

# **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**

**Draft Alternatives Presentation**

to

**Indian River County Metropolitan Planning Organization**

**Technical Advisory Committee**

January 27, 2023

# Agenda

- Project location, purpose and need
- Design considerations
- Traffic demand (Year 2045)
- Aviation Blvd Extension project by the County
- **FDOT PD&E Alternatives**
  - Alternative 1 – Conventional Intersection
  - Alternative 2 – Twin Intersections
  - 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)
- **Regional bicycle route concept beyond PD&E**
- **Summary and future coordination**



**US-1 northbound at Aviation Blvd.**



**FEC Railroad at Aviation Blvd.**

# Project Location | Purpose and Need

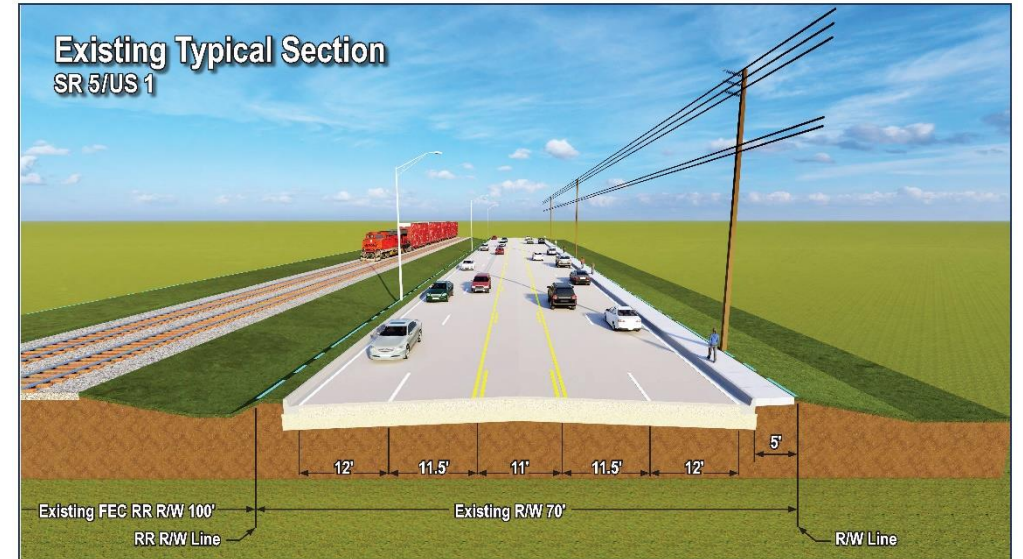
Project is located:

- Within the City of Vero Beach and Indian River County
- Project study area encompasses the area
  - Along SR 5/US 1 from 21<sup>st</sup> Street to 41<sup>st</sup> St
  - Along Aviation Boulevard from 27<sup>th</sup> Avenue to 13<sup>th</sup> Avenue

## Purpose and Need

- Existing and future traffic congestion and growth
- Evaluate intersection improvements at SR 5/US 1 and Aviation Boulevard to improve safety; address existing and projected traffic demand; and enhance the multi-modal features

### Project Location Map



# Design Considerations

## ■ Alternatives analysis and development

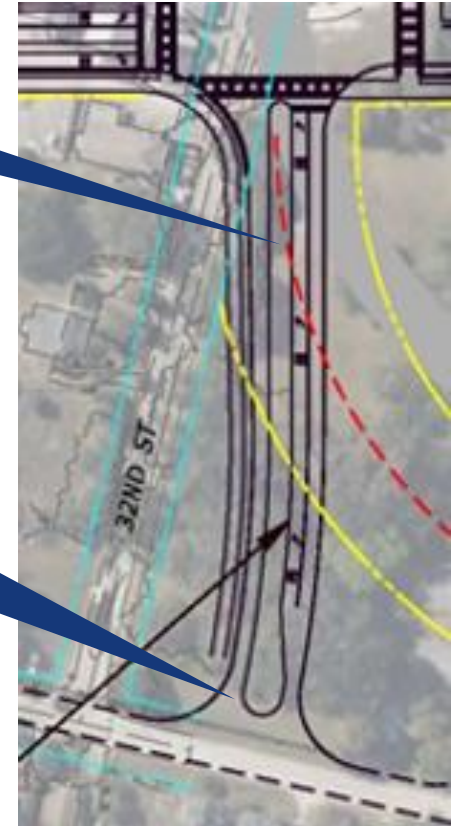
- PD&E alternatives are developed to
  - satisfy the project's purpose and need
  - be **compatible with** the County extension of Aviation Blvd
  - have **independent utility** which means they will function without the County's extension of Aviation Blvd by connecting to 13<sup>th</sup> Ave.
- Median access and side street connections are under review
- Alternatives are draft and subject to change

## ■ Major alignment factors

- FEC Railroad – minimize skew, widen US 1 to the east
- Vero Beach Airport
  - Runway Protection Zone – ground-based zone
  - Flight Surface – aerial overhead zone (40:1)
- Vero Man Ice Age archeological zone – between Main Canal and Aviation Blvd
- Constrained US 1 right of way beyond project limits - reduces effectiveness of on street bike lane connectivity.

Compatibility with IRC extension of Aviation Blvd

Independent Utility with connection to 13<sup>th</sup> Ave



# Design Elements and Criteria

## SR 5 / US-1

- Florida Design Manual
- Context Classification = C4 Urban General
- Target/Design/Posted Speed = 45 mph
- 6% overpass profile

## Aviation Boulevard

- Florida Greenbook
- Context Classification = C3C Commercial
- Target/Design/Posted Speed = 30 mph
- 7% overpass profile

## Common features provided:

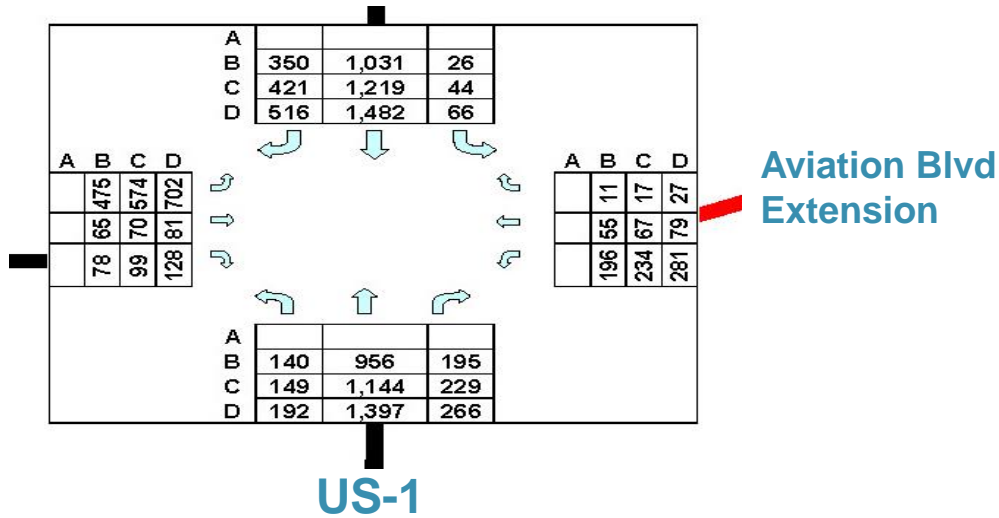
- 11-foot travel lanes
- Raised median
- Main Canal Bridge widening or replacement
- New construction with drainage, lighting, pedestrian crosswalks and signals
- Sidewalks, shared use paths, and bike lanes at right turn lanes
- Transit stops and/or bus bays on US 1

# Peak Hour Traffic Volumes at US 1 and Aviation Blvd.

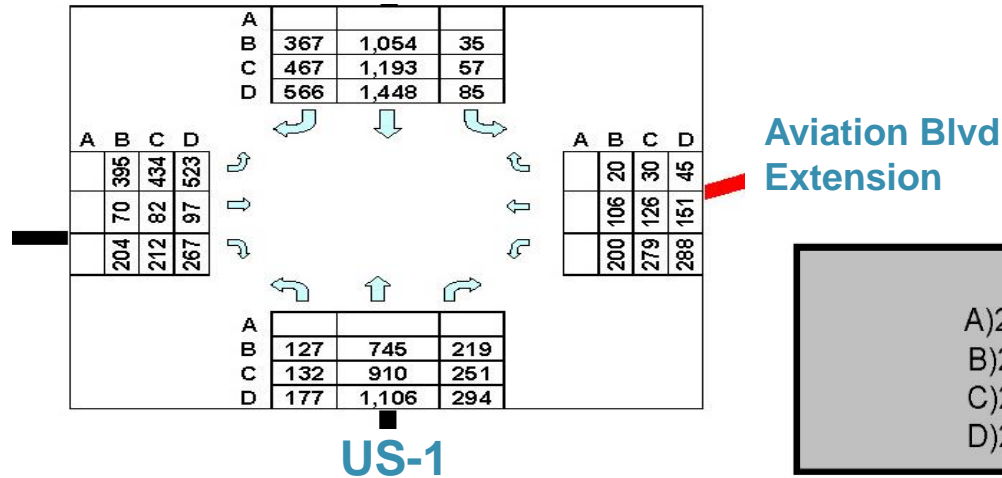


North

## AM PEAK HOUR

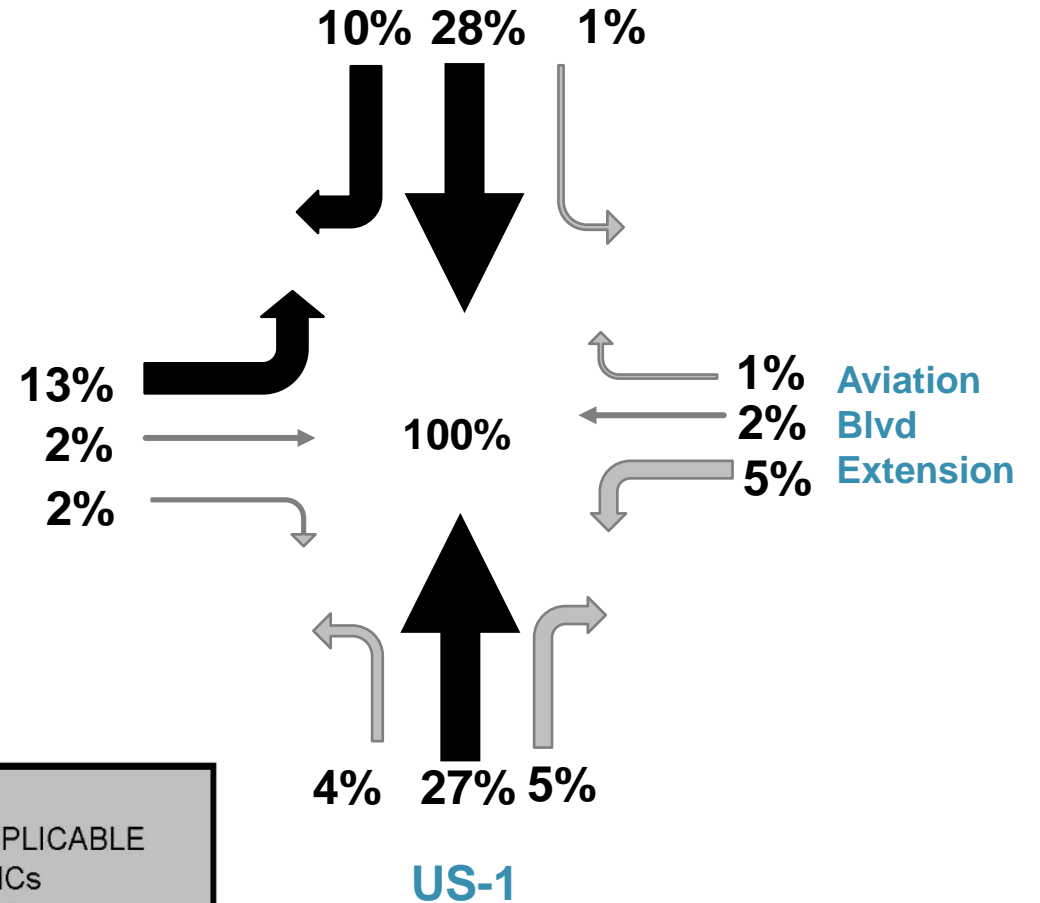


## PM PEAK HOUR



## Percent (%) of Total Intersection Volume

(AM Peak Hour)



**LEGEND**

- A) 2021 – NOT APPLICABLE
- B) 2025 – EST TMCs
- C) 2035 – EST TMCs
- D) 2045 – EST TMCs

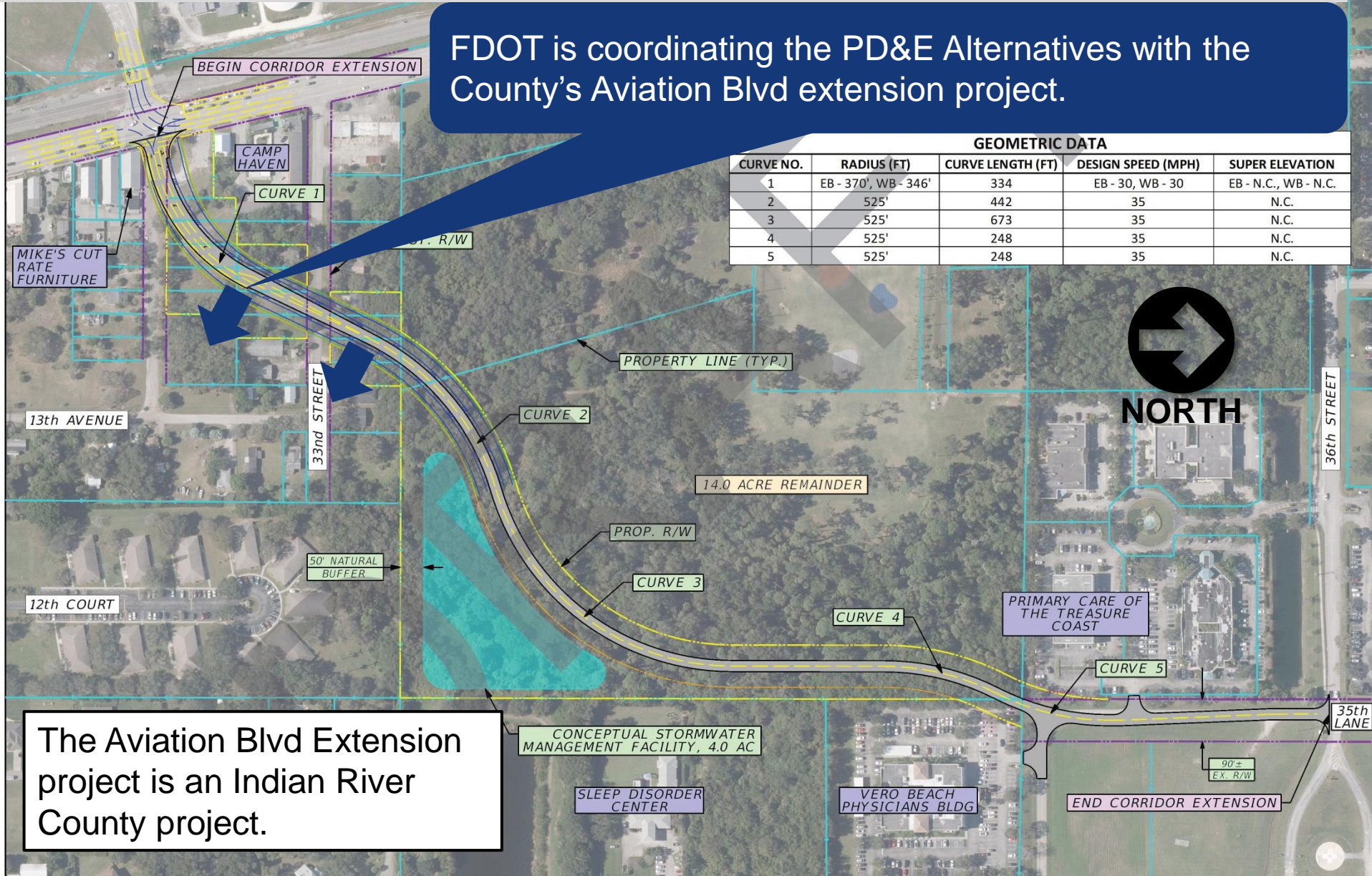
# Indian River County

## Aviation Blvd Extension Project



FDOT is coordinating the PD&E Alternatives with the County's Aviation Blvd extension project.

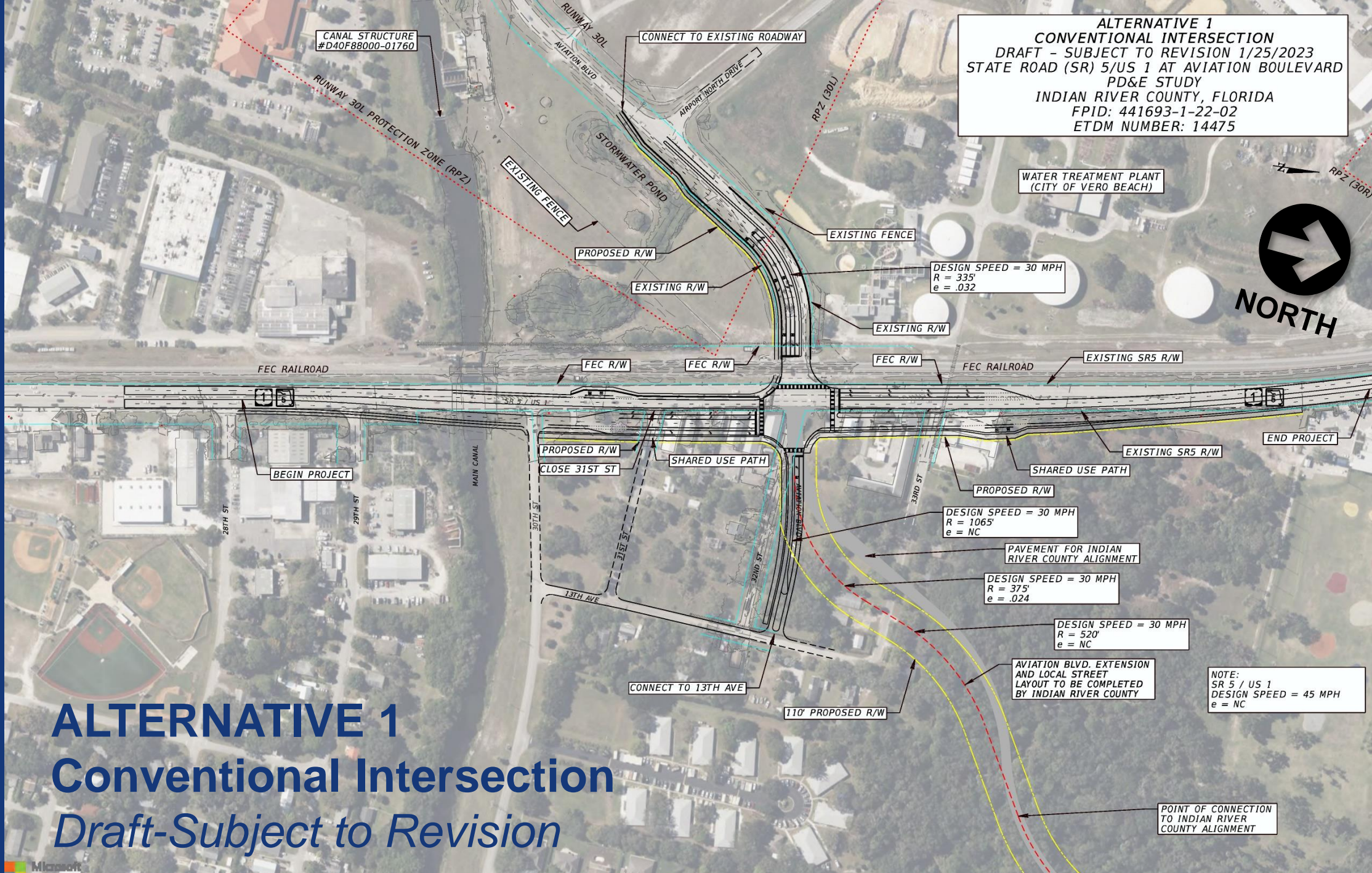
GEOMETRIC DATA				
CURVE NO.	RADIUS (FT)	CURVE LENGTH (FT)	DESIGN SPEED (MPH)	SUPER ELEVATION
1	EB - 370', WB - 346'	334	EB - 30, WB - 30	EB - N.C., WB - N.C.
2	525'	442	35	N.C.
3	525'	673	35	N.C.
4	525'	248	35	N.C.
5	525'	248	35	N.C.



The Aviation Blvd Extension project is an Indian River County project.

	REVISIONS
	DATE BY DESCRIPTION
INDIAN RIVER COUNTY	BOARD OF COUNTY COMMISSIONERS AVIATION BOULEVARD EXTENSION ALTERNATIVE ALIGNMENT STUDY
PREFERRED ALIGNMENT	
FIGURE NO.	
	13

**ALTERNATIVE 1**  
**CONVENTIONAL INTERSECTION**  
 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  
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# ALTERNATIVE 1

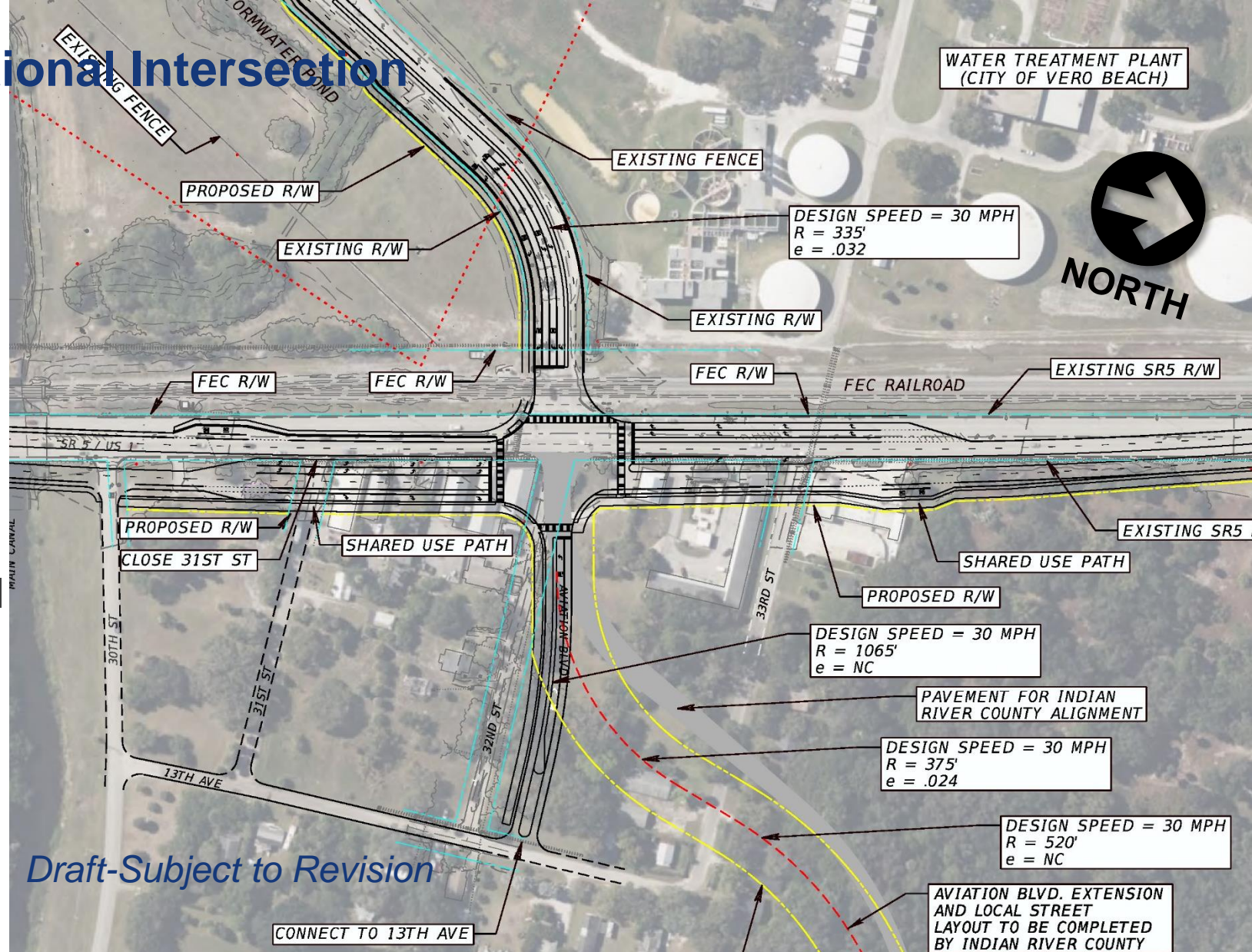
## Conventional Intersection

### Draft-Subject to Revision



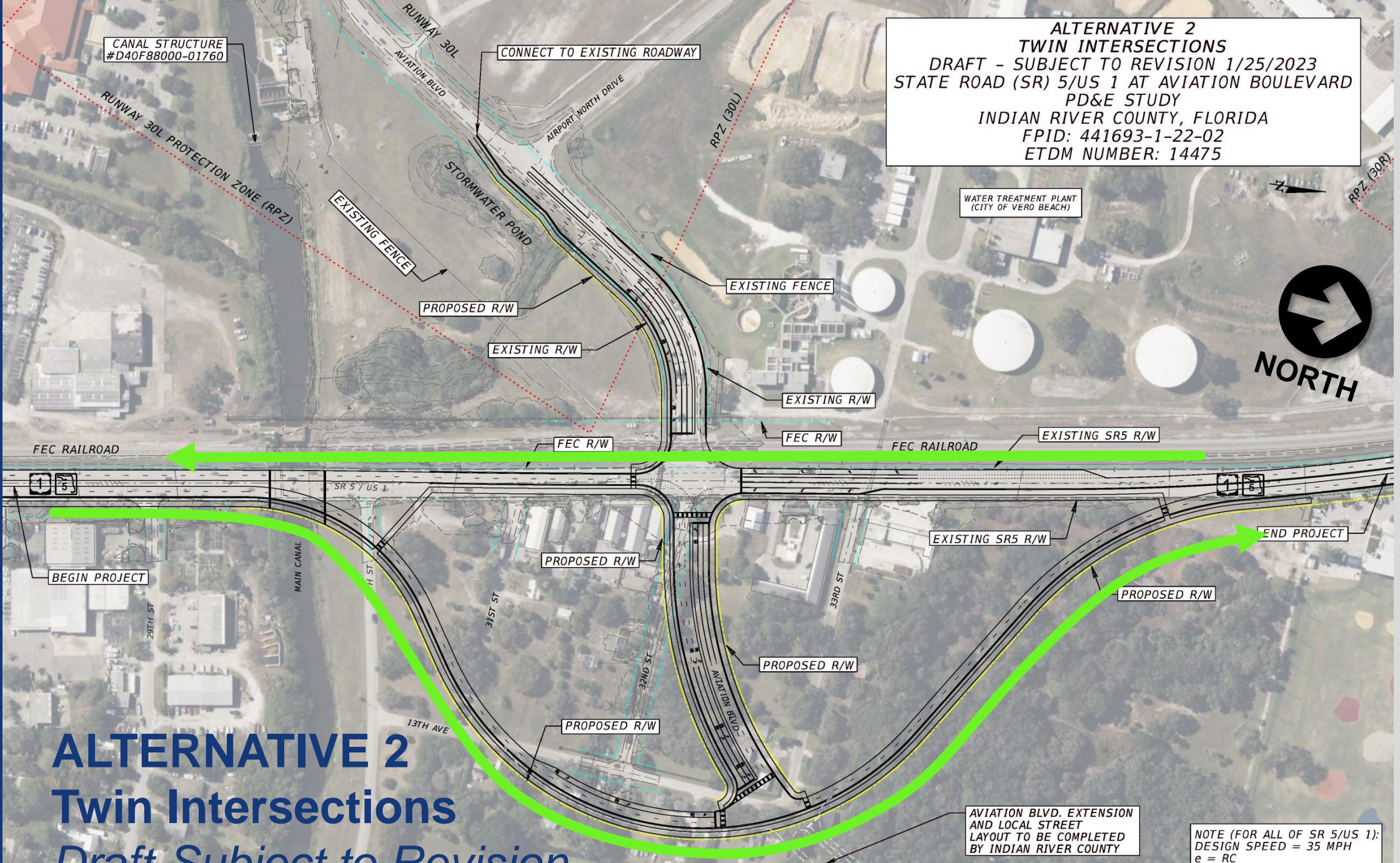
# Alternative 1: Conventional Intersection

- Widens US-1 ~85 ft
- Railroad grade crossing remains in place
- Shared Use Path on US-1 and Aviation Blvd
- Bus bays on US-1
- Full access to Airport N. Drive
- Businesses and residential impacts



2045 LOS (Delay AM/PM)	New Bridges	FEC Railroad	Airport N. Drive	Aviation Blvd (west of SR 5)	Cultural Effects	Aviation Blvd (east of SR 5)	Social Effects	Cost
D (38.3/46.4)	Main Canal Bridge	At grade crossing	Full access provided	Expands R/W	Minor widening to south	Shifts IRC alignment	Residential and business impacts	TBD

**ALTERNATIVE 2**  
**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  
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# ALTERNATIVE 2

## Twin Intersections

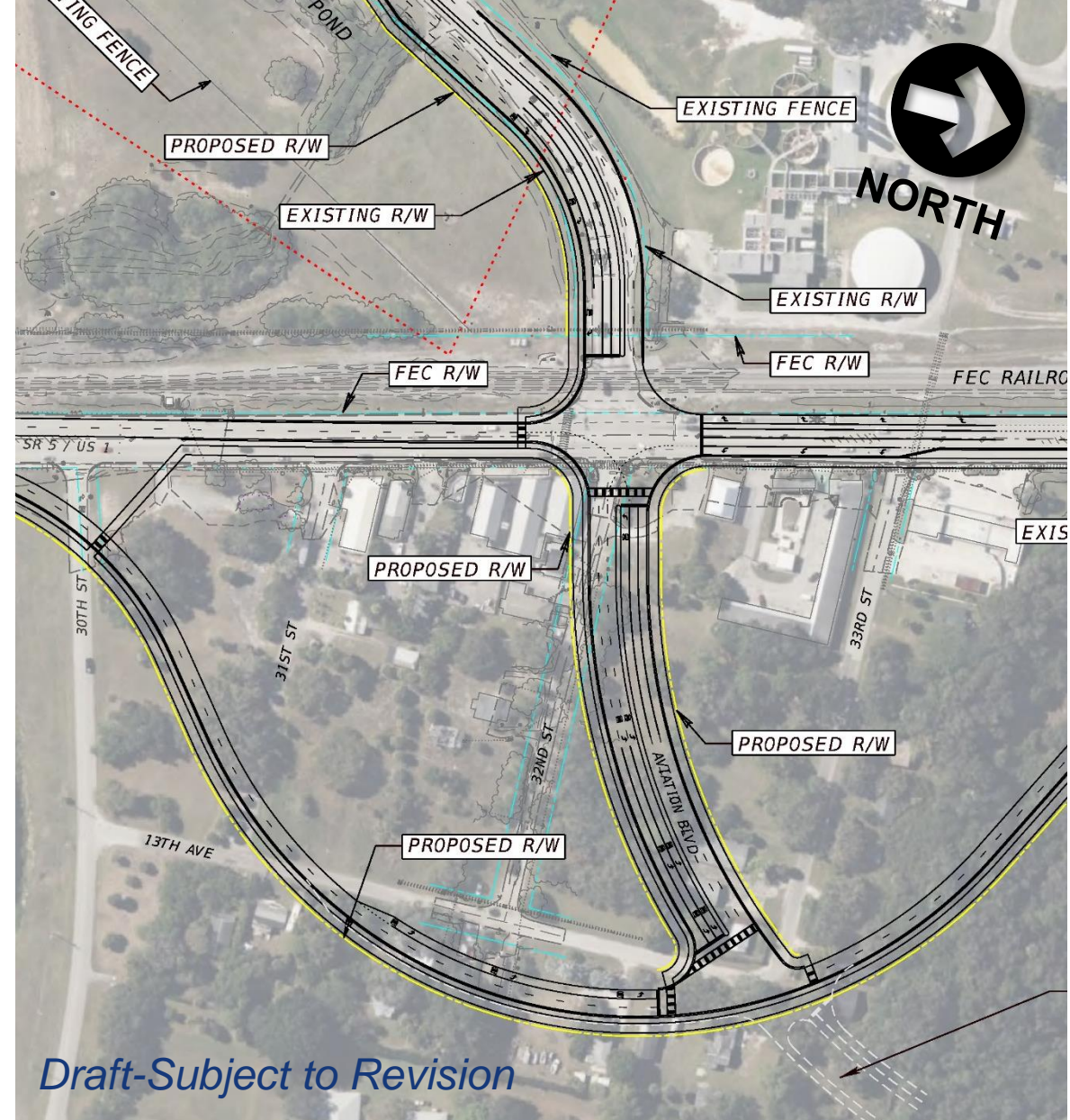
### Draft-Subject to Revision

AVIATION BLVD. EXTENSION  
AND LOCAL STREET  
LAYOUT TO BE COMPLETED  
BY INDIAN RIVER COUNTY

NOTE (FOR ALL OF SR 5/US 1):  
DESIGN SPEED = 35 MPH  
e = RC

# Alternative 2: Twin Intersections

- Railroad grade crossing remains in place
- Existing US-1 becomes southbound (SB)
- New US-1 northbound (NB) alignment
- Eastbound Aviation Blvd left turn queue length and storage needs push the NB intersection into 13<sup>th</sup> Avenue
- Effects large number of properties
- Business and residential impacts

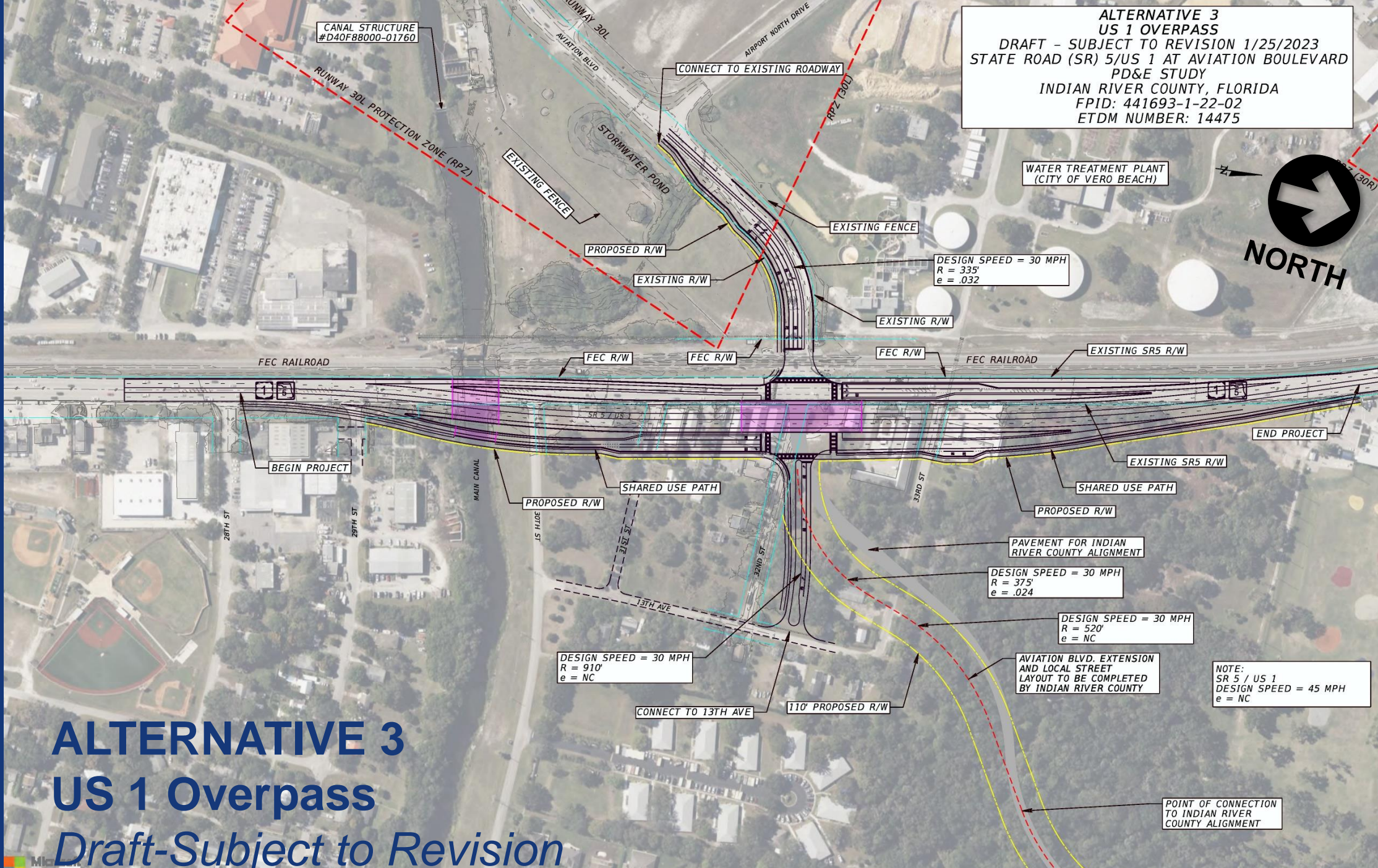


*Draft-Subject to Revision*

Intersection	2045 LOS (Delay AM/PM)
SB US-1 @ Aviation Blvd	C (34.5/33.8)
NB US-1 @ Aviation Blvd	D (42.3/35.3)

New Bridges	FEC Railroad	Airport N. Drive	Aviation Blvd (west of SR 5)	Cultural Effects	Aviation Blvd (east of SR 5)	Social Effects	Cost
2 @ Main Canal Bridge	At grade crossing	Full access provided	Expands R/W	Minor widening to south	Shifts IRC alignment	Residential and business impacts	TBD

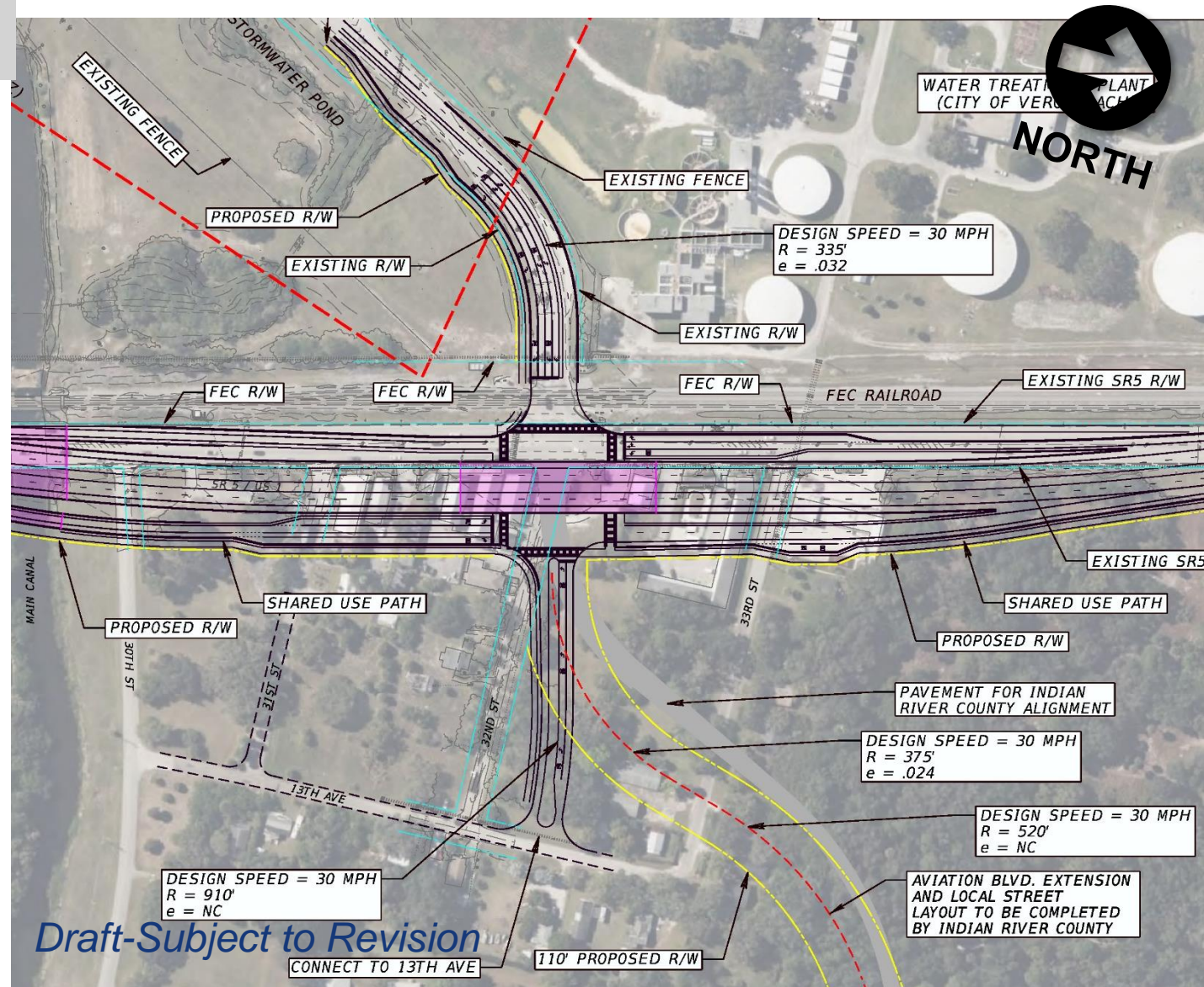
**ALTERNATIVE 3  
US 1 OVERPASS**  
 DRAFT - SUBJECT TO REVISION 1/25/2023  
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**ALTERNATIVE 3**  
**US 1 Overpass**  
*Draft-Subject to Revision*

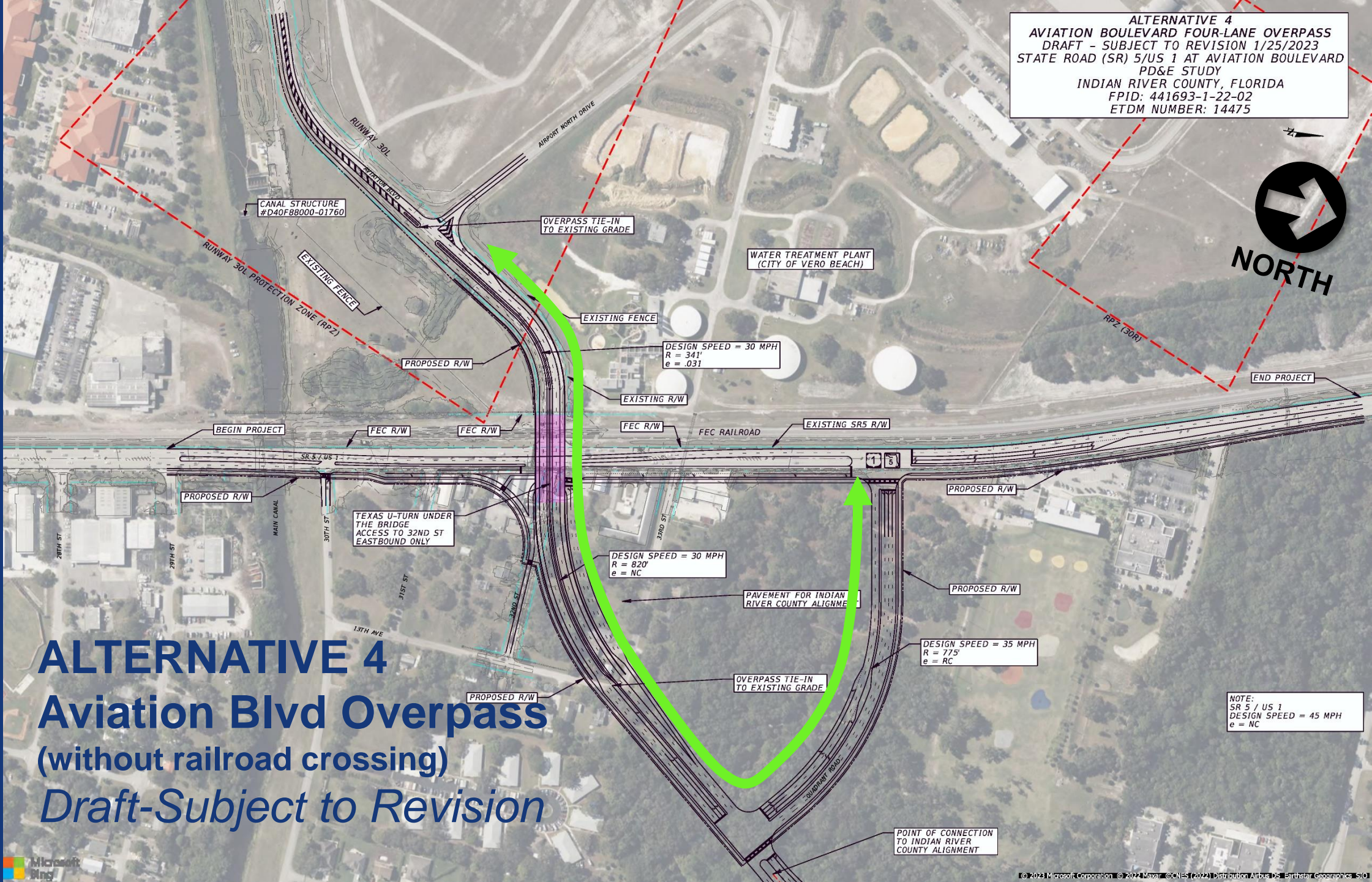
# Alternative 3: US 1 Overpass

- Widens US-1 ~150 ft
- 4 Lane US-1 overpass
  - Serves 55% of traffic volume
- Railroad grade crossing remains in place
- Bicyclists and pedestrians at street level
- Full access to Airport N. Drive
- Business and residential impacts



2045 LOS (Delay AM/PM)	New Bridges	FEC Railroad	Airport N. Drive	Aviation Blvd (west of SR 5)	Cultural Effects	Aviation Blvd (east of SR 5)	Social Effects	Cost
C (25.7/25.9)	2 @ Main Canal 1 @ Aviation Blvd	At grade crossing	Full access provided	Expands R/W	Minor widening to south	Shifts IRC alignment	Residential and business impacts	TBD

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  
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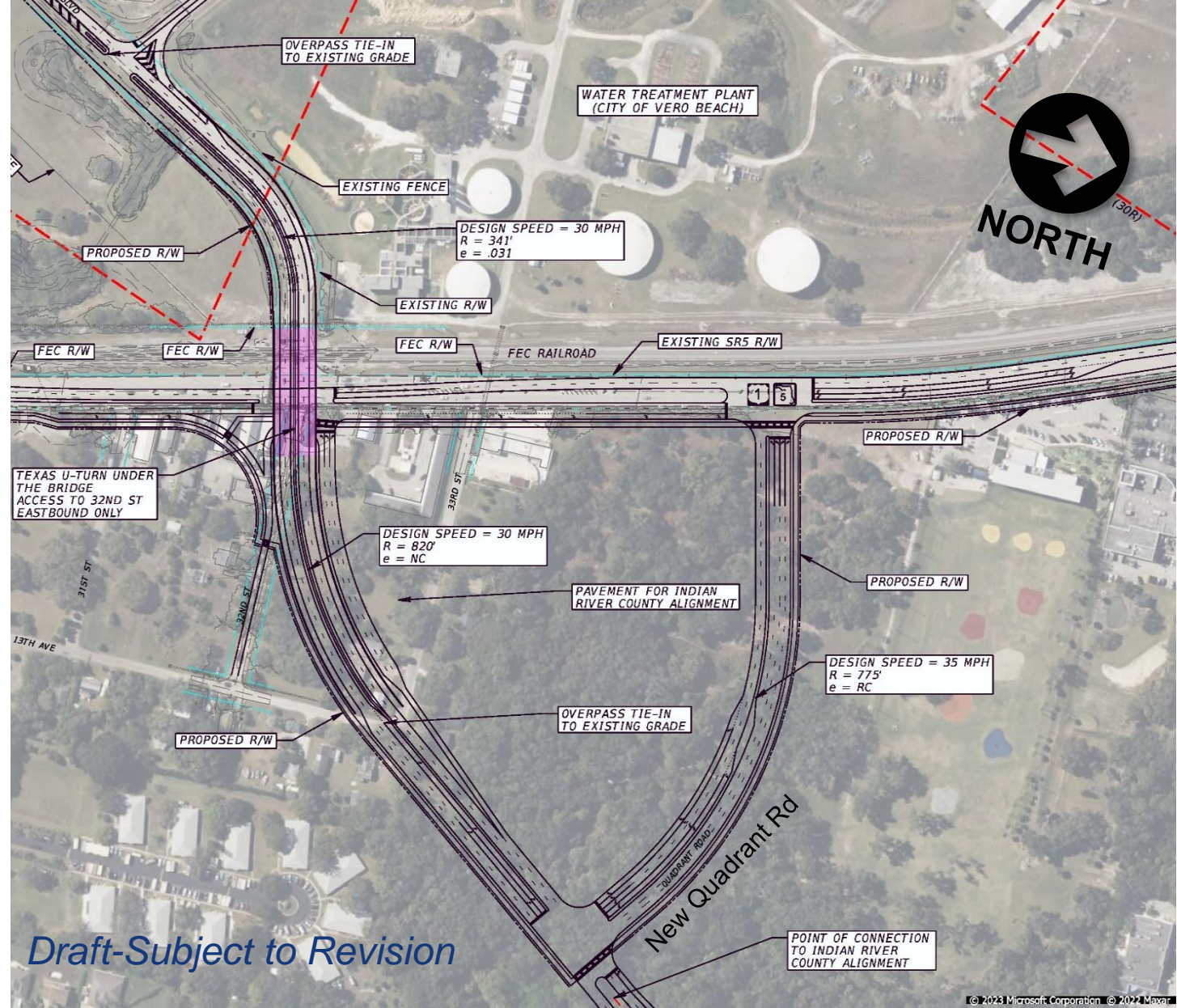
**ALTERNATIVE 4**  
**Aviation Blvd Overpass**  
 (without railroad crossing)  
*Draft-Subject to Revision*

NOTE:  
 SR 5 / US 1  
 DESIGN SPEED = 45 MPH  
 e = NC

# Alternative 4 Aviation Blvd Overpass (without railroad crossing)

- Widens US-1 ~50 ft
- 4 lane Aviation Blvd Overpass
  - Serves 33% of traffic volume
- Aviation Blvd connects to US-1 via quadrant road
- Eliminates the railroad crossing
- Bicyclists and pedestrians use overpass
- Partial intersection at US-1 & 32<sup>nd</sup> St
- Business and residential impacts

Intersection	2045 LOS (Delay AM/PM)
US-1 at 32 <sup>nd</sup> Street (below overpass)	B (18.4/13.3)
Aviation Blvd @ Quadrant Rd	C (34.7/34.5)
US-1 @ Quadrant Rd	C (26.2/28.3)



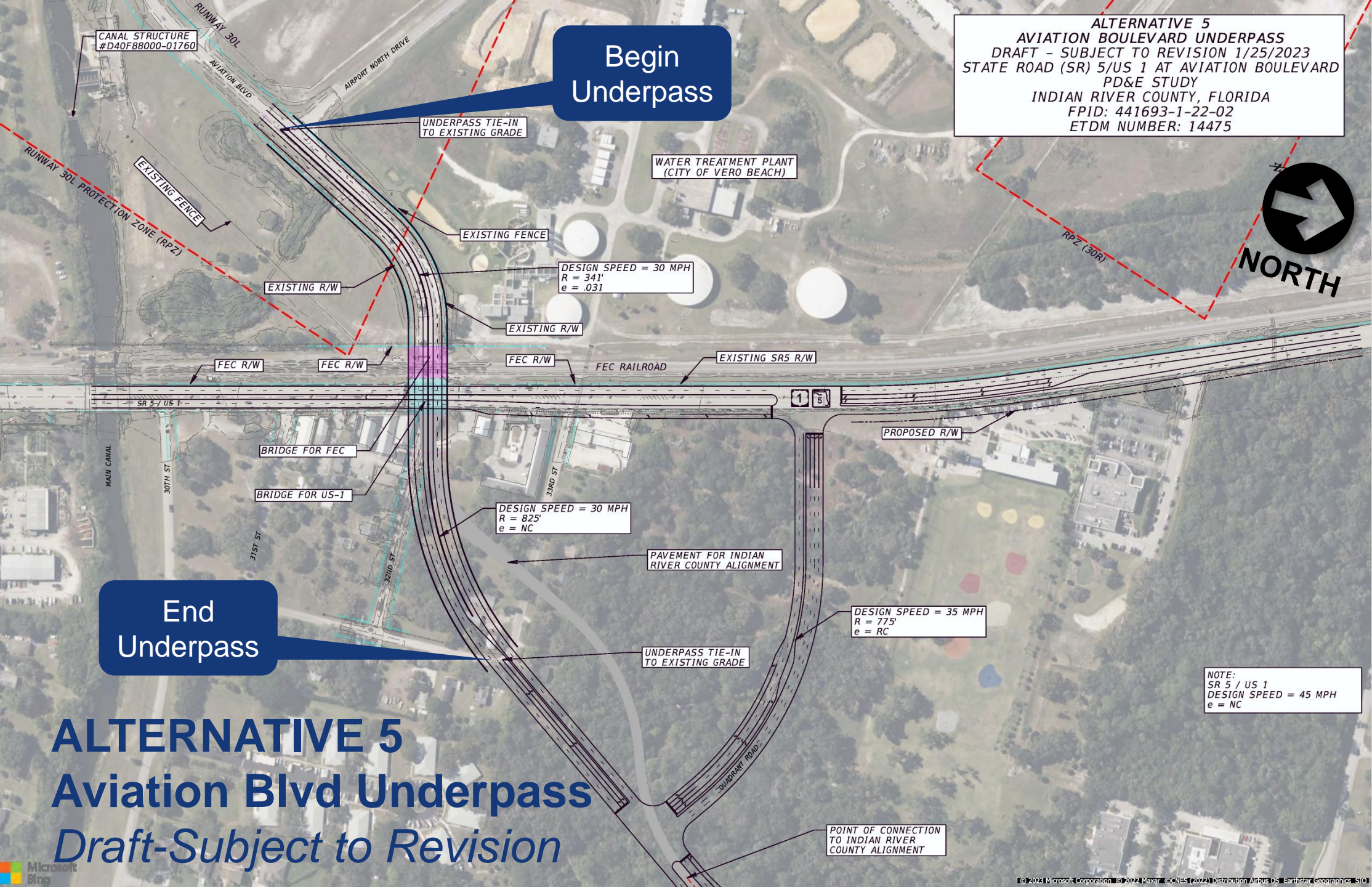
New Bridges	FEC Railroad	Airport N. Drive	Aviation Blvd (west of SR 5)	Cultural Effects	Aviation Blvd (east of SR 5)	Social Effects	Cost
Aviation Blvd Main Canal	Grade separated crossing	Full access provided	Expands R/W	Minor widening to south	Shifts IRC alignment	Residential and business impacts	TBD

**ALTERNATIVE 5**  
**AVIATION BOULEVARD UNDERPASS**  
 DRAFT - SUBJECT TO REVISION 1/25/2023  
 STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD  
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 INDIAN RIVER COUNTY, FLORIDA  
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**Begin Underpass**



**NORTH**



**End Underpass**

**ALTERNATIVE 5**  
**Aviation Blvd Underpass**  
*Draft-Subject to Revision*

NOTE:  
 SR 5 / US 1  
 DESIGN SPEED = 45 MPH  
 e = NC

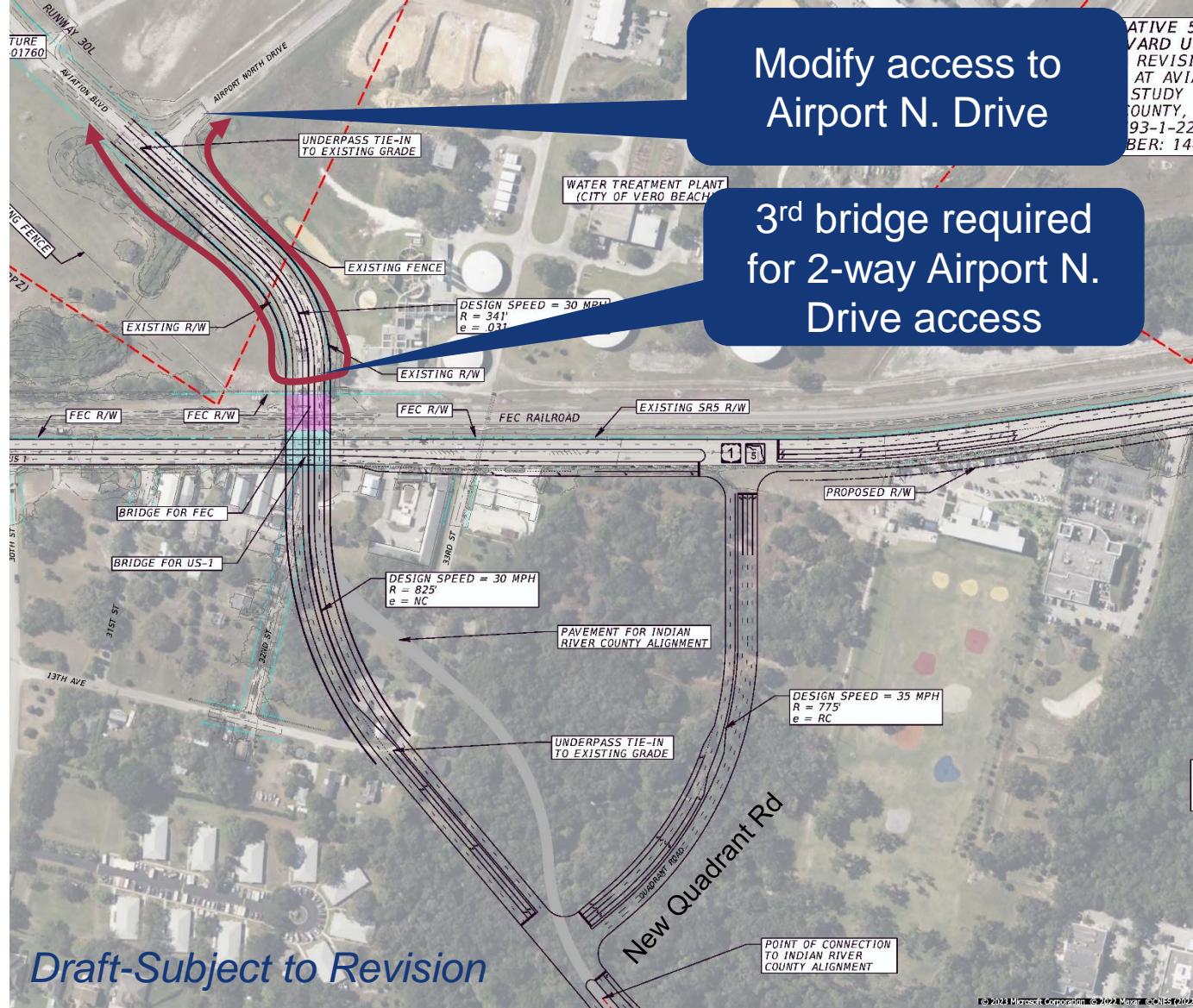


# Alternative 5: Aviation Blvd Underpass

- Widens US-1 ~40 ft
- 4 lane Underpass, + 3 bridges (FEC RR, US-1, Airport N. Drive)
- Airport N. Drive access rerouted
- Aviation Blvd connects to US-1 via a new quadrant road
- Eliminates railroad crossing
- Bicyclists and pedestrians use underpass
- Business and residential impacts

Intersection	2045 LOS (Delay AM/PM)
Aviation Blvd @ Quadrant Rd	D (38.3/37.8)
US-1 @ Quadrant Rd	C (33.0/33.8)

New Bridges	FEC Railroad	Airport N. Drive	Aviation Blvd (west of SR 5)	Cultural Effects	Aviation Blvd (east of SR 5)	Social Effects	Cost
1 @ FEC RR 1 @ US-1 1 for Airport N. Drive	Grade separated crossing Requires train stoppage during railroad bridge construction	Access requires separate road with bridge next to FEC above the underpass	Expands R/W	Moderate widening to south with 18-foot depth of excavation	Shifts IRC alignment	Residential / Business Displacements	TBD

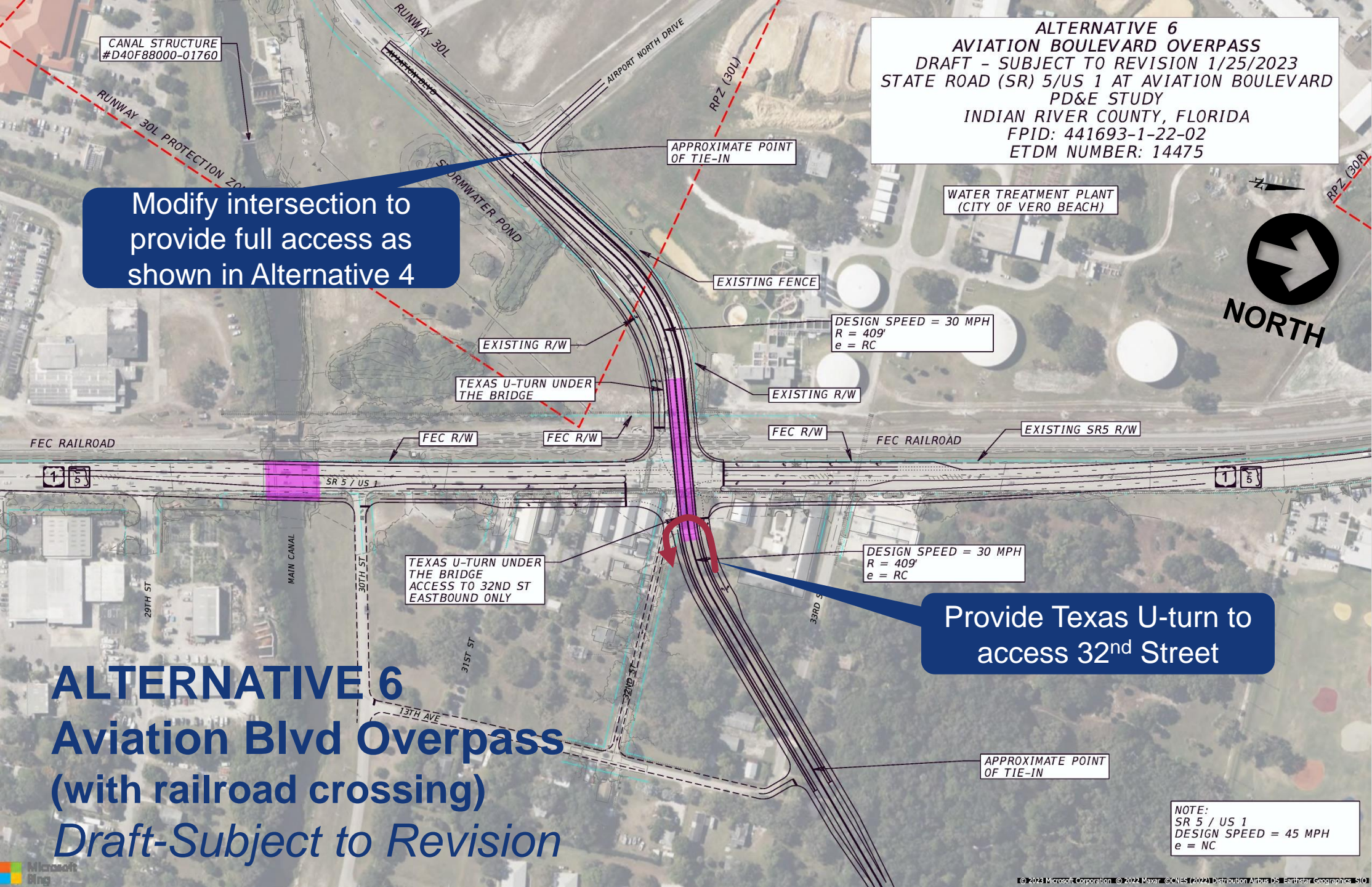


**ALTERNATIVE 6**  
**AVIATION BOULEVARD OVERPASS**  
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 STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD  
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Modify intersection to provide full access as shown in Alternative 4

Provide Texas U-turn to access 32<sup>nd</sup> Street

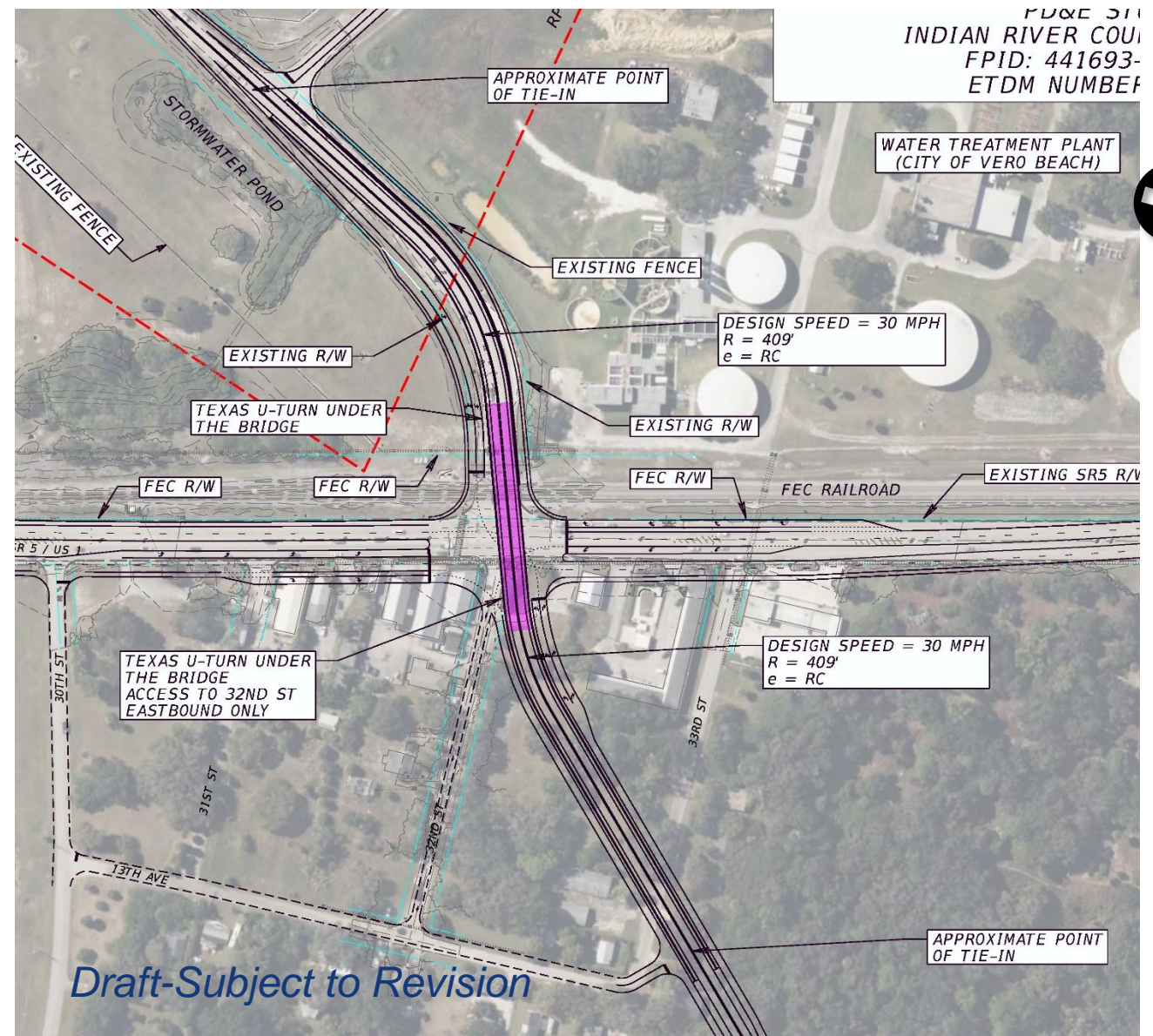
**ALTERNATIVE 6**  
**Aviation Blvd Overpass**  
 (with railroad crossing)  
*Draft-Subject to Revision*



NOTE:  
 SR 5 / US 1  
 DESIGN SPEED = 45 MPH  
 e = NC

# Alternative 6: Aviation Blvd Overpass (with railroad crossing)



- Widens US-1 ~40 ft
- 2 lane overpass
- Maintains railroad grade crossing
- Full intersection at US-1 and Aviation Blvd
- Potential 2 Phase Project
  - PH I Conventional Intersection
  - PH II Overpass with Extension
- Full access to Airport N. Dr. with intersection
- Business and residential impacts



FD&E 311  
INDIAN RIVER COU  
FPID: 441693-  
ETDM NUMBER

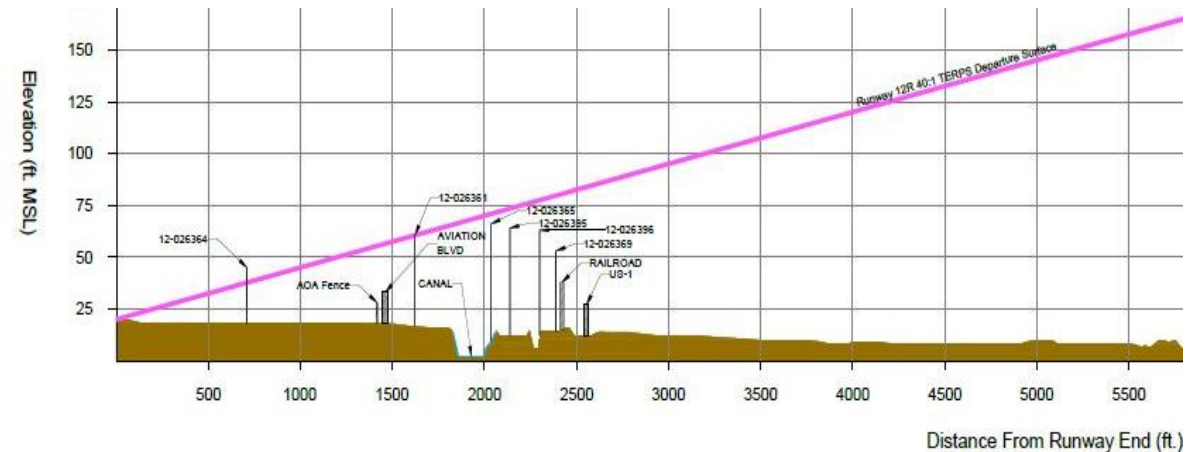
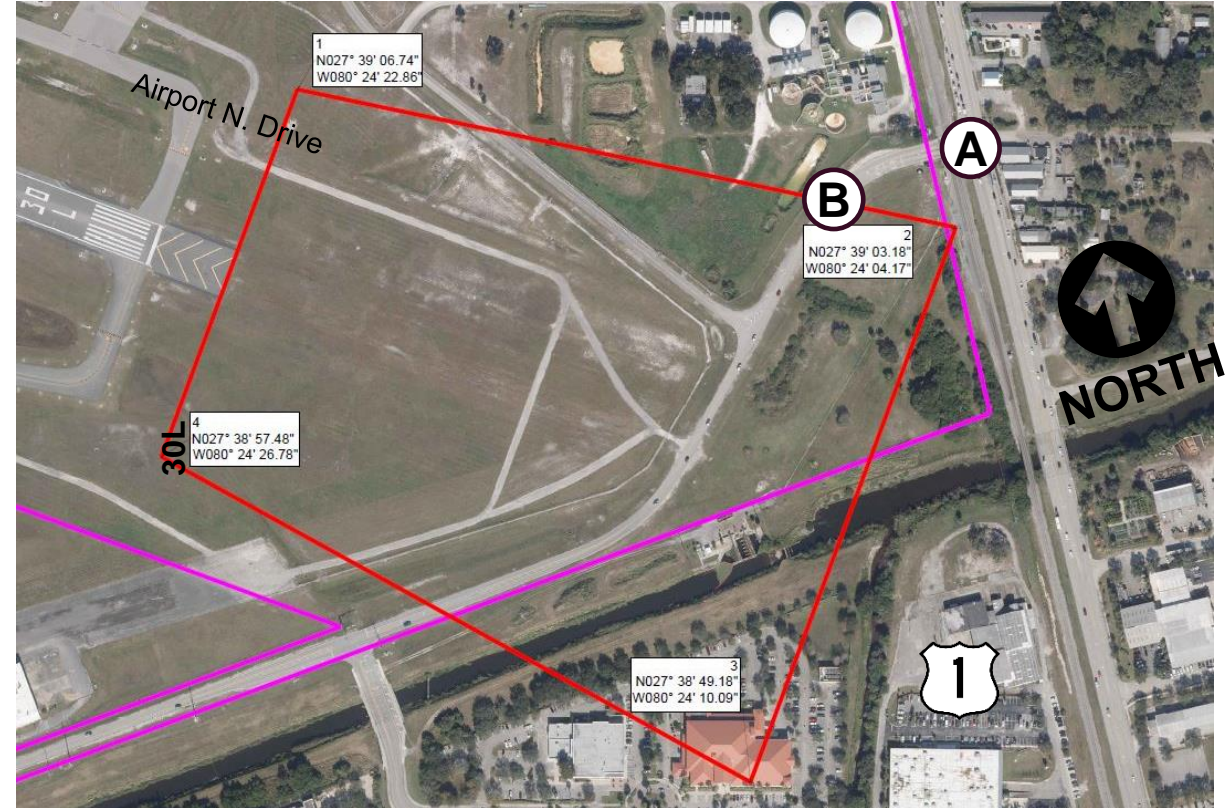
2045 LOS (Delay AM/PM)	New Bridges	FEC Railroad	Airport N. Drive	Aviation Blvd (west of SR 5)	Cultural Effects	Aviation Blvd (east of SR 5)	Social Effects	Cost
C (31.3/24.0)	1 @ US 1 1 @ Main Canal	At grade crossing	Full access capable	Expands R/W	Moderate widening to south	Shifts IRC alignment	Business and residential impacts	TBD

# Runway 12R-30L

-  ■ Runway Protection Zone
-  ■ Flight Surface (TERPS)
  - Slope 40:1 from end of runway

Elevation (Approximate feet mean sea level)	Alternative 3 <b>A</b>	Alternatives 4 and 6 <b>B</b>
Flight Surface	66.6'	54.6'
Overpass Deck Elevation	40.8'	36.8
Clearance between overpass deck and flight surface	25.8'	17.8'

- Roadway profile factors
  - 10 ft bridge superstructure depth
  - 6% Alternative 3 (SR 5)
  - 7% Alternatives 4 and 6 (Aviation Blvd)



# Potential Alternative Bicycle Route

## Shared Use Path and Local Streets

*This is not a component of the SR 5 PD&E Study*

### Why use alternative route

- US-1 has narrow existing R/W (70 ft) restricting implementation of bicycle lanes beyond project limits

### Alternative bicycle route concept

- Use Shared Use Path within PD&E Build Alternative Limits
- Partnership with City and County to develop a bicycle route on low-speed local streets with FDOT providing the bicycle route through the PD&E project area

### Alternative bicycle route benefits

- Provides a viable two-mile route connecting the town center of Vero Beach with residential, parks, restaurants, shopping, and health services areas
- Placing bicycle route within active land use with cross street connectivity at US-1 signals provides viable bicycle system between SR 60 and 41<sup>st</sup> Street



## Summary

- **Alternatives will undergo further evaluation and discussion**
  
- **Key activities or discussions to follow**
  - Federal Aviation Administration
  - Florida East Cost Railway
  - County's alignment and right of way activities
  - Alternative route for bicyclist
  - Selection of viable alternatives to move forward through the PD&E study with more detailed engineering and environmental effects analysis
  - Continue coordination with interested parties

## Upcoming Coordination

- **Attending City of Vero Beach Meeting**
- **Federal Aviation Administration**
  - Runway requirements and R/W review process
- **FEC Railroad and Brightline**
- **Continue meeting with**
  - IRC MPO
  - IRC Public Works
  - Vero Beach Regional Airport
  - City of Vero Beach Public Works
  - Other interested parties
- **Conduct Public Alternatives Meeting**
  - Late summer or fall of 2023
- **Public Hearing** mid 2024
- **PD&E study completion** end of 2024

**MOVE OVER**

**FLORIDA LAW**

**MOVE OVER**

**FOR STOPPED  
EMERGENCY VEHICLES**

**FLHSMV**



## ***Thank You***

SR 5 / US 1 at Aviation Boulevard  
Project Development and Environment (PD&E) Study