STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

PRELIMINARY ENGINEERING REPORT

Florida Department of Transportation

District 4

SR 5/US 1 at Aviation Boulevard

Limits of Project: n/a

Indian River County, Florida

Financial Management Number: 441693-1-22-02

ETDM Number: 14475

Date: 10/23/2024

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022 and executed by the Federal Highway Administration and FDOT.

Project Development & Environment (PD&E) Study

SR 5/US 1 at Aviation Boulevard

Milepost 7.217

Financial Management Number: 441693-1-22-02 ETDM Number: 14475 Indian River County, Florida

PRELIMINARY ENGINEERING REPORT

Prepared for:



Florida Department of Transportation

District 4

Prepared by:

WGI, Inc. 2035 Vista Parkway West Palm Beach, FL 33411

October 2024

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PROFESSIONAL ENGINEER CERTIFICATION

PRELIMINARY ENGINEERING REPORT

Project: SR 5/US 1 at Aviation Boulevard

ETDM Number: 14475

Financial Project ID: 441693-1-22-02

Federal Aid Project Number: N/A

This preliminary engineering report contains engineering information that fulfills the purpose and need for the SR 5/US-1 at Aviation Boulevard Project Development & Environment Study in (Indian River County), Florida. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

I hereby certify that I am a registered professional engineer in the State of Florida practicing with WGI, Inc., and that I have prepared or approved the evaluation, findings, opinions, conclusions or technical advice for this project.



This item has been digitally signed and sealed by *[William Evans, PE]* on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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1.0 PROJECT SUMMARY

1.1 **Project Description**

The project intersection of SR 5/US 1 and Aviation Boulevard is located within the urbanized area of the City of Vero Beach in Indian River County (IRC), Florida. This is a 4-legged, signalized intersection that accommodates the Florida East Coast (FEC) Railroad crossing on the eastbound approach. The FEC Railroad, which is part of the Strategic Intermodal System (SIS) Railroad Corridor, includes double-tracks running north-south parallel to SR 5/US 1 on the west side. Pedestrian crosswalks are provided on the northbound and westbound approaches of the intersection. There are no dedicated bicycle facilities. Nearby landmarks include Vero Beach Regional Airport, Cleveland Clinic Indian River Hospital and Indian River Medical Center, and downtown Vero Beach. The intersection is near a Runway Protection Zone (RPZ) of the Vero Beach Regional Airport.

The project proposes operational and capacity improvements to the intersection of SR 5/US 1 and Aviation Boulevard/32nd Street. Various alternatives were considered during the Project Development & Environment (PD&E) study, which included at-grade and grade-separated crossings over the FEC Railroad. Additional features were considered such as multi-modal improvements. To account for potential grade separation and other solutions that address the purpose and need, the north-south limits of the Efficient Transportation Decision Making (ETDM) screening extend along US 1 between 21st Street and 41st Street (approximately 2 miles). The ETDM limits extend along Aviation Boulevard from 27th Avenue to 13th Avenue. The PD&E study limits, as defined by the Preferred Alternative in **Section 1.5**, are shown in **Figure 1-1**.

SR 5/US 1 constitutes the north and south approaches of the intersection, as a four-lane divided facility with a painted center turn-lane, curb and gutter on both sides, and a sidewalk on the east side. SR 5/US 1 has a functional classification of Urban Principal Arterial Other and a context classification of C4 Urban General since there are mostly non-residential land uses along the corridor with residential neighborhood connections. Indian River County and FDOT have designated the SR 5/US 1 corridor as a hurricane evacuation route.

At the eastbound approach of the intersection, Aviation Boulevard crosses the FEC Railroad. This is a 2-lane undivided roadway with no pedestrian facilities. Aviation Boulevard has a functional classification of Urban Minor Arterial and a context classification of Suburban Commercial (C3C) due to the non-residential land uses. The westbound approach is served by 32nd Street as a local 2-lane undivided street serving limited commercial and residential properties.



Figure 1-1 Project Location Map

1.2 Purpose & Need

Purpose

The primary purpose of the project is to evaluate intersection improvement solutions to address existing and projected traffic demands, improve safety, support economic growth, and enhance modal interrelationships with rail, bicycle, and pedestrian modes.

Need

Project Status

The project is listed in the Indian River Metropolitan Planning Organization's (MPOs) 2045 Long Range Transportation Plan (LRTP) Cost Feasible Plan Projects as Project ID 2 and is included in the local Transportation Improvement Program (TIP). This project is also listed as Priority Project #6 in the MPOs 2024 Priority Projects Report. The project is programmed for funding for the Project Development & Environment (PD&E) phase and Preliminary Engineering (PE) phase in the TIP and the State Transportation Improvement Plan (STIP). The project is planned for funding for the right of way and construction phases according to the 2045 LRTP.

Traffic Demand and Capacity

According to the IRC MPO 2021 Priority Projects Report, the intersection is currently failing or nearly failing during peak periods.

As part of this PD&E study, FDOT District 4 developed, under a separate study, the Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support, dated November 2, 2021. The Efficient Transportation Decision Making (ETDM) traffic forecasting section is updated as follows.

The SR 5/US 1 at Aviation Blvd intersection operates in the year 2021 at Level of Service (LOS) C/D in the AM/PM peak periods. The eastbound and westbound approaches operate at LOS E or F during both peak periods, with the eastbound queue length exceeding the available storage.

The future No-Build (without improvements) shows the 2045 traffic demand increasing due to population and employment growth as well as planned capacity improvements in the immediate network; therefore, conditions are expected to degrade at this intersection without improvements.

According to the analysis forecast developed from the Treasure Coast Regional Planning Model (TCRPM), the Annual Average Daily Traffic (AADT) is projected to increase 61% between the years 2021 and 2045. Along SR 5/US 1 south of Aviation Boulevard, No-Build traffic volumes are projected to increase from 26,500 to 42,600 AADT for the analysis years 2021 and 2045, respectively. To the north of Aviation Boulevard, SR 5/US 1 traffic volumes will increase from 34,200 to 55,000 AADT. Along Aviation Boulevard, the increase is from 12,000 to 19,300 AADT.

It is anticipated that traffic operations will degrade to LOS F by 2045 at the intersection of SR 5/US 1 at Aviation Boulevard without improvements under the No-Build condition. Delays will reach 135/156 seconds per vehicle during AM/PM peak periods. The eastbound and westbound approaches would operate at LOS F with delays reaching 206/135 seconds of delay per vehicle, and the eastbound queue length exceeding the available storage by 169%.

The IRC Aviation Boulevard extension project, which is a separate nearby project, has construction funds committed according to the IRC Capital Improvement Element adopted in December 2020. At the time of this study, construction had not begun on the

project, but the County has started the right-of-way acquisition process and design. All evaluated Build Alternatives will connect with the new IRC road that extends Aviation Boulevard to the east from US 1 to 41st Street. According to the IRC MPO 2045 LRTP, other planned nearby capacity improvements include widening of Aviation Boulevard from 2 to 4 lanes, from 27th Avenue to the subject intersection with SR 5/US1. These projects will increase the traffic demand at the intersection of SR 5/US 1 and Aviation Boulevard as well.

<u>Safety</u>

The 2021 Florida Strategic Highway Safety Plan (FSHSP) has identified intersections as an emphasis area while rail crossings are an evolving emphasis area. A historical crash evaluation of the intersection of SR 5/US 1 and Aviation Boulevard revealed a total of 54 crashes observed over a five-year period between 2016 and 2020. Approximately 23% of these crashes resulted in injuries. The majority of these crashes were rear end at approximately 42% followed by sideswipe at 26% and left turn crashes at 15%. These types of crashes may be correlated to congested conditions at the intersection. One crash involved an FEC Railroad train and a vehicle which resulted in injury. Two crashes involved the FEC Railroad crossing gate. The existing facility's safety performance crash rate was calculated at 0.92 which is significantly higher than the Statewide crash rate of 0.53 and the Districtwide crash rate of 0.34. This indicates a potential safety concern. The SR 5/US 1 corridor has been designated by IRC as an evacuation route.

Social Demands or Economic Development

According to the IRC MPO 2045 LRTP, the County's population is projected to grow 41% between the year 2015 to 2045 (143,326 population in 2015 to 201,839 in 2045). Similarly, employment is projected to grow 24% (76,386 employed during 2015 to 94,626 in 2045).

The City of Vero Beach Comprehensive Plan (April 2018) shows existing undeveloped lands along SR 5/US 1 in the vicinity of the intersection with Aviation Boulevard. The Future Land Use map presents a transformation of this area with mixed-use development, commercial, mixed residential, and residential medium. This indicates potential land development growth in the immediate area of the project.

Based on the IRC Comprehensive Plan, the IRC/City of Vero Beach Enterprise Area includes an area from SR 5/US 1 as the eastern boundary, 43rd Avenue as the western boundary, 53rd Street as the northern boundary, and Atlantic Boulevard as the southern boundary. The Enterprise Area encourages economic growth and investment through tax incentives which may increase traffic demand in the area.

The Vero Beach Regional Airport Master Plan includes an Airport Commercial Village and proposes to increase daily passenger traffic and identifies aircraft storage. Moreover, the master plan forecasts an annual average growth rate for aircraft operations at 1.5% indicating an increase an air traffic to/from the airport.

Modal Interrelationships

The intersection of SR 5/US 1 and Aviation Boulevard currently serves numerous modes of transportation, including: vehicles, pedestrians (sidewalks and crosswalks), transit, and the FEC Railroad crossing at the eastbound approach of the intersection. IRC's transit system, GoLine, includes three bus routes along SR 5/US 1 and one route along Aviation Boulevard based on the 2021 transit system map. In addition, the Vero Beach Regional Airport is located directly northwest of the intersection with direct access along Aviation Boulevard.

The existing bicycle and pedestrian networks are limited in the vicinity of the project. There are no bicycle lanes, and sidewalks are only present on the east side of SR 5/US 1. Guided by the 2015 Bicycle and Pedestrian Plan, the Indian River MPO 2045 LRTP proposes new sidewalks and bicycle facilities in conjunction with roadway improvement projects along Aviation Boulevard between SR 5/US 1 and 43rd Avenue which is the entire southern boundary of the Vero Beach Regional Airport. The plan also proposes a new bicycle facility along SR 5/US 1 north of Aviation Boulevard which supports a vision to have a bicycle facility along most SR 5/US 1 within the County.

The Indian River MPO 2045 LRTP, which is based on the IRC Transit Development Plan (TDP), presents several transit needs in the immediate area of the intersection of SR 5/US 1 including a potential bus shelter at the intersection, new/modified route service along SR 5/US 1, and improved route operations along Aviation Boulevard.

The FEC Railroad, which is parallel and abutting west of SR 5/US 1, is part of the FDOT SIS. According to the Indian River MPO 2045 LRTP, a performance evaluation goal is to enhance the FDOT SIS by constructing a flyover at the FEC Railroad at the intersection of SR 5/US 1 and Aviation Boulevard (Objective 1.04, Policy 1.04.1, and Performance Indicator 1.041.1).

In 2016, the Vero Beach Regional Airport released their master plan that identified numerous needs such as an "Airport Commercial Village" along Aviation Boulevard which would function as a key commercial district. In addition, the plan describes improvements to Aviation Boulevard which is the gateway and primary access to the Airport.

1.3 Commitments

Project commitments are as follows:

- 1. FDOT is committed to continue coordination with Camp Haven Rehabilitation Center during the design and right of way process.
- 2. FDOT is committed to archaeological monitoring by a professional archaeologist during earth-disturbing construction activities.
- 3. The most recent version of *USFWS' Standard Protection Measures for the Eastern Indigo Snake* will be adhered to during construction of the proposed project.
- 4. The most recent version of the *USFWS Standard Manatee Conditions for In-Water Work* will be adhered to during construction of the proposed project.
- 5. A gopher tortoise burrow survey within suitable tortoise habitat will be conducted prior to construction.
- 6. Noise abatement measures are not recommended for construction as part of the proposed project. If changes occur to the conceptual Preferred Alternative, additional analysis may be warranted. If this occurs, the FDOT commits to the construction of feasible and reasonable noise abatement measures at noise-impacted locations contingent on the following:
 - Final recommendations on the construction of the abatement measure are determined during the project's final design and through the public involvement process;
 - Detailed noise analyses during the final design process support the need, feasibility, and reasonableness of providing abatement;
 - Cost analysis indicates that the cost of the noise barrier(s) will not exceed the cost reasonable criterion;
 - Community input supporting types, heights, and locations of the noise barrier(s) is provided to the District Office;
 - Safety and engineering aspects as related to the roadway user and the adjacent property.
- 7. The FDOT is committed to continued coordination with the Florida East Coast Railway and City of Vero Beach during the design phase to identify acceptable

railroad risk counter measures and potential closure of the 14th Ave railroad crossing.

8. FDOT is committed to coordinating the FDOT project with the Indian River County project that extends Aviation Boulevard east of SR 5/US 1.

1.4 Alternatives Analysis Summary

Alternatives analysis is the process of developing, evaluating, and eliminating potential project alternatives based on the purpose and need of the project. The analysis focused on the intersection and approaches at SR 5/US 1 and Aviation Boulevard. The IRC MPO LRTP included a feasibility study into the PD&E study to consider grade separating the intersection over the railroad. The process also included a separate RPZ alternatives analysis requested by the Federal Aviation Administration (FAA) to evaluate effects to Runway 30L operations and safety.

The alternatives analysis process included a screening of eight alternatives, elimination of four alternatives, and four alternatives considered for additional study. The 'No-Build' alternative is defined as the alternative in which the proposed project improvements would not take place and is used as the baseline against which 'Build' alternatives are evaluated. Local coordination with the public, Vero Beach Regional Airport, City of Vero Beach, IRC Public Works and MPO occurred throughout the alternatives analysis process.

1.4.1 Alternatives Considered

No Build Alternative: This alternative does not implement improvements and maintains the existing conditions through the project with only periodic maintenance improvements.

Alternatives 1 through 6 represent the at-grade and grade separated alternatives. Alternatives 7 and 8 resulted from the Intersection Control Evaluation (ICE) process.

Alternative 1 Conventional Intersection: This alternative reconstructs the intersection and adds turn lanes to all approaches. This alternative adds one westbound through lane on Aviation Boulevard to accept the dual left and right turns. The Indian River Farms Water Control District (IRFWCD) Main Canal bridge along SR 5/US 1 located north of 28th Street is replaced due to the widening of the roadway typical section. The at-grade railroad crossing is improved. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 2 One-way Pair: This alternative splits SR 5/US 1 into a pair of roadways. The existing SR 5 serves southbound traffic, and a new two-lane roadway is located 600 feet

to the east. The Main Canal bridge is replaced. The at-grade railroad crossing is improved. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 3 US-1 Overpass Alternative: This alternative elevates the four through lanes of SR 5/US 1 over Aviation Boulevard with ramps to provide for turning movements and local access. The Main Canal bridge is replaced. The at-grade railroad crossing is improved. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints. The SR 5/US 1 overpass is outside of the runway protection zone (RPZ) and below the 40:1 flight surface.

Alternative 4 Aviation Boulevard Overpass (with railroad grade-separation): This alternative elevates Aviation Boulevard over SR 5/US 1 and eliminates the at-grade FEC railroad crossing and signalized intersection on SR 5/US 1. A new four-lane quadrant street connection provides for turning movements to/from the overpass. The overpass and approaches are within the RPZ and below the 40:1 flight surface. The Main Canal bridge is replaced. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 5 Aviation Boulevard Underpass (with railroad grade-separation): This alternative depresses Aviation Boulevard and eliminates the at-grade FEC railroad crossing and signalized intersection on SR 5/US 1. A new four-lane quadrant street connection provides for turning movements to/from the underpass. Two (2) new bridge structures would be required to carry the FEC railroad and SR 5/US 1 roadway over the underpass. This depressed, open-cut type roadway is within the RPZ and below the 40:1 flight surface. The Main Canal bridge is replaced. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 6 Aviation Boulevard Overpass (with partial railroad grade-separation): This alternative elevates Aviation Boulevard through lanes over the FEC railroad and SR 5/US 1 and retains an at grade railroad crossing for turning movements and the signalized intersection at SR 5/US 1. The Aviation Boulevard overpass embankment is within the RPZ and below the 40:1 flight surface with 17.8 ft of clearance between the bridge profile and flight surface. The Main Canal bridge is replaced. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 7 Displaced Left Turn (DLT): This alternative is at-grade with the northbound SR 5/US 1 left turn displaced or deflected to the west side of the SR 5/US 1 right of way via a signalized directional median and a two-lane, two-way parallel roadway located between southbound lanes of SR 5/US 1 and the FEC right of way. The Main Canal bridge is replaced. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 8 Median U-Turn with Roundabout: This alternative eliminates three of the four left turns and incorporates a roundabout and quadrant road to provide for the left turns on the northbound, westbound, and southbound approaches. The eastbound left turn remains in place. The Main Canal bridge is replaced. The at-grade railroad crossing is improved. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

1.4.2 Alternatives Considered and Eliminated

The alternatives analysis process included several coordination meetings with the city, county, airport, FAA, FEC RR, and MPO. The FAA required a RPZ alternatives analysis that evaluated the PD&E alternatives and alternatives that modified the runway. The RPZ analysis concluded that at-grade PD&E alternatives were the best solution for aviation safety and operations. The FAA, airport, and city officials concurred with the findings of the RPZ alternatives analysis and supported only at-grade railroad crossing alternatives. A screening matrix (**Table 5.3**) compared the eight alternatives 'operations, impacts and cost. The four at-grade alternatives scored best. Alternatives 3, 4, 5, and 6 were eliminated from further study.

1.4.3 Alternatives Considered for Further Evaluation

Alternatives 1, 2, 7, and 8, which are the at-grade railroad crossing alternatives, were advanced into detailed PD&E analysis. A public alternatives workshop was held and further coordination with the city, county, airport, FAA, FEC RR, and MPO occurred. Alternative 1 scored the best, was supported by the city, county and public and became the Preferred Alternative.

1.5 Description of Preferred Alternative

The Preferred Alternative was identified based on the results of the alternatives evaluation, public involvement, and coordination with local officials. The existing and proposed speed limit on SR 5/US 1 is 45 mph with an urban four lane divided proposed typical section. The existing and proposed speed limit on Aviation Boulevard is 30 mph with an urban four lane divided typical section to the west of SR 5/US 1; and an urban two lane typical section to the east of SR 5/US 1. No design exceptions or variations are anticipated with the Preferred Alternative, shown in **Appendix A**.

The Preferred Alternative reconstructs the SR5/US 1 and Aviation Boulevard intersection:

- Limits of Construction:
 - SR 5/US 1 limits begin at 28th Street and end 1300 ft north of Aviation Boulevard, for a total length of 2700 ft. Proposed travel lane widths are 11-ft wide.
 - Aviation Boulevard limits begin 750 ft west of Airport N. Drive and end 670 ft east of SR 5/US 1, for a total length of 2200 ft. Proposed travel lane widths are 11-ft wide.
- The existing SR 5/US 1 bridge (no. 880085) over the Indian River Farms Water Control District (IRFWCD) Main Canal will be replaced and includes, 11-ft travel lanes, 25-ft-4-in inch raised median, 7-ft bike lanes, with additional 1-ft-4-in shoulder width, and a 12-ft shared use path on the east side.
- A 2.52-acre dry retention pond is proposed and located adjacent to the project between 30th Street and 31st Street.
- SR 5/US 1 at Aviation Boulevard intersection configuration:
 - Northbound approach: two left turn lanes, two travel lanes, and one right turn lane,
 - Southbound approach: one left turn lane, two travel lanes, and two right turn lanes,
 - o Westbound approach: one left turn lane, one travel lane, one right turn lane,
 - o Eastbound approach: two left turn lanes, one travel lane, one right turn lane,
 - Bicycle lanes are provided on SR 5/US 1 from 29th Street to approximately 350 ft north of 33rd Street.
 - Bicycle lanes are provided on Aviation Boulevard from SR 5/US 1 to 33rd Street in the eastbound and westbound direction; and from SR 5/US 1 to Airport N. Drive in the westbound direction only. The bicyclist will use the shared use path in the eastbound direction within the airport property.

- The alignment east of SR 5/US 1 curves to the north and connects with 33rd Street to be compatible with the proposed alignment of the Aviation Boulevard Extension project being conducted by IRC. At the Main Canal Bridge, SR 5/US 1 is shifted 15 feet to the east for additional maintenance access between the bridge and FEC Railroad right-of-way.
- Bus bays are provided on SR 5/US 1, north and south of the intersection.
- A 12-ft shared use path is provided along the east side of SR 5/US 1 throughout the study area and a 12-ft shared use path is provided on the south side of Aviation Boulevard west of SR 5/US 1.
- High emphasis crosswalks are provided on the south and east approach of the intersection.
- Access to Airport N. Drive is provided with one westbound right turn lane and one eastbound left turn lane.
- Approximately 6.44 acres of additional right-of-way is needed from 27 parcels. A potential of four (4) business relocations and zero (0) residential relocations are anticipated. One outdoor advertising sign (#CB560) will require acquisition.

The conceptual plans for the Preferred Alternative are shown in **Appendix A** and the proposed typical sections for SR 5/US 1 and Aviation Boulevard are shown in **Figure 1-2**, **1-3** and **Figure 1-4**, respectively.



Figure 1-2 Preferred Alternative Typical Section SR 5/US 1



Figure 1-3 Preferred Alternative Typical Section SR 5/US 1 Main Canal Bridge



Figure 1-4 Preferred Alternative Typical Section Aviation Boulevard

1.6 List of Technical Documents

Below is a list of technical documents prepared as a part of this PD&E Study and included as part of the project file in FDOT's State-Wide Environmental Project Tracker (SWEPT).

Public Involvement:

- Public Involvement Plan July 2022
- Comments and Coordination Report July 2024
- Public Hearing Transcript June 2024

PD&E Engineering:

- Bridge Load Rating July 2024
- Geotechnical Report May 2024
- Intersection Control Evaluation Stage 1 Report April 2024
- Location Hydraulics Report February 2024
- Pond Siting Report July 2024
- Preliminary Engineering Report August 2024
- Project Traffic Analysis Report July 2024
- Typical Section Package July 2024
- Utilities Assessment Package February 2024

Environment:

- Conceptual Stage Relocation Plan Apil 2024
- Contamination Screening Evaluation Report (CSER) March 2024
- Cultural Resource Assessment Survey April 2024
- Noise Study Report July 2024
- Section 4(f) Determination of Applicability (DOA) July 2023
- Sociocultural Effects Evaluation (SCE) July 2024
- Type II Categorical Exclusion August 2024
- Water Quality Impact Evaluation March 2024

General:

- Planning Consistency Form July 2024
- Project Commitments Record August 2024

2.0 EXISTING CONDITIONS

This section of the report summarizes the existing conditions of the study area. It should be noted that managed lanes, noise walls and perimeter walls, and intelligent transportation system (ITS)/Transportation System Management and Operations (TSM&O) features are not present within the study area.

2.1 Roadway

The SR 5/US 1 at Aviation Boulevard PD&E Study area includes SR 5/US 1 from 21st Street to 41st Street, and Aviation Boulevard from 27th Avenue to SR 5/US 1 and 32nd Street from SR 5/US 1 to 13th Avenue. The SR 5/US 1 existing typical section contains two (2) travel lanes in each direction with a center flush paved median for left turns and a concrete sidewalk along the east side. SR 5/US 1 is a designated FDOT evacuation route. FEC railroad tracks run parallel to SR 5/US 1 along the west side. SR 5/US 1 Bridge No. 880085 over the Main Canal follows the same typical section as the roadway and includes two-foot shoulders on either side of the bridge. Most of the SR 5/US 1 corridor is flanked by curb and gutter and has a normal crown. The existing typical section (with normal crown) for SR 5/US 1 can be seen in **Figure 2-1**.



Figure 2-1 Existing Typical Section – SR 5/US 1

Within the study limits, there is approximately 750 feet of SR 5/US 1 that doesn't have normal crown and is comprised of a cross slope that is sloped down towards the east curb and gutter. This mono-pitched section of SR 5/US 1 occurs at the intersection with Aviation Boulevard. The second existing typical section (with mono-pitch cross slope) for SR 5/US 1 can be seen in **Figure 2-2**.



Figure 2-2 Existing Typical Section 2 – SR 5/US 1

Aviation Boulevard is an IRC maintained roadway with one (1) travel lane in each direction with curb and gutter from 27th Avenue to 27th Street and grass shoulders from 27th Street to SR 5/US 1. The county is currently evaluating extending Aviation Boulevard east from SR 5/US 1 to the Cleveland Clinic Hospital, which would reconstruct the existing 32nd Street. The proposed extension would connect the intersection of SR 5/US 1 at Aviation Boulevard directly to 37th Street, go along the west perimeter of the hospital campus and extend north of 37th Street to 41st Street. The existing typical section for Aviation Boulevard can be seen in **Figure 2-3**.



Figure 2-3 Existing Typical Section – Aviation Boulevard

2.2 Right-of-Way

The right-of-way width along SR 5/US 1 is 70 feet from 21st Street to 26th Street and from south of Main Canal Bridge No. 880085 to 37th Street. Between 26th Street and Main Canal Bridge No. 880085, the right-of-way expands to 104 feet with the increased right-of-way area on the east side of the roadway. Between 37th Street and 41st Street, the right-of-way on SR 5/US 1 varies from 70 feet to 120 feet.

The existing right-of-way along Aviation Boulevard is 74.5 feet and expands to 92 feet starting with the first of two horizontal curves leading to SR 5/US 1.

According to the FDOT Runway Protection Zone report, the right of way for Aviation Boulevard is on airport land with oversight/approval authority by the FAA. The Aviation Blvd right-of-way survey is in **Appendix B**.

Aviation Boulevard is located on Airport property and a portion of the right-of-way travels through the RPZ of Runway 30L. Aviation Boulevard is located outside of the RSA and the Runway Object Free Area. It appears from the Airport's Exhibit "A" that the land upon which Aviation Boulevard is located on Airport property was acquired through the Surplus Property Act of 1944. Additionally, the FAA has approval authority over any property that "i. materially impacts the safety and efficient operation of aircraft at, to, or from the airport, and ii. adversely affects the safety of people or property on the ground adjacent to the airport as a result of aircraft operations" within the Airport property line through Section 163 of the FAA Reauthorization Act of 2018.

2.3 Roadway Classification & Context Classification

Functional classification for SR 5/US 1 and Aviation Boulevard was obtained from FDOT straight line diagrams (**Appendix B**) and federal functional classification and urban area boundary maps for IRC, Florida. Project Level Context Classification (PLCC) was obtained from the FDOT Complete Streets Team via an email dated April 21, 2021. The functional and context classification for SR 5/US 1 and Aviation Boulevard within the study area are summarized in **Table 2-1**.

Roadway	Limits	Functional Classification	Context Classification
SR 5/US 1	21 st Street to 38 th Lane	Urban Principal Arterial Other	C4 Urban General
Aviation Blvd	27 th Ave to SR 5/US 1	Urban Minor Arterial	C3C Suburban Commercial

Table 2-1	Roadway Classification	

2.4 Adjacent Land Use and Vero Beach Regional Airport

The PD&E study area is located within the FHWA Urban Area Boundary. The surrounding parcels feature a variety of land use throughout the SR 5/US 1 and Aviation Boulevard study corridors. SR 5/US 1 adjacent land use is primarily Airport Light Industrial, Commercial, Industrial, and Park zones. The surrounding parcels adjacent to Aviation Boulevard have existing land uses that are primarily Industrial, Airport Light Industrial, and Residential Single-Family zones. The City of Vero Beach's water treatment plant is located on the northwest of SR 5/US 1 and Aviation Boulevard. Undeveloped areas within the project study area are herbaceous (dry prairie), shrub and brushland, and streams and waterways. Existing land use, obtained from the City of Vero Beach and IRC, for the study area is shown in **Figure 2-4**, with the study corridors highlighted in yellow.

2.4.1 Vero Beach Regional Airport and Runway Protection Zone

The Vero Beach Regional Airport (VRB) is located on the north side of Aviation Boulevard and west of Airport N Drive. At the time of the PD&E study, an airport master plan update was underway. Vero Beach Regional Airport has three runways, with the longest runway measuring 7,314 feet. The airport serves all facets of general aviation, including intercontinental business jets and most air carrier aircraft. The mission of the Airport is to provide safe and efficient aviation facilities and associated services to both commercial and non-commercial users, while operating in harmony with the community's quality of life goals. The airport contributes \$1.32 billion in direct, indirect, and induced economic impact, including over 5,500 jobs, to the City of Vero Beach. The airport facilities map from the VRB Airport Master Plan (working paper Jan/2023) are shown in **Figure 2-5**. Aviation Boulevard currently traverses the Runway 30L Runway Protection Zone (RPZ). The study intersection is located off airport property, but the project would include improvements to Aviation Boulevard on Airport property including within the Runway 30L RPZ. A RPZ analysis was conducted to evaluate impacts from the alternatives to the RPZ and is located in **Appendix B**.



Figure 2-4 Existing Land Use





2.5 Access Management Classification

The segment of SR 5/US 1 from 21st Street to south of 39th Street is Access Class 6 and from south of 39th Street to 41st Street is Access Class 5. The entire study limits have a flush paved median. Aviation Boulevard intersects with SR 5/US 1 within the Access Class 6 section of SR 5/US 1. Access Class 6 criteria set by Rule 14-97 Florida Administrative Code (FAC) and included in the FDOT Florida Design Manual Table 201.4.2 is shown in **Table 2-2**. Aviation Boulevard is a county roadway and does not have a FDOT access classification.

Access Class	Median Type	Connection Spacing (ft)	Median Opening Directional (ft)	Median Opening Full (ft)	Signal Spacing (ft)
6 Non- 440 > 45 mph Restrictive 245 <u><</u> 45 mph				1320	

Table 2-2 Access Class 6 Criteria	Table 2-2	Access Class 6 Criteria
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Several locations along SR 5/US 1 do not meet the access spacing standards; existing spacing for access openings are summarized in **Table 2-3**.

Table 2-3SR 5/US 1 Access Management

Existing Opening	Existing Median Opening Type	Existing Spacing (ft)	Existing Signal Spacing (ft)	Variance
21 st Street	Full (unsignalized)			
22 nd Street	Full (unsignalized, t-intersection)	430		
23 rd Street/Royal Palm Blvd	Full (signal)	450		
24 th Street	Full (unsignalized, t-intersection)	450		
25 th Street	Full (unsignalized, t-intersection)	450		
14 th Avenue	Directional (unsignalized)	150		67%
26 th Street	Full (signal)	285	1335	None
28 th Street	Full (unsignalized, t-intersection)	775		
29 th Street	Full (unsignalized, t-intersection)	335		
30 th Street	Full (unsignalized, t-intersection)	460		

Existing Opening	Existing Median Opening Type	Existing Spacing (ft)	Existing Signal Spacing (ft)	Variance
31 st Street	Full (unsignalized, t-intersection)	325		
Aviation Blvd/32 nd Street	Full (signal)	350	2245	None
33 rd Street	Full (unsignalized, t-intersection)	370		
Pickerill Lane	Full (unsignalized, t-intersection)	1,620		
36 th Street	Full (unsignalized, t-intersection)	650		
37 th Street	Full (signal)	720	3360	None
37 th Place	Full (unsignalized, t-intersection)	300		
38 th Street	Directional (unsignalized, t- intersection)	275		
38 th Place	Directional (unsignalized, t- intersection)	265		
38 th Lane	Full (signal)	270	1110	16%
39 th Street	Directional	265		
41 st Street	Full (signal)	1,400	1665	None

2.6 Design and Posted Speeds

Based on existing plans (Financial Management (FM) 415291-1-52-01), SR 5/US 1 has a design speed that matched the posted speed. Southbound SR 5/US 1 has a posted speed of 35 mph from the being project limit and transitions to a 45-mph posted speed limit north of the 31st Street intersection. Northbound SR 5/US 1 has a posted speed of 35 mph from the being project limit and transitions to a 45-mph posted speed of 35 mph from the being project limit and transitions to a 45-mph posted speed of 35 mph from the being project limit and transitions to a 45-mph posted speed south of the 28^h Street intersection.

Target speed is dependent on several factors including the adjacent land use, mobility activity, and the posted and design speeds. The SR 5/US 1 segment from 21st Street to 33rd Street has 27 connecting driveways and side street connections along the east side or northbound lanes. North of 33rd Street to 41st Street there are approximately 12 connections along the northbound lanes of SR 5/US 1. Based on the posted speeds and access considerations, target speeds of 35 mph, 40 mph and 45 mph, from south to north, respectively, are noted in **Table 2-4**. This provides a transition from the flush paved

median section at 35 mph to the raised median section at 45 mph. A draft Target Speed Memorandum and coordination on 01/09/23 identified a 45-mph target speed with opportunity to use a 35 mph to 40 mph speed depending on the alternative. The PD&E build alternatives contain construction limits between 28th Street to south of 37th Street, which is identified to have a 45-mph design, posted and target speed.

Based on Aviation Boulevard Roadway Widening plans obtained from the City of Vero Beach, Aviation Boulevard has a design speed of 40 mph from station 150+92.00 to station 198+46.99 and a reduced design speed of 35 mph from station 198+46.99 to station 202+86.32 through the intersection with SR 5/US 1. Aviation Boulevard generally has a 40-mph posted speed limit. However, there is a 25-mph advisory speed limit posted for the reverse curve just west of the SR 5/US 1 intersection.

Roadway	Segment	Existing Posted Speed	Context Classification per FDOT PLCC	Access Class	Proposed Design Speed	Proposed Posted Speed	Proposed Target Speed
SR 5/US 1	21 st ST to 28 th ST	35 mph	*C4 Urban General	Class 6 (non-raised median)	35 mph	35 mph	35 mph
SR 5/US 1	28 th ST to 39 th ST	45 mph	C4 Urban General	Class 6 (non-raised median)	45 mph	45 mph	45 mph
SR 5/US 1	39 th ST to 41 st ST	45 mph	C4 Urban General	Class 5 (raised median)	45 mph	45 mph	45 mph
Aviation Blvd	27 th Ave to County Admin Rd	40 mph	C3C Suburban Commercial	Future 4-lane (raised)	35 mph	35 mph	35 mph
Aviation Blvd	County Admin Rd to SR 5/US 1	25 mph advisory	C3C Suburban Commercial	Future 4-lane (raised)	30 mph	30 mph	30 mph

Table 2-4Roadway Design, Posted and Target Speeds

*Note: The shaded rows are anticipated segments for the PD&E proposed Build improvements.

2.7 Vertical and Horizontal Alignment

Straight Line Diagrams and existing plans were obtained from FDOT and the City of Vero Beach and used in the evaluation of vertical alignments.

- FM 415291-1-52-01, SR 5 from 20th Place to south of 33rd Street, Resurfacing Plans, 10/7/2009.
- FM 406589-1-52-01, IRC (88010) Countywide, Signalization Plans, 1/3/2002

- State Project No 88010-3510, SR 5 (US 1), Widening and Resurfacing Plans, 9/23/1980
- City of Vero Beach Project No. 2011-11, Aviation Boulevard Widening Project from 43rd Avenue to US Hwy 1, 9/15/2011

Within the study area, the vertical alignments of SR 5/US 1 and Aviation Boulevard are relatively flat with grades of less than 1% along either corridor. SR 5/US 1 follows a sawtooth profile before the bridge over the Main Canal. North of the Main Canal bridge, the roadway profile has a slightly steeper grade with small vertical curves until the end of the project limits. Aviation Boulevard is also comprised of a sawtooth profile along the curbed sections of the roadway within the study limits. East of the intersection with County Admin/27th Street, the Aviation Boulevard profile remains flat and begins to drop as Aviation Boulevard approaches SR 5/US 1.

Survey data was collected for this PD&E Study and used in the horizontal alignment evaluation for both study corridors. Aviation Boulevard has three (3) superelevated curves throughout the project limits. SR 5/US 1 has four (4) horizontal curves within the project limits with survey information showing one (1) of the curves being superelevated. There is a deflection of approximately five (5) degrees through the intersection at 26th Street. Horizontal alignment information for both study corridors is summarized in **Table 2-5**.

PC Sta.	PT Sta.	Degree of Curvature	Radius (ft.)	Curve Length (ft.)	Superelevation	Plan Source of Data		
SR 5/US 1								
2019+96.25	2023+54.49	1.44	3,973.8′	258.2′	Normal Crown	Survey		
2054+84.87	2059+87.43	1.65	3,466.1'	502.6′	Normal Crown	Survey		
2079+09.17	2085+49.22	2.87	1,994.3'	640.1′	3.5%	Survey		
Aviation Boulevard								
1001+79.52	1006+28.37	9.96°	575.4′	448.8′	4%	Survey		
1032+35.63	1035+70.44	11.94°	479.7′	334.8′	5%	Survey		
1042+85.35	1045+94.81	15.3°	375.1′	309.5′	5%	Survey		

Table 2-5Existing Horizontal Alignment

2.8 Existing Pedestrian and Bicycle Accommodations

Along SR 5/US 1, the sidewalk spans the entire length of the study area on the east side of SR 5/US 1 and measures approximately five (5) feet wide. The west side of SR 5/US 1 features only a small stretch of sidewalk between 38th Lane (Old Dixie Highway) and 41st Street. Pedestrian facilities are absent along Aviation Boulevard. All crosswalks are marked throughout the corridor, and most are in fair condition (as shown in **Figure 2-6** and **Figure 2-7**).

At the intersection of SR 5/US 1 and Aviation Boulevard, designated crosswalks are only provided on the south and east approaches. This intersection was under construction by Brightline at the time of this report. New pedestrian features were being installed.



Figure 2-6 SR 5/US 1 and 32nd Street (looking south)



Figure 2-7 SR 5/US 1 and 30th Street (looking north)

Existing designated bicycle facilities are absent along SR 5/US 1 and Aviation Boulevard. The 2015 IRC Bicycle and Pedestrian Master Plan has identified a need for both SR 5/US 1 and Aviation Boulevard corridors within the study area to have detailed corridor studies completed for bicycle facility recommendation.

The Build Alternatives for this PD&E Study evaluate shared use paths along both SR 5/US 1 and Aviation Boulevard.

2.9 Planned Pedestrian, Bicycle and Trail Accommodations

There are no existing trails or multi-use paths within the study area. The Central IRC Greenways Plan (2007) and this projects ETDM Summary Report identified potential future trail corridors that traverse the project area. See **Figure 2-8** for potential shared use trail improvements. These include the Central Indian River Greenway Corridor, All Aboard Florida Rail with Trail Corridor, Florida East Coast Railroad Corridor, Main Relief Canal Corridor and Airport Loop Trail. The corridors and trails have several names and have a common set of multi-use trail along either SR 5/US 1 and/or Aviation Boulevard. These were evaluated with a Section 4(f) Determination of Applicability review.



Figure 2-8 Central IRC Greenways Plan
2.10 Transit Facilities

The GoLine, the IRC public transportation system, services the study area with bus routes 3 and 8. GoLine route 3 runs along SR 5/US 1 from the beginning of the project to 37^{th} Street and has bus stops at 28^{th} Street and 30^{th} Street. GoLine route 8 runs along Aviation Boulevard, turns north at the intersection with SR 5/US 1, and continues to the end of the project limits. Route 8 has one bus stop located within the study area at 38^{th} Lane. Both transit bus routes typically stop twice an hour at each location and run from 6AM - 7PM, Monday through Friday, and 8AM - 5PM on Saturday. **Appendix B** contains the transit map that illustrates the full route and schedule for each GoLine bus route.

The 2023 GoLine Transit Development Plan: Vision for 2033 (TDP), Table 7-1 identifies IRC Transit Priority Needs FY 2024-2033, as:

- FY 2030 Route 8, weekday frequency improvements
- FY 2033 Route 3, weekday frequency improvements

The FEC Railroad, which is parallel and abutting west of SR 5/US 1, is part of the FDOT Strategic Intermodal System (SIS) and is currently operating Brightline passenger service between Maimi and Orlando. There are currently no Brightline stations in IRC.

There are no existing park-and-ride lots and transfer centers within the study area.

2.11 Pavement Type and Condition

The most recent SR 5/SU 1 resurfacing project was FM 415291-1-52-01, in the year 2009. The latest Pavement Condition Survey reports for SR 5/US 1 were received from FDOT with test date 6/1/2023 and 6/5/2023. The current pavement conditions for SR 5/US 1 did not indicate any deficiencies (crack rating of 6.4 or less) and current conditions are summarized in **Table 2-6** and the condition survey is in **Appendix B**.

Begin End		Cracking Rate		Rut	Rate	Ride Rate		
Milepost	Milepost	NB	SB	NB	SB	NB	SB	
5.845	7.268	8.5	8.5	9	9	7.0	7.4	
7.268	7.930	8.0	8.5	8	8	7.2	7.4	
7.930	13.625	8.5	8.5	9	9	8.1	8.1	

Table 2-6SR 5/US 1 Pavement Condition

Due to Aviation Boulevard being a city owned roadway, west of US 1, Pavement Condition Survey reports are not available from FDOT. Existing plans for Aviation Boulevard were obtained from City of Vero Beach and show a pavement design comprised of Type 'B' Stabilization for 12 inches, optional base group 6, Type SP-12.5 structural course (Traffic C, 2 inches) and friction course FC-9.5 (Traffic C, 1 inch rubber).

Based on field reviews, the pavement on SR 5/US 1 and Aviation Boulevard appears to be in fair condition with some minor cracking and rutting (**Figure 2-9**). The pavement within the FEC railroad crossing on Aviation Boulevard, just west of SR 5/US 1, at the intersection appears to be new and in good condition due to the Brightline railroad crossing improvement project.



Figure 2-9 Existing Roadway Pavement on SR 5/US 1 (looking north)

2.12 Traffic Volumes and Operational Conditions

The FDOT planning office prepared a Traffic Forecasting Memorandum, dated 11/02/21. A Project Traffic Analysis Report (pre-draft PTAR 08/11/23) was prepared during the PD&E study.

The existing traffic data was collected in May 2021 on typical weekdays from 05/25/2021 to 05/27/2021 (Tuesday, Wednesday, and Thursday) at the intersections and roadways within the vicinity of the Aviation Boulevard Intersection. This data collection effort was performed during the peak hours for traffic.

The Average Daily Traffic (ADT) volume was then estimated as the average of the threeday counts. The Annual Average Daily Traffic (AADT) was computed by applying the seasonal factor (SF) and axle factor (AF). The existing year AADT volumes can be seen in **Figure 2-10** for the study area.

Six-hour vehicle turning movement counts (TMCs) (from 6:00 am to 9:00 am and from 4:00 pm to 7:00 pm), were obtained as part of the data collection effort for the following study intersections. The existing turning movement volumes for the AM and PM peak hours are summarized in **Figure 2-11** and **Figure 2-12**.

- 1. SR 5/US 1 & Aviation Blvd.
- 2. SR 5/US 1 & 26th Street
- 3. SR 5/US 1 & 37th Street
- 4. 27th Avenue & Aviation Blvd
- 5. County Admin Rd & Aviation Blvd



Figure 2-10 2021 Existing Annual Average Daily Traffic (AADT) Volumes







Figure 2-12 Existing Intersection Turning Movement Volumes – PM Peak Period

Existing traffic conditions for signalized intersections were analyzed using Highway Capacity Manual (HCM) 6 methodology. SYNCHRO 11 software was used to perform the analysis. The analysis was performed for AM and PM peak periods. **Table 2-7** and **Table 2-8** show the existing conditions LOS analysis results for the signalized intersections. The SYNCHRO reports for the existing intersection analysis are included in Appendix D of the *Project Traffic Analysis Report (PTAR)* **located in the project file**.

		Approach Delay (s/veh)/LOS									Intersection	
No	Intersection	EB		WB		NB		SB		Control Delay (s/veh)/LOS		
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
1	SR 5/US 1 & Aviation Blvd	61.5	E	107.4	F	14.0	В	29.8	С	29.7	С	
2	SR 5/US 1 & 26 th Street	67.8	E	71.4	E	9.2	А	48.8	D	34.4	С	
3	SR 5/US 1 & 37 th Street	-	-	69.1	E	13.6	В	9.0	А	15.4	В	
4	27 th Avenue & Aviation Blvd	12.1	В	6.9	А	-	-	66.8	E	15.5	В	
5	County Admin & Aviation Blvd	13.1	В	5.4	А	18.6	В	-	-	9.5	А	

 Table 2-7
 2021 Existing Intersections Level of Service – AM Peak Period

Table 2	2-8
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2021 Existing Intersections Level of Service – PM Peak Period

		Approach Delay (s/veh)/LOS									Intersection	
No	Intersection	EB		WB		NB		SB		Control Delay (s/veh)/LOS		
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
1	SR 5/US 1 & Aviation Blvd	68.3	E	105.1	F	34.9	С	44.7	D	46.3	D	
2	SR 5/US 1 & 26 th Street	70.0	Е	74.5	Е	7.3	А	41.3	D	31.3	С	
3	SR 5/US 1 & 37 th Street	-	-	64.1	Е	17.3	В	10.2	В	25.5	С	
4	27 th Avenue & Aviation Blvd	19.0	В	10.4	В	-	-	41.7	D	19.9	В	
5	County Admin & Aviation Blvd	11.1	В	5.6	A	18.4	В	-	-	8.8	A	

The analysis results show that all the existing signalized intersections are operating at an overall LOS D or better during the peak periods. The SR 5/US 1 at Aviation Blvd intersection operates at an overall LOS C during the AM peak period and LOS D during the PM peak period. However, the eastbound approach operates at LOS E and the westbound approach operates at LOS F during both the AM and PM peak periods. The following intersection approaches are operating at LOS E or F.

AM and PM Peak Periods

- Eastbound and westbound approaches at SR 5/US-1 & Aviation Boulevard
- Eastbound and westbound approaches at SR 5/US-1 & 26th Street
- Westbound approach at SR 5/US-1 & 37th Street
- Southbound approach at 27th Avenue & Aviation Boulevard

2.13 Intersection Layout and Traffic Control

The PD&E Study intersection of SR 5/US 1 and Aviation Boulevard is a four (4) approach signalized intersection. Pedestrian crosswalks are provided on south and east approaches. The FEC railroad crosses the west approach of the intersection. Signal timing for the intersection includes split phases for the east and westbound approaches and includes pre-emption for the railroad. IRC Traffic Engineering maintains the signalized intersection. The existing lane layout for the study intersection is shown in **Figure 2-13**. Existing traffic operations for the intersection are provided in **Section 2.12**.



Figure 2-13 Existing Lane Geometry at SR 5/US 1 and Aviation Boulevard

2.14 Railroad Crossings

Aviation Boulevard intersects the FEC railroad at crossing number 273047Y. The railroad is directly adjacent to the SR 5/US 1 west right-of-way line throughout the study area. In 2021, FEC railroad/Brightline had a project that reconstructed the railroad crossing, added double tracks, and replaced the railroad bridge over the Main Canal.

Additional FEC railroad crossings located within the study limits are:

- 272192U at 21st Street
- 272191M at 23rd Street
- 272190F at 14th Avenue
- 272189L at 26th Street

All crossings are used for freight transportation and operate with crossbuck assemblies, advanced warning signs, "two quad" gate configurations, and mast mounted flashing lights for warning devices. Right-of-way for the railroad varies between 74 feet to 98 feet along the length of the project.

Brightline is a privately owned and operated intercity high-speed train and utilizes the FEC railroad tracks within the study area. The daily trains increased to 30 trains per day in October 2023.

2.15 Crash Data and Safety Analysis

Safety analysis was performed along SR 5/US 1 and Aviation Boulevard within the study area using the latest available five (5) years of crash data to identify crash patterns and contributing causes. Crash data from 2017 to 2021 for SR 5/US 1 (Roadway ID: 88010000) within the project limits were obtained from the FDOT Crash Analysis Reporting System (CARS) database. The crash data for the same analysis period for Aviation Boulevard (Roadway ID: 88000024) was obtained from the FDOT State Safety Office Geographic Information System (SSOGis) Query Tool on the Traffic Safety Web Portal. The crash data for both roadways data includes environmental and driver characteristics that were existent at the time of each crash and provides the basis for the crash data analysis.

Based on the crash analysis, a total of 102 crashes occurred on SR 5/US 1 and eight (8) crashes occurred along Aviation Boulevard within the study area from 2017 to 2021.

Rear-end crashes were the predominant crash type accounting for 49 (45%) of the total crashes; followed by 21 angle crashes (19%), 13 sideswipe object crashes (12%), 9 fixed

object crashes (8%) and 5 left turn crashes (5%). There was one (1) pedestrian crash and one (1) bicycle crash. Most of the crashes (89 crashes, 80.9%) occurred under daylight conditions, while 16 crashes (14.5%) occurred during nighttime. The number of nighttime crashes is lower than the statewide percentage of 33%. Poor surface conditions contributed only marginally to the number of crashes recorded over the five-year period as 88 (80%) of the crashes occurred during clear weather conditions and 99 (90%) occurred on dry pavement surface. Only 10% of crashes (10) occurred on wet pavement. This is lower than the statewide average of 15%.

One (1) fatal crash occurred within the study limits during the five-year period. Property Damage Only (PDO) crashes accounted for 65 (59.1%) of all crashes; 44 crashes (40.0%) resulted in Injury. Among the contributing causes documented in the crash data, 'carelessness or negligent manner' (27 crashes, 25%), resulted in the most crashes. Other contributing causes include 'failed to yield right-of-way' (20 crashes, 18%), 'followed too closely' (20 crashes, 18%), and 'ran red light' (4 crashes, 4%). **Table 2-9** and **Figure 2-14** show the crash summary for the study roadway segments.

			Numb	er of C	5 Year	Mean			
SR 5/05 1 and	Aviation Boulevard			Year		Total	Crashes	%	
	2017	2018	2019	2020	2021	Crashes	Per Yr		
	Rear End	10	10	20	9	0	49	13	44.5%
	Head On	1	0	0	0	0	1	0	0.9%
	Angle	4	3	9	5	0	21	5	19.1%
	Left Turn	2	0	2	1	0	5	1	4.5%
	Right Turn	0	2	1	4	0	3	1	2.7%
	Sideswipe	3	3	3	0	0	13	3	11.8%
	Pedestrian	0	0	1	0	0	1	0	0.9%
	Bicycle	0	1	0	2	0	1	0	0.9%
	Fixed Object	0	4	6	0	1	13	3	9.5%
CRASH TYPE	Curb	0	1	1	1	0	2	1	1.8%
	Embankment	0	0	0	0	0	1	0	0.9%
	Guardrail Face	0	1	0	0	0	1	0	0.9%
	Other Traffic Barrier	0	1	0	0	0	1	0	0.9%
	Tree (Standing)	0	0	0	0	1	1	0	0.9%
	Other Post, Pole, or Support	0	0	1	0	0	1	0	0.9%
	Other Fixed Object	0	0	1	0	0	2	0	1.8%
	Others	3	1	2	1	0	7	1	6.4%
	Total Crashes	23	23	41	22	2	110	22	100%
	PDO Crashes	14	13	23	15	0	65	13	51.9%
SEVERITY	Fatal Crashes	0	0	1	0	0	1	0	0.9%
	Injury Crashes	9	10	17	7	1	44	9	40.0%
	Daylight	19	18	30	21	1	89	18	80.9%
CONDITIONS	Dusk	1	1	3	0	0	5	1	4.5%
Combinionio	Dark	3	4	8	1	0	16	3	14.5%
SURFACE	Dry	23	20	34	21	1	99	20	90.0%
CONDITIONS	Wet	0	3	7	1	0	11	2	10.0%
	January	1	1	5	5	0	12	2	10.9%
	February	2	0	5	2	0	9	2	8.2%
	March	3	1	3	2	1	10	2	9.1%
	April	4	2	3	1	0	10	2	9.1%
MONTH OF YEAR	Мау	0	3	3	1	0	7	1	6.4%
TEAR	June	2	1	6	1	0	10	2	9.1%
	July	3	2	6	2	0	13	3	11.8%
	August	1	3	2	2	0	8	2	7.3%
	September	2	1	0	3	0	6	1	5.5%

Table 2-9 SR 5/US 1 and Aviation Boulevard Crash Summary Statistics

SR 5/US 1 and Aviation Boulovard			Numb	er of C	5 Year	Mean			
			Year					Crashes	%
		2017	2018	2019	2020	2021	Crashes	Per Yr	
	October	0	5	1	1	0	7	1	6.4%
	November	4	1	2	0	0	7	1	6.4%
	December	1	3	5	2	0	11	2	10.0%
	Monday	4	3	8	0	0	15	3	13.6%
	Tuesday	3	6	7	4	0	20	4	18.2%
	Wednesday	4	6	6	4	1	21	42	19.1%
DAY OF WEEK	Thursday	2	1	6	7	0	16	3	14.5%
	Friday	4	3	3	5	0	15	3	13.6%
	Saturday	5	2	4	2	0	13	3	11.8%
	Sunday	1	2	7	0	0	10	2	9.1%
	00:00-06:00	1	0	1	0	0	2	0	1.8%
	06:00-09:00	1	1	6	2	0	10	2	9.1%
	09:00-11:00	2	4	3	2	1	12	2	10.9%
HOUR OF DAY	11:00-13:00	5	3	7	5	0	20	4	18.2%
	13:00-15:00	2	4	6	4	0	16	3	14.5%
	15:00-18:00	9	7	7	8	0	31	6	28.2%
	18:00-24:00	3	4	11	1	0	19	4	17.3%
	No Contributing Action	4	2	2	1	0	9	2	8.2%
	Careless or Negligent Manner	8	8	8	3	0	27	5	24.5%
	Failed to Yield Right- of-Way	5	5	7	3	0	20	4	18.2%
	Improper Backing	0	0	0	1	0	1	0	0.9%
	Improper Turn	0	1	1	0	0	2	0	1.8%
CAUSES	Followed too Closely	1	1	10	8	0	20	4	18.2%
(VEHICLE	Ran Red Light	1	0	2	1	0	4	1	3.6%
ONLY)	Drove too Fast	0	1	1	0	0	2	0	1.8%
	Improper Passing	0	0	1	1	0	2	0	1.8%
	Exceed Posted Speed	0	0	0	1	0	1	0	0.9%
	Failed to Keep in Proper Lane	0	1	0	1	0	2	0	1.8%
	Ran off Roadway	0	0	1	0	1	2	0	1.8%
	Other Contributing Action	4	4	8	2	0	18	4	16.4%
	Clear	20	20	29	18	1	88	18	80.0%
	Cloudy	3	1	9	3	0	16	3	14.5%
CONDITIONS	Rain	0	2	3	1	0	6	1	5.5%







Figure 2-14 Crash Summary Statistics Histograms

2.15.1 Crash Hotspots

A crash accumulation analysis was conducted along SR 5/US 1 to identify specific segments or intersections with high crash frequencies and identify possible roadway deficiencies that can be improved. The crash accumulation analysis is graphically illustrated in **Figure 2-15**. Based on analysis, the following locations were identified as high crash frequency locations i.e., greater than 20 crashes for the five-year period.

- 1. SR 5/US 1 & 26th Street intersection (MP 6.7-6.9)
- 2. SR 5/US 1 & Aviation Boulevard intersection (MP 7.1-7.3)



3. SR 5/US 1 & 37th Street intersection (MP 7.7-7.9)

Figure 2-15 Safety Hotspots along SR 5/US 1

The Aviation Boulevard intersection with SR 5/US 1 provides access to the airport as well as the county administration offices. A total of 21 crashes occurred at this intersection from 2017 to 2021. Four (4) crashes occurred in 2017, 6 occurred in 2018, 9 occurred in 2019, 3 occurred in 2020, and none in 2021. Rear end crashes were the predominant crash type accounting for 41% of the total crashes, followed by angle and left turn crashes accounting for a combined 23% of the total crashes. There were no pedestrian or bicycle crashes at this location. No fatal crash occurred at this location; however, 32% of the crashes were injury crashes. Among the contributing causes documented in the crash data, 'carelessness or negligent manner' (10 crashes) resulted in the most crashes. Other

contributing causes included 'failed to yield right of way' (18%) and 'followed too closely' (18%). Most of the angle and left turn crashes occurring at this location were attributed to failure to yield right of way which may be due to inadequate signal timing and clearance time as well as poor signal visibility due to lack of retroreflective backplates.

The 26th Street intersection with SR 5/US 1 provides access to several adjacent businesses including the IRC Veterans Service Office. A total of 21 crashes occurred at this intersection from 2017 to 2021. Rear end crashes were the predominant crash type with accounting for 33% of the total crashes, followed by angle crashes accounting for 29% of the total crashes. There were no pedestrian, bicycle, or fatal crashes at this location. Among the contributing causes documented in the crash data, 'carelessness or negligent manner' (24%) resulted in the most crashes. Other contributing causes included 'failed to yield right of way' (14%), 'followed too closely' (14%) and 'run red light' (14%). Most of the angle crashes occurring at this location were attributed to failure to yield right of way and red light running. This intersection is operated in conjunction with the St Lucie Avenue and 26th Street intersection on the west side of the railroad. This may be contributing to inadequate signal timing and clearance time due to the railroad and not meeting driver expectancy. The mast arms at this location are also decorative with small signal heads resulting in poor signal visibility. In addition, the several adjacent driveway openings and the lack of a raised median increases the friction at this intersection.

The 37th Street intersection with SR 5/US 1 provides access to Cleveland Clinic and several medical offices. A total of 29 crashes occurred at this intersection from 2017 to 2021. Rear end crashes were the predominant crash type with accounting for 52% of the total crashes, followed by angle crashes accounting for 21% of the total crashes. There were no pedestrian crashes; however, one bicycle and one fatal crash occurred at this location. Among the contributing causes documented in the crash data, 'followed too closely' (31%) resulted in the most crashes. Other contributing causes included 'failed to yield right of way' (24%), 'carelessness or negligent manner' (21%). Most of the angle crashes occurring at this location were attributed to failure to yield right of way and red light running. This may be due to inadequate signal timing and clearance time as well as poor signal visibility due to lack of retroreflective backplates.

2.15.2 Fatal Crashes

Fatal crashes are a major concern in roadway safety analysis. Based on the crash data, one fatal crash occurred within the study area along SR 5/US-1. There were no fatal crashes along Aviation Boulevard. The police reports for these crashes were obtained from the FDOT and reviewed to identify specific contributing factors that may have caused or influenced this fatal crash. Fatal crash descriptions, as obtained from the crash reports, are presented below.

On 05/28/2019, a vehicle traveling northbound along SR5/US-1, failed to yield right of way at the intersection of SR5/US-1 and 37th Street (MP 7.853) which resulted in an angle collision. The driver of this vehicle died due to the impact. This crash occurred under dry surface conditions and during the daytime.

2.16 Drainage

The project improvements are located within the jurisdictional boundaries of the St. Johns River Water Management District (SJRWMD) and Indian River Farms Water Control District (IRFWCD) and is situated within the Indian River Lagoon Basin. The existing roadway drainage system along SR 5/US 1 is comprised of "closed conveyance systems" where stormwater runoff is collected and conveyed via curb and gutter to inlets and underground pipes, ultimately discharging into the IRFWCD Main Relief Canal. The existing roadway drainage system along Aviation Blvd. is comprised of "open conveyance systems" where stormwater runoff sheet flows from the roadway into roadside ditches and an existing dry detention pond, ultimately discharging into the Main Relief Canal. There are no formal stormwater facilities (SWFs) for the local roadways located east of SR 5/US 1. Runoff sheet flows into shallow roadside ditches the discharges into the groundwater by soil percolation.

The project corridor, within the project limits, is divided into five (5) distinct sub-basins that correspond to the existing drainage patterns along the project corridor. The five (5) existing drainage basins are depicted in **Figure 2.16** and described below:

Basin 100 (550 feet west of Airport North Drive to SR 5/US 1 on Aviation Boulevard): The existing roadway consists of east, west through lanes and turn lanes at SR 5/US 1 and Airport North Drive. Runoff from the roadway sheet flows into roadside ditches and is conveyed to the Main Relief Canal. There is an existing dry detention pond located on the south side of Aviation Boulevard. This pond discharges into the Main Relief Canal that ultimately flows into the Indian River Lagoon.

Basin 200 (26th Street to Main Relief Canal on SR 5/US 1): The existing roadway consists of two through lanes in each direction and with a center flush paved median for left turns. Runoff from the roadway sheet flows to curb inlets on either side of SR 5/US 1 and is conveyed to the Main Relief Canal. There are no existing Stormwater Management Facilities (SMFs) on SR 5/US 1 and the roadway storm system directly discharges into the Main Relief Canal that ultimately flows into the Indian River Lagoon.

Basin 300 (Main Relief Canal to Aviation Boulevard on SR 5/US 1): The existing roadway consists of two through lanes in each direction and with a center flush paved median for left turns. Runoff from the roadway sheet flows to curb inlets on either side of SR 5/US 1 and is conveyed to the Main Relief Canal. There are no existing SMFs on SR 5/US 1 and

the roadway storm water directly discharges into the Main Relief Canal that ultimately flows into the Indian River Lagoon.

Basin 400 (Local roads; 30th Street, 31st Street, 32nd Street, 33rd Street and surrounding properties east of SR 5/US 1): The existing roadways consist of one through lane in each direction. Runoff sheet flows into shallow roadside ditches the discharges into the groundwater by soil percolation. This area will accumulate the proposed roadway improvements associated with the proposed design alternatives.

Basin 500 (Aviation Boulevard to approximately 1,500 feet west of Aviation Boulevard on SR 5/US 1): The existing roadway consists of two through lanes in each direction and with a center flush paved median for left turns. Runoff from the roadway sheet flows to curb inlets on either side of SR 5/US 1 and is conveyed to the Main Relief Canal. There are no existing SMFs on SR 5/US 1 and the roadway storm water directly discharges into the Main Relief Canal that ultimately flows into the Indian River Lagoon.



Figure 2-16 Drainage Basin Map

Most of the project limits are located within Floodplain Zone X, an area of minimal flood hazard, and poses no significant floodplain encroachment as shown in Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRMette) 12061C0244J (effective 1/26/23). The Indian River Farms Main Relief Canal is located within Floodplain Zone AE, areas where base flood elevations are determined. The flood base elevations within Zone AE range from 16 to five (5) feet North American Vertical Datum (NAVD)'88. The FEMA FIRMette is shown in **Figure 2-17**.



Figure 2-17 National Flood Hazard Layer FIRMette

Potential drainage challenges are present within the project limits. Vero Beach Regional Airport expressed not wanting to expand the existing pond located on the airport property due to the sensitive archeological zone and runway protection zone. New SMFs may not be within 100 feet of public wells. Due to the dense development along the corridor, detention ponds will have to be located north of the canal. The Indian River Farms Main Relief canal is classified as an impaired waterbody. Additionally, SMF detention ponds must have a maximum 48-hour detention period per the Federal Aviation Administration (FAA) Advisory Circular 150/5200-33C.

The permitting agency that will be the main point of contact in coordination between parties is the SJRWMD. The existing permits associated with the project location are::

- Indian River Memorial Hospital (1987) Permit 40-061-0027
- Alcohope of the Treasure Coast (2003) Permit 42-061-86755-3
- Aviation Boulevard Roadway Widening (2010) Permit 40-061-123418-1

• All Aboard Florida - Fiber Optic Cable (2015) - Permit 144190-1

2.17 Soils and Geotechnical Data

Based on a review of the Geological Map of IRC from the United States Geological Survey (USGS), the soils within the study area are anticipate being in the Anastasia Formation (variably lithified coquina of shells and sands and unlithified fossiliferous sand) group. The Anastasia Formation is interbedded with coquinoid limestone and quartz sands. The base of the undifferentiated Quaternary sediments/Anastasia Formation is approximately 30 feet below land surface at the project area. Beneath these shallow sediments are undifferentiated Tertiary/Quaternary shelly sediments of fine-to-medium quartz sand with variable amounts of micrite, silt, marine mollusk shells, and clay.

A United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) IRC Soil Survey map is presented in **Figure 2-18**. Based on a review this map, Map Unit 22 Urban land (a miscellaneous area, with no soils information available) comprised the largest percent of soils within the study area with Map Unit 5 Myakka-Myakka wet, fine sands comprising the second largest percent of area. A summary of all the soils present within the study is provided in **Table 2-10**.

Map Unit Symbol	Map Unit Name	Acres in Study Area	Percent of Study Area
5	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	49.6	21.4%
8	Paola sand, 0 to 5 percent slopes	0.4	0.2%
11	St. Lucie sand, 0 to 8 percent slopes	11.4	4.9%
21	Pomello sand, 0 to 5 percent slopes	22.7	9.8%
22	Urban land, 0 to 2 percent slopes	72.7	31.3%
23	Arents, 0 to 5 percent slopes	48.9	21.1%
28	EauGallie-Urban land complex	11.3	4.9%
29	Immokalee-Urban land complex	7.7	3.3%
32	Jonathan sand, 0 to 5 percent slopes	0.4	0.2%
49	Pompano fine sand, 0 to 2 percent slopes	0.6	0.3%
100	Waters of the Atlantic Ocean	6.2	2.7%
Totals for A	rea of Interest	231.9	100.0%

 Table 2-10
 USDA Soil Map Unit Legend



2.18 Utilities

There are numerous utilities throughout the study area. Based on review of existing plans, field reconnaissance and a Florida Sunshine 811 design ticket, a total of 13 utility agency owners (UAO) were identified within the study area. **Table 2-11** lists the utility agency owners identified within the study area which are further defined in the Utility Assessment Report.

Utility Agency Owner	Contact	Utility Type
AT&T Florida	Luke Folkerts	Telephone
7747 Ellis Rd	407-496-6041	
W Melbourne, FL 32904	<u>lf2490@att.com</u>	
AT&T Transmission	Kenneth Wagner	Communication
6000 Metro West Blvd Ste 201	407-578-8000	Lines, Fiber
Orlando, FL. 32835-7631	swagner@pea-inc.com	
Lumen (CenturyLink) National	Michael Hunt	Fiber
7003 Presidents Dr. Suite 100,	716-480-2073	
Orlando, FL 32809	michael.hunt@lumen.com	
City of Vero Beach	Todd Young	Water,
17-17th Street	772-978-5209	Wastewater
PO Box 1389	TYoung@covb.org	
Vero Beach, FL 32961-1389		
Comcast	Timothy Henes	CATV
1401 Northpoint Pkwy,	561-325-2963	
West Palm Beach, FL 33407	Timothy Henes@comcast.com	
Crown Castle	Danny Haskett	Fiber
1601 NW 136 Avenue, Suite A-200	786-246-7827	
Sunrise, FL 33323	danny.haskett@crowncastle.com	
Florida City Gas/NextEra	Tristan Simoes-Ponce	Gas
4045 NW 97th Ave.	305-607-2038	
Doral, FL. 33178	Tristan.Simoes-	
	ponce@nexteraenergy.com	
FP&L Distribution	Rob Morris	
4406 SW Cargo Way	772-223-4215	Electric
Palm City, FL 34990	rob.morris@fpl.com	
FP&L Transmission	Thomas Colucci	
15430 Endeavor Dr	315-219-7458	Electric
Jupiter, FL 33478	Thomas.Colucci@fpl.com	
Indian River County Utilities	Harrison Youngblood	
1801 27th Street – Bldg A, Vero	772-226-4343	Sewer, Water
Beach, FL 32960	hyoungblood@ircgov.com	

 Table 2-11
 Existing Utilities in the Study Area

Utility Agency Owner	Contact	Utility Type
Resurgence Infrastructure Group	Laura Glass	
608 Huck Finn Dr.	850-826-0846	Fiber
Crestview, FL 32536	laura.glass@glass811.com	
Sprint	Jon Baker	
360 S. Lake Destiny Dr., Ste. A	352-409-5095	Fiber
Orlando, FL 32810	jabaker@cogentco.com	
Verizon	Donovan Carr	Communication
4700 Exchange Ct.	954-213-1959	
Boca Raton, FL 33431	donovan.carr@verizon.com	

AT&T Florida – AT&T Florida provided marked up utility plan sheets that showed existing buried conduit facilities that run parallel along the west side of the FECRR from south of the SR 5/US 1 at Aviation Boulevard intersection up to 41st Street. South of the intersection, the buried conduit turns southwest across the Main Canal. The markups show "other" facilities running parallel along Aviation Boulevard on the south side of the roadway.

AT&T Transmission – Based on utility plan markups, AT&T transmission maintains a high-capacity fiber optic cable (in a joint duct bank) that runs parallel on the west side of SR 5/US 1 within the study area.

Lumen / CenturyLink – Based on utility plan markups, CenturyLink has existing facilities that run parallel along the west side of the FECRR throughout the study area.

City of Vero Beach (Water & Sewer) – The City of Vero Beach provided utility markup plans that show an existing eight (8)-inch water main (12 inch under the Main Canal) that runs on the east side of SR 5/US 1 from Royal Palm Boulevard to 37th Street with meters spaced throughout. On Aviation Boulevard, the City has three (3) abandoned and one (1) active 24-inch water lines that cross the roadway west of the FECRR crossing. Running to the east along 30th Street there is a 16-inch water main, eight (8)-inch sanitary sewer with service laterals and 12-inch force main. Running along 31st Street is an eight (8)-inch sanitary sewer, (16) inch reuse (non-potable) water main and a 2.5-inch water main with meters. Running along 32nd Street is an eight (8)-inch sanitary sewer with service laterals and 2.5-inch water main with meters. Lastly, within the study limits running along 33rd Street is a (24) inch effluent transmission main, eight (8)-inch sanitary sewer with service laterals and six (6)- inch water main with meters.

Comcast – Based on utility plan markups, Comcast has existing aerial facilities that run parallel along the west side of the FECRR from 21st Street to 29th Street. At 29th Street the facilities are relocated underground and run due west. There are no Comcast facilities

along SR 5/US 1 near the Main Canal. Existing aerial facilities resume north of Aviation Boulevard/32nd Street, on the east side of SR 5/US 1 and run parallel to north of 36th Street. No existing Comcast facilities are located along Aviation Boulevard.

Crown Castle – Based on utility plan markups, Crown Castle has existing facilities that run parallel along the east side of SR 5/US 1. There are no facilities present along Aviation Boulevard.

Florida City Gas/NextEra – Based on utility plan markups, Florida City Gas/NextEra has several existing facilities within the study area. There is an existing four (4) inch gas main that crosses SR 5/US 1 on the north side of the 26th Street intersection. An existing six (6) inch gas main crosses SR 5/US 1 on the north side of the intersection and connects to an existing valve on the northeast corner of the intersection. An existing six (6) inch gas main runs parallel along the east side of SR 5/US 1 from Aviation Boulevard to the end project limit.

FPL Distribution – Based on utility plan markups, FPL Distribution has an existing 120V line that crosses SR 5/US 1 north of the 30th Street intersection and then runs parallel on the pole line in addition to a two (2) phase 13kv distribution line along SR 5/US 1 on the east side to 37th Street. Overhead lines also run along the west side of SR 5/US 1 and the FECRR from 26th Street, across Aviation Boulevard and continue to run parallel to FECRR beyond project limits.

On Aviation Boulevard, FPL Distribution has existing overhead lines that run along both sides of the roadway from the begin project limit to approximately 1,500 feet to the east. The overhead distribution line then continues along the east side of Aviation Boulevard to just north of the County Administration Road intersection where the roadway curves to the north.

FPL Transmission – Based on utility plan markups, FPL Transmission has existing overhead facilities along SR 5/US 1 from the beginning project limit to 26th Street. On Aviation Boulevard, there are existing FPL Transmission facilities from 27th Avenue to just south of the intersection of County Administration Road.

IRC Utilities – Based on utility plan markups, IRC has a 12-inch existing water transmission main that runs parallel along the west side of FECRR from north of 33rd Street to the end project limit. There is also an existing eight (8)-inch water transmission line on the east side of SR 5/US 1 from 28th Street to the end project limit.

Resurgence Infrastructure Group – Based on utility plan markups, Resurgence Infrastructure Group has an existing underground fiber cable that is located in a shared FECRR Duct Bank within the FECRR right-of-way. The underground cable runs parallel

to FECRR on the west side from the begin project limit to 29th Street where it crosses the track to the east side of FECRR right-of-way.

Sprint – Based on utility plan markups, Sprint's only existing facilities, two (2) inch underground conduit, are located within FEC right-of-way.

Verizon – Based on utility plan markups, Verizon has existing underground facilities located in PVC duct in FECRR right-of-way throughout the study area. There are no facilities present along Aviation Boulevard.

2.19 Lighting

Conventional lighting along SR 5/US 1 runs along the east side of the corridor from the beginning of the project limits to just after the bridge over main canal. At this point the lighting infrastructure crosses SR 5/US 1 and continues along the west side of the corridor until 37th Street. After 37th Street lighting is present on either side of SR 5 until the end of the project limits. All lighting consists of high-pressure sodium.

Lighting is absent along Aviation Boulevard but is provided at the signalized intersections (on mast arms) of 27th Avenue and County Administration Road/27th Street. Lighting is maintained by Indian River County for both roadways.

2.20 Signs

Existing conventional roadside regulatory traffic signs and information signs exist throughout the intersection including required railroad crossing signs. No Variable Message Signs (VMS) or overhead signs are present within the limits of the project.

2.21 Aesthetics Features

The existing SR 5/US 1 right of way is completely impervious asphalt and concrete sidewalk with no opportunity for landscape. There are large trees located beyond the right of way. One outdoor advertising sign is located on the east roadside of SR 5/US 1 north of 33rd Street. Aviation Boulevard within the airport does not have landscape due to aviation safety requirements. The FDOT is responsible for maintenance activities along SR 5/US1, while the city maintains Aviation Boulevard west of SR 5/US1 and 32nd Street east of US 1.

2.22 Bridges and Structures

The study limits include one existing bridge structure along SR 5/US 1 over the IRFWCD Main Canal (Bridge No. 880085) located at Mile Post (MP) 7.053 approximately 866 feet south of the intersection of SR 5/US 1 with Aviation Boulevard (MP 7.217) within IRC, Florida. The existing conditions at the bridge were analyzed during field reviews and

reviews of the as-built construction plans (Project No. 88010-3510) and corresponding bridge inspection reports. A Bridge Load Rating Summary report (**Appendix B**) was completed in June 2023 for Bridge No. 880085 and found all ratings for the legal loads on the bridge to be adequate.

The existing bridge structure was designed in the late 1970's and constructed in 1980. The bridge width is 70 feet and accommodates two (2) vehicular lanes per direction and one (1) two-way left turn lane in the center (see **Figure 2-19** Existing Bridge Plan View). The bridge spans over the IRFWCD Main Canal with four (4) simply supported spans of 26, 32, 31, and 26 feet, respectively, for a total bridge length of 114 feet (See Bridge Elevation View in **Figure 2-20**). The bridge horizontal alignment has a zero-degree skew-angle and the existing substructure consists of cast-in-place end and intermediate bents supported on 18-inch square precast prestressed concrete piling.



Figure 2-19 Existing Bridge Plan View

The vertical clearance shown in the original construction plans is zero (0) feet and eight (8) inches above the High Water Elevation of 11.35 feet (National Geodetic Vertical Datum (NGVD)) [9.89-ft NAVD] and the low member elevation is 12.33 feet NGVD [10.87-ft NAVD]. The Bridge Hydraulic Design Data Table in the existing plans call for a minimum 3'-0" vertical Drift Clearance above the Design High Water (50-yr) Elevation of 8.20 feet (NGVD) [6.74-ft NAVD]. The vertical drift clearance provided is 4.33 feet. The Normal Flow Elevation is listed as 1.58 feet (NGVD) [0.12-ft NAVD]. As seen in **Figure 2-20**, the existing canal bank armoring consists of sandbags with an embankment slope of 1.5:1 (horizontal to vertical).



Figure 2-20 Existing Bridge Elevation View over the IRFWCD Main Canal (Note: Canal Elevations Shown are in NGVD)

The existing five (5) lane bridge typical section consists of four (4) 10-ft lanes with a center 10-ft two-way left turn lane a 10-ft 7-inch southbound outside shoulder and 5-ft 2-inch sidewalk with curb and gutter in the northbound direction (see **Figure 2-21**). The deck cross-slope is 0.02 ft/ft with the deck crowned and sloped to either side. The superstructure consists of a flat slab system with 7-ft-wide precast prestressed slab units with a cast-in-place concrete toping for a total superstructure depth of 1-ft 1-inch.



Figure 2-21 Existing Bridge Typical Section (Looking South)

The latest bridge inspection report on file with the Department indicated that above and underwater bridge inspections were completed on May 5, 2021, and May 24, 2021, respectively. Minor cracking in various bridge super structure elements and some scaling (loss of concrete matrix) to substructure piling was noted but deemed minor in nature. These reports reflected a Sufficiency Rating of 96.5 and a Health Index of 97.35. Some minor scouring and/or silting was noted in the canal bottom cross sections compared with the original canal sections.

A survey for asbestos-containing materials (ACM) was completed on December 21, 2007, at the SR 5/US 1 and Main Canal Bridge (No. 880085) and published their findings in their report dated February 21, 2007, on file with the department. The findings of this asbestos survey indicated that asbestos-containing graphite material was present in the bridge bearing pads associated with the intermediate bents. These bearing pads consist of 45% to 60% asbestos material and are classified by the Environmental Protection Agency (EPA) as a Category II non-friable material. The demolition work associated with

this project will require this material to be properly removed and disposed of by a state of Florida licensed asbestos abatement.

The existing plans identified the existing bridge site as Non-Coastal as it relates to environmental classification.

There are five (5) known utilities near the bridge location. Resurgence Infrastructure Group and AT&T Transmission each run a Fiber Optic Cable within a Joint Use Duct Bank just east of the FEC Railroad tracks between the existing bridge and the railroad tracks within FEC right-of-way. Florida Power and Light (FPL) has overhead distribution lines far enough north of the bridge that proposed bridge construction should not impact the lines, but they could be impacted due to roadway improvements. Crown Castel Fiber has facilities adjacent to the bridge that appear on the northbound side of the bridge structure which will be impacted by the proposed bridge construction. These will need to be relocated. The City of Vero Beach has a number of water mains running parallel and crossing the existing bridge structure as seen in Figure 2-22. There is a 12-inch Cast-Iron-Pipe watermain attached to the existing bridge barrier on the east side of the bridge (northbound direction). This facility will need to be relocated if the bridge is replaced. The city also has a 16-inch Ductile Iron Pipe watermain crossing beneath the end span on the north side of the bridge. This main crosses diagonally north of the east side of the bridge at a 45-degree angle and continues east along 30th Street. It will be necessary to obtain more accurate utility locations with level "A" locates (soft-dig) on the watermain during the final design phase. This will allow for the development of a potential pile spacing for the proposed bridge north end bent to avoid the need to relocate this facility.



Figure 2-22 Existing City of Vero Beach Water and Sewer Utilities

Canal structure No. D40F88000-01760 is located on the Main Canal approximately 750 feet west (upstream) of the Main Canal bridge. The proposed improvements for this study are not anticipated to impact this existing control structure.

2.23 Existing Environmental Features

The following subsections provide a summary of key existing environmental characteristics found within the study area that may be affected by the proposed improvements. This project was evaluated through the FDOT's ETDM process (ETDM Project No. 14475). The purpose of the ETDM process is to incorporate environmental considerations into transportation planning to inform project delivery. An ETDM Programming Screen Summary Report was published on January 21, 2022, containing comments from the ETAT on the project's effects on various natural, physical, and social resources. Supporting environmental documents are provided in **Appendix C**.

A complete evaluation of environmental characteristics is documented in the following reports prepared for this PD&E Study and provided in SWEPT:

- SocioCultural Effects (SCE)
- Contamination Screening Evaluation Report (CSER)
- Conceptual Stage Relocation Plan (CSRP)

- Cultural Resource Assessment Survey (CRAS)
- Natural Resources Evaluation Report (NRE)
- Noise Study Report (NSR)
- Type 2 Categorical Exclusion (Type 2 CE)

2.23.1 Social and Economic

This project is within the City of Vero Beach and the unincorporated community of Gifford, two census designated areas within IRC, Florida. The population of residents in the corridor study area is 19.66% racial/ethnic minority, compared to the county's 26.07% racial/ethnic minority population.

The project intersection is in an area with a mix of commercial and light industrial land uses, the FEC railroad, abandoned homes and vacant lands. The immediate project area lacks any defined public or sense of community space. Sidewalks exist only along the east side of SR 5/US 1 and the local streets are both paved and unpaved without pedestrian walkways.

Camp Haven Men's Rehabilitation Center is a shelter that works to rebuild the lives of homeless men in IRC by providing temporary residency along with employment, psychological and personal counseling. It operates on private donations. Based on conversations with the center's board members, the center is zoned as Motel and is inspected by the County as a motel.

The area between SR 5/US 1 and 13th Avenue, and between 30th Street and 33rd Street was previously a tourist fishing retreat called Camp Gordon with many wooden cabins. Over the years the business closed, cabins were abandoned and/or demolished.

A few occupied wooden homes with residents are located 500 feet east of SR 5/US 1 along 13th Avenue. Further east of 13th Avenue and away from the project, are single and multi-family residential units and the Vero Beach Golf and Country Club.

Community focal points include:

- Community and Fraternal Centers
 - Vero Beach Community Center, 2266 14TH AVE 32960
 - Visitors Bureau for IRC, 1216 21ST ST 32960
 - o Camp Haven, 3256 US 1 32960
 - Chamber Of Commerce IRC, 1216 21ST ST 32960
 - Elks Lodge 1774, 1350 26TH ST 32960
 - o Italian American Civic Associates, Inc, 1600 25TH ST 32960

- Masonic Lodge Vero 250 F & Am 1959 14TH AVE 32960
- Florida Irish American Society Inc 1314 20TH ST 32960
- o Boys & Girls Club IRC 2926 PIPER DR 32960
- o Garden Club of IRC 2526 17TH AVE 32960
- Cultural Centers
 - Indian River Citrus Museum/Heritage Center 2140 14TH AVE 32960 (at Pocahontas Park)
 - The Railroad Museum 2336 14TH AVE 32960
 - o IRC Law Library 2000 16TH AVE 32960
 - IRC Library 1600 21ST ST 32960
- Parks and Recreational
 - Michael Field Complex
 - Pocahontas Park
 - Hosie Schumann Park
 - Central IRC Greenways Plan
- Historic and Archaeological
 - Vero Man Ice Age Archeological Zone

2.23.2 Section 4(f) Potential

There are four (4) potential Section 4(f) resources identified within the project study area:

- Michael Field Complex
- Hosie Schumann Park
- Pocahontas Park
- Central IRC Greenways Plan

2.23.3 Cultural Resources

A Cultural Resource Assessment Repot (CRAS) was prepared for this study. Two previously recorded archaeological sites were identified within or adjacent to the study area during a search of the Florida Master Site File (FMSF): Site 8IR1 Vero Man and Site 8IR9 Vero Locality. These archaeological sites are 8IR1 and 8IR9, are now considered one and the same site, and will be referred to henceforth as 8IR1/8IR9. Site 8IR1/8IR9 is associated with Pre-Columbian burials and is considered eligible for listing in the National

Register by the State Historic Preservation Officer (SHPO). The site is located between the southwest corner of the study intersection and the Main Canal.

A total of 24 previously recorded historic structures were identified within the historic resources study area during the search of the Florida Master Site File (FMSF) and background information. Of the previously recorded 24 historic structures, 13 are extant and 11 have been demolished. The previously recorded buildings were recorded in 1990 as a result of the *Historic Properties Survey of the City of Vero Beach*, Florida. Although not evaluated by the SHPO for National Register eligibility, the initial recorder considered all of the buildings ineligible for listing in the National Register, both individually and as part of a district (Historic Property Associates 1990; FMSF Manuscript No. 2670).

Ten (10) extant previously recorded buildings are affiliated with the c. 1931-1955 tourist camp, Camp Gordon, also known as Beattyville. It was founded in 1931. Most of the structures associated with Camp Gordon have been demolished so that the group no longer retains integrity of design or setting. None of the original Camp Gordon commercial buildings are extant. The remaining Camp Gordon structures within the study area are in poor to ruinous condition. The resources do not have enough integrity to be considered National Register eligible.

Three (3) previously recorded resource groups were identified within the study area during the search of the FMSF. The Indian River Farms Main Canal (8IR1148) within the current area of potential effect (APE) was determined ineligible for listing on the National Register by the SHPO on January 1, 2014. The FEC Railway (8IR1497) has been determined eligible countywide but has not been evaluated within the current APE. Dixie Highway (8IR1519) has been determined eligible for the National Register by the SHPO outside of the current APE but has not been evaluated within the current APE.

2.23.4 Natural Resources

A Natural Resource Evaluation (NRE) report was prepared for this study to document the natural resources analysis performed to support decisions related to the evaluation of project alternatives and to summarize potential impacts to wetlands, federal and state protected species, protected habitats, and Essential Fish Habitat (EFH).

In order to determine the approximate locations and boundaries of existing upland and wetland communities within the project study area, available site-specific data was collected and reviewed. The project boundary includes all of the limits of the intersection of SR 5/US 1 and Aviation Boulevard/32nd Street. The north-south limits extend beyond the intersection along US 1 between 21st Street and 41st Street (approximately 2 miles). The west limits extend along Aviation Boulevard between 27th Avenue and SR 5/US 1 (approximately 1 mile). The east limits include the area east of SR 5/US 1 to 13th Avenue.

The project study area encompasses the project boundary plus an approximate 300-foot buffer. The following information was collected and analyzed:

- USDA, NRCS, Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx);
- NRCS Soil Survey of Indian River County (2023);
- U.S. Fish and Wildlife Service (USFWS), NWI Wetlands Mapper (https://www.fws.gov/wetlands/data/mapper.html);
- SJRWMD FLUCFCS (2014);
- FDOT, FLUCFCS, 3rd edition, 1999;
- USFWS, Classification of Wetlands and Deepwater Habitats of the United States, (Cowardin, et. al. 1979);
- FNAI 2010. Guide to the Natural Communities of Florida: 2010 edition. Florida Natural Areas Inventory, Tallahassee, Florida; and
- 2019 aerial photographs of the project study area.

This project was evaluated for impacts to wildlife and habitat resources, including protected species, in accordance with 50 CFR Part 402 of the ESA of 1973, as amended, the Florida Endangered and Threatened Species Act, Section 379.2291, FS, and the FDOT PD&E Manual chapter titled Protected Species and Habitat.

The project area falls within USFWS-designated CH for West Indian manatee (*Trichechus manatus*). The project falls entirely within the USFWS CAs of the Florida scrub-jay (*Aphelocoma coerulescens*), piping plover (*Charadrius melodus*), Audubon's crested caracara (*Caracara plancus audubonii*), and Atlantic salt marsh snake (*Nerodia clarkii taeniata*). The project falls within the Core Foraging Area (CFA) of one wood stork colony, Pelican Island, located approximately nine miles north of the project limits.

A review of USFWS, FWC, Florida Department of Agriculture and Consumer Services (FDACS), and Florida Natural Areas Inventory (FNAI) data indicates thirty-two (32) protected plant and wildlife species known to occur in Indian River County. Twenty-one (21) of the species are federally listed endangered or threatened. Eleven (11) listed species are state listed endangered or threatened. The bald eagle (*Haliaeetus leucocephalus*) was delisted from protection under the Endangered Species Act in 2007. However, the bald eagle is still protected under the Bald and Golden Eagle Protection Act (BGEPA), Migratory Bird Treaty Act (MBTA), and State law (FAC 68A-16.002). Multiple species of bats are state protected by FAC 68A-4.001 General Prohibitions and 68A-9.010 Taking Nuisance Wildlife.

To further summarize the results of desktop and field data collection efforts, each potential occurring species was assigned a likelihood for occurrence of "none", "low", "moderate", or "high" within habitats found on the project corridor and an indicator of suitable habitat proximity to the project area of "distant", "near", or "contiguous". Definitions of probability of species presence/habitat proximity are provided below.

Likelihood of Species Presence

None – Species has been documented in Indian River County, but due to complete absence of suitable habitat, could not be naturally present within the project corridor.

Low – Species with a low likelihood of occurrence within the project area are defined as those species that are known to occur in Indian River County or the bio-region, but preferred habitat is limited in the project area, or the species is rare.

Moderate – Species with a moderate likelihood for occurrence are those species known to occur in Indian River or nearby counties, and for which suitable habitat is well represented in the project area, but no observations or positive indications exist to verify presence.

High – Species with a high likelihood for occurrence are suspected within the project area based on known ranges and existence of sufficient preferred habitat in the area; are known to occur adjacent to the project; or have been previously observed or documented in the vicinity.

Habitat Proximity

Distant – Appropriate habitat is distant from the project footprint when accounting for the species' home range size and level of mobility.

Near – Appropriate habitat is near the project footprint when accounting for the species' home range size and level of mobility.

Contiguous – Appropriate habitat occurs within or immediately adjacent to the project footprint.

Figure 2-23 depicts field observations as well as historic species occurrences from the database searches. **Table 2-12** lists the federally and state listed wildlife species known to occur within Indian River County that could potentially occur near the project area based on availability of suitable habitat and known ranges.



Figure 2-23 Species Occurrence Map

	_		Tab	le 2-12 Potentially Occurring and Observed Listed Species		
Scientific Name	Common Name	State	Federal	Habitat	Habitat Occurrence in Relation to Project Footprint	Probability of Species Presence or Occurrence
Plants						
Harrisia fragrans	Fragrant prickly-apple	FE	E	Scrubby flatwoods and xeric hammocks on the Atlantic Coastal Ridge	Distant	None
Dicerandra immaculata	Lakela's mint	FE	E	Coastal sand-pine scrub vegetation on dunes	Distant	None
Insects			·			
Cyclargus thomasi bethunebakeri	Miami blue butterfly	FE	E	Tropical hardwood hammocks, tropical pine rocklands, and beachside scrub	Distant	None
Reptiles						
Drymarchon couperi	Eastern indigo snake	FT	Т	Hydric hammock, palustrine, sandhill scrub, upland pine forest, mangrove swamp	Contiguous	Low
Eretmochelys imbricata	Hawksbill sea turtle	FE	E	Oceans, Bays, Inlets and beaches	Distant	None
Dermochelys coriacea	Leatherback sea turtle	FE	E	Oceans, Bays, Inlets and beaches	Distant	None
Caretta caretta	Loggerhead sea turtle	FT	Т	Oceans, Bays, Inlets and beaches	Distant	None
Chelonia mydas	Green sea turtle	FT	Т	Oceans, Bays, Inlets and beaches	Distant	None
Nerodia clarkii taeniata	Atlantic salt marsh snake	FT	Т	Salt marsh tidal flats that contain grasses	Distant	None
Gopherus polyphemus	Gopher tortoise	Т	NL	Old fields, sandhill, scrub, xeric hammock, ruderal, dry prairie, pine flatwood	Contiguous	Moderate
Birds						
Antigone canadensis pratensis	Florida sandhill crane	т	NL	Basin marsh, depression marsh, dry prairies, marl prairie, pastures, human-altered suburban landscapes	Contiguous	Low
Aphelocoma coerulescens	Florida scrub-jay	FT	Т	Relict dune ecosystems or scrub on well drained to excessively well drained sandy soils	Distant	Low
Athene cunicularia floridana	Florida burrowing owl	Т	NL	Native prairies and cleared areas with short groundcover	Near	Low
Calidris canatus rufa	Rufa red knot	FT	т	Coastal marine and estuarine habitats with large areas of exposed intertidal sediments.	Distant	None
Caracara plancus audubonii	Audubon's crested caracara	FT	Т	Improved pastures and prairie with cabbage palm	Distant	Low
Charadrius melodus	Piping plover	FT	Т	Sandy upper beaches, sparsely vegetated shores of shallow lakes, ponds, rivers, and impoundments	Distant	None
Charadrius nivosus	Snowy plover	Т	NL	Beaches, dry mud or salt flats, sandy shores of rivers, lakes, and ponds	Distant	None
Egretta caerulea	Little blue heron	Т	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
Egretta rufescens	Reddish egret	Т	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
Egretta tricolor	Tricolored heron	Т	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
Falco sparverius paulus	Southeastern American kestrel	Т	NL	Sandhill, mesic flatwoods, ruderal, dry prairie	Near	Low
Haliaeetus leucocephalus	Bald eagle	BGEPA ¹	BGEPA ¹	Forests, estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
Laterallus jamaicensis ssp.	Eastern black rail	FT	Т	Tidal marshes, coastal marsh and wet meadows	Distant	None
Scientific Name	Common Name	State	Federal	Habitat	Habitat Occurrence in Relation to Project Footprint	Probability of Species Presence or Occurrence
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Jamaicensis						
Mycteria americana	Wood stork	FT	Т	Estuarine tidal swamps/marshes, lacustrine, seepage stream, ditches	Contiguous	Moderate
Platalea ajaja	Roseate spoonbill	Т	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
Rynchops niger	Black skimmer	Т	NL	Open sand on beaches, sandbars, and dredge material islands	Distant	None
Sterna dougallii	Roseate tern	FT	Т	Nest sites include bare limestone, shell-sand beaches, newly deposited rock and marl fill, dredge material, rooftops. Forages in open water over sandbars, reefs, tidal channels.	Distant	None
Sternula antillarum	Least tern	Т	NL	Coastal areas throughout Florida, including beaches, lagoons, bays, and estuaries. Increasingly use artificial nesting sites, including gravel rooftops, dredge spoil islands or other dredged material deposits, construction sites, causeways, and mining lands. Nesting areas have a substrate of well-drained sand or gravel and usually have little vegetation.	Distant	None
Mammals						
Peromyscus polionotus niveiventris	Southeastern beach mouse	FT	т	Coastal dunes with sea oats	Distant	None
Puma concolor coryi	Florida panther	FE	E	Extensive blocks of forests, large wetlands, can use human-altered landscapes	Distant	None
Trichechus manatus	West Indian manatee	FT	Т	Coastal waters, bays, rivers, estuaries, sometimes lakes and canals	Contiguous	Low
Eumops floridanus	Florida bonneted bat	FE	E	Roosting habitat: Forest and other areas with tall, mature trees or other areas with suitable roost structures. Artificial roosting structure includes buildings, bridges, and bat houses. Foraging habitat: open fresh water, permanent or seasonal freshwater wetlands, wetland and upland forests, and wetland and upland shrub.	Near	Low
	Bats (multiple species)	-	*	Forested areas, manmade structures	Near	Moderate

The extent and types of wetlands in the project study limits were documented in accordance with Executive Order 11990, Protection of Wetlands, and the FDOT PD&E Manual. Surface waters were identified through the review of available literature, GIS data, and field verification.

Following the review of all available materials, field assessments were conducted on June 22, 2023, to identify the presence of wetland vegetation, evidence of hydrology, and hydric soil indicators. The jurisdictional limits of the surface waters were estimated using the criteria stated in the USACE Final Regional Supplement to the Corps of Engineers Wetland Delineations Manual: Atlantic and Gulf Coastal Plain Region (October 2010), and Florida statewide unified wetland delineation methodology as adopted by the FDEP and the Water Management Districts per Chapter 62-340 of the FAC and described in *The Florida Wetlands Delineation Manual*. Project scientists evaluated wetland and surface water systems using the Uniform Mitigation Assessment Method (UMAM).

The project area contains one surface water (SW) (SW-1 [Main Canal]) and four Other Surface Waters (OSWs) (OSW-1, OSW-2, OSW-3, and OSW-4). The SW is classified as FLUCFCS 5100: streams and waterways (USFWS: PEM1Hx [Palustrine, Emergent, Persistent, Permanently Flooded, Excavated]) and is a man-made canal which drains to the Indian River Lagoon. The OSWs are classified as FLUCFCS 5300: reservoirs (USFWS: PSS1Cx [Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Excavated]), which are man-made, open water ponds with mowed edges. A surface water map is included as **Figure 2-24**.

No wetlands were identified within the project study area.



Figure 2-24 Surfaces Waters (Preferred Alternative)

2.23.5 Physical Resources Contamination

A Contamination Screening Evaluation Report (CSER) was prepared for this study. The preliminary (Level I) evaluation was conducted to determine potential contamination issues within the proposed project limits from properties or operations located within the vicinity of the project. The contamination study area encompasses the right-of-way and properties within 500 feet of the corridor, non-landfill solid waste sites within 1000 feet, landfills, and Superfund sites within a ½ mile of the project. Sites found to have a history of contamination, or to house hazardous substances, were evaluated for potential contamination involvement within the proposed Build Alternative and a degree of risk was assigned for each site.

A total of 13 potential contamination sites were identified within the project study area (**Figure 2-25**). Three (3) sites were assigned No Risk, six (6) sites were assigned Low Risk and no sites were assigned a High Risk rating. Four (4) sites were assigned a Medium Risk rating for potential contamination concerns:

- FEC Railroad (Map ID #1)
 - This railroad bed has a long history of use (the railroad was constructed in 1894) and may contain arsenic and other contaminants from treated railroad ties and spraying. The railroad is within the likely construction zone of each alternative.
- Vero Beach Water Treatment Plant (Map ID #2)
 - There was "sewage disposal" circa 1970s-1980s north of Aviation Boulevard, and there have been multiple ponds or ditches along both sides of Aviation Blvd that, based on historical aerials, appear to have received effluent.
- Sullivan Site (Map ID #3)
 - Two Underground Storage Tanks (USTs) were removed or abandoned circa 1998 but there is no record of confirmatory soil or groundwater sampling.
- W C Graves Jr. / Indian River Associates (Map ID #4)
 - Two USTs were removed before 1990 but there is no record of confirmatory soil or groundwater sampling. One heating oil UST was present but there is no record that it was removed or properly abandoned.



Figure 2-25 Potential Contamination Map

The project study area includes one bridge: FDOT Structure No. 880085 (SR 5/US-1 & Main Relief Canal Bridge). The Asbestos Survey Report, *State Road 5/US-1 & Main Relief Canal bridge No. 880085 (MP 7.053) Indian River County, Florida* dated February

2007, was obtained for this study. The bridge's graphite bearing pads were previously determined in 2007 to have 45-60% asbestos. Bridge plans indicate there may be asbestos-containing materials (ACM) that were inaccessible for testing so there may be additional asbestos. No metal components with suspect metals-based coatings were identified by the survey.

There are numerous old houses and commercial buildings in the project area; these may contain ACM and lead-based paint (LBP). After the preferred alternative is selected, ACM and LBP surveys will need to be conducted on any of these structures that would require demolition.

3.0 FUTURE CONDITIONS

3.1 Future Conditions Considerations

Future land use for the study area is planned to change slightly with some commercial parcels becoming mixed use in the future. Projected future travel demand and future year AADT forecasts for this study were developed under a separate study, *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021. The PTAR, dated August 2023, was prepared for this study. These reports are summarized below.

3.1.1 County Extension of Aviation Boulevard

IRC public works project will extend Aviation Boulevard to the Cleveland Clinic Hospital and medical region. This project was in the design phase during the PD&E study and was considered in the study's traffic forecasting. Aviation Boulevard will be extended east of SR 5/US 1 to 36th Street. The initial concept route is shown in **Figure 3-1**. PD&E Alternatives were developed to be compatible with IRC's project to extend Aviation Boulevard. The county extension of Aviation Boulevard is accounted for in the No-Build and Build Alternatives.



Figure 3-1 IRC Aviation Boulevard Extension Concept

3.1.2 Project Traffic Development

The Treasure Coast Regional Planning Model Version 5.0 (TCRPM5) with base year 2015 and horizon year 2045 was used to estimate the future years daily forecasts for the study area. The 2045 model is based on the adopted year 2045 Regional Long-Range Transportation Plan (RLRTP) for Indian River, St. Lucie, and Martin Counties.

The traffic forecasting methodology used for this PD&E Study included an evaluation of the following forecast methodologies:

1. Regression analysis of 10 years of the most recent historical AADTs from FDOT count sites.

2. Regression analysis of 10 years of the most recent historical AADTs from FDOT combined with the adopted TCRPM5 Model.

3. Growth between the base year (2015) and the validation (2045) year of the adopted TCRPM5 Model roadway volumes.

4. Zonal analysis of adjacent traffic analysis zones (TAZ) employment and population data from the validation year and the adopted TCRPM5 Model.

Based on a comparison of the growth rates on the study segment resulting from each of the evaluated forecasting methodologies, an areawide compound rate of 2.0% was recommended. This growth rate was calculated by averaging each of the rates obtained from each of the forecasting methods.

The developed AADT forecast volumes and future year turning movement volumes (TMV) for the study intersections are provided in the *Project Traffic Analysis Report (PTAR)* prepared as part of this PD&E Study. The 2025 opening year and 2045 design year future AADT volumes are summarized in **Figure 3-2** and **Figure 3-3**, respectively. The 2025 opening year and 2045 design year future TMVs for the AM and PM peak hours are summarized in **Figure 3-4** and **Figure 3-5**, respectively. The complete *PTAR* is included as part of the project folder and can be found in SWEPT.

Operational and LOS analysis results for the No-Build and Build Alternatives are provided in **Section 5.0**.



Figure 3-2 2025 Future Annual Average Daily Traffic (AADT) Volumes



Figure 3-3 2045 Future Annual Average Daily Traffic (AADT) Volumes



Figure 3-4 2025 and 2045 Turning Movement Volumes– AM Peak Period



Figure 3-5 2025 and 2045 Turning Movement Volumes – PM Peak Period

4.0 DESIGN CONTROLS & CRITERIA

Build alternatives for this PD&E Study were developed and analyzed based on FDOT and AASHTO design standards and criteria as set in the Florida Design Manual (FDM) and PD&E Manual that were in effect at the time of this study.

The versions of the manuals and guidelines that were approved at the time of the PD&E study were utilized in the development of study alternatives. The following FDOT Manuals and Guidelines were used in conducting the PD&E study:

- Florida Statues
- Florida Administrative Codes
- Applicable Federal Regulations, U.S. Codes, and Technical Advisories
- FDOT PD&E Manual
- FDOT ETDM Manual
- FDOT Design Manual (FDM), January
- SocioCultural Effects Evaluation Handbook,
- Public Involvement Handbook
- Highway Capacity Manual (HCM)
- Manual on Uniform Traffic Studies (MUTS)
- Manual of Uniform Traffic Control Devices (MUTCD)
- Minimum Standards for Design, Construction, and Maintenance Streets and Highways (Florida Greenbook)
- A Policy on Geometric Design of Highways and Streets
- AASHTO Guide for the Development of Bicycle Facilities
- AASHTO Guide for the Development of Pedestrian Facilities
- Highway Safety Manual (HSM)
- Right of Way Mapping Handbook
- Right of Way Procedures Manual
- Survey and Mapping Handbook
- Soils and Foundation Handbook
- Electronic Field Book (EFB) User Handbook
- Structures Manual
- FDOT Drainage Manual & Drainage Design Guide
- SJRWMD Permit Information Manual
- Indian River Farms Water Control District (IRFWCD) Permit Criteria
- Federal Aviation Administration (FAA) Advisory Circular 150/5200-33C
- FDEP and Department of Management Services (DMS) Florida State Owned Land and Record Information System (FL-SOLARIS) and Land Inventory Tracking System (LITS)

- U.S. Department of Agriculture, Soil Conservation Service (SCS)
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) SSURGO Database of Clay County, Florida
- United States Geological Survey (USGS) 7.5-Minute Quadrangle Map
- U.S. Fish and Wildlife Service National Wetland Inventory (NWI)
- Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM)
- CADD Manual
- FDOT Multimodal Quality / Level of Service Handbook
- Manual On Intersection Control Evaluation (ICE)
- Project Traffic Forecasting Handbook & Project Traffic Forecasting Procedure No. 525-030-120
- Traffic Analysis Handbook
- FDOT Traffic Engineering Manual
- Access Management Guidebook
- Florida Highway Landscape Guide
- Basis of Estimates Manual
- Federal Transit Administration (FTA) and Federal Rail Administration (FRA) Program Guidance
- Project Management Handbook
- Aerial Surveying Standards for Transportation
- CADD production Criteria Handbook

4.1 Roadway Context Classification

Project Level Context Classification was obtained from the FDOT Complete Streets Team via an email dated April 21, 2021. The context classification for SR 5/US 1 is C4 Urban General and C3C for Aviation Boulevard west of SR 5/US 1, and was considered C4 Urban east of SR 5/US 1.

4.2 Airport/Runway

The Vero Beach Regional Airport is located to the west of the SR 5/US 1 and Aviation Boulevard intersection. Runway 30L and the land within the airport property is controlled by the Federal Aviation Administration (FAA) and Vero Beach Airport regulations. An Airport RPZ analysis was conducted due to the proximity of the study intersection to the airport (**Figure 4-1**). The *Flight Surface* controls the airspace to keep the aircraft flight space clear. The FAA concurred with the Runway Protection Zone analysis that concluded the at-grade roadway alternative was the best solution for improvements within the Vero Beach Airport (VRB) Runway 30L RPZ.



Figure 4-1 Vero Beach Airport Runway Protection Zone

4.3 Railroad

The FEC railroad crosses Aviation Boulevard on the west side of SR 5/US 1. Refer to *FDM Chapter 220* and *FDOT Standard Plans Index 509-070* regarding the railroad crossing.

4.4 Design Control and Criteria

The design standards used to govern the development of proposed improvements for the SR 5/US 1 at Aviation Boulevard PD&E study area are summarized in **Table 4-1**.

The build alternative alignments were developed with the two main controlling factors consisting of the FEC railroad right of way and the north right of way line along Aviation Boulevard. The alignment of Aviation Boulevard was kept perpendicular to the railroad

for safety considerations and the curvature of Aviation Boulevard through the airport property held close to the existing curvature to minimize impact to the Vero Ice Age Man archeological zone located just south of Aviation Boulevard.

The vertical alignment is a best fit between the railroad tracks, existing ground along the west side of SR 5 /US 1 and the bridge over Main Canal.

				-
Design Criteria	Crite	eria	Reference	Notes
			Document	
		General		
Functional Classification	SR 5/US 1 – Ur	ban Principal		
	Arterial	Other	Straight Line Diagram	
	Aviation Blvd –	Urban Minor		
	Arter	rial		
Context Classification			ETDM Screening Report	
	SR 5/U	S1-	01/21/2022	
	from 21 st St to 38	th Ln C4 (Urban	Target Speed	
	Gene	ral)	Recommendation	
			Report	
	Aviation	Blvd –		
	C3C (Suburban	Commercial)	FDOT Preliminary	
	west of SF	R 5/US 1	Context Classification	
	C4 (Urban Gen	neral) east of	GIS Viewer	
	SR 5/L	US 1		
Truck %	4.3% FDOT		FDOT Traffic Report	
Design Speed		45	FDM Table 201.5.1	
	SR 5/US 1 -	– 45 mph		
	Aviation Bive	d – 30 mpn	Target Speed	
	Shared Use Pa	ith – 18 mph	Recommendation	
Posted Speed	+			
	SR 5/US 1 – 35 m	ph from 21 st St	Target Speed	
	to 26 th St, 45 mp	oh from 26 th St	Recommendation	
	to 41 ^s	st St	Report	
	Aviation Blvd –	40 mph from		
	27th Ave to Count	ty Admin Rd, 25		
	mph advisory s	peed west of		
	Airport N	l. Drive		
Design Vehicle	WB-62	2 FL		
	Ac	ccess Managemo	ent	
	Existing	Proposed		
Access Class	6	5		SR 5/US 1:
Median Type	Non-Restrictive	Restrictive	FDM Table 201.4.2	- Access Class 6 from
	440 ft > 45 mph	245 ft <u><</u> 45	Rule 14-97 - Arterial	21st St to south of
Connection Spacing (Feet)	245 ft <u><</u> 45 mph	mph	Access Classifications &	39th St
Directional Median Opening			Standards	- Access Class 5 from
Spacing (Feet)	N/A	660 ft		south of 39th St to

Table 4-1Roadway Design Criteria

Design Criteria	Crite	eria	Reference	Notes
			Document	
Full Median Opening Spacing (Feet)	N/A	1320 ft		41st St
Signal Spacing (Feet)	1320 ft	1320 ft		
	Lane	e and Median W	lidths	
Minimum Travel Lanes (Feet)	10' for 25 11' for 40	-35 mph -45 mph	FDM Table 210.2.1	C3 Suburban / C4 Urban General
Minimum Auxiliary Lanes (Feet)	10' for 25 11' for 40	-35 mph -45 mph	FDM Table 210.2.1	C3 Suburban / C4 Urban General
Two-way Left Turn	11' for 25 12' for 40	-35 mph -45 mph	FDM Table 210.2.1	TWLT lanes typically 1 ft wider than travel lane
Bike Lane Width (Feet)	7' buffered	bike lane	FDM 223.2.1.1	
Bike Keyhole Lane (Feet)	7′		FDM 223.2.1.3	
Shared Use Path	8' to	14'	FDM 224.4	10 ft where R/W is limited, 8 ft in constrained conditions
Median Width (Feet)	C3C – 22' C4 with 25-35 mph design speed– 15.5'		FDM Table 210.3.1	
		Border Width		
Min. Border Width for C4 Urban General	12 feet at 2 14 feet at	5-40 mph 45 mph	FDM Table 210.7.1	
	Нс	orizontal Alignm	ent	
Allowable Deflection	2 degrees (≤4 1 degree (≥4	40, curbed) I5, curbed)	FDM Section 210.8.1	
Length of Horizontal Curve (Feet)	450' = 3 525' = 3 600' = 4 675' = 4	0 mph 5 mph 0 mph 5 mph	FDM Table 210.8.1	
Maximum Deflection Angle Through Intersection	6 degrees = 5 degrees = 3 degrees=	= 35 mph = 40 mph = 45 mph	FDM Table 212.7.1	
Minimum Radius for emax=0.05	refer to	table	FDM Table 210.9.2	
Superelevation	e _{max} =(0.05	FDM Table 210.9.2	
	V	/ertical Alignme	nt	·
Maximum Grade	8% for 25 t 7% for 35 t	o 30 mph o 40 mph	FDM Table 210.10.1	

Design Criteria	Criteria	Reference	Notes
		Document	
	6% for 45 mph		
Max. Change in Grade	1.00 for 25-30 mph		
Without Vertical Curve	0.90 for 35 mph	FDM Table 210.10.2	
	0.70 for 45 mph		
Min. distance between VPIs	250 \$		
on curbed roadways	250 ft	FDIVI Section 210.10.1.1	
Min. grade on curbed	0.20%		
roadway	0.30%	FDIVI Section 210.10.1.1	
	Vertical Curve		
Min. K Value for Sag Curve	37 for 30 mph		
	49 for 35 mph	EDM Table 210 10 2	
	64 for 40 mph		
	79 for 45 mph		
Min. K Value for Crest Curve	31 for 30 mph		
	47 for 35 mph	EDM Table 210 10 3	
	70 for 40 mph		
	98 for 45 mph		
Min. Vertical Curve Length	90 for 30 mph		
for Sag Curve (Feet)	105 for 35 mph	FDM Table 210 10 4	
	120 for 40 mph		
	135 for 45 mph		
Min. Vertical Curve Length	90 for 30 mph		
for Crest Curve (Feet)	105 for 35 mph	FDM Table 210 10 4	
	120 for 40 mph		
	135 for 45 mph		
	Vertical Clearan	ce	
Min. Vertical Clearance for	16.5' over roadway	FDM 260 6	
Bridges (feet)	2.0' above design flood stage		
Min. Vertical Clearance over	23.5' over railroad	FDM 260 6	
railroad (feet)	24.25' over electrified railroad	20010	
Min. Vertical Clearance (feet)	17.5' Overhead signs		
	19.5' Dynamic Message signs	FDM 210.10.3	
	17.5' Traffic signals		

5.0 ALTERNATIVES ANALYSIS

5.1 Previous Planning Studies

No previous planning studies were completed for the SR 5/US 1 and Aviation Boulevard intersection. In 1999 a county-wide study of potential railroad crossing grade separations was conducted that identified 41st Street as a potential grade separation location.

5.2 No-Build (No-Action) Alternative

The No-Build Alternative assumes no proposed improvements and serves as a baseline for comparison against the other alternatives throughout the entire PD&E process. The No-Build Alternative maintains the existing configuration along SR 5/US 1 and Aviation Boulevard. In the No-Build Alternative, SR 5/US 1 includes two through lanes and a dedicated left turn lane in both the southbound and northbound directions. Aviation Boulevard consists of one through-left-right shared lane and one exclusive left turn lane in the eastbound direction and one shared through-left-right turn lane in the westbound direction.

The No-Build Alternative also includes on-going construction projects and all funded or programmed improvements scheduled to be opened to traffic in the analysis year being considered. These improvements must be part of the Department's adopted Five-Year Work Program, IRC MPO Cost Feasible LRTP, and any developer-funded transportation improvements specified in approved Development Orders.

IRC has programmed improvements to extend Aviation Boulevard east from SR 5/US 1 to the Cleveland Clinic Hospital, which would realign/reconstruct the existing connection at 32nd Street. The proposed extension would connect the intersection of SR 5/US 1 at Aviation Boulevard directly to 37th Street. This county road extension will serve as an alternative route to improve existing and future access to the Cleveland Clinic Indian River Hospital and provide relief to 37th Street, which is nearing vehicular capacity. In the No-Build Alternative, the Aviation Boulevard Extension consists of two 12-ft lanes, 7-ft bike lanes, and intersection improvements at SR 5/US 1.

Future traffic operational analysis was completed for the No-Build Alternative and included five (5) study intersections. The existing signal timings were optimized for the No-Build analysis to account for traffic growth and demand. For the 2045 design year, the SR 5/US 1 and Aviation Boulevard intersection is forecasted to operate at LOS F during both the AM and PM peak period. All the other intersections are expected to operate at LOS D or better. In addition, four (4) intersection approaches will operate at LOS E during the AM while three (3) intersection approaches will operate at LOS F and four (4) intersection approaches will operate will operate at LOS F and four (4) intersection approaches will operate at LOS F and four (4) inters

operate at LOS E during the PM peak periods. **Table 5-1** and **Table 5-2** show the Future No-Build conditions LOS analysis results for the signalized intersection within the traffic study area.

				Approa	ch Del	ay (s/ve	h)/LOS	;		Intersection Control Delay (s/veh)/LOS	
No	Intersection	EI	3	w	В	N	B	SE	3		
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US 1 & Aviation Blvd	287.8	F	217.2	F	113.0	F	281.0	F	219.0	F
2	SR 5/US 1 & 26 th Street	71.2	E	78.3	E	13.5	В	32.5	С	28.7	С
3	SR 5/US 1 & 37 th Street	-	-	58.6	E	23.2	С	15.5	В	21.0	С
4	27 th Avenue & Aviation Blvd	24.3	С	12.8	В	-	-	44.2	D	24.4	С
5	County Admin & Aviation Blvd	13.6	В	6.0	A	25.7	С	-	-	10.2	В

 Table 5-1
 2045 Future No-Build Intersection LOS – AM Peak Period

Table 5-2	2045 Future No-Build Intersection LOS – PM Peak Period
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				Approa	ch Del	ay (s/ve	h)/LOS	;		Intersection Control Delay (s/veh)/LOS	
No	Intersection	El	3	w	В	N	B	SE	3		
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US 1 & Aviation Blvd	236.9	F	272.7	F	151.1	F	378.3	F	272.1	F
2	SR 5/US 1 & 26 th Street	67.9	Е	79.6	E	16.3	В	23.7	С	25.9	С
3	SR 5/US 1 & 37 th Street	-	-	63.3	E	20.0	С	15.2	В	24.0	С
4	27 th Avenue & Aviation Blvd	31.7	С	19.8	В	-	-	60.5	E	31.5	С
5	County Admin & Aviation Blvd	13.2	В	6.0	A	25.3	С	-		10.5	В

The No-Build Alternative requires no acquisition of additional right-of-way, has no environmental impacts and requires no additional funding. However, the No-Build Alternative has numerous disadvantages including not meeting the purpose and need of the study and fails to meet the goals of the IRC MPO's LRTP. In the 2045 design year, the No-Build Alternative results in failing level of service for the SR 5/US 1 and Aviation

Boulevard intersection in both the AM and PM peak period. Furthermore, the No-Build Alternative does not provide any additional safety improvements.

5.3 Transportation Systems Management and Operations (TSM&O) and Multimodal Alternatives

The Transportation System Management and Operations (TSM&O) Alternative is included in the PD&E process and evaluates strategies that reduce existing traffic congestion, preserve the existing capacity, improve the security, safety, and reliability of the transportation system, while minimizing environmental impacts. TSM&O options generally include traffic management strategies, traffic signal and intersection improvements, access management, and transit improvements.

TSM&O measures that could reduce congestion within the study area that do not include additional capacity improvements include: transit, traffic operations improvements, and pedestrian/bicycle facilities. Indian River Transit, GoLine runs two (2) bus routes within the study area. Ridership could be increased with increased frequency of buses, additional bus stops, and new transit amenities.

Signal timing improvements at the SR 5/US 1 and Aviation Boulevard intersection would provide limited operational benefits at that isolated location. For this proposed project, it was determined that the traffic demand and capacity and safety improvement needs cannot be provided solely through the implementation of TSM&O improvements.

A separate Multimodal Alternative was also determined not to meet the purpose and need of the project due to the additional capacity needs and safety improvements needed. Multimodal features are included in the evaluated Build Alternatives.

5.4 Alternatives Considered

The alternatives development process included conventional intersection alternatives, grade separation alternatives that address the MPO planning goal to conduct a grade separation feasibility analysis, and alternatives that evolved from the Intersection Control Evaluation (ICE) component.

The ICE is a process used to consider multiple context-sensitive intersection control strategies when planning a new or modified intersection. The goal of ICE is to provide a quantitative decision-making process to identify and select a control strategy that fits the location's context, provides safe travel facilities for all road users, and offers the best overall value. As part of the PD&E Study, an ICE stage 1 analysis was performed for the intersection of SR 5/US 1 and Aviation Boulevard.

The ICE Stage 1 involves two analysis components: 1) A planning level volume-tocapacity (V/C) ratio assessment using the Capacity Analysis at Junctions (CAP-X) tool; and 2) a planning level safety assessment using Safety Performance for Intersection Control Evaluation (SPICE). The CAP-X tool is based on the operational analysis using the critical lane method to evaluate selected types of innovative intersection designs. Each control type was compared operationally using a planning level V/C ratio based on the 2045 design year traffic volumes. The FDOT expanded version of FHWA's SPICE tool was used to rank the control strategies selected for the CAP-X tool. It should be noted that the SPICE Tool does not include the Partial Displaced Left Turn, Partial Median U-Turn, Quadrant Roadway, and Single Point Grade Separation control strategies. As such, they were not evaluated in the SPICE analysis.

Based on the preliminary safety and capacity analysis evaluation as well as the multimodal accommodation, the following intersection control strategies were recommended to be evaluated during the PD&E study:

- 1. Single Point Grade Separation (SR 5/US 1 over Aviation Boulevard)
- 2. Single Point Grade Separation (Aviation Boulevard over SR 5/US 1)
- 3. Quadrant Roadway (S-E quadrant)
- 4. Quadrant Roadway (N-E quadrant)
- 5. Partial Displaced Left Turn
- 6. Median U-Turn
- 7. Traffic Signal

Both grade separation of SR 5/US 1 over Aviation Boulevard and Aviation Boulevard over SR 5/US 1 were recommended to be further evaluated from the ICE process. Currently there are no grade separated crossings over the FEC railroad within a 2-mile radius from the study area. The proposed Brightline service along the FEC corridor will increase the number of trains resulting in additional delays and safety concerns at grade crossings. Although grade separation of the minor roadway (Aviation Boulevard over SR 5/US 1) does not result in significant operational improvements, it can enhance safety and emergency response across the railroad tracks to the nearby Cleveland Clinic Indian River Hospital. The combination of these control strategies was evaluated in this PD&E Study to determine the optimal configuration for this intersection. The complete ICE Report for this PD&E Study with the corresponding justifications for the various control strategies are included in Appendix F of the *PTAR*.

Throughout the course of the PD&E study and ICE, the PD&E team created and investigated eight (8) different alternatives for consideration. The IRC extension project

for Aviation Boulevard, eastward of SR 5/US 1, was being designed during the PD&E study and was considered to be built before the PD&E project was completed.

The eight (8) alternatives considered are:

- Alternative 1 Conventional Intersection
- Alternative 2 One-Way Pair
- Alternative 3 US 1/SR 5 Overpass
- Alternative 4 Aviation Boulevard Overpass without railroad crossing
- Alternative 5 Aviation Boulevard Underpass without railroad crossing
- Alternative 6 Aviation Boulevard Overpass with railroad crossing
- Alternative 7 Displaced Left Turn
- Alternative 8 Median U-Turn Roundabout

5.5 Screening Evaluation Matrix for the Alternatives Considered

5.5.1 Evaluation of Alternatives Considered

Given the amount and variety of alternatives, the design team created a screening evaluation matrix to narrow down the range of viable alternatives. The matrix evaluates the alternatives in a comprehensive range of engineering and environmental categories and scores them on a one (1) to four (4) scale with one (1) being the least desirable and four (4) being the most desirable. The screening evaluation matrix is shown in **Table 5-3**. The categories investigated include the following:

- PD&E Purpose and Need
 - Improve Safety
 - Address Forecasted Traffic Demain
 - Enhance Multimodal Functions
- Support from local constituents / stakeholders
 - Local Government entities and public
 - FAA and Vero Beach Regional Airport
 - o FEC Railroad
- Compatible with surrounding roadway network and future Aviation Boulevard extension
- Impacts
 - Severity and number of business and residential parcels
 - o Cultural
 - Environmental
 - o Noise
 - o Contamination
- Constructability and Cost

Alternative 1 (Conventional Intersection) consists of a conventional, at-grade intersection with a LOS D rating and a shared used path to enhance multimodal access; the shared use path is included in each alternative. This alternative is compatible with FAA and Vero Beach Regional Airport requirements as well as FEC Railroad even though the crossing expands from three (3) lanes to six (6) lanes. The at-grade intersection allows for a future connection to the planned Aviation Boulevard extension and maintains access to the local corridor network. However, the expanded pavement footprint impacts the businesses and residents east of SR-5/US-1 along with minor social, cultural, environmental, and physical impacts. The constructability of this alternative poses minimal challenges with a new bridge over the main canal and a relatively low cost compared to the other alternatives. A concept layout of Alternative 1 can be seen in **Figure 5-1**.



Figure 5-1 Alternative 1 Concept Layout

Alternative 2 (One-Way Pair) introduces a bifurcated path for SR 5/US 1 with the southbound direction remaining in the original pavement footprint and a new northbound alignment splitting and shifting east to form a second intersection with Aviation Boulevard. This alternative was developed to evaluate options to minimize impacts to the businesses and non-profit organization on SR 5/US-1 The one-way pair results in a LOS C and LOS D for southbound and northbound SR 5/US 1, respectively. Like Alternative 1, Alternative 2 is compatible with FAA and Vero Beach Regional Airport requirements as well as FEC Railroad even though the railroad crossing expands from three lanes to six lanes. The twin intersections allow for a future connection to the planned Aviation Boulevard extension but changes access to the local corridor network. By splitting the northbound and southbound directions, the businesses along SR 5/US 1 have minimal impacts. However, residential impacts are more prominent, specifically the residents along 13th Avenue. This design has a minor impact on cultural resources and a moderate impact on the surrounding environment. Due to the curvature of the alignment leading into the bifurcation, the main canal bridge will have to be reconstructed into two bridges which is a moderate cost and constructability challenge when compared to the other alternatives. A concept layout of Alternative 2 can be seen in **Figure 5-2**.



Figure 5-2 Alternative 2 Concept Layout

The bridge construction would require a temporary roadway and bridge which will also require temporary or permanent right of way acquisition. A concept layout of the temporary roadway and bridge for construction of the Main Canal bridge can be seen in **Figure 5-3**.



Figure 5-3 Alternative 2 Temporary Bridge

Alternative 3 (US 1 Overpass) is the first of four alternatives with a grade separation. The SR 5/US 1 through movements are elevated over the intersection with an overpass which reduces conflict points and results in a LOS C. Elevating SR 5/US 1 is not preferred by the MPO which wanted Aviation Blvd over SR 5/US 1. The City of Vero Beach was against all grade separation alternatives. Like the other alternatives, the layout increases the number of lanes crossing the railroad from three to six. The at-grade portion of the layout is compatible with the future extension of Aviation Boulevard; however, the large footprint of the bridge and necessary ramps eliminate access to several local side streets and results in major impacts to businesses and residents. The new intersection layout is shifted east to minimize impacts to cultural and environmental resources. The inclusion of three bridges over the Main Canal makes this alternative one of the highest construction costs and difficult to construct. A concept layout of Alternative 3 can be seen in **Figure 5-4**.



Figure 5-4 Alternative 3 Concept Layout

Alternative 4 (Aviation Boulevard Overpass without railroad crossing) is the second grade separated layout and transforms Aviation Boulevard into a four-lane bridge (two lanes in each direction). The removal of the at-grade crossing enhances safety for the project even though the design adds two new intersections by allowing vehicles, pedestrians, and bicyclists to use the elevated structure avoiding at-grade rail conflict points. The US 1/Aviation Boulevard intersection becomes a LOS B, and the two intersections forming the new "Quadrant Road" are both LOS C. To meet the required vertical clearance over the railroad and tie-down within reasonable limits, steep profile grades of 7% are required for the overpass. However, the elevated roadway inside the RPZ is not preferred by the FAA and Vero Airport even though the free-flowing traffic will reduce traffic queuing within the RPZ. The City of Vero Beach was against Alternative 4. The total removal of the at-grade railroad crossing gives this design the highest preference for the FEC. The high elevation of the overpass expands past the typical tiein points of the other alternatives in relation to the future Aviation Boulevard extension and limits the connectivity to the existing local street network. The large footprint of the design has major implications for the surrounding businesses and residents as well as property owners further north along SR 5/US 1. The impacts to cultural and environmental resources are minor and moderate, respectively. As with Alternative 3, Alternative 4 has a high cost and degree of difficulty to construct due to the reconstruction of the main canal bridge and new overpass. A concept layout of Alternative 4 can be seen in Figure 5-5.



Figure 5-5 Alternative 4 Concept Layout

Alternative 5 (Aviation Boulevard Underpass without railroad crossing) mimics the previous alternative except it features an underpass to bypass the railroad crossing in lieu of an overpass. The removal of the at-grade crossing enhances safety for the project even though the design adds two intersections. The US 1/Aviation Boulevard intersection is removed, and the two intersections forming the new "Quadrant Road" are LOS C and D at SR 5/US 1 and Aviation Boulevard, respectively. To meet the required vertical clearance under the railroad and tie-in within reasonable limits, steep profile grades of 7% are required for the underpass. The FEC RR, SR 5/US1 and Airport Drive would bridge over the "open trench" underpass. However, the open trench, depressed roadway inside the RPZ is not preferred by the FAA and Vero Airport even though the free-flowing traffic will reduce traffic queuing within that zone. The FAA would require a full tunnel section through the RPZ. The underpass restricts connectivity to the existing local street network. The large footprint of the design has major implications for the surrounding businesses and residents as well as property owners further north along SR 5/US 1. Due to the deep excavation required to construct the underpass, additional archaeological findings could be discovered given the adjacent proximity to the Vero Man site. The impacts to cultural and environmental resources are substantial and moderate, respectively. This alternative has the highest cost and degree of difficulty to construct due to the underpass and new bridges for the railroad and SR 5/US 1. A concept layout of Alternative 5 can be seen in Figure 5-6.



Figure 5-6 Alternative 5 Concept Layout

Alternative 6 (Aviation Boulevard Overpass with railroad crossing) combines Alternatives 1 and 4 by transforming Aviation Boulevard into a two-lane bridge (one lane in each direction) while keeping the at-grade railroad crossing and removing the "Quadrant Road" portion. The at-grade railroad crossing remains at three lanes but adds the overpass between the eastbound and westbound lanes. The US 1/Aviation Boulevard intersection becomes LOS C. To meet the required vertical clearance over the railroad and tie-down within reasonable limits, steep profile grades of 7% are required for the overpass. However, the elevated roadway inside the RPZ is not preferred by the FAA and Vero Airport even though the free-flowing traffic will reduce traffic queuing within that zone. The high elevation of the overpass expands past the typical tie-in points of the other alternatives in relation to the future Aviation Boulevard extension and limits the connectivity to the existing local street network. Due to the converging movements of the overpass and at-grade connections, this alternative does not have independent utility and would require the Aviation Boulevard extension to be completed. The large footprint of the design has major implications for the surrounding businesses and residents. The impacts to cultural and environmental resources are minor and moderate, respectively. Similar to the other grade separated alternatives, Alternative 6 has a high cost and degree of difficulty to construct due to the new overpass over the railroad. A concept layout of Alternative 6 can be seen in Figure 5-7.



Figure 5-7 Alternative 6 Concept Layout

Alternative 7 (Displaced Left Turn) consists of a conventional, at-grade intersection with an added displaced left turn lane for the northbound SR 5/US 1 movement. The main US 1/Aviation Boulevard intersection has a LOS D and the northbound left turn signal operates at LOS A. This alternative is compatible with FAA and Vero Beach Regional Airport requirements as well as FEC Railroad even though the crossing expands from three (3) lanes to six (6) lanes. However, the deflected left turn movement at the railroad is an added safety concern for signal/gate timing. The at-grade intersection allows for a future connection to the planned Aviation Boulevard extension and maintains access to the local corridor network. However, the expanded pavement footprint impacts the businesses and residents east of SR 5/US 1 along with minor cultural, environmental, and physical impacts. The displaced left turn reduces the opportunity for southbound transit stops and increases the complexity for pedestrians crossing SR 5/US 1. The constructability of this alternative poses few challenges besides a new bridge over the main canal and a relatively low cost compared to the other alternatives. A concept layout of Alternative 7 can be seen in Figure 5-8.



Figure 5-8 Alternative 7 Concept Layout

Alternative 8 (Median U-Turn with Roundabout) consists of a conventional, at-grade intersection and an additional roundabout intersection with a new "Quadrant Road". The left-turn movements are removed from the intersection (except for westbound Aviation Boulevard) and motorists are directed to enter a roundabout to make their desired turn. The main intersection has LOS C, the roundabout has LOS B, and the "Quadrant Road" has LOS C. This alternative is compatible with FAA and Vero Beach Regional Airport requirements as well as FEC Railroad even though the crossing expands from three (3) lanes to five (5) lanes. The at-grade intersection allows for a future connection to the planned Aviation Boulevard extension and maintains access to the local corridor network. The expanded pavement footprint impacts the businesses and residents east of SR 5/US 1 along with minor cultural impacts but moderate environmental and physical impacts. The constructability of this alternative poses few challenges besides a new bridge over the main canal and a moderate cost compared to the other alternatives. A concept layout of Alternative 8 can be seen in **Figure 5-8**.



Figure 5-9 Alternative 8 Concept Layout

5.5.2 5-Screening Evaluation Matrix

Based on the screening evaluation for the alternatives considered, the four (4) alternatives that were dropped from further investigation were:

- Alternative 3 US-1 Overpass had substantial effects to future property access along SR 5/US 1 and is not desirable by either the county or city.
- Alternative 4 Aviation Boulevard Overpass (without railroad crossing) had the highest number of property impacts and potential business and residential relocations; and was opposed by the city.
- Alternative 5 Aviation Boulevard Underpass (without railroad crossing) has very complex construction, railroad track detour and bridge work that found this alternative not viable due to constructability.
- Alternative 6 Aviation Boulevard Overpass (with railroad crossing) was dropped from further consideration based on right-of-way impacts, being opposed by the city, plus it does not have independent utility without the extension of Aviation Boulevard being constructed first.

The result of the screening evaluation analysis is illustrated in the matrix shown in **Table 5-3**.

CRITERIA	ALTERNATIVE 1 CONVENTIONAL	ALTERNATIVE 2 ONE-WAY PAIR	ALTERNATIVE 3 US 1 OVERPASS	ALTERNATIVE 4 AVIATION BLVD OVERPASS (WITHOUT RAILROAD CROSSING)	ALTERNATIVE 5 AVIATION BLVD UNDERPASS (WITHOUT RAILROAD CROSSING)	ALTERNATIVE 6 AVIATION BLVD OVERPASS (WITH RAILROAD CROSSING)	ALTERNATIVE 7 DISPLACED LEFT TURN	ALTERNATIVE 8 MEDIAN U-TURN ROUNDABOUT
<u>PD&E PURPOSE AND NEED</u> IMPROVES SAFETY	Yes (3)	Yes: Reduced speeds and conflict points. Short crosswalks. Adds 1 intersection. NB US-1 curvature potential sight distance challenges. (2)	Yes: Reduced conflict points. (3)	Yes: Eliminates railroad crossing. Adds 1 full intersection. (4)	Yes: Eliminates railroad crossing. Adds 1 full intersection. (4)	Yes: Keeps at-grade railroad crossing and adds an overpass over railroad. (3)	Yes. Reduced conflict points. Adds 1 DLT intersection. (3)	Yes: Reduced speeds and conflict points with roundabout. Adds 1 directional intersection. (3)
<u>PD&E PURPOSE AND NEED</u> ADDRESSES TRAFFIC DEMAND	LOS D (3)	US-1 SB LOS C US-1 NB LOS D (3)	LOS C (4)	US-1 LOS B <u>New Quadrant Rd</u> US-1 @ QR LOS C Aviation @ QR LOS C (4)	<u>New Quadrant Rd</u> US-1 @ QR LOS C Aviation @ QR LOS D (3)	US-1 @ QR LOS C required. (4)	US-1 LOS D US-1 DLT LOS A (3)	US-1 LOS C, <u>New Quadrant Road (QR)</u> US-1 @ QR LOS B Aviation @ QR LOS C (4)
PD&E PURPOSE AND NEED ENHANCES MULTIMODAL	Shared Use Path (4)	Shared Use Path (4)	Shared Use Path (4)	Shared Use Path. Roadway 7% profile grade. (3)	Shared Use Path. Roadway 7% profile grade. (3)	Shared Use Path. Roadway 7% profile grade. (3)	Shared Use Path. Crosswalk at DLT Signal. (3)	Shared Use Path (4)
LOCAL GOVERNMENT AND PUBLIC SUPPORT	City supported. Public supported. County supported. (4)	City opposed. County neutral. (1)	City opposed. Public opposed. County wants Aviation Blvd. overpass (1)	City opposed. Public opposed. County supported. (2)	City opposed. Public opposed. County supported. (2)	City opposed. Public opposed. County supported. (2)	City neutral. County supported. (4)	City neutral. County supported. (4)
COMPATIBLE WITH FAA AND AIRPORT NEEDS	Yes (4)	Yes (4)	Elevated roadway outside RPZ. (1)	Elevated roadway inside RPZ. Reduces traffic queue in RPZ. (1)	Depressed roadway inside RPZ. (1)	Elevated roadway inside RPZ. (1)	Yes (4)	Yes (4)
COMPATIBLE WITH FEC RAILROAD NEEDS	Yes: 6 lanes at rail crossing (2)	Yes: 6 lanes at rail crossing. (2)	Yes: 6 lanes at rail crossing. (2)	Yes: Removes at-grade rail crossing. (4)	Yes: Removes at-grade rail crossing. (4)	Yes: 3 lanes at rail crossing. (3)	Yes: 6 lanes at rail crossing. Adds separated NB deflected left turn lane at RR crossing. (2)	Yes: 5 lanes at rail crossing. (3)
COMPATIBLE WITH AVIATION BLVD EXTENSION	Yes (3)	Yes (3)	Yes (3)	Yes: Extension would connect at quadrant road intersection. (3)	Yes: Extension would connect at quadrant road intersection. (3)	PD&E Alt 6 does not have independent utility. Needs Aviation Blvd extension built to have logical termini. (1)	Yes. (3)	Yes: Extension would connect at quadrant road roundabout. (3)
ACCESS MANAGEMENT COMPATIBILITY WITH LOCAL STREET NETWORK	Maintains existing access. (4)	Changes circulation on 30 th , 31 st ,32 nd , 33 rd Streets and 13 th Ave. (2)	Close access to 30 th and 33 rd Streets. Reduces property access along US- 1 ramps. (1)	Closes 31 st Street. Disconnects 13 th Ave and 33 rd St from local network. Increased access with quadrant road. (1)	Closes 32 nd Streets. Maintains access to 30 th and 31 st Streets. Eliminates access to Aviation Blvd east of US-1. Increased access with quadrant road. (1)	Maintains access to 30 th , 31 st and 33 rd Streets. Eliminates access to Aviation Blvd east of US-1. (2)	Closes access to 31 st and 32 nd Streets. Adds new directional signalized median. (3)	Close access to 31 st and 32 nd Streets. Roundabout provides local traffic circulation. Increased access with quadrant road. (4)

 Table 5-3
 Screening Evaluation Matrix

LEGEND:

$\langle \cdot \rangle$	Less	More De			
V	1 point	2 points	3 points		


CRITERIA	ALTERNATIVE 1 CONVENTIONAL	ALTERNATIVE 2 ONE-WAY PAIR	ALTERNATIVE 3 US 1 OVERPASS	ALTERNATIVE 4 AVIATION BLVD OVERPASS (WITHOUT RAILROAD CROSSING)	ALTERNATIVE 5 AVIATION BLVD UNDERPASS (WITHOUT RAILROAD CROSSING)	ALTERNATIVE 6 AVIATION BLVD OVERPASS (WITH RAILROAD CROSSING)	ALTERNATIVE 7 DISPLACED LEFT TURN	ALTERNATIVE 8 MEDIAN U-TURN ROUNDABOUT
PROPERTY IMPACT TYPES	Business and residential impacts. (2)	Reduced business impacts on US-1. Impacts homes on 13 th Ave. US-1 NB lanes split parcels into 2 parts. (1)	Business and residential impacts. (2)	Business and residential impacts. Physical separation of land north/south of overpass. Modifies entrance and eliminates first row of parking at Big Shots. (1)	Business and residential impacts. Physical separation of land north/south of underpass. Modifies entrance and eliminates first row of parking at Big Shots. (1)	Business and residential impacts. Physical separation of land north/south of overpass. (1)	Business and residential impacts. (2)	Business and residential impacts. (2)
PARCELS EFFECTED AND POTENTIAL DISPLACEMENTS	21 Parcels. Potential 9 business and 2 residential displacements. (2)	35 Parcels. Potential 2 business displacements. Potential 10 residential displacements along 13 Ave. (1)	23 Parcels. Potential 9 business and 2 residential displacements. (2)	35 parcels. Potential 9 business and 6 residential displacements. Quadrant Road (3.7acres) (1)	35 Parcels. Potential 9 business and 6 residential displacements. Quadrant Road (3.7 acres) (1)	27 Parcels. Potential 9 business and 6 residential and 2 residential displacements. Quadrant Road (3.7acres) (1)	22 Parcels. Potential 9 business and 2 residential displacements. (2)	25 Parcels. Potential 9 business and 6 residential displacements. Quadrant Road (2 acres) (1)
CULTURAL: HISTORIC AND ARCHEOLOGICAL POTENTIAL	Minor (2)	Minor (2)	Minor (2)	Minor (2)	Substantial excavation required adjacent to Vero Man site, increased potential for archeological findings. (1)	Minor (2)	Minor (2)	Minor (2)
NATURAL ENVIRONMENT	Minor (3)	Moderate. Effects forested area. (2)	Minor (3)	Moderate. Effects forested area. (2)	Moderate. Effects forested area. (2)	Moderate. Effects forested area. (2)	Minor (3)	Moderate. Effects forested area. (2)
PHYSICAL: NOISE	Low (3)	Shifts US-1 NB lanes eastward 500 feet towards homes. (1)	Elevated US-1 structure. (1)	Elevated Aviation Blvd structure. (1)	Depressed Aviation Blvd structure. (1)	Elevated Aviation Blvd structure. (1)	Low (3)	Road closer to residential. (2)
PHYSICAL: CONTAMINATION	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)
CONSTRUCTABILITY	Typical construction. One Main Canal Bridge. (4)	Requires 2 bridges over Main Canal. (3)	Requires 1 Main Canal bridge and 1 overpass. (2)	Requires 1 Main Canal bridge and 1 overpass. (2)	Requires Aviation Blvd underpass, high speed railroad track detour, railroad bridge, US 1 bridge at underpass, Main Canal Bridge. (1)	Requires Aviation Blvd Overpass. 1 Main Canal bridge. (2)	Requires two US-1 medians and 1 Main Canal bridge. (3)	Typical Construction. 1 Main Canal bridge. (4)
COST: CONSTRUCTION	Low (4)	Moderate (3)	High (2)	High (2)	Very High (1)	High (2)	Low (4)	Moderate (3)
TOTAL POINTS: (HIGHER IS DESIRABLE)	49	36	35	35	31	32	46	47
RANKING	1	4	5	6	8	7	3	2
SELECTED TO MOVE TO DETAILED PD&E PHASE	YES	Yes	Eliminate: Opposed by City. Aviation Blvd not raised.	Eliminate: Opposed by City.	Eliminate: Not viable due to constructability.	Eliminate: Not viable due to logical termini.	YES	YES
u	EGEND:	<u> </u>	les	ss Desirable	Mo	re Desirable		
			200					

Table 5-3 Screening Evaluation Matrix, continued

A mulit-discipline review meeting was held on May 23, 2023, The Alternatives Screening Evaluation Matrix meeting ranked Alternatives 1, 2, 7, and 8 the highest which are the Conventional Intersection, One-Way Pair, Displaced Left Turn, and Median U-Turn Roundabout, respectively. Alternatives 3, 4, 5, and 6, were grade separated intersections that were not supported by the FAA, Airport and City of Vero Beach, and proved to be expensive and/or intrusive for the project site. Therefore, based on the FAA findings, screening evaluation, public input, and coordination with the city, county, airport, and agencies, the four (4) overpass or underpass alternatives were eliminated from further consideration.

5.6 Build Alternatives

After the initial screening of alternatives and stakeholder engagement discussed in **Section 5.5**, the four (4) at grade Build Alternatives that were further developed and evaluated in this PD&E Study included:

- Alternative 1 Conventional Intersection
- Alternative 2 One-Way Pair
- Alternative 7 Displaced Left Turn Intersection
- Alternative 8 Median U-turn with Roundabout

These four alternatives were evaluated through a comprehensive multi-discipline engineering and environmental analysis which is documented in several reports contained in the project file. This section will provide additional detail on the evaluated Build Alternatives and how the alternatives address the project's purpose and need.

5.6.1 Alternative 1 Conventional Intersection

Alternative 1 proposes a conventional at grade signalized intersection that is similar to the existing intersection geometry but includes additional turn lanes and safety improvements. The horizontal alignment of SR 5/US 1 is shifted slightly to the east, requiring right-of-way acquisition of the adjacent parcels east of SR 5/US 1 throughout the study intersection area. The flush paved median is replaced with a raised curbed median. The intersection lane layout is modified to include the following improvements:

- South approach: an additional dedicated left turn lane
- East approach: an additional dedicated left turn lane
- North approach: two (2) additional dedicated right turn lanes
- West approach: an additional dedicated left and right turn lane
- All approaches include a raised median and median traffic separator

The west approach of the intersection is proposed to be widened to the south to accommodate the additional turn lanes at the intersection and a twelve (12)-ft wide shared use path. The proposed improvements to the west approach of the intersection will also cross the existing FEC railroad right-of-way and will need to be coordinated with the agency. The proposed improvements to the east approach of the intersection will also require additional right-of-way (total width of 110 feet) to accommodate the turn lane improvements, 12-ft shared use path and re-alignment to connect to the IRC Aviation Boulevard extension project. The design speed for the east and west approaches (along Aviation Boulevard) is 30 mph.

Access management changes in this alternative include implementing a raised median, closure of 31st Street at SR 5/US 1 and the closure of 32nd Street at the new extension of Aviation Boulevard.

The bridge over the Main Canal will need to be replaced. Multimodal improvements for this alternative include bus bays on SR 5/US 1 north and south of Aviation Boulevard, shared use paths along SR 5/US 1 and Aviation Boulevard and bicycle key holes on the north and south approach of the signalized intersection.

In the design year 2045, the SR 5/US 1 and Aviation Boulevard intersection is forecasted to operate at LOS D for both the AM and PM peak periods for Alternative 1. All intersection approaches will also operate at LOS E or better for both peak periods. Design year 2045 LOS results for Alternative 1 are shown in **Table 5-4**.

	Approach Delay (s/veh)/LOS									Intersection	
Intersection	EB		W	3	NB		SE	3	(s/veh)/ LOS		
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
AM Peak Period											
SR 5/US 1 & Aviation Blvd.	67.4	Е	62.0	Е	33.9	С	37.7	D	43.3	D	
PM Peak Period											
SR 5/US 1 & Aviation Blvd.	67.7	Е	53.1	D	35.8	D	40.5	D	45.0	D	

 Table 5-4
 2045 Future Build Alternative 1 Intersection LOS

This alternative meets the purpose and need of the study by improving the traffic operations of the intersection, improving safety, supporting economic growth and enhancing modal interrelationships with rail, bicycle, and pedestrian modes.

5.6.2 Alternative 2 One-Way Pair

Alternative 2 shifts northbound SR 5/US 1 alignment to the east starting at Main Canal, creating two (2) one-way roadways through the connection with Aviation Boulevard. Northbound SR 5/US 1 reconnects with southbound SR 5/US 1 approximately 1,200 feet north of the Aviation Boulevard intersection. The typical section of bifurcated SR 5/US 1 proposes two (2) lanes in each direction with curb and gutter. A new signalized intersection on Aviation Boulevard with northbound SR 5/US 1 is proposed approximately 700 feet east of the existing signalized intersection with southbound SR 5/US 1. Due to the curvature of the alignment leading into the bifurcation, the main canal bridge will have to be reconstructed into two (2) bridges.

The lane layout for the Aviation Boulevard intersection with southbound SR 5/US 1 is:

- South approach: n/a
- East approach: one (1) left turn lane, one (1) through lane, one (1) shared through/right lane.
- North approach: one (1) left turn lane, two (2) through lanes, one (1) right turn lane.
- West approach: one (1) left turn lane, two (2) through lanes, one (1) right turn lane.

The lane layout for the Aviation Boulevard intersection with northbound SR 5/US 1 is:

- South approach: one (1) left turn lane, two (2) through lanes.
- East approach: County project
- North approach: n/a
- West approach: Two (2) left turn lanes, one (1) through lane.

The creation of a one-way pair roadway through this area reduces the need for additional right-of-way acquisition along SR 5/US 1 but does require additional right-of-way east of 13th Avenue. Additional right-of-way on the south side of Aviation Boulevard, west of SR 5/US 1, is still required in this alternative for additional eastbound turn lanes and proposed shared use path. A 12-ft shared use path is proposed along the east side of both northbound and southbound SR 5/US 1.

Access changes associated with this alternative include SR 5/US 1 being split into two one-way roadways, 30th Street being connected with the proposed northbound SR 5/US 1 roadway, the elimination of 13th Avenue, 32nd Street and 33rd Street. Vehicles traveling eastbound wanting to make a left turn to travel north on SR 5/US 1 will need to head east through the existing Aviation Boulevard intersection and make a left turn at the new intersection with northbound SR 5/US 1.

The project intersection at SR 5/US 1 and Aviation Boulevard will operate at LOS C during the 2025 opening year and LOS D during the 2045 design year for both the AM

and PM peak periods. All of the intersection approaches and most movements will also operate at LOS D or better except for the eastbound right turn movement at the southbound intersection and the eastbound left turn movement at the northbound intersection which operates at LOS E during the 2045 PM peak period. The overall intersection and approach LOS for Alternative 2 is summarized in **Table 5.5**.

	Approach Delay (s/veh)/LOS								Interse	ction	
Intersection	EB		WI	WB		NB		3	(s/veh)/ LOS		
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
AM Peak Period											
SR 5/US 1 SB & Aviation Blvd.	49.1	D	29.9	С	-	-	33.1	С	36.7	D	
SR 5/US 1 NB & Aviation Blvd.	48.7	D	52.6	D	37.3	D	-	-	42.3	D	
			РМ	Peak P	eriod						
SR 5/US 1 SB & Aviation Blvd.	49.7	D	29.7	С	-	-	33.1	С	36.6	D	
SR 5/US 1 NB & Aviation Blvd.	46.8	D	52.7	D	28.3	С	-	-	37.5	D	

Table 5-52045 Future Build Alternative 2 Intersection LOS

Reconstructing the bridge over Main Canal in this alternative has significant issues from a construction standpoint. Given the proposed horizontal geometry, superelevation and required vertical geometry of the northbound travel lanes on the bridge there is inadequate area to adequately maintain four (4) lanes of traffic and pedestrian/bicycle facilities during construction. Other issues associated with Alternative 8 include the following:

- 1. No southbound bicycle facilities are provided along SR 5/US 1.
- 2. Due to curvature of the bridge two (2) separate bridges would be required over the Main Canal. Given the curvature of the northbound structure and the need to develop a three-span structure to accommodate the canal operations an AASHTO or FIB bridge with an 8-inch cast in place concrete deck would be required. This would necessitate a significant increase in vertical profile for this bridge.
- 3. Phased construction of the bridge will likely necessitate the use of a temporary bridge for the northbound movement placed directly east of the proposed bridge with corresponding diversion. This would necessitate significant additional right-of-way implications to build the structure.
- 4. A temporary pedestrian bridge will be required as well.
- 5. Phased construction is complicated by the proposed alignment.



Figure 5-10 Alternative 2 – Proposed Bridge over the Main Canal

5.6.3 Alternative 7 Displaced Left Turn Intersection

Alternative 7 consists of a conventional, at grade intersection with an added displaced left turn (DLT) for the northbound SR 5/US 1 movement to the west side of the SR 5/US 1 right-of-way via a signalized directional median and a two-lane, two-way parallel roadway that is separated from SR5/US 1 by a concrete separator. This two (2)-lane parallel roadway also allows the eastbound to southbound right turn to utilize the DLT signalized intersection. This alternative is similar to Alternative 1 as it expands Aviation Boulevard and the railroad grade crossing to provide four (4) eastbound lanes (one right, one through, two lefts), a median separator and two (2) westbound through lanes. Access to Airport North Drive is provided at grade. A shared use path would be along the south side of Aviation Boulevard.

In Build Alternative 7, the DLT movement was developed for the northbound SR 5/US 1 movement only. The PD&E team considered a southbound DLT and concluded not to advance the concept since that traffic movement was a very low volume and the second DLT signalized intersection pushes impacts into the golf driving range business and further constrains available queue storage between SR 5/US 1 and 30th Street along Aviation Boulevard. Adding the southbound DLT would increase the number of lanes across SR 5/US 1, increasing pedestrian crossing times and right of way needs. This could potentially push the 33rd Street connection further northeast and require a new quadrant road to be developed to relocated turns, provide storage and provide logical termini. It was concurred upon that the southbound DLT would not be advanced unless the DLT alternative was selected to move forward after the public alternatives workshop.

Alternative 7 requires pedestrians to cross an additional traffic separator due to the displaced left turn lanes on the south approach and precludes a busbay or bus stop in the southbound direction.

The project intersection at SR 5/US-1 and Aviation Blvd will operate at LOS C during the 2025 opening year for both the AM and PM peak periods. For the 2045 design year, the intersection will also operate at LOS C for both the AM and PM peak periods. Most of the intersection approaches and movements will also operate at LOS D or better except for the westbound approach, left turn and shared thru-right movements as well as the right turn movement at the displaced left turn cross over which operates at LOS E during the 2025 opening year and 2045 design year for both AM and PM peak periods. The design year 2045 overall intersection and approach LOS results are summarized in **Table 5-6**.

			Approa	ch Dela	ay (s/veh)/LOS			Intersection	
Intersection	E	3	WB		NB		SB		(s/veh)/ LOS	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
AM Peak Period										
SR 5/US 1 & Aviation Blvd.	44.2	D	69.9	E	31.1	С	21.1	С	32.0	С
SR 5/US 1 & DLT	65.3	Е	-	-	6.8	А	14.5	В	12.4	В
DLT & Aviation Blvd.	30.9	С	1.8	А	8.6	А	-	-	18.2	В
			PM	Peak P	eriod					
SR 5/US 1 & Aviation Blvd.	24.5	С	57.7	E	26.3	С	26.3	С	28.2	С
SR 5/US 1 & DLT	73.1	E	-	-	8.9	A	13.8	A	16.1	В
DLT & Aviation Blvd.	21.9	С	1.9	A	9.9	A	-	-	12.6	В

 Table 5-6
 2045 Future Build Alternative 7 Intersection LOS

5.6.4 Alternative 8 Median U-turn with Roundabout

Alternative 8 combines a proposed quadrant roadway and new roundabout intersection to address future traffic demands. The alternative proposes improvements within the FEC railroad right-of-way to accommodate a new dedicated eastbound right turn lane. This alternative improves safety by removing several left turn movements, traffic calming with the proposed roundabout and shared use paths on both SR 5/US 1 and Aviation Boulevard.

Access changes with this alternative include raised median, and the eastbound, northbound and southbound left turns removed from the SR 5/US 1 and Aviation Boulevard intersection. The connection of the two local streets, 30th and 32nd are eliminated at SR 5/US 1. Eastbound left turns would travel through the intersection and make a left turn at the proposed roundabout, continue northeast along the new quadrant roadway and then continue north on SR 5/US 1. Northbound left turns will need to make a right turn at Aviation Boulevard and utilize the roundabout to then travel westbound through the intersection. Southbound left turning traffic is moved to the directional signalized intersection at the new quadrant roadway, north of Aviation Boulevard intersection.

The project intersection at SR 5/US-1 and Aviation Blvd will operate at LOS C during the 2025 opening year for both the AM and PM peak periods. For the 2045 design year, the intersection will operate at LOS D and LOS C for the AM and PM peak periods respectively. Most of the intersection approaches and movements will also operate at LOS D or better except for the eastbound and westbound approaches as well as the eastbound thru and westbound left turn movements during the AM peak period and the eastbound approach, thru and right turn movements as well as the westbound left turn movement which operates at LOS E during the PM peak period for both 2025 and 2045. The design year 2045 overall intersection and approach LOS results are summarized in **Table 5-7.**

	Approach Delay (s/veh)/LOS									ction	
Intersection	E	3	WB		NE	3	SB		(s/veh)/ LOS		
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	
AM Peak Period											
SR 5/US 1 & Aviation Blvd.	64.3	Е	58.1	Е	28.7	С	31.4	С	38.9	D	
SR 5/US 1 & Access Road	-	-	72.5	Е	19.0	В	20.1	В	28.8	С	
Aviation Blvd. Ext & Roundabout	8.2	А	35.9	Е	-	-	6.0	А	14.4	В	
			PM	Peak P	eriod						
SR 5/US 1 & Aviation Blvd.	65.3	E	52.6	D	19.1	В	24.8	С	33.5	С	
SR 5/US 1 & Access Road	-	-	55.4	E	0.6	A	14.7	В	16.8	В	
Aviation Blvd. Ext & Roundabout	7.5	А	31.5	D	-	-	6.9	А	14.4	В	

 Table 5-7
 2045 Future Build Alternative 8 Intersection LOS

5.7 Comparative Build Alternatives Evaluation

An evaluation matrix was completed to evaluate the four (4) at-grade Build Alternatives and the No-Build Alternative. The evaluation matrix used specific criteria to weigh the alternatives on a scale from one (1) to four (4). In the ranking scale, a low score or score of one (1) denoted less desirable effects and a score of four (4) reflected a higher desired effect or good alternative. The evaluation matrix is shown in **Table 5-9**. This evaluation matrix was utilized in the Public Alternatives Workshop held on October 11th, 2023.

Level of Service – Traffic operational analysis found Alternatives 7 and 8 to have the least amount of vehicular delay in the design year despite both alternatives having two (2) signalized intersections. Alternatives 1 and 2 are both expected to operate within target level of service. The No-Build Alternatives is expected to have failing level of service in the design year. The Project Traffic Analysis Report (PTAR) documents the detailed traffic analysis.

Safety - A future crash prediction analysis was conducted for the SR 5/US 1 and Aviation Boulevard arterial segments under the various project alternatives using the Highway Safety Manual (HSM) Analysis spreadsheet for Urban and Suburban Arterials. Build Alternative 8 results in the lowest number of expected total crashes with an overall crash reduction of 80% compared to the No-Build Alternative. Build Alternative 1 and Build Alternative 2 provide similar overall crash reduction of 72% compared to the No-Build Alternative. Build Alternative 7 provides the least crash reduction of 64% compared to the No-Build Alternative. Detailed crash prediction analyses are provided in the PTAR as part of the project file. **Table 5-8** shows the average expected crashes per year along the arterial segments.

Crash	20	25 Opening Ye	ar	20	Crash		
Severity	Fatal and injury	Property damage only	Total	Fatal and injury	Property damage only	Total	Reduction
No-Build	7.2	14.5	21.6	9.6	18.7	28.3	-
Build Alt. 1	2.0	4.1	6.0	2.7	5.2	7.9	72%
Build Alt. 2	2.0	4.1	6.0	2.7	5.2	7.9	72%
Build Alt. 7	2.6	5.2	7.8	3.5	6.7	10.2	64%
Build Alt. 8	1.4	2.9	4.3	1.9	3.7	5.7	80%

 Table 5-8
 Expected Annual Crashes Frequency Comparison

Mobility (Transit, Bicycle, Pedestrian) – Alternatives 1 and 8 ranked the highest in this category due to shared use path and bus bay improvements. Alternatives 2 and 7 do not include proposed bus bays on SR 5/US 1 due to geometric constraints but do propose shared use paths. The No-Build Alternative does not include any proposed mobility improvements such as bus bays, shared use path or bike lanes. The shared use path supports the county planning goals of providing trails and pathways through this intersection.

Roadway Alignment – Alternative 1 proposes a straight alignment for SR 5/US 1 that shifts slightly to the east starting south of Main Canal and ties back into the existing roadway near Big Shots Golf of Vero Beach. Alternative 2 proposed two (2) separate alignments for SR 5/US 1 that separates the roadway into one-way pairs. Southbound SR 5/US 1 will remain on the existing roadway alignment and retain the five (5) ft border width to the FEC R/W. Northbound SR 5/US 1 has an alignment that curves to the east and requires a superelevated bridge over the Main Canal and sweeps east through the existing residential homes. The roadway alignment in Alternative 7 shifts to the east approximately 40 feet more than Alternative 1 to provide space for the northbound to westbound displaced left turn and eastbound to southbound right turn. These displaced lanes are separated from SR 5/US 1 with a six (6) ft concrete separator. Alternative 8 shifts the SR 5/US 1 alignment to the east, creating a larger buffer with the FEC railroad. This alternative also removes left turns from the SR 5/US 1 and Aviation Boulevard intersection and has higher traffic volumes on Aviation Boulevard between the two one-way pairs that will utilize the proposed roundabout and quadrant roadway.

Drainage – All four (4) Build Alternatives would include new drainage features to improve drainage throughout the study area. The No-Build Alternative has no associated drainage improvements and existing drainage inlet grates are within the sidewalk. Pond options for Alternative 1 were sized to accommodate a required water quality/quantity of 2.72 ac-ft and within existing Basins 300, 400, and 500. Alternative 2 were sized to accommodate a required water quality/quantity of 3.44 ac-ft and within existing Basins 300, 400, and 500. Pond options for Alternative 7 were sized to accommodate a required water quality/quantity of 1.48 ac-ft and within existing Basins 300, 400, and 500. Alternative 3 were sized to accommodate a required water quality/quantity of 3.50 ac-ft and within existing Basins 300, 400, and 500. The pond options for Alternative 1 and Alternative 7 were similar and received the same score in the evaluation. Alternative 2 and 8 received better scores in the evaluation matrix due to their potential pond locations. The pond siting analysis is documented in the *Pond Siting Report*.

Bridge and Canal – Alternative 1, 7 and 8 improve the canal and bridge maintenance by shifting SR 5/US 1 to the east and providing additional space within the roadway right of way for maintenance vehicles and personnel to stay out of the railroad right of way.

Alternative 2 proposes for the southbound SR 5/US 1 lanes to remain the same over the bridge and does not provide the maintenance area, a new bridge is proposed for the northbound lanes. The No-Build alternative proposes no changes to the existing aging bridge.

Railroad –Alternative 8 scored the highest out of the Build Alternatives due to the proposed large buffer along US 1 and the railroad, elimination of left turns across the railroad tracks, and proposing five (5) roadway lanes at the crossing. Alternative 1 scored a point lower than Alternative 8 due to the same proposed features but included six (6) roadway lanes at the railroad crossing. Alternative 2 proposes a minimal buffer along US 1 and railroad and six (6) roadway lanes crossing the rail tracks. Alternative 7 proposes to shift northbound left turn lanes to the west of the southbound lanes, closer to the railroad tracks and scored lowest in this category.

Right of Way Properties Impacted – Alternatives 1 and 7 impact the least number of parcels and received the higher score for this evaluation category. Alternative 2 is expected to impact the highest number of impacted parcels and residential home impacts, while Alternative 8 is expected to impact the largest land area of the properties impacted. The right of way impacts are documented in the *Conceptual Stage Relocation Plan*.

Environmental – The project location is an urban area and environmental impacts are expected to be minimal to the natural environment. All four (4) Build Alternatives are expected to improve stormwater quality with drainage improvements. There are minimal impacts to cultural resources. Alternatives 1 and 7 ranked the highest in this category due to the minimal impacts expected from the proposed improvements. A *Natural Resource Evaluation* and *Cultural Resource Assessment Report* were prepared for the study.

Noise Impacts – Alternative 2 was ranked the lowest for Noise in the evaluation matrix due to the alternative proposing to shift SR 5/US 1 travel lanes eastward 500 feet towards homes. Alternative 8 was also ranked less desirable due to the proposed roundabout having a higher traffic level and being located closer to residential land use. Alternative 1 and 3 were ranked the same with a score of 3. A *Noise Study Report* was prepared for the alternatives.

Maintenance – Alternative 1 ranked the highest for maintenance since the alternative proposes only one signalized intersection at the current location and provides a bridge maintenance area. Alternative 2 does not provide a bridge maintenance area and has two separate roadways to maintain. Alternatives 7 and 8 proposed two (2) signalized intersections which would require more maintenance in the future. The No-Build Alternative would require additional maintenance as well since the roadway would be older.

Constructability – Alternative 1 and 8 ranked the highest for constructability due to the proposed roadway and bridge work being able to be completed in phases. Alternative 7 would require additional construction phases for the displaced left turn geometry and was ranked less desirable. Alternative 2 would require a temporary bridge and detour and was ranked the lowest.

Total Cost – Right of way and Long Range Estimate (LRE) construction cost estimates were completed for all four (4) Build Alternatives. Preliminary engineering and construction engineering costs were based on FDOT recommended percentages of the construction cost. The Preferred Alternative LRE is in **Appendix A**.

Alternative 8 had the highest estimated construction cost and was ranked the lowest. Alternative 1 had the lowest estimated construction cost and was ranked the most desirable.

Cost Element	Preferred Alternative	Alternative 2 One-Way Pair	Alternative 7 Displaced Left Turn	Alternative 8 Median U-turn with Roundabout
Right of Way (RW)	\$17,059,500	\$20,500,000	\$21,600,000	\$25,400,000
Construction (CST)	\$16,277,971	\$14,800,000	\$13,700,000	\$15,200,000
Preliminary Engineering (PE)	\$1,953,357	\$2,460,000	\$2,592,000	\$3,048,000
Construction Engineering (CEI)	\$2,278,172	\$2,072,000	\$1,918,000	\$2,128,000
Total Cost	\$37,569,000	\$39,832,000	\$39,810,000	\$45,776,000

Table 5-9Build Alternatives Cost Estimate

Public Comment - During the public involvement outreach, the City of Vero Beach was in favor of Alternative 1. Some members of the public had concerns with the operations of Alternative 7 and 8. A detailed discussion is included in **Section 6.0** below and in the *Comments and Coordination Report*.

CRITERIA	NO BUILD	ALTERNATIVE 1 CONVENTIONAL	ALTERNATIVE 2 ONE-WAY PAIR	ALTERNATIVE 7 DISPLACED LEFT TURN	ALTERNATIVE 8 MEDIAN U-TURN ROUNDABOUT						
LEVEL OF SERVICE	US 1 & Aviation Blvd LOS F (AM/PM) (1)	US 1 & Aviation Blvd – LOS D AM/PM (3)	US 1 & Aviation Blvd – LOS D AM/PM (3)	US 1 & Aviation Blvd – LOS D (AM) US 1 & Aviation Blvd – LOS C (PM) (4)	US 1 & Aviation Boulevard – LOS D (AM) US 1 & Access Rd– LOS C (AM) US 1 & Aviation Boulevard – LOS C (PM) US 1 & Access Rd– LOS B (PM) (4)						
SAFETY	Paved median remains. No crash reduction measures. (1)	Adds a raised median. 72% crash reduction (3)	Adds a raised median. 72% crash reduction (3)	Complicated pedestrian crossing and left turns at railroad crossing. 64% crash reduction (2)	Adds a raised median. 80% crash reduction (4)						
MOBILITY (TRANSIT, BICYCLE, PEDESTRIAN)	No bicycle facilities and cracked sidewalks (1)	Shared use path for bicyclists and pedestrians. Bus bay provided for transit (4)	Shared use path for bicyclists and pedestrians. Transit stops provided. (3)	Does not provide for transit southbound. Displaced left adds second pedestrian crossing maneuver. (1)	Shared use path for bicyclists and pedestrians. Bus bay provided for transit. (4)						
ROADWAY ALIGNMENT	Bridge and curb remain adjacent to railroad right of way. (1)	Straight alignment. Roadway is buffered from railroad right of way. (4)	One way pair. Superelevated curved bridge. (1)	Additional deflection and bridge widening for displaced left turn. (2)	Redirection of left turns and higher traffic volumes east of SR 5/US-1 (3)						
DRAINAGE	Sidewalk drainage problems (1)	Pond 1-C Score 221 (2)	Pond 2A Score 214 (3)	Pond 7C Score 225 (2)	Pond 8-A Score 219 (3)						
BRIDGE AND CANAL	Aging bridge. No canal access upstream of the bridge. (1)	Canal-Bridge maintenance access provided on all sides. (4)	Canal-Bridge maintenance access provided on one side. (1)	Canal-Bridge maintenance access provided on all sides. (4)	Canal-Bridge maintenance access provided on all sides. (4)						
RAILROAD	Bridge and roadway remain adjacent to railroad right of way (1)	Raised median on Aviation Blvd. Large US 1 rail-roadway buffer. 6 lanes at railroad crossing (3)	Raised median on Aviation Blvd. Minimal US 1 rail-roadway buffer. 6 lanes at railroad crossing. (2)	Raised median on Aviation Blvd. Moderate US 1 rail-roadway buffer. 6 lanes at railroad crossing. Displaced left turn at rail crossing. (1)	Raised median on Aviation Blvd. Large US 1 rail-roadway buffer. 5 lanes at railroad crossing (4)						
RIGHT OF WAY PROPERTIES IMPACTED	N/A	27 Parcels, 7.68 Acres, Relocations: 4 business, (0) residential (4)	42 Parcels, 7.61 Acres, Relocations: 2 business, 10 residential (1)	29 Parcels, 6.03 Acres, Relocations: 5 business, 2 residential (3)	35 Parcels, 8.89 Acres Relocations: 5 business, 6 residential (1)						
ENVIRONMENTAL	Does not improve water quality. (1)	Stormwater quality improvements. Minor impacts. (3)	Stormwater quality improvements. Some effects to forested area. (2)	Stormwater quality improvements. Minor impacts. (3)	Stormwater quality improvements. Some effects to forested area. (2)						
NOISE IMPACTS	N/A	Low (3)	Shifts US-1 travel lanes eastward 500 feet towards homes (1)	Low (3)	Higher traffic levels around roundabout. Road closer to residential. (2)						
MAINTENANCE	Increased maintenance (1)	1 Signal (4)	2 Signals. Additional access road maintenance. (2)	2 Signals (3)	2 Signals. Additional access road maintenance. (2)						
CONSTRUCTABILITY	N/A	Construct roadway and bridge in phases. (3)	Requires temporary bridge detour. (1)	Construct roadway and bridge in phases. Adds phase for displaced left turn. (2)	Construct roadway and bridge in phases. (3)						
TOTAL COST	Maintenance cost	\$37,569,000 (4)	\$39,832,000 (2)	\$39,810,000 (3)	\$45,776,000 (1)						
SCORE / RANK	N/A	44 points / #1	25 points / #4	33 points / #3	37 points / #2						
		LEGEND:	N								
		Less Desirable	More Desirable								
		1 point 2 points	3 points 4 points								

5.8 Selection of the Preferred Alternative

Based on the comprehensive evaluation of the four build alternatives, Alternative 1 was chosen as the Preferred Alternative. Alternative 1 meets the purpose and need of the study, reconstructs the existing conventional intersection geometry, and results in the least impacts and costs.

5.9 Value Engineering

The purpose of the Value Engineering Study is to evaluate the preferred alternative to identify cost savings or added value measures that can improve the overall benefit of the alternatives and has the most efficient design.

A Value Engineering (VE) Study was held on December 4th-8th, 2023 and generated 13 recommendations. The VE Team evaluated the Preferred Alternative and an additional concept (RD-4) that was similar to Alternative 2. This additional concept was developed as an effort to mitigate impacts to the Camp Haven property east of SR 5/US 1. Due to numerous impacts associated with the additional concept, the concept was dropped.

After review of the engineering and environmental effects four (4) recommendations were accepted and two (2) were partially accepted as noted in **Table 5-10**. The VE Resolution Memorandum is included in **Appendix D** and the Value Engineering Study Report is provided in SWEPT as part of the project file.

5.10 Preferred Alternative

The Preferred Alternative (Alternative 1) was updated with the accepted VE recommendations, additional comments from the City and County and is summarized in **Section 1.5** and detailed in **Section 7.0**. The Preferred Alternative concept plans are provided in **Appendix A**.

The Preferred Alternative is a conventional intersection with through lanes, left and right turn lanes, bike lanes, and a shared use path. The main canal bridge is replaced with wide shoulders and a shared use path on the east side. Bus bays are provided on SR 5/US 1 along the northbound and southbound departure sides of the Aviation Boulevard intersection. A dry pond is provided along the east side of SR 5/US 1, north of 30th Street.

ltem	Value Engineering Recommendation	Functional Score	VE Cost Avoidance (Addition)	Decision
RD-1	One right turn lane with longer storage SB US-1 to WB Aviation Blvd	2	\$768,000	Not Accepted
RD-2	One left turn lane with longer storage NB US-1 to WB Aviation Blvd	2	\$698,000	Not Accepted
RD-3	Continuation of bike lanes north of Aviation Blvd	4	(\$18,000)	Accepted
RD-4	Reconfigure US-1 and Aviation Blvd intersection per Alternative 9	-17	(\$2,525,000)	Dropped
RD-5	One left turn lane NB US-1 and one right turn lane SB US-1 to WB Aviation Blvd	2	\$1,535,000	Not Accepted
RD-6	Reconstruct 13th Ave between 30th & 33rd St	5	(\$117,000)	Not Accepted
RD-7	Reconfigure 13th Ave and 33rd St to create a right-angle intersection with Aviation Blvd	9	(\$710,000)	Not Accepted
RD-8	Tie Aviation Boulevard into 32nd St	7	\$3,628,000	Not Accepted
RD-9	Provide two through lanes and one right turn lane at the intersection Airport N. Drive	6	(\$85,000)	Accepted
RD-10	Provide left turn lane SB US-1 to EB 28th St	2	Negligible	Accepted
RD-11	Incorporate shared use path around pond	1	(\$99,000)	Partially Accepted
RD-12	Add bike lane NB US-1 on bridge	9	(\$271,000)	Accepted
RD-13	Add pedestrian lighting for the shared use path on the east side of US-1	2	(\$159,000)	Partially Accepted

 Table 5-11
 Value Engineering Recommendations and Decisions

6.0 PROJECT COORDINATION & PUBLIC INVOLVEMENT

A *Public Involvement Plan* was prepared to outline the public outreach efforts. A *Comments and Coordination Report* was prepared to capture the relevant public and agency comments obtained throughout the study. Both documents are provided as part of the project file on SWEPT.

Throughout the PD&E Study process, a project website was developed and maintained (<u>https://www.fdot.gov/projects/sr5aviationblvdpde</u>). The project website was utilized to share project information, documents, photos, public notices, and schedules with the public and agencies. The website also included a page where the public could be included in the mailing list and submit comments.

6.1 Agency Coordination

An initial agency screening was conducted through the FDOT's Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) (ETDM #14475).

6.1.1 Local, State and Federal Agencies Meeting Dates

A project kick-off meeting with FDOT, IRC, City of Vero Beach and the IRC MPO staff occurred on April 21, 2022, to initiate the project study, present an overview of the project, and begin coordination efforts.

A local coordination meeting occurred on October 25, 2022 with IRC, the City of Vero Beach, and IRC MPO staff to coordinate the PD&E Study with the County Aviation Boulevard extension project. The group was informed about the ongoing Public Kick-off Meeting activities and encouraged to attend the public kick-off meeting on October 26, 2022.

A project briefing to the IRC MPO occurred on December 2, 2023 to present the traffic analysis and status of the alternatives development.

A local coordination meeting with IRC MPO staff, IRC and City of Vero Beach Public Works, and Vero Beach Regional Airport occurred on January 19, 2023, to review the study alternatives and gain input from stakeholders.

The City of Vero Beach organized and conducted a Public Information Meeting on February 8, 2023, with affected property owners and invited FDOT to present the alternatives being developed. The city and several members of the public supported the at-grade intersection improvements and opposed the grade separated alternatives.

On February 9, 2023 FEC Railroad was contacted by District 4 Railroad Office, who transmitted a coordination memorandum to FEC that contained project alternatives.

On March 8, 2023 the project team attended a joint FEC, Brightline, and FDOT District 4 Railroad Coordination Workshop. The workshop was held to identify a potential set of requirements for developing a checklist to support FEC railroad coordination in District 4. Representatives from FEC, Brightline, and FDOT were in attendance. The representatives shared characteristics and requirements of their services in the project area.

A local coordination meeting with Vero Beach Regional Airport and FAA was held on March 28, 2023, to clarify the action items related to the FDOT PD&E build alternatives presented to the Vero Beach Regional Airport at a prior coordination meeting. The FAA and airport officials requested a RPZ analysis be conducted and that FDOT would be the party responsible to conduct the study.

On May 16, 2023 the City Council proposed a resolution regarding the study alternatives but that resolution was tabled until more information was available.

A local coordination meeting with IRC MPO staff, IRC and City of Vero Beach Public Works, and Vero Beach Regional Airport occurred on June 16, 2023, to review build alternatives, the screening evaluation matrix, results from the RPZ analysis and gain input. The airport and FAA concurred with the RPZ analysis and findings that the PD&E at-grade alternatives represented the best solution for aviation operations and safety.

On June 30, 2023 a FEC RR coordination memorandum was transmitted to FEC with the four at-grade build alternatives 1, 2, 7, and 8 to obtain input from FEC.

A coordination meeting with IRFWCD was held on August 4, 2023, via teleconference to discuss the SR 5/US 1 at Aviation Boulevard PS&E Study alternatives, preliminary pond sites and bridge replacement concepts. IRFWCD desired access to each quadrant of the bridge for maintenance and a maintenance access width of 15 feet is desired.

On August 18, 2023, the project team attended a FEC Railroad Coordination Meeting. At the meeting funding, bicycle and pedestrian crossings, railroad closures and future reviews of the PD&E documents were discussed.

On February 29, 2024, a local coordination meeting with IRC MPO staff, IRC and City of Vero Beach Public Works, and Vero Beach Regional Airport was held to discuss the preferred alternative and VE study refinements that will be presented at the public hearing.

6.1.2 MPO Meeting Dates

Coordination with MPO occurred throughout the entire PD&E Study. The MPO planning staff were invited and attended the local coordination meetings held with the city and county public works departments.

The PD&E project team made a presentation at the MPO Technical Advisory Committee (TAC) Meeting on Friday, December 2, 2022. The City of Vero Beach stated that they have significant issues with any overpass being located near the airport that could impact the runway protection zone.

The PD&E project team made a presentation at the MPO Citizens Advisory Committee (CAC) Meeting on Tuesday, December 6, 2022. The members had some concerns as to the status of when Brightline will be coming through and the impact on this intersection.

The PD&E project team made a presentation at the MPO Board Meeting on Wednesday, December 14, 2022. After the presentation the floor was opened for comments and concerns. Concerns raised included movement of emergency vehicles, impacts an overpass would have to the airport, inclusion of bike lanes and coordination with Brightline.

The PD&E project team presented the build alternatives to the MPO TAC meeting on January 27, 2023. Comments regarding the City of Vero Beach having significant issues with any overpass being located near the airport that could impact the runway protection zone and/or archeological area were discussed. The City had been contacted by property owners along the corridor who oppose the overpass due to their future development plans.

The PD&E project team presented the build alternatives to the MPO Citizens Advisory Committee (CAC) Meeting on February 7, 2023. Discussion included questions about the status of Brightline and whether train traffic would interact with the proposed project.

The PD&E project team gave an update presentation to the IRC MPO TAC on August 25, 2023, and the Governing Board on September 13, 2023. The update included recent findings from FAA and FEC Railroad coordination, the Build Alternatives that were eliminated, and the Build Alternatives that were identified for further study.

6.2 Public Involvement

Public Involvement activities occurred throughout the study and are documented in the *Comments and Coordination Report.* This technical document is included in the PD&E Study project files and uploaded to SWEPT.

Public Kickoff Meeting was held on October 20th, 2022 (virtual), and October 26^h, 2022 (in-person). Registration links and information were provided in advance and included a QR code for easy access. Project information was posted on the project website. Questions and comments could be submitted prior to the meeting through the project website or by emailing the project manager.

The virtual Public Kickoff meeting began at 5:35 p.m. A project presentation video was played. After the project presentation the project team members addressed comments and questions from meeting attendees. Attendees had the option to submit comments and questions using the raise hand feature to be unmuted or typing their comment or question into the question panel of the GoToMeeting panel. The presentation and a recording of the meeting are available on the project website. There were 23 attendees (excluding the 11 team members). Laurence Reisman, TC Palm Reporter, attended. No elected officials attended.

The in-person Public Kickoff meeting was an open house format and began at 5:30 p.m. A project presentation played on a loop. The following project boards were displayed for attendees: Welcome, Title VI, Schedule, Traffic, Typical Sections, Aviation Typical Sections, and Existing Conditions.

Two elected officials attended the in-person Public Kickoff meeting:

- City of Vero Beach, Vice Mayor Rey Neville
- City of Vero Beach, Council Member Honey Minuse

Five agency representatives attended the in-person Public Kickoff meeting:

- City of Vero Beach, Planning and Development Director, Jason Jeffries
- IRC MPO, Staff Director Brian Freeman
- IRC MPO CAC member Joan Edwards
- Indian River Historical Society President Mark Holt
- Old Vero Ice Age Sites Committee Chair Randy Old

One reporter attended the in-person Public Kickoff meeting:

• TC Palm, Thomas Weber

The **Alternatives Public Workshop** was held on October 10th, 2023 (virtual), and October 11th, 2023 (in-person).

At the virtual Alternatives Public Workshop there were 16 public attendees with six comments and/or questions received. The comments/questions were general comments not related to any specific issue or alternative. Responses were addressed live on the virtual meeting. A recording of the meeting was posted on the website.

At the in-person Alternatives Public Workshop there were 44 public attendees, a presentation on a video loop was available and questions were answered one-on-one by FDOT and consultant staff. Public comments obtained at the workshop included three (3) comments in favor of Alternative 1, 27 comments in favored Alternative 2 and one (1) comment in favored Alternative 8.

Four elected officials attended the in-person Alternatives Public workshop:

- City of Vero Beach, Councilmember Tracey Zudans
- City of Vero Beach, Councilmember Rey Neville
- City of Vero Beach, Councilmember John Carroll
- Commissioner Indian River County

One reporter attended the in-person Alternatives Public workshop:

• TC Palm, Nick Slater

6.3 Public Hearing

The Public Hearing was held on June 18th, 2024 (virtual) and June 20th, 2024 (in-person). The *Public Hearing Transcripts* for the virtual and in-person public hearings are included in the project record and uploaded to SWEPT separately. The Comments and Coordination Report contains detailed summaries and the mailing list, public notifications, exhibits and presentations.

At the virtual Public Hearing there were 17 public attendees with one (1) comment and/or question received. During the formal comment period, one (1) comment received was regarding concern about impacts to emergency management service (EMS) traffic to and from the hospital as this intersection is a key intersection for hospital traffic. A recording of the meeting was posted on the project website.

The in-person Public Hearing was held adjacent to the project site and there were 23 public attendees. The hearing consisted of an informal open house session to view the exhibits and talk one-on-one with project representatives followed by a presentation and formal public comment period. During the formal comment period, one (1) oral comment was received regarding traffic at 26th Street and how ambulances will get to the hospital faster. The commenter also suggested the closure of 30th Street. One (1) written comment was received regarding bicycle lanes and clearly defined lane markings.

A *Public Hearing Transcript* is included with this PD&E Study and uploaded to SWEPT separately.

7.0 PREFERRED ALTERNATIVE DESIGN FEATURES

7.1 Engineering Details of the Preferred Alternative

The Preferred Alternative was selected based on the results of the alternatives evaluation, public involvement, and coordination with agencies and officials at the local, state and federal levels. Conceptual plans of the Preferred Alternative are provided in **Appendix A**.

The preferred alternative reconstructs SR 5/US 1 and Aviation Boulevard as follows:

- Project Limits:
 - SR 5/US 1 limits begin at 28th Street and end 1300 ft north of Aviation Boulevard, for a total length of 2700 ft.
 - Aviation Boulevard limits begin 750 ft west of Airport N. Drive and end 670 ft east of SR 5/US 1, for a total length of 2200 ft.
- The existing SR5 5/US 1 bridge (no. 880085) over the IRFWCD Main Canal will be replaced. The new bridge includes shoulders, a 12-ft shared use path on the east side, and a 15-ft canal maintenance area on the east and west sides.
- A 2.52-acre dry retention pond is proposed and located adjacent to the project between 30th Street and 31st Street.
- SR 5/US 1 at Aviation Boulevard intersection configuration:
 - o Northbound approach: two left turns, two travel lanes, and one right turn lane,
 - o Southbound approach: one left turn, two travel lanes, and two right turn lanes,
 - o Westbound approach: one left turn lanes, one travel lane, one right turn lane,
 - Eastbound approach: two left turn lane, one travel lane, one right turn lane,
 - Bicycle lanes are provided on SR 5/US 1 from 29th Street to approximately 350 ft north of 33rd Street.
 - Bicycle lanes are provided on Aviation Boulevard from SR 5/US 1 to 33rd Street in the eastbound and westbound direction; and from SR 5/US 1 to Airport N. Drive in the westbound direction only. The bicyclist will use the shared use path in the eastbound direction within the airport property.

- The alignment east of SR 5/US 1 curves to the north and connects with 33rd Street to be compatible with the proposed alignment of the Aviation Boulevard Extension project being conducted by IRC. At the Main Canal Bridge, SR 5/US 1 is shifted 15 feet to the east for additional maintenance access between the bridge and FEC Railroad right-of-way.
- Two bus bays are provided on SR 5/US 1, north and south of the Aviation Boulevard intersection, on the departure side of the intersection.
- A 12-ft shared use path is provided along the east side of SR 5/US 1 and on the south side of Aviation Boulevard west of SR 5/US 1.
- High emphasis crosswalks are provided on the south and east approaches of the intersection.
- Access to Airport N. Drive is provided with one westbound right turn lane and one eastbound left turn lane.

Engineering details of the Preferred Alternative are summarized in the following sub sections. Note that the following subsections are not included in the Preferred Alternative evaluation due to not being present or applicable to the project: tolls, managed lanes, landscaping, and wildlife crossings.

7.1.1 Typical Sections

The project is primarily an intersection reconstruction with a raised median that tapers in width to match the existing travel lanes at each end of the project.

The SR 5/US 1 typical section is a four-lane divided, urban section with a raised 28-ft median, 7-ft bicycle lanes, and a 12-ft shared use path on the east side. The context classification for SR 5/US 1 is C4 Urban General and has a design target speed of 45 mph. The proposed typical section for SR 5/US 1 is shown in **Figure 7-1**.

The context classification for Aviation Boulevard is C3C with a design target speed of 30 mph. The typical section for Aviation Boulevard, west of SR 5/US 1, is a four (4) lane, urban section with a 12-ft shared use path on the south side and a westbound seven (7)-ft buffered bicycle lane. The proposed typical section for Aviation Boulevard, west of SR 5/US 1 is shown in **Figure 7-2**. The typical section for Aviation Boulevard, west of SR 5/US 1, is a four (4) lane, urban section with a westbound seven (7)-ft buffered bicycle lane and 12-ft shared use path. The typical section for Aviation Boulevard, east of SR 5/US 1, is a two lane, urban section with seven (7)-ft buffered bicycle lanes and six (6)-ft concrete sidewalks on both sides and provided in **Appendix A**.



Figure 7-1 Preferred Alternative Typical Section - SR 5/US 1



Figure 7-2 Preferred Alternative Typical Section – Aviation Blvd West Approach

The proposed bridge structure provides four (4) travel lanes, outside shoulders, a raised median, and a shared use path on the east side. A proposed bridge typical section for the replacement bridge structure (bridge No.880085) over the Main Canal is shown in **Section 7.1.8 Bridges and Structures** and shown in **Figure 7-3**. It should be noted that a 25 ft 4-inch median was needed on the bridge typical section to meet horizontal curve criteria on SR 5/US 1 while holding the FEC ROW line on the west side of the roadway. Barrier wall is also not provided between the shared-use path and travel through lanes due to sight distance issues at 30th Street.



Figure 7-3 Preferred Alternative Typical Section - Bridge Over Main Relief Canal

The approved Typical Section Package will be provided in SWEPT as part of the project file after the public hearing.

7.1.2 Right-of-Way and Relocations

Additional right-of-way is required to construct the Preferred Alternative. Due to the FEC railroad on the west side of SR 5/US 1, the alignment must be widened to the right or east side of SR 5/US 1. The Vero Beach Regional Airport owns the land west of the FEC right of way and additional right-of-way is required on the south side of Aviation Boulevard. The existing alignment of Aviation Boulevard within the airport property is designated by easement agreement through the airport and FAA. This agreement would require modification to incorporate the addition right of way needed for Aviation Boulevard.

During the PD&E study, Indian River County purchased and cleared the property known as Mike's Furniture located at the SR 5/US 1 and Aviation Boulevard/32nd Street.

In order to meet current design standards for clear zone, border width, maintenance access for the bridge approaches, roadway, shared use path improvements, and stormwater management approximately 6.44 acres of additional right-of-way is needed from 27 parcels and would require four (4) business relocations. A Conceptual Stage Relocation Plan was prepared and included the SWEPT file. The preferred alternative Right of Way exhibit is provided in **Appendix A**.

7.1.3 Horizontal and Vertical Geometry

The horizontal alignment on SR 5/US 1 curves east to match the alignment required for the dual southbound right turns, bicycle lane, two through lanes, a left turn lane and median separator. This shift provides a 15 ft maintenance access area between the Main Canal Bridge and the FEC railroad bridge. The SR 5/US 1 horizontal alignment curves back into the existing alignment north of 33rd Street to match existing curvature and pavement. The horizontal alignment proposed for Aviation Boulevard follows the existing alignment, maintains a near perpendicular railroad crossing and minimizes intrusion in the archeological zone to the south. Horizontal alignment curve data for SR 5/US 1 and Aviation Boulevard is provided in **Table 7-1**.

Roadway	Curve No	Radius (ft)	Curve Length (ft)	Superelevation (e)	Design Speed (MPH)
SR 5/US 1 (PGL LT)	1L	17,016.14	1098.80	Normal Crown	45
SR 5/US 1 (PGL LT)	2L	7,706.25	800.97	Normal Crown	45
SR 5/US 1 (PGL RT)	1R	17,044.14	1135.56	Normal Crown	45
SR 5/US 1 (PGL RT)	2R	8689.68	712.34	Normal Crown	45
Aviation Blvd (PGL LT)	A1L	654.42	440.76	Reverse Crown	30
Aviation Blvd (PGL LT)	A2L	470.92	404.51	Reverse Crown	30
Aviation Blvd (PGL LT)	A3L	371.00	247.06	e= 0.025	30
Aviation Blvd (PGL RT)	A1R	701.92	459.15	Reverse Crown	30
Aviation Blvd (PGL RT)	A2R	446.87	400.00	Reverse Crown	30
Aviation Blvd (PGL RT)	A3R	396.00	471.20	e = 0.021	30

Table 7-1 Horizontal Curve Data

The vertical alignment for SR 5/US 1 was developed through coordination with the IRFWCD high water elevations, bridge superstructure depth and FEC Railroad track elevations. The SR 5/US 1 roadway elevation is raised approximately two (2) feet to provide the required vertical curvature across the railroad along Aviation Boulevard. A saw-tooth grade was also applied to assist in drainage. Vertical curve data is summarized in **Table 7-2**.

Roadway	Vertical Curve No	Vertical Curve Length (ft)	K _{value}	Entrance Grade %	Exit Grade %
SR 5/US 1 (PGL)	1	500	714.28	0.350	-0.350
Aviation Blvd (PGL RT)	1	145	205.00	-0.400	0.300

Table 7-2Vertical Curve Data

7.1.4 Bicycle and Pedestrian Accommodations

A 12-ft shared use path is proposed on the east side of SR 5/US 1 and south side of Aviation Boulevard west of SR 5/US 1. A six (6)-ft sidewalk is proposed on both sides of Aviation Boulevard from SR 5/US 1 to 33rd Street. West of SR 5/US 1 sidewalk is not provided on the north side of Aviation Boulevard to minimize ROW needs, minimize impacts to the existing dry detention pond, minimize archaeological site impacts, to restrict pedestrian activity at the railroad tracks to use the shared use path, and to restrict pedestrians from the aviation side of the corridor. High emphasis crosswalks are proposed on the south and east approaches of the intersection.

Bicycle lanes are provided on SR 5/US 1 in both directions from 29th Street to approximately 350 ft north of 33rd Street and the new bridge has wide shoulders to accommodate bicycles. Bicycle lanes on Aviation Boulevard are proposed in the east/west bound direction from SR 5/US 1 to 33rd Street; and in the westbound direction from SR 5/US 1 to Airport N. Drive with eastbound bicycle traffic served by the shared use path.

The shared use path crosses the FEC railroad tracks on the west approach of the intersection. Pedestrian and bicycle safety features should be provided on both sides of the track. An example from the Manual on Uniform Traffic Control Devices (MUTCD) 11th edition of signing and markings for a pathway crossing railroad tracks is shown in **Figure 7.4**.





7.1.5 Multi-Modal Accommodations

Two (2) new bus bays are proposed on SR 5/US 1. One (1) bus bay is located south of the intersection and one (1) bus bay is located north of the intersection. The 70-ft bus bays will support an articulated bus. Bus shelters, if required at these locations, should be coordinated with GoLine, the IRC maintaining and operating transit agency.

A 12-ft shared use path is proposed on the east side of SR 5/US 1 from 28th Street to the end project limit and on the south side of Aviation Boulevard from the west project limit to the bus bay on SR 5/US 1. The shared use path will provide long term continuity with the proposed shared use paths identified in the IRC Bicycle Pedestrian Master Plan.

On Aviation Boulevard, east of SR 5/US 1 six (6)-ft concrete sidewalks are proposed on both sides of the roadway.

Seven (7)-ft buffered bike lanes are proposed on SR 5/US 1 from 29th Street to the north project limit where a bike ramp is provided to provide access to bicyclists to the shared use path. On Aviation Boulevard, seven (7)-ft bicycle lanes are provided in the westbound direction from SR 5/US 1 to Airport N Drive and seven (7)-ft bicycle lanes are provided in both directions from SR 5/US 1 to 33rd Street.

These multimodal features were coordinated with and requested by the MPO staff, IRC public works and City of Vero Beach public works.

7.1.6 Access Management

The Preferred Alternative proposes improvements along SR 5/US 1 for approximately a half mile and ties back into existing flush paved median at each end. Through coordination with the District Access Management Manager, it was determined that a median opening table was not required for this project. Email correspondence is provided in **Appendix E**.

The existing access management classification of SR 5/US 1 is Class 6 and the proposed access class for the Preferred Alternative is Class 5. Criteria for both access classes are provided in **Table 7-3**. The target, design and posted speed is 45 mph on SR 5/US 1.

SR 5/US 1 Access Class	Median Type	Connection Spacing < 45 mph (ft)	Median Opening Directional <u><</u> 45 mph (ft)	Median Opening Full <_45 mph (ft)	Signal Spacing <u>< 4</u> 5 mph (ft)
Proposed Class 5	Restrictive	245	660	1320	1320
Existing Class 6	Non-Restrictive	245			1320

Table 7-3Access Class Criteria

The Preferred Alternative focuses on improvements at the SR 5/US 1 at Aviation Boulevard intersection and modifies the median access with a proposed raised median. Access to 29th Street, 30th Street, and 33rd Street from SR 5/US 1 is reduced to right in/right out in the Preferred Alternative. The existing connection of 31st Street from SR 5/US 1 is removed in the Preferred Alternative due to the right turn lane and taper location. There is one median opening at Aviation Boulevard, which is a full signalized intersection, spaced 1470 ft and 1300 ft from the begin and end project limit, respectively.

Aviation Boulevard is a county roadway, and the proposed typical section implements a raised median from Airport N. Drive to SR 5/US 1 to 33rd Street. West of the airport property the only existing access is to Airport N. Drive, which will remain a full median opening. West of SR 5/US 1 the realignment of Aviation Boulevard and turn lane approaches to SR 5/US 1 require implementation of a raised median. This 600 ft segment has a traffic separator between the westbound left turn and eastbound travel lane which prohibits any median opening.

7.1.7 Intersection Concepts

The Preferred Alternative includes the one (1) signalized intersection at SR 5/US 1 and Aviation Boulevard with additional turn lanes on all four (4) approaches at the intersection. The SR 5/US 1 alignment shifts east, further away from the FEC railroad tracks. High emphasis crosswalks are proposed on the south and east approach of the intersection. SR 5/US 1 left turn lanes (northbound dual lanes and southbound single lane) were evaluated using auto-turn to ensure opposing left turns meet eight (8) feet spacing requirement and four (4) feet minimum separation for the dual turn lanes.

On SR 5/US 1, several of the existing unsignalized side street connections are proposed to have access changes due to the proposed raised median. The intersections of 29th Street, 30th Street and 33rd Street are proposed to become right in/right out intersections. The intersection of SR 5/US 1 and 31st Street is eliminated.

Aviation Boulevard is widened to four (4) lanes at the non-signalized T-intersection at Airport North Drive. A dedicated southbound right turn lane and northbound left turn lane is provided.

Aviation Boulevard at 33rd Street intersection will be the connection to the IRC project to extend Aviation Boulevard to hospital region. The local streets 31st, 32nd, and 33rd are owned and maintained by the City of Vero Beach. These streets may be modified by future private development. City and County coordination during the design and right of way phase is required for the connection to 33rd Street and the extension project.

Concept plans showing the intersections for the Preferred Alternative is included in **Appendix A**. Right-of-way corner clips at the SR 5/US 1 and Aviation Boulevard intersection should be re-evaluated during the design phase when mast arm locations are determined.

7.1.8 Bridges and Structures

Bridge Typical Section

The proposed bridge typical section will consist of a four (4)-lane divided roadway with a 28-ft 0-inch-wide raised median and 11-ft wide travel lanes. An 8-ft 4-inch buffered bicycle lane adjacent to the exterior 1-ft 4-inch traffic railing (36-inch Single Sloped, with bullet rail) completes the southbound feature of the bridge typical section. In the northbound direction a 7-ft 0-inch bicycle lane is provided adjacent to a raised sidewalk allowing for the 12-ft shared-use-path. A 1-ft 1-inch concrete traffic railing (32-inch Vertical Shape, with bullet rail completes the section. **Figure 7-5** depicts the relationship between the existing bridge deck slab and the proposed deck superstructure for the Preferred Alternative.

Due to sight distance issues from 30th Street, north of the bridge, barrier wall is not provided to separate the shared-use-path from the travel lanes.



Figure 7-5 Proposed Bridge Typical Section (Looking North)

Bridge Span Arrangement and Vertical Profile

The proposed bridge span arrangement will consist of a 126-ft 0-inch three-span symmetrical structure with a 52-ft center span and 37-ft approach spans. The Begin and End Bridge points are located an additional 9-inches from the center of the new piles (solid lines below) at the end bents. This arrangement was selected to accommodate adequate spacing between existing and proposed piling. As seen in **Figure 7-6**, the proposed line of new piles are placed 5-ft from the centerline of the existing piles. Piles would consist of 18-inch precast prestressed concrete piles supporting cast in place end and intermediate pile bent caps. The pile bents will be placed approximately parallel to the Main Canal and existing pile bents.

The proposed superstructure will consist of a series of 15-inch-deep precast prestressed Florida Flat Slab Beams (per Standard Index 450-452) connected using a 6.5-inch reinforced composite cast-in-place (C.I.P.) concrete topping and a reinforced C.I.P. concrete keyway or pockets between adjacent beams. The travel lanes are on a horizontal curve as the roadway crosses the canal. To accommodate this shifting horizontal geometry, the bridge deck width is approximately 9-inches wider and will have a 2.5° skew with respect to the pile bents. The total bridge width is 104'-0" measured perpendicular to the skew.



Figure 7-6 Proposed Span Arrangement and Bent Layout

The integral topping is an FDOT requirement to mitigate past historical reflective cracking problems and poor performance of precast flat slab systems constructed side-by-side without a reinforced C.I.P. concrete keyway or pocket (Sonovoids and Prestressed Slab Units). The total depth of the new slab structure is 24-inches when considering camber and construction tolerances versus the existing 13-inch slab units and toping.

Bridge Vertical Profile, Piles and Riprap

The bridge vertical profile was established to meet the vertical clearance required by both FDOT and IRFWCD for both drainage and navigation (maintenance). A hydraulic analysis was performed by IRFWCD consultant, Carter and Associates, and is included in **Appendix E**. Based on an assumed superstructure depth of 3.55-ft (which accounts for member thickness and deck cross-slope) the new profile is anticipated to be approximately 1.75-ft higher than the existing profile at the canal crossing. Vertical clearance requirements set for the Main Canal Bridge are shown in **Table 7-4**.

Agency	Design Criteria	Water EL (NGVD-29)	Water EL (NAVD-88)	Min Low Mem. EL (NGVD-88)
FDOT	6-ft clearance above Control Elevation - Navigation	1.58	0.12	6.12
FDOT	2-ft drift clearance above DHW (50-yr event) - Drainage	8.20	6.74	8.74
IRFWCD	1-ft drift clearance above DHW (100-yr event) - Drainage	11.35	9.89	10.89

 Table 7-4
 Vertical Clearance Requirements

This system slightly increases the bridge superstructure depth requiring an increase in the roadway vertical profile; but has the advantage of achieving longer spans. This system reduces the number of spans (from four to three) and substructure units in the main canal from three to two. This provides larger spacing between intermediate pile bents for ease of canal maintenance and will facilitate construction of the bridge. In coordination meetings with IRFWCD it was indicated that they did not want to reduce the existing low member elevation of 12.33-ft NGVD [10.87-ft NAVD] for the proposed bridge. They also indicated that they would like to see a sacrificial pile placed upstream of the center span pile bents and the bank armoring for the bridge abutments to be in substantial conformance with IRFWCD Rubble Riprap detail along IRFWCD Canals (see **Figure 7.6**). Therefore, the proposed profile takes this into consideration. The roadway approaches would also require 30-ft reinforced concrete approach slabs on either end to transition to the roadway.



Figure 7-7 Rubble Riprap along IRFWCD Canal – Standard Detail

Bridge Environmental Classification and Asbestos

Based on corrosion test results obtained from FDOT Statewide Environmental Data and project site location, Tierra South Florida recommend the following environmental classifications: Steel Substructure – Extremely Aggressive (Resistivity 820 ohm-cm); Concrete Substructure – Moderately Aggressive (Resistivity 820 ohm-cm); and Superstructure – Slightly Aggressive. This is consistent with the existing plans that identified the existing bridge site as Non-Coastal.

As stated in **Section 2.22**, there were findings of asbestos-containing graphite material in the bridge bearing pads associated with the intermediate bents. These bearing pads consist of 45% to 60% asbestos material and are classified by the Environmental Protection Agency (EPA) as a Category II non-friable material. The demolition work associated with this project will require this material to be properly removed and disposed of by a state of Florida licensed asbestos abatement.

Bridge Cost Estimate

The probable estimated construction cost for this bridge widening is based on using \$280 per square foot of deck area (new bridge costs include a 25% increase in unit prices due to required phase construction and construction over water). For temporary retaining walls near the existing bridge, a preliminary estimated cost of \$35 per square foot was used for four walls with a length of approximately 20 feet and a height of 25 feet; the preliminary estimated cost is \$17,500. This cost is included in the square foot cost of the bridge. Based on a deck area of 13,230 square feet, the estimated cost is \$3,704,400. Additional costs include Bridge demolition and removal which is estimated at \$52 per square foot of deck area. Based on an existing deck area of 7,980 square feet (70-ft x 114-feet), the estimated cost for removal is \$414,960. The cost of roadway approach slabs is \$230,404. The total estimated construction cost for replacement of the bridge is estimated at \$4,353,000. Note that the total costs do not include the cost of rubble rip-rap in the canal.

7.1.9 Intelligent Transportation System and TSM&O Strategies

During the design phase, coordination with IRC public works, emergency services and the FEC railroad is required to identify any special ITS or TSM&O equipment required at the railroad crossing.

7.1.10 Utilities

The estimated impacts to utility facilities resulting from the recommended Preferred Alternative are itemized in the *Utility Assessment Package* prepared for the PD&E Study. Impacts are estimated to occur to buried and overhead telephone, water main, force main, sanitary sewer main, sewer laterals, water meter, fire hydrants, gas main, overhead electric, and overhead fiber optic cable.

The City of Vero Beach has an existing water plant on the northwest corner of SR 5/US 1 and Aviation Boulevard. The City also has plans to relocate the city's wastewater plant to this location. Several buried pipes run underneath SR 5/US 1 to service the city's residents from the existing plant. Impacts to these utilities are anticipated due to the preferred alternative.

Due to the SR 5/US 1 alignment being shifted to the east to accommodate the maintenance access easement for the bridge over Main Canal, several utilities on the east side of SR 5/US 1 will be impacted. Notably, the overhead electric lines that run from 30th Street to 33rd Street will need to be relocated due to roadway improvements.

As stated in **Section 2.22**, Crown Castel Fiber has facilities adjacent to the bridge that appear on the northbound side of the bridge structure which will need to be relocated. There is a 12-inch Cast-Iron-Pipe watermain attached to the existing bridge (Bridge No. 880085) barrier on the east side of the bridge (northbound direction) which will require relocation. The city also has a 16-inch Ductile Iron Pipe watermain crossing beneath the end span on the north side of the bridge. This main crosses diagonally north of the east side of the bridge at a 45-degree angle and continues east along 30th Street. It will be necessary to obtain more accurate utility locations with level "A" locates (soft-dig) on the watermain during the final design phase. This will allow for the development of a potential pile spacing for the proposed bridge north end bent to avoid the need to relocate this facility.

Contact information for the impacted utilities is provided in **Section 2.18**.

7.1.11 Railroad Crossings at Aviation Boulevard and 14th Avenue

Aviation Boulevard intersects the FEC railroad at crossing number 273047Y. The proposed concept considers FRA safety features for railroad quiet zones. The proposed crossing will be expanded to four eastbound lanes (one right lane, one through lane, dual left turn lanes) and two westbound through lanes with a 12.5-ft wide median to accommodate a railroad exit gate arm. On-street bicycle lanes are provided on westbound Aviation Boulevard and start just west of the railroad tracks. A 12-ft shared use path will cross the tracks on the south side of Aviation Boulevard and safety features detailed in **Section 7.1.4** should be considered. A sidewalk is not provided on the north side to reduce the number of bike/pedestrian crossing locations. The horizontal alignment of Aviation Boulevard will maintain a near perpendicular crossing with the railroad, as in the existing condition, and the posted speed is 30 mph. Continued coordination with the FEC Railroad during design is required.

During the design phase, it is recommended that the following items are considered:

- Pedestrian one way exit gates,
- Second train warning signs,
- Traffic signal uninterrupted power supply,
- Activated blank-out signs for southbound right and northbound left turn lanes,
- Advanced railroad preemption for pedestrians,
- Providing a supervised railroad preemption circuit instead of the existing single break system.

FDOT Standard Index 509-070 details median criteria needed for signal gates at the railroad crossing. Due to the northbound dual left turn lanes the 50-ft length needed for the median on the west approach is not achievable.

During the PD&E study, the potential to close the one-lane, one-way 14th Avenue railroad crossing was discussed as a rail/roadway risk countermeasure to improve safety. The closure of the 14th Avenue crossing (272190F) and the evaluation of the southbound traffic being relocated upstream to the nearby 26th Street crossing (272189L) was evaluated in a separate study.

The potential closure of 14th Avenue was presented at the October 10th and 11th, 2023 Alternatives Public Workshop.

If the closure of 14th Avenue is determined to be acceptable, the FDOT Railroad Closure Application process would commence as a separate project outside of this PD&E study.
7.1.12 Permits

The U.S. Army Corps of Engineers (USACE) and SJRWMD regulate impacts to wetlands within the project area. Other agencies, including the USFWS, EPA, and the FWC, review and comment on wetland permit applications. The project is located adjacent to the Vero Beach Airport and contains FEC railroad tracks within the project limits. Coordination with these agencies was conducted during the PD&E study and anticipated permits were identified.

Due to the Preferred Alternative proposing an additional travel lane, it is currently anticipated that the project will qualify for a SJRWMD Individual Permit under FAC Chapter 62-330.054. Due to the section of new alignment, it is anticipated that the project will qualify for a USACE Nationwide Permit #14 for Linear Transportation Projects. This permit allows for the construction of transportation facilities; however, impacts cannot exceed 0.5 acre for non-tidal systems.

Anticipated Permits

Permit	Issuing Agency
Section 404 Dredge and Fill NWP 14	USACE
Environmental Resource Permit (ERP)	SJRWMD
National Pollutant Discharge Elimination System (NPDES) Permit	FDEP
Railroad Permit	FEC
FAA Permit with the airport	FAA

The anticipated needed permits for this project are listed in Table 7.5.

Table 7-5

It is anticipated that a permit be required from the USACE. Surface water impacts are related to proposed modifications to abutments and bridge approaches and pilings. Due to the section of new alignment, it is anticipated that the project will qualify for a USACE NWP 14 - Linear Transportation Projects. This permit allows for the construction of transportation facilities; however, impacts cannot exceed 0.5 acre for non-tidal systems.

SJRWMD requires an ERP when construction of any project results in the creation or modification of a surface water management system or results in impacts to jurisdictional wetlands. The ERP permitting process depends on the size of the project and/or the extent of wetland impacts. This project is anticipated to require an individual permit.

40 CFR Part 122 prohibits point source discharges of stormwater to waters of the U.S. without an NPDES permit. Under the State of Florida's delegated authority to administer the NPDES program, construction sites that will result in greater than one acre of disturbance must file for and obtain either coverage under an appropriate generic permit contained in Chapter 62-621, FAC, or an individual permit issued pursuant to Chapter 62-620, FAC.

7.1.13 Drainage and Stormwater Management Facilities

The pond siting selection process for SR 5/US-1 at Aviation Boulevard adhered to the FDOT District 4 Pond Siting Procedures. A Pond Siting Team consisted of members from FDOT District 4 Planning and Environment Management, Roadway Design, Drainage, Survey, Right-of-Way, Maintenance, Construction, and Legal advisor. Three multidisciplinary team meetings were conducted to evaluate the impacts and compare the pond sites to determine the preferred pond site. Refer to the *Pond Siting Report* for additional information.

The Preferred Alternative will have a "closed conveyance system" and a new dry detention pond that is required to be dry within 72 hours to meet aviation requirements. Three (3) pond options (Pond 1A, Pond 1B, and Pond 1C) were sized to treat and attenuate the proposed road right-of-way within Basins 300, 400, and 500. The ponds will meet the water quality/quantity (treatment and attenuation) criteria set forth by SJRWMD and IRFWCD.

The preferred pond configuration is Pond 1A. IRFWCD has a specific discharge criterion that limits the outfall flow into their canal system. Therefore, the pond volume capacity was increased to meet the discharge requirement. The provided water quality/quantity volume of 2.72 ac-ft. plus attenuation storage in Pond 1A is 4.04 ac-ft, and the right-of-way requirement is 2.52 acres. The pond will include a 20-foot maintenance berm to allow access to maintenance crews.

This project improves the water quality as the existing SR 5/US 1 system does not have an existing stormwater treatment system. The project has no adverse impact to the area's water quality. Stormwater treatment of the additional impervious areas will be treated as required by the SJRWMD Permit Information Manual.

The modifications to the existing drainage system within the project limits will result in an insignificant change in the capacity to carry floodwater. These changes will cause little to no increase in flood heights, flood risks or damage. There will not be a change in the potential for interruption or termination of emergency service or emergency evacuation routes.

7.1.14 Floodplain Analysis

Most of the project limits are located within Floodplain Zone X, an area of minimal flood hazard, and poses no significant floodplain encroachment as shown in Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) 12061C0244J (effective 1/26/23). The Indian River Farms Main Relief Canal is located within Floodplain Zone AE, areas where base flood elevations are determined. The flood base elevations within Zone AE range from 16 to 5 feet NAVD'88. In addition, there are no regulated floodway(s) within the project limits. However, the only floodplain involvement with federally defined floodplains will be the proposed bridge widening. The new bridge has one less bridge span and pile bent within the canal which improves flow. Therefore, it has been determined that there is no change in flood "Risk" or floodplain impacts associated with this project.

Floodplain impacts resulting from construction of the proposed roadway and bridge will be compensated for with the "cup for cup" methodology. No net encroachment into the floodplain shall be allowed. The floodplain encroachment (fill) is based on the volume of proposed fill between the existing ground, (or the Seasonal High Ground Water Table (SHGWT) if a lake or wetland is present) and the 100-year flood elevation. The volume of floodplain compensating storage (cut) is based on the volume of cut between the existing ground and the SHGWT.

7.1.15 Transportation Management Plan

During construction of the project, proper traffic control will be needed to minimize impacts to the community, local businesses, vehicular and pedestrian traffic, and transit. As part of the PD&E Study, a preliminary traffic control plan for the construction of the proposed improvements was developed and consists of four (4) separate phases. The preliminary traffic control plan does not require a full closure on SR 5/US 1 or Aviation Boulevard and detours are not needed. Pedestrian detours will be provided as needed to safely guide pedestrians around construction zones.

Phase 1 – On SR 5/US 1, existing northbound and southbound traffic is maintained, and the work zone is located on the east side of the roadway. On Aviation Boulevard, traffic is maintained on the existing lanes and the work zone for future eastbound traffic is located to the south of the existing lanes.

Phase 2 – On SR 5/US 1, northbound traffic is shifted to the newly constructed northbound roadway and southbound traffic is maintained on the existing lanes. The median and adjacent center lanes, including the bridge, are constructed between the flow

of SR 5/US 1 traffic. On Aviation Boulevard, traffic is shifted to the newly constructed future eastbound lanes and the work zone is concentrated on the existing lanes for future westbound traffic.

Phase 3 – On SR 5/US 1 northbound traffic will remain on the newly constructed northbound lanes consistent with Phase 2, but southbound traffic will be shifted to the newly constructed median and adjacent center lanes. The SR 5/US 1 work zone will be concentrated on the existing lane to construct the new southbound roadway, including the bridge. On Aviation Boulevard, friction course, signing and pavement markings and landscaping would be constructed.

Phase 4 – This phase would only be needed for SR 5/US 1 to construct friction course, signing and pavement markings and landscaping.

Typical sections detailing the temporary traffic control plans are included in the conceptual design plans in **Appendix A**.

7.1.16 Constructability and Construction Impacts

One of the critical aspects of developing roadway improvements along SR 5/US 1 is determining how those improvements will be constructed.

The existing roadway section and traffic volumes will require that four lanes of traffic be maintained during peak-hour periods during the day. Based on this requirement, the bridge would need to be constructed in three (3) phases. A conceptual temporary traffic control scheme was developed for the bridge is provided in the preliminary plans for the preferred Alternative in **Appendix A**. Approximately 45-feet of the proposed bridge can be constructed in Phase 1 without impact to the existing bridge travel lanes and sidewalk. Phase 2 and 3, with its median construction is the most critical phase and is depicted in **Figure 7-8** below.



Figure 7-8 Bridge Traffic Control Phase 2 and 3

In Phase 2, pedestrian traffic and the two (2) northbound lanes can be shifted to the structure built in Phase 1 and the two (2) southbound lanes can remain on the existing structure. The barrier protected shared use path will be utilized for pedestrian and bicycle traffic for this phase and all future phases. During Phase 2, 35-feet of the existing structure will be removed, and an additional 30-feet of the proposed structure will be constructed

to be used in Phase 3. In Phase 3, the two (2) southbound lanes will be shifted to the proposed bridge. This will allow room for the last 35 feet of the existing bridge to be removed and the final 30 feet of the proposed bridge to be constructed.

In all cases the existing City of Vero Beach 12-inch watermain attached to the bridge on the east side must be relocated. The relocation will have to be done away from the bridge in additional right of way or an easement and installed via horizontal directional drilling (HDD) utilizing High Density Polyethylene (HDPE) watermain grade pipes.

Temporary impacts to businesses will be minor as most of the businesses located north of the canal will require acquisition of the entire parcel or large portions of the parcels and building structures. Access can be maintained to 28th and 29th Streets south of the canal.

Temporary detours and access to 30th Street and 13th Avenue may be required during construction until the new access to 33rd Street is constructed. There is a potential for IRC to have constructed the extension of Aviation Boulevard from US 1 to the medial region which would improve access to 30th Street and 13th Avenue during construction.

The existing residential area is east of 13th Avenue which is more than 500 feet from SR 5/US 1 which lessens the construction noise impacts. There is an medical eye surgery facility located at the north end project limit.

The bridge pile driving, drilling, and crane operations require coordination with the Vero Beach Airport and FAA as the bridge is under the flight path. Potential pile driving activities near the FEC railroad bridge should be coordinated with FEC Railroad.

Construction activities may cause short-term air quality impacts in the form of dust from earthwork and unpaved roads. These impacts will be minimized by adherence to applicable state regulations and to applicable FDOT Standard Specifications for Road and Bridge Construction.

It is anticipated that the application of the FDOT Standard Specifications for Road and Bridge Construction will minimize or eliminate most of the potential construction noise and vibration impacts. However, should unanticipated noise or vibration issues arise during the construction process, the Project Manager, in concert with the District Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

Minimization measures and best management practices to control erosion and stormwater impacts during construction will be documented in a Stormwater Runoff Control Concept (SRCC) to be prepared in the design phase.

Contractor requirements related to interaction with protected species will be refined in the design and permitting phase. During construction, best management practices,

adherence to FDOT's Standard Specification for Road and Bridge Construction and use of preconstruction surveys are strategies that will be considered, as needed, for protection of listed species.

Although no evidence for archeological site 8IR1/8IR9 was identified, archaeological monitoring by a professional archaeologist within the vicinity of the site is recommended during project construction. Specifically, monitoring is recommended during earth-disturbing activities in the following locations:

- Along Aviation Boulevard
- SR 5/US 1 between Aviation Boulevard and 28th Street
- Pond 1A

Should construction activities uncover archaeological remains, it is recommended that activity in the immediate area of the remains be stopped while a professional archaeologist evaluates the remains. In the event that human remains are found during construction or maintenance activities, the provisions of Chapter 872.05, F.S. will apply.

7.1.17 Special Features

The Preferred Alternative has several special features incorporated in the design.

- A 15-ft wide canal maintenance area on the upstream and downstream side of the Main Canal bridge. The Indian River Farms Water Control District (IRFWCD) requested this feature to allow bridge maintenance access without encroaching on the FEC right of way and to access the downstream bridge area from the south side. Access and guardrail connections will need to be coordinated during design for both approaches on the bridge. A special IRFWCD riprap detail for under the bridge is anticipated.
- Guardrail is needed on Aviation Boulevard, at the west end of the project, where the roadway is being widened to the south into an existing dry stormwater pond. This area will require slope protection or retaining wall for approximately 600 ft stretch with a pedestrian/bicycle railing.
- Bicycle lane connection to the shared use path was recommended by the VE Study and is located on the northbound side just north of 33rd Street.
- Traffic signal and railroad signal timing control interface is required.
- Bus bays are provided on SR 5/US 1, north and south of Aviation Boulevard.

• The Value Engineering Study recommended adding pedestrian lighting on the SR 5/US 1 shared use path and an additional pathway around the proposed pond if the path would be part of a trail system and if the city wanted a path around the pond.

7.1.18 Design Variations and Design Exceptions

No design variation and/or design exceptions are anticipated for the Preferred Alternative. The 10 foot buffer between the shared use path and edge of pavement avoides a design variation by providing the placement of signs outside of the lateral clear zone for the vehicles on the roadway and bicycles on the shared use path.

7.1.19 Cost Estimates

A construction cost estimate for the Preferred Alternative was obtained using the Long-Range Estimate (LRE) cost estimating tool.

Item	Cost Estimate	Comments
Right-of-Way	\$17,059,500	
Construction	\$16,277,971	Update 3/16/2024
Design @ 12% of construction cost	\$1,953,357	Phase 32
Construction Inspection and Engineering (@ 13% of Construction Cost)	\$2,278,172	Phase 62
Total Cost	\$37,569,000	

Table 7-6 Cost Estimate for Preferred Alternative

7.2 Summary of Environmental Impacts of the Preferred Alternative

7.2.1 Future Land Use

The future land use obtained from the City of Vero Beach Department of Public Works/GIS Division and is shown in **Figure 7-9**. Existing commercial land use on the east side of SR 5/US 1 at the Aviation Boulevard intersection is planned to become Mixed Use in the future. The Preferred Alternative proposes a conventional intersection geometry which is compatible with future land use.



Figure 7-9 Future Land Use Map

7.2.2 Sociocultural

Expansion of SR 5/US 1 and Aviation Boulevard requires right of way acquisition throughout the project limits. The Conceptual State Relocation Plan (CSRP) was prepared and included in the SWEPT project file.

Additional right of way is required within the Vero Beach Airport property along the realignment of Aviation Boulevard to 33rd Street. Twenty (27) parcels are anticipated to be impacted including several business impacts.

Along Aviation Boulevard west of the railroad tracks, an airport agreement is required to modify the description of the land required for Aviation Boulevard. This agreement requires coordination with the FAA and FDOT Aviation Offices.

One outdoor advertising sign is located on the east roadside north of 33rd Street and is within the right of way acquisition area.

With regards to aesthetic effects, the existing SR5/US 1 right of way is 100% impervious asphalt or concrete with no opportunity for landscape. The project will enhance the area with shared use paths, new sidewalks, grassed medians and potential areas for landscape in areas of the new right of way. A landscaping plan has not been developed as part of the PD&E Study. Retention pond design should evaluate opportunities to retain the large mature oak trees that are located within the general pond area. A landscaping concept opportunity plan and/or design would be developed during the design phase. Future proposed landscaping plan for the corridor will be coordinated with the City of Vero Beach and IRC.

However, due to the existing commercial and residential development, the proposed project is anticipated to have a Degree of Effect (DOE) of *Minimal*, as identified in the ETDM Summary Report.

7.2.3 Section 4(f)

There are two Section 4(f) resources within the project limits, the Micheal Field Baseball Complex located 135 ft east of SR 5/ US 1 and just south of 28th Street. Another resource are planned trails which were identified in the Central IRC Greenway Plan and have planned routes through the project corridor. The shared use path provided in the preferred alternative supports the future implementation of these trails. These resources were evaluated through a Section 4(f) Determination of Applicability which is included in the SWEPT and the Type 2 Categorical Exclusion and found to have either No Use of the resource or Section 4(f) is Not Applicable. The SWEPT resource outcome is shown in **Table 7-7.**

Resource Name	Facility Type	Property Classification	Owner or Official with Jurisdiction	Recommend ed Outcome	OEM SME Action
Michael Field Complex	A city owned baseball field complex.	Park/Rec Area	City of Vero Beach	No Use	Determination 07-18-2023
Central Indian River County Greenways Plan	Multiple planned shared use paths or trails	Park/Rec Area	Indian River County	Not Applicable	Determination 07-19-2023

Table 7-7Section 4(f) Determination

7.2.4 Cultural Resources

A total of 57 shovel tests were excavated within the archaeological APE in areas devoid of hardscape, underground utilities, and deep layers of fill or spoil. There was no evidence of the previously recorded archaeological site, 8IR1/8IR9, nor were new archaeological sites or occurrences identified in the archaeological APE as a result of the background research, the pedestrian survey, or the subsurface testing. Eight (8) shovel tests were dug within the City of Vero Beach Vero Man Local Historic Site/Archaeological Zone on the west side of SR 5/US 1 south of the airport. The tests were excavated to approximately two (2) meters and most encountered fill material near the surface. On the east side of SR 5/US 1 within the purported location of site 8IR1/8IR9, 26 shovel tests were excavated. Twenty-five of these tests were excavated within the location of proposed Pond 1A.

Although no evidence for site 8IR1/8IR9 was identified, archaeological monitoring by a professional archaeologist within the vicinity of the site is recommended during project construction. Specifically, monitoring is recommended during earth-disturbing activities in the following locations:

- Along Aviation Boulevard
- SR 5/US 1 between Aviation Boulevard and 28th Street
- Pond 1A

The historic resources survey identified 37 historic resources, including 16 extant previously recorded resources and 21 newly identified resources. The 16 previously recorded resources consist of three linear resources and 13 buildings. The 21 newly identified resources consist of 18 buildings (8IR1883-8IR1890; 8IR1893-8IR1903) and three resource groups (8IR1904-8IR1905; 8IR1954). The resource groups include the Vero's Motel Complex (8IR1904),the Vero Beach Regional Airport (8IR1905), and Camp Gordon (8IR1954). Florida Master Site File (FMSF) forms were prepared for the newly recorded resources. FMSF forms were updated for four buildings (8IR744; 8IR745; 8IR755; 8IR766) and the two linear resources which had not been recorded or evaluated within the current APE, the Florida East Coast (FEC) Railway (8IR1497) and Dixie Highway (8IR1519). An updated FMSF form was not prepared for the Indian River Farms Main Canal (8IR1148), which has been determined ineligible within the APE by the SHPO, as it does not exhibit physical changes nor changes in eligibility since it was last recorded.

The segment of the FEC Railway (8IR1497) within the APE has been determined eligible under Criterion A for Community Planning and Development and Transportation for its role in the development of the east coast of Florida including Vero Beach and Indian River County.

This segment of SR 5/US 1 (8IR1519) within the APE exhibits modern improvements such as widening, signalization, and signage. Therefore, this segment is considered National Register–ineligible, because other segments of SR 5/US 1 have been determined eligible within Indian River County, the entire resource maintains National Register-eligibility per the Historic Linear Resource Guide (FDHR 2022).

Vero's Motel (8IR1904) does not embody a distinctive type or style of high architectural value and exhibits modifications. The Vero Beach Regional Airport (8IR1905) lacks historic integrity as its terminals and runways have been altered. Due to a loss of historic structures and the construction of non-historic structures, the airport does not convey its associations with its early 20th-century or World War II military history. Therefore, both resource groups are considered ineligible for the National Register.

One newly recorded building, a packinghouse at 2745 St. Lucie Avenue (8IR1894), is considered National Register-eligible under Criterion A in the areas of Agriculture and Industry due to its association with the region's post-World War II agricultural economy and the Indian River Citrus District.

Seventeen of the buildings are affiliated with the c. 1931-1955 tourist camp, Camp Gordon (8IR1954). The vernacular cottages and commercial buildings that constituted Camp Gordon were an associated collection of resources. The loss of most of the structures and deterioration of the remaining structures does not lend itself to a district,

and individually, the resources do not have enough integrity or importance to be considered eligible for the National Register. The additional newly recorded buildings not associated with Camp Gordon are also considered ineligible because they exhibit common architectural styles, modifications, and lack historical associations.

7.2.5 Wetlands

No wetlands were identified within the project study area, so no impacts to wetlands are proposed due to the Preferred Alternative.

Surface water impacts (SW-1) for the Preferred Alternative total 0.11 acres, which equates to a total functional loss of 0.06 palustrine herbaceous units. Direct fill impacts to SW-1 result from construction of bridge pilings and widening activities. Shade impacts are not considered since this area for surface waters consists of non-vegetated bottom. Other surface water (OSW-1) impacts for the Preferred Alternative total 0.11 acres. Mitigation is not required for impacts to OSW since these reservoirs have been permitted through an existing permitted stormwater system and are thus non-jurisdictional.

Impacts to SW and OSW within the Preferred Alternative are summarized in **Table 7-8**. UMAM scores and functional loss analysis for surface waters for the Preferred Alternative are also summarized in **Table 7-8**. For impacts to surface waters, it is anticipated that mitigation would be required by both the SJRWMD and USACE. Permanent impacts to surface waters associated with pilings and bridge widening activities resulted in 0.06 units of functional loss. Shade impacts are not considered since this area for surface waters consists of non-vegetated bottom. No impacts to OSWs are proposed to be mitigated.

FLUCFCS / ID	USFWS Classification	Preferred Alternative					
		Impact Type	Impact Acreage	UMAM Score	Functional Loss		
Surface Waters	Surface Waters						
5100 / SW-1	PEM1Hx	Fill	0.11	0.50	0.06		
Other Surface Waters							
5300 / OSW-1	PSS1Cx	Fill	0.11	-	-		
Preferred Alternative Tota			0.22		0.06		

 Table 7-8
 Potential Surface Water Impacts

7.2.6 Protected Species and Habitat

The project may affect but is not likely to adversely affect federally and state listed wildlife species. The species key for the indigo snake, wood stork and manatee were utilized and are contained in the Natural Resource Evaluation (NRE) in the project file. The Effect Determination Keys were utilized for the eastern indigo snake, wood stork, and West Indian manatee. The NRE was transmitted for informational purposes to the USFWS and concurrence on effect is not required.

The project is anticipated to have **no effect** on the following federally listed species:

- Fragrant prickly-apple
- Lakela's mint
- Miami blue butterfly
- Loggerhead sea turtle
- Green sea turtle
- Leatherback sea turtle
- Hawksbill sea turtle
- Atlantic salt marsh snake
- Florida scrub-jay
- Red knot
- Audubon's crested caracara
- Piping plover
- Eastern black rail
- Roseate tern
- Florida bonneted bat
- Southern beach mouse
- Florida panther

Federally listed species assigned an effect determination of **may affect**, **not likely to adversely affect** include:

- Eastern indigo snake
- Wood stork
- West Indian manatee

There is **no effect anticipated** on the following state listed species:

• Snowy plover

- Black skimmer
- Least tern

There is **no adverse effect anticipated** on the following state listed species:

- Gopher tortoise
- Florida sandhill crane
- Florida burrowing owl
- Little blue heron
- Reddish egret
- Tricolored heron
- Southeastern American kestrel
- Roseate spoonbill

There are species which may occur in the project vicinity that are not listed as threatened or endangered but receive other legal protection. The project is not expected to negatively impact the bald eagle which is protected under the BGEPA, the MBTA, and State law (FAC 68A-16.002).

No roosting bats were observed within the project study area during field reviews. The tricolored bat is not likely to roost or forage within the project study area. FDOT will continue coordination with USFWS to determine the potential effect to the tricolored bat once a final listing decision has been made. No impacts are anticipated to state or federally protected bats due to the proposed project.

Multiple avenues of protection will be employed to negate and minimize any potential effects to these species. Some of the measures employed may include detailed surveys and agency coordination during the project design phase, including providing appropriate mitigation to offset impacts. During construction, best management practices, adherence to *FDOT's Standard Specification for Road and Bridge Construction* and use of preconstruction surveys are strategies that will be considered, as needed, for protection of listed species.

The study area occurs within areas of critical habitat for the West Indian manatee. No impacts to manatee critical habitat are anticipated as a result of this project. For these reasons, it was determined that the Build Alternatives will result in **no destruction or adverse modification** of critical habitat for the West Indian manatee.

7.2.7 Essential Fish Habitat

No EFH exists within the project study area, therefore the proposed project will have no involvement with EFH, and an EFH analysis was not required.

7.2.8 Highway Traffic Noise

The project is considered a Type I project due to the substantial horizontal alternation of the roadway. The existing land use in the noise study area consists of 22 residences, a baseball field, preschool gym, rehabilitation center, motel and a restaurant.

Design year (2045) exterior traffic noise levels with the project (future build with Preferred Alternative 1) are predicted to range from 52.0 to 66.0 dB(A) at the residences, with traffic noise levels predicted to approach, meet, or exceed the NAC for Activity Category B at one residence. Noise barriers were not evaluated for the single impacted residential receptor. Consistent with FDOT's traffic noise policy, a noise barrier must benefit a minimum of two impacted receptors to be considered feasible.

A traffic noise level of 53.6 dB(A) was predicted for the baseball field, a level that does not approach, meet, or exceed the NAC for Activity Category C.

Traffic noise levels are not predicted to approach, meet, or exceed the NAC for any of the Activity Category E uses evaluated, ranging from 62.3 to 69.2 dB(A). Finally, an interior traffic noise level of 47.0 dB(A) at the Small Wonders Preschool Gym does not approach, meet, or exceed the NAC for Activity Category D. When compared to existing traffic noise levels, the largest increase with the proposed project is predicted to be 11.1 dB(A). None of the evaluated noise sensitive land uses are predicted to experience a substantial increase (greater than 15 dB(A)) in traffic noise resulting from the proposed project.

Noise abatement measures are not recommended for construction as part of this project. If changes occur to the current conceptual design, additional analysis may be warranted.

7.2.9 Contamination

A total of 13 potential contamination sites were identified within the contamination study area and are shown in **Figure 2-25**. Of the 13 sites, none have a High Risk rating and 4 sites have a Medium Risk rating. The following have a Medium Risk rating:

- FEC Railroad (Map ID #1)
 - This railroad bed has a long history of use and may contain arsenic (from chromated copper arsenate), petroleum products (from creosote oil), and other contaminants from treated railroad ties. All project alternatives include modifications to the railroad crossing at Aviation Boulevard.

- Vero Beach Water Treatment Plant (Map ID #2)
 - There have been one or more ponds or ditches along Aviation Boulevard that have received effluent including spent lime sludge from the City's water treatment plant.
- Sullivan Property (Map ID #3)
 - Two USTs were removed circa 1998 but no tank closure report with confirmatory soil or groundwater sampling was found.
- W C Graves Jr. / Indian River Associates (Map ID #4)
 - Two USTs were removed before 1990 but there is no record of confirmatory soil or groundwater sampling. One heating oil UST was also present but there is no record that it was removed or properly abandoned.

The remaining sites were categorized as Low Risk or No Risk. This determination was made because these sites either do not possess an active industrial waste permit or storage tank, the permit files do not indicate any current or prior contamination issues, and/or they are not situated near the proposed project improvements. The following sites have a Low Risk rating:

- Vero Beach City Water Treatment Plant (Map ID #5)
- Vero Beach Naval Air Station (Map ID #6)
- Hogan & Sons, Inc (Map ID #)
- Treasure Coast Oil/Tire Kingdom (Map ID#)
- Moran Service Station (Map ID#)
- Amoco #60304 (Map ID#)

The following sites have a No Risk rating:

- Orange Blossom Village (Map ID#)
- Hogan & Sons Citrus Packers (Map ID#)
- Michael Field DDMS (Map ID#)

It is recommended that the project be re-evaluated during design to determine if any new contamination-related risks are present, to determine if remediation by others reduces or eliminates risk, and to evaluate potential dewatering concerns. Level II contamination assessment investigations may be appropriate for some areas that have proposed subsurface work activities (e.g., pole foundations or drainage features) or where excess soils are expected to be produced.

If dewatering is needed during construction, an SFWMD Water Use Permit will be required. Dewatering operations in the vicinity of potentially contaminated areas may be limited to low-flow and short-term to avoid potential contamination plume exacerbation. Dewatering near contaminated sites may also require the installation of groundwater barriers and/or an effluent treatment plan. The contractor should be held responsible for compliance with any necessary dewatering permits.

There are numerous old houses and commercial buildings in the contamination study area; these may contain Asbestos Containing Materials (ACM) and/or Lead-Based Paint (LBP). A survey for ACM, conducted in December of 2007, confirmed ACM in the Main Canal bridge bearing pads associated with the intermediate bents. ACM and LBP surveys will need to be conducted by a licensed asbestos consultant on buildings and structures if demolition or renovation is proposed.

APPENDICES

Appendix A – Preferred Alternative



Preferred Alternative

(Alternative 1)

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study Indian River County, Florida Financial Project ID: 441693-1-22-02 Efficient Transportation Decision Making (ETDM) Number: 14475

WATER TREATMENT PLANT (CITY OF VERO BEACH)

PROPOSED R/W

-122' PROPOSED R/W

FEC RAILROAD

EXISTING

-FEC R/W-

<u>t | X |</u> t | X |

- STA 32+18.31 END CONSTRUCTION CONNECT TO 33RD ST

- FUTURE EXTENSION OF AVIATION BLVD BY INDIAN RIVER COUNTY





Draft Alternative

April 2nd 2024

Preferred Alternative





State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study Indian River County, Florida Financial Project ID: 441693-1-22-02 Efficient Transportation Decision Making (ETDM) Number: 14475

Per Runway Protection Zone – Alternative Analysis Runway 30L, Vero Beach Regional Airport Report Section 17 dated June 8, 2023

Aviation Blvd. is located on Airport property and a portion of the right-of way travels through the RPZ of Runway 30L. Aviation Blvd. is located outside of the RSA and the Runway Object Free Area. It appears from the Airport's Exhibit "A" that the land upon which Aviation Blvd. is located on Airport property was acquired through the Surplus Property Act of 1944. Additionally, the FAA has approval authority over any property that "i. Materially impacts the safety and efficient operation of aircraft at, to, or from the airport, and ii. adversely affects the safety of people or property on the ground adjacent to the airport as a result of aircraft operations" within the Airport property line through Section 163 of the FAA Reauthorization Act of 2018. Portions of the RPZ, not associated with Aviation Blvd. or Airport N. Road, are associated with land that is not owned by the Airport.

CITY OF VERO BEACH - . 32392600011074000001.0 10607731 SF

WATER TREATMENT PLANT (CITY OF VERO BEACH)

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- STA 32+18.31 END CONSTRUCTION CONNECT TO 33RD ST



Right of Way Acquisition

April 2,nd2024

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION



TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 441693-1-22-02

INDIAN RIVER COUNTY (88010000) STATE ROAD NO. 5

SR-5/US-1 AT AVIATION BOULEVARD

FDOT DISTRICT DESIGN ENGINEER

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JOHN OLSON, P.E. CONCURRING WITH: TYPICAL SECTION ELEMENTS TARGET SPEED DESIGN & POSTED SPEEDS

FDOT DISTRICT INTERMODAL SYSTEMS DEVELOPMENT MANAGER



CESAR J. MARTINEZ, P.E. CONCURRING WITH: CONTEXT CLASSIFICATION TARGET SPEED

FDOT DISTRICT TRAFFIC OPERATIONS ENGINEER

Digitally signed by Jonathan Jonathan M Overton M Overton Date: 2024.10.03 13:23:37 -04'00' JONATHAN M. OVERTON, P.E. CONCURRING WITH: TARGET SPEED DESIGN & POSTED SPEEDS

FDOT DISTRICT STRUCTURES DESIGN ENGINEER

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PROJECT LOCATION URL: http://tinyurl.com/44169312202 PROJECT LIMITS: BEGIN MP 6.944 - END MP 7.690 **EXCEPTIONS:** NONE BRIDGE LIMITS: BR#880085 MP 7.051 - MP 7.073 RAILROAD CROSSING: 273047Y

APPROVED BY:



INDEX OF SHEETS

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION



TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 441693-1-22-02

INDIAN RIVER COUNTY (88010000) STATE ROAD NO. 5

SR-5/US-1 AT AVIATION BOULEVARD



FDOT DISTRICT DESIGN ENGINEER

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CONCURRING WITH: TYPICAL SECTION ELEMENTS DESIGN & POSTED SPEEDS

PROJECT LOCATION URL: http://tinyurl.com/44169312202 PROJECT LIMITS: BEGIN MP 6.944 - END MP 7.690 EXCEPTIONS: NONE BRIDGE LIMITS: BR#880085 MP 7.051 - MP 7.073 RAILROAD CROSSING: 273047Y



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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION PACKAGE

FINANCIAL PROJECT ID 441693-1-22-02

INDIAN RIVER COUNTY (88010000) STATE ROAD NO. 5

SR-5/US-1 AT AVIATION BOULEVARD

PROJECT LOCATION URL:	http://tinyurl.com/44169312202
PROJECT LIMITS:	BEGIN MP 6.944 - END MP 7.690
EXCEPTIONS:	NONE
BRIDGE LIMITS:	BR#880085 MP 7.051 - MP 7.073
RAILROAD CROSSING:	273047Y



FDOT DISTRICT DESIGN ENGINEER

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TARGET SPEED RECOMMENDATION REPORT

SR 5/US 1 at Aviation Boulevard PD&E Study

FM: 441693-1-22-02 ETDM: 14475

FDOT Project Manager Vandana Nagole, PE

Prepared By: WGI, Inc. 2035 Vista Parkway West Palm Beach, FL 33411

July 19, 2024

William T. Evans, State of Florida, Professional Engineer, License No. 45207

This item has been digitally signed and sealed by

William T

Digitally signed by William T Evans Date: 2024.07.22 10:53:46 -04'00'

Evans

on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies. WGI, Inc. 2035 Vista Parkway

West Palm Beach, FL 33411 Wm. T. Evans P.E. NO. 45207

PROJECT DESCRIPTION:

This Target Speed Memorandum is prepared for the development and analysis of the build alternatives for the SR 5/US 1 at Aviation Boulevard Project Development and Environment (PD&E) Study. The PD&E Study purpose and need is to improve the operations and safety of the SR 5 at Aviation Boulevard intersection with at-grade or grade separated build alternatives.

EXISTING TYPICAL SECTION:

The SR 5 existing right of way ranges from 70 ft to 120 ft. Within the limits of the build alternatives, the typical right of way width is 70 ft. The typical section contains two travel lanes (11 ft and 12 ft) in each direction with a center flush 11 ft paved median for left turns and a concrete sidewalk along the east side. Bridge #880085 over the Main Canal follows the same typical section but includes a 3.5 ft shoulders on the west side and a 4.5 ft sidewalk on the east side. The majority of the corridor has Type F curb and gutter. (Attachments: Straight Line Diagrams and typical sections from FPID 415291-1-52-01)

West of SR 5/US 1, Aviation Boulevard is a City of Vero Beach roadway, with one lane in each direction and grassed shoulders. Aviation Boulevard is being extended east of SR 5/US 1 and will be under the jurisdiction of Indian River County.

PROPOSED TYPICAL SECTION:

The build alternatives will evaluate SR 5 with four travel lanes with pedestrian and bicycle features. Due to the limited right of way shared use paths are considered to provide connectivity to areas beyond the project.

CONTEXT CLASSIFCATION:

FDOT District 4 established a Project Level Context Classification (PLCC) recommendation on 4/21/21 (**Attachment** and noted below). Aviation Boulevard, east of SR 5/ US 1, does not exist and is proposed by this project. This area is within the same area as the SR 5 C4 Urban General context classification. The area is characterized by local, low speed streets, small lot single family residential homes and the future use is increased density and multi-unit housing. Therefore, C4 Urban General is assigned to Aviation Boulevard east of SR 5/US 1.

Roadway	Limits	Functional Classification	Project Level Context Classification
SR 5	21 st Street (MP 6.347) to	Urban Principal	
Section # 88010000	38 th Lane (MP 8.055)	Arterial Other	C4 Urban General
Aviation Blvd		Urban Minor	
Section # 88000024	27 th AVE to SR 5	Arterial	C3 Commercial
Aviation Blvd	SP E to 22rd Street	Urban Minor	
New roadway	SK 5 to 55 " Street	Arterial	C4 Urban General

Table 1: Functional and Context Classification

Access Management Classification

The FDOT Access Management Classifications (See attached pdf of the FDOT KMZ file).

- Access Class 6 from 21st Street to south of 39th Street
- Access Class 5 from 39th Street to 41st Street

On SR 5, there are six traffic signals within the ETDM study limits.

SR 5 Intersection (Signalized)	Mile Post	Distance (miles)	Distance (feet)
23 rd Street	6.541		
26 th Street	6.794	.253	1336
Aviation Blvd or 32 nd Street	7.217	.423	2233
37 th Street	7.853	.636	3358
38 th Lane	8.061	.208	1203
41 st Street	8.365	.304	1605

 Table 2: SR 5 Signal Spacing

85% SPEED/OBSERVED SPEEDS

A speed study has not been completed for either corridor. The following table outlines the existing posted speed, design and target speeds; and the Project Level Context Classification (PLCC). The shaded rows are the PD&E Build Alternative segments.

Roadway	Segment	Posted Speed	Context Class	Access Class (median type)	Allowable Design Speed
SR 5	21 st ST to 28 th ST	35 mph	C4 Urban General	Class 6 (non-raised)	25 - 45 mph
SR 5	28 th ST to 39 th ST	45 mph	C4 Urban General	Class 6 (non-raised)	25 - 45 mph
SR 5	39 th ST to 41 st ST	45 mph	C4 Urban General	Class 5 (raised)	25 - 45 mph
Aviation Blvd	27 th AVE to County Admin Rd	40 mph (35 mph advisory)	C3 Commercial	Class n/a (future raised)	25 – 40 mph
Aviation Blvd	County Admin Rd to SR 5	25 mph advisory speed	C3 Commercial	Class n/a (future raised)	30 mph based on R/W constraints

LAND USE:

The surrounding parcels feature a variety of land use throughout the Aviation Blvd. and US-1 corridors. The west side of SR 5 is controlled by the FEC Railroad right of way. SR 5 land use maps contain primarily Airport Light Industrial, Commercial, Industrial, and Park zones. Retail and commercial businesses are located along the east roadside with shallow set back distance to the buildings. There are 29 access points on the east roadside between 21st Street and Aviation Boulevard (4100 feet of frontage). Behind the businesses are single and multi-family residential land uses.

Aviation Boulevard contains primarily Airport Light Industrial, Industrial, and Residential Single Family land use zones.

VEHICULAR TRAFFIC:

The existing and future AADT listed in Table 4 were obtained from the FDOT District 4 Traffic Forecasting Memorandum, dated 11/02/21.

Roadway Segment		Existing AADT	2045 AADT	
SR 5 21 st ST to 26 th ST		25,400	44,000	
SR 5	SR 5 26 th ST to 39 th ST		38,600 to 45,800	
SR 5 39 th ST to 41 st ST		29,300	46,300	
Aviation Blvd27th Ave to County Admin Road		9,800	16,600	
Aviation Blvd	County Admin Road to SR 5	10,400 to 12,000	17,600 to 20,400	

Table 4: Existing and 2045 No Build AADT

TRANSIT:

GoLine Indian River Transit routes 3 and 8 travel through the project limits. Route 3 runs from the beginning of the project to 37th Street and has stops at 28th Street and 30th Street. Route 8 has one stop at 38th Lane. Both routes typically stop twice an hour at each location and run from 6AM – 7PM Monday through Friday and 8AM – 5PM on Saturday.

According to the 2021 Annual Update of the Indian River County Transit Development Plan (TDP), the 2018 TDP major update recommended extending weekday and weekend service, adding Sunday service, and increasing the bus frequency on core routes. These developments are in the planning stage and not funded for implementation as of the date of this report.

BICYCLISTS / PEDESTRIANS:

There is an existing sidewalk located along the east side of SR 5. There are no bicycle facilities along SR 5 or Aviation Blvd. There is no sidewalk along Aviation Blvd.

Coordination with the Indian River County identified their desire to provide sidewalks, bike lanes and/or shared use paths for multi-modal use.

ETDM Summary Report identified two Office of Greenway Trails multi-use trail opportunities listed as All Aboard Florida Rail with Trail Corridor and Central Indian River Greenway Corridor. There are no planned projects or physical corridors associated with these trail opportunities.

SAFETY:

The SR 5 corridor is a designated evacuation route. The intersection of SR 5 and Aviation Blvd experienced 21 crashes in the years 2017 to 2021. Rear end and angle crash types accounted for 66% of the crashes. One pedestrian and one bicycle crashes occurred.

LOCAL INPUT:

Local coordination with Indian River County Public Works and City of Vero Beach identified:

- A design speed of 30 mph for Aviation Boulevard
- Desire for sidewalks, 7 foot on-street bicycle lanes and/or 10 foot shared use paths.

FUTURE DEVELOPMENT PLANS:

Between the begin project limit and Aviation Boulevard, SR 5 is developed with retail businesses. North of Aviation Boulevard, the corridor is a mix of undeveloped parcels, commercial, medical and light residential. A water treatment plant is within the airport property and located on the north side of Aviation Boulevard. South of Aviation Boulevard is the Vero Man archeological site which limits future development.

The Vero Beach Airport initiated the Master Plan update process to identify future development within the airport property. Several planning initiatives are being discussed at the City of Vero Beach and Indian River County which are:

- Redevelopment of the area around the project intersection, west of US 1 and between 30th Street and 33rd Street.
- The City of Vero Beach is relocating the wastewater treatment plant to be on the airport property in the vicinity of the existing water treatment plant.
- Aviation/Industrial development potential along 41st Street west of US 1

CONCLUSIONS AND RECOMMENDATION:

The PD&E study alternatives begin at 28th Street and end south of 38th Street which occurs within the existing SR 5 segment that is posted at 45 mph. FDOT project FPID 415291-1-52-01 utilized a 45-mph design and posted speed for this segment as well.

The range of alternatives being considered includes conventional, grade separated, and a quadrant intersection on a generally tangent alignment. According to the FDOT FDM, a roadway with a context classification of C-4, Urban General allows for design speed ranges between 25 mph and 45 mph.

For this PD&E study a 45 mph design, target and posted speed is recommended for the SR 5 alternatives. Aviation Boulevard will utilize a 30 mph design, target, and posted speed which was confirmed by the City of Vero Beach and Indian River County.

Roadway	Segment	Existing Posted Speed	Proposed Design Speed	Proposed Target Speed	Proposed Posted Speed	Context Class per FDOT PLCC	Access Class
SR 5	28 th ST to 39 th ST	45 mph	45 mph	45 mph	45 mph	C4 Urban General	Class 6 non-raised median
Aviation Blvd	County Admin Rd to SR 5	25 mph advisory speed west of Airport N. Drive	30 mph	30 mph	30 mph	C3 Commercial	Future 4-lane w/raised median
Aviation Blvd	SR 5 to 33 rd ST	N/A	30 mph	30 mph	30 mph	C4 Urban General	Future 2-lane w/raised traffic separator

Table 5: Recommended Build Design, Target, and Posted Speeds

Attachments






CURRENT YEAR ESTIMATED OPENING YEAR = 2010 AADT = 45400 ESTIMATED DESIGN YEAR = 2030 AADT = 70300 K = 9.8% D = 51.2% T = 3.7% (24 HOUR) DESIGN HOUR T = 1.9% DESIGN SPEED = 35/45 MPH POSTED SPEED = 35/45 MPH

	REVISIONS						Michael Priory, P.E.		STATE OF FLO	
DATE BY	BY	DESCRIPTION DATE			SCRIPTION DATE BY DESCRIPTION	P.E. No.: 60614		STATE OF FLO		
							3230 W. Commercial Blvd.	DEP	PARTMENT OF TRAN	<i>SPORTATION</i>
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William Evans

From:	Wallace, Larry <imceaexo=exchangelabs_ou=exchange+20administrative+20group+20+28fydibohf23spdlt+29< th=""></imceaexo=exchangelabs_ou=exchange+20administrative+20group+20+28fydibohf23spdlt+29<>
	_CN=RECIPIENTS_CN=97C58B5367F04A3B8757E5833625C93B-PT429LW@namprd09.prod.outlook.com>
Sent:	Wednesday, April 21, 2021 4:56 PM
То:	Nagole, Vandana; Bush, Lois; Hymowitz, Larry; Dan Hardy; Stewart Robertson (Stewart.Robertson@kimley-horn.com); Peterson, Scott; Killion,
	Saige; Gonzalez, Karen
Subject:	RE: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

Hello Team,

Please see the Project Level Context Classification (PLCC) recommendation below:

- Section # 88000024 From Aviation Blvd from 27th Ave to US1/SR 5. From Mile Post 2.041 to Mile Post 2.955
 > C3-Commercial
- Section # 88010000 From US1/SR 5 from 21st Street to 38th Lane. From Mile Post 6.347 to Mile Post 8.055 > C4-Urban General



Larry Wallace Florida Department of Transportation – District 4 Pedestrian/Bicycle/Complete Streets Coordinator Office Phone: (954) 777-4208

Email: Larry.Wallace@dot.state.fl.us

From: Nagole, Vandana <Vandana.Nagole@dot.state.fl.us>

Sent: Wednesday, March 31, 2021 3:40 PM

To: Wallace, Larry <Larry.Wallace@dot.state.fl.us>

Cc: Bush, Lois <Lois.Bush@dot.state.fl.us>; Hymowitz, Larry <Larry.Hymowitz@dot.state.fl.us>; Dan Hardy <dhardy@citiesthatwork.com>; Stewart Robertson (Stewart.Robertson@kimley-horn.com) <Stewart.Robertson@kimley-horn.com>

Subject: RE: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

Larry:

The WPCR is not required at this moment until the PD&E is in the process. We would like to request CC for the following limits.

- Section # 88000024 From Aviation Blvd from 27th Ave to US1/SR 5. From Mile Post 2.041 to Mile Post 2.955
- Section <u># 88010000</u> From US1/SR 5 from 21st Street to 38th Lane. From Mile Post <u>6.347</u> to Mile Post <u>8.055</u>

Thank You,

Vandana Nagole, P.E. Project Manager Consultant Management- Section 4



District 4 3400 West Commercial Blvd. Fort Lauderdale, FL 33309-3421 Phone: 954-777-4281 Fax: 954-777-4482 Email: <u>vandana.nagole@dot.state.fl.us</u>

From: Wallace, Larry <Larry.Wallace@dot.state.fl.us>
Sent: Wednesday, March 31, 2021 2:57 PM
To: Nagole, Vandana <<u>Vandana.Nagole@dot.state.fl.us</u>>
Cc: Bush, Lois <<u>Lois.Bush@dot.state.fl.us</u>>; Hymowitz, Larry <<u>Larry.Hymowitz@dot.state.fl.us</u>>; Dan Hardy <<u>dhardy@citiesthatwork.com</u>>; Stewart Robertson
(Stewart.Robertson@kimley-horn.com) <<u>Stewart.Robertson@kimley-horn.com</u>>
Subject: RE: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

Hi Vandana,

According to GIS, FM# 446193-1 is only illustrated (red line) along US-1 at Aviation Blvd / 32nd St. If you wish for the Complete Streets Team to provide a Project Level Context Classification (PLCC) for the other limits you mentioned, please create a Work Program Change Request (WPCR) with the following:

- Section # _____ From Aviation Blvd from 27th Ave to US1/SR 5. From Mile Post _____ to Mile Post
- Section # _____ From US1/SR 5 from 21st Street to 37th Street. From Mile Post _____ to Mile Post

Once this is updated in Work Program, I will provide the other PLCCs. http://fdotwp2.dot.state.fl.us/ProjectSuiteEnterpriseEdition/Pages/Project/Project.aspx?item=441693&itemSeg=1



Any questions please contact me.

Thank you,

Larry Wallace

Florida Department of Transportation – District 4 Pedestrian/Bicycle/Complete Streets Coordinator Office Phone: (954) 777-4208 Email: <u>Larry.Wallace@dot.state.fl.us</u>

 From: Nagole, Vandana <<u>Vandana.Nagole@dot.state.fl.us</u>>

 Sent: Wednesday, March 31, 2021 2:46 PM

 To: Wallace, Larry <<u>Larry.Wallace@dot.state.fl.us</u>>

 Cc: Stewart Robertson (<u>Stewart.Robertson@kimley-horn.com</u>) <<u>Stewart.Robertson@kimley-horn.com</u>>; Bush, Lois <<u>Lois.Bush@dot.state.fl.us</u>>; Hymowitz, Larry

 <<u>Larry.Hymowitz@dot.state.fl.us</u>>; Peterson, Scott <<u>Scott.Peterson@dot.state.fl.us</u>>; Dan Hardy <<u>dhardy@citiesthatwork.com</u>>; Hay, Wibet

 <<u>Wibet.Hay@dot.state.fl.us</u>>; Emmons, Erin <<u>Erin.Emmons@kimley-horn.com</u>>; Gonzalez, Karen <<u>Karen.Gonzalez@kimley-horn.com</u>>; Killion, Saige

 <<u>Saige.Killion@kimley-horn.com</u>>

 Subject: RE: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

Larry: No, I was thinking for project 441693-1 Aviation blvd . Aviation Blvd from 27th Ave to US1/SR 5 SR 5 from 21 street to 37th street.

Thank You,

Vandana Nagole, P.E. Project Manager Consultant Management- Section 4



3400 West Commercial Blvd. Fort Lauderdale, FL 33309-3421 Phone: 954-777-4281 Fax: 954-777-4482 Email: <u>vandana.nagole@dot.state.fl.us</u> From: Wallace, Larry <<u>Larry.Wallace@dot.state.fl.us</u>>
Sent: Wednesday, March 31, 2021 2:32 PM
To: Nagole, Vandana <<u>Vandana.Nagole@dot.state.fl.us</u>>
Cc: Stewart Robertson (<u>Stewart.Robertson@kimley-horn.com</u>) <<u>Stewart.Robertson@kimley-horn.com</u>>; Bush, Lois <<u>Lois.Bush@dot.state.fl.us</u>>; Hymowitz, Larry
<<u>Larry.Hymowitz@dot.state.fl.us</u>>; Peterson, Scott <<u>Scott.Peterson@dot.state.fl.us</u>>; Dan Hardy <<u>dhardy@citiesthatwork.com</u>>; Hay, Wibet
<<u>Wibet.Hay@dot.state.fl.us</u>>; Emmons, Erin <<u>Erin.Emmons@kimley-horn.com</u>>; Gonzalez, Karen <<u>Karen.Gonzalez@kimley-horn.com</u>>; Killion, Saige
<<u>Saige.Killion@kimley-horn.com</u>>
Subject: RE: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

Hi Vandana,

Just to confirm, you were referring to FM# 447648-1 SR-5/US-1 from 12th Street to 20th Place, correct? If not, please provide me the FM# and limits.

Thank you for the clarification.

Larry Wallace Florida Department of Transportation – District 4 Pedestrian/Bicycle/Complete Streets Coordinator Office Phone: (954) 777-4208 Email: Larry.Wallace@dot.state.fl.us

 From: Nagole, Vandana <<u>Vandana.Nagole@dot.state.fl.us</u>>

 Sent: Wednesday, March 31, 2021 1:56 PM

 To: Wallace, Larry <<u>Larry.Wallace@dot.state.fl.us</u>>; Stewart Robertson (<u>Stewart.Robertson@kimley-horn.com</u>) <<u>Stewart.Robertson@kimley-horn.com</u>>; Bush, Lois <<u>Lois.Bush@dot.state.fl.us</u>>; Hymowitz, Larry <<u>Larry.Hymowitz@dot.state.fl.us</u>>; Peterson, Scott <<u>Scott.Peterson@dot.state.fl.us</u>>; Dan Hardy

 <<u>dhardy@citiesthatwork.com</u>>; Hay, Wibet <<u>Wibet.Hay@dot.state.fl.us</u>>; Emmons, Erin <<u>Erin.Emmons@kimley-horn.com</u>>; Gonzalez, Karen

 <<u>Karen.Gonzalez@kimley-horn.com</u>>; Killion, Saige <<u>Saige.Killion@kimley-horn.com</u>>

 Subject: RE: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

Thank you Larry. 😊

Thank You,

Vandana Nagole, P.E.

Project Manager Consultant Management- Section 4



District 4 3400 West Commercial Blvd. Fort Lauderdale, FL 33309-3421 Phone: 954-777-4281 Fax: 954-777-4482 Email: vandana.nagole@dot.state.fl.us

From: Wallace, Larry <Larry.Wallace@dot.state.fl.us>
Sent: Wednesday, March 31, 2021 1:29 PM
To: Nagole, Vandana <<u>Vandana.Nagole@dot.state.fl.us</u>>; Stewart Robertson (Stewart.Robertson@kimley-horn.com) <<u>Stewart.Robertson@kimley-horn.com</u>>;
Bush, Lois <Lois.Bush@dot.state.fl.us>; Hymowitz, Larry <Larry.Hymowitz@dot.state.fl.us>; Peterson, Scott <<u>Scott.Peterson@dot.state.fl.us</u>>; Dan Hardy
<<u>dhardy@citiesthatwork.com</u>>; Hay, Wibet <<u>Wibet.Hay@dot.state.fl.us</u>>; Emmons, Erin <<u>Erin.Emmons@kimley-horn.com</u>>; Gonzalez, Karen
<<u>Karen.Gonzalez@kimley-horn.com</u>>; Killion, Saige <<u>Saige.Killion@kimley-horn.com</u>>;
Subject: RE: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

Hello Team,

Please see the PLCC recommendation below:

• FM# 447648-1 SR-5/US-1 from 12th Street to 20th Place (entire project limits) – C4-Urban General

Note: See attached email for details.

Any questions please contact me.

Thank you

Larry Wallace Florida Department of Transportation – District 4 Pedestrian/Bicycle/Complete Streets Coordinator Office Phone: (954) 777-4208 Email: Larry.Wallace@dot.state.fl.us

 From: Nagole, Vandana < Vandana.Nagole@dot.state.fl.us>

 Sent: Tuesday, March 30, 2021 5:41 PM

 To: Wallace, Larry < Larry.Wallace@dot.state.fl.us>; Stewart Robertson (Stewart.Robertson@kimley-horn.com) < Stewart.Robertson@kimley-horn.com>; Bush,

 Lois < Lois.Bush@dot.state.fl.us>; Hymowitz, Larry < Larry.Hymowitz@dot.state.fl.us>; Peterson, Scott < Scott.Peterson@dot.state.fl.us>; Dan Hardy

 <dhardy@citiesthatwork.com>; Hay, Wibet < Wibet.Hay@dot.state.fl.us>; Emmons, Erin < Erin.Emmons@kimley-horn.com>; Gonzalez, Karen

 <Karen.Gonzalez@kimley-horn.com>; Killion, Saige < Saige.Killion@kimley-horn.com>

 Subject: RE: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

Good afternoon Larry:

Hope everything is going great at your end. We also need CC for US 1 from 20th Street to 41 street.

Thank You,

Vandana Nagole, P.E.

Project Manager Consultant Management- Section 4



3400 West Commercial Blvd. Fort Lauderdale, FL 33309-3421 Phone: 954-777-4281 Fax: 954-777-4482 Email: <u>vandana.nagole@dot.state.fl.us</u>

From: Wallace, Larry <<u>Larry.Wallace@dot.state.fl.us</u>>

Sent: Monday, March 29, 2021 1:31 PM

To: Stewart Robertson (<u>Stewart.Robertson@kimley-horn.com</u>) <<u>Stewart.Robertson@kimley-horn.com</u>>; Bush, Lois <<u>Lois.Bush@dot.state.fl.us</u>>; Hymowitz, Larry <<u>Larry.Hymowitz@dot.state.fl.us</u>>; Peterson, Scott <<u>Scott.Peterson@dot.state.fl.us</u>>; Dan Hardy <<u>dhardy@citiesthatwork.com</u>>; Nagole, Vandana <<u>Vandana.Nagole@dot.state.fl.us</u>>; Hay, Wibet <<u>Wibet.Hay@dot.state.fl.us</u>>; Emmons, Erin <<u>Erin.Emmons@kimley-horn.com</u>>; Gonzalez, Karen <<u>Karen.Gonzalez@kimley-horn.com</u>>; Killion, Saige <<u>Saige.Killion@kimley-horn.com</u>>; Subject: RE: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

Hello Team,

The Project Level Context Classification (PLCC) for this project is recommended as follows:

SR-5/US-1 at Aviation Boulevard (entire intersection limits) – C4-Urban General

Note: Please see comments / responses below from the Complete Streets team to be used for the PLCC tracking.

Any questions please contact me,

Thank you.

Larry Wallace Florida Department of Transportation – District 4 Pedestrian/Bicycle/Complete Streets Coordinator Office Phone: (954) 777-4208 Email: Larry.Wallace@dot.state.fl.us

From: Dan Hardy <<u>dhardy@citiesthatwork.com</u>>
Sent: Friday, March 26, 2021 1:20 PM
To: Wallace, Larry <<u>Larry.Wallace@dot.state.fl.us</u>>; Hymowitz, Larry <<u>Larry.Hymowitz@dot.state.fl.us</u>>; Bush, Lois <<u>Lois.Bush@dot.state.fl.us</u>>;
Subject: FW: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

I double checked with Erin Emmons on this one – there's one correction in that we do not have a prior PLCC as a precedent. So I went back and forth on this one. This section of US 1 by the Vero Beach Airport is challenging and another place to check on how Version 1.3c gauges it when we expand to all five counties. Where there are local streets, there's a grid, but most of the land is undeveloped, and the very presence of the airport is likely to keep the land uses more industrial/suburban in nature even though there's a fair amount of older single-family residential along the east side. But since this is just one intersection, it happens that the only developed quadrant is urban in nature, we have the "round up" logic, and we are updating the SPCC, it seems logical to retain PLCC=SPCC=C4.

Dan Hardy, P.E., PTP Principal Renaissance Planning 703-776-9922 x502 (office) 703-314-4227 (cell) <u>dhardy@citiesthatwork.com</u> https://www.citiesthatwork.com/insights-news From: Bush, Lois <Lois.Bush@dot.state.fl.us>
Sent: Friday, March 19, 2021 7:18 PM
To: Dan Hardy <<u>dhardy@citiesthatwork.com</u>>
Cc: Karen Kiselewski <<u>kkiselewski@camsys.com</u>>
Subject: FW: PLCC FM# 441693.1 (SR-5/US-1 at Aviation Boulevard)

For review under CA095 TWO 7/14

Lois Bush FDOT, District Four 954-777-4654 lois.bush@dot.state.fl.us

From: Robertson, Stewart <<u>Stewart.Robertson@kimley-horn.com</u>>
Sent: Friday, March 19, 2021 5:20 PM
To: Bush, Lois <<u>Lois.Bush@dot.state.fl.us</u>>; Wallace, Larry <<u>Larry.Wallace@dot.state.fl.us</u>>; Hymowitz, Larry <<u>Larry.Hymowitz@dot.state.fl.us</u>>; Peterson, Scott
<<u>Scott.Peterson@dot.state.fl.us</u>>; Dan Hardy <<u>dhardy@citiesthatwork.com</u>>; Nagole, Vandana <<u>Vandana.Nagole@dot.state.fl.us</u>>
Cc: Hay, Wibet <<u>Wibet.Hay@dot.state.fl.us</u>>; Emmons, Erin <<u>Erin.Emmons@kimley-horn.com</u>>; Gonzalez, Karen <<u>Karen.Gonzalez@kimley-horn.com</u>>; Killion,
Saige <<u>Saige.Killion@kimley-horn.com</u>>
Subject: PLCC FM441693.1 (SR-5/US-1 at Aviation Boulevard)

EXTERNAL SENDER: Use caution with links and attachments.

Good afternoon Complete Streets team,

On behalf of Wibet Hay and Larry Wallace, please review FM# 441693.1 (SR-5/US-1 at Aviation Boulevard) Project Level Context Classification (PLCC). This is project is labeled as a Planning, Engineering, Etc.

The project intersection falls within a segment with a previous PLCC recommendation of C4-Urban General, which we recommend maintaining.

- SR-5/US-1 at Aviation Boulevard C4-Urban General
 - There are multiple uses along the southern leg of the intersection, including a Carpet & Tile Store, Vero Motel, and a furniture store.
 - Setback distances are generally shallow.
 - The block length of the south leg block is 330 feet; the block length of the north block is 320 feet.
 - Vero Beach Regional Airport is located to the west of the intersection, limiting development, but also increases vehicle activity in the surrounding areas.
 - There are small residential communities behind the fronting uses at the intersection that connect to SR-5/US-1 via 30th Street.

The SPCC classifies this corridor as the following:

SR-5/US-1 at Aviation Boulevard – C4-Urban General

Thank you, Stewart

Stewart Robertson, P.E. | Vice President Kimley-Horn | 8201 Peters Road, Suite 2200, Plantation, FL 33324 Direct: 954 535 5104 | Mobile: 954 732 0882 | www.kimley-horn.com Connect with us: Twitter | LinkedIn | Facebook | Instagram

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PD&E PREFERRED ALTERNATIVE PLANS

ROADWAY PLANS STRUCTURE PLANS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION



PD&E PREFERRED ALTERNATIVE PLANS

FINANCIAL PROJECT ID 441693-1-22-02,

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2 - 5	TYPICAL SECTIONS
6 - 14	ROADWAY PLANS
15 - 23	ROADWAY PROFILES
24 - 27	TEMPORARY TRAFFIC CONTROL PLANS

(FEDERAL FUNDS)

INDIAN RIVER COUNTY (88010000) STATE ROAD NO. 5 US-1 AT AVIATION BOULEVARD

PROJECT LOCATION URL:	http://tinyurl.com/44169312202					
PROJECT LIMITS:	BEGIN MP 6.944 - END MP 7.690					
EXCEPTIONS:	NONE					
BRIDGE LIMITS:	BR#880085 MP 7.051 - MP 7.073					
RAILROAD CROSSING:	273047Y					



GOVERNING STANDARD PLANS:

Florida Department of Transportation, FY2023-24 Standard Plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and associated IRs are available at the following website: http://www.fdot.gov/design/standardplans

Standard Plans for Bridge Construction are included in the Structures Plans Component

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, FY 2023-24 Standard Specifications for Road and Bridge Construction at the following website: http://www.fdot.gov/programmanagement/Implemented/SpecBooks

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SR 5 / US 1 STA. 1000+00.00 TO STA. 1005+57.00 STA. 1006+84.00 TO STA. 1013+40.00

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					ROAD NO.	COUNTY	FINANCIAL PROJECT ID
				2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	SR 5	INDIAN RIVER	441693-1-22-02

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SR 5 / US 1 STA. 1005+57.00 TO STA. 1006+84.00

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				LICENSE NUMBER: 45207	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
				2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	SR 5	INDIAN RIVER	441693-1-22-02





AVIATION BLVD STA. 16+60.00 TO STA. 24+60.00

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				2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	SR 5	INDIAN RIVER	441693-1-22-02	



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ENGINEER OF RECORD	STATE OF FLORIDA					
VANS, P.E.	DEPARTMENT OF TRANSPORTATION					
NUMBER: 45207	ROAD NO.	COUNTY	FINANCIAL PROJECT ID			
⁻ A PARKWAY M BEACH, FL 33411	SR 5	INDIAN RIVER	441693-1-22-02			

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ROADWAY PROFILES	SHEET NO.
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ROADWAY PROFILES	SHEET NO.	
A VIATION BLVD	23	





	REVISIONS			ENGINEER OF RECORD	STATE OF FLORIDA		LORIDA
DATE	DESCRIPTION	DATE	DESCRIPTION	UILLIAM EVANS, P.E. ULCENSE NUMBER 45207		NSPORTATION	
				WGL INC.	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
				2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	SR 5	INDIAN RIVER COUNTY	441693-1-22-02





1. CONSTRUCT FRICTION COURSE, MEDIAN, SIGNING AND PAVEMENT MARKINGS AND LANDSCAPE.

	REVISIONS			ENGINEER OF RECORD	STATE OF FLORIDA		LORIDA	
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. USENSE NUMBER 45207		NSPORTATION		
				WGI. INC.	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
				2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	SR 5	INDIAN RIVER COUNTY	441693-1-22-02	

- PROFILE GRADE POINT (RT)

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TEMPORARY TRAFFIC	SHEET NO.
CONTROL PLAN	25

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PHASE 2 - AVIATION BLVD

SHIFT TRAFFIC TO THE NEWLY CONSTRUCTED EASTBOUND ROADWAY.
CONSTRUCT THE WESTBOUND ROADWAY.

REVISIONS		ENGINEER OF RECORD		STATE OF FL	ORIDA		
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E.	DEP	ARTMENT OF TRAN	ISPORTATION
				LICENSE NUMBER 45207 WGL INC	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
				2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	SR 5	INDIAN RIVER COUNTY	441693-1-22-02

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TEMPORARY TRAFFIC	SHEET NO.
CONTROL PLAN	26



PHASE 3 - AVIATION BLVD

1. CONSTRUCT FRICTION COURSE, SIGNING AND PAVEMENT MARKINGS AND LANDSCAPE.

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REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA			
PATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E.	ZAM EVANS, P.E. DEPARTMENT OF TRANSPOSI		ISPORTATION	PORTATION
				WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
					SR 5	INDIAN RIVER COUNTY	441693-1-22-02	

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TEMPORARY TRAFFIC	SHEET NO.
CONTROL PLAN	27

PD&E PREFERRED ALTERNATIVE PLANS

SHEET DESCRIPTION

PLAN AND ELEVATION - ALTERNATIVE #1

CONSTRUCTION SEQUENCE (1 OF 2) - ALTERNATIVE #1

CONSTRUCTION SEQUENCE (2 OF 2) - ALTERNATIVE #1

TYPICAL SECTION - ALTERNATIVE #1

KEY SHEET

INDEX OF STRUCTURE PLANS

SHEET NO.

B - 1

В-2

В-З

B - 4 B - 5

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

PD&E PREFERRED ALTERNATIVE PLANS



FINANCIAL PROJECT ID 441693-1-22-02 (FEDERAL FUNDS)

INDIAN RIVER COUNTY (88010000)

STATE ROAD NO. 5 OVER MAIN RELIEF CANAL

STRUCTURE PLANS



GOVERNING DESIGN STANDARDS:

Florida Department of Transportation, FY 2023-24 Standard Plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and associated IRs are available at the following website: http://www.fdot.gov/design/standardplans

Standard Plans for Bridge Construction are included in the Structures Plans Component

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, FY 2023-24 Standard Specifications for Road and Bridge Construction at the following website: http://www.fdot.gov/programmanagement/Implemented/SpecBooks



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ALLOUT	LOCATION	STATION	Ø (T.C.)
A	BEGIN APP. SLAB	1005+27.86	85°31'28"
В	BEGIN BRIDGE	1005+57.95	85°45'37"
С	∉ INT. BENT 2	1005+95.05	86°03'04"
D	∉ INT. BENT 3	1006+47.16	86°27'35"
Ε	END BRIDGE	1006+84.22	86°45'01"
F	END APP. SLAB	1007+14.27	86°59'09"

5: EE ROADWAY PLAN FOR HORIZONTAL GEOMETRY. LL PILE BENTS ARE PARALLEL TO EXISTING BENTS. RIDGE DECK AND FSB DIMENSIONS ARE MEASURED ERPENDICULAR TO DECK SKEW (2.5°) WITH PILE BENT. RIDGE DECK IS OVERBUILT TO ACCOMMODATE HORIZON URVATURE OF ROADWAY. OADWAY ELEMENT DIMENSIONS ARE MEASURED ERPENDICULAR TO PGL (TRAVEL LANES). EXISTING BRIDGE NO.	S. TAL 880085			
PLAN AND FLEVATION - ALTERNATIVE #1				
SR 5 (US 1) AT AVIATION BLVD PD&E				
SR 5 OVER MAIN RELIEF CANAL	B-2			



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FDOT Long Range Estimating System - Production R3: Project Details by Sequence Report

Project: 441693-1-	52-01	Letting Date: 01/209		
Description: SR-5	/US-1 AT AVIATION BOULEVARD			
District: 04 Contract Class: 7	County: 88 INDIAN RIVER Lump Sum Project: N	Market Area: 11 Design/Build: N	Units: English Project Length: 1.237	MI
Project Manager:	NAGOLE			
Version 17 Project Description: 2024	: Grand Total WPUC SR-5/US-1 AT AVIATION BC	ULEVARD - PREFE	\$16 RRED ALTERNATIVE	,277,971.35
Sequence: 1 NDU	- New Construction, Divided, Urban		Net Length:	0.549 MI 2,899 LF

Description: SR-5/US-1 Corridor including bridge with shared-use path on east side.

	EARTH	WORK COMPONENT		
User Input Data				
Description				Value
Standard Clearin	g and Grubbing Limits L/R			80.00 / 80.00
Incidental Clearin	ng and Grubbing Area			0.00
Alignment Numb	er			1
Distance				0.549
Top of Structural	Course For Begin Section			105.00
Top of Structural	Course For End Section			105.00
Horizontal Elevat	ion For Begin Section			104.00
Horizontal Elevat	ion For End Section			104.00
Front Slope L/R				6 to 1 / 6 to 1
Median Shoulder	⁻ Cross Slope L/R			0.00 % / 0.00 %
Outside Shoulde	r Cross Slope L/R			3.00 % / 3.00 %
Roadway Cross	Slope L/R			2.00 % / 2.00 %
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	10.65 AC	\$49,392.09	\$526,025.76
120-6	EMBANKMENT	6,248.35 CY	\$29.58	\$184,826.19

X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.61 AC	\$49,392.09	\$128,913.35
	Comment: Proposed Pond			
120-1	REGULAR EXCAVATION	21,058.20 CY	\$22.27	\$468,966.11
	Comment: Proposed Pond			
	Earthwork Component Total			\$1,308,731.41

ROADWAY COMPONENT

User Input Data	
Description	
Number of Lanes	

Value 4 Roadway Pavement Width L/R Structural Spread Rate Friction Course Spread Rate

165 80

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	17,495.39 SY	\$16.19	\$283,250.36
285-709	OPTIONAL BASE, BASE GROUP 09	14,171.52 SY	\$18.98	\$268,975.45
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,169.15 TN	\$148.38	\$173,478.48
337-7-82	ASPH CONC FC,TRAFFIC C,FC- 9.5,PG 76-22	566.86 TN	\$207.81	\$117,799.18

Turnouts/Crossovers Subcomponent

Description	Value
Asphalt Adjustment	10.00
Stabilization Code	Y
Base Code	Y
Friction Course Code	Y

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	1,749.54 SY	\$16.19	\$28,325.05
285-709	OPTIONAL BASE, BASE GROUP 09	1,417.15 SY	\$18.98	\$26,897.51
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	116.92 TN	\$148.38	\$17,348.59
337-7-82	ASPH CONC FC,TRAFFIC C,FC- 9.5,PG 76-22	56.69 TN	\$207.81	\$11,780.75

Pavement Marking Subcomponent

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	222.00 EA	\$4.02	\$892.44
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	4.39 GM	\$1,171.40	\$5,142.45
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	2.20 GM	\$449.94	\$989.87
	Roadway Component Total			\$934,880.13

SHOULDER COMPONENT

User Input Data	
Description	Value
Total Outside Shoulder Width L/R	8.25 / 19.25
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 5.00
Sidewalk Width L/R	6.00 / 12.00

LRE - R3: Project Details by Sequence Report

Extended Amount	Unit Price	Quantity Unit	Description	Pav item
\$78,294.43	\$27.01	2,898.72 LF	CONCRETE CURB & GUTTER, TYPE F	520-1-10
\$78,294.43	\$27.01	2,898.72 LF	CONCRETE CURB & GUTTER, TYPE F	520-1-10
\$329,816.36	\$56.89	5,797.44 SY	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	522-1
\$5,024.45	\$3.12	1,610.40 SY	PERFORMANCE TURF	570-1-1
			bl	Erosion Contro
				Pay Items
Extended Amount	Unit Price	Quantity Unit	Description	Pay item
\$10,667.29	\$1.84	5,797.44 LF	SEDIMENT BARRIER	104-10-3
\$1,906.40	\$13.89	137.25 LF	FLOATING TURBIDITY BARRIER	104-11
\$1,784.25	\$13.00	137.25 LF	STAKED TURBIDITY BARRIER- NYL REINF PVC	104-12
\$4,039.69	\$4,039.69	1.00 EA	SOIL TRACKING PREVENTION DEVICE	104-15
\$4,353.72	\$155.49	28.00 EA	INLET PROTECTION SYSTEM	104-18
\$285.97	\$20.47	13.97 AC	LITTER REMOVAL	107-1
\$921.60	\$65.97	13.97 AC	MOWING	107-2
\$515,388.59			Shoulder Component Total	

MEDIAN COMPONENT

User Input Data	
Description	Value
Total Median Width	20.00
Performance Turf Width	19.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	5,797.44 LF	\$27.01	\$156,588.85
520-5-12	TRAF SEP CONC-TYPE I, 6' WIDE	870.00 LF	\$96.27	\$83,754.90
570-1-1	PERFORMANCE TURF	6,119.52 SY	\$3.12	\$19,092.90
	Median Component Total			\$259,436.65

DRAINAGE COMPONENT

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	20.00 EA	\$7,013.89	\$140,277.80
425-1-451	INLETS, CURB, TYPE J-5, <10'	6.00 EA	\$11,481.26	\$68,887.56
425-1-521	INLETS, DT BOT, TYPE C, <10'	3.00 EA	\$6,099.36	\$18,298.08
425-2-41	MANHOLES, P-7, <10'	3.00 EA	\$6,729.69	\$20,189.07
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	1,456.00 LF	\$179.47	\$261,308.32
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	440.00 LF	\$267.91	\$117,880.40
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	2,752.00 LF	\$426.25	\$1,173,040.00
570-1-1	PERFORMANCE TURF	166.90 SY	\$3.12	\$520.73

X-Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-1	CONC CLASS II, CULVERTS	11.30 CY	\$1,869.81	\$21,128.85
	Comment: 2x 36" Straight End Wall a End Wall. 2 x 4.53 CY + 1 x 2.24 CY =	and 1x 24" Straight 11.3 CY		
425-1-542	INLETS, DT BOT, TYPE D, >10'	1.00 EA	\$10,218.67	\$10,218.67
	Comment: Control Structure for Prop	osed Pond		
570-1-2	PERFORMANCE TURF, SOD	12,632.00 SY	\$5.34	\$67,454.88
	Comment: Proposed Pond			
	Drainage Component Total			\$1,899,204.36

SIGNING COMPONENT

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	20.00 AS	\$471.57	\$9,431.40
700-1-12	SINGLE POST SIGN, F&I GM, 12- 20 SF	5.00 AS	\$1,500.79	\$7,503.95
700-2-15	MULTI- POST SIGN, F&I GM, 51- 100 SF	2.00 AS	\$8,253.40	\$16,506.80
700-2-16	MULTI- POST SIGN, F&I GM, 101- 200 SF	2.00 AS	\$13,724.53	\$27,449.06
	Signing Component Total			\$60,891.21

SIGNALIZATIONS COMPONENT

Signalization 1	
Description	Value
Туре	4 Lane Mast Arm
Multiplier	1
Description	Standard 4 MA intersection

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	750.00 LF	\$13.87	\$10,402.50
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	250.00 LF	\$30.56	\$7,640.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00 PI	\$6,269.35	\$6,269.35
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	16.00 EA	\$1,210.12	\$19,361.92
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00 AS	\$4,103.18	\$4,103.18
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00 LF	\$5.95	\$357.00
646-1-11	ALUMINUM SIGNALS POLE, PEDESTAL	4.00 EA	\$1,510.67	\$6,042.68
649-21-10	STEEL MAST ARM ASSEMBLY, F&I, 60'	3.00 EA	\$74,945.13	\$224,835.39
649-21-21	STEEL MAST ARM ASSEMBLY, F&I, 78'	1.00 EA	\$89,526.96	\$89,526.96
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	14.00 AS	\$1,175.52	\$16,457.28
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	4.00 AS	\$723.59	\$2,894.36
665-1-11	PEDESTRIAN DETECTOR, F&I,	4.00 EA	\$192.56	\$770.24

	STANDARD			
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	1.00 AS	\$32,025.59	\$32,025.59
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00 EA	\$148.19	\$592.76
700-5-21	INTERNAL ILLUM SIGN, F&I OM, UP TO 12 SF	2.00 EA	\$3,107.28	\$6,214.56
700-5-22	INTERNAL ILLUM SIGN, F&I OM, 12-18 SF	2.00 EA	\$3,190.30	\$6,380.60
X-ltoms				
A-items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
Pay item 660-4-11	Description VEHICLE DETECTION SYSTEM- VIDEO, CABINET	Quantity Unit 1.00 EA	Unit Price \$4,555.07	Extended Amount \$4,555.07
Pay item 660-4-11	Description VEHICLE DETECTION SYSTEM- VIDEO, CABINET Comment: Indian River County preferred d system: Video Detection	Quantity Unit 1.00 EA etection	Unit Price \$4,555.07	Extended Amount \$4,555.07
Pay item 660-4-11 660-4-12	Description VEHICLE DETECTION SYSTEM- VIDEO, CABINET Comment: Indian River County preferred d system: Video Detection VEHICLE DETECTION SYSTEM- VIDEO, ABOVE G	Quantity Unit 1.00 EA etection 4.00 EA	Unit Price \$4,555.07 \$6,801.42	Extended Amount \$4,555.07 \$27,205.68
Pay item 660-4-11 660-4-12	Description VEHICLE DETECTION SYSTEM- VIDEO, CABINET Comment: Indian River County preferred d system: Video Detection VEHICLE DETECTION SYSTEM- VIDEO, ABOVE G Comment: Indian River County preferred d system: Video Detection	Quantity Unit 1.00 EA etection 4.00 EA etection	Unit Price \$4,555.07 \$6,801.42	Extended Amount \$4,555.07 \$27,205.68

Signalizations Component Total

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description Spacing Pay Items				Value MAX
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,898.72 LF	\$13.87	\$40,205.25
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	378.26 LF	\$30.56	\$11,559.63
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00 EA	\$1,210.12	\$14,521.44
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	9,830.94 LF	\$3.70	\$36,374.48
715-61-342	LIGHT POLE CMPLT,STD,F&I, 40'MH,12'ARM L	12.00 EA	\$9,544.29	\$114,531.48
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	12.00 EA	\$999.15	\$11,989.80
	Subcomponent Total			\$229,182.07
	Lighting Component Total			\$229,182.08

BRIDGES COMPONENT

Bridge 880085

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	126.00
Width (LF)	105.00
Туре	Low Level
Cost Factor	1.00
Structure No.	880003
Removal of Existing Structures area	8,050.00
Default Cost per SF	\$120.00
Factored Cost per SF	\$120.00

\$465,635.12

Final Cost per SF	\$297.62
Basic Bridge Cost	\$1,587,600.00
	LOW LEVEL BRIDGE WITH 4 LANES. ELEVATED 8-FT
Description	SIDEWALK ON THE WEST SIDE OF BRIDGE AND 12-FT
	SHARED-USE PATH ON THE EAST SIDE OF BRIDGE.

Bridge Pay Item	IS			
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-3	REMOVAL OF EXISTING STRUCTURES/BRIDGES	8,050.00 SF	\$51.67	\$415,943.50
400-2-10	CONC CLASS II, APPROACH SLABS	233.33 CY	\$735.46	\$171,604.88
415-1-9	REINF STEEL- APPROACH SLABS	40,832.75 LB	\$1.44	\$58,799.16
Bridge X-Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-47	CONC CLASS II, CIP TOP W/ SR ADMIX	440.00 CY	\$2,327.50	\$1,024,100.00
400-4-5	CONC CLASS IV, SUBSTRUCTURE	144.00 CY	\$1,468.71	\$211,494.24
415-1-5	REINF STEEL- SUBSTRUCTURE	111,080.00 LB	\$1.62	\$179,949.60
455-34-3	PRESTRESSED CONCRETE PILING, 18" SQ	4,680.00 LF	\$145.83	\$682,484.40
515-2-311	PED/BICYCLE RAILING, ALUM,42" TYPE 1	187.00 LF	\$114.63	\$21,435.81
	Bridge 880085 Total			\$4,353,411.59
	Bridges Component Total			\$4,353,411.59

RETAINING WALLS COMPONENT

Retaining Wall	1			
Description		Valu		
Length		100.0	0	
Begin height		5.0	0	
End Height	eight 20.00			
Multiplier		1		
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,250.00 SF	\$37.03	\$46,287.50
Retaining Wall	2			
Description		Valu	е	
Length		100.0	0	
Begin height		5.0	0	
End Height		20.0	0	
Multiplier			1	
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,250.00 SF	\$37.03	\$46,287.50

Retaining Wall 3	
Description	Value
Length	100.00
Begin height	5.00
End Height	20.00
Multiplier	1

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,250.00 SF	\$37.03	\$46,287.50
Retaining Wall	4			
Description		Valu	e	
Length		100.0	0	
Begin height		5.0	0	
End Height		20.0	0	
Multiplier			1	
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX	1.250.00 SF	\$37.03	\$46.287.50
0.0.1	BARRIER	.,	<i>Q</i> 000	<i> </i>
Retaining Wall &	5			
Description		Valu	е	
Length		50.0	0	
Begin height		20.0	0	
End Height		20.0	0	
Multiplier			1	
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX	1.000.00 SF	\$37.03	\$37.030.00
	BARRIER	.,		<i> </i>
Retaining Wall	6			
Description		Valu	е	
Length		50.0	0	
Begin height		20.0	0	
End Height		20.0	0	
Multiplier			1	
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,000.00 SF	\$37.03	\$37,030.00
	Retaining Walls Component Total			\$259,210.00

Sequence: 2 NUU - New Construction, Undivided, Urban

Net Length: 0.284 MI 1,500 LF

Description: Aviation Blvd West of SR 5/US 1 with shared-use path on south side, 7' bike lane on north side, and Median. Special light fixtures needed for Airport property approval.

EARTHWORK COMPONENT

	EARTHWORK CO			
User Input Data	1			
Description				Value
Standard Clearin	ng and Grubbing Limits L/R			44.00 / 113.00
Incidental Cleari	ing and Grubbing Area			0.00
	5			
Alignment Numb	ber			1
Distance				0.284
Top of Structura	I Course For Begin Section			105.00
Top of Structura	I Course For End Section			105.00
Horizontal Eleva	Horizontal Elevation For Begin Section			104.00
Horizontal Eleva	Horizontal Elevation For End Section			104.00
Front Slope L/R				6 to 1 / 6 to 1
Outside Shoulde	er Cross Slope L/R			2.00 % / 2.00 %
Roadway Cross	Slope L/R			2.00 % / 2.00 %
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	5.40 AC	\$49,392.09	\$266,717.29
	Earthwork Component Total			\$266,717.29
Hoor Input Date	ROADWAY CON	IPONENT		
	1			
Description		Value	•	
Number of Lane	25 mant Width I /D	4		
Structural Sprea	nent Width L/R	29.00 / 22.00		
Structural Sprea	iu Rale Sprood Poto	105		
		00	,	
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	9,360.30 SY	\$16.19	\$151,543.26
285-709	OPTIONAL BASE, BASE GROUP 09	8,500.27 SY	\$18.98	\$161,335.12
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	701.27 TN	\$148.38	\$104,054.44
337-7-83	ASPH CONC FC,TRAFFIC C,FC- 12.5,PG 76-22	340.01 TN	\$197.89	\$67,284.58
X-Items				
Dev item	Description	Quantity Unit	Unit Price	Extended Amount

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
570-1-2	PERFORMANCE TURF, SOD	1,334.00 SY	\$5.34	\$7,123.56
	Comment: Median Sod. (1500 ft)x(8 ft)/(9 ft)yd2	ft2/yd2)=1334		

Turnouts/Crossovers Subcomponent	
Description	Value
Asphalt Adjustment	20.00
Stabilization Code	Y
Base Code	Y
Friction Course Code	Y

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	1,872.06 SY	\$16.19	\$30,308.65
285-709	OPTIONAL BASE, BASE GROUP 09	1,700.05 SY	\$18.98	\$32,266.95
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	140.25 TN	\$148.38	\$20,810.29
337-7-83	ASPH CONC FC,TRAFFIC C,FC- 12.5,PG 76-22	68.00 TN	\$197.89	\$13,456.52

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	3

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	192.00 EA	\$4.02	\$771.84
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	2.27 GM	\$1,171.40	\$2,659.08
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	1.70 GM	\$449.94	\$764.90

Peripherals Subcomponent

Description	Value
Off Road Bike Path(s)	0
Off Road Bike Path Width L/R	0.00 / 12.00
Bike Path Structural Spread Rate	200
Noise Barrier Wall Length	0.00
Noise Barrier Wall Begin Height	0.00
Noise Barrier Wall End Height	0.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	2,666.75 SY	\$16.19	\$43,174.68
285-701	OPTIONAL BASE, BASE GROUP 01	2,000.06 SY	\$14.76	\$29,520.89
334-1-12	SUPERPAVE ASPHALTIC CONC, TRAFFIC B	200.01 TN	\$158.98	\$31,797.59
339-1	MISCELLANEOUS ASPHALT PAVEMENT	24.33 TN	\$281.07	\$6,838.43
536-1-1	GUARDRAIL- ROADWAY, GEN TL-3	720.00 LF	\$27.75	\$19,980.00
536-85-26	GUARDRAIL END TREATMENT- TYPE CRT	1.00 EA	\$4,619.10	\$4,619.10
544-3-2	CRASH CUSHION, TL-3, WIDE	1.00 EA	\$34,793.88	\$34,793.88
	Roadway Component Total			\$763,103.77

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	0.00 / 0.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00

0.00 / 0.00

Sidewalk Width L/R

X-Items

Description	Quantity Unit	Unit Price	Extended Amount
CONCRETE CURB & GUTTER, TYPE F	6,000.00 LF	\$27.01	\$162,060.00
Comment: Median C&G and outside sides. (1500 ft)x(4 sides)=6000 ft	edge of pavt. both		
	Description CONCRETE CURB & GUTTER, TYPE F Comment: Median C&G and outside sides. (1500 ft)x(4 sides)=6000 ft	DescriptionQuantity UnitCONCRETE CURB & GUTTER, TYPE F6,000.00 LFComment: Median C&G and outside edge of pavt. both sides. (1500 ft)x(4 sides)=6000 ft	DescriptionQuantity UnitUnit PriceCONCRETE CURB & GUTTER, TYPE F6,000.00 LF\$27.01Comment:Median C&G and outside edge of pavt. both sides. (1500 ft)x(4 sides)=6000 ft\$27.01

Erosion Control

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	3,000.10 LF	\$1.84	\$5,520.18
104-11	FLOATING TURBIDITY BARRIER	71.03 LF	\$13.89	\$986.61
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	71.03 LF	\$13.00	\$923.39
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$4,039.69	\$4,039.69
104-18	INLET PROTECTION SYSTEM	15.00 EA	\$155.49	\$2,332.35
107-1	LITTER REMOVAL	3.44 AC	\$20.47	\$70.42
107-2	MOWING	3.44 AC	\$65.97	\$226.94
	Shoulder Component Total			\$176,159.58

DRAINAGE COMPONENT

Pay Items

-				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	11.00 EA	\$7,013.89	\$77,152.79
425-1-451	INLETS, CURB, TYPE J-5, <10'	3.00 EA	\$11,481.26	\$34,443.78
425-1-521	INLETS, DT BOT, TYPE C, <10'	2.00 EA	\$6,099.36	\$12,198.72
425-2-41	MANHOLES, P-7, <10'	2.00 EA	\$6,729.69	\$13,459.38
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	664.00 LF	\$179.47	\$119,168.08
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	64.00 LF	\$267.91	\$17,146.24
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	1,424.00 LF	\$426.25	\$606,980.00
570-1-1	PERFORMANCE TURF	86.37 SY	\$3.12	\$269.47
	Drainage Component Total			\$880,818.46

SIGNING COMPONENT

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	6.00 AS	\$471.57	\$2,829.42
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00 AS	\$1,500.79	\$3,001.58
700-2-15	MULTI- POST SIGN, F&I GM, 51- 100 SF	1.00 AS	\$8,253.40	\$8,253.40
	Signing Component Total			\$14,084.40

LIGHTING COMPONENT

Conventional	Lighting Subcomponent			
Description				Value
Spacing				MAX
Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,500.05 LF	\$13.87	\$20,805.69
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	195.74 LF	\$30.56	\$5,981.81
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	6.00 EA	\$1,210.12	\$7,260.72
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	5,087.38 LF	\$3.70	\$18,823.31
715-61-342	LIGHT POLE CMPLT,STD,F&I, 40'MH,12'ARM L	6.00 EA	\$9,544.29	\$57,265.74
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	6.00 EA	\$999.15	\$5,994.90
	Subcomponent Total			\$116,132.17
	Lighting Component Total			\$116,132.17

Sequence 2 Total

\$2,217,015.67

Net Length:

Description: Aviation Blvd East of SR-5/US-1 with 7' bike lanes on both sides and median.

EARTHWORK COMPONENT

User Input Data	
Description	Value
Standard Clearing and Grubbing Limits L/R	50.00 / 60.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.085
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	103.00
Horizontal Elevation For End Section	103.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.13 AC	\$49,392.09	\$55,813.06
120-6	EMBANKMENT	1,964.91 CY	\$29.58	\$58,122.04
	Earthwork Component Total			\$113,935.10

ROADWAY COMPONENT

User Input Data	
Description	Value
Number of Lanes	3
Roadway Pavement Width L/R	17.00 / 18.00
Structural Spread Rate	165
Friction Course Spread Rate	80

Pay Items

Stabilization Code

Friction Course Code

Base Code

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	2,007.36 SY	\$16.19	\$32,499.16
285-709	OPTIONAL BASE, BASE GROUP 09	1,749.44 SY	\$18.98	\$33,204.37
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	144.33 TN	\$148.38	\$21,415.69
337-7-83	ASPH CONC FC,TRAFFIC C,FC- 12.5,PG 76-22	69.98 TN	\$197.89	\$13,848.34
X-Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
570-1-2	PERFORMANCE TURF, SOD	550.00 SY	\$5.34	\$2,937.00
	Comment: Median Sod. (450 ft)x(11 ft)/ yd2	' (9 ft2/yd2)=550		
Turnouts/Cross	sovers Subcomponent			
Description		Value		
Asphalt Adjustm	nent	15.00		

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Pay items				
Pay item	Description	Quantity Unit	Unit Price Ext	ended Amount
160-4	TYPE B STABILIZATION	301.10 SY	\$16.19	\$4,874.81
285-709	OPTIONAL BASE, BASE GROUP 09	262.42 SY	\$18.98	\$4,980.73
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	21.65 TN	\$148.38	\$3,212.43
337-7-83	ASPH CONC FC,TRAFFIC C,FC- 12.5,PG 76-22	10.50 TN	\$197.89	\$2,077.85

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	3
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	2

Pay Items Pay item Description Quantity Unit Unit Price Extended Amount 46.00 EA 706-1-3 RAISED PAVMT MARK, TYPE B \$4.02 \$184.92 PAINTED PAVT 710-11-101 0.51 GM \$1,171.40 \$597.41 MARK,STD,WHITE,SOLID,6" PAINTED PAVT 710-11-131 0.34 GM \$449.94 \$152.98 MARK,STD,WHITE,SKIP, 6" **Roadway Component Total** \$119,985.69

SHOULDER COMPONENT

User Input Data					
Description	Value				
Total Outside Shoulder Width L/R	13.25 / 13.25				
Total Outside Shoulder Perf. Turf Width L/R	5.00 / 5.00				
Sidewalk Width L/R	6.00 / 6.00				

Pay Items				
Pay item	Description	Quantity Unit	Unit Price Ext	tended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	449.86 LF	\$27.01	\$12,150.72
520-1-10	CONCRETE CURB & GUTTER, TYPE F	449.86 LF	\$27.01	\$12,150.72
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	599.81 SY	\$56.89	\$34,123.19
570-1-1	PERFORMANCE TURF	499.84 SY	\$3.12	\$1,559.50

X-Items

Pay item	Description	Quantity Unit	Unit Price Ext	ended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	900.00 LF	\$27.01	\$24,309.00
	Comment: Median C&G both sides. (450 900 ft	0 ft)x(2 sides)=		

Erosion Control Pay Items

Pay item Description

Quantity Unit Unit Price Extended Amount

3/13/24	1.04	РM
J/IJ/ZH	1.04	1 111

LRE - R3: Project Details by Se

	Shoulder Component Total			\$91,427.53
107-2	MOWING	1.03 AC	\$65.97	\$67.95
107-1	LITTER REMOVAL	1.03 AC	\$20.47	\$21.08
104-18	INLET PROTECTION SYSTEM	5.00 EA	\$155.49	\$777.45
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$4,039.69	\$4,039.69
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	21.30 LF	\$13.00	\$276.90
104-11	FLOATING TURBIDITY BARRIER	21.30 LF	\$13.89	\$295.86
104-10-3	SEDIMENT BARRIER	899.71 LF	\$1.84	\$1,655.47
PM	LRE - R3: Project Details by Sequence Report			

DRAINAGE COMPONENT

Pay Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	4.00 EA	\$7,013.89	\$28,055.56
425-1-451	INLETS, CURB, TYPE J-5, <10'	1.00 EA	\$11,481.26	\$11,481.26
425-1-521	INLETS, DT BOT, TYPE C, <10'	1.00 EA	\$6,099.36	\$6,099.36
425-2-41	MANHOLES, P-7, <10'	1.00 EA	\$6,729.69	\$6,729.69
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	200.00 LF	\$179.47	\$35,894.00
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	24.00 LF	\$267.91	\$6,429.84
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	432.00 LF	\$426.25	\$184,140.00
570-1-1	PERFORMANCE TURF	25.90 SY	\$3.12	\$80.81
	Drainage Component Total			\$278,910.52

SIGNING COMPONENT

Pay Items				
Pay item	Description	Quantity Unit	Unit Price E	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	5.00 AS	\$471.57	\$2,357.85
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00 AS	\$1,500.79	\$1,500.79
700-2-15	MULTI- POST SIGN, F&I GM, 51- 100 SF	1.00 AS	\$8,253.40	\$8,253.40
	Signing Component Total			\$12,112.04

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description Spacing Pay Items				Value MAX
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	449.86 LF	\$13.87	\$6,239.56
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	58.70 LF	\$30.56	\$1,793.87
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	2.00 EA	\$1,210.12	\$2,420.24
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	1,525.68 LF	\$3.70	\$5,645.02

Λ	LRE - R3: Project Details by Sequence Report			
715-61-342	LIGHT POLE CMPLT,STD,F&I, 40'MH,12'ARM L	2.00 EA	\$9,544.29	\$19,088.58
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	2.00 EA	\$999.15	\$1,998.30
	Subcomponent Total			\$37,185.57
	Lighting Component Total			\$37,185.57

Sequence 3 Total

\$653,556.45

Sea	uence:	4 MIS	- Miscellaneous	Construction
004	acrice.	- IVII O	moodululoouo	0011301001011

Description: Disputes Review Board Pay Items

ROADWAY COMPONENT

X-Items				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
999-20-1	DISPUTES REVIEW BD, MEETING- DO NOT BID	36.00 DA	\$3,900.00	\$140,400.00
	Comment: Assume 36 month construction			
999-20-2	DISPUTES REVIEW BD, HEARING- DO NOT BID	6.00 EA	\$4,500.00	\$27,000.00
	Comment: Assume 1 hearing every 6 month	ns.		
	Roadway Component Total			\$167,400.00

\$167,400.00

Date: 3/13/2024 11:43:48 AM

FDOT Long Range Estimating System - Production R3: Project Details by Sequence Report

Project: 441693-1-	52-01		Letting Date: 01/2099
Description: SR-5	/US-1 AT AVIATION BOULEVARD		
District: 04 Contract Class: 7	County: 88 INDIAN RIVER Lump Sum Project: N	Market Area: 11 Design/Build: N	Units: English Project Length: 1.237 MI
Project Manager:	NAGOLE		
Version 17 Project Description: 2024	: Grand Total WPUC SR-5/US-1 AT AVIATION BO	ULEVARD - PREFE	\$16,277,971.35 RRED ALTERNATIVE

Project Sequ	ences Subtotal			\$13,323,943.26
102-1	Maintenance of Traffic	10.00 %		\$1,332,394.33
101-1	Mobilization	10.00 %		\$1,465,633.76
Project Sequ	ences Total			\$16,121,971.35
Project Unkno	owns	0.00 %		\$0.00
Design/Build		0.00 %		\$0.00
Non-Bid Con	nponents:			
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
999-16	PARTNERING (DO NOT BID)	2.00 LS	\$3,000.00	\$6,000.00
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)	LS	\$150,000.00	\$150,000.00

Version 17 Project Grand Total

Project Non-Bid Subtotal

\$16,277,971.35

\$156,000.00

Appendix B – Existing Conditions





I PRO PRO	DATE: 07/03/0 DPOSAL : T4212 DJECT(S): 41529	B PROPOSAL SUMMARY OF P LEAD PROJECT : 41529115201 COUNTY : INDIA 115201 COUNTY/SECTION: 88010000	AY ITE	us	PAG WANDIST: 04	GE: I A0001	2	I PROL PRO	DATE: 07/03/08 POSAL : T4212 IECT(S): 4152911	PROPOSAL SUMMARY OF LEAD PROJECT : 41529115201 COUNTY : INL 5201 COUNTY /SECTION: 88010000
1	0001 SUMMA	RY OF ROADWAY	PA	Y ITEWS	 735				0001 SUMMARY	OF ROADWAY
P IAL	LT I ITEM 3 NUMBER	I ITEM I DESCRIPTION	IUN 1 1/T 1	41529115201		I QUANTITY TOTAL	1	P IAL	TI ITEM I NUMBER	DESCRIPTION
1					--			1	107/0- //-///	IDA INTER DAVENENT WARKINGS STANDARD WHITE
1	10101- 1-	IMOBILIZATION	115 1	1.000 N I		1 1.000			10/10-11-111	IFAINTED FAVENERT MARKINGS, STANDARD, WHITE,
1	10102- 1-	IMAINTENANCE OF TRAFFIC	122 1	1.000 N 1	,	1 7.000			1	ISULID, B
τı	10/02- 14-	ITRAFFIC CONTROL OFFICER	1 MH 1	8.000 N 1		1 8.000		1.	10/10-11-122	IPAINIEU PAVEMENI MARAINGS, SIANDARD, WHITE,
1	10/02- 60-	IWORK ZONE SIGN	IEDI	8602.000 N I		1 8602.000				ISULID, O
1	10102- 74-	I IBARRICADE, TEMPORARY, TYPES I, II, DI. VP & DRUM	IED I	22258.000 N 1		22258.000			10/10- 11-123	IPAINIEU PAVENENI MARKINGS, STANDARD, WHITE,
1	10/02-74-	2 IBARRICADE, TEMPORARY, TYPE III. 6'	IED I	999.000 N 1		999.000				ISOLID, 12
1	10/02- 76-	1ADVANCE WARNING ARROW PANEL	IED 1	764.000 N I		1 764.000	1	ι.	10710-11-124	IPAINTED PAVENENT WARKINGS, STANDARD, WHITE,
1	10/02-77-	HIGH INTENSITY FLASHING LIGHTS, TEMP. TYPE B	IEQ I	2873.000 N I		1 2873.000	1	1	1	ISOLID, 18"
i i	10/02- 99-	ICHANGEABLE-VARIABLE MESSAGE SIGN, TEMPORARY	IED I	328.000 N 1		1 328.000	1	1	10710-11-125	IPAINTED PAVEMENT MARKINGS, STANDARD. WHITE.
i	10102-911-	I LPAVENENT MARKING REHOVABLE, WHITE-BLACK, SKIP	ILF I	23691.000 N 1		23691.000	1	1	1	ISOLID, 24"
i	10102-911-	2 IPAVENENT MARKING REMOVABLE, WHITE-BLACK .SOLID	ILF I	42222.000 N 1		42222.000	I	1	10710-11-131	IPAINTED PAVENENT MARKINGS, STANDARD. WHITE, SI
i i	10/02-9//-	3 IPAVENENT WARKING REMOVABLE, WHITE-BLACK, OTHER	ISF I	2938.000 N I		1 2938.000	L	1	1	16 *
÷	10102-912-	I IPANT WARKING REMOVABLE, YELLOW, SKIP	ILF I	2482.000 N 1		1 2482.000	1	1	10710-11-160	IPAINTED PAVEMENT MARKINGS, STANDARD, WHITE,
- i	10102-912-	2 IPAVENENT MARKING REMOVABLE, YELLOW, SOLID	ILF I	3/22/.000 N 1		1 31221.000	1	1	1	IMESSAGE
- i	10/04- 16-	IPOCK BAG	IFA I	900.000 N I		900.000	T	1	10710-11-170	IPAINTED PAVEMENT MARKINGS, STANDARD, WHITE,
	10/10- 1-	I ICLEARING & GRUBBING	1/5 1	1.000 N I		1 1.000	1	1	1	IARROWS
1	10/10- 1-	I DELOVAL OF EXISTING CONCRETE PAVENENT	IST	920,000 N 1		920.000	1	1	10710-11-211	IPAINTED PAVEMENT MARKINGS, STANDARD, YELLOW,
	10170- 4-	A LOODDOW EVENIATION TOUCH VEASUDE	ICY	20 000 # 1		1 20.000	Ĩ	1	1	1SOL 1D. 6'
	10/20- 2-	L BURRUW EXCAVATION, TRUCK MEASURE	115	1 000 # 1		1 / 000	1	1	10710-11-222	IPAINTED PAVENENT WARKINGS. STANDARD. YELLOW.
	10720- 77-	REGULAR EXCAVATION (S-R PROJECTS UNLI)	ISY			1 111 000	i a	i	1	150/ 10. 8*
	10285-775-	IUFTIUNAL BASE, BASE GROUF TS	157 1	54302 000 N 1		1 54302 000	T	i i	10710-11-224	VPAINTED PAVENENT NARKINGS, STANDARD, YELLOW,
1	10327 - 70-	8 MILLING EXIST ASPH PAVI, 2 172 AVG DEPTH	157 1	54502.000 N 1		1 34302.000	1	- É	1	
1	10334 - 1-	IS ISUPERPAVE ASPHALITC CONC., TRAFFIC C	17.0	4947.400 # 1		1 3142 400	1	÷ 1	10710-11-231	IPAINTED PAVENENT WARKINGS STANDARD YELLOW
1	10337 - 7	TASPHALT CONCRETE FRICTION COURSE, TRAFFIC B, FC-9.		3142.400 N		1 3142.400	· ·	÷ .	10/10- 11-251	ICKID E'
1	1	15, RUBBER		17 000 11		1 17 000	-	1	10710-11-200	IDAINTED DAVENENT WARKINGS STANDARD YELLOW
1	10339- 1-	IMISCELLANEOUS ASPHALT PAVEMENT	ITN	17.900 N I		1 17.900	1. ·	1	10/10- 11-290	ITAINIED FAVENENT MARKINGS, STANDARD, TELLOW,
1	10400- 1-	II ICONCRETE CLASS I, RETAINING WALLS	ICY	8.000 N 1		8.000	1	!	10715 14 19	TISLAND NUSE
1	10425- 6-	IVALVE BOXES, ADJUST	IEA	16.000 N		1 76.000	1	-	10/15-14-12	ILIGHING - FULL BUX, FWI, SIDEWALK
1	10425- 10-	IY ARD DRAIN	IEA	1.000 N I		1 1.000	1	1	10999- 16-	IPARINERING, DO NOI BID
1	10460- 70-	2 IALUMINUM BULLET RAILINGS, DOUBLE RAIL	ILF	106.000 N I		1 106.000	1	1	10999- 25-	TINITIAL CONTINGENCY AMOUNT, DU NUT BID
1	105/5- 1-	2 IPIPE HANDRAIL - GUIDERAIL, ALUMINUM	ILF	I 60.000 N I		1 60.000	1	1		
1	10520- 1-	IO ICONCRETE CURB & GUTTER, TYPE F	1LF	1 1439.000 N 1		1 1439.000	L			FLORIDA DEPARIMENT O
1	10520- 2-	2 ICONCRETE CURB, TYPE B	ILF	97.000 N I		1 97.000	1		-	
1	10520- 2-	4 ICONCRETE CURB, TYPE D	ILF	I 144.000 N I	141	1 144.000	1			
1	10522- 1-	ISIDEWALK CONCRETE, 4" THICK	ISY	I 907.000 N I		1 907.000	1			
i.	10522- 2-	ISIDEWALK CONCRETE, 6' THICK	ISY	I 63.000 N I		I 63.000	1			
· 1	10527 - 1-	IDETECTABLE WARNING ON WALKING SURFACE, RETROFIT	IEA	7.000 N .		1 7.000	I			
	10536- 1-	I IGUARDRA IL -ROADWAY	ILF	288.000 N	-	1 288.000	1			
÷	10536- 1-	6 IGUARDRAIL - BRIDGE, THRIE BEAN	ILF	1 176.000 N 1	í	1 176.000	1			
- 1	10536- 8-	ICUARDRAIL - BRIDGE ANCHORAGE ASSEMBLY (FURNISH &	IFA	4.000 N	ĥ	4.000	1 .			
	10338- 8-	LINCTALLS	1			1	1			
	10576 77	ICUADORA IL REMOVAL	UE	267 000 1		267 000	1			
	10536-73-	ICCHARDRAIL FUD ANCHORACE ASSEMBLY - PARALLEI	IEA	201.000 #		2 000	1	1	DATE: 07/03/08	PROPOSAL SUMMARY OF
1	10536 - 85-	24 IGUARURAIL END ANGHORAGE ASSEMBLI - FARALLEL	IEA	2.000 //		1 2.000		PROP	OSAL : T4212	LEAD PROJECT : 41529115201 COUNTY : IND
1	10536- 85-	25 IGUARURAIL END ANCHURAGE ASSEMBLI - ITPE IT	1CA			1 1283 000		PROJ	ECT(S): 41529115	5201 COUNTY/SECTION: 88010000
1	10/06- 3-	INEINU-REFLECTIVE PAVEMENT MARKERS	EA	1203.000 #		1 1203.000		1		
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FLORIDA DEPARTMENT OF TRANSPORTATION

FLOR IDA DEPARTMENT OF

DATE BY DESCRIPTION DATE BY DESCRIPTION P.E. No.: 606/4 DEPARTMENT OF TRANSPORTATION Certificate of Authorization No. 24 Certificate of (954) 733-7233 P.E. No.: 606/4 DEPARTMENT OF TRANSPORTATION Date BY Description P.E. No.: 606/4 DEPARTMENT OF TRANSPORTATION South Wo Certificate of Authorization No. 24 Post Buckley Schuh & Jernigan. Inc., d/b/o/ PBS&J DEPARTMENT OF TRANSPORTATION	<u> </u>		REVI	SIONS			DDCI	Michael Priory, P.E.		STATE OF FLO	RIDA	1
Certificate of Fort Louderdale, FL 33309 Authorization No. 24 (954) 733-7233 5 INDIAN RIVER 415291-1-52-01 Post Buckley Schuh & Jernigan, Inc., d/b/o/ PBS&J	DATE	BY ,	DESCRIPTION	DATE	BY	DESCRIPTION	- Maria	P.E. No.: 60614 3230 W. Commercial Blvd.	DEI	COUNTY	SPORTATION	
	-						Certificate of Authorization No. 24 Post Buckley Schuh &	Fort Lauderdale, FL 33309 (954) 733-7233 Jernigan, Inc., d/b/a/ PBS&J	5	INDIAN RIVER	415291-1-52-01	

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E: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE BIGI5-23.003, F.A.





JECT(S): 41529	PROPOSAL SUMMARY E LEAD PROJECT : 41529115201 COUNTY ; 115201 COUNTY /SECTION: 88010000	OF PAY IT INDIAN RIV	EMS E ,	PAGE: I A000 WANDIST:04	<i>i</i>	I D PROPO PROJE	TE: 07/03/08 SAL : T4212 CT(S): 4152911	LEAD PROJEC 5201 COUNTY/SECT	PROPOSAL SUMMARY OF T : 41529115201 COUNTY : IND TION: 88010000	PAY ITE IAN RIVE		PAG MANDIST: 04	E: 2 A0ÓOI
0001 SUMMA	ARY OF ROADWAY	P.	AY ITEMS		•	s	0001 SUMMARY	OF ROADWAY		PA	Y ITEMS CONTINUED		
TI ITEM NUMBER	DESCRIPTION	1 <i>UN</i> 1 <i>1T</i>	1 41529115201 I I I	I QUANTITY T	07AL	P IALT C I	ITEM NUMBER	1	ITEM DESCRIPTION	10N 1 177 1	41529115201 I	1	QUANTITY TOTAL I
NUBBLR 10/01- 10/02- 10	I DESCRIPTION IMOBILIZATION IMAINTENANCE OF TRAFFIC ITRAFFIC CONTROL OFFICER IWORK ZONE SIGN I BARRICADE. TEMPORARY. TYPES I, II, DI, VIE 2 BARRICADE. TEMPORARY. TYPES I, II, DI, VIE 2 BARRICADE. TEMPORARY. TYPES I, II, DI, VIE 2 BARRICADE. TEMPORARY. TYPE III, 6' IADVANCE WARNING ARROW PANEL IHIGH INTENSITY FLASHING LIGHTS, TEMP, TYPE B ICHANGEABLE-VARIABLE WESSAGE SIGN. TEMPORARY I PAVEMENT WARKING REMOVABLE, WHITE-BLACK, SOLI 3 IPAVEMENT WARKING REMOVABLE, WHITE-BLACK, SOLI 3 IPAVEMENT WARKING REMOVABLE, WHITE-BLACK, OTH 1 PAVE MARKING REMOVABLE, WHITE-BLACK, SOLID INFOCK DAG 1 ICLEARING & GRUBBING IREMOVAL OF EXISTING CONCRETE PAVEMENT 2 IPAVEMENT WARKING REMOVABLE, YELLOW, SOLID INFOCK DAG 1 ICLEARING & GRUBBING IREGULAR EXCAVATION, TRUCK MEASURE IREGULAR EXCAVATION, TRUCK MEASURE IREGULAR EXCAVATION, TRUCK MEASURE IREGULAR EXCAVATION, TRUCK MEASURE IREGULAR EXCAVATION, TRUCK MEASURE INFORME SCAVATION, TRUCK MEASURE INFORME SCAVATION, TRUCK MEASURE INFORME SCAVATION, TRUCK MEASURE INFORME SCAVATION, TRUCK MEASURE INFORME EXCAVATION, TRUCK MEASURE INFORME 1 SUPERPAVE ASPHALTIC CONC, TRAFFIC C 30 IASPHALT CONCRETE FRICTION COURSE, TRAFFIC B, 15, NUBBER IMISCELLANEOUS ASPHALT PAVEMENT 11 ICONCRETE CLASS I, RETAINING WALLS IVALVE BOXES, ADJUST IYARD DRAIN 2 IALUMINUM BULLET RAILINGS, DOUBLE RAIL 2 IPIPE HANDRAIL - GUIDERAIL, ALUMINUM 10 ICONCRETE CURB, TYPE B 4 ICONCRETE CURB, TYPE B 4 ICONCRETE CURB, TYPE B 4 ICONCRETE CURB, TYPE B 4 ICONCRETE CURB, THE BEAM IGUARDRAIL - BRIDGE, THICK ISIDEWALK CONCRETE, 4' THICK ISIDEWALK CONCRETE, 5' THICK ISIDEWALK CONCRETE, 6' THICK ISIDEWALK CONCRETE, 7YPE F 2 ICONCRETE CURB, TYPE B 4 ICONCRETE CURB, TYPE B 4 ICONCRETE CURB, THE BEAM IGUARDRAIL - BRIDGE, THICE BEAM IGUARDRAIL - BRIDGE, THICE BEAM IGUARDRAIL - BRIDGE, THICE BEAM IGUARDRAIL - BRIDGE ANCHORAGE ASSEMBLY (FURN INN	11// 1LS 1LS 1LS 1LS 1LS 1ED DRUM 1ED P 1ED P 1EF 1ED P 1EF 1EF <tr< td=""><td>1.000 N 1.000 N 8.000 N 8.000 N 1.22250.000 N 1.22250.000 N 1.22250.000 N 1.22250.000 N 1.2673.000 N 1.2673.000 N 1.23691.000 N 1.23691.000 N 1.2222.000 N 1.23691.000 N 1.222.000 N 1.222.000 N 1.222.000 N 1.222.000 N 1.222.000 N 1.222.000 N 1.20.000 N</td><td>1 1 0.00 1 1 0.00 1 8.00 8602.00 1 22258.00 1 1 764.00 1 1 764.00 1 1 764.00 1 1 764.00 1 1 764.00 1 1 23691.00 1 1 23691.00 1 1 23691.00 1 1 2938.00 1 1 2482.00 1 1 900.00 1 1 900.00 1 1 900.00 1 1 900.00 1 1 900.00 1 1 900.00 1 1 1.00 1 1 1.00 1 1 1.00 1 1 1.01 1 1 1.02 1 1 1.02 1 1 1.05 0</td><td></td><td></td><td>10710-11-122 10710-11-123 10710-11-123 10710-11-123 10710-11-125 10710-11-125 10710-11-125 10710-11-125 10710-11-121 10710-11-221 10710-11-224 10710-11-224 10710-11-224 10710-11-225 10710-11-226 10710-11-226 10710-11-226 10710-11-227 10710-11-227 10710-11-228 10710-11-288 10</td><td>IPAINTED PAVEMENT ISOLID. 6* IPAINTED PAVEMENT ISOLID. 12* IPAINTED PAVEMENT ISOLID. 12* IPAINTED PAVEMENT ISOLID. 18* IPAINTED PAVEMENT ISOLID. 24* IPAINTED PAVEMENT IPAINTED PAVEMENT ISOLID. 6* IPAINTED PAVEMENT ISOLID. 6* IPAINTED PAVEMENT ISOLID. 6* IPAINTED PAVEMENT ISOLID. 18* IPAINTED PAVEMENT ISOL</td><td>PROPOSAL SUMMARY OF</td><td>INM I INM I ILF I I ILF I I ILF I I ILF I I ILF I I ILF I I ILF I I I ILF I I I ILF I I I I I I I I I I I I I I I I I I I</td><td>4.027 N 1085.000 N 3231.000 N 502.000 N 934.000 N 19.000 N 186.000 N 10.223 N 1790.000 N 1126.000 N 10.243 N 109.000 N 109.000 N 1.000 N 1.000 N 1.000 N 1.000 N 1.000 N 1.000 N</td><td>PAG</td><td>4.027 1085.000 3231.000 502.000 934.000 2.382 19.000 86.000 1.000 1.26.000 1.26.000 1.000 1.000 1.000 1.000</td></tr<>	1.000 N 1.000 N 8.000 N 8.000 N 1.22250.000 N 1.22250.000 N 1.22250.000 N 1.22250.000 N 1.2673.000 N 1.2673.000 N 1.23691.000 N 1.23691.000 N 1.2222.000 N 1.23691.000 N 1.222.000 N 1.222.000 N 1.222.000 N 1.222.000 N 1.222.000 N 1.222.000 N 1.20.000 N	1 1 0.00 1 1 0.00 1 8.00 8602.00 1 22258.00 1 1 764.00 1 1 764.00 1 1 764.00 1 1 764.00 1 1 764.00 1 1 23691.00 1 1 23691.00 1 1 23691.00 1 1 2938.00 1 1 2482.00 1 1 900.00 1 1 900.00 1 1 900.00 1 1 900.00 1 1 900.00 1 1 900.00 1 1 1.00 1 1 1.00 1 1 1.00 1 1 1.01 1 1 1.02 1 1 1.02 1 1 1.05 0			10710-11-122 10710-11-123 10710-11-123 10710-11-123 10710-11-125 10710-11-125 10710-11-125 10710-11-125 10710-11-121 10710-11-221 10710-11-224 10710-11-224 10710-11-224 10710-11-225 10710-11-226 10710-11-226 10710-11-226 10710-11-227 10710-11-227 10710-11-228 10710-11-288 10	IPAINTED PAVEMENT ISOLID. 6* IPAINTED PAVEMENT ISOLID. 12* IPAINTED PAVEMENT ISOLID. 12* IPAINTED PAVEMENT ISOLID. 18* IPAINTED PAVEMENT ISOLID. 24* IPAINTED PAVEMENT IPAINTED PAVEMENT ISOLID. 6* IPAINTED PAVEMENT ISOLID. 6* IPAINTED PAVEMENT ISOLID. 6* IPAINTED PAVEMENT ISOLID. 18* IPAINTED PAVEMENT ISOL	PROPOSAL SUMMARY OF	INM I INM I ILF I I ILF I I ILF I I ILF I I ILF I I ILF I I ILF I I I ILF I I I ILF I I I I I I I I I I I I I I I I I I I	4.027 N 1085.000 N 3231.000 N 502.000 N 934.000 N 19.000 N 186.000 N 10.223 N 1790.000 N 1126.000 N 10.243 N 109.000 N 109.000 N 1.000 N 1.000 N 1.000 N 1.000 N 1.000 N 1.000 N	PAG	4.027 1085.000 3231.000 502.000 934.000 2.382 19.000 86.000 1.000 1.26.000 1.26.000 1.000 1.000 1.000 1.000
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÷	10635- 1- 15	IPULL & UNICTION DOVES, FRI, FOLL DOX	IEA I	3000 1 1		33.000
	10633- 1- 73	IFUEL & JUNCTION BOXES, F&L, FIBER OFFICS	ILA I	2.000 N 1		2.000
	10039- 7-23	ISTORALS, ELECTRICAL POWER SERVICE, UNDERGROUND	IAS I	2.000 N 1		2.000
	10639- 2- 1	ISIGNALS, ELECTRICAL SERVICE WIRE	ILF I	325.000 N I		325.000
1	10649- 31-108	IMASI ARM, F&I, WIND SPEED-150, SINGLE ARM, WITH	IEA I	2.000 N I		2.000
1	1	ILUMINAIRE-60	+ 1	1		
1	10649 - 31-112	IMAST ARM.F&I, WIND SPEED-150,DOUBLE ARM,W/O	IEA I	1.000 N I		1.000
L I	l I	ILUMINAIRE, 36-60	1 1	1		1
T	10649- 31-116	IMAST ARM, F&I, WIND SPEED-150, DOUBLE ARM, W/O	IEA I	1.000 N I		1.000
1	1	ILUMINAIRE, 46-70.5	1 1	Т		a na konsumurfülde
1	10649 - 31-206	IMAST ARM, F&I, WIND SPEED-130, SINGLE ARM, W/O	IEA I	2.000 N 1		2.000
r -	1	ILUMINAIRE, ARM LENGTH 36'	1 1			
r i	10650 - 51-311	ITRAFFIC SIGNAL FRI 3 SECTION I WAY STANDARD	145 1	15 000 N 1		. 15 000
	10650 - 51-511	ITRAFFIC SIGNAL FRI 5 SECTIONS I WAY STANDARD	145 1	2 000 N		1 2,000
	10050 51 511	ITRAFFIC SIGNAL, TWI, S SECTIONS, TWAT, STANDARD	LAC	2.000 # 1		2.000
	10650- 37-373	IFRAFFIC SIGNAL, FOI, 5 SECTIONS, I WAR, SFECTAL	TAS I	7.000 N 1		1.000
	10653-191-	IPEDESTRIAN SIGNAL, F&I, LED - COUNT DOWN, I	IAS I	6.000 N I		6.000
1	1	IDIRECTION	1 1	1		
1	10653-192-	IPEDESTRIAN SIGNAL, F&I, LED - COUNT DOWN. 2	1A5 1	5.000 N I		5.000
1	1	IDIRECTIONS	T 1	1		i i i i i i i i i i i i i i i i i i i
1	10659-106-	ISIGNAL HEAD AUXILIARIES, F&I, TUNNEL VISOR	IEA I	66.000 N I		66.000
1	10659-107 -	ISIGNAL HEAD AUXILIARIES, F&I. ALUMINUM PEDESTAL	IEA 1	6.000 N I		6,000
1	10660 - 2-106	ILOOP ASSEMBLY. F&I. TYPE F	IAS 1	1.000 N I		1.000
1	10663-74-11	WEHICLE DETECTOR ASSEN, FAL, OPTICAL TYPE	IFA I	16.000 N 1		16 000
i i	10665- 11-	PEDESTRIAN DETECTOR ENI DETECTOR STATION POLE	IEA I	15 000 N 1		16.000
î.	1	IN CONTROLLER CABINET WOUNTED	1 1	10.000 # 1		1 70,000
i i	10670- 5-130	ITRAFFIC CONTROLLER ASSEMBLY FUL SPECIAL	145 1	1 000 N 1		
÷	10670 - 5-131	ITRAFFIC CONTROLLED ACCEMPLY FALL OPECIAL ONE	LAC I	1.000 # 1		1.000
2	10670- 5-151	ADDECKOTION DIAN	IAS I	1.000 N 1		1 7.000
		IPREEMPITUN PLAN	1			
1	10685-706-	ISYSTEM AUXILIARIES, F&I, UNINTERRUPTIBLE POWER	IEA I	2.000 N I		2.000
1	Contraction of the second	ISOURCE	1 1	1		1
1	10685-120-	ISYSTEM AUXILIARIES. F&I, TELEMETRY TRANSCEIVER	IEA I	2.000 N 1		2.000
	and a second	ISYSTEN AUXILIARIES, EURNISH & INSTALL, INTERFACE				7 000
I .	10685-128-	is size newrethings, renarising a morner, ner ner	LA I	2.000 N I		2.000
1	10685-128- I	IPANEL		2.000 N I		2.000
1 1	10685-128- 1 10686-101-	IPANEL ICLOSED CIRCUIT TY EQUIPMENT . FAI. CAMERA ASSEMBLY		2.000 N I		
 	10685-128- 1 10686-101- -1	IPANEL ICLOSED CIRCUIT TV EOUIPMENT, F&I, CAMERA ASSEMBLY	IEA EA -	2.000 N 1 1.000 N 1		1.000
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1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10685-128- 1 10686-101- -1	IPANEL ICLOSED CIRCUIT TV EQUIPMENT, F&I, CAMERA ASSEMBLY FLORIDA DEPARTMENT OF TH PROPOSAL SUMMARY OF PA LEAD PROJECT : 41529115201 COUNTY : INDIAN 5201 COUNTY /SECTION: 88010000 OF SIGNALIZATION	12A EA RANSPO AY ITE RIVE RIVE	2.000 N 1.000 N RTATION 	PAC MANDIST: 04	2.000 1.000 E: 5 A0003
1 PROPO PROJE 	10685-128- 1 10686-101- 1 DATE: 07/03/08 25AL: T4212 ECT(S): 4152911 0003 SUNNARY 1 ITEM 1 NUMBER	IPANEL ICLOSED CIRCUIT TV EQUIPMENT, F&I, CAMERA ASSEMBLY FLORIDA DEPARTMENT OF TH PROPOSAL SUMMARY OF PA LEAD PROJECT : 41529115201 COUNTY : INDIAN 5201 COUNTY /SECTION: 88010000 OF SIGNALIZATION I ITEM DESCRIPTION	12A EA - RANSPO AY ITE RIVE RIVE PA	2.000 N .000 N 	PAC MANDIST: 04	2.000 1.000 E: 5 A0003 QUANTITY TOT
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1	DATE: 07/03/08 PROPOS PROPOSAL : T4212 LEAD PROJECT : 41529115201 PROJECT(S): 41529115201 COUNTY/SECTION: 88010000	AL SUMMARY OF PAY ITEMS COUNTY : INDIAN RIVE , ,	PAGE: 6 A0004 MANDIST:04
s	0004 SUMMARY OF LANDSCAPE / PERIPHERAL	PAY ITEMS	
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т	I 10570- I- 2 IPERFORMANCE TURF, SOD I 10580- I- I ILANDSCAPE COMPLETE- SMALL PLANTS I 10580- I- 2 ILANDSCAPE COMPLETE- LARGE PLANTS I 10590- 70- IIRRIGATION SYSTEM	ISY I 2226.000 N I ILS I 1.000 N I ILS I 1.000 N I ILS I 1.000 N I ILS I 1.000 N I	2226.000 1.000 1.000 1.000

FLORIDA	DEPARTMENT	OF	TRANSPO	RTAT ION	

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		REVISIONS					CTATE OF FLO	nm i
DESCRIPTION	DATE	BY	DESCRIPTION		P.E. No.: 60614 3230 W. Commercial Bivd.	DEF	PARTMENT OF TRAN	NIDA VSPORTATION
					Suite 100	ROAD NO.	COUNTY	FINANCIAL PROJECT IL
				Certificate of Authorization No. 24 Post Buckley Schuh & Ju	Fort Lauderadie, FL 55309 (954) 733-7233 ernigan, Inc., d/b/o/ PBS&J	5	INDIAN RIVER	415291-1-52-01

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	SHEET NO.
SUMMARY OF PAY ITEMS	3





REVISIONS						Michael Priory, P.F.	CTATE OF FLODIDA			
DATE BY	DESCRIPTION	DATE	BY	DESCRIPTION	= PK &	P.E. No.: 60614 3230 W. Commercial Blvd.	DEP	ARTMENT OF TRAN	SPORTATION	
			9				Sulte 100 Fort Laudordalo EL 33300	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
						Authorization No. 24 Post Buckley Schub &	(954) 733-7233 Jerniaan, Inc., d/b/a/ PBS&J	5	INDIAN RIVER	415291-1-52-01

CURRENT YEAR ESTIMATED OPENING YEAR = 2010 AADT = 45400 ESTIMATED DESIGN YEAR = 2030 AADT = 70300 K = 9.8% D = 51.2% T = 3.7% (24 HOUR) DESIGN HOUR T = 1.9% DESIGN SPEED = 35/45 MPH POSTED SPEED = 35/45 MPH



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		Stat	e Of Florida Departm	ent Of Transportation	le	CONS.
		Roi	idway - As-Built P	Pavement Data (2900121
	Project ID.: 41529	91-1-52-01	Pay Item No.: 1	01-1	Material ID.: P	ROABS
	Sample Level: V		Manfr or Prod: C	ommunity Asphalt	Date Sampled:	0/1/09
	Dest. LabID: D040	11	Sample No.: P	0001V	Sampled By: M	arie Kinne
	Sta. From: 313+9	96.90	Sta. To: 39	00+22		
	LANE L1	▼ L2 ▼ R	Lane In	formation	•	.
	· · · · · · · · · · · · · · · · · · ·		Pavement	Information		
	(13)	Layer Number	ement Layers - S Subgrade (if new)	Base (if new)		2
	Milling Depth	Layer Code			5P125C	FL95
		Approx. Thickness in.			1.5 "	1 *(
	Layer Number	3	4	5	6	7
	Layer Code					
	Approx. Thickness in./mm					
	Remarks: S 1 of 3 Friction	Dample Po . Structur n Mix De	001V is ral Mix i signs ar	s for T Design is e 08-60	ypical Sea 07-5748 59A \$ 08	_tion D_ _6059 <u>P</u>
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epartme	nt Of Transportation	6.	700-050-12 CONSTRUCTION 02/09						
Built F	Pavement Data (L	IMS)							
Pag	ge No、 of		2900126614						
No.: 10	1-1	Material ID.: PF	ROABS						
rod: Co	mmunity Asphalt	Date Sampled:	0/1/09						
No.: P0	001V	Sampled By: Ma	arie Kinne						
To: 390)+22								
ne Inf									
ment l rs - Sl	Information tart With First Pav	/ement Layer Plac	ced)						
le)	Base (if new)	1	2						
		5P125C	FL95						
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are	2 08-605	9A : 08-	6059 D.						

	NUdi	iway - Mo-Duill	ravement Data it				
	Date	Pa	ge No. of	LIMS ID(RODIAB		
Project ID.: 415291	-1-52-01	Pay Item No.: 10)1-1	Material ID.: PF	Material ID.: PROABS		
Sample Level: V		Manfr or Prod: Co	ommunity Asphalt	Date Sampled:			
Dest. LabID: D04011		Sample No.: PC	0002V	Sampled By: Ma	arie Kinne		
Sta. From: 313+96	.90	Sta. To: 39	0+22				
		Lane Ini	formation				
LANE L1	▼ L2 ▼ R1	▼ R2					
		Pavement	Information	/ I			
(Ente	er Only New Pave	ment Layers - S Subgrade (if new)	Base (if new)	1	2		
Milling Depth	Layer Code			SP125 C	FC95		
	Approx. Thickness in.			1.5"	1 "		
Layer Number	3	4 5		6	7		
Layer Code							
Approx. Thickness in./mm							
Remarks: Sar Structure Designs	nple Pool 1 Mix De	ozvis- signis	for Typica 07-5748 08-60590	al Section D. Frictio	n Z of ' n Mix		
Designs				· · · · · · · · · · · · · · · · · · ·			
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• •		λ.	5			Ro Date	adway - As-Built Pa	Pavement Data (L ige No. of	IMS)	190012862V
					Project ID.: 41529	91-1-52-01	Pay Item No.: 10	01-1	Material ID.: PF	ROABS
					Sample Level: V		Manfr or Prod: C	ommunity Asphalt	Date Sampled:	0/1/09
					Dest. LabID: D0401	11	Sample No.: P	0003V	Sampled By: Ma	arie Kinne
		î.			Sta. From: 313+9	96.90	Sta. To: 39	0+22		
					LANE L1	▼ L2 ▼ R	Lane In 1 V R2	formation	.	.
							Pavement	Information		
					<u>(En</u>	ter Only New Pav	ement Layers - S	tart With First Pa	vement Layer Pla	ced)
						Layer Number	Subgrade (if new)	Base (if new)	1	2
					Milling Depth	Layer Code			SPIZSC	FC95
						Approx. Thickness in.			1.5"	، ،
					Layer Number	3	4	5	6	7
					Layer Code					
					Approx. Thickness in./mm					
					Remarks: So 3 of 3	ample P . Struct	0003V j ural Mix	s for Typ Design	ical Secti is 07-57	のへ 48 D .
				-	Friction	Mix Des	igns are	08-60591	1 1 08-605	9 D.
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uilt Pavement Data (LIMS)			
Page No. of		<u>P090(</u>	128624
lo.: 101-1	Material ID.:	PROABS	
od: Community Asphalt	Date Sampled:	10/1	109
lo.: P0003V	Sampled By:	Marie Kin	ne
Го: .390+22			

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lix	Desig	n is	07	-574	8 .	
e	08-60	SJA	; 08	-6059	Ъ.	
	- <u>,, 190</u> 0.789-)
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TRAFFIC DATA STA. 3/3+75.00 TO STA. 390+22.00

CURRENT YEAR = 2005 AADT = 39200ESTIMATED OPENING YEAR = 2010 AADT = 45400 ESTIMATED DESIGN YEAR = 2030 AADT = 70300 K = 9.8% D = 51.2% T = 3.7% (24 HOUR) DESIGN HOUR T = 1.9% DESIGN SPEED = 45 MPH POSTED SPEED = 45 MPH

			REVISIONS				Michael Priory, P.E.		STATE OF FLO	RMA
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	— PK 🕅	P.E. No.: 60614 3230 W. Commercial Blvd,	DEF	PARTMENT OF TRA	VSPORTATION
		<i>2</i>					Suite 100	ROAD NO.	COUNTY	FINANCIAL PROJECT IL
						Authorization No. 24	(954) 733-7233	5	INDIAN RIVER	415291-1-52-01
						Post Buckley Schuh &	Jernigan, Inc., d/b/a/ PBS&J	,	205/9	



	FIFID BOOK	DEWADKE	STANDARD	A)	IES (EA	EMBL	AS	IORAGE	ANC	ENL		IARDRAIL (LF)	GL			
102-1 INCL	REFERENCE	REMARKS	INDEX	EL	PARALLI		TYPE	RIDGE	RED	FLA	TY TREATMENT	PEDESTRIAN SAFE	DWAY	ROA	SIDE	STATION
UNDE		SE CORNER				<i>F</i>	Ρ				+	FROM	<u>г</u> 155 л	P 37.5'	07	FROM 377+42.61
RELO	-	OF BRIDGE	400								377+92.45	T0	20	51.5	<i>π</i>	TO 377+80.11-
CABL		OF BRIDGE	400				- 1				377+92.71	TO	50	37.5'	<u>,</u> <u>L</u> T	TO 377+80:21
INCL		NE CORNER	400	_		-					379 + 49.31	FROM	21	25'	RT	FROM 379+61-81
102-14 INCL		W CORNER									379+56.56	FROM	210	187.5'	с. 1 <i>Т</i>	FROM 379+63.06
SIGN		OF BRIDGE	400	24	1 1	0.1	2					TO	200		2.	TO 381+50.56
10-1-1 INCL			e	0.		-01	f=				1799, 69 UP	JA My Lat	321.1	288'		TOTAL
LANL		BRIDGE THRIE BEAM TRANS.	402					+ 1 -		<u> </u>	311196.45	TO	31.5	44'	RT	TO 378+23.95
IIU-4 INCL	a fi de de Antonio de A	BRIDGE THRIE	402					1			377+92.71	FROM	31.5	44'	LT	FROM 377+80.21
285-713 BAS		BRIDGE THRIE	402					1.				FROM	215	44'	RT.	FROM 379+17.81
101		BEAM TRANS.	402								379 +49.31	TO	31.0		• 10	<u>TO 379+61.81 - FROM 379+19.06</u>
21-10-8 INCL		BEAM TRANS.	402				P				379+50.56	TO	3.5	44'		TO <u>379+63.06</u>
34-1-13 INCL							/	4	— F			KIN 2 PIDAMA	126:	176'		THRIE BEAM TOTAL
425-6 INCL		GUARDRAIL							-			FROM	25	25'	LT	FROM 351+40.93
425-10 INCL		GUARDRAIL						_			+	FROM	- <u>-</u>	CA'	1,7	FROM 377+48.63
0-70-2 INCL		REMOVAL	1									70 5000	64	04		TO 378+11.71
20-1-10 100		REMOVAL			_							70	64	64'	RT	TO 378+11.43
ADJA		GUARDRAIL	-									FROM	63	63'	LT	FROM 379+30.24
20-2-2 INCL		GUARDRAIL										FROM	51	5/'	RT	FROM 379+30.33
ADJA		REMOVAL										Τ0	51			TO 379+80.80
													16N	267		TOTAL
522-1 INCLU				η,							<u></u>	NO TO TROUG				
0-2-4 INCLU	-	CHEDULE OF	S									WORK Nº ·	EARIE	RY UF	UMMAI	5
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	ISTMENT/F	ON (D) ADJU	STATIC								/3					FILL
	5 8	<u>, , , , , , , , , , , , , , , , , , , </u>	328+80]							3				(18%)	FILL ADJUSTMENT
CONST		5+	329+4													FILL
CONST			010.10												T (25:4)	
CONST		5 +	379+75				17				20			v	CAVATION	TOTAL BORROW EX
CONST		5 <u>+</u>	379+75 383+10		11	0		1			1					
CONST		5 <u>+</u> 0 <u>+</u> 0 <u>+</u>	379+75 383+10 383+60		11	ð	66									REGULAR EXCAVAT
CONST		5 <u>+</u> 0 <u>+</u> 0 <u>+</u> 0 <u>+</u>	379+75 383+10 383+60 390+60		/	• D	31.				31				ION	
CONST		5 ± 0 ± 0 ± 0 ± 0 ± 0 ±	379+75 383+10 383+60 390+60 390+80		UCTED,	D D CONSTR	31. DN 15	R OPTI	ANOTH	ON. IF	31 .5) ONLY BASE OPTIC	ROUP 13 (TYPE B-12.	NG BASE G	LATED US	ION N CALCU	ARTHWORK HAS BEE
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2.C	1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 ± 0 ± 0 ± 0 ± 0 ± 0 ± 0 ± 0 ± 0	379+75 383+10 383+60 390+60 390+80 TOTAL SOME VALVES M CONTACT CITY O DEPARTMENT, 1 EOR FUNCTION	SOOF	/ / / / / / / / / / / / / / / / / / /	D CONSTR	<u>31.</u> DN 15 ITY.	R OPTI QUANT	anoth by pla	IN. IF MADE	31 3.5) ONLY BASE OPTIC WHICH PAYMENT IS I ALLIMINIUM	GROUP 13 (TYPE B-12. RK QUANTITES FOR WI TY WALL	RAVI	INTED USI N TO THE	RY O	CARTHWORK HAS BEE CHERE SHALL BE NO SUMMAR
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L Bys	1 1 1 1 1 1 1 1 1 1 1 1 1 1	5 ± 0 ± 0 ± 0 ± 0 ± 0 ± 0 ± 0 ± 0	379+75 383+10 383+60 390+60 390+80 TOTAL SOME VALVES N CONTACT CITY O DEPARTMENT, T FOR EXACT LOO	S C D F	/ / / / / / / / / / / / / / / / / / /	RAI CONSTR	31. 31. NDI FI RE	R OPTI QUANT HAI S SWK	anoth By pla I M E MARI	N. IF MADE /NL R ELE	31 2.5) ONLY BASE OPTIC WHICH PAYMENT IS I ALUMINUM HANDRAIL LF F 50 60.0 V 1.1	GROUP 13 (TYPE B-12. RK QUANTITES FOR W. TY WALL LASS I NCRETE CY F F F SIONS	RAVI	N TO THE	ION REVISION RY O TA. 36+59.12	ARTHWORK HAS BEE HERE SHALL BE NO SUMMAR LOCATION STA. TO ST 385+99.62 TO 38
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PAY ITEM NOTES

EMS OF MOBILIZATION NOT INCLUDED FOR PAYMENT UNDER ITEMS.

EMS OF MAINTENANCE OF TRAFFIC NOT INCLUDED FOR PAYMENT E PAY ITEMS. THIS INCLUDES BUT IS NOT LIMITED TO THE ORM WATER FROM THE ROADWAY DURING CONSTRUCTION, THE EXISTING STREET SIGNS, TEMPORARY ACTUATION, AND ALL REALIGNMENT OF SIGNAL HEADS TOGETHER WITH REQUIRED ES, TO THE PROPER LANE CONFIGURATION AS REQUIRED DURING LSO INCLUDES THE COST OF MAINTAINING COMMUNICATIONS. ORARY LINES AND CONNECTIONS.

OLLING AND DIRECTING TRAFFIC IN THE WORK ZONE ONLY WHEN T IN USED AT A SIGNALIZED INTERSECTION.

OF REMOVING TREES AND SHRUBS AS NOTED IN THE VS.

OF REMOVING BRICKS AND DECORATIVE PAVERS

D TO B-12.5 TO EXPEDITE CONSTRUCTION AND OP OFF.

SITION AREAS.

ITTING ASPHALT SURFACE AS REQUIRED.

SENCY OF 5 VALVE ADJUSTMENTS IF NEEDED AT OTHER LOCATIONS.

OF PLUG AND COLLAR OF TEE.

OF REMOVAL AND DISPOSAL OF EXISTING HANDRAIL.

OF CURB PAD, PAVEMENT SAWCUT, AND PAVEMENT RESTORATION EW CURB AND GUTTER.

OF CURB PAD, PAVEMENT SAWCUT, AND PAVEMENT RESTORATION EW CURB. ALSO INCLUDES COST OF SUBSURFACE MATERIAL AND DS.

STS ASSOCIATED WITH RECONSTRUCTION OF THE EXISTING ER CURB RAMP AT NE CORNER OF 8TH AVENUE AND 21ST STREET. OF CURB PAD, PAVEMENT SAWCUT, AND PAVEMENT RESTORATION EW CURB.

WN ON THE SUMMARY OF ROADWAY PAY ITEMS ARE FOR PAINTED NGS USED FOR MAINTENANCE OF TRAFFIC.

INCLUDED AS A CONTENGENCY IF NEEDED DUE TO CURB RAMP THE SE CORNER OF 9TH AVENUE. QAty = の きみ

PLAN QUANTY ANALYSIS SUMMARY OF GUARDRAIL

		LOCATIO	N		
	STATION	SIDE	PLAN	DIFFERENCE	FINAL
И	377 + 42.61	RT	37.5	12.5	50.0
	377 + 92.45	22.0	5713		
N	377 + 42.71	IT	37.5	12.5	50.0
	377 + 92.71	0400	57.5		
M	379 + 49.31	рт	25	-4.0	21.0
	379 + 70.31	ni.	23	-4.0	11.0
N	379 + 50.56	IT	187.5	12.5	200.0
	381 + 50.56		107.0		
NEV	V GUARDRAIL		288	34	321.0
	TOTAL		200		
M	377 + 92.45	RT	44	31.5	-12.5
	378 + 23.95				
М	377 + 92.71	ιт	44	31.5	-12.5
	378 + 24.21				
M	379 + 17.81	PT	44	31.5	-12.5
	379 + 49.31			52.5	
M	379 + 19.06	17	44	31.5	-12.5
	379 + 50.56			51.5	44.15
Т	HRIE BEAM TOTAL		176	126	-50.0

UMMARY OF QUANTITIES

SHEET NO. 9

SEA

AND

SIGNED

E

STR.	071700	Ч осторити	<i>IELS</i>		PVC	PIPE	MANH		HOLE	CURB INLETS		DITCH BOTTOM INLETS DRAIN		ILETS YARD		^OWNENTS	DEMARKE			
NO.	STATION	DESCRIPTION	BARF	12'	15'	18 •	24 '	P-7 0'</th <th>P-7 ≥10'</th> <th>P-5 PART</th> <th>P-6 PART</th> <th>J-5 PART</th> <th>J-6 PART</th> <th>C <10'</th> <th>E <10'</th> <th>EA</th> <th></th> <th></th> <th>REMARKS</th> <th></th>	P-7 ≥10'	P-5 PART	P-6 PART	J-5 PART	J-6 PART	C <10'	E <10'	EA			REMARKS	
S-1	386+58J2 I	RT YARD DRAIN	1													1	CONNE	CT TO 24" RCP	STANDARD INDE	X 282
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TE	BY DESCRIPTION	REVISIONS	BY	<i>r</i>	ESCRIPTIO	DN]	DD	CI	Mîchael	Priory. P.E	5.		STAT	E OF FLO	ORIDA				SHEET
	DESCRIPTION			L	2.50/10/10	·····			Ň	P.E. 3230 W. (NO.: 60614 Commercial L	Blvd.	DEP	ARTMENT	OF TRA	NSPORTA	A TION	SUMMA	RY OF	NO.
							Cel	tificate of)	Su Fort Laude	ilte 100 rdale. Fl 3	3309 R	DAD NO.	COU	NTY	FINANC	TAL PROJECT ID			
	1						Au	thorization	No. 24	(954)	733-7233		5	INDIAN	RIVER	4152	91-1-52-01	DRAINAGE S	IKUCTURES	10

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GENERAL NOTES

I. BENCHMARK DATA IS NORTH AMERICAN VERTICAL DATUM OF 1988 (N.A.V.D.- '88).

- 2. ALL PUBLIC LAND CORNERS AND MONUMENTS WITHIN THE LIMITS OF CONSTRUCTION ARE TO BE PROTECTED BY CONTRACTOR AS FOLLOWS: CORNERS AND MONUMENTS IN CONFLICT WITH THE WORK AND IN DANGER OF BEING DAMAGED, DESTROYED OR COVERED HAVE TO BE PROPERLY REFERENCED BY A REGISTERED LAND SURVEYOR IN ACCORDANCE WITH THE MINIMUM TECHNICAL STANDARDS OF THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS PRIOR TO BEGINNING WORK AT THAT SITE. THE CONTRACTOR SHALL RETAIN THE LAND SURVEYOR TO REFERENCE, AND RESTORE UPON COMPLETION OF THE WORK, ALL SUCH CORNERS AND MONUMENTS AND WILL FURNISH TO THE DISTRICT LOCATION ENGINEER A SIGNED AND SEALED COPY OF THE LAND SURVEYOR'S REFERENCED DRAWING. THE CONTRACTOR SHALL INCLUDE ALL COSTS OF REFERENCING, RESTORING AND PRESERVING, AS DEFINED ABOVE IN THE BID PRICE FOR ITEM 101-1, MOBILIZATION. IF A CORNER MONUMENT IS IN DANGER OF BEING DESTROYED AND HAS NOT BEEN PROPERLYREFERENCED, THE PROJECT ENGINEER SHOULD NOTIFY THE DISTRICT LOCATION SURVEYOR, WITHOUT DELAY, ROBERT HUGHAN AT (954)777-4556.
- 3. ALL N.A.V.D. BENCH MARK MONUMENTS WITHIN THE LIMITS OF CONSTRUCTION WILL BE PROTECTED AND REFERENCED BY THE CONTRACTOR IN THE SAME WAY AS PUBLIC LAND CORNERS EXCEPT THAT THE LAND SURVEYOR WILL NOT BE REQUIRED TO RESTORE THE N.A.V.D. BENCH MARK UPON COMPLETION OF THE WORK. THE CONTRACTOR WILL PROMPTLY TRANSMIT ALL DISPLACED OR DAMAGED N.A.V.D. BENCH DISCS TO THE DISTRICT LOCATION SURVEYOR AT (954) 777-4556, WHO WILL NOTIFY THE GEODETIC INFORMATION CENTER. THE CONTRACTOR SHALL INCLUDE ALL COSTS OF REFERENCING, RESTORING AND PRESERVING, AS DEFINED ABOVE IN THE BID PRICE FOR ITEM IOI-I, MOBILIZATION.

4. ALL STATIONS AND OFFSETS ARE FROM BASELINE OF SURVEY UNLESS OTHERWISE NOTED IN THE PLANS.

- 5. ALL EXCESS MATERIAL IS TO BE DISPOSED OFF BY THE CONTRACTOR IN APPROVED AREAS PROVIDED BY THE CONTRACTOR WITHIN THREE (3) FULL WORKING DAYS OF BEING DEPOSITED IN THE CONSTRUCTION AREA AND AT THE CONTRACTOR'S EXPENSE. DO NOT DEPOSIT MATERIALS ONTO ADJACENT PROPERTIES.
- 6. EXISTING DRAINAGE STRUCTURES WITHIN CONSTRUCTION LIMITS SHALL REMAIN, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT MILLED MATERIAL FROM ENTERING THE DRAINAGE SYSTEM. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING INLETS CLEAN OF PAVING MATERIAL, SILT, LIMEROCK, AND DEBRIS DURING THE CONSTRUCTION AT NO ADDITIONAL COST.
- 7. MILLED SURFACE MUST BE RESURFACED THE SAME DAY. RESURFACING MUST TAKE PLACE PRIOR TO TRAFFIC USE.
- 8. THE CONTRACTOR IS TO MAINTAIN AND KEEP STREET NAME IDENTIFICATION VISIBLE DURING CONSTRUCTION OPERATIONS, IN ORDER TO FACILITATE EMERGENCY VEHICLE TRAFFIC.
- 9. EROSION CONTROL ITEMS ARE ESTIMATED FOR PREVENTION, CONTROL, ABATEMENT OF EROSION, SEDIMENTATION, AND WATER POLLUTION. THESE ITEMS ARE TO BE USED AT THE LOCATIONS DESCRIBED IN THE CONTRACTOR'S APPROVED EROSION CONTROL PLAN OR AS DIRECTED BY THE PROJECT ENGINEER TO COMPLY WITH ALL FEDERAL. STATE AND LOCAL REGULATIONS.
- IO. CONTRACTOR SHALL GIVE WRITTEN NOTIFICATION TO PROPERTY OWNERS, ADJACENT TO THE PROJECT, 14 DAYS IN ADVANCE OF CLEARING AND GRUBBING.
- II. CONTRACTOR SHALL SAW CUT: EXISTING ASPHALT PAVEMENT AT THE LIMITS OF MILLING AND RESURFACING AND AT ALL AREAS OF EXISTING ASPHALT. IF ADJACENT TO/PARALLEL TO NEW CONCRETE AND OR WIDENING; EXISTING CURB OR CURB AND GUTTER AND SIDEWALK ADJACENT TO NEW CURB OR CURB AND GUTTER AND SIDEWALK.
- 12. ALL LANES OF SR-5/US-I MUST BE OPENED FOR TRAFFIC DURING AN EVACUATION NOTICE OF A HURRICANE OR OTHER CATASTROPHIC EVENT AND SHALL REMAIN OPENED FOR THE DURATION OF THE EMERGENCY OR EVENT AS DIRECTED BY THE PROJECT ENGINEER.
- 13. ALL ROADWAY CONDUIT TRENCHING SHALL BE COMPLETED PRIOR TO MILLING AND RESURFACING OPERATIONS.
- 14. MILLING AND RESURFACING DEPTHS SHALL BE ADJUSTED FOR THE ASPHALT OVERLAY ON THE APPROACH SLABS SO AS TO NOT DAMAGE THE APPROACH SLABS.
- 15. THE BRIDGE ON THE PROJECT WAS INSPECTED AND TESTED FOR ASBESTOS CONTAINING MATERIAL (ACM) AS DEFINED IN FDOT PROCEDURES. THE BRIDGE BEARING PADS WERE FOUND TO BE ASBESTOS CHRYSOTILE. THE CONTRACTOR IS TO CONTACT THE DISTRICT CONTAMINATION IMPACT COORDINATOR (DCIC) AT (954)777-4286 THIRTY DAYS PRIOR TO CUTTING THE TRAFFIC RAILAND/OR BARRIER AND COORDINATE THAT ACTIVITY WITH THE DEPARTMENT'S CONTAMINATION AND REMEDIATION (CAR) CONTRACTOR. THE CAR CONTRACTOR WILL PROVIDE OVER SIGHT OF THE RAIL CUTTING ACTIVITY AND HANDLE AND DISPOSE OF ANY ACM EXPOSED.
- 16. IF SUSPECTED CONTAMINATED OR HAZARDOUS MATERIAL IS FOUND ON THE PROJECT. OR ENCOUNTERED DURING CONSTRUCTION, NOTIFY THE DISTRICT CONTAMINATION IMPACT COORDINATOR (DCIC) AT 954-777-4286.
- 17. DUE TO THE PROXIMITY TO THE VERO BEACH MUNICIPAL AIRPORT, THE CONTRACTOR SHALL SUBMIT A FORM 7460-1 TO FAA FOR HEIGHTS REVIEW OF ANY CRANES EXPECTED TO BE USED DURING CONSTRUCTION.
- 18. THERE SHALL BE NO DEWATERING BETWEEN STA. 327+77 TO 330+35, AND BETWEEN STA. 350+74 TO 352+74, IN ORDER TO AVOID IMPACTING AREAS OF KNOWN GROUNDWATER CONTAMINATION.

- - B. SW CORNER OF SR 5 AND IOTH AVENUE (STA. 329+34 S)

ARM FOOTERS AT THE FOLLOWING LOCATIONS WHICH HAVE BEEN IDENTIFIED AS HAVING CONTAMINATED SOIL AND/OR GROUNDWATER: A. NE CORNER OF SR 5 AND IOTH AVENUE (STA. 383+77 N) C. NE CORNER OF SR 5 AND 23RD STREET (STA. 35/+74 E) CONSTRUCTION. UTILITY LOCATIONS AND ADJUSTMENTS SHALL BE REQUESTED BY THE CONTRACTOR. SERVICE LATERALS WHICH MAY NOT BE SHOWN IN THE PLANS. THE CONTRACTOR MUST REQUEST THE LOCATION OF THESE LATERAL SERVICES FROM UTILITY COMPANIES. THE ADDITIONAL COST OF EXCAVATING, INSTALLING, BACKFILLING AND COMPACTING AROUND THESE LATERALS SERVICING SAID PROPERTIES MUST BE INCLUDED IN THE BID RELATED ITEM FOR THE WORK BEING DONE. WHILE EXCAVATING, INSTALLING, BACKFILLING OR COMPACTING AROUND THE UTILITIES. THE COST IS TO BE INCLUDED IN RELATED ITEM FOR WORK BEING DONE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ANY UTILITY THAT HAS BEEN PROPERLY LOCATED. EXCAVATION SO THAT A UTILITY COMPANY REPRESENTATIVE CAN BE PRESENT. IN THE EVENT THAT A UTILITY CONTACT INFORMATION HAS CHANGED SINCE THESE PLANS WERE PRODUCED, THE CONTRACTOR SHALL CONTACTSUNSHINE ONE CALL AT THE NUMBER SHOWN BELOW TO GET THE LATEST UTILITY CONTACT INFORMATION. TECHNIQUES AND SHOULD BE CONSIDERED APPROXIMATE ONLY. THE VERIFIED LOCATIONS/ELEVATIONS APPLY ONLY AT THE POINTS SHOWN. INTERPOLATIONS BETWEEN THESE POINTS HAVE NOT BEEN VERIFIED. S CONTACT MR. MIKE KOENIG MR. CHRISTOPHER J. STEMER MR. JOE DEMARZO MR. ROB BOLTON MR. LEONARD MAXWELL MR. JOHN ANKENY MS. KARA SCHWARTZ / MR. CARLTON CARD HECTOR HARTMANN, OFFICE OF MODAL DEVELOPMENT, 3400 W COMMERCIAL BLVD FORT LAUDERDALE, FL 33309-3421 TELEPHONE NO. (954) 777-440/ FAX NO. (954) 677-7892 D. MAINTENANCE OF TRAFFIC (MPACTS A CROSSING, A. ON OR ABOVE THE RAILROAD RIGHT-OF-WAY. B. WITHIN 25' FROM THE CENTERLINE OF THE TRACKS, E. AS REQUIRED BY THE RAILROAD. C. IF THERE IS A RISK OF FOULING THE TRACKS (CRANES). · ·) BEFORE STARTING ANY WORK NEAR THE RAILROAD RIGHT-OF-WAY. THE CONTACT PERSON FOR THE FLORIDA EAST COAST RAILWAY L.L.C. WILL BE: 5 122 g MR. CHARLES STONE / TELEPHONE: 1-800-342-1131 EXT. 6057 OR 904-538-6057 MS. SISSY BUICE / TELEPHONE: 1-904-538-6052 SHEET NO. GENERAL NOTES 11

19. CONTRACTOR IS TO CONTACT THE DISTRICT CONTAMINATION IMPACT COORDINATOR AT (954)777-4286 THIRTY DAYS PRIOR TO INSTALLING MAST THE DISTRICT CONTAMINATION IMPACT COORDINATOR WILL ARRANGE FOR THE REMOVAL AND DISPOSAL OF CONTAMINATED SOIL, GROUNDWATER, DRILLING MUD OR ANY OTHER CONTAMINATED MATERIAL RESULTING FROM THE CONTRACTOR'S CONSTRUCTION OF THE FOOTER'S AT THESE LOCATIONS. NO ADDITIONAL TIME OR PAYMENT WILL BE MADE TO THE ROADWAY CONTRACTOR FOR THE COORDINATION OF THIS WORK. 20. COORDINATE THE SELECTION AND REVIEW OF PROPOSED STAGING AREAS ASSOCIATED WITH THE PROJECT WITH THE DISTRICT CONSTRUCTION ENVIRONMENTAL COORDINATOR (954) 777-4665. 21. TREE PROTECTION BARRIERS SHALL BE INSTALLED PRIOR TO SITE WORK. THERE SHALL BE NO CONSTRUCTION ACTIVITY WITHIN THE TREE PROTECTION BARRIER ZONE. REFER TO FOOT STANDARD INDEX 544 FOR TREE PROTECTION BARRICADE DETAIL AND NOTES. 22. EXISTING BRICK PAVERS AT THE SOUTHWEST CORNER OF SR-5 AND 11TH AV THAT ARE REMOVED TO CONSTRUCT THE PROPOSED CURB RAMP AND SIDEWALK ARE TO BE PROVIDED TO THE PATIO RESTAURANT, 1103 21ST ST, CONTRACTOR SHALL COORDINATE WITH THE MAINTENANCE PERSON AT THE RESTAURANT. UTILITIES: I. ALL EXISTING UTILITIES ARE TO REMAIN UNLESS OTHERWISE NOTED. 2. THE LOCATION OF EXISTING UTILITIES SHALL BE DETERMINED BY THE CONTRACTOR AND THE UTILITY OWNER, WHEN NECESSARY DURING 3. THE CONTRACTOR IS ADVISED THAT PROPERTIES ADJACENT TO THE PROJECT MAY HAVE ELECTRIC, TELEPHONE, GAS, WATER AND/OR SEWER 4. THE CONTRACTOR SHALL HAND DIG PRIOR TO EXCAVATING NEAR KNOWN UTILITIES. EXTREME CAUTION SHALL BE EXERCISED BY THE CONTRACTOR 5. THE CONTRACTOR IS TO USE EXTREME CAUTION WHEN WORKING IN OR AROUND AREAS OF OVERHEAD UTILITIES. 6. THE APPROPRIATE UTILITY COMPANY SHALL BE NOTIFIED BY THE CONTRACTOR AT LEAST TWO (2) FULL WORKING DAYS IN ADVANCE OF ANY 7. THE LOCATION(S) OF THE UTILITIES SHOWN IN THE PLANS INCLUDING THOSE DESIGNATED VVH ARE BASED ON LIMITED INVESTIGATION 8. UTILITY OWNERS: GENERAL RAILROAD NOTES: I. PRIOR TO THE PRE-CONSTRUCTION MEETING CONTACT THE DEPARTMENT OF TRANSPORTATION: 2. THE CONTRACTOR WILL BE REQUIRED TO HAVE A RAILROAD FLAGMAN AT ANY TIME WORK IS BEING DONE:

COMPANIES	TELEPHONE NUMBER
BELLSOUTH	(772) 460-4431
CITY GAS	(305) 694-6870
CITY OF VERO BEACH ELECTRIC	(772) 978-5460
CITY OF VERO BEACH WATER & SEWER DEPT.	(772) 978-4800
COMCAST	(954) 444-5//3
INDIAN RIVER COUNTY TRAFFIC ENGINEERING	(772) 226-1563
PLANNING AND ENVIRONMENTAL MANAGEMENT	(954) 777-4364 / 466
SUNSHINE ONE CALL	(800) 432-4770

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TRAFFIC CONTROL GENERAL NOTES

- I. ARROWS DENOTE DIRECTION OF TRAFFIC ONLY AND DO NOT REFLECT PAVEMENT MARKINGS.
- 2. ALL TRAFFIC CONTROLS SHALL BE IN ACCORDANCE WITH PROJECT PLANS AND THE 2003 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES WITH REVISION I AND 2 INCORPORATED. DATED DECEMBER 2007. AS A MINIMUM CRITERIA.
- 3. ALL TRAFFIC CONTROL LAYOUTS SHOULD FOLLOW STANDARD INDEX NUMBERS: 600. 611-613. 615-617. 619. 630. AND 660.
- 4. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ALL POTHOLES WHICH DEVELOP WITHIN THE PROJECT LIMITS AND SHALL MAINTAIN A SUPPLY OF COLD MIX ON THE PROJECT SITE TO EXPEDITE THOSE REPAIRS. COST INCLUDED IN ITEM 102-1 MAINTENANCE OF TRAFFIC.
- 5. LANE CLOSURES SHALL NOT BE PERMITTED DURING PEAK HOURS FROM 7:00 AM TO 9:00 AM AND FROM 4:00 PM TO 6:00 PM , IN ADDITION TO THOSE HOURS WHICH MAY BE DESIGNATED BY THE ENGINEER DUE TO EXCESSIVE TRAFFIC AND/OR HAZARDOUS CONDITIONS. SHOULD ANY LANE CLOSURE CAUSE AN UNACCEPTABLE LEVEL OF TRAFFIC CONGESTION, THE CONTRACTOR WILL BE DIRECTED BY THE ENGINEER TO OPEN THE LANE UNTIL SUCH TIME THAT THE TRAFFIC IS RETURNED TO AN ACCEPTABLE FLOW. ALL LANES SHALL BE RE-OPENED DURING INACTIVE WORK PERIODS. THE CITY OF VERO BEACH NOISE ORDINANCE PROHIBITS CONSTRUCTION NOISE BETWEEN 7:00 PM AND 7:00 AM, UNLESS A SPECIAL PERMIT HAS BEEN OBTAINED FROM THE CITY MANAGER. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PERMIT. COST INCLUDED IN ITEM 102-1 MAINTENANCE OF TRAFFIC.
- 6. PRIOR TO ANY LANE CLOSURE THE CONTRACTOR SHALL NOTIFY THE FDOT CONSTRUCTION PROJECT ENGINEER OR RESIDENT CONSTRUCTION ENGINEER AT LEAST FOURTEEN (14) DAYS PRIOR TO CLOSURE FOR APPROVAL. THE NOTIFICATION WILL INCLUDE SKETCHES, CALCULATIONS, AND OTHER DATA REQUIRED BY THE ENGINEER.

NOTIFY: FLORIDA DEPARTMENT OF TRANSPORTATION KATHERINE KEHRES, RESIDENT ENGINEER 3601 OLEANDER AVENUE FORT PIERCE, FL 33450 (772) 465-7396

- 7. THE CONTRACTOR SHALL CONTACT THE FOOT DISTRICT 4 PUBLIC INFORMATION OFFICER, BARBARA KELLEHER AT (954) 777-4090 AT LEAST 10 BUSINESS DAYS PRIOR TO LANE CLOSURE.
- 8. THE CONTRACTOR SHALL ONLY BE ALLOWED TO WORK WITHIN A DESIGNATED SEGMENT OF ROADWAY LIMITED TO A MAXIMUM LENGTH OF 1000 FEET AT ANY TIME DURING CONSTRUCTION ACTIVITIES INVOLVING LIMITED TO A MAXIMUM LENGTH OF DOU FEET AT ANT TIME DURING CONSTRUCTION ACTIVITIES INVOLVING REMOVAL AND REPLACEMENT OF CONCRETE AND CONDUIT INSTALLATION. THE DESIGNATED CONSTRUCTION AREA IS TO BE APPROVED BY THE PROJECT ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES. AND SHALL CONSIST OF ONLY ONE SIDE OF THE ROADWAY. THE CONTRACTOR SHALL NOT PROCEED TO THE NEXT PRE-APPROVED 1000 FOOT CONSTRUCTION AREA UNTIL ALL WORK IS COMPLETED IN THE PREVIOUS 1000 FOOT SECTION, UNLESS APPROVED BY THE PROJECT ENGINEER. IF THE CONTRACTOR WOULD LIKE TO WORK OUTSIDE OF THIS DESIGNATED AREA, THEY MUST OBTAIN WRITTEN APPROVAL 14 DAYS IN ADVANCE OF THE WORK BEING PERFORMED. AND THE SPECIFIC WORK ACTIVITIES MUST BE DOCUMENTED IN THE REQUEST.
- 9. CHANNELIZING DEVICES SHALL BE OFFSET 2 FEET FROM LANE LINES.

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- 10. THE EXISTING POSTED REGULATORY SPEED SHALL BE MAINTAINED THROUGH THE WORK ZONE.
- II. CONTRACTOR SHALL REMOVE, RELOCATE OR COVER ANY SIGNS AND/OR PAVEMENT MARKINGS THAT CONFLICT WITH THE TRAFFIC CONTROL PLANS. WHEN THE CONFLICT NO LONGER EXISTS. THE CONTRACTOR SHALL REPLACE THOSE SIGNS AND/OR MARKINGS IN THEIR ORIGINAL POSITION. THE CONTRACTOR SHALL COVER WORK ZONE SIGNS WHEN CONDITIONS NO LONGER WARRANT THEIR USE.
- 12. CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMMEDIATE REMOVAL OF STORM WATER FROM ROADWAYS UTILIZED FOR MAINTAINING TRAFFIC IN A MANNER APPROVED BY THE ENGINEER.
- 13. THE LENGTH OF AN OPEN TRENCH SHALL NOT EXCEED 500 FEET. THE CONTRACTOR WILL NOT BE ALLOWED TO OPEN ANY TRENCHES THAT CANNOT BE BACK-FILLED DURING THE SAME WORKING PERIOD WITHOUT THE APPROVAL OF THE ENGINEER.

- 14. AT THE END OF EACH WORK DAY OR WHENEVER THE WORK ZONE BECOMES INACTIVE, ANY DROP OFF ADJACENT TO THE PEDESTRIAN, BICYCLE, WHEELCHAIR TRAVEL PATHS, AND TRAVEL WAY SHALL BE TREATED.
- 15. THE CONTRACTOR SHALL MAINTAIN THE EXISTING LEVEL OF ILLUMINATION THROUGHOUT CONSTRUCTION.
- 16. CONTRACTOR TO MAINTAIN BLUE RPM'S DURING CONSTRUCTION PHASES. PERMANENT RPM'S, AS REQUIRED FOR LANE LINES, SHALL BE PLACED WITHIN 72 HOURS OF COMPLETION OF THE MAIN LINE FRICTION COURSE. OTHER LOCATIONS FOR RPM PLACEMENT MAY BE DESIGNATED BY THE ENGINEER.
- 17. THE CONTRACTOR SHALL INSTALL CONSTRUCTION SIGNING PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES AND MAINTAIN SIGNING DURING ALL PHASES OF CONSTRUCTION.
- 18. THE ALTERATION OF TRAVEL WAYS TO CREATE A WORK ZONE SHALL NOT COMMENCE UNTIL ALL LABOR AND MATERIAL ARE READY FOR THE CONSTRUCTION IN THAT ZONE.
- 19. THE CONTRACTOR SHALL NOTIFY INDIAN RIVER COUNTY TRAFFIC ENGINEERING DIVISION TWO (2) WORKING DAYS PRIOR TO ANY MODIFICATION AND/OR CHANGES TO AN EXISTING TRAFFIC SIGNAL.

INDIAN RIVER COUNTY TRAFFIC ENGINEERING DIVISION JOHN ANKENY 1840 25TH STREET VERO BEACH, FL 32960 (772) 226-1563

- 20. SIGNALIZED INTERSECTIONS SHALL BE MAINTAINED AT ALL TIMES BY UTILIZING THE EXISTING SYSTEMS OR BY THE USE OF TEMPORARY SYSTEMS. COST IS TO BE INCLUDED UNDER PAY ITEM 102-1 MAINTENANCE OF TRAFFIC.
- 21. THE CONTRACTOR SHALL MAINTAIN VEHICLE AND PEDESTRIAN DETECTION THROUGHOUT CONSTRUCTION. RESPONSE TIME TO ALL REPORTED MALFUNCTIONS OF TRAFFIC SIGNALS AND RELATED EQUIPMENT SHALL BE WITHIN TWO (2) HOURS OF NOTIFICATION. THE CONTRACTOR SHALL RESTORE ALL MALFUNCTIONING TRAFFIC SIGNAL EQUIPMENT TO ITS LEVEL OF OPERATION PRIOR TO THE MALFUNCTION WITHIN TWENTY-FOUR (24) HOURS OF NOTIFICATION.
- 22. SIGNAL HEADS SHALL BE REALIGNED AS NECESSARY.
- OR INSTALLING NEW ONES), A TRAFFIC CONTROL OFFICER SHALL DIRECT TRAFFIC.

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23. WHEN A CONTRACTOR IS PERFORMING SIGNAL WORK IN AN INTERSECTION (REMOVING EXISTING SIGNAL CONTROLLER AND SIGNAL HEADS.

		TRAFFIC	CONTROL	GENL	<u>ERAL NOTES</u>				PORT	ABLE CHANGE	ABLE (VA
	24. 25.	THE CONTRACTOR SHALL INSTAL SIGNALIZATION AND/OR SIGNAL IN THE CASE THAT A DESIGNAT	L ANY NECES MODIFICATION TED CROSSING	SARY F TO ACC OR AN	PAVEMENT, ROAD ROCK, PAVEMENT COMMODATE AN EXISTING OR ALTE IN PORTION OF THE DESIGNATED	MARKING SIGNAGE AND/OR ANY P RNATE WALK ROUTE. WALK ROUTE CAN NOT BE MAINTA.	EDESTRIAN			PCMS	TO BE PL
		DIVISION, (772) 567-8000 EXT. AN ALTERNATE CROSSING/ROUT	I234, A MININ E CAN BE ES	UN OF STABLIS	TEN (ID) WORKING DAYS PRIOR TO HED.	CLOSING THAT ROUTE IN ORDER	THAT AN			0-14 DAYS PRIOR TO CONSTRUCTION	
	26.	THE CONTRACTOR IS RESPONSIE WITH DISABILITIES ACT (ADA) F VICINITY OF THE CONSTRUCTION ROUTES/ACCESS TO AND FROM TO AND FROM TRANSIT VEHICLI BE CREATED. THE SAFE WAL CONSTRUCTION FENCE FOR THE	LE FOR PROV OR PEDESTRI ZONE SHALL EXISTING BU ES AT BUS S K ROUTE SHI ENTIRE LEN	VIDING A VANS. BE MV S STOP STOPS C ALL BE IGTH OF	SAFE AND ADEQUATE WALKING S SAFE WALK ROUTES FOR ALL PE AINTAINED THROUGHOUT CONSTRUC S AND TRANSIT VEHICLES. IF I CANNOT BE MAINTAINED. THEN A SEPARATED FROM THE CONSTRU THE PROJECT OR THE LENGTH	URFACE APPLICABLE TO THE AME DESTRIANS AND TRANSIT USERS W TION. THIS INCLUDES SAFE WALN HE CURRENT WALKING SURFACE A TEMPORARY ROAD-ROCK 4' WALK W CTION ACTIVITY BY THE 4' HIGH O OF THE WALK ROUTE, WHICHEVER	RICANS VITHIN THE (ND ACCESS VAY SHALL VRANGE R IS LESS.			CONST TO BEGIN XX/XX/XX	
	27.	PEDESTRIAN WALKWAYS. BUS ST OBSTRUCTIONS AND HAZARDS S HAZARDS NEAR OR ADJACENT	OPS AND PEL UCH AS HOLE TO WALKWAYS	DESTRIA S, DEB , BUS S	N ACCESS TO TRANSIT VEHICLES IRIS, MUD, CONSTRUCTION EQUIPME STOPS AND ACCESS TO TRANSIT	SHOULD BE MAINTAINED FREE OF NT, STORED MATERIALS, ETC. A YEHICLES SHOULD BE CLEARLY DE	ANY NY LINEATED.				PCMS
	28.	WHERE SAFE PEDESTRIAN ACCE ROUTES BY APPROPRIATE TRAF MAINTAINED (SPECIAL ATTENTIO SIGNING, AND CHANNELIZATION L THE MUTCD SECTIONS ON WORK	SS/WALKWAYS FFIC CONTROL IN IS DIRECTE DEVICES. SU CZONE TRAF	CANNO DEVICE D TO ICH CON FIC CON	T BE PROVIDED, PEDESTRIANS S ES. PEDESTRIAN, BICYCLE, AND THE EXISTING BUS STOP LOCATIO TROL DEVICES SHALL BE INSTALL ITROL FOR PEDESTRIANS AND CH	HOULD BE DIRECTED TO ALTERNA WHEELCHAIR TRAFFIC SHALL BE G V ACCESSJ USING APPROVED WARNI ED AND MAINTAINED IN ACCORDANC WFTER 6D, PEDESTRIAN AND WORK	TIVE SUIDED AND ING LIGHTS. SE WITH SER SAFETY	<i>.</i>	ADVANCI	CONSTRUCTION	I NOTICE:
	29.	THE EXISTING BUS STOPS WITHIN RELOCATION OF EXISTING SIGNS IN ITEM 102-1 MAINTENANCE OF	I THE PROJEC SHALL BE CO TRAFFIC. TH	CT LIMI IORDINAT IE CONT	TS SHALL BE MAINTAINED DURING TED WITH THE APPROPRIATE LOC RACTOR SHALL CONTACT BEFORE	CONSTRUCTION. ANY ADJUSTMENT AL TRANSIT AUTHORITY. COST TO CONSTRUCTION:	s or Be Includi	ED	THE CON MESSAGE CVMS SH	ITRACTOR SHALL I SIGN AT LOCATIO ALL BE AS INDICA	FURNISH ANL ON SHOWN OI ATED ON TH
		INDIAN RIVE COUNTY PLA 1840 25TH ATTENTION: (772) 567-80	R TRANSIT WNING OFFICE STREET. VER PHILL MANSO 000 EXT. 145	RO BEAC ON 55	CH, FL 32960				ENGINEEI ANY WOR TRAFFIC BEGINS J	R.THE CVMS SHAL K ITEMS AFFECTI . CVMS INSTALLAT AND DURING CONST	L BÉ IN PL NG THE EXI TION, OPERAT
		TO COORDINATE COLLECTION OF T	HE REMOVED	BUS S	TOP SIGNS, BENCHES AND ACCES	TO THE BUS STOPS DURING CON	STRUCTION.		PORTABL	E CHANGEABLE-V	ARIABLE MES
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LACED ON SR-5:



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CONSTRUCTION PHASING

PHASE I (A) & (B)

- I. SHIFT ALL LANES AS REQUIRED BY WORK ZONES (OUTSIDE LANE CLOSURE CAN BE PERFORMED ON ONE SIDE AT A TIME DURING PERMITTED LANE CLOSURES), IN ACCORDANCE WITH FDOT STANDARD INDEX NO. 600, AND 611-613.
- 2. INSTALL MAST ARM FOUNDATIONS.
- 3. CONSTRUCT CURB RETURNS.
- 4. INSTALL SIDEWALKS AND INSTALL CURB CUT RAMPS. REPLACE CURB & GUTTER AND DRIVEWAY TURNOUTS, AS REQUIRED.
- 5. INSTALL TRAFFIC SIGNAL MAST ARM AND PEDESTRIAN POLE FOUNDATIONS.

PHASE II

- I. CLOSE THE INSIDE LANES TO THROUGH TRAFFIC, DURING PERMITTED LANE CLOSURES, IN ACCORDANCE WITH FDOT STANDARD INDEX NO. 600, 611-613, AND 615-617.
- 2. INSTALL TEMPORARY SIGNING AND PAVEMENT MARKINGS. ADJUST SIGNAL HEADS AS NEEDED TO MAINTAIN LEFT TURN MOVEMENTS.
- 3. REMOVE EXISTING MEDIAN CURB & GUTTER, AS REQUIRED.
- 4. PERFORM INSTALLATION OF NEW MEDIAN CURB/CURB & GUTTER AND PAVEMENT WIDENING EXCLUDING FRICTION COURSE.
- 5. INSTALL CANTILEVER TRUSS FOUNDATION.
- 6. PERFORM LANDSCAPING ACTIVITIES.

PHASE III

- I. PERFORM MILLING AND RESURFACING CONSTRUCTION ACTIVITIES. MAINTAIN TRAFFIC IN ACCORDANCE WITH INDEX NO. 613, 615, AND 628.
- 2. PLACE PAVEMENT MARKINGS IN FINAL LOCATION. MAINTAIN TRAFFIC IN ACCORDANCE WITH INDEX NO. 619
- 3. INSTALL TRAFFIC SIGNAL MAST ARMS. PEDESTRIAN POLES. AND CANTILEVER TRUSS.
- 4. PERFORM LANDSCAPING ACTIVITIES.







		RI	EVISIONS			DDCI	Michael Priory, P.E.		STATE OF FLO	RIDA
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		P.E. No.: 60614 3230 W. Commerciai Bivd.	DEF	PARTMENT OF TRAN	VSPORTATION
						Cartificate of	Suite 100	ROAD NO.	COUNTY	FINANCIAL PROJECT ID
						Authorization No. 24 Post Buckley Schuh &	(954) 733-7233 Jerniaan, Inc., d/b/a/ PBS&J	5	INDIAN RIVER	415291-1-52-01



5/28/2008



SPECIFIC PURPOSE SURVEY

205/9

					3427 NW 55TH STREET FORT LAUDERDALE FL, 333 CERTIFICATE OF AUTHORIZ	309 ZATION G75525	road no. 5	COUNTY INDIAN RIVER	FINANCIAL PROJECT ID 415291-1-52-01	PR
DATE BY	DESCRIPTION	REVISIONS DATE	BY	DESCRIPTION	MARK R. SOWERS, PLS SURVEYOR LICENSE NUMBER	R 5266	DEP	STATE OF FLO ARTMENT OF TRAI	IRIDA NSPORTATION	
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BM8	N/A	N/A	N/A	27°39′03.8758	80°24102,6254	382+25.9	44.0	12.93	SET FDOT BRASS	DISK S
BM7	N/A	N/A		27°38′52.5383	80°23'59,2196	385.25 0	84.9	13.82	SET FOOT BRASS	DISK S
BM6	N / A			27°38'41.5483	80°23′56.4615	373-41-4	59.6	13.30	SET FDOT BRASS	DISK S
BM5	N/A	N/A		27°38'30.9958	80*23151.8069	361+00 4	128.1	12.67	SET FOOT BRASS	DISK S
BM4	N / A			27°38′23.3693	80°23'45.9457	350.55 5	46.0	11.75	SET FDOT BRASS	S DISK S
BM3	N/A	N/A	N/A	21°38'22.1182	80*23137.1962	330+51.8	-72.5	9.86	SET FDOT BRASS	> DISK S
BM2	N ZA	N/A	N / A	27°38′23.6183	80°23'25.9739	320+47.0	51.6	8.11	SET FDOT BRASS	DISK S
ВМІ	N/A	N / A	N/A	27°38′16.3917	80°23′19.4665	N/A	N / A	7.25	SET FDOT BRASS	5 DISK S
A16	850800.925	1202200.961	0.9999846	27°38′23.0198	80°23′55.7951	344+00.46	-462.15	14.02	SET NAIL AND E	JISK ST
A15	849998.827	1206833.55	0.99998424	27°39′08.9306	80°24'04.4638	390+60.52	-2.24	13.85	SET NAIL AND E	JISK ST
AI 4	850105.534	1206502.268	0.99998429	27°39′05.6451	80°24′03.2950	387+13.59	25.52	13.76	SET NAIL AND E	JISK ST
A13	850364.621	1205414.958	0.99998441	27°38′54.8660	80°24′00.4727	375+95.84	27.93	10,65	SET NAIL AND E	JISK ST
A12	850439.279	1205100.74	0.99998444	27°38′51.7510	80°23′59.6595	372+72.87	28.42	11.32	SET NAIL AND D	JISK ST
ALI	850628.435	1204338.248	0.99998452	27°38′44.1916	80°23′57.5974	364+86.83	37.13	13.23	SET 5/8" FDOT I	RON ROE
ALO	850664-904	1203953.755	0.99998454	27°38′40.3826	80°23′57.2127	361+07.36	-41.10	14.47	SET NAIL AND C	DISK ST
Α9	850886.962	1203494.382	0.99998464	27°38′35.8232	80°23′54.7685	356+01,51	25.54	12.65	SET NAIL AND E	JISK ST
A8	850880.699	1203068.381	0.99998464	27°38′31.6052	80°23'54.8612	351+99.00	-114.12	14.29	SET 5% ″IRON R	OD AND
Α7	851194.305	1202588.169	0.99998478	27°38′26.8349	80°23′51.4002	346+44.62	32.90	12.23	SET NAIL AND E	JISK ST
A6	851161.792	1202222.77	0.99998476	27°38′23.2183	80°23′51.7815	343+07.90	-112.67	14.41	SET NAIL AND E	JISK ST
A5	852010.225	1202160.783	0.99998514	27°38′22.5634	80°23'42.3513	335+21.86	-32.19	10.39	SET NAIL AND D	JISK ST
Α4	852667.065	1202227.726	0.99998544	27°38′23.1944	80°23′35.0444	328+63.77	35.92	8.89	SET 5% " FDOT I	RON ROD
A3	853314.245	1202174.869	0.99998573	27°38′22.6395	80°23'27,8514	322+19.08	-41.59	9.09	SET ⅔″FDOT I	RON ROD
A2	853844.1997	1202152.013	0.99998597	27°38′22.3872	80°23′21.9602	316+46.64	-44.43	7.60	SET 5% "FDOT I	RON ROD
AI	853983.3386	1201860.163	0.99998603	27°38′19.4905	80°23′20,4292	313+02.32	45.68	6.65	SET 5% " FDOT I	RON ROD
BLC6	850019-815	1206925.044	0.99998425	27°39′09.8356	80°24'04.2254	391+44-75	39.21	13.50	SET FOUT BRASS	> DISK S
BLC5	850155+118	1206009,486	0.99998431	27°39'00+7631	80°24 02.7705	301+44 75	-39.41	11.33	SET FOOT BRASS	DISK S
BLC4	850716.359	1204019.099	0,99998456	27°38′41.0272	80°23'56.6370	302+23-50	28.27	12.52	SET FOOT BRASS	> DISK S
BLC3	851306.007	1202159.136	0.99998483	27°38′22.5812	80°23'50-1815	342+26.06	-31.46	13.20	SET FOOT BRASS	DISK S
BLC2	853971.155	1202273.723	0.99998603	27°38′23.5862	80°23'20.5419	316+37-10	131.10	5.86	SET FDOT BRASS	S DISK S
BLCI	853891,822	1201612.896	0,99998599	27°38′17.0465	80°23'21.4603	310+53.93	-42.74	7.52	SET FDOT BRASS	S DISK S
POINT NAME	EASTING	NORTHING	FACTOR	LATTIUDE	LONGITUDE	STATION	OFFSET	ELEVATION		
	(X)	(Y)	SCALE		LONOLTUDE	BASELINE	OFFET	(Z)		

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STAMPED "5-88-06-86"	
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STAMPED "5-88-06-B8"	
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	VFRIFIED UTILITY	10CA	ATION	S				
VVH	UTILITY, SIZE AND DESCRIPTION	STATION	OFFSET (FT)	TOP OF UTILITY ELEVATION	UTILITY	GROUND FIEVATION (FT)	DEPTH (FT)	NOTE
CSHI	2" PVC UNKNOWN UTILITY	314+68.63	24.28 LT	4.60	N/S	7.//	2.5/	
ĊSH7	1/2" PVC BURIED ELECTRIC	328+73.33	49.30 RT	8.16	NW/SE	8.97	0.8/	
CSH6	EXPLORATORY DEPTH; NO UTILITY FOUND	328+78.47	52.69 RT	N/A	N/A	8.77	8.24	
CSHI3	6" PVC WATER LINE	328+80.71	51.29 RT	5.63	N/S	8.85	3.22	
CSH5	4" CI UNKNOWN UTILITY	328+85.11	52.19 RT	6.53	N/S	8.79	2.26	
CSHB	6" PVC WATER LINE	328+86.42	53.60 LT	5.85	N/S	9.16	3.31	
CSH2	EXPLORATORY DEPTH; NO UTILITY FOUND	329+41.37	51.41 RT	N/A	N/A	8.60	8.1	
CSH4	2" CI UNKNOWN UTILITY	329+43.12	57.16 RT	8.05	NW/SE	8.69	0.64	
CSH3	1/2" CI UNKNOWN UTILITY	329+44.87	55.72 RT	8.00	SW/NE	8.79	0.79	
CSH9	EXPLORATORY DEPTH; NO UTILITY FOUND	350+98.30	50.67 LT	N/A	N/A	15.36	8.27	
CSHI6	2 X 2" PVC	35/+63.85	24.20 RT	10.81	E/W	12.22	1.41	
CSHI7	18" RCP STORM SEWER	35/+66.72	24.48 RT	10.27	NW/SE	12.01	1.74	
CSHI5	8" CI WATER LINE	35/+70.37	34.67 RT	10.77	N/S	12.30	1.53	
CSHI4	8" DIP WATER LINE	35/+70.74	33.34 RT	9.02	N/S	12.21	3.19	
CSHI2	2" PVC STREET LIGHT	379+92.38	35.99 LT	9.04	N/S	11.90	2.86	
CSHII	2" PVC STREET LIGHT	380+52.80	34.40 LT	10.06	N/S	12.10	2.04	
CSHIO	2" PVC STREET LIGHT	38/+08.39	34.97 LT	9.38	N/S	11.96	2.58	
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REVISIONS						DDCI	Michael Priory, P.E.	STATE OF FLORIDA			
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		P.E. No.: 60614 3230 W. Commercial Blvd.	DEI	PARTMENT OF TRAI	NSPORTATION	
							Suite 100	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	1
						Certificate of Authorization No. 24 Post Buckley Schuh &	Fort Lauderdale, FL 33309 (954) 733-7233 Jernigan, Inc., d/b/a/ PBS&J	5	INDIAN RIVER	415291-1-52-01	
								7	205/9	-	7/5/200



Plan Ref. #	Stations	L	w	AREA SI	AREA SY	RUNNIN
11	316+55 to 316+70	15.00	4.80	72.0000	8.00	8
12	318+75 to 318+79	4.00	1.98	7.9200	0.88	8
13	318+96 to 319+00	4.00	1.98	7.9200	0.88	9
14	318+96 to 319+01	5.00	4.41	22.0500	, 2.45	12
15	NW corner 11th Av	8.50	7.50	63.7500	7.10	19
16	NE corner 22nd st	3.50	6.00	21.0000	2.30	21
31	SE corner 23rd st	3.00	5.00	15.0000	1.66	23
32	NE corner 23rd st	2.00	16.00	32.0000	3.55	26
33	NE corner 23rd st	7.00	5.00	35.0000	3.90	30
34	NE corner 12 Av	9.00	7.50	67.5000	7.50	38
35	NE corner 26 st	5.00	20.00	100.000	11.10	49
36	NE corner 26 st	5.00	5.00	25.0000	2.70	52
37	SE corner 28 st	5.00	10.00	50.0000	5.50	57
38	342+42 to 342+53	5.00	11.00	55.0000	6.10	63
39	320+57 to 320+63	6.00	6.24	37.4400	4.16	67
40	319+81 to 319+86	5.00	6.39	31.9500	3.55	71
46	318+60 to 318+70	6.51	10.00	65.1000	7.23	78
47	318+46 to 318+36	6.51	10.00	65.1000	7.23	85
48	390+85 to 390+95	10.00	3.96	39.6000	4.40	90
						00

Removal of existing concrete pavement, pay item 110-4

PAY ITEM TOTAL QUANITY

REVISIONS DATE BY Harry L. Belton, L.A. R.L.A. No.: 900 3230 W. Commercial Blvd. Suite 100 Fort Louderdale, FL 33309 (954) 733-7233 STATE OF FLORIDA DATE BY DEPARTMENT OF TRANSPORTATION FINANCIAL PROJECT ID ROAD NO. COUNTY Certificate of Authorization No. 24 (954) 733-7233 Post Buckley Schuh & Jernigan, Inc., d/b/a/ PBS&J 415291-1-52-01 5 INDIAN RIVER 205

6 NG TOTAL 3.00 3.88 9.76 2.21 9.31 1.61 3.27 6.82 0.72 8.22 9.32 2.02 7.52 3.62 7.78 1.33 8.56 5.79 0.19 90.19 90.19 SHEET NO. SIDEWALK EXTRA WORK ASBUILTS UTV-2 H:\Transportation\41529115201\andscp\gnntld02xt.dgt 3:19:37 P


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	 		SUMMARY OF ROADWAY PAY ITEM	; ;				****	******
	۰. ۸ آ	I ITEM		j u	NI 88010-3510				
		I 1 NUMBER	I ITEM	11	IFA NON PART				TOTAL
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		1 102- 1-	IMAINT OF TRAFFIC		1.000	7		1	1.00
		1 110- 1-	ICLEARING & GRUBBING	16	51 1.000			••••• • •••• •	
1		120- 1-	IREGULAR EXCAV	10	YI 465.000 YI 847.000	1	1	1	465.00
		200- 1- 2	ILIMEROCK BASE (8") (D-CSE)	15	ri 1112.000	<u> </u>	<u>i</u>		1112.00
		1 300- 1- 1	IBIT MATL (PRIME COAT)	IG	AI 270.000	17			167.00 270.00
		1 300- 1- 13	IBIT MATL (PLANT MIX) (ASPH CEM 20)		Al 4647.000				4647.00
	i .	1 333- 2- 9	ITYPE 111 ASPH CONC (1000 LB S	TAB) I TI	NI 55.000	· ·		1	55.00
í	· [1 339- 1-	ICONC APPRH SLABS	111 IE	AI 2.000		<u>+</u> 1	1 .	2.00
	÷	1 425- 5-	IADJ MANHOLES	16	Al 1.000	ľ.			1.00
		1 522- 1-	ICONC SIDEWALK, 4" THICK	IS	1 82.000		1	1	82.00
		1 536- 1- 1	IRIPRAP (SAND-CEMENT) (RUADWAY) IGUARDRAIL (RDWY)	1 10	FI 237.500				237.50
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CESPA18A PAGE 01 OF 01

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6/01/78 8.48.36 CESPA18D PAGE 01 OF 01

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TRAFFIC DATA

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1999 ADT : 18,801

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Design HR.T.

(Seed & Mulch)



Const. conc. swk

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Ano W.



SUMMARY OF GUARDRAIL SIDE LENGTHANCHORAGE REMARKS STATION TO STATION 62.5 Sto. 377+46.5 Sta. 378+09 Lt. Guardrail - Bridge Guardrail Bridge Sto. 317+46.5 Sta. 378+09 Rt 62.5 Sta. 379+31 Sta. 379+935 Lt. 62.5 Guardrail - Bridge Sta. 319+31 Sta. 379+81 Rt 50 Guardrail-Bridge Sta 377-555 Sta. 378-18 1+ 62.5 Remore Guardrail Sta 379-23 Sta. 379-855 Lt. 625 Remove Swordrail GRAND TOTALS 237.5 LF. Const. Guardrail 125 LF. Remove Guardrail

Stationing shown above is approximate. Exact stations to be determined by the Engineer during construction.

Connection of Guardrait to proposed bridge shall be in accordance with Index to BGR-OI Existing guardrait that is removed shall be delivered by the Contractor to: 5025-41 street (S. Gifford Rd.) Vero Beach, Florido.

SUMMANT OF LANT	
CHANNEL EXCAVATION	847 C.Y.
REGULAR EXCAVATION	465 C.Y.

PAY ITEM FOOTNOTES

ITEM NO. 104-11	Included for prevention, control, and abotement of erosion and water pollution and ore to be used at Acations as directed by the Engineer. Limits shown on plans are approximate only.
ITEM NO. 110-1	Includes the removal of approx. 175 L.F. of cone. curb and gutter and approx. 90 SY. of cone. swk.
ITEM NO. 120-1	The pay quantity for this item shall be the plan quantity.
ITEM NO. 331-2	Includes estimated 6 tans for sidestreets.
ITEM NO. 339-1	Included for pavement under guerdrail.
ITEM NO. 425-5	Included for the ocjustment of the storm sewer monhole at Sta. 380+02
ITEM NO. 530-1-1	Included for the spillway as shown an plans. This is an estimated quantity and is to be increased or decreased as directed by the Faminese
[TEM NO. 536-7 ITEM NO. 570-2	The buyers of placement on approach stabs. Included the post placement on approach stabs. Included in the cost for this item will be approximately 1.3 (bs. grass seed, 25 tans mulch moterial, 2008 tans Artilizer, and 0.13 MB water. Also includes any final dressing that may be neve
ITEM NO. 700-2	Includes 47 ca. red and calorkers and 30 ca. amber f amber (reflective parement markers).
ITEM NO. TIL 6-41	Includes 317 L.F. white and 1040 L.F. yellow.



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Var Varies

2.875 1125' to 8.5

Profile grode

-Vories 1375 # 0

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1) Mone of the existing limerock base that is removed is to be used in the construction of new linerock base. For information on Maintenance of Traffic see Bridge Plans.

- 2)
- rar miormanian an maintenance at trattic see Bridge Plans. Wew construction and widening shall be constructed with Type 5-1 asphaltic concrete surface course (2007xr Double Course), 1*r layer to be (100°%xx) and the 2** layer to be constructed along with roadway resurface (10075x) 3)



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MARINE PARTY

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County Indian River

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NOTE : ALL PAVEMENT MARKINGS TO BE THERMOPLASTIC UNLESS OTHERWISE SPECIFIED





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3	FLA.	8801

ESTIMATED BRIDGE QUANTITIES * ITEM NO. ITEM UNITS QUANTITIES 110.3 Removal of Existing Structure L.S. 1 400-2-5 Class II Concrete (Substructure) C.Y. 111 400-2-4 Closs II Concrete (Superstructure) C.Y. 178 400-5-4 Concrete Handrail (Barrier) L.F. 114 400.5.5 Concrete Hondrail (Sidewalk Barrier Type) L.F. 114 415-1-4 Reinforcing Steel (Superstructure) Lb, 45,158 415-1-5 Reinforcing Steel (Substructure) 17,225 Lb, Resetting Pre stressed Slab Units 450.7/*** L. F. 1,100 455-3-2 Pre stressed Concrete Piling Furnished (18") L.F. 1,624 455.4.2 Pre stressed Concrete Piling Driven (18"") L.F. 1,624 455-9-12 Unloaded Test Piles (Pre-stressed Conc.) (18") 140 L.F. Test Load (90 Tons) / ** 455-10-90 Eq. Test Load (110 Tons) Eq. / * * 455-10-110 455-15 Pre formed Pile Holes Eq. 22 455-17-2 Pile Splices (18") Ea. 1 460-91-2 L.F. 137 Expansion Joint Seal (Compression Elast.) 530-1-2 Rip Rap (Sand-Cement)(Bridge) C.Y. 100

INDEX OF BRIDGE SHEETS

- Summary of Quantities, Index of Drawings, General Notes and Rip-Rap details. B-1
- General Plan and Elevation. B-2
- 8-3 Bridge Design Data Sheet.
- Soils Data. Pile Layout and Finish Grade Elevations. 8.4 B-5
- 8-6 End Bents I and 5. Plan and Elevation.
- B-7 End Bents I and 5. Sections and Details.
- В-8 В-9 Interior Bents 2,3 and 4.
- Superstructure. Spans 1 thru 4. D-10 Superstructure Details.
- B-11 Concrete Hondrail Barrier. (Index 11,407) B-12 Sidewalk Barrier. (Index 11,460)
- B-13 12", 14" and 18" Prestressed Concrete Piles. (Index 3400)
- 8.14 Construction Sequence.
- *** The Prestressed Slab Units shall be furnished by the Department of Transportation and shall be picked up by the Confractor of the F. Miyers Maintenance Vard, 702 Pine Island Road (5. R. 78), Ft. Myers, Florida and transported to the job site.
 - The Contractor shall notify Mr. D.M. Heflin, Post Office Box "M"; Ft. Myers, Florida, 33902, Phone

No. (8/3) 975: 5403 two(2) weeks in advance of the intended date for picking up the Prestressed Sinb Units. The cost of picking up the Prestressed Sibb Units, transporting them to the job site, and the cost of any necessary cleaning and repairs so that the Units may be used in the proposed structure shall be included in the Contract Unit Price for "Resetting Pre stressed Slob Units"

GENERAL NOTES

GENERAL SPECIFICATIONS: Florido Department of Transportation Standard Specifications for Road and Bridge Construction (1977). & 1978 Supplement,

DESIGN SPECIFICATIONS : Designed in accordance with the 1973 edition of A.A.S.H.O.

Standard Specifications for Highway Bridges and opproved revisions. DESIGN LOADING : HS 20-44 Roadway.

GO P.S.F. Sidewalk.

MATERIAL STRESSES: All allowable stresses are in accordance with the 1973 edition of the A.A.S.H.O. Standard Specifications for all the materials shown on plans. Maximum working atresses for Concrete: Class II 1360 p.s.1. Class III 2000 p.s.1. Class I 2200 p.s.1.

REINFORCING STEEL: Grade GO, except pre-stressed concrete piles may be Grade 40. CONCRETE STRENGTH: (28 days): Cluss II 3400 p.S.I., Class II 5000 p.S.I. and Class II 5500 p.S.I. SURFACE FINISH: All surfaces shown in detail below, including top and inside face of End Bent wingwalls, shall receive a Class 5 opplied finish cooting.

ENVIRONMENT : Non-Coastal.





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3 FLA. 88010-3 PRESTRESS SLAB UNITS SCHED. SIZE LENGTH NO. REQ'D.

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TATE

1. Joint's between adjacent Precast, Prestresse Composite Bridge Deck Units may be seal with a sand-cement grout or a material a

7:0" × 91/4" 25'-0"

7'0" × 914" 30' - 0"

- by the Engineer. 2. Comber will be checked and compensated the field.
- 3. Drilling of holes for 4" P.V.C. pipe to be dor field after erection of deck units. Do not us drills.
- 4. Form Placement: When differences in comber a the individual panel units the height of the bearing on the caps shall be adjusted so that the under of the panel units form plane surfaces at the ce span without deviation of more than 1/4 inch betw panel units. When adjustments for comber diffe quire the thickness of the bearing material on i be greater than 11/2 inches the height adjustment made including alternate layers of neaprene be not less than 1/2 inch thick and the total aggre ness of felt and fiberboard material shall to 11/2 inches.
- The panel units shall be placed with the joints i panel units situated parallel to the centerline ture with a tolerance of t 1/2 inch with respect
- 5 Longitudinal Joints: Longitudinal joints sha at intervals not exceeding 21 feet on each spo precast pre-stressed panels are used. The jo be formed or when approved, they may be sawed in the cast in place concrete shall be located a above and aligned with a mating joint betwee units. Formed joints shall extend for the full the cast in place, concrete and saved joints a minimum of 114 inches deep. When more i langitudinal joint is required, the yoints sha spaced symmetrically about the & of the si Longitudinal joints shall be scaled withan a neoprene compression seal not exceeding 3/
- neoprene compression seal not exceeding 34 width. G. Placing Concrete: To insure the necessary fu between the precist pre-stressed panels and in-place concrete, at time of concrete place interface must be free of any foreign mate Immediately prior to placing the Slab con-precast pre-stressed panels shall be saturd water. The original design thickness of the dec shall be maintained as at the point of maxim camber in the slab units.

5 bars bars @ 18°o.c. 5 bars @ 18°o.c. 5 bar	Invig.) <u>ELASTOMERIC COMPRESSION SEAL NOTES</u> For temperatures other than 70°F. adjust opening.0052 in. per degree difference between 70°F. and the remperature at the time the junt is constructed. For temperatures above 70°F. diminish opening and for temperatures below 70°F. Increase opening. The Expansion Junt Scal shall be installed in accordance with the recommendations of the manufacturer. The cost of labor and materials reguired for construction of the junts in the bridge dect. shall be included in the Contract STATE ROAD 5 (U.S.I) OVE
1/4 1/4 Specing) 1/2 Premoulded Exp.Math. 2:0 1/0 2.8 at End Bents; cost to be micluded in the Contract Unit price. for Class II Concrete (Superstructure) NOTE: Asbestos Rad may or in 2:0 SECTION AT INTERIOR BENT SECTION AT END BENT Note for Class II	MAIN CANAL Intermediation Joint Seals. MAIN CANAL is contribution is contribution Intermediation Intermediation







HED ROAD STATE PROJECT 40 3 FLA. 88010-351

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		SUMMARY OF ROADWAY PAY I	TEMS			1
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	300- 1- 3	IBIT MATL (TACK COAT)	IGA	270.0001		1 270.0001
	331- 2-	TYPE S-I ASPH CONC	ITN	240.0001/		1 4647.0001
	333- 2- 9	ITYPE 111 ASPH CONC (1000	LB STABIITN	55.0001		55.0001
	339- 1-	ICONC APPRH SLARS	IN			1 7,0001
	425- 5-	ADJ MANHOLES	IEA	1.0001/		1 1.0001
	520- 1- 10	ICONC CURB & GUTTER (TYPE F)	ILF			1 130.0001
	530- 1- 1	IRIPRAP (SAND-CEMENT) (ROADWAY)	ICY	7,0001		1 7.0001
	536- 1- 1	IGUARDRAIL (RDWY)	ILF	237.5001 ~		1 237.5001
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			400-	5- 4	ICONC HANDP		(BARPIER)	O TYPEL	ILFI	114.000				114.000	
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	ι		455-	9-12	LUNL TEST P	TLFS	(PREST CONC)	(18" 50)	ILFI	140.000		and an		140.000	5 1
		1	455- 455-	10- 90	ITEST LOADS		(90 TN) (110 TN)		IEAI	1.000				1.000	01 01
		!	455-	15-	IPREFORMED	PILE HOLES	(18")	,	IFAL	22.000				22.000	
	-		460-	91- 2	IF XPANSION	JOINT SEAL	COMPRESSION FLA	<u>ST)</u>	ILFI	137.000					
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TEM NO.	ITEM	UNITS	QUANTITIES
110-3 🔺	Removal of Existing Structure	L.S.	1
400-2-5	Class IT Concrete (Substructure)	C.Y.	111
400-2-4	Closs II Concrete (Superstructure)	C.Y.	178
400-5-4	Concrete Handrall (Barrier)	L.F.	114
400-5-5	Concrete Hondrail (Sidewalk Barrier Type)	L.F.	114
415-1-4	Reinforcing Steel (Superstructure)	Lb,	45,158
415.1-5	Reinforcing Steel (Substructure)	Lb,	17,225
450-7/ * **	Resetting Pre stressed Slab Units	L.F.	1,100
455-3-2	Pre stressed Concrete Piling Furnished (18"0)	L.F.	1,624
455-4-2	Pre stressed Concrete Piling Driven (18"")	L.F.	1,624
455-9-12	Unloaded Test Piles (Pre-stressed Conc.)(18**)	L.F.	140
455-10-90	Test Load (90 Tons)	Eq.	/ **
455-10-110	Test Load (110 Tons)	Eq.	/ * *
455-15	Pre formed Pile Holes	Eq.	22
455-17-2	Pile Splices (18")	Eq.	1
460-91-2	Expansion Joint Seal (Compression Elgst.)	L.F.	/37
			(00
530-1-2	Rip Rap (Sand-Cement)(Bridge)	C.Y.	100

*Does not include Quantities for Approach Slab

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** The number of test loads may be increased or amitted as directed by the Engineer.

INDEX OF BRIDGE SHEETS

- Summary of Quantities, Index of Drawings, General Notes and Rip-Rap details. General Plan and Elevation. B-1
- B-2
- 8-3 Bridge Design Data Sheet. B.4
- Soils Data. Pile Layout and Finish Grade Elevations. 8.5
- 3-6 End Bents I and 5. Plan and Elevation. B-7 End Bents I and 5. Sections and Details.
- B-8 8-9
- 0.10
- 8-11
- End Bents I and 5. Zeciens and Ocianis. Interio Bents 2,3 and 4. Superstructure: Spans I thru 4. Superstructure Details. Concrete Handrail Darrier. (Index II,407) Sidewalt. Barrier. (Invex II,400). 12°,14° and 18° Prestressed Concrete Ries. (Index 3100) (2°,14° and 18° Prestressed Concrete Ries. (Index 3100) 8-/2 8-/3
- 8-14 Construction Sequence.

*** The Prestressed Slab Units shall be furnished by the Department of Transportation and shall be picked up by the Contractor at the Fr. Myers Maintenance Vard, 702 Pine Island Road (S.R. 78), Fr. Myers, Florida and transported to the job site. The Contractor shall notify Mr. D.M. Heflin, Post Office Dox "M", Fr. Myers, Florida, 33102, Phone No. (8)31976: 5603 Hind (Stressen advance of the intended date for picking up the Prestressed Sing Units. The cost of picting up the Prestressed Slob Units, transporting them to The job site, and the cost of any necessary cleaning and repoirs so that the Units may be used in the proposed structure shall be included in the Contract Unit Price for "Resetting Pre stressed Slob Units."

GENERAL NOTES

GENERAL SPECIFICATIONS: Florido Department of Transportation Standard Specifications for Road and Bridge Construction (1977). 81978 Supplement,

ALC: NOTE OF

DESIGN SPECIFICATIONS : Designed in accordance with the 1973 edition of A.A.S.H.O. Standard Specifications for Highway Bridges and opproved revisions. DESIGN LOADING : HS 20-44 Roadway.

GO P.S.F. Sidewalk.

MATERIAL STRESSES All allowable stresses are in accordance with the 1973 edition of the A.A.S.H.O. Standard Specifications for all the materials shown on plans.

Maximum working stresses for Concrete: Class II 1360 p.s.1. Closs III 2000 p.s.1. Class II 2200 p.s.1.

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REINFORCING STEEL: Grade GO, except pre-stressed concrete piles may be Grade 40. CONCRETE STRENGTH: (28 days): Cluss II 3400 p.s.1., Class II 5000 p.s.1. and Class II 5500 p.s.1. SURFACE FINISH: All surfaces shown in detail below, including top and inside face of End Bent wingwalls, shall receive a Class 5 opplied finish coating.

CLASS 5 APPLIED

ENVIRONMENT : Non-Coastal.







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Bridge No.

880085

Analysis Method: LRFR-LRFD

SR5 (US1) over Main Canal, Indian County

FDOT Bridge Load Rating Summary Form (Page 1 of 1)

Location Description

Concrete prestressed panels with CIP deck (4 spans, 26-31-31-26)

Rating Type	Rating Type	Gross Axle Weight (tons)	Moment/Shear	/Service	Dead Load Factor	Live Load Factor	Live Load Distrib. Factor (axles)	Rating Factor	Span No Girder No., Interior/Exterior, %Span Length	RF·Weight (tons)
Level	Vehicle	Weight	Member Type	Limit	DC	LL	LLDF	RF	Governing Location	RATING
Inventory	HL93	36	Prestressed	Strength, Moment	1.25/0.90	1.75	NA	0.944	Bending at middle of Spans 2 and 3	34.0
Operating	HL93	36	Prestressed	Strength, Moment	1.25/0.90	1.35	NA	1.224	Bending at middle of Spans 2 and 3	44.1
Permit	FL120	60	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.083	Bending at middle of Spans 2 and 3	65.0
Permit Max Span	FL120	60	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.083	Bending at middle of Spans 2 and 3	65.0
	SU2	17	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	2.706	Bending at middle of Spans 2 and 3	46.0
	SU3	33	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.514	Bending at middle of Spans 2 and 3	50.0
	SU4	35	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.393	Bending at middle of Spans 2 and 3	48.8
Legal	C3	28	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	2.133	Bending at middle of Spans 2 and 3	59.7
	C4	36.7	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.501	Bending at middle of Spans 2 and 3	55.0
	C5	40	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.492	Bending at middle of Spans 2 and 3	59.7
	ST5	40	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.737	Bending at middle of Spans 2 and 3	69.5
Emergency Vehicle	EV2	28.75	Member Type	Limit Test	NA	NA				-1
(EV)	EV3	43	Member Type	Limit Test	NA	NA				-1

Original Design Load	H20		Performed by:	Soheila Sadough		Date:	06/04/23
Rating Type, Analysis	LRFR-LRFD		Checked by:			Date:	
Distribution Method	AASHTO Formula				This item has bee signed and seale	en digitally d by	
Impact Factor	33.0%	(axle loading)			Sohoila	Cadaua	_
FL120 Gov. Span Length	31.0	(feet)			Soliella	Sauougi	
Minimum Span Length	26.0	(feet)			on the date adja of this document	cent to the seal. are not conside	Printed copies red signed and
Recommended Posting	At/Above legal loads.	Posting Not Required.	I. P.E. Seal seal		sealed and the si electronic copies	e verified on any	
Recommended SU Posting	99	(tons)					
Recommended C Posting	99	(tons)					
Recommended ST5 Posting	99	(tons)					
Owner	01 State Highway Age	ncy					
Location	Neither interstate traf reasonable access to a	ffic nor within 1 mile an interstate	Comments:				
EV Posting	No. EV posting is not FAST Act does not app	recommended. The bly					
Floor Beam Present?	No						
Segmental Bridge?	No						
Project No. & Reason	FIN No.	Update					
Plans Status	Built						

This 01-01-2022 summary follows the FDOT Bridge Load Rating Manual (BLRM), and the FDOT BMS Coding Guide. *Recommended SU Posting levels for Florida SU trucks adequately restricts AASHTO SU trucks; see BLRM Chapter 7.

TABLE OF CONTENTS

TABLE OF CONTENTS	1
SECTION 1 – EXECUTIVE SUMMARY	2
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APPENDIX A – Bridge Plans APPENDIX B – Existing Load Rating APPENDIX C – Load Rating Computations

SECTION 1 – EXECUTIVE SUMMARY

The objective of this evaluation is to load rate Bridge No. 880085, SR5 (US1), over the Main Canal located in Indian County. The bridge consists of four spans with simple precast slabs and a continuous cast-in-place deck. The structure was designed in the late 1970s using the AASHTO Standard Specifications of 1973 and built in 1980. The total length of the bridge is 114 feet, with four spans of 26-31-31-26 feet. The bridge width is 70 feet.

The load rating is performed using the LRFR methodology. The load rating evaluation is performed using spreadsheets. The analysis for live loads is performed using MIDAS Civil. The rating is based on the design drawings included in Appendix A. The design drawings do not show details related to the prestressing of the precast slab panels, and this information was gathered from the existing load ratings in 1990 and included in Appendix B. The rating is performed for the HL-93 design load at the inventory and operating rating, the Florida permit vehicle FL120, and the legal loads, SU2, SU3, SU4, C3, C4, C5, and ST5.

The results for the load rating analysis of the superstructure for the design load (HL-93) are as follows:

For the HL-93 design vehicle, the LRFR rating factor at inventory level is 0.944, with a load carrying capacity of 34.0 tons, and is controlled by bending at the middle of the interior spans 2 and 3 at the strength limit state. The operating rating is 1.224 with a load carrying capacity of 44 tons and occurs at the same location as the inventory rating. The FL-120 LRFR operating rating factor is 1.083, with a load carrying capacity of 39 tons. All ratings for the legal loads are adequate. The details of the load rating analysis are presented in Appendix C.

SECTION 2 – BRIDGE DESCRIPTION

Bridge No. 880085, SR5 (US1) over Main Canal is in Indian County and consists of four simply supported spans. The superstructure consists of flat slabs with prestressed slab units with a cast-in-place concrete toping. The structure was designed in the late 70's using the AASHTO Standard Specifications of 1973 and built in 1980. The total length of the bridge is 114 ft with four spans of 26-32-31-26 feet. The bridge width is 70 ft.



Figure 2-1: Plan View



Figure 2-2: Elevation View



Figure 2-3: Cross Section



Figure 2-3: Typical Prestresses Slab Unit

The existing bridge drawings do not show the prestressed reinforcement for the slab unit. The information used for this rating was gathered from the existing load rating.

Additional details of the bridge are included in the design drawings in Appendix A.

SECTION 3 – LOAD RATING PARAMETERS AND CRITERIA

Standards and Specifications

- AASHTO Manual for Bridge Evaluation, 3er Edition (2018).
- FDOT Structures Manual, January 2023.
- FDOT Bridge Load Rating Manual, January 2022.
- American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications – 9th Edition

Load Rating Method

• Load and Resistance Factor Rating (LRFR).

Load Rating Program Used

- Leap Bridge Concrete (prestress beams)
- In house spreadsheets (Concrete T beams)
- Midas Civil for live load analysis

Loadings

•	Dead Loads (DC):	
	Concrete, Structural:	150 pcf
	Barriers and sidewalks:	Weight evaluated within calcs

- Live Load (LL+IM): Design Loading: Permit Loading: Legal Loads:
- Material Properties Reinforcing Steel: Reinforcing Strands: Concrete: Deck: Precast panels:

HL-93 FL 120 SU2, SU3, SU4, C3, C4, C5 and ST5.

Grade 60 ½" diameter, Grade 270

3.4 ksi 5.0 ksi

Bridge Plans

The design plans are provided in Appendix A.

Summary of Load Rating

The rating is controlled by bending at the strength limit state at the middle of the interior spans 2 and 3.

Level	Vehicle	Limit	RF
8	111.02	Service	1.084
Inventory	HL93	Strength	0.944
Operating	HL93	Strength	1.224
	SU2	Strength	2.706
	SU3	Strength	1.514
	SU4	Strength	1.393
Legal	C3	Strength	2.133
	C4	Strength	1.501
	C5	Strength	1.492
	ST5	Strength	1.737
Permit	FL120	Strength	1.083

The load rating computation details are shown in Appendix C.

APPENDIX A

Bridge Plans



2	, Y	6/06/78 10.09.21				CESPA18A Page 01 of 01
	7 1.1			8801	10-3510	
		!	SUMMARY OF ROADWAY PAY ITEMS			
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	† -	NUMBER		I IFA NON PARTI		I TOTAL
		1 101- 1-	IMOBILIZATION	ILSI 1.0001	/	1 1.00
		1 102- 1-	MAINT OF TRAFFIC	1LSI 1.0001	V	1 1.00
	· .	1 110- 1-	ICLEARING & GRUBBING	ILSI 1.0001		1 1.00
		1 120- 5-	CHANNEL EXCAVATION	ICYI 847.0001		847.00
	i,	$\frac{1200-1-2}{1300-1-1}$	ILIMEROCK BASE (8") (D-CSE) IBIT MATL (PRIME COAT)	ISYI 1112.0001		
		1 300- 1- 3	IBIT MATL (TACK COAT)	IGAI 270.0001		1 1 270.00
	i i na sama	1 331- 2-	ITYPE S-I ASPH CONC	ITNI 240.0001	<u>e</u>	1 240.00
		1 333- 2- 9	INTER ASPH CONC (1000 LB S	ITNI 7.0001		55.00
	14 20	1 360- 1-	ICONC APPRH SLABS	IEAI 2.0001		1 2.00
		1 520- 1- 10	ICONC CURB & GUTTER (TYPE F)	ILFI 130.0001		1 130.00
	,	530- 1- 1	IRIPRAP (SAND-CEMENT) (ROADWAY)	ICYI 7.000	~	7.00
	· · · · · · · · · ·	T 536- 6-	IEND ANCHORAGE ASSEM TYPE II	IEAI 4.0001	1 ²	1 237.50
		1 536- 7-	ISPECIAL GUARDRAIL POST	IEAI 8.0001		1 1 8.00
		1 570- 2-	ISEED & MULCH	ISYI 62.0001		62.00
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	1 455- 10- 90	ITEST LOADS	(90 TN)	IEAI	1.000				
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	1 455- 17- 2		(18")	IEAL	1.000		1	i i	1
	1 460- 91-	FEXPANSION JOINT SEAL	(COMPRESSION FLAST)	ILFI	137.000		<u> </u>	1	1
	1 530- 1- 2	P INIPRAP (SAND-CEMENT)	(BRIDGE)	ICYI	100.000	1-2	1	1 Standard Star	3
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S	SUMMARY	Y OF	GUAF	RDRAIL	-
STATION TO	STATION	SIDE	LENGTH	ANCHORAGE	REMARKS
Sto. 377+46.5	Sta. 378+09	Lt.	62.5	1	Guardrail - Bridge
Sto. 317+ 46.5	Sta. 378+09	Rt.	62.5	1	Guardrail Bridge
Sta. 379+31	Sta. 379+93.5	Lt.	62.5	1	Guardrail - Bridge
Sta. 319+31	Sta. 379+81	Rt.	50	1	Guardrail- Bridge
Sta. 377-555	Sta. 378+18	Lt.	625		Remore Guardrail
Sta. 379-23	Sta. 379-855	Lt.	62.5		Remove Guardrail
			1		
GRAND TOTALS			237.5 LF.	4	Const. Guardrail
			195 15		Roman Cuncdonil

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88010-3510

Stationing shown above is approximate. Exact stations to be determined by the Engineer during construction.

Connection of Guardrail to proposed bridge shall be in accordance with Index Ho. BGR-OI Existing guardrail that is removed shall be delivered by the Contractor to: 5025-41st Street (S. Giffard Rd.) Vero Beach, Florida.

SUMMA	RY OF EA	ARTHWORK
CHANNEL E	XCAVATION	847 CY
REGULAR EX	CAVATION	465 C.Y.

PRY ITEM FOOTNOTES.

ITEM NO. 104-11	Included for prevention, control, and abatement of erasion and water pollution and are to be used at locations as directed by the Engineer. Limits shown on plans are approximate only.
ITEM NO. 110-1	Includes the removal of approx. 175 L.F. of cone. curb and gutter and approx. 90 SY. of cone. swk.
ITEM NO. 120-1	The pay quantity for this item shall be the plan quantity.
ITEM NO. 331-2	Includes estimated 6 tans for sidestreets.
ITEM NO. 339-1	Included for pavement under guerdrail.
ITEM NO. 425-5	Included for the odjustment of the storm sewer monhole at Sta. 380:02
ITEM NO. 530-1-1	Included for the spillway as shown an plans. This is an estimated quantity and is to be increased or decreased as directed by the Famineer
ITEM NO. 536-7 ITEM NO. 570-2	The bighter. The dual for post placement on approach stabs. Included in the cost for this item will be approximately 1.3 lbs. grass seed, 25 tans mulch material, .008 tans Artifizer, and 0.13 MB water. Also includes any final dressing that may be need
ITEM NO. TOB-2	Includes 47 ca. red and calorkers and 30 ca. amber f amber (reflective parement markers).
ITEM NO. TIL 6-41	Includes 317 L.F. white and 1080 L.F. yellow.



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NOTE: ALL PAVEMENT MARKINGS TO BE THERMOPLASTIC UNLESS OTHERWISE SPECIFIED





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ESTIMATED BRIDGE QUANTITIES *			
ITEM NO.	ITEM	UNITS	QUANTITIES
110.3 🔺	Removal of Existing Structure	L.S.	1
400-2-5	Class II Conscrete (Substructure)	C. Y.	111
400-2-4	Closs II Concrete (Superstructure)	C.Y.	178
400-5-4	Concrete Handrall (Barrier)	L.F.	114
400-5-5	Concrete Hondrail (Sidewalk Barrier Type)	L.F.	114
4/5-/-4	Reinforcing Steel (Superstructure)	L6,	45,158
415-1-5	Reinforcing Steel (Substructure)	<i>Lb</i> ,	17,225
450-7/***	Resetting Pre stressed Slab Units	L. F.	1,100
455-3-2	Pre stressed Concrete Piling Furnished (18"0)	L.F.	1,624
455-4-2	Pre stressed Concrete Piling Driven (18"")	L.F.	1,624
455-9-12	Unloaded Test Piles (Pre-stressed Conc.)(18")	L.F.	140
455-10-90	Test Load (90 Tons)	Eq.	/ **
455-10-110	Test Load (110 Tons)	Eo.	/ * *
455-15	Pre formed Pile Holes	Eq.	22
455-17-2	Pile Splices (18")	Eq.	1
460.41-2	Expansion Joint Seal (Compression Elast.)	<i>L.F.</i>	/37
530-1-2	Rip Rap (Sand-Coment)(Bridge)	C.Y.	100

Approx. 7,015 5.F. of Cast in Place Slab Bridge.

* Does not include Quantities for Approach Slab

** The number of test loads may be increased or amitted as directed by the Engineer.

INDEX OF BRIDGE SHEETS

- B-1 Summary of Quantities, Index of Drawings, General Notes and Rip-Rop details.
- 8-2 General Plan and Elevation.
- 8-3 Bridge Design Data Sheet.
- Soils Data. Pile Layout and Finish Grade Elevations. 3.4 B-5
- End Bents I and 5. Plan and Elevation. 8-6
- B-7 End Bents I and 5. Sections and Details.
- 8-8 8-9 Interior Bents 2,3 and 4.
- Superstructure. Spans I thru 4. D-10 Superstructure Details.
- B-11 Concrete Hondrail Darrier. (Index 11,407) B-12 Sidewolk Barrier (Index 11,460)
- B-13 12", 14" and 18" Prestressed Concrete Piles. (Index 3400)
- 8.14 Construction Sequence.
- *** The Prestressed Slab Units shall be furnished by the Department of Transportation and shall be picked up by the Contractor of the Fr. Nijers Maintenance Vard, 702 Pine Island Road (5. R. 78), Fr. Nijers, Florida and Transported to the Job site.

 - The Contractor shall notify Mr. D.M. Hellin, Post Office Box "M", Ft. Myers, Florida, 33902, Phone The Contractor shall notify Mr. D.M. Hellin, Post Office Box "M", Ft. Myers, Florida, 33902, Phone No. (8)3) 1915: 5403 two (2) weeks in advance of the intended date for picking up the Prestressed Slab Units. The cost of picking up the Prestressed Slab Units, transporting them to the jub site, and the cast of any necessary cleaning and repairs so that the Units, transporting them to the probased structure shall be included in the Contract Unit Price for "Resetting Pre stressed Slab Units."

GENERAL NOTES

GENERAL SPECIFICATIONS; Florido Department of Transportation Standard Specifications for Road and Bridge Construction (1977). & 1978 Supplement,

DESIGN SPECIFICATIONS : Designed in accordance with the 1973 edition of A.A.S.H.O.

Standard Specifications for Highway Bridges and opproved revisions. DESIGN LOADING : H5 20-44 Roadway.

GO P.S.F. Sidewalk.

MATERIAL STRESSES: All allowable stresses are in accordance with the 1973 edition of the A.A.S.H.O. Standard Specifications for all the materials shown on plans. Maximum working stresses for Concrete: Class II 1360 p.s.1. Class III 2000 p.s.1. Class I 2200 p.s.1.

REINFORCING STEEL: Grade GO, except pre-stressed concrete piles may be Grade 40. CONCRETE STRENGTH: (28 days): Class II 3400 p.S.I., Class II 5000 p.S.I. and Class II 5500 p.S.I. SURFACE FINISH: All surfaces shown in detail below, including top and inside face of End Bent wingwalls, shall receive a Class 5 opplied finish cooting.

CLASS 5 APPLIED

FINISH COATING

ENVIRONMENT : Non-Coastal.



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PRESTRESS SLAB UNITS SCHED. LENGTH NO. REQ'D. SIZE 7:0" × 91/4" 25'-0" 20 7'0' x 9'4" 30' - 0" 20

1. Joint's between adjacent Precast, Prestresse Composite Bridge Deck Units may be seal with a sand-cement grout or a moterial a

by the Engineer. 2. Comber will be checked and compensated the field.

3. Drilling of holes for 4" P.V.C. pipe to be dor field after erection of deck units. Do not us drills.

4. Form Placement: When differences in comber o the individual panel units the height of the bearing on the caps shall be adjusted so that the under of the panel units form plane surfaces at the ce span without deviation of more than 1/4 inch betw panel units. When adjustments for comber diffe quire the thickness of the bearing material on i be greater than 11/2 inches the height adjustment made including alternate layers of neaprene be not less than 1/2 inch thick and the total aggre ness of felt and fiber board material shall to 11/2 inches.

The panel units shall be placed with the joints i panel units situated parallel to the centerline ture with a tolerance of t 1/2 inch with respect

b) the win a biseconce of 1 / a monowin respect 5) longitudinal Journ's: Longitudinal joint's ahar at intervals not exceeding 21 feet on each spe precast pre-stressed panels are used. The yo be formed or when approved, they may be sawed in the cast in place concrete shall be located a above and aligned with a mating joint betwee units. Formed joints shall extend for the full the cast in place, concrete and saved joints a minimum of 114 inches deep. When more i langitudinal joint is required, the yoints sha spaced symmetrically about the & of the si Longitudinal joints shall be scaled withan g neoprene compression seal not exceeding 3/

neoprene compression seal (no) exceeding 34 width. .Placing Concrete: To insure the necessary fu between the precest pre-stressed panels and in-place concrete, at time of concrete place interface must be free of any foreign main france disky prior to placing the stab con-precast pre-stressed panels shall be saturd water. The original design thickness of the dec shall be maintained as at the point of maxin camber in the slab units.

SUPERSTRUCTURE DETAILS

INDIAN RIVER

Henes Dete Durigand by NCIE Nov. 77

Checkel by RPTR JAH. 78 Quantizer by NCR NOV 77

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SR-5

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APPENDIX B

Existing Load Rating



Sp 3. Raye to 5:2 ろうう Span 11= Range 1=20-11 1-1 70 - 5* 4-4 2 5-2 2.2 5-2' 3-3 5-2" 3-3 L 2 201 8' 4-4 Sp- 4 Rong = 1 - 5-2" 2-2 3 5.2 3.3 Pary 2. 20-11 1-1 CARD 11 Section [-] Range 1 20'-1' Rang 2 - 5-21 Souton 22 CARD 15 1 Void description (SECTION 1) Diameter V/A Center to bot. of beam M/A -Concrete shape description Beam depth 9.25 Top flange width _____84.0" 1.75 1608 1k Prestressing strand layout field From measurement ! SLEETION Z nen deptt. 9.25' 84" symmetry Top width 84.0 Ast 11,20 ay. 13-1.81-11.19" 9.25, 1.75 16 p 1/2 - 270/car. Card 14 : Sp. 1 Ruge 1 Section 1 C Effedime clay width = 84.0. slos width B4.0 Fillet-tichen.0 experts eilars Withens. 3.75 Slas thickness 3.75 Frilit wight. 0 dy. 1-8750' Ast. - H 9 @ 7.50" = 1.00(84) 11.20"2 7:50 ays 1.25 - 1.128 - 1.81" fy2 60,000 per SECTION 2 ! 1.75 1K 1608 "depth = 9.25" Ben 11.19 27 11.29 TOP Home- St.O ASTOP 11.20' dy- 13.0 - 1.81- 11.19"

		0		(2	BRIDGE NO	0088	-28
MEMPER		PRESTRES	SED SONOVOID	UNITS			24	4
MEMBER		(7-2-3)						
CARD 7	-							
Loss(k	ips/sq in) _		F's(kips	/sq in) _	220			
F"c(1b	s/sqin)							
Other								
CARD 8								
Effect	ive span len	leth 7	31 ^L 0"	, ¹ ,		•		
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CARD 9	(If necessa	irv)	;		•	•		
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CARD 1	.0							
Superi	mposed deadl	oads						
1	. Barrier wa	1 15						
2	. Curbs							
• 3	. Median		· •					
4	. Sidewalks					· · ·	•	
5	. Rails							
6	. Posts							
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8	. utner	Cotal medabe		4.	11.0	¥	31-00	
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CARD 11	. •	
Range 1 5'-2' Section 3-3 2 2018' 4-9 3-5 3-3		
Void description 5000000000000000000000000000000000000	NOU 3	
Center to bot. of beam	••	
Concrete shape description		
Beam depth 9.25		**
Top flange width 84.0'	. · · · ·	
Prestressing strand layout	1k 2100 2t 11.20 11	1.75 . 19
Freid measurement. 84.0"	•	
21 \$ 12 Strands (270 k		
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Section 4 been depter 9.25 115 2108 1.75		
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1	PRESTRESSED SONOVOID UNITS MEMBER ID Gri (Spin 3)	44
	CARD 7	
	Loss(kips/sq in) F's(kips/sq in) 770 km	
	F"c(lbs/sq in)	
,	Other	
	CARD 8	
	Effective span length	
	<u> </u>	
	Liveload distribution - Load fraction	
	S -	
	D =	
	Load fraction = S/D =	
	CARD 9 (If necessary)	
	CARD 10	
	Superimposed deadloads	
	1. Barrier walls	
	2. Curbs	
	3. Median	
	4. Sidewalks	
	5. Rails	
	6. Posts	
	7. Asphalt	
	8. Other	
	Total weight per ft per unit 111.0 Length 3(
	9. Concentrated loads	

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Range 1 <u>5'- 2"</u>	Section 3-3	
2 2 2 3 5'2 CARD 15	3-3	
Void description P Diameter	• 	
Center to bot. of be	eam	**
Concrete shape descriptio	n	
Beam depth		
Top fl ange wi dth		. · · · ·
Pre	estressing strand layout	
SUETION 3-3 (50	erre as spr 2)	, , .
sech 4.4 (S	erne as spr z)	• • • •
5.24 (5.4 (5. 15; Same	erne as spr 2) Spr 2.	
5.01. 4.4 (S 15; Same us	erne as spr z) Spr z.	
5 ech. 4.4 (5 15; Same	erne as sprz) Spr Z.	· · · · · · · · · · · · · · · · · · ·
Sech 4.4 (5 15; Same	erne as sprz) Spr z.	
Sech 4.4 (5 13; Same . us	erne as spr z) Spr z.	
5 ech 4.4 (5 15; Same us	erne as sprz) Spr z.	
Sech 4.4 (5 15; Same	erne as spr z) Spr z,	

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MEMBE	R ID Goe (Sp	PRESTRESS - 4)	ED SONOVOID UNITS			4_44
CARD	7					
Loss(kips/sq in)		F's(kips/sq i	.n)		
F"c(1	.bs/sqin)					
Other	•					
CARD	8				•	
Effec	tive span length	1	22-31		·	
						<u> </u>
Livel	oad distribution	n - Load fr	action	<u>.</u>	20 - Constantino de la constan	
	S =		•••	• •		
	C =					
	D =			۰.		
	D = Load fraction	n = S/D = _		· · · · · · · · · · · · · · · · · · ·	•	***********************
CARD	D = Load fraction 9 (If necessary)	a = S/D = _	:			
CARD	D = Load fraction 9 (If necessary) 10	n = S/D = _				
CARD CARD Super	D = Load fraction 9 (If necessary) 10 rimposed deadload	a = S/D = _) ds	•			
CARD CARD Super	D = Load fraction 9 (If necessary) 10 rimposed deadload 1. Barrier walls	n = S/D = _) ds				
CARD CARD Super	D = Load fraction 9 (If necessary) 10 rimposed deadload 1. Barrier walls 2. Curbs	a = S/D = _) ds s				
CARD CARD Super	D = Load fraction 9 (If necessary) <u>10</u> rimposed deadload 1. Barrier walls 2. Curbs 3. Median	a = S/D = _) ds				
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CARD CARD Super	D = Load fraction 9 (If necessary) 10 rimposed deadload 1. Barrier walls 2. Curbs 3. Median 4. Sidewalks 5. Rails	a = S/D = _) ds				· ·
CARD CARD Super	D = Load fraction 9 (If necessary) 10 rimposed deadload 1. Barrier walls 2. Curbs 3. Median 4. Sidewalks 5. Rails 6. Posts	a = S/D = _) ds s				
CARD CARD Super	D = Load fraction 9 (If necessary) 10 rimposed deadload 1. Barrier walls 2. Curbs 3. Median 4. Sidewalks 5. Rails 6. Posts 7. Asphalt	a = S/D = _) ds s				· · ·
CARD CARD Super	D = Load fraction 9 (If necessary) 10 rimposed deadload 1. Barrier walls 2. Curbs 3. Median 4. Sidewalks 5. Rails 6. Posts 7. Asphalt 8. Other	a = S/D = _) ds s				· · · · · · · · · · · · · · · · · · ·

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CARD 15			
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Diameter			
Center to bot. of bea	m	**	
Concrete shape description	ц · · ·		
Beam depth			
Top flange width			
Pres	stressing strand layout	•	
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Cord 15 same as	spel		n an Le Manager (no. 2
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c) $\frac{A}{16}$ $\frac{228.4}{10.53.6}$ $\frac{A}{11.1220}$ $\frac{2906.6}{2326.7}$ $\frac{306.59}{201.97}$ $\frac{A}{4.725}$ $\frac{C}{341.6}$ $\frac{C}{626.8}$
c) $\frac{147}{10.53.6}$ $\frac{111.1220}{10.53.6}$ $\frac{2906.6}{10.53.6}$ $\frac{306.59}{20.97}$ $\frac{A}{4.725}$ $\frac{C}{341.6}$ $\frac{C}{646.8}$ $\frac{147}{10.57}$ $\frac{45.9}{10.53.6}$ $\frac{147}{10.53.6}$ $\frac{147}{10.56}$ $\frac{147}{10.56}$ $\frac{147}{10.56}$ $\frac{147}{10.56}$ $\frac{16}{10.50}$ $\frac{16}{10.50$

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23 D/P STR. I.D.-- 880-085 and the state of the - 38 - 33 42 - 85 41 - 67 0 MICROFILM REEL NUMBERS DESIGN PLANS COMPUTATIONS CORRESPONDENCE 0 TRUCK TYPE VEH. SU4 MEMBER ID. Gí SPAN - 2 CRITICAL-C.P. DIST. -- 45.5 FEET MOMENT MEMBER CAPACITY -DL EFFECT CAPACITY FOR (LL+I) 190.1 ACTUAL (LL+I) --- 159.6 POSTING GROSS TONNAGE 41.7 Ο



21 D/P STR. ID-- 880-085 MICROFILM REEL NUMBERS-DESIGN PLANS COMPUTATIONS CORRESPONDENCE OPERATING RATING SUMMARY MEMBER I.D. Gí 2 CRITICAL C.P. DIST. 15.5 FE LIVE LOAD DESIGNATION HS20 15.5 FEET 42 MOMENT (FOOT-KIPS) 465.5 MEMBER CAPACITY 46 DL EFFECT 141.2 CAPACITY FOR (LL+I) ACTUAL (LL+I) 190.1 50 118.5 OPERATING RATING HS 32.07 54 57 58 59



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				T 131 1	6W	····· []	IVE LO	DAD '							
	LIVE LOOD		REDIS	LIAIME		LOC.NO.	DIR	LL+IMP	LAN L	E MOMENT	- LOC. CONC	F.	IXED	9	HEAR
	1999 946 6 6 F.F	F	FT-KIPS F	T-KIPS !	FT-KIPS	T WHEEL FT.		FT-KIPS	FT-KIPS	LOAD #1 ET.	LOAD #2 FT.	+V KIPS	-V KIPS	LEFT KIPS	RIGHT
<u>TNV.</u>	<u>HS20 +</u>	BEND BEND	0.00	$-\frac{115.6}{35.0}$	88.9	<u></u>	<u></u>		72.6	<u> 10.100 </u>	<u> </u>	0.00	0.00		<u> </u>
INV.	2 +	BEND BEND	0.00		0.0	0.000	R	0.0	0.0	37.650	0.000	0.00	0.00	0.00	0.00
<u> </u>	<u> </u>	<u>BEND</u> BEN))	<u> 0.00 </u> 0.00	<u> </u>	<u> </u>	<u> </u>		<u> </u>	<u> </u>	<u> </u>	0.000	0.00	0.00		0.00
LNV	4 +]	BEND BEND	0.00 0.00		0.0			ŏ.ŏ	0.0	0.000	0.000	0.00	0.00	0.00	0.00
T N132		<u>BEND</u>	0.00	0.0	<u> </u>	0.000		<u>Ö.Ö</u>	<u> </u>	<u> </u>	0.000	0.00	0.00	0.00	0.00
TUAN *	0 +) _:	BEND	0.00	0.0	0.0	0.000		0.0 0.0	0.0 0.0	0.000	0.000	0.00	0.00	0.00	0.00
OPER	HS20 +1	BEND	0.00	115.6	88.9	38.100	R	94.4	72.6	10,100	0.000	0.00		11 47	4.4 A"7
OPER	2, ST5 +1	BEND	0.00	103.3	26.9 79.5	59.451 41.100	R	-23.1	-17.8 0.0	37.650	0.000	0.00	0.00 0.00		
POST	1 SH2 +1	REND									<u>0.300</u> -	<u>0.00</u>	ö. öö	(*	
		BEND	0.00	20.9	16.1	47.550	R			,		0.00	0.00 0.00	8.27	8.27
	· · · · · · · · · · · · · · · · · · ·	BEND	0.00	19.1	14.7	30.751						0.00	0.00	9,23	
POST	2 SU3 +H	BEND	0.00	141.2	108.6	21.105	R					0.00	0.00	13.06	13.06
POST	5 C4 +H	BEND BEND	0.00	131.9	101.5	-21.736	P A					0.00	0.00	-13.50	-13.50
	- 3 604 + 1	BEND -			<u> </u>		R					0.00	0.00	2 M	
POST	- د د 5 + E	BEND	0.00 0.00	43.0 131.9	33.1 101.5	48.950	R					0.00	0.00		13,14
COCC	·]	BEND	0.00	28.9	22.3	67,450						ŏ.ŏŏ	0.00	-13.47	-1 <i>0.447</i>
SPEC	71 	BEND	0.00	0.0	0.0	0.000						0.00	0.00	0.00	0.00
SPEC		SEND SEND	$-\frac{0.00}{0.00}$		<u> </u>	0.000						0.00 	ŏ.ŏŏ	0.00	0.00
SPEC		SEND REND	0.00	0.0		0.000	RL					0.00 0.00	ŏ.ŏŏ	0.00	0.00
	È	BEND	<u> </u>	<u>0.0</u>	<u> </u>	0.000	r(,		0.00	0.00	0.00	0.00

DATE 7/ 3/90

5	<u> </u>	RATIN	FACTOR	XXXXXX						, ,		·
3				RATING MO	FACTOR F	OR		RATING F	ACTOR FO	IR	RATING	FACT
			+BEND	OF BEND	BEEND	OTT BEND	+BEND	OP 	HALLIY 4REND	OTT	LEFT	HEAR RI
	INV.	HS20	1.498	1.578	1.498	1.578	0.000	0.000	0.000	0 000		~~~~~
	<u> </u>	2	0.000	0.000	0.000	0.000	0.000	0.000			0.000	0.
	INV.	3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	<u> </u>	4	0.000	0.000	0.000	<u> 0.000 </u>	0.000	0.000-	0.000		0.000	10 a 1 A
	INV.	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.
	INV.	6	0.000	-0.000	0.000	0.000	0.000	-0,000	-0.000	<u> </u>	0.000	0.0
	OPER	HS20	2.496	2.630	1.766	2.630	0.000	0.000	0.000	0.000	0.000	
	OPER_	<u>2 sts</u>	2.793	4.262	1.976	4.262	0.000		<u> 0.000 </u>	<u> </u>	0.000	0.0
	FOST	1 SU2	3.451	4.408	2.442	4.408	0.000	0.000	0.000	0.000	0 000	0 × 1
	POST	<u>4 C3</u>		4.814	2.254	4.814	0.000-	0.000	<u> </u>		0.000	0.0
	POST :	2 SU3	2.042	2.331	1.445	2.331	0.000	0.000	0.000	0.000	0.000	~ ~ ~ ~
	<u>POST</u>	5 <u> </u>		3.309		-3.309	0.000	-0.000-	-0.000	<u> </u>	0.000	0.t
	POST 3	3 SU4	1.860	2.140	1.316	2.140	0.000	0.000	0.000	0.000 0.000	0 000	
		6 <u>C5</u>	2.187	-3,179-				<u></u>	<u> </u>		0.000	(V x C
	SPEC		0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.900	0.000	\v}.(
	<u> </u>	2	0.000	0.000	0.000	-0.000		-0.000	0.000	-0.000	0.000	0.0
	SPEC 3	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	<u> </u>	
	<u>SPEC 4</u>	3	0.000	0,000	0.000	0.000	0.000	<u> </u>		0.000	0.000	0.0
	SPEC 5	ş	0.000	0.000	0.000	0.000	0.000	0 000	0 000			
								01000	V. 000	Ø.000	0.000	0.0



2	DATE	7/ 3/90	•		Cí	MPOSITE	PRESTRE	OAD DAT	AT MOME	NT CHECK PO					
									CALLE FL	EXURAL MEMB	ER - LOAI) FACTOR	RATING		
67	<u></u>	LOAD CA	LCULATT	ANG (TM	1. A. 65 million and a second							MEM)	BER I.D.	$\frac{1 \cdot D}{2} = 8$	80-085 1 -50
8					ALL FACT	<u>0R = 0.3</u>	<u>)0 FOR</u>	+BEND AN	<u>D = 0 300</u>	FOR BEND)			F'r	10E 1
• 10	LOAD		REDIS LL+I	T +IME	UCK MOME	NT	LVE LO	AD	L <i>f</i>	NE MOMENT					
● 12 12	TNV. HS2	O + REND	FT-KIPS	FT-KIPS	FT-KIFS	1 WHEEL FT,		FT-KIPS	ET-KIPC	LOC CONC LOAD #1	LOAD #2	с	IXED	·····	SHEAR
	INV. 2	-BEND +BEND	0.00	$-\frac{113.9}{43.7}$	<u>87.6</u> 33.6	<u>-15.375</u> 59.451	R	- 94.2			FT.	KIPS	KIPS	LEFT KIPS	RIGE
	<u>INV. 3</u>	<u>+BEND</u> -BEND	0.00	0.0 0.0		0.000		0.0	-22.2	37.650 0.000	0.000	0.00	8.00	-14,11_	
18	INV. 5	+BEND -BEND	0.00 0.00	0.0		0.000		<u> </u>	<u> </u>	0,000 0,000	0.000	0.00		0.00	0.00
19 20	INV. 6	-BEND +BEND	<u> 0.00</u> 9.00 9.00	0.0	<u>0.0</u>	0.000 <u>0.000</u> 0.000		<u>ŏ`.ŏ</u>	0.0	0.000	0.000	0.00 0.00 0.00	0.00	0.00	0.00
● 21 22	OPER HS20	-BEND	0.00	0.0		0.000 0.000		0.0	0.0	0.000	0.000	0.00	0.00 	-0.00	
23 24	OPER 2 ST5	-BEND	0.00	113.9	87.6 33.6	-15.375	Ļ	- 94.2	72.5	0.000	0.000	0.00	0.00	0.00	0.00
25 26	POST 1 SU2	BEND +BEND	<u> </u>		77.3	43.626	IX.	-28.9	-22.2	37.650	0.000	0.00	0.00	14.11	14.11
27 28	POST 4 C3	BEND	0.00	78.3	60.2 20.1	-0.375 47.550	L R	v		0.000		0.00	0.00	-13.04	-13.64
29 30	POST 2 SU3	-BEND	0.00	23.9	18.4	- <u>22.624</u> 30.751						0.00	0.00	9.02	9.02
31	POST 5 C4	-BEND +BEND	0.00	135.9 -49.3 128.7	104.6	23.627	R R					0.00	0.00	-11,13	
33	POST 3 SU4	+BEND	0.00 0 00	34.8	26.7	-23.375 70.549						0.00 	0.00	15.14	15.14
35 36	POST 6 C5	-BEND +BEND	0.00	53.7	41.3	48.950	R R					0.00	0.00 -	17.10	-17.10
37	SPEC	+BEND	0.00	36.2	27.8	67.450	A					0.00 0.00 0.00	<u> </u>	15,57	-15,57
39	· SPEC 2	-BEND +BEND -BEND	0.00	0.0	0.0 0.0 0.0	0.000						0.00	0.00	17.28	-17.28
41	SPEC 3 4	BEND BEND	0.00	<u> </u>	<u> </u>	0.000 0.000 0.000	R					0.00	0.00	0.00	0.00
43	SPEC 5 +	BEND BEND	0.00	0.0 		0.000	Î. R					0.00	0.00 0.00	0.00	0.00
44	••••	BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00

	DATE 77 :	\$790 \$									DZP STR MEMBER C.P. LO	UCTŬ I.D. JĈATI
	NNNN RATIN	FACTOR ***** - RATING FACTOR FOR MOMENT TOP BOTI +REND -BEND +BEND -REND			RATING FACTOR FOR SERVICEABILITY TOP BOTT +BEND -BEND +BEND -BEND				RATING FACTOR FOR SHEAR LEFT RIGHT			
	INV. HS20	1.503	1.305	1.503	1.305	0.000	0.000	0.000	0.000	0.000	0.000	
	INV. 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	INV. 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	INV. 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	INV. 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	INV. 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	OPER HS20	2.505	2.175	1.740	2.175	0.000	0.000	0.000	0.000	0.000	0.000	
	OPER 2 ST5	2.838	3.392	1.971	3.392	0.000	0.000	0.000	0.000	0.000	0.000	
	POST 1 SU2	3.644	3.646	2.531	3.646	0.000	0.000	0.000	0.000	0.000	0.000	
2	POST 4 C3	3.368	3.981	2,340	3.981	0.000	0.000	0.000	0.000	0.000	0.000	
	POST 2 SU3	2.099	1.927	1.458	1.927	0.000	0.000	0.000	0.000	0.000	0.000	
	POST 5 C4	2.216	2.737	1.539	2.737	0.000	0.000	0.000	0.000	0.000	0.000	
	POST 3 SU4	1.909	1.770	1.326	1.770	0.000	0.000	0.000	0.000	0.000	0.000	
	POST 6 C5	2.216	2.629	1.539	2.629	0.000	0.000	0.000	0.000	0.000	0.000	
	SPEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	SPEC 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	SPEC 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	SPEC 4	0.000	0.000	0.000	0,000	0.000	0,000	0,000	0.000	0,000	0.000	

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DA	TE 7/3	.790			COMI	OSITE PR	ÊSTRÎ	ESSED CONC	RETE FLEX	URAL MEMBEI	R - LOAD	FACTOR P	ATING IRUCTURE	I.D. = 88	0-085
												<u></u>	OCATION-		90 GE 1
<u><u> </u></u>		<u></u>	REDIS_	INS (IMEA)	CT FACTUR	<u> </u>	FOR VE L	-+BEND AND OAD	LAN	FOR BEND)		FI)	XED	S'	HEAR
** 5 4 1 4	LOAD		FT-KIFS	FT-KIPS	FT-KIPS	1 WHEEL FT.		FT-KIPS	FT-KIPS	LOAD #1 FT.	LOAD #2 FT.	+V KIPS	-V KIPS	LEFT KIPS	RIGH KIPS
INV.		BEND BEND BEND BEND BEND	0.00 0.00 0.00 0.00 0.00	107.2 0.0 0.0	17.9 82.5 0.0 0.0	90.451 45.675 0.000 0.000	R	15.1 -104.2 0.0 0.0	$-\frac{11.6}{-80.1}$ 0.0 0.0	<u>68,650</u> 37,650 0,000 0,000		0.00	0.00		34.91 0.00
INV.	4 +) 	BEND BEND BEND BEND	0.00 0.00 0.00 0.00 0.00			0.000 0.000 0.000 0.000			0.0	0.000	0.000	0.00	0.00 0.00 0.00 0.00	0.00	0.00
INV. (-) \$ +? -	BEND BEND BEND	0.00 0.00 0.00	0.0 0.0 0.0		01000 01000 01000		0.0 0.0 0.0	010 010 010	0.000 0.000 0.000	0.000 0.000 0.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00	0.00
OPER OPER :	HS20 +1 2 ST5 +	BEND BEND BEND BEND	0.00 0.00 0.00 0.00	23.3 107.2 5.1 90.7	17.9 82.5 3.9	90.451 45.675 138.751 24.574	R R	15.1 -104.2 0.0	11.6 -80.1 0.0	68.650 37.650 0.000	0.000 15.150 0.000	0.00	0.00	34.91 -29.22	34.91 28.33
POST 1	(SU2 +) 4 C3 +	BEND BEND BEND	0.00	13.9 52.2 12.8	10.7	78.550 47.550	R R	• • • •				0.00	0.00	20.12	20.12
POST :	2 SU3 +) 5 C4 +	BEND BEND BEND REND		91.9 26.3 	20.2 76.2	44.550 77.947 	R					0.00	0.00	36.60	36.60
	-) 3_6U4_+	BEND BEND BEND	0.00 	120.0	92.3 	79.950 49.950	<u>R</u>			•		0.00 0.00 <u>0.00</u>	0.00	-27.70 38.43	30.38
POST &	> C5 +F	BEND	0.00	19.5	15.0 98.1	100.483	IX		****		·	0.00	0.00	-30.37	32.20
SPEC :	+ 1 7 7 +1	BEND BEND BEND BEND	0.00 0.00 0.00 0.00	0.0 0.0 0.0		0.000 0.000 0.000 0.000	R					0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00	0.00
SPEC 2	5 + F 7	SEND BEND	0.00 0.00	0.0	ŏ.ŏ	ŏ.ŏŏŏ o.ooo	R				·	0.00	0.00	0.00	0.00

• •													
5													
> /	<u>****</u>	<u>× R</u> i	ATING FAC	CTOR **	KXXX Ating f	ACTOR FO	Q	R	ATING FA	CTOR FOR		RATING	FACT
3				TOP	40M	IENT BO'	TT	то	SERVICEA P	BILITY BO	T1	SH LEFT	IEAR RI
	T 5357				EEND	+BEND	<u>BEND</u>	+BEND	-BEND	+BEND	BEND		
		573. 	≎	.207 .	2.416	32.207	2.416	0.000	0.000	0.000	0.000	0.000	0.
	<u> </u>	 	Ŭ.	000 0	9.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	187.	.5	0.	000 (0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	ø.
	INV.	_4	<u>.</u>	000 (0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Q.,
	INV.	5	Θ.	000 (9.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Θ.
	INV.	<u>6</u>	<u> </u>	000 (9.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.
	OPER	н	320 20.	345 4	4.027	18.846	4.027	0.000	0.000	0.000	0.000	0.000	ø.
	OPER	2 (<u>15 93.</u>	144 4	9.763	86.279	4.763	0.000	-0.000	0.000	0.000	0.000	
	POST	1 St	J2 34.	135 8	3.275	31.619	8.275	0.000	0.000	0.000	0.000	0.000	ο.
2	POST	4	<u>C3 37.</u>	136 4	1.697	34.399	4.697	0.000	0.000	0.000	0.000	0.000	
	POST	2 91	J3 18.	044	4.369	16.714	4.369	0.000	0.000	0.000	0.000	0.000	0.
	POST		C4 25.	353 2	3.597	23.484	3.597	0.000	-0.000	0.000	-0.000	0.000	
	POST	3 SI	JA 16.	567 4	4.017	15.346	4.017	0.000	0.000	0.000	0.000	0.000	0.
	POST	<u>6</u>	<u>C5 24.</u>	372 2	3.387	22.576	3.387	0.000	0.000	0,000	0.000	0.000	
	SPEC		0.	000 (9.000	0.000	0.000	0.000	0.000	0.000	0,000	0.000	. 0
0.0000	SPEC	2		000 0		0,000	0.000	0.000	0.000	0.000	<u></u>	_A_AAA	5 5 7
	SPEC	3	Θ.	000 (9.000	0.000	 	0 000	0 000	0 000	0 000	0 000	 0
	SPEC	Δ	Α.	AAA 6		0 000	0.000	~ ~~~	0 . 0 0 0	0 000	0.000	0.000	0.
	CPE C	E.	<u>.</u>	000 /	x 000	<u> </u>	0.000	<u></u>	<u> </u>		<u></u>	0.000	÷,
	54 LU		V.	VVV (9.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Θ.



	DA	TE 77	3/90			COM	POSITE PI	RESTRI	ESSED CON	RETE FLEX	URAL MEMBÉ	R'- LOAD	FACTOR D/F	RATING STRUCTURE	I.D. = 88	0-085
														LOCATION -		1 50
长长	<u> </u>	LIVE	LOAD C	ALCULATIO	INS (IMPA	CT FACTOR	- L = 0.300		+REND ANT		FODDENDS				PA	GE 1
					715.11		L:	IVE L.(JAD (AC	V 8 77 4 5	·					h
		LIVE		REDIŞ			LOC.NO.	DIR	LL+IMP	LAN	E MOMENT	LOC CONC	F SI	IXED	S	HEAR
		L. (J1977		FT-KIPS	FT-KIPS	-T-KIPS	1 WHEEL FT.		FT-KIPS	FT-KIPS	LOAD \$1 FT.	LOAD #2 FT.	KIPS	-V KIPS	LEFT KIPS	RIGH KIPS
<u> </u>	۷.	<u> HS20</u>	+ REND	0.00	118.5		12.750	<u> </u>		<u>76 5</u>	40,750	0.000	-0.00	0,00	42.22	12,22
ΪŅ	V. 2	2	+BEND	0.00	0.0	23.6	0.000	ĸ	-26.1	-20.1	68.650 0.000	0.000 0.000	0.00	0.00	0.00	0.00
<u> </u>	V. 3	٤	+BEND	0.00	<u>0_0</u>	<u>0.0</u>	0.000		0.0	0.0	0.000	0.000	0.00	0.00	<u>a</u> aa	0 00
IN	V. 4	ł	+BEND	0.00	0.0	0.0	0.000		0.0 0.0		0.000	0.000 0.000	0.00	0.00	0.00	Α ΑΔ
<u> </u>	V. "	:	-BEND	0.00	0.0	<u> 0.0</u>	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0 00	0 00
IN	V. 6	,	+BEND	0.00	0.0		0.000		0.0	0.0	0.000	0.000	0.00	0.00	0 00	
			-BEND	0.00	0.0	0.0	0.000		ô.ô	Ö.Ö	ŏĩŏŏŏ	ŏ1ŏŏŏ	ŏ.ŏŏ	ŏ:ŏŏ	0.00	0.00
0P1	ER	HS20	+BEND -BEND	0.00	118.5 30.7	91.2 23.7	12.750	R	98.1	75.5	40.750	0.000	0.00	0.00	12.22	12.22
0P1	ER 2	ST5	+BEND -BEND	0.00	107.8	82.9	71.748	, 、	0.0	0.0	0.000	0.000	0.00	0.00	10.47	10.47
PO	ST 1	SU2	*BEND	0.00	84.3	44 9	57 750	n	V + V	Q.,Q		Ux & UU				
P0:	3T 4	<u> </u>	-BEND	0.00	18.3	14.1	78.550	Ŕ					0.00	0.00	8.12	8.12
			-BEND	0.00	16.8	13.0	61.751		· i			<u>.</u>	0.00	0.00 0.00		
PO:	BT 2	su3	+BEND	0.00	147.1	113.1	51.752	R	•				0.00	0.00	12.99	12.99
F'0:	3T 3	C 4	+BEND	0.00	116.9	89.9	8.914	K					0.00	0.00	-14.52	-14.52
eror		CIIA	- DEND	U.UU A AA	23.2	17.4	-19,210						0.00	0.00		
			-BEND	0.00	37.8	29.0	-54.084 79.950	R R					0.00	0.00	13,1 7	13,17
r U;)) () -	6.0	+BEND -BEND	0.00	$117.3 \\ 25.7$	90.3 19.7	8.916 100.483						0.00	ŏ.ŏŏ	-14.45	-14.45
SPI	:: ::		+BEND	0.00	0.0	0.0	0.000						0.00	0.00		0 00
SPE	IC 2		-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0 00	V * VV ∧ ∧∧
SPE	EC 3		-BEND +BEND	0.00	0.0	<u> </u>	0,000	R					0.00	<u> </u>	0.00	0.00
SPI	EC 4		-BEND +BEND	0.00	0.0	0.0	0.000	L p					0.00	0.00	0.00	0.00
Ch Ch ch			EEND	<u> </u>	ŏ.ŏ	<u>ă ă</u>	ŏ_`ŏŏŏŏ_	I					0.00	<u>0.00</u>	0.00	0.00

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COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD

FACTOR RATING

NAMEN RATING FACTOR MANNE -- RATING FACTOR FOR --SERVICEABILITY MOMENT SHEAR RIGHT -- RATING FACTOR FOR ---ABEND TOP ABEND AREND + REND INV. 2 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 INV. A 0.000 INV. 6 0.000 0.000 0.000 0.000 0.000 0.000 0.000 4.592 OPER 2 STS 1.763 11.679 0.000 3.847 20GT 4 CZ 3,974 8.384 2.2.2.9 0.304 0.000 0.000 0.000 POST 2 SU3 0.000 0.000 0.000 4.072 4.072 POST 5 C4 0.000 0.000 POST 3 SU4 0,000 0.000 0,000 1.191 3.739 2764 0.000 0.000 0.000 0.000 0.000 0.000 34 0.000 0.000 0.000 0.000 SPEC 3 0.000 0.000 0,000 A J'AR 0,000 0.000 0.000 0.000 0.000 0.000 0.000 SPEC 5 0.000 0.000

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DAT	c: 7/7	/9/3			COM	POSITE PF	ESTRI	LOAD DATA Essed Conc	AT MOMENT RETE FLEX	URAL MEMBE	NT FOR R - LOAD	FACTOR	RATING	1 7 - 0	00 005
12P4 1		70									8	MEMI	STRUCTORE SER I.D	$\begin{array}{c} \mathbf{I} \cdot \mathbf{D} \cdot = \mathbf{B} \\ \mathbf{G} \\ \mathbf{G} \\ \mathbf{X} \end{array}$	1 1 00
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<u> </u>	IVE LOG	ND_CA	LCULATIC	INS (IMP/	CT FACTO	R ≕ 0,306 1	VE I	<u>+BEND AND</u> DAD		FOR -BEND)					
	.IVE		REDIS	LL+IMP	JCK MOMEN	T	DIR	11+1MP	LAN	E MOMENT	LOC.CONC		TXED	494 Her 2011 - 441 - 44	SHEAR
	LOAD		LL+I FT-KIPS	FT-KIPS	FT-KIPS	1 WHEEL FT.		FT-KIPS	FT-KIPS	LOAD #1 FT.	LOAD #2 FT:	+V KIPS	KIPS	LEFT KIPS	RIGH KIPS
INV	<u>HS20 +</u>]	REND	0.00	18.8	14.5	120.301	<u>R</u>	17.0	· 13.1	97.350	0.000	0.00	0.00	34.88	34.88
INV. 2	h + f	SEND	0.00	108.1	83.1 0.0	36.050	L .	-109.6	-84.3	68.650 0.000	43.850	0.00	0.00 0.00	0.00	0.00
<u>INV. 3</u>	1 + E	SEND (END	0.00	<u> </u>	0.0	0.000		<u>0_0</u>	<u>0.0</u>	0.000	0.000	0.00	0.00	0.00	0.00
INV. 4		SEND SEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
<u> </u>		SEND SEND	0.00	0.0		0.000		0.0	0.0	0.000	0.000	$-\frac{0.00}{0.00}$	0.00		0.00
INV. 6	-1 + [_1	END	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
OPER	HS20 +F	ALIND ALIND		18 8	14 5	120 204	0	47.0	47.4	07 250	0.000		0.00	74 00	70 00
OPER 2	-1 SIS +F	SEND	0.00	108.1	83.1	36.050	L	-109.6	-84.3	68.650	43.850	0.00	0.00		
		<u>BEND</u>	ŏ.`ŏŏ	<u> </u>	<u> </u>	105.450		ŏ.ŏ	ŏ.ŏ	<u> </u>	<u> </u>	<u>-ŏ.ŏŏ</u>		£.0 × 30	
POST 1	SU2 +E	SEND SEND	0.00	11.4	8.7 39.1	107.826	R					0.00	0.00	20.08	20.08
FOST 4	<u> </u>	REND BEND	0.00	<u>12.4</u> 93.7	72.1	<u>92.308</u> 75.549		· .				0.00	<u> </u>	-22.14	22.14
POST 2	SU3 +E	BEND	0.00	21.4	16.4	108.349	R					0.00	0.00	36.48	36.48
POST 5		BEND BEND	<u>0.00</u> 0.00	97.4 18.5	<u>74.9</u> 14.3	<u>51 450</u> 131.709	k .,					0.00	0.00	-30.32	30.32
	I	SEND	0.00	124.2	95.6	34.548						0.00	0.00		
		SEND	<u> </u>	104.5	18.0 30.4	<u>-109.800</u> 53.148	- R L.					0.00	0.00		38.30
PUS1 6	C5 +1 -1	BEND BEND	$\begin{array}{c} 0.00\\ 0.00\\ 0.00\end{array}$	18.5 133.6	14.3 102.7	131.709 33.717						0.00	0.00	-32.11	32.11
SPEC	+ [BEND	0.00	0.0	0.0	0.000						0.00	0.00	0.00	0.00
SPEC 2		SEND SEND	0.00	0.0	0.0	0.000	Ŗ					0.00	0.00	0.00	0.00
SPEC 3	-+ E	SEND	0.00	0.0	0.0	0.000	R	······			· · · · · · · · · · · · · · · · · · ·	0.00	0.00	0.00	0.00
SPEC 4		SEND SEND	0.00	0.0		0.000	R					0.00	0.00	0.00	0.00
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<u></u>	<u>¢</u>	RATING	FACTOR	*****	TACTON F			1 A T T 110 m	1	4	an gran at the se
					MENT		1	SERVICE	ALTOR FUI		KALING
			+BEND	-BEND	+ BEND	-BEND	+BEND	JP BEND	*BEND	JTI REND	LEFT
INV.		HS20	15.146	2.363	15.146	2.363	0.000	0.000	0.000	0.000	0.000
INV.	2		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
INV.	3		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
INV.	4		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
INV.	5		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
INV.	6		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
OPER		HS20	25.243	3.938	23,383	3.938	0.000	0.000	0.000	0.000	0.000
OPER	2	875	60.406	4.521	55.954	4.521	0.000	0.000	0.000	0.000	0.000
POST	1	SU2	41.786	8.501	38.707	8.501	0.000	0.000	0.000	0.000	0.000
<u> </u>	4	<u> </u>	38.369	4,609	35.541	4,609	0.000	0.000	0.000	0.000	0.000
POST	2	รบช	22.197	4.433	20.561	4.433	0.000	0.000	0.000	0.000	0.000
	<u>5</u>	<u>C4</u>	25,597	3.475	-23,710	3,475		0.000			
POST	3	SU4	20.220	4.131	18.730	4.131	0.000	0.000	0.000	0.000	0.000
POST	-6	<u> </u>	25.597	3.232	23.710	3.232	0.000	0.000	0.000	0.000	
SPEC			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SPEC	2		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0,000	0,000
SPEC	3		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SPEC	4		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
SPEC	53		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0 000	0.000
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D/F STRUCTURE I.D. 880-085 MEMBER I.D.-G01 MATERIAL-CPS SUPERIMPOSED CONCENTRATED DL(S) DIST. FROM LT SUPPORT**** ÷ié FT. TRANS. LONG. NO. KIFS FT. 11 12 3. 43 46 47 48 50 51 52 54 55

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	NON-C	<u>)</u> :0M	<u>in si</u> 9,25	7. IN. 777.0	_SQ >0	.IN. 2.45	ΪŃ. 4.6	î 7	N. 2.00	ÏŇ 2	і <u>кт</u> і 83 4	<u> </u>	<u> </u>	1 <u>**4</u>		<u>IN**</u> 5639	á ří	4.58	I N)
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	<u>NON</u>	COMP :		7.5	(Ø	_КД ≕		2	in =	7,	.06		жжж_ (<u>С</u> ()Wb:		p	 1	1.25	
].	***	INF	LUENCI	E LINE	: (S	IMPLE	SPAN)								** PRE	*** STRES	ULTIMA S STEI	TE STI EL 7	RENG [.] CONC
	<u> </u>	<u> </u>	CE CE	E E							POS	AREA			SLA	R %≔F	Y 600	r 30.*	PSI 34
	经共济转移	ORI	INATES	Ş OF A	ND	AREAS	UNDER	INFL	.UENC	E_L]	NE (CO	NTIN	uous s	(MAG		ENTOR	Y 27000 G <u>270</u> 00	90. 90.	50 50
		TO	<u>5</u> F1	.000	o O	.000	o.0	00	SFAN 0.0	00	O.00	o O	0.00))	POS POS	T VEH	2 27000	90. 90.	<u>50</u> 50
		N 2	2	.2(2 -	· 0	.332 .870	0.1	$\frac{42}{32}$ -	0.0	31 52	0.00	0 1	0.000	>	POS POS	T VEH T SPE	3 27000 C	90. 0.	50
		H 4	5	.235 -	्र्	.044	0.2	98 -	0.0	63 70	0.00	o O	0.000	}	***	** D	L MOME	V.L	
		r g	12	.130 - .097 -	0	. 010	0.2 0.2	28 -	0.0	68 61	0.00	0 0	0.000	Ş		DI		SDL.	
			1	.313 -	· 0	.422	0.1	11	0.0	35	0.00	0 0	0.000) >		 K 1 87	• <u>•</u> ••••••••••••••••••••••••••••••••••	- <u>K1PS</u> 5.0	INV
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		I TVF	*** \$ \$\$\$	1 1 4 7		TRUC	K LOA	D	n 1	D			L/	ANE L	DAD	······································	<u> </u>	COMC	<u> </u>
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	INV	HS20	+BEND	115	. <i>F</i> .	88.		8 106) R			94	4	77 A	10	100			
			-BEND	35	s.ö	26.	9 Š	91451	Ŕ			23	<u>.</u> 1	17.8	37	. 650	Ø	.000	
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ł	POST	SPEC	+BEND -BEND	60	0.0	<u>0</u> .	0	0.000	<u>}</u>										



		DATE	07/03/	(90			COM	POSITE PRI	LSTRESS	MUMEN ED-COM	I UHECK PO: S rete flex i	LNT FOR JRAL NEMBE F	
2 3	NAME	<u>* SE</u>	CTION	PROPERTI	ES IN RA	NGE 1 CE	SPAN	2					
7 3 3 3	NON-I SLAI NON	COM B RES COMP	H IN S 9.25 TEEL D =	AREA Q_IN 777.000	AS 3.22 0.00 KD	CT D <u>IN T</u> 4.68 2 0.00 1.50 J	A I N . LOS: FF	ECC FI IN KIF 2.82 60 3 = 3665 = 481 2.80	9 7.7 7.4 1 7.8 1	IX BEND IN===4 5670.3 4381.5 4381.5	IX - BEN1 <u>IN**</u> 5670 5670 5670	C (BOT) 3 4.57 3 6.18 3 6.19	TO + BE 12 46 46
0 1 2	*****	* IN <u>X-D</u>	FLUENC IST (F	E LINE (T.)	SIMPLE S	F'AN))))))		***** PRESTRESS	ULTIMATE SI STEEL /	RENGT
3 4 5	****	Y-O X OR	RDINAT DINATE SP	E S OF ANI AN 1 S) AREAS U Fan 2	NDER INFL Span 3	UENCE I SPAN 4	INE (CON	TINUOUS SPAN	SPAN)	SLAB *=F INVENTORY OPERATING	60000.* 270000. 270000.	340 500 500
6 7 8			0 0 0	.000 .222 .431 .413	0.000 0.652 - 1.505 - 2.552 -	0.000 0.468 0.766 0.918	0.000 0.102 0.172 0.213	0.000 0.000 0.000 0.000		00 30 00 30	POST VEHA POST VEHA POST SPEC	270000. 270000. ; 0.	500 500
2			- 0 - 0	.254 .842 .862 .801	3.813 5.266 3.818 2.548	0.950 0.886 0.751 0.570	0.229 0.224 0.201 0.163	0.000 0.000 0.000 0.000	0.0 0.0 0.0	00 00 00 00	ANANA DI DL ET-KIR	MOMENT FFECT SDL ST-KIPS	
3		N 9 T 0	- 0 C	.384 .000	0.660 -	0.368 0.169 0.000	0.115 0.059 0.000	0.000 0.000 0.000		00 00 10 00 10 00	136. (ЕА жжжж (A. HALL	OPER VEH.
7	FU: NEC 	5 AREI 8 AREI 6 <u>L I</u>	A A <u>VE LO</u> A	0.0 14.0 D AND RA	69.3 0.0 NING CAL	0.0 18.1 СШ АТТОМЯ	3.7 0.0	0.0 0.0 0.0	0 0	.0 .0 . con .	73.0 POS 32.2 NEG	605.2 0.0	VEH SPEC
3 		LIVE LOAD		LL+IMP	TRUCK LL FT-KIPS	LOAD LOC.NO. 1 WHEEL	DIR	AXLE L SPACE FT. FY	L+IMP	ANE LC		LOC.CONC LOC.CONC LOAD 2	
	INV	H620	+BEND -BEND	118.5 30.7	91.2 23.7	12.750 90.451	L Ř		98.1 26.1	75.5 20.1	40.750 68.650	0.000	
	POST	HSZO	+BEND -BEND +BEND	118.5 30.7	91.2 23.7 44 0	12.750 20.451 57.250	R		98.1 26.1	75.5 20.1	40.750 68.650	0.000	
	POST	VEH2	-BEND +BEND -BEND	18.3	1421 113.1	78:550 51.753	R						
	POST	VЕНЗ	+BEND -BEND	159.6 37.8	122.8 29.0	54.084 79.950	R R	<u> </u>				<u> </u>	
	POST	SPEC	+BEND -BEND	<u></u>	0.0 0.0	0.000					•		



-		DATE	07/03	190				FOSITE P	RESIRES	seo-coi	tere fe fele	XURAL MEMBE	R
	<u>. 8 k n 1</u>	<u>.</u> #	ECTION	PROPERT	IES IN R	4NGE 1_0	F-SPAN-	4					
	NON- SLA	COM B REI COMP	H <u>IN</u> 9125 STEEL	AREA 50.IN 777.00	AS 2.45 0.00	CT 4.67 0.00	DA IN 2.00 LOS: FF	ECC F IN KI 2.83 4 5 = 348 5 = 348	1 63.0 31.3 77.7	IX + BEND -IN114 5639.8 4306.0	1: - BE IN# 563 563 563	X C ND (BUT) 44 IN, 9.8 4258 2.8 4258 2.8 4258	+)
	****	* I)	IFLUEN	CE LINE	(SIMPLE S	SPAN)		4.06	<u>H M H</u>	COMP		44.25	
		<u> </u>	<u>ist (</u>)rding	<u> </u>					AREA =		PRESTRES	ULIIMALE SI 38 STEEL / pot	CON
	****	* ()f	DINATI SI	ES OF ANI) AREAS L	INDER INFI SPAN 3	LUENCE (INE (CO)		SPAN)	SLAB *= INVENTOR OFERATIN	Y 60000.* Y 270000 VG 270000	54 54 54
	Letter, and a			0.959 - 1.936 - 2.93 0 -	0.000 0.664 1.088 1.305	0.000 0.178 - 0.290 - - 0.348 -	0.000 0.039 0.065 0.061	0.000 0.000 0.000			POST VEN POST VEN POST SPE	12 270000. 12 270000. 13 270000. 50 0.	
				9.019 - 5.162 - 5.872 - <u>3.872 -</u>	1.352 1.262 1.072 0.815	0.360 - 0.336 - 0.285 - 0.285 - 0.216 - 0.21	0.037 0.085 0.076	0.000	9 0.0 9 0.6 9 0.6	00 00 00 00	жжжжы <u>Г</u> Э. Т.	L MOMENT EFFECT	
		1 8 N 9 J 0	Ś	1.641 - .738 - .000	0.528 0.244 0.000	0.139 - 0.064 - 0.000	0.043 0.022 0.000	0.000 0.000 0.000 0.000		00 00 00 00 A	ГТ-КІ 96 RFA жжжж	PS FT KIPS	
	Р'0; NE(жжжы)	3 ARE 2 ARE 4 1 T	A A VE 102	60.5 0.0	25.8	6.9 0.0	0.0 1.4	0.0 0.0) 6	. 0 . 0	FALS 67.4 POS 27.2 NEG	494.6 0.0	VEI VEI VEI SPE
		1 1.45			TRUCK	LULATIONS) (IMPAC	T FACTOR	(30)	O FOR	NREND AND		
•		LOAD		ET-KIPS	-FT-KIPS	LOC.NO. 1 WHEEL ET.	DIR	AXLE SPACE	LL+IMP		LOC.CON LOAD	C LOCICONC	
	TAV Opro	H820	+BEND	113.9 43.7	87.6 33.6	- 15.375 59.451	; L R		94.2 28.9	72.5	12.625 37.650	0.000	
	Engr	nozv Vrux	-BEND	113.9 43.7	87.6 33.6	- 15.375 59.451	R		94.2 28.9	72.5 22.2	12.625 37.450	0.000	an fair an an an an an an an an an an an an an
	poer	A MARINE	-BEND	26.1	20.1	47.550	Ŕ						
		v c. Hki	- BEND	135.9 49.3	104.6 38.0	23.627 46.948	R R						
	POST	VEH3	+BEND -BEND	149.5 53.7	$115.0 \\ 41.3$	- 0.709 48.950	L R						
	POST	SPEC	+ BEND - REND	0.0	0.0	0.000							



								DETATI	DATA AT	MOMEN	CHECK POIN						
	DATE	07/03	/90				COMP	POSITE PR	ESTRESS	ED CONC	RETE FLEXUE	AL MEMBER		DZP ST MEMBER	RUCTURE I	D. 880-	085
狭外关系	* SE	STION	PROP	ERTIE	S IN RA	NGE 1.0	SPAN	2						C.P. L	OCATION	2	
		H TN.	AREA SQ.IN	. 80	AS L. IN.	CT TN.	DA E	ECC FI	÷-	IX Bend IN##4	- BEND TN##4	(BOT)	TOP + BEND TN##3	TOP - BEN TN##	BOTTC D + BEN 3 IN##	M BOT	TOM C END O
NON- SLA NON	COM B RES -COMP	9.25 TEEL <u>D</u> =	777	.00 .50	3.22	4.68 11.19	1.75 LOSS FF	2.82 60 5 = 4566 = 46 7.60	7.7 7.1 1 0.8 1	5670.3 4381.5 4381.5 COMP	5670.1 5670.3 5670.3	4.57 6.18 6.18	1210.8 4691.0 4691.0 KD	121	0.8 124 0.0 232 0.0 233		241.7 P 0.0 N 0.0 3N
96 96 96 Ye	% I.N	FLUEN	CE LI	NE CE	SIMPLE S	PAN)					***** UL	TIMATE ST	RENGTH **	нии МО	MENT CAPAG	CITY OTTOM D	OTTOM
	X-D Y-0	<u>TST (</u> RDINA	FT.) TE					POS A	REA =		SLAB *=FY	60000.*	2400. F	+ BEND T-KIPS	FT-KIPS FT	-KIPS FT	-KIPS
转运行转	* OR	DINAT S	ES OF Pan 1	AND	AREAS L	NDER INF	UENCE I	INE (CON SPAN_5	TINUOUS	SPAN)	OPERATING POS1_VEH1	270000.	5000.	46 <u>5</u> .5 465.5	440.6 440.6	465.5	440.6 440.6
	EN 2	****	0.608		.329	0.355 -	0.0077	0.000	0.0		POST VEH2 POST VEH3 POST SPEC	270000. 270000. 0.	5000.	465.5 465.5 0.0	440.6 440.6 0.0	465.5 465.5 0.0	440.6
	H 4 5		$\frac{1.6.05}{2.062}$	- 2	2.703	0.696 0.720 0.672	0.174	0.000 0.000 0.000	0.0	00 00 00	nnrrr DL EF	MOMENT	经预制	AVAI	L.CAPAC.FC P TOP	R LL+IMP BOT	ACT
	P 6 0 7 1 8		2.356 2.191 1.767	- 2	143 .630 .055	0.569 -	0.152	0.000	0.0	00 00 00	FT-KIPS	SDL FI-KIPS	NVENTOR	+BE F-K Y 284	ND -BEND PS E-KP9 6 259.1	+BEND F-KPS 284 A	BEND F-KPS 250 (
	N 9 T 0		1.049	(c).489).000	0.128 -	0.045	0.000	0.0 0.0	00 00 _AF	REA **** UL	T MOM CAP	OPERATIN VEH. 1	IG 474	13 431.8 3 431.8	439.4	431.8
P0 NE	S ARE G ARE	A A	0.0 38.3		0.0 51.6	13.7	0.0 2.8	0.0	0	. 0 . 0	13.7 POS 92.8 NEG	572.7	VEH. 3 Special	474	13 431.E	439.4	431.8
<u> </u>	36 	VE LO	AD AN	D RAT	TNG CAL	CULATION	S (IMPA)	T FACTOR	= .30	O FOR	ABEND AND	.300 FOR	-BEND>				
	LOAD		Г.Т	+IMP KIPS	EL -	· LUC.NU 1 WHEE FT	L DIR	AXLE SPACE FT F	LL+IMP T-KIPS	EI-KIPS	LOC.CONC LOAD S FT.	LOC.CONC LOAD 2 FT.		RATING FACT.	CAPACITY TONS) RATING (VALUE	
TNV	HS20	+BEN -BEN	D D 1	23.3 07.2	17.5 82.5	90.45 45.67	1 R 5 R		15.1 104.2	11.6 80.1	68.650 37.650	15,150		2.416	87.0	HŞ 48.3	
OPER	HS26	+BEN -BEN	D D 1	23.3 07.2	17.9 82.5	90.45 45.67	1 R 5 R		15.1 104.2	11.6 80.1	68.650 37.650	15.150		4.027	145.0	HS 80.5	
POST	VEH1	+ BEN -BEN	p p	13.9 52.2	10.7 40.1	7 <u>8.55</u> 47.55	o <u>r</u> OR							8.275	140.7		
POST	VEH2	+BEN -BEN	D D	26.3 98.8	20.2	20.45	7 . R							4.369	144,2		
POST	VEH3	+BEN -BEN	D D 1	28.6	22.0	79.95	0 R 0 R							4.017	140.6		
POST	SPEC	+BEN	D	0.0	0.0	0.00	0							0.000	0.0		

	1	DATE	07/03/	90					<u> </u>	POSI	<u>te b</u> t	<u> VĒSI</u> F	vessi	-D-COA	icrete	FLE	XÜR	AL NEMI	ER	
	<u> </u>	<u>¢ se</u>	CTION	PROPER	TIES :	IN RA	INGE I	OF 9	3P'AN					IX		I	x	С		TOP
	N0N	ากห	H IN.S 9.95	AREA Q.IN. 777.0	AS SQ.II	4.		DA IN	75:	ECC IN 2 82	F : K 1 F 	I > <u>S</u> 37 7	-+- 	BEND N##4 M70	2	- BE - IN# - 527	ND #4	(BOT)) 7 77	+ BEND
	SLAI	B RES	TEEL	7 5		,20	11.19	in.	LOS FF	5 = 	4588 40	57.7 50.8	1 Å 1 Å	1381.5 1381.5	i S	- 567 567	013 013	6.1	8	4691
	H H H H I	K IN	FLUENC	E LINE	(SIM	PLE S	PAN)					'n	<u>с ж. я</u>		% %	***	UL.	TIMATE	STR	ENGTH
		Хр Ү-О	IST_(F RDINAT	ï.) É							POS (AREA			SLA	B 46m	SS FY	51666 <u>PSI</u> 60000.	/ し 序 .*	UNC <u>SI</u> 3400.
	*****	e or	DINATE SP	S OF A	VD ARI SPAN	igs l	INDER II SPAN 3	vFLUI SI	ENCE	LINE	(CO) Pan :	NT I NI 5	JOUS SPAN	SPAN)	1NV 0PE 	ENTO RATI T VE	RY NG H1	270000. 270000. 270000	• •	5000. 5000. 5000 .
		T 0 E 1 N 2	0 0 0	.000 .163 - .316 -	0.00)0 57 - 14 -	0.000 1.292 2.114	((0.000 9.282 0.474	1	0.000 0.000 0.000	9 9 9	0.00)0)0)0	P09 P09 P09	T VE T VE	H2 H3 EC	270000. 270000.	. 	5000.
		<u>T 3</u> H 4 5	0 0 0	<u>.450</u> - .553 - .618 -	2.0	71	2.620	{	0.633 0.633	1	0.00(0.00(0.00(3 9 8	0.00)0)0 10	 %#X	*n	DL	MOMENT		
		P 6 0 7	ě	.633 - .588 -	2.6	20	2.070		0.553 0.450		0.000 0.000	ð 	ŏ.ŏ			<mark>F⊺≕K</mark>	ĬĿč	, с.с., SDI ЕТ_КЈ	<u>es</u>	** \$ 11 1 *** \$ 1 *
ŀ		N 9 T 0	. Ö	-282 - -000	1.29	22 20	0.467	((9.163 9.163 9.000	(0.000	9 9	0.00)0)0)0	REA	* * * *	UL.	T_MOM_C	CAP	OPERAT
	F'OS NEC	S ARE G ARE	A A	10.3	0 50	. 0 . 0	0.0 50:0		10.3		0.(0.())	0 0	0 0	100.0	POS NEG		605.1 572.1	; ? ?	VEH. 3 VEH. 3 SPECIA
	<u> </u>	<u>k</u>	VE LOA	D AND	RATIN		CULATI LOAD	<u></u>	<u>(IMPA</u>	<u>CT F</u>	ACTO	\$ <u></u>) FOR	+REND	<u></u>			COR-	-BEND)
		LIVE		LL+I FI-KI	MP I DS ST	l 		NØ. EEL	DIR	AX SPAI	LE CE	LL+1 :::	IMP IDC I	L.L. 57	LC L	C.CO OAD	NC		ЭМС 2	
	INV	HS20	+BEND -BEND	18	.ș	14.5	120.	301 350	R	, 1	× ,	17	. Ø	13.1	97	.350		47 04	: (2)	
	OPER	H820	+BEND -BEND	18	.8 1	14.5	5 1 <u>20.</u>	301	R			17.	. 0 . 0	13.1	97	.350	1	A72 OF	α τ Δ	
	-Post	VEH1	+ DEND		- 3	-8-7	<u>197.</u>	324							·				· · ·	
	POST	VEH2	+BEND	21	. 9 . 4	16.4	108.3	349	R.											
	POST	VEH3	+BEND	23	, 4	18.0) 108.8	9300 300	R R				, ,							
	POST	SPEC	+BEND	104	.5	80.4) 53. 0.(148 900	<u> </u>											
			-EEND	õ	.0	Ø.3) Ö.	900												







APPENDIX C

Load Rating Computations



Project: Load Rating of SR5 (US1) over Main Canal

COINSUL	ANIS Project Number:	Designed By:	SS
Subject:	Load Rating Calculations	Date:	May 23
		Checked By:	GH
		Date:	May 23

Bridge 880085 load rating calculations

1. Assumptions

1. Perform the load rating using LRFR.

2. Slightly/Moderately Aggressive Environment: for prestressed slab unit consider 6*sqrt(f'c) for tension (Inventory Load Rating).

3. The rating is performed manually. The analysis for live loads is performed using MIDAS.

4. The prestressed slab units are simply supported for non-composite dead loads. The slab topping provides continuity for composite dead and live loads, however, there is not at full connection at the intermediate diaphragms and consequently the system will be treated as fully simple supported.

2. Geometry

Span Lengths:	Span 1 & 4 =	<mark>26</mark> ft
	Spans 2 & 3 =	31 ft

Span lengths (Centerline of bearing to centerline of bearing):

Span 1 & 4 =	24.5 ft
Spans 2 & 3 =	29.5 ft



Bridge width =	70 ft	
Sidewalk width =	6.541667 ft	(one side only)
Barrier width =	1.375 ft	
Curb-to-curb distance =	62.08333 ft	
Number of traffic lanes =	5	

Concrete f'c	(CIP toping	g) =	3.4	ksi		
Concrete f'c	(Prestresse	ed slab units) =	5	ksi		
Reinforcing	Steel Yield	strength, Fy =	60	ksi		
Prestressed	strands, fs	u =	270	ksi		
4. Loads						
The analysis	s is perform	ed for each panel widt	h. The pane	els are placeo	d back-to-back .	
Width of pre	ecast panel	=	7	ft		
4.1 Dead Lo a) Deck (nor	ads n-composite Thickness Weight (De	e) (PS slab + CIP toping) = C non-composite) =		1.0833333 1.1375	ft k/ft per precast pane	el
b) Composit	:e: Sidewalk:	Average Thickness = Weight =		6.5654167 0.5368596	ft k/ft	
	Barrier:	Ū			-	· 3*
	Area =	(15*3+(15+8)/2*10+(6 2.034722 ft2	;+8)/2*19)/	/144=	9	- Py as 3
	Weight =	0.305208	k/ft		1	ma eminac
	Aluminum	rail = 0.015	k/ft		10" R0	<u>an</u>
	Weight of	2 barriers + rail =	0.625417	k/ft	Solar Cont	or- const tolat

Distribute the composite load equally along the whole width of the bridge

Total composite load =

3. Material Data

0.116228 k/ft per precast panel

t 1/2



MIDAS definition of HL93 truck and negative moment two trucks

AASHTO LRFD Load				
ehicular Load Properti	25			
Vehicular Load Name :		HL-93TDM		
Vehicular Load Type :		HL-93TDM		
Dynamic Load Allowan	ce:	33		%
W	+ +		_	
No Load(ki S	↓ ↓ ← D1 →	w	0.64	kips/ft
W I 25 2 25	↓ ↓ I← D1 Dacing(ft) 4 and	W Ps	0.64	kips/ft kips

MIDAS definition of HL93 tandem

Analysis is performed for one lane of traffic and envelopes of response between the 3 cases shown above are

b) Permit Vehicle, FL120





MIDAS definition of FL120

c)Similar definition for the legal loads





5. Live Load Distribution Factor (Slab type bridge, AASHTO 4.6.2.2 Beam-Slab Bridges)

The particular type of section (precast panel with a CIP deck) is considered to be represented by case (f) in AASHTO Table 4.6.2.2.1-1

Precast Solid, Voided, or Cellular Concrete Boxes with Shear Keys	Cast-in-place concrete overlay	(f)
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5.1 Distribution factors for Interior Beams

Concrete Beams used in Multibeam Decks	f, g	One Design Lane Loaded: $k \left(\frac{b}{33.3L}\right)^{0.5} \left(\frac{I}{J}\right)^{0.25}$	$ \begin{array}{r} 35 \le b \le 60 \\ 20 \le L \le 120 \\ 5 \le N_b \le 20 \end{array} $
		where: $k = 2.5(N_b)^{-0.2} \ge 1.5$ Two or More Design Lanes Loaded: $k\left(\frac{b}{305}\right)^{0.6} \left(\frac{b}{12.0L}\right)^{0.2} \left(\frac{I}{J}\right)^{0.06}$	

where:

Nb =	Number of beams =	10
b = Beam wi	dth (in) =	84 in
The comput	ations are performed for the central spa	ins, since it controls the design.
L1 = Span le	ngth (ft) =	24.5 ft
L2 = Span le	ngth (ft) =	29.5 ft

From Table 4.6.2.2.1-3: I/J = 0.54*(d/b)+0.16		
d = (depth of beam) =	9.25	in
I/J =	0.219464	

<u>a) One design lane:</u>	
k =	1.577393
DF Span 1=	0.34643
DF Span 2=	0.315709

b) Two or more design lanes:

DF Span 1=	0.517125
DF Span 2=	0.49827

5.2 Distribution factors for Exterior Beams

Concrete Box Beams Used in Multibeam Decks	f, g	$g = e g_{interior}$ $e = 1.125 + \frac{d_e}{30} \ge 1.0$	$g = e g_{interior}$ $e = 1.04 + \frac{d_e}{25} \ge 1.0$	$d_e \leq 2.0$
---	------	---	--	----------------

_	e C	1'-4'/2"
		1
+ · · · ·	· · · · · · ·	$de = 16.5^{\circ} - 7$ = 9.5° or
21/1-	<u> </u>	=0.79/7fx
1	de	¢_7"

de is negat	ive			
<u>a) One des</u>	ign lane:			
	e =	1.09861		
	DF Span 1=	0.380591		
	DF Span 2=	0.346841		
b) Two or more design lanes:				
	e =	1.008332		
	DF Span 1=	0.521434		
	DF Span 2=	0.502422		

Summary:

a) Span 1 & 4:	DF =	0.521
b) Spans 2& 3:	DF =	0.502

6. Structural analysis results

Midas Structural model of span 1 and span 2 (each span simple supported).



Live load moment - HL 93 (k-ft).

Since the controlling load rating location (bending) is at the middle of the span, the tabulated values are shown in the table below:



DC1 and DC2 are reported by ft of slab.	Live load moments are reported	by lane of loading
---	--------------------------------	--------------------

Span	Elem	Load	Part	Shear-z (ki	Moment-y (ft*kips)		Ms per be	am (7 ft w	vide)
	7	DC1	I[7]	0	12.15		Ms = (Dc1·	+Dc2)*7+().8 LL*DF
	7	DC1	J[8]	0.4	11.66				
	7	DC2	I[7]	0	1.24	Span	Live Load	Part	Ms
	7	DC2	J[8]	0.04	1.19			I[7]	255.9
	7	HL93(max)	1[7]	29.79	388.83		п193	J[8]	253.9
	7	HL93(max)	J[8]	37.3	383.92		62	I[7]	176.0
	7	C3(max)	1[7]	16.1	197.17		L3	J[8]	178.0
	7	C3(max)	J[8]	20.62	202.05		<u> </u>	I[7]	217.8
	7	C4(max)	1[7]	24.28	297.48		C4	J[8]	216.9
	7	C4(max)	J[8]	30.14	295.33		65	I[7]	212.8
C	7	C5(max)	1[7]	22.08	285.4			J[8]	206.9
Span 1	7	C5(max)	J[8]	27.69	271.32		51420	I[7]	274.9
	7	FL120(max	1[7]	35.44	434.2	Span 1	FL120	J[8]	275.9
	7	FL120(max	J[8]	44.56	436.68			I[7]	197.3
	7	ST5(max)	1[7]	20.03	248.38		515	J[8]	198.0
	7	ST5(max)	J[8]	24.82	249.93			I[7]	168.5
	7	SU2(max)	1[7]	15.12	179.22		SU2	J[8]	170.0
	7	SU2(max)	J[8]	18.66	182.9			I[7]	225.4
	7	SU3(max)	1[7]	24.28	315.76		SU3	J[8]	224.8
	7	SU3(max)	J[8]	30.14	314.25		I[7]	241.1	
	7	SU4(max)	1[7]	24.62	353.37		504	J[8]	237.7
	7	SU4(max)	J[8]	32.08	345.2			I[20]	361.7
	19	DC1	1[20]	-0.06	18.55		HL93	J[21]	361.7
	19	DC1	J[21]	0.42	18.03		C3	I[20]	268.5
	19	DC2	1[20]	-0.01	1.9			J[21]	273.7
	19	DC2	J[21]	0.04	1.84		<u> </u>	I[20]	321.4
	19	HL93(max)	HL93(max) I[20] 30.33 543.81		C4	J[21]	324.3		
	19	HL93(max)	J[21]	37.83	543.72			I[20]	322.4
	19 C3(max) 19 C3(max) 19 C4(max) 19 C4(max) 19 C5(max)	C3(max)	1[20]	16.77	311.98	3 4 5 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7		J[21]	322.0
		C3(max)	J[21]	21.18	324.74		I[20]	390.1	
		C4(max)	1[20]	24.5	443.36		FLIZU	J[21]	402.2
		C4(max)	J[21]	30.21	450.73		I[20]	297.2	
6		C5(max)	1[20]	22.53	446.02		J[21]	292.9	
Span 2	19	C5(max)	J[21]	29.02	444.89		<u>си</u> 2	I[20]	239.9
	19	FL120(max	1[20]	36.32	614.46		502	J[21]	242.0
	19	FL120(max	J[21]	50.15	644.5		6113	I[20]	321.6
	19	ST5(max)	I[20]	20.18	383.24		503	J[21]	319.9
	19	ST5(max)	J[21]	26.2	372.63		CLIA	I[20]	336.0
	19	SU2(max)	I[20]	15.19	240.6		504	J[21]	335.2
	19	SU2(max)	J[21]	19.6	245.99				· · · · · ·
	19	SU3(max)	I[20]	24.5	444.02				
	19	SU3(max)	J[21]	32.66	439.73				
	19	SU4(max)	I[20]	26.1	479.81				
	19	SU4(max)	J[21]	33.5	477.77				

7. Computation of Section properties and bending capacities

Elasticity modulus CIP deck = Edeck =	3323.643 k	si
Elasticity modulus slab precast panel = Epanel =	4030.509 k	si







(Furnished by the Deportment of Transportation)

84 in

40 in

32 in

1.

Precast panel equivalent section (for a 7ft panel length)

Bottom width = Width at Elevation 4.25 in = Width at Elevation 9 in =



Area =	528.5 in ²
Ycg =	3.668677 in
lx =	3336.328 in ⁴
S top =	597.7665 in ³
S bottom =	909.4089 in ³

tooth width = 5in at bottom

tooth width = 4in at top

Cast in place section equivalent section (for a 7ft panel length):

Top width =	84 in
Width at top of precast section tooth =	52 in
Width at bottom of precast section tooth=	44 in



Area =	547.5	in^2
Ycg =	9.2376332	in
Ix =	3357.9892	in ⁴
S top =	892.52041	in ³
S bottom =	673.26306	in ³

Composite section properties for a deck width of 84 inches

Aprecast = Acomposite = Aprecast -	528.5 in ² + n. A deck =	Adeck = 979.9801 in ²	547.5 in ²	
Ycg_comp= Sum (AxYcg	_Precast + n*Adeck *	* Ycg deck)/A com	iposite =	4.798849 in
I composite = sum(Io,i +	Ai (Ycomp-Ycgi)^2),i=	=precast, deck =		15675.87 in ⁴
Section Modulus				
Sbottom-precast = I com	posite /Ycg_comp =			3266.59 in ³
Stop-precast = I compos	ite /(9.25-Ycg_comp)	=		3521.756 in ³
Stop-deck = I composite	/(13-Ycg_comp) =			1911.423 in ³
Summary (Section prope	erties)			
Noncomposite:	Area =	528.5 in ²	Precast Pa	anel

Noncompositer	711'00	52015	11000
	Sbottom =	909.4089 in ³	
	Stop =	597.7665 in ³	
Composite:	Area =	979.9801 in ²	
	Sbottom =	3266.59 in ³	
	Stop =	3521.756 in ³	
	Stop_deck =	1911.423 in ³	

8. Section ultimate bending capacity and prestress losses for service condition checking.

a) Spans 1 and 4; 26 ft spans

From existing load rating:



dp = 13-1.75 = 11.25 in Assume low relaxation strands К = 0.28 $c = \frac{A_{ps}f_{pu} + A_sf_s - A'_sf'_s}{\alpha_1 f'_c \beta b + kA_{ps}\frac{f_{pu}}{d_p}}$ Neutral axis position, c: fpu = 270 ksi f'c = 3.4 ksi **α1** = 0.85 β1 = 0.85 2.966653 in c = a = β1 c = 2.521655 in Compression block depth Stress in prestresing steel, fps = 250.06409 ksi Nominal Flexural Resistance, $Mr = \phi Mn$ ϕ from article 5.5.4.2

$$Mn = Aps fps (dp-a/2) =$$

6114.941 k-in

or

509.5784 k-ft

$$0.75 \le \phi = 0.75 + \frac{0.25(\varepsilon_t - \varepsilon_{cl})}{(\varepsilon_{tl} - \varepsilon_{cl})} \le 1.0$$
(5.5.4.2-1)



 $\epsilon t = (dp/c-1)\epsilon u (0.003) =$ ecl = 0.002 etl = 0.005 φ= 1

0.0083765 in/in net tensile strain in steel Compression controlled strain limit in steel Tension controlled strain limit in steel

b) Spans 2 and 3; 31 ft spans

1.1



Mr = C =



509.58 K-ft

for rectangular section behavior:

Mn = Aps fps (dp-
$$0.75 \le \phi = 0.7$$

 $f_{ps} = f_{pu} \left(1 - k \frac{c}{d_p} \right)$

Aps = 21 - 1/2" strands = 3.213 in²
dp = 13-1.75 = 11.25 in
Assume low relaxation strands
K = 0.28 for rectangular section behavior:
Reutral axis position, c:
fpu = 270 ksi
fc = 3.4 ksi

$$\alpha_1 f_c'\beta \beta + kA_{ps} \frac{f_{pu}}{d_p}$$

 $\alpha_1 f_c'\beta \beta + kA_{ps} \frac{f_{pu}}{d_p}$
 ominal Flexural Resistance, Mr = ϕ Mn
 ϕ from article 5.5.4.2
Mn = Aps fps (dp-a/2) = 7564.73 k-in or 630.3942 k-ft
 $0.75 \le \phi = 0.75 + \frac{0.25(\varepsilon_r - \varepsilon_{cl})}{(\varepsilon_u - \varepsilon_{cl})} \le 1.0$ (5.5.4.2-1)
 $\alpha_1 f_c'\beta \beta + kA_{ps} f_{ps} = f_{pu} \left(1 - k \frac{c}{d_p} \right)$

0.002 ecl = etl = 0.005 φ= 1

Compression controlled strain limit in steel Tension controlled strain limit in steel

Mr = C = 630.39 K-ft 8.1 Prestress losses

a) Elastic shortening:

Ep = Ect =?	28500 ksi		Δf_{pES}	$= \frac{E_p}{E_{ct}} f_{cgp}$		(5.9.3.2.3a-1)
Strength o	f concrete at transfer,	f'ci				
f'ci =	4 ksi		where	e:		
Ect =	3604.997 ksi		F		C 1 4 1 1 C	
Self-weigh sw = Mdc at mi Mdc = Prestress i	t of member, sw 0.550521 k/ft ddle of beam (conside 59.88634 k-ft nitial pulling force, 759	r max span) % fpu	$E_p = E_{ct} = f_{cgp} =$	 modulu modulu time of concret prestret force i weight maxim 	as of elasticity of p is of elasticity of cload application (the stress at the ssing tendons du mmediately after of the member um moment (ksi).	concrete at transfer or (ksi) center of gravity of te to the prestressing transfer and the self- er at the section of
fpi =	202.5 ksi					
Assume el	astic shortening loss =		0.042	fpu	(iterate on this gu	uess)
Prestress s	stress at transfer =		191.16	ksi		
A nc =		528.5 in	2			
S at cg of s	strands =	1738.869 in	3			
fcg =		1.426582 ks	si			
Δf_{pES} =		11.27812 ks	si	or	0.042 fpu	
	b) Long term losses	(Use AASHTO				
Н =	75% Relative	humididty		f		
fpi =	202.5 ksi		$\Delta f_{pLT} = 1$	$0.0 \frac{\mu}{A_r} \gamma_h \gamma_h \gamma_h \gamma_h \gamma_h \gamma_h \gamma_h \gamma_h \gamma_h \gamma_h$	$\gamma_{st} + 12.0\gamma_h\gamma_{st} + \Delta f_{pR}$	(5.9.3.3-1)
Aps =	3.213 in ²			- 1 27		
Ag =	1092 in ²		in which	1:		
0			v = 1.7	-0.01H		(5933-2)
γ _h =	0.95		$I_{h} = 1.7$	0.0111		(5.5.5.5 2)
γ_{st} =	1.000			5		(50222)
			$\gamma_{st} = \frac{1}{(1+1)^{1-1}}$	$f_{ci}')$		(3.9.3.3-3)
Δf_{pR} =	2.4 ksi		where:			
$\Delta f_{pLT} =$	19.46026 ksi		$f_{pi} =$ $\gamma_h =$	prestressing transfer (ks correction ambient air	g steel stress imme i) factor for relative	ediately prior to humidity of the

Total prestress loss = 30.73838 ksi

Stresses in prestressed steel after losses:

Assume that prestress was pulled at 75% of fpu

Assume a lump sum loss of 45 ksi (approximation used in AASHTO standard specs, 9.16.2.2)

fpo = 171.7616 ksi or 63.62% of fpu

Compression stress in tension fiber (bottom od deck)

 σ bottom PT = P/A + P.e/Sbottom

e = Ycg prestress panel - 1.75 =	1.9186771 in
Sbottom-prestress panel =	909.40894 in ³
Area_prestress panel =	528.5 in ²

At Spans 1 and 4:

P =	420.4724 k
σ bottom PT =	1.682711 ksi

At Spans 2 and 3:	
P =	551.8701 k
σ bottom PT =	2.208559 ksi

9. Load Rating for Design Vehicle HL93, Permit Load and Legal Loads

<u>Rating equation:</u> Use MBE Equation 6A.4.2.1-1 as expanded below:

$$RF = \frac{C - \left[\gamma_{DC} \cdot DC + \gamma_{DW} \cdot DW + \gamma_{EL} \cdot EL + \gamma_{FR} \cdot FR + \gamma_{CR} \cdot (TU + CR + SH)\right]}{\gamma_{LL} \cdot (LL + IM)}$$

- RF Rating factor
- C Factored capacity.
- y Load factor
- DC Component dead load
- DW Wearing dead load
- EL Permanent locked-in erection forces
- FR Bearing friction, or frame action
- TU Uniform temperature
- CR Creep
- SH Shrinkage
- LL Live load
- IM Dynamic impact

Limit	DC ⁷	LL Inventory	LL Operating	LL Legal	LL FL120	LL EV
Strength ¹	1.25/0.90	1.75	1.35	1.35	1.35	1.30
Service ² II	1.00	1.30	1.00	1.30	0.90	0.90
Strength ¹	1.25/0.90	1.75	1.35	1.35	1.35	1.30
Service ² I	NA	NA	NA	NA	NA	NA
Strength ¹	1.25/0.90	1.75	1.35	1.35	1.35	1.30
Service ² III	1.00	0.80	NA, 0.80 ⁵	NA, 0.80 ⁵	NA, 0.70 ⁵	NA, 0.70 ⁵
	Limit Strength ¹ Service ² II Strength ¹ Service ² I Strength ¹ Service ² III	LimitDC7Strength11.25/0.90Service2 II1.00Strength11.25/0.90Service2 INAStrength11.25/0.90Service2 III1.00	Limit DC7 LL Inventory Strength1 1.25/0.90 1.75 Service2 II 1.00 1.30 Strength1 1.25/0.90 1.75 Service2 II 1.00 1.30 Strength1 1.25/0.90 1.75 Service2 I NA NA Strength1 1.25/0.90 1.75 Service2 III 1.00 0.80	Limit DC7 LL Inventory LL Operating Strength1 1.25/0.90 1.75 1.35 Service2 II 1.00 1.30 1.00 Strength1 1.25/0.90 1.75 1.35 Service2 II 1.00 1.30 1.00 Strength1 1.25/0.90 1.75 1.35 Service2 I NA NA NA Strength1 1.25/0.90 1.75 1.35 Service2 II NA NA NA Strength1 1.25/0.90 1.75 1.35 Service2 III 1.00 0.80 NA, 0.80 ⁵	Limit DC7 LL Inventory LL Operating LL Legal Strength1 1.25/0.90 1.75 1.35 1.35 Service2 II 1.00 1.30 1.00 1.30 Strength1 1.25/0.90 1.75 1.35 1.35 Service2 II 1.00 1.30 1.00 1.30 Strength1 1.25/0.90 1.75 1.35 1.35 Service2 I NA NA NA NA Strength1 1.25/0.90 1.75 1.35 1.35 Service2 I NA NA NA NA Strength1 1.25/0.90 1.75 1.35 1.35 Service2 III 1.00 0.80 NA, 0.80 ⁵ NA, 0.80 ⁵	Limit DC7 LL Inventory LL Operating LL Legal LL FL120 Strength1 1.25/0.90 1.75 1.35 1.35 1.35 Service2 II 1.00 1.30 1.00 1.30 0.90 Strength1 1.25/0.90 1.75 1.35 1.35 1.35 Service2 II 1.00 1.75 1.35 1.35 1.35 Service2 I NA NA NA NA NA Strength1 1.25/0.90 1.75 1.35 1.35 1.35 Service2 I NA NA NA NA NA Strength1 1.25/0.90 1.75 1.35 1.35 1.35 Service2 III 1.00 0.80 NA, 0.80 ⁵ NA, 0.80 ⁵ NA, 0.70 ⁵

FDOT Table 6A.4.2.2-1—LRFR Limit States and Load

a) Inventory Rating for HL93

a1) Service conditions (t	tension stress at deck bottom is checked)
---------------------------	---

	C = Capacity = 6 sqrt (f	c) =	0.4242641	ksi	
	Sbottom nc =	909.4089	in ³		
	Sbottom c =	3266.59	in ³		
a1.1) Span	s 1 and 4				
	Mdc1 (nc) =	85.05	k-ft		
	Mdc2 (c) =	8.68	k-ft		
	M(LL+I) =	202.7492	k-ft	0.8 M(LL+I) =	162.1994 k-ft
	Odc1 =	1.122267	ksi		
	σ dc2 =	0.031886	ksi		
	$\sigma(LL + I) =$	0.595849	ksi		
	RF =	1.599			
a1.2) Span	s 2 and 3				
	Mdc1 (nc) =	129.85	k-ft		
	Mdc2 (c) =	13.3	k-ft		
	M(LL+I) =	273.2219	k-ft	0.8 M(LL+I) =	218.5775 k-ft
	σdc1 =	1.713421	ksi		
	σ dc2 =	0.048858	ksi		
	σ(LL +I)=	0.802957	ksi		
	RF =	1.084			

a2) Streng	<u>gth conditions</u>				
	γ_{dc} =	1.25	$\gamma_{ m LL}$	L =	1.75
a2.1) Spar	ns 1 and 4				
<i>2</i> 1	C = Capacity = N	/lr =	509.58 k-1	ft	
	RF =		1.106		
a2.2) Spar	ns 2 and 3				
	C = Capacity = N	⁄lr =	630.39 k-	ft	
	RF =		0.944		
b) Operating Rating fo	<u>r HL93</u>				
In accorda	ance to the FDOT	LR manua	l, only stre	ength conditions	are checked.
b1.1) Spa	ns 1 and 4				
	$\gamma_{dc} =$	1.25	γ_{LL}	L =	1.35
	RF =		1.434		

h1 2) Spans 2 and 3	
51.2) Spans 2 and 5	
RF =	

c) Rating Factors for Legal and Permit vehicle

γ_{dc} = 1.25 γ_{LL} = 1.3
--

1.224

c1) Spans 1 and 4	
C = Capacity = Mr =	509.58 k-ft
Mdc1 (nc) =	85.05 k-ft
Mdc2 (c) =	8.68 k-ft

Vehicle	M (LL+I)	RF
SU2	93.45	3.110
SU3	164.65	1.765
SU4	184.26	1.578
C3	102.81	2.827
C4	155.12	1.874
C5	148.82	1.953
ST5	129.51	2.244
FL120	226.41	1.284

c1) Spans 2 and 3

C = Capacity = Mr =	630.39 k-ft
Mdc1 (nc) =	129.85 k-ft
Mdc2 (c) =	13.3 k-ft

Vehicle	M (LL+I)	RF
SU2	123.59	2.706
SU3	220.93	1.514
SU4	240.04	1.393
C3	156.75	2.133
C4	222.75	1.501
C5	224.09	1.492
ST5	192.55	1.737
FL120	308.72	1.083

10. Load Rating Summary

Bending at middle of spans 2 and 3 controls

Level	Vehicle	Limit	RF
Inventory	HL93	Service	1.084
		Strength	0.944
Operating	HL93	Strength	1.224
Legal	SU2	Strength	2.706
	SU3	Strength	1.514
	SU4	Strength	1.393
	C3	Strength	2.133
	C4	Strength	1.501
	C5	Strength	1.492
	ST5	Strength	1.737
Permit	FL120	Strength	1.083

Precast







PLAT BOOK	
PAGE	
DOCKET No.	
SHEET	4 OF 4
GENERAL NOTES:

1. BEARINGS AND COORDINATES AS SHOWN HEREON ARE BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, NORTH AMERICAN DATUM OF 1983/1999 READJUSTMENT. THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 34, TOWNSHIP 32 SOUTH, RANGE 39 EAST BEARS NORTH 00°58'55" EAST AND ALL OTHER BEARINGS SHOWN HEREON ARE RELATIVE THERETO.

2. STATION AND OFFSETS ARE RELATIVE TO THE BASELINE OF SURVEY FOR AVIATION BLVD. UNLESS OTHERWISE NOTED.

3. ALL BEARINGS AND DISTANCES ARE CALCULATED UNLESS OTHERWISE SPECIFIED.

4. UNDERGROUND FOUNDATION ENCROACHMENTS NOT LOCATED.

5. PROPERTY BOUNDARIES DETERMINED FROM FIELD SURVEY, PLATS OF RECORD.

6. ONLY FIXED IMPROVEMENTS PERTINENT TO THE PARCELS TO BE ACQUIRED ARE SHOWN. FIXED INTERIOR IMPROVEMENTS NOT LOCATED.

7. THIS CONTROL SURVEY WAS PREPARED UNDER THE RESPONSIBLE CHARGE OF G. MARTIN BURDETTE, FLORIDA PROFESSIONAL LAND SURVEYOR AND MAPPER NUMBER 4136. CERTIFIED COPIES OF THIS SURVEY ARE FILED OF RECORD IN INDIAN RIVER COUNTY.

8. THIS CONTROL SURVEY WAS PREPARED FOR THE PURPOSE OF PREPARING RIGHT OF WAY MAPS FOR ROADWAY EXPANSION PURPOSES.

9. SIDE STREET ALIGNMENTS ARE ASSIGNED A STATION OF 30+00.00 AT THE POINT OF INTERSECTION WITH THE BASELINE OF SURVEY FOR AVIATION BLVD. UNLESS OTHERWISE NOTED.

10. RIGHT OF WAY MONUMENTS TO BE SET AFTER CONSTRUCTION OF PROJECT IS COMPLETED.

LEGEND: DELTA ANGLE $\Delta OR D =$ PER DESCRIPTION (DESC.) FIELD MEASURED (F) PER PLAT (P) ADDITIONAL ADD. BASELINE BUILDING BLDG. CENTERLINE CONCRETE BLOCK STRUCTURE CMON CONCRETE MONUMENT CONC. CONCRETE COR. CORNER COVB CITY OF VERO BEACH D.B. DEED BOOK D.E. DRAINAGE EASEMENT DEDICATED DED. EASTING EXISTING EDGE OF PAVEMENT E/P EXISTING EXIŞT F.E.C FLORIDA EAST COAST FORMALLY KNOWN AS FKA FOUND FND. IP IRON PIPE IRON ROD IR IRON ROD & CAP IR&C LEFT LT. MON MONUMENT NORTHING NAIL & TIN TAB NL&T NO. NUMBER OFFICIAL RECORD BOOK 0.R.B Ρ.Β. PLAT BOOK POINT OF INTERSECTION P.I. PAGE PG. PK NAIL & TIN TAB PKNL&TT PK NAIL & WASHER PKNL&W PROPERTY LINE RADIUS RESIDENCE RES. R/R RAILROAD RIGHT RT. RIGHT OF WAY R/W S.R. STATE ROAD SEC. SECTION STA. STATION T.C.E. TEMPORARY CONSTRUCTION EASEMENT PERMANENT EASEMENT Ρ.Ε. UTILITY EASEMENT U.E. WD. FRM. WOOD FRAMED

BURDETTE & ASSOCIATES, INC. 1680 STONEWALL DRIVE VERO BEACH, FLORIDA 32966 (772) 299-4488

Barber Ave EVERO BEACH Cherry Lane MUN. AIRPORT AVIATION BLVD Cana Exit 147 **LSR** O sceo / a Blvd. 656 and the second 17th < NEW σ HIBISCUS edual indexts "acteda" abasian · Lins Rose M 12 10 11 (PVT.) <u>603</u> 8th St.SW SW 8th Nev 16 -18 15 14 Stever 13 4th St. 619 Ø 1st St. SW INDIAN RIVER

BEGIN R/W CONTROL SURVEY PI STA. 10+00 B SURVEY AVIATION BLVD.

THE CITY OF VERO BEACH, FLORID DEPARTMENT OF PUBLIC WORKS

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\EAST QUARTER COR SECTION 35

SOUTHEAST COR SECTION 35 N 1204358.842 E 851297.421 FD. DISK IN BOX CUT

EAST QUARTER COR SECTION 2

KEY SHEET FIELD BOOK NO.'S MAPS PREPARED BY RIGHT OF WAY CONTROL SURVEY BURDETTE & ASSOCIATES, INC. AVIATION BOULEVARD AS SHOWN SCALE: SHEET 3 OF 12 FROM 43rd AVENUE EAST TO EAST OF U.S. 1

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OINT NAME	(X) EASTING	(Y) NORTHING	SCALE FACTOR	LATITUDE	LONGITUDE	BASELINE	OFFSET	(Z) ELEVAT
A1	840609.224	1204461.947	0.999980	27° 38'45.88672185	80°25'48.99948606			24.335
A2	840740.250	1204405.095	0.999980	27° 38'45.31777548	80° 25'47.54545166	10+90.27	20.87' (RT)	24.618
A3	841590.124	1204453.031	0.999981	27° 38'45.75349522	80°25'38.09277700	19+39.94	30.58'(LT)	24.857
A4	842024.251	1204570.515	0.999981	27° 38'46.89687552	80°25'33.25941030	24+12.02	49.29'(LT)	23.862
A5	842526.019	1204817.237	0.999981	27° 38'49.31681149	80° 25'27.66718371	29+71.17	48.72'(LT)	23.846
A6	843249.815	1204962.512	0.999981	27° 38'50.72186575	80° 25'19.61127616	37+00.98	29.38'(LT)	23.978
А7	843480.510	1205419.431	0.999981	27° 38'55.23562626	80° 25'17.02221540	38+14.04	521.31' (LT)	22.871
A8	843143.158	1204517.262	0.999981	27° 38'46.31788686	80°25'20.82042658	36+14.08	423.55'(RT)	24.782
A9	843983.620	1204658.413	0.999982	27° 38'47.67656680	80° 25'11.46750213	44+90.04	28.13' (RT)	21.799
A10	843996.167	1204370.018	0.999982	27° 38'44.82026767	80° 25'11.34305292			24.134
A11	844154.058	1204943.511	0.999982	27° 38'50.49170595	80° 25'9.55739216	46+52.21	274.96'(LT)	21.282
A12	844486.342	1204645.294	0.999982	27° 38'47.52'323928	80° 25'5.87812440	49+85.92	21.66' (RT)	21.073
A13	844711.667	1204692.732	0.999982	27° 38'47.98245471	80° 25'3.37011683	52+11.01	26.86' (LT)	21.480
A14	844897.565	1205079.003	0.999982	27° 38'51.79867171	80° 25'1.28273759	53+95.06	414.02'(LT)	21.585
A15	844710.325	1204381.109	0.999982	27° 38'44.89679705	80° 25'3.40138748	52+11.17	284.77' (RT)	22.433
A16	845378.548	1204639:137	0.999982	27° 38'47.42055399	80°24'55.95750839	58+78.14	23.54' (RT)	19.912'
A17	846026.235	1204626.205	0.999983	27° 38'47.26208838	80°24'48.75619967	65+25.19	21.60' (LT)	21.529
A18	846564.769	1204444.614	0.999983	27° 38'45.43859081	80°24'42.77755997	70+95.59	28.11' (RT)	20.831
A19	847503.370	1204796 474	0.999983	27° 38'48 87836563	80°24'32.32205037	80+93 94	35.48' (RT)	18,804
A20	848555.044	1205211.743	0.999984	27° 38'52,94041087	80°24'20.60565221	92+24 48	17.06' (RT)	20.43
A21	849323.793	1205591.390	0.999984	27° 38'56.66299274	80°24'12.03699838	100+80.57	27.66' (RT)	19,485
A22	849954.860	1206477 471	0 999984	27° 39'5 40678182	80° 24'4.97188813	111+97 00	21.52' (LT)	17 260
Δ23	850151 698	1206484 712	0.999984	27° 39'5 46902675	80° 24'2 78264208			14 348
<u>A2J</u>	840658 798	1205310 547	0.999981	27° 38'54 28739795	80° 25'48 40468406	10+05 08	884 24' (I T)	24 086
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PROJECT NETWORK CONTROL TABULATION SHEET DETAILS

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VRB RUNWAY 30L-ALTERNATIVE RUNWAY PROTECTION ZONE – ALTERNATIVE ANALYSIS VERO BEACH REGIONAL AIRPORT

BACKGROUND			
1. AIRPORT:	2. LOCATION (CITY, STATE):		3. LOC ID:
VERO BEACH REGIONAL AIRPORT	VERO REACH, ELORIDA		VDR
	VERO BLACH, FLORIDA		VRD
4. EFFECTED RUNWAY: 30L APPROACH	5. APPROACH RPZ DIMENSION: LENGTH: 1 700 FEET	6. DEPARTURE RPZ	DIMENSION:
12R DEPARTURE	INNER WIDTH: 1,000 FEET	INNER WIDTH: 500 F	FEET
	OUTER WIDTH: 1,510 FEET ACRES: 48.978	OUTER WITH: 1,010 ACRES: 29.463	FEET
7 DESIGN AIRCRAFT OF RUNWAV			
Boeing 737-800W (ARC D-III) or Airbus A320	(ARC C-III)		
8. DATE OF LATEST FAA SIGNED ALP: October 20, 2016			
9. TRIGGERING EVENT (i.e. what event car	used the new or modified land use in the RPZ)		
An airfield project (e.g. runway extension	runway shift)		
A shange in the aritical design sizes θ when			
A change in the critical design aircraft wh	ich increases the RPZ dimensions		
A new or revised instrument approach pro	cedure that increases the RPZ dimensions		
X A local development proposal in the RPZ	(either new or reconfigured)		
Other (please describe):			
10. SELECT TYPE OF INCOMPATABLE L	AND USE IN RPZ:		
Buildings and structures (Examples includ	e, but are not limited to: residences, schools, chur	ches, hospitals or other m	nedical care facilities,
Recreational land use (Examples include, 1	but are not limited to: golf courses, sports fields, a	amusement parks, other p	laces of public assembly,
etc.) Transportation Facilities. (Examples inclu-	de, but are not limited to rail facilities (light or he	avy passenger or freight) public roads/highways
x vehicular parking facilities) ROAD IMPR	OVEMENTS/LANE ADDITIONS OR WIDENIN	NG	
Fuel storage facilities (above and below gr	round)		
Hazardous material storage (above and be	ow ground)		
Wastewater treatment facilities			
Above-ground utility infrastructure (i.e. el	ectrical substations), including any type of solar p	anel installations.	
Does the Airport Sponsor own or control the area	where the shows in competible land uses is to set	- 10 X X N	
bots the Allport sponsor own of control the area	a where the above incompatible land uses is locate	ed? Yes <u>X</u> No	
ALTERNATIVES ANALYSIS			
11. PROVIDE A DESCRIPTION OF EACH	ALTERNATIVE INCLUDE A NARRAITIVE	DISCUSSION AND EX	HIBITS OR FIGURES
DEPICTING THE ALTERNATIVE:			
Aviation Blvd. currently traverses the Runway 3	OL RPZ. It is a public-use perimeter road located	on Section 163 relevant l	and owned by the Vero Beach
RR). This intersection is located off airport prop	erty, but the project would include the widening a	tion Blvd., U.S. 1, and Floand/or addition of lanes to	orida East Coast Railroad (FEC Aviation Blvd. on Airport
property including within the Runway 30L RPZ. AVCON, INC. on behalf of the FDOT has propo	The FDOT, the sponsor of the intersection proje sed an additional six alternatives. All alternatives	ct, has proposed eight alto s are illustrated at the end	ernatives to the intersection. of this report.

ALTERNATIVE 1(Figure 2); Conventional intersection with an expanded Aviation Blvd. and railroad grade crossing to provide four eastbound lanes, a median separator and two west bound lanes. Access to Airport N. Drive is provided at grade.

ALTERNATIVE 2 (Figure 3): Twin Intersections with an expanded Aviation Blvd. and railroad grade crossing to provide four eastbound lanes, a median separator, and two westbound lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. This alternative would have a similar footprint on airport property as Alternative 1, except for the shared use path along the south side of Aviation Blvd.

ALTERNATIVE 3 (Figure 4): U.S. 1 Overpass Alternative with an expanded Aviation Blvd. and railroad grade crossing to provide four east bound lanes, a median separator, and two west bound lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. This alternative will have a similar footprint on airport property at Alternative 1.

ALTERNATIVE 4 (Figure 5): Aviation Blvd. Overpass (eliminated railroad grade crossing) would provide a four-lane overpass to move all Aviation Blvd. traffic over the railroad and U.S. 1 without a signalized intersection and without crossing the FEC RR. Access to Airport N. Drive is provided at grade. The Aviation Blvd. embankment created by the overpass is within the Runway 30L RPZ.

ALTERNATIVE 5 (Figure 6): Aviation Blvd. Underpass (without railroad grade crossing) would depress Aviation Blvd. under the FEC RR tracks and U.S. 1 with two eastbound and two westbound lanes. The existing railroad grade crossing would be removed. This alternative would have an open-cut section within the RPZ. Access to Airport N. Drive may require a re-route to the east to cross over the depressed roadway and connect back to Aviation Blvd. from the south side at a location west of the existing Airport N. Drive Intersection. This alternative would operate in free flow traffic conditions within the RPZ.

ALTERNATIVE 6 (Figure 7): Aviation Blvd. Overpass (with railroad crossing) would carry the Aviation Blvd. east-west lanes over U.S. 1 and the FEC RR tracks with an at grade railroad crossing for turning movements and a signalized intersection at U.S. 1. The access to Airport N. Drive is modified to a westbound right turn, southbound right turn access with a U-turn below the overpass to access Airport N. Drive from the west. The Aviation Blvd. overpass embankment is within the RPZ.

ALTERNATIVE 7 (Figure 8): Aviation Blvd. Conventional intersection with an expanded Aviation Blvd. and railroad grade crossing to provide four eastbound lanes, a median separator and two west bound lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. Would provide a railroad crossing at grade. Would provide for two west bound turning lanes onto Aviation Blvd. and one dedicated east bound turning lane onto Aviation Blvd. All other changes would occur south of the Aviation Blvd./FEC RR/U.S. 1 intersection.

ALTERNATIVE 8 (Figure 9): Aviation Blvd. Conventional intersection with an expanded Aviation Blvd. and railroad grade crossing to provide four eastbound lanes, a median separator and two west bound lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. Would provide a railroad crossing at grade. Would provide for two west bound turning lanes onto Aviation Blvd. and one dedicated east bound turning lane onto Aviation Blvd. All other changes would occur south of the Aviation Blvd./FEC RR/U.S. 1 intersection.

ALTERNATIVE 9 Figure 10): Re-route Aviation Blvd. around the existing Runway 30L RPZ. Aviation Blvd. would be closed between 27th Street and U.S. 1. Vehicles approaching 27th Street would be obliged to travel south on 27th Street, transition to 20th Ave. and south to 26th Street. The vehicles would travel east on 26th Street to U.S. 1. U.S. 1 can be traversed north to 32nd street if that is the ultimate direction. Aviation Blvd. south of 33rd Street would remain open as a private road to Airport traffic only. Airport N. Drive would be rerouted to hug the northern edge of the RPZ and would access Aviation Blvd. closer to the intersection with U.S. 1 and the FEC RR.

ALTERNATIVE 10 (Figure 11): Shorten Runway 30L by 1,100 feet, making Runway 12R/30L a total of 6,214 feet in length. Both the approach and departure RPZs would then be brought north of Aviation Blvd. Aviation Blvd. to remain in its current location and the preferred alternative from Alternatives 1 through 8 would be applied to Aviation Blvd. without further issues.

ALTERNATIVE 11 (Figure 12): Shorten Runway 30L by 810 feet and place a displaced threshold 290 feet north of the new threshold. This would make the shortened Runway 30L 6,504 feet long. The approach and departure RPZs would be offset 290 feet and both RPZs would be north of Aviation Blvd. Airport N. Drive would be re-routed north and east of the re-positioned approach and departure RPZs.

ALTERNATIVE 12 (Figure 13): Relocate Runway 12R/30L 1,100 feet northwest along its centerline to provide enough area to accommodate both the Runway 30L RPZs and Aviation Blvd. Extend Runway 12R by 1,100 feet to the northwest and re-route 43rd Avenue to the northwest around the RPZs for Runway 12R. All extensions and re-routing will be on currently owned Airport land.

ALTERNATIVE 13 (Figure 14): Shorten Runway 10L by 370 feet and depress Aviation Blvd. a minimum of 15 feet the full width of the approach RPZ for Runway 30L. The approach/departure road sloping down to each end of the clear-cut portion would need to be 453 feet long on each end as the current speed on Aviation Blvd. is posted at 40 miles per hour (mph), except for the curved portion of Aviation Blvd. where the speed limit is 25 mph. The clear-cut portions would need to be approximately 48 feet wide to allow for two lanes of traffic and pull-off areas. Where the Aviation Blvd. widens as it reaches the FEC RR, the roadway would widen to as much as 94 feet to accommodate up to seven lanes of traffic, two medians, and a shared use path. Runway 10L would be shortened by 370 feet for a total length of Runway 12R/30L of 6,944 feet. This would bring the approach RPZ to Runway 30L to the northwest enough to avoid conflict with the ascending Aviation Blvd. as it approaches the FEC RR and U.S. 1 intersection. Two new traffic lanes would be provided at grade adjacent to and south of Aviation Blvd. to allow access to 27th Street.

ALTERNATIVE 14 (Figure 15): Close Aviation Blvd. at the northeast side of the intersection of Aviation Blvd and 27th Street and again on the western side of the intersection of Aviation Blvd., FEC RR, and U.S. 1. Re-route Airport N. Drive south of 33rd Street to hug the northern edge of the RPZ and intersect with Aviation Blvd. closer to the intersection of U.S. 1 and the FEC RR. No improvements to the intersection of Aviation Blvd., the FEC RR, and U.S. 1. This alternative would not provide an alternative route through or around the Airport.

12. PROVIDE FULL COST ESTIMATES ASSOCIATED WITH EACH ALTERNATIVE REGARDLESS OF POTENTIAL FUNDING

SOURCES: These are Order of Magnitude Cost Estimates. Alternatives 1 through 8 only address the issues associated directly with the intersection of Aviation Blvd., U.S. 1, and the FEC RR. Alternatives 9 through 14 only address the issues of Aviation Blvd. and its presence in the RPZ of Runway 30L of the Vero Beach Regional Airport. Therefore, the costs of Alternative 1 were added to the cost estimates of Alternatives 9 through 14 where applicable, to achieve a total cost for Alternatives 9 through 14.

Alternative 1: \$14,701,000 Alternative 2: \$21,357,000

Alternative 3: \$44,872,000
Alternative 4: \$41,893,000
Alternative 5: \$34,975,000
Alternative 6: \$29,461,000
Alternative 7: \$23,687,000
Alternative 8: \$24,666,000
Alternative 9: \$22,117,000
Alternative 10: \$20,095,000
Alternative 11: \$19,823,000
Alternative 12: \$32,665,000
Alternative 13: \$26,224,000
Alternative 14: \$16,878,000

13. PROVIDE A PRACTICABILITY ASSESSMENT BASED ON THE FEASIBILITY OF THE ALTERNATIVE IN TERMS OF COST, CONSTRUCTABILITY AND OTHER FACTORS:

FDOT proposed improvements, currently being studied by WGI Inc., on behalf of the FDOT are proposed at the intersection of Aviation Blvd., U.S. 1, and the FEC RR. This intersection is located northeast of VRB Airport, where Aviation Blvd. traverses the RPZ for Runway 30L, the primary runway of the Airport. Currently, traffic at the intersection backs up along Aviation Blvd. into the RPZ and this backup is forecast to increase over the coming years. The purpose of the project is to relieve the congestion at this intersection and prevent the traffic from backing up into the Runway 30L RPZ. WGI Inc. has proposed eight alternatives that address the congestion caused by the intersection at Aviation Blvd., U.S. 1, and the FEC RR. These are Alternatives 1 through 8. None of these alternatives directly address the situation of Aviation Blvd. in the RPZ of Runway 30L. Therefore, AVCON, INC., on behalf of the FDOT has created an additional six alternatives that more specifically address the issue as it relates to Aviation Blvd. in the Runway 30L RPZ. These are Alternatives 9 through 14.

EXISTING CONDITIONS (Figure 1)

ALTERNATIVE 1 (Figure 2)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.
- Most cost effective of the alternatives at \$14,701,000.

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Adds four additional lanes, a median, and a 12-foot-wide shared use path onto a portion of the existing road in the RPZ.

ALTERNATIVE 2 (Figure 3)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.
- Among the top third of lower-cost alternatives

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Adds four additional lanes, a median, and a 12-foot-wide shared use path onto a portion of the existing road in the RPZ.

ALTERNATIVE 3 (Figure 4)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.
- Has the least amount of impact to the RPZ of the intersection only alternatives.

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Adds four additional lanes, a median, and a 12-foot-wide shared use path onto a portion of the existing road in the RPZ.
- Most costly alternative at \$44,872,000.

ALTERNATIVE 4 (Figure 5)

ADVANTAGES

• Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ. DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Adds four additional lanes, a median, and a 12-foot-wide shared use path onto a portion of the existing road in the RPZ.
- Higher end of cost range at \$41,893,000.
- Has the highest amount of overall impact to the RPZ of all the alternatives at 127,209 square feet or 2.92 acres.

ALTERNATIVE 5 (Figure 6)

ADVANTAGES

• Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ. DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Provides a declining ramp to an underpass at the intersection. A portion of the ramp within the RPZ is still above ground level for much of the RPZ.
- Potentially blocks the intersection of Airport N. Road and Aviation Blvd.
- Adds two additional lanes, a median, and retaining walls to the existing road in the RPZ.
- Higher end of cost range at \$34,975,000.
- Higher end of the amount of RPZ impact at 102,875 square feet or 2.36 acres.

ALTERNATIVE 6 (Figure 7)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.
- At the lower end of impact to the RPZ of the intersection only alternatives at 99,200 square feet or 2.28 acres

DISADVANTAGES

• Does not address the existing issue of a road in the RPZ.

- Adds an elevating ramp structure, two additional lanes, a median, and adjacent sidewalks along both sides of the ramp, as well as an additional non-structural median to an additional portion of the existing road within the RPZ.
- Potentially blocks the intersection of Airport N. Road and Aviation Blvd.
- Widens the existing Aviation Blvd. from two lanes to four lanes and adds a median between the two sets of lanes as well as the ascending ramp structure within the RPZ.

• Higher end of cost range at \$29,461,000.

ALTERNATIVE 7 (Figure 8)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.
- Second lowest impact to the RPZ of the intersection only alternatives at 97,265 square feet or 2.23 acres.

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Adds four additional lanes, a median, and a 12-foot-wide shared use path onto a portion of the existing road in the RPZ.

ALTERNATIVE 8 (Figure 9) ADVANTAGES

• Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ. DISADVANTAGES

- Does not address the existing issue of a public road in the RPZ.
- Adds a wide median, three additional lanes, and a 10-foot-wide shared use path on the south side of Aviation Blvd. in the RPZ.
- Second highest impact to the RPZ of all alternatives at 122,100 square feet or 2.8 acres.

ALTERNATIVE 9 (Figure 10)

ADVANTAGES

- Would prevent congestion from the intersection building up in the RPZ.
- Eliminates all public roads traveling through the RPZ thereby severely reducing the impact of these roads on the RPZ.
- Middle portion of the cost range at \$22,117,000.

DISADVANTAGES

- Moves the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection to the intersection of U.S. 1/FEC RR/26th Street.
- The intersection of Aviation Blvd. and Airport N. Drive is too closer to the intersection of Aviation Blvd./FEC RR/U.S. 1, which would no longer be congested due to the closure of Aviation Blvd. to public traffic.
- Unidentified city streets would need widening to accommodate increased traffic.

ALTERNATIVE 10 (Figure 11)

ADVANTAGES

- Eliminates the conflict between Aviation Blvd. and Airport N. Road and the Runway 30L RPZ.
- Lower end of cost range at \$20,095,000.

DISADVANTAGES

Runway 12R/30L would be shortened by 1,100 feet from 7,314 feet to 6,214 feet. The existing design aircraft for the Runway is an AAC C and an ADG of III, per the 2016 VRB Master Plan. Many of these aircraft require a runway length of about 5,385 feet and 6,250. Reducing the length of the runway could restrict some of the current design aircraft from landing at the Airport. The future design aircraft; an AAC of D and an ADG of III; would require an even longer runway of about 6,735 feet.

• Airport N. Road would need to be re-routed.

ALTERNATIVE 11 (Figure 12)

ADVANTAGES

- There would no longer be a conflict between the Runway 30L RPZ and Aviation Blvd. or Airport N. Road.
- Lower end of cost range at \$19,823,000

DISADVANTAGES

- There would be a displaced threshold on Runway 30L.
- Runway 12R/30L would be shortened by 810 feet from 7,314 feet to 6,504 feet. Most of the current design aircraft could use this runway, but a few would require a longer runway or would have to take a penalty by reducing their load. The future design aircraft would likely not be able to use the runway.
- Airport N. Road would need to be re-routed.

ALTERNATIVE 12 (Figure 13)

ADVANTAGES

- There would no longer be a conflict between the Runway 12R/30L RPZ, Aviation Blvd., and Airport N. Road
- Runway 12R/30L would remain at 7,314 feet in length.
- Also corrects the presence of 43rd Ave. in the Runway 12R RPZ.

DISADVANTAGES

- 43rd Ave. would need to be re-routed around the Runway 12R RPZ.
- Airport N. Road would need to be re-routed around the relocated Runway 30L RPZ.
- Could restrict some future lengthening of Runway 12R/30L.
- Higher end of cost range at \$32,665,000.

ALTERNATIVE 13 (Figure 14)

ADVANTAGES

• Would eliminate the conflict between the Runway 30L RPZ, Aviation Blvd., and Airport N. Road.

DISADVANTAGES

 Would shorten Runway 30L by 370 feet to 6,944 to accommodate the decent from the Aviation Blvd./FEC RR/U.S. 1 intersection to the depressed portion of Aviation Blvd. to allow the entire descent to be outside of the RPZ.

ALTERNATIVE 14 (Figure 15)

ADVANTAGES

- Would eliminate the conflict between Aviation Blvd., the Runway 30L RPZ, and Airport N. Road.
- Second lowest alternative cost at \$16,878,000.

DISADVANTAGES

• Would not solve the issue of traffic, would only move it off the Airport.

- The intersection of Aviation Blvd. and Airport N. Drive is too close to the intersection of Aviation Blvd./FEC RR/U.S. 1, which would no
 longer be congested due to the closure of Aviation Blvd. to public traffic.
- Does not direct where the public traffic should move.

14. DESCRIBE THE PREFERRED ALTERNATIVE THAT WOULD MEET THE PROJECT PURPOSE AND NEED WHILE MINIMIZING RISK ASSOCIATED WITH THE LOCATION WITHIN THE RPZ:

The proposed action is to construct intersection improvements with as few modifications within the Runway 30L RPZ as possible. Alternative 1 would provide an at-grade solution that would provide sufficient capacity at the intersection of Aviation Blvd., the FEC RR, and Route 1 to alleviate the congestion that currently builds along Aviation Blvd. and within the Runway 30L RPZ. Currently, Aviation Blvd. affects 69,333 square feet or 1.59 acres within the RPZ (about 3.2 percent of the RPZ), all of it outside the RSA and the Runway Object Free Area. Alternative 1 would affect another 31,215 square feet or 0.7 acres of RPZ land (about 1.5 percent of the RPZ) still outside the RSA and the Runway Object Free Area for a total of 100,548 square feet or 2.31 acres of affected land within the RPZ or about 4.7 percent of the RPZ. Alternative 1 would significantly reduce the number of cars queuing for the intersection within the RPZ and would maintain the current length and utility of Runway 12R/30L.

15. IDENTIFY ALL FEDERAL, STATE AND LOCAL TRANSPORTATION AGENCIES INVOLVED OR INTERESTED IN THE ISSUE: The City of Vero Beach, Florida; Indian River County, Florida; the Florida Department of Transportation, and the Federal Aviation Administration.

16. PROVIDE AN ANALYSIS OF THE SPECIFIC PORTION(S) AND PERCENTAGES OF THE RPZ AFFECTED, DRAWING A CLEAR DISTINCTION BETWEEN THE CENTRAL PORTION OF THE RPZ VERSUS THE CONTROLLED ACTIVITY AREA, AND CLEARLY DELINEATING THE DISTANCE FROM THE RUNWAY END AND RUNWAY LANDING THRESHOLD.

The existing Aviation Blvd. is located outside of the existing RSA and ROFA for Runway 30L. The areas and percentages of the RPZ of additional roadwork, as well as the total impact of either Airport N. Road or Aviation Blvd. to the Runway 30L RPZ was calculated along with the distances of either road to the runway end and/or the runway threshold. The results of these calculations are shown in tabular form in Figure 16.

17. PROVIDE AN ANALYSIS OF (AND ISSUES AFFECTING) SPONSOR CONTROL OF THE LAND WITHIN THE RPZ.

Aviation Blvd. is located on Airport property and a portion of the right-of way travels through the RPZ of Runway 30L. Aviation Blvd. is located outside of the RSA and the Runway Object Free Area. It appears from the Airport's Exhibit "A" that the land upon which Aviation Blvd. is located on Airport property was acquired through the Surplus Property Act of 1944. Additionally, the FAA has approval authority over any property that "i. Materially impacts the safety and efficient operation of aircraft at, to, or from the airport, and ii. adversely affects the safety of people or property on the ground adjacent to the airport as a result of aircraft operations" within the Airport Property line through Section 163 of the FAA Reauthorization Act of 2018. Portions of the RPZ, not associated with Aviation Blvd. or Airport N. Road, are associated with land that is not owned by the Airport.

18. ANY OTHER RELEVANT FACTORS FOR HEADQUARTERS CONSIDERATION:

The proposed upgrades to the intersection of Aviation Blvd., the FEC R.R., and Route 1 have City of Vero Beach and Airport support if the upgrades remain at grade. These would be representative of Alternatives 1, 2, 7, and 8. There does not appear to be a great deal of support for the intersection alternatives that include bridges or underpasses at the intersection. It is doubtful that anyone in the community would support an RPZ alternative that would include making Aviation Blvd. into a private Airport road forcing the re-routing of traffic to other areas of the community, such as Alternatives 9 and 14.

19. SIGNATURE OF ORIGINATOR	20. PRINTED NAME OF ORIGINATOR	21. DATE
mary Sodersturen	Mary Soderstrum, AIA, NCARB	19 June 2023
22. ORIGINATOR'S TITLE	23. TELEPHONE	24. E-MAIL
Senior Airport Planner	(407) 599-1122	MSoderstrum@avconinc.com

FIGURE 01 - EXISTING CONDITIONS

400 800 160

N

JUNE 2023

TWIN INTERSECTIONS DRAFT - SUBJECT TO REVISION 1/25/2023 STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD PD&E STUDY INDIAN RIVER COUNTY, FLORIDA FPID: 441693-1-22-02 ETDM NUMBER: 14475

EXISTING SR5 R/W

PROPOSED R/W

13

END PROJECT

NOTE (FOR ALL OF SR 5/US 1): DESIGN SPEED = 35 MPH e = RC

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FIGURE 5 - ALTERNATIVE 4 AVIATION BOULEVARD FOUR-LANE OVERPASS DRAFT - SUBJECT TO REVISION 1/25/2023 STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD PD&E STUDY INDIAN RIVER COUNTY, FLORIDA FPID: 441693-1-22-02 ETDM NUMBER: 14475

END PROJECT

NOTE: SR 5 / US 1 DESIGN SPEED = 45 MPH e = NC

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FIGURE 6 - ALTERNATIVE 5 AVIATION BOULEVARD UNDERPASS DRAFT - SUBJECT TO REVISION 1/25/2023 STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD PD&E STUDY INDIAN RIVER COUNTY, FLORIDA FPID: 441693-1-22-02 ETDM NUMBER: 14475

> NOTE: SR 5 / US 1 DESIGN SPEED = 45 MPH e = NC

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FIGURE 7 - ALTERNATIVE 6 AVIATION BOULEVARD OVERPASS DRAFT - SUBJECT TO REVISION 1/25/2023 STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD PD&E STUDY INDIAN RIVER COUNTY, FLORIDA FPID: 441693-1-22-02 ETDM NUMBER: 14475

> WATER TREATMENT PLANT (CITY OF VERO BEACH)

> > EXISTING SR5 R/W

APPROXIMATE POINT OF TIE-IN

NOTE: SR 5 / US 1DESIGN SPEED = 45 MPH e = NC

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FIGURE 10 - ALTERNATIVE 9 - RE-ROUTE AVIATION BOULEVARD

RUNWAY PROTECTION ZONE - ALTERNATIVE ANALYSIS

JUNE 2023

FIGURE 11 - ALTERNATIVE 10 - SHORTENED RUNWAY

2

RUNWAY PROTECTION ZONE - ALTERNATIVE ANALYSIS

JUNE 2023

FIGURE 12 - ALTERNATIVE 11 - DISPLACED THRESHOLD AND SHORTENED RUNWAY

\2023\2023.303.01 - FDOT D4 VRB RPZ Alternatives Analysis\CAD\2330301_Exhibit10.dwg May 24

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RUNWAY PROTECTION ZONE - ALTERNATIVE ANALYSIS

JUNE 2023

FIGURE 13 - ALTERNATIVE 12 - RELOCATED RUNWAY

JUNE 2023

FIGURE 14 - ALTERNATIVE 13 - DEPRESS AVIATION BOULEVARD AND SHORTEN RUNWAY

RUNWAY PROTECTION ZONE - ALTERNATIVE ANALYSIS

JUNE 2023

FIGURE 15 - ALTERNATIVE 14 - CLOSE AVIATION BOULEVARD TO ALL BUT AIRPORT TRAFFIC

RUNWAY PROTECTION ZONE - ALTERNATIVE ANALYSIS

JUNE 2023

Figure 16 VRB RUNWAY 30L RUNWAY PROTECTION ZONE IMPACTS BY ALTERNATIVE

	New Area of Impact in the Central Portion of the RPZ	New Area of Impact in the Controlled Activity Area	New Area of Impact within the Entire RPZ	Total Area of Impact in the Central Portion of the RPZ	Total Area of Impact in the Controlled Activity Area	Total Area of Impact within the Entire RPZ	Distance of Airport N. Road from Runway	Distance of Aviation Blvd. from Runway	Distance of Airport N. Road from Threshold	Distance of Aviation Blvd. from Threshold
Alternative	(Square Feet)	(Square Feet)	(Square Feet)	(Square Feet)	(Square Feet)	(Square Feet)	End (feet)	End (feet)	(feet)	(feet)
Existing	0	0	0	33,184	36,149	69,333	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.0%	0.0%	0.0%	1.6%	1.7%	3.2%	070 1 510	1 1 50 1 710	070 1 510	1 1 50 1 712
Alternative I	8,/24	22,491	31,215	41,908	58,640	100,548	8/9-1,519	1,150-1,/13	8/9-1,519	1,150-1,/13
Percentage of RPZ	0.4%	1.1%	1.5%	2.0%	2.7%	4.7%		1 1 50 1 510	050 1 510	1 1 50 1 510
Alternative 2	9,050	20,821	29,871	42,233	56,970	99,204	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.4%	1.0%	1.4%	2.0%	2.7%	4.6%	0.50 1.510		0.50 4 540	
Alternative 3	1,768	20,055	21,823	34,952	56,204	91,156	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.1%	0.9%	1.0%	1.6%	2.6%	4.3%				
Alternative 4	34,958	22,918	57,876	68,142	59,067	127,209	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	1.6%	1.1%	2.7%	3.2%	2.8%	6.0%				
Alternative 5	10,527	23,015	33,543	43,711	59,164	102,875	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.5%	1.1%	1.6%	2.0%	2.8%	4.8%		Т		
Alternative 6	11,451	18,417	29,868	44,635	54,566	99,200	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.5%	0.9%	1.4%	2.1%	2.6%	4.6%		Т		
Alternative 7	8,448	19,484	27,932	41,632	55,633	97,265	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.4%	0.9%	1.3%	2.0%	2.6%	4.6%		1		1
Alternative 8	30,997	21,770	52,767	64,181	57,919	122,100	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	1.5%	1.0%	2.5%	3.0%	2.7%	5.7%				
Alternative 9	0	0	0	0	0	0	Private Airport Road	Private Airport Road	Private Airport Road	Private Airport Road
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				
Alternative 10	0	0	0	0	0	0	Outside RPZ	Outside RPZ	Outside RPZ	Outside RPZ
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%		-		
Alternative 11	0	0	0	0	0	0	Outside RPZ	Outside RPZ	Outside RPZ	Outside RPZ
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				
Alternative 12	0	0	0	0	0	0	Outside RPZ	Outside RPZ	Outside RPZ	Outside RPZ
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				
Altownotive 13	0	0	0	0	0	0	Suppressed Below	Suppressed Below	Suppressed Below	Suppressed Below
Alternative 15	0.00/	0.00/		0.00/			Kullway Elevation	Kullway Elevation	Kullway Elevation	Kullway Elevation
Alternative 14	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	Private Airport Road	Private Airport Road	Private Airport Road	Private Airport Road
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				

Beachs • Saturday	side to Main Transit Hub ay hours of operation 8:00 a.m. – 5:00 p.m.	2 Indian River Mall to Main Transit Hub • Saturday hours of operation 8:00 a.m. – 5:00 p.m.	Gifford Health Center to Main Transit Hub • Saturday hours of operation 8:00 a.m. – 5:00 p.m.	4 IG Center to Main Transit Hub • Saturday hours of operation 8:00 a.m. – 5:00 p.m.	5 Sebastian (North Area) • Saturday hours of operation 8:00 a.m. – 5:00 p.m.	IG Center to Main Transit Hub • Saturday hours of operation 8:00 a.m. – 5:00 p.m.
Holiday Conn Way & Ocean Dr	ay nours of operation follow regular schedule. Beachside to Main Transit Hub 6:00 7:00 8:00 9:0010:00 11:00 12:00 1:00 0:00 0:00 0:00	Holiday hours of operation follow regular schedule. Indian River Mall to Main Transit Hub Indian River Mall (food court) 6:00 7:00 8:00 9:00 10:00 11:00 10:00 10:00 0:00 0:	Holiday hours of operation follow regular schedule. Gifford Health Center to Main Transit Hub Gifford Health Center Ford 700 800 900 10001100 1000 1000 1000	Holiday hours of operation follow regular schedule. IG Center to Main Transit Hub IG Center 600 700 800 900 1000 1000 1000 1000 1000 1000	Holiday hours of operation follow regular schedule. Sebastian River Medical Center to North County Transit Hub Sebastian River Medical Center 600 700 800 900 10001100 1000 100 000 000 000	Holiday hours of operation follow regular schedule. IG Center to Main Transit Hub IG Center 6:00 7:00 8:00 9:00 10:00 11:00 100 2:00 2:00 4:00 5:00 5:00
South End of Boardwalk Vero Beach Hotel & Spa	** * * * * * * * * * * * * * * * * * *	Shoe Carnival * <	US 1 & 45 St * * * * * * * * * * * * * * * * * * *	Oslo Rd & TCCH *	Riverwalk Plaza (roadside US 1) * * * * *	The Preserve at Oslo ** *
Sexton Plaza Costa d'Este	· · · · · · · · · · · · · ·	Walmart (roadside) *	45 St & Indian River Blvd ** * * * * * * * * * * * * * * * * * *	Oslo Rd & 10 Ave SW * ** * * * * * * * * * * * * * * * * *	US 1 & Davis St * * * * * * * * * * * * * * * * * *	15 St & 20 Ave SW * * * * * * * * * * * * * * * * * * *
Humiston Park Cardinal & Camelia	· · · · · · · · · · · · · ·	20 St & 41 Ave * ** * * * * * * * * * * * * * * * * *	7 Terr & 37 St (777 Building) * * * * * * * * * * * * * * * * * * *	S Vero Plaza (McDonalds roadside) * * * * * * * * * * * * * * * * * * *	Grace's Landing * * * * * * * * * * * * * * * * * * *	17 Lane SW & Highland Dr * </th
Casey's Beachland & A1A		Aviation Blvd & Airport Dr * * * * * * * * * * * * * * * * * * *	Cleveland Clinic IRH Hlth/Wellness * * * * * * * * * * * * * * * * * *	US 1 & 1 SL * * * * * * * * * * * * * * * * * *	Main St & Powerline Rd * * * * * * * * * * * * * * * * * * *	Highland Dr & 21 St SW * * * * * * * * * * * * * * * * * * *
Vero Beach City Marina Parc 24	SSSSSSSSSSSSSS * * * * * * * * * * * * *	20 St & 27 Ave * ** * * * * * * * * * * * * * * * * *	37 St & 15 Ave * * * * * * * * * * * * * * * * * * *	IR Blvd & 8 St * * * * * * * * * * * * * * * * * * *	Main St & Poinciana St * ** * * * * * * * * * * * * * * * * *	Highlands Clubhouse ** *
Miracle Mile Plaza (roadside) 21 St & 7 Ave		19 St & 20 Ave * ** * * * * * * * * * * * * * * * * 19 St & 16 Ave * ** * * * * * * * * * * * * * * * * *	US 1 & 11 Ave * * * * * * * * * * * * * * * * * * *	IR Blvd & Bridgewater Medical * * * * * * * * * * * * * * * * * * *	Fleming St & Hibiscus Ave * * * * * * * * * * * * * * * * * * *	Iniginality of & old Dixle Hwy * <
US 1 & 20 St US 1 & 17 St (Walgreens)	* * * * * * * * * * * * *	14 Ave & 16 St * ** * * * * * * * * * * * * *	10 Ave & 18 St * * * * * * * * * * * * * * * * *	b AVe & 16 St * * ** * * * * * * * * * * * * * * * Gardenia Gardens * * * * * * * * * * * * * * * * * * * 6 Ave & 12 St * * * * * * * * * * * * * * * * * * *	Fleming St & Vocelle Ave ************************************	Old Dixie Hwy & 4 PI SW *
Main Transit List	Main Transit Hub to Beachside	Main Transit Hub to Indian River Mall Main Transit Hub 6:30 7:30 8:30 9:30 10:30 11:30 12:30 3:30 4:30 5:30 6:30 14 Ave & 16 ST * * * * * * * * * * * * * * * * * * *	Main Transit Hub 6:30 7:30 8:30 9:30 10:30 12:30 1:30 2:30 3:30 4:30 5:306:3010 10 Ave & 18 St * * * * * * * * * * * * * * * * * * *	6 Ave & 8 St * * * * * * * * * * * * * * * * * * *	שמוטפר אַ געסטע אַ אָאָאָ אָ	Old Dixie Hwy & 2 St ** *
US 1 & 17 St (Walmart Market) US 1 & 19 Pl	et) * * * * * * * * * * * * * * * * * *	14 Ave & 19 St * ** * * ** * * * * * * * * * * * * * * * * * 20 St & 17 Ave * ** * * * * * * * * * * * * * * * * * * * * * * *	10 Ave & 20 Pl * * * * * * * * * * * * * * * * * * *	IR Plaza - Dollar Store * ** * * * * * * * * * * * * * * * *	North County Transit Hub to Sebastian River Medical Center	Old Dixie Hwy & 8 St ** * <t< th=""></t<>
21 St & 7 Ave Treasure Coast Plaza (roadside)	* * ** * * * * * * * * * * *	20 St & De Leon Ave * * * * * * * * * * * * * * * * * * *	US 1 & 28 St * * * * * * * * * * * * * * * * * *	Main Transit Hub to IG Center Main Transit Hub 6:30 7:30 8:30 9:30 10:30 12:30 1:30 2:30 3:30 4:30 5:30 6:30	North County Transit Hub 6:30 7:30 8:30 9:30 10:30 11:30 12:30 1:30 2:30 3:30 4:30 5:30 6:30 Barber St & Cody * <th>Main Transit Hub 6:30 7:30 8:30 9:3010:30 11:30 12:30 3:30 4:30 5:30 6:30</th>	Main Transit Hub 6:30 7:30 8:30 9:3010:30 11:30 12:30 3:30 4:30 5:30 6:30
Parc 24 Royal Palm Pointe A	· · · · · · · · · · · · · ·	Aviation Blvd & 27 Ave ** * * * * * * * * * * * * * * * * * *	37 St & 17 Ave * * * * * * * * * * * * * * * * * * *	Kmart * * * * * * * * * * * * * * * * * * *	Fleming St & Vocelle Ave *** * </th <th>Old Dixie Hwy & 14 Ave * * * * * * * * * * * * * * * * * * *</th>	Old Dixie Hwy & 14 Ave * * * * * * * * * * * * * * * * * * *
Riverside Park Dr & Beachland E E Indian River Dr % D	nd Blvd s s s s s s s s s s s s s s s s s s s	34 Ave & 20 St * * * * * * * * * * * * * * * * * * *	35 Lane & 11 Ct (VOVN Bldg) *	US 1 & 10 St (The Source) ** * * * * * * * * * * * * * * * * *	Fleming St & Lake Dr * ** * * * * * * * * * * * * * * * * *	Homeless Family Ctr & 4 St * </th
Vero Beach City Marina E Indian River Dr & Beachland	**** *	20 St & 41 Ave * ** * * * * * * * * * * * * * * * * * * * * * * * * * * * 20 St & 53 Ave (Walmart) ** * * * * * * * * * * * * * * * * * *	Cleveland Clinic IRH Main Entrance *	6 Ave & 12 St * * * * * * * * * * * * * * * * * *	Main St & Poinciana St * * * * * * * * * * * * * * * * * * *	Old Dixle Hwy & 1 St SW *
Wells Fargo Conn Way & Ocean Dr.	7:00 8:00 9:00 10:0011:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00	20 St Panera (roadside) * <th>41 St & Indian River Blvd ** * * * * * * * * * * * * * * * * * *</th> <th>6 Ave & 16 St * <</th> <th>Perican isle Apartments * * * * * * * * * * * * * * * * * * *</th> <th>Old Dixie Hwy & 10 St SW (UP)* <td< th=""></td<></th>	41 St & Indian River Blvd ** * * * * * * * * * * * * * * * * * *	6 Ave & 16 St * <	Perican isle Apartments * * * * * * * * * * * * * * * * * * *	Old Dixie Hwy & 10 St SW (UP)* * <td< th=""></td<>
1	s = Spacial star (Shoe Carnival * * * * * * * * * * * * * * * * * * *	Orchard Grove & 45 St * * * * * * * * * * * * * * * * * * *	IR Blvd & Indian River Apts ** * * * * * * * * * * * * * * * * * *	Grace's Landing * * * * * * * * * * * * * * * * * * *	Highland Dr & Old Dixle Hwy *
Ria	S – Special Stop () Riders must call for pick up at special stops.		Ginoru Health Center 7:00 8:00 9:0010:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00	IF Bive & 0 St * * * * * * * * * * * * * * * * * * *	US 1 & Wendy's * * * * * * * * * * * * * * * * * * *	Highland Dr & 8 Ave SW *
1				Vista Royale (roadside) * ** * * * * * * * * * * * * * * * * *	Sebastian River Medical Center 7:00 8:009:00 10:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00	Highland Dr & 21 St SW * * * * * * * * * * * * * * * * * * *
1				Oslo Rd & 8 Ct SW * ** * * * * * * * * * * * * * * * * *		17 Lane SW & 15 Ave SW *
1		N		Oslo Rd & 12 Ave SW * ** * * * * * * * * * * * * * * * * *		10 5t 5W & 20 Ave SW * * * * * * * * * * * * * * * * * * *
				יניט צ:טט 9:0010:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00		
7 IG Cente • Saturd	ter to Indian River Mall ay hours of operation 8:00 a.m. – 5:00 p.m.	B Gifford Health Center to Main Transit Hub • Saturday hours of operation 8:00 a m = 5:00 a m	9 North County Transit Hub to Indian River Mall • Saturday hours of operation 8:00 a.m. 5:00 a.m.	10 Fellsmere to North County Transit Hub • Saturday hours of operation 8:00 a m = 5:00 a m	 Sebastian (South Area) Saturday hours of operation 8:00 a m = 5:00 cm 	13 Indian River Mall to Vero Fashion Outlets • No bus service on Saturday.
• Holiday	ay hours of operation follow regular schedule. IG Center to Indian River Mall	Holiday hours of operation follow regular schedule. Gifford Health Center to Main Transit Hub	Holiday hours of operation follow regular schedule. North County Transit Hub to Indian River Mall	Holiday hours of operation follow regular schedule. Sonrise Apartments to North County Transit Hub	Holiday hours of operation follow regular schedule. Indian River Publix to North County Transit Hub	Holiday hours of operation follow regular schedule. Indian River Mall to Vero Fashion Outlets
IG Center The Preserve at Olso (Oslo Rd)	6:00 7:00 8:00 9:00 10:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00 * <td< td=""><td>Gittord Health Center 6:00 7:00 8:00 9:00 10:00 11:00 12:00 1:00 2:00 3:00 6:00 45 St & 30 Ave * ** * * * * * * * * * * * * * * * * *</td><td>North County Transit Hub 6:30 7:30 8:30 9:30 10:30 11:30 12:30 3:30 4:30 5:30 Sebastian River High School *** *</td><td>Sonrise Apartments 5:50 6:50 7:50 8:50 9:50 10:50 11:50 12:50 1:50 2:50 3:50 4:50 5:50 6:50 Lincoln Rd & Willow St * * * * * * * * * * * * * * * * * * *</td><td>Indian River Publix (Barber St) 6:00 7:00 8:00 9:00 10:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00 US 1 & Whispering Palms ** *</td><td>Indian River Mall 6:00 7:00 8:00 9:00 10:00 1:00 2:00 3:00 4:00 5:00 6:00 58th Ave & College Lane ** *</td></td<>	Gittord Health Center 6:00 7:00 8:00 9:00 10:00 11:00 12:00 1:00 2:00 3:00 6:00 45 St & 30 Ave * ** * * * * * * * * * * * * * * * * *	North County Transit Hub 6:30 7:30 8:30 9:30 10:30 11:30 12:30 3:30 4:30 5:30 Sebastian River High School *** *	Sonrise Apartments 5:50 6:50 7:50 8:50 9:50 10:50 11:50 12:50 1:50 2:50 3:50 4:50 5:50 6:50 Lincoln Rd & Willow St * * * * * * * * * * * * * * * * * * *	Indian River Publix (Barber St) 6:00 7:00 8:00 9:00 10:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00 US 1 & Whispering Palms ** *	Indian River Mall 6:00 7:00 8:00 9:00 10:00 1:00 2:00 3:00 4:00 5:00 6:00 58th Ave & College Lane ** *
оно ка & 27 Ave (Dollar General) 27 Ave & 5 St SW 27 Ave & 1 St SW	······································	35 Ave * * * * * * * * * * * * * * * * * * *	86 Lane & 66 Ave *	Booker St & Grant Ave * ** * * * * * * * * * * * * * * * * *	Delores St & Schumann Dr	IRSC Mueller Campus * * * * * * * * * * * * * * * * * * *
27 Ave & 4 St 27 Ave & 8 St		43 St & 31 Ave * * * * * * * * * * * * * * * * * * *	64 Ave & 85 St * * * * * * * 85 St & 62 Ave * * * * * * *	Grace Ave & Meadow Ct ** * * * * * * * * * * * * * * * * * *	Engress Dr & Schumann Dr ** *	Mission (Vero Green) * * * * * * * * * * * * * * * * * Walker Woods * * * * * * * * * * * * * * * * * * *
20 Ave & 8 St 20 Ave & 10 Pl	· · · · · · · · · · · · ·	43 St & 26 Ave * * * * * * * * * * * * * * * * * * *	85 St & 59 Ave * * * * * * * * * * * * * * * * * * *	New York Ave & N Lime St * <th>Day Dr & Schumann Dr * * * * * * * * * * * * * * * * * * *</th> <th>VIIlage Green/Poinciana *</th>	Day Dr & Schumann Dr * * * * * * * * * * * * * * * * * * *	VIIlage Green/Poinciana *
20 Ave & 12 St 27 Ave & 12 St	· ·· · · · · · · · · · · ·	US 1 & 38 Lane	58 Ave & // St * ** * * * * * * * * * * * * * * * * *	New York Ave & Broadway St 6:00 7:00 8:00 9:00 10:0011:0012:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 Broadway St & CR 512 * * * * * * * * * * * * * * * * * * *	Concha Dr & Barber St * * * * * * * * * * * * * * * * * * *	SR 60 & 79 Ave * * * * * * * * * * * * * * * * * * *
27 Ave & 16 St Leisure Square & 16 St	· · · · · · · · · · · · · · ·	27 St & UP Center * * * * * * * * * * * * * * * * * * *	58 Ave & 65 St *	S Oleaner St & CR 512 * * * * * * * * * * * * * * * * * * *	Benedictine Terr & Barber St ** * <t< th=""><th>82 Ave & Vero Palm Estates * * * * * * * * * * * * * * * * * * *</th></t<>	82 Ave & Vero Palm Estates * * * * * * * * * * * * * * * * * * *
43 Ave & 16 St 20 St & 50 Ave 20 St & 53 Ave		14 Ave & 19 St * ** * * * * * * * * * * * * * * * * *	58 Ave & 49 St *	Broadway St & Massachusetts Ave * * * * * * * * * * * * * * * * * * *	Winn Dixie *	02 Ave α ο δι * ** * * * * * * * * * * * * * * 90 Ave & 8 St * ** * * * * * * * * * * * * * * * * *
20 St Panera (roadside) 20 St Bob Evans (roadside)	** * * * * * * * * * * *	Main Transit Hub to Gifford Health Center	58 Ave & 41 St * * * * * * * * * * * * * * * * * * *	S EIM St & Iennessee Ave * * * * * * * * * * * * * * * * * * *	Indeclaritie into a Dolphillin AveSS	90 Ave & Hale Groves ** * * * * * * * * * * * * * * * 90 Ave & TA Travel Center * * * * * * * * * * * * * * * * * * *
	Indian River Mall to IG Center	Main Transit Hub 6:30 7:30 8:30 9:30 10:30 11:30 12:30 3:30 4:30 5:30 6:30 14 Ave & 16 St *<	Indian River Mall to North County Transit Hub	CR 512 & 128 Ave * ** * * * * * * * * * * * * * * * * *	AutoZone (512 roadside) ** * * * * * * * * * * * * * * * * *	CVS Distribution Center s ssssssss
Indian River Mall Chik-Fil-A (roadside)	6:30 7:30 8:30 9:30 10:30 11:30 12:30 1:30 2:30 3:30 4:30 5:30 6:30	14 Ave & 19 St * ** * * * * * * * * * * * * * * * * *	Indian River Mall 6:00 7:00 8:00 9:00 10:00 1:00 2:00 3:00 4:00 5:00 6:00 26 St & Woodfield Blvd ** *	I-95 Interchange * * * * * * * * * * * * * * * * * * *	North County Transit Hub 6:30 7:30 8:30 9:3010:30 11:30 12:30 3:30 4:30 5:30 6:30 Publix (510 roadside) * ** * * * * * * * * * * * * * * * * *	Vero Fashion Outlets to Indian River Mall Vero Fashion Outlets (behind Loft) 6:30 7:30 8:30 9:30 10:30
vvaimart (SR 60) SR 60 & 50 Ave 43 Ave & 16 St		20 St & St Lucië Ave ** * * * * * * * * * * * * * * * * * *	58 Ave & 37 St * ** * * * * * * * * * * * * * * * * *	101 Ave & 87 St * * * * * * * * * * * * * * * * * * *	Autozorie (512 roadside) ** * * * * * * * * * * * * * * * * * *	90 Ave & TA Travel Center * * * * * * * * * * * * * * * * * * *
Leisure Square & 16 St 27 Ave & 16 St	* * * * * * * * * * * *	US 1 & 38 Lane * ** * * * * * * * * * * * * * * * *	58 Ave & 49 St * ** * * * * * * * * * * * * * * * * *	83 St & 94 Ave * * * * * * * * * * * * * * * * * * *	Roseland Rd & Doctor Ave By The River * * * * * * * * * * * * * * * * * * *	90 Ave & Lakewood Vlg/Heron Cay *
27 Ave & 12 St 20 Ave & 12 St	· ·· · · · · · · · · · · · ·	43 St & 26 Ave * ** * * * * * * * * * * * * * * * * *	58 Ave & 65 St * ** * * * * * * * * * * * * * * * * *	9 Ave & 8/ St * * * * * * * * * * * * * * * * * *	Laconia St & Tulip Dr * ** * * * * * * * * * * * * * * * *	82 Ave & Heritage Plantation * <td< td=""></td<>
20 Ave & 10 Pl 20 Ave & 8 St	· · · · · · · · · · · · · · · · · · ·	43 St & 31 Ave * ** * * * * * * * * * * * * * * * * *	ов Ave & Syngenta * * * * * * * * * * * * * * * * * * *	North County Transit Hub to Sonrise Apartments North County Transit Hub 6:30 7:30 8:30 9:30 10:30 11:30 12:30 1:30 2:30 3:30 4:30 5:30 6:30 Sebastian River High School ** *<	Bolling Hill Dr & Barber St ** * * * * * * * * * * * * * * * * * *	82 Ave & Vero West Community Ctr * * * * * * * * * * * * * * * * * * *
27 AVE & 8 St 27 AVE & 4 St 27 AVE & 1 St StM		35 AVE & 44 SL * ** * * * * * * * * * * * * * * * * *	85 St & 59 Ave * ** * * * * * * * * * * * * * * * * *	91 Ave & 87 St * * * * * * * * * * * * * * * * * *	Acorn Terr & Barber St * * * * * * * * * * * * * * * * * * *	Isles of Vero * * * * * * * * * * * * * * * * * * *
27 Ave & 5 St SW Oslo Rd & 27 Ave (Dollar General)	····	Gifford Health Center 7:00 8:00 9:0010:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00	64 Ave & 85 St * ** * * * * * * * * * * * * * * * * *	83 St & 98 Ave * * * * * * * * * * * * * * * * * * *	Dahl Ave & Schumann Dr ** *	IRSC Mueller Campus * * * * * * * * * * * * * * * * * * *
The Preserve at Oslo	** *		86 Lane & 66 Ave * * * * * * * * * * * * * * * * * * *	101 Ave & 87 St * <th>Englar Ur & Schumann Dr ** *<!--</th--><th>Dour Ave & College Lane ** *</th></th>	Englar Ur & Schumann Dr ** * </th <th>Dour Ave & College Lane ** *</th>	Dour Ave & College Lane ** *
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				CR 512 at Dollar General ** * * * * * * * * * * * * * * * * * *	s = Special stop ()	Riders must call for pick up at special stops.
					nuers must call tor pick up at special stops.	
	nino Dulas		GoLine Indian River Transit System Map	Gifford Health Center to Indian River Mall	15 IG Center to Ft. Pierce/Indian River State	GoLine Bus System Information
G	VLIIIC nules		Effective August 2021	Saturday nours of operation 8:00 a.m. – 5:00 p.m. Holiday hours of operation follow regular schedule. Gifford Health Center to Indian River Mall	No bus service on Saturday. IG Center to Ft. Pierce/Indian River State College Main Campus	GoLine is the Indian River County public transit system with bus service on 14 fixed routes throughout the County and Indian
Violation of ru	rule(s) may result in removal			Gifford Health Center 6:00 7:008:00 9:0010:00 11:00 12:00 1:00 2:00 3:00 4:00 5:00 6:00 49 St & 28 Court * * * * * * * * * * * * * * * * * * *	IG Center 7:00 8:00 9:00NBS NBS NBS NBS 3:00 4:00 5:00 Goodwill * * NBS NBS NBS NBS * *	River State College (Main Campus).
German Shirt and shoes and shoe	are required at all times	Goline	Goline	49 St & 33 Ave * * * * * * * * * * * * * * * * * * *	Walgreens * * NBS NBS NBS NBS NBS * * * IRSC Main Campus 7:30 8:30 9:30NBS NBS NBS NBS NBS NBS 3:30 4:30 5:30 (East Parking Lpt) *	GoLine buses operate from 6:00 a.m. – 7:00 p.m. Monday through Friday. In addition, Saturday service is offered on several
Use of profanity i Disrespect to the	r is not permitted e bus driver will not be tolerated			49 St & 47 Court * * * * * * * * * * * * * * * * * * *	Cross Campus Rd & Knights Center * * * NBS NBS NBS NBS NBS * * Cross Campus Rd & 35 St * * * NBS NBS NBS NBS NBS * *	routes from 8:00 a.m. $-$ 5:00 p.m. Riders under the age of 12 must be accompanied by an adult and all passengers must be
 No open food or u in the vehicle 	r drinks may be carried on or consumed	getting you there	getting you there	49 St & 58 Ave * * * * * * * * * * * * * * * * * * *	Public Safety Complex * * NBS NBS NBS NBS * * South Point Plaza (Publix) * * * NBS NBS NBS NBS * *	able to board, disembark and carry their own packages on and off the buses. Instead of a charge to ride the bus, GoLine
The noise level in other riders	in the bus may not disturb the driver or		Download Transloc	+5 St & 47 Court * * * * * * * * * * * * * * * * * * *	Goodwill * * NBS NB\$ NB\$ NB\$ NB\$ NB\$ * * IG Center 8:00 9:00 10:00NB\$ NB\$ NB\$ NB\$ NB\$ NB\$ A:00 5:00 6:00	passengers are encouraged to make a donation to help support the bus system.
Smoking, vaping	g or creating a disturbance on the bus is		The free TransLoc app that provides real-time bus arrival/departure	45 St & 40 Ave * * * * * * * * * * * * * * * * * * *	NBS = No bus service	For additional GoLine information, compliments, or complaints
• Riders must take	e all package and personal belongings on		information. Get information based on route, address or current location.	38 Ave & 43 St * * * * * * * * * * * * * * * * * * *		prease can doline at. 772-ספט-טשטט, Monday through Friday from 6:00 a.m. – 7:00 p.m.
and off the bus i. • GoLine is not resp	sin a single boarding sponsible for packages and/or personal			43 Ave & Airport West Blvd * * * * * * * * * * * * * * * * * * *		 All GoLine vehicles are wheelchair accessible. The GoLine system does not operate on Theologicities
items GoLine riders mutation 	ust be at a GoLine bus stop to board			26 St & 45 Court * * * * * * * * * * * * * * * * * * *		Christmas and New Year's Day. On other holidays, GoLine routes follow the regular schedule
or disembard the • When <mark>GoLine</mark> bus	ne bus us door closes no additional riders will			Indian River Mall to Gifford Health Center Indian River Mall 6:30 7:308:30 9:3010:30 11:30 12:30 12:30 12:0 2:20 2:20 12:0 2:20		 GoLine passengers should arrive at the bus stop approximately 10 minutes before the schooluled pick up
be permitted • Destruction of Go	oLine property is not permitted			26 St & 52 Ave * * * * * * * * * * * * * * * * * * *		time and stand next to the bus stop sign. The driver will only stop at the bus ston sign
				43 Ave & 26 St * * * * * * * * * * * * * * * * * * *		 GoLine passengers must be able to carry all purchases on and off the bus in one boarding. Large items that block
				38 Ave & 41 St * * * * * * * * * * * * * * * * * * *		 the aisle or must be carried overhead are not permitted. GoLine bus drivers are not permitted to deviate from the
				45 St & 38 Ave * * * * * * * * * * * * * * * * * * *	If you SEE something, SAY something.	scheduled route.

45 St & 47 Court	*	*	*	*	*	*	*	*	* *		*	*	Call 9-1-1	
45 St & 52 Court	*	*	*	*	*	*	*	*	* *		*	*	or your local police department	
45 St & 58 Ave	*	*	**	*	*	*	*	*	* *		*	*	or your local police department	
49 St & 58 Ave	*	*	**	*	*	*	*	*	* *		*	*		
49 St & 50 Dr	*	*	* *	*	*	*	*	*	* *		*	*	DHS.GOV/SEE-SOMETHING-SAY-SOMETHING	
49 St & 47 Court	*	*	*	*	*	*	*	*	* *		*	*		
49 St & 43 Ave	*	*	**	*	*	*	*	*	* *		*	*		
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49 St & 33 Ave	*	*	**	*	*	*	*	*	* *		*	*	Eveny effort has been made to opeying the accuracy of the Colling h	
49 St & 28 Court	*	*	*	*	*	*	*	*	* *		*	*	Every enormals been made to ensure the accuracy of the Goline b	JUS
Gifford Health Center 7:00	8:009:	00 10	:00 11:	00 12	:00 1:	00 2	2:00 3:	00 4:	00 5:0	0 6:0	0 7:0	00	schedules and of the Goline bus information provided in this broch Goline assumes no responsibility for errors or omissions.	iure.

Report suspicious activity Call 9-1-1 may be requested in an alternative format. • A door-to-bus stop connector is available for riders who local police department qualify and don't have access to a GoLine bus stop. E-SOMETHING-SAY-SOMETHING

In accordance with Title VI of the Federal Civil Rights Act of 1964, any person who feels they have been discriminated against may issue a formal written complaint. The complaint procedure and Title VI Policy is available upon request from Indian River Transit's Administrative Offices or by calling 772-569-0903.

SR 5/US 1 - Pavement Summary Report

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6/5/2023	4	88010000	5	1	1	3	1	2	R2	4.058	4.779	0.704	132	3.32	0.10				3	1.5	G	G	5.5	9	6.3	С	DEP BLD
6/1/2023	4	88010000	5	1	1	3	1	2	R2	4.779	5.845	1.060	129	3.25	0.18				2	1	F	F	7	9	6.4	С	BW DEP BLD
6/1/2023	4	88010000	5	1	1	3	1	2	R2	5.845	7.268	1.360	105	3.73	0.17				1	0.5	В	В	8.5	9	7.0	С	BLD
6/1/2023	4	88010000	5	1	1	3	1	2	R2	7.268	7.930	0.628	98	3.87	0.25				1	1	В	F	8	8	7.2	С	RIP DEP BLD
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6/1/2023	4	88010000	5	1	1	3	1	2	R2	13.625	14.860	1.230	94	3.72	0.15				1	0.5	В	В	8.5	9	7.3	С	DEP BLD COR
6/1/2023	4	88010000	5	1	1	3	1	2	R2	14.860	18.770	3.910	67	3.83	0.11			L1	2.5	1	J	J	6.5	9	8.0	С	RAV BLD
6/1/2023	4	88010000	5	1	1	3	1	2	R2	18.770	19.940	1.112	113	3.24	0.16				2.5	1	J	F	6.5	9	6.8	С	BW DEP BLD DEL SPL
6/1/2023	4	88010000	5	1	1	3	1	2	R2	19.940	22.269	2.305	91	3.58	0.08				2.5	1	J	F	6.5	9	7.4	С	RIP DEP DEL
6/1/2023	4	88010000	5	1	1	2	1	2	L2	19.940	22.269	2.311	87	3.62	0.09				2.5	1	J	F	6.5	9	7.5	С	RIP DEP DEL
6/1/2023	4	88010000	5	1	1	2	1	2	L2	18.770	19.940	1.160	116	3.35	0.17				3	1	G	F	6	9	6.7	С	BW DEP
6/1/2023	4	88010000	5	1	1	2	1	2	L2	14.860	18.770	3.899	78	3.71	0.11			L1	4.5	1	К	J	4.5	9	7.8	С	RAV MH RIP DEP BLD
6/5/2023	4	88010000	5	1	1	2	1	2	L2	13.625	14.860	1.228	84	3.88	0.16				1	0.5	В	В	8.5	9	7.6	С	BLD
6/5/2023	4	88010000	5	1	1	2	1	2	L2	7.930	13.625	5.645	64	4.02	0.13			L1	1	0.5	1	В	8.5	9	8.1	С	RAV BLD SCR
6/5/2023	4	88010000	5	1	1	2	1	2	L2	7.268	7.930	0.657	90	3.95	0.28				1	0.5	В	В	8.5	8	7.4	С	
6/5/2023	4	88010000	5	1	1	2	1	2	L2	5.845	7.268	1.379	91	3.57	0.11				1	0.5	В	В	8.5	9	7.4	С	
6/5/2023	4	88010000	5	1	1	2	1	2	L2	4.779	5.845	1.037	130	3.39	0.20				2	1	F	F	7	8	6.3	С	BW
6/5/2023	4	88010000	5	1	1	2	1	2	L2	4.058	4.779	0.669	123	3.35	0.12				3	1.5	G	G	5.5	9	6.5	С	
6/5/2023	4	88010000	5	1	1	2	1	3	L2	1.829	4.058	2.171	72	3.85	0.11				1	0.5	В	В	8.5	9	7.9	с	DEP BLD
Appendix C – Environmental

Central Indian River County Greenways Plan Map



Section 4(f) Resources

Michael Field Complex Map Official with Jurisdiction, City of Vero Beach



Appendix D – Value Engineering



JARED W. PERDUE, P.E. SECRETARY

MEMORANDUM

RON DESANTIS

GOVERNOR

DATE:	June 21, 2024
TO:	Kadian McLean, District Value Engineering Administrator
FROM:	John P. Krane, P.E., Director of Transportation Development John Krane 06/24/2024 5
COPIES:	John Olson, P.E., Anson Sonnett, P.E., Vandana Nagole, P.E., VE Team Members
SUBJECT:	Value Engineering Study Responses SR 5/US 1 at Aviation Boulevard PD&E Study Indian River County, Florida FPID: 441693-1-22-02 ETDM Number: 14475

This memorandum is in response to the Value Engineering (VE) study conducted the week of December 4 through December 8, 2023. The VE Team generated 13 recommendations that were considered by the PD&E team and attendees at the VE Resolution meeting. Responses to the VE recommendations are provided in this memorandum. Four VE recommendations were accepted and two VE recommendations are partially accepted. Refer to Table 1 on page 6.

Recommendation RD 1: Roadway

One southbound (SB) right turn lane with longer storage to westbound (WB) Aviation Boulevard. Possible cost avoidance of \$768,000.

Response: Not accepted. Reducing the SR 5 southbound dual right turn to westbound Aviation Boulevard to a single lane degrades the traffic operations to Level of Service (LOS) to "F" on the southbound SR 5 through movement and northbound SR 5 left turn. The overall intersection delay increases to near the LOS D/E threshold. The single SB right turn lane carries 566 vph and requires 660 foot of storage, taper and deceleration distance. The RD-1 turn lane taper location would result in the same location as the proposed PD&E curb line due to the curvature of the SB alignment which ties to existing curb line. Therefore, the through lanes would not shift and right of way impacts would not be reduced.

This right turn movement crosses the FEC railroad tracks and has the potential to experience large queues during closure of the railroad gates. Providing dual right turn lanes provides storage and keeps the SR 5 southbound lanes clear and will assist in clearing the queued cars faster after the railroad gates open. Due to these geometric and operational issues, and negligible cost savings RD-1 is not accepted.



Figure 1: RD-1 Condition with Single Right Turn

Recommendation RD 2: Roadway

One northbound (NB) left turn lane with longer storage to WB Aviation Boulevard. If the recommendation can be implemented, there is a possible cost avoidance of \$768,000.

Response: Not accepted. Reducing the northbound SR 5 to westbound Aviation Boulevard left turn lane to a single lane degrades the traffic operations to Level of Service (LOS) to "F" on the southbound SR 5 through movement and northbound SR 5 left turn. The overall intersection delay increases and reaches the LOS D/E threshold.

The SB traffic separator location controls the NB edge of pavement. Elimination of one NB left turn lane shifts the through lanes creating a three-degree deflection of the NB through lanes across the intersection. The three-degree deflection is the maximum deflection allowed through an intersection per FDM Table 212.7.1. If one left turn lane was removed per RD-2 the proposed right of way line would pass through all the same buildings, the same number of parcels are affected and the 93 foot width of impact is reduced to 82 ft. The acquisition of the business buildings would remain the same as the original alternative.

This left turn movement crosses the FEC railroad tracks and has the potential to experience larger queues during closure of the railroad gates. Providing dual left turn lanes increases storage to reduce queue spill over into the through lanes and assist in clearing the queued cars faster after the railroad gates open. Due to these operational issues, the recommendation is not accepted.

Recommendation RD 3: Roadway

Continuation of the bike lanes north of Aviation Boulevard. If the recommendation can be implemented, there is a possible cost addition of \$18,000.

Response: Accept. This recommendation is to continue the bike lanes further north on SR 5 and provide a northbound connection to the shared use path on the east side. RD-3 is accepted.



Figure 2: RD-3 Implementation

Recommendation RD 4: Roadway

Reconfigure SR 5 and Aviation Boulevard intersection per Alternative 9. This alternative was developed as an additional attempt to avoid Camp Haven Rehabilitation Center and was evaluated by the multidiscipline team during the VE Study. This alternative would have a possible cost addition of \$2,525,000. The VE Study recommended this alternative be dropped from consideration due to the low functional score and increased right of way impacts.

Response: Dropped. Alternative 9 proposed a bifurcated US 1, similar to Alternative 2, but only provided an eastbound movement for Aviation Boulevard between the bifurcated intersections on SR 5. Westbound Aviation Boulevard movements are re-routed to a new signalized intersection north of Aviation Boulevard and then U-turn to travel south on SR 5 and then travel westbound on Aviation Boulevard. This alternative received a low functional score of -17 during the VE Study with increased right of way impacts and a cost increase of \$2,525,000, therefore RD-4 was dropped during the VE Study.

Recommendation RD 5: Roadway

One NB left turn lane and one SB right turn lane on SR 5. If the recommendation can be implemented, there is a possible cost avoidance of \$1,535,000.

Response: Not accepted. This recommendation combined recommendations RD 1 and RD 2. RD 1 and RD 2 are not accepted due to operational concerns; therefore RD 5 is not accepted.

Recommendation RD 6: Roadway

Reconstruct 13th Avenue between 30th Street and 33rd Street. If the recommendation can be implemented, there is a possible cost addition of \$117,000.

Response: Not accepted. This recommendation called for the local side street of 13th Avenue to be reconstructed from 30th Street to 33rd Street. This recommendation is not accepted as 13th Avenue is a local city street, under the jurisdiction of the City of Vero Beach and will be updated when the area redevelops. RD 6 is not accepted.

Recommendation RD 7: Roadway

Reconfigure 13th Avenue and 33rd Street to create a right-angle intersection with Aviation Boulevard. If the recommendation can be implemented, there is a cost addition of \$710,000.

Response: Not Accepted. This recommendation proposed realigning 13th Avenue and 33rd Street to create a perpendicular connection with Aviation Boulevard. These two streets are under the jurisdiction of the City of Vero Beach and RD-7 would increase right of way cost and impacts.

This connection should be evaluated during the SR 5 design phase to be consistent with the county's design phase of Aviation Boulevard extension project. RD 7 should be forwarded to the design phase. Modifications to 13th Avenue and 33rd Street connections should not be included in the PD&E project and would be best addressed by the county in the extension project.

Recommendation RD 8: Roadway

Tie Aviation Boulevard into 32nd Street. If the recommendation can be implemented, there is a possible cost avoidance of \$3,628,000.

Response: Not Accepted. This recommendation proposes a tangent alignment for Aviation Boulevard parallel to 32nd Street. The VE alignment requires a new 32nd Avenue alignment located north of the existing alignment. This would require additional R/W acquisition and abandoning the existing 32nd Street as surplus property. RD 8 would be discarded once the county's Aviation Blvd extension project is built. The county extension project was a two-lane roadway not a four-lane roadway and the PD&E Aviation Boulevard connection to 33rd Street was a two-lane roadway. Coordination with FDOT OEM on January 16, 2023, concluded the Preferred Alternative with the connection to 33rd Street met the purpose and need, therefore it would move forward to design phase. Therefore RD 8 is not accepted.

Recommendation RD 9: Roadway

Provide two through lanes and one right turn lane at the intersection of Aviation Boulevard and Airport N Drive. If the recommendation can be implemented, there is a possible cost addition of \$85,000.

Response: Accept. The VE team recommended extending the two westbound through lanes on Aviation Boulevard at Airport N Drive and providing a dedicated right turn lane onto Airport N Drive. The project team accepts this recommendation to provide additional capacity through the intersection and improve operations.



Figure 3: RD-9 Implementation

Recommendation RD 10: Roadway

Provide SB left turn lane to 28th Street. If the recommendation can be implemented, there is a possible cost avoidance that is negligible.

Response: Accept. This recommendation proposes to add a southbound left turn lane from SR 5 to 28th Street. There is an existing southbound to eastbound left turn provided at this location. RD 10 is accepted.



Figure 4: RD-10 Implementation

Recommendation RD 11: Roadway

Incorporate shared use path around pond. If the recommendation can be implemented, there is a possible cost addition of \$99,000.

Response: Partially Accepted. The VE team recommended adding a shared use path around one of the proposed pond locations. This recommendation will be coordinated with the city, county, and MPO to see if the path would support future trails and if it is a desired community feature. Support is needed from the local community prior to implementation. The evaluation in the design phase would determine pond slopes, depth, right of way, safety and maintenance needs related to the walkway. RD 11 is partially accepted.

Recommendation RD 12: Roadway

Add bike lane NB SR 5 on bridge. If the recommendation can be implemented, there is a possible cost addition of \$271,000.

Response: Accepted. This recommendation adds a northbound on-street bike lane on the SR 5 bridge over Main Canal for future compatibility with on-street bike lanes south of the project. The bridge replacement will have a 70 year life-span and should not preclude future bike lanes. The preferred alternative includes bike lanes from the bridge to north of Aviation Boulevard. A 12-foot-wide shared use path is proposed across the bridge and located adjacent to the northbound side of SR 5. The northbound bike lane will begin at 28th Street and continue north across the bridge on a 8 ft 4 in shoulder. Adding the bike lane will add a minor amount of right of way acquisition in two parcels south of the bridge. RD 12 was accepted.



Figure 5: RD-12 Implementation NB Bike Lane on Main Canal Bridge

Recommendation RD 13: Roadway

Add pedestrian lighting for the sharded use path on the east side of US 1. If the recommendation can be implemented, there is a possible cost increase of \$159,000.

Response: Partially Accepted. The VE team recommended adding pedestrian lighting for the shared use path on the east side of SR 5. RD 13 requires a lighting analysis study during the design phase and coordination with the airport and FAA regarding street lighting. This recommendation should be further discussed with the local maintaining agency to see if there is local support for pedestrian lighting, cost participation and maintenance. If local support is identified during the PD&E study RD 13 should be evaluated in the design phase when the lighting analysis is conducted. RD 13 is partially accepted.

Item	Value Engineering Recommendation	Functional Score	VE Cost Avoidance (Addition)	Decision
RD-1	One right turn lane with longer storage SB US-1 to WB Aviation Blvd	2	\$768,000	Not Accepted
RD-2	One left turn lane with longer storage NB US-1 to WB Aviation Blvd	2	\$698,000	Not Accepted
RD-3	Continuation of bike lanes north of Aviation Blvd	4	(\$18,000)	Accepted
RD-4	Reconfigure US-1 and Aviation Blvd intersection per Alternative 9	-17	(\$2,525,000)	Dropped
RD-5	One left turn lane NB US-1 and one right turn lane SB US-1 to WB Aviation Blvd	2	\$1,535,000	Not Accepted
RD-6	Reconstruct 13th Ave between 30th St & 33rd St	5	(\$117,000)	Not Accepted
RD-7	Reconfigure 13th Ave and 33rd St to create a right- angle intersection with Aviation Blvd	9	(\$710,000)	Not Accepted
RD-8	Tie Aviation Boulevard into 32nd St	7	\$3,628,000	Not Accepted
RD-9	Provide two through lanes and one right turn lane at the intersection Airport N. Drive	6	(\$85,000)	Accepted
RD-10	Provide left turn lane SB US-1 to EB 28th St	2	Negligible	Accepted
RD-11	Incorporate shared use path around pond	1	(\$99,000)	Partially Accepted
RD-12	Add bike lane NB US-1 on bridge	9	(\$271,000)	Accepted
RD-13	Add pedestrian lighting for the shared use path on the east side of US-1	2	(\$159,000)	Partially Accepted

Table 1 Value Engineering Recommendation Decision

Appendix E - Coordination



Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E. SECRETARY

MEETING NOTES

DATE:	October 28, 2022
TO:	Attendees on sign-in sheet below
FROM:	Vandana Nagole, PE, FDOT Project Manger
COPIES:	n/a
SUBJECT:	Meeting Notes – Local Coordination Meeting on 10/25/22

Summary of Meeting:

The purpose of the meeting was to coordinate the FDOT PD&E study with the IRC Aviation Boulevard extension project. The group was informed about the ongoing Public Kick-off Meeting activities and encouraged to attend the meeting on 10/27/22. An overview presentation covered the project's purpose and need, potential alternatives, and schedule.

The Aviation Boulevard discussion below focused on the segment from Airport Road to 13th Ave and the US-1 intersection.

1. The county desires the following features to be studied for the build typical sections:

- a. Two lane roadway (1-lane in each direction) with curb and gutter.
- b. 7 ft on-street bike lanes and/or
- c. One shared use path along the south side of Aviation Blvd if possible.
- 2. The horizontal alignment criteria was discussed.
 - a. The existing right of way for Aviation Blvd is typically 74.5 feet and is set by agreement between the City/Airport and Federal Aviation Agency (FAA). The City noted the FAA is strict within the Runway Protection Zone (RPZ), and will not likely to support expanding the roadway right of way within the RPZ.
 - b. The alignment for Aviation Blvd at the railroad crossing should minimize the skew to the railroad to the extent that is practical.
 - c. The design speed of Aviation Blvd will be 30 mph. Horizontal curvature will likely require some superelevation to provide a minimum skew crossing and stay within the existing roadway right of way west of the FEC railroad R/W.

- 3. Railroad crossing discussion:
 - a. The city requested the crossing to meet quiet zone requirements and incorporate sealed corridor features, and/or medians.
 - b. The city is the lease on the active railroad crossing agreement with FEC that will require modification to be consistent with the selected PD&E build alternatives. The city requested cost sharing with the FDOT for the proposed wider crossing.
- 4. Potential build alternatives
 - a. Conventional intersection improvement
 - b. Bifurcated or one-way pair
 - c. US 1 overpass over Aviation Blvd
- 5. The city noted, they are not in favor of an overpass alternative.
- 6. The county noted, it is a good time to look at multiple alternatives and requested two additional Aviation Blvd alternatives to consider during alternatives analysis
 - a. An overpass with Aviation Blvd elevated over US 1
 - b. An underpass with Aviation Blvd under US 1
 - c. These were briefly discussed on eliminating the at grade railroad crossing and using a quadrant intersection to the east and/or roundabout to handle the turning movements
 - d. The FDOT will discuss the request for two additional alternatives with District 4 management.
- 7. The County provided an update on the Aviation Boulevard extension project
 - a. The alignments are being developed and will be ready for coordination again round the Thanksgiving holiday.
 - b. The FDOT will coordinate with the county where the two projects connect.
 - c. The county anticipates having their project advance to construction ahead of the FDOT project.
- 8. The city provided an update on the Airport Master Plan update.
 - a. The master plan update is in the 5 year update. Included is the potential development of the northern portion of airport property along 41st Street with industrial type of development.
 - b. The relocation of the wastewater treatment plant to the water treatment property is still planned and not anticipated to affect the roadway project.
- 9. The next joint FDOT/City/County meeting will be held the last week of November or first week of December 2022.

The group is encouraged to contact the FDOT at any time with any questions or updates on the various projects, so the projects may move forward successfully.

The project meeting attendance report follows on the next page.

1. Summary			
Meeting title	Technical Meet	ing 441693-1 S	R5/US1 at Aviation Blvd PD&E Study
Attended participants	15		
Start time	10/25/22, 1:22:4	43 PM	·
End time	10/25/22, 3:00:	53 PM	
Meeting duration	1h 38m 10s		
Average attendance time	59m 43s		
U			
2. Participants	1	1	
·	1	In-meeting	
Name	First join	duration	Email
	10/25/22,		
William Evans	1:22:49 PM	1h 16m 14s	William.Evans@wginc.com
	10/25/22,		
Robert Winslow	1:23:30 PM	1h 15m 22s	Robert.Winslow@wginc.com
Matthew Mitts (COVB)	10/25/22,		
(Guest)	1:27:04 PM	1h 11m 33s	mmitts@covb.org
	10/25/22,		
John Thompson	1:29:01 PM	1h 9m 44s	JThompson@hanson-inc.com
	10/25/22,		
Jason Jeffries (Guest)	1:29:41 PM	1h 9m 2s	jjeffries@covb.org
	10/25/22,		
Julieta Rivero-Manso	1:30:42 PM	1h 8m 3s	JManso@hanson-inc.com
Negela Vandona	10/25/22,	1h 7m 21c	Vardara Nagala@dat state flug
Nagole, vandana	1:31:15 PIVI	10 /m 315	Vandana.ivagoie@dot.state.ii.us
Godfrey Lamptey	10/25/22, 1.22.46 DM	1h 1m Qc	rodfray lamatev@roalassociates.com
	1.52.40 F 101	111 111 33	goulley.lampley@goalassociates.com
Blake Swafford	1.33.09 PM	1h 5m 33s	RSwafford@hanson-inc.com
James W. Ennis - IRC PW	10/25/22.		
(Guest)	1:34:44 PM	1h 3m 54s	iennis@ircgov.com
	10/25/22,		
Phil Matson	1:35:37 PM	1h 6m 3s	pmatson@ircgov.com
	10/25/22,		
Brian Freeman (Guest)	1:37:00 PM	1h 23m 52s	bfreeman@ircgov.com
Rich Szpyrka - IRC PW	10/25/22,		
(Guest)	1:49:30 PM	25m 24s	rszpyrka@ircgov.com



JARED W. PERDUE, P.E. SECRETARY

MEETING NOTES

MEETING DATE: March 28, 2023 at 10:00 AM via TEAMS call

SUBJECT: Local Coordination Meeting with Vero Beach Regional Airport and FAA SR 5/US 1 at Aviation Boulevard PD&E Study Indian River County FM: 441693-1-22-02 ETDM: 14475

Meeting Purpose and Summary:

The purpose of the meeting was to clarify the action items related to the FDOT PD&E build alternatives presented to the Vero Beach Regional Airport and Federal Aviation Administration in a prior coordination memorandum. The range of PD&E build alternatives have modifications either at the existing ground level, elevated and/or depressed roadway sections. All alternatives require some adjustment to the existing right of way along Aviation Boulevard.

The meeting started with a recap of the ongoing coordination between FDOT, Federal Aviation Administration (FAA) and the Vero Beach Regional Airport (VRB).

1. Runway Protection Zone (RPZ)

- a. **RPZ analysis need:** Discussion on relocating the Aviation Boulevard crossing at the FEC Railroad to another location outside of the RPZ was previously found not viable in prior VRB studies and correspondence. Therefore, the parties concurred that relocating the Aviation Boulevard was not possible and an RPZ analysis was required to evaluate the PD&E Alternative(s).
- b. **RPZ / PD&E Alternatives:** FAA noted the runway protection zone (RPZ) analysis is to determine and document that there is no other alternative available other than a proposed build alternative. The FAA noted that all PD&E alternatives that are under consideration should be reviewed in the RPZ analysis. The VRB stated the airport and City Council are opposed to an overpass alternative and however the city and VRB are in support of Alternative 1 which has an at-grade railroad crossing. FDOT noted the PD&E process includes the public comments into the decision making process and technical RPZ analysis as well.
- c. **Responsible party:** The VRB and FAA noted that since this was an FDOT initiated project, the FDOT should fund and conduct the RPZ analysis. FDOT concurred that the FDOT would fund and conduct the RPZ analysis. The VRB requested an opportunity to review the draft RPZ scope of work prior to issuing the work order.
 - i. Action item: FDOT to send draft scope to VRB and initiate a work order to conduct the RPZ with the FDOT Aviation consultant through the District 4 Aviation office.

- d. **Timeline and review process:** Three months is anticipated to complete the RPZ analysis and review process. The FDOT will prepare the RPZ analysis, VRB reviews or comments then issues a recommendation to FAA, and then FAA finalizes the recommendation with a response to VRB and FDOT.
- e. **Contact person:** William Howard (VRB) and John Thompson (VRB/Hanson), and Laurie McDermont (FDOT).

2. Environmental:

- a. VRB asked FAA if an environmental review would be required such as a Cat Ex or 153 Application. FAA responded a minor environmental review would be required and Amy Reed would be the reviewer.
- b. Expansion of existing stormwater ponds within the RPZ was discussed. FDOT noted there are existing drainage ditches and existing ponds within the RPZ, however due to the archeological zone, those pond expansions may have cultural impacts. FAA noted that expansion of the existing stormwater ponds in the RPZ or archeological zone are not desired and would not be approved.
- c. FDOT brought up the Vero Beach Ice Age Archeological Zone which is loosely defined as being located between Aviation Boulevard, the Main Canal to the south and FEC Railroad to the east. FDOT has Janus Research conducting the cultural resource analysis and report (CRAS) and has initiated the archeological testing for the project. FAA noted Amy Reed would be interested in the findings of the CRAS.

3. Airspace Analysis (AA) and Obstruction Evaluation (OE)

- a. **Airspace Analysis:** AA submittal is mandatory during the design phase to review and approve the project. However, a preliminary AA can be prepared during the PD&E phase with the preferred alternative or a limited number of viable alternatives. FAA noted not to overwhelm the system with all eight alternatives. A separate AA case or form submittal is required for each PD&E alternative and a separate FAA response would be given for each AA case or alternative that is submitted.
- b. **Obstruction Evaluation:** The OE is to be completed in the design phase when 60% design plans are being prepared for construction and not during PD&E.
- c. **AA/OE submittal:** These evaluations require submittal of a PD&E alternative in plan view showing the elevation of select ground, roadway, and above ground project features such as lighting, bridges, signs, signals. Prior to construction, a submittal for temporary construction activities is also required to identify crane, piling and/or other construction actions that are in or around the runway flight path or RPZ.
- **d. Approving authority:** FAA receives recommendation from VRB. FAA is the approving authority. The AA/OE reviews for projects on airport property are completed by the FAA Orlando Regional office, and off airport property projects are reviewed in FAA Atlanta office.
- e. Contact persons: William Howard (VRB) and John Thompson (VRB/Hanson), and Laurie McDermont (FDOT), and Bill Farris (FAA).

---continued----

4. Future Aviation Boulevard right of way needs:

- f. VRB noted the FAA provided funding to extend the Aviation Boulevard roadway from 27th Avenue/20th Street/County Admin Road to SR 5/US-1.
- g. FDOT would like to know the process to adjust/modify the right-of-way width and associated legal R/W or easement documents for the preferred PD&E build alternative.
- h. The project involves widening Aviation Boulevard to add through and turn lanes at US-1 then taper back to the existing two-lane Aviation Boulevard roadway. A shared use pathway is being proposed on the south side of Aviation Blvd. The project may have curb and gutter and/or paved shoulders.
- i. FDOT asked if there was any potential fatal flaw with the wider proposed right of way, at this time, VRB and FAA did not anticipate any fatal flaws. However, the FAA was interested in reviewing the cultural resource findings when they are available as it relates to the widening of the right of way.
- j. Action item: FAA will research the right of way or easement agreements for Aviation Blvd and get back to FDOT and VRB.
- k. Action item: FDOT will provide the cultural resource assessment report (CRAS) to the FAA for review.

The meeting concluded at 10:58AM.

Attendance Report

2. Participants

1. Summary	441693-1-22-02 SR 5/US-1 at Aviation Blvd PD&E Study
Meeting title	VRB Airport, FAA and FDOT Coordination Meeting
Attended participants	7
Start time	3/28/23, 9:54:22 AM
Meeting duration	58 minutes

First Join	Email
3/28/23, 9:57:17 AM	William.Evans@wginc.com
3/28/23, 9:57:22 AM	JThompson@hanson-inc.com
3/28/23, 9:58:03 AM	whoward@covb.org
3/28/23, 9:59:17 AM	Laurie.McDermott@dot.state.fl.us
3/28/23, 10:00:27 AM	Bill.Farris@faa.gov
3/28/23, 10:00:37 AM	Stephen.Wilson@faa.gov
3/28/23, 10:00:55 AM	Vandana.Nagole@dot.state.fl.us
	First Join 3/28/23, 9:57:17 AM 3/28/23, 9:57:22 AM 3/28/23, 9:58:03 AM 3/28/23, 9:59:17 AM 3/28/23, 10:00:27 AM 3/28/23, 10:00:37 AM 3/28/23, 10:00:55 AM



MEETING NOTES ALTERNATIVES SCREENING EVALUATION MATRIX MEETING

May 23, 2023

Project Name: SR 5 / US-1 at Aviation Blvd PD&E Study			WGI Project: 02217003.00
Client Name:	FDOT District 4	Client Contract: CAI127	FDOT FM: 441693-1-22-02

MEETING DISCUSSION

The attendees were briefed on the objective of this meeting which was to conduct a planning level comparison of the eight project alternatives, identify the best alternatives to move forward through the PD&E process, and to identify the alternatives to drop from further investigation.

Discussion Topics

- A brief overview of the major factors influencing the alignments was provided. Those factors included the county extension of Aviation Blvd., FEC RR, narrow exist R/W, and runway protection zone (RPZ). The notable environmental factors are archeological, noise, aesthetics and local support either for or against an overpass.
- 2. A brief overview was provided of the previously reviewed Alternatives 1 through 6.
- **3.** The two new Alternatives 7 and 8 were fully explained.
- **4.** Alternative 7 Deflected Left Turn discussion:
 - a. The DLT movement was developed for the northbound US-1 movement only.
 - b. The team asked why the DLT for SB US-1 is not included. The PD&E team considered a southbound DLT and concluded not to advance the concept since that traffic movement was a very low volume and the second DLT signalized intersection pushes impacts into the golf driving range business and further constrains available queue storage between US-1 and 30th Street along Aviation Blvd. Adding the SB DLT would increase the number of lanes across US-1, increasing pedestrian crossing times and right of way needs. This could potentially push the 33rd Street connection further northeast and require a new quadrant road to be developed to relocated turns, provide storage and provide logical termini. It was concurred upon that the southbound DLT would not be advanced unless the DLT alternative was selected to move forward after the public alternatives workshop.
 - c. Alternative 7 operates at LOS D.
 - d. Discussion about increased driver task loading and potential for eastbound to southbound right turning vehicles needing to negotiate the railroad tracks, DLT lanes and southbound US-1 lanes could be challenging. Pedestrians would also have an additional traffic separator to cross.
 - i. Also mentioned that DLT for Aviation Blvd. EB would have been an improvement due to the volume; however, the challenges over the railroad make this too complicated.

- 5. The crosswalks on the northside were discussed. The west side of Aviation Blvd does not have pedestrian features along the north right of way line and a shared use pathway is along the south side. This is consistent with the county's plan for Aviation Blvd.
- **6.** A shared use pathway provides for bicycle use and connectivity to future planned shared use trails. On street bicycle lanes are not provided on either US-1 or Aviation Blvd. This is due to the existing conditions beyond the PD&E project that do not facility on street bicycle lanes. The existing US-1 right of way is constrained at 70 ft and airport operations to control pedestrian activity within the airport property along Aviation Blvd.
- **7.** The screening criteria (1st column of matrix) and scoring value (1 to 4) was reviewed and concurred upon.
- 8. The team conducted the evaluation matrix review. The activity's objective was to identify the differentiators between the alternatives. Each row of the matrix was reviewed along with the initial factors and scoring value assigned to each alternative. Minor adjustments were noted in the matrix.
- **9.** The scores were tallied, and the alternatives were ranked:
 - a. The alternatives that were chosen for further investigation through the PD&E process were the four at-grade alternatives, which ranked the highest:
 - i. Alternative 1 Conventional
 - ii. Alternative 2 On-Way Pair / Twin Intersections
 - iii. Alternative 7 Deflected Left Turn
 - iv. Alternative 8 Median U-Turn with Roundabout
 - b. The four alternatives that were dropped from further investigation were:
 - i. Alternative 3 US-1 Overpass which had substantial effects to future property access along US-1 and is not desirable by either the county or city.
 - ii. Alternative 4 Aviation Blvd Overpass had the highest number of property impacts and potential business and residential relocations; and was opposed by the city.
 - iii. Alternative 5 Aviation Blvd Underpass has very complex construction, railroad track detour and bridge work that found this alternative not viable due to constructability.
 - iv. Alternative 6 was dropped from further consideration based on similar factors plus it does not have independent utility without the extension of Aviation Blvd being constructed first.
- **10.** It was concurred upon that the four viable alternatives will be presented in detail at the Public Alternatives Workshop and the four alternatives that were dropped will be presented in lesser detail as alternatives considered and dropped from further consideration.
- **11.** The next local coordination date was discussed and concurred that it could occur during the month of June. It was noted that it should occur after the Runway Protection Zone (RPZ) analysis is completed and ready for discussion.
 - After the screening meeting finished, the RPZ analysis engineer was contacted and the report should be ready by June 9th. The city, county, airport and MPO were notified and a meeting was set for June 16th.

The meeting concluded at 12:03 PM. The attendance table is below. Attachments: Updated Screening Evaluation Matrix

Attendance Table

1. Summary				
	Screening Evaluation Matrix Meeting			
Meeting title	4416931-SR 5 at	Aviation Blvd PD&E Study		
Attended participants				
	5/23/23, 10:00			
Start time	AM			
	5/10/23, 12:03			
End time	PM			
Meeting duration	2h 3m			
2. Participants				
Name		Email		
William Evans		William.Evans@wginc.com		
Lynn Zolezzi		Lynn.Zolezzi@wginc.com		
Robert Winslow		Robert.Winslow@wginc.com		
Rick Joseph		Rick.Joseph@wginc.com		
James Hughes		James.Hughes@dot.state.fl.us		
Nagole, Vandana		Vandana.Nagole@dot.state.fl.us		
Martinez, Cesar		Cesar.Martinez@dot.state.fl.us		
LopezLandaverde, Dina		Dina.LopezLandaverde@dot.state.fl.us		
Phan, Trang		Trang.Phan@dot.state.fl.us		
Victor Ramos		Victor.Ramos@dot.state.fl.us		
Godfrey Lamptey		godfrey.lamptey@goalassociates.com		



RON DESANTIS

GOVERNOR

Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E. SECRETARY

MEETING NOTES

DATE:	June 16, 2023 at 9:30 AM via TEAMS call
TO:	Rich Szpyrka, William Howard, Jason Jefferies, John Thompson, Jim Mann, Laurie McDermott, Mary Soderstrum
FROM:	Vandana Nagole
COPIES:	Bill Evans, Jim Hughes, Brian Freeman, Matthew Mitts
SUBJECT:	Local Coordination Meeting SR 5/US 1 at Aviation Boulevard PD&E Study Indian River County FM: 441693-1-22-02 ETDM: 14475

Agenda Topics:

The purpose of the meeting is to present the FDOT SR 5 PD&E build alternatives, screening evaluation matrix, and gain input from the local public works and planning departments. The meeting was attended by Indian River County, City of Vero Beach, Vero Beach Regional Airport and Indian River County MPO public works and/or planning managers.

Meeting Notes:

- 1. An update was provided by Jason Jefferies, City Planning, regarding the May 16th City Council Meeting and resolution.
 - a. Resolution was tabled and will be reconsidered when the RPZ analysis is complete.
 - b. The alternative that was mentioned during the Council meeting isn't feasible as it goes through the archaeological site.
- 2. Rich Szpyrka, IRC County Public Works, provided an update on the status of the Aviation Blvd extension project.
 - a. The Aviation Blvd extension Project is moving ahead and property is being appraised and purchased. ROW is being coordinated with FDOT District 4 ROW office to ensure county acquired property is according to FDOT regulations.
 - b. The county will adjust their project as needed to match the outcome of the PD&E study. Construction start dates will be better known when ROW is finalized and design is complete. Design is currently at 30-45%.



3400 West Commercial Boulevard Fort Lauderdale, FL 33309 JARED W. PERDUE, P.E. SECRETARY

- 3. Mary Soderstrum (FDOT aviation consultant) provided an update on the findings of the Runway Protection Zone analysis that FDOT District 4 conducted.
 - a. FDOT conducted the study at the request of the FAA and the Vero Beach Airport.
 - b. RPZ analysis considered the 8 PD&E alternatives and another 6 RPZ alternatives. The RPZ alternatives were developed to evaluate options to move either the RPZ or Aviation Blvd from occupying the same space and clear the RPZ area. The RPZ analysis recommends Alternative 1 (at grade) due to the least impact to the existing RPZ, cost and need to service the airport.
 - c. Jason Jefferies noted the city and airport master plans require Aviation Blvd to be in place to provide mobility for the planned growth and relocating Aviation Blvd traffic to the south via 26th Street is not feasible due to probable impacts and existing traffic congestion on the other roadways.
 - d. The Vero Beach Airport reviewed and commented on the RPZ report.
 - e. The RPZ report will be updated and sent to FAA with copies sent to the Airport, city and county public works. The RPZ report will be sent to FAA the week of 6/19/23.
 - f. FAA will offer a formal response after their review which is anticipated to conclude the RPZ analysis process.
- 4. The discussion of the eight (8) PD&E alternatives and the screening evaluation matrix was led by Bill Evans. Two new alternatives were presented as a recommendation from the Intersection Control Evaluation (ICE) analysis. The two new concepts are Alternative 7 (displaced left turn) and Alternative 8 (median u-turn and roundabout).
- 5. The screening evaluation matrix was presented and the following comments obtained.
 - a. The local government and public support criteria and ratings were discussed.
 - i. Rich Szpyrka, IRC disagreed with the lack of independent utility as a negative factor for Alternative 6 (Aviation Blvd overpass) since the roadway is in the design phase. Bill Evans noted the main factors for the elimination of Alternative 6 were conflicts within the airport RPZ due to the elevated roadway, impacts to access and splitting of the properties east of SR 5, city and public opposition to an overpass, and the overpass did not have an existing connecting road, hence no independent utility.
 - b. Bill Evans stated that all participants review the local support item and provide positions on the alternatives if they are different than shown on the matrix.
 - i. Following the meeting, Jason Jeffries, City of Vero Beach, provided a response from the City Manager regarding the city's support:
 - Alternative 1, at grade, City Supports
 - Alternative 2, twin intersections, City Opposed, due to impacts to adjacent properties and property owner opposition
 - Alternative 7, deflective left turn, City Neutral, need property owner input prior to offering City position



Florida Department of Transportation 3400 West Commercial Boulevard Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E. SECRETARY

- Alternative 8, median u-turn roundabout, City Neutral, need property owner input prior to offering City position
- City Opposed to any overpass alternative.
- c. FEC RR criteria: IRC noted the FEC RR is asking for lane-per-lane closure to match any intersection expansions and asked what city street was being proposed for closure for the Aviation Blvd expansion, since Aviation Blvd is a city street at the railroad crossing. Bill Evans noted the FEC had identified 14th Avenue as a potential crossing closure candidate. The city noted it may have reviewed that crossing in the past and it may have needs to access downtown. It was agreed that the FDOT will reach out to FEC again to obtain clarification.
- d. Right of way criteria: The portion of Aviation Blvd within the airport property is under the regulations of the federal Surplus Property Act of 1944 and Section 163 of the FAA Reauthorization Act of 2018 that provides FAA approval authority on improvements. The FDOT ROW office will be reviewing the ROW requirements for the alternatives and follow-up coordination with the airport is anticipated.
- e. An additional right of way amount of 2 acres is being considered for potential pond sites. The city will be contacted as the pond sitting process is conducted.
- f. The city and county requested copies of the ROW acquisition sheets that will be utilized for the ROW acquisition estimates.
- 6. The four viable alternatives to advance into detailed PD&E analysis are:
 - a. Alternative 1: Conventional Intersection
 - b. Alternative 2: Twin Intersections or One-way Pairs
 - c. Alternative 7: Displaced Left Turn
 - d. Alternative 8: Median U-turn with Roundabout
- 7. Coordination dates with City Council, County Commission, MPO Board prior to workshop was discussed.
 - a. The county noted the best way to coordinate with the county officials is through the MPO Board meeting. The September 13th MPO Board meeting and August 25th MPO TAC meetings will be scheduled.
 - b. The City will get back to FDOT on whether the city council needs to be briefed prior to the public meeting.
- 8. Tentative Public Alternatives Workshop
 - a. November 14th (virtual)
 - b. November 15th (in person) at City Community Center in Pocahontas Park

The attendance report follows on the next page.



Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E. SECRETARY

Attendance Report:

Meeting title	Project Alternatives Call - 441693-1 SR 5 at Aviation Blvd		
Attended participants	10		
Start time	6/16/23, 9:19:57 AM		
End time	6/16/23, 11:52:45 AM		
Average attendance time	1h 16m 33s		
2. Participants			
Name	First Join	Email	
William Evans	6/16/23, 9:26:19 AM	William.Evans@wginc.com	
Rick Joseph	6/16/23, 9:26:32 AM	Rick.Joseph@wginc.com	
Soderstrum, Mary	6/16/23, 9:28:21 AM	msoderstrum@avconinc.com	
Rich Szpyrka (Guest)	6/16/23, 9:28:21 AM	rszpyrka@ircgov.com	
Will KVRB (Guest)	6/16/23, 9:28:21 AM	whoward@covb.org	
McDermott, Laurie	6/16/23, 9:29:11 AM	Laurie.McDermott@dot.state.fl.us	
Jim Mann	6/16/23, 9:29:11 AM	jmann@ircgov.com	
John Thompson	6/16/23, 9:30:49 AM	JThompson@hanson-inc.com	
Nagole, Vandana	6/16/23, 9:31:17 AM	Vandana.Nagole@dot.state.fl.us	
Jason Jeffries (Guest)	6/16/23, 9:31:21 AM	jjeffries@covb.org	

Vn:wte

From:	<u>McDermott, Laurie</u>
То:	Soderstrum, Mary; William Evans; William Howard; John Thompson; Todd Scher; Nagole, Vandana; Brandon
	<u>Dambeck</u>
Subject:	[EXTERNAL] RE: VRB Runway 30L RPZ Analysis
Date:	Tuesday, June 27, 2023 5:29:04 PM
Attachments:	image001.png
	image002.png
	image003.png
	image004.png

Thank you!

Laurie McDermott Aviation Coordinator/Office of Modal Development Florida Department of Transportation, District 4 3400 West Commercial Blvd Fort Lauderdale, FL 33309 Tel: (954)777-4497 Laurie.McDermott@dot.state.fl.us



From: Soderstrum, Mary <msoderstrum@avconinc.com>Sent: Tuesday, June 27, 2023 5:08 PMTo: McDermott, Laurie <Laurie.McDermott@dot.state.fl.us>; William Evans<William.Evans@wginc.com>; William Howard <WHoward@covb.org>; John Thompson<jthompson@hanson-inc.com>; Todd Scher <TScher@covb.org>; Nagole, Vandana<Vandana.Nagole@dot.state.fl.us>; Brandon Dambeck <BDambeck@covb.org>Subject: Fwd: VRB Runway 30L RPZ Analysis

EXTERNAL SENDER: Use caution with links and attachments.

Laurie,

It looks like we are all clear with the FAA on the VRB RPZ Analysis. They do ask that any light poles associated with the project be submitted to the FAA OE/AAA at least 45 days prior to construction.

Mary

Begin forwarded message:

From: "Wilson, Stephen (FAA)" <<u>Stephen.Wilson@faa.gov</u>>
Date: June 27, 2023 at 4:39:26 PM EDT
To: "Soderstrum, Mary" <<u>msoderstrum@avconinc.com</u>>
Cc: "Farris, Bill (FAA)" <<u>Bill.Farris@faa.gov</u>>, "Reed, Amy M (FAA)"
<<u>amy.m.reed@faa.gov</u>>, "McDermott, Laurie" <<u>Laurie.McDermott@dot.state.fl.us</u>>,
"Howard, William" <<u>WHoward@covb.org</u>>
Subject: RE: VRB Runway 30L RPZ Analysis

Mary,

Per the email below, we do not object to the VRB 30L RPZ Analysis. Although we maintain approval authority, the nature of the proposal doesn't warrant a formal 163 determination.

Any street lighting associated with the proposal should be coordinated in OEAAA for review and comment.

Let us know if you have any questions.

Thank you

From: Soderstrum, Mary <<u>msoderstrum@avconinc.com</u>>
Sent: Monday, June 26, 2023 2:53 PM
To: Wilson, Stephen (FAA) <<u>Stephen.Wilson@faa.gov</u>>
Subject: RE: VRB Runway 30L RPZ Analysis

Stephen,

Understood. I will let all the interested parties know.

BTW. How is your review of the ISM Master Plan Update coming?

MARY SODERSTRUM, AIA, NCARB SENIOR AVIATION PLANNER | AVCON, INC.



Transforming Today's Ideas into Tomorrow's Reality for the Past 35 Years

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From: Wilson, Stephen (FAA) <<u>Stephen.Wilson@faa.gov</u>>
Sent: Monday, June 26, 2023 2:51 PM
To: Soderstrum, Mary <<u>msoderstrum@avconinc.com</u>>; Farris, Bill (FAA)
<<u>Bill.Farris@faa.gov</u>>
Cc: McDermott, Laurie <<u>Laurie.McDermott@dot.state.fl.us</u>>; <u>rszpyrka@irc.com</u>; Reed,
Amy M (FAA) <<u>amy.m.reed@faa.gov</u>>
Subject: RE: VRB Runway 30L RPZ Analysis

Mary,

I reviewed the VRB RW 30L RPZ Analysis and do not object to the proposal. I'll need to issue the 163 approval however, I need to speak to Amy first regarding NEPA.

Thanks

From: Soderstrum, Mary <msoderstrum@avconinc.com>
Sent: Monday, June 19, 2023 12:20 PM
To: Wilson, Stephen (FAA) <<u>Stephen.Wilson@faa.gov</u>>; Farris, Bill (FAA)
<<u>Bill.Farris@faa.gov</u>>
Cc: McDermott, Laurie <<u>Laurie.McDermott@dot.state.fl.us</u>>; rszpyrka@irc.com
Subject: FW: VRB Runway 30L RPZ Analysis

Stephen and Bill,

I tried to send you the email below earlier this morning. Unfortunately, the attached file was too large. I have reduced the size of the file and I am attempting it again.

MARY SODERSTRUM, AIA, NCARB SENIOR AVIATION PLANNER | AVCON, INC.



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Sent: Monday, June 19, 2023 11:58 AM
To: Stephen.Wilson@faa.gov; Farris, Bill (FAA) <Bill.Farris@faa.gov
Cc: McDermott, Laurie Laurie.McDermott@dot.state.fl.us; Nagole, Vandana

Vandana

To: McDermott, Laurie Laurie.McDermott@dot.state.fl.us; Nagole, Vandana

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Stephen and Bill,

As you know, FDOT District 4 has been considering alternatives to an intersection of Aviation Blvd., the Florida East Coast Railroad, and Route 1 in Vero Beach, FL. Aviation Blvd. currently travels through the RPZ of Runway 30L at VRB and the existing intersection causes traffic to build up along Aviation Blvd. within the RPZ. FDOT asked AVCON to review the alternatives and to write an RPZ alternatives analysis of the alternatives to the intersection that have been produced. Please find attached the resulting RPZ Analysis that was completed for the VRB Runway 30L RPZ on behalf of the FDOT District 4. The draft of this report has been reviewed by the Airport, FDOT, and the persons copied on this email as well as a few others.

Please review this report and let those copied know at your earliest convenience your thoughts on the report and how the project should best proceed. If at any point during your review the report is unclear and you have questions, please contact me. We look forward to hearing from you.

MARY SODERSTRUM, AIA, NCARB SENIOR AVIATION PLANNER | AVCON, INC.



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JARED W. PERDUE, P.E. SECRETARY

TELEPHONE CALL NOTES

DATE: July 27, 2023

RON DESANTIS

GOVERNOR

TO: George Simons, IRFWCD Consultant

FROM: Bill Evans (WGI)

COPIES: Vandana Nagole (FDOT), David Gunter (IRWCD), Attendees

SUBJECT: Pond Sites and Main Canal Bridge SR 5/US 1 at Aviation Boulevard PD&E Study Indian River County FM: 441693-1-22-02 ETDM: 14475

Attendees: George Simons, Bill Evans, Robert Carballo, Jerry Saval

Purpose:

The purpose of the call was to identify the best method of coordination and introduce the FDOT SR 5/US-1 PD&E Study and build alternatives and gain input related to the design requirements of IRFWCD related to the project pond sites and widening or replacement of the low level bridge over the Main Canal.

Notes:

The project alternatives, pond sites and bridge were briefly presented to George Simons, Consultant for Indian River Farms Water Control District (IRFWCD).

- 1. Permit Application and Review:
 - a. Mr. Simons mentioned that general information can be provided, but that any detailed reviews would require a permit application and associated review fees. It was discussed that the detailed reviews typically happened with final design and what the study team was looking for at this time is clarity on design and permitting requirements as well as identifications of fatal flaw opinions on the concepts.
- 2. Pond Sites
 - a. Three pond sites per PD&E roadway alternative were presented. Each pond will be a dry pond due to the nearby aviation runway located just west of the railroad. The roadway alternative would require one pond that may range in size from 1.6 acres to 2.8 acres depending on the alternative.



Florida Department of Transportation

RON DESANTIS GOVERNOR 3400 West Commercial Boulevard Fort Lauderdale, FL 33309 JARED W. PERDUE, P.E. SECRETARY

- b. IRCWCD noted typically the ponds are required to outfall to a sub-lateral canal to allow for spillage to be contained outside of the main lateral connections. In the case of this project, there are no sublateral canals in proximity to the proposed improvements. The outfalls would need to be directly connect to the Main Canal. The use of oil separators were discussed to assist in controlling contamination from entering the canal. It was agreed that his would be a practical approach combined with the use of dry detention swales.
- 3. The main canal and bridge was discussed. It is anticipated the existing four span bridge will be replaced with potentially a three span bridge.
 - a. IRFWCD noted the bridge requirements are discussed on a case-by-case basis. David Gunter will provide input on the maintenance requirements and historical major storm observations. A follow up meeting was scheduled for a later date.
 - b. Downstream or east of the bridge is a salinity weir structure.
 - c. Upstream or west of the bridge is a county owned water control structure that collects floating debris and plant material prior to reach the Indian River Lagoon.
 - d. The IRFWCD has model information that can be provided for the peak stage elevation, tailwater elevation and clearance above high water. It was mentioned that the department typically seeks to obtain stage and flow information for the 10, 25, 50 and 100-year recurrence events. Mr. Simmons indicated that they have information on all events except the 50-yr.
- e. The IRFWCD requires a minimum of 25 ft horizontal clearance between the central spans which is consistent with what the design team is proposing with the three-span structure. Robert Carballo indicated that the three-span concept places a new line of pile 5-ft from the existing intermediate bents on either side of the channel thus creating a larger center span than the 25-ft minimum in the permanent condition. He did mention that during construction the separation between the new intermediate bents and the existing center bent (to be removed) would be less than 25-ft.
 - f. IRFWCD noted, if during construction, clearance is reduced for end bent construction or slope stabilization, sheet pile cofferdams have been allowed one foot above the high water elevation. The top elevation of the cofferdams must be low enough to allow water to flow over the top during the large storm events that result in the higher water levels. This allows better flow and reduces upstream flood levels.
 - g. It was mentioned that IRFWCD will accept rip-rap for bank protection, but does not want it placed along the bottom of the canal beyond the toe of slope since this impacts their ability to dredge sediment build-up. Riprap up and downstream of the bridge will be required, keep the center canal bottom clear of riprap to facilitate maintenance operations, and no riprap placement under the center bridge span.



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- h. Further discussion is needed to identify the IRFWCD bridge maintenance access requirements. Access is open along the north canal bank. Access is available from 12th Avenue to the south canal bank.
- i. The Main Canal right of way (ROW) is approximately 300 ft wide east of the bridge and 30th Street pavement is shown within the IRFWCD right of way. A right of way permit will be required for work on 30th Street. There is some current encroachments into the canal ROW along the south bank.
- j. The two US-1 outfalls are located adjacent to the Main Canal Bridge along the east side of the bridge. Two new outfalls will be constructed, one on each bank of the canal, east of the new bridge.
- 4. Public Alternatives Workshop dates:
 - a. October 10th (virtual) at 5:30 PM
 - b. October 11th (in person) at 5:30 PM in the Vero Beach Community Center
 - c. A meeting announcement will be sent to the IRFWCD.

WE:wte



Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E. SECRETARY

MEETING NOTES

DATE: August 04, 2023

TO: Attendees

FROM: Bill Evans, Project Manager (WGI)

COPIES: Vandana Nagole, Project Manager (FDOT)

SUBJECT: Pond Sites and Main Canal Bridge

SR 5/US 1 at Aviation Boulevard PD&E Study Indian River County FM: 441693-1-22-02 ETDM: 14475

Attendees:

IRFWCD: George Simons, David Gunter, Ward Gunter WGI FDOT PD&E Team: Bill Evans, Robert Carballo, Jerry Saval

Purpose:

The purpose of the teleconference meeting was to introduce the FDOT SR 5/US-1 PD&E Study build alternatives (Alt. 1, 2, 7 and 8, attached), preliminary pond sites, and bridge replacement concepts to gain input from the Indian River Farms Water Control District (IRFWCD) design requirements.

Notes:

The project alternatives, pond sites and bridge were presented to Indian River Farms Water Control District (IRFWCD).

- 1. Ponds site discussion:
 - a. Each roadway alternative contained three pond site alternatives A, B, and C. One pond (A, B or C) is required for a roadway alternative.
 - b. IRFWCD noted there is a shallow hard pan layer that is deeper on the west side of US-1 and shallower on the east side of US-1. Pond site "B" and "C" locations may encounter the hard pan layer and may need underdrain to dry the ponds in 72 hours. Typically, the underdrains have one foot of cover and one foot of good drainage below the pond. Pond sites "A" are located where the prior natural creek flowed from near the main canal bridge, to the northeast, towards the existing pond site and Indian River Lagoon. Pond sites "A" are more likely to have less hard pan and some soils suitable for fill than sites "B" and "C".

- c. Dry ponds are to recover within 72 hours per Saint John's Water Management District (SJRWMD) permitting requirements.
- d. IRFWCD suggested providing underdrains within the dry ponds to ensure timely storage recovery period and to include the cost in the PD&E alternatives. If during final design a more detailed geotechnical investigation determines that they are not needed then they could be removed at that time from the project. This approach ensures the initial budget accounts for the possible need for an underdrain system.
- e. The petroleum skimmer located just prior to the outfall is preferred by IRFWCD.
- 2. Main Canal and Bridge
 - a. The study team provided a brief overview of the existing bridge configuration as seen below. Reference: FDOT Plans 88010-3510, The existing bridge consists of 4 spans (26ft, 31ft, 31ft, 26ft).



IRFWCD Meeting

August 4, 2023

- b. The existing bridge elevation reflects a low member elevation of 12.33-ft NGVD and a highwater elevation of 11.35-ft NGVD. See Bridge Elevation View below.
- c. The study team mentioned that the existing 4 span bridge is anticipated to be replaced with a new 3 span bridge with a 52 ft center span and 36 ft 4.5-inch end spans. The proposed piles would be located approximately five feet away from existing piles. See layout presented during the meeting of the existing bridge pile locations and the proposed new center of pile lines depicted in RED.



IRFWCD Meeting

August 4, 2023

- d. The study team inquired about IRFWCD minimum horizontal clearance requirements for the bridge main span. IRFWCD noted the minimum horizontal clearance should be at least 25 ft.
- IRFWCD noted the center of the bridge should be located on the center of the canal e. cross section. The study team explained that to facilitate construction and maximize the horizontal opening for the main span over the channel a three-span arrangement is being incorporated into the concepts. This would remove the existing center pier. The team also explained that the bridge would need to be constructed in phases to accommodate traffic along SR 5 / US-1. During construction of the first phase of the bridge the new intermediate pier locations will reduce the spacing between the center line of the proposed piles and the existing center intermediate bent piles from 31-ft to 26-ft. Given that the intermediate bent caps are approximately 4-ft in width this would temporarily reduce the horizontal opening between caps to approximately 22-ft during construction. IRFWCD indicated that they could work with the department given that this was a temporary condition during construction and the permanent horizontal opening would be greater the 25-ft (currently estimated to be 48-ft (52-ft minus 4-ft for caps) between front face of intermediate bent to front face of intermediate bent assuming 18-inch prestressed precast concrete piling.
- f. IRFWCD indicated that a sacrificial pile located upstream of the intermediate piers is desired to avoid damaging the bridge structure during debris removal maintenance.
- g. IRFWCD asked if the existing piles would be extracted. The study team indicated that once the bridge is removed the existing intermediate and end bent piles would be cut and removed 2 ft below permanent canal bottom grade.
- h. IRFWCD does not want any soil bench under the deck along the embankment slopes into the water as depicted in the existing bridge cross section above. They indicated that a sloped riprap is preferred with a pile cap and liner and presented the detail below during the meeting. IRFWCD will provide canal riprap armor and liner detail sheet.



i. The study team asked about the design water elevations for the bridge crossing and reviewed the existing bridge elevations and the bridge hydraulics sheet information from the 88010-3510 plans. The study team indicated that there appeared to be discrepancies between the information on IRFWCD's website data, FEMA Maps and the BHRS information. IRFWCD reviewed their model information during the meeting and noted the following elevations below. They confirmed that they do not have data on the 50 yr storm event.

i.	Storm	NGVD	NAVD
ii.	100 yr.	9.8	8.3
iii.	25 yr.	8.7	7.2
iv.	10 yr.	7.9	6.4

- j. The highwater elevation of 11.35-ft NGVD noted on the existing bridge elevations was discussed with the assumption that it accounted for potential effects of storm surge. IRFWCD will run the flood model to evaluate storm surge to assist with determining the low member elevations. It was agreed that the existing low member elevation of 12.33-ft NGVD should be maintained. They indicated that they have not seen elevations in the canal reach those levels in the past.
- k. The study team asked when IRFWCD could complete their modeling analysis of the water elevations since the study team had an upcoming Alternatives Workshop with the Public on October 10 and 11, 2023. IRFWCD indicated that they would try an have some results by the end of September.
- 1. IRFWCD indicated that the salinity weir located in the main canal approximately 4000 feet east of US-1 has a top elevation of approximately 1.5 NGVD or 0.0 NAVD.
- m. The potential construction sequencing of the bridge was discussed along with the implications of the existing 12-inch watermain on the east side of the structure. IRFWCD concurred that the existing bridge mounted utilities should be removed and a new utility lines horizontally directional drilled under the canal to facilitate construction of the bridge and associated sequencing.
- n. IRFWCD desires access to each quadrant of the bridge for maintenance. A width of 15 feet is desired. Along the northbound US-1 approach to the canal, a 15 ft wide access was requested to access the canal. Details of this access will be discussed further after the preferred alternative has been selected.
- 3. Right of Way (ROW)
 - a. The existing canal right of way is approximately 300 feet wide and has the existing pavement of 30th Street located within a portion of canal ROW. IRFWCD noted this ROW condition should be investigated for ownership or existing agreements. They suggested reaching out to Richard Glass (Glass Land Acquisition) who they have coordinated with in the past.

WE:wte


Alternative 1 - Conventional Intersection SR 5 at Aviation Boulevard

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study Indian River County, Florida Financial Project ID: 441693-1-22-02 Efficient Transportation Decision Making (ETDM) Number: 14475



Draft Alternative

June 6th, 2023



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Alternative 2 - One-Way Pair **SR 5 at Aviation Boulevard**

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study Indian River County, Florida Financial Project ID: 441693-1-22-02 Efficient Transportation Decision Making (ETDM) Number: 14475





12' SHARED USE PATH

LEGEND:

EXISTING RIGHT-OF-WAY PROPOSED RIGHT-OF-WAY RUNWAY PROTECTION ZONE (RPZ)

15

0 20 100 Feet

Draft Alternative

June 6th, 2023



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Alternative 7 - Displaced Left Turn Intersection **SR 5 at Aviation Boulevard**

Project Development and Environment (PD&E) Study Indian River County, Florida Financial Project ID: 441693-1-22-02 Efficient Transportation Decision Making (ETDM) Number: 14475



June 6th, 2023



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RON DESANTIS GOVERNOR 3400 West Commercial Boulevar Fort Lauderdale, FL 33309 JARED W. PERDUE, P.E. SECRETARY

MEETING NOTES

MEETING

DATE: August 18, 2023

TO: Project File

FROM: Bill Evans (WGI)

COPIES: Vandana Nagole (FDOT)

SUBJECT: FEC Railroad Coordination Meeting

SR 5/US 1 at Aviation Boulevard PD&E Study Indian River County FM: 441693-1-22-02 ETDM: 14475

Invitees:

FDOT: Ana Quero, Vandana Nagole, Maria Formoso, Eugene Jules, Jessie Smiley, Yanique Kelly, Efrain.Bernal, Birgit Olkuch, Binod Basnet, John Krane, Kelli Phillips
FEC Railroad: Nicole Radford, Dan Fetahovic, Robert Ledoux
Indian River County: Richard Szpyrka
City of Vero Beach: Matthew Mitts
FDOT Consultants: William Evans (WGI) Julieta Rivero-Manso (Hanson)

Purpose:

A meeting was organized by the District 4 Railroad office and held in Vero Beach, Florida at the Indian River County Public Works building on August 18, 2023. The purpose of the meeting was to discuss the PD&E alternatives and Florida East Coast Railway requirements related to the FDOT SR 5/US-1 PD&E Study build Alternatives 1, 2, 7, and 8. (See Attached). The CR 510 PD&E study immediately preceded the SR 5 presentation but is not detailed in these notes.

The discussion that related to both the SR 5 and CR 510 PD&E studies are as follows.

- 1. FEC noted the grant and Federal Rail funding is available for the crossing improvements if there is a closure associated with the crossing improvements.
 - a. Matching funds can be 80% FRA and 20% local, or 50/50 depending on the type of project and closures included.
 - b. The CR 510 and SR 5 project could be bundled together, which is preferred for the funding and rail process.



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- c. The commitment to close a crossing and allow the widening of an existing crossing would occur with the approval of the railroad crossing closure application.
- d. The formal agreement that links the railroad crossing closure and the PD&E study together is the SOP Stipulation of Parties.

The discussion related to SR 5 at Aviation Boulevard is noted below:

- 2. The grade separated overpass and underpass alternatives were eliminated from further study due to the Federal Aviation Administration requirements of the Runway Protection Zone (RPZ). The FAA required an analysis of the RPZ which identified the best alternative was an At-grade roadway crossing to best meet the aviation safety and operations requirements. Also the public was noted as opposed to an overpass as well as the City of Vero Beach was opposed to an overpass. The detailed discussion continued for the four at-grade alternatives.
- 3. FEC noted that a shared use path width of eight feet is preferred with some type of divider to prevent motorized four wheeled vehicles from using the shared use path for crossing the tracks.
- 4. FEC inquired whether an elevated pedestrian bridge could be provided. The team responded that the project is minimizing below grade work to avoid potential involvement with the Vero Ice Age archeological site.
- 5. The project team inquired about the design plans for the crossing and main canal bridge construction project. FEC will review and reply with the bridge plans. Brightline may have more advanced crossing plans than the permit plans that are online.
- 6. The SR 5 project had several benefits that reduced risk such as:
 - a. Moving SR 5 further away from the FEC R/W especially where there may be pedestrians walking.
 - b. Raised median on Aviation Blvd.
 - c. Some alternatives removed turning movements from the railroad crossing.
 - d. Profile grade improvements to remove the crossing hump.
 - e. The bus bay was considered a pedestrian attractor which was not desired by the FEC RR however the need for multimodal was important and the bus bay would likely be allowed.
 - f. The Main Canal bridge is shifted away from the FEC R/W which provides maintenance area inside of the SR 5 R/W so the water control district does not need to be on FEC R/W for canal maintenance at the bridge.
- 7. Discussion continued about whether a crossing closure at another location would be required.
 - a. The SR 5 project had provide a set of alternatives early in 2023 and at that time the FEC responded that an overpass and crossing closure was the preferred alternative.
 - b. It was not determined that closure is required for the SR 5 Aviation Blvd project however including a crossing closure would greatly assist in obtaining FEC approval.



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- 8. The potential closure of 14th Avenue was discussed.
 - a. Aerial photos and ground photos of the recent construction improvements were reviewed.
 - b. The crossing is a one-lane, one-direction skewed crossing from SR 5 to 14th Avenue and operates as a right turn off of SR 5.
 - c. It was noted that if a SR 5 southbound right turn lane was constructed at 23rd Street the SR 5 R/W is only 70 ft wide and widening would require acquisition of businesses on the east side of SR 5. If the right turn lane was further north at 26th Street, some business relocations would occur but not as many since the SR 5 R/W is 100 ft wide north of 26th Street.
 - d. FDOT Central Railroad Office noted that on the statewide FEC track safety review, not part of the SR 5 PD&E study, it was noted that 14th Avenue should be a candidate for closure due to the skew and roadway connections.
- 9. The meeting concluded with the following summary:
 - a. The PD&E studies are presenting at-grade bicycle and pedestrian crossings.
 - b. The SR 5 project will submit the alternatives to SR 5 for formal comment by the FEC.
 - c. The required preliminary engineering and environmental analysis by FDOT consultants will be determined at a following meeting.
 - d. Phase 27 funding will be allocated for the FEC to review the PD&E study alternatives.



SR 5 / US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study

Indian River County, Florida Financial Project ID: 441693-1-22-02 Efficient Transportation Decision Making (ETDM) Number: 14475

Florida Department of Transportation, District Four

Florida East Coast Railroad Coordination Meeting FEC RR Crossing Number: 273047Y August 18, 2023



441693-1-02 | SR 5/US 1 at Aviation Boulevard PD&E Study

FEC RR Crossing Number: 273047Y

Location: City of Vero Beach, Indian River County Purpose and Need: Evaluate Intersection to improve safety, address travel demand, improve multimodal features





FPOT Daily Traffic Volumes, Growth and Comparison

Daily Traffic Volume (AADT)

	Year 2021	Year 2045	Total Growth
SR 5 US 1	34,200	55,000	61%
Aviation Boulevard	12,000	19,300	61%

Traffic Movement Volume Comparison



FEC Railroad Crossing Construction @ Aviation Blvd

FEC Crossing Project

- FEC Double Track
- RR Signal System
- SR 5 Mast Arms
- Main Canal Bridge

Aviation Blvd

- 2 Lanes Eastbound
- I Lane Westbound
- Pedestrian crossing on south side
- Painted median buffer
- Rural typical section





SR 5 and Aviation Blvd Pedestrian Crossing Construction



SR 5 Crosswalk – Looking East



Aviation Blvd - Looking East



Crosswalk at Crossing – Looking West



FEC RR Crossing – Looking West



Alternatives Considered, Coordination, and Screening

Alternatives Considered

- Alternative 1 Conventional Intersection
- Alternative 2 One-way Pair
- Alternative 3 US 1 Overpass
- Alternative 4 Aviation Blvd Overpass
- Alternative 5 Aviation Blvd Underpass
- Alternative 6 Aviation Blvd Overpass (with railroad crossing)
- Alternative 7 Displaced Left Turn
- Alternative 8 Median U-Turn with Roundabout

Coordination Meetings

- Property Owners
- City of Vero Beach Public Works
- IRC Public Works
- IRC Metropolitan Planning Organization (MPO)
- IR Farms Water Control District (IRFWCD)
- Florida East Coast Railroad (FEC RR)
- Federal Aviation Administration (FAA)



Federal Aviation Administration (FAA) Runway and Aviation Regulations

Runway 30L and the land within the airport property is controlled by the Federal Aviation Administration (FAA) and Vero Beach Airport regulations.

The Runway Protection Zone (RPZ), shown as , controls the ground surface to minimize ground hazards to aircraft.

The Flight Surface controls the airspace to keep the aircraft flight space clear.

The FAA concurred with the Runway Protection Zone analysis that concluded the at-grade roadway alternative was the best solution for improvements within the Vero Beach Airport (VRB) Runway 30L RPZ.







Alternatives Eliminated and Alternatives Advancing Forward

Alternatives Eliminated:

Based on the FAA and airport runway protection zone regulations, screening evaluation, coordination with the city, county, and public, the four (4) alternatives with an overpass or underpass were eliminated from further consideration.

- Alternative 3 US 1 Overpass
- Alternative 4 Aviation Blvd Overpass
- Alternative 5 Aviation Blvd Underpass
- Alternative 6 Aviation Blvd Overpass (with railroad crossing)

Alternatives Advancing Forward:

The four (4) alternatives without an overpass or underpass are the best alternatives for further study that will benefit the community, enhance safety, enhance multi-modal features, and improve existing and future traffic congestion.

- Alternative 1 Conventional Intersection
- Alternative 2 One-Way Pair
- Alternative 7 Displaced Left Turn
- Alternative 8 Median U-turn with Roundabout



Common Features of the Alternatives Moving Forward

Common Railroad Crossing Features

- Raised median separator on Aviation Blvd at railroad crossing
- Profile grade improvements with reconstruction of SR 5/US-1
- Shared use path on southside of Aviation Blvd
- Single crosswalk across US-1

Common Roadway Features

- Reconstruction of the roadway, drainage, traffic signals and street lighting.
- Increased roadside border between FEC RR right of way and SR 5/US-1 roadway
- Increased maintenance areas outside of FEC R/W for canal maintenance
- Widen or replacement of the US-1 bridge over the Main Canal
- Shared use path



ALTERNATIVE 1 - Conventional Intersection





ALTERNATIVE 1 - Conventional Intersection







ALTERNATIVE 2 – One-Way Pair





ALTERNATIVE 2 – One-Way Pair





ALTERNATIVE 7 – Displaced Left Turn





ALTERNATIVE 7 – Displaced Left Turn





ALTERNATIVE 8 – Median U-turn with Roundabout





ALTERNATIVE 8 – Median U-turn with Roundabout





Discussion of Crossing Closure Requirement





Discussion of Crossing Closure Requirement



14th Ave – Looking South



SR 5 at 14th Ave – Looking South



14th Ave - Looking North



14th Ave – Looking North



Railroad Crossing Countermeasures at Other Crossings



Active Message Signs



Pedestrian Crossing Gates



Raised Median



Profile Hump Correction



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Summary

PD&E Build Alternatives Measures to Reduce Railroad Risk

- Dynamic Envelope
- Raised median at railroad crossing
- Single shared use path for bicycles and pedestrians
- No on-street bike lanes across railroad tracks
- Increased border width between SR 5/US-1 travel lanes and FEC RR right of way
- Crossing profile hump correction with SR 5/US-1 reconstruction
- Highway lighting on crossing and SR 5/US-1
- Elimination or reduction in number of left turn lanes across railroad crossing, or left turn movements onto the railroad crossing







Schedule and Funds Programmed

Schedule

Funds Programmed

Funded in

Fiscal Year

2026

\$700,000

\$700,000



SR 5 / US 1 at Aviation Boulevard PD&E Study | FPID No: 441693-1-22-02

Public Involvement

Attend Public Meetings

- Public Alternatives Workshop:
 - October 10, 2023 at 5:30 PM (Webinar online)
 - October 11, 2023 at 5:30 PM (In-person)
 - Vero Beach Community Center
 - 2266 14th Avenue, Vero Beach, FL 32960
- Public Hearing: May/June 2024 (tentative)
- Contact Project Manager:
 - Vandana Nagole, PE

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- Email: <u>Vandana.Nagole@dot.state.fl.us</u>
- Project Website: <u>https://www.fdot.gov/projects/SR5AviationBlvdPDE</u>

Public comments and questions are always welcome!

Stay Informed!

Twitter: @MyFDOT_SEFL

Use telephone camera to scan image





Safety Message





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Thank You

SR 5 / US 1 at Aviation Boulevard Project Development and Environment (PD&E) Study


MEETING NOTES POND SITING MEETING 3 Identify Preferred Pond Alternatives

August 30, 2023

Project Name: SR 5 / US-1 at Aviation Blvd PD&E Study			WGI Project: 02217003.00
Client Name:	FDOT District 4	Client Contract: CAI127	FDOT FM: 441693-1-22-02

Attendees: Vandana Nagole, Cesar Martinez, Bill Evans, Robert Winslow, Linda Hess, Fernando Ascanio, James Hughes, Jerome Saval, Jim Pepe, Daniel Marwood, Lynn Kelley, James Poole, Victor Ramos, Ann Broadwell, Christina Brown, Robert Vater

The purpose of the meeting was to discuss the pond sites, evaluation matrix and determine the preferred pond location. The proposed ponds for Alternatives 1, 2, 7 and 8 were reviewed. Each alternative had 3 proposed pond sites (A, B and C) evaluated and only one pond site is needed per alternative. The sites are dry ponds that must dry in the required 72 hours. The following topics were discussed.

General Comments:

• The evaluation matrix did consider getting water from the ponds to the outfall location. The number of property owners per pond site could be challenging when purchasing the right of way for the ponds. Indian River County does own 3 parcels off of US 1. The intent for the public alternatives workshop is to show 1 pond site per alternative.

Pond Site A for Alternatives 1 and 7

- The Indian River Farms Water Control District (IRFWCD) did like Pond A the best since the site is located closest to the outfall site. The outfall canal is maintained by IRFWCD.
- Despite the cultural resource findings within Pond Site A 1, the evaluation matrix rated the site highest.
- The cultural resources related to the Old Vero Site 8IR9 and the historic structures were discussed and preliminary graphics of the cultural resource investigation were reviewed. The Old Vero Site (8IR9) has an area that includes portions of Pond Site A. Cultural resource consultant, Janus Research, explained that the Site 8IR9 boundary is an extrapolation from findings in other areas west and south of Pond Site A. No archeological testing was conducted in the area of pond site A during the Site 8IR9 investigation.
- Pond Site 1A and 7A are recommended and the team advised that interval testing should be conducted to determine the archeological determination. The archeological testing would be conducted at 25 meter intervals along with auger drills.
- It was noted that the pond site would be shallow since they are dry ponds. If archeological resources were found in Pond Site 1A or 7A, they could be deep as previously found on the Vero Site at other locations. Therefore, it is possible that the pond will not impact the cultural resource, if they were located deep enough.
- There has been a lot of interest in the Vero Man Site so it could be a concern of the local community.
- Pond 1A and 7A are the recommended pond sites and complete additional testing to clear the site. If testing can't be completed to clear Pond A before the public workshop Pond C will also be shown.

Pond Site B

- Pond Sites 1B and 7B is comprised of two smaller ponds that are split by a local road. Pond B sites that were split will be renamed #B South and #B north.
- Pond Site 2B was recommended for Alternative 2.
- Pond site 8B was discussed to be reshaped to utilize the 3 parcels between US 1 and the proposed pond site. After the meeting the size of the parcels along US 1 did not have sufficient acreage to hold the revised Pond B, therefore Pond B was not revised.

Pond Site C

- Pond C has existing old cabin structures that are mostly abandoned. Janus, the cultural resource consultant, noted the structures lack building integrity and likely would not be found significant by the SHPO due to poor structural condition. FDOT noted the SHPO did not allow abandoned homes to be removed on another project.
- Pond 1C and 7C were the second choice, if Pond A did not move forward.
- Pond 8C was recommended for Alternative 8.

Public Workshop Exhibit

The pond sites would be shown on a separate exhibit with the four alternatives with ponds shown on one exhibit board.

- Alternative 1 Pond 1A
- Alternative 2 Pond 2B
- Alternative 7 Pond 7A
- Alternative 8 Pond 8C

If the archeological investigation is not conclusive, the exhibit could show 2 pond sites for Alternatives 1 and 7, with notes on the graphic that only pond site A or C is needed.

ltem	Weight Factor*	Factor	Score**	Weighted Score	Score**	Weighted Score	Score**	Weighted Score
	1 to 5	PD&E Build Alternative 1 Conventional Intersecion	1 to 5		1 to 5		1 to 5	
		Pond Alternative Number		1-A		1-B		1-C
-		Brief Description of Pond Alternative	Utilize	es 1 full block 30th and 31st St	Close	s 32nd Street	North of	33rd Street
		Number of parcels effected	Dottroom	3		9		6
		Existing property use	vac	ant parcel	vacant with 2 active residential units impacted by pond Abondonded hou commercial bu (roadway wid acquires the cor		d houses and a cial business ay widening ne commercial ucture)	
		Pond Size (Acres)		1.61		1.81		1.81
	*	 * Weight factors are 1 for least critical and 5 for most critical ** Score factors are 1 for most negative effect and 5 for most positive effect 		** **		**		
1	4	Right of Way (number of properties required)	4	16	1	4	2	8
2	4	Right of Way (number of relocations)	5	20	1	4	2	8
3	2	Economic Development	3	6	1	2	4	8
4	2	Right-of-Way Costs	5	10	1	2	3	6
5	3	Drainage Considerations	5	15	4	12	3	9
6	2	FEMA Flood Zone	3	6	3	6	3	6
7	3	Contamination/Hazardous Materials	4	12	3	9	1	3
8	3	Utilities	4	12	4	12	4	12
9	4	Threatened/Endangered Species	4	16	4	16	3	12
10	4	Wetlands/Protected Uplands	5	20	5	20	5	20
11	5	Cultural Resources Involvement	1	5	5	25	3	15
12	5	Section 4(f)	5	25	5	25	5	25
13	4	Public Wellfield	5	20	5	20	4	16
14	3	Construction	5	15	3	9	5	15
15	3	Maintenance	5	15	3	9	5	15
16	3	Aesthetics	4	12	4	12	4	12
17	4	Public Opinion/Adjacent Residency Concerns	3	12	3	12	3	12
18	1	Other	3	3	3	3	3	3
		Score		240		202		205
		Ranking		1		3		2
Note: R	ankings are	from 1-5, with 5 being the highest or most desired score.						

ltem	Weight Factor*	Factor	Score**	Weighted Score	Score**	Weighted Score	Score**	Weighted Score
	1 to 5	PD&E Build Alternative 2 One Way Pairs	1 to 5		1 to 5		1 to 5	
		Pond Alternative Number		2-A		2-В		2-C
		Brief Description of Pond Alternative	Two pond St an	cells around 30th d 15th Ave.	Closes	32nd Street	North of	33rd Street
		Number of parcels effected	(6 parc roa	10 els are part of dway r/w)	(6 parce roa	14 els are part of dway r/w)	(5 parce road	10 s are part of way r/w)
		Existing property use	vacan residentia t	t land with 3 I units impacted by pond	vacant land with 2 residential units impacted by pond vacant and forested with 3 abandom residential units by pond		I forested land abandoned units impacted pond	
		Pond Size (Acres)		1.86		2.49	2.54	
	*	* Weight factors are 1 for least critical and 5 for most critical ** Score factors are 1 for most negative effect and 5 for most positive effect		**	**		**	
1	4	Right of Way (number of properties required)	2	8	1	4	2	8
2	4	Right of Way (number of relocations)	1	4	2	8	3	12
3	2	Economic Development	4	8	3	6	4	8
4	2	Right-of-Way Costs	2	4	3	6	5	10
5	3	Drainage Considerations	5	15	4	12	3	9
6	2	FEMA Flood Zone	3	6	3	6	3	6
7	3	Contamination/Hazardous Materials	4	12	3	9	2	6
8	3	Utilities	3	9	3	9	4	12
9	4	Threatened/Endangered Species	4	16	4	16	3	12
10	4	Wetlands/Protected Uplands	5	20	5	20	5	20
11	5	Cultural Resources Involvement	1	5	5	25	3	15
12	5	Section 4(f)	5	25	5	25	5	25
13	4	Public Wellfield	5	20	5	20	4	16
14	3	Construction	3	9	5	15	4	12
15	3	Maintenance	3	9	5	15	4	12
16	3	Aesthetics	4	12	4	12	3	9
17	4	Public Opinion/Adjacent Residency Concerns	2	8	3	12	3	12
18	1	Other	3	3	3	3	3	3
		Score		193		223		207
		Ranking		3		1		2
Note: Ra	ankings are	from 1-5, with 5 being the highest or most desired score.						

ltem	Weight Factor*	Factor	Score**	Weighted Score	Score**	Weighted Score	Score**	Weighted Score
	1 to 5	PD&E Build Alternative 7 Displaced Left Turn	1 to 5		1 to 5		1 to 5	
		Pond Alternative Number		7-A		7-B	7-C	
		Brief Description of Pond Alternative	Utilizes 1 30th	full block between and 31st St.	Close	s 32nd Street	North of 33rd	Street
		Number of parcels effected		3		9	6	
		Existing property use	va	cant parcel	vacan residentia	vacant with 2 active residential units impacted by pond the building structure)		
		Pond Size (Acres)		1.59		1.81	1.58	
	*	* Weight factors are 1 for least critical and 5 for most critical ** Score factors are 1 for most negative effect and 5 for most positive effect		** **		**		
1	4	Right of Way (number of properties required)	4	16	1	4	2	8
2	4	Right of Way (number of relocations)	5	20	1	4	2	8
3	2	Economic Development	3	6	1	2	4	8
4	2	Right-of-Way Costs	5	10	1	2	3	6
5	3	Drainage Considerations	5	15	4	12	3	9
6	2	FEMA Flood Zone	3	6	3	6	3	6
7	3	Contamination/Hazardous Materials	4	12	3	9	1	3
8	3	Utilities	4	12	4	12	4	12
9	4	Threatened/Endangered Species	4	16	4	16	3	12
10	4	Wetlands/Protected Uplands	5	20	5	20	5	20
11	5	Cultural Resources Involvement	1	5	5	25	3	15
12	5	Section 4(f)	5	25	5	25	5	25
13	4	Public Wellfield	5	20	5	20	4	16
14	3	Construction	5	15	3	9	5	15
15	3	Maintenance	5	15	3	9	5	15
16	3	Aesthetics	4	12	4	12	4	12
17	4	Public Opinion/Adjacent Residency Concerns	3	12	3	12	3	12
18	1	Other	3	3	3	3	3	3
		Score		240		202	205	
		Ranking		1		3	2	
Note: Ra	ote: Rankings are from 1-5, with 5 being the highest or most desired score.							

1105 1105 1105 1105 1105 1105 1105 100 PORA Alternative Number EX- <	ltem	Weight Factor*	Factor	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
Pond Alternative Number BA B-A B-B B-C Brief Description of Pond Alternative Utilizes 1.5 full blocks between 30th and 32nd 8t Utilizes 1.5 full blocks between 30th and 32nd 8t North of 33rd Steet Number of parcels offected 5 1 6 Existing property use vacant parcels with 1 businesses in Cludes with 2 businesses in Cludes with 3 businesses in Cludes with 1 businesses in Cludes with 3 businesses in Cludes with 1 businesses in Cludes with 1 busineses in Cludes with 1 businesses in Cludes with 1 businesses in Clu		1 to 5	PD&E Build Alternative 8 Median U-turn with Roundabout	1 to 5		1 to 5		1 to 5	
Image: Problem in the sector of Pond Alternative Utilizes 1.5 full blocks between 30th and 32nd 5t. Utilizes 1.5 full blocks between 30th and 32nd 5t. Image: Pond Size Acres) Number of parcels effected 5 (1 parcels are part of roadway five) roadway five) for analysing five and spin			Pond Alternative Number		8-A		8-B		8-C
Image: boot stateNumber of parcels effectedImage: boot stateImage: boot state<			Brief Description of Pond Alternative	Utilizes between 3	1.5 full blocks 80th and 32nd St.	Utilizes 1.5 full blocks between 31st and 33rd St. North of 33rd S		33rd Street	
Listing property use use and parcels with 1 bulenesses (n/cuber wulti- unit apt.) use and parcels with 1 bulenesses (n/cuber wulti- unit apt.) use and parcels with 1 bulenesses and 2 recreises are 1 for (not for most chical ** Score factors are 1 for reast chical and 5 for most chical ** Score factors are 1 for reast chical and 5 for most chical ** Score factors are 1 for reast chical and 5 for most chical ** Score factors are 1 for reast chical and 5 for most chical ** Score factors are 1 for reast chical and 5 for most chical ** Score factors are 1 for reast chical and 5 for most positive effect I			Number of parcels effected		5	(3 parcel	11 s are part of roadway r/w)	(2 parce road	6 Is are part of way r/w)
Pond Size (Acres) 2.40 2.77 2.49 i i*Weight factors are 1 for least oritical and 5 for most positive effect i** i** i** i** i** i** i** i** i** 1 4 Right of Way (number of properties required) 4 16 1 4 2 8 2 4 Right of Way (number of properties required) 4 16 1 4 2 8 4 16 3 2 Economic Development 3 66 2 4 2 10 4 2 Right-of-Way Costs 3 66 1 2.2 5 10 5 3 Drainage Considerations 5 15 4 12 3 9 3 66 3 66 3 66 3 66 3 66 3 66 3 66 3 66 3 66 3 66 3 66 3 66 3 66 3 66 3 66 3 66 3			Existing property use	vacant businesse u	parcels with 2 s (includes multi- nit apts.)	vaca busines	ant parcels with 1 ses and 2 residential units	Vacant land with abondonded houses	
· ····································			Pond Size (Acres)		2.40		2.77	2.49	
1 4 Right of Way (number of properties required) 4 16 1 4 2 8 2 4 Right of Way (number of relocations) 1 4 2 8 4 16 3 2 Economic Development 3 6 2 44 2 8 4 16 4 2 Right-of-Way Costs 3 6 1 2 5 10 5 3 Drainage Considerations 5 15 4 12 3 9 6 2 FEMA Flood Zone 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 6 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		*	* Weight factors are 1 for least critical and 5 for most critical ** Score factors are 1 for most negative effect and 5 for most positive effect	**		** **		**	
2 4 Right of Way (number of relocations) 1 4 2 8 4 16 3 2 Economic Development 3 6 2 4 2 4 4 2 Right-of-Way Costs 3 6 1 2 5 10 5 3 Drainage Considerations 5 15 4 12 3 9 6 2 FEMA Flood Zone 3 6 3 6 3 6 3 6 7 3 Contamination/Hazardous Materials 4 12 3 9 2 6 8 3 Utilities 3 9 3 9 4 12 9 4 Threatened/Endangered Species 4 16 4 16 3 12 10 4 Wetlands/Protected Uplands 5 20 5 20 5 20 1 15 16 3 15 15 15 15 15 15 15 15 15 15	1	4	Right of Way (number of properties required)	4	16	1	4	2	8
3 2 Economic Development 3 6 2 4 2 4 4 2 Right-of-Way Costs 3 6 1 2 5 10 5 3 Drainage Considerations 5 15 4 12 3 9 6 2 FEMA Flood Zone 3 6	2	4	Right of Way (number of relocations)	1	4	2	8	4	16
4 2 Right-of-Way Costs 3 6 1 2 5 10 5 3 Drainage Considerations 5 15 4 12 3 9 6 2 FEMA Flood Zone 3 6 3 6 3 6 3 6 7 3 Contamination/Hazardous Materials 4 12 3 9 2 6 8 3 Utilities 3 9 3 9 3 9 4 12 9 4 Threatened/Endangered Species 4 16 4 16 3 12 10 4 Wetlands/Protected Uplands 5 20 5 20 5 20 15 20 11 5 Cultural Resources Involvement 1 5 25 5 25 5 25 15 25 13 4 Public Wellfield 5 20 5 20 4 16 14 3 Construction 4 12 5<	3	2	Economic Development	3	6	2	4	2	4
5 3 Drainage Considerations 5 15 4 12 3 9 6 2 FEMA Flood Zone 3 6 3 6 3 6 3 6 7 3 Contamination/Hazardous Materials 4 12 3 9 2 6 8 3 Utilities 3 9 3 9 4 12 9 4 Threatened/Endangered Species 4 16 4 16 3 12 10 4 Wetlands/Protected Uplands 5 20 5 20 5 20 11 5 Cultural Resources Involvement 1 5 25 5 25 5 25 15 25 15 25 15 25 15 25 15 25 15	4	2	Right-of-Way Costs	3	6	1	2	5	10
6 2 FEMA Flood Zone 3 6 3 6 3 6 3 6 7 3 Contamination/Hazardous Materials 4 12 3 9 2 6 8 3 Utilities 3 9 3 9 4 12 9 4 Threatened/Endangered Species 4 16 4 16 3 12 10 4 Wetlands/Protected Uplands 5 20 5 200 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 25 5 25 5 25 5 25 5 25 5 25 5 15 16 14 3 Construction 4 12 5 15 15 15 15 15 15 15 15 15	5	3	Drainage Considerations	5	15	4	12	3	9
7 3 Contamination/Hazardous Materials 4 12 3 9 2 6 8 3 Utilities 3 9 3 9 4 12 9 4 Threatened/Endangered Species 4 16 4 16 3 12 10 4 Wetlands/Protected Uplands 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 25 5 25 5 25 5 25 5 25 5 25 5 25 5 25 5 25 5 25 5 25 5 16 16 14 12 5 15 15 15 15 15 15 15 15 15 15 15 </td <td>6</td> <td>2</td> <td>FEMA Flood Zone</td> <td>3</td> <td>6</td> <td>3</td> <td>6</td> <td>3</td> <td>6</td>	6	2	FEMA Flood Zone	3	6	3	6	3	6
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9 4 Threatened/Endangered Species 4 16 4 16 3 12 10 4 Wetlands/Protected Uplands 5 20 5 20 5 20 5 20 1 20 10 1 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 20 5 25 3 15 15 15 25 5 25 5 25 5 25 5 25 5 25 5 25 5 25 5 25 15 25 15 25 15 25 15 16 14 14 14 12 14 16 14 12 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 15 16 16 16<	8	3	Utilities	3	9	3	9	4	12
10 4 Wetlands/Protected Uplands 5 20 5 20 5 20 5 20 11 5 Cultural Resources Involvement 1 5 5 25 3 15 12 5 Section 4(f) 5 25 5 25 5 25 5 25 13 4 Public Wellfield 5 20 5 20 4 16 14 3 Construction 4 12 5 15 5 15 15 15 3 Maintenance 4 12 5 15 5 15 16 3 Aesthetics 3 9 4 12 4 12 17 4 Public Opinion/Adjacent Residency Concerns 3 12 3 3 3 3 18 1 Other 3 208 217 220 Ranking 8 1 0 1 208 1 1	9	4	Threatened/Endangered Species	4	16	4	16	3	12
11 5 Cultural Resources Involvement 1 5 5 25 3 15 12 5 Section 4(f) 5 25 5 25 5 25 15 25 13 4 Public Wellfield 5 20 5 20 4 16 14 3 Construction 4 12 5 15 5 15 15 3 Maintenance 4 12 5 15 5 15 16 3 Aesthetics 3 9 4 12 4 12 17 4 Public Opinion/Adjacent Residency Concerns 3 12 3 12 4 16 18 1 Other 3	10	4	Wetlands/Protected Uplands	5	20	5	20	5	20
12 5 Section 4(f) 5 25 5 25 5 25 13 4 Public Wellfield 5 20 5 20 4 16 14 3 Construction 4 12 5 15 5 15 15 3 Maintenance 4 12 5 15 5 15 16 3 Aesthetics 3 9 4 12 4 12 17 4 Public Opinion/Adjacent Residency Concerns 3 12 3 12 4 16 18 1 Other 3 3 3 3 3 3 3 3 Ranking 3 208 217 220	11	5	Cultural Resources Involvement	1	5	5	25	3	15
13 4 Public Wellfield 5 20 5 20 4 16 14 3 Construction 4 12 5 15 5 15 15 3 Maintenance 4 12 5 15 5 15 16 3 Aesthetics 3 9 4 12 4 12 17 4 Public Opinion/Adjacent Residency Concerns 3 12 3 12 4 16 18 1 Other 3 208 217 220 200 1 1 1 1 1 1 1 1 1 1 2 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 <td>12</td> <td>5</td> <td>Section 4(f)</td> <td>5</td> <td>25</td> <td>5</td> <td>25</td> <td>5</td> <td>25</td>	12	5	Section 4(f)	5	25	5	25	5	25
14 3 Construction 4 12 5 15 5 15 15 3 Maintenance 4 12 5 15 5 15 16 3 Aesthetics 3 9 4 12 4 12 17 4 Public Opinion/Adjacent Residency Concerns 3 12 3 12 4 16 18 1 Other 3 208 217 220 Ranking 3 208 217 220	13	4	Public Wellfield	5	20	5	20	4	16
15 3 Maintenance 4 12 5 15 5 15 16 3 Aesthetics 3 9 4 12 4 12 17 4 Public Opinion/Adjacent Residency Concerns 3 12 3 12 4 16 18 1 Other 3 3 3 3 3 3 3 18 1 Other 208 217 220 200 Ranking 3 2 1	14	3	Construction	4	12	5	15	5	15
16 3 Aesthetics 3 9 4 12 4 12 17 4 Public Opinion/Adjacent Residency Concerns 3 12 3 12 4 16 18 1 Other 3 3 3 3 3 3 3 10 Score 208 217 220 10 Ranking 3 3 2 1	15	3	Maintenance	4	12	5	15	5	15
17 4 Public Opinion/Adjacent Residency Concerns 3 12 3 12 4 16 18 1 Other 3	16	3	Aesthetics	3	9	4	12	4	12
18 1 Other 3 </td <td>17</td> <td>4</td> <td>Public Opinion/Adjacent Residency Concerns</td> <td>3</td> <td>12</td> <td>3</td> <td>12</td> <td>4</td> <td>16</td>	17	4	Public Opinion/Adjacent Residency Concerns	3	12	3	12	4	16
Score 208 217 220 Banking 3 2 1	18	1	Other	3	3	3	3	3	3
Ranking 3 2 1			Score		208		217		220
			Ranking		3		2		1



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PREFERRED ALTERNATIVE MEETING

November 8, 2023

Project Name:	SR 5 / US-1 at Aviation B	lvd PD&E Study	WGI Project: 02217003.00
Client Name:	FDOT District 4	Client Contract: CAI127	FDOT FM: 441693-1-22-02

The purpose of this meeting was to discuss the results of the public alternatives workshop and determine the preferred alternative to advance to the value engineering study.

PUBLIC COMMENTS AND PREFERRED ALTERNATIVE

- 1. The comments received during the two Public Alternatives Workshops were discussed.
 - a. There were three written comments supporting Alternative 1, 25 comments supporting Alternative 2 (due to the alternative's reduced impacts to Camp Haven), and one comment supporting Alternative 8.
 - b. The City of Vero Beach submitted an email in support of Alternative 1, noting a resolution would be forthcoming in support of Alternative 1.
- 2. In response to the support for Alternative 2 which ranked 4th or last in the evaluation matrix, the team prepared a presentation regarding further review of Alternative 2. The presentation discussed the challenges associated with Alternative 2. Alternative 2 scored the lowest on the evaluation matrix and impacts 42 properties with additional cost related to a temporary bridge detour and temporary detour right of way. Alternative 2 requires several design variations for the existing US 1 roadway to remain within the existing right of way. The constructability and detour bridge are needed for the canal bridge, and there are impacts to the nine residential single family homes along 13th Avenue. It is not known, but the homes may have a low income or minority homeownership.
- 3. Alternative 7, ranked 3rd, and was not desired due to the complex displaced left turn occurring at the railroad crossing.
- 4. Alternative 8, ranked 2nd, and impacts an additional eight parcels, adding 3.59 acres of property acquisition, with a total cost being \$8.66 million greater than Alternative 1.
- 5. Based on the discussion and scores in the Alternative Evaluation Matrix, the team will move forward to the VE study with Alternative 1 as the preferred alternative.

VALUE ENGINEERING STUDY (VE STUDY)

The group discussed including a second alternative in the VE Study, because Alternative 1 is straight forward and has limited areas to investigate during the VE Study. Based on the next highest ranked alternative, which is Alternative 8, being much more costly with higher impacts, it was determined to only include Alternative 1 in the Value Engineering Study.

RAILROAD CROSSING CLOSURE

District 4 recently discussed with FDOT OEM if the railroad closure needs to be completed before LDCA. The OEM response was that the final outcome of FEC RR coordination did not need to be completed prior to LDCA, but a commitment in the PD&E documents could be added. A suggested commitment would be similar to: Coordination with FEC Railroad will continue into the next phase.

NEXT STEPS

The current supplemental agreement is in process. It will be revised to remove the railroad closure application effort but retain the railroad coordination hours. The supplement will take approximately 4-6 weeks to execute.

For the meeting with Camp Haven, a virtual component will be added to the meeting invitation for FDOT staff that will attend virtually. Staff to include are Cesar, Dan, and John Olson to the meeting invite. FDOT will coordinate with OEM, if any socio-cultural concerns arise.

Attendance List		
Meeting Title	4416931-Progress Meeting	- for SR 5 at Aviation Blvd PD&E Study
Attended participants	10	
Start time	11/08/23, 1:25:55 PM	
End time	11/08/23, 2:15:08 PM	
Meeting duration	49m 12s	
Average attendance time	40m 22s	
2. Participants		
Name	In-Meeting Duration	Email
William Evans	48m 55s	William.Evans@wginc.com
LopezLandaverde, Dina	48m 4s	Dina.LopezLandaverde@dot.state.fl.us
Robert Winslow	47m 26s	Robert.Winslow@wginc.com
Phan, Trang	45m 21s	Trang.Phan@dot.state.fl.us
Linda Hess	44m 23s	Linda.Hess@wginc.com
Marwood, Daniel	43m 20s	Dan.Marwood@dot.state.fl.us
Nagole, Vandana	41m 4s	Vandana.Nagole@dot.state.fl.us
Martinez, Cesar	40m 49s	Cesar.Martinez@dot.state.fl.us
Hughes, James	38m 54s	James.Hughes@dot.state.fl.us
Sonnett, Anson	5m 22s	Anson.Sonnett@dot.state.fl.us



3

Alternatives 1, 2, 7, and 8 (At-Grade Alternatives)





ALTERNATIVE EVALUATION MATRIX

SR 5/US-1 at Aviation Boulevard PD&E Study - FPID: 4441693-1-22-02

	LEGEI	ND:		Ν
Less Desirable			More Desirable	$\left[\right]$
1 point	2 points	3 points	4 points	γ

CRITERIA	NO BUILD	ALTERNATIVE 1 CONVENTIONAL	ALTERNATIVE 2 ONE-WAY PAIR	ALTERNATIVE 7 DISPLACED LEFT TURN	ALTERNATIVE 8 MEDIAN U-TURN ROUNDABOUT
LEVEL OF SERVICE	US 1 & Aviation Blvd LOS F (AM/PM)	US 1 & Aviation Blvd – LOS D AM/PM (3)	US 1 & Aviation Blvd – LOS D AM/PM (3)	US 1 & Aviation Blvd – LOS D (AM) US 1 & Aviation Blvd – LOS C (PM) (4)	US 1 & Aviation Boulevard – LOS D (AM) Us 1 & Access Rd– LOS C (AM) US 1 & Aviation Boulevard – LOS C (PM) US 1 & Access Rd– LOS B (AM) (4)
SAFETY	Paved median remains. No crash reduction measures (1)	Adds a raised median 72% crash reduction (3)	Adds a raised median 72% crash reduction (3)	Complicated turns movements at railroad crossing. 64% crash reduction (2)	Adds a raised median 80% crash reduction (4)
MOBILITY (TRANSIT, BICYCLE, PEDESTRIAN)	No bicycle facilities and cracked sidewalks	Shared use path for bicyclists and pedestrians. Bus bay provided for transit (4)	Shared use path for bicyclists and pedestrians. Transit stops provided. (3)	Does not provide for transit southbound. Displaced left adds second pedestrian crossing maneuver. (1)	Shared use path for bicyclists and pedestrians. Bus bay provided for transit. (4)
ROADWAY ALIGNMENT	Bridge and curb remain adjacent to railroad right of way	Straight alignment. Roadway is buffered from railroad right of way. (4)	One way pair. Superelevated curved bridge. (1)	Additional deflection and bridge widening for displaced left turn (2)	Redirection of left turns and higher traffic volumes east of SR 5/US-1 (3)
DRAINAGE	Continued drainage problems along sidewalk	Pond 1-C Score 221 (2)	Pond 2A Score 214 (3)	Pond 7C Score 225 (2)	Pond 8-A Score 219 (3)
BRIDGE AND CANAL	Aging bridge and no canal access upstream of the bridge at the railroad.	Canal-Bridge maintenance access provided on all sides (4)	Canal-Bridge maintenance access provided on one side (1)	Canal-Bridge maintenance access provided on all sides (4)	Canal-Bridge maintenance access provided on all sides (4)
RAILROAD	Bridge and roadway remains adjacent to railroad right of way	Raised median provided on Aviation Blvd. Large US 1 rail-roadway buffer. 6 lanes at railroad crossing (3)	Raised median provided on Aviation Blvd. Minimal US 1 rail-roadway buffer. 6 lanes at railroad crossing. (2)	Raised median provided on Aviation Blvd. Moderate US 1 rail-roadway buffer. 6 lanes at railroad crossing. Displaced left turn at rail crossing. (1)	Raised median provided on Aviation Blvd. Large US 1 rail-roadway buffer. 5 lanes at railroad crossing (4)
RIGHT OF WAY PROPERTIES IMPACTED	N/A	27 Parcels, 5.33 Acres (4)	42 Parcels, 7.61 Acres (1)	29 Parcels, 6.03 Acres (3)	35 Parcels, 8.89 Acres (1)
ENVIRONMENTAL	Does not improve water quality (1)	Stormwater quality improvements. Minor impacts. (3)	Stormwater quality improvements. Some effects to forested area. (2)	Stormwater quality improvements. Minor impacts. (3)	Stormwater quality improvements. Some effects to forested area. (2)
NOISE IMPACTS	N/A	Low (3)	Shifts US-1 travel lanes eastward 500 feet towards homes (1)	Low (3)	Higher traffic levels around roundabout. Road closer to residential. (2)
MAINTENANCE	Increased maintenance as road ages	1 Signal (4)	2 Signals. Additional access road maintenance. (2)	2 Signals (3)	2 Signals. Additional access road maintenance. (2)
CONSTRUCTABILITY	N/A	Roadway and bridge can be construction in phases (3)	Requires temporary bridge and detour (1)	Roadway and bridge can be constructed in phases Increased phase for displaced left turn. (2)	Roadway and bridge can be constructed in phases (3)
TOTAL COST	Maintenance cost	\$37,114,000 (4)	\$39,832,000 (2)	\$39,810,000 (3)	\$45,776,000 (1)
SCORE / RANK	N/A	44 points	25 points	33 points	37 points

SR 5 / US 1 at Aviation Boulevard PD&E Study | FPID No: 441693-1-22-02



JARED W. PERDUE, P.E. SECRETARY

MEETING NOTES

DATE:	November 13, 2023 from 11:00 AM to 12:30 PM
PLACE:	City Hall of City of Vero Beach and via TEAMS meeting
то:	Chuck Bradley, Gordon Stewart, Adam Logemann, Matthew Mitts, Jason Jefferies, Jim Hughes, Cesar Martinez, Dan Marwood
FROM:	Vandana Nagole, FDOT Project Manager
COPIES:	Bill Evans, Linda Hess
SUBJECT:	Local Coordination Meeting with Camp Haven Representatives SR 5/US 1 at Aviation Boulevard PD&E Study Indian River County

Meeting Summary:

FM: 441693-1-22-02

ETDM: 14475

The purpose of the meeting was to facilitate an open and interactive discussion with representatives from the Camp Haven Rehabilitation Center, the City of Vero Beach and FDOT regarding the subject project and right of way impacts to the Camp Haven Rehabilitation Center for Men. 1. The public workshop concepts and right of way maps were available for Alternatives 1 (conventional intersection) and Alternative 2 (one-way pair).

- 1. Camp Haven representatives provided an overview of the center's goal, facility and operations:
 - a. The center is a privately funded non-profit organization that provides counseling, work force training, life skills coaching, meals and housing for men ages 18 to 77, that were previously homeless. Their success rate is 75% which is high for these types of programs. The operating budget is upwards of \$750,000 annually.
 - b. The comprehensive program is available for men that have successfully completed prior alcohol or addiction treatment. The structured program provides onsite housing for 12 to 24 months and psychological counseling. Men are required to have a job within 30 days. The nearby churches provide meals for the tenants.
 - c. The center's location is nearby to several support organizations such as United Against Poverty, The Source, Treasure Coast Homeless Services, St Vincent De Paul Society, Manpower, Cleveland Clinic hospital, and medical care. Local bus service is provided on SR 5/US 1 and the ability to bike or walk to the local services and job opportunities is a benefit.

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- d. The zoning for the Camp Haven parcel has approval for short term tenants as a motel. Camp Haven is gathering funding for four (4) long-term rental units and has about 60% of the goal achieved.
- 2. The group discussed the FDOT Right of Way (RW) process, project timeline, and property owner rights.
 - a. Once the PD&E is completed and the Design phase reaches approximately 60% complete the FDOT RW office begins the appraisal process. The PD&E is scheduled for completion by December 2024. The Design phase for the project (if it becomes funded) is tentatively scheduled for 2025 and 2026. The R/W phase (if funded) would start about midway through the design phase.
 - b. FDOT conducts an appraisal and presents an offer to the landowner to purchase the land and impacted on-site improvements such as parking and buildings. FDOT only purchases the area that is needed for the project.
 - c. Properties that have small parcel remainders have an option to sell to FDOT.
 - d. The FDOT provides the owner funding for an advisor and/attorney service based on the phase of the RW process, such as appraisal/offer phase and relocation phase.
- 3. The group discussed the potential options for Camp Haven to relocate or rebuild what is lost to RW acquisition.
 - a. Camp Haven stated that is quite difficult to identify available land for relocating to that has the correct zoning, acceptable price, and similar location features that the current site provides.
 - b. The City noted:
 - i. The Code of Ordinances Sec 64.29 (enclosed below) allows for any original non-conformity to remain but not be enlarged after a RW acquisition occurs.
 - ii. Any parcel selected outside the city limits would be under county zoning rules.
 - iii. The City's code would allow for relocation in industrial zoned areas such as along the US-1/FEC railroad corridor. The City is conducting a land supply analysis. One potential parcel is the old city nursery on Old Dixie by the cemetery. The City is conducting a new City Master Plan for US 1 south of Main Canal.
 - iv. The City noted that the county bought the used furniture building on the southeast corner of US 1 and 32nd Street (Aviation Blvd.).
 - c. Camp Haven stated their best option is to stay at the current location
 - i. If impacted, would they have the opportunity to replace lost features on adjacent properties?
 - ii. The solution would need to identify how the "L" shaped building would be impacted, identify replacement housing and office space with visibility to the remaining site.
 - iii. The timing of the impact and construction of the replacement housing is critical to Camp Haven's operation, maintaining housing and services for the on-site residents, and ability to keep financial donors engaged with contributions to the non-profit organization during the process.

- 4. The group discussed the timing of the impacts, demolition of existing structures and actual relocation date.
 - a. The typical R/W process begins with the purchase offer, agreement, and then the relocation process begins.
 - b. Camp Haven noted that their ability to accept an offer is in part contingent on the post R/W acquisition conditions of their facility and/or relocation options. Potential timelines may to be need longer than typical durations for zoning changes and or construction of replacement housing due the nature of their social services.
 - c. The option of FDOT Advance Acquisition (RWAA) process was discussed. RWAA is the ability to start the appraisal/offer process sooner or earlier in the design phase. Advanced acquisition is subject to funding and approval.
- 5. Next Steps:
 - a. FDOT ROW will look into advanced acquisition, funding status, and the financial requirements of the process.
 - b. The FDOT will contact Camp Haven by February 2024 to provide an update.

Attendees:

Camp Haven: Chuck Bradley, Gordon Stewart, Adam Logemann, City of Vero Beach: Matthew Mitts, Jason Jefferies, FDOT: Vandana Nagole, Jim Hughes, Cesar Martinez, Dan Marwood WGI: Bill Evans, Linda Hess

VN:wte

Enclosure: Sec. 64.29 Nonconformities

11/13/23, 8:53 AMVero Beach, FL Code of OrdinancesSec. 64.29. - Nonconformities resulting from exercise of the power of eminent domain.

Any lot or parcel of land, or structure or other improvement located thereon, that is made nonconforming with the land development regulations of the city, part III of this Code, on or after May 1, 2009, as a result of eminent domain proceedings instituted by the city or other condemning authority, or through voluntary conveyance by such lot or parcel owner in lieu of formal eminent domain proceedings, shall be deemed to be conforming for all purposes under the land development regulations of the city without the necessity for a variance, but only to the extent that such lot, parcel, structure, or other improvement was otherwise conforming to said regulations at the time of such eminent domain or voluntary conveyance and only so long as any such nonconformity is not expanded, increased, or enlarged in any manner. Any structure or site improvement subject to this section may be rebuilt, relocated, reconstructed, expanded or enlarged so long as such rebuilding, relocation, reconstruction, expansion or enlargement does not further expand, increase, or enlarge the nonconformity.

(Ord. No. 2009-16, § 1, 9-15-2009)



JARED W. PERDUE, P.E. SECRETARY

MEETING NOTES

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GOVERNOR

- **DATE:** February 29, 2024, at 1:00 PM to 2:30 PM via TEAMS call
- **TO:** Kristin Leiendecker, Matthew Mitts, William Howard, Jason Jefferies, Brian Freeman, Victor Ramos, Dan Marwood, Erik Ferguson
- **FROM:** Vandana Nagole
- **COPIES:** Bill Evans
- SUBJECT: Local Coordination Meeting SR 5/US 1 at Aviation Boulevard PD&E Study Indian River County FM: 441693-1-22-02 ETDM: 14475

Meeting Notes:

The purpose of the meeting was to present the PD&E preferred alternative to Indian River County and City of Vero Beach Public Works, IR MPO planners, and Vero Beach Airport engineers.

- 1. FDOT provided an overview of the October public workshop and value engineering study. The preferred alternative was discussed including the geometry, bridge replacement, shared use path, bicycle lanes and pond.
 - a. The city, county and MPO requested on-street bicycle lanes to be provided on Aviation Boulevard. FDOT noted that this alternative has been available for review throughout 2023 and the shared use path was presented as the facility to serve bicyclists. Discussion at the meeting and in follow up emails that day concluded FDOT PD&E team will investigate the following:
 - i. West of the FEC RR: Add a westbound 5 ft to 7 ft on-street bike lane. An on-street bicycle lane is not required eastbound where the shared use path is located.
 - ii. **East of the FEC RR:** Add west/eastbound on-street 7 ft bike lanes, remove the shared use path and add 6 ft sidewalks.
 - iii. **Railroad crossing:** investigate the railroad gate and potential median gate requirements.
 - iv. **Superelevation transition:** This was reviewed after the meeting and meets standards.
 - v. Erik Ferguson provided a PDF of comments on the plan sheets via email.
- 2. The City requested an updated right of way parcel map cadd file once the changes are implemented. No other updates were provided by the City.

- 3. Extension of Aviation Boulevard to the hospital area.
 - a. The County noted they are working with land owners on the extension alignment. A comment noted the County alignment does not match the PD&E alignment. The FDOT responded the county project was developed with a connection to the existing US 1 travel lanes and existing R/W, which does not support the required curvature for the PD&E alignment and widening of US 1. The FDOT noted the county alignment should match the PD&E alignment to avoid reconstruction of the county's extension project.
 - b. The County noted there is not a timeline for the extension project as the project has not moved past the current study phase while discussions with land owners continue. The MPO noted the county project was likely funded in the county capital improvement plan.
- 4. The FDOT R/W process will take 36 months. The FDOT is looking into funds for advancing the R/W appraisal process for Camp Haven. FDOT recommended to the City and County to implement an Eminent Domain Policy in the land codes to address a parcel's "after" condition for non-compliant parcels.
- 5. Upcoming Coordination Meetings:
 - a. Camp Haven on March 4th
 - b. MPO Board in April (before SR-5 hearing) or June (after SR-5 hearing)
 - c. Public Hearing tentative dates at this time:
 - i. Draft documents will be available to the public 21 days prior to the hearing.
 - ii. Virtual: June 5th Wednesday at 6:30 PM
 - iii. In-Person: June 6th Thursday at 6:30 PM
- 6. Complete the PD&E study December 2024.

1. Summary	Meeting Attendance	
Meeting title Preferred Alternative -		SR 5/US 1 at Aviation Blvd PD&E 441693-1
Attended participants	9	
Start time	2/29/24, 12:57:14 PM	
End time	2/29/24, 2:34:26 PM	
Meeting duration	1h 37m 11s	
2. Participants		
Name	In-Meeting Duration	Email
William Evans	1h 37m 7s	William.Evans@wginc.com
Kirstin Leiendecker	1h 35m 4s	kleiendecker@indianriver.gov
Brown, Christina	1h 27m 27s	Christina.Brown@dot.state.fl.us
Brian Freeman	1h 34m 7s	bfreeman@indianriver.gov
Nagole, Vandana	1h 33m	Vandana.Nagole@dot.state.fl.us
Matthew Mitts	1h 32m 57s	mmitts@covb.org
Jason Jeffries	1h 31m 32s	jjeffries@covb.org
Marwood, Daniel	7m 33s	Dan.Marwood@dot.state.fl.us
Ramos, Victor	37m 1s	Victor.Ramos@dot.state.fl.us
Erik Ferguson		eferguson@indianriver.gov

Linda Hess

From:	Harvey, Carina <carina.harvey@dot.state.fl.us></carina.harvey@dot.state.fl.us>
Sent:	Thursday, February 29, 2024 9:28 AM
То:	William Evans; Nagole, Vandana
Cc:	Keel, Rana; Rodrigues, Nadir; Linda Hess
Subject:	RE: [EXTERNAL] RE: Access Management - 441693-1 SR 5 At Aviation Blvd

You're welcome!

Carina Harvey District Access Management Manager FDOT District 4 Consultant 3400 West Commercial Blvd. Fort Lauderdale, FL 33309-3421 Email: <u>D4AccessManagement@dot.state.fl.us</u> Phone: 954-777-4363



From: William Evans <William.Evans@wginc.com>
Sent: Thursday, February 29, 2024 9:14 AM
To: Harvey, Carina <Carina.Harvey@dot.state.fl.us>; Nagole, Vandana <Vandana.Nagole@dot.state.fl.us>
Cc: Keel, Rana <Rana.Keel@dot.state.fl.us>; Rodrigues, Nadir <Nadir.Rodrigues@dot.state.fl.us>; Linda Hess <Linda.Hess@wginc.com>
Subject: RE: [EXTERNAL] RE: Access Management - 441693-1 SR 5 At Aviation Blvd

Thank you Carina: We will make a note in the PE Report of the D4 findings.

> William Evans, PE, AICP PD&E Market Leader



How Are We Dwing?

From: Harvey, Carina <<u>Carina.Harvey@dot.state.fl.us</u>>
Sent: Thursday, February 29, 2024 9:04 AM
To: Nagole, Vandana <<u>Vandana.Nagole@dot.state.fl.us</u>>
Cc: Keel, Rana <<u>Rana.Keel@dot.state.fl.us</u>>; Rodrigues, Nadir <<u>Nadir.Rodrigues@dot.state.fl.us</u>>; William Evans <<u>William.Evans@wginc.com</u>>
Subject: [EXTERNAL] RE: Access Management - 441693-1 SR 5 At Aviation Blvd

Good morning Vandana,

Based on our review, an access management reclassification/median opening table will not be required for this project.

Thank you,

Carina Harvey District Access Management Manager FDOT District 4 Consultant 3400 West Commercial Blvd. Fort Lauderdale, FL 33309-3421 Email: <u>D4AccessManagement@dot.state.fl.us</u> Phone: 954-777-4363



From: Nagole, Vandana <<u>Vandana.Nagole@dot.state.fl.us</u>>
Sent: Thursday, February 22, 2024 9:32 AM
To: Harvey, Carina <<u>Carina.Harvey@dot.state.fl.us</u>>
Cc: Keel, Rana <<u>Rana.Keel@dot.state.fl.us</u>>; Rodrigues, Nadir <<u>Nadir.Rodrigues@dot.state.fl.us</u>>; William Evans <<u>William.Evans@wginc.com</u>>
Subject: FW: Access Management - 441693-1 SR 5 At Aviation Blvd

Good morning Harvey :

The subject project is a PD& E project on SR 5 at Aviation Blvd. The attached document shows the preferred alternative that was determined during the study. Please see the email below and let us know how we can proceed.

Thank You,

Vandana Nagole, P.E., CSM Project Manager Consultant Management- Section 4



3400 West Commercial Blvd. Fort Lauderdale, FL 33309-3421 Phone: 954-777-4281 Fax: 954-777-4482 Email: vandana.nagole@dot.state.fl.us

From: William Evans <<u>William.Evans@wginc.com</u>>
Sent: Thursday, February 15, 2024 12:24 PM
To: Nagole, Vandana <<u>Vandana.Nagole@dot.state.fl.us</u>>

Cc: Linda Hess <<u>Linda.Hess@wginc.com</u>> Subject: Access Management - 441693-1 SR 5 At Aviation Blvd

EXTERNAL SENDER: Use caution with links and attachments.

Hello Vandana:

Can you talk to the Access Management coordinator about the project and find out how they want to proceed?

- Is an Access management reclassification required, even though the project is less than a half mile long?
- Is an Access Management median opening table required, even though there is only one signal, no other median openings, and the project returns to a flush paved median at each end of the project?

Project Facts

This is a unique project with only one signal and raised medians on SR 5 and no other openings between the project begin or end termini. The project limits are 1300 ft north and 1455 ft south of the signalized intersection.

- The existing Access Management Classification is Class 6 Non-Restrictive
- The proposed Access Management Classification will be Class 5 Restrictive

Thank you, Bill Evans



William Evans, PE, AICP PD&E Market Leader

2035 Vista Parkway West Palm Beach, FL 33411 561.687.2220 (office) | 561.209.7774 (direct)



How Are We Dwing?