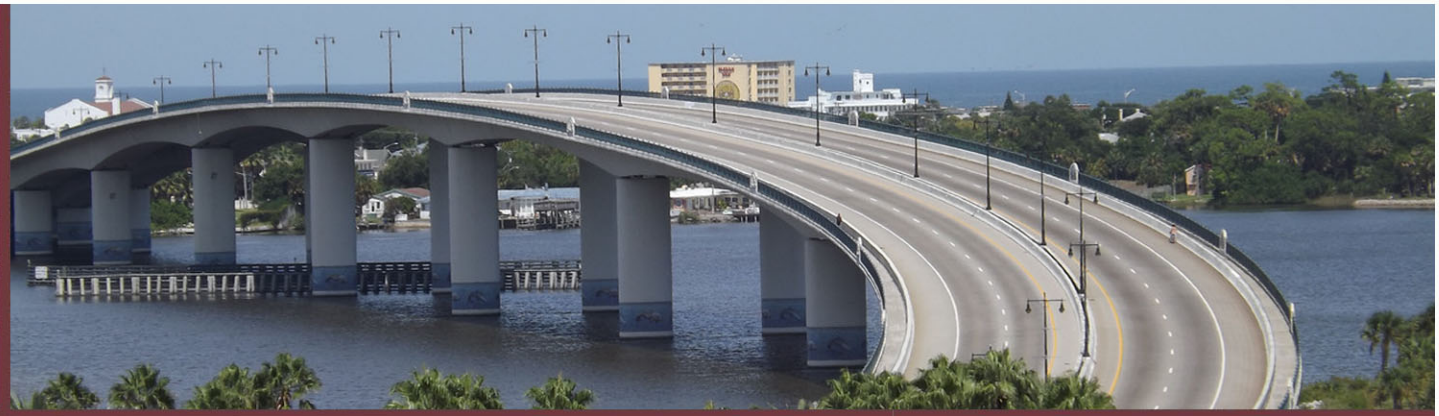

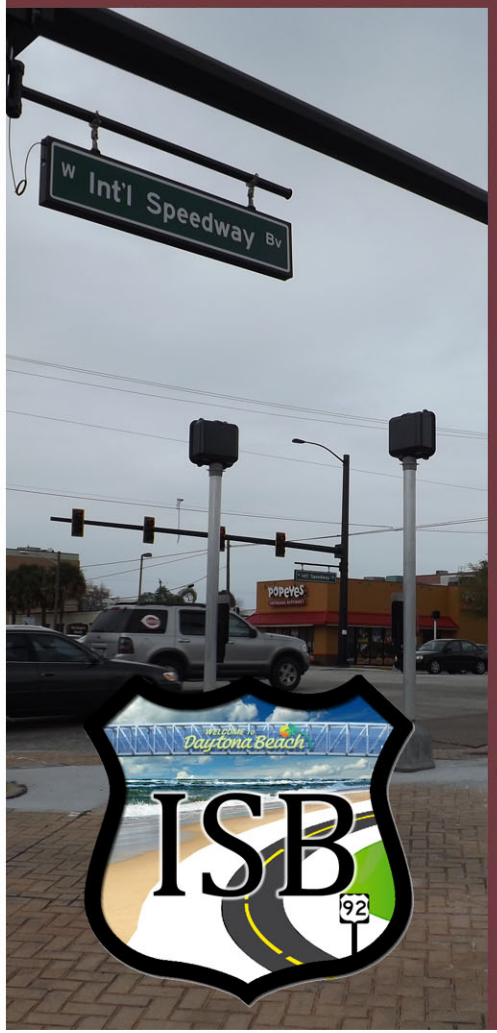

US 92 CORRIDOR MASTER MANAGEMENT PLAN

Corridor Assessment Report

November 2015

Prepared for:

Centennial FDOT 1915 ★ 2015

Prepared by Ghyabi & Associates, Inc.

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1 INTRODUCTION

The United States Highway (US) 92/State Road (SR) 600/ International Speedway Boulevard (ISB) (collectively referred to as US 92/SR 600/ISB throughout the study) Corridor Master Management Plan (CMMP) is a Florida Department of Transportation (FDOT) project in collaboration with the International Speedway Boulevard Coalition (ISB Coalition), Volusia County, City of Daytona Beach, Daytona Beach International Airport, River to Sea Transportation Planning Organization (R2CTPO), Volusia County's Public Transit System (Votran), and other associated organizations.

The study area is centered on US 92/SR 600/ISB, located in the City of Daytona Beach, FL, between its intersections with I-4 on the west and the SR A1A/Atlantic Avenue to the east. Figure 1 depicts the study area.

This report includes an initial corridor assessment with development of planning-level concept plans, identification of evaluation criteria to be utilized, an operational assessment of improvement strategies, and an alternatives evaluation that results in recommendations for improvement strategies for the US 92/SR 600/ISB corridor. The project follows a series of six tasks, as shown below, culminating in a corridor management plan.

- Task 1.0: Public Involvement
- Task 2.0: Existing Conditions
- Task 3.0: Identification of Corridor Needs
- **Task 4.0: Initial Corridor Assessment**
- **Task 5.0: Alternatives Evaluation**
- Task 6.0: Corridor Management Plan

This project report addresses Task 4.0 and Task 5.0 and includes the following major sections:

- Development of Planning-Level Concept Plans
- Identification of Viable Alternatives
- Operational Assessment
- Identification of Evaluation Criteria
- Planning-Level Cost Estimates
- Comparative Evaluation
- Recommendations

This phase of the CMMP study is a joint effort of the corridor stakeholders to identify, describe and illustrate the overall goals for the development of context sensitive improvements to ensure maximum effectiveness and return on investment of future transportation projects, given the rapid amount of new development under construction or proposed within the study area. This assessment utilizes the results of the visioning phase, including input received from the Project Visioning Team, to evaluate identified improvement strategies and provide further definition of the policy elements of the CMMP planning process. A summary of the alternatives comparison, supporting detail with respect to the engineering and environmental evaluations, project costs, policy considerations, and other supporting detail is provided.

A list of abbreviations used throughout the report is included in Appendix A.

Figure 1: Project Study Area

2 IDENTIFICATION OF VIABLE ALTERNATIVES

The size and diversity of the US 92/SR 600/ISB corridor makes it likely that a range of transportation improvements will be needed for the existing system to meet all of the corridor's future needs. Therefore, this study examines a variety of transportation modes and improvements that may be part of the overall long-range transportation solutions for the corridor. Based on an understanding of the corridor conditions, needs and goals, the overall planning process moved from general to detailed evaluation and from many alternatives to one recommendation.

For the purposes of this study, the CMMP study area is evaluated in four segments: Segment 1 – I-4 to I-95; Segment 2 – I-95 to SR 483/ Clyde Morris Boulevard; Segment 3 – SR 483/Clyde Morris Boulevard to US 1/Ridgewood Avenue; and Segment 4 – US 1/Ridgewood Avenue to SR A1A/Atlantic Avenue.

Planning-level concept plans were developed for each segment as well as exhibits depicting multimodal improvement alternatives to for further evaluation. Evaluation criteria have also been identified to be utilized in the subsequent analyses.

2.1 ALTERNATIVES

2.1.1 Alternative A

Alternative A, the Minimal Build Context Sensitive Concept, is depicted in Figure 2. This concept incorporates existing programmed FDOT capacity and pedestrian improvement projects, as well as City of Daytona Beach streetscaping projects. In addition, multimodal gaps created between identified programmed projects are identified with connectivity enhancements to establish a seamless multimodal friendly corridor the entire length of the CMMP study area. Furthermore, pedestrian and bicycle facility enhancements are included throughout the corridor. In Segments 1 and 2, shared use paths and wide sidewalks are included, further buffering pedestrians and cyclists from sections of the corridor with posted speed limits of 50 mph and above. In Segments 3 and 4, where right-of-way is significantly constrained, sidewalks are widened to the maximum width possible and medians are included to reduce pedestrian and vehicle conflict points. In constrained areas, street trees are provided using planter boxes and/or tree wells to create a barrier between pedestrians and automobiles. This offers a more urban landscape that is conducive to a walkable environment while providing an aesthetic improvement and, depending on tree selection, shade for pedestrians. Other elements incorporated into Alternative A include street lighting and street furniture, enhanced crosswalks, removal or relocation of sidewalk obstructions, and extensions of sidewalks from the corridor to adjoining uses.

Figure 2: An illustration of the proposed improvements under the

three proposed alternatives – Looking east from LPGA Boulevard.

2.1.2 Alternative A1

Alternative A1 builds upon the capacity improvement projects that comprise Alternative A. In addition, two roundabouts along US 92/SR 600/ISB are proposed in this alternative. The two intersections identified to receive these road modifications are SR 441/Peninsula Drive and SR A1A/Atlantic Avenue.

In Segments 1 and 2, shared use paths and wide sidewalks are included, further buffering pedestrians and cyclists from sections of the corridor with posted speed limits of 50 mph and above. In Segments 3 and 4, where right-of-way is significantly constrained, sidewalks are widened to the maximum width possible and medians are included to reduce pedestrian and vehicle conflict points. However, east of the FEC railroad crossing, excluding the Halifax River Bridge, this alternative does not include bicycle lanes along the ISB corridor. With this alternative, bicyclists would be encouraged to utilized parallel facilities, such as Bay Street and Magnolia Avenue, which would include signage designating them as bicycle corridors.

Similar to Alternative A, several other elements are included such as street lighting and street furniture, enhanced crosswalks, removal or relocation of sidewalk obstructions, and extensions of sidewalks from the corridor to adjoining uses.

2.1.3 Alternative A2

Alternative A2 builds upon the capacity improvement projects that comprise Alternative A. However, this alternative relies on the addition of high frequency transit service to mitigate traffic concerns. This transit system, BRT Lite (Bus Rapid Transit Lite), will serve the northern and southern curbsides of the corridor.

Transit service characteristics considered include:

- Traffic Signal Priority (TSP) – bus green light priority at key signals, enabling them to travel 10-15 percent faster
- Low floor, uniquely branded buses
- Real time passenger information at stops
- Fewer stops
- 10-minute peak/15-minute off-peak frequency

Because of the high frequency of this transit service, Alternative A2 will not include the addition of the two roundabouts found in Alternative A1.

In Segments 1 and 2, shared use paths and sidewalks are included, further buffering pedestrians and cyclists from sections of the corridor with posted speed limits of 50 mph and above. In Segments 3 and 4, where right-of-way is significantly constrained, sidewalks are widened to the maximum width possible and medians are included to reduce pedestrian and vehicle conflict points.

Similar to Alternative A, several other elements are included such as street lighting and street furniture, enhanced crosswalks, removal or relocation of sidewalk obstructions, and extensions of sidewalks from the corridor to adjoining uses.

2.2 ALTERNATIVE TYPICAL CROSS SECTIONS

The alternative cross sections for all segments are described in the sections below. Perspective renderings and cross sections are depicted in Figures 3 through 11.

2.2.1 Segment 1 – I-4 Ramps to I-95 Interchange

Segment 1's typical cross sections are depicted in Figure 3. Perspective renderings are provided in Figure 4.

The existing typical section consists of two 11.5-foot eastbound travel lanes, two 12-foot westbound travel lanes, a 5-foot eastbound shoulder/bicycle lane, a 4 foot westbound shoulder/bicycle lane and a 35-foot median. There are no pedestrian facilities.

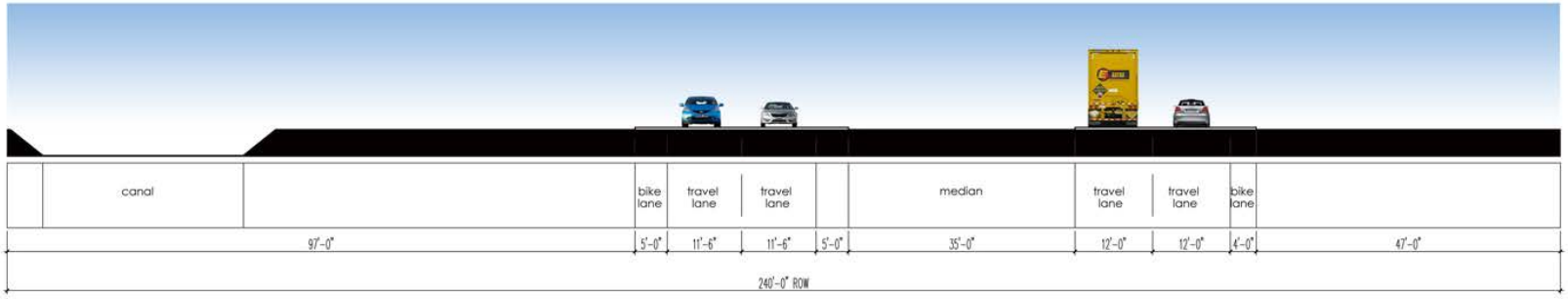
The typical sections for all three alternatives are identical within Segment 1. The typical section consists of six 12-foot travel lanes, two five-foot bicycle lanes, a 5-foot westbound-sidewalk, a 10-foot eastbound shared use path and a 24-foot eight inch median. Enhanced landscaping is provided in the median and right-of-way between the travel lanes, sidewalk and shared use path. A major element is the addition of a shared use path which will be physically separate from the travel lanes, which have maximum posted speed limits of 55 mph.

2.2.2 Segment 2 – I-95 Interchange to Midway Avenue

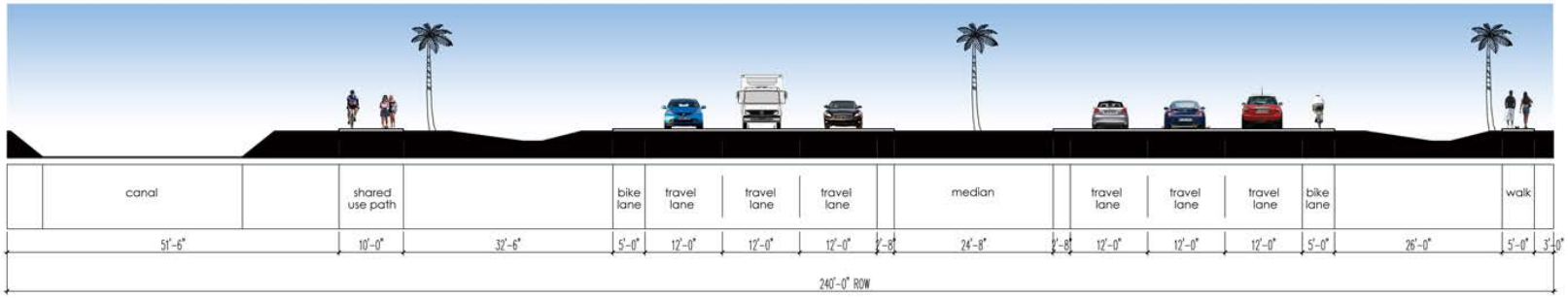
The typical cross sections for this section of Segment 2 are depicted in Figure 5. Perspective renderings are provided in Figure 6.

The existing typical section consists of eight 12-foot travel lanes, 4-foot bicycle lanes, 5-foot sidewalks, and a 30-foot raised median. The 200-foot right-of-way also includes open swales adjacent to the sidewalks on both sides of US 92/SR 600/ISB.

Alternatives A, A1 and A2, from the I-95 Interchange/Indigo Drive intersection to Midway Avenue, convert the existing swales to a closed drainage system to provide additional landscaped buffer space between the sidewalks and travel lanes. East of this area, a large portion of this cross section is currently under construction as a part of FDOT's US 92 Pedestrian Improvement project between Williamson Boulevard and Midway Avenue. Sidewalks on both sides of the street are expanded to 12 feet in width and include decorative fencing to channel pedestrians to signalized intersections and pedestrian overpasses to safely cross US 92/SR 600/ISB. In the current US 92 Pedestrian Improvement Project, FDOT is funding the construction of these amenities while the City of Daytona Beach will be responsible for their maintenance. In addition, through milling and resurfacing or restriping, travel lanes are reduced to 11 feet in width, creating additional space for a 7-foot buffered bicycle lane on both sides of the street. The speed limit on this segment will be reduced from 50 mph to 45 mph due to the lane width reduction.



SEGMENT 1 - EXISTING (I-4 to Tomoka Farms Rd)



SEGMENT 1 - ALL ALTERNATIVES
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Figure 3: Typical Cross Section – Segment 1

Figure 4: Perspective Rendering of Segment 1 and Segment 2

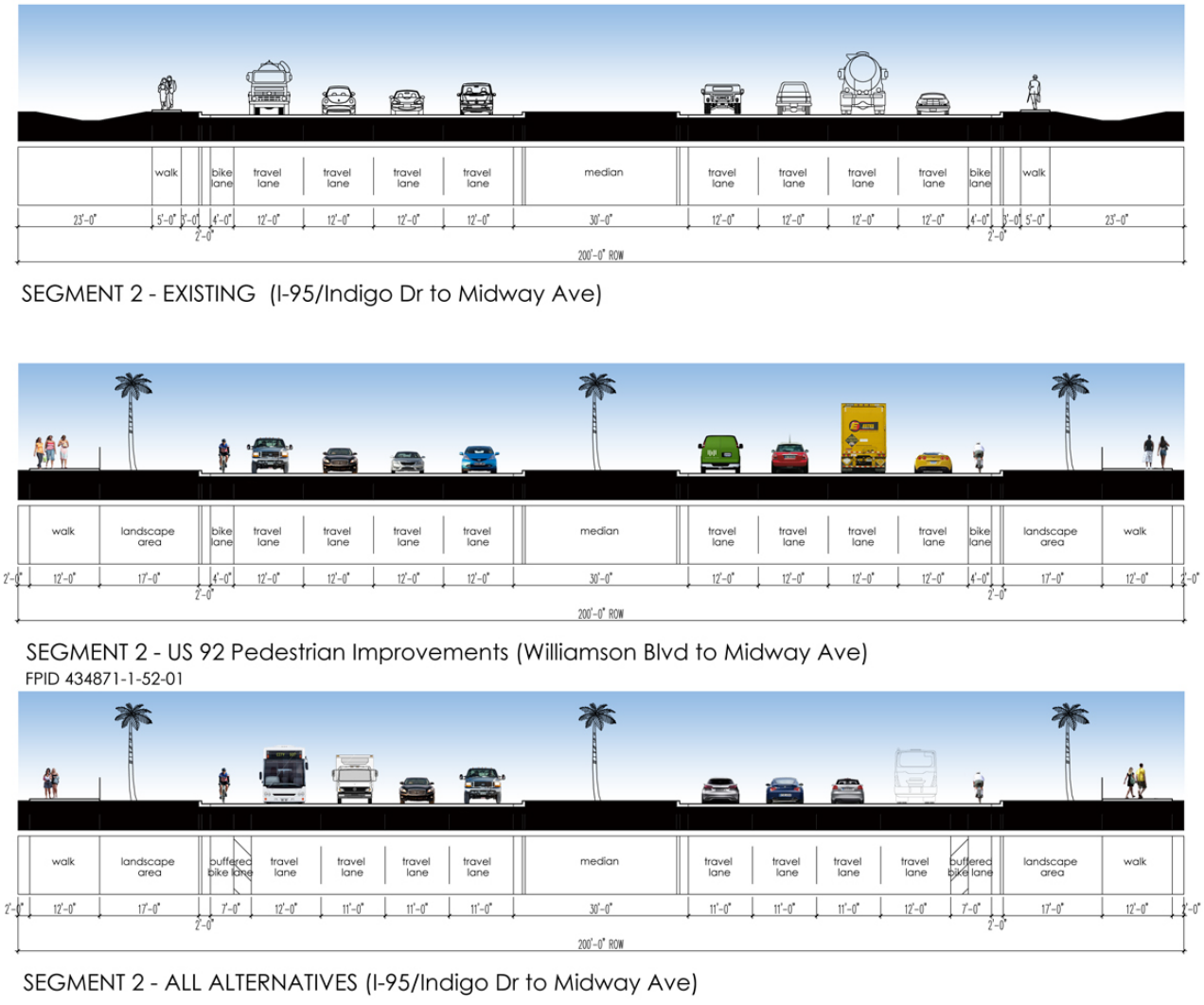


Figure 5: Typical Cross Section – Segment 2 (I-95/Indigo Drive to Midway Avenue)

2.2.3 Segment 2 – Midway Avenue to SR 483/Clyde Morris Boulevard

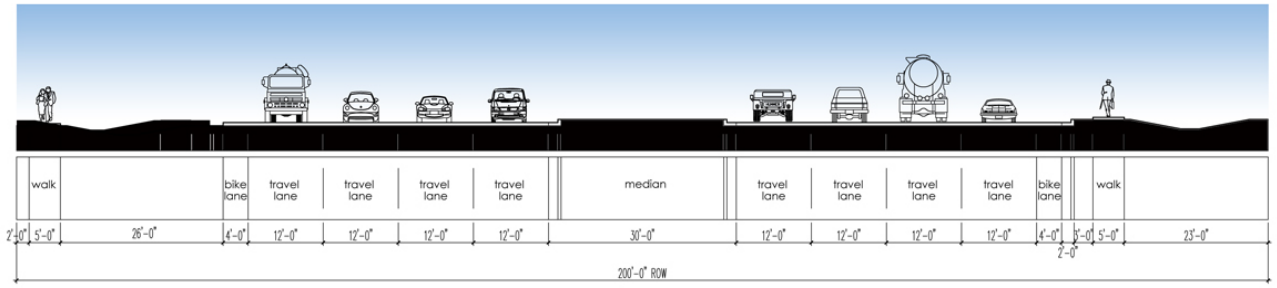
The typical cross sections for this section of Segment 2 are depicted in Figure 6. Perspective renderings are provided in Figure 4.

The existing typical section consists of eight 12-foot travel lanes, 4-foot bicycle lanes, 5-foot sidewalks, and a 30-foot raised median. The 200-foot right-of-way also includes open swales located on the outside of the westbound sidewalk and on the inside of the eastbound sidewalk.

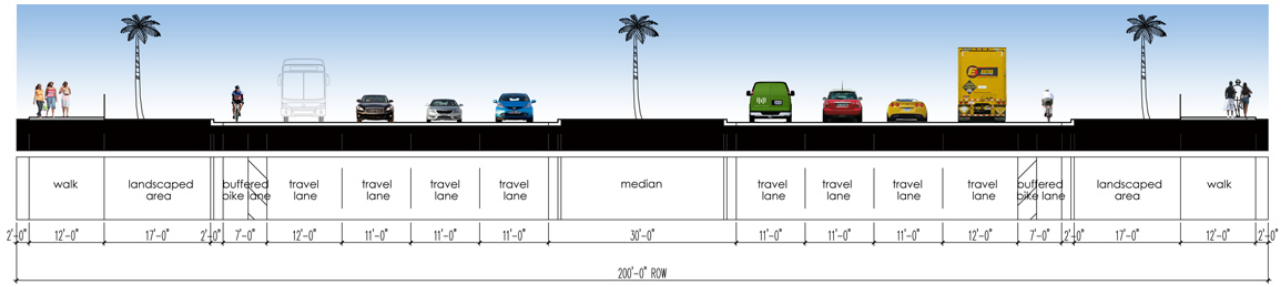
Alternatives A and A2 are essentially an extension of the current US 92 Pedestrian Improvement project's proposed cross section. These alternatives convert the existing swales to a closed drainage system to provide additional landscaped buffer space between the sidewalks and the travel lanes. In addition, all travel lanes are reduced to 11 feet in width, through milling, resurfacing and restriping, to make space for seven foot buffered bicycle lanes.

Alternative A1 also provides 7-foot buffered bicycle lanes by reducing the existing travel lane width to 11 feet. However, due to drainage concerns in the corridor, the open swales remain in place.

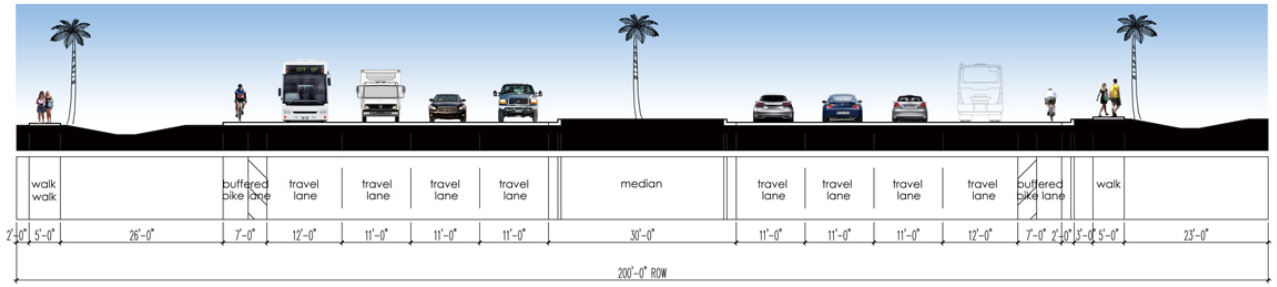
Due to the lane width reduction, the maximum posted speed limit on this segment would be reduced from 50 mph to 45 mph for all alternatives.



SEGMENT 2 - EXISTING (Midway Ave to Clyde Morris Boulevard)



SEGMENT 2 - ALTERNATIVES A, A2



SEGMENT 2 - ALTERNATIVE A1

Figure 6: Typical Cross Section – Segment 2 (Midway Avenue to Clyde Morris Boulevard)

2.2.4 Segment 3 – SR 483/Clyde Morris Boulevard to SR 5A/Nova Road

The typical cross sections for this section of Segment 3 are depicted in Figure 7. Perspective renderings are provided in Figure 8.

The existing typical section consists of six 11-foot 4 inch travel lanes, 4-foot bicycle lanes, 3-foot planter strips, 5-foot sidewalks, and a 22-foot raised median.

All alternatives include a typical cross section that consists of six 11-foot travel lanes, 7-foot buffered bicycle lanes, 3½-foot planter strips, 7-foot sidewalks and an 18-foot raised median.

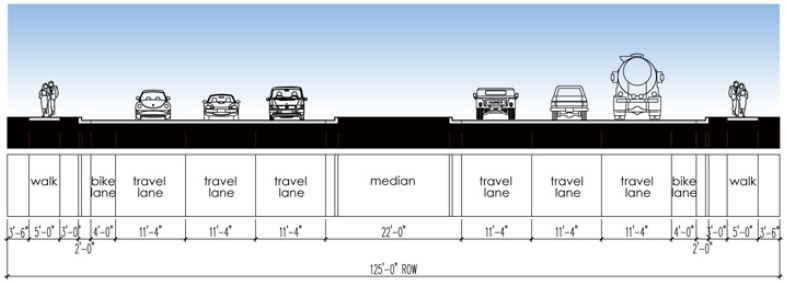
2.2.5 Segment 3 – SR 5A/Nova Road to US 1/Ridgewood Avenue

The typical cross sections for this section of Segment 3 are depicted in Figure 7. Perspective renderings are provided in Figure 8.

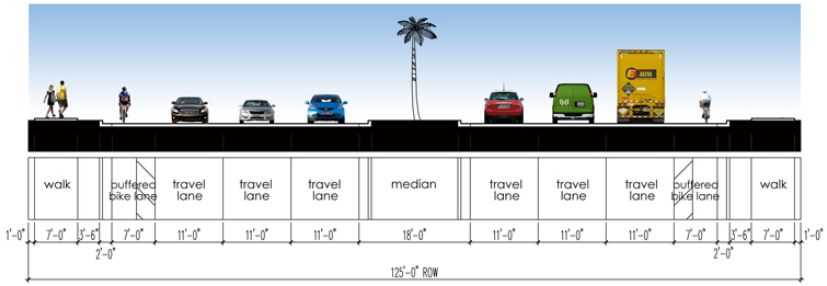
The existing typical section consists of four 10.5-foot travel lanes, a 12-foot two-way left turn lane, 4-foot bicycle lanes, and 7-foot sidewalks.

All alternatives include a typical cross section that consists of four 10.5-foot travel lanes, 4-foot bicycle lanes, 7-foot sidewalks, and a 12-foot raised landscaped median.

In addition, recent zoning district changes within the City of Daytona Beach's Midtown Redevelopment Area require new development to have minimal front setbacks of 10-feet and maximum setbacks of 25-feet. This policy incrementally adds space for additional landscaping and pedestrian oriented activity along the sidewalk within the constrained Midtown Redevelopment Area.



SEGMENT 3 - EXISTING (Clyde Morris Blvd to Nova Rd)



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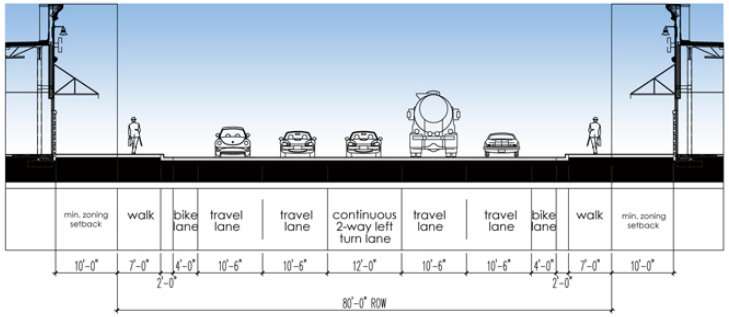
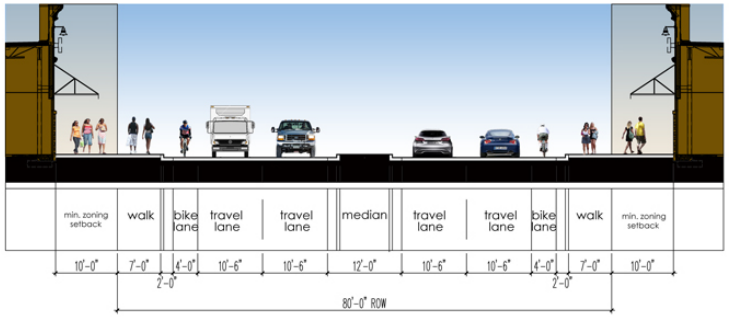


SEGMENT 3 - EXISTING (Nova Rd to Ridgewood Ave)



SEGMENT 3 - ALL ALTERNATIVES

Figure 7: Typical Cross Section – Segment 3

Figure 8: Perspective Rendering – Segment 3

2.2.6 Segment 4 – US 1/Ridgewood Avenue to Beach Street

The typical cross sections for this section of Segment 4 are depicted in Figure 9. Perspective renderings are provided in Figure 10.

Serving downtown Daytona Beach, this existing typical cross section for this segment consists of four 12-foot travel lanes, two 8-foot parallel parking lanes (as measured from face of curb), 11-foot sidewalks, and a 10-foot two-way left turn lane.

Alternatives A and A2 consist of four 10.5-foot travel lanes, two 8-foot parallel parking lanes (as measured from face of curb), 10-foot sidewalks, 5-foot bicycle lanes and a 10-foot raised landscaped median.

Alternative A1 consists of four 10.5-foot travel lanes, two 8-foot parallel parking lanes (as measured from face of curb), 11-foot sidewalks, and a 16-foot raised landscaped median. No bicycle lanes exist on US 92/SR 600/ISB in this alternative between Seagrave Street and Beach Street.

Due to the constrained right-of-way of US 92/SR 600/ISB through Downtown Daytona Beach, Alternative A1 would restripe Bay Street and Magnolia Avenue, between Seagrave Street and the Halifax River Greenway (Beach Street), to accommodate a dedicated bicycle facility. Running parallel to US 92/SR 600/ISB one block north and south, these corridors offer the possibility of shifting a significant amount of bicycle traffic away from the US 92/SR 600/ISB intersection with US 1/Ridgewood Avenue. In addition, the utilization of Seagrave Street as a multimodal corridor within this vicinity would increase connectivity between US 92/SR 600/ISB and the existing Greyhound and Votran Transfer Plaza bus terminals.

An example of bike lanes in conjunction with on-street parking (Pottstown, PA)

2.2.7 Segment 4 – Halifax River Bridge

The typical cross sections for this section of Segment 4 are depicted in Figure 9.

The existing typical cross section for the Halifax River Bridge consists of four 12-foot travel lanes, 8-foot inside shoulders, 10-foot outside shoulders and 8-foot sidewalks.

All alternative cross sections include the conversion of the outside shoulders to buffered bicycle lane facilities.

2.2.8 Segment 4 – Halifax River to SR A1A/Atlantic Avenue

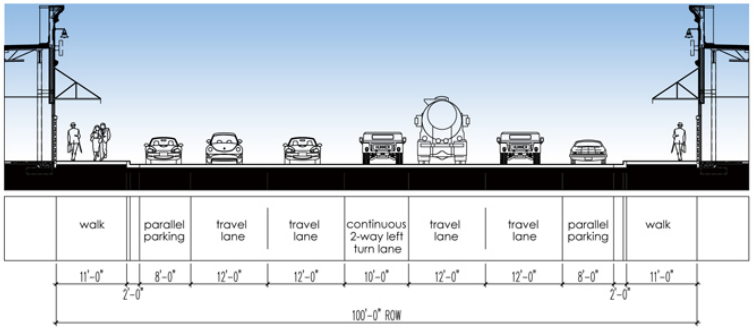
The typical cross sections for this section of Segment 4 are depicted in Figure 11. Perspective renderings are provided in Figure 10.

Considered the main gateway to the "World's Most Famous Beach," this existing typical cross section consists of four 10-foot travel lanes, 6.5-foot planter strips, 6-foot sidewalks, and an 11-foot two-way left turn lane.

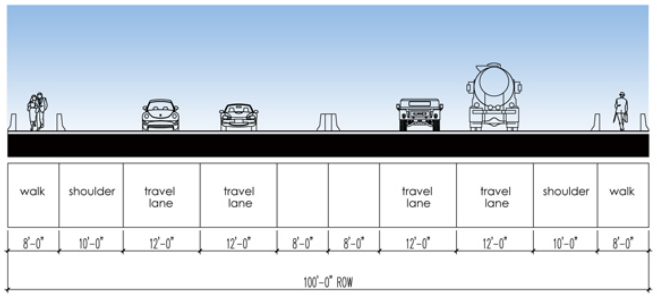
Alternatives A and A2 consist of four 10-foot travel lanes, 4-foot bicycle lanes, 8-foot sidewalks and a 12-foot raised landscaped median.

Alternative A1 consists of four 10-foot travel lanes, 12.5-foot sidewalks and an 11-foot raised landscaped median. There are no bicycle lanes included in this alternative.

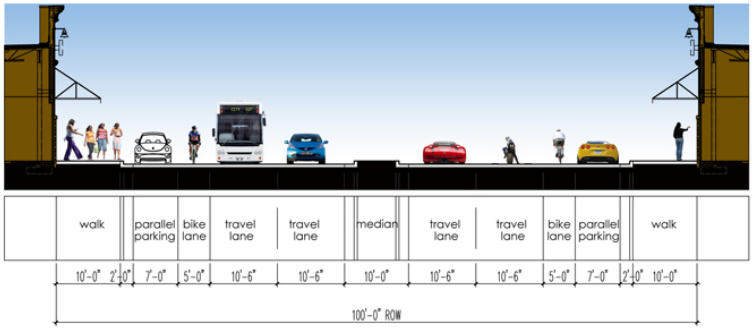
In addition, a new City of Daytona Beach zoning district, Redevelopment Beachside – International Speedway Boulevard Corridor, requires new development to have minimal front setbacks of 10-feet and maximum setbacks of 25-feet. This policy incrementally adds space for additional landscaping and pedestrian oriented activity along the sidewalk within the ROW constrained Beachside corridor.



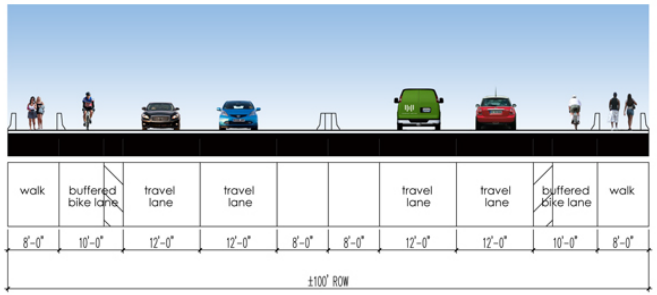
SEGMENT 4 - EXISTING (Ridgewood Ave to Beach St)



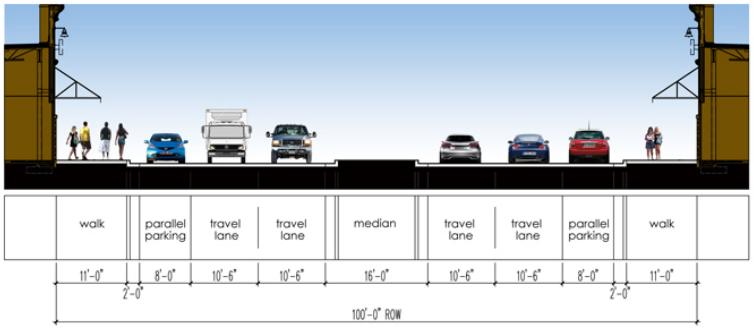
SEGMENT 4 - EXISTING (Halifax River Bridge)



SEGMENT 4 - ALTERNATIVES A, A2



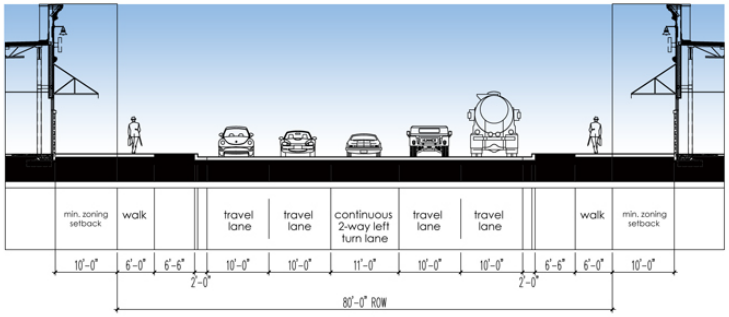
SEGMENT 4 - ALL ALTERNATIVES



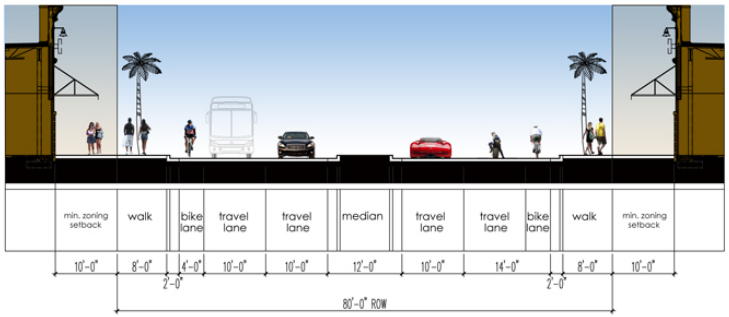
SEGMENT 4 - ALTERNATIVE A1

Figure 9: Typical Cross Section – Segment 4 (Ridgewood Avenue to Beach Street)

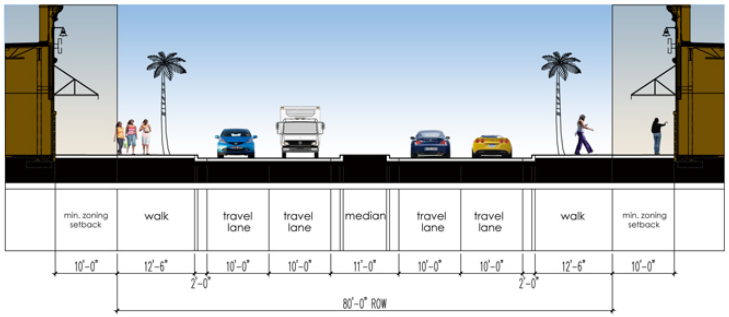
Figure 10: Perspective Rendering – Segment 4



SEGMENT 4 - EXISTING (Halifax River to Atlantic Ave)



SEGMENT 4 - ALTERNATIVES A, A2



SEGMENT 4 - ALTERNATIVE A1

Figure 11: Typical Cross Section – Segment 4 (Halifax River to Atlantic Avenue)

2.3 ROUNDABOUTS

In Florida, over 44% of all traffic fatalities and serious injuries occur at conventional (stop and signal-controlled) intersections. Roundabouts have been proven to reduce the number of fatal and severe injury crashes, by 82% over a stop-controlled intersection and 78% over a signalized intersection. This is attributed to the fact there are no vehicular crossing movements in a roundabout, which eliminates left-turn and right-angle crashes.

Key advantages of roundabouts are slower entry speeds, reduction of conflict points, decreased delay and reduced fuel consumption and emissions. They can also serve as a gateway feature.

While there are several benefits with the installation of roundabouts, they are not the best option at all locations. Therefore, the Department must carefully evaluate potential locations and understand the benefits and drawbacks of installing roundabouts.

The City of Daytona Beach has expressed an interest in exploring the installation of roundabouts at two signalized intersections within the study area. Alternative A1 includes this option at US 92/Peninsula Drive and US 92/SR A1A/Atlantic Avenue. As of the date of this report, the City has both roundabout locations on the River to Sea Transportation Planning Organization's (R2CTPO) priority list. The illustration shown in Figure 12 depicts one potential concept layout.

Before roundabouts can be programmed for design, more coordination and collaboration will be needed to determine a final roundabout concept. Therefore, at this time, the Department is recommending spot improvements as part of this study, such as raised concrete medians and re-striping.

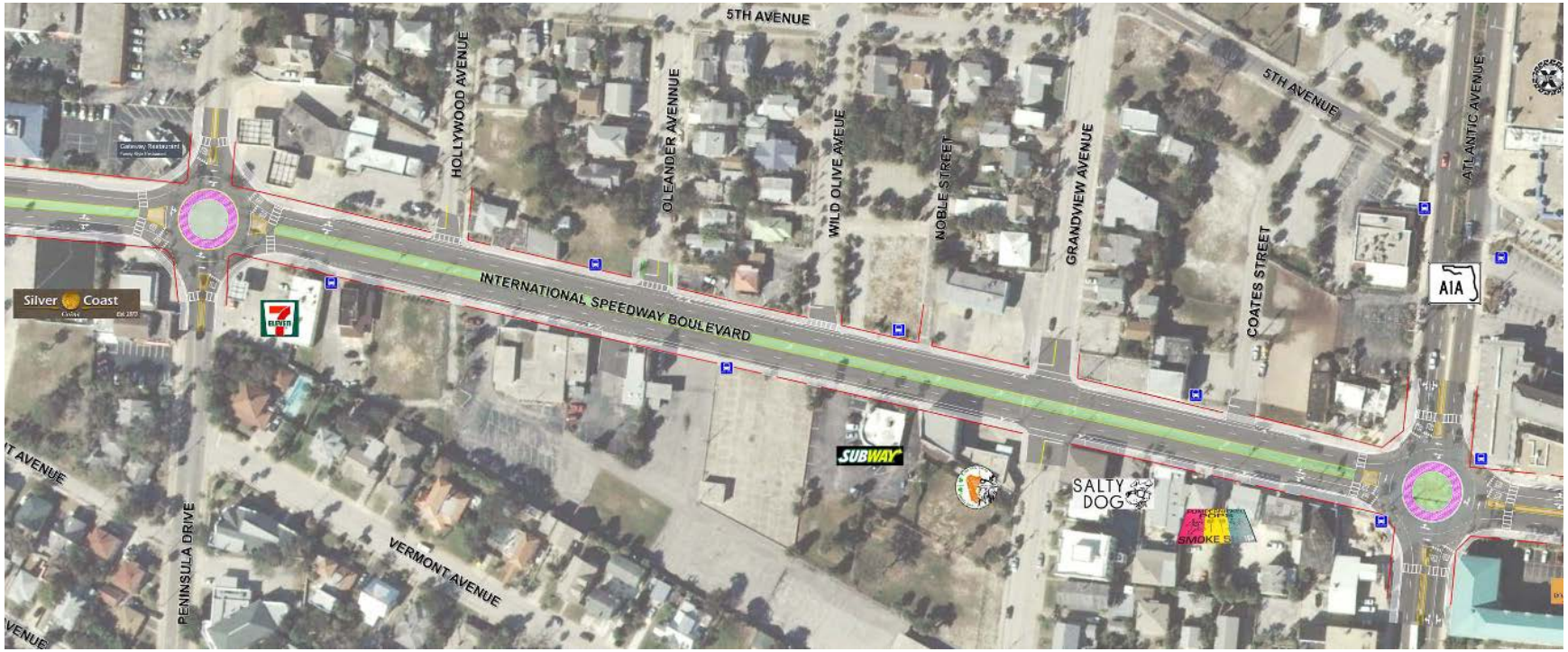


Figure 12: Potential Concept Rendering of US 92 with Roundabouts

2.4 PEDESTRIAN BRIDGES & MID-BLOCK CROSSINGS

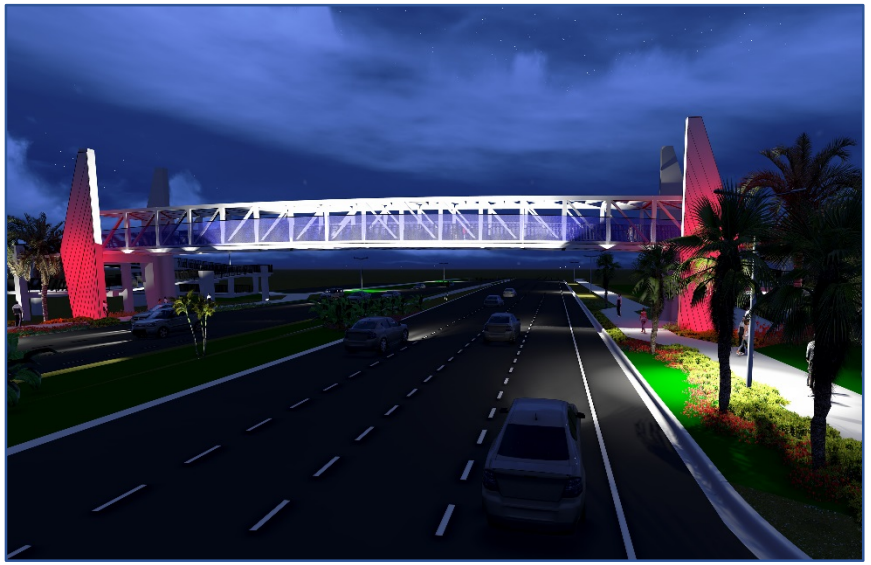
Despite being located on US 92/SR 600/ISB, the campuses of Daytona State College and Mainland High School are difficult to access for non-motorized users. Existing signalized intersections and crosswalks require students and pedestrians to walk as much as a half mile out of the way to cross the US 92/SR 600/ISB corridor. It is recommended that a pedestrian and bike movement study be performed in this portion of Segment 3. A grade separated crossing may be warranted to enhance pedestrian safety on US 92/SR 600/ISB, at least in part to mitigate the combination of the maximum posted speed limit of 45 mph and anticipated growth at both campuses, including dual enrollment programs.

The adjacent image depicts a planned pedestrian overpass across US 92/SR 600/ ISB just west of Bill France Boulevard. To facilitate use of the pedestrian bridge, additional landscaping/pedestrian channelization treatments between signalized intersections are included to discourage jaywalking and avoidance of the bridge. The pedestrian bridge also provides an opportunity for creating a "gateway element" within Segments 2 and 3 *(Speedway and Midtown,* based on *City of Daytona Beach Wayfinding Signage Program*) by highlighting the locations near the transition zone of these two important US 92/SR 600/ISB districts. Enhancements could include signage, fencing and bridge lighting.

It is recommended that an additional study be performed to assess the need for mid-block crossings in Midtown west of the FEC railroad. Mid-block crossings facilitate pedestrian movement to places that people want to go but that are not well served by the existing traffic network. Mid-block crossings work best when they complement crosswalks at existing intersections.

It is also recommended that an additional study be done to determine whether a pedestrian bridge is recommended in certain locations It is important to note that pedestrian bridges are expensive, present a challenge in determining the appropriate location, and require the supporting data and analysis to validate the location and benefits of bridges, rather than a mid-block crossing.

All alternatives can be advanced with or without the pedestrian bridge and mid-block crossing options. There are potential community impacts that should be fully investigated before any of the options are pursued and additional community input should be solicited regarding the need and location. This outreach should include potential users, adjacent property owners and businesses, and the community-at-large. Additional engineering, survey, design, and permitting will be required, along with right-of-way acquisition for the pedestrian bridge ramps.



An artist's rendering of the planned pedestrian overpass on US 92/SR 600/ISB near Bill France Boulevard

3 OPERATIONAL ASSESSMENT

The Identification of Corridor Needs report identified needed improvements for the Design Year 2035. The 2015 estimated annual average daily traffic (AADT) is based on the latest 2013 traffic counts, grown by 2 percent per year to 2015. The estimated 2015 AADT is considered the base year. Future Year estimated AADT is based on growing the 2015 estimated AADT by 2 percent per year to arrive at the 2035 horizon year. The 2 percent growth rate was established based on a straight line calculation between the 2013 annual FDOT traffic counts and model output volumes from the 2040 Central Florida Regional Planning Model (CFRPM) v.6.0.

Based on these traffic volumes, roadway segment operating level of service (LOS) and multimodal LOS were determined using the Generalized Service Volume Tables from the Quality/Level of Service (Q/LOS) Handbook (FDOT, 2013).

3.1 FUTURE 2035 OPERATIONAL LEVEL OF SERVICE

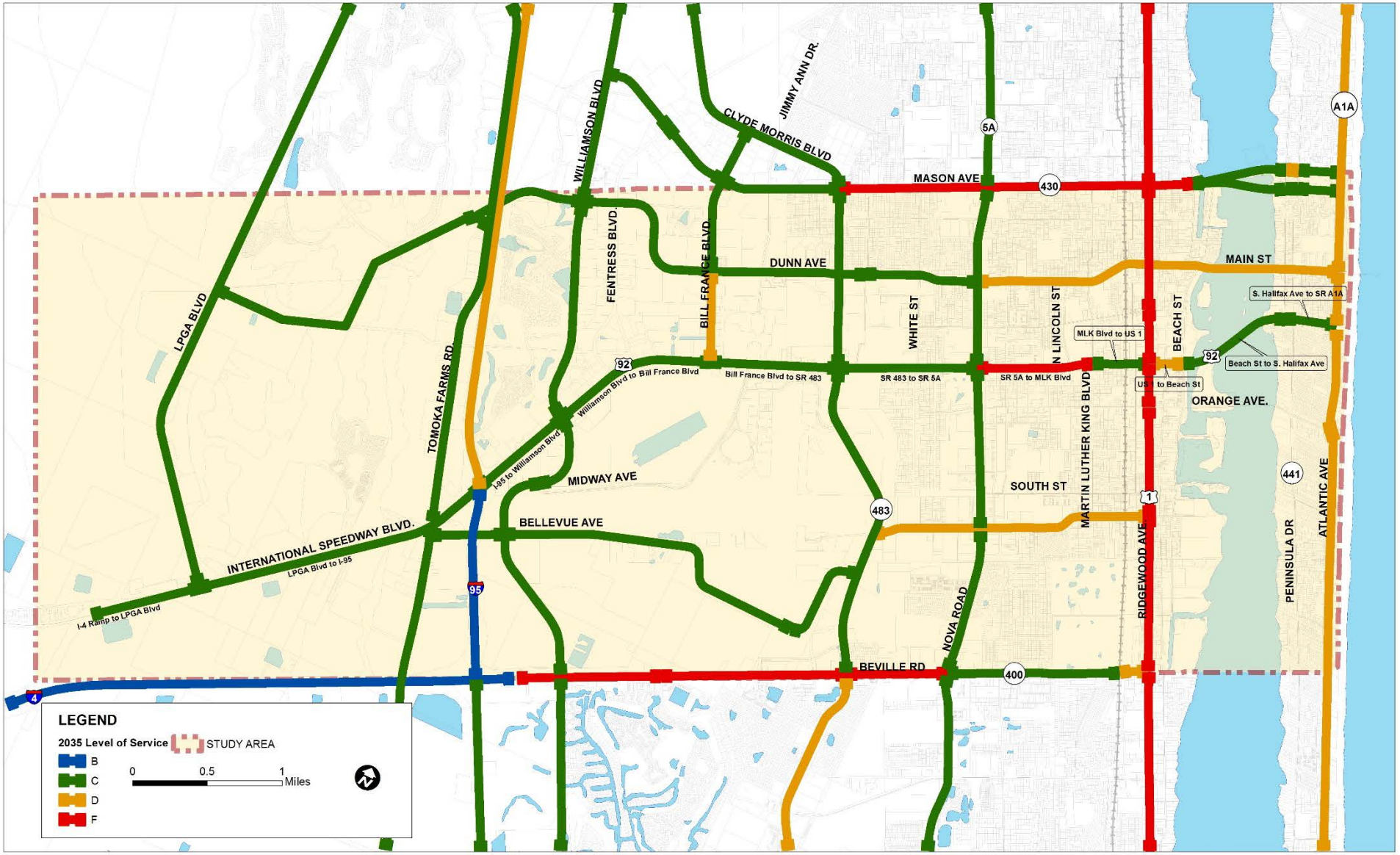
Table 1 summarizes the existing and projected roadway segment LOS. The adopted minimum standard for US 92/SR 600/ISB is LOS D. Those roadway segments that are projected to operate below this standard are highlighted in the table. Future (2035) LOS for the US 92/SR 600/ISB corridor is also graphically depicted in Figure 13.

All of the roadway segments currently operate at LOS C in both daily and peak hour conditions. The corridor will continue to operate at an acceptable level through the Design Year with the exception of the segment from SR 5A/Nova Road to MLK Boulevard, which falls to LOS F.

With continued growth in automobile travel and limited ability to provide additional roadway capacity on US 92/SR 600/ISB, between SR 5A/Nova Road and MLK Boulevard (Midtown), it is imperative that mobility options, other than the automobile, are provided along this corridor.

Table 1: Roadway Segment Level of Service

Roadway Segment	2015		2035	
	Daily	Peak	Daily	Peak
I-4 Ramp to LPGA Blvd.	C	C	C	C
LPGA Blvd. to I-95	C	C	C	C
I-95 to Williamson Blvd.	C	C	C	C
Williamson Blvd. to Bill France Blvd.	C	C	C	C
Bill France Blvd. to SR 483/ Clyde Morris Blvd.	C	C	C	C
SR 483/Clyde Morris Blvd to SR 5A/Nova Rd.	C	C	C	C
SR 5A/Nova Rd. to MLK Blvd.	C	C	F	F
MLK Blvd. to US 1/Ridgewood Ave.	C	C	C	C
US 1/Ridgewood Ave. to Beach St.	C	C	D	D
Beach St. to S. Halifax Ave.	C	C	C	C
S. Halifax Ave. to SR A1A	C	C	C	C



2035 Level of Service Map. Source: Ghyabi & Associates. Created: 5/19/2015

Figure 13: 2035 Level of Service for US 92/SR 600/ISB and Other Major Facilities

3.2 MULTIMODAL QUALITY OF SERVICE

The 2013 Q/LOS Handbook provides multimodal quality of service (QOS) calculations for bicycle, pedestrian and transit components based on available infrastructure and motorized traffic along the corridor. The analysis considers such factors as the presence of bike lanes or paved shoulders, the existence of sidewalks, bus frequency and motorized vehicle volumes. Each of these factors influences the utility or effectiveness of the facilities for pedestrians, bicyclists and transit users. The Generalized Tables from the 2013 Q/LOS Handbook can be found in Appendix D.

The multimodal QOS is summarized in Table 2. While the analysis provides a general indication of operating conditions by mode of travel, it does not accurately account for features such as the proposed pedestrian bridges to aid pedestrian crossing movements or safety enhancements of existing bicycle and pedestrian facilities.

The transit QOS in Alternative A2 reflects an increase in service along the entire corridor.

Table 2: Multimodal Level of Service

Segment	Alternative A			Alternative A1			Alternative A2		
	Bike LOS	Ped LOS	Transit LOS	Bike LOS	Ped LOS	Transit LOS	Bike LOS	Ped LOS	Transit LOS
I-4 to LPGA Blvd	C	C	F	C	C	F	C	C	B
LPGA Blvd to I-95	C	D	F	C	D	F	C	D	B
I-95 to Williamson Blvd	C	D	D	C	D	D	C	D	B
Williamson Blvd to Bill France Blvd	C	D	D	C	D	D	C	D	B
Bill France Blvd to SR 483	C	D	C	C	D	C	C	D	B
SR 483 to SR 5A	C	E	C	C	E	C	C	E	B
SR 5A to MLK Blvd	D	F	C	D	F	C	D	F	B
MLK Blvd to US 1	C	D	C	C	D	C	C	D	B
US 1 to Beach St	C	D	C	E	D	C	C	D	B
Beach St to S. Halifax Ave	C	C	B	C	C	B	C	C	B
S. Halifax Ave to SR A1A	B	C	B	E	C	B	B	C	B

4 IDENTIFIED MULTIMODAL PROJECTS

Multimodal accommodations identified within the CMMP study area were coordinated with transit entities and local government officials. Currently planned projects, such as those found in the R2CTPO's Transportation Improvement Plan (TIP) and Long-Range Transportation Plan (LRTP), were the basis of this project list. While this list is primarily focused on planned facilities, additional projects have been identified through the visioning process and previous studies that are not yet prioritized or funded. Details regarding projects that are included in the LRTP Cost Feasible Plan and the TIP can be found in Appendix E and Appendix F, respectively.

Also included is the consideration of bicycle and pedestrian facilities according to Chapter 14 of the FDOT's Project Development & Environment Manual and Chapter 8 of the FDOT's Plans Preparation Manual. These multimodal projects are depicted in Figure 14. Each project name is followed by the lead agency.

4.1 SEGMENT ONE

4.1.1 Short-Term (2015-2019)

1. *I-4 Widening from SR 44 to east of I-95 – FDOT*

   This $134 million dollar project will widen I-4, 4 lanes to 6 lanes, and reconfigure the interchange at US 92 and I-4. It also includes 3 animal crossings. The project completion date is anticipated to be Spring of 2016. (Source: www.cflroads.com)

2. *US 92 Widening from I-4 Ramp to Tomoka Farms Road - FDOT*

   This $25.4 million FDOT project expands US 92/SR 600/ISB to six lanes. The LPGA Boulevard, Gene Daniels Road and Tomoka Farms Road intersections will be improved with additional turn lanes and receiving lanes. This project will include 10-foot shoulders/bicycle lanes, a 10-foot shared use path on the north side of US 92/SR 600/ISB and a 5-foot sidewalk on the south side of this corridor. Right-of-way acquisition is planned for 2018/2019.

3. *Reconstruction of Bellevue Avenue Bridge - FDOT*

   In order to reconstruct the I-95/US 92/SR 600/ISB interchange, FDOT will reconstruct Bellevue Avenue from Williamson Boulevard to Tomoka Farms Road. As a part of this bridge replacement project, bicycle lanes and a sidewalk on the north side of the street will be added. Construction is anticipated to start in spring 2015 and be completed in fall 2018.

4. *Bus Service from Daytona Beach to DeLand - Votran*

   The addition of a bus route that crosses Volusia County will connect the ISB corridor with population and employment centers outside of the study area. These connection will allow transit riders to connect to existing bus routes in both Daytona Beach and DeLand. The estimated capital cost is $1.84 million and the operating expenses are estimated to be $24.76 million. The anticipated completion year is 2018. (Source: R2CTPO 2035 LRTP)

5. *Adaptive Signal Control – FDOT*

   The upgrade of 22 existing signal cabinets will allow for adaptive signal control. This will allow traffic signals to adjust the timing of phases based on information from detection loops on the roadway surface, thus reducing delay for drivers.

4.2 SEGMENT TWO

4.2.1 Short-Term (2015-2019)

6. *Dunn Avenue Extension – City of Daytona Beach*

   This project provides an alternate route for eastbound and westbound traffic between residential and commercial districts that are proposed in northwestern part of the study are. The estimated year of completion is 2030 and the estimated cost is $25 million.

7. *I-95 Interchange Reconstruction Design-Build – FDOT*

   This $205 million FDOT project reconstructs US 92/SR 600/ISB and its interchange with I-95 from Tomoka Farms Road to Indigo Drive. It is intended to increase safety for merging, exiting and through-traffic. Multimodal improvements to US 92/SR 600/ISB include a new 5-foot sidewalk from Tomoka Farms Road to Professional Boulevard on the south side of the street and bicycle lanes on both sides of the street. Construction is anticipated to be completed in summer 2018.

8. *US 92/SR 600/ISB Pedestrian Improvements – FDOT*

   This $17.2 million FDOT project adds 1.38 miles of pedestrian improvements on US 92/SR 600/ISB between Williamson Boulevard and Midway Avenue. Improvements include:

   a. Upgrade the intersection at Williamson Boulevard with new mast arms and other improvements.
   b. Replace existing sidewalk and swales with 12-foot shared use path and a closed drainage system on both sides of US 92/SR 600/ISB
   c. Construct a pedestrian overpass 750 feet west of Bill France Boulevard. Aesthetic treatments include landscaping, lighting, pedestrian channelization and fencing and bridge treatments.
   d. ADA accessible Votran bus stops.

   Estimated completion is early 2016.

9. *Dunn Avenue Paved Shoulder – City of Daytona Beach*

   Paved shoulder/bike lanes along Dunn Avenue from Bill France Boulevard to SR 483/Clyde Morris Boulevard. (Source: R2CTPO TIP)

10. *Bus Service from Daytona Beach International Airport (DBIA) to Votran Transfer Plaza. – Votran*

    This added bus service will provide access to the core destination of Daytona Beach and decrease headways to 15 minutes. The estimated completion date is 2018. (Source: Votran TDP)

11. *SR 600 (US 92) Traffic Signal Mast Arms – FDOT*

    This project will stretch from Midway Avenue to Adams Street, upgrading the existing traffic signals to mast arms. As of now, all but three intersections contain mast arms. The project is managed by FDOT, however, the City of Daytona Beach is expected to contribute local funds to the project.

4.2.2 Long-Term (2015-2019)

12. *SR 483/Clyde Morris Boulevard Widening and Intersection Improvements with US 92/SR 600/ISB – FDOT*

    SR 483/Clyde Morris Boulevard will be widened from 4-lanes to 6-lanes between US 92/SR 600/ISB and SR 400/Beville Road. Improvements will include direct pedestrian and bicycle access to ERAU's campus with the addition of a 12-foot shared use path along SR 483/Clyde Morris Boulevard. This project is scheduled to be complete by 2025 and will include a multimodal improvement to the intersection of US 92/SR 600/ISB at SR 483/Clyde Morris Boulevard. The estimated cost is $66.4 million.

13. *Dunn Avenue Widening – TBD*

    This project will widen the section of Dunn Avenue between Williamson Boulevard and SR 483/Clyde Morris Boulevard from 2 lanes to 4 lanes. Improvements will include direct pedestrian and bicycle access to the corridor. The estimated year of completion is 2030 and the estimated cost is $12 million.

4.3 SEGMENT THREE

4.3.1 Short-Term (2019-2035)

14. *ISB Streetscape Project – City of Daytona Beach*

    This project includes beautification and streetscaping of sidewalks and the addition of ADA accessible Votran bus stops on both sides of US 92/SR 600/ISB between SR 5A/Nova Road and Lincoln Street. (Source: CODB)

15. *SR 5A/Nova Road Sidewalk Improvements Project – FDOT*

    This project includes sidewalk improvements along SR 5A/Nova Road south of US 92/SR 600/ISB as a part of the SR 5A/Nova Road resurfacing project. Sidewalk improvements on both sides of SR 5A/Nova Road would strengthen safety and connectivity for non-motorized modes between US 92/SR 600/ISB and an existing shared use path paralleling SR 5A/Nova Road, south to SR 400/Beville Road. In addition, the existing sidewalk will be expanded to match the multi-use path along SR 5A/Nova Road. (Source: R2CTPO 2035 LRTP)

16. *SR 5A/Nova Road Resurfacing Project – City of Daytona Beach*

    This project will resurface SR 5A/Nova Road from US 92/SR 600/ISB to SR 400/Beville Road.

4.3.2 Long-Term (2019-2035)

17. *Daytona Area Trolley Circulator – Votran*

    This project will provide transit service for key destination throughout downtown Daytona Beach with frequent service. The estimated year of completion is 2020. (Source: Votran TDP)

18. *Intercity FEC Passenger Rail Station – TBD*

    This proposed rail station would provide a stop in Daytona Beach for passengers using the passenger rail line that is proposed along the FEC corridor. The estimated completion date of the project is to be determined. (Source: R2CTPO 2035 LRTP)

4.4 SEGMENT FOUR

19. *SR 441/Peninsula Drive Resurfacing Project – FDOT*

    The addition of bicycle lanes along SR 441/Peninsula Drive between US 92/SR 600/ISB and Silver Beach Avenue, as part of the SR 441/Peninsular Drive resurfacing project will provide bicycle network connectivity between US 92/SR 600/ISB and the new Veterans Memorial Bridge.

20. *Orange Avenue Bridge Replacement Project – FDOT*

    This project, which is expected to begin construction in the summer of 2015, will replace the existing draw bridge with a 4 lane, continuous roadway. In addition, the bridge will contain a barrier separated path for bicyclists and pedestrians.

21. *Halifax Greenway – City of Daytona Beach*

    The creation of the Halifax Greenway (shared use path) north of the intersection at US 92/SR 600/ISB and Beach Street will provide a connection between the existing greenway and US 92/SR 600/ISB.

4.4.1 Long-Term (2019-2035)

22. *Bus Rapid Transit (BRT) from Daytona Beach to DeLand – Votran*

    This project will provide a thoroughfare for transit riders who are travelling east and west between these two cities. BRT generally has fewer stops than a traditional bus route, which allows for shorter trip times. The ongoing Volusia Connector study is examining potential routes and stop locations for this project. The estimated year of project completion is 2030. (Source: R2CTPO 2035 LRTP)

4.5 LONG-TERM UNFUNDED (ALL SEGMENTS)

23. *Sidewalk gap on Tomoka Farms Road from US 92/SR 600/ISB to Bellevue Avenue – TBD*

    The completion of the US 92 Widening and Bellevue Avenue reconstruction projects will result in the creation of a roughly 800-foot long sidewalk gap on the east side of Tomoka Farms Road, just north of US 92/SR 600/ISB to Bellevue Avenue. Consider eliminating this potential gap through the coordination of sidewalk connectivity with the design and construction of the US 92 Widening project.

24. *Indigo Drive and US 92/SR 600/ISB Intersection Improvement – TBD*

    There is a sidewalk gap at the intersection of Indigo Drive and US 92/SR 600/ISB. This project should be scheduled for completion at the same time as the US 92/SR 600/ISB improvements.

25. *Mill and Resurface US 92 to add Buffered Bike Lanes from Indigo Drive to SR 483/Clyde Morris Boulevard – TBD*

    As the pavement on this stretch reaches the end of its useful life, milling and resurfacing the roadway provides the opportunity to create narrower lanes and install a buffered bike lane in Segment 2 of the study area.

26. *Fentress Boulevard Sidewalk – TBD*

    Construct sidewalk and ADA accessible bus stops along Fentress Boulevard from US 92/SR 600/ISB to Bayless Boulevard. (Source: US 92 Pedestrian Connectivity and Safety Assessment (PCSA))

27. *ISB Pedestrian Improvements – TBD*

    This project will be an extension of the short-term US 92/SR 600/ISB pedestrian improvements found in the TIP. This project will link Indigo Drive to Williamson Boulevard and will link Midway Avenue to SR 483/Clyde Morris Boulevard. Improvements include:

    a. Replacing existing sidewalk and ditches with 12-foot shared use path and a closed drainage system
    b. Lighting and fencing treatments to buffer pedestrians and cyclists from motorized vehicles
    c. ADA accessible Votran bus stops

28. *Williamson Boulevard Bike Lane Extension –TBD*

    This project will extend the northbound and southbound bicycle lanes on Williamson Boulevard to the intersection at US 92/SR 600/ISB. This will provide a direct link to the shared use path on US 92/SR 600/ISB, which is included in the TIP.

29. *Richard Petty Boulevard Sidewalk Extension –TBD*

    This project will provide a 12-foot shared use path along Richard Petty Boulevard from Midway Avenue to Corsair Drive. This facility will connect to the existing sidewalks found on Midway Avenue and Richard Petty Boulevard, which link to the improvements included in the TIP. (Source: PCSA)

30. *Bill France Boulevard Sidewalk Extension – TBD*

    This project will provide a 12' shared use path along Bill France Boulevard from US 92/SR 600/ISB to Dunn Avenue. This facility will create a link for bicyclists travelling to and from the Dunn Avenue shoulder improvements, which are included in the TIP. (Source: PCSA)

31. *Thames Road Sidewalk – TBD*

    Construct sidewalk on Thames Road to Midway Avenue. (Source: PCSA)

32. *Williamson Boulevard Sidewalk – TBD*

    Construct sidewalk on Williamson Boulevard from US 92/SR 600/ISB to Bellevue Avenue. (Source: PCSA)

33. *Bayless Boulevard Sidewalk – TBD*

    Construct sidewalk on Bayless Boulevard from Williamson Boulevard to Fentress Boulevard. (Source: PCSA)

34. *Jimmy Ann Drive Sidewalk –TBD*

    Construct sidewalk along Jimmy Ann Drive from Dunn Avenue to the Volusia Mall. (Source: PCSA)

35. *Median Retrofit – SR 483/Clyde Morris Boulevard to SR 5A/Nova Road –TBD*

    This project narrows the width of the raised median from 22 feet to 18 feet. This extra width will allow for buffered bike lanes in Segment 3.

36. *ISB Landscaped Medians – TBD*

    The addition of a landscaped median, which includes pedestrian refuges and enhanced crosswalks at intersections on US 92/SR 600/ISB between SR 5A/Nova Road and US 1/Ridgewood Avenue will increase the safety and connectivity for bicyclists and pedestrians traveling north or south.

37. *Mid-Block Crossing Feasibility Study– TBD*

    Study the feasibility of adding a mid-block crossing or a grade-separated crossing on US 92/SR 600/ISB between SR 483/Clyde Morris Boulevard and White Street to provide safe and direct access for pedestrians and bicyclists.

38. *ADA Accessible Bus Stops – TBD*

    Construct ADA Accessible bus stops on US 92/SR 600/ISB between SR 483/Clyde Morris Boulevard to SR 5A/Nova Road and between Martin Luther King Drive and US 1/Ridgewood Avenue.

39. *Speed Limit Reduction –TBD*

    Lower the speed limit along US 92/SR 600/ISB to 35 mph.

40. *Heineman Street Sidewalk – TBD*

    Construct sidewalk between Mayberry Avenue and Hilton Avenue. (Source: PCSA)

41. *Dr. Mary McLeod Bethune Boulevard Sidewalk and Bike lanes – TBD*

    Construct sidewalks along Dr. Mary McLeod Bethune Boulevard from Heineman Street to SR 5A/Nova Road. Also, restripe the road to include bike lanes. (Source: PCSA)

42. *Dunn Ave Bike Lanes – City of Daytona Beach*

    Construct bike lanes along Dunn Avenue from SR 5A/Nova Road to Beach Street. (Source: Daytona Beach Midtown Master Plan)

43. *Dr. Mary McLeod Bethune Boulevard Bike Lanes – City of Daytona Beach*

    Construct bike lanes along Dr. Mary McLeod Bethune Boulevard from SR 5A/Nova Road to Beach Street. (Source: Daytona Beach Midtown Master Plan)

44. *Orange Avenue Bike Lanes –City of Daytona Beach*

    Construct bike lanes along Orange Avenue from SR 5A/Nova Road to Beach Street. (Source: Daytona Beach Midtown Master Plan)

45. *Bellevue Avenue Bike Lanes – City of Daytona Beach*

    Construct bike lanes along Bellevue Avenue from SR 5A/Nova Road to Beach Street. (Source: Daytona Beach Midtown Master Plan)

46. *Martin Luther King Boulevard Bike Lanes – City of Daytona Beach*

    Construct bike lanes along Martin Luther King Boulevard from Dunn Avenue to Shady Place. (Source: Daytona Beach Midtown Master Plan)

47. *Lincoln Street Bike Trail – City of Daytona Beach*

    Construct bike trail along Lincoln Street from Dunn Avenue to US 92/SR 600/ISB. (Source: Daytona Beach Midtown Master Plan)

48. *ISB Streetscape – TBD*

    Context Sensitive Streetscape of US 92/SR 600/ISB between US 1/Ridgewood Avenue and SR A1A/Atlantic Avenue. Improvements would include addition of bicycle facilities, ADA accessible Votran bus stops, widened sidewalks, enhanced crosswalks and pedestrian scale lighting to convert the corridor into a major downtown and beachside gateway. In addition, raised medians will be added between US 1/ Ridgewood Avenue and Beach Street and between the Halifax River Bridge and SR A1A/Atlantic Avenue. The location and number of medians will be dependent on existing business accessibility.

49. *Parallel Bike Corridor – TBD*

    Add bike lanes to Bay Street and Magnolia Avenue to serve as bike facilities parallel to US 92/SR 600/ISB.

50. *A1A Streetscape – TBD*

    Streetscape A1A south of US 92/SR 600/ISB to Silver Beach Avenue with landscaped medians.

51. *Main Street Bride Replacement – TBD*

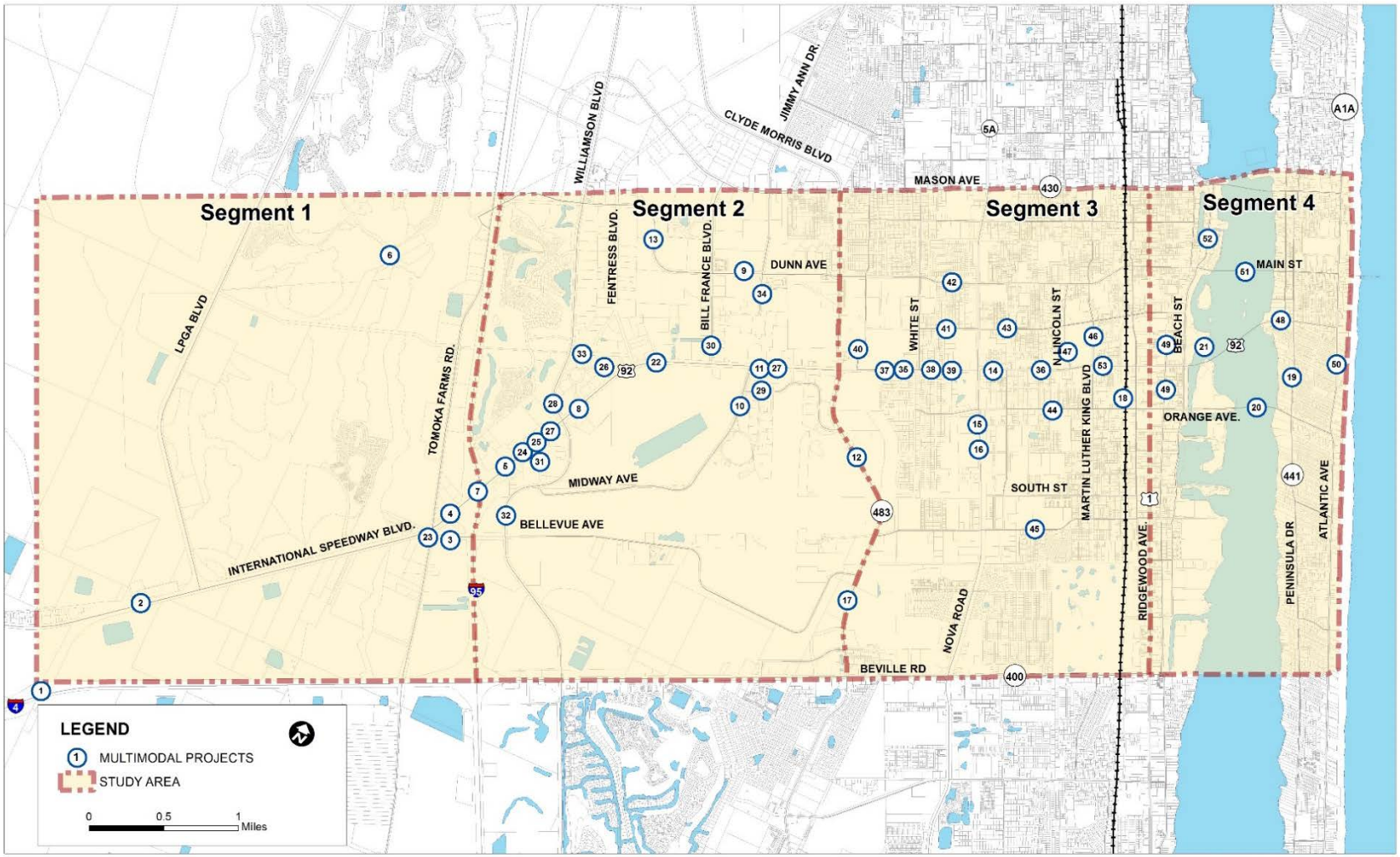
    This project will replace the existing draw bridge with a 4 lane, continuous roadway. The estimated year of completion for this project is 2030.

52. *Halifax Greenway – City of Daytona Beach*

    The creation of the Halifax Greenway (shared use path) north of the intersection at US 92/SR 600/ISB and Beach Street will provide a connection between the existing greenway and US 92/SR 600/ISB.

53. *Mid-block Crossing Feasibility Study – TBD*

    Study the feasibility of adding of a mid-block crossing between Adams Street and US 1/Ridgewood Avenue in order to increase connectivity in a densely populated neighborhood while creating a safer route for pedestrians.



Multimodal Projects Map. Source: River to Sea TPO and Ghyabi & Associates. Created: 11/17/2015

Figure 14: Multimodal Projects

5 EVALUATION CRITERIA

In order to score and rank the alternatives, evaluation criteria were developed based on a wide range of objectives. Within the categories of Public Safety, Mobility, Environmental Impacts, Social and Cultural Impacts, Right-of-way Impacts, Planning Considerations, Engineering Considerations and Cost Analysis, various measures of effectiveness were identified. These include both quantitative and qualitative criteria intended to complement established community visioning efforts for the corridor, such as the Midtown Master Plan, and are illustrated in the adjacent images.

Table 3 provides the evaluation criteria used in the matrix with the objectives, measures of effectiveness and descriptions of the rating scales used.

Illustrations of the future US 92/SR 600/ISB corridor – Midtown Master Plan (upper and lower)

Table 3: Alternatives Evaluation Criteria

Policy Goal / Study Objectives	Measures of Effectiveness	Rating Scale ○	Rating Scale ◑	Rating Scale ●
Public Safety				
Reduction of Conflict Points	Reduction of conflict points	Minimal or no reduction in conflict points	Moderate redution in number of conflict points	Substantial reduction in number of conflict points
Improvements at HCLs	Improved safety at high conflict locations	Minimal or no improvement at HCLs	Moderate improvement at HCLs	Substantial improvement at HCLs
Pedestrian & Bicycle Safety	Improved pedestrian & bicycle facilities	Negative impact to pedestrian & bicycle safety	Little or no impact to pedestrian & bicycle safety	Substantial improvement to pedestian & bicyle safety
Mobility				
Automobile LOS	Auto LOS	Lowest LOS	Middle LOS	Highest LOS
Multimodal LOS	Multimodal LOS	Lowest LOS	Middle LOS	Highest LOS
Multimodal Enhancements	Quantity & quality of multimodal features	Minimal or no enhancement to multimodal facitlities or features	Moderate enhancement to multimodal facilities or features	Substantial enhancement to multimodal facilities or features
Environmental Impacts				
Wetlands	Extent of wetland encroachments	Substantial encroachments	Moderate encroachments	Minimal encroachments
Contamination Site	Extent of encroachment on contamination sites	Substantial encroachments	Moderate encroachments	Minimal encroachments
Flood Plains	Extent of encroachment on Flood Plains	Substantial encroachments	Moderate encroachments	Minimal encroachments
Air & Noise	Impact on Air Quality or Noise Levels	Substantial impact	Moderate impact	Minimal impact
Mitigation Requirements	Extent and cost of mitigating environmental impacts	Extensive mitigation; high cost	Moderate amount of mitigation; low cost	Little or no mitigation required
Social and Cultural Impacts				
Historic or Archaelogic Sites	Impact on Historic or Archaelogic Sites	Substantial impact	Moderate impact	Minimal impact
Community Facilities	Impact on Community Facilities	Substantial impact	Moderate impact	Minimal impact
New or Redevelopment Opportunities	Ability to provide development opportunities	Limited new development or reredevelopment expected	Moderate level of new development or redevelopment opportunities	Implementation creates opportunities for new development or redevelopment
Construction Timeframe	Length of time construction may signficantly impact community	Long duration; significant use of temporary facilities and driveways; significant traffic disruption	Moderate duration; limited use of temporary facilities; moderate traffic disruption	Relatively short duration; no temporary facilities; limited or no traffic disruption
Right-of-Way Impacts				
Parcels Affected	Number of parcels requiring takings	Significant number of takings	Moderate number of takings	Limited or no takings
Relocations	Number of residential or business relocations	Significant number of relocations	Moderate number of relocations	Limited or no relocations
Total Acreage Required	Total acreage of additional right-of-way required	Significant amount of additional rights-of-way	Moderate amount of additional rights-of-way	Little or no additional rights-of-way
Planning Considerations				
Aesthetics	Quality of aesthetic improvements	Little or no aesthetic improvement	Moderate level of aesthetic treatment	High level of aesthetic treatment
Ease of Implementation / Funding	Ability to program & obtain funding	No funding available and	Funding not currently available but funding sources identified	Funding currently available or readily obtainable
Public-Private Partnerships	Ability to form public-private partnerships	No PPP opportunities exist	Limited ability for PPP participation	Implementation fosters PPP opportunities
Public Acceptance	Level of public support or opposition to proposed action	Significant opposition from one or more interest groups expected; limited public support	Some opposition expected; moderate public support	Widely supported, no significant opposition expected
Engineering Considerations				
Consistency with Design Standards	Remediation of geometric deficiencies	All safety issues addressed, some require Design Exceptions & Variations	All safety issues addressed, some require Design Variations	All safety issues addressed, no Design Exceptions or Variations required
Drainage/Permitting	Complexity of design and permitting issues	Relatively complicated; large scope	Moderately complicated; moderate in scope	Relatively simple; limited scope, easily permittable
Utility Impacts	Level of impact to existing utilities	Significant relocations; multiple utilities impacted	Moderate level of relocations; limited number of utilties impacted	Minimal or no utility impacts
Maintenance of Traffic	Complexity of maintenance of traffic & constructability	Relatively complicated; large scope, numerous phases or long duration; requires new temporary facilities	Moderately complicated; moderate in scope, phases or duration; requires construction of new permanent facilities	Relatively simple; limited scope, phases or duration; uses existing facilities
Cost Analysis				
Design/Permitting Costs	Conceptual Design/Permitting Costs	Highest cost option	Middle cost option	Lowest cost option
Right-of-Way Costs	Conceptual right-of-way costs	Highest cost option	Middle cost option	Lowest cost option
Construction Costs	Conceptual construction cost	Highest cost option	Middle cost option	Lowest cost option

6 PLANNING-LEVEL COST ESTIMATES

Planning-level cost estimates have been developed for each alternative and are summarized below in Table 4. Further detail for each estimate is provided in Appendix C. The proposed roundabouts are included in Alternative A-1.

Table 4: Total Cost Estimates

Alternative	Total Cost
Alternative A	$57,623,024
Alternative A1	$68,877,838
Alternative A2	$70,623,024

Source: FDOT 2014 Generic Cost Per Mile Model; 2012 Votran Transit Development Plan and other data sources

The alternatives include all capital projects identified in the R2CTPO 2014-15 to 2018-19 TIP and the 2035 Cost Feasible Transportation Plan, as well as pedestrian and bicycle facility connectivity improvements needed to convert the entire US 92/SR 600/ISB corridor into a multimodal friendly thoroughfare. Wayfinding signage, landscaping, street lighting and other streetscaping features, a pedestrian overpass~~es~~, new raised medians east of SR 5A/Nova Road, and two mid-block crossings are also included. Alternative A1 includes roundabouts at SR 441/Peninsula Drive and SR A1A/Atlantic Avenue on the Beachside. The estimated capital cost for Alternative A improvements is $57,623,024 and $68,877,838 for Alternative A1.

Alternative A2 includes high frequency or BRT-Lite, on the US 92/SR 600/ISB corridor within the CMMP study area.

The image below illustrates an example of a BRT-Lite transit system with dedicated lanes in Central Florida. The estimated capital cost for these improvements is $70,623,024. This estimate includes $13,000,000 for high frequency transit service along the US 92/SR 600/ISB corridor within the study area. To accommodate motorized vehicle movement through the study area, improvements to Dunn Avenue and SR 430/Mason Avenue, including a grade separated railroad crossing, should be considered.

Hillsborough Area Regional Transit (HART) MetroRapid is an example of BRT Lite.

7 COMPARATIVE EVALUATION

As detailed in Table 5, the evaluation criteria were applied to each alternative and a preliminary score assigned based on the identified measures of effectiveness. These include both quantitative and qualitative criteria with scores based on how the alternative satisfied the criteria for each measure of effectiveness. Within each category (Public Safety, Mobility, Environmental Impacts, etc.), a total score for each category was assigned based upon an average of the individual objectives and measures of effectiveness. The scores were then summed to determine the Preliminary Score for each Alternative.

Alternative A2 received the highest preliminary scores due to its minimal impact to neighboring parcels, opportunity for Public Private Partnerships (P3), redevelopment opportunities, and its higher provision for multimodal travel.

The *Environmental* and *Social and Cultural* impacts are relatively minor for all three alternatives. Right-of-way impacts are confined to the Mainland High School and Daytona State College within Segment 3 for the addition of a pedestrian bridge. These improvements may be completed by an easement agreement, should one be reached between the stakeholders. In addition, Alternative A1 requires commercial right-of-way at key intersections to design and construct roundabouts at SR 441/Peninsula Drive and SR A1A/Atlantic Avenue. These proposed improvements must provide a geometry that allows buses and commercial vehicles to pass through. Alternative A1 ranks third due to capital costs, ROW impacts, permitting costs, utility impacts and planning and engineering considerations.

Table 5: Alternatives Evaluation Matrix

	ISB Study Area - Segments 1 through 4		
Corridor Evaluation Objectives and Measures of Effectiveness	Alternative A	Alternative A1	Alternative A2
Public Safety			
Reduction of Conflict Points	●	●	●
Improvements at HCLs	●	●	●
Pedestrian & Bicycle Safety	●	◑	●
Mobility			
Automobile LOS	●	●	●
Multimodal LOS	◑	◑	●
Multimodal Enhancements	◑	◑	●
Environmental Impacts			
Wetlands	●	●	●
Contamination Sites	●	●	●
Flood Plains	●	●	●
Air & Noise	●	●	●
Mitigation Requirements	●	◑	●
Social and Cultural Impacts			
Historic or Archaeological Sites	●	●	●
Community Facilities	●	●	●
New or Redevelopment Opportunities	◑	●	●
Construction Timeframe	●	◑	◑
Right-of-Way Impacts			
Parcels Affected	●	○	●
Relocations	●	◑	●
Total Acreage Required	●	○	●
Planning Considerations			
Aesthetics	◑	●	●
Ease of Implementation / Funding	◑	○	◑
Public-Private Partnerships	◑	◑	●
Public Acceptance	●	○	●
Engineering Considerations			
Consistency with Design Standards	●	●	●
Drainage/Permitting	●	◑	◑
Utility Impacts	◑	○	◑
Maintenance of Traffic	●	◑	●
Cost Analysis			
Design/Permitting Costs	◑	○	◑
Right-of-Way Costs	●	○	◑
Construction Costs	●	◑	○
Preliminary Score	78	63	79

8 RECOMMENDATIONS

This section provides the recommended alternative based on the evaluation matrix and from input received from the Project Visioning Team, interested stakeholders and the general public through visioning and public meetings held throughout the course of the study. In addition, recommended strategies are outlined to further advance multimodal improvements that can benefit the CMMP study area beyond the selection of a specific alternative.

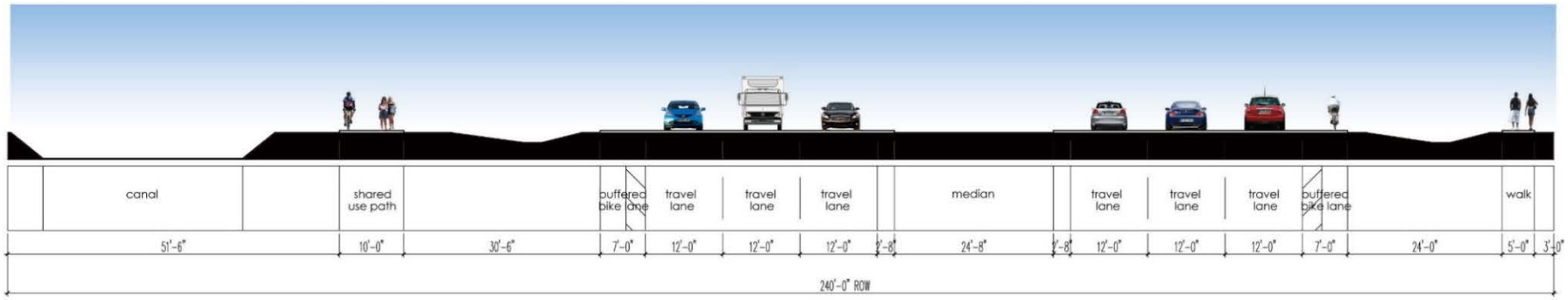
8.1 MODIFICATIONS FOR ADDITIONAL ANALYSIS

All of the alternatives detailed in the study were reviewed by District 5 Planning staff. Additionally, the alternatives were vetted by various internal units within the Department, including Right of Way, Traffic Operations and Design. This review led to an investigation of modifications to the alternatives for Segments 1 and 4.

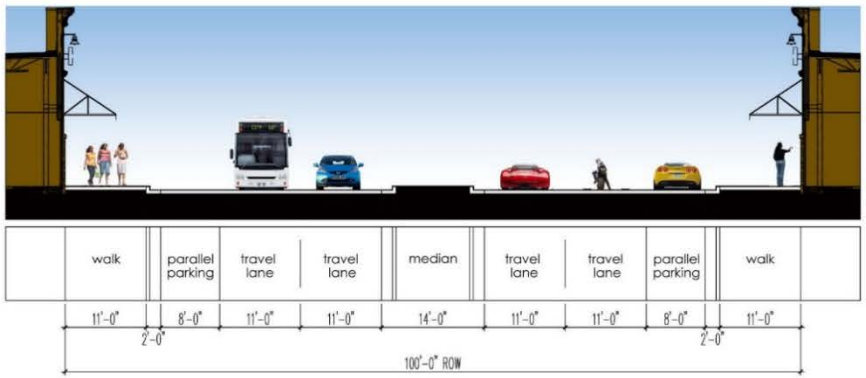
At the suggestion of planning staff, Segment 1 was modified to include seven-foot buffered bicycle lanes to provide additional separation from vehicular travel lanes rather than five-foot bike lanes with no buffer. The modified Alternative A2 for Segment 1 is depicted in Figure 15.

In Segment 4, from US1/Ridgewood Avenue to Palmetto Avenue, there will be five-foot bike lanes with no parallel parking. However, at the suggestion of Traffic Operations, dedicated bicycle lanes were removed in favor of preserving existing parallel parking lanes between Palmetto Avenue and Beach Street. In addition, the travel lanes increase from ten and a half (10.5) feet to eleven feet and the median increases from ten feet to fourteen feet. The parallel parking is increased from seven feet in the original Alternative A2 to eight feet in this modified Alternative A2.

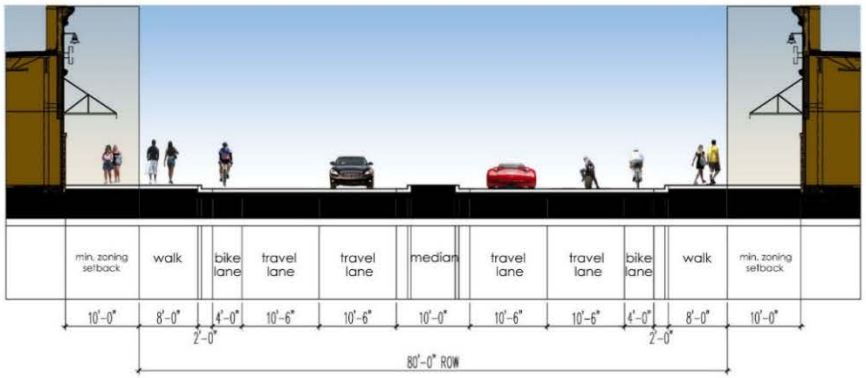
Segment 4 from the Halifax River to SR A1A/Atlantic Avenue now includes ten and a half (10.5)-foot travel lanes instead of ten-foot travel lanes and a ten-foot median instead of a twelve-foot median. The modified cross section for Segment 4 from the Halifax River to SR A1A/Atlantic Avenue can be seen in Figure 14.



SEGMENT 1 - MODIFIED ALTERNATIVE (LPGA Blvd to Tomoka Farms Rd)



SEGMENT 4 - MODIFIED ALTERNATIVE (Ridgewood Ave to Beach St)



SEGMENT 4 - MODIFIED ALTERNATIVE (Halifax River to Atlantic Ave)

Figure 15: Modified Alternative A2 Cross Sections for Segments 1 and 4

8.2 RECOMMENDED ALTERNATIVES

The recommended alternatives for Segments 1, 2, 3 and 4 are depicted in Figures 16 through 18.

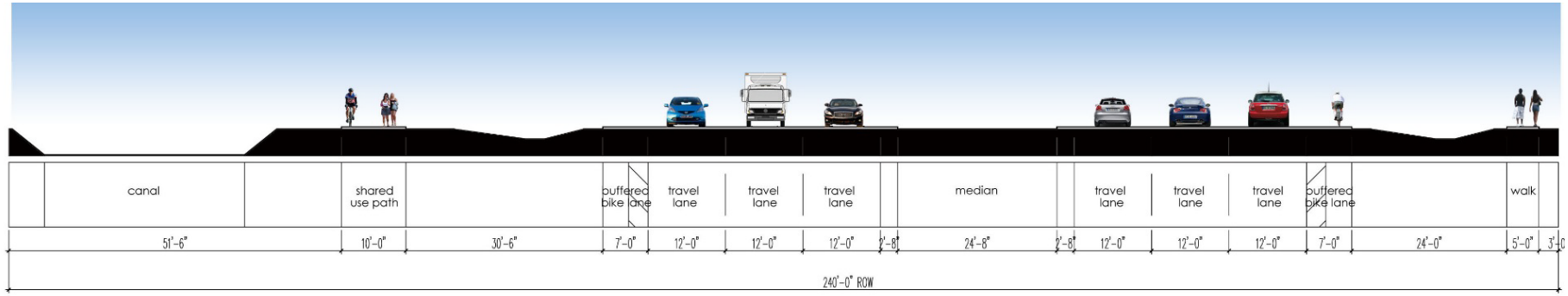
It is recommended that the modified version of Alternative A2 for Segment 1 be pursued through further concept development to determine right-of-way and utility impacts, design and permitting issues, and to investigate matters such as path/trail maintenance and identification of responsible entities.

The recommended alternative for Segments 2 and 3 is Alternative A2. This alternative provides mobility improvements for pedestrians and bicyclists and can be developed in conjunction and coordination with other transit improvements and maintenance projects to provide a comprehensive multi-modal solution for a significant portion of the US 92/SR 600/ISB corridor. Due to the cost and potential impacts of the additional pedestrian bridges and mid-block crossings in Segment 3, further investigation is needed for these specific items.

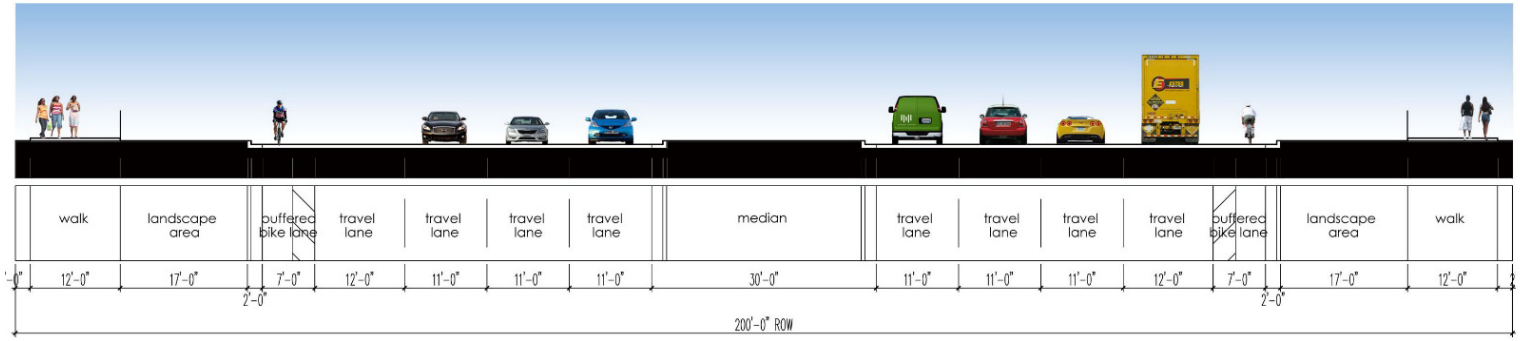
The recommended alternative for Segment 4 is the modified version of Alternative A2. This alternative best balances mobility improvements for pedestrians, bicyclists and motorists within relatively constrained right-of-way and areas of the community that are also dominated with historically significant land uses.

With these improvements, automobile, pedestrian and bicycle travel will be significantly enhanced within a relatively constrained right-of-way. Access management, signalization and intersection improvements will provide operational improvements for automobiles. Pedestrian facilities will be significantly improved with wider sidewalks, high visibility crosswalks, landscaping and the addition of street furniture and other streetside enhancements. Bicyclists will have use of a shared use path, buffered bicycle lanes in areas of higher maximum posted speed limits, and dedicated bicycle lanes in constrained areas along the corridor. Enhanced transit stops and the introduction of a premium transit option along the corridor will provide significant transit service improvements.

These improvements, when combined with the implementation of other strategies and policies to enhance mobility and accessibility, can transform the US 92/SR 600/ISB corridor into a multimodal thoroughfare that is seamlessly integrated with adjacent local land use policies and that achieves many of the Complete Streets and Context Sensitive Design principles.

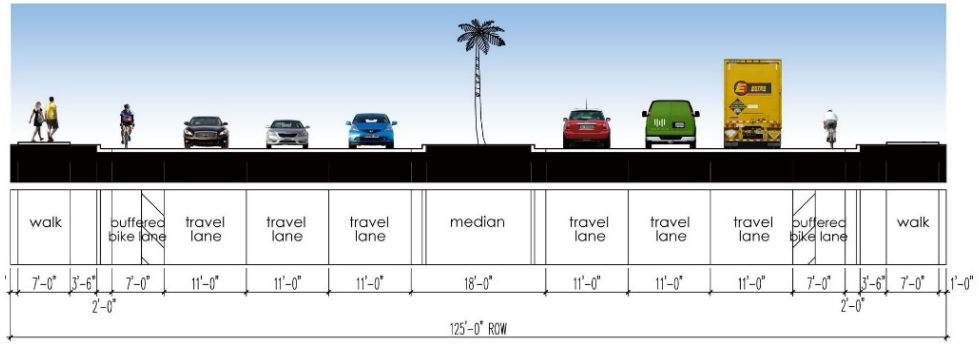


SEGMENT 1 - RECOMMENDED ALTERNATIVE (I-4 to Tomoka Farms Rd/I-95)

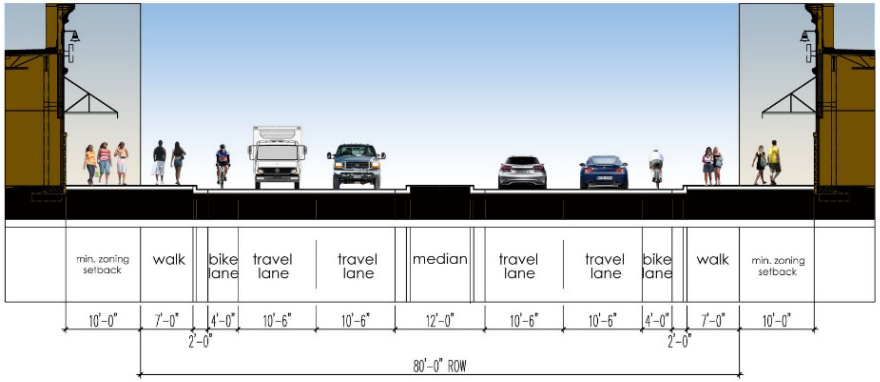


SEGMENT 2 - RECOMMENDED ALTERNATIVE (I-95/Indigo Rd to Clyde Morris Blvd)

Figure 16: Recommended Alternative Typical Cross Section for Segments 1 and 2 (I-4 to SR 483/Clyde Morris Boulevard)

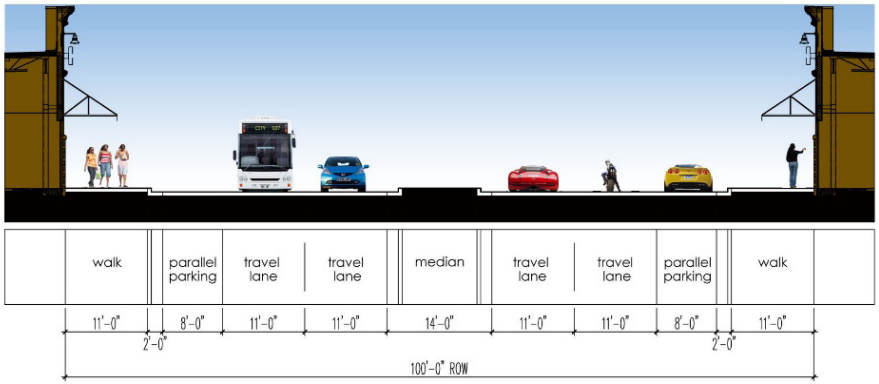


SEGMENT 3 - RECOMMENDED ALTERNATIVE (Clyde Morris Blvd to Nova Rd)

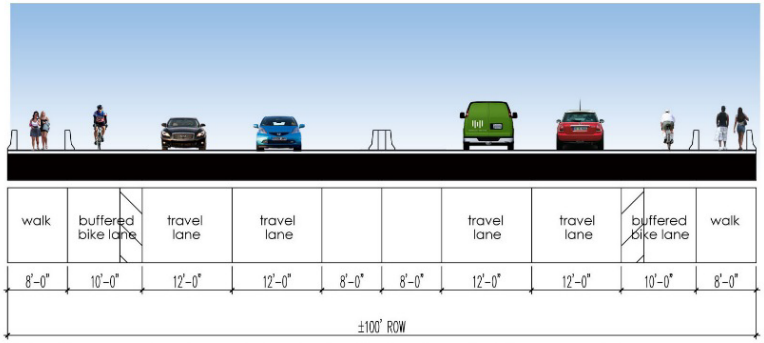


SEGMENT 3 - RECOMMENDED ALTERNATIVE (Nova Rd to Ridgewood Ave)

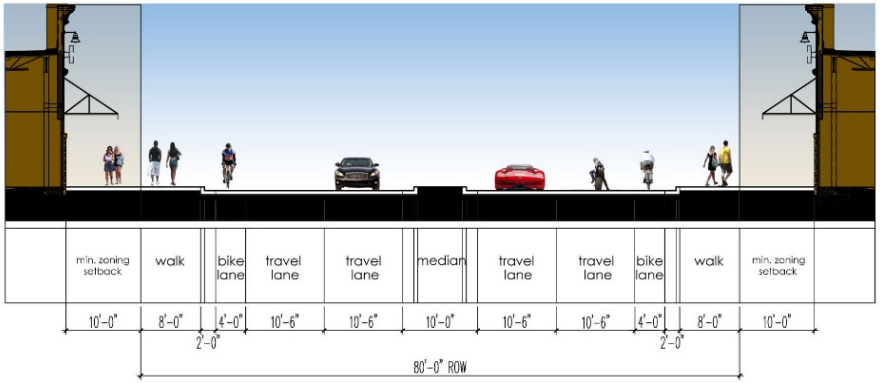
Figure 17: Recommended Alternative Typical Cross Sections for Segment 3 (SR 483/Clyde Morris Blvd to US 1/Ridgewood Ave)



SEGMENT 4 - RECOMMENDED ALTERNATIVE (Ridgewood Ave to Beach St)



SEGMENT 4 - RECOMMENDED ALTERNATIVE (Halifax River)



SEGMENT 4 - RECOMMENDED ALTERNATIVE (Halifax River to Atlantic Ave)

Figure 18: Recommended Alternative Typical Cross Sections for Segment 4 (Nova Rd to Ridgewood Ave)

8.3 OTHER RECOMMENDED STRATEGIES

In addition to implementation of the Recommended Alternatives, there are other multimodal strategies that can be incorporated within the study corridor and with adjacent or nearby facilities and land uses. Travel options can be expanded through parallel facilities and network connectivity can be improved to facilitate automobile, pedestrian, bicycle and transit movement within the corridor and by connecting land use activities and facilities north and south of the corridor. In addition, streetside design principles applied within the public right-of-way and incorporated into land development regulations for the development or redevelopment of adjacent land uses can foster a more walkable environment inviting to pedestrians, bicyclists and transit users.

8.3.1 Parallel Facilities and Network Connectivity

Parallel Roadways

Diversion of traffic to parallel facilities has the potential to alleviate traffic conditions within the US 92/SR 600/ISB study area. It is recommended that improvements to SR 430/Mason Avenue and Dunn Avenue be investigated to provide additional viable alternative parallel facilities between LPGA Boulevard and SR A1A/Atlantic Avenue. Additional transportation analysis may be needed to determine if these facilities may be capable of diverting local trips from the US 92/SR 600/ISB corridor. Additional analysis may include evaluation of potential environmental, socio-economic, safety, and right-of-way impacts, and other considerations.

Driveway Connectivity

Multiple access driveways are a negative presence in the pedestrian environment, as they present potential conflicts between drivers and pedestrians and the increased possibility that pedestrian through travel will be compromised. In addition, a high number of driveways (and the resultant crossing width between the driveway curb cuts) reduces the available space for planting and other amenities. Improved driveway design can provide added space for planting to improve street aesthetics.

Land development standards or guidelines that encourage or require shared-use driveway connections and interconnections between adjoining parking areas not only reduce conflict points and improve safety along the study corridor, but they can also significantly reduce short automobile trips between adjacent uses, keeping these trips from arterials and thereby reducing congestion. In addition, efforts to combine or reduce existing driveway connections should be part of the land development review process before approving new development proposals.

Bicycle Facilities/Network Connectivity

For a bicycle network to attract the widest possible segment of the population, its most fundamental attribute should be to provide routes between user's origins and destinations that do not require cyclists to use links that exceed their tolerance for traffic stress and that do not involve an undue level of detour[i]. The designation of a series of connected bicycle facilities and low-volume local streets parallel to the corridor would significantly expand bicycling opportunities for both experienced and casual recreational bicyclists beyond the existing and recommended bicycle facilities along US 92/SR 600/ISB.

In order to achieve such a network, additional study to develop measures of low-stress connectivity, classifying state, county, and local streets by levels of traffic stress is recommended.

8.3.2 Transit

Right-of-way constraints within the US 92/SR 600/ISB corridor limit the options for significant roadway capacity improvements. Therefore, in addition to policy considerations (regional visioning principles, comprehensive plan policies, Context Sensitive Streets guidelines, and goals and objectives of this study and other long-range transportation policies), public transit must play a significant role in satisfying the mobility needs of the study area.

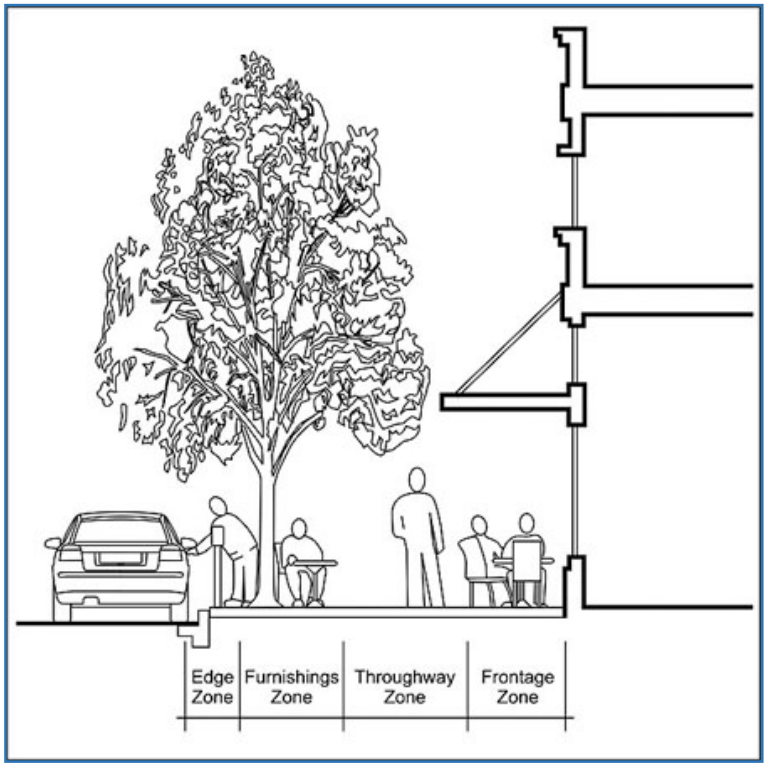
While there are several destinations with significant concentrations of activity that can be served by transit (e.g. the Beachside, Daytona International Speedway, ERAU, DBIA, BCU, DSC), the relatively dispersed and scattered development pattern along the US 92/SR 600/ISB corridor creates challenges for implementing high quality transit service in the study area. To avoid long walking distances, route lengths must be increased and stops introduced to deliver transit patrons to their final destination.

Transit improvements for this study area are an integral part of FDOT's ongoing Volusia Transit Connector Study. The FDOT is conducting the study to identify a recommended alternative or alternatives to provide effective transit service to improve connectivity and mobility in Volusia County. The recommendations are intended to meet both current and future transportation needs to enhance mobility. The study area extends from SR 46 in Seminole County to US 1/Ridgewood Avenue in Daytona Beach, directly impacting Segments 1, 2 and 3 of the CMMP study.

Recommendations will be jointly adopted by FDOT, the River to Sea TPO, MetroPlan Orlando, and local government agencies. The study is scheduled to conclude in February of 2016 and its findings will become the basis for future transit recommendations.

8.3.3 Streetside Design

Several principles should be included when creating a walkable environment that is inviting for pedestrians, encourages interaction between streetside activities and adjacent land uses, and provides inviting areas to wait for transit. Generally, there should be well-defined zones so that the pedestrian zone is clearly delineated and clear of obstacles such as utilities, signage and landscaping. These zones are illustrated in the figure, below.



Source: Designing Walkable Urban Thoroughfares: A Context Sensitive Approach (ITE)

The furnishings zone can contain a number of elements – street furniture, street lighting, transit stops with shelters, bicycle racks and landscaping – and should be located in a manner without interference with the pedestrian way ("throughway zone"). The various elements also serve as a barrier between the roadway and the pedestrian zone, which serves to increase pedestrian comfort. An important consideration in Florida's environment is the use of shade trees, canopies and/or shelters to provide shade and protection from the elements. The adjacent illustration depicts a typical streetside layout with commercial frontage. However, the principles of a free and clear pedestrian way and a clearly demarcated furnishings zone can also apply to predominantly commercial frontage and other land uses that exist along US 92/SR 600/ISB.

References:

Low Stress Bicycling and Network Connectivity, Mineta Transportation Institute, May 2012 http://transweb.sjsu.edu/PDFs/research/1005-low-stress-bicycling-network-connectivity.pdf)

[i] *Transit Capacity and Quality of Service Manual, 2nd Edition,* Transportation Research Board, May 8, 2012 http://www.trb.org/Main/Blurbs/153590.aspx

[iii] *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach,* ITE, 2010 http://www.ite.org/css/online/

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