IMMOKALEE ROAD CORRIDOR CONGESTION STUDY

Capital Project Planning, Impact Fees & Program Management Division

Board of County Commissioners
October 12, 2021

Collier County

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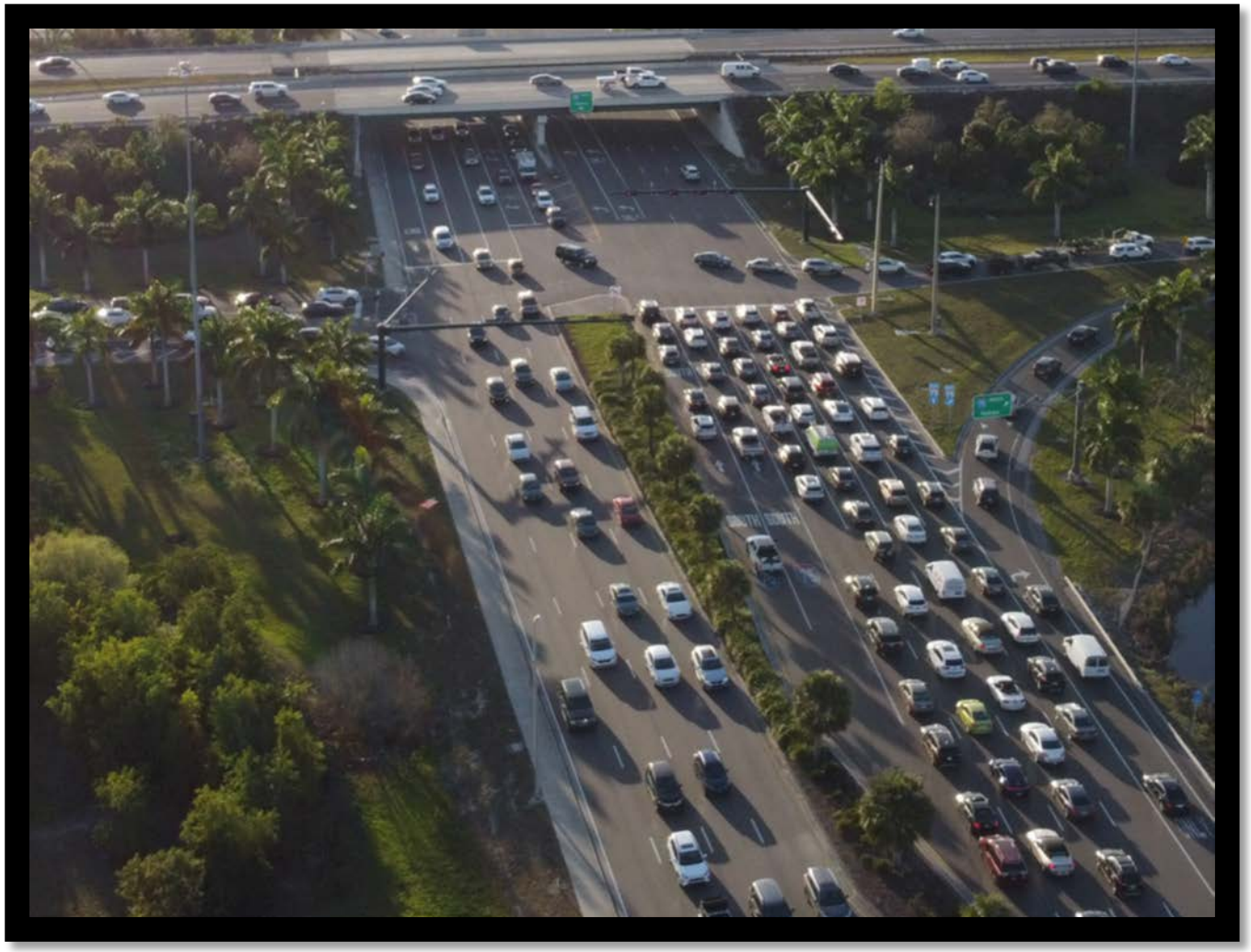
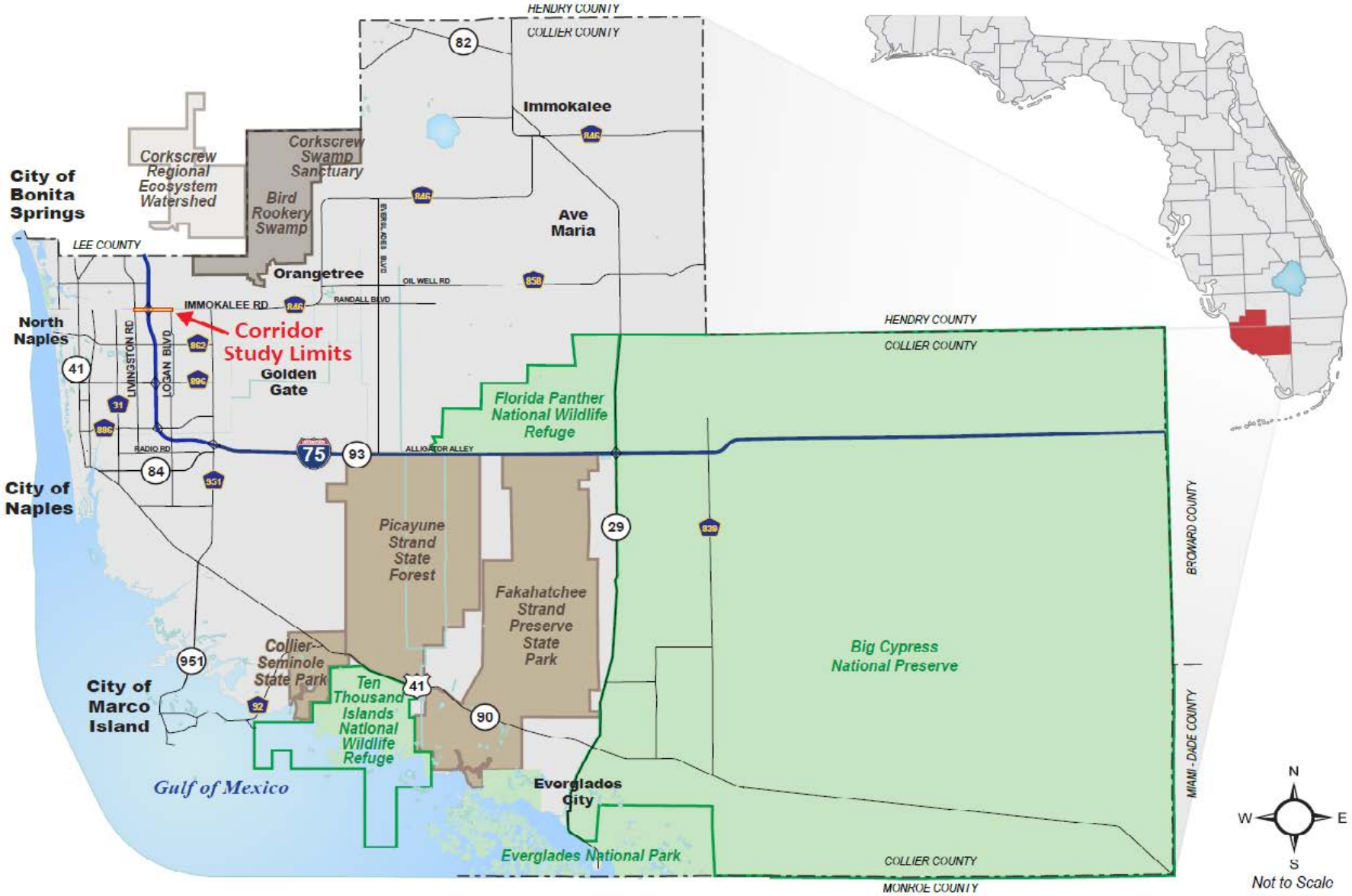
Immokalee Road Corridor Congestion Study



Presentation Agenda

- Project Limits
- Project Purpose and Need
- Project Overview
- Explain Analysis Methods
- Discuss Findings and Recommendations
- Review Next Steps

Immokalee Road: Critical East-West Network Link



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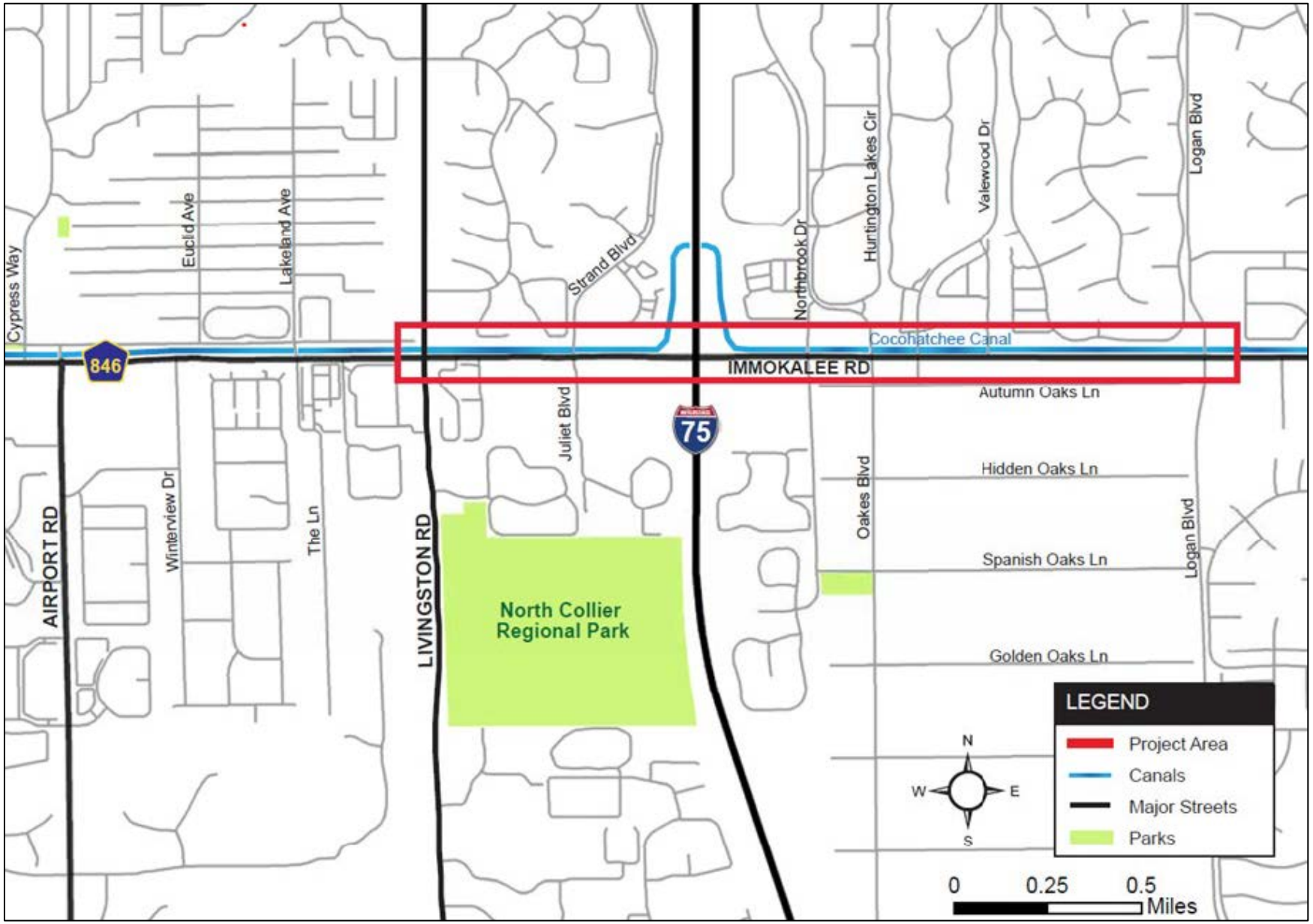
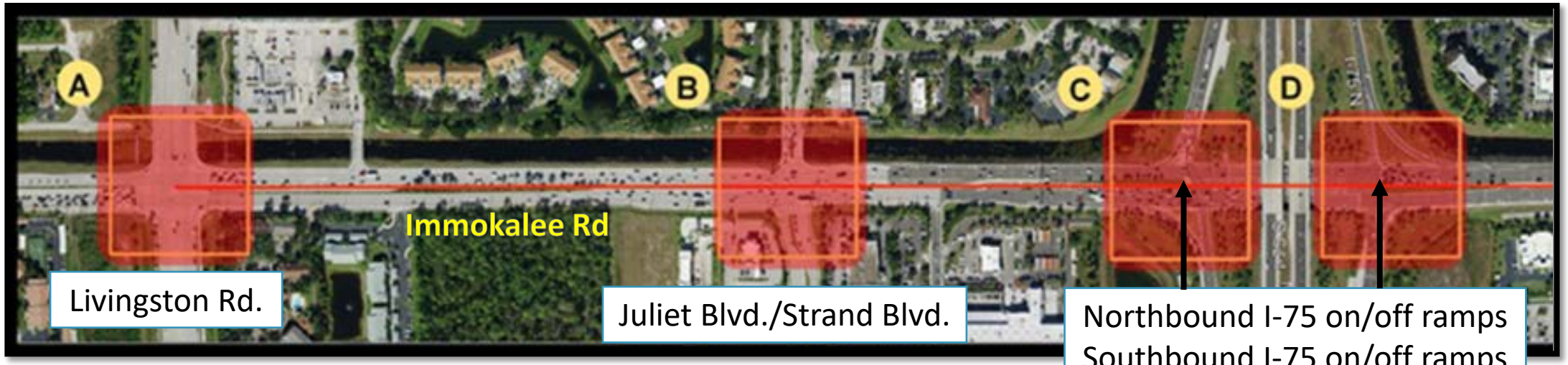
Project Limits: Livingston Road to Logan Boulevard



Team Studied Nine (9) Intersections within Project Limits



- Improvements will be required along the entire corridor for it to operate efficiently. For example, the traffic flow at Intersection "A" (Livingston Rd.) influences the traffic flow at Intersections "B" through "I."

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Project Purpose, Needs and Goals

Project Purpose: The *Immokalee Rd. Corridor Congestion Study* was performed to analyze the existing and future traffic conditions along the Immokalee Rd. corridor between Livingston Rd. and Logan Blvd.

Project Need: The current traffic volumes along the Immokalee Corridor are currently approaching the capacity of the existing roadway. Based on anticipated traffic growth, the corridor operations will experience severe delays by 2040 if no improvements are made.

Project Goal: The goal of the study is to model and project future traffic volumes and level of service (LOS) for both a 5-year (2025) and 20-year (2040) period and to identify corridor improvements that will accommodate future growth.

Immokalee Road Corridor Congestion Study

Study identified and recommend improvements that will reduce congestion and prepare for projected traffic volumes and needs in 2040

- **Reduce congestion for future traffic needs**
  - Continued growth in Collier County with projections at +40%
  - Traffic volume increases on Immokalee Road estimated at 67% by 2040
  - Travel time reliability
- **Improve safety by reducing conflicts**
  - Reduce accidents along the corridor
  - Provide Multimodal corridor
  - Emergency evacuation route
- **Enhance local and regional mobility**
  - Freight corridor
  - Connectivity to I-75
  - Major east-west arterial corridor
  - Links north-south major arterials
  - Serves both urban and coastal Collier County

Corridor Overview

Immokalee Road Corridor: Livingston Road to Logan Boulevard

Corridor Characteristics

- Study area approximately 2 miles
- Existing 6-lane roadway
- Current service levels approaching capacity
- Existing transit services (CAT Routes)
- Bicycle and pedestrian accommodations
  - Shared-use path north of canal between Northbrooke Drive and Logan Boulevard
  - Sidewalk along the south (entire project limits)

Corridor Constraints

- Cocohatchee Canal to the north
- Right-of-Way
  - Limited vacant parcels north and south of corridor
- Policy constraints
  - Constrained to a maximum of six lanes or when intensive land use development is immediately adjacent to roads
- Utilities

Immokalee Corridor: Traffic Volume Growth

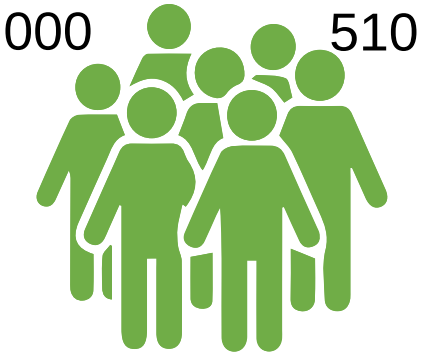
POPULATION

expected to grow

over 40%

2015 Population
358,000

2045 Population
510,000

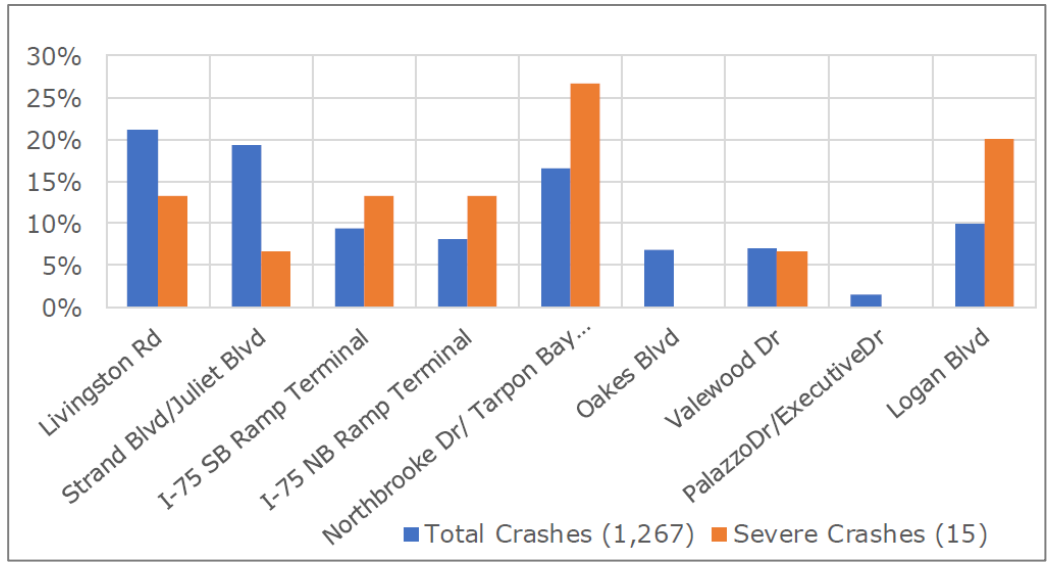


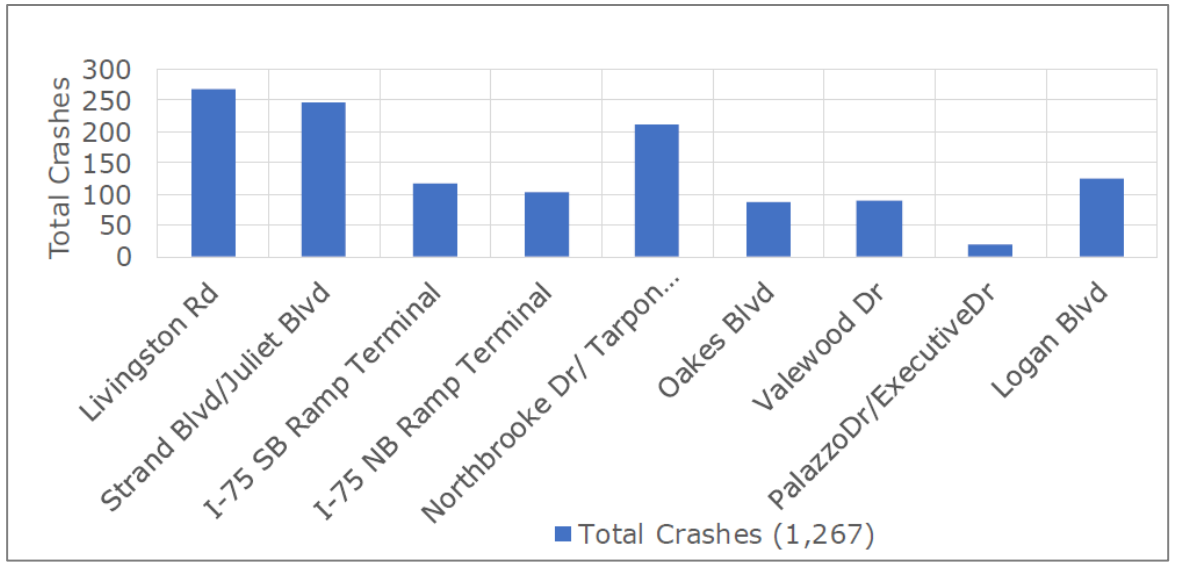
	Current	2040	% Growth
Traffic Volume	43,400	72,450	67%

Safety

Vehicular, as well as multimodal users (transit, pedestrian, and bicyclist) safety, is an important factor when evaluating roadway improvements

- Crash data was collected over a 5-year period





Development of Alternatives

- **No-Build (Continued Congestion)**

FDOT Intersection Control Evaluation (ICE) Process
- Verifiable approach to intersections used statewide
- Consistent and defendable quantitative approach
- Ranked on performance-based measures (quantitative)
- Safety of ALL road users (vehicles, bike/ped) considered

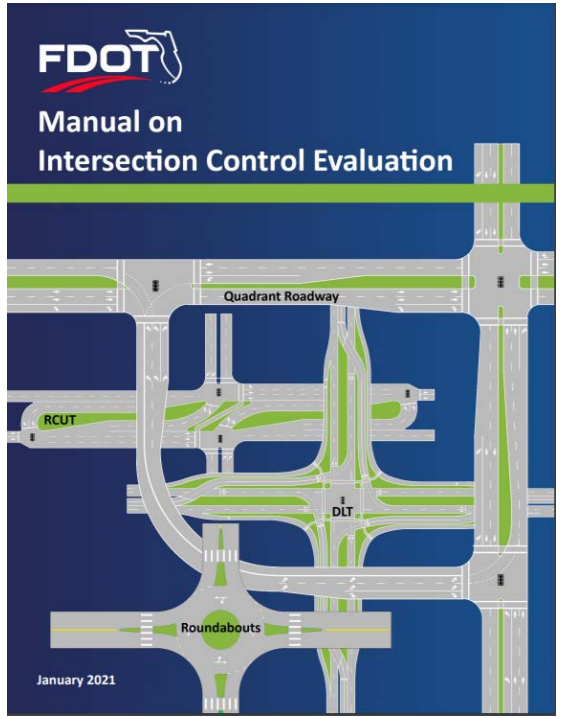
- **Conventional Improvements**
  - Add through lanes, add turn lanes
  - Roundabout
  - Cloverleaf Interchange, Partial Cloverleaf Interchange

- **Innovative Improvements:**
  - Left Turns
    - Displaced Left Turn (Continuous Flow Intersection)
    - Partial Displaced Left Turn
  - Interchanges
    - Diverging Diamond Interchange (DDI)
    - Echelon Interchange
    - Single Point Urban Interchange (SPUI/Overpass)
  - U-Turns
    - Median U-Turn
    - Partial Median U-Turn
    - Restricted Crossing U-Turn
  - Jughandle Intersection

FDOT Intersection Control Evaluation (ICE) Methodology

Methodology Considers…

- Consistent and defendable approach for all alternatives
- Purpose & Need
- Safety of ALL road users (vehicles, bike/ped)
- Goals and needs of community
- Alternatives are ranked on performance-based measures (quantitative)



ICE Manual Procedures fully effective January 1, 2020

Promotes thoughtful consideration of alternative intersection types through both qualitative and quantitative analyses

Experience developing the Collier MPO 2045 LRTP provided us with insight on potential improvements

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Livingston Rd (Intersection "A") – Example "ICE" Data Analysis

Capacity Analysis for Planning of Junctions

Input Worksheet 2

Project Name:	Immokalee Road Corridor Congestion Study
Project Number:	D3191200
Location:	Collier County, FL
Date:	January 16, 2020
Analysis Type:	At-Grade Intersections and Interchanges

Number of Lanes for Non-roundabout Intersections

TYPE OF INTERSECTION	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Traffic Signal	FULL		2	3	1		2	3	1		2	3	1		2	3	1
Two-Way Stop Control	N-S		2	3	1		3	3	1		3	3	1		3	3	1
	E-W		2	3	1		2	3	1		2	3	1		2	3	1
All-Way Stop Control	FULL		2	3	1		2	3	1		2	3	1		2	3	1
Continuous Green T	W		2	3				3	1		2		1				
	N						2		1		2	3				3	1
	E			3	1		2	3							2		1
	S		2		1							3	1		2	3	
Quadrant Roadway	S-W	Use the respective intersection tab(s) to specify the # of lanes inputs.															
	N-E																
	S-E																
	N-W																
Partial Displaced Left Turn	N-S		2	3	1		2	3	1		2	3	1		2	3	1
	E-W		2	3	1		2	3	1		2	3	1		2	3	1
Displaced Left Turn	FULL		2	3	1		2	3	1		2	3	1		2	3	1
Signalized Restricted Crossing U-Turn	N-S	1	1	3	1	1	1	3	1				1				1
	E-W				1				1	1	1	3	1	1	1	3	1
Unsignalized Restricted Crossing U-Turn	N-S	1	1	3	1	1	1	3	1				1				1
	E-W				1				1	1	1	3	1	1	1	3	1
Median U-Turn	N-S	2		3	1	2		3	1			2	1			2	1
	E-W			3	1			3	1	2		3	1	2		3	1
Partial Median U-Turn	N-S	1		3	1	1		3	1		1	3	1		1	3	1
	E-W		1	3	1		1	3	1	1		3	1	1		3	1

For shared lanes, enter "0" in L or R

Capacity Analysis for Planning of Junctions

Input Worksheet 2

Number of Lanes for Interchanges

TYPE OF INTERCHANGE	Sheet	Northbound				Southbound				Eastbound				Westbound			
		U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Diamond	N-S		2	3	1		2	3	1		2	3	1		2	3	1
	E-W		2	3	1		2	3	1		2	3	1		2	3	1
Partial Cloverleaf A	N-S			3				3			2		1		2		1
	E-W		2		1		2		1			3				3	
Partial Cloverleaf B	N-S		2	3	1		2	3	1		2		1		2		1
	E-W		2		1		2		1		2	3	1		2	3	1
Displaced Left Turn	N-S		2	3	1		2	3	1		2	3	1		2	3	1
	E-W		2	3	1		2	3	1		2	3	1		2	3	1
Diverging Diamond Interchange	N-S		2	3	1		2	3	1		2		1		2		1
	E-W		2		1		2		1		2	3	1		2	3	1
Single Point	N-S		2	3	1		2	3	1		2	3	1		2	3	1
	E-W		2	3	1		2	3	1		2	3	1		2	3	1

Existing AM

Lanes, Volumes, Timings
3: Livingston Rd & Immokalee Rd

06/30/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	338	893	174	405	1878	396	301	544	348	430	808	527
Future Volume (vph)	338	893	174	405	1878	396	301	544	348	430	808	527
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	640		230	640		0	550		800	450		330
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	25			25			25			25		

AM

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score
Diverging Diamond Interchange N-S	1.02	1	3.3
Single Point N-S	1.10	2	2.4
Displaced Left Turn	1.52	3	2.4
Displaced Left Turn (Interchange) E-W	1.69	4	2.4
Partial Displaced Left Turn N-S	1.74	5	2.4
Partial Displaced Left Turn E-W	1.74	5	2.4
Diverging Diamond Interchange E-W	1.81	7	3.3
Single Point E-W	1.81	7	2.4
Displaced Left Turn (Interchange) N-S	1.86	9	2.4
Traffic Signal	2.23	10	2.4

PM

TYPE OF INTERSECTION	Overall v/c Ratio	V/C Ranking	Multimodal Score
Single Point N-S	1.07	1	2.4
Diverging Diamond Interchange N-S	1.18	2	3.3
Displaced Left Turn	1.33	3	2.4
Displaced Left Turn (Interchange) E-W	1.38	4	2.4
Diverging Diamond Interchange E-W	1.40	5	3.3
Single Point E-W	1.40	5	2.4
Partial Displaced Left Turn N-S	1.49	7	2.4
Partial Displaced Left Turn E-W	1.51	8	2.4
Displaced Left Turn (Interchange) N-S	1.78	9	2.4
Traffic Signal	1.89	10	2.4

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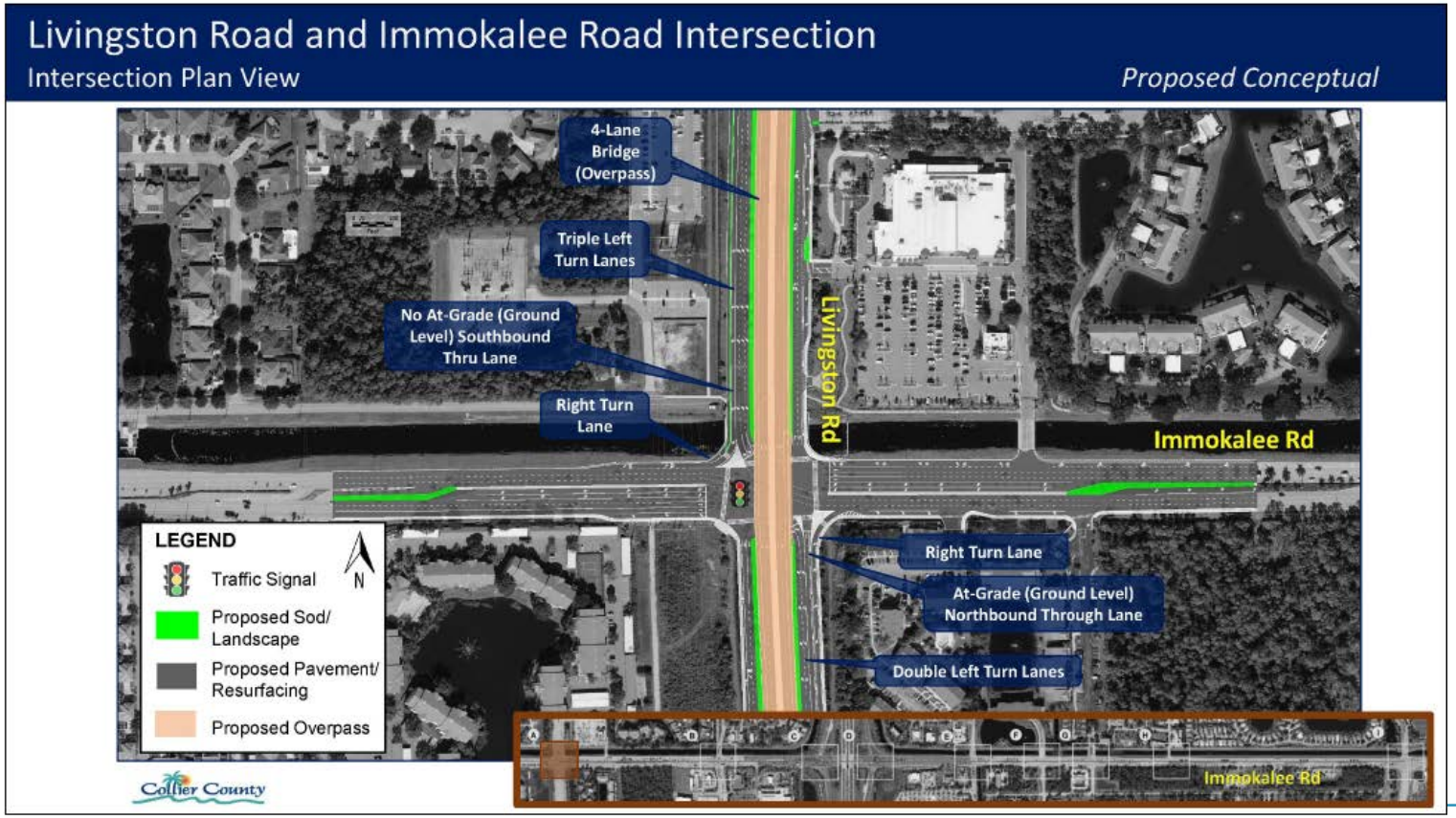
Livingston Rd (Intersection "A") - Analysis
Innovative Intersection Recommendation

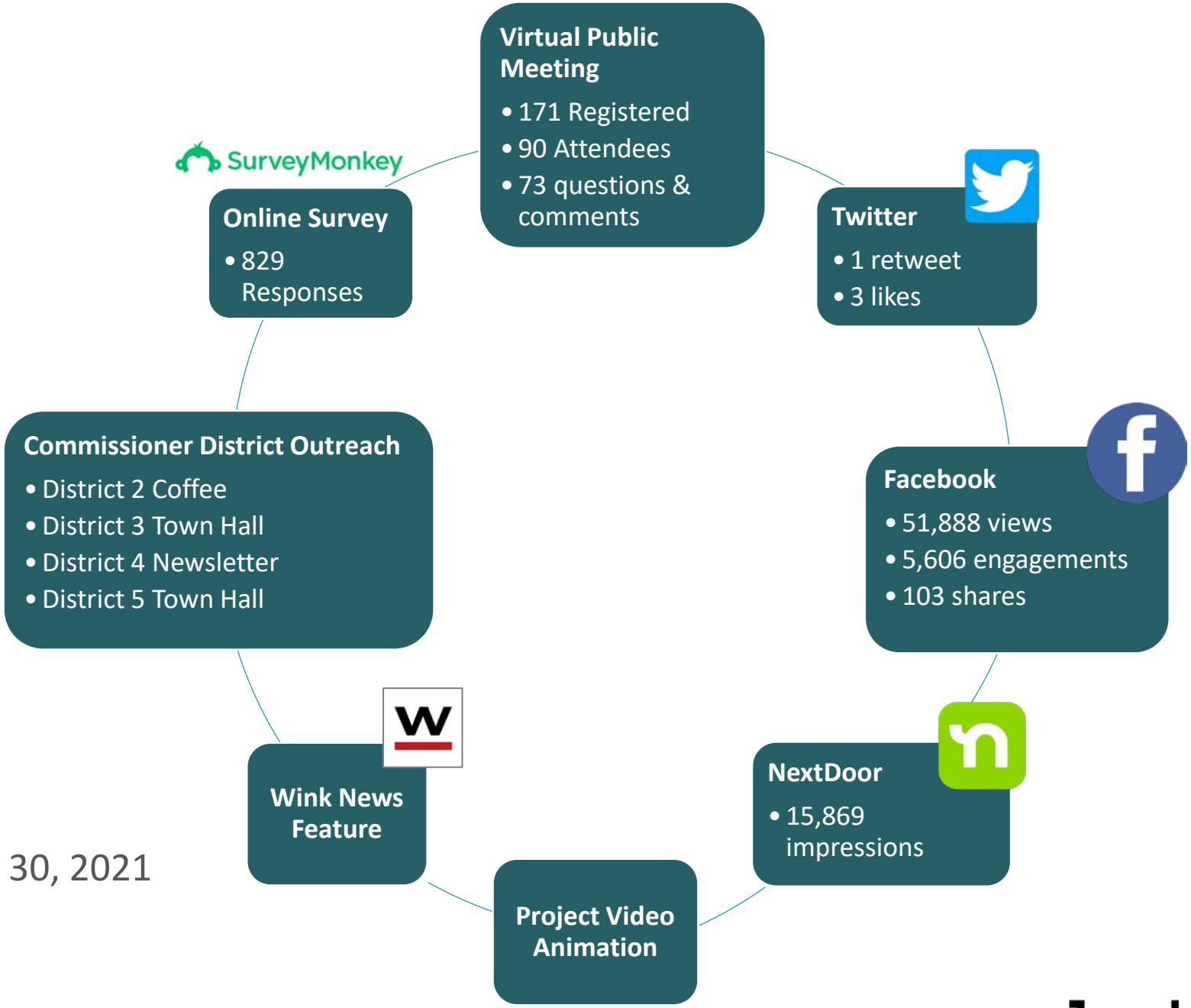
- Conventional intersection would not provide the necessary relief.



Public Engagement

Outreach

- Website
  - Video Presentation
  - Online Survey
  - FAQs
- HOA Meetings
- Social Media
- Email Correspondence
- Commissioner Outreach
- Virtual Public Meeting – April 30, 2021



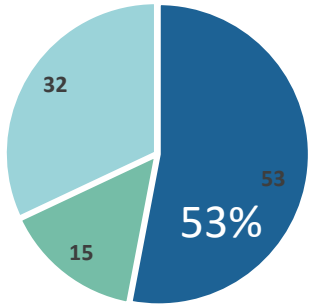
Public Engagement

Survey Feedback

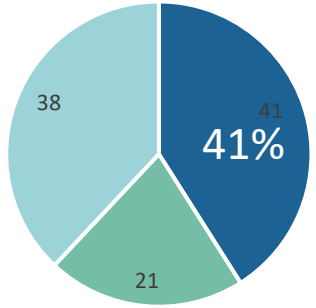
- Safety
- Congestion
- Growth
- Access

- **65%** of respondents travel through the study area every day
- **66%** of respondents **live** with one-mile, while **21% work** within the study area
- **87%** of respondents are year-round residents
- **60%** of respondents use the Livingston Road intersection **daily**

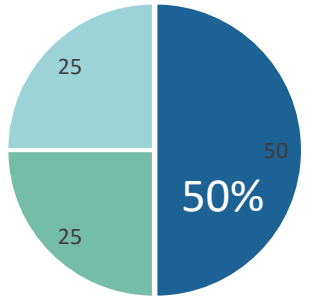
Overpass at Immokalee Rd. & Livingston Rd.



DDI at Immokalee Rd. & I-75



Partial Displaced Left Turn at Immokalee Rd. & Logan Blvd.



Support Opposition Neutral

Categories of Improvements

Minor Improvements – Operational Quick Fix

- Adaptive Traffic Signal Control - along the entire Immokalee Rd. corridor

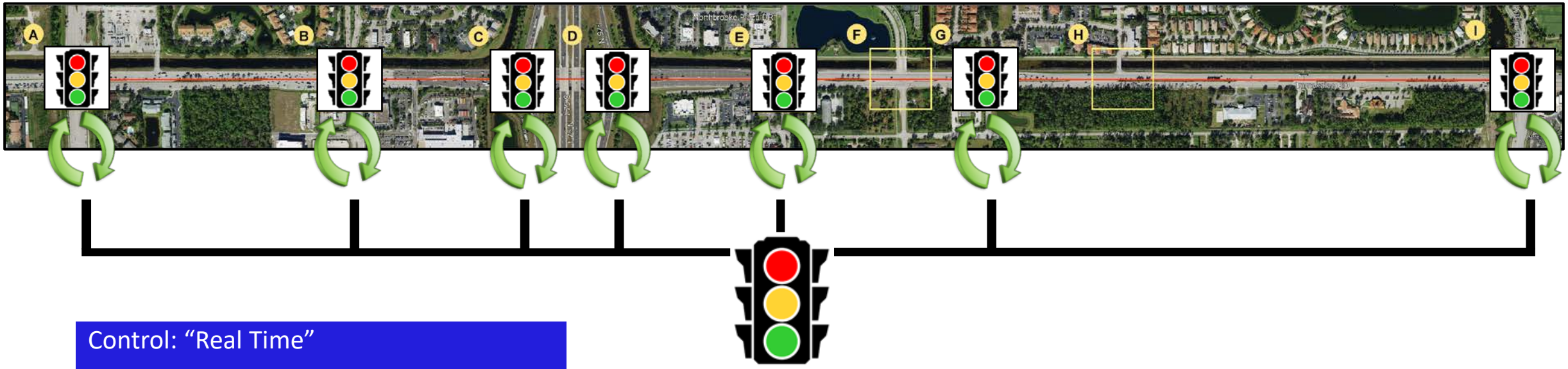
Conventional Improvements – Optimizing Capacity and Operations

- Add Through/Right Turn Lane – Along entire Immokalee Rd. corridor
- Add Turning Lanes – All intersections except Oakes Blvd., Executive Dr., & Logan Blvd.
- Extend Turning Lanes (using the median) – All intersections except Valewood Dr. & Executive Dr.

Innovative Improvements – Ultimate Improvements

- Overpass/SPUI - Immokalee Rd. & Livingston Rd. Intersection
- Diverging Diamond Interchange (DDI) - I-75 Interchange
- Partial Displaced Left Turn (Continuous Flow Intersection) - Immokalee Rd. & Logan Blvd. Intersection

Adaptive Traffic Signal Control



Control: “Real Time”

- Adjusts the timing of red, yellow, and green lights to accommodate changing traffic patterns
- Reduces traffic congestion based on real time traffic

“Centralized Signal System”

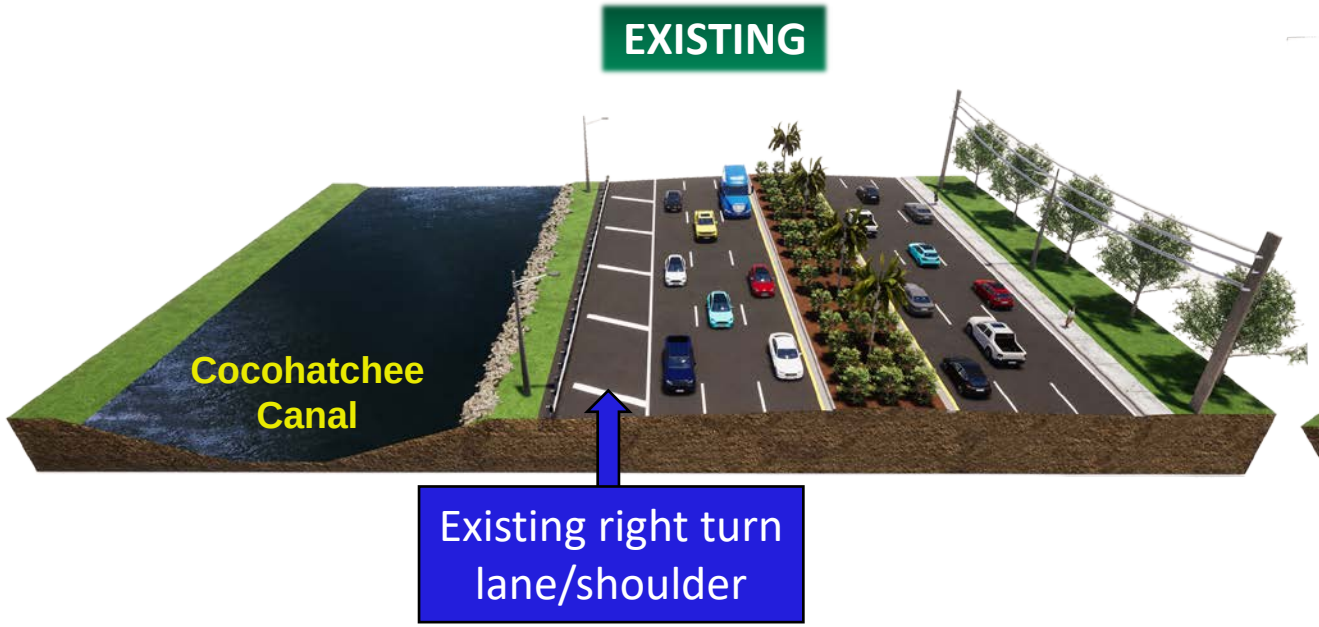
The 6 signalized intersections in the corridor will be “coordinated,” allowing communication between the signals.

Recent Collier County Study performed by Traffic Engineering Division indicates that a Significant Cost Savings can be realized from the Operational Improvements resulting from Adaptive Traffic Signalization.

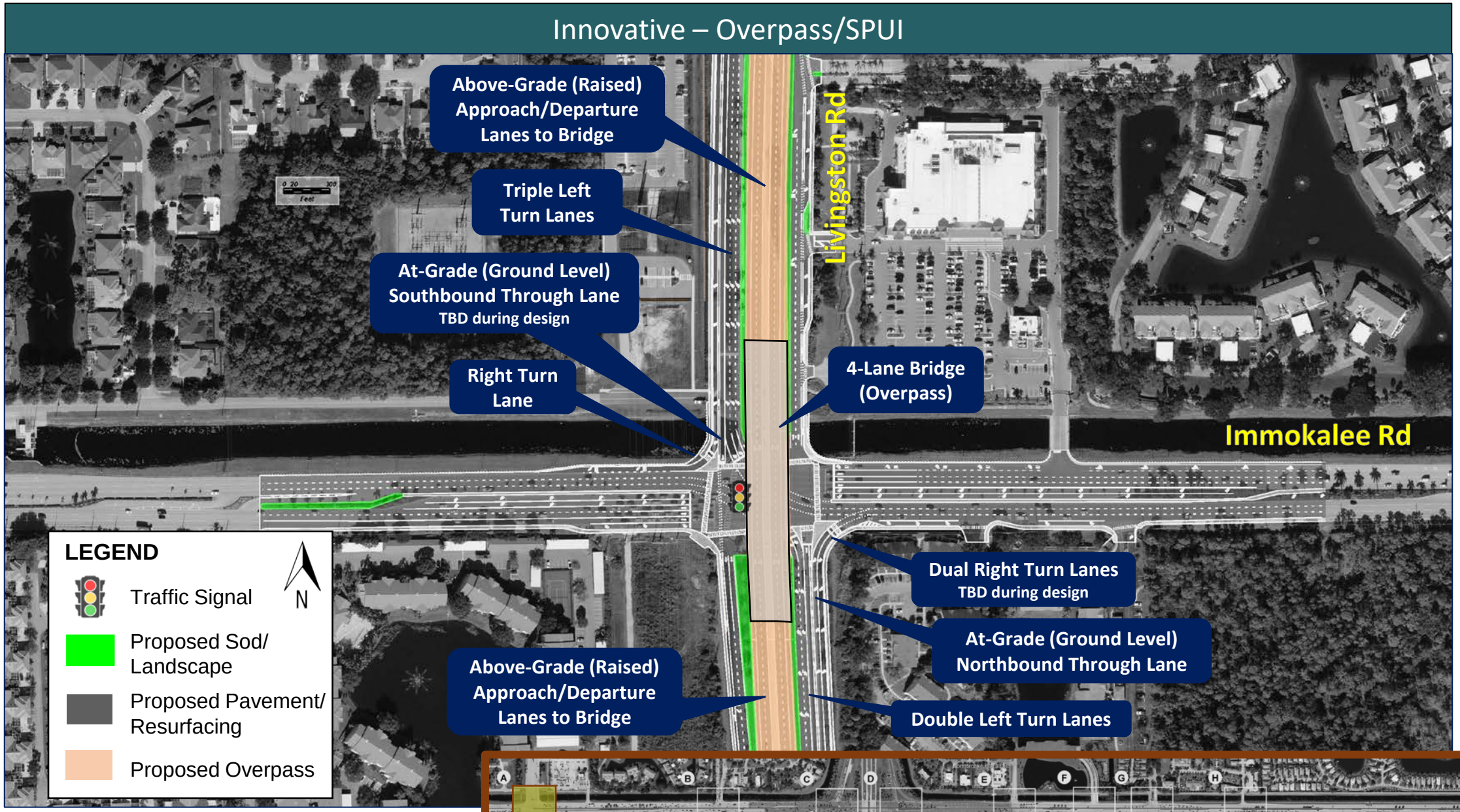
Immokalee Road Overall Corridor Improvements

Conventional Improvement – Optimizing existing infrastructure (Turn lanes/Shoulders)

- Add Combination Through/Right Turn Lane – along entire Immokalee Rd. corridor
  - Phased implementation
  - Includes minor road widening and relocation of guardrail, signal mast arm, light poles, etc.
  - Drainage improvements and permitting required



1. Livingston Road and Immokalee Road Intersection



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2. Strand Blvd./Juliet Blvd. and Immokalee Rd. Intersection

Conventional Improvements

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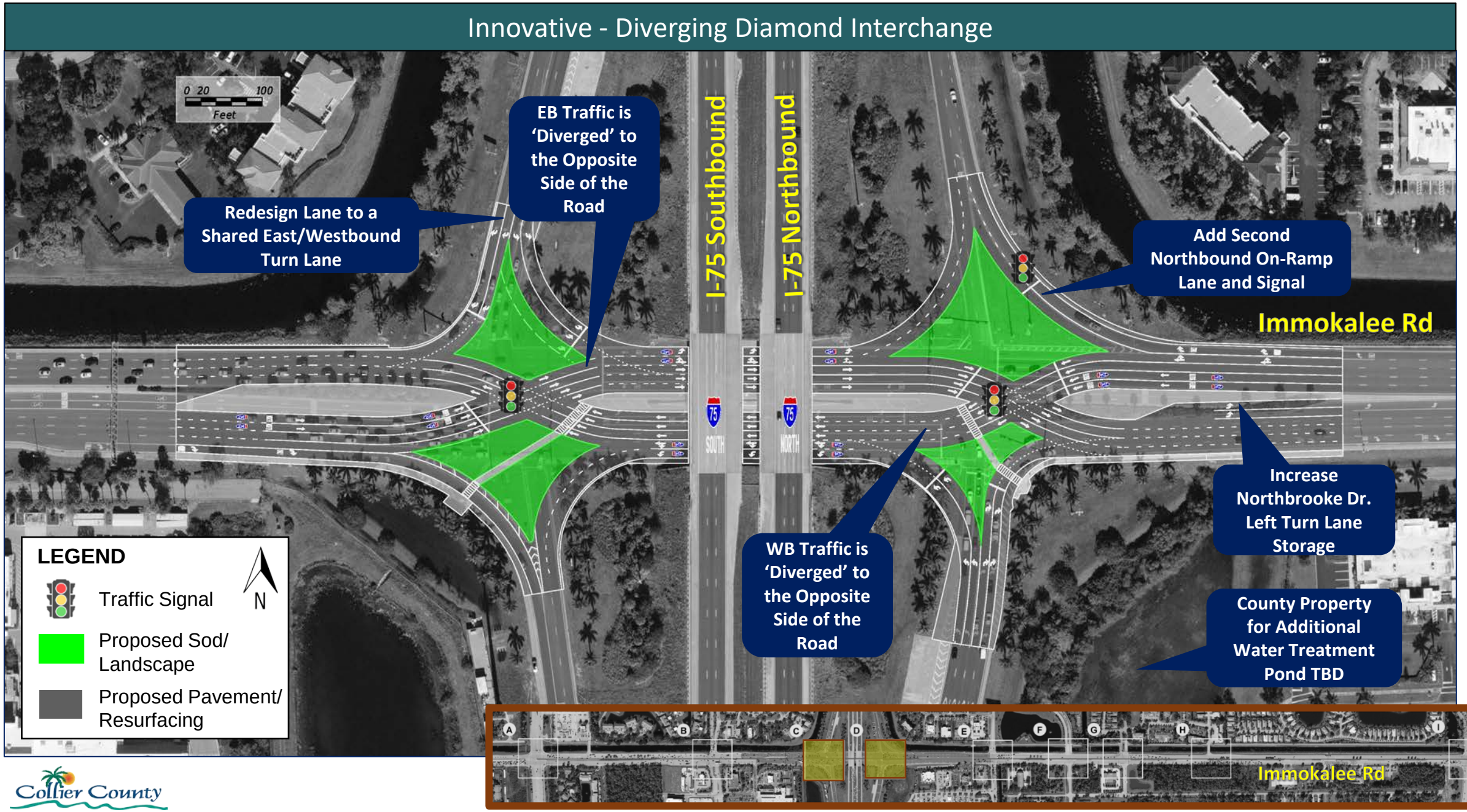
3 & 4. I-75 Southbound & Northbound On/Off Ramps



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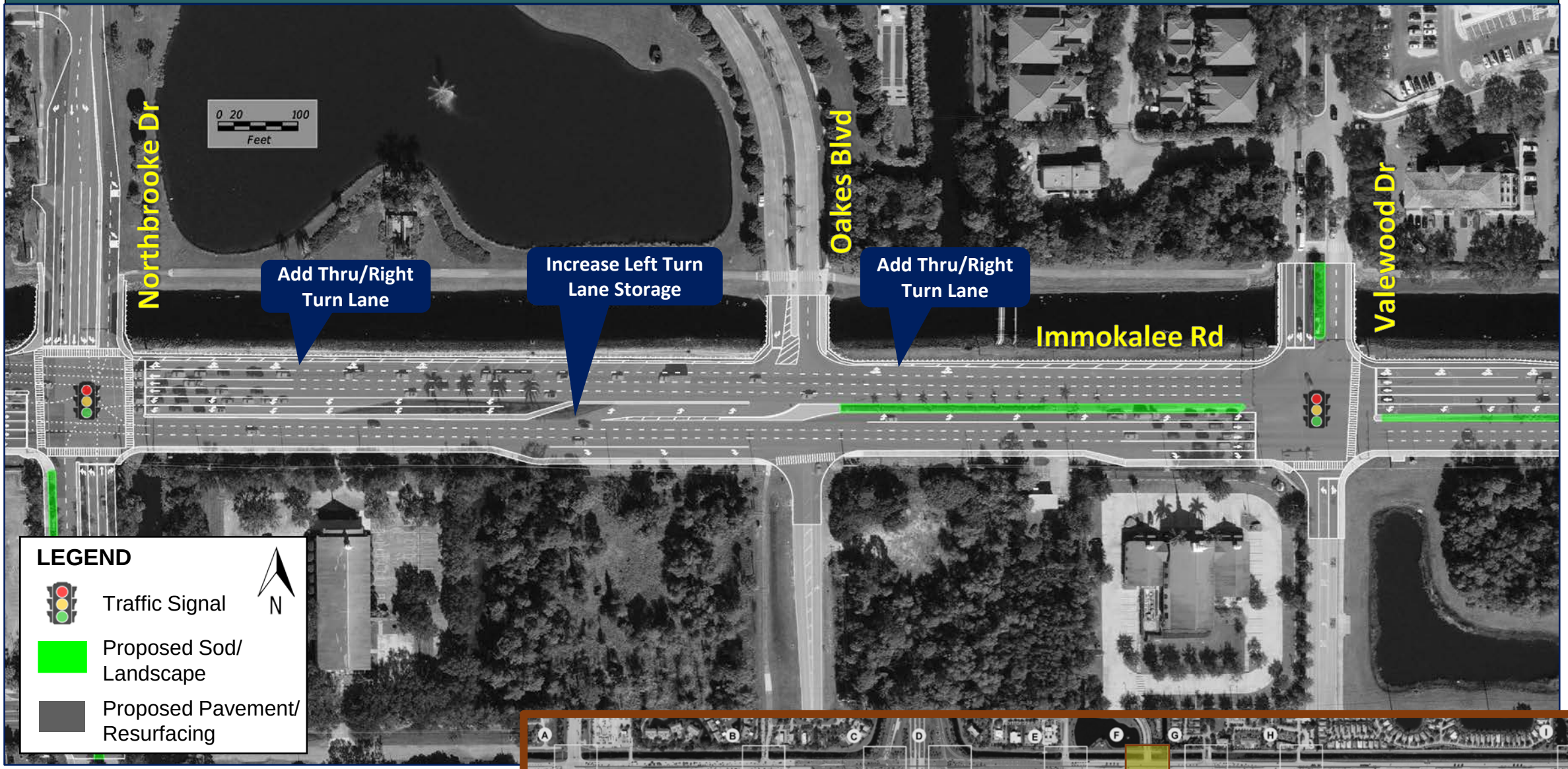
5. Northbrooke Dr./Tarpon Bay Blvd. and Immokalee Rd. Intersection

Conventional Improvements

6. Oakes Boulevard and Immokalee Road Intersection

Conventional Improvements



7. Valewood Drive and Immokalee Road Intersection

Conventional Improvements

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8. Executive Drive and Immokalee Road Intersection

Conventional Improvements

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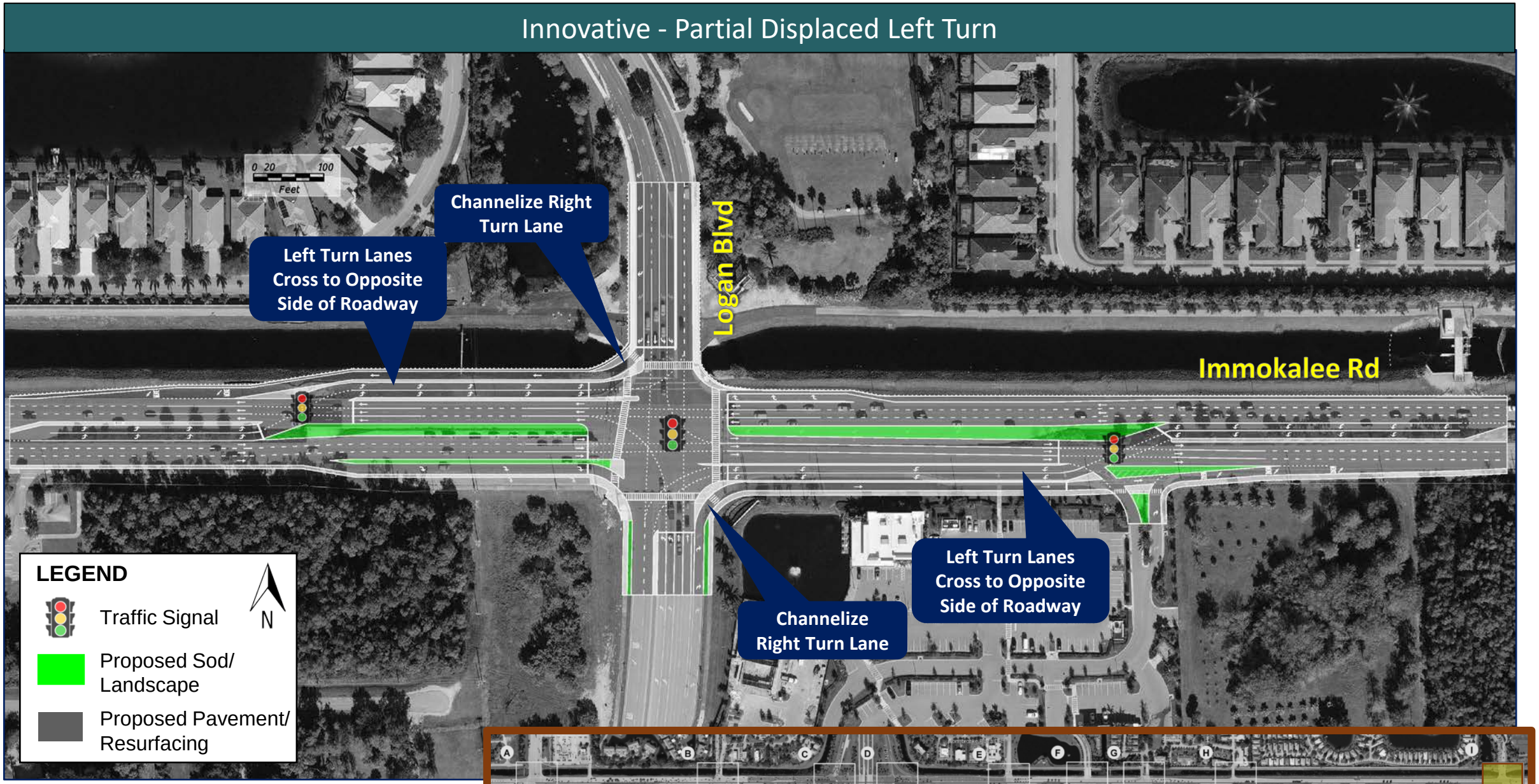
9. Logan Boulevard and Immokalee Road Intersection



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Immokalee Road Corridor Congestion Study

Recommendations and Next Steps

- **Approve IRCC Study** which includes:
  - Implement adaptive traffic signal controls
  - Immokalee Road westbound Thru/Right turn Lane Modifications – Inclusive of a phasing plan.
  - Conventional Intersection Improvements at: Strand Blvd., Northbrooke Dr., Oakes Blvd., Valewood Dr., Executive Dr.
  - Pursue an Overpass (SPUI) at Immokalee Rd. & Livingston Rd. Intersection
  - Pursue a Diverging Diamond Interchange (DDI) at Immokalee Rd. & I-75 Interchange (coordinate with FDOT)
  - Pursue a Partial Displaced Left Turn (Continuous Flow Intersection) at Immokalee Rd. & Logan Blvd. Intersection
  - Continue public engagement with stakeholders throughout the design and construction phases

Questions?