares the total daily forecast against the No-Build alternative. The change in system-wide ridership represents the total forecasted transit ridership on the RTS system for the current year and 2035.

The Level 1 assessment shows that Base Corridor B is forecasted to have a slightly higher (only 51 riders) future ridership impact than Base Corridor A with the build alternative. In 2035, Corridor A would generate 2,577 added daily riders and Corridor B an added 2,628 daily riders system-wide compared to the No-Build alternative. The forecasted percentage of net new ridership system-wide with the Build alternative between 6-8 percent. When comparing the build alternatives to their counterpart TSM alternatives, the Base Corridor A Build alternative would attract 1,976 more riders system-wide while Base Corridor B Build alternative would attract 1,829 more riders system-wide.

Table 6-5. 2035 Build – Systemwide Daily Ridership Forecast

Alternative	Systemwide 2013 Ridership Forecast	Systemwide 2035 Ridership Forecast		2035 Build Alternatives Ridership Forecast	
		Ridership	Change from 2013	Ridership	Change from 2013
No Build Alternative	41,083	45,511	4,428		
Corridor A (Base)				48,088	7,005
Celebration Pointe – A1				2,058*	
Corridor A w/A2 & A3 (Both Options)				48,457	7,374
New ridership (Base vs. No-Build)					2,577 (6%)
Corridor B (Base)				48,139	7,056
Celebration Pointe – B1				2,058*	
Corridor B w/B2 (South of Archer)				46,789	5,706
Corridor B w/B3 (SW 35th Blvd.)				48,001	6,918
New ridership (Base vs. No-Build)					2,628 (6%)

**Option A1 & B1 spur lines only*

Note: Systemwide ridership cannot be directly compared to route level ridership.

Level 2 - Segment Ridership Forecasts

Table 6-6 summarizes the forecasted total daily ridership for both Build alternatives during the peak and off-peak periods. Figures 6-8 and 6-9 identify the segments / links with the highest ridership on the alternatives showing the best performing sections of the route alternatives. The routing options tested with the corridor alternatives had only minor deviations and the forecasted ridership on the segments are shown on the maps. Corridor B had an option that went south of Archer Road to access the high density residential areas, even though this option provided greater access to the residential areas, the ridership is forecasted to be higher on the Archer Rd. Corridor. The Build alternative is forecasted to attract between 4,000 and 5,000 riders per day on the alternate corridors.

Figure 6-8. Build Corridor A - Route Level (Stop-to-Stop) Daily Ridership Forecasts

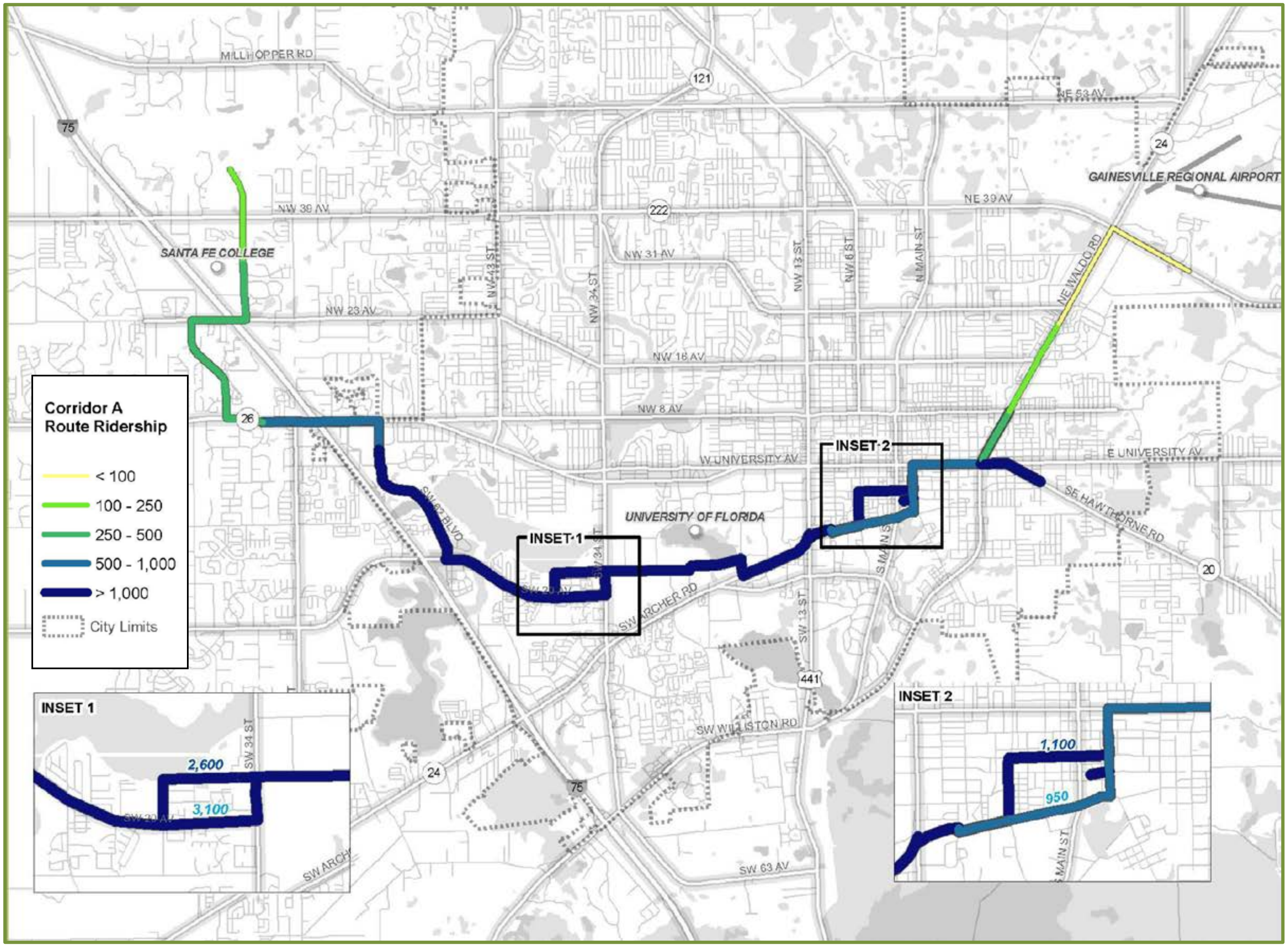


Figure 6-9. Build Corridor B - Route Level (Stop-to-Stop) Daily Ridership Forecasts

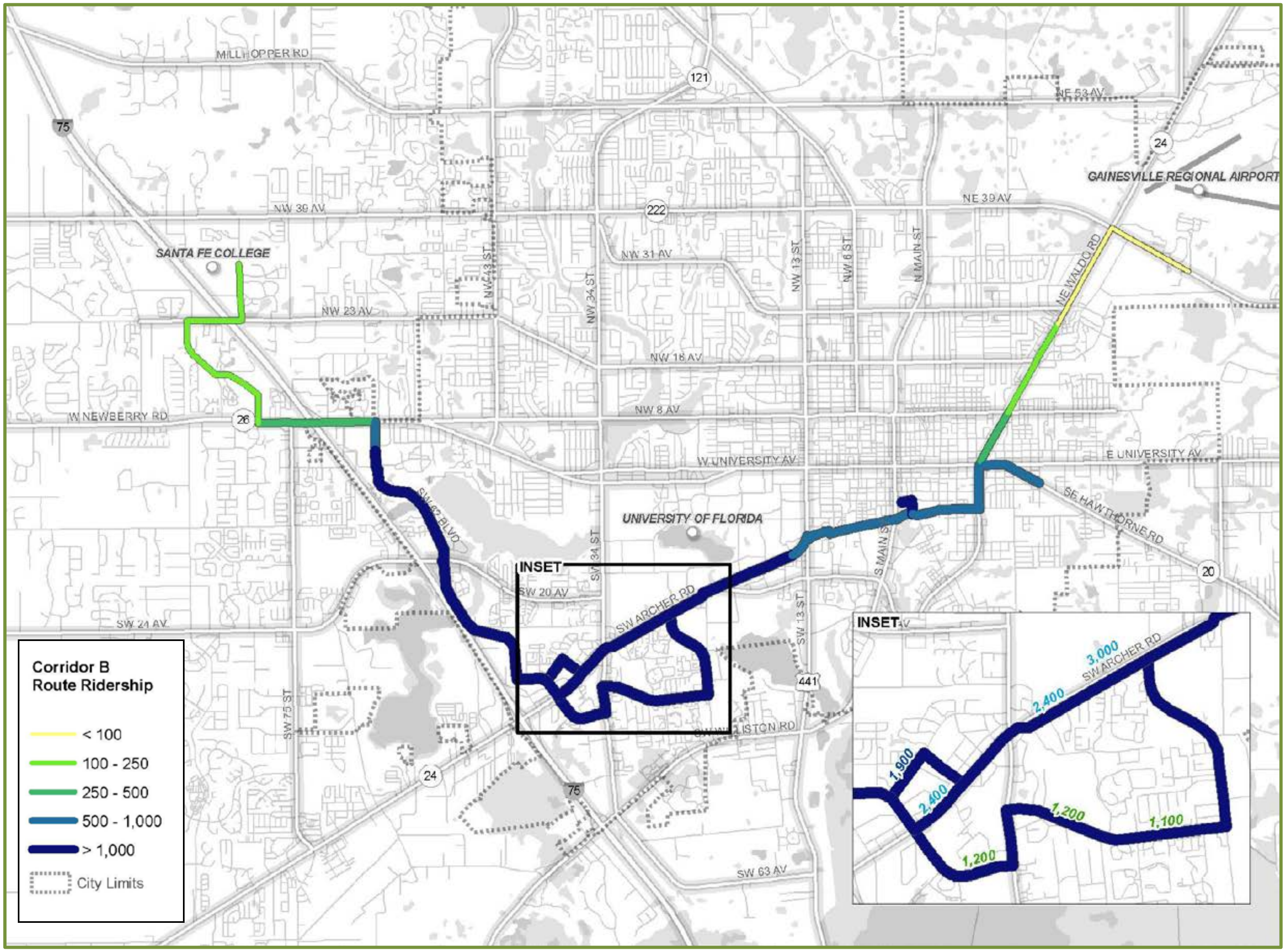


Table 6-6. 2035 Build Route Level Daily Ridership Forecasts

Build Alternatives	2035 Ridership		
	Peak	Off-Peak	Total
Corridor A (Base)	688	4,278	4,967
Celebration Pointe – A1	617	1,440	2,058
Corridor A w/A2 & A3 (Both Options)	714	3,976	4,690
Corridor B (Base)	716	3,406	4,121
Celebration Pointe – B1	617	1,440	2,058
Corridor B w/B2 (South of Archer)	412	1,695	2,107
Corridor B w/B3 (SW 35th Blvd.)	750	3,283	4,034

Level 3 - Neighborhood Level / TAZ Level Analysis

The Level 3 assessment summarizes the ridership forecasts at the neighborhood level, looking at the percentage of ridership change from the No-Build alternative by TAZ.

Figures 6-10 and 6-11 summarize the ridership change by neighborhood/TAZ for the two Build alternatives.

6.3.4 Sensitivity Analysis

Sensitivity testing was performed with the TSM and Build alternatives, where the headways were reduced by 50 percent on existing routes on the two corridors. The resulting system-wide ridership for both the TSM and Build alternatives decreased substantially with the lower accessibility from the local bus system to the station areas affecting ridership.

6.4 Summary

The ridership forecasts identify the change in system ridership as well as ridership on the premium service associated with the TSM and Build alternatives. Year 2035 was the designated analysis year for forecasts. The 2013 baseline transit network was held constant throughout the analysis. The Level 1 system-wide analysis identifies that the Build alternatives have a higher forecast of future ridership than the TSM alternatives. Table 6-7 shows that the No-Build alternative is forecasted to have 4,400 new riders on the transit system by 2035, the TSM alternative is forecasted to have more than 5,000, and the Build (BRT) alternative is projected to have around 7,000. The histogram (bar chart) below identifies the system-wide ridership for the various alternatives compared to the existing system-wide ridership (red line on the chart).

Figure 6-10. Build Corridor A – Daily Ridership Change by Neighborhood / TAZ

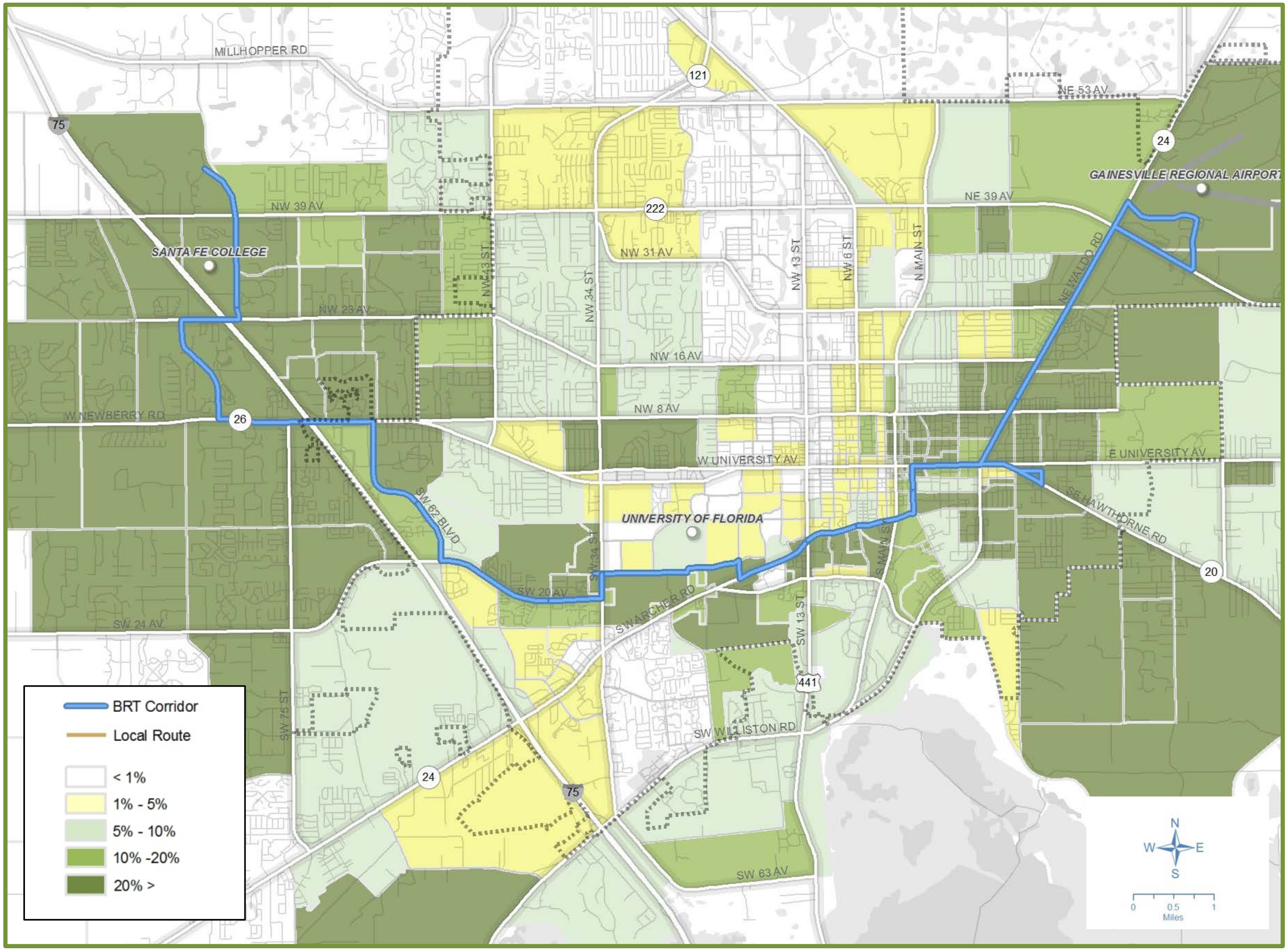


Figure 6-11. Build Corridor B – Daily Ridership Change by Neighborhood / TAZ

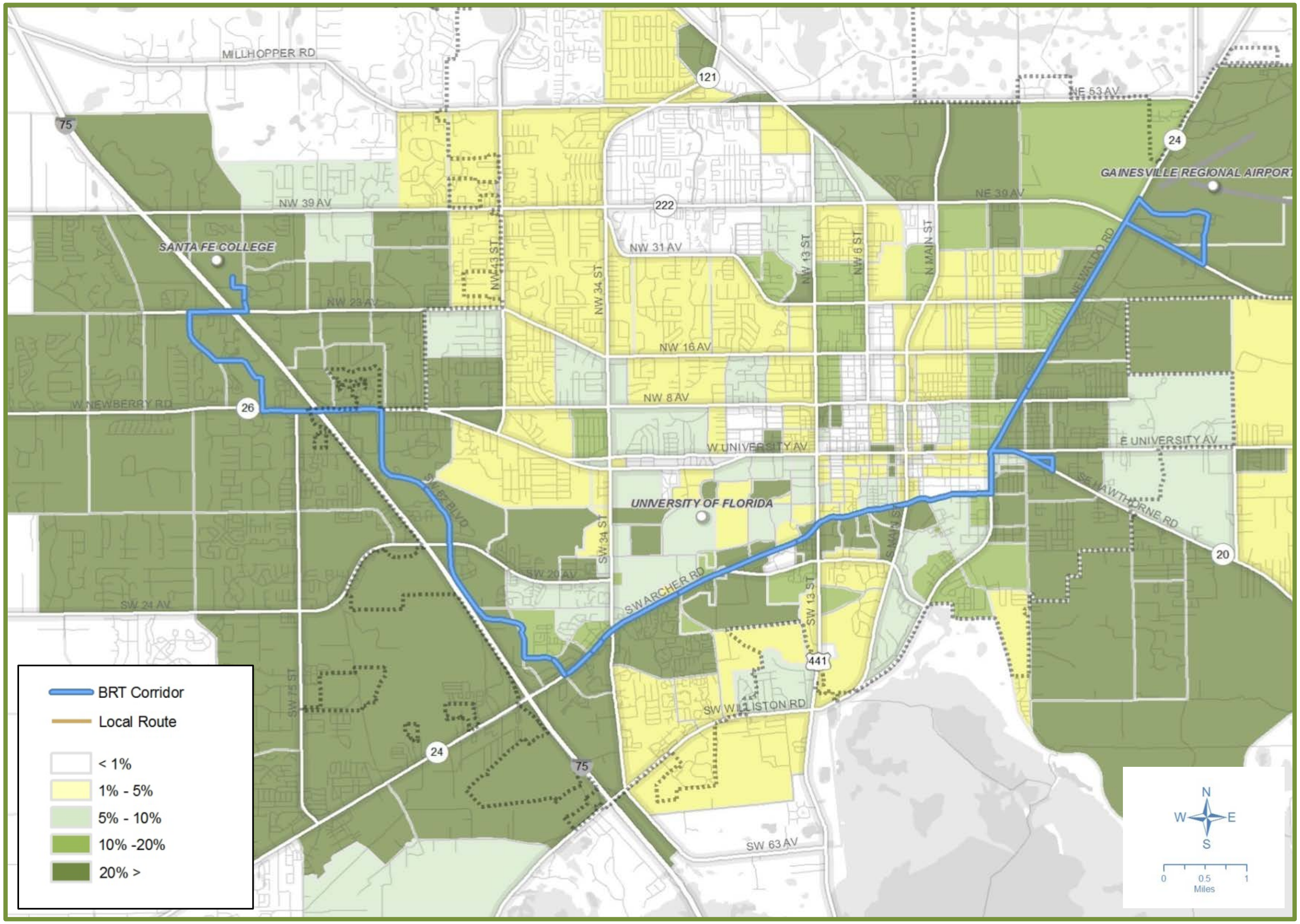
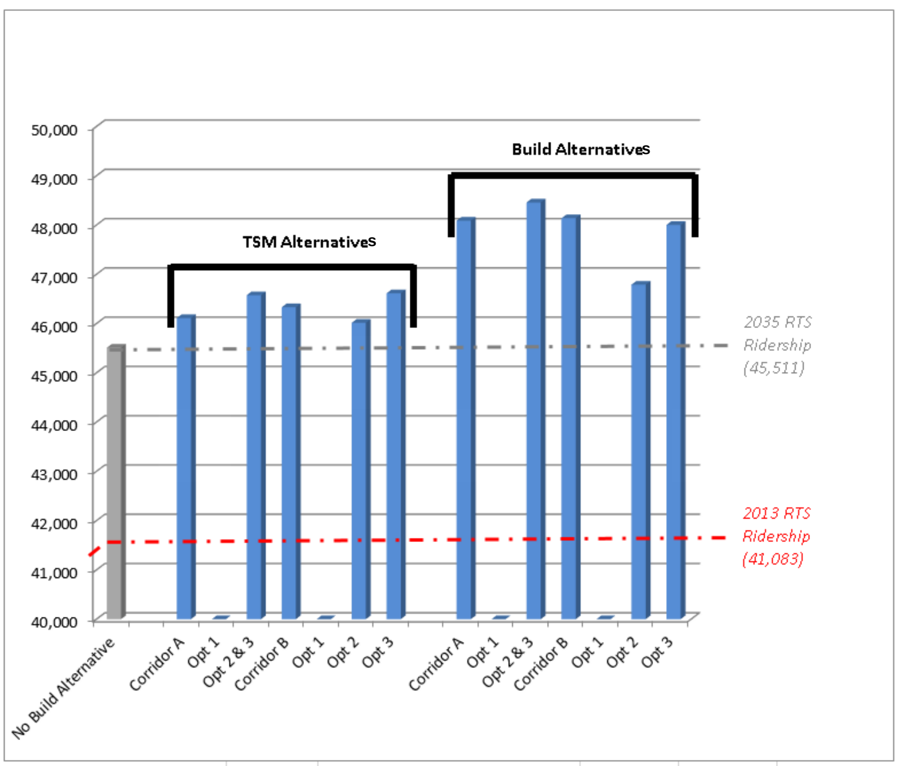


Table 6-7. Systemwide Daily Ridership Summary

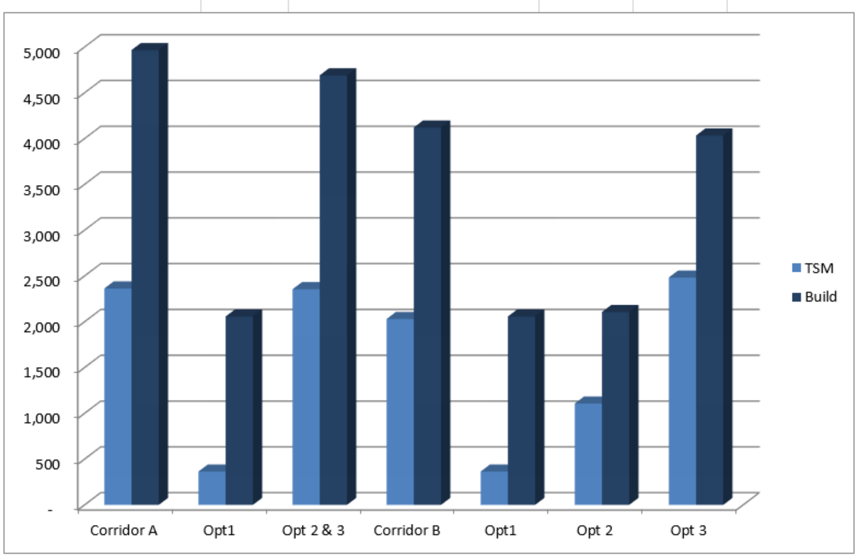
Alternative	System-wide 2013 Ridership Forecast	System-wide 2035 Ridership Forecast	
	Ridership	Ridership	Change
No Build Alternative	41,083	45,511	4,428 (11%)
TSM Alternative			
Corridor A (Base)		46,112	5,029 (12%)
Celebration Pointe Option – A1		365	
Corridor A w/A2 & A3 (Both Options)		46,574	5,491 (13%)
Corridor B (Base)		46,332	5,249 (13%)
Celebration Pointe Option – B1		365	
Corridor B w/B2 (South of Archer)		46,015	4,932 (12%)
Corridor B w/B3 (SW 35th Blvd.)		46,615	5,532 (12%)
Build Alternative			
Corridor A (Base)		48,088	7,005 (17%)
Celebration Pointe Option – A1		2,658	
Corridor A w/A2 & A3 (Both Options)		48,457	7,374 (18%)
Corridor B (Base)		48,139	7,056 (17%)
Celebration Pointe Option – B1		2,659	
Corridor B w/B2 (South of Archer)		46,789	5,706 (14%)
Corridor B w/B3 (SW 35th Blvd.)		48,001	6,918 (17%)



The Level 2 route level analysis identifies that the Build alternatives have a higher forecast of future ridership than the TSM alternatives. Table 6-8 shows that the premium service with the Build alternatives are forecasted to have between 4,000 and 5,000 riders per day compared to the TSM alternative, which is forecasted to have less than 2,500 riders per day. Comparing the ridership by route against the forecasted system-wide ridership, the TSM ridership will be largely due to a shift from the existing system. Whereas the majority of the ridership with the BRT passengers will be new riders. The maps of ridership between stops show that the highest performing portions of all alignments are between Newberry Village and Shands Hospital.

Table 6-8. 2035 Route Daily Ridership Summary

Corridor	TSM Alternative			Build Alternative		
	Peak	Off Peak	Total	Peak	Off Peak	Total
Corridor A (Base)	730	1,633	2,363	688	4,278	4,967
Celebration Pointe Option – A1	112	252	365	617	1,440	2,058
Corridor A w/A2 & A3 (Both Options)	944	1,412	2,356	714	3,976	4,690
Corridor B (Base)	679	1,351	2,030	716	3,406	4,121
Celebration Pointe Option – B1	112	252	365	617	1,440	2,058
Corridor B w/B2 (South of Archer)	559	548	1,107	412	1,695	2,106
Corridor B w/B3 (SW 35th Blvd.)	967	1,516	2,483	750	3,283	4,034



Both the TSM and Build alternatives are forecasted to increase ridership between SFC and Butler Plaza by 2035; however, the Build alternative ridership is projected to improve mobility more in the East Gainesville area, capturing minority and low income populations that are currently underserved and have fewer transportation options.

7.0 COST ESTIMATES

7.1 Overview

Cost estimates are developed for the alternatives based on the characteristics described throughout the preceding sections of this report. There are two categories of costs – capital and operating/maintenance (O&M). Federal funding may be obtained for a portion of the capital costs associated with major transit investments under the Section 5309 program (See Section 11.0). These costs are generally one-time costs related to vehicles and items that are construction-related, like right-of-way acquisition, signal equipment, station improvements, and road modifications. The other cost category relates to O&M. These costs recur frequently. They may include items such as payroll and fuel among others. Most O&M costs are paid locally with some federal and state funding. The estimates below have been assembled consistent with standard FTA formats to facilitate comparisons as well as FTA submittals.

Operating cost estimates for the TSM and Build alternatives for Corridors A and B were based on the assumed operating plan for each alternative (presented in Section 2.0), and a derived O&M Cost Model. The number of required vehicles to provide the identified premium service was also derived from the estimation of required vehicle revenue hours. The vehicle estimate was then incorporated into the capital cost estimate for the particular type of vehicle assumed for TSM (40-foot standard) vs. BRT (60-foot articulated).

Capital costs for the TSM and Build alternatives in Corridors A and B are also estimated based on industry unit costs for different equipment items and local construction costs. Capital costs are summarized using the FTA Standard Cost Categories (SCC) worksheets for the different premium service elements, including running-way, transit priority treatments, vehicles, and stations. The SCC worksheets identify different capital improvement and project management categories and associated contingencies; these worksheets are the standard format that FTA requires for projects to be considered for Section 5309 funding.

Operating costs presented in this section are in existing dollars (2013, or base year). Section 12 presents the draft LPA where a specific implementation schedule has been identified along with operating and capital costs that have been extrapolated into estimated year of expenditure dollars.

7.2 Operating Costs

7.2.1 Methodology

For the TSM and two Refined Build Alternatives in Corridors A and B, as defined in Sections 2.0 through 5.0, operating costs were estimated using a worksheet that initially calculated annual operating hours based on factors including corridor length, estimated operating speeds, service headway, span of service, and operating days per year. Operating speeds reflected travel time savings from existing conditions at locations where applicable transit priority treatments were identified in Section 3.0; in the case of the BRT alternatives, added travel time savings for extended queue jump implementation, off-board fare collection, BAT lanes and exclusive transitways. The operating costs were then identified multiplying the annual operating hours by the 2013 hourly rate of $62.98 paid by RTS for bus service.

The existing bus travel speeds for representative bus routes currently operating in the corridor were used as a basis for identifying recommended speed adjustments to premium service. Existing bus speeds were derived from a sample of current bus schedules and time points along the routes that serve similar corridors as the TSM and Build alternatives. Existing travel speeds for buses, and presumably BRT vehicles, along these corridors for weekday and weekend conditions are presented in Tables 7-1 and 7-2.

Table 7-1. Existing Weekday Bus Operating Speeds in Corridors A and B

Roadway	RTS Route	Speed (miles/hr)		
		AM Peak	PM Peak	Off-Peak
Ft. Clarke Blvd./Newberry	Route 23	14	14	17
62nd Blvd./20th Avenue	Route 20	20	14	20
SW 23rd Terrace	Route 9	10	10	15
Archer Road	Route 1	14	12	14
Depot Avenue	Route 43	8	8	10
Waldo Road	Route 25	28	22	28

Source: RTS Bus Schedule and Time Points, SYNCHRO modeling and calculations by Parsons Brinckerhoff, 2013.

Table 7-2. Existing Weekend Bus Operating Speeds in Corridors A and B

Roadway	RTS Route	Speed (miles/hr)		
		Saturday	Sunday	Off-Peak
Ft. Clarke Blvd./Newberry	Route 23	17	17	17
62nd Blvd./20th Avenue	Route 20	20	14	20
SW 23rd Terrace	Route 9	15	15	15
Archer Road	Route 1	14	14	14
Depot Avenue	Route 43	10	10	10
Waldo Road	Route 25	28	28	28

Source: RTS Bus Schedule and Time Points, SYNCHRO modeling and calculations by Parsons Brinckerhoff, 2013.

7.2.2 TSM Alternative

The TSM alternative costs have been estimated for both Corridor A and Corridor B including the alternate routing options. The TSM alternatives service characteristics include the provision of limited stop service at premium headways (10-minute peak and 15-minute off-peak weekday) with intersection-based infrastructure improvements limited to signal priority and queue jump bus treatments (with no physical lane modifications).

As discussed in Section 2.0, these alternatives were developed to illustrate the maximum operational enhancements to local bus service along with minimal infrastructure improvements that would reduce corridor transit travel time. The travel time analysis described above was incorporated to calculate the revenue hours for new TSM service as well as the required number of vehicles to provide this premium service. The travel time analysis included an assumption that transit signal priority treatments would be implemented along all intersections located in Corridors A and B. Specific travel time savings for specific priority treatments were presented in Section 3.0.

The operating hours and costs in 2013 dollars and required number of vehicles for the TSM alternatives in Corridors A and B are shown in Table 7-3 and reflect the proposed TSM operational improvements. The detailed spreadsheet showing the calculation of vehicle revenue hours for the TSM alternatives is included in Appendix D.

Operating hours, costs and required number of vehicles are slightly lower for the Corridor A options. Annual operating hours range from 66,000 to 78,000, operating costs from $4.1 to $4.9 million, and required number of vehicles from 18 to 22.

Table 7-3. TSM Alternative Operating Cost Summary (Base Year)

Corridor Alternative	Operating Hours Per Year	Estimated Annual Operating Cost	No. of Vehicles Required
Corridor A Base	72,000	$4,535,000	20
Corridor A (A2 and A3 Alt)	68,000	$4,283,000	19
Corridor A (A2 Alt)	66,000	$4,157,000	18
Corridor A (A3 Alt)	69,000	$4,346,000	19
Corridor B Base	75,000	$4,724,000	21
Corridor B (B2 Alt)	78,000	$4,913,000	22
Corridor B (B3 Alt)	75,000	$4,724,000	21

Note: The number of vehicles required for the TSM alternative assumes a spare ratio of 15 percent.

7.2.3 Build Alternatives

The Build alternative costs have been estimated for both Corridor A and Corridor B following the main line routing as well as the optional route modifications. As discussed in Section 2.0, this alternative would include a broader set of infrastructure improvements that would enhance travel time and thus reduce vehicle revenue hours and operating costs. This includes exclusive transitway and BAT lanes along segments of the two corridors, as well as off-board fare collection and transit priority travel time savings.

The operating hours and costs in 2013 dollars and the required number of vehicles for the Build alternatives are shown in Table 7-4 and reflect all of the proposed operational improvements. The detailed vehicle revenue hour and operating cost calculation spreadsheets for these alternatives are included in Appendix D. Table 7-5 shows the estimated incremental operating costs for the alternatives evaluated to serve Celebration Pointe.

Table 7-4. Build Alternatives Operating Cost Summary (Base Year)

Corridor Alternative	Operating Hours Per Year	Estimated Annual Operating Cost	No. of Vehicles Required
Corridor A Base	57,000	$3,590,000	18
Corridor A (A2 and A3 Alt)	55,000	$3,464,000	17
Corridor A (A2 Alt)	53,000	$3,338,000	16
Corridor A (A3 Alt)	56,000	$3,527,000	17
Corridor B Base	57,000	$3,590,000	18
Corridor B (B2 Alt)	60,000	$3,779,000	19
Corridor B (B3 Alt)	57,000	$3,590,000	18

Note: The number of vehicles required for the Build alternatives assumes a spare ratio of 25 percent since these are unique vehicles for RTS.

Build alternative operating hours, costs, and the number of vehicles are less than the TSM alternatives. As for the TSM alternatives, Corridor B options required higher costs and vehicles.

Operating hours ranged from 53,000 to 60,000 per year, operating costs from $3.3 million to $3.8 million per year, and required number of vehicles from 16 to 19.

Table 7-5. Build Alternatives to Celebration Pointe Operating Cost Summary (Base Year)

Corridor Alternative	Operating Incremental Hours Per Year	Estimated Incremental Annual Operating Cost	No. of Vehicles Required
Celebration Pointe Option – A1	4,000	$252,000	1
Celebration Pointe Option – B1	1,000	$63,000	1

Because of the shorter distance in making the connection, corridor B has a lower number of operating hours and costs to serve Celebration Pointe.

7.2.4 Summary

A final comparison of TSM versus Build alternative operating costs for 2013 for three different corridor segments was conducted. These segments represent a potential staging of premium transit improvements. The segments include:

- Oaks Mall to Five Points Transfer Station,
- Five Points to Airport, and
- Oaks Mall to Santa Fe Village or SFC.

Table 7-6 summarizes the segment evaluation. The difference in the total operating cost for the evaluation per segment corresponds to the variation in rounding the number of vehicles required to serve shorter segments as opposed to the whole corridor.

It's important to note that travel time savings have an impact on operating costs. Short cycle times under the Build alternative means fewer vehicles are required to meet specified frequencies. For example, the weekday cycle time for TSM A operating over the Initial Operating Segment (IOS) would be 87 minutes while for Corridor A the Build alternative weekday IOS cycle time would be 72 minutes. This Build alternative IOS operates 15 minutes faster than the TSM alternative. As summarized in Table 7-6, the TSM A would require 11 vehicles while the Build A IOS would require 9 (number of required vehicles = cycle time / headway). Two more vehicles would be operated each weekday due to travel time differences at an approximate cost of $441,000 for operations alone (this excludes bus purchase prices).

Table 7-6. TSM and Base Build Corridor A and B Operating Cost by Segment (Existing Million $)

	TSM			Build		
Corridor Alternative	Operating Hours Per Year	Estimated Annual Operating Cost	No. of Vehicles Required	Operating Hours Per Year	Estimated Annual Operating Cost	No. of Vehicles Required
Corridor A (Initial Operating Segment)	37,000	$2,331,000	11	30,000	$1,890,000	10
Corridor B (Initial Operating Segment)	41,000	$2,583,000	12	30,000	$1,890,000	10
Corridor A (Springhill)	22,000	$1,386,000	7	16,000	$1,008,000	5
Corridor B (Santa Fe)	21,000	$1,323,000	6	16,000	$1,008,000	5
Corridor A (Airport)	13,000	$819,000	5	12,000	$756,000	4
Corridor B (Airport)	13,000	$819,000	5	12,000	$756,000	4

7.3 Capital Costs

7.3.1 Methodology

Capital costs reflective of the running-way and station concept plans (which included transit priority treatments), off-board fare collection, real-time passenger information, and security systems, and the number of vehicles from the operating plan analysis, were aggregated into the different FTA SCC categories, as shown in Table 7-7. The assumed contingency for different construction line items (known as "allocated" contingency), ranging from 5 to 20%, was also identified. An "unallocated" contingency of 10% across all project elements was also identified, based on FTA guidance and consultant team project experience. Finally, Project Management was assumed to be 27% of Items 10-50, broken out into the different items as shown (8% of total cost). The breakdown percentages were also based on consultant team project experience.

Table 7-7. Relationship of Corridor A and B Build Alternative Cost Categories to FTA SCC Categories

Category	Sub-category	Description	Allocated Contingency
10 Guideway & Track Elements	10.01 Guideway: At-grade exclusive right-of-way	Reconstruct Curb	20%
		Full Depth Reconstruction - Asphalt	
		Excavation	
		Rough Grading	
		Roadway Striping/Signing	
		Auxiliary Lane Extension for Queue Jump Implementation	
	10.03 Guideway: At-grade in mixed traffic	Station Transitway/Landing Area	
20 Stations, Stops, Terminals, Intermodal	20.01 At-grade station, stop, shelter, mall, terminal, platform	Station Concrete	20%
		Canopy	
		Thermal Moisture Protection	
		Finishes	
		Electrical Componenets	
40 Sitework & Special Conditions	40.01 Demolition, Clearing, Earthwork	Guideway Clearing and Grubbing	20%
		Station Site Demolition	
	40.02 Site Utilities, Utility Relocation	Stormwater Construction	
		Station Utilities Allowance	
	40.05 Site Structures	Structure Protection - Erosion Control	
		Overhead Signage	
	40.06 Pedestrian / bike access and accommodation, landscaping	Guideway Reconstruct Sidewalk and Ramps	
		Guideway Curbside Lanscaping	
		Station Furnishings	
		Station Lascaping Allowance	
	40.08 Temporary Facilities	Mobilization	
		MOT	
50 Systems	50.02 Traffic Signals and crossing protection	Prioritazion at Intersections	15%
		Signal Modification for Curb Modification	
		Pedestrian Crossing	
	50.05 Communications	Schedule Info Panel	20%
	50.06 Fare Collection System and Equipment	Ticket Vending Machine	
60 ROW, Land, Existing Improvements	60.01 Purchase or lease of real estate	ROW Acquisition	20%
70 Vehicles	70.04 Bus	Vehicle Cost	5%
80 Professional Services	80.01 Project Development	10% of Construction Subtotal	10%
	80.03 Project Management for Design and Construction	6% of Construction Subtotal	
	80.04 Construction Administration & Management	7% of Construction Subtotal	
	80.05 Professional Liability and other Non-Construction Insurance	2% of Construction Subtotal	
	80.06 Legal; Permits; Review Fees by other agencies, cities, etc	1% of Construction Subtotal	
	80.07 Surveys,Testing, Investigation, Inspection	Guideway Testing	
		0.5% of Construction Subtotal	
	80.08 Start Up	0.5% of Construction Subtotal	

For the purpose of comparing the TSM and Build alternatives for Corridors A and B, capital costs were identified in existing dollars. Associated with the evaluation of a draft LPA, Section 12 will have capital costs extrapolated into estimated year of expenditure dollars. Three levels of capital costs were identified:

- Total
- In subareas with routing options
- By the three corridor segments, which could be potential improvement phases
  - Oaks Mall to Five Points
  - Five Points to Airport
  - Oaks Mall to SFC or Santa Fe Village

Table 7-8 presents the total capital cost comparisons for the TSM and Build alternatives for the base Corridors A and B. The detailed FTA SCC Build Worksheet for each alternative is included in Appendix E. Table 7-9 presents capital cost comparisons for the different subarea route options for Corridors A and B, excluding vehicle costs.

Table 7-8. Estimated TSM and Build Base Corridor A and B Capital Costs

(Existing $)

Category	TSM		Build	
	Corridor A	Corridor B	Corridor A	Corridor B
Guideway & Track Elements	$385,000	$385,000	$5,087,000	$8,842,000
Stations, Stops, Terminals, Intermodal	$805,000	$805,000	$8,430,000	$7,396,000
Sitework & Special Conditions	$552,000	$552,000	$6,973,000	$10,260,000
Systems	$420,000	$368,000	$2,890,000	$2,465,000
ROW, Land, Existing Improvements	$207,000	$207,000	$1,569,000	$3,087,000
Vehicles	$10,500,000	$11,025,000	$20,790,000	$20,790,000
Professional Services	$528,000	$516,000	$5,804,000	$7,192,000
Unallocated Contingency	$1,340,000	$1,386,000	$5,154,000	$6,003,000
TOTAL	**$14,736,000**	**$15,243,000**	**$56,698,000**	**$66,036,000**

Table 7-9. Estimated Subarea Routing Capital Costs for TSM and Build Base Corridors A and B (Existing $)

		Incremental Improvements				Corridor Capital Cost with Option	
Corridor / Routing Option	Description	TSM		Build			
		Components	Cost	Components	Cost	TSM	Build
A2	Base Corridor A (via SW 20th Ave)	Prioritization at Intersections	$27,000	Station Improvements Prioritization at Intersections	$2,827,000	$14,736,000	$56,698,000
	Routing Option (via SW 38th Ter.)	Prioritization at Intersections	$9,000	Station Improvements Prioritization at Intersections	$1,763,000	$14,718,000	$55,634,000
A3	Base Corridor A	Prioritization at Intersections	$27,000	Station Improvements Prioritization at Intersections Curb Modifications	$979,000	$14,736,000	$56,698,000
	Routing Option (via Innovation Square)	Prioritization at Intersections	$63,000	Station Improvements Prioritization at Intersections Curb Modifications	$2,074,000	$14,772,000	$57,793,000
B2	Base Corridor B	Prioritization at Intersections	$36,000	Station Improvements Prioritization at Intersections Curb Modifications ROW Acquisition	$7,295,000	$14,736,000	$66,036,000
	Routing Option (via SW 37th Blvd/SW 35th Pl/SW 23rd Ter.)	Prioritization at Intersections	$36,000	Station Improvements Prioritization at Intersections Curb Modifications	$3,554,000	$14,736,000	$62,295,000
B3	Base Corridor B	Prioritization at Intersections	$9,000	Station Improvements Prioritization at Intersections Curb Modifications	$1,089,000	$14,736,000	$66,036,000
	Routing Option (via Windmeadows Blvd/SW 35th Blvd)	Prioritization at Intersections	$9,000	Station Improvements Prioritization at Intersections Curb Modifications	$1,226,000	$14,736,000	$66,173,000

7.3.2 TSM Alternative

Both Corridor A and Corridor B TSM alternatives from Santa Fe Village to Gainesville Regional Airport are estimated to have a capital cost of around $15 million in existing dollars (base year 2013). In both cases about 60% of the cost is associated with new 40-foot vehicles (assumed to be $500,000 each) to provide the increase service and 21% of the cost is associated with the construction of the Five Points Station.

7.3.3 Build Alternatives

Corridor A

Total

The Build Corridor A from Santa Fe Village to Gainesville Regional Airport is estimated to have a capital cost around $56.7 million in existing dollars. Major cost items include the running-way improvements along Newberry Rd., eighteen 60-foot articulated BRT vehicles (assumed to be $1.1 million each based on recent average bid prices for articulated stylized hybrid vehicles), and 23 BRT stations. Station cost related to guideway is allocated to guideway cost category while the at-grade station category includes the cost associated with the vertical structure that are not included in other categories such as landscaping and fare collection systems. The cost to develop the side of road or median transitway along NW 83rd St., and Fort Clarke Blvd. and through Newberry Village will be covered by developer contributions. Running-way improvements would comprise about 25% of the costs, stations 18%, and vehicles 30%.

Subarea Options

In the area around the University park-n-ride, the SW 38th Terrace connection (A2) is identified as having a substantially lower capital cost (by about $1 million) than the SW 20th Ave. routing; the difference in capital cost is mainly due to the cost associated with improvements to the stations located along SW 20th Ave. between SE 38th Terrace and SW 34th St.. South of downtown Gainesville, the alternate connection to Innovation Square via SW 6th St. and SW 4th Ave. (A3) is identified to have a sizable higher cost (by around $1 million) than the base route using Depot Ave. This is with the added station serving Innovation Square and added signal priority treatments.

It is noted that no capital costs were assumed for the Celebration Pointe extension, assuming the cost of the new I-75 grade separation and transitway and station within the development would be borne by the developer.

Corridor B

Total

The Build Corridor B alternative from SFC to Gainesville Regional Airport is estimated to have a capital cost around $66 million in existing dollars. Major cost items include the running-way improvements along Newberry Rd. , SW 62nd Blvd. , and SW Archer Road, as well as 18 BRT vehicles, and 22 BRT stations. Running-way improvements would comprise about 31% of the costs, stations 17%, and vehicles 25%.

Subarea Options

The alternate connection south of Archer Rd. using SW 37th Blvd., SW 35 Pl and SW 23rdTerrace (B2) is estimated to have a sizable lower cost (about $3.7 million) than the direct Archer Rd. connection due to less running-way improvements and right-of-way acquisition. The connection option to Archer Rd. from the Butler Plaza using Windmeadows Blvd. and SW 35th Blvd. (B3) is estimated to cost slightly more than the connection using SW 37th Blvd., because of the difference in cost for improvements associated with the station designation identified for SW 35th Blvd. / Windmeadows Blvd. (Designated Station – Reduced Canopy).

7.3.4 Summary

A comparison of TSM versus build alternative capital costs by corridor segment is shown in Table 7-10. Corridor A and Corridor B were divided in three segments to represent a potential staging of premium transit improvements. For Corridor A, the base corridor was compared to the base Corridor B option operating on Old Archer Road including the BAT lanes on eastbound Archer Road from SW 16th Ave.

Table 7-10. TSM and Base Build Corridor A and B Capital Cost by Segment (Existing $)

Corridor Segment	TSM		Build	
	Corridor A	Corridor B	Corridor A	Corridor B1
Oaks Mall to Five Points	$9,464,000	$9,406,000	$37,819,000	$46,547,000
Five Points to Airport	$2,347,000	$2,347,000	$9,202,000	$9,202,000
Oaks Mall to Santa Fe Village or S	$3,502,000	$3,490,000	$9,677,000	$10,287,000

[1]With BAT lane on eastbound Archer Road from east of SW 16th Avenue

8.0 ENVIRONMENTAL SCREENING

An environmental screening was conducted to identify potential effects of the defined corridor alternatives to existing community, cultural and natural resources. This analysis was supported by community and environmental data sets housed within the Florida Geographic Data Library (FGDL). Since these corridors run through areas that are almost entirely developed the primary focus was on identifying potential "fatal flaws" using the Environmental Screening Tool (EST), an interactive database and internet mapping application that integrates the latest environmental resource information. The EST was developed in support of Florida's Efficient Transportation Decision Making (ETDM) Process. The quantification of impacts provided a means to compare the potential effects of each primary base corridor (Corridor A and Corridor B). Optional routes would require additional screening during the PD&E phase should the project proceed into the project development phase.

8.1 Socio-cultural Resources

The socio-cultural resource analysis examined neighborhood characteristics, demographics, visual and aesthetic conditions, as well as potential noise and vibration impacts to certain types of land uses. Each of the following sections describes the respective evaluations.

8.1.1 Neighborhoods and Demographic Characteristics

Corridor A and Corridor B have relatively similar demographic characteristics and serve populations associated with a high propensity to use public transit. For almost all variables, the two corridors and the optional routes to Celebration Pointe exceed the Alachua County average including the size of the minority population, number of households below the poverty level, and number of households without an automobile, as shown in Table 8-1. The demographic characteristics of the Celebrate Pointe (A1 and B1) routes are largely similar to those of the base route with no consistent positive or negative difference across the variables (refer to Figure 8-1 for an illustration of the Celebration Pointe routes for Corridor A and Corridor B).

Table 8-1. Demographic Characteristics (1320 Foot Buffer)

Description	Corridor A		Corridor B		Celebration Pointe A1 & B1		Alachua County	
	Total	Percent	Total	Percent	Total	Percent	Total	Percent
White	34,578	64.4%	34,312	63.9%	2,718	59.0%	172,156	69.6%
African-American	12,133	22.6%	12,681	23.6%	1,020	22.1%	50,282	20.3%
Other Race	5,419	10.1%	6,716	12.5%	690	15.0%	24,898	10.1%
Hispanic	6,269	11.7%	6,420	11.9%	644	14.0%	20,752	8.4%
Age 65+	7,635	7.7%	7,253	6.9%	309	6.7%	26,627	10.8%
Under Age 18	13,953	14.2%	13,929	13.3%	1,063	23.1%	44,285	17.9%
HH w/o Car	4,470	12.4%	4,997	12.8%	332	7.9%	7,406	7.6%
Median Family Income[1]	$43,642	n/a	$39,473	n/a	$30,325	n/a	$61,188	n/a
HH Below Poverty Level	6,472	28.8%	8,036	32.5%	1,620	38.7%	20,955	20.9%

Source: 2010 Decennial Census

Notes: 1 Census Bureau uses a set of monetary income thresholds that vary by household size and composition to determine who is in poverty. Thresholds vary according to size of the household and ages of the occupants.

8.1.2 Visual and Aesthetic Conditions

From a visual and aesthetic perspective, neither Corridor A nor B is expected to have a negative effect. The proposed transit stops (intended as part of the Build alternative) would have an enhanced design and improved passenger amenities than existing passenger amenities which should improve the aesthetic appeal of the area around the stations..

An important aesthetic feature along the Base Corridor B includes the Veteran's War Memorial and Championship Trees that line Archer Rd. Coordination has occurred with the City arborist to ensure that tentative roadway design modifications to support the corridor preserves and maintains these assets.

8.1.3 Noise and Vibration

While the transit alternatives provide good access to health care and assisted living facilities, these facilities are also sensitive to noise and vibration effects mostly related to construction activities associated with building the required roadway and transit stop infrastructure. As shown in Table 8-2, there are 78 sites that are sensitive to noise and vibration within 200 feet of Corridor A, and 70 sites within a 200-foot buffer of Corridor B. Figure 8-1 portrays the noise and vibration sensitive sites in proximity to the transit alternatives. Given that transit service already occurs adjacent to these facilities and the proposed level of roadway modifications and station construction will be de minimus, there is no expectation that negative impacts cannot be planned for and mitigated during the PD&E and construction phases.

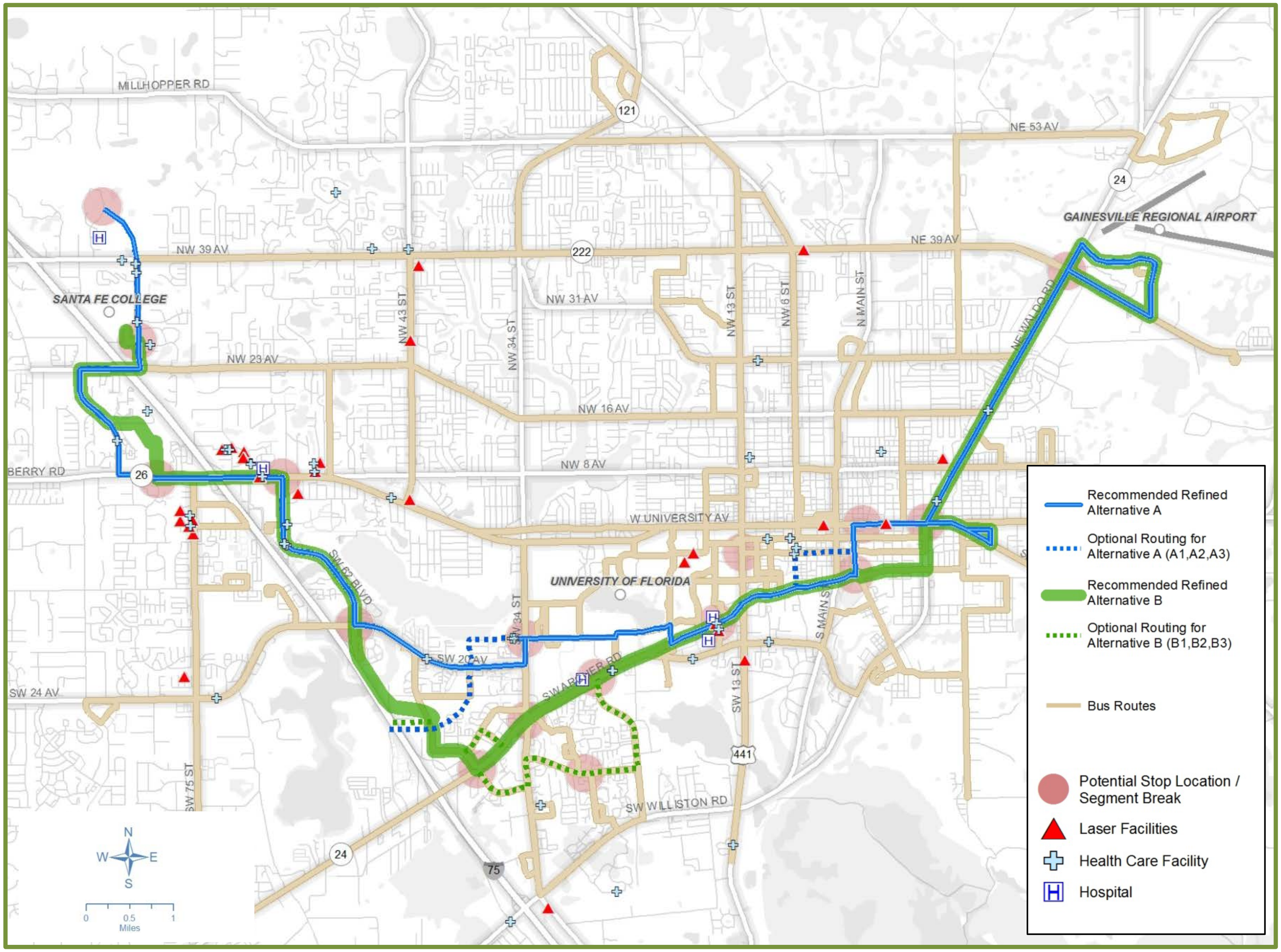
It should be noted that the data summarized in Table 8-2 and illustrated on Figure 8-1 was obtained from the Florida Geographic Data Library. It is intended for planning purposes and is not guaranteed to be one hundred percent accurate. The layers utilized included the assisted housing layer (UF Shimberg Center, Assisted Rental Housing, July 2013); group care layer (Florida Department of Health, February 2008); hospitals (UF GeoPlan Center, February 2013); and laser facilities (UF GeoPlan Center, November 2010).

Table 8-2. Noise and Vibration Sensitive Sites (200-foot Buffer)

Description	Corridor A	Corridor B	Celebration Pointe A1 & B1
	Count	Count	Count
Geocoded Assisted Housing	1	1	0
Geocoded Health Care Facilities	14	10	0
Geocoded Hospitals	0	0	0
Geocoded Laser Facilities	12	10	0
Group Care Facilities	51	49	0

Source: University of Florida GeoPlan Center, Florida Department of Health, and Bureau of Radiation Control

Figure 8-1. Noise and Vibration Sites



8.2 Cultural Resources

Although Corridors A and B to traverse several historic districts, potential adverse impacts to these resources and other cultural resources are expected to be minimal since transit vehicles would operate within existing right-of-way within the historic districts and no bus pull outs are proposed in these areas either.

8.2.1 Historic and Archeological Resources

The majority of the historic and archeologically significant resources in Corridors A and B are located in and around downtown Gainesville. Figure 8-2 shows the cluster of historic structures in downtown Gainesville. Both Corridors A and B traverse the southern part of downtown adjacent to several historic structures, but because road widening is not anticipated in the corridor, impacts are expected to be minimal. Table 8-3 quantifies the historic and archeological sites within the 500 foot buffers of each alternative.

Corridors A and B traverse several historic districts, including the Downtown Gainesville Historic District, South East Gainesville Residential District, and the North East Gainesville Residential District. Additionally, Corridor B traverses the Cotton Club Historic District near the intersection of SE 11th St. and SE 7th Ave.

The optional routes that abut resources were examined more closely, once identified, to avoid and/or mitigate the potential for adverse impacts particularly in identified districts. This level of scrutiny was not applied to all optional routes, unless a potential adverse impact was anticipated due to proposed improvements or proximity to identified resources. For example, Optional Route A2 for Corridor A traverses an additional historic district, Porters Quarters Historic District, near the proposed Innovation Square BRT stop location. Additionally, because this route continues further into downtown Gainesville, it has 27 more historic structures within its 100-foot buffer than the corresponding segment of Base Corridor A. Optional routes A1 and B1 do not have many historical or archaeological impacts along the route, but the spur terminates at the edge of the Mable Barnes Prehistoric Archaeological Site.

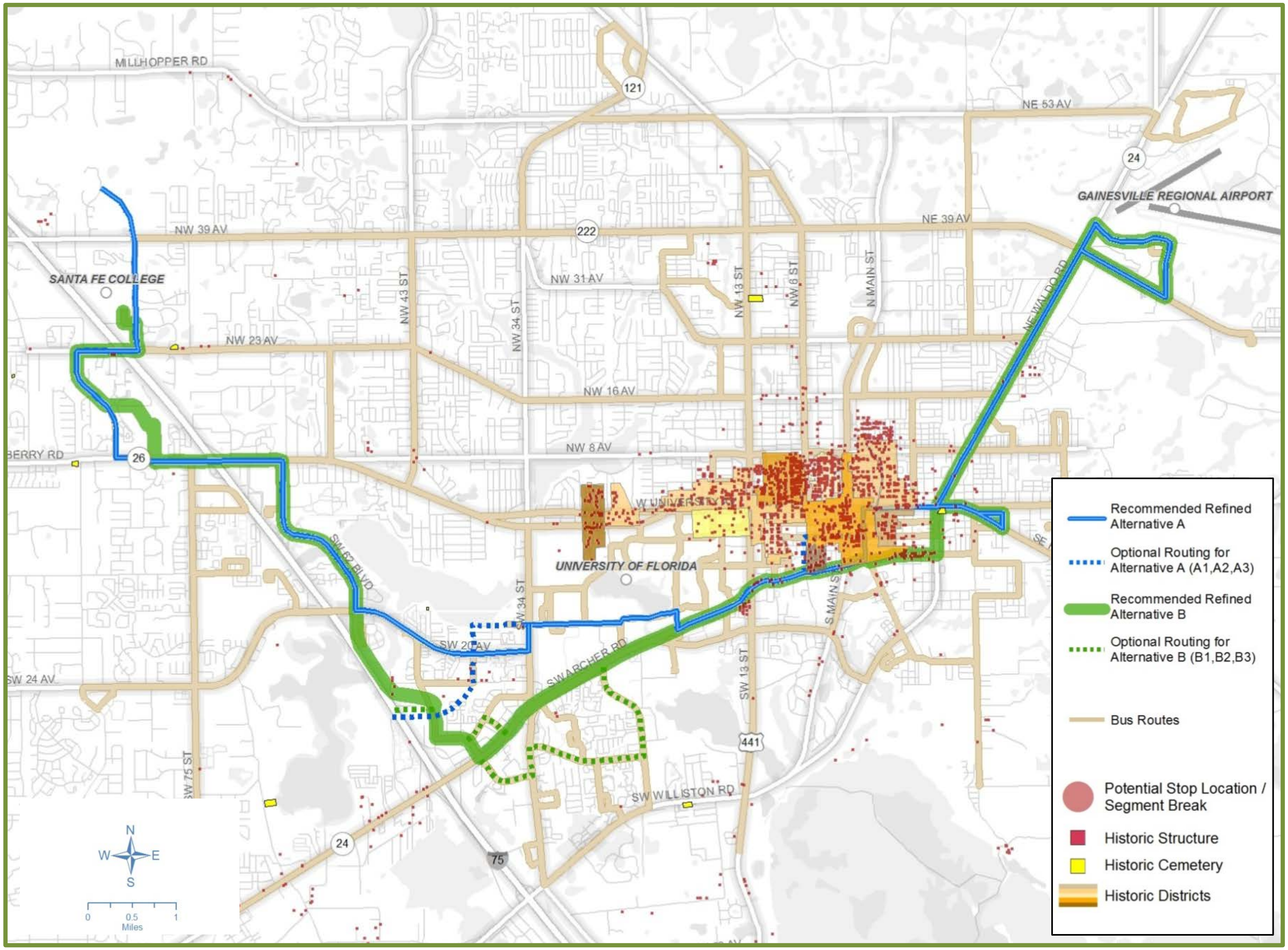
The B'nai Israel Cemetery, established in 1871, is located at the southeast corner of E. University Ave. and NE Waldo Rd. This historic cemetery is adjacent to the transit routes for both Corridors A and B. The transit infrastructure is not anticipated to require any rights-of-way in this quadrant of the intersection; therefore, no impacts to the cemetery are anticipated.

Table 8-3. Historical and Archaeological Sites (500-foot Buffer)

Description	Corridor A		Corridor B		Celebration Pointe A1 & B1	
	Count	Acres	Count	Acres	Count	Acres
Florida Site File Cemeteries	1	2.0	1	2.0	0	0.0
Florida Site File Historic Bridges	0	0.0	0	0.0	0	0.0
Florida Site File Historic Standing Structures	180	0.0	123	0.0	3	0.0
List of Florida Site File Archaeological or Historic Sites	24	143.1	19	143.8	4	6.5
National Register of Historic Places	11	48.0	5	2.7	0	0.0
Resource Groups	13	217.5	13	140.2	1	9.7
State Historic Highways	0	0.0	0	0.0	0	0.0

Source: Bureau of Archaeological Research

Figure 8-2. Historical and Archeological Resources



June 2014

8.3 Natural Resources

8.3.1 Ecosystems and Habitats

Conservation and wildlife habitat areas exist in several portions of both corridors. Table 8-4 quantifies the acreage of potentially sensitive habitat within the 500-foot buffer of each alternative. Florida Managed Areas include for example the Sugarfoot Prairie Conservation Area, Split Rock Conservation Area, Forest Nature Park, the Natural Area Teaching Laboratory, and Lake Alice South Wetlands. Optional Route B1 for Corridor B has more acreage within ecosystem management areas because of its approach to Bivens Rim Forest and Solar Park Pond between the proposed stations of Gainesville Place and University Commons.

Although a majority of the project corridor is located within the core foraging area (CFA) of an active wood stork nesting colony, these are designated in such a manner that they cover large regions and most importantly there are no active wood stork nests within a mile buffer of the corridors.

It is important to note that neither primary corridor calls for the construction of a new roadway. Where proposed transit service may operate on areas not currently constructed, like Celebration Pointe, the entities for these projects are going through the process of satisfying all local, state, and federal environmental protection requirements.

Table 8-4. Wildlife and Habitat (500-foot Buffer)

Description	Corridor A		Corridor B		Celebration Pointe A1 & B1	
	Count	Acres	Count	Acres	Count	Acres
Ecosystem Management Areas[1]	1	2,217.9	1	2,167.7	1	155.1
Florida Managed Areas[2]	8	42.7	9	34.1	0	0.0
Threatened or Endangered Species Occurrence	1	0.0	1	0.0	0	0.0
Wood Stork Core Foraging Areas	1	1,429.1	1	1,515.5	1	155.1
FNAI Element Occurrence	10	0.0	4	0.0	0	0.0
FWC Black Bear Nuisance Reports	0	0.0	1	0.0	0	0.0

Sources: The Florida Fish and Wildlife Conservation Commission, Florida Department of Environmental Protection, Florida Fish and Wildlife Conservation Commission-Fish and Wildlife Research Institute, Florida Natural Areas Inventory (FNAI), Florida Fish and Wildlife Conservation Commission, and U.S. Fish and Wildlife Service

Notes: 1 Boundaries of 24 Ecosystem Management Areas as defined by Florida Department of Environmental Protection

2 Land, public and private, identified by FNAI as having natural resource value and that are being managed at least partially for conservation purposes

8.3.2 Water Quality

Table 8-5 shows the acreage of certain water resources within the 500-foot buffer of the alternative corridors. As stated above, because the project is anticipated to use mostly existing rights-of-way, impacts to water quality are expected to be minimal. Stormwater runoff mitigation, however, may be needed to address new station construction.

The differences between the optional routes and the corresponding segments of the refined alternatives for potential impacts on water quality are negligible.

Table 8-5. Water Quality and Quantity (500-foot Buffer)

Description	Corridor A		Corridor B		Celebration Pointe A1 & B1	
	Count	Acres	Count	Acres	Count	Acres
303(D) 1998 Impaired Waters[1]	6	339.0	2	153.7	1	57.7
FDEP Springs 2009	0	0.0	0	0.0	0	0.0
Principal Aquifers of the State of Florida	2	899.6	1	161.9	1	57.7
Recharge Areas of the Floridan Aquifer	1	899.6	1	161.9	1	57.7
US EPA National Pollutant Discharge Elimination System (NPDES)	34	0.0	3	0.0	0	0.0
Verified Impaired Florida Waters: Cycle 1 Group 1-5 Basins and Cycle 2 Group 1-3 Basins - 2010[2]	4	97.1	1	23.0	0	0.0

Sources: U.S. Geological Survey, U.S. Environmental Protection Agency, Florida Department of Environmental Protection, Watershed Assessment Section, and Southwest Florida Water Management District

Notes: 1 Water bodies on this list fall short of state surface water quality standards and require the preparation of a water cleanup plan

Notes: 2 Water bodies on this list fail to attain any of their designated uses – such as for drinking, recreation, aquatic habitat, and industrial use - and/or meet the minimum criteria for surface waters

8.3.3 Parks and Public Lands

Table 8-6 identifies the acreage of parks and public lands within a 500-foot buffer of the alternatives. There are several schools and parks in close proximity to Corridors A and B. These community focal points and others represent highly trafficked areas that would benefit from the enhanced accessibility provided by the proposed alternatives. No adverse impacts to the parks and public lands are anticipated because the enhanced transit service and supporting transit stop features are expected to be operationalized within the existing rights-of-way.

There are minimal differences between the parks and public lands adjacent to the optional routes of both corridors and their corresponding base segments.

Table 8-6. Parks and Public Lands (500-foot Buffer)

Description	Corridor A		Corridor B		Celebration Pointe A1 & B1	
	Count	Acres	Count	Acres	Count	Acres
Florida State Parks	0	NA	0	NA	0	NA
Geocoded Parks	4	NA	4	NA	0	NA
Geocoded Schools	8	NA	6	NA	0	NA
Greenways Ecological Priority Linkages	2	20.7	1	19.5	0	0.0
Public Land[1]	8	42.7	9	34.1	0	0.0

Source: University of Florida GeoPlan Center, National Park Service, Florida Natural Areas Inventory

Notes: 1Public Land may include duplicate information to other datasets in table

8.3.4 Contamination

Table 8-7 shows that the number of potential or confirmed contaminated sites within the 100-foot buffer of Corridors A and B are similar. These potential contamination sites are clustered along major roadways and industrial areas, as shown in Figure 8.3. There are no potential contamination sites identified along the A1 and B1 transit spurs to Celebration Pointe. There is one Brownfield site relative to both corridors located near the corner of Depot Ave. and Main St..

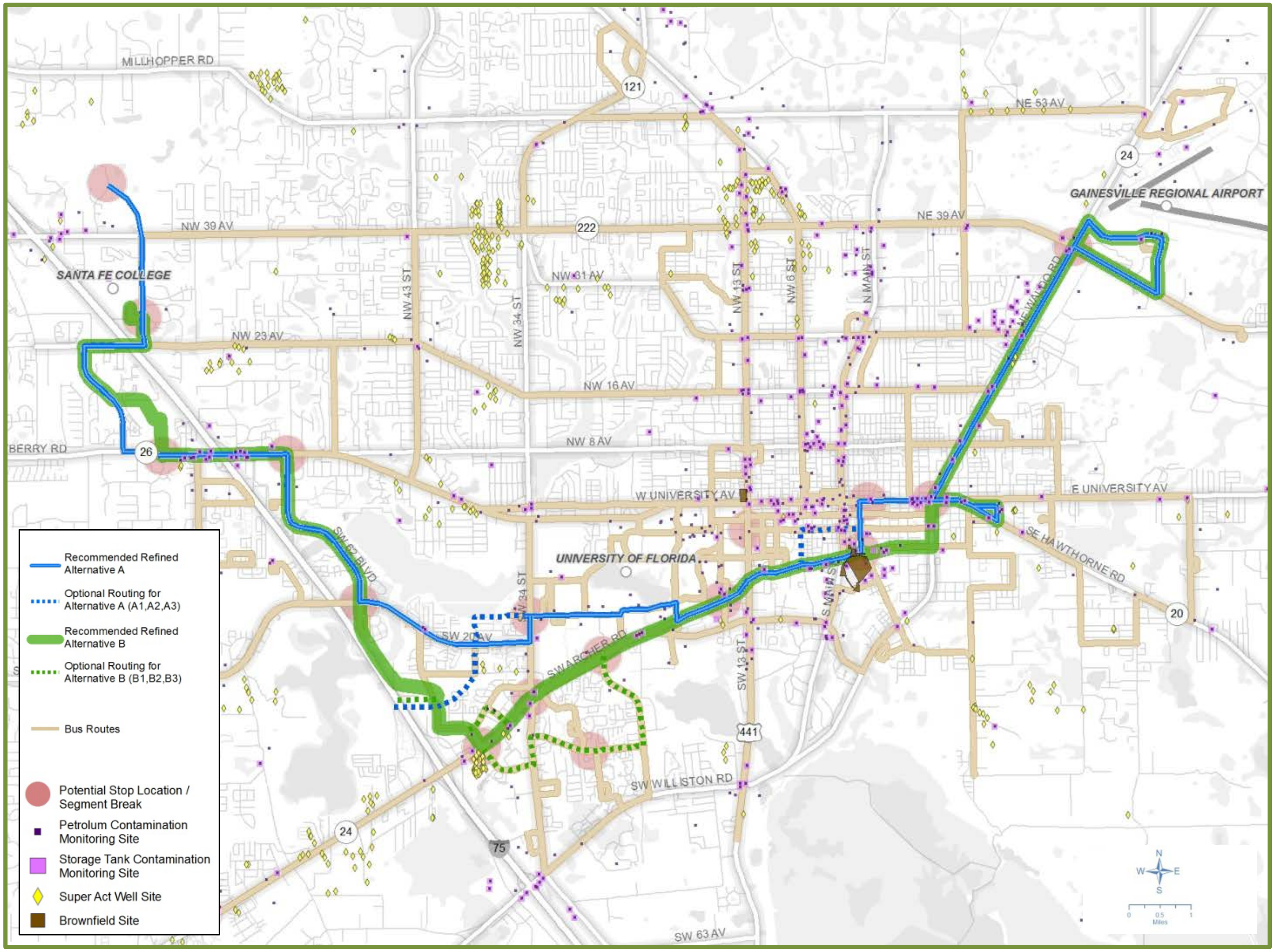
Butler Plaza, a proposed stop location is located near several potential contamination sites as well as a dense assemblage of SUPER Act well sites. These sites are private and public water wells within one-mile of potential petroleum contamination sources.

Table 8-7. Contamination Sites (100-foot Buffer)

Description	Corridor A	Corridor B	Celebration Pointe A1 & B1
	Count	Count	Count
Hazardous Waste Facilities	7	8	0
National Priority List Sites	0	0	0
Petroleum Contamination Monitoring Sites	12	13	0
Solid Waste Facilities	0	0	0
Storage Tank Contamination Monitoring (STCM)	19	20	0
Super Act Risk Sources	12	12	0
Super Act Wells	0	0	0
Superfund Hazardous Waste Sites	0	0	0
Toxic Release Inventory Sites	0	0	0
US EPA Resource Conservation and Recovery Act (RCA) Regulated Facilities	25	28	0

Source: U.S. Environmental Protection Agency, Florida Department of Health, Florida Department of Environmental Protection, Division of Waste Management

Figure 8-3. Contamination Sites



8.4 Summary of Potential Environmental Effects

The potential environmental effects to community, cultural and natural resources for both Corridors A and B are expected to be minimal. This is largely attributable to the minimal right-of-way requirements associated with the proposed alternatives. From a socio-cultural perspective, both alternatives are supportive of the demographic, land use, and aesthetic character of the respective corridors. Although Corridors A and B to traverse several historic districts, potential adverse impacts to these resources and other cultural resources are expected to be minimal since transit vehicles would operate within existing right-of-way within the historic districts and no bus pull outs are proposed in these areas either. The major passenger transfer activity in downtown Gainesville would occur at the existing Rosa Parks Downtown Transit Station.

Potential effects to natural resources for Corridor B may be slightly higher than for Corridor A. Corridor B proposes improvements on two new roadway alignments, Newberry Village and SW 62nd Blvd. However, these roadway improvements are expected be implemented as part of a separate project and are assumed to be completed in advance of the proposed transit or TSM improvements. Therefore, the impacts to natural resources in the alternative corridors should be minimal as well.

9.0 MARKET AND DEVELOPMENT POTENTIAL

9.1 Overview and Approach

The market potential for development is an important factor in the framework for evaluating transit alternatives in the *Go Enhance RTS Study* corridor. While research has shown[5,6] that the presence of high quality transit can have a significant positive influence on property values and development activity in a place, the sources of market-driven development potential are multiple, complex, and variable. Demographics, accessibility, neighborhood characteristics, land availability, costs and land use regulations are among the most influential factors that can shape the development potential of any given location. A market assessment typically involves a detailed examination of these and other conditions for a specific site or study area, with the analyst's conclusion emerging as a synthesis of these factors.

For the *Go Enhance RTS Study* corridors, the objective was to prepare an assessment that provides insight into the relative development potential of possible transit station locations. The study area corridor is large and contains 39 potential station locations that have been identified through preceding analysis. Therefore, an approach was developed that focuses on a limited number of key analytical variables to produce a readily understandable system for identifying stations with the greatest development potential. The resulting approach is a scoring and ranking system that addressed the entire study area and 39 potential station locations collectively. It should be noted that during the screening process the project team, RTS staff, technical advisors, and stakeholders identified additional or nearby station locations that were either new locations or slight modifications to the 39 initially evaluated for market and development potential.

The approach is data-driven, using readily available sources and focusing on variables that capture a cross section of the factors that influence development potential. While the framework described below may not cover every possible factor, these variables collectively should point to the areas that are likely to receive the most attention from developers and investors. This does not mean that the other locations will not attract development. But the analysis is designed to identify the locations that should have the greatest potential for attracting development, particularly development that values transit access and other characteristics of Transit Oriented Development (TOD).

9.2 Methodology

The economic development analysis methodology consists of two steps: (1) data collection and analysis for each potential station location using a standard set of variables, and (2) application of a scoring system that allows comparison of the station locations' relative development potential. The variables evaluated in the analysis are divided into two categories. The first category addresses the "attractiveness" of the station area to developers and investors.

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[5] Fogarty, Nadine et al. *Capturing the Value of Transit*. Center for Transit-Oriented Development. November 2008. http://www.reconnectingamerica.org/resource-center/books-and-reports/2008/capturing-the-value-of-transit-3.

[6] Fogarty, Nadine and Mason Austin. *Rails to Real Estate: Development Patterns along Three New Transit Lines*. Center for Transit-Oriented Development. March 2011. http://www.ctod.org/portal/node/2302.

It is concerned with locational and demographic characteristics that would cause developers to choose one site over another. The second category addresses the “capacity” of the station area for new development or redevelopment. It is concerned with primarily physical factors related to the availability of land and the relative ease and cost of assembling and preparing sites for development projects. While a significant amount of capacity on its own can be attractive to developers, it does not primarily influence the market success of a project – only its execution.

9.3 Attractiveness Variables

The attractiveness analysis looked at six different analytical variables:

- Walkability
- Employment density
- Change in educational attainment
- Income level
- Future land use
- Job access

These six variables were chosen to address a cross section of the factors that drive a site’s attractiveness for development, with reference to the pioneering research of Christopher Leinberger on walkable urban places in the Washington, D.C. region.[7] Leinberger found that such places tended to economically outperform auto-oriented suburban places in terms of the rents or prices for the real estate located there. The most important factor was the walkability of the place (which explained two-thirds of the economic performance), followed by job density and educational attainment in the surrounding area. The analysis addressed walkability directly with one variable, and addressed educational attainment by focusing on two different variables: the change in educational attainment (to capture if more-educated people have been moving in), and current income level as a proxy for educational attainment. The latter also reflects other dynamics that would be attractive to potential developers.

Two other variables address aspects of attractiveness for potential development. Future land use reflects the level of planning for TOD or transit supportive land uses in a station area. Job access reflects how the availability of jobs influences where people live regardless of the availability of high quality transit service. An overview of each variable’s likely influence, how it is defined, and its data source are provided below.

[7] Leinberger, Christopher B. *DC: The WalkUP Wakeup Call*. The George Washington University School of Business. Page 36.2012. http://business.gwu.edu/walkup.

9.3.1 Walkability

Creating places where people are encouraged to or feel comfortable walking is critical to successful transit-oriented development. It is not only the physical characteristics of an area that encourages walking, but also the presence of shopping and services, particularly everyday needs such as grocery stores, coffee shops, personal services, and similar activities. A more-walkable place is also more likely to have a connected street network, which puts more parcels within an accessible distance to a transit station.

For purposes of this analysis, walkability is defined as the Walk Score of each potential station location, using the Walk Score internet tool. Walk Score measures the walkability of a location by awarding points based on the distance to various amenities, with amenities within a five-minute walk (assumed to be 0.25 miles) awarded maximum points. The tool also measures some elements of pedestrian friendliness by incorporating factors such as block length and intersection density into the analysis.[8] Walk Score has been extensively used by researchers in urban planning, real estate, and public health to represent the walkability of places.[9] To most accurately describe walkability conditions, Walk Score's "Street Smart" version was used, which uses the network distance to amenities from a location rather than the simple buffer distance. One notable factor that Walk Score does not address is the comfort of the walking environment, which is affected by physical and environmental conditions along the route.

9.3.2 Employment Density

The employment density around a transit station has an important influence on ridership, and is a factor that is often used in determining TOD guidelines and zoning requirements for station areas. A higher employment density also reflects a place that has more office and commercial space that both hosts employees and serves their needs for shopping and services.

For the purpose of this analysis, job density was estimated using place-based employment data from the U.S. Census Bureau's Local Employment-Household Dynamics (LEHD) Program to count the number of workers within a half-mile radius of the potential station locations in 2011. The employment counts were translated into employment per acre for each station area.

9.3.3 Change in Educational Attainment

While various demographic variables can be used to evaluate the development potential of a place, the key one examined in this assessment is the percentage of adults having at least a Bachelor's degree education. This population cohort typically has higher incomes, works professional jobs, and represents a market segment that is targeted by many retailers and housing developers in higher density urban areas where TOD is more commonly found; it is important to note that this analysis is simply evaluating the development potential of station areas, while the focus of the *Go Enhance RTS Study* is to improve mobility for all people, not just the demographic noted here.

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[8] Description of methodology obtained from http://www.walkscore.com/methodology.shtml.

[9] For a list of research studies and policy reports that have used Walk Score in their analyses, see http://www.walkscore.com/professional/walkability-research.php.

Because income and educational attainment are tightly correlated, the current-year college-degree attainment figures largely parallel the current income levels in the corridor study area. For this reason, the analysis focuses on the change in college degree attainment for the population age 25 and older around each station from 2000 to 2011. The analysis uses educational attainment data by block group for each potential station location from the 2000 Census counts and the 2007-2011 American Community Survey (ACS); block group population figures were prorated to the station area according to the percentage of the block group within a half mile buffer of the station. Because the majority of adults are not likely to be newly obtaining college degrees, a substantial change in the college-educated percentage would suggest an influx of new, more-educated residents into the area rather than a change in the educational attainment of existing residents. By focusing on the population older than 25 the analysis also screens out most of the undergraduate student population from the analysis.

9.3.4 Income Level

Professional experience of the consultant has shown that the higher a neighborhood's income level is, the more attractive it generally is for development. Higher incomes typically translate to greater retail spending power, higher home prices, and a desirable community image. Income level also serves as a proxy for good schools, low crime, stable demographics, and other positive features. All else being equal, most developers prefer to invest in places with higher incomes.

Income level was measured by calculating the per capita income for a half-mile radius around each potential station location. Population and aggregate income data were obtained at the Census block group level from the 2007-2011 ACS. Population and aggregate income figures were prorated to the station area according to the percentage of the block group land area falling within a half mile radius of the station radius. Per capita income was used rather than median household income because it controls for the difference in purchasing power between different sized households with the same income. For example, a one-person household earning $50,000 per year will have more disposable income and a different spending pattern than a four-person household earning the same amount.

9.3.5 Future Land Use

Land use planning and policy-making by local governments have a significant influence on market potential. Future land use designations and the associated policies contained within the comprehensive plan determine the basic character, intensity, and potential mix of uses for parcels that may be prospects for development (or redevelopment). Certain future land use categories offer a greater ability to develop at the densities, intensities, and mixes needed for effective TOD. Developers can always seek plan amendments, but it is easier to pursue projects in places where such additional effort is not required. Furthermore, to the extent that local land use and transportation planning are synchronized, these places are those which are the most likely to be linked by new or enhanced transit service.

The analysis evaluated the future land use classifications around the potential station locations by identifying parcels within a half-mile radius of a station that are designated for TOD-friendly land use categories in the Alachua County Comprehensive Plan and Gainesville Comprehensive Plan. Categories considered TOD-friendly were:

- Alachua County:
    - Mixed Use
    - Residential High Density
    - Residential Medium High Density

- City of Gainesville:
    - Mixed Use High
    - Mixed Use Medium
    - Residential High
    - Urban Mixed Use 1
    - Urban Mixed Use 2

The percentage of total land area those parcels represent was calculated to produce the analytical variable.

9.3.6 Job Access

Most people for the foreseeable future will still base their decisions on where to live, work, and shop on what they can reach by automobile in a reasonable time. Station areas with convenient access to the largest number of jobs independent of the potential transit service are likely to be more attractive as locations for development.

For the purpose of this study, job access was defined as the number of jobs that can be reached by car from a given location within a 15-minute travel time. The travel time threshold was selected based on the mean travel time to work for Gainesville residents found in the 2007-2011 ACS, which was 16.2 minutes. A 15-minute drive time area for each potential station location was created in GIS using congested travel times and the existing roadway network from the regional travel demand model. The number of jobs within the 15-minute area was calculated by compiling the total employment encompassed within the drive time area using data from the U.S. Census Bureau's LEHD Program.

9.4 Capacity Variables

The capacity analysis looked at five different analytical variables:

- Vacant land
- Current development intensity
- Number of owners
- Average parcel size
- Community Redevelopment Agency (CRA) presence

These five variables are indicators of the capacity for, or likelihood of, physical change in a station area. Put simply, the intent is to try and measure relative level of effort that would be required for a development project to be implemented and thus to assess which station areas are likely to be more susceptible to change as developers explore potential opportunities; it is important to note that while the capacity analysis does not directly consider the varying degrees of infrastructure around each station that may be undevelopable the variables themselves give a clear indication of available land.

Because one of the most challenging tasks for a developer in an infill or redevelopment scenario is to secure the land for the project at an economically feasible cost, most of the variables address different aspects of assembling and clearing land. Vacancy status and current intensity address the presence of (or lack of) existing uses and buildings on a site and the need to clear land. The number of parcels and average parcel size in a station area are indicators of fragmentation and multiple owners, which can pose challenges to assembling sufficient land area to develop an economically feasible project. Finally, the presence of a CRA area can provide planning resources, policy tools, and financial incentives from the local government and other stakeholders that facilitate redevelopment.

An overview of each variable's likely influence, how it is defined, and its data source are provided below.

9.4.1 Vacant Land

Vacant land is usually the easiest for developers to acquire because it has no existing use on it and is presumably ready for development. A significant amount of vacant land in a station area can attract developer attention when the local market conditions are strong enough to support demand for new real estate product.

The analysis calculated the percentage of land area that is vacant within a half-mile buffer using data from the Alachua County Property Appraiser.

9.4.2 Current Development Intensity

The current development intensity variable profiles the magnitude of developed areas around each station. This is important because the level to which a parcel is currently developed influences its redevelopment potential, as a developer must pay the additional costs of both acquiring and removing the existing development. Accordingly, while vacant land is the most favorable condition, very low-density development (with minimal structures present) can be ripe for acquisition and redevelopment. As existing development intensity increases to the level of conventional suburban-strip development and above, redevelopment can be a more challenging and risky effort on the part of a developer to change the development pattern of a station area.

Development intensity is represented by the current floor-area ratio (FAR) of the station area, which is derived from the total building area on the developed parcels within a half-mile of the station divided into the total land area of those developed parcels (only developed lands were included because the intent of this variable was to strictly measure the difficulty in clearing these lands – vacant land is addressed in a separate variable). Parcel data come from the Alachua County Property Appraiser. The experience of the consultant has shown that typical suburban-strip development usually exhibits a FAR of between 0.20 and 0.50. Parcels with a lower FAR would be comparatively easier to redevelop, while parcels with a higher FAR would be comparatively more difficult. The collective FAR of the developed parcels in each station area provides a profile of the relative intensity of existing development that would need to be removed if redevelopment were to occur, allowing a comparative score to be assigned to each potential station.

9.4.3 Number of Owners

When considering the potential need to assemble multiple properties to create a sufficiently large development site, the number of parcels (and thus individual owners) can pose a challenge due to the costs, complexity, and time required for negotiations. The number of owners was determined by a count of the unique parcel owner names for parcels located within a half-mile of the potential station; while this may underestimate the true number of unique owners (e.g., one owner multiple limited liability corporations) it should still accurately approximate the number of legal entities that a developer would have to work with.

9.4.4 Average Parcel Size

The average parcel size is another measure of fragmentation in a station area, similar to the number of parcels discussed above. But it also describes the typical land area that is available for development per parcel. Larger parcels are generally considered more attractive for redevelopment because they allow greater flexibility in layout, more efficient construction operations, and simply larger development projects that generate more revenue. The greater capacity of larger parcels also presents a greater potential for producing “catalytic” development projects that can shift the market position of a station area and stimulate follow-on development of other nearby parcels. The average parcel size was derived from the Alachua County Property Appraiser data for all parcels within a half-mile of the potential station.

9.4.5 Community Redevelopment Agency Presence

Redevelopment is a complex undertaking, and often public sector intervention or facilitation is helpful to achieve substantial progress in reshaping the physical form of an area. CRAs largely exist to implement public policies that marshal financial resources and create incentives that can overcome the many hurdles of market-driven redevelopment. The presence of a CRA area that encompasses some or all of a station area means that the area will be a focal point for a variety of public resources and public-private partnership opportunities are potentially available to spark redevelopment activity.

CRA presence was determined by examining redevelopment area boundary maps obtained from the Gainesville CRA website. The College Park/University Heights, Downtown, and Eastside redevelopment areas each have at least one potential station in them.

9.5 Scoring Method

The tables presented in the appendix F compiles the variable data for the 39 potential station locations. These data form the basis of a scoring method that assigns points to the station areas for their performance in each variable. Performance was measured on a three-part scale that focused on development potential: low or minimal potential received zero points, moderate potential received one point, and major potential received two points. Given the importance of walkability on development performance identified in the research cited above, any points awarded for the walkability variable were doubled to give greater weight to this station area attribute. Therefore, a station scoring one point for walkability on the base scale was awarded two points and a station scoring two points for walkability on the base scale was awarded four points. The minimum scoring thresholds, shown below in Table 9-1, were selected to call out above-average and upper-tier performance in each variable.

It should be noted that the analysis is evaluating the development potential of stations in comparison to each other, not the overall development potential of the corridor itself when compared to other corridors. Therefore, the station scores are not being compared to scores of stations elsewhere in Florida or the nation. Moreover, the proposed corridors are immediately adjacent to or in the vicinity of most currently planned large scale developments in the area so it would be looking to augment their success not compete against it.

The scoring results for 39 potential station locations are shown in Tables 9-2 through 9-4, followed by discussion. The tables are sorted generally by the station's location along the corridor, from northwest to northeast. It should be noted that during the screening process the project team, RTS staff, technical advisors, and stakeholders identified additional or nearby station locations that were either new locations or slight modifications to the 39 initially evaluated for market and development potential. This does not undermine the usefulness of this analysis, as many of the new or modified stations were located in close proximity to the ones included in this analysis.

9.6 Results

For the purposes of summarizing the results the station area scores were classified as low, medium, and high development potential by dividing the range of available points into thirds. For the capacity analysis, stations scoring between zero and three points were classified as low potential, stations scoring four to seven points were medium potential, and stations scoring eight to 10 points were high potential. For the attractiveness analysis, the ranges from low to high were zero to four points, five to nine points, and 10 to 12 points, respectively.

Table 9-1. Scoring Thresholds for the Analytical Variables

Variable	Description	Threshold for One Point	Threshold for Two Points
Attractiveness Variables			
Walkability	Street Smart Walk Score of potential station location; point values are doubled when awarded	70 (defined as "very walkable" by Walk Score)	90 (defined as a "walker's paradise" by Walk Score)
Employment Density	Jobs per acre within a half-mile radius around the potential station location	12.5 (80% of 1 standard deviation above the mean of all potential stations)	24.0 (two standard deviations above the mean of all potential stations)
Change in Educational Attainment	2000-2011 percentage-point change in the share of adults holding at least a Bachelor's degree for a half-mile radius around potential station location	n/a (No moderate-score threshold was selected in order to focus only on major changes)	10 percentage points[10]
Income Level	Per capita income in 2011 for a half-mile radius around potential station location, percentage above citywide level	4.5% above (75th percentile of potential stations)	47.9% above 90th percentile of potential stations)
Future Land Use	Percentage of land area in TOD-friendly future land use designations within a half-mile radius of potential station location	31.2% (75th percentile of potential stations)	49.5% (90th percentile of potential stations)
Job Access	Jobs accessible by car within a 15-minute drive of potential station location	88,202 (1 standard deviation above the mean of all potential stations)[11]	98,463 (2 standard deviations above the mean of all potential stations)
Capacity Variables			
Vacant Land	Percentage of land area classified as vacant	12.7% (75th percentile of potential stations)	19.5% (90th percentile of potential stations)
Current Development Intensity	Collective FAR of developed parcels within a half-mile radius around the potential station location	0.20 to 0.49 (typical suburban strip intensity)	Less than 0.20 (lightly developed intensity)
Number of Owners	Count of unique parcel owners within a half-mile radius around the potential station location	231 (25th percentile of potential stations)	107 (10th percentile of potential stations)
Average Parcel Size	Average size of parcels in acres within a half-mile radius around the potential station location	2.07 (75th percentile of potential stations)	5.86 (90th percentile of potential stations)
CRA Presence	Presence of CRA area encompassing some or all of the station area	n/a	Portion of the station area is located within a CRA

[10] This margin was selected as a signifier of major change, following the example of the comparison between regional and station area demographics in: Pollack, Bluestone, and Billingham. *Maintaining Diversity in America's Transit-Rich Neighborhoods: Tools for Equitable Change*. Dukakis Center for Urban and Regional Policy. October 2010.

[11] Other than a few stations at the low end of the distribution, there was not much variation in Job Access findings, meaning that most of the figures were clustered in a fairly close range. Therefore, no stations fell one or two standard deviations above the mean.

9.6.1 Attractiveness Analysis Results

Of the 39 potential stations, one scored as medium potential and the rest scored as low potential.

- The highest scoring station, receiving six points, is SE 3rd Street/SE 2nd Avenue, which is located in downtown Gainesville (on Corridor A). The station received its points from four of the six analysis variables.
- The next five highest scoring stations each received four points. Three of these stations are located in close proximity to each other along West Newberry Road (both A and B corridors). Given that they received all their points from high income levels and high amounts of educational attainment change they are likely to attract development in general, not just TOD. The other two stations are located in Innovation Square (SW 6th Street/SW 4th Avenue) and Santa Fe Village (NW 89th Boulevard).
- Eighteen of the remaining stations received zero points.

Table 9-2. Attractiveness Scoring Results, Sorted by Location

Station Description	Applicable Build Corridor	Walkability	Employment Density	Change in Educ. Attainment	Income Level	Future Land Use	Job Access	TOTAL SCORE
NW 89th Blvd. (Santa Fe Village)	A	0	0	0	2	2	0	4
Santa Fe College	A	0	0	0	1	0	0	1
NW 83rd St./NW 27th Blvd.	B	0	0	0	1	0	0	1
W. Newberry Rd. /NW 84th St.	A	0	0	2	2	0	0	4
W. Newberry Rd. /NW 80th Blvd. (just north)	B	0	0	2	2	0	0	4
W. Newberry Rd. /NW 80th Blvd. (Newberry Village)	A	0	0	2	2	0	0	4
W. Newberry Rd. /NW 75th St.	A,B	0	0	0	1	0	0	1
Regional Medical Center/Oaks Mall	A,B	2	0	0	1	0	0	3
Oaks Mall	A,B	0	0	0	0	0	0	0
SW 62nd Blvd./SW 24th Ave.	B	0	0	0	0	0	0	0
N. of SW 20th Ave./SW 52nd St.	A,B	0	0	0	0	0	0	0
SW 20th Ave./SW 43rd St.	A,B	0	0	0	0	1	0	1
W of I-75/SW Archer Rd. (Celebration Pointe)	A1,B1	0	0	0	1	0	0	1
SW 42nd St. N. of SW 33rd Pl.	B	0	0	0	0	0	0	0
SW 20th Ave./SW 38th Terrace	A2	0	0	0	0	2	0	2
SW Archer Rd. /SW 37th Blvd.	B	0	0	0	0	0	0	0
Windmeadows Blvd./SW 35th Blvd.	B3	0	0	0	0	0	0	0
SW 20th Ave./SW 37th Way	A	0	0	0	0	2	0	2
Hull Rd. (west end)	A	0	0	0	0	1	0	1
SW Archer Rd. /SW 34th St.	B	0	0	0	0	0	0	0
SW 34th St./SW 35th Pl.	B2	0	0	0	0	0	0	0
Hull Rd. E. of Bledsoe Dr.	A	0	0	0	0	0	0	0
SW Archer Rd. /SW 28th Pl.	B	0	0	0	0	0	0	0
SW 35th Pl. E. of 28th Terrace	B2	0	0	0	0	0	0	0

Table 9-2. Attractiveness Scoring Results, Sorted by Location (Cont.)

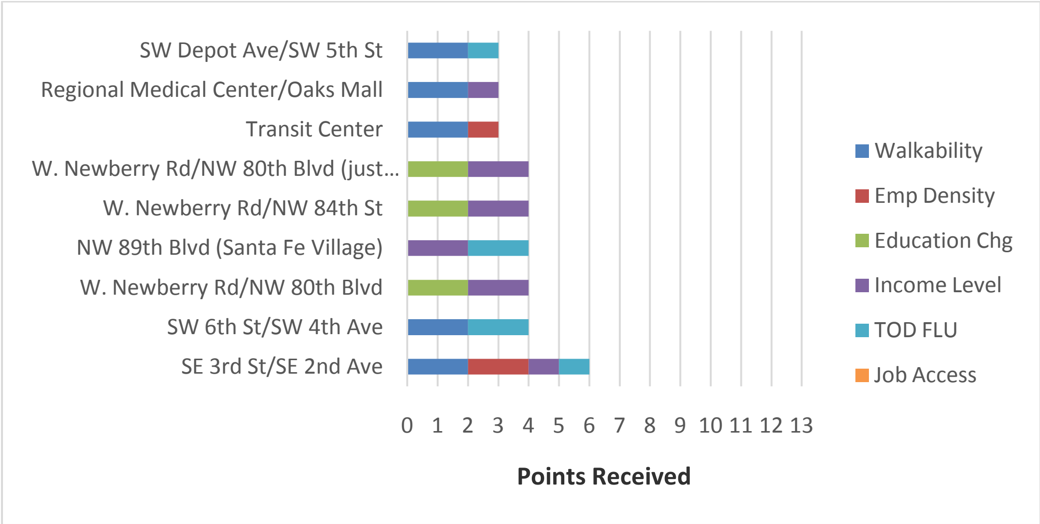
Station Description	Applicable Build Corridor	Walkability	Employment Density	Change in Educ. Attainment	Income Level	Future Land Use	Job Access	TOTAL SCORE
Hull Rd. /SW 23rd Dr.	A	0	0	0	0	0	0	0
SW Archer Rd. / SW 23rd Dr.	A,B	0	0	0	0	0	0	0
Mowry Rd. W. of Gale Lemerand Dr.	A	0	2	0	0	0	0	2
SW Archer Rd. / Gale Lemerand Dr.	A,B	0	2	0	0	0	0	2
SW Archer Rd. / SW 16th St. (Shands)	A,B	0	1	0	0	1	0	2
SW Depot Ave. / SW 11th St.	A,B	0	0	0	0	1	0	1
SW 6th St. / SW 4th Ave.	A3	2	0	0	0	2	0	4
SW Depot Ave. / SW 5th St.	A,B	2	0	0	0	1	0	3
SE 3rd St. / SE 2nd Ave.	A	2	2	0	1	1	0	6
Rosa Parks Transfer Center	A,B	2	1	0	0	0	0	3
5 Points Transfer Station (SE Hawthorne Rd.)	A,B	0	0	0	0	0	0	0
NE Waldo Ave. / 12th Ave.	A,B	0	0	0	0	0	0	0
UF Eastside Campus	A,B	0	0	0	0	0	0	0
NE 39th Ave. near Airport	A,B	0	0	0	0	0	0	0
Airport	A,B	0	0	0	0	0	0	0

Focusing on the nine stations with the highest scores (between three and six total points) shows that Income Level is the largest driver of the scores, with six of the nine stations receiving points for this variable. This followed closely by walkability, with five stations receiving points. Figure 9-1 below shows the score breakdown by variable for the top nine potential station locations.

Table 9-3. Total Scores, Sorted by Location

Station Description	Applicable Build Corridor	Total Attractiveness Score	Total Capacity Score
NW 89th Blvd. (Santa Fe Village)	A	4	7
Santa Fe College	A	1	4
NW 83rd St. / NW 27th Blvd.	B	1	3
W. Newberry Rd. / NW 84th St.	A	4	2
W. Newberry Rd. /NW 80th Blvd. (just north)	B	4	2
W. Newberry Rd. /NW 80th Blvd.(Newberry Village)	A	4	2
W. Newberry Rd. / NW 75th St.	A,B	1	2
Regional Medical Center / Oaks Mall	A,B	3	1
Oaks Mall	A,B	0	1
SW 62nd Blvd. / SW 24th Ave.	B	0	2
N. of SW 20th Ave. / SW 52nd St.	A,B	0	2
SW 20th Ave. / SW 43rd St.	A,B	1	3
NW of I-75 / SW Archer Rd. (Celebration Pointe)	A1,B1	1	4
SW 42nd St. N. of SW 33rd Pl.	B	0	3
SW 20th Ave. / SW 38th Terrace	A	2	3
SW Archer Rd. /SW 37th Blvd.	B	0	3
Windmeadows Blvd. / SW 35th Blvd.	B3	0	3
SW 20th Ave. / SW 37th St.	A	2	2
Hull Rd. (west end)	A	1	3
SW Archer Rd. / SW 34th St.	B	0	1
SW 34th St./SW 35th Pl.	B2	0	1
Hull Rd. E. of Bledsoe Dr.	A	0	6
SW Archer Rd. /SW 28th Pl.	B	0	1
SW 35th Pl. E. of 28th Terrace	B2	0	1
Hull Rd. / SW 23rd Dr.	A	0	2
SW Archer Rd. / SW 23rd Dr.	A,B	0	2
Mowry Rd. / W. of Gale Lemerand Dr.	A	2	3
SW Archer Rd. / Gale Lemerand Dr.	B	2	2
SW Archer Rd. /SW 16th St. (Shands)	A,B	2	0
SW Depot Ave. / SW 11th St.	A,B	1	2
SW 6th St. / SW 4th Ave.	A3	4	3
SW Depot Ave. / SW 5th St.	A,B	3	3
SE 3rd St. / SE 2nd Ave.	A	6	3
Rosa Parks Transfer Station	A,B	3	3
5 Points Transfer Station (SE Hawthorne Rd.)	A,B	0	6
NE Waldo Ave. / 12th Ave.	A,B	0	4
UF Eastside Campus	A,B	0	2
NE 39th Ave. near Airport	A,B	0	6
Airport	A,B	0	6

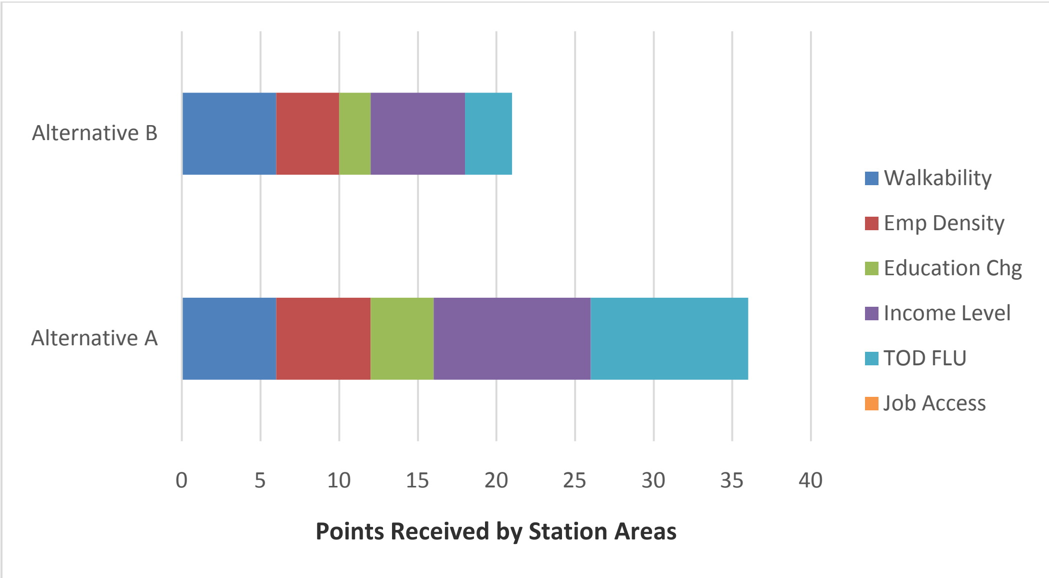
Figure 9-1. Attractiveness Score Breakdown of the Top-Ranked Potential Station Locations



Of all the stations, only SE 3rd Street/SE 2nd Avenue (downtown) scored in three or more separate variables; the others all scored in only two.

Overall, the scores received by the stations were low. Looking at the combined scores of the stations according to the route alternative on which they are located, Corridor A scored significantly higher than Corridor B, receiving a collective 36 points versus 21 points, as shown in Figure 9-2. The optional stations are not included in the collective score.

Figure 9-2. Collective Attractiveness Scores of the Two Refined Build Alternatives



The individual variable scores show that TOD Future Land Use was the most important in generating higher scores for Corridor A, with the proposed alignment receiving over three times as many points as Corridor B for that variable. Corridor A also received significantly more points for Income Level, but the points received for the other variables were basically equal between the two alternatives.

9.6.2 Capacity Analysis Results

The capacity analysis considered five criteria and they are vacant land, development intensity, number of parcels, average parcel size and CRA presence. Five stations had notable scores as reflected in Table 9-3; they are:

- NW 8th Blvd. (SFC),
- SW Archer Rd. /SW 28th Place,
- Five Points transfer station,
- NE 39th Avenue (near airport), and
- Gainesville Regional Airport

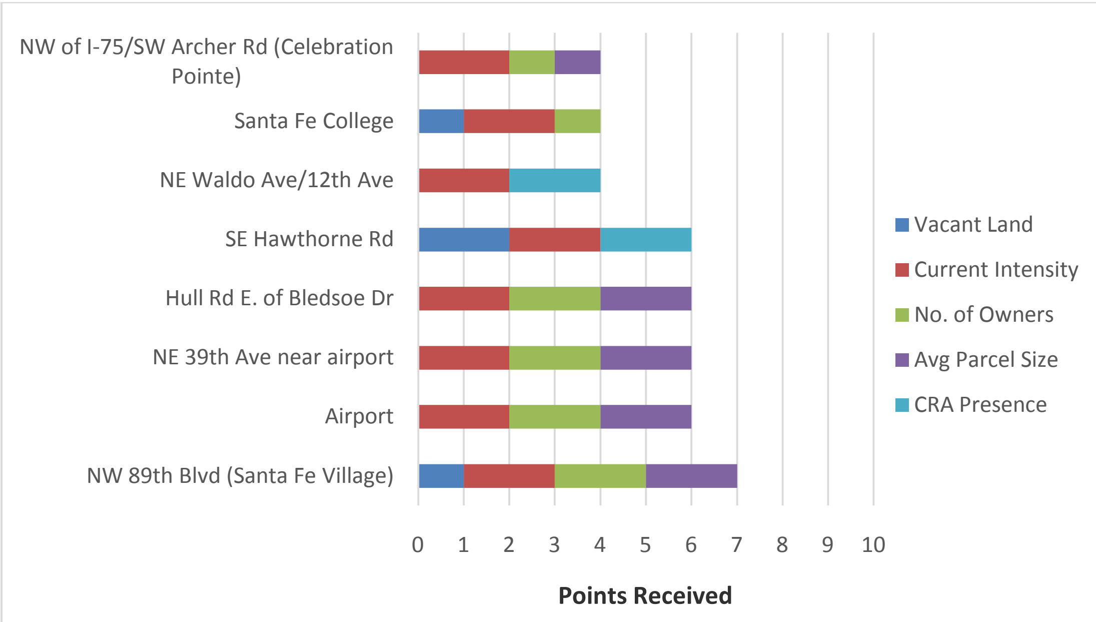
Principally, these sites indicated a combination of the potential for land assembly and average parcel size.

Of the 39 potential stations, 31 scored as medium potential and eight as low potential.

- The highest scoring station, receiving seven points, is NW 89th Blvd. (Santa Fe Village). The station received its points from four of the five analysis variables.
- Four stations received six points, putting them in the middle of the medium potential range. Three of the stations are on the east end of the study corridor, two of which are at or near the airport. The fourth station is on Hull Rd. east of Bledsoe Dr.
- Three stations received four points, which puts them at the lowest end of the medium potential range. These stations are NE Waldo Ave./12th Ave., SFC, and NW of I-75/SW Archer Rd. (Celebration Pointe).
- The remaining 31 stations were classified as low potential.

Focusing on the eight stations with the highest scores (between four and seven total points) shows that Current Intensity and Number of Owners are the largest drivers of high scores, with most of the stations receiving points for these variables. Average Parcel Size is also a significant contributor. Figure 9-3 below shows the score breakdown by variable for the top eight potential station locations.

Figure 9-3. Capacity Score Breakdown of the Top-Ranked Potential Station Locations



Looking at the combined scores of the stations according to the route alternative on which they are located, the two alternatives scored fairly similarly. Corridor A received a collective 77 points while Corridor B received a collective 67 points, as shown in Figure 9-4. The optional stations are not included in the collective scores.

Figure 9-4. Collective Capacity Scores of the Two Refined Build Alternatives

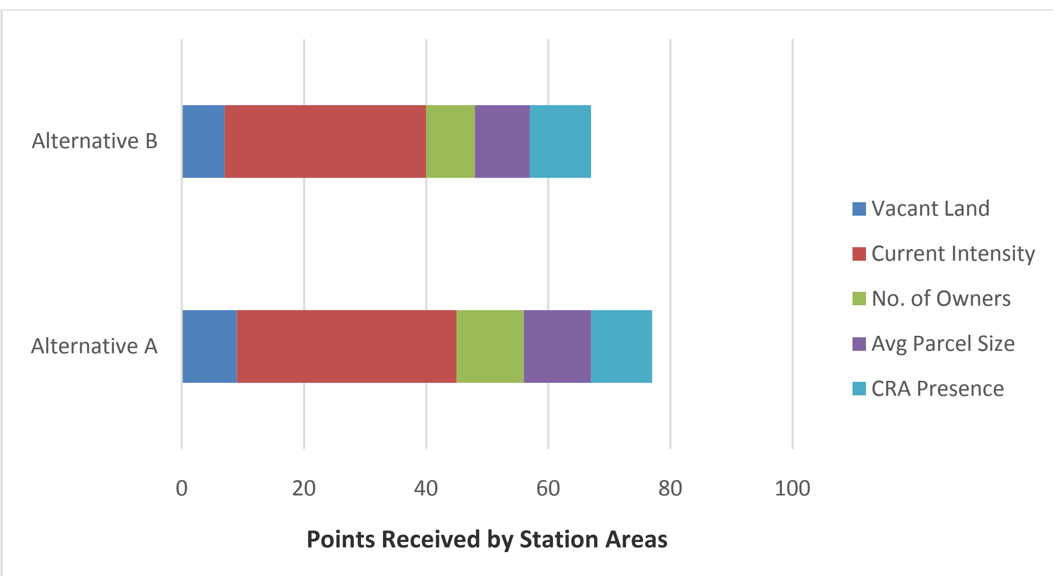


Table 9-4. Capacity Scoring Results, Sorted by Location

Station Description	Applicable Build Corridor	Vacant Land	Current Development Intensity	Number of Parcels	Average Parcel Size	CRA Presence	TOTAL SCORE
NW 89th Blvd. (Santa Fe Village)	A	1	2	2	2	0	7
Santa Fe College	A	1	2	1	0	0	4
NW 83rd St./NW 27th Blvd.	B	0	2	1	0	0	3
W. Newberry Rd. /NW 84th St.	A	0	2	0	0	0	2
W. Newberry Rd. /NW 80th Blvd. (just north)	B	0	2	0	0	0	2
W. Newberry Rd. /NW 80th Blvd. (Newberry Village)	A	0	2	0	0	0	2
W. Newberry Rd. /NW 75th St.	A,B	0	2	0	0	0	2
Regional Medical Center/Oaks Mall	A,B	0	1	0	0	0	1
Oaks Mall	A,B	0	1	0	0	0	1
SW 62nd Blvd./SW 24th Ave.	B	1	1	0	0	0	2
N. of SW 20th Ave./SW 52nd St.	A,B	0	2	0	0	0	2
SW 20th Ave./SW 43rd St.	A,B	1	2	0	0	0	3
NW of I-75/SW Archer Rd. .(Celebration Pointe)	A1,B1	0	2	1	1	0	4
SW 42nd St. N. of SW 33rd Pl.	B	2	1	0	0	0	3
SW 20th Ave./SW 38th Terrace	A	2	1	0	0	0	3
SW Archer Rd. /SW 37th Blvd.	B	0	1	1	1	0	3
Windmeadows Blvd./SW 35th Blvd.	B3	1	1	1	0	0	3
SW 20th Ave./SW 37th St.	A	1	1	0	0	0	2
Hull Rd. (west end)	A	2	1	0	0	0	3
SW Archer Rd. /SW 34th St.	B	0	1	0	0	0	1
SW 34th St./SW 35th Pl.	B2	0	1	0	0	0	1
Hull Rd. E. of Bledsoe Dr.	A	0	2	2	2	0	6
SW Archer Rd. /SW 28th Pl.	B	0	1	0	0	0	1
SW 35th Pl. E. of 28th Terrace	B2	0	1	0	0	0	1

Table 9-4. Capacity Scoring Results, Sorted by Location (Cont.)

Station Description	Applicable Build Corridor	Vacant Land	Current Development Intensity	Number of Parcels	Average Parcel Size	CRA Presence	TOTAL SCORE
Hull Rd. /SW 23rd Dr.	A	0	1	0	1	0	2
SW Archer Rd. /SW 23rd Dr.	A,B	0	1	0	1	0	2
Mowry Rd. W. of Gale Lemerand Dr.	A	0	1	1	1	0	3
SW Archer Rd. /Gale Lemerand Dr.	B	0	1	0	1	0	2
SW Archer Rd. /SW 16th St. (Shands)	A,B	0	0	0	0	0	0
SW Depot Ave./SW 11th St.	A,B	0	0	0	0	2	2
SW 6th St./SW 4th Ave.	A3	0	1	0	0	2	3
SW Depot Ave./SW 5th St.	A,B	0	1	0	0	2	3
SE 3rd St./SE 2nd Ave.	A	0	1	0	0	2	3
Rosa Parks Transfer Station	A,B	0	1	0	0	2	3
5 Points Transfer Station (SE Hawthorne Rd.)	A,B	2	2	0	0	2	6
NE Waldo Ave./12th Ave.	A,B	0	2	0	0	2	4
UF Eastside campus	A,B	0	2	0	0	0	2
NE 39th Ave. near Airport	A,B	0	2	2	2	0	6
Airport	A,B	0	2	2	2	0	6

9.6.3 Comparing Attractiveness and Capacity

The development potential analysis evaluates both attractiveness and capacity, but the total scores for these two measures cannot be summed because they reflect attributes that are generally in conflict with each other. While it would be possible, but rare, for a station to score highly for both attractiveness and capacity, it is more likely that a station that scores highly in one measure will not score highly in the other.

Because the attractiveness score measures a station's current relative attractiveness to developers and potential market strength, it reflects the factors that make a location a target for development and investment independent of whether there is actually land available for development. In fact, in places with very strong attractiveness scores developers are likely to make special efforts to obtain developable sites, by acquiring and clearing already-developed properties, engaging in Brownfield cleanup, and other significant (and sometimes costly) efforts.

In contrast, the capacity score measures a station's potential for physical change through development or redevelopment activity, independent of demographic and economic characteristics that may make it attractive to developers. While in some cases a very strong capacity score could on its own attract developer interest, at least some of the attractiveness factors will need to be in place or the potential must exist to create or strengthen them in order to make development market-feasible. The capacity score reflects the potential ability of developers to implement projects that can contribute to strengthening the attractiveness of a location by attracting new residents and businesses that revitalize an area.

Figures 9-5 and 9-6 show the potential station locations and their total attractiveness and capacity scores. The scores show while there is not an immediate desirability for development around the proposed station locations a number of them are inclined to future redevelopment.

Figure 9-5. Potential Station Locations and their Total Attractiveness Scores

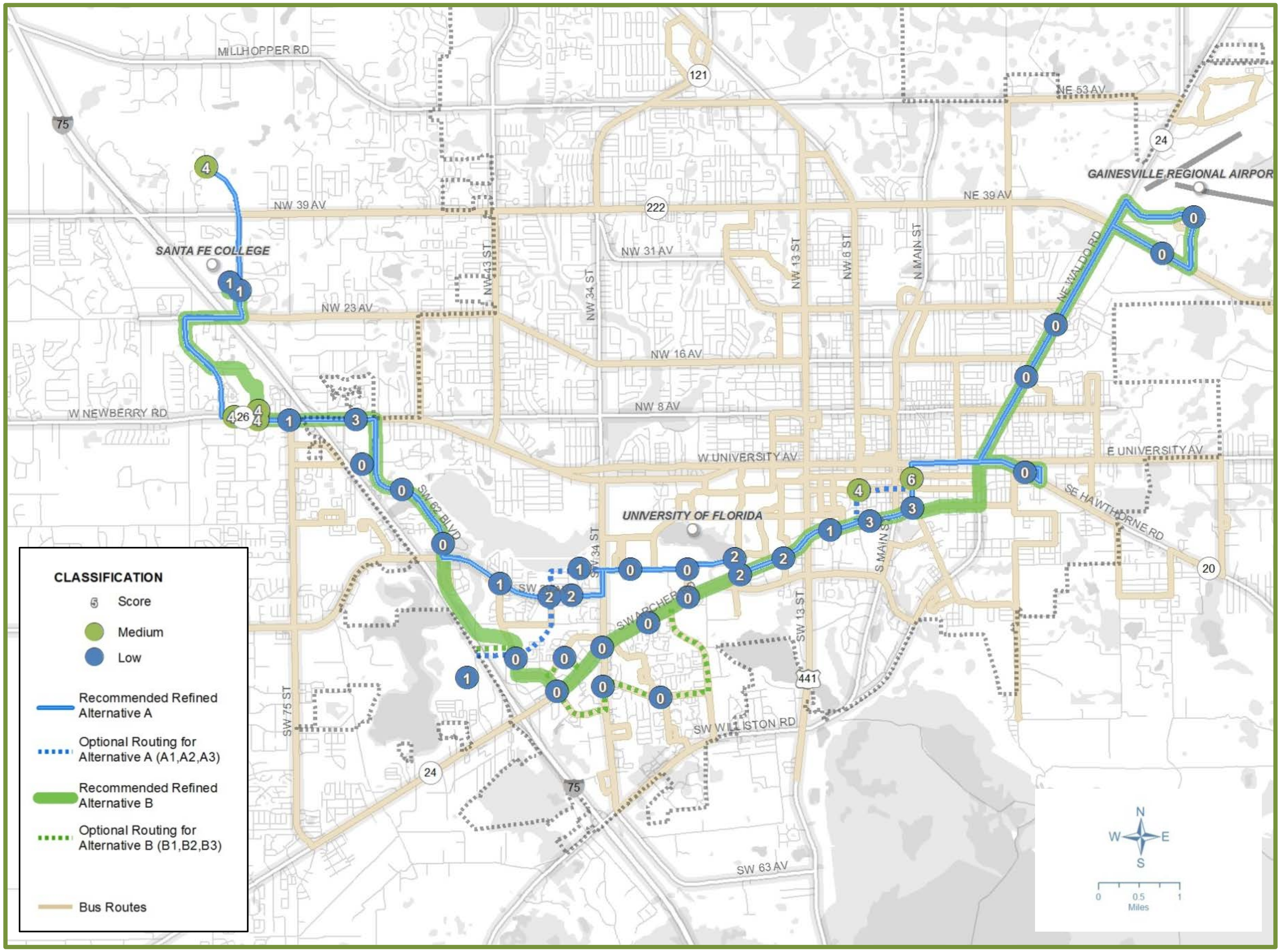
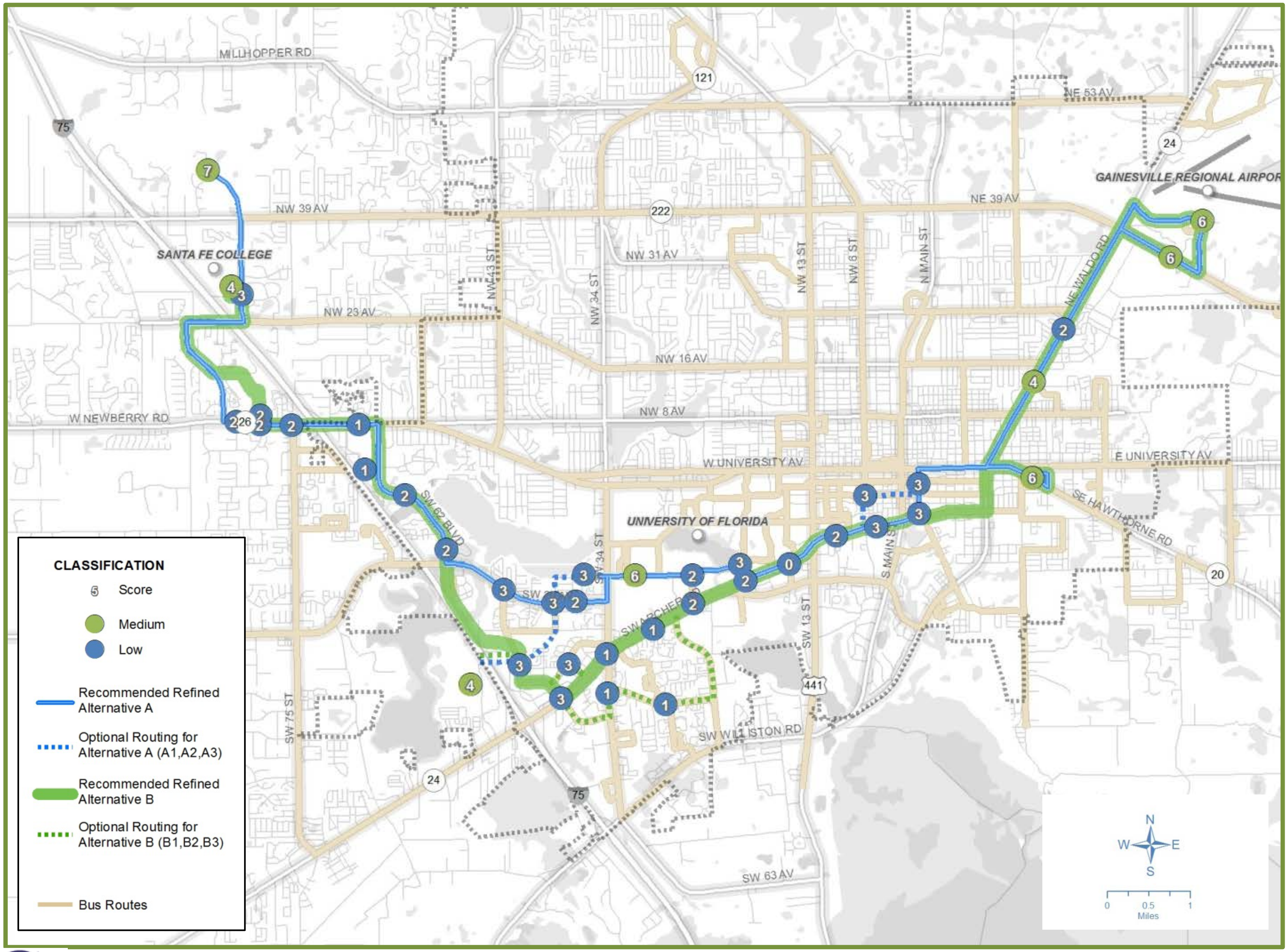


Figure 9-6. Potential Station Locations and their Total Capacity Scores



10.0 OVERALL CORRIDOR EVALUATION

The overall corridor evaluation documents the performance of the TSM and Build alternatives relative to two sets of screening criteria:

- Local Tier 3 Performance Measures; and
- Federal Project Justification Criteria.

Premium transit projects are ultimately transportation improvements approved locally and most likely funded with federal and state partners, including FTA and FDOT. For this reason, it was decided to present the results of both the local screening criteria developed by the TAC and PAWG and the federal criteria for FTA New Starts projects.

10.1 Local Tier Three Performance Measures

Local Tier 3 performance measures were developed for consistency with City of Gainesville, Alachua County, North Central Florida Regional Planning Council (NCFRPC), and MTPO goals and objectives so that the most technically sound, environmentally sensitive, economically feasible and socially acceptable project would be advanced. It also considered federal and state, processes like FTA's discretionary Section 5309 Capital Investment Grant program (New Starts) which evaluates a project based on factors that include mobility, land use, and local financial commitment and FDOT's Project Development and Environment (PD&E) process which is designed to ensure project compliance with the National Environmental Policy Act (NEPA).

The study goals and objectives are shown in Table 10-1. Where feasible, the evaluation criteria were quantifiable. In some instances, the evaluation measures were qualitative.

Details describing the methods for developing a number of these inputs are provided in earlier sections of this report. For example, Section 3.0 provides the analysis used to determine travel time savings while Section 6.0 provides the ridership projections and accompanying methodology. Since the analysis of relative performance is described in detail in these earlier sections, the results of the analyses presented here are documented in comparative terms only, to avoid redundancy.

A corridor evaluation matrix for each relevant measure has been prepared using a four category rating system of "Fair," "Good", "Better", and "Best." Breakpoints have been calculated based upon the mean and standard deviation. The mean and standard deviation were calculated for each item in the evaluation matrices; thereby, evaluating the two primary corridors and their respective optional routing against each other. The Celebration Pointe options were evaluated as standalone segments as they are short alignments that go with either primary corridor.

Table 10-1. GO Enhance RTS Goals, Objectives, and Performance Measures

GOALS	OBJECTIVES	TIER 3 PERFORMANCE EVALUATION MEASURES
1. Improve Mobility and Transit Accessibility In Gainesville and Alachua County	a) Improve travel circulation by connecting major activity centers in the study area	• Total employment served (2035).
	b) Provide an effective connection to existing and future transit service	• Number of intersections with existing RTS routes. • Number of High and Medium ridership stop locations served.
	c) Improve transit travel times between existing and future major employers/ major trip destinations	• Total travel time savings for each complete corridor (in minutes for the weekday AM peak period).
	d) Accommodate the variable travel demand associated with University of Florida, Santa Fe College, and special events	• Number of stations served by University of Florida (UF) routes. • Number of stations served by Later Gator routes.
2. Assure Equitable Transportation Options for the Community	a) Enhance accessibility for transit dependent population	• Zero car and one car population located within ½ mile of the corridors.
	b) Provide equitable transportation services and benefits	• Linear mileage of alignment within Transit Supportive Areas (combined high and very high TSA employment and residential densities).
	c) Provide equitable sharing of costs for transportation improvement among those who benefit from them	• No geospatial/ quantifiable measure proposed.
3. Enhance the Quality of the Environment	a) Promote transportation improvements that are consistent with adopted growth management and transportation plans	• Acreage of mixed use, commercial, office, and high density residential future land use designated areas within ½ mile of alignment.
	b) Provide an alternative to automobile use and that manages parking demand within the University of Florida (UF) and Santa Fe College campuses, downtown and other major activity centers in area to sustainable levels	• Number of UF parking spaces located within 1/2 mile along alternative corridors [Note: Santa Fe College Parking data is not coded by TAZ].
	c) Improve air quality by reducing automobile emissions and pollutants	• Reduction in vehicle miles traveled (VMT) by alternative.

Table 10-1. GO Enhance RTS Goals, Objectives, and Performance Measures (Cont.)

GOALS	OBJECTIVES	TIER 3 PERFORMANCE EVALUATION MEASURES
4. Enhance the Social Integrity of the Urban Community	a) Support development of a pedestrian environment with increased transit use, and more walking	• No additional analysis is proposed. Percent of alternative/corridor with direct sidewalk connections was used in Tier 2.
	b) Serve existing and support future high-density land uses (e.g. mixed-use, residential, commercial, office, and institutional use)	• Acreage of mixed use, commercial, office, and high density residential zoning within ½ mile of alignment. • Acreage of institutional uses with ¼ mile of alignment (Section 8.0).
	c) Provide transit investments supportive of City and County redevelopment/ development and land use plans	• Acreage of designated redevelopment area within ½ mile of alignment.
5. Develop Transportation Options that are Financially Viable	a) Determine the ability of local agencies to fund the estimated local share of capital costs	• Ratio of proposed capital costs to RTS capital budget for 2011.
	b) Determine the ability of local agencies and the private sector to fund estimated operating and maintenance (O&M) costs	• Ratio of proposed O&M costs to RTS O&M budget for 2011.
	c) Develop transit improvements in the most cost-effective manner	• Capital cost per mile of alternative.
	d) Maximize the economic benefits gained from transit capital investments	• Acreage of mixed use, commercial, office, and high density residential zoning within ½ mile of stations along alternatives.
	e) Implement transit improvements in a timely manner	• Projected number of months to implement Phase 1 improvements.

- Best – mean plus above one standard deviation
- Better – ranges from the mean to plus one standard deviation
- Good – ranges from the mean to minus one standard deviation
- Fair – ranges from mean minus two standard deviations and lower

The results are based on calculations for a quarter-mile buffer around each station. Then, all stations associated with a particular alternative were tabulated and presented.

The “Best” results are color coded in green, the “Better” results are coded in yellow, the “Good” results are coded in orange, and the “Fair” results are color coded with light red; the mean, standard deviation, and breakpoints are presented with each measure.

10.1.1 Improve Mobility and Transit Accessibility Analysis

Six performance measures were used to evaluate mobility and accessibility. A summary of the results is included in Table 10-2A.

1) Total employment served (2035)

The MTPO socioeconomic data served as the data source for this analysis. The total 2035 employment by TAZ was identified using a quarter-mile buffer with the number of employees estimated based upon the proportion of a particular TAZ within the quarter-mile buffer. The result shown is the total calculated for all stations comprising an alternative.

Total employment along the study corridor is listed in the second column of Table 10-2A with ranges from approximately 24,600 to nearly 27,000. Corridor A with both options performed the best. Corridor A with optional route A3 along SW 6th St. also performs well, only losing 143 jobs.

2) Number of intersections with existing RTS routes.

Spring 2013 RTS bus routes served as the data source for this analysis. Bus routes within 75-feet of a corridor were counted.

The number of intersecting routes ranges from 28 to 32. Corridor A along the base route performed the “Best” in terms of providing 32 connections to existing RTS routes.

3) Number of High and Medium ridership stop locations served.

The 2013 RTS automatic passenger counter (APC) data by bus stop was used to Identify high (>1,000 daily passengers)and medium (>500 daily passengers) ridership stops served by each corridor.

The number of high and medium ridership stops served ranges from 7 to 14. Corridor A – base route, with the optional route A3 along SW 6th St. and serving Innovation Square, and with both options all perform the “Best” by serving 14 such stops. Of the Corridor B route options the one serving SW 35th Place (B3) serves the most high and medium ridership stops (12).

Table 10-2A. Local Project Evaluation Measures
Goal 1: Improve Mobility and Transit Accessibility in Gainesville and Alachua County

Alternative Routing Options	Total Employment Served (2035)	Connects with Existing RTS Routes	High and Medium Ridership Stops Served	Total Travel Time Savings TSM	Total Travel Time Savings Build	Common Stations with UF Routes	Common Stations with Later Gator
Corridor A (Base)	24,661	32	14	5.8	17.1	8	46
Corridor A w/A2 (SW 38th Ter.)	24,804	28	10	6.5	16.4	8	46
Corridor A w/A3 (SW 6th St.)	26,813	31	14	10.6	17.5	13	46
Corridor A w/A2 & A3(Both Options)	26,956	31	14	10.7	27.3	15	42
Corridor B (Base)	24,651.0	29	11	5.5	21.9	3	21
Corridor B w/B3 (SW 35th Blvd.)	25,777.0	31	12	12.3	37.0	5	25
Corridor B w/B2 (South of Archer)	25,664.0	29	7	6.8	20.1	3	30

Fair	0 - 24,710.9	0 - 28.8	0 - 9.3	0 - 6.6	0 - 6.6	0 - 3.5	0 - 26.4
Good	24,710.9 - 25,618.0	28.8 - 30.1	9.3 - 11.7	6.6 - 15.4	6.6 - 15.4	3.5 - 7.9	26.5 - 36.6
Better	25,618.0 - 26,525.1	30.1 - 31.5	11.7 - 14.1	15.4 - 24.2	15.4 - 24.2	7.9 - 12.2	36.6 - 46.7
Best	26,525.1	31.5	14.2	24.2	24.2	12.2	46.7

4) Total travel time savings for each complete corridor (in minutes).

The detailed methods for analysis and predicted travel time savings were calculated and presented earlier in this report. In brief, the total existing RTS bus travel time was calculated with speed variables from current conditions and compared against speeds that could be obtained by implementing various transit priority improvements. Two columns are included for reporting travel time savings with the TSM Corridor results reported in the fifth column and the Build Corridor results reported in the sixth column. This illustrates that the time savings resulting from the different operating and capital improvements would yield different travel time savings along the same roadways.

Travel time savings range from 10.5 minutes to 37.0 minutes per bus cycle. Build Corridor B along SW 35th Blvd. performed the "Best" in terms of providing the highest travel time savings.

5) Number of common stations with University of Florida (UF) routes.

Spring 2013 RTS bus routes served as the data source for the analysis. Stops served by campus routes within 75-foot of a corridor were counted.

The number of common stations ranges from 3 to 15. Corridor A along both options performed the "Best" with 15 connections with existing UF routes whereas both Corridor B routing options connect with three to five UF routes.

6) Number of common stations with Later Gator routes.

Spring 2013 Later Gator bus route data served as the data source for the analysis. Stops served by Later Gator routes within 75-foot of a corridor were counted.

The number of common stations ranges from 21 to 46. Both Corridor A serves 46 common stations and performed the "Best."

Summary

Six performance measures were used to evaluate mobility and accessibility as summarized in Table 10-2A. The Corridor A base Build route has the most "Best" and "Better" ratings assigned to it for the six mobility and accessibility measures followed by the Corridor A TSM alternative.

10.1.2 Assure Equitable Transportation Options for the Community Analysis

Three performance measures were selected to reflect Goal 2 of the Go Enhance RTS study. Measure results are based on the area within a quarter-mile of each respective corridor station location. A summary of the results is included in Table 10-2B.

7) Persons in households with no access to a vehicle.

There are multiple measures that could be used to evaluate transportation equity but none are more reflective than access to a vehicle. The MTPO socioeconomic data was the data source for this analysis. The total number of persons without access to a vehicle by TAZ was identified using a quarter-mile buffer with the figure for each TAZ based on its relative proportion within the buffer area.

The number of persons without access to a car ranges from 527 to 1,233. Corridor A, with both options performed the "Best" by serving 1,233 households without access to a car. This is closely followed by Corridor A with the SW 6th Street option.

Table 10-2B. Local Project Evaluation Measures
Goal 2: Assure Equitable Transportation Options for the Community

Alternative Routing Options	Households without Access to a Vehicle (1/4 mile)	Households in One-Car Households (1/4 mile)	Acres of Transit Supportive Employment Intensity and Residential Density (1/4 mile)
Corridor A (Base)	919	3,914	896
Corridor A w/A2 (SW 38th Ter.)	927	3,965	896
Corridor A w/A3 (SW 6th St.)	1,225	4,473	972
Corridor A w/A2 & A3	1,233	4,524	972
Corridor B (Base)	527	2,245	1,057
Corridor B w/B3 (SW 35th Blvd.)	537	2,311	1,090
Corridor B w/B2 (South of Archer)	539	2,318	1,306
Mean	843.9	3,392.9	1,027.0
Standard Deviation	292.0	977.5	132.6
Fair	0 - 551.9	0 - 2,415.4	0 - 894.4
Good	551.9 - 843.9	2,415.4 - 3,392.9	894.4 - 1,027.0
Better	843.9 - 1,135.8	3,392.9 - 4,370.3	1,027.0 - 1,159.6
Best	1,135.8	4,370.4	1,159.6

Corridor B along the main line routing option serves 314 persons without access to a car.

8) Persons in households with access to one vehicle.

The MTPO socioeconomic data served as the data source for this analysis. The total number of households with access to only one vehicle by TAZ was identified using a quarter-mile buffer with the figure for each TAZ based on its relative proportion within the buffer area.

The number of persons with limited access a car ranges from 2,245 to 4,524. Results are similar to households with zero vehicles. Corridor A, with both options performed the "Best" by serving 4,524 households; and is closely followed by Corridor A with the SW 6th Street option at 4,473.

9) Transit-supportive acreage served by transit.

Alachua County and City of Gainesville zoning was utilized to calculate the transit supportive areas. Zoning designations of high employment and high residential were combined for these values. Acreage of transit supportive density was calculated on a station basis, thus summarizing acreages for all stations associated with an alternative. This methodology was employed to better understand the land use potential at stations where passengers live and work.

Corridor B, with the SW 35th Pl (South of Archer) option scores the highest in this measure, with the other Corridor B alternatives scoring only slightly lower. Additionally, Corridor A scores average only 10 percent lower than Corridor B.

Summary

Three performance measures were used to evaluate equitable transportation options as summarized in Table 10-2B. Corridor A with both options performed the "Best" followed by Corridor A routing along SW 6th Street in terms of transportation equity.

10.1.3 Enhance the Quality of the Environment Analysis

In Table 10-2C, the following three performance measures were used to examine the comparative advantage of the corridors:

- Future Land Use
- University Parking
- Reduction in Vehicle Miles Traveled

Table 10-2C. Local Project Evaluation Measures
Goal 3: Enhance the Quality of the Environment

Alternative Routing Options	Future Land Use Designation (MU/COM/OFC/HDR) Acres (within 1/4 mile of stations)	UF Parking Spaces (within 1/4 mile)	Reduction in Vehicle Miles Traveled (Build)*	Reduction in Vehicle Miles Traveled (TSM)*
Corridor A (Base)	1,221.6	5,491	17,308	4,096
Corridor A w/A2 (SW 38th Ter.)	1,259.4	5,850	-	-
Corridor A w/A3 (SW 6th St.)	1,291.5	5,491	-	-
Corridor A w/A2 & A3	1,329.3	5,850	14,883	4,122
Corridor B (Base)	935.9	5,152	27,838	5,539
Corridor B w/B3 (SW 35th Blvd.)	960.2	5,152	13,503	2,148
Corridor B w/B2 (South of Archer)	1,164.1	5,152	40,861	11,196
Mean	1166.01	5448.29	22878.60	5420.20
Standard Deviation	146.16	290.26	10303.64	3082.86
Fair	0 - 1,019.8	0 - 5,158.0	0 - 12,574.9	0 - 2,337.3
Good	1,019.8 - 1,166.0	5,158.0 - 5,448.3	12,575.0 - 22,878.6	2,337.3 - 5,420.2
Better	1,166.0 - 1,312.2	5,448.3 - 5,738.5	22,878.6 - 33,182.2	5,420.2 - 8,503.1
Best	1,312.2	5,738.6	33,182.3	8,503.1

1. VMT information not available for A2 & A3 options individually

Below, the data sources and methods of analysis are described along with the results.

10) Future Land Use designations served.

The Future Land Use (FLU) designations in the City of Gainesville and Alachua County were identified using the respective geospatial layers. Transit-supportive land use categories included those that allowed mixed-use, commercial, office, and high density residential development. The acreage of each land use type that was within quarter mile of each corridor station location was summed.

The combined acreage of mixed-use, office, commercial and high density residential uses ranges from 387 to 469. Corridor B along the South of Archer route performs the “Best”. Both Corridor A routing options perform better than the base Corridor B option.

11) University of Florida (UF) parking spaces.

The MTPO socioeconomic data served as the data source for this analysis. When the MTPO was developing the TAZ data, UF staff provided an inventory of parking spaces. In this analysis, the parking inventory acts as a proxy for providing UF students, staff, and faculty with access to transit.

The number of UF parking spaces located within a quarter-mile of the corridor station locations ranges from 5,152 to 5,850. Corridor A along SW 38thTerrace and Corridor A with both options performed the “Best” by serving 5,850 spaces.

12) Reduction in vehicle miles traveled.

This performance measure used the weekday vehicle miles traveled (VMT) calculations from the regional travel demand model associated with the ridership estimation task. Reducing VMT enhances air quality and reduces energy consumption.

The resulting VMT reductions were reported for both the TSM and Build alternatives highlighting the impact of different operating and capital improvement strategies. The VMT reductions are different because of the different number of passengers leaving their cars to use transit. Note that the VMT reductions calculated only varied between the TSM and Build Alternatives and did not distinguish the VMT for all of the various localized routing options.

The Build alternatives resulted in greater reductions in VMT than the TSM alternatives. Corridor B with routing option B2 (South or Archer) performed the “Best” in terms of providing the greatest VMT reductions (40,861 miles).

Qualitative Environmental Benefits

The potential environmental impacts on community, cultural, and natural resources are expected to be minimal for both Corridors A and B since minimal right-of-way will be acquired to implement the proposed alternatives. In terms of community character, the alternatives are supportive of the demographic, land use, and aesthetic character of the respective corridors. Even where Corridors A and B traverse several historic districts since road widening is not anticipated in these areas, impacts to cultural resources are expected to be minimal.

Potential natural environmental impacts for Corridor B may be slightly higher than for Corridor A. Corridor B proposes BRT or TSM improvements on a new segment of roadway that traverses Forest Nature Park, a conservation area that flows into the larger Split Rock Conservation Area. However, these roadway improvements are expected be implemented as part of a separate project and are assumed to be completed in advance of the transit or TSM improvements. Therefore, the impacts to natural resources in the alternative corridors are minimal.

Summary

Three performance measures have been presented to evaluate the environmental impacts as summarized in Table 10-2C. Corridor A performed the "Best" for both routing options.

10.1.4 Enhance the Social Integrity of the Urban Community Analysis

In Table 10-2D, the following three performance measures were used to examine the comparative advantage of the corridors:

- Existing Land Uses/Zoning
- Institutional Uses
- Redevelopment Areas

Below, the data sources and methods of analysis are described along with the results. As for previous geographic measures, a quarter-mile around each station location was used.

13) Existing land/ local zoning classifications.

The zoning classifications in the City of Gainesville and Alachua County were identified using the respective geospatial layers. Transit-supportive zoning categories were identified as mixed-use, commercial, office, and high density residential. For each of these categories, the acreage within corridor station areas was calculated and summed. The results are reported in the second column of Table 10-2D.

The combined acreage of mixed-use, office, commercial and high density residential uses ranges from 352 to 451. Corridor A along the SW 38thTerrace routing option performs the "Best."It specifically provides more accessibility to retail and office uses. Extending Corridor A to Celebration Pointe increases the transit-supportive acreage by 33.

14) Institutional acreage within study corridor.

It is important to quantify how well the corridors serve institutional uses such as SFC, the North Florida Regional Medical Center, UF, the VA Hospital, Shands Hospital, the Alachua County School Board, and other major community facilities. In Section 9.0, an analysis of land uses is presented based upon Alachua County land use data. Included in the analysis is the acreage of Institutional land uses served by the overall corridors within half-mile buffers. It is only presented for Corridor A and Corridor B without the localized routing options.

Table 10-2D. Local Project Evaluation Measures
Goal 4: Enhance the Social Integrity of the Urban Community

Alternative Routing Options	Zoning Classifications (MU/COM/OFC/HDR) Acres (within 1/4 mile of stations)	Institutional Use Acres (within 1/4 mile of stations)	Designated Redevelopment Area (acres within 1/4 mile of stations)
Corridor A (Base)	785.9	925	666
Corridor A w/A1 (SW 38th Ter.)	796.5	945	666
Corridor A w/A3 (SW 6th St.)	879.9	947	785
Corridor A w/ A2 & A3(Both Options)	890.6	968	785
Corridor B (Base)	951.0	702	563
Corridor B w/B3 (SW 35th Blvd.)	956.0	702	563
Corridor B w/B2 (South of Archer)	1,102.0	705	563
Mean	908.8	473.8	655.8
Standard Deviation	100.2	152.5	92.1

Fair	0 - 808.7	0 - 321.3	0 - 563.7
Good	808.7 - 908.8	321.3 - 473.8	563.7 - 655.8
Better	908.8 - 1,009.0	473.8 - 626.3	655.8 - 748.0
Best	1,009.0	626.3	748.0

The number of institutional acres within the buffer ranges from 702 to 968. Corridor A with both options performed the “Best” at 968 acres; however, Corridor A with either option is closely behind with 945 and 947 acres.

15) Designated Redevelopment and Brownfield areas.

To support community growth plans, it is important to serve areas designated for future redevelopment. The city and county geospatial data for redevelopment and Brownfield areas along with a half-mile buffer were used for this analysis.

The community designated redevelopment acres within the buffer ranges from 563 acres to 785 acres. Corridor A performs the “Best” in terms of redevelopment and following the SW 6th St. routing option adds about 120 acres of additional redevelopment potential compared to the base routing.

Assessment of Economic Development

The Alachua County Property Appraiser’s database was used to calculate the ratio of land value to building value. This measure serves as a proxy for the potential for redevelopment. The assumption is that redevelopment will occur on underutilized properties, where the existing structures are approaching the end of their financial usefulness. Below market building values alone may only indicate the presence of blight; whereas, the combination of medium to high land values with undervalued structures serves as an indicator of economic redevelopment opportunity. As such, Table 10-3 provides an analysis of the land to buildings value ratios at each of the station areas along these corridors. The number of designated redevelopment acres within each station area is also shown. Given these two measures, less building to land value id identified with the Corridor B options, whereas Corridor A has more designated redevelopment area (primarily associated with Innovation Square).

Table 10-3. Indicators of Economic Development Potential at Stations

Alternative	Building to Land Value Ratio (parcels within ¼ mile)	Designated Redevelopment Areas (acres within ¼ mile)
Corridor A (Base)	11.90	666
Corridor A w/A2 (SW 38 Ter)	12.00	666
Corridor A w/A3 (SW 6th St.)	11.46	785
Corridor A w/ A2 & A3	11.57	785
Corridor B (Base)	6.77	563
Corridor B w/B3 (SW 35th Blvd.)	6.33	563
Alternative B w/B2 (South of Archer)	6.89	563

10.1.5 Develop Transportation Options that Are Financially Viable

Four performance measures were identified for financial viability; and, they are:

- Ratio of local capital costs to RTS capital budget.
- Ratio of local operating and maintenance (O&M) costs for the project to the RTS O&M budget for the agency (without the project).
- Local share capital cost per mile for the project.
- Cost per acre of transit supportive areas served.

16) Ratio of local capital costs to RTS capital budget.

This capital costs ratio illustrates RTS' capacity to manage a large capital investment. The baseline used for this measure is the RTS FY 2013 capital budget of $3.5 million. This was assumed to be a reasonable level of expenditure into future years. To calculate this measure, it was assumed that the total capital cost for each TSM and Build alternative would be expended by 2025, with the annual average expenditure being divided over the 12 year period from 2013. The local share of the capital investment for a TSM alternative was assumed to be 100 percent whereas the local capital cost for the Build alternatives was assumed to be 25 percent. Typically, the federal share is 50 percent and the state share is 25 percent for Small Starts projects. The RTS capital budget was assumed to include new vehicles for existing service, new technology systems, and other improvements to the year 2025. This measure is only meant to serve as an indicator of financial capacity to pay for the proposed improvements with a lower percentage indicating that the project is a relatively smaller proportion of previous investments. Essentially, it illustrates local experience (or inexperience) with large capital budgets.

The analysis showed the Build Corridor A having the lowest ratio, though the TSM alternatives have only a slightly lower ratio. Over ratios ranged from 36 to 43 percent.

17) Ratio of O&M costs of project to RTS O&M budget.

This O&M costs ratio illustrates RTS' capacity to manage an increase in the size of the operating budget. The data source for this performance measure is the estimated O&M costs for each project alternative compared to the most recent (FY 2013) RTS O&M budget of $21 million. The RTS O&M budget was assumed to include the same local bus service modifications in the future associated with the implementation of premium transit improvements. It is noted that RTS is in the process of conducting both a Comprehensive Operational Analysis (COA) and Transit Development Plan (TDP) that will identify specific service modifications and improvements and associated O&M costs.

Table 10-2E. Local Project Evaluation Measures
Goal 5: Develop Transportation Options That Are Financially Viable

Alternative Routing Options	Ratio of Local TSM Capital Costs (100%) to Capital Budget*	Ratio of Local Build Capital Costs (25%) to Capital Budget*	Ratio of Proposed O&M [TSM] to RTS O&M Budget	Ratio of Proposed O&M [Build] to RTS O&M Budget	Local Share TSM Capital Cost Per Mile	Local Share Build Capital Cost Per Mile	Local TSM Capital Cost per Acre of Transit Supportive Areas Served	Local Build Capital Cost per Acre of Transit Supportive Areas Served
Corridor A (Base)	39.8%	36.8%	59.0%	45.4%	$676,000	$624,978	$38,000	$37,000
Corridor A w/A1 (SW 38th Ter.)	39.8%	36.1%	56.0%	43.0%	$712,000	$646,711	$46,000	$44,000
Corridor A w/A3 (SW 6th St.)	39.8%	37.5%	56.0%	43.0%	$713,000	$671,385	$41,000	$40,000
Corridor A w/ A2 & A3(Both Options)	39.8%	36.8%	56.0%	43.0%	$712,000	$659,147	$40,000	$41,000
Corridor B (Base)	39.6%	42.9%	54.3%	41.8%	$731,000	$790,661	$38,000	$41,000
Corridor B w/B3 (SW 35th Blvd.)	39.6%	43.0%	54.3%	41.8%	$731,000	$728,778	$38,000	$42,000
Corridor B w/B2 (South of Archer)	39.6%	40.5%	59.1%	45.4%	$731,000	$686,068	$35,000	$41,000

** = Please note that the Capital Budget includes the 2015-2030 capital costs for a maintenance facility, system upgrades, and replacement budgets (without BRT). The Capital Costs are based upon the number provided in the Capital Costs Section. This table will need to be updated when the updated costs data is revised and prior to public meetings.*

Mean	39.4%	49.9%	$700,981	$40,143
Standard Deviation	2.0%	6.7%	$41,490	$2,748

Fair	100.0% - 41.5%	100.0% - 56.7%	$1,000,000 - $742,472	$100,000 - $42,892
Good	41.4% - 39.4%	56.6% - 49.9%	$742,471 - $700,981	$42,891 - $40,143
Better	39.3% - 37.4%	49.8% - 43.2%	$700,980 - $659,490	$40,142 - $37,395
Best	37.3%	43.1%	$659,489	$37,394

The Build alternatives for both corridors result in lower O&M cost ratios. It is not unusual to see an inverse relationship between the level of capital investment ratio and the O&M cost ratio. The reason is the additional investments in infrastructure improve travel time which results in fewer buses being required to serve the same area.

Extending Corridor A to Celebration Pointe creates a ratio of 2 percent of project O&M costs to RTS O&M costs in 2020. Developing and operating the spur from Corridor B results in a ratio that is less than 1 percent of O&M costs.

The Corridor B Build alternatives performed "Best" with the base and SW 35th Blvd. routing options at 41.8 percent. The TSM alternatives had ratios that ranged from 54.3 to 59.1 percent of O&M costs.

18) Local capital costs per mile.

This capital cost ratio indicates the level of investment per mile of the various alternatives. The data source for this performance measure is the SCC worksheets presented in Appendix E which detail the costs associated with the various project alternatives as well as the length of the alternatives. For the purposes of this summary, the cost estimates were rounded to the nearest thousand but the mileage was not rounded. The local share for a TSM alternative was assumed to be 100 percent whereas the local capital cost for the Build alternatives was assumed to be 25 percent. The Base Build Corridor A would have the lowest capital costs per mile of $625,000 with the Base Build Corridor B cost of $791,000. The TSM alternatives would range from $676,000 to $731,000 per mile.

19) Local capital cost per transit-supportive acre served.

This performance measure indicates the cost to serve the highly developed areas of the community. Areas where development density and intensity are high are already attracting smart development patterns. Building a transportation investment that supports the private sector is a good indicator of the ability to create financial partnerships with private developers so that they can pay a share of local capital costs.

As discussed earlier in this section, high density residential and high intensity non-residential transit supportive areas were identified using U.S. Census and American Community Survey (ACS) data. The local share of the capital cost for each alternative was divided by the transit supportive area they serve. The Build costs range from $37,000 (Base Corridor A) to $44,000 (with SW 38th Terrace option) per acre. TSM alternatives ranged from $38,000 to $46,000 per acre for the same alternatives.

10.1.6 Conclusion

As illustrated in Table 10-5, Corridor A with both the SW 38th Terrace and SW 6th St. routing options rates the "Best" against the local quantitative performance measures. Relative to the Corridor A TSM, the Build alternative performed slightly better than the TSM alternative.

Table 10-5. Summary of Local Performance Evaluation Analysis – Build Alternatives

Alternative Routing Options	*Corridor A (Main Line)*	*Corridor A with SW 38th Terrace*	*Corridor A with SW 6th Street*	*Corridor A with both options*	*Corridor B Main Line*	*Corridor B with Butler Option*	*Corridor B with SW 35th Place*
Employment Served							
Connections to RTS							
High Ridership Stops Served							
Total Travel Time Savings TSM							
Total Travel Time Savings Build							
Common Stations with UF Routes							
Common Stations with Later Gator							
Persons without Access to a Vehicle							
Persons in One-Car Households							
Acres of Transit Supportive Development							
Future Mixed Use, Commercial, and High Density Acres Served							
UF Parking Spaces							
Reduction in Vehicle Miles Traveled (TSM)*							
Reduction in Vehicle Miles Traveled (Build)*							
Existing Mixed Use, Commercial, and High Density Acres Served							
Institutional Uses Acres Served							
Redevelopment Served							
Ratio of Local TSM Capital Costs (100%) to Capital Budget*							
Ratio of Local Build Capital Costs (25%) to Capital Budget*							
Ratio of Proposed O&M [TSM] to RTS O&M Budget							
Ratio of Proposed O&M [Build] to RTS O&M Budget							
Local Share TSM Capital Cost Per Mile							
Local Share Build Capital Cost Per Mile							
Local TSM Capital Cost per Acre of Transit Supportive Areas Served							
Local Build Capital Cost per Acre of Transit Supportive Areas Served							
Best Ratings for All Local Performance Measures							
Number of "Best"	5	4	6	12	1	2	3
Number of "Better"	13	8	10	5	5	8	5
Number of "Good"	3	6	7	8	7	7	9
Number of "Fair"	4	5	0	0	12	8	8

1. VMT not identified for this alternative

10.2 Application of FTA Rating Criteria

10.2.1 Overview

As part of this Tier 3 screening analysis, each of the two base Refined Build Alternatives were evaluated against FTA's Section 5309 project rating criteria for Small Starts projects. Though not considered eligible for Small Starts funding, the base TSM alternatives were also rated against the criteria to allow a comparison with the base build alternatives. FTA must rate and evaluate potential premium transit projects for funding in terms of both *Project Justification* and *Local Financial Commitment*. For each criterion in these two categories, five potential ratings are identified: High, Medium-High, Medium, Medium-Low and Low. This section of the report summarizes an initial evaluation of the base project alternatives with respect to the criteria.

Six project justification criteria have been identified by FTA:

- Mobility Improvements
- Cost-effectiveness
- Environmental Benefits
- Economic Development
- Land Use
- Congestion Relief

FTA weighs these six project justification criteria equally (16.67% each) to determine a summary project justification rating for each project submitted for funding consideration. Three local financial commitment criteria have been identified:

- Current Financial Condition of Sponsor
- Commitment of Capital and Operating Funds
- Reasonableness of Financial Plan

FTA weighs the first two local commitment criteria 25% each and reasonableness of financial plan 50%. In developing a total project rating, both the project justification rating and the local financial commitment rating each weigh 50%.

10.2.2 Project Justification Criteria

Mobility Improvements

FTA defines the Mobility Improvements criterion as the number of estimated annual trips the enhancement will provide. Acknowledging the important role that public transportation plays in providing mobility to populations without regular access to a private automobile, FTA allows transit dependent riders - as codified in the regional travel demand model – to be double-counted. Table 10-6 shows the breakpoints for the Mobility Improvements criterion as given in the final FTA guidance.

Table 10-6. Mobility Breakpoints in Final FTA Guidance

Rating	Annual Trips on Project (trips by non-transit dependent persons + trips by transit dependent persons multiplied by 2)
High	>30.0 million
Medium - High	15 million - 29.9 million
Medium	5.0 million - 14.9 million
Medium - Low	2.5 million - 4.9 million
Low	<2.5 million

As described in Section 6.0, the number of "route level" annual trips is projected for the TSM alternatives and the Build alternatives along Corridors A and B. It is estimated that the RTS ridership increases by 11 percent from 2013 to 2035. As such, the 2035 trips reported in Section 6.0 were decreased by 11 percent to reflect the number of trips in the current year. Based on RTS existing trends, the ridership during weekends is approximately 20 percent of the weekday ridership; as such, the annual trips reported in this section include the estimated ridership for weekends. In Gainesville's adopted regional transportation model, the MTPO traffic analysis zone socioeconomic data includes the number of persons without access to a vehicle. The number of persons without access to a vehicle has been used as a proxy for transit dependent persons. This approach is consistent with FTA guidance. As shown in Section 8.0, an analysis of socioeconomic characteristics for the two corridors indicates that 12 percent of the population is without access to a car (considered to be the transit dependent population for this analysis). The derived estimate of annual trips used to measure the relative mobility improvements is shown in Table 10-7.

Table 10-7. Mobility Improvements Calculations

Route Level Ridership	2013 Annual Non-Transit Dependent Person Trips	2013 Annual Transit Dependent Person Trips x 2	2013 Total Annual Mobility Benefits	2035 Annual Non-Transit Dependent Person Trips	2035 Annual Transit Dependent Person Trips x 2	2035 Total Annual Mobility Benefits
TSM A	577,503	138,601	716,104	648,880	155,731	804,611
TSM B	496,120	119,069	615,189	557,438	133,785	691,223
Build A	1,213,905	291,337	1,505,242	1,363,938	327,345	1,691,283
Build B	1,007,148	221,822	1,228,970	1,131,627	271,590	1,403,217

Table 10-8 presents the Mobility Improvement Ratings for each the alternatives.

Table 10-8. Mobility Improvements Ratings

TSM A	TSM B	Build A	Build B
Low	Low	Low	Low

None of the alternatives do particularly well in terms of FTA's measure for Mobility Improvements. Of the four, Build A has both the highest ridership and carries the highest number of transit dependent persons, but this and the other alternatives would still have a low rating. However, given the threshold defined by FTA to achieve a Medium-Low rating (i.e.: 2.5 million annual trips), any additional refinements to the operating plans are not likely to be significant enough to improve the Low rating.

Cost-effectiveness

FTA's measure for Small Starts Cost-Effectiveness is the annualized federal share of the project per project trip. Table 10-9 shows the Cost-Effectiveness breakpoints based on a cost per project trip criteria for New Starts and Small Starts projects according to the FTA final guidance.

Table 10-9. Cost-effectiveness Breakpoints in FTA Final Guidance

Rating	Cost per Project Trip	
	New Starts	Small Starts
High	<$4.00	<$1.00
Medium - High	$4.01 - $5.00	$1.01 - $1.99
Medium	$6.00 - $9.99	$2.00 - $3.99
Medium - Low	$10.00 - $14.99	$4.00 - $5.00
Low	>$15.00	>$5.00

As opposed to the Mobility Improvements rating, which is an absolute representation of ridership, Cost-Effectiveness scales ridership to project capital costs (and then, only the share of costs to be borne by the federal government). Section 7.0 includes the Capital Cost estimates prepared consistent with the FTA Standard Cost Category (SCC) worksheets. These estimates for the two refined Build Alternatives include costs associated with the different BRT system elements, such as running-way, transit priority treatments, vehicles, and stations. For the purposes of this analysis, it is assumed that 50 percent of the capital costs would comprise the federal share of project costs for the Build alternatives. It was also assumed that no federal costs could be assigned to the TSM alternatives. To determine annualized costs the SCC cost estimate was multiplied by 50 percent to reflect the federal share and 20 years was used as the "useful life" of capital investments. The Federal Share was divided by 20 (years) and a discount rate of 2.5 percent (based on recent Consumer Price Index) applied to create a proxy for the annualized cost estimate for initial rating purposes. Table 10-10 presents the cost-effectiveness calculations for the different project alternatives assuming it would be eligible as a Small Starts project.

Table 10-10. Cost-effectiveness Calculations

Capital Costs	Base Cost Estimates Rounded	Assumed Federal Share of Base Costs	Annualized Cost Estimate	Base Annual Year Ridership	Cost Per Rider
TSM A	$15,313,000	$0	$0	583,992	$0.00
TSM B	$15,243,000	$0	$0	501,694	$0.00
Build A	$56,700,000	$28,350,000	$1,417,500	1,213,905	$1.17
Build B	$66,100,000	$33,050,000	$1,652,500	1,007,148	$1.64

The ratings for each alternative for FTA's Small Starts cost effectiveness measure are presented in Table 10-11.

Table 10-11. Cost-effectiveness Ratings

TSM A	TSM B	Build A	Build B
High	High	Medium-High	Medium-High

The two TSM alternatives rated "High" with Small Starts cost-effectiveness results at below one dollar, which is the threshold between a High and Medium-High for this measure. The two Build alternatives achieved a Medium-High rating since their cost-effectiveness would be more than $1.01 per rider.

Environmental Benefits

The environmental benefits measure for Small Starts projects is the sum of the monetized value of the benefits resulting from the changes in air quality and greenhouse gas emissions, energy use and safety, divided by the same annualized capital federal share of the project as used in the cost-effectiveness measure. FTA multiplies the resulting ratio by 100 and expresses the environmental benefit measure as a percentage. Environmental benefits are computed based on the change in VMT resulting from implementation of the proposed project. Table 10-12 shows the environmental benefits breakpoints as established by the FTA final guidance.

Table 10-12. Environmental Benefits Breakpoints in FTA Final Guidance

Rating	Environmental Benefits/Cost
High	>10%
Medium - High	5 - 10%
Medium	0 - 5%
Medium - Low	0 to -10%
Low	< -10%

The calculation is facilitated by an FTA-produced spreadsheet tool which includes values corresponding to the benefits previously noted. For this project evaluation, only the air quality and energy criteria were evaluated. The calculations are presented in Table 10-13 and the ratings in Table 10-14.

The estimated fuel consumption for the alternatives tested is based on the change in VMT between the 2035 No-Build alternative and the 2035 TSM and Build alternatives which derives from the ridership forecasts. If VMT resulting from the project are expected to be reduced by more than 10 percent, then a rating of "High" is assigned. For three of the four corridors, the VMT is expected to decline by more than 10 percent.

Using the estimated change in VMT and the 2013 EPA estimate of 20.1 miles per gallon for the average automobile, the forecasted fuel savings for the TSM and Build alternatives are estimated to range from a savings of approximately 82,000 gallons for TSM Corridor A to over 559,000 gallons for Build Corridor B. Using an average fuel price of $3.50 per gallon, the estimated annual cost savings in fuel ranges from over $288,000 for TSM Corridor A to over $1.9 million for the Build Corridor B. The forecasted emissions reduction for each alternative is mostly a product of the change in VMT resulting in annual fuel savings for the BRT and TSM alternatives. The EPA estimates one gallon of fuel emits 19.6 pounds of CO2.[12]

Table 10-13. Environmental Benefits Calculations

Alternatives	VMT Reductions	CO2 Emission Reductions (tons/year)	Annual Fuel Savings (gallons)	Annual Cost Savings	Environmental Benefits / Cost
TSM A	(4,096)	(2)	(82,330)	$ (288,154)	>10%
TSM B	(5,539)	(3)	(111,334)	$(389,669)	>10%
Build A	(17,308)	(8)	(347,891)	$(1,217,618)	>10%
Build B	(27,838)	(13)	(559,544)	$(1,958,403)	>10%

The analysis revealed a "High" rating for both the TSM and Build alternatives.

Table 10-14. Environmental Benefits Ratings

TSM A	TSM B	Build A	Build B
High	High	High	High

[12] EPA (2012). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010. Annex 2 (Methodology for estimating CO2 emissions from fossil fuel combustion), Table A-35 and P. A-71. U.S. Environmental Protection Agency, Washington, DC. U.S. EPA #430-R-12-001 (PDF)

Economic Development

FTA's measure for Economic Development is the extent to which a proposed project is likely to enhance additional, transit-supportive development in the future based on a qualitative examination of existing local plans and policies to support economic development. In addition, policies to promote affordable housing in the corridor are now considered by FTA in its evaluation of this criterion.

Guidance was issued on the economic development and affordable housing criteria in August 2013; however, a data source showing permanently designated affordable housing in the corridor has not been identified.

A preliminary rating of "Medium" has been assigned to each of the four alternatives in recognition of both the City's and County's efforts to develop plans that pursue a "Smart Growth" strategy. This criterion would be more appropriately assessed (and as intended by the guidance) should the project be pursued further and enter into PD&E where station-area and corridor-area specific development plans are expected to be created to support the project.

Fundamental to the improvement of this rating for any of alternatives is the proactive and sustained outreach by local jurisdictions to collaborate with developers, economic development agencies, and housing authorities to take the specific steps and make the necessary commitments to create an environment which further enhances maximizes the economic benefits of a *GO Enhance RTS*-like transit investment.

Table 10-15 below shows the ratings for the four alternatives.

Table 10-15. Economic Development Ratings

TSM A	TSM B	Build A	Build B
Medium	Medium	Medium	Medium

Land Use

FTA has established five quantitative measures to determine a rating for existing Land Use:

- Employment within ½ mile of proposed stations
- Population density within ½ mile of proposed stations
- Average cost per day of downtown (central business district) parking
- Downtown parking spaces per employee
- Ratio of current affordable housing in the project corridor to region-wide

Table 10-16 and Table 10-17 show the land used breakpoints for the different quantitative measures according to FTA final guidance.

Table 10-16. Land Use Breakpoints in Final FTA Guidance

Rating	Station Area Development		Parking	
	Employment	Pop. Density	CBD cost/day	CBD spaces/emp
High	>220,000	>15,000	>$16	<0.2
Medium - High	140,000 - 219,999	9,600 - 15,000	$12 - $16	0.2 - 0.3
Medium	70,000 - 139,999	5,760 - 9,599	$8 - $12	0.3 - 0.4
Medium - Low	40,000 - 69,999	2,561 - 5,759	$4 - $8	0.4 - 0.5
Low	<40,000	<2,560	<$4	>0.5

Table 10-17. Land Use Breakpoints in Final FTA Guidance

Rating	Legally Binding Affordability Restricted Housing: Corridor's Share Compared to County's Share
High	>2.50
Medium - High	2.25 - 2.49
Medium	1.50 - 2.24
Medium - Low	1.10 - 1.49
Low	<1.10

Table 10-18 shows the employment and average population density for existing (2010) land uses within a half-mile of proposed stations for each alternative. Note that because TSM Corridors A and B share the same route as Build Corridors A and B, they also have the same ratings. On the right side of the table, the land use ratings are shown for employment and population.

Table 10-18. Land Use Rating Analysis

Corridor	Station Area Development		Rating	
	Employment served by system	Average Population Density (persons/ square mile)	Employment served by system	Average Population Density (persons/ square mile)
2010 Corridor A Rating	77,592	2,845	Medium	Medium-Low
2010 Corridor B Rating	76,309	3,207	Medium	Medium-Low

The CBD parking criteria were not specifically evaluated. Parking in downtown Gainesville includes a substantial amount of free on-street parking, complimentary structured parking, and campus parking for students, staff, and faculty. Given the extent of free parking, the parking criteria probably would rate in the "Medium" or below category.

FTA's measure for existing affordable housing requires a region-wide accounting and analysis of the entirety of its affordable housing supply. Due to the complexity of the calculation, and the limited amount of data available, existing affordable housing also has not been included in the rating of alternatives beyond what was discussed above; should the project proceed into PD&E, a detailed analysis would be completed in conjunction with agencies like the Gainesville Housing Authority. Based on the available data, Table 10-19 summarizes the Land Use rating for each of the alternatives:

Table 10-19. Land Use Rating Summary

TSM A	TSM B	Build A	Build B
Medium-Low	Medium-Low	Medium-Low	Medium-Low

Congestion Relief

FTA has not yet proposed nor adopted a measure for Congestion Relief. Until it does, FTA has stated that it will assign a "Medium" rating to this criterion for all projects seeking Small Starts funds.

10.2.3 Local Financial Commitment

FTA's Project Justification criteria, comprises only half of a New Starts rating of a project. The other half is Local Financial Commitment. The following measures are required as part of the Small Starts funding application:

- Current Financial Capital and Operating Condition
- Commitment of Capital and Operating Funds
- Reasonableness of Financial Plan

FTA assigns a rating of high, medium-high, medium, medium-low, or low to each of these financial measures; FTA then assigns a summary financial rating of high, medium-high, medium, medium-low, or low to each project based on a combination of the individual ratings for each measure.

Current Financial Condition

The current financial capital and operating condition is evaluated based on the audited financial statements, condition of the agency's capital assets and the agency's bond rating. The rating for the current RTS financial condition vary from "Medium-Low" to "High" as shown in the highlighted cells in Table 10-20.

Table 10-20. Current Financial Condition of Sponsor (Capital and Operating) (25%)

Rating	Average Bus Fleet Age	Current Ratio[1]	Bond Ratings	Cash Flow	Transit Service
High	<6 years	>2.0	AAA	Positive, no shortfalls	No recent cutbacks
Medium - High	<6 years	>1.5	AA	Positive, no shortfalls	No recent cutbacks
Medium	<8 years	>1.2	A	Positive, no shortfalls	Only minor changes
Medium - Low	<12 years	>1.0	BBB+	Positive, no shortfalls	Major cutbacks
Low	>12 years	<1.0	BBB or below	Recent cash flow issues	Major cutbacks

[1] Ratio of current assets to liability.

Commitment of Capital and Operating Funds

The degree of commitment and availability is evaluated based on the evidence provided by the project sponsor that may include the Metropolitan Planning Organization's (MPO) adopted Transportation Improvement Program (TIP), legislative approvals or any other evidence of funding commitment. Table 10-21 shows the rating criteria for Commitment of Capital and Operating Funds (25%) according to FTA guidance. Currently, there is no capital or operating funds committed or budgeted other than the draft surtax proposal from the City of Gainesville Public Works in late FY2013 that showed some degree of funding being partially allocated to BRT. However, a specific dollar commitment for a Small Starts project is not required until application for a full-funding agreement is made after NEPA is completed in the Project Development phase.

Table 10-21. Commitment of Capital and Operating Funds (25%)

Rating	% Non-New Starts Capital Funds Committed or Budgeted	% Opening Year O&M Funds Committed or Budgeted
High	>75%	>75%
Medium - High	>50%	>50%
Medium	>30%	>30%
Medium - Low	>10%	Reasonable plan to secure commitments
Low	<10%	No reasonable plan to secure commitments

Reasonableness of Financial Plan

The evaluation of capital cost estimates and planning assumptions focuses on the sensitivity of the financial health of the agency with respect to the assumptions regarding revenue forecasts, socio-economic conditions, cost inflation, and the reasonability of the cost estimates. Financial capacity to absorb cost increases or funding shortfalls is based on the adequacy of cash balances or reserve funds, and the availability of additional debt financing or other committed funds. Table 10-22 shows the rating for Reasonableness of Financial Plan (50%) as established in the FTA guidance.

As per the commitment of capital and operating funds, there is no expectation that a financial plan would be present at this stage of the project. A plan would be required at the time the project is rated associated with a request to FTA for a full-funding grant agreement.

Table 10-22. Reasonableness of Financial Plan (50%)

Rating	Cost & Planning Assumptions Relative to Recent History	Access to Funds via Debt Capacity, Cash Reserves, or Committed Funds	
		% of Project Cost	% of Annual O&M Expenses
High	Conservative	>50%	>50% (6months)
Medium - High	Conservative	>25%	>25% (3months)
Medium	Consistent	>15%	>12% (1.5 months)
Medium - Low	Optimistic	>10%	>8% (1 month)
Low	Very Optimistic	<10%	Insufficient to balance budget

10.2.4 Conclusion

Projects must achieve at least a "Medium" rating for both Project Justification and Local Financial Commitment to be considered for funding under Section 5309. Table 10-23 summarizes the ratings for each of the alternatives against the six Project Justification criteria. A summary project justification rating is also presented, based upon the average ratings assigned to the six criteria. It cannot be emphasized enough that these ratings are based on relatively early planning analyses, and are thus subject to change as planning and design advances. However, given the preliminary scores it is unlikely the project would be competitive for these funds. Nonetheless, as demonstrated in the above sections there are aspects of the TSM alternative that would benefit both transit and non-transit passengers that can be pursued with local and state funding in a cost effective manner. This will be explored more thoroughly in Section 12.0.

Table 10-23. Summary Project Justification Rating

Criteria	TSM A	TSM B	Build A	Build B
Mobility Improvements	Low	Low	Low	Low
Cost-Effectiveness	High	High	Medium-High	Medium-High
Environmental Benefits	High	High	High	High
Economic Development*	Medium	Medium	Medium	Medium
Land Use	Medium-Low	Medium-Low	Medium-Low	Medium-Low
Congestion Relief*	Medium	Medium	Medium	Medium
Project Justification Rating	**Medium**	**Medium**	**Medium**	**Medium**

*FTA has not yet developed specific thresholds for measure, hence the “medium” rating designation.

11.0 POTENTIAL FUNDING/FINANCING SOURCES

11.1 Overview

This chapter outlines potential federal, state, and local (public and private) funding and financing sources that could be used for construction of the *GO Enhance RTS Study* LPA. This chapter also includes a brief overview of potential operating and maintenance (O&M) funding sources.

11.2 Federal Sources

11.3 Federal Formula Grants

RTS receives funding from several federal formula grant programs for transportation-related uses. FTA and the Federal Highway Administration (FHWA) apportion funds based on legislated formulas that determine the amount for which states, metropolitan areas, and large transit agencies across the country qualify. Funds may then be allocated to specific projects based on local planning priorities. The total amount apportioned annually under each federal grant program is authorized by law. For capital projects, formula funds may be used for up to 80 percent of the project costs, with a 20 percent local match.

States are permitted to use certain toll revenue expenditures as a credit toward the non-federal share of programs authorized by Title 23 (with the exception of Emergency Relief Programs) and for transit programs authorized by Chapter 53 of Title 49, U.S.C. This is in essence a "soft-match" provision that allows the federal share to be increased up to 100% to the extent credits are available. The State of Florida allows for a portion of soft-match credits to be used to fund the state or local share on transit projects managed by local transit agencies. The state sets the amount of toll revenue credits available for transit annually and also must approve the use of toll revenue credits on proposed transit capital projects.

The *GO Enhance RTS* LPA could be an eligible expense under three federal formula grant programs:

- *Urbanized Area Formula Program (§ 5307).* FTA's largest formula-based grant program, this source offers the broadest range of eligibility among all FTA funding programs. Eligible activities include capital, planning, job access and reverse commute, and operating costs for transit providers in small urban areas, like RTS, or transit providers in large urban areas that operate up to 100 buses in fixed-route service during peak hours. In FY 2013, RTS was apportioned approximately $2.6 million.
- *Bus and Bus Facilities (§ 5339).* Changed to a formula program under MAP-21, FTA's Bus and Bus Facilities program provides capital funding to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities. In FY 2013, Florida was apportioned $2.6 million to allocate across the state's UZAs with populations between 50,000 and 199,999, which includes the Gainesville UZA.
- *Surface Transportation Program Funds.* Surface Transportation Program (STP) funds could be applied towards the *GO Enhance RTS* LPA. These funds are referred to as "flexible" because they may be used for an array of eligible projects, including transit. Aside from its highway uses, the STP program can be applied to the capital cost of any public transportation projects eligible for grant assistance under the transit title of the U.S. Code (49 U.S.C. Chapter 53 - Public Transportation). RTS may apply to have a portion

of STP funds “flexed” for transit uses and has attained these funds for various capital projects in recent years.

Any federal formula funds applied to the *GO Enhance RTS* LPA are likely to only be enough to cover a small percentage of the capital cost. To cover a larger percentage of the project costs, all formula funds discussed in this chapter that are assumed in the TIP and/or STIP could be considered if the region decided to divert formula funds from their current programmed uses to the GO Enhance RTS LPA. In addition, there is considerable uncertainty surrounding the amount and availability of formula funds after federal fiscal year (FFY) 2014 given that MAP-21, the current law authorizing these programs, will expire and federal dollars are increasingly constrained.

11.4 Federal Discretionary Grants

The federal government also awards discretionary grants to states and other eligible recipients through competitive application processes. Unlike formula grants, there is no set allotment for a given geographic area and individual projects compete against other projects nationwide. These programs typically expect a local share of 50% or more to be considered competitive. Three federal discretionary grants are presented as potential sources for the *GO Enhance RTS* LPA.

<u>Fixed Guideway Capital Investment Grants – Small Starts (§ 5309).</u> The Fixed Guideway Capital Investment Grants program is the largest federal grant program for new and expanded fixed guideway or corridor-based bus transit projects. FTA administers the program and defines three categories of eligibility: New Starts, Small Starts, and Core Capacity. Small Starts have a total capital cost of less than $250 million and request a federal share of less than $75 million. Corridor-based bus projects operate in mixed-traffic for at least half of the right-of-way with high frequency service that emulates rail. *The GO Enhance RTS* LPA could be eligible for funding under Small Starts because the range of capital costs for the detailed alternatives is well under $250 million and all of the alternatives operate in mixed-traffic for the majority of the guideway; note this is only applicable if a build alternative is purposed.

The Small Starts process has two phases: PD&E and Construction. Project Development includes environmental review and clearance, completion of sufficient engineering and design, and securing of non-5309 funding commitments. Project sponsors may then apply for a grant agreement to cover construction as well as costs incurred under Project Development before entering construction. FTA evaluates projects on the basis of Project Justification and Local Financial Commitment (see section 10.0). Under Local Financial Commitment, FTA evaluates projects based on the current capital and operating condition of the project sponsor, the commitment of funds to the project and to O&M for the existing system, and the reasonableness of the financial plan. Small Starts may qualify for a streamlined financial evaluation if the project sponsor can demonstrate a reasonable plan for securing the non-federal share of project costs, the additional O&M cost of the project is less than five percent of the project sponsor’s current systemwide operating budget, and the project sponsor is in reasonably good financial condition. FTA assigns a summary rating to the project that is weighted equally between the rating for Project Justification and the rating for Local Financial Commitment criteria.

The *GO Enhance RTS* LPA may also consider Very Small Starts, which offers a simplified rating process for projects that meet specific thresholds for each of the Small Starts criteria. An expanded set of Small Starts criteria went into effect on April 9, 2013, resulting in the suspension of the Very Small Starts program until new thresholds are developed to address the expanded criteria. However, when the thresholds are finalized this could be a viable source for the study's LPA.

It should be noted that the Fixed Guideway Capital Investment Grants program is increasingly competitive and funding is constrained. However, many BRT projects have fared well under Section 5309. In the FTA's FY 14 Annual New Starts report, 13 projects in Small Starts Project Development are BRT projects. All five of the projects recommended for Small Starts grant agreements are BRT.

National Infrastructure Investments (TIGER) The National Infrastructure Investments grant program, more widely known as TIGER, is a discretionary grant program established under the American Recovery and Reinvestment Act. In theory, TIGER funds may be used for virtually any transportation infrastructure investment that would have a significant impact on the nation, a region, or a metropolitan area. Eligible projects include not only transit but also highways, airports, and freight facilities.

The U.S. Department of Transportation (DOT) administers the program and may award grants covering up to 80 percent of a project's construction costs, although successful applications in urban areas generally request no more than $20 million and less than 35 percent of project costs from this program. Funds are required to be obligated within two years of award and are typically allocated to projects that have completed the National Environmental Policy Act (NEPA) process. In Florida, NEPA review is conducted within PD&E.

While TIGER is not a statutory program, given the overwhelming demand for the program to date, it is probable that future rounds of funding will be made available. To date there have been five rounds of TIGER funding.

11.5 State Capital Funding Sources

Florida's State Transportation Trust Fund (STTF) serves as the state's funding source for transit. A minimum of 15 percent of all state revenues deposited into the STTF must be committed to public transportation projects. Specific programs administered by the FDOT's Transit Office that could be used to fund construction of the GO Enhance RTS LPA include:

- New Starts Transit Program. This program provides grants to local governments in developing and constructing fixed guideway and bus rapid transit projects that will accommodate and manage urban growth and development. The program leverages state funds to generate local transportation revenues and secure FTA Section 5309 New Starts funding for Florida projects. The state programs funding for allocation under the New Starts Transit Program annually. Unused allocations rollover to the next fiscal year. For FY 2015, FDOT has $121.4 million available under this program—this includes unallocated funding from preceding years. Between $35.5 million and $41.5 million in additional funding is programmed annually from FY 2016 through FY 2019.

- *Public Transit Block Grant Program.* This program provides matching funds for FTA's Section 5307 (as well as Section 5311 and Community Transportation Coordinators). In FY 2013, RTS was apportioned approximately $1.6 million.

- *Transit Corridor Program.* This program provides funding to support new services within specific corridors when the services are expected to help reduce or alleviate congestion or other mobility issues within the corridor. Through FY 2018, FDOT has, on average, $11.5 million annually for the Transit Corridor Program. However, these funds are largely committed to existing projects.

- *FDOT Service Development Program.* This program provides initial funding for special projects that apply a new or innovative technique or measure to improve or expand public transit services. These projects specifically involve the use of new technologies; services, routes, or vehicle frequencies; the purchase of special transportation services; and other techniques for increasing service to the public. Historically, RTS has received less than $200,000 annually from this program.

All of the aforementioned FDOT programs may be used to fund up to 50 percent of the non-federal share of the capital costs of a transit project. In addition, the Florida State Legislature provides campus development funds for transportation-related services at state universities. RTS has applied these funds for other capital investments in recent years, including bus procurements, and depending on the final alignment selected for the *GO Enhance RTS* project, could consider coordinating with UF to utilize campus development funds for project implementation.

11.6 Local Funding Sources

At the local level, governments could fund the proposed project through existing revenue streams, such as tax proceeds and the City's general fund to the extent the proposed project is an eligible use and the funds are available. Revenue from temporary or permanent sales taxes dedicated to transit uses is increasingly utilized for capital investments. Several potential innovative funding sources could be considered:

- *Special Assessments.* These impose special charges on property close to a new facility. The assessment is levied only against those parcels that receive a special benefit that can be clearly identified and measured. Implementation of special tax districts can be challenging relative to other value capture mechanisms, as increases in taxes are politically sensitive and highly visible to affected property owners, businesses, and local consumers. Before this mechanism becomes politically feasible, it will require additional effort to convince local landowners and businesses that the tax is worth the value of the infrastructure improvement. Once in place, however, they are relatively easy to administer and the additional taxes are collected along with current property tax. Nationally, special tax districts are one of the most common forms of value capture for transit projects. In Florida, a special assessment district has incorporated into the funding plan for The Wave Streetcar in Fort Lauderdale and in Tampa, the City Council created a special assessment district to help fund operations of the TECO Streetcar Line. In the Washington, DC metropolitan area, Loudoun and Fairfax counties created special assessment districts to raise funds for their portion of the Dulles Metrorail extension project.

- *Joint Development.* This refers to the development of a transportation facility and/or adjacent private real estate development, in which a private sector partner: (1) with respect to the transportation facility either provides the facility or makes a financial contribution to offset its costs; and/or (2) incorporates a profit sharing mechanism into the private portion of the project that enables the public sector to share in the private returns. Joint Development has been an important component of Miami-Dade County's build out of public transit and through the city's Metrorail stations. Since 1984, the County has entered into a number of joint development agreements, mainly for office and retail space near Metrorail stations.

- *Naming rights.* This involves the selling of naming rights of premium transit stations to private entities. In Tampa, Florida, the Tampa Electric Company paid $1 million over 10 years for the naming rights of the streetcar system. The naming right to stations and streetcars are also available for $100,000 and $250,000 respectively. The New York Metropolitan Transportation Authority (MTA) sold the naming rights to the Atlantic Terminal subway station to Barclays PLC in 2009 for $200,000 annually for 20 years. Las Vegas Monorail, Massachusetts Bay Transportation Authority, and Dubai Metro have also employed naming rights to help pay for transit systems.

- *Private contributions.* These include donations from private entities in exchange for a specific benefit (i.e. advertising). In 2010, Apple Inc. (Apple) contributed approximately $4 million to renovate the Chicago Transit Authority's North/Clybourn station in exchange for CTA leasing the bus turnaround that formerly wrapped around the station's east side to Apple at no cost for ten years, with options for future lease extensions. The bus turnaround and station is also adjacent to a new Apple Store that was under construction. Apple also received right of first refusal for advertising in the station and priority on naming rights if the CTA later decides to offer those rights to outside bidders. The New York MTA and the Southeastern Pennsylvania Transportation Authority, among many other agencies, have all employed private developer contributions.

Special assessments and joint development can be bonded against project costs under the right set of circumstances. For special assessment, the right circumstances include a strong real estate market, agreement among property owners being assessed that the value from the project justify the additional tax, and having mechanisms in place to collect and properly direct the revenue to a fund to repay the debt. Bonding against joint development is far less likely, but issuing bonds based on a lease revenue stream could be considered. Naming rights and private sector contributions can help cover upfront capital expenses, but they are rarely suitable for bonding.

11.7 Financing Tools

Project financing includes specially designed techniques and tools that typically entail borrowing money, either through bonds, loans, or other financing mechanisms. These techniques can be used to fund projects when federal, state, and/or local funds are unavailable or are insufficient to cover the upfront capital costs on a pay-as-you-go basis. Project financing does come at a cost, as interest is paid over the long-term for the money that is borrowed. Federal, state, and local financing vehicles are discussed below.

11.8 Federal Financing Vehicles

Federal financing vehicles include loan programs and bonds. Specific programs that could be considered include:

- *Transportation Infrastructure Finance and Innovation Act (TIFIA) Credit Assistance Program.* TIFIA provides federal credit assistance in the form of direct loans, loan guarantees, and standby lines of credit to finance surface transportation projects of national and regional significance. It provides improved access to capital markets, flexible repayment terms, and potentially more favorable interest rates than can be found in private capital markets for similar instruments. Projects must have a capital cost of at least $50 million and, for transit, be eligible for grant assistance under the transit title of the U.S. Code (chapter 53 of 49 U.S.C.). TIFIA projects must pledge repayment in whole or in part with dedicated revenue sources such as tolls, user fees, special assessments, sales tax revenues, or other non-Federal sources. TIFIA allows for debt repayment terms extended over a period of up to 35 years for no more than 33 percent of a project's capital cost for standby lines of credit and up to 49 percent of capital costs for a loan. U.S. DOT administers TIFIA credit through a competitive application process.

  TIFIA has been used as financing vehicle for transit projects, including the Eagle P3 Project in the Denver, Colorado metropolitan area; the Crenshaw/LAX Transit Corridor in Los Angeles, California; and the extension of the DART Orange Line in the Dallas, Texas metropolitan area. All of the projects received TIFIA direct loans: the DART Orange Line received $120 million, the Eagle P3 received $280 million, and Crenshaw/LAX was granted $545 million. For Dallas and Crenshaw/LAX, TIFIA accounted for approximately 30 percent of total project costs, while for the Eagle P3 Project, TIFIA accounted for approximately 15 percent of the project cost. TIFIA has also been applied in Florida for the Port of Miami Tunnel, I-595 Roadway Improvements, and the Miami Intermodal Center. In these projects, TIFIA accounted for 25 percent to 30 percent of the total project costs.

- *Grant Anticipation Notes (GANs).* These are debt instruments for transit projects secured by anticipated future federal grants. Formula (Section 5307) and discretionary (Section 5309) funds have been used as the GAN repayment source by some transit agencies. The project sponsor issues the bonds with a pledge of future federal-aid assistance. GANs are typically shorter term debt issuances because transit formula funds can only be anticipated for one to two year periods as they are subject to annual Congressional appropriations. New Jersey Transit (NJ Transit) has used GANs for projects that have received grant agreements under the FTA New Starts program. NJ Transit issued $450 million worth of GANs for the Hudson-Bergen Light Rail project and $110 Million for the Newark-Elizabeth Rail Link project. GANs accounted for approximately 20 and 15 percent of each project's capital costs, respectively.

- *Tax-Exempt Private Activity Bonds (PABs).* These are issued by a public, conduit issuer on behalf of a private entity for surface transportation projects which receive federal assistance under Title 23 (federal-aid highway funding) or Title 49 (public transportation), U.S.C. The bonds allow a private developer to benefit from the lower financing cost of tax-exempt municipal bonds, reducing the developer's infrastructure costs and thus increasing its capacity for financial contribution to public improvements. U.S. DOT administers the allocation of PABs through an application process. TIFIA projects are also eligible to receive PABs as TIFIA is Title 23 assistance. To date, PABs have been issued for seven projects, totaling just over $3 billion, and allocations just over $5 billion have been approved for an additional eight projects. To date, the only transit project to use PABs is the Eagle P3 in Denver. The Denver Regional Transit District issued $396 million worth of PABs for the project.

11.9 State Financing Vehicles

FDOT administers a fixed-guideway transportation funding program under which revenue bonds may be issued for the financing or refinancing of fixed capital expenditures for fixed-guideway transportation systems. The Division of Bond Finance may issue such bonds for up to 50 percent of total project costs with non-FDOT revenues used for remaining costs. FDOT's share of debt service is limited to a maximum of two percent of all state revenues deposited in the STTF and must come from the portion of the STTF dedicated to transit funding. Excluding reimbursements, federal aid, and interest, in FY 2011-12, state revenues deposited into the STTF was $2,820 million.[13] In the same period, $497.5 million was allocated to transit in FDOT's Work Program.[14]

Another financing tool that can be considered is Florida's State Infrastructure Bank, which is a revolving loan and credit enhancement program that consists of two separate accounts and can be used to leverage funds to improve project feasibility. The federally-funded account is capitalized by federal money matched with state money as required by law and the state-funded account is capitalized by state money and bond proceeds. Projects financed from the state-funded account must be on the State Highway System or provide increased mobility on the State's transportation system, or provide intermodal connectivity with airports, seaports, rail facilities, and other transportation terminals.

11.10 Local Financing Vehicles

Tax-exempt borrowing is the traditional and most common local financing technique. Bonds are typically issued with the debt repaid by a dedicated revenue source or a General Obligation pledge of a taxing entity. Tax-Increment Financing (TIF) is a mechanism for capturing all or part of the increase in property tax paid by properties within a designated area. TIF is not an additional tax, nor does it deprive governments of existing property tax revenues up to a set

[13] Florida Department of Transportation, State Transportation Trust Fund, Adopted Work Program Fiscal Year 2011-12 through Fiscal Year 2016-17, Office of Work Program and Budget, http://www.dot.state.fl.us/programdevelopmentoffice/fr/STTF_ROW_Finance_Plans.pdf.

[14] Florida Department of Transportation 2012/13 Program and Resource Plan Summary, Fiscal Years 2013/14 to 2021/22, http://www.dot.state.fl.us/programdevelopmentoffice/pra/ProgramAndResourcePlanSummary.pdf.

base within the TIF district. Instead, part of or all of future property taxes (above the set base level) resulting from increased property values or new development are dedicated to paying for the public improvement that caused the value increases and additional development.

11.11 Peer Review of Capital Cost Sources

Table 11-1 presents a summary of funding and financing sources used to cover the capital costs of a sampling of BRT projects in the U.S. In recent years, many BRT projects have secured federal funding for at least half of the project's capital cost and have matched the federal dollars with an array of state and/or local sources.

Table 11-1: Summary of Capital Funding/Financing Sources for Select BRT Projects

Project Project Location	Project Sponsor	Length (mi)	Capital Cost (YOE $)	Opening Year*	Funding/Financing Sources
JTA BRT North Corridor Jacksonville, FL	Jacksonville Transportation Authority (JTA)	9.3	$33.48M	2014	• Federal: $26.8M (80%) - Section 5309 Small Starts • State: $3.4M (10%) - FDOT New Starts Transit Program • Local: $3.4M (10%) - JTA Local Discretionary Gas & Sales Tax
JTA BRT Southeast Corridor Jacksonville, FL	Jacksonville Transportation Authority (JTA)	11	$23.9M	2015	• Federal: $19.1M (80%) - Section 5309 Small Starts • State: $2.4M (10%) - FDOT New Starts Transit Program • Local: $2.4M (10%) - JTA Local Discretionary Gas & Sales Tax
LYMMO Orlando, FL	Central Florida Regional Transportation Authority (LYNX) & the City of Orlando	2.5	$20.8M	1997	• Federal: $10.5M (50%) - Section 5309 New Starts • State: $5.3M (25%) - FDOT Transit Capital Program • Local: $5.3M (25%) - City of Orlando
Parramore BRT (LYMMO Extension) Orlando, FL	Central Florida Regional Transportation Authority (LYNX) & the City of Orlando	2.1	$12.2M	2013	• Federal: $10.0M (80%) - TIGER II • Local: $2.5M (20%) - City of Orlando
EmX (Emerald Express) Franklin Corridor Eugene, OR	Lane Transit District (LTD)	4	$25.0M	2007	• Federal: $20.0M (80%) - Section 5309 Small Starts: $13.3M / Section 5307 Urbanized Area Formula Funds: $6.7M • State and Local: $5.0M - LTD Capital Fund (dedicated source: local payroll tax)
Fresno Area Express Blackstone/ Kings Canyon BRT Fresno, CA	Fresno Area Express (FAX)	15.7	$47.2M	2015	• Federal: $37.8M (80%) - Section 5309 Small Starts • State: $9.5M (20%) - General Obligation Bonds (Proposition 1B)
Main Street MAX (Orange Line) Kansas City, MO	Kansas City Area Transportation Authority (KCATA)	6	$20.9M	2005	• Federal: $16.7M (80%) - Section 5309 New Starts: $3.4M / Section 5309 Bus & Bus Facilities Discretionary: $8.3M** / Highway Flex Funds: $5.0M • Local: $4.2M (20%) -City bonds, KCATA
Troost MAX (Green Line) Kansas City, MO	Kansas City Area Transportation Authority (KCATA)	9	$30.7M	2011	• Federal: $24.6M (80%) - Section 5309 Very Small Starts • Local: $6.2M (20%) - Local sales tax revenue

**Projects listed that have not yet opened have either secured the federal funds shown or are recommended for a federal grant agreement for the amounts provided in the table.*

***Changed to formula program under MAP-21.*

11.12 Potential O&M Sources

The majority of the federal, state, and local sources funding existing RTS operations can be applied to the *GO Enhance RTS* LPA. Federal and state sources include FTA's Urbanized Area Formula Program (§5307) and FDOT's Public Transit Block Grant funds. Local sources include passenger fare (including additional fare revenue from the *GO Enhance RTS* LPA), advertising, and pass program revenues, city gas tax proceeds, and general fund contributions.

RTS also funds a portion of O&M expenses through annual contributions from UF. Under a longstanding partnership, RTS provides unlimited access to its services for the UF community in exchange for annual funding covered through UF student activity and service fees, UF campus development funds from the state, and revenue from UF transportation and parking services. RTS also maintains a similar agreement with SFC. Depending on the final alignment of the *GO Enhance RTS* LPA, annual UF and SFC revenue could be used towards project O&M costs.

Additional sources that may be considered include the FDOT Transit Corridor Program and the FDOT Service Development Program (discussed under State Capital Funding Sources on page 11-4). Under the FDOT Transit Corridor Program, funds may be used to pay up to 50 percent of eligible operating costs or an amount equal to the total revenue excluding fare box, charter, and advertising revenue, and federal O&M assistance (whichever is less). It should be noted that funding requests are reviewed annually for this discretionary program and the program is likely not a viable long-term O&M funding source. FDOT Service Development Projects are subject to specified times of duration, but no more than three years. FDOT may fund up to 50 percent of the non-federal share of the costs of local projects.

At the local level, other sources that could be considered include:

- Premium fare for the service above the existing RTS base fare;
- Value capture strategies such as special assessment districts, private contributions, and TIF (discussed under Local Funding Sources for capital expenses);
- New taxes to the extent that O&M expenses are an eligible expense (e.g. ad valorem and sales tax).

12.0 DRAFT LOCALLY PREFERRED ALTERNATIVE

12.1 Overview

This chapter presents a recommendation on a draft LPA for the GO Enhance RTS Study. The draft LPA reflects the thorough comparison of TSM vs. build alternatives as presented in Chapter 10. The draft LPA also reflects a perception of the level of community support for a build alternative, and potential funding availability for a major transit investment. The chapter also considers the relationship of the LPA to a no-build scenario.

The draft LPA is presented in terms of phases to be implemented through the year 2025, with the level of service improvements and facility improvements identified on an annual basis. Estimated capital and operating costs are translated into year of expenditure dollars.

12.2 Derivation of the Draft LPA

Ridership

The ridership analysis revealed that the build alternative (in either Corridor A or B) would only increase system ridership by 6% over the no-build alternative, and 4-5% over the TSM alternative, by year 2035. Other implemented BRT systems have achieved upwards of a 25% increase in system ridership. Thus, there does not appear to be strong ridership growth with a physical investment in exclusive bus lanes, articulated vehicles and enhanced station and off-board fare collection assumed with the build alternative. For the TSM alternative, higher ridership for a new limited stop route in Corridor A as opposed to B was identified.

Evaluation against Local Performance Measures

Calculation of the 26 measures related to the five goals and associated objectives for transit improvements in the east-west corridor identified Corridor A as the “best” alternative. Use of Corridor A in particular would reduce capital cost and vehicle miles travelled, as well as serve a higher transit dependent population.

Evaluation against Local FTA Project Rating Criteria

The rating of the TSM and build alternatives for Corridors A and B indicated an overall “Medium” rating against the new FTA New Starts Project Justification criteria in all cases. Thus there was no rating advantage of the Build over the TSM alternative based solely on technical evaluation. Experience is showing that projects need at least a “Medium-High” rating to receive strong consideration for New Starts funding. This means that should a build alternative be or would likely need to be funded entirely from local sources.

The Financial Commitment criteria as part of the New Starts rating was not evaluated given there is no funding for a build alternative to cover either capital or operating costs currently programmed by RTS or another non-federal entity as a local share for the project. To achieve a “Medium” rating, at least 30% of capital and operating (opening year) funds must already be committed or budgeted (75% to achieve a “High” rating).

Conclusion

Given the limited impact on system ridership, the associated reduced cost-effectiveness given the level of capital investment, and only average project rating against the FTA New Starts criteria, a Build alternative is not recommended to proceed as a draft LPA from the GO Enhance RTS Study. The issue then becomes does a TSM alternative warrant investment over the No-Build alternative, assuming neither would be eligible for FTA New Starts funding.

Relative to the No-Build alternative, the TSM alternative offers street network modifications that benefit both automobile and transit traffic at minimal costs, achieves higher system-wide ridership increases (even if minimal), establishes the area's first continuous, high frequency transit corridor that links key community focal points like East Gainesville, UF/Shands/VA, and Oaks Mall/North Florida Regional Medical Center, and reflects the community's clearly articulated desire to improve transit while still devoting adequate financial resources for basic roadway maintenance improvements. Critically, the operating costs for the new limited stop service could be partially offset by reductions in existing, overlapping local RTS service in the corridor (see section 12.4 for more information).

12.3 Further Development of TSM Alternative

A TSM-oriented draft LPA has been identified, which focuses on Corridor A, and a two-phase implementation plan:

- Phase 1 – Oaks Mall to Five Points
- Phase 2 – Oaks Mall to Santa Fe Village

The LPA will involve implementation of new limited stop bus service between the identified destinations, with service levels similar to those of BRT (and what were evaluated for the TSM alternatives in this study), but with transit infrastructure improvements just focused on transit signal priority improvements at intersections and construction of the Five Points Transfer Station. Service levels of the new service would be as follows:

<u>Weekdays</u>

- 18 hours a day
- 10-minute frequency (AM and PM peak)
- 15-minute frequency (early morning, mid-morning/early afternoon, evening)

<u>Saturdays</u>

- 15 hours a day
- 20-minute frequency

<u>Sundays/Holidays</u>

- 12 hours a day
- 30-minute frequency

The physical characteristics of each service phase are identified as follows. Both capital and operating costs have been apportioned to an estimated year of expenditure out to year 2025, assuming a compounded inflation factor of 2.5% per year (consistent with the Consumer Price Index in recent years). Figure 12-1 shows the estimated timeline to develop Phases 1 and 2 of the new limited stop service.

12.3.1 Phase 1 – Oaks Mall to Five Points

Figure 12-2 illustrates the proposed Phase 1 limited stop service, following Corridor A between the existing RTS stop on the south side of Oaks Mall and a new Five Points Transfer station, to be developed on the north side of Hawthorne Road just east of SE 11th Avenue. The service would travel on SW 62nd Boulevard, SW 20th Avenue, SW 38th Terrace, Hull Road, Mowry Road, Gale Lemerand Drive, Archer Road, Depot Avenue, SE 3rd Street, and University Avenue. The alternate route using SW 38th Terrace and the Hull Road extension is proposed for the route as it would provide a direct connection to the existing Hull Road park-n-ride, without any out of direction travel.

The service would serve 21 existing RTS stops plus the new Five Points station. Stops would include the following locations:

- Oaks Mall
- SW 62nd Blvd. at Apartments South of Oaks Mall (SB and NB)
- SW 62nd Blvd. at SW 20th Avenue (SB and NB)
- SW 20th Avenue at SW 43rd Street (EB and WB)
- SW 20th Avenue at SW 38th Terrace (EB and WB)
- Hull Road Park-Ride
- Hull Road at UF Recreational Center/Museum (EB and WB)
- Mowry Road at Gale Lemerand Drive (EB and WB)
- Archer Road at Shands Hospital (EB and WB)
- Depot Avenue at SE 11th Street (EB and WB)
- Rosa Parks Transfer Station
- SE 3rd Street At SE 2nd Avenue (EB and WB)
- Five Points Transfer Station

No physical improvements would be made at the existing RTS stops. The Five Points Transfer Station would be constructed to include four bus bays and a 30-space park-n-ride facility (initial design concept shown in Figure 5-7).

Eleven new 40-foot standard buses would be acquired to provide the new limited stop service; this reflects a 15% spare ratio to accommodate for potential mechanical issues and accidents.[15] These buses would include Automatic Vehicle Location (AVL) to allow for conditional TSP to be provided at the designated intersections during acceptable traffic operations conditions, as well as Automatic Passenger Counters (APC).

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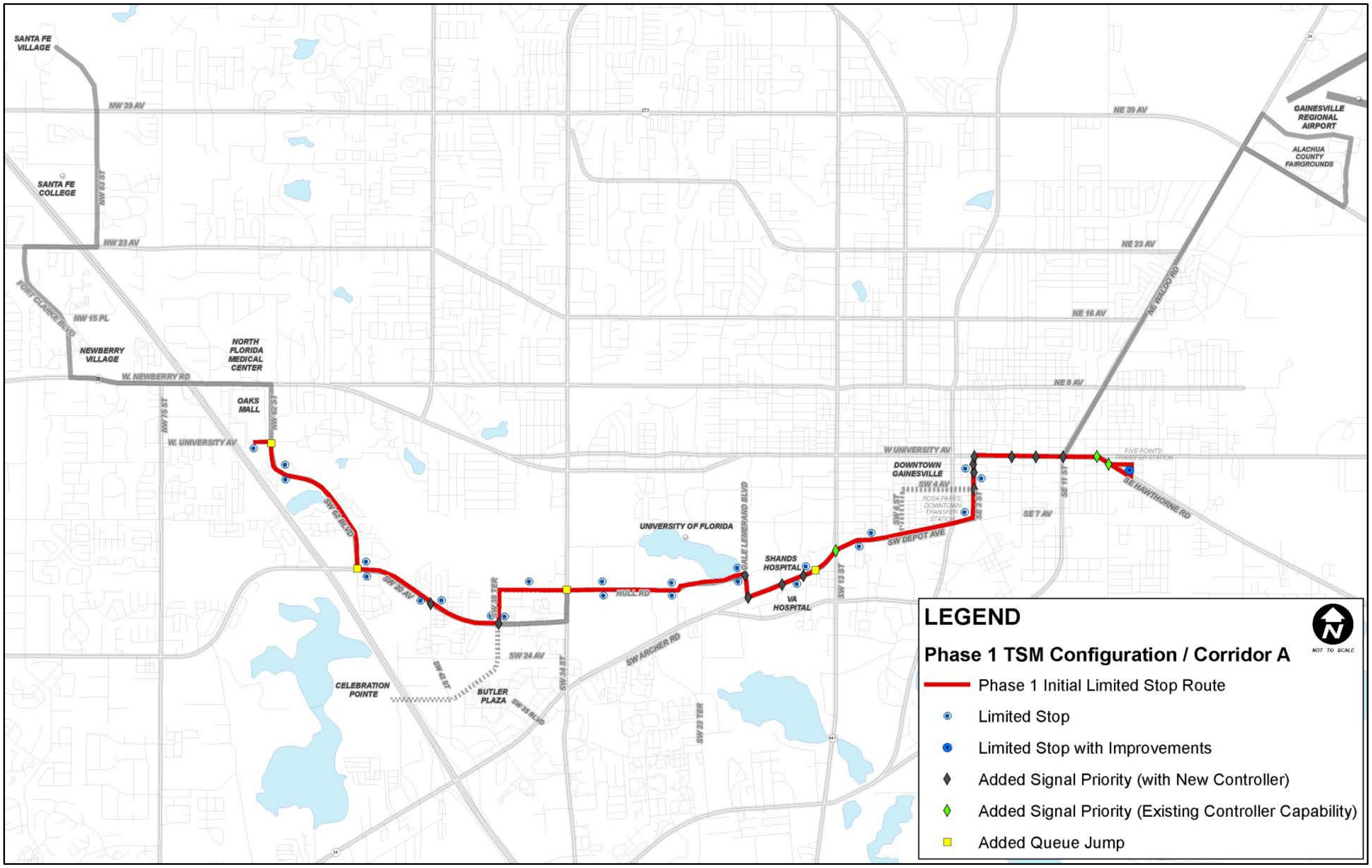
[15] The multi-year schedule reflected in Figure 12-1 for bus purchases accounts for the bid process and extended manufacturing to local specification that occurs with transit vehicle purchases.

Figure 12-1: Draft Implementation Schedule for New Limited Stop Service

	YEAR										
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
Phase 1											
Five Points Transfer Station											
Design	$78,365										
Right-of-Way		$245,315									
Construction			$2,842,825								
Vehicles (11 - 40ft buses)			$7,011,971								
Transit Priority Improvements											
Added Intersections - Oaks Mall to Five Points (8 Locations)		$141,460									
Added Intersections - Oaks Mall to Five Points (5 Locations)			$112,214								
Limited Stop Service - Oaks Mall to Five Points Transfer Station											
10 Min. Peak/15 Min. Off Peak				$2,637,313	$2,703,245	$2,770,826	$2,840,097	$2,911,100	$2,983,877	$3,058,474	$3,134,936
Phase 2											
Vehicles (6 - 40 ft buses)					$4,018,338						
Transit Priority Improvements											
Added Intersections - Santa Fe Village to Oaks Mall (3 Locations)					$43,398						
Added Limited Stop Service - Santa Fe Village to Five Points											
(With Service to Newberry Village)						$1,647,518	$1,688,706	$1,730,924	$1,774,197	$1,818,552	$1,864,016
Total	**$78,365**	**$386,775**	**$9,967,010**	**$2,637,313**	**$6,764,981**	**$4,418,345**	**$4,528,804**	**$4,642,024**	**$4,758,074**	**$4,877,026**	**$4,998,952**

Construction / Acquisition
Operation

Figure 12-2: Phase 1 Limited Stop Service



TSP would be developed at 19 intersections along the Phase 1 corridor. This includes three intersections which already have compatible controllers for TSP, and 16 intersections where new controllers would be required. These intersections include:

Intersections with Current Compatible Controllers

- Archer Road/SW 13th Street
- University Avenue/Hawthorne Road
- University Avenue/SE 15th Street

Intersections Needing New Controllers

- SW 20th Avenue/SW43rd Street
- SW 20th Avenue/SW 38th Terrace
- Mowry Road/Gale Lemerand Drive
- Gale Lemerand Drive/Archer Road
- Archer Road/Center Drive
- Archer Road/SW 16th Street
- SE 3rd Street/SE 4th Avenue
- SE 3rd Street/SE 2nd Avenue
- SE 3rd Street/SE 1st Avenue
- SE 3rd Street/University Avenue
- University Avenue/SE 7th Street
- University Avenue/SE 9th Street
- University Avenue/Waldo Road/SE 11th Street

At three intersections along Depot Avenue (SW 11th St., SW 6th St., SW Main St.), there are plans to convert the existing signalized intersections to roundabouts in the shorter term and hence TSP improvements were not assumed at these intersections.

Queue jumps would be developed at four intersections along the Phase 1 corridor:[16]

- SW 62nd Blvd./Oaks Mall South Access (SB right turn lane)
- SW 20th Avenue/SW 62nd Blvd. (WB right turn lane)
- Hull Road/SW 34th Street (EB and WB right turn lanes)
- Archer Road/Newell Road

[16] No cost is reflected for the development of queue jumps since it only requires minor striping and signage to indicate the bus's use of existing, non-modified turn lanes.

In addition to the TSP developed in the Phase 1 corridor, TSP could also be implemented in the short term in the Phase 2 corridor at ten intersections where there is current controller compatibility[17]. Local RTS service could then take advantage of these priority treatments until Phase 2 limited stop service is developed. These intersections include:

- NW 62nd Boulevard/Newberry Road
- Newberry Road/NW 66th Street
- Newberry Road/NW 69th Terrace
- Newberry Road/I-75 NB and SB Ramps
- Newberry Road/I-75 and SB Ramps
- Newberry Road/Tower Road
- Newberry Road/NW 76th Boulevard
- NW 83rd Street/South Road (south SFC access)
- NW 83rd Street/North Road (north SFC access)

The identified implementation schedule for the Phase 1 limited stop service assumes design, right-of-way acquisition and construction of the Five Points Transfer Station in the 2015-17 time frames. New 40-foot vehicles would be ordered in 2015 with delivery by 2017. TSP improvements would be completed in 2016 and 2017. Phase 1 service would be initiated in 2018.

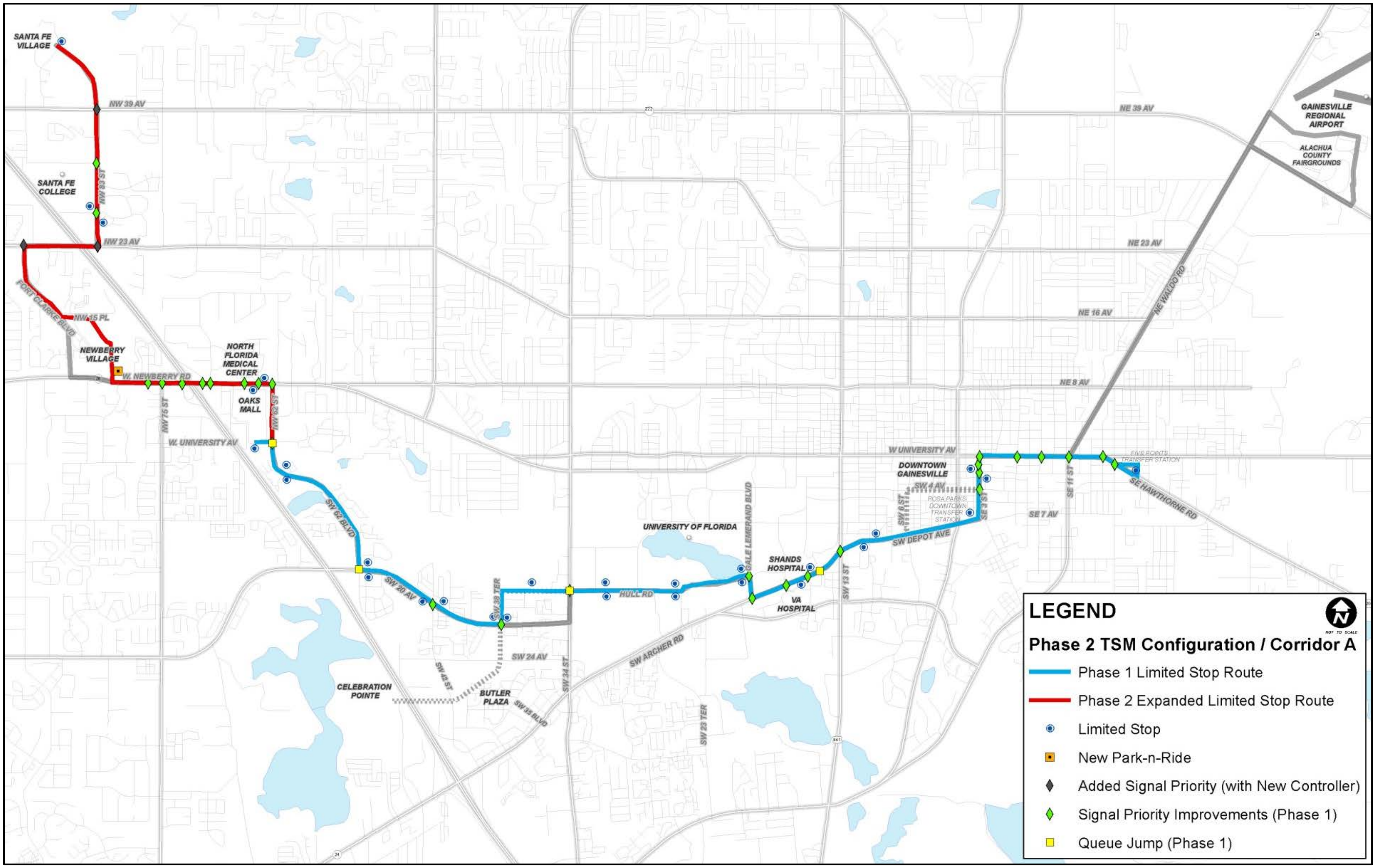
12.3.2 Phase 2 – Oaks Mall to Santa Fe Village

Figure 12-3 illustrates the expanded limited stop service with the Phase 2 extension. Phase 2 services would extend west of Oaks Mall to serve the North Florida Regional Medical Center, SFC, and the new Newberry Village, Spring Hill, and Santa Fe Village developments. The timing of this service extension is associated with the implementation of these new developments. Alachua County staff has indicated various phases of all three will be underway or completed by 2020.

The extended service would operate from the south side Oaks Mall stop north on SW 62nd boulevard to Newberry Road, then west through the I-75 interchange to the new access road through Newberry Village, then through the village to Ft. Clarke Blvd., then north to NW 23rd Avenue. The service would then extend east to NW 83rd Street, north on NW 83rd Street to serve SFC then north on NW 83rd Street across NW 39th Avenue to serve Spring Hill and Santa Fe Village.

[17] No cost has been allocated to TSP implementation at existing controllers since achievement only requires enabling already embedded features and using existing staff resources to program functionality.

Figure 12-3: Limited Stop Service with Phase 2 Extension



The extended limited stop service would serve five stops:

- Newberry Road at NW 66th Street (North Florida Regional Medical Center/north side of Oaks Mall – WB and EB)
- Newberry Village (east side of site access road north of Newberry Road, with new park-n-ride)
- SFC (either existing RTS stop or new stop designated by college on-campus)
- Santa Fe Village (north terminus with turnaround)

No physical improvements would be made at the existing RTS stops at NW 66th Street. Any relocation of the stop serving SFC within the campus is assumed to be paid for by the college. As part of their development agreements, both Newberry Village and Santa Fe Village are committed to provide transit stations in their developments for new premium transit service. This includes the provision of a site for a park-n-ride at Newberry Village.

Six added 40-foot standard buses would be acquired to provide the new expanded limited stop service covering both the Phase 1 and 2 corridors. As for the initial bus purchase, these buses would include AVL to provide the capability for instituting conditional TSP at the designated intersections during acceptable traffic operations conditions, as well as APC units.

Infrastructure improvements associated with the limited stop service would focus on TSP at those intersections in the Phase 2 corridor where new controllers would be required to institute TSP. This includes the following intersections:

- Ft. Clarke Boulevard/NW 23rd Avenue
- NW 23rd Avenue/NW 83rd Street
- NW 83rd Street/NW 39th Avenue

The development agreements for Newberry Village and Santa Fe Village identify side of road busway treatments to be developed along the east side of Ft. Clarke Blvd. north of NW 15th Place and on the west side of NW 83rd Street between NW 23rd Avenue and NW 39th Avenue. If implemented, the limited stop service would use these facilities, with the SFC stop relocated to the busway corridor at the South Road access.

An order for the six added buses would be placed in 2017, with delivery by the end of 2019. TSP improvements and stop improvements were assumed to be completed by 2020, as well. The expanded limited stop service would be initiated sometime in 2020.

12.3.3 Potential Phase 3

The original TSM alternative identified limited stop service all the way to the Gainesville Regional Airport. At this time, limited stop service beyond the new Five Points Station up Waldo Road to the airport is not considered to have sufficient ridership potential to justify a premium service investment. If the County Fairgrounds redevelops and/or other employment growth around the airport occurs to serve as a trigger, then extension of the limited stop service to the airport should be reconsidered.

12.3.4 Serving Celebration Pointe and Innovation Square

Because of the back tracking required to access Innovation Square and Celebration Pointe from Corridor A the draft LPA assumes that transit service to these developments would occur via local services per agreement with the County; however, the Celebration Pointe development under certain scenarios would be required to fund high frequency transit service from the development which could involve a direct connection to the TSM alternative. Additionally, with further maturation of the Innovation Square development it would be prudent to reevaluate instituting the optional alignment in this area – potentially to correspond with the implementation of Phase 2.

12.4 Funding for Improvements

Chapter 11 goes into great detail about potential project funding sources. As shown in Figure 12-1, from the initial acquisition/construction year to 2025 costs for the TSM alternative range from less than $100,000 to almost $10 million. The two highest years of expenditures are largely related to the capital costs of bus purchases. Historically, RTS has received approximately $2 to $3 million annually from state and federal formula grants for *all* capital purchases. Given that the bus purchases occur over a multi-year period RTS could reasonably cover a moderate portion of their cost with these grants but the majority of the funding will still need to be applied for through some discretionary program like FTA's Bus and Bus Facilities Program (Section 5309). Discretionary funding will also need to be sought for the Five Points Transfer Station, which may be able to take advantage of the economic development programs associated with the Gainesville Community Redevelopment Agency. There are no currently programmed funds to further TSP conversion at intersections, based on a discussion with City of Gainesville Traffic Operations staff.

To operate the new limited stop service, some of the funds would come from existing local service in the corridor whose service frequency would be cut back (by as much as 50%) with the new service. For example, portions of the TSM alternative are duplicated by the routes 20, 21, and 23 and likely some origin-destination pairs of the routes 5, 10, 43, 7, and 11, as well.[18] In 2013 dollars, the daily cost to operate phase 1 and 2 of the TSM alternative is approximately $10,200. Based on fall 2013 operating characteristics, the daily cost per bus is approximately $870. The removal of two buses each from the routes 20, 21, and 23, and equivalent reduction of two buses from the other routes mentioned above would equate to $6,960 or almost 70% of the TSM daily operating cost. The provision of a transfer station in the vicinity of Reitz Union would also create an opportunity for the TSM alternative to penetrate the UF campus in a timelier manner than possible now and allow for further reduction of more localized services.

The passage of a transit-inclusive transportation referendum would provide a new revenue stream to meet these costs, as well.

[18] It is important to note that a number of the routes listed receive a majority, if not all of their funding, from sources other than the City of Gainesville. Therefore, any systematic change will require a collaborative, highly inclusive effort.

12.5 Future Reassessment of BRT

The TSM or limited stop service proposal is identified out to a year 2025 timeframe. At that time, with the success of the limited stop service evaluated, with added development in corridor, and potentially with added funding from a local referendum, the need and timing of transforming the limited stop service to a full-fledged BRT operation could be evaluated. This will include a focus on acquisition of articulated vehicles, major station improvements, development of exclusive bus lanes, and provision of off-board fare collection.