

# Multimodal Access Management Applications Guide

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## List of Acronyms

AADT	Annual Average Daily Traffic
CAMP	Corridor Access Management Plan
CAR	Crash Analysis Reporting
CMF	Crash Modification Factor
FAC	Florida Administrative Code
FDM	FDOT Design Manual
FDOT	Florida Department of Transportation
F.S.	Florida Statute
LOS	Level of Service
MAMG	Multimodal Access Management Guidebook
MOE	Measures of Effectiveness
OBT	Orange Blossom Trail
ORB	Official Record Book
PD&E	Project Development and Environment
RCUT	Restricted Crossing U-Turn
RIRO	Right-In Right-Out
RRR	Resurfacing, Restoration, and Rehabilitation
SHS	State Highway System
TWLTL	Two-Way Left Turn Lane
TWSC	Two-Way Stop Control
V/C	Volume to Capacity Ratio

# 1. Introduction

## Purpose of the Guide

The Florida Department of Transportation (FDOT) *Multimodal Access Management Applications Guide* serves as a companion document to the FDOT *Multimodal Access Management Guidebook* (MAMG). The MAMG explains FDOT rules and standards developed in various FDOT documents and manuals related to access management which should be followed in developing and designing access to state transportation facilities. This *Applications Guide* demonstrates the multimodal access management concepts outlined in the MAMG by demonstrating best practices from real world situations.

## Document Organization

This *Applications Guide* provides case study examples for the following multimodal access management elements:

- Driveways
- Median Openings
- Corridor Access Management Plans (CAMPs)

Several key topics are addressed by multiple case study examples in this *Applications Guide* including:

- |   |   |
|---|---|
| ✓ Driveway Closure                          | ✓ Pedestrian Access Walkway (Sidewalk Connection) |
| ✓ Driveway Relocation                       | ✓ Side Street (Local Street) Connection           |
| ✓ Driveway Near Interchange                 | ✓ Emergency Only Access Connection                |
| ✓ Driveway Spacing                          | ✓ Frontage Road/Backage Road Connection           |
| ✓ Non-Conforming Driveway                   | ✓ Site Frontage Improvement                       |
| ✓ Driveway Consolidation                    | ✓ Closure of Median Opening                       |
| ✓ Driveway Length                           | ✓ Median Modification                             |
| ✓ On-Site Queuing                           | ✓ Median Opening Spacing                          |
| ✓ Shared Driveway / Cross-Access Connection | ✓ Turn Lane/U-turn Accommodation                  |

These case studies are intended to demonstrate best practices related to particular access management elements. The case studies may not address all issues related to access management at the particular site. The concepts addressed in this guide are not intended to set standards or requirements; standards and requirements can be found in the MAMG, FDOT Design Manual (FDM), Florida Administrative Code (FAC) 14-96, FAC 14-97, and other relevant documents.

# 2. Driveways

## Overview

Driveways provide a physical connection between a property and the abutting roadway and are one of the most common roadway design elements. They should be located and designed to minimize impacts on roadway traffic while providing safe access to and from developments. The location and design of each connection must consider characteristics of the roadway, the geographic site, context classification, and the potential users.

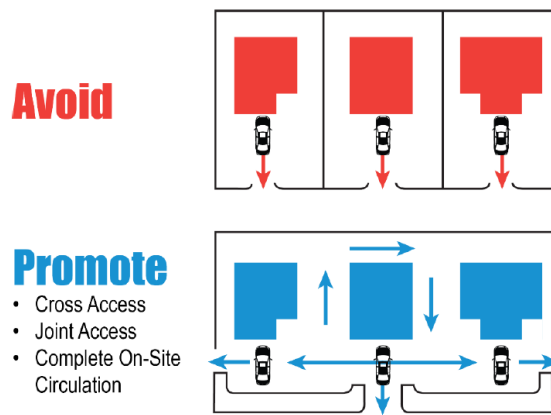
This chapter provides case studies for the following topics related to driveways:

- Closure or Relocation of Driveways
- Driveway Length and On-Site Queuing
- Emergency Access Connections
- Frontage / Backage Roads

## Closure or Relocation of Driveways

A driveway constructed too closely to another connection could negatively impact roadway safety and traffic flow. As discussed in the MAMG, the standards for determining the spacing requirements for driveways are set by FAC 14-97.003. These spacing standards and the distances from other connections based upon the roadway speed limit and roadway access classification are provided in the MAMG. Section 2.6 of the MAMG includes a detailed discussion of driveway spacing considerations.

If significant land use changes have occurred, FDOT requires that a permit be obtained in accordance with FAC 14-96.005(2), pursuant to the provisions of Florida Statute (F.S.) 335.187(1), FDOT will modify or close an unpermitted connection if such modification or closure is determined to be necessary because the connection would jeopardize the safety of the public or would have a negative impact on the operational characteristics of the State Highway System (SHS). Cross access and joint access can be encouraged to consolidate and remove driveways, as shown in **Figure 1**.



Source: "Managing Corridor Development, A Municipal Handbook," Center for Urban Transportation Research, University of South Florida, October 1996. Williams, Kristine M. and Marshall, Margaret A.

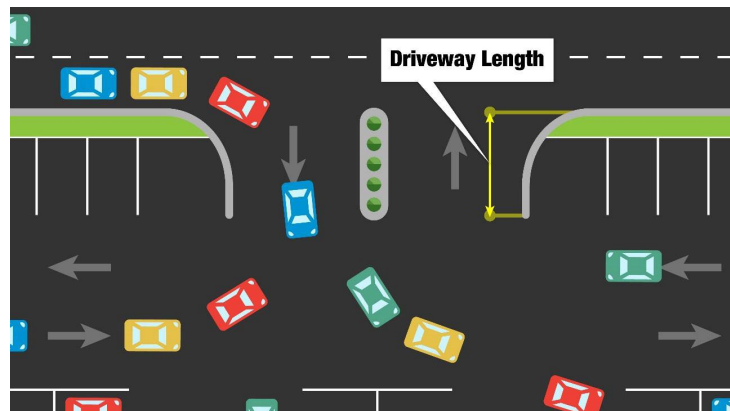
**Figure 1. Driveway Consolidation**

The following case studies demonstrate closing or relocation of driveways:

- [SR 44 \(West Main Street\) Driveway Closure](#)
- [US 27 Driveway Relocation](#)
- [SR 820 Driveway Consolidation and Cross Access](#)
- [US 301 Driveway Relocation and Cross Access](#)

## Driveway Length and On-Site Queuing

As discussed in the MAMG, sufficient driveway length (or throat length) helps make a driveway operate more efficiently. **Figure 2** illustrates a schematic of a site with a driveway length that is too short and creates conflicts and backups onto the SHS. An uninterrupted area (driveway length) before the first conflict point on site is an important element. The appropriate method for measuring a driveway's length is to begin from the edge of the traveled way to the first "conflict point." The recommended minimum driveway lengths for major entrances provided in the MAMG can be used for unsignalized driveways or as a first estimate of driveway length.



**Figure 2. Improper Driveway Length**

For sites with drive-throughs, pick up/drop off areas such as schools, gates, or other features that create queues, knowledge of the expected queues is important when developing site design including driveway length. These queues should be stored away from the area of the driveway used for driveway length. Land-use types that produce a significant number of vehicle trips that also include a drive-through should be studied carefully to not impact the other users on the SHS.

The following case studies demonstrate driveway length and on-site queuing issues:

- [SR 45 \(US 41\) Driveway with Adequate Length](#)
- [SR 716 Driveway with On-Site Queuing and Cross Access](#)
- [US 19 with Adequate On-Site Queuing and Cross Access](#)

## Emergency Only Access Connections

Emergency only access connections should be discussed at the driveway connection permit pre-application meeting. Since an emergency only access driveway on the SHS would not be used regularly by vehicles, it does not have to meet the access spacing requirements of FAC 14-97. The driveway design should accommodate the turning movements of the largest expected emergency vehicle. It is required that the local government record the access in the development order as “Emergency Access Only” to assist in preventing improper use in the future.

The following case study demonstrates an emergency access that was permitted:

- [SR 572 Emergency Only Access](#)

## Frontage / Backage Roads

As discussed in the MAMG, a frontage road or reverse frontage road (backage road) can be constructed to minimize the number of connections to the SHS and facilitate the associated traffic operational and safety benefits. Frontage roads are a type of shared access that can reduce the number of existing or future driveways that have direct access to the SHS. Frontage and backage roads can also encourage traffic circulation within adjacent land uses. Shared access, as provided by frontage and reverse frontage roads (backage roads), is an effective tool to improve access management practices on the SHS and should be promoted where possible.

The following case study provides an example of a backage road:

- [SR 52 Backage Road](#)

# SR 44 (West Main Street) Driveway Closure

## Key Topics

- ✓ Driveway Closure
- ✓ Driveway Spacing
- ✓ Shared Driveway / Cross-Access Connection
- ✓ Pedestrian Access Walkway (Sidewalk Connection)
- ✓ Side Street (Local Street) Connection

## Setting

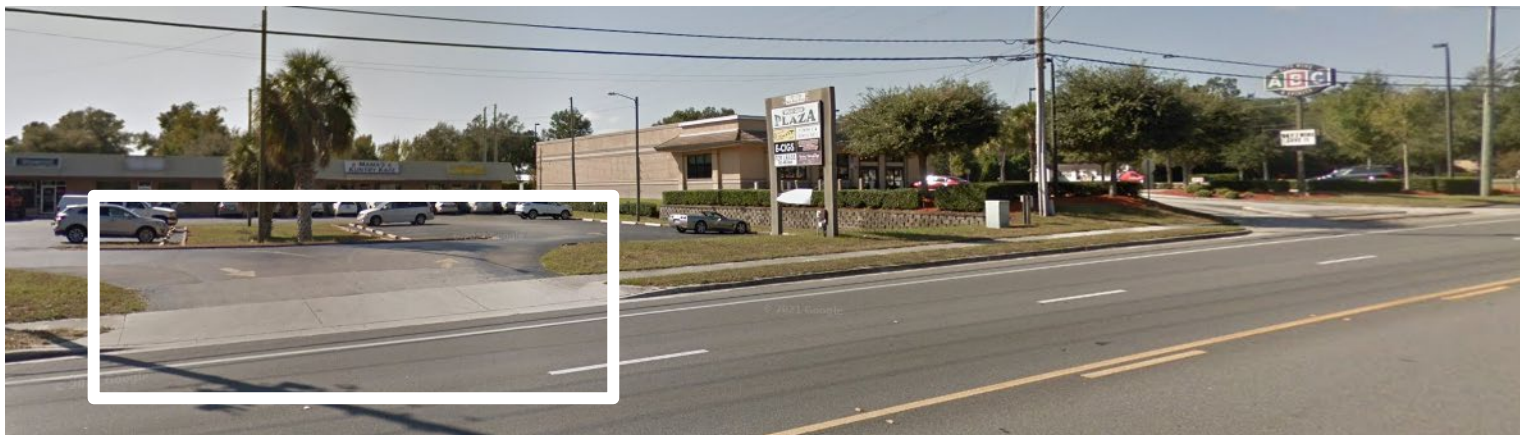
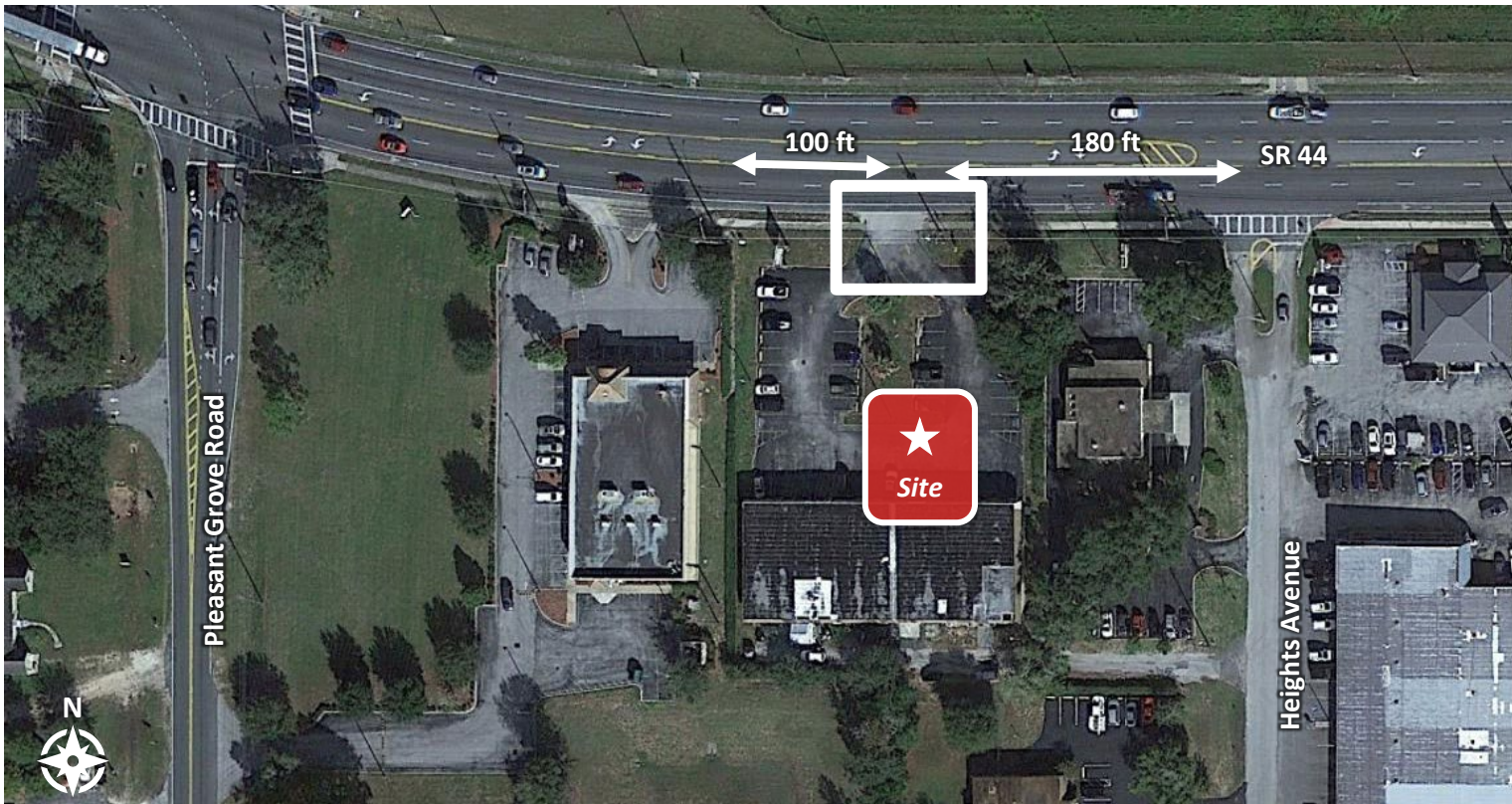
### Characteristics

Number of Lanes	4
Access Classification	6
Context Classification	C3C
Posted Speed Limit	45

### Background

Description	Driveway/connection permit review for a fast-food development.
Location	Southwest quadrant of SR 44 (West Main Street) and Heights Avenue in Citrus County, FL.

## Before





**Issues**

- Existing non-conforming driveway
- Median striping on SR 44 at driveway could not be modified to allow left turns due to the proximity to nearby intersections

**Before Connection Spacing**

Distance from Previous (West)	100 ft
Distance from Next (East)	<b>180 ft</b>
Minimum Connection Spacing Standard	245 ft

**Solutions and Outcomes**

- 1 The existing SR 44 access driveway was closed due to non-conforming spacing and the inability to accommodate median striping modifications for left turns.
- 2 A shared access connection was constructed to the property west of the site.
- 3 Adequate access to the site is available via the side streets Heights Avenue and Pleasant Grove Road.
- 4 A direct pedestrian access walkway was constructed at the closed SR 44 driveway location.

**After**



## US 27 Driveway Relocation

### Key Topics

- ✓ Driveway Relocation
- ✓ Driveway Near Interchange
- ✓ Driveway Spacing
- ✓ Driveway Consolidation
- ✓ Shared Driveway / Cross-Access Connection

### Setting

#### Characteristics

Number of Lanes	6
Access Classification	2
Context Classification	C3R
Posted Speed Limit	55

#### Background

Description	Driveway/connection permit review for a multifamily residential development.
Location	Southwest quadrant of the US 27 & US 192 interchange (north of an existing hotel) in Polk County, FL.

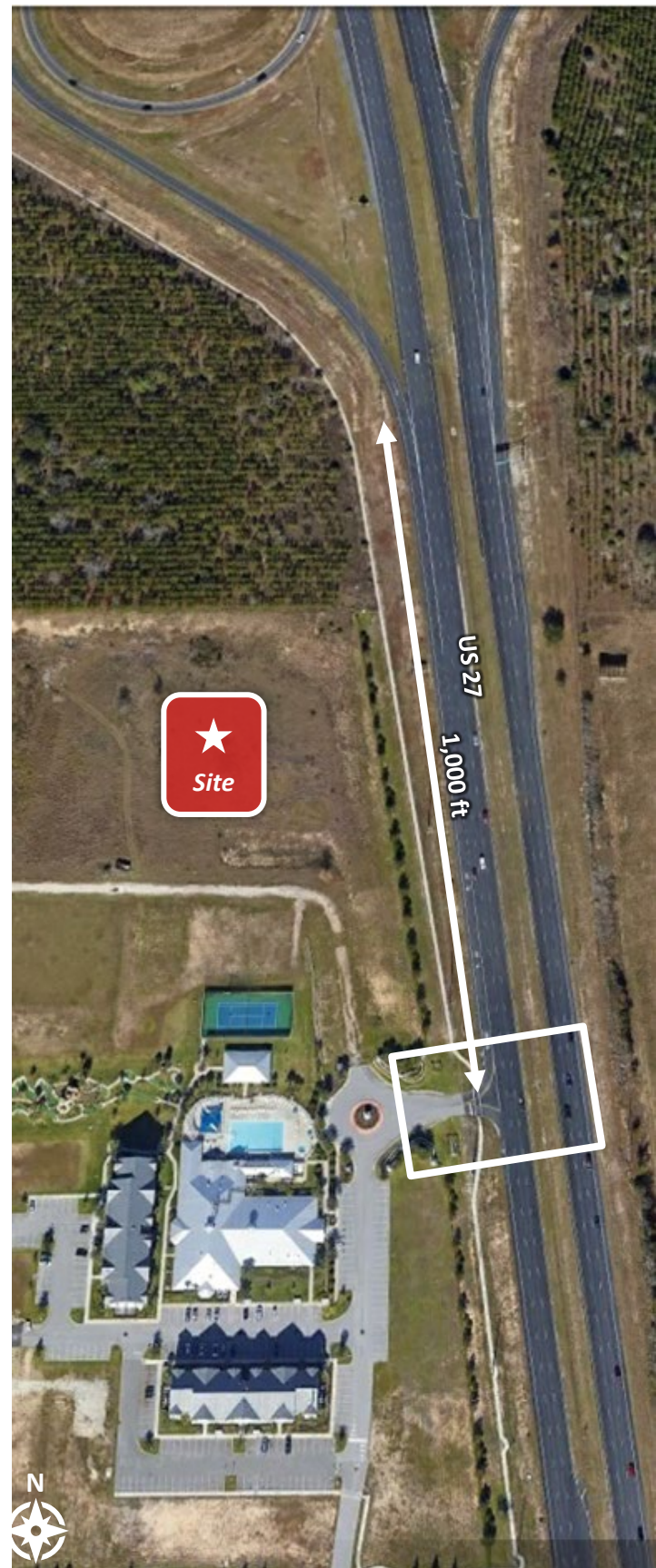
### Issues

The existing development driveway was located too close to the system ramp between westbound US 192 and southbound US 27, which did not meet spacing requirements.

#### Before Connection Spacing

Distance from Interchange (North)	<b>1,000 ft</b>
Minimum Connection Spacing from Interchange Standard	1,320 ft

Before



After



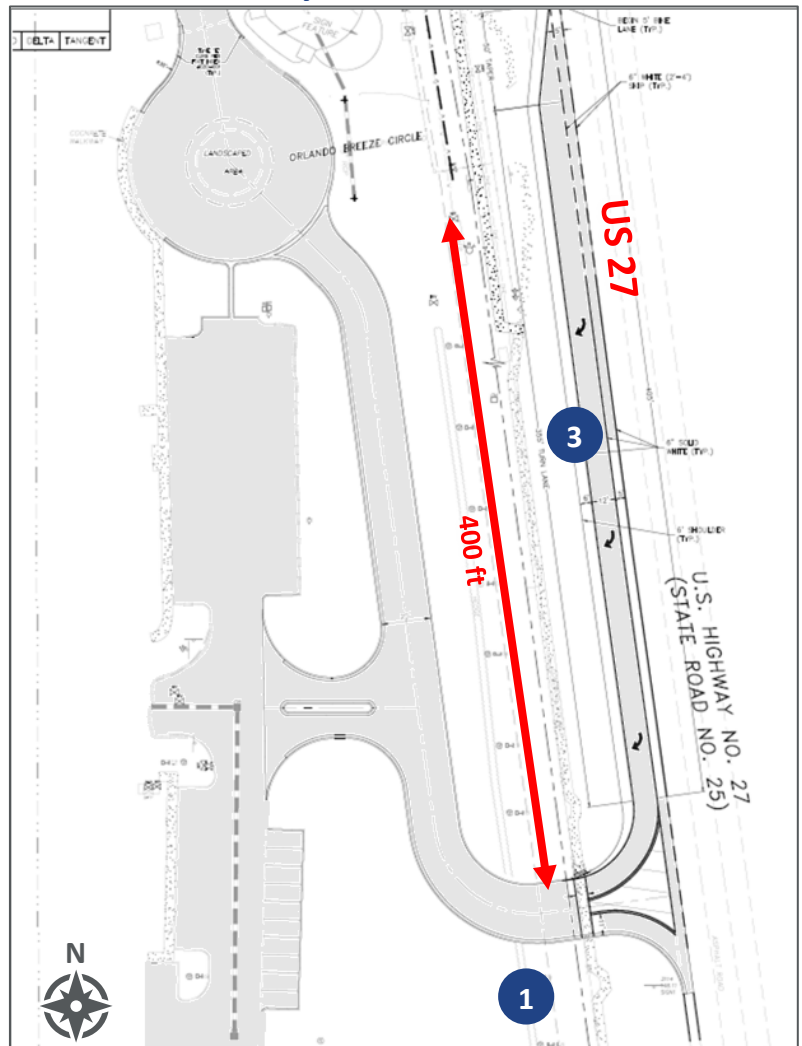
Solutions and Outcomes

- 1 The existing driveway connection on US 27 will be relocated approximately 400 feet to the south of its existing location to the neighboring property.
- 2 The relocated driveway design will allow for an acceleration lane for the US 192 ramp with taper, improving safety.
- 3 The relocated driveway design will allow for a dedicated right-turn lane into the site.
- 4 A cross-access agreement with the adjacent property owners was recorded at the Court of Polk County.

After Connection Spacing

Distance from Interchange (North)	1,400 ft
Minimum Connection Spacing from Interchange Standard	1,320 ft

Relocated Driveway



# SR 820 Driveway Consolidation and Cross Access

## Key Topics

- ✓ Driveway Spacing
- ✓ Driveway Consolidation
- ✓ Shared Driveway / Cross-Access Connection
- ✓ Driveway Consolidation
- ✓ Median Modification

## Setting

### Characteristics

Number of Lanes	6
Access Classification	3
Context Classification	C3C
Posted Speed Limit	45

### Background

Description	Driveway/connection permit review for a multifamily residential development.
Location	South side of SR 820, west of 184 <sup>th</sup> Avenue in Pembroke Pines, FL.

## Issues

- With the current configuration of the existing driveways, a new driveway at the proposed development would not have met driveway spacing standards.
- There was an elevated rate of crashes due to the placement of the right-in/right-out driveway serving the parcel to the west in relation to the placement of the directional median opening. Many illegal left turns from the property were indicated by the crash data.

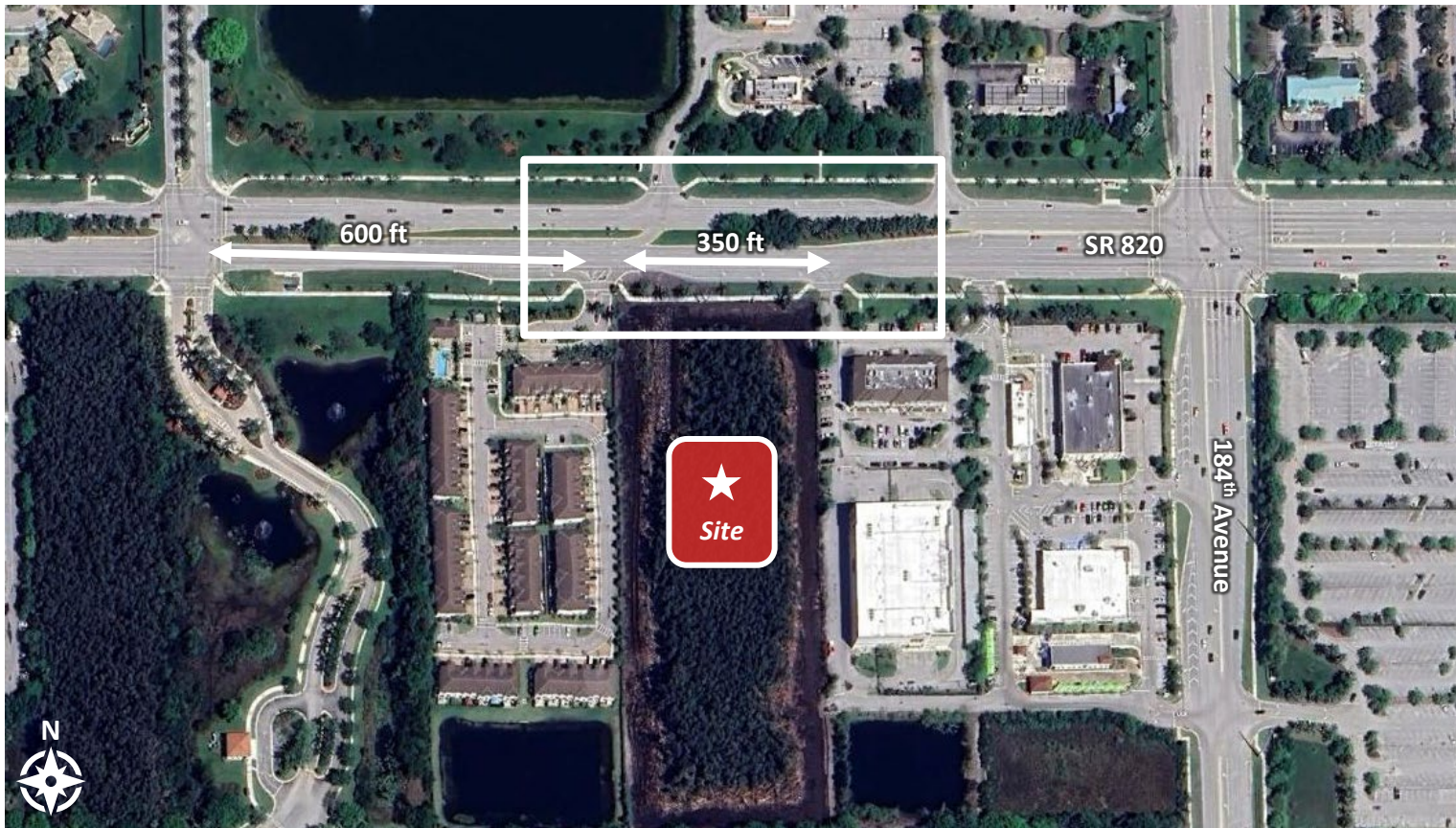
### Before Median Opening Spacing

Distance from Previous Median Opening (West)	<b>800 ft</b>
Distance from Next Median Opening (East)	<b>900 ft</b>
Minimum Directional Median Opening Spacing Standard	1,320 ft

### Before Connection Spacing

Distance from Previous Driveway (West)	600 ft
Distance from Next Driveway (East)	<b>350 ft</b>
Minimum Connection Spacing Standard	440 ft

## Before



**Solutions and Outcomes**

- 1 Cross-access was required by FDOT to the adjacent properties immediately east and west of the site, and the existing driveways to those adjacent properties are to be removed.
- 2 The proposed shared access driveway will remove the right-in/right-out driveway to the west of the property, shift access to the east, and address the existing safety concern with illegal left turns from the driveway.
- 3 A minimum driveway length of 100 feet, as measured from the ultimate right-of-way line to the first conflict, was required.
- 4 A minimum driveway length of 100 ft to the call box and/or gate house and a turnaround area before the gate will be required if a gate is proposed.
- 5 A Joint-Access Agreement between adjacent property owners was required. The joint-access agreement was required to be included on the site plan with the Official Record Book (ORB) and page number of instrument number on the plan sheet.

**After Median Opening Spacing**

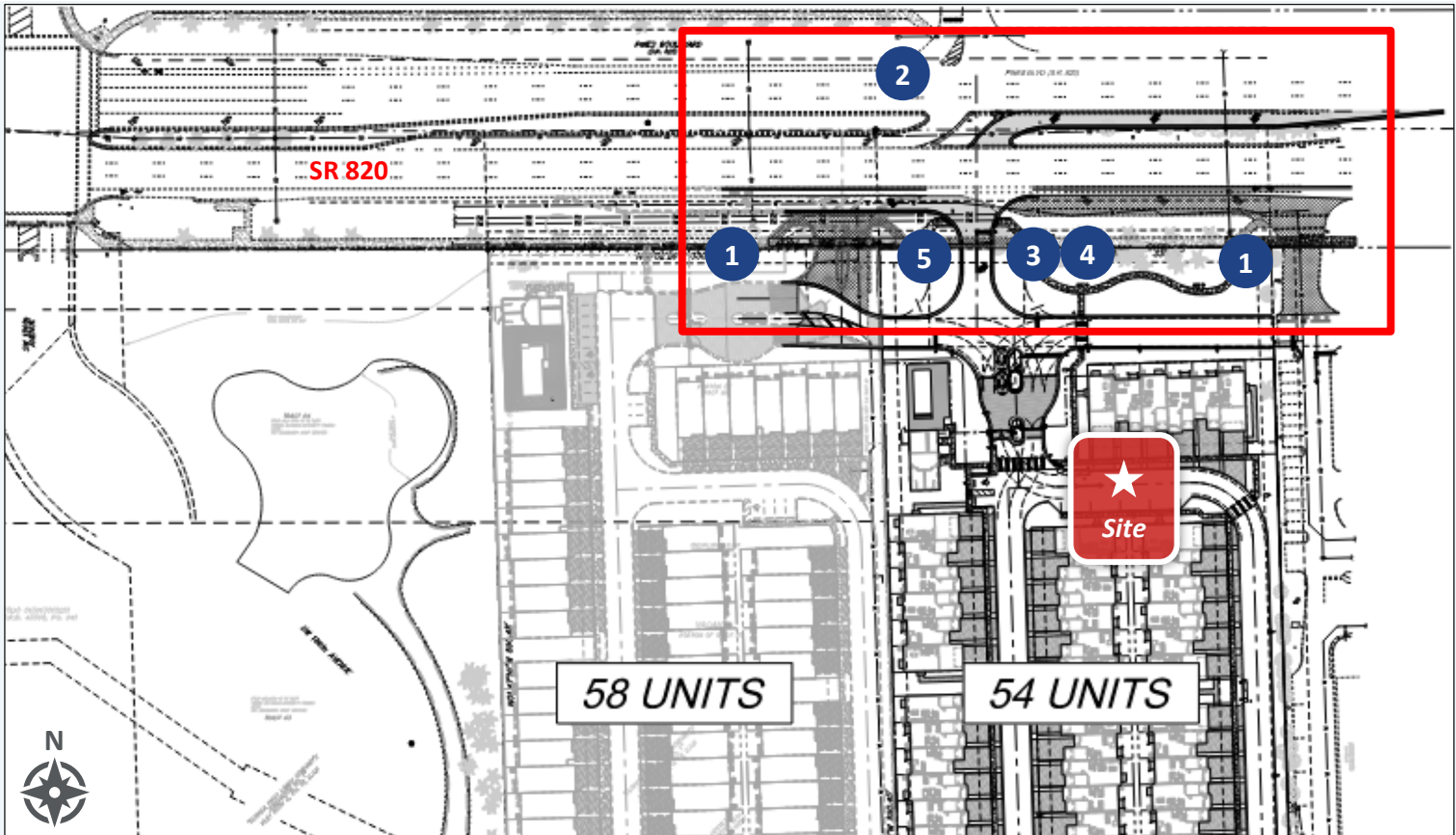
Distance from Previous Median Opening (West)	<b>800 ft*</b>
Distance from Next Median Opening (East)	<b>900 ft*</b>
Minimum Directional Median Opening Spacing Standard	1,320 ft

\*Variance Required

**After Connection Spacing**

Distance from Previous Driveway (West)	750 ft
Distance from Next Driveway (East)	500 ft
Minimum Connection Spacing Standard	440 ft

**After**



## US 301 Driveway Relocation and Cross Access

### Key Topics

- ✓ Driveway Relocation
- ✓ Driveway Spacing
- ✓ Non-Conforming Driveway
- ✓ Shared Driveway / Cross-Access Connection
- ✓ Median Modification

### Setting

#### Characteristics

Number of Lanes	6
Access Classification	3
Context Classification	C3R
Posted Speed Limit	55

#### Background

**Description** Driveway/connection permit review for the redevelopment of a parcel into an automobile care center.

**Location** The west side of US 301 south of Tucker Jones Road in Hillsborough County, FL.

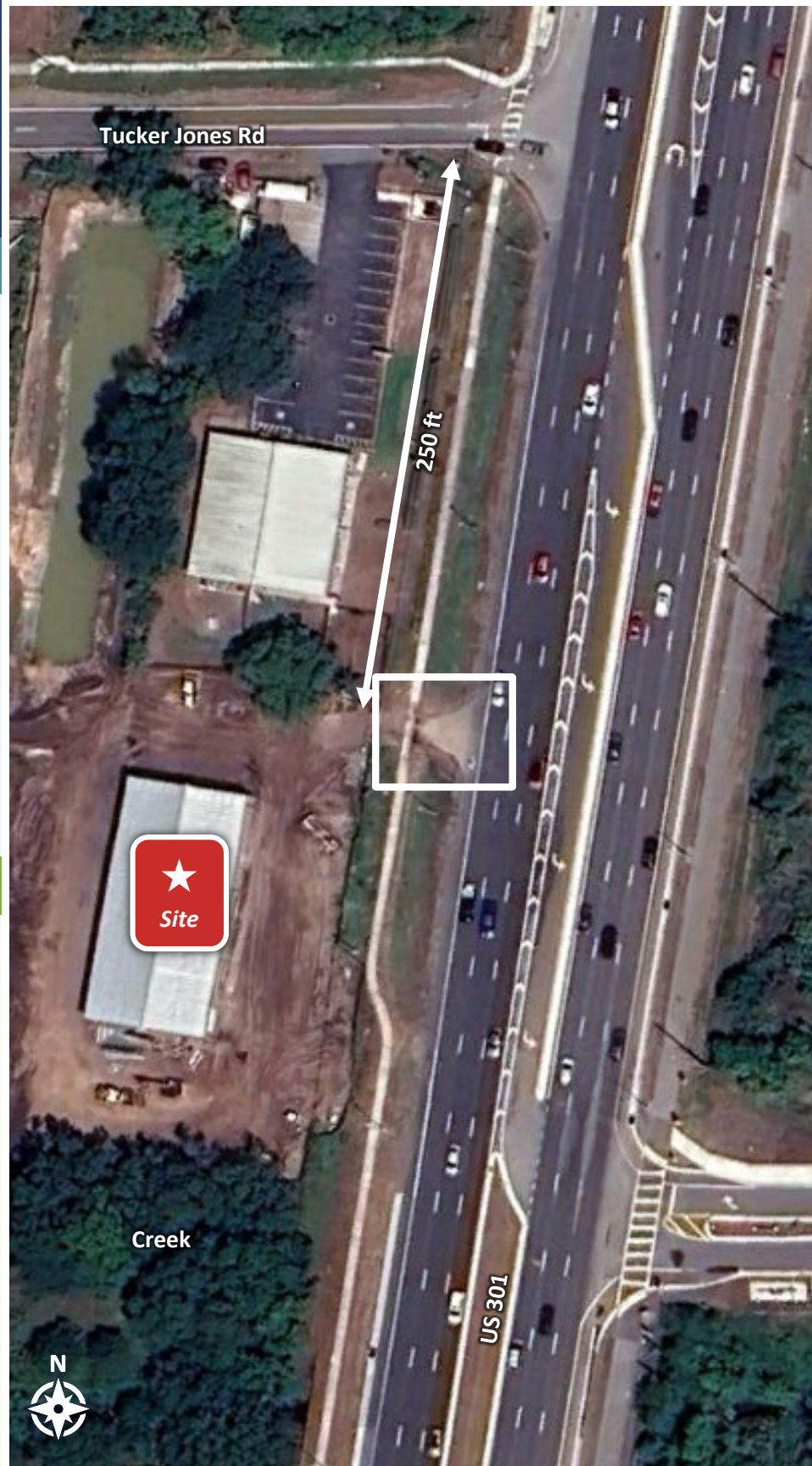
### Issues

- The parcel had an existing non-conforming driveway on US 301 located too close to the public street intersection to the north.
- The existing driveway did not effectively prevent drivers from exiting the site and crossing three lanes into the southbound left-turn lane.

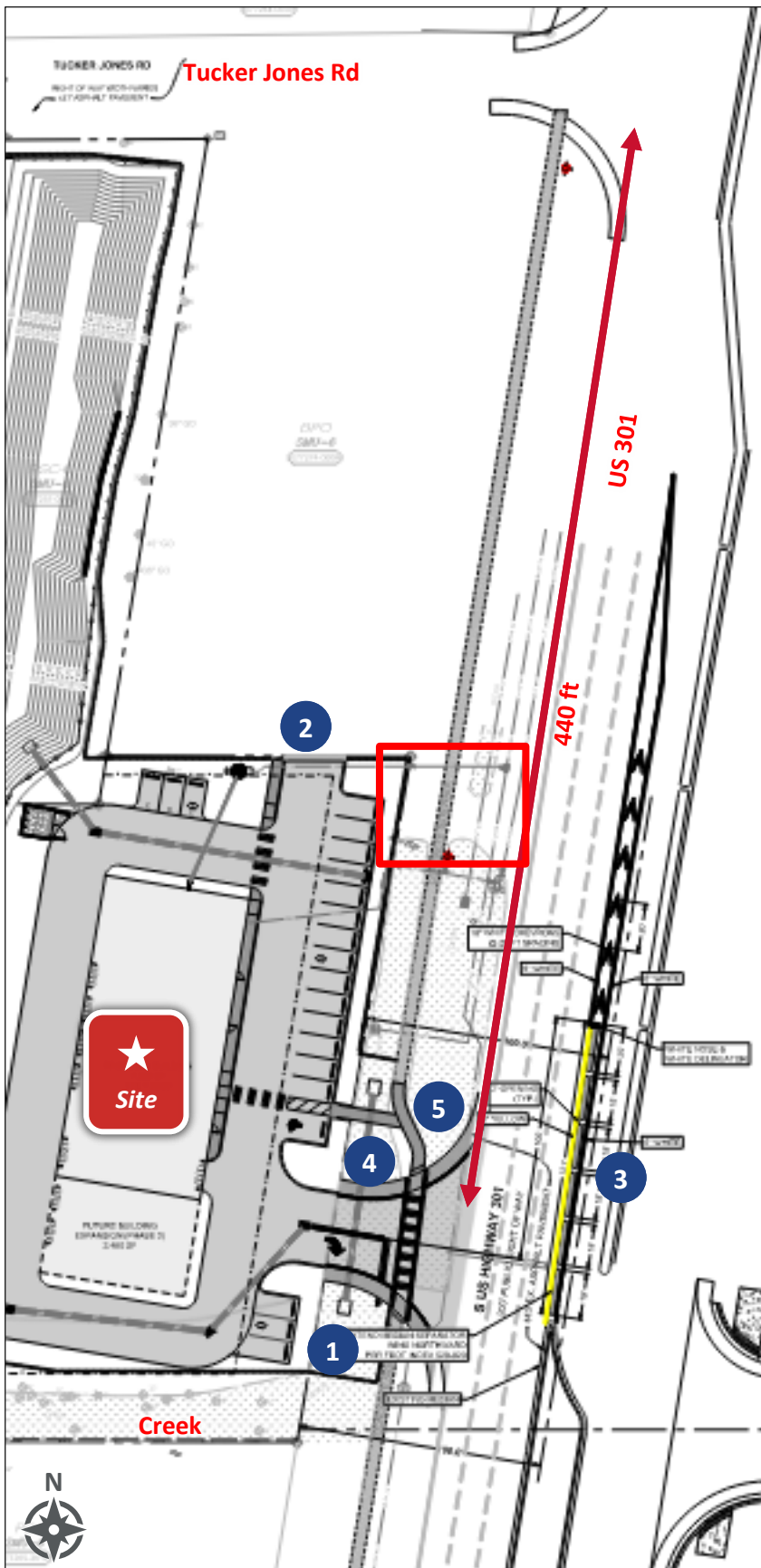
#### Before Driveway Spacing

Distance from Previous (North)	<b>250 ft</b>
Distance from Next (South)	780 ft
Minimum Connection Spacing Standard	660 ft

Before



After



Solutions and Outcomes

- 1 FDOT required relocating the existing driveway southward, as close to the creek as possible.
- 2 A cross-access easement was required for potential future redevelopment of the neighboring property to the north (and possibly the rear property per the County) due to this being considered a non-conforming connection as well as the proximity to the intersection.
- 3 FDOT required a median wing extension to prevent drivers exiting the site from using the southbound left-turn lane to make illegal left turns out of the site.
- 4 A sidewalk connection to the state system was required.
- 5 Lighting of sidewalks and/or shared paths was required to meet current standards (FDM section 231).

After Connection Spacing

Distance from Previous (North)	<b>440 ft*</b>
Distance from Next (South)	<b>630 ft*</b>
Minimum Connection Spacing Standard	660 ft

\*Non-conforming and subject to future closure

## SR 45 (US 41) Driveway Relocation and Length

### Key Topics

- ✓ Driveway Relocation
- ✓ Driveway Consolidation
- ✓ Driveway Length
- ✓ Pedestrian Access Walkway (Sidewalk Connection)
- ✓ Site Frontage Improvement

### Setting

#### Characteristics

Number of Lanes	4
Access Classification	3
Context Classification	C3R
Posted Speed Limit	55

#### Background

Description	Driveway/connection permit review for a new medical center.
Location	The southeast side of SR 45 (US 41) north of Mirabay Boulevard in the city of Apollo Beach, FL.

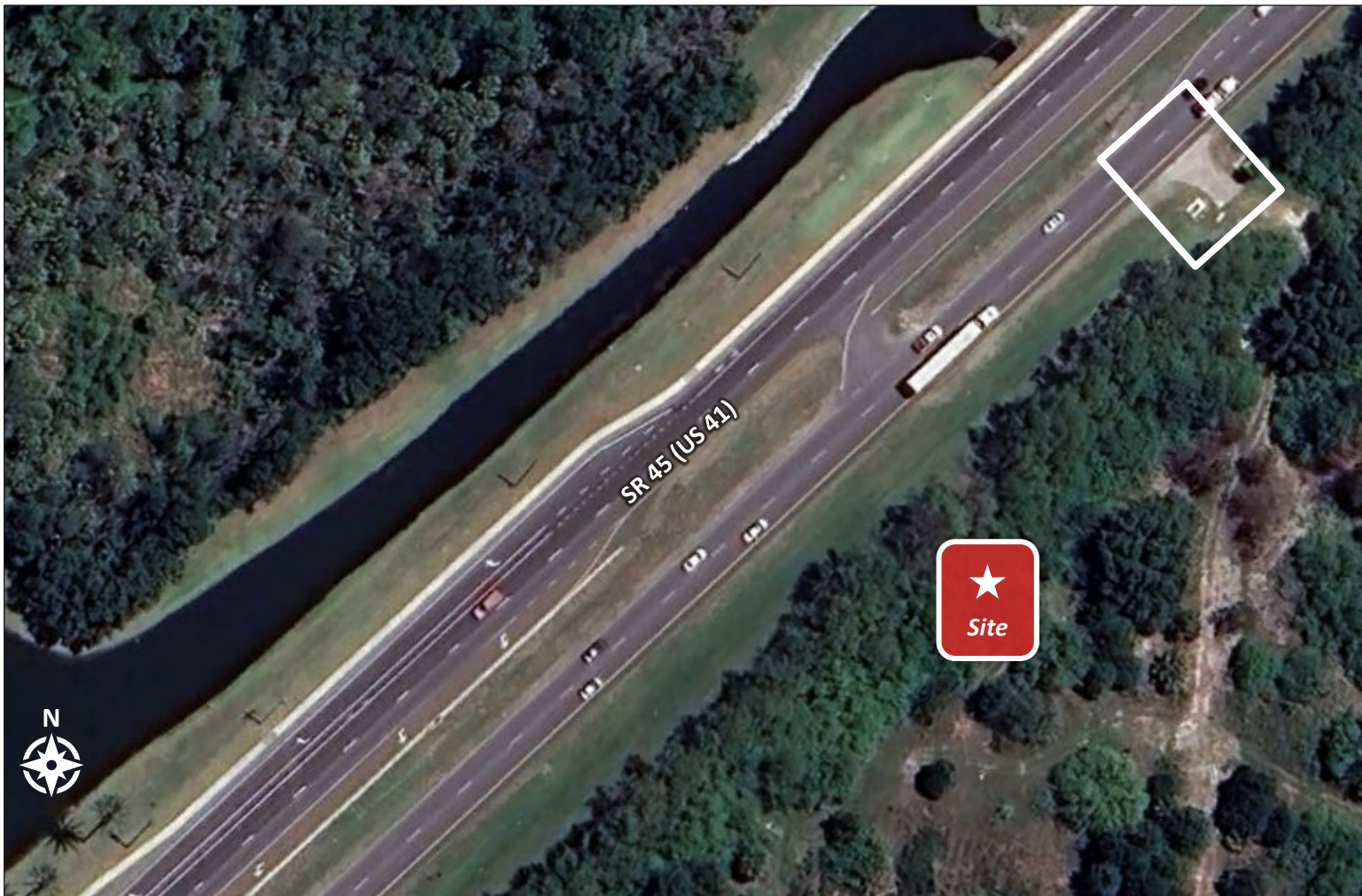
### Issues

The existing driveway does not align with the directional median opening located to the southwest.

#### Before Connection Spacing

Distance from Previous Driveway (Southwest)	975 ft
Distance from Next Driveway (Northeast)	1,800 ft
Minimum Connection Spacing Standard	660 ft

### Before







# SR 716 Driveway with On-Site Queuing and Cross Access

## Key Topics

- ✓ Shared Driveway / Cross-Access Connection
- ✓ On-Site Queuing

## Setting

### Characteristics

Number of Lanes	6
Access Classification	5
Context Classification	C4
Posted Speed Limit	45

### Background

Description	Driveway/connection permit review for a drive-through coffee shop site development.
Location	The north side of SR 716 (Port St. Lucie Boulevard) east of SW Wayne Street in the City of Port St. Lucie, FL.

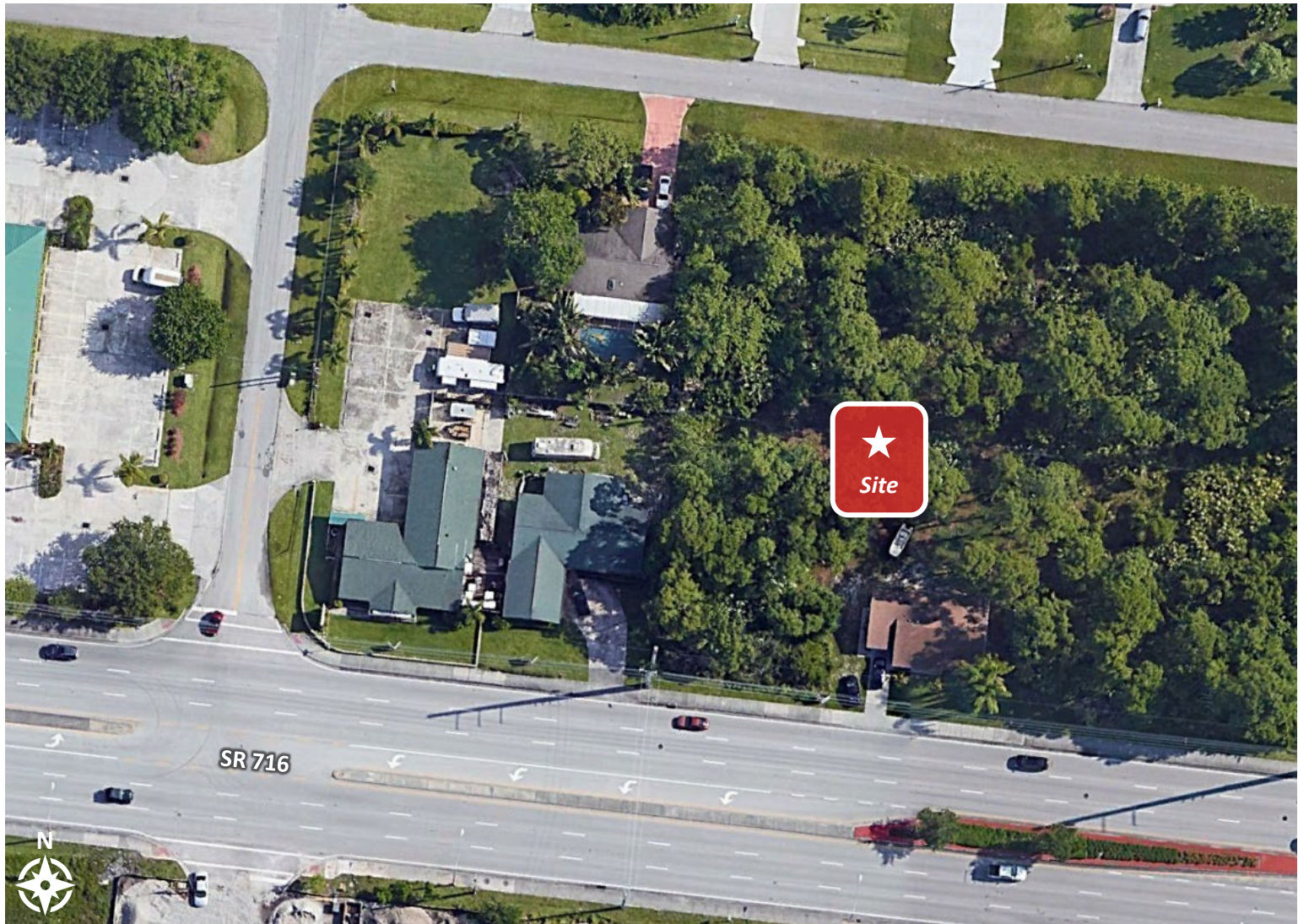
## Issues

Adequate on-site storage is needed to prevent the internal queues from backing up onto SR 716 and creating safety and operational issues.

### Before Connection Spacing

Distance from Previous Driveway (East)	375 ft
Distance from Next Driveway (West)	<b>110 ft</b>
Minimum Connection Spacing Standard	245 ft

## Before





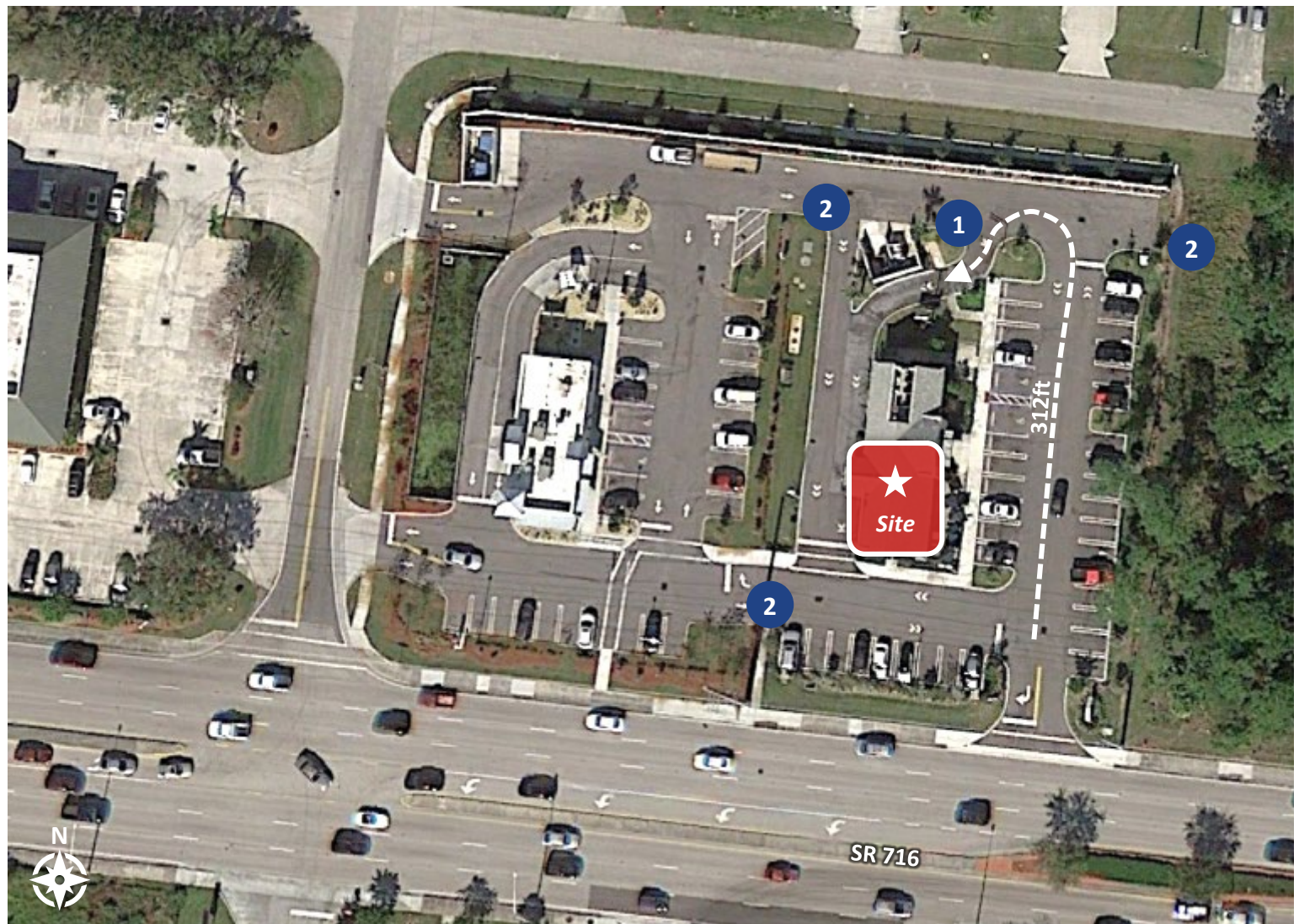
## Solutions and Outcomes

- 1 A stacking distance of at least 300 feet was required for the proposed Drive-Through to accommodate queues on-site; the revised site plan provided 312 feet of on-site storage.
- 2 Cross-access agreements with the adjacent properties to the east and west were required.
- 3 External pedestrian access and internal circulation were provided to both premises.

### After Connection Spacing

Distance from Previous Driveway (South)	375 ft
Distance from Next Driveway (North)	275 ft
Minimum Connection Spacing Standard	245 ft

After



# US 19 with Adequate On-Site Queuing and Cross Access

## Key Topics

- ✓ Non-Conforming Driveway
- ✓ Shared Driveway / Cross-Access Connection
- ✓ On-Site Queuing
- ✓ Site Frontage Improvement

## Setting

### Characteristics

Number of Lanes	8
Access Classification	3
Context Classification	C3C
Posted Speed Limit	55

### Background

Description	Driveway/connection permit review for a carwash site development.
Location	The west side of US 19 between Tampa Road and Nebraska Avenue in Pinellas County, FL.

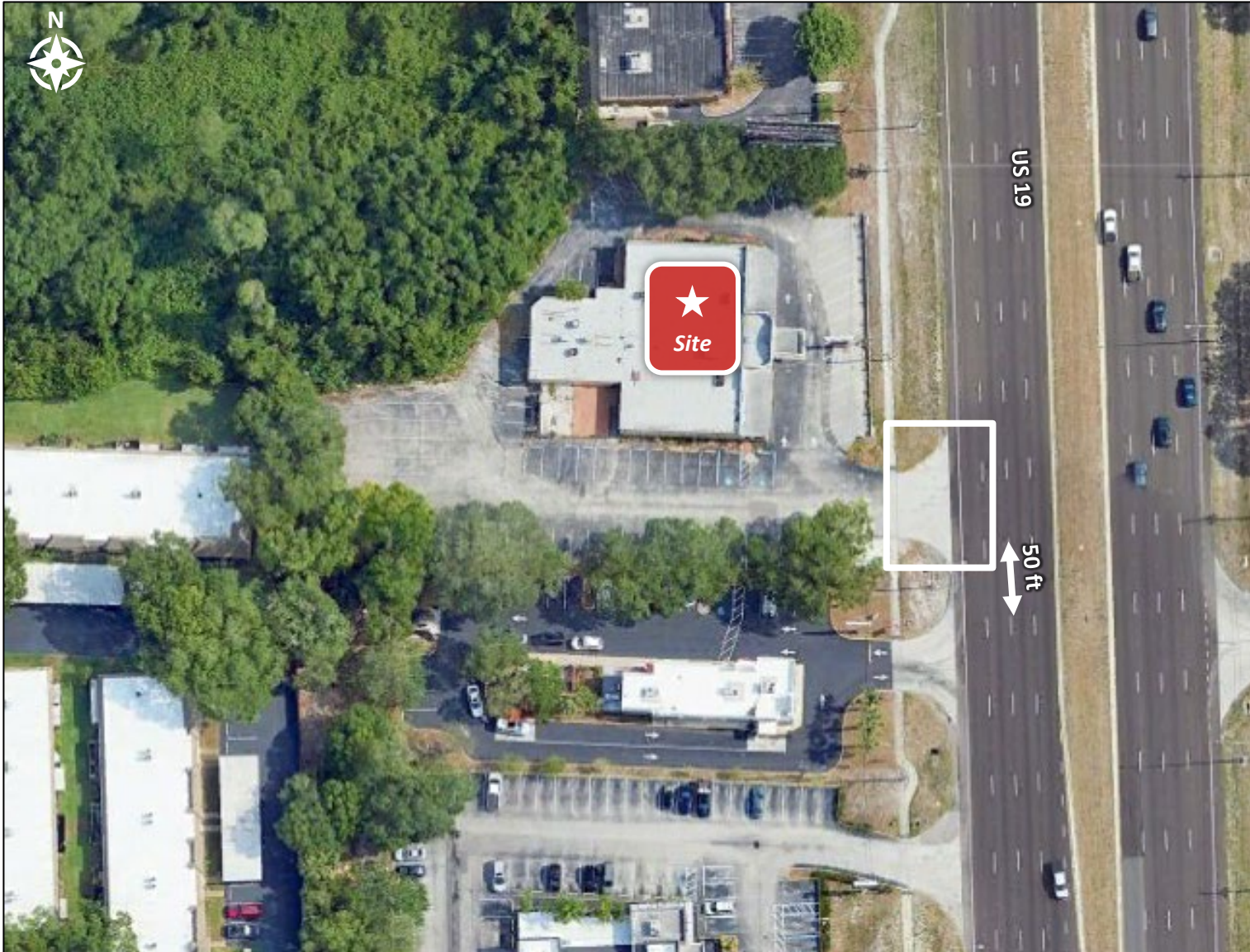
## Issues

- The existing driveway provides only 50 feet of spacing to the adjacent driveway to the south.
- The site proposes a car wash, and adequate storage is needed to accommodate queues on-site.

### Before Connection Spacing

Distance from Previous Driveway (North)	<b>380 ft</b>
Distance from Next Driveway (South)	<b>50 ft</b>
Minimum Connection Spacing Standard	660 ft

## Before





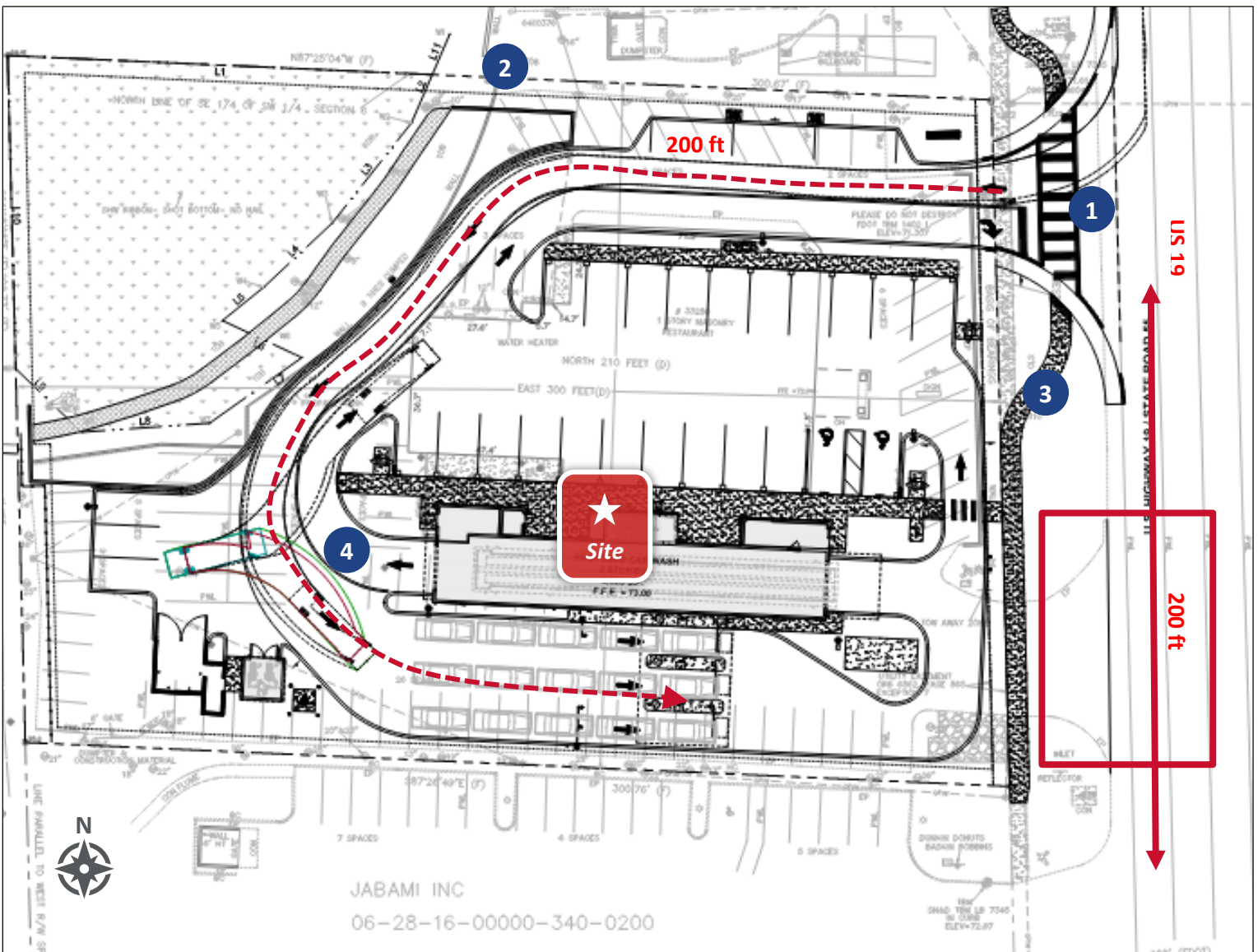
## Solutions and Outcomes

- 1 The driveway was relocated approximately 150 feet to the north of its existing location to provide increased spacing between driveways.
- 2 A recorded cross-access easement was required so the parcel to the north could later modify the driveway (which is still non-conforming), if necessary.
- 3 FDOT required the sidewalk to be realigned closer to the road and replaced along the entire frontage of the state road at the driveway location with a minimum sidewalk width of six feet per FDM.
- 4 Adequate on-site storage was required to accommodate queued vehicles.

### After Connection Spacing

Distance from Previous Driveway (North)	<b>230 ft*</b>
Distance from Next Driveway (South)	<b>200 ft*</b>
Minimum Connection Spacing Standard	660 ft
*Non-conforming and subject to future closure	

## After



## SR 572 Emergency Only Access

### Key Topics

- ✓ Driveway Spacing
- ✓ Non-Conforming Driveway
- ✓ Pedestrian Access Walkway (Sidewalk Connection)
- ✓ Side Street (Local Street) Connection
- ✓ Emergency Only Access Connection

### Setting

#### Characteristics

Number of Lanes	2
Access Classification	4
Context Classification	C3C
Posted Speed Limit	50

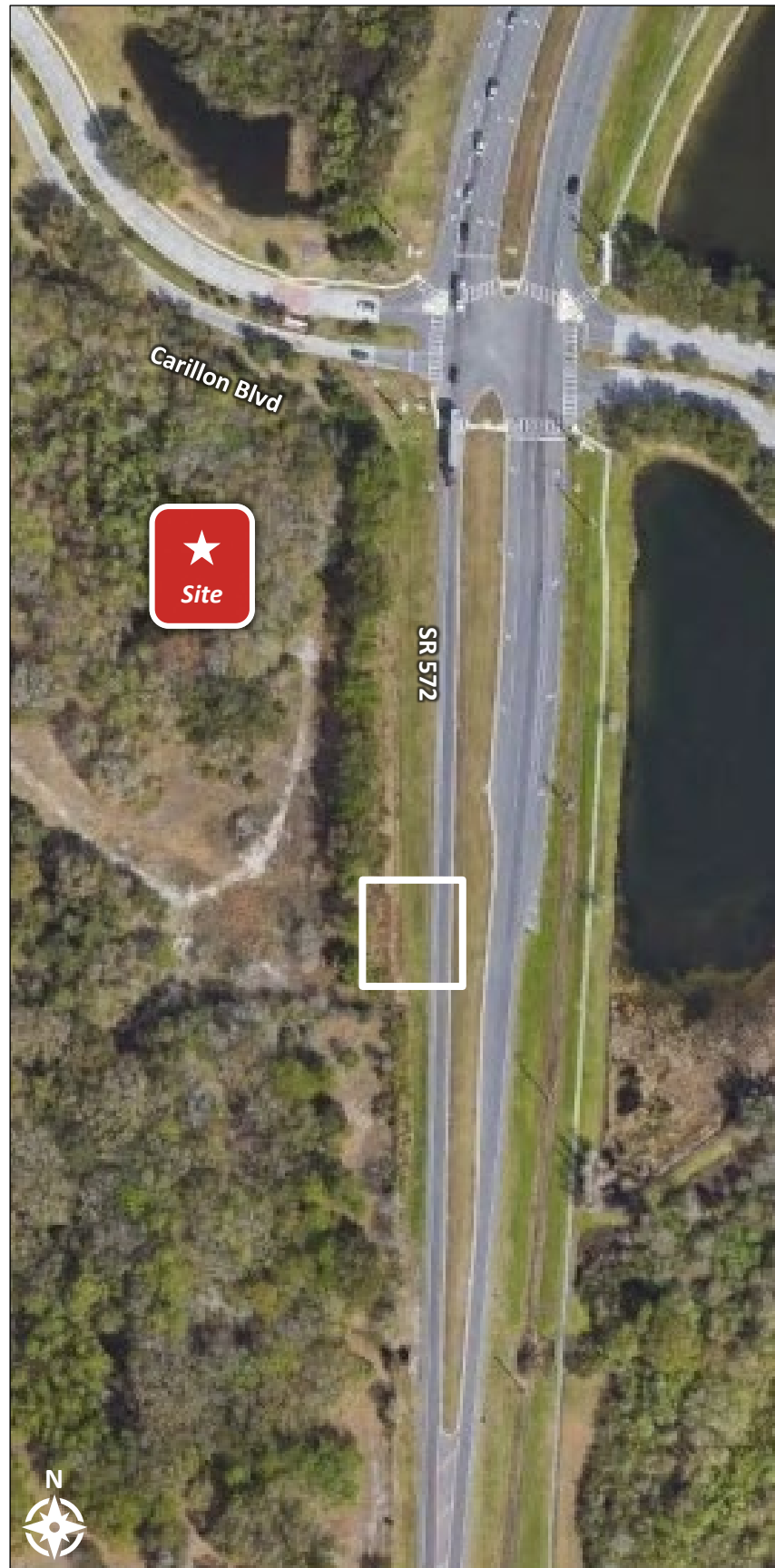
#### Background

Description	Driveway/connection permit review for a multifamily residential development.
Location	The southwest quadrant of the SR 572 (Airport Road) and Carillon Boulevard signalized intersection in the city of Lakeland, FL.

### Issues

The developer initially proposed a right-in/right-out driveway on SR 572 but that driveway did not meet the required spacing standards. If this driveway were constructed, FDOT would have required the developer to provide a cross-access easement to the site to the south.

### Before



After



Solutions and Outcomes

1

The developer opted to convert the proposed driveway to an emergency access only to avoid the cross-access easement requirement. It was issued as a non-conforming connection permit since it does not meet spacing standards. The driveway was required to be constructed as a maintenance driveway, grassed and 12 feet wide. FDOT required written documentation from the Fire Marshall for this access, including how will it be maintained as emergency only ("Knox Box").

2

General access to the residential development will be provided via the side street, Carillon Boulevard.

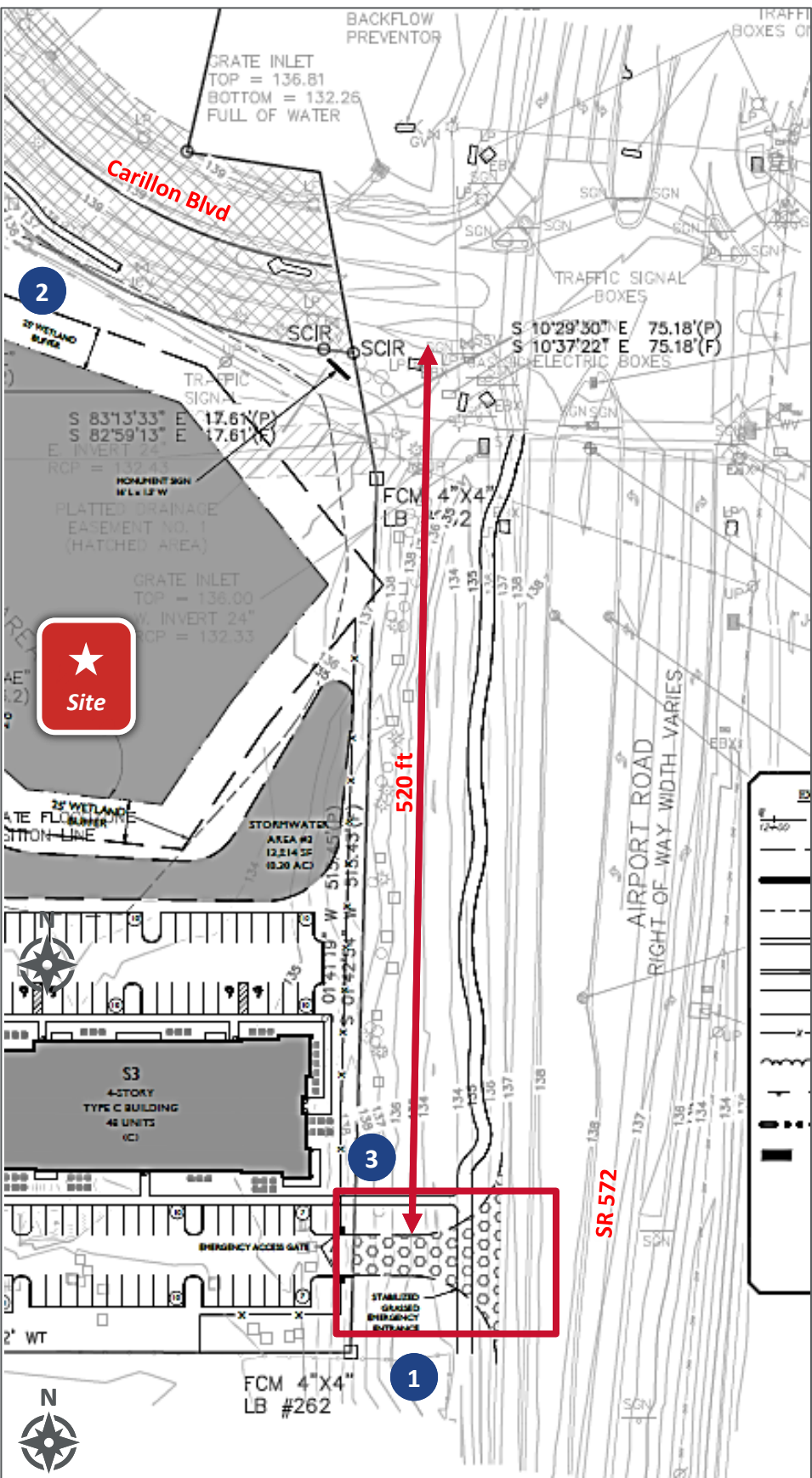
3

Pedestrian access via a direct sidewalk connection was provided near the emergency access.

After Connection Spacing

Distance from Previous (North)	<b>520 ft*</b>
Distance from Next (South)	1,000 ft
Minimum Connection Spacing Standard	660 ft

\*Non-conforming and subject to future closure



## SR 52 Backage Road

### Key Topics

- ✓ Side Street (Local Street) Connection
- ✓ Frontage Road/Backage Road Connection
- ✓ Site Frontage Improvement

### Setting

#### Characteristics

Number of Lanes	6
Access Classification	5
Context Classification	C3C
Posted Speed Limit	50

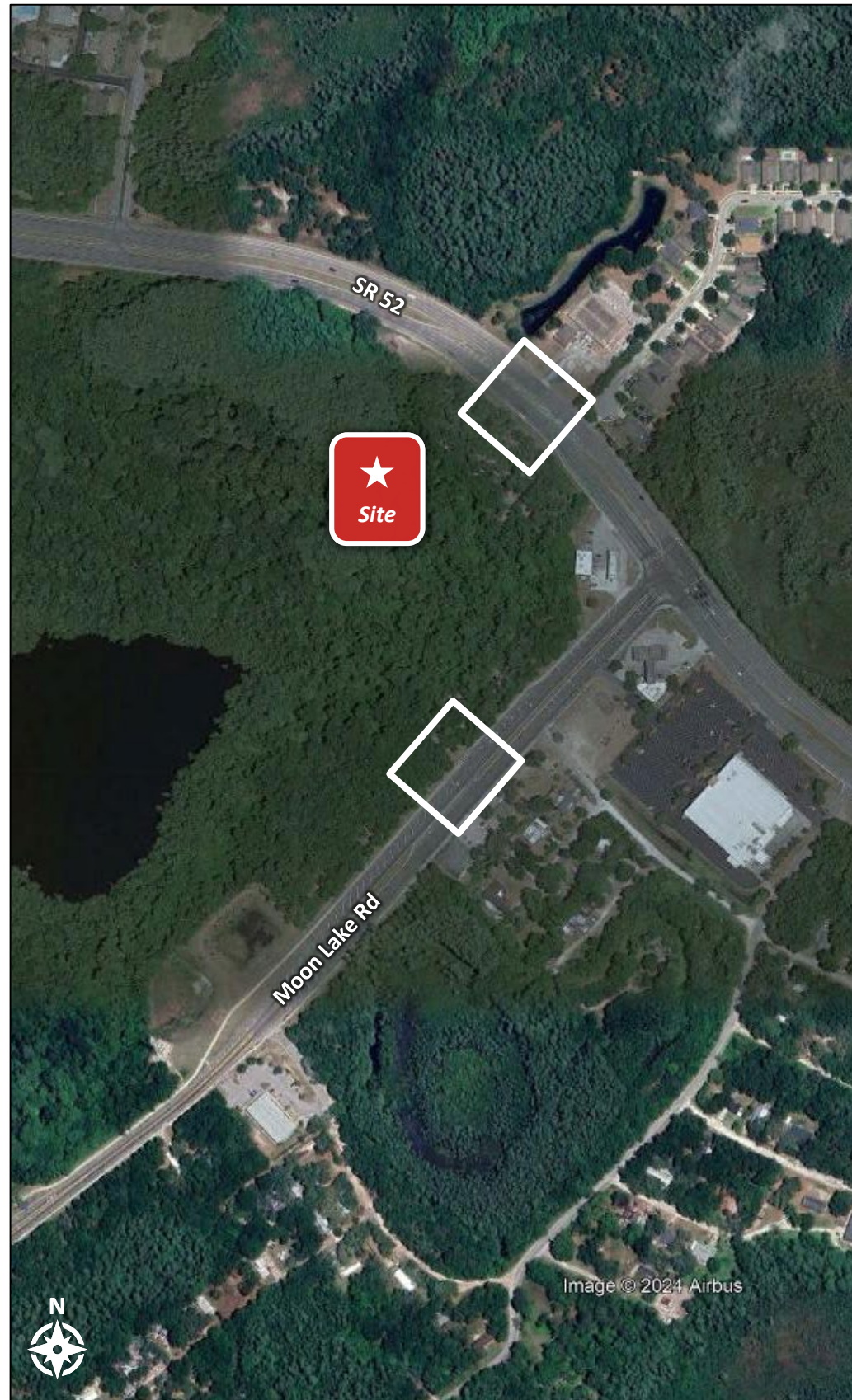
#### Background

Description	Driveway/connection permit review for a car wash site.
Location	The southwest quadrant of the SR 52 and Moon Lake Road intersection in Pasco County, FL.

### Issues

Future developments are expected along Moon Lake Road adjacent to the SR 52 signalized intersection. Developing the backage road/frontage road with the first development within the undeveloped area will provide consolidated access to the development sites and avoid multiple driveways closer to the intersection.

### Before





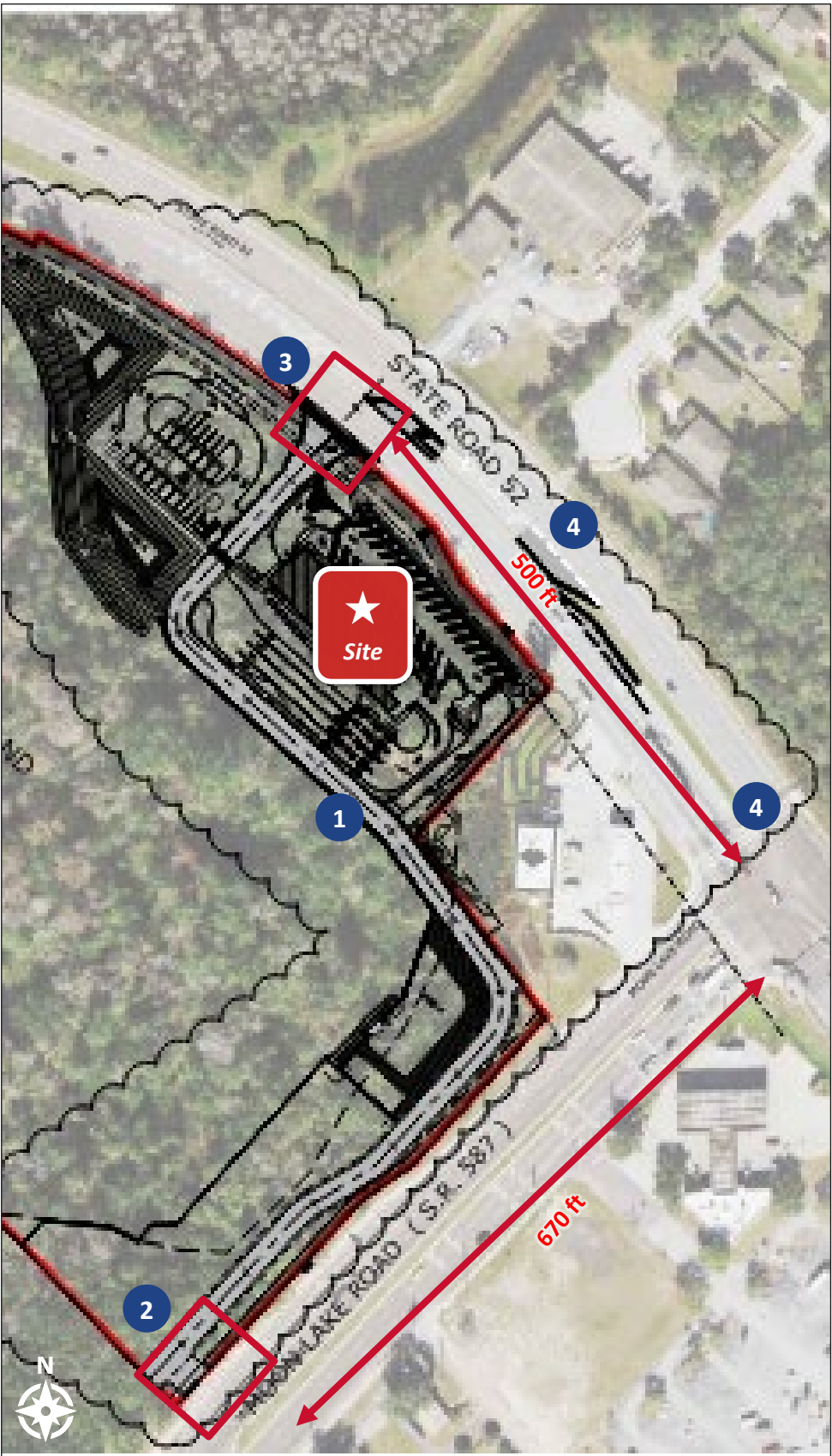
After

 Solutions and Outcomes

- 1 FDOT requested the developer to provide a shared access reverse frontage road (backage road).
- 2 FDOT requested the backage road connection to Moon Lake Road (side street) to be located further away (approximately 670 feet) from the SR 52 and the Moon Lake Road signalized intersection.
- 3 As part of the driveway permit application, the developer agreed to repave SR 52 where the access driveway is located.
- 4 The left-turn lane at the access driveway and the U-turn lane at the SR 52 and Moon Lake Road intersection are proposed to be extended and repaved.

**After Connection Spacing**

Distance from Previous (West)	1,000+ ft
Distance from Next (East)	500 ft
Minimum Connection Spacing Standard	440 ft



# 3. Median Openings

## Overview

A median is a traffic control feature or device that separates vehicular traffic traveling in opposite directions on a roadway. A restrictive median physically separates vehicular traffic traveling in opposite directions. A non-restrictive median is a flush median or painted centerline that does not provide a physical barrier between center traffic turning lanes or traffic lanes traveling in opposite directions.

Restrictive medians and well-designed median openings are a key component of access management. Raised or restrictive medians can be paved or landscaped areas that separate vehicular traffic. There are two main types of restrictive median openings: full and directional. Full median openings allow for all available movements (left-turn, through, right-turn) to and from the driveway or intersecting street. Directional median openings only allow for specific movements to and from the driveway or intersecting street. Most commonly these specific movements are left-turns from the SHS into the driveway/street. Both provide specific benefits but should be installed depending on the local roadway conditions.

## Closing or Modification of Median Openings

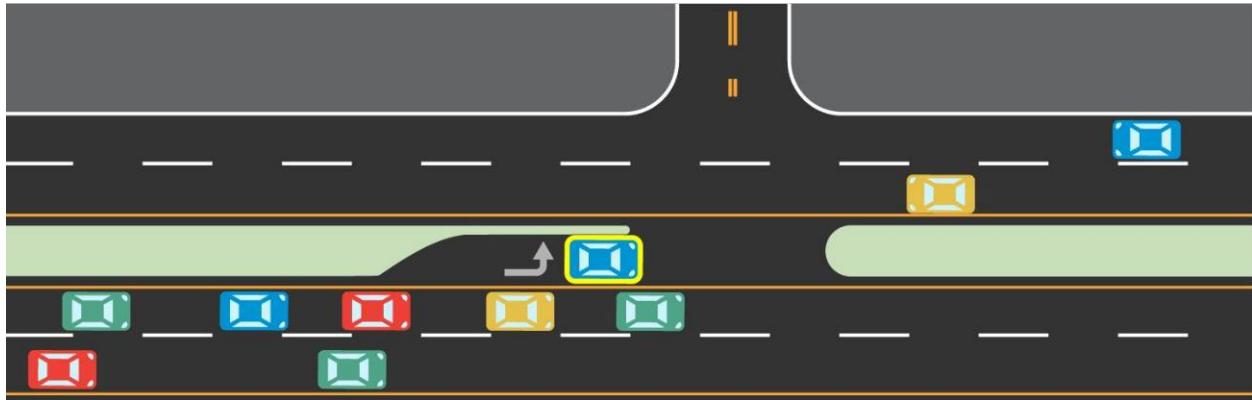
Median openings provide access into or out of a site using left-turn or through movements. These types of openings can pose an elevated risk of severe traffic crashes due to the nature of the crossing conflicts. Issues can also occur when critical components of the opening are not designed appropriately or inadequate spacing exists between the median openings. Other potential median-related issues include the following:

- Inadequate space for left-turn deceleration and storage.
- Through traffic queue from the downstream signalized intersection that extends past the median opening.
- Traffic operational issues such as high volume of left-out movements onto the SHS.
- Safety concerns such as high percentage of angle and/or left-turn crashes involving the left-out turning movement.
- Increased multimodal conflicts such as high volumes of bicycles or pedestrians crossing the cross-street or driveway, or in locations with a history of pedestrian/bicycle crashes.

Additional discussion of the median opening issues is provided in the MAMG.

Adequate storage length should be provided to accommodate left-turn demand at median openings and to remove left-turn traffic from the through lanes (**Figure 3**). If this is not provided, left-turn queues can

extend into the through lanes and create safety issues. The spacing between successive median openings in opposite directions of travel should be sufficient to accommodate the deceleration and storage needs of back-to-back left-turn lanes, if applicable. In some cases, a median opening may need to be closed or modified. In these scenarios, it is necessary to provide an appropriate place for the displaced left-turns or through movements to make downstream U-turns.



**Figure 3. Left-Turn Lane to Store Turn Vehicles Outside the Through Traffic Lanes**

The identification of median opening types is conducted based on three evaluation criteria:

- 1) Compliance with minimum access spacing standards per FAC 14-97 of the F.S. 335.18.
- 2) Identification of historical crash patterns to verify or modify the median plan.
- 3) Identification of traffic operational deficiencies caused by either undue vehicular delay for unsignalized traffic movements or vehicle queues from a nearby signalized intersection spilling back and blocking access to an unsignalized driveway.

The following case studies provide examples of median closures or modifications:

- [US 41 at 8th Avenue Closure of Median Opening](#)
- [US 92 at Driveway Median Opening Modification](#)
- [US 98 at Hoffman Drive Closure of Directional Median Opening](#)

# US 41 at 8th Avenue Closure of Median Opening

## Key Topics

- ✓ Closure of Median Opening
- ✓ Median Opening Spacing
- ✓ Turn Lane/U-turn Accommodation

## Setting

### Characteristics

Number of Lanes	6
Access Classification	5
Context Classification	C3C
Posted Speed Limit	45

### Background

**Description** Driveway/connection permit review for a convenience store and gasoline station development.

**Location** The southeast corner of the US 41 and 6<sup>th</sup> Avenue intersection in Bradenton, FL.

## Issues

- The existing full median opening does not meet spacing standards.
- The existing full median opening has an elevated number of left-turn crashes including injury crashes.

### Before Median Opening Spacing

Median Opening Type	Full
Distance from Previous (South)	<b>420 ft</b>
Distance from Next (North)	<b>400 ft</b>
Minimum Full Median Opening Spacing Standard	1,320 ft

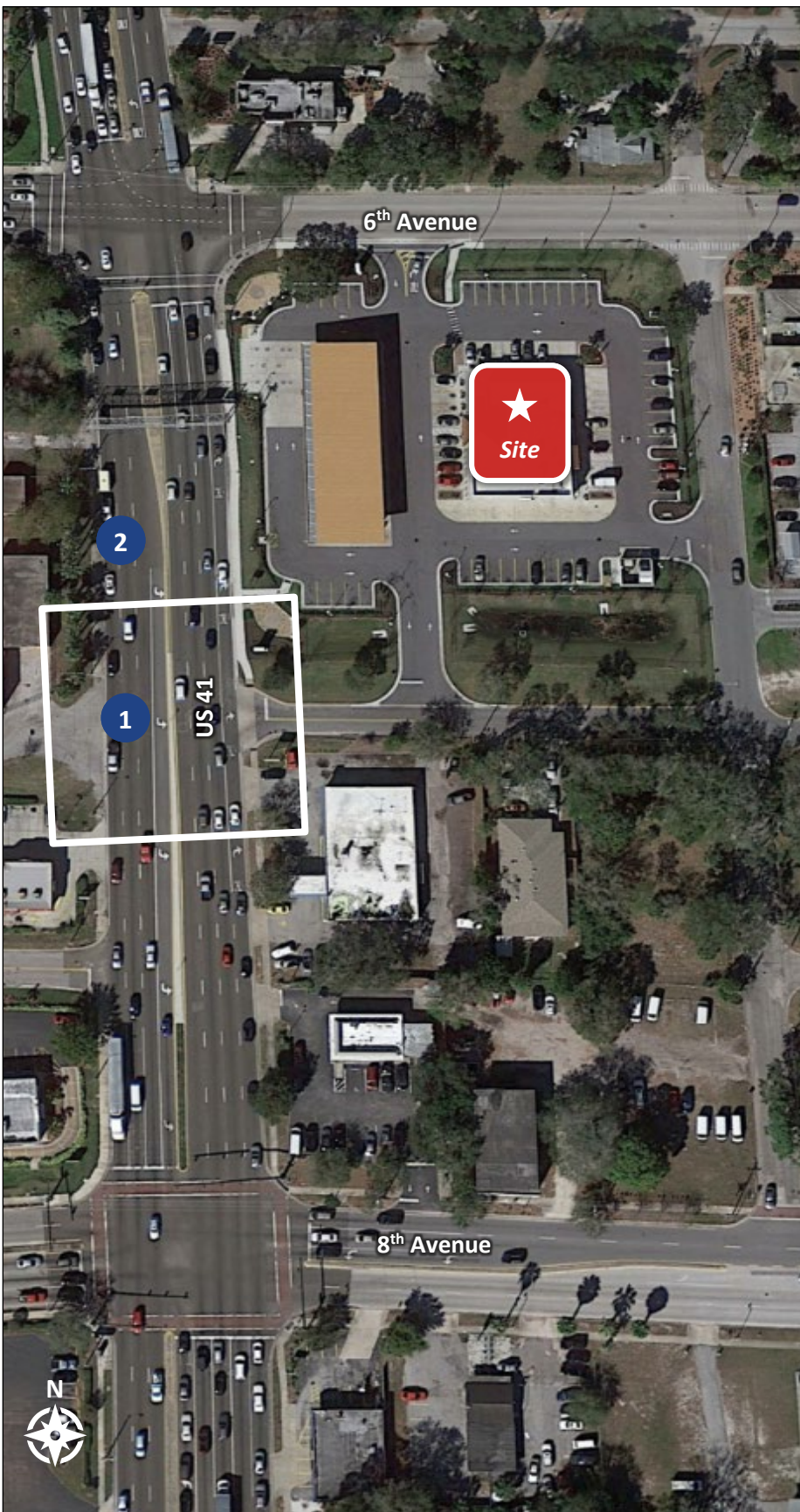
### 5-Year Crash History at Median Opening

Total Crashes	39
Fatal Crashes	0
Injury Crashes	20
Left-Turn Crashes	26

## Before



### After



### Solutions and Outcomes

1

FDOT required the closure of the full median opening at the US 41 at 8th Avenue as a condition of the connection permit.

2

The southbound left-turn lane was extended at 9th Avenue to accommodate additional U-turn movements due to the closed median.

# US 92 at Driveway Median Opening Modification

## Key Topics

- ✓ Median Modification
- ✓ Median Opening Spacing
- ✓ Turn Lane/U-turn Accommodation

## Setting

### Characteristics

Number of Lanes	4
Access Classification	3
Context Classification	C3C
Posted Speed Limit	55

### Background

Description	Driveway/connection permit review for a planned hospital and planned multi-use residential/commercial development.
Location	The northwest quadrant of the interchange of US 92 at SR 570 (Polk Parkway) in Polk County, FL.

## Issues

- The existing median opening provided full access with no directional turn lanes provided.
- The existing median opening did not meet spacing standards.

### Before Median Opening Spacing

Median Opening Type	Full
Distance from Previous (West)	<b>900 ft</b>
Distance from Interchange (East)	<b>1,500 ft</b>
Minimum Full Median Opening Spacing Standard	2,640 ft
Minimum Full Median Opening Spacing From Interchange Standard	2,640 ft

## Before





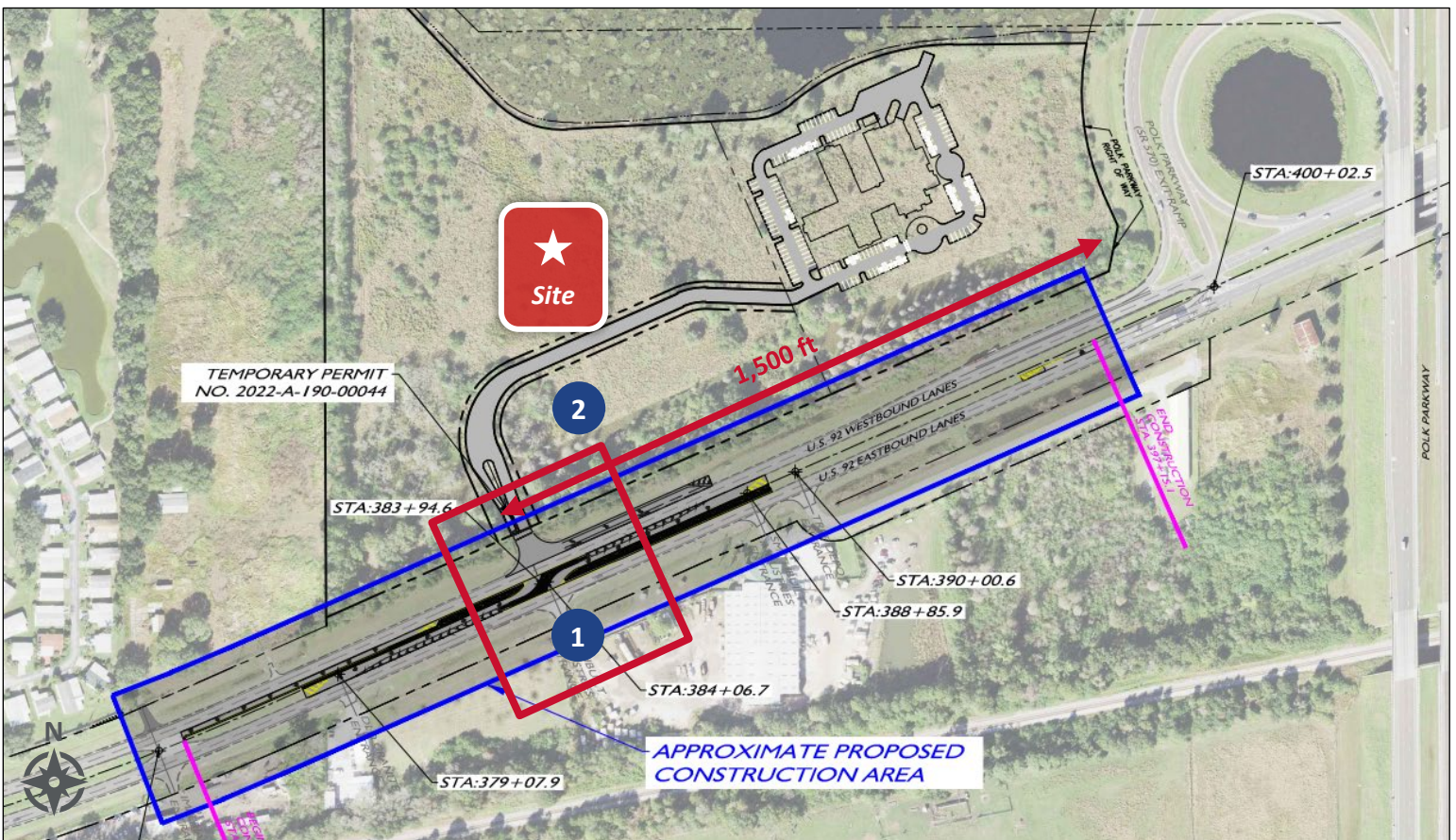
## Solutions and Outcomes

- 1 FDOT required the median to be modified to a directional median opening as an unsignalized restricted crossing U-turn (RCUT) intersection.
- 2 With future construction phases, FDOT required the developer to conduct a signal warrant analysis and signalize the RCUT when warranted. The approved permit with stated conditions, including the legal description for all parcel(s) as shown in the approved site plan was required to be recorded with County Courthouse prior to final acceptance of the FDOT permit.

### After Connection Spacing

Median Opening Type	Directional
Distance from Interchange (East)	1,500 ft
Minimum Directional Median Opening Spacing from Interchange Standard	1,320 ft

### After



# US 98 at Hoffman Drive Closure of Directional Median Opening

Before

## Key Topics

- ✓ Closure of Median Opening
- ✓ Median Modification
- ✓ Median Opening Spacing
- ✓ Turn Lane/U-turn Accommodation

## Setting

### Characteristics

Number of Lanes	6
Access Classification	5
Context Classification	C3C
Posted Speed Limit	35

### Background

Description	Review of an existing directional median opening.
Location	Hoffman Drive at US 98 in Gulf Breeze, FL.

## Issues

- There was a significant crash history at the directional median opening for southbound left turns at Hoffman Drive into the Gulf Breeze Shopping Center.
- Northbound vehicles routinely queued from the signal upstream past the directional median opening, creating a blocked condition with stacked vehicles and sight distance issues for vehicles attempting to turn left through the queue.
- The directional median opening did not meet spacing standards.

### Before Median Opening Spacing

Median Opening Type	Directional
Distance from Previous (North)	<b>540 ft</b>
Distance from Next (South)	<b>800 ft</b>
Minimum Directional Median Opening Spacing Standard	660 ft

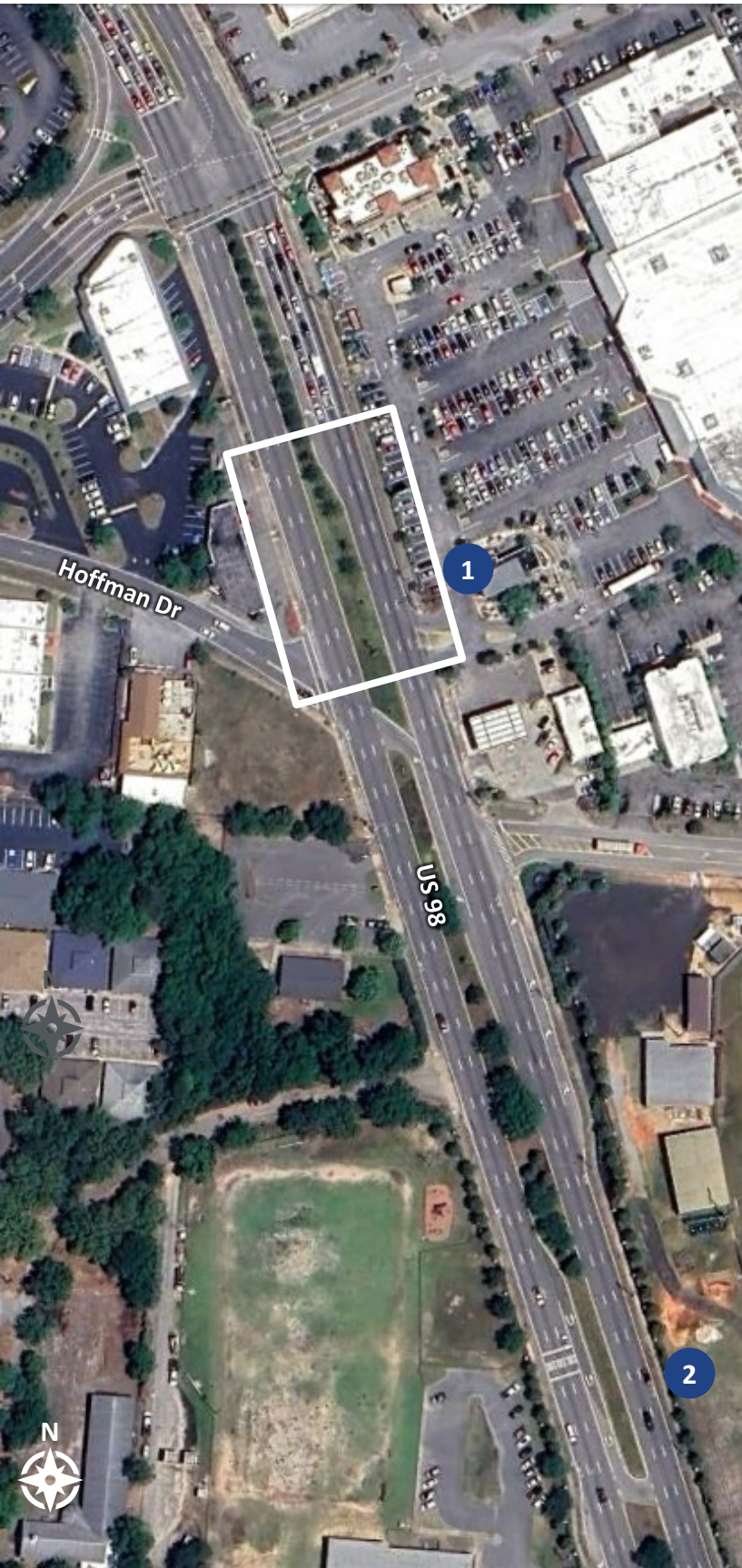
### 5-Year Crash History at Median Opening

Total Crashes	66
Fatal Crashes	0
Injury Crashes	10
Left-Turn Crashes	66





After



Solutions and Outcomes

1

The directional median opening was permanently closed.

2

A southbound U-turn lane was constructed approximately 870 feet to the south for vehicles completing a U-turn at the next median opening; thus providing an alternate route to access the shopping center. Vehicles are also able to access the shopping center via the signal upstream.

# 4. Corridor Access Management Plan (CAMP)

## Overview

As noted in the MAMG, a CAMP is defined in FAC 14-97 as a *strategy defining site specific access management and traffic control features for a particular roadway segment, developed in coordination with the affected local government and adopted by the Department in cooperation with the affected local government(s)*. A CAMP can be developed in a variety of ways and may not necessarily be a stand-alone corridor study or plan. For example, it could be created in conjunction with new development or redevelopment, or as an element of another project or study, such as a Project Development and Environment (PD&E) Study, a Resurfacing, Restoration, and Rehabilitation (RRR) project, or a traffic operations or safety study.

This chapter provides several examples of CAMPs that were developed in various ways and with different purposes and focuses. Each case study provides the following elements:

- An overview and background, along with maps, aerials, and photos or concepts. Many aerial images and photos illustrate before and after conditions.
- Key corridor characteristics, including number of lanes, access management classification, context classification, and posted speed.
- A checklist of strategies and features that are frequently included in a CAMP, noting which specific strategies were proposed or implemented as part of a case study.
- A checklist of key CAMP elements based on the guidance in the MAMG, showing which specific elements were addressed as part of the CAMP. Since CAMPs vary widely as to what elements are included, this provides a comparison between different case studies to show how projects can be implemented and objectives achieved by different means.

The following key strategies and features are reviewed as a part of the CAMP case studies:

- |   |   |
|---|---|
| ✓ Reconfigure or Relocate Median Openings                             | ✓ Incorporate Auxiliary and Turn Lanes                |
| ✓ Address Substandard Median Opening Spacing                          | ✓ Eliminate Closely Spaced or Jogged Intersections    |
| ✓ Consolidate Driveways   | ✓ Change Traffic Control                              |
| ✓ Reconfigure or Relocate Driveways                                   | ✓ Provide Multimodal Crossing Opportunities           |
| ✓ Narrow Wide Driveways   | ✓ Provide Multimodal Facilities & Connections         |
| ✓ Provide Property Access via Side Streets                            | ✓ Provide Frontage / Backage Road                     |
| ✓ Provide Joint Driveways or Cross Access Between Adjacent Properties | ✓ Install Medians in Place of Two-Way Left-turn Lanes |

The following case studies provide examples of CAMPs:

- [SR 438 \(Princeton Street\) CAMP](#)
- [SR 820 \(Hollywood/Pines Boulevard\) CAMP](#)
- [US 1 CAMP](#)
- [SR 44 \(Dixie Avenue\) CAMP](#)

## 📍 SR 438 (Princeton Street) CAMP

### ☑️ Key Strategies and Features

- ✓ Reconfigure or Relocate Median Openings
- ✓ Consolidate Driveways
- ✓ Provide Property Access via Side Streets
- ✓ Incorporate Auxiliary and Turn Lanes
- ✓ Change Traffic Control
- ✓ Provide Multimodal Facilities & Connections
- ✓ Install Medians in Place of Two-Way Left-turn Lanes

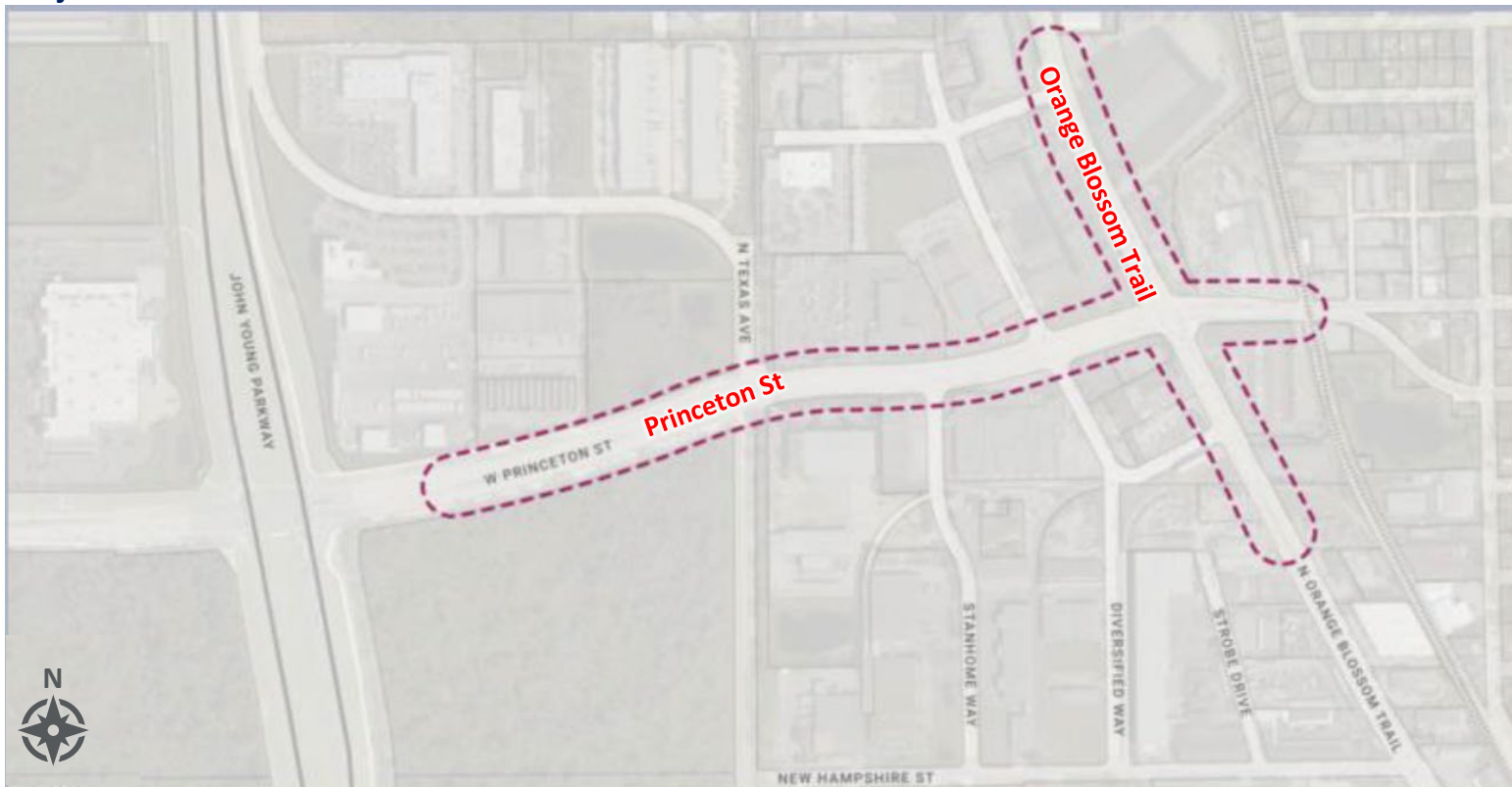
### 📍 Setting

**Description** The city of Orlando leveraged the 200-acre mixed-use private development of the Packing District to invest in roadway improvements and infrastructure. Princeton Street (SR 438) was redesigned as a Complete Street with features to promote walkability and a safer environment for all modes. The redesigned roadway features four lanes with a raised median, improved access management, on-street parking, sidewalks, and separated bike lanes.

**Location** The Packing District along Princeton Street (SR 438) from SR 423 / John Young Pkwy to east of US 441 / Orange Blossom Trail (OBT) and N Orange Blossom Trail (SR 500) in Orlando, FL.

**Length** 0.73 mi

### Project Limits





## Study Findings & Plan Details

- Existing base year traffic (19,000 AADT) was substantially under the capacity of a six-lane roadway with volume-to-capacity (v/c) ratio of 0.30. With future background growth and the new trips associated with the Packing District redevelopment, the projected 2040 future traffic (21,200 AADT) was also anticipated to be substantially under capacity even with a lane repurposing to a four-lane section (future v/c ratio of 0.62 with the four-lane reconfiguration).
- One reason the lane repurposing was feasible was that no changes were made to the number of lanes or configuration at the John Young Parkway signal, and only minor lane assignment changes were made at the OBT signal. Therefore, the existing capacities of the two signalized intersections were not reduced.
- All movements for each intersection in the future conditions are projected to operate under capacity, and all intersections are projected to operate at LOS E or better.
- A partial two-lane roundabout was introduced in place of two-way stop control at a full median opening at the Texas Avenue intersection, with a fourth leg added on the south side supporting new development at the Packing District. A benefit-cost analysis concluded the roundabout would cost less than a signal at this location with superior safety and operations.
- Crash modification factors (CMFs) were used to estimate the anticipated reduction of crashes per year. In the absence of a CMF for reducing the number of lanes, the safety benefit was conservatively estimated using the CMF for the addition of a raised median.
- Two previously full median openings (Stanhome Way, Diversified Way) were reconfigured as directional median openings, and sections of continuous two-way center turn lane were replaced with median. On Princeton Street, U-turns are now prohibited at the two directional medians, but can be made downstream in either direction.
- Driveways on the south side of Princeton Street east of OBT were consolidated to a single right-in, right-out driveway, and an eastbound directional left access was provided to the parcel on the north side
- Similar access improvements were made along a 0.35-mile section of OBT with medians, a new signal at a previous full median with TWSC (Cannery Way/Traylor Boulevard), one directional median opening, and several locations with driveway consolidation.
- Multimodal improvements included two-way separated bike lanes on the south side of Princeton Street and on the east side of OBT. On-street parking was added in some locations along Princeton Street and OBT.
- The narrower street section, Complete Street features, roundabout, on-street parking, and additional landscaping along Princeton Street embody the speed management principles of engagement, enclosure, and deflection and support the use of lower posted speeds, which were lowered for the majority of the corridor from 40 mph to 25 and 30 mph. Posted speeds between John Young Parkway and the roundabout at Texas Avenue were lowered from 45 mph to 35 mph.



Princeton Street at directional median opening at Diversified Way.



Princeton Street at Texas Avenue roundabout.

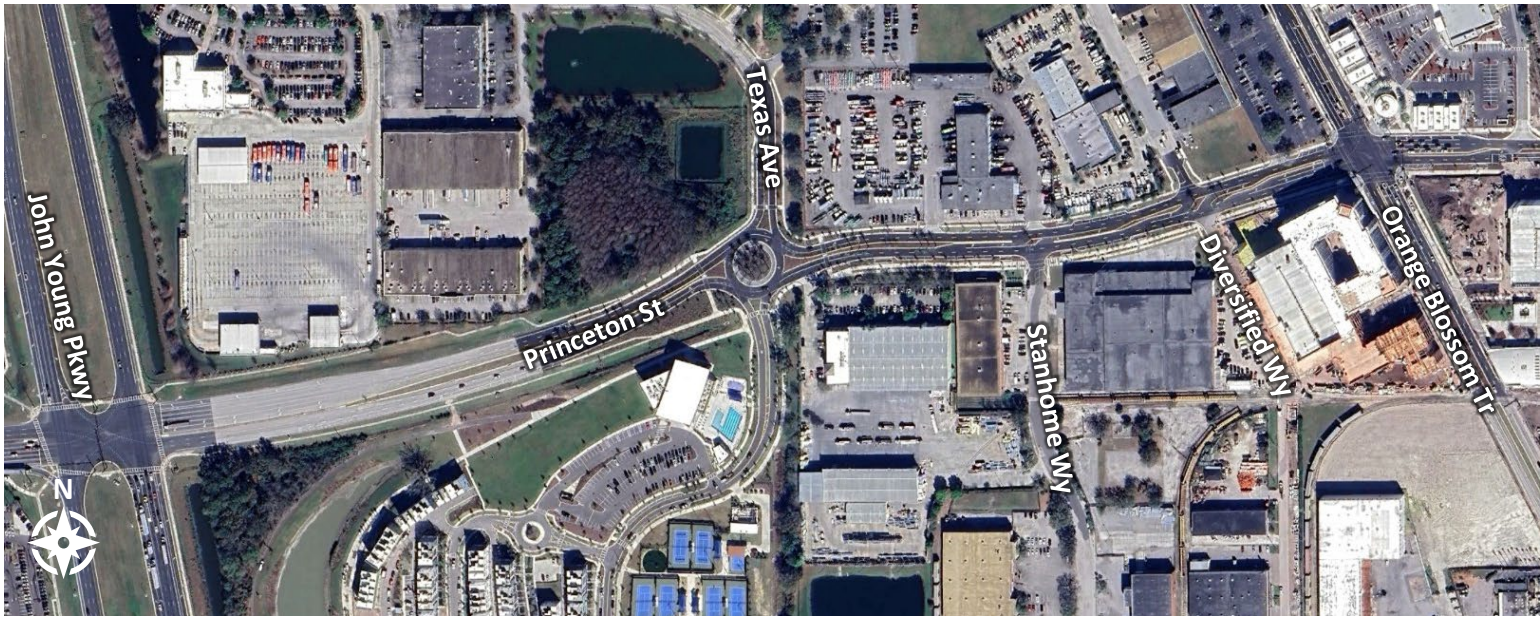


# SR 438 (Princeton Street) CAMP (continued)

## Before



## After

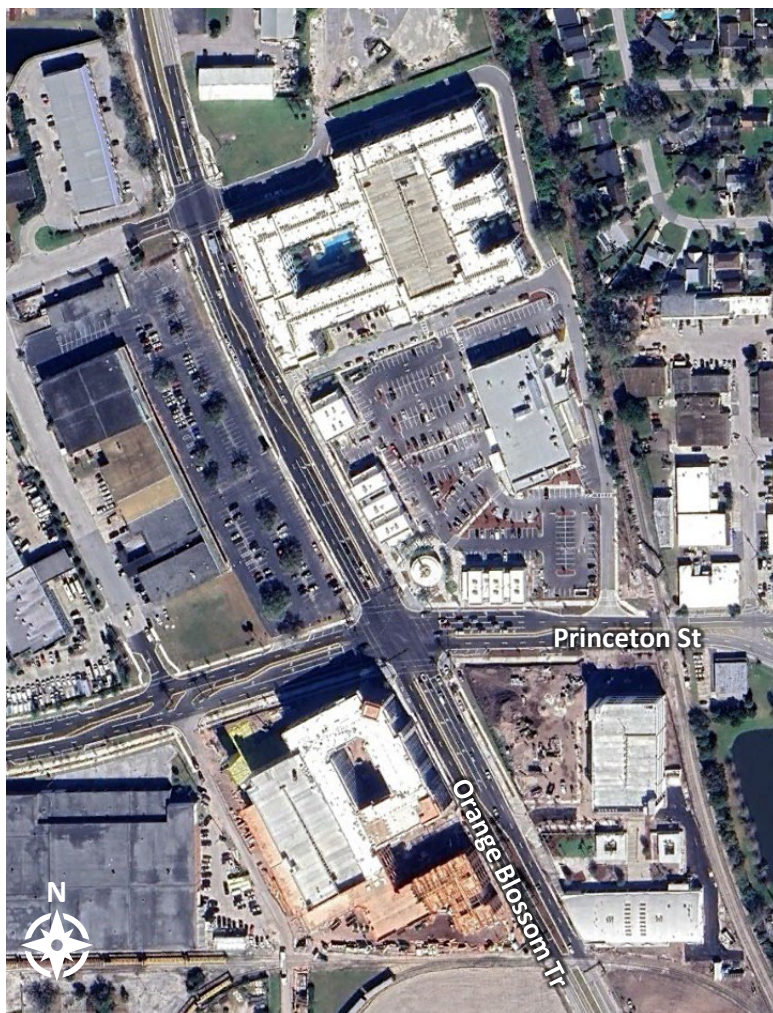
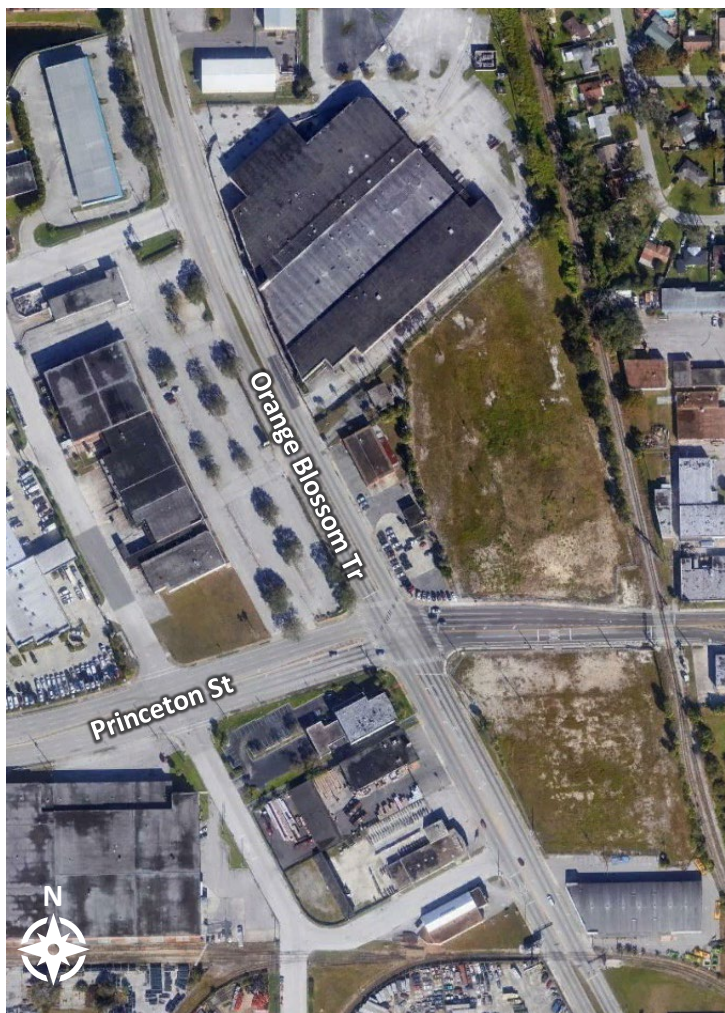


### Characteristics

	Before	After	Measures of Effectiveness
Number of Lanes	6	4	• Vehicular LOS
Access Class	3	3	• Vehicular Delay
Context Class	C4	C4	• Reduction in Crashes
Posted Speed	40/45	25/30/35	• Posted Speed
			• Multimodal Enhancements (qualitative assessment)

Before

After



## CAMP Elements Included in Case Study

### Steps Undertaken

- ✓ Corridor Definition
- ✓ Data Collection
- ✓ Crash & Safety Analysis
- ✓ Existing Safety Analysis
- ✓ Observations & Issues / Road Safety Audit
- ✓ Future Safety Analysis
- ✓ Traffic Operations Analysis
- ✓ Existing Conditions Analysis
- ✓ Traffic Forecast & Analysis Methodology
- ✓ Projected Future No Build Traffic Volumes
- ✓ Future Conditions Analysis
- ✓ Development of Access Alternatives
- ✓ Evaluation of Alternatives
- ✓ Recommended CAMP

## SR 820 (Hollywood/Pines Boulevard) CAMP

### Key Strategies and Features

- ✓ Reconfigure or Relocate Median Openings
- ✓ Address Substandard Median Opening Spacing
- ✓ Provide Property Access via Side Streets
- ✓ Incorporate Auxiliary and Turn Lanes
- ✓ Change Traffic Control
- ✓ Provide Multimodal Crossing Opportunities
- ✓ Provide Multimodal Facilities & Connections
- ✓ Install Medians in Place of Two-Way Left-turn Lanes

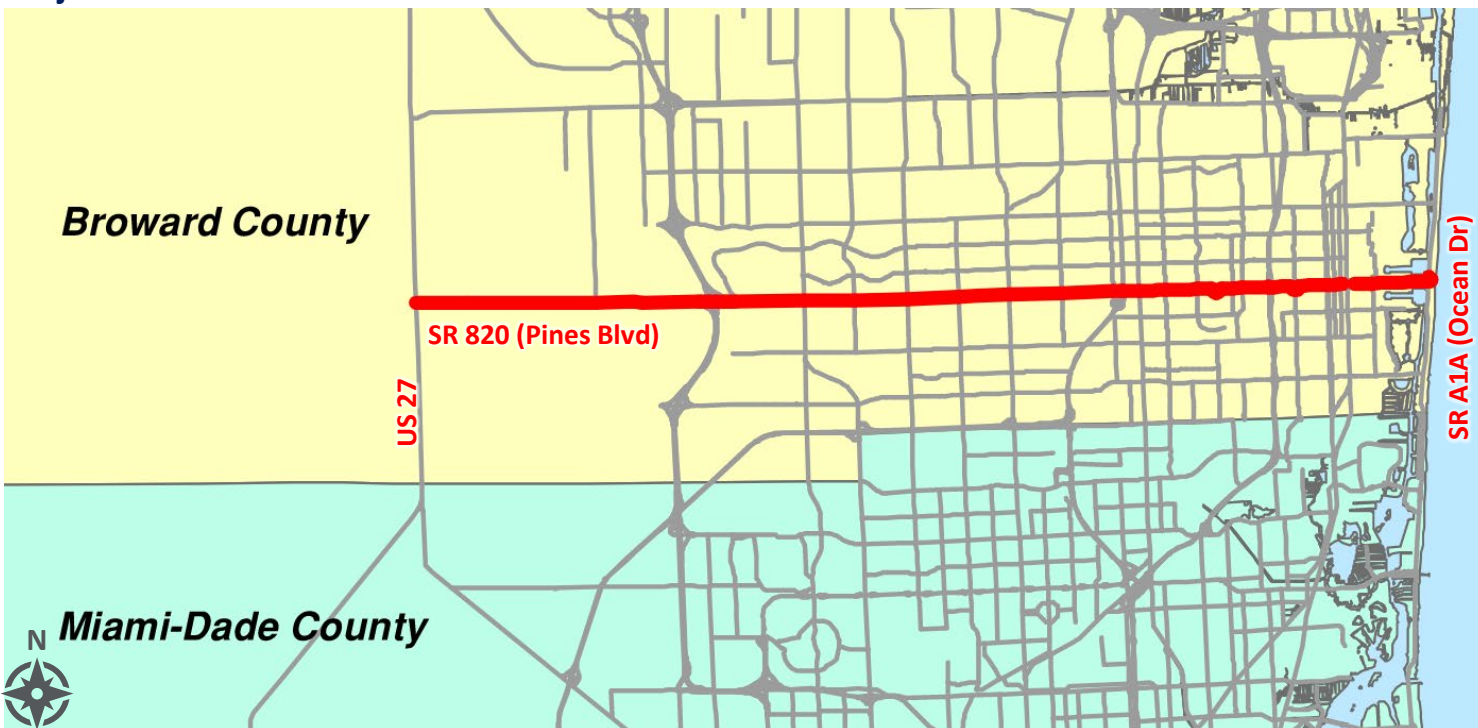
### Setting

**Description** Broward MPO Transportation Planning Department conducted a proactive study on SR 820 (Hollywood/Pines Boulevard) from US 27 to SR A1A (Ocean Drive). The Hollywood/Pines Boulevard Multimodal Corridor Study was prepared in 2004 to improve transportation conditions for four primary modes of travel (pedestrian, bicycle, transit, and roadway). The study created a mobility vision and recommended strategies including filling in gaps in the sidewalk network, providing a continuous bicycle trail, developing infrastructure at multimodal hubs (key transfer locations) for enhanced integration of transit, other alternative travel modes into the transportation network, and more.

**Location** SR 820 (Hollywood/Pines Boulevard) from US 27 to SR A1A (Ocean Drive) in Pembroke Pines and Hollywood, FL.

**Length** 19.7 mi

### Project Limits







## Study Findings & Plan Details

- The study findings were organized by mode:
  - **Pedestrian:** sections of discontinuous sidewalks were identified, particularly near US 27 and I-75, but sidewalk coverage was generally good. Pedestrian LOS was D or worse for 50% of the facility.
  - **Bicycle:** no bicycle lanes were provided on the corridor. Bicycle LOS ranged from D to F.
  - **Transit:** bus travel time on the corridor was 76% higher than automobile travel time because of frequent stops. Many of the transit stops were not ADA accessible, with furniture blocking sidewalks or no sidewalk connections to the curb. Most stops did not have shelters.
  - **Roadway:** Intersection levels of service of E or F were measured at a number of intersections. Vehicle crashes were elevated between 64th Avenue and 28th Avenue and near US 27.
  - **Access Management:** 60 of the 83 median openings on the corridor were noncompliant with FDOT access spacing standards
- A number of strategy recommendations were made along the corridor in addition to several targeted recommendations. A table of the strategies recommended is included below. Specific strategies included:
  - **Pedestrian:** construct sidewalks to fill gaps near the I-75 interchange, between 96th Avenue and 91st Street. Improve school zone crossing near McArthur High School. Enhance street lighting from Dixie Highway to 28<sup>th</sup> Avenue.

- **Bicycle:** Construct a multipurpose path from US 27 to 155th Avenue and bicycle lanes from 155th Avenue to 83rd Avenue, 64th Way to US 441, and on perpendicular routes.
- **Transit:** Install benches, trash receptacles, shelters at strategic locations, provide ADA accessible bus stops at all locations, and convert stops to far-side stops.
- **Roadway:** Improve intersections at US 27, 155th Avenue, Hiatus Road, Palm Avenue, Park Road, and 118th Street.
- **Access Management:** Four access management improvements were developed as part of the study:
  - Convert the full median opening at SW 63rd Terrace to a westbound directional median opening.
  - Remove the N/S 62nd Avenue traffic signal and close the median opening.
  - Convert the full median opening at North 61st Avenue to an eastbound directional median opening.
  - Add a raised median along Hollywood Boulevard from US 441 to Presidential Circle and conduct an access management study to determine locations for median openings.



Hollywood Boulevard at 24<sup>th</sup> Avenue with new median, bike lane, pedestrian crossing, and enhanced lighting.

Pedestrian	Bicycle	Transit	Multimodal	Roadway
Construct Missing Sidewalk Links	Bicycle Paths	Provide More Frequent Service	Multimodal Hubs	Construct Through Travel Lanes
Provide Intersecting Pedestrian Connections	Bicycle Lanes	Provide Express Bus Service	Transportation Demand Management	Construct Turn Lane Improvements
Provide Enhanced Connections to Transit Stops	Paved Shoulders	Consolidate Bus Stops	Transit-Oriented Development	Construct Turbo Lanes
Install Mid-Block Pedestrian Signals	Wide Curb Lanes	Expand Community Bus Shuttles	Bus Schedule Coordination	Construct HOV Lanes
Upgrade Lighting Features	Enhanced Bicycle Signage	Far Side Bus Bays	Park-n-Ride Lots	Optimize Signal Timing
	Enhanced Connections to Transit Stops	Near Side Queue Jumpers	Information Kiosks	Reduce Signal Cycle Lengths
	Greater Continuity for Bicyclists	Modify Bus Stop Infrastructure to Meet ADA Requirements		Roundabouts
	Enhanced Bicycle Infrastructure	Provide Benches at all Bus Stops		Florida "T" Intersections
		Provide Shelters at Bus Stops with Significant Passenger Activity		Signing and Marking Enhancements
		Implement Lighting Improvements		Frontage Road Networks
		Develop Transit Marketing Techniques		Far Side Bus Bays
		Implement ITS Improvements		Traffic Calming Techniques
				Access Management Strategies

Strategies proposed for corridor improvements.



# SR 820 (Hollywood/Pines Boulevard) CAMP (continued)

## Before



## After



## Characteristics

	Before	After	Measures of Effectiveness
Number of Lanes	7	6	<ul style="list-style-type: none"> <li>95% Confidence Level Crash Rate</li> </ul>
Access Class	3/5/6	3/5/6	<ul style="list-style-type: none"> <li>LOS (Multimodal)</li> </ul>
Context Class	C3C/C4	C3C/C4	<ul style="list-style-type: none"> <li>Person Throughput</li> </ul>
Posted Speed	45/35	45/35	<ul style="list-style-type: none"> <li>Pedestrian and Bicycle Facility Coverage</li> <li>Deviation from Access Management Classification Standards</li> </ul>

**Before**

**After**



**CAMP Elements Included in Case Study**

- ✓ Corridor Definition
- ✓ Data Collection
- ✓ Crash & Safety Analysis
  - Existing Safety Analysis
- ✓ Observations & Issues / Road Safety Audit
  - Future Safety Analysis
- ✓ Traffic Operations Analysis
  - Existing Conditions Analysis
  - Traffic Forecast & Analysis Methodology
  - Projected Future No Build Traffic Volumes
- ✓ Future Conditions Analysis
- ✓ Development of Access Alternatives
- ✓ Evaluation of Alternatives
- ✓ Recommended CAMP

## US 1 CAMP

### Key Strategies and Features

- ✓ Reconfigure or Relocate Median Openings
- ✓ Address Substandard Median Opening Spacing
- ✓ Incorporate Auxiliary and Turn Lanes
- ✓ Change Traffic Control
- ✓ Install Medians in Place of Two-Way Left-turn Lanes

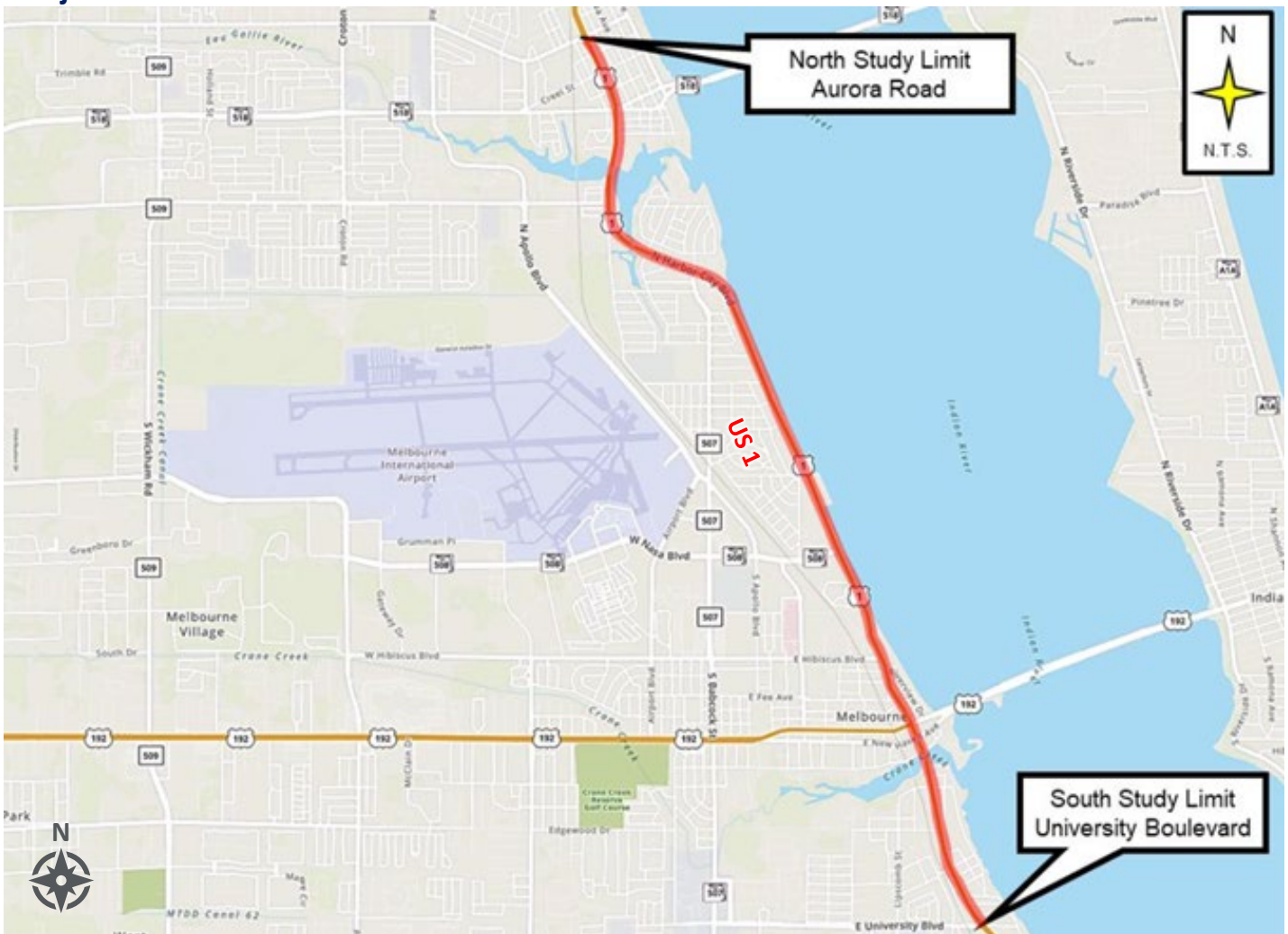
### Setting

**Description** FDOT commissioned a CAMP for US 1 in 2021 to study the seven-lane segment through Melbourne/Brevard County. Existing traffic conditions and crash history were analyzed, and the study recommended conversion of the existing continuous two-way left-turn lane to a raised 16.8-foot median with auxiliary 10-foot left-turn lanes at directional or full median openings. The study found these improvements would reduce crashes substantially and have an undiscounted crash benefit-cost ratio of 7.0:1 and a net present value of over \$34 million. Because this study is relatively recent, the improvements have not yet been constructed.

**Location** US 1 from University Boulevard to Aurora Road in Melbourne, FL.

**Length** 11.56 mi

### Project Limits





## Study Findings & Plan Details

- US 1 is a north/south arterial that extends through Brevard County from the Indian River/Brevard County line, through Melbourne, to the Brevard/Volusia County line. US 1 is a seven-lane divided roadway with a center two-way left-turn lane, curb and gutter, and no paved shoulders. Traffic volumes on the corridor ranged from 37,000 AADT on the south end of the corridor to 55,000 AADT in the central portion of the corridor. This traffic volume did not lend itself to lane repurposing on the corridor.
- From 2013 to 2019, there were a total of 2,487 crashes along the study corridor. 18 of the crashes resulted in a death and 731 of the crashes resulted in an injury. The most common crash types were rear-end, sideswipe, and angle crashes. The fatal crash types were bicycle (5), off-road (5), pedestrian (4), head-on (2), and left-turn (2).
- If access management improvements are constructed, many of the left-turn and angle collisions at the unsignalized intersections and driveways should be reduced/eliminated.
- Turning volumes at unsignalized locations along the study corridor were low. Queues in the TWLTL were minimal to moderate (usually two left-turns) during the peak hour observations. Occasional friction was observed when drivers in opposing directions entered the TWLTL simultaneously and in advance of where they intended to turn (accessed the TWLTL prematurely).
- Pedestrians generally were observed to cross at traffic signals in compliance with pedestrian indications. Some pedestrians were observed crossing midblock at various locations throughout the corridor; although patterns and well-defined paths were not apparent. Most midblock pedestrians crossed when a gap was available in one direction of traffic and continued to walk within the TWLTL until a gap became available in the opposing direction.
- The proposed locations for directional and full median openings were identified for the corridor based on the operational and safety evaluations of the corridor while taking into consideration existing turning movement volumes and side street connectivity. Roadway access, crashes, left-turn volumes, U-turn opportunities, and types of vehicles to utilize the intersections/businesses were all considered when reviewing each location. Twelve full access openings were identified at traffic signals, and 20 directional median openings were identified.
- The proposed typical section shows the conversion of the existing 11-foot two-way left-turn lane to a 16.8-foot maximum-width median with 10-foot auxiliary left-turn lanes, and the narrowing of the existing inside two lanes to 10 feet wide, with the outside lanes varying from 10 feet to 11 feet wide depending on the existing roadway width.
- Per the installation of a raised median along the study corridor, the US 1 study section should be reclassified to an access class 5 roadway. Per FAC 14-97, the full median opening spacing standard for an access class 5 facility with a posted speed of 45 mph or less is 1,320 feet and the spacing standard for directional median openings is 660 feet.



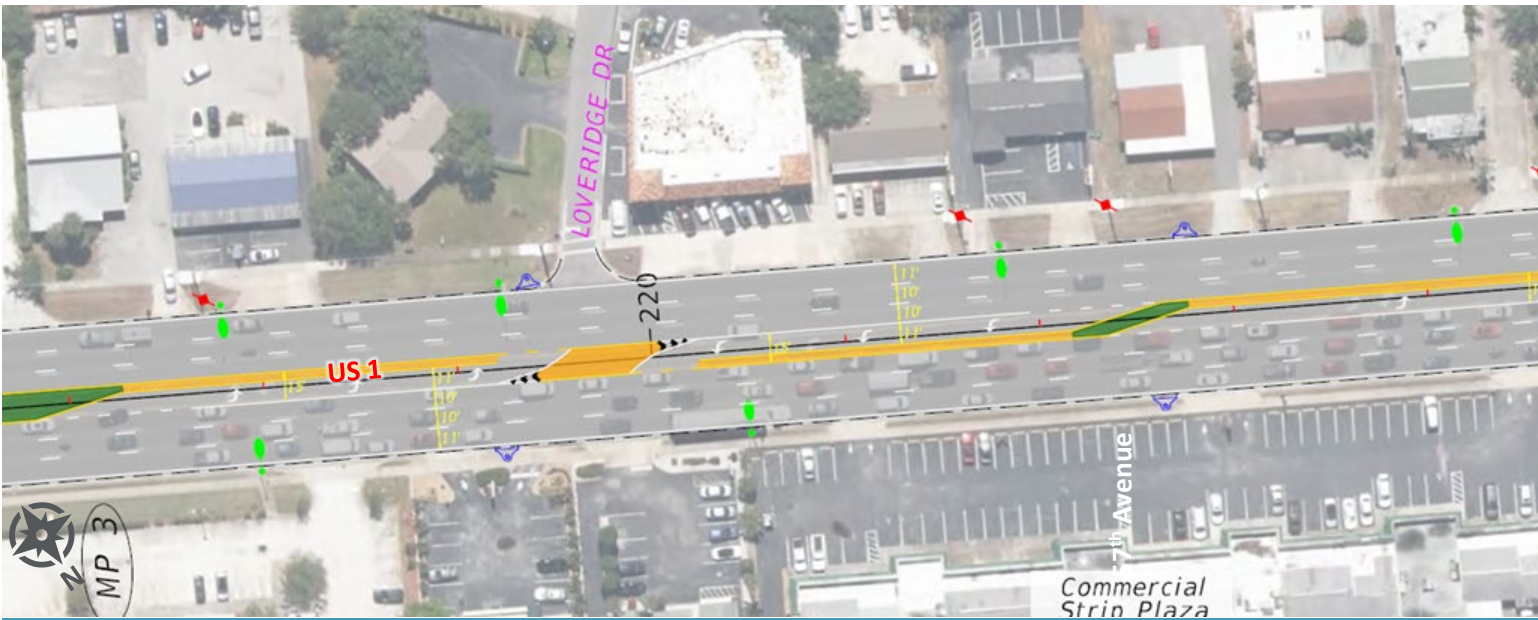
Current US 1 Cross-section in central portion of the corridor.

**US 1 CAMP (continued)**

**Before**



**After**

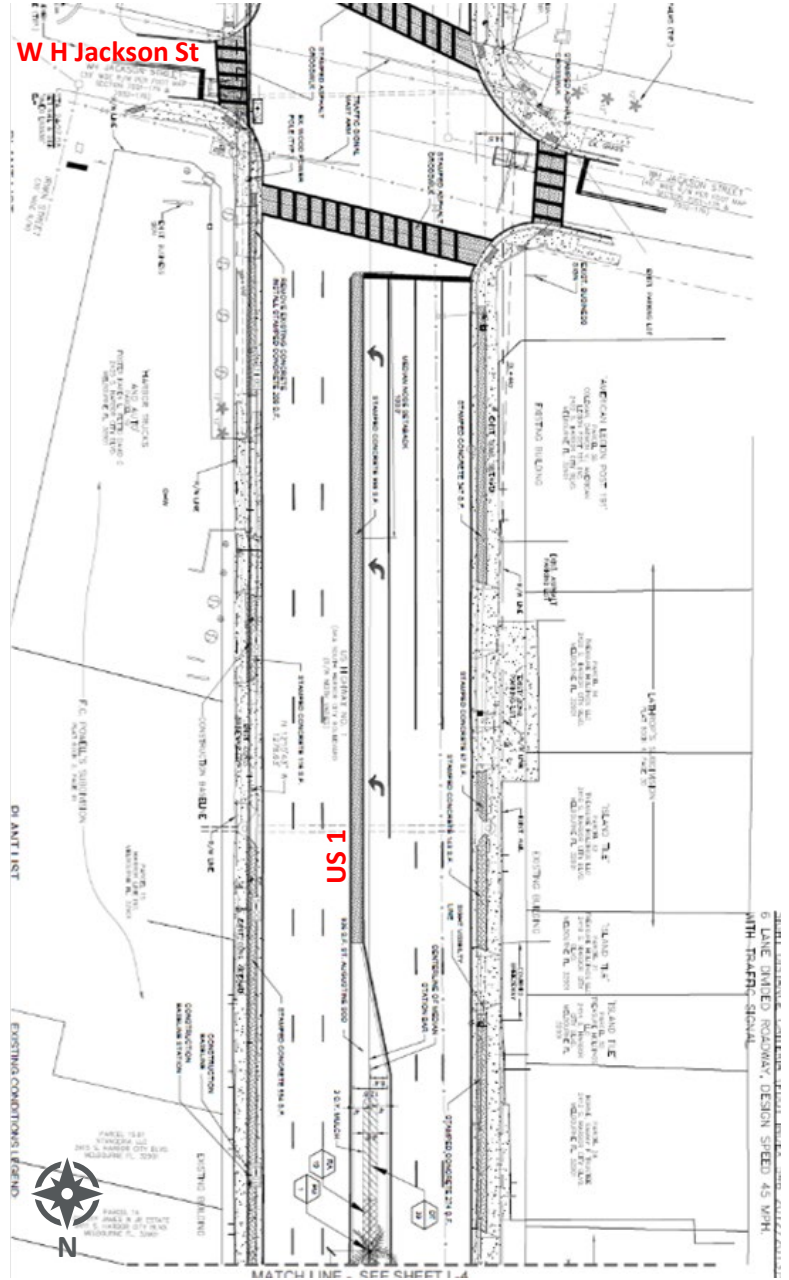


**Characteristics**

	Before	After	Measures of Effectiveness
Number of Lanes	7	6	• Reduction in Crashes
Access Class	6	5	• Crash Benefit-to-Cost Ratio
Context Class	C3C/C4	C3C/C4	• Compliance with FDOT requirements
Posted Speed	35/40/45	35/40/45	• Vehicular LOS
			• Vehicular Delay

Before

After



**CAMP Elements Included in Case Study**

- ✓ Corridor Definition
- ✓ Data Collection
- ✓ Crash & Safety Analysis
- ✓ Existing Safety Analysis
- ✓ Observations & Issues / Road Safety Audit
- ✓ Future Safety Analysis

- Traffic Operations Analysis
- Existing Conditions Analysis
- Traffic Forecast & Analysis Methodology
- Projected Future No Build Traffic Volumes
- Future Conditions Analysis
- ✓ Development of Access Alternatives
- ✓ Evaluation of Alternatives
- ✓ Recommended CAMP

## SR 44 (Dixie Avenue) CAMP

### Key Strategies and Features

- ✓ Provide Multimodal Crossing Opportunities
- ✓ Install Medians in Place of Two-Way Left-turn Lanes

### Setting

**Description** The city of Leesburg requested a feasibility study to assess the viability of Complete Streets and traffic calming enhancements along SR 44 (Dixie Avenue) to reduce conflict points, improve vehicular safety, reduce travel speeds, establish pedestrian refuge areas, and visually improve the corridor. The concept plan included narrower travel lanes and a series of landscaped medians and median islands, although the purpose of the medians and islands was less to manage corridor access and more to introduce enclosure for speed management. The improvements were incorporated into an FDOT Resurfacing, Restoration, and Rehabilitation (RRR) project for the corridor.

**Location** US 27 (14<sup>th</sup> Street) to US 441, Leesburg, FL

**Length** 2.2 mi

### Project Limits

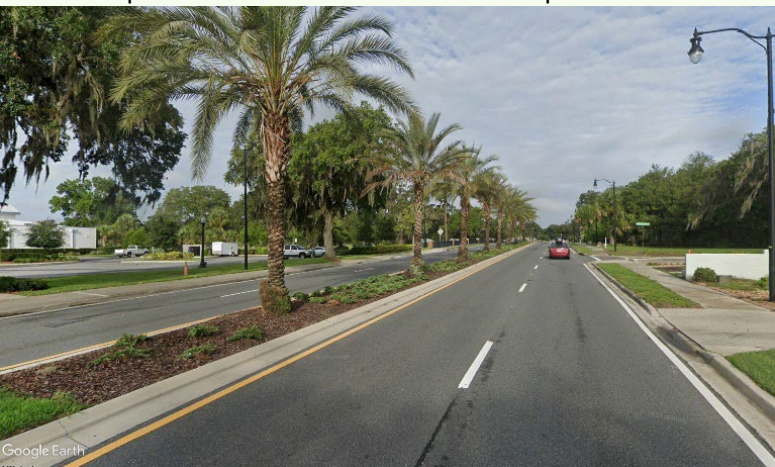






## Study Findings & Plan Details

- This section of Dixie Avenue is heavily used by local and through traffic and serves as the truck bypass route around downtown Leesburg, with truck traffic accounting for more than 10% of the total traffic volume. However, the corridor also contains two significant and unique areas, including the city's signature park, Venetian Gardens, and a medical services area that includes the Leesburg Regional Medical Center.
- Speeding was a significant issue, with 35% of traffic on the western portion of the corridor traveling 5 mph or more above the posted 35-mph speed limit, and 62% traveling 5 mph or more above the 40-mph posted speed limit on the eastern portion of the corridor. The high speeds were a concern relative to the safety of pedestrians crossing to Venetian Gardens, the community pool, and the Pat Thomas baseball stadium, as well as for the high proportion of elderly visitors to the medical services area.
- Numerous typical section alternatives were evaluated, including an option with bike lanes; however, the preferred typical section included narrower lanes and a 14-foot center turn lane and medians/median islands. The width of the median allowed for incorporation of street trees to help enhance the enclosure effect to encourage slower speeds.
- A walking audit was completed with key stakeholders to gain insight into issues and help develop ideas for improvements.
- A limited traffic analysis was conducted for the SR 44 intersection at US 441 to justify a proposed restriping concept for the eastbound SR 44 approach to facilitate improved lane utilization and traffic operations.
- The islands and medians were configured to complement the city's existing street network and optimize traffic circulation patterns, but also limit the need for traffic to make U-turns (which are physically difficult on this corridor).
- Existing side street access was left largely unchanged, with only four minor streets experiencing additional access restrictions due to the new median. In each of those cases, redundant access was available via other city streets.
- Islands were generally placed to avoid access restrictions where possible and to provide a minimum of 50 feet of left-turn storage. Island placement also considered potential future access to undeveloped parcels along the corridor.
- All locations where access would be median-restricted were verified to have redundant driveway access or access via simple circulation on the city's street network.
- The recommendations from the study were developed collaboratively with the city, MPO, and FDOT, and successfully incorporated into the FDOT RRR design.
- Landscaping was completed as a separate stand-alone project by the city; however, the RRR design incorporated the placement of landscape irrigation sleeves to facilitate maintenance of the landscaping once installed by the city.



*Dixie Avenue adjacent to Venetian Gardens.*



*Dixie Avenue south of Main Street..*

**SR 44 (Dixie Avenue) (continued)**

**Before**



**After**



**Characteristics**

	Before	After	Measures of Effectiveness
Number of Lanes	5	4/5	<ul style="list-style-type: none"> <li>• Vehicular LOS &amp; Delay</li> <li>• Multimodal Enhancements (qualitative assessment)</li> <li>• Minimizing Access Restrictions and potential for U-turns (quantitative assessment)</li> </ul>
Access Class	4/6	4/5	
Context Class	C4	C4	
Posted Speed	35/40	35/40	

Before

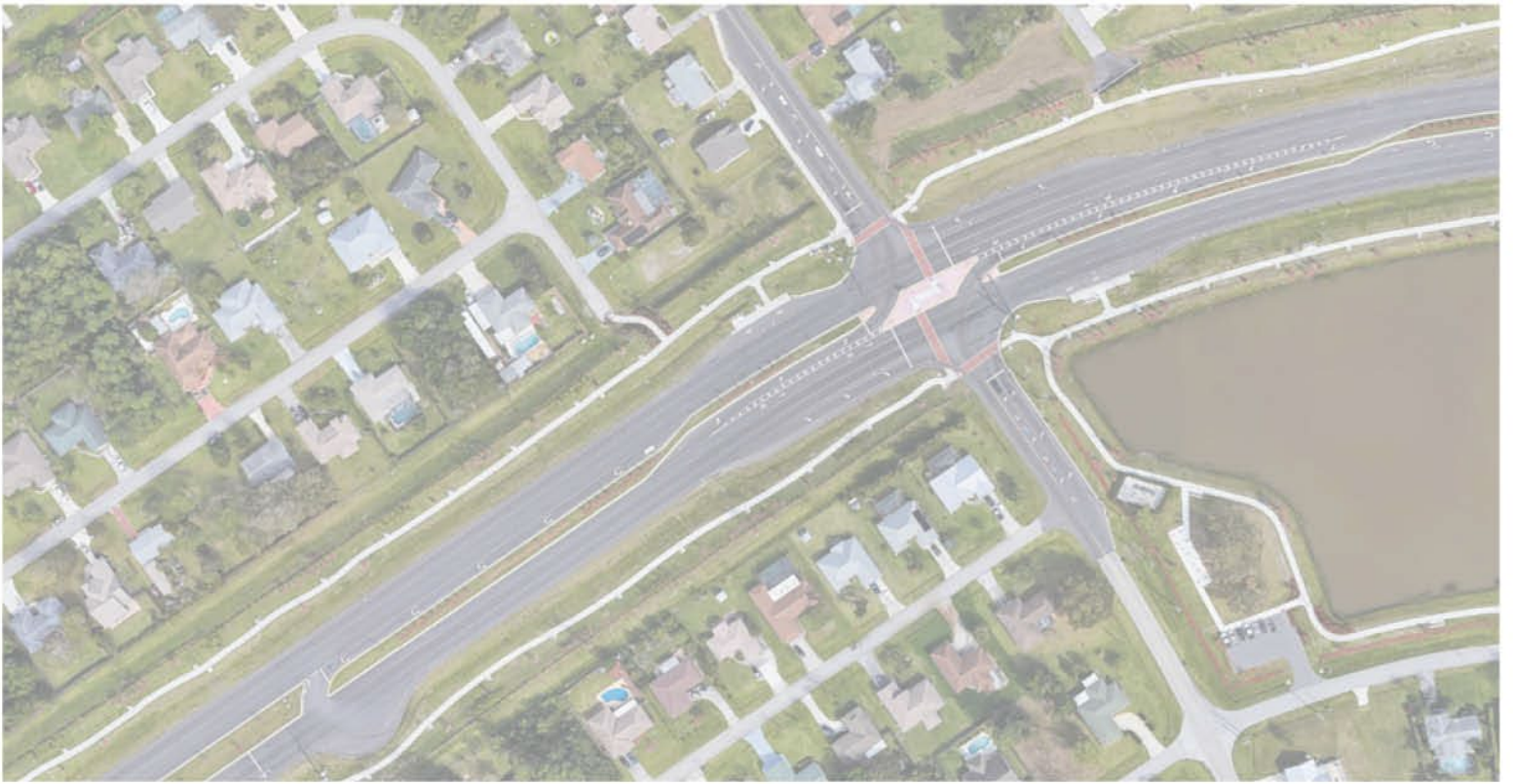


After



 CAMP Elements Included in Case Study

- ✓ Corridor Definition
- ✓ Data Collection
- ✓ Crash & Safety Analysis
- ✓ Existing Safety Analysis
- ✓ Observations & Issues / Road Safety Audit
- ✓ Future Safety Analysis
- ✓ Traffic Operations Analysis
- Existing Conditions Analysis
- Traffic Forecast & Analysis Methodology
- Projected Future No Build Traffic Volumes
- Future Conditions Analysis
- ✓ Development of Access Alternatives
- ✓ Evaluation of Alternatives
- ✓ Recommended CAMP



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