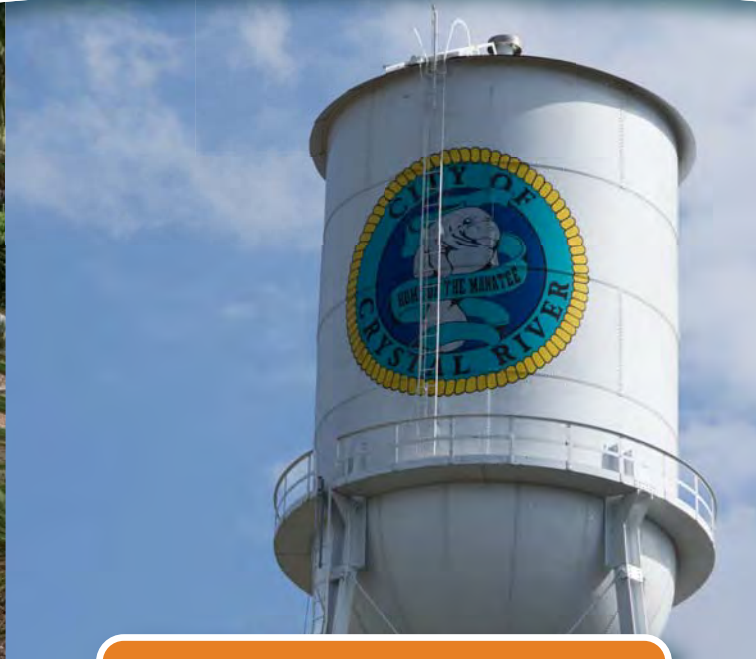




# CONGESTION MANAGEMENT PROCESS

CRYSTAL RIVER - CONGESTION MANAGEMENT STUDY



MAY 2017

# HERNANDO/CITRUS MPO

## CRYSTAL RIVER CONGESTION MANAGEMENT STUDY

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# INTRODUCTION

The Crystal River Congestion Management Study was completed as part of the Hernando/Citrus MPOs ongoing Congestion Management Process which provides assistance to local governments in identifying issues and mobility improvements. The Crystal River Congestion Management Plan was undertaken to address concerns that the City of Crystal River had previously identified to the MPO. These concerns were grouped together into four issue areas:

## Trails

The Crosstown Trail lacks defined connectivity to the downtown and proposed Riverwalk area.



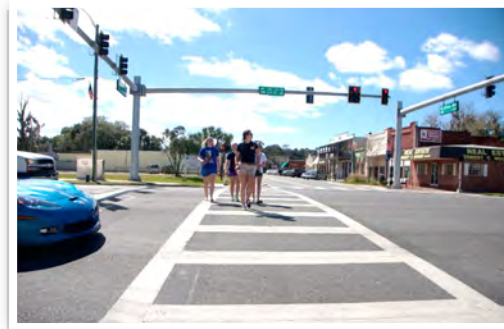
## US 19

The design and travel volumes on US 19 limits connectivity between the north and south in downtown Crystal River.



## Citrus Avenue

Citrus Avenue has developed as the City's "Main Street" however significant regional travel and truck usage impact the quality of the corridor.



## Crystal River Middle School

As with many schools, there are concerns with conflicts between local and school traffic, especially during afternoon pickup.

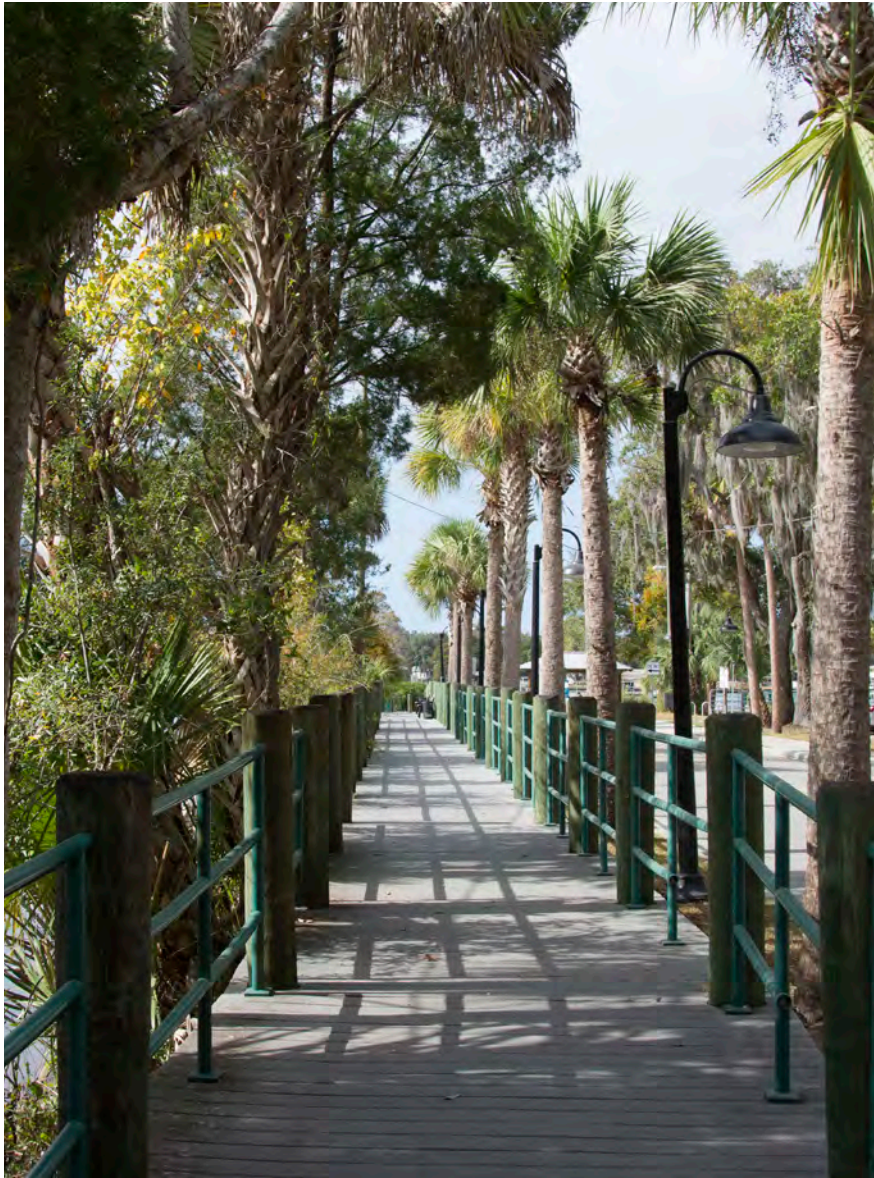


It is the purpose of the Crystal River Congestion Management Study to identify the key issues and concerns associated with mobility concerns identified above. This plan explores these issues, identifies feasible improvements that can be implemented, and identifies action plan activities where appropriate to support implementation.

# INTRODUCTION

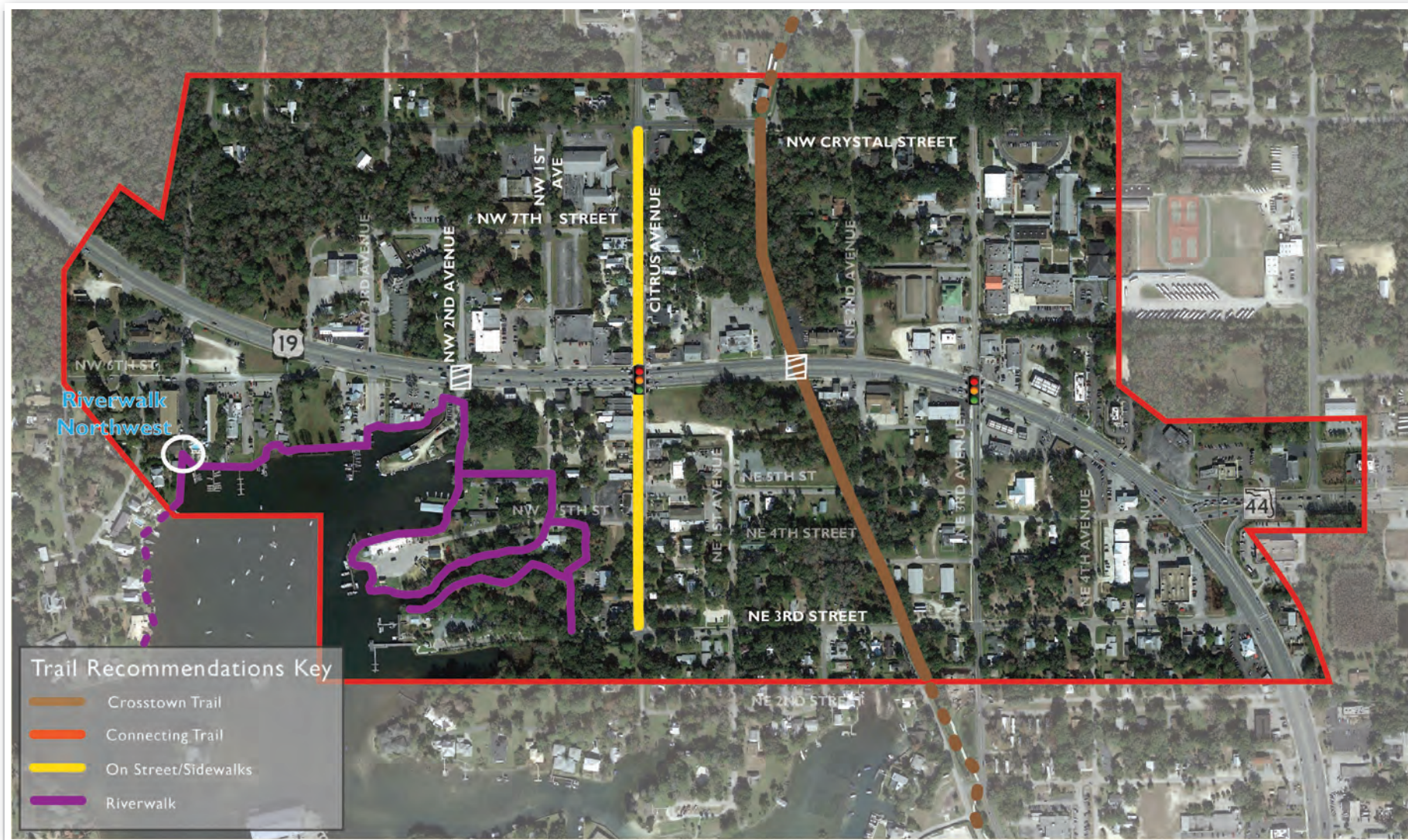


The Crystal River Congestion Management Study evaluated four set of mobility issues in the City



The City of Crystal River attracts residents and visitors that enjoy active lifestyles due to the access to natural resources provided in the city. One of these existing resources is the Crosstown Trail which connects the downtown areas to the Three Sisters Springs south of downtown. The purpose of the trail evaluation had three elements:

- 1) *Connect the trail to the Downtown area, specifically Citrus Avenue.*** Currently the trail and downtown/Citrus Avenue are only informally connected to each other by existing city streets and sidewalk facilities. There is no clear routing or enhanced bicycle/pedestrian facilities to communicate the connectivity of this two community assets.
- 2) *Connect the trail to the proposed Riverwalk on the northern portion of Crystal River.*** The City of Crystal River is working to implement a master plan that would develop a Riverwalk facility that would begin near NW Bay Path Drive, proceed north and then west, and then end near NW 6th Avenue.
- 3) *Connect the northern portion of the trail to other community assets/destinations.*** Currently, the trail ends less than a quarter mile north of US 19 and this northern portion of the trail does not connect to other pedestrian infrastructure nor does the trail connect to a park or other community asset. There are few trail users on this northern part of the trail and very few persons are observed crossing US 19 at the trail crossing.



The evaluation seeks to connect the existing Crosstown Trail to downtown and the future Riverwalk.

# TRAIL CONNECTIONS

## Guiding Principles

The identification and evaluation of potential options to connect the existing Crosstown Trail to downtown and the proposed Riverwalk considered eight major guiding principles summarized below.

### Pleasing Quality

The potential routes should do more than connect the community assets together, the routes themselves should aspire to reflect a quality that is similar to the destinations. In this context, this would typically include corridors that are relatively peaceful with trees and other landscaping, as well as street lighting to promote nighttime usage.

### Constructability (Right of Way)

Sufficient right of way must be available to allow for the construction of appropriate facilities.

### Constructability (Drainage)

Addressing significant drainage issues escalates the cost of pedestrian and bicycle facilities and limit their feasibility of implementation. Selecting routes that avoid significant drainage issues is more cost effective and allows for more bicycle and pedestrian facilities to be constructed or other amenities to be provided.

### Constructability (Other)

Utility conflicts, natural grades, large trees, etc. can also limit the feasibility of implementing bicycle and pedestrian facilities.





## Direct Route

Direct routes are preferred over more circuitous routes. Direct routes are typically shorter reducing costs and are easier for visitors to find their destinations.

## Existing Facilities

The presence of existing facilities such as sidewalks, pathways, and street lighting allow for faster implementation and are often already located on preferred pedestrian/bicycle routes.

## Parking Conflicts

Routing options that place pedestrians and bicyclists directly between parking and the street should be avoided for both safety and constructability reasons.

## Auto Traffic

Routes that have significant vehicle traffic, especially high speed traffic should be avoided when other routes with less traffic are available.



# TRAIL CONNECTIONS

## Alternatives



Multiple Alternatives were identified to connect the Crosstown Trail to Citrus Avenue, Citrus Avenue to the Riverwalk, and the Trail to Citrus Avenue north of US 19.

|                       |     | Direct Route | Constructability |          |       | Auto Traffic | Parking Conflicts | Existing Facilities | Pleasing Quality | Total | Corridor |
|-----------------------|-----|--------------|------------------|----------|-------|--------------|-------------------|---------------------|------------------|-------|----------|
|                       |     |              | ROW              | Drainage | Other |              |                   |                     |                  |       |          |
| NW 3rd Street         | W4  | 3            | 3                | 3        | 3     | 1            | 2                 | 3                   | 2                | 20    | A        |
| City Park             | W3  | 1            | 3                | 2        | 3     | 3            | 3                 | 0                   | 3                | 18    |          |
| NW 5th Street         | W2  | 1            | 1                | 1        | 0     | 2            | 1                 | 0                   | 1                | 7     |          |
| Property              | W1  | 2            | 0                | 0        | 1     | 3            | 3                 | 0                   | 3                | 12    | B        |
| NW 3rd Street         | C4  | 3            | 3                | 3        | 2     | 1            | 2                 | 3                   | 2                | 19    | A        |
| NW 5th Street         | C3  | 1            | 1                | 1        | 1     | 2            | 1                 | 0                   | 1                | 8     |          |
| Coastal Heritage      | C2  | 1            | 0                | 2        | 1     | 3            | 2                 | 0                   | 3                | 12    |          |
| Existing Passage      | C1  | 2            | 3                | 2        | 3     | 3            | 2                 | 3                   | 2                | 20    | B        |
| NE 3rd Street         | E4  | 3            | 3                | 3        | 2     | 1            | 2                 | 3                   | 2                | 19    | A        |
| NE 4th Street         | E3  | 1            | 1                | 0        | 0     | 2            | 2                 | 1                   | 3                | 10    |          |
| NE 5th Street         | E2  | 2            | 3                | 3        | 3     | 2            | 0                 | 2                   | 2                | 17    |          |
| City Property - South | E1B | 2            | 3                | 2        | 2     | 3            | 3                 | 1                   | 2                | 18    | B        |
| City Property - North | E1A | 2            | 3                | 2        | 2     | 2            | 2                 | 0                   | 1                | 14    |          |
| NW 2nd Ave            | N2  | 2            | 3                | 2        | 1     | 2            | 1                 | 0                   | 3                | 14    |          |
| Crystal Street        | N1  | 3            | 3                | 2        | 1     | 2            | 3                 | 2                   | 3                | 19    | C        |

*Eight guiding principles were evaluated for multiple corridor options to identify the most feasible and highest quality connection options.*

### Trail Connection Recommendations

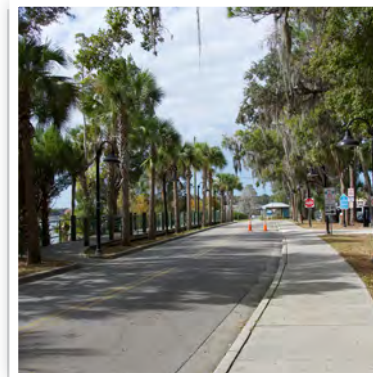
Based on the evaluation of connection options between the Crosstown Trail, Citrus Avenue, and the Riverwalk. Three corridors are recommend as illustrated on Page 10:

**NW 3rd Street:** Expand and enhance existing sidewalk connections leveraging the existing infrastructure. Add bicycle sharrows on the street.

**Trail Corridor:** Improve existing pathway connections west of Citrus Avenue. Construct trail east of Citrus Avenue to the Crosstown Trail. Construct crossing across Citrus Avenue with adequate sight visibility and width.

**NW Crystal Street:** Construct Sidewalk between east of Citrus Avenue to NW 1st Street. Connect sidewalk to NW 2nd Avenue via NW 7th Street and NW 1st Avenue. Add sharrows to streets.

The resulting trail connections will result in a southern connection, central connection, and north connection of the Crosstown Trail, Citrus Avenue, and the proposed Riverwalk.



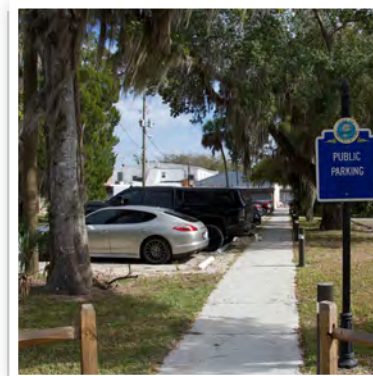
*NW 3rd Street*



*NW 3rd Street*



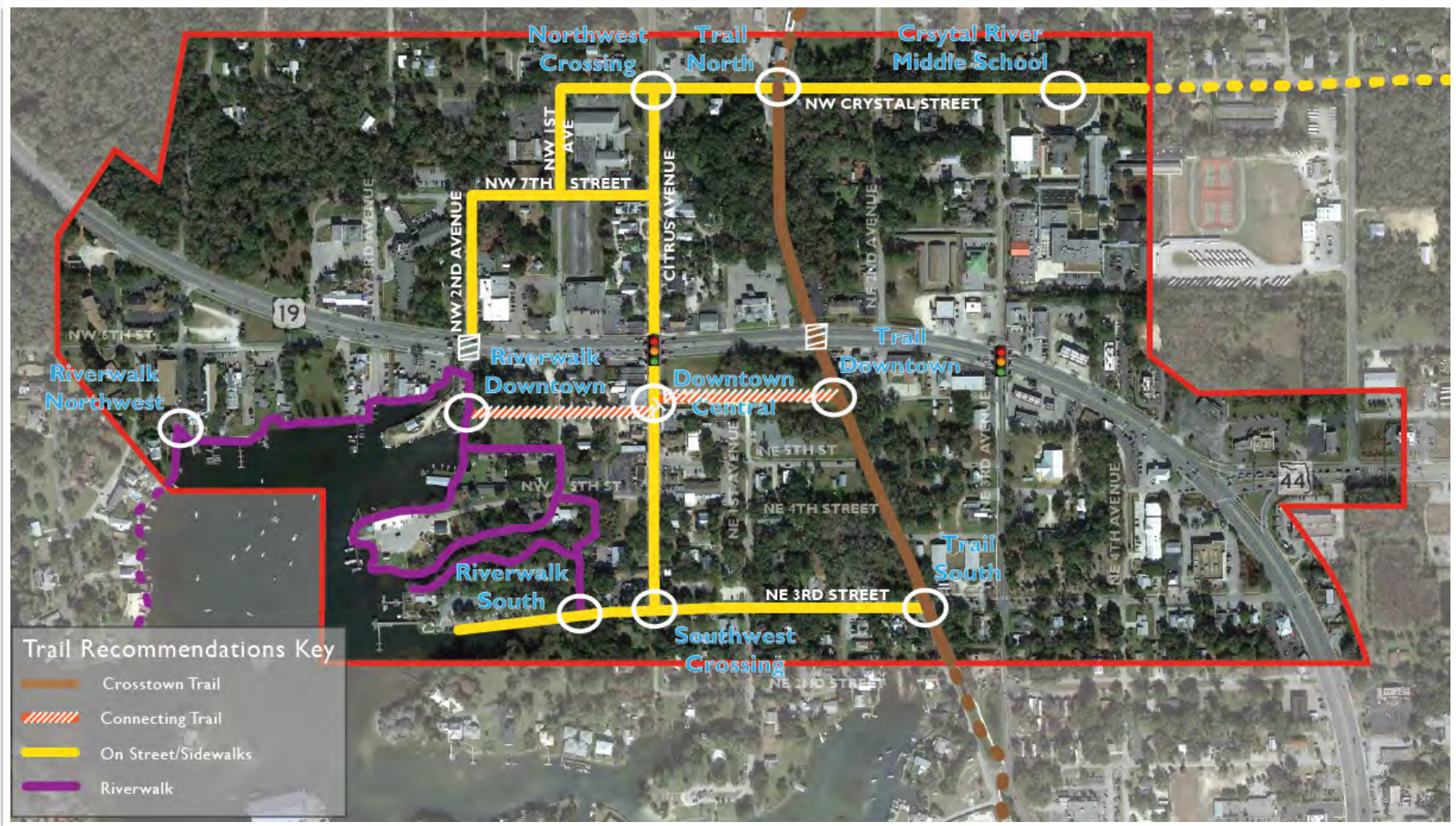
*Trail Corridor West of Citrus Ave.*



*Trail Corridor East of NW 1st Ave.*



*Trail Corridor East of Citrus Ave.*



The recommended trail connectivity options include the use, enhancement, and expansion of existing pedestrian and roadway facilities. The recommendations also include constructing a new trail/pathway just south of US 19 between the Crosstown Trail, Citrus Avenue, and the proposed Riverwalk.

# TRAIL CONNECTIONS

## Wayfinding



The implementation of a wayfinding systems for the bicycle and pedestrian facilities connecting the community assets is critically important. This wayfinding system must be cost effective and consistent with the character of the City of Crystal River. Local residents will typically understand how to navigate the appropriate local streets to reach destinations such as the Crosstown Trail, downtown, and the Riverwalk.

Visitors who are unfamiliar with the area will default to known routes such as the sidewalk along US 19 which significantly diminishes the quality of the experience or will navigate down roadways which may not provide continuous connectivity or appropriate bicycle/pedestrian facilities. Effective wayfinding both identifies the preferred routes and also communicates to visitors that the other destinations are available. The wayfinding examples on this page illustrate signage implemented by other coastal communities in Florida.

## Introduction

US 19 is part of the Florida Strategic Intermodal System (SIS) which is a network of high priority transportation corridors that as a system carries the majority of long distance vehicle travel, especially freight/goods movement. US 19's inclusion on the SIS network adds design limitations which were considered when considering improvements to the corridor. Currently, US 19 is a four lane typical cross section with five foot sidewalks, curb and gutter drainage, paved shoulders, and center turn lanes. One of the priorities of this study was to address concerns relative to the US 19 corridor, which included:

- Safety concerns (especially for bicyclists and pedestrians)
- Aesthetic design elements to improve the character of the downtown area consistent with other improvements in the downtown area
- Signal/Intersection operations at US 19 and Citrus Avenue

The evaluation of the US 19 corridor is described in greater on the following pages.

### *Medians*

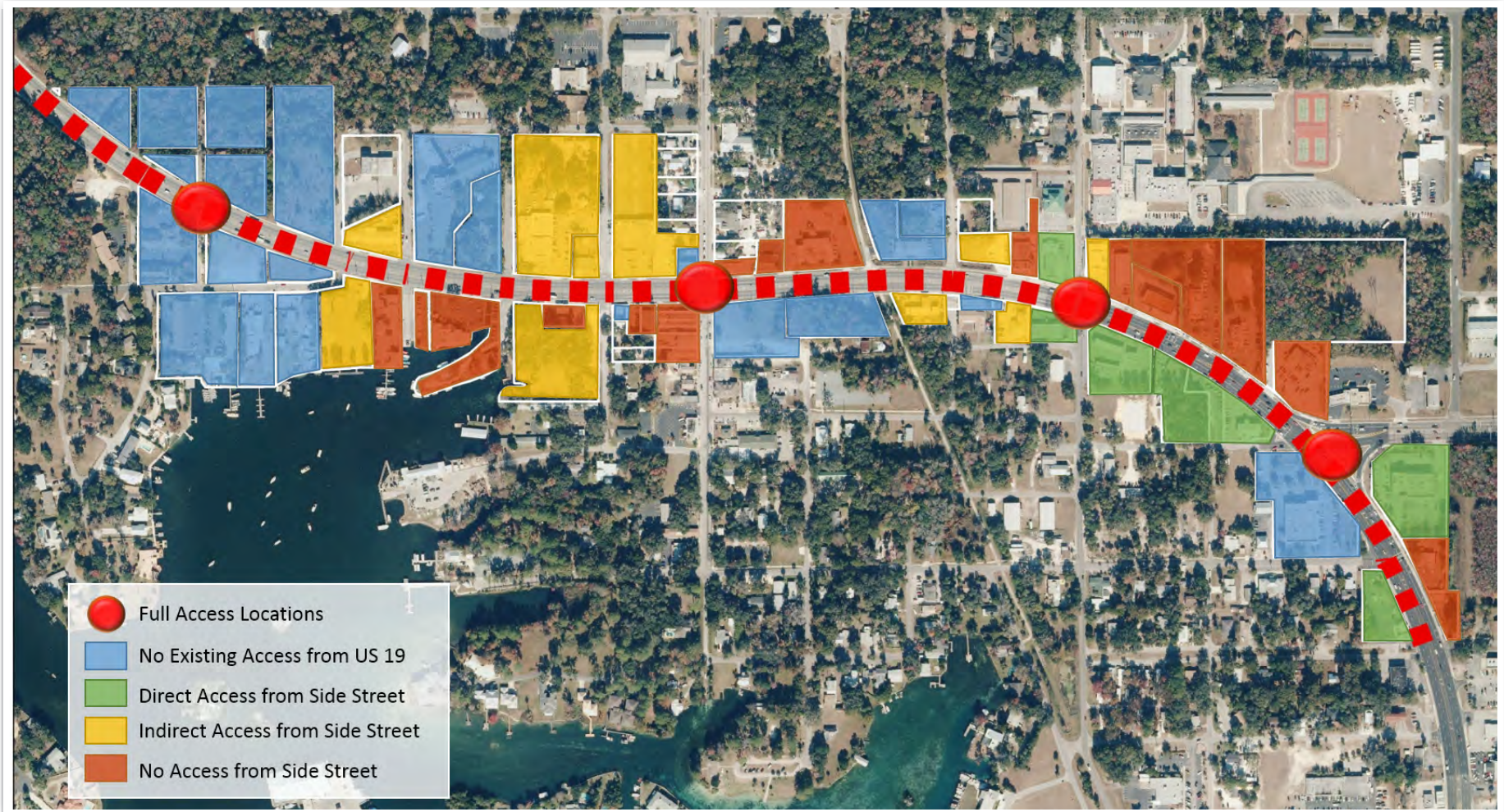
US 19 through the core of downtown Crystal River consists of turn lanes at intersections and two-way left turn lanes between intersections. The lack of physical medians allows for relatively unrestricted turning movements which are unpredictable and generally promotes higher travel speeds (above the posted speed limit) due to the open nature of the roadway. The lack of medians is also unappealing in a downtown context in that they do not accommodate landscaping or hardscaping features common to a downtown area. Finally, the lack of physical medians makes safe pedestrian crossings more challenging at non-signal controlled intersections since they do not provide a safe refuge area for pedestrians to break their crossings into two stages.

### *Bicycle and Pedestrian Safety*

The evaluation of bicycle and pedestrian safety on US 19 focused on the design of facilities to address deficiencies such as the lack of bicycle lanes that meet FDOT standards and the lack of mid-block crossing locations for pedestrians.

### *Intersection Operations*

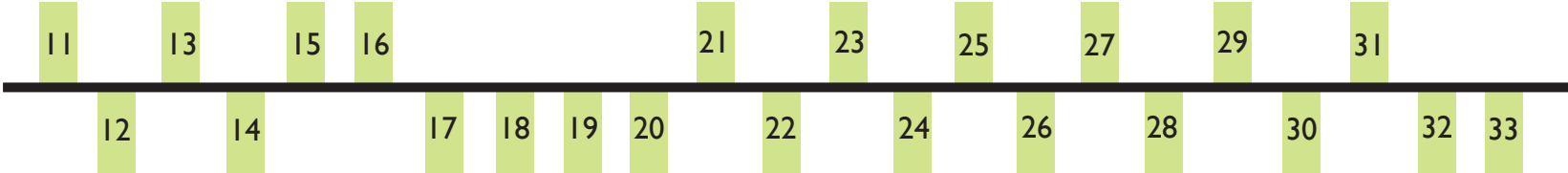
A technical evaluation of the intersection of US 19 at Citrus Avenue was also undertaken to identify potential intersection modifications to improve traffic operations and pedestrian safety/mobility. Recommendations associated with this analysis will be reported in Citrus Avenue section of this report.



*The evaluation of potential median locations considered the access that would be provided to properties along US 19 if access was restricted to connecting side streets only. Most of the properties on the eastside of the study area were dependent on direct access. Most properties in the center and west of the study area had either direct or indirect access to US 19. No properties had access to US 19 to the far westside of the study area.*



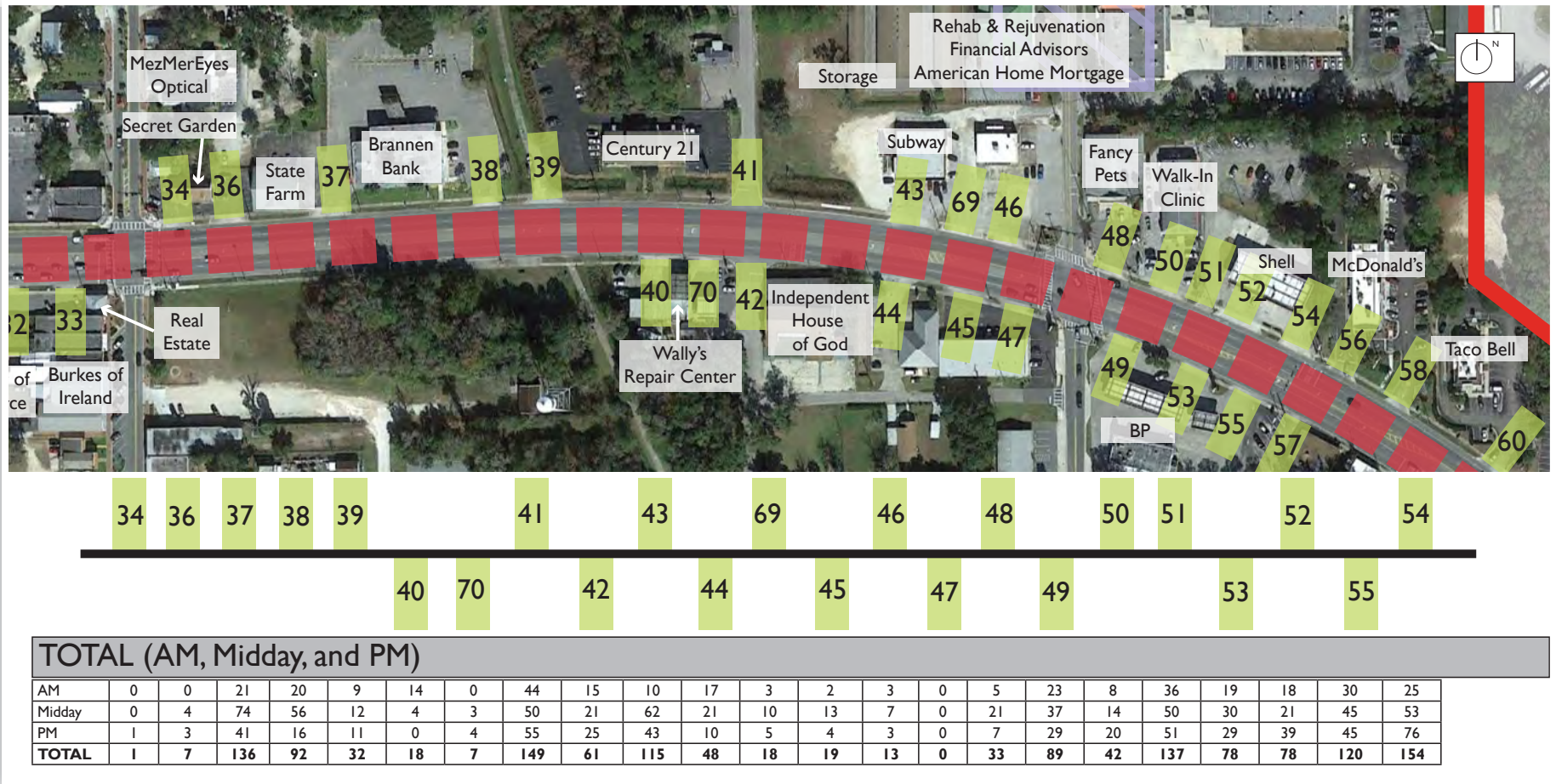
Turning movement counts were conducted at major/signalized intersections to support the technical evaluation of the US 19 corridor.



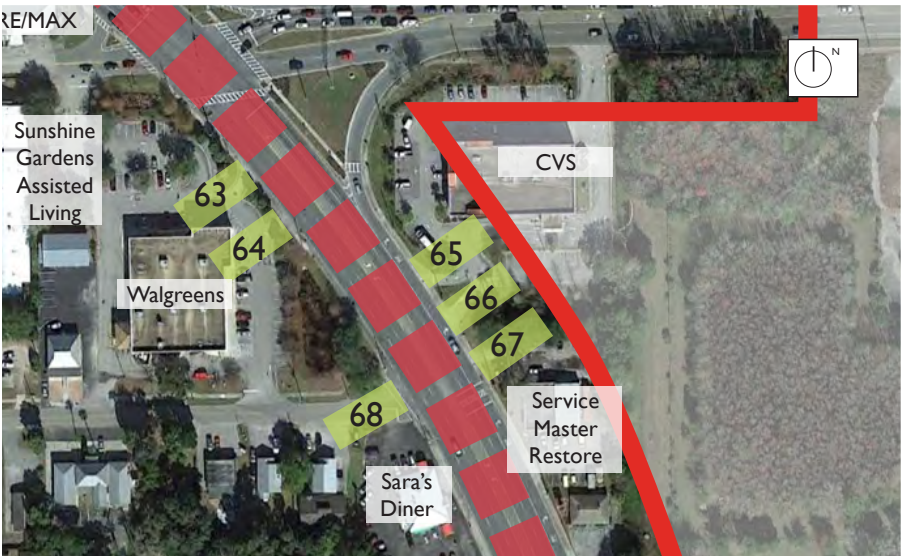
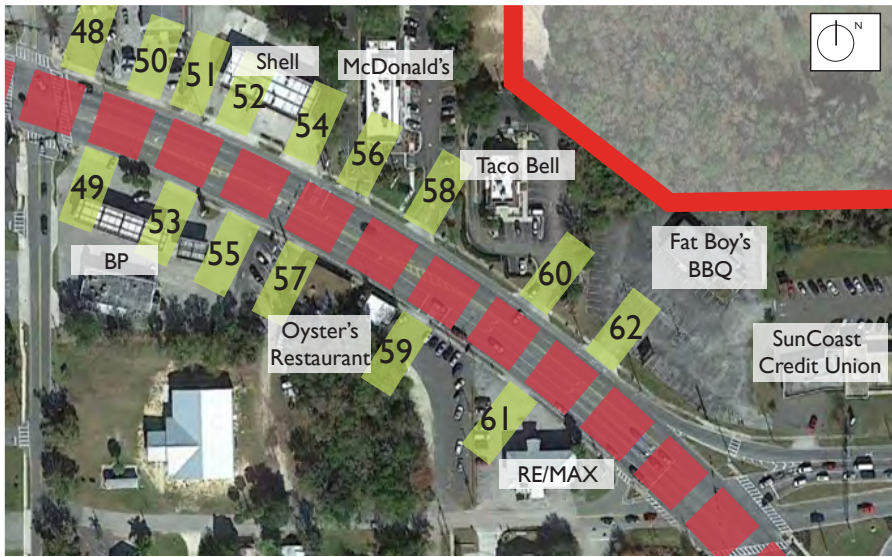
**TOTAL (AM, Midday, and PM)**

|              |           |            |           |            |           |           |           |           |           |           |            |           |           |           |           |           |            |           |          |          |           |          |          |
|--------------|-----------|------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|-----------|-----------|-----------|-----------|-----------|------------|-----------|----------|----------|-----------|----------|----------|
| AM           | 12        | 29         | 6         | 99         | 6         | 1         | 5         | 3         | 5         | 2         | 32         | 13        | 25        | 13        | 7         | 16        | 35         | 20        | 2        | 0        | 3         | 0        | 1        |
| Midday       | 18        | 73         | 5         | 175        | 5         | 4         | 48        | 36        | 35        | 34        | 37         | 10        | 13        | 28        | 3         | 34        | 51         | 33        | 4        | 3        | 18        | 1        | 3        |
| PM           | 14        | 56         | 12        | 191        | 12        | 7         | 7         | 31        | 16        | 35        | 43         | 19        | 10        | 28        | 2         | 35        | 26         | 45        | 3        | 3        | 21        | 1        | 2        |
| <b>TOTAL</b> | <b>44</b> | <b>158</b> | <b>23</b> | <b>465</b> | <b>23</b> | <b>12</b> | <b>60</b> | <b>70</b> | <b>56</b> | <b>71</b> | <b>112</b> | <b>42</b> | <b>48</b> | <b>69</b> | <b>12</b> | <b>85</b> | <b>112</b> | <b>98</b> | <b>9</b> | <b>6</b> | <b>42</b> | <b>2</b> | <b>6</b> |

Turning movements accessing minor streets and property driveways were collected and considered in evaluating potential median impacts. The greatest concentration of observed access was the minor streets such as NW 6th Avenue and NW 6th Street.



Turning movements accessing minor streets and property driveways were collected and considered in evaluating potential median impacts. The greatest concentration of observed access was the minor streets such as NW 1st Avenue and businesses such as Brannen Bank and the Shell station.



**TOTAL (AM, Midday, and PM)**

|              |           |            |            |           |            |           |            |
|--------------|-----------|------------|------------|-----------|------------|-----------|------------|
| AM           | 2         | 193        | 227        | 3         | 46         | 4         | 27         |
| Midday       | 6         | 193        | 208        | 5         | 266        | 9         | 112        |
| PM           | 6         | 140        | 141        | 3         | 205        | 9         | 75         |
| <b>TOTAL</b> | <b>14</b> | <b>526</b> | <b>576</b> | <b>11</b> | <b>517</b> | <b>22</b> | <b>214</b> |

|              |           |           |           |           |            |          |
|--------------|-----------|-----------|-----------|-----------|------------|----------|
| AM           | 6         | 14        | 3         | 10        | 89         | 0        |
| Midday       | 21        | 9         | 22        | 38        | 194        | 0        |
| PM           | 23        | 14        | 22        | 38        | 150        | 0        |
| <b>TOTAL</b> | <b>50</b> | <b>37</b> | <b>47</b> | <b>86</b> | <b>433</b> | <b>0</b> |

Turning movements accessing minor streets and property driveways were collected and considered in evaluating potential median impacts. The greatest concentration of observed access was the minor streets such as NE 3rd Street and businesses such as McDonald's and Taco Bell. The highest number of turning movements accessing specific business driveways were located in this section of the study area, thus median closures are not recommended.

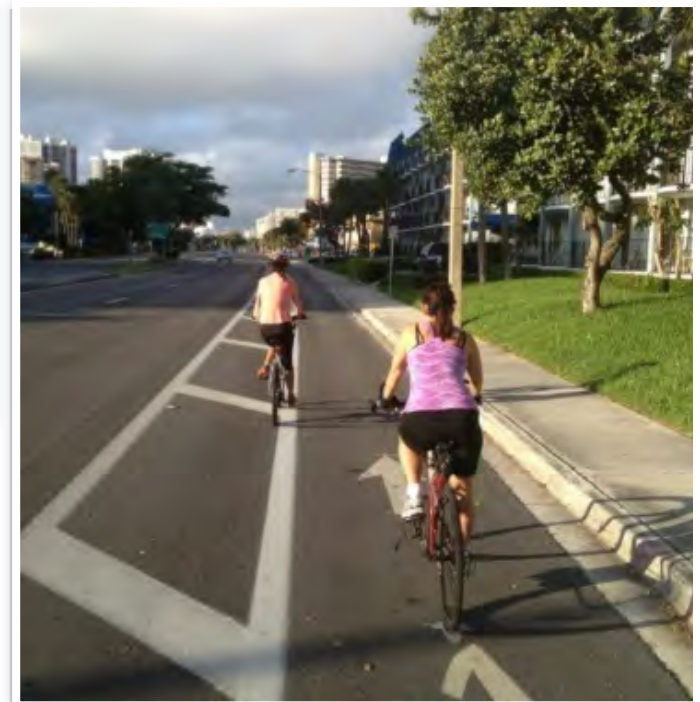
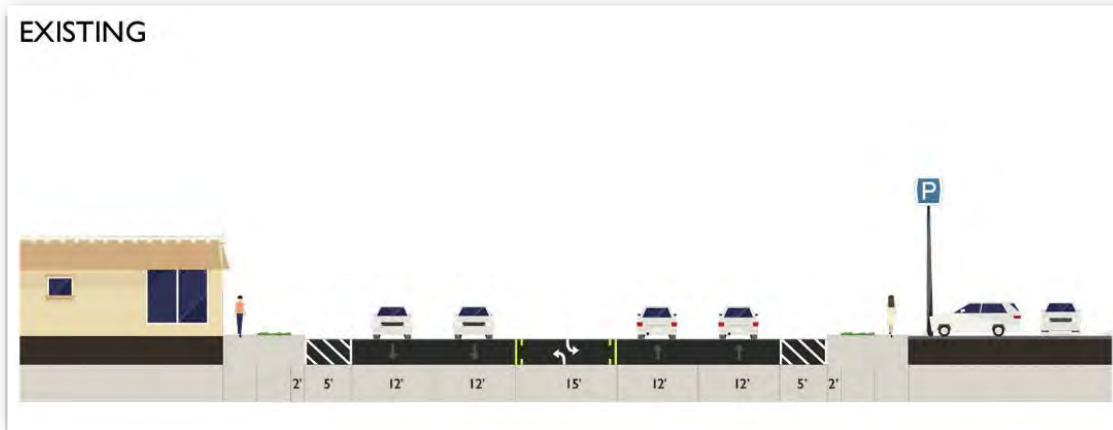


*Median Option 1 is the most restrictive of the two median alternatives. The focus of this option is to provide raised, landscaped medians at key locations for pedestrians while minimizing impacts to property access along US 19. This Option is the preferred option of the City of Crystal River.*



*Median Option 2 is the most restrictive of the two median alternatives. This option expands the medians east and west of the Crosstown Trail crossing location and also eliminates left turns in and out at the US 19 intersection with NW 6th Street. This median option is not recommended for implementation due to a lack of local support.*

## Recommended Typical Cross Sections (Between NW 6th Avenue and SR 44)



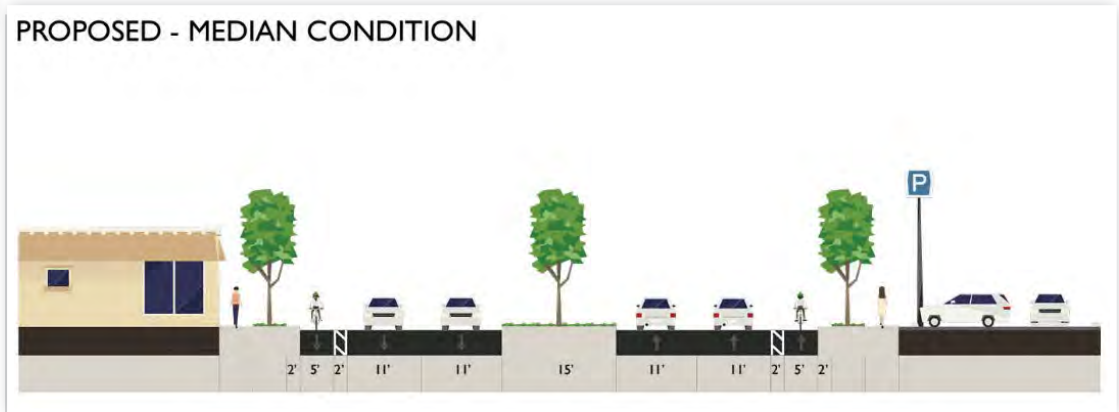
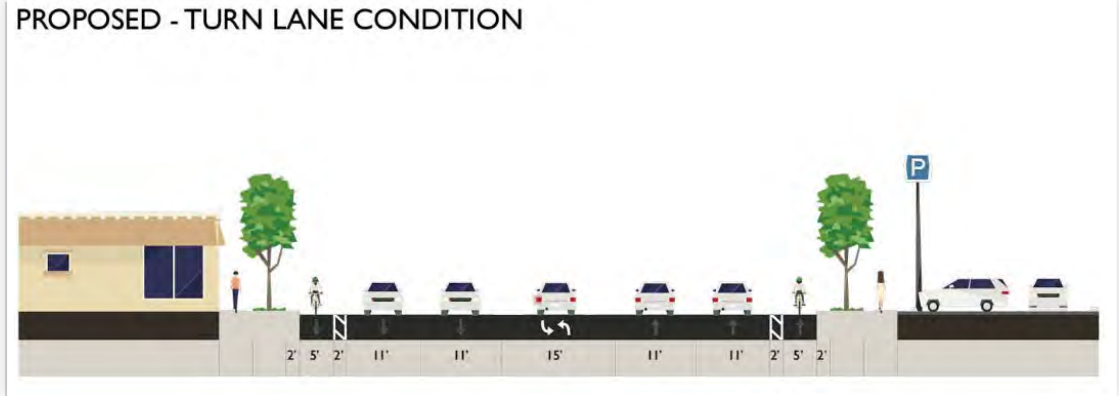
*Buffered Bicycle Lanes: Buffered bicycle lanes provide additional separation between bicyclists and vehicles. The construction of buffered bicycle lanes is now FDOT standard, especially for higher speed and higher volume roadways.*

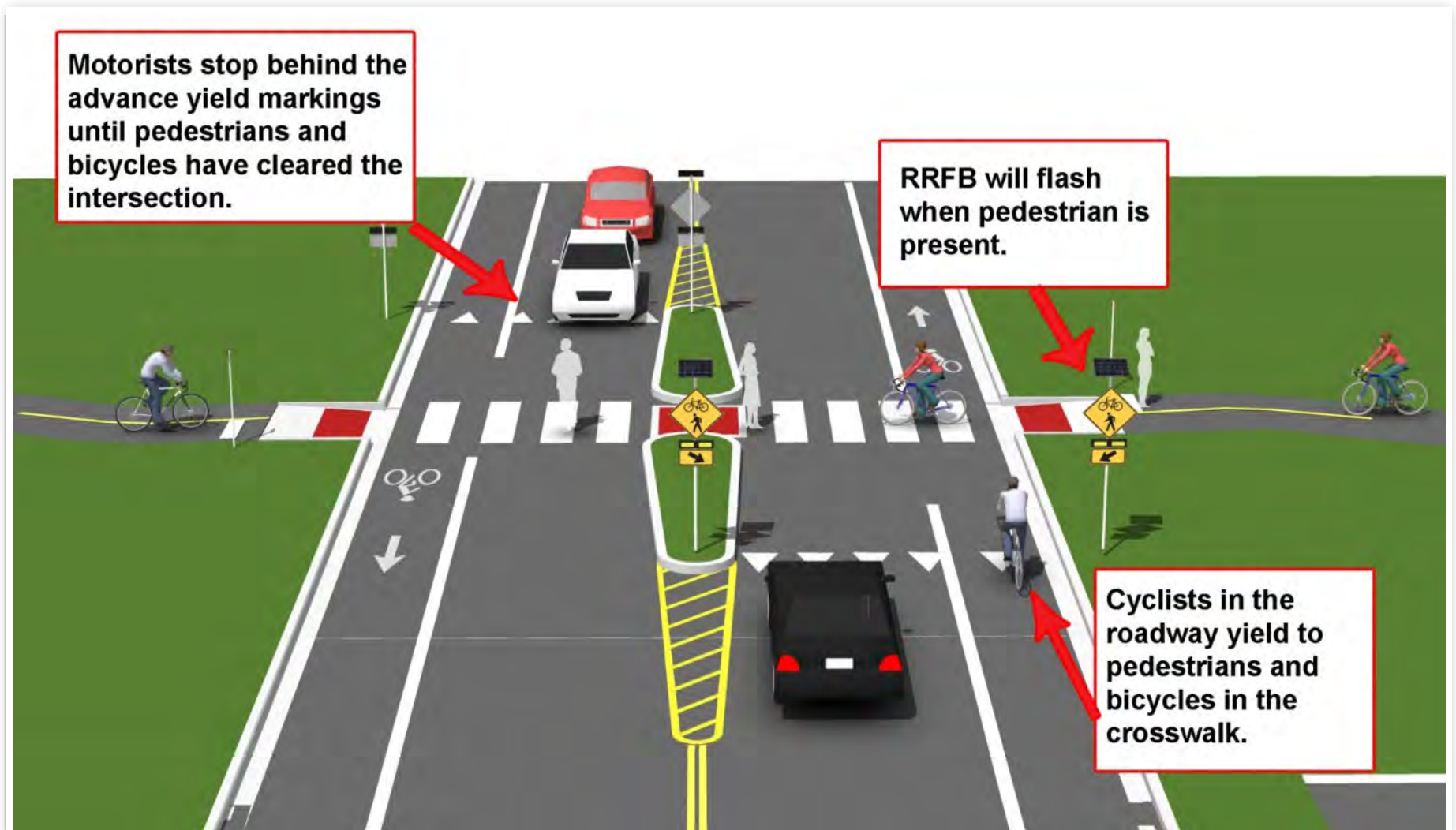
### *US 19 Key Cross Section Recommendations*

- 1) Construct Physical Landscaped Median (Consistent with Option 1)
- 2) Reduce Travel Lanes to 11 feet
- 3) Construct 7 Foot Buffered Bicycle Lanes (2 Foot Buffer + 5 Foot Bicycle Lane)
- 4) Maintain Existing Curb to Curb Width (Where Feasible)
- 5) Construct Enhanced Widewalks (Widen Sidewalks, Improve Streetlighting, and Street Trees where feasible)
- 6) Construct Pedestrian Crossover Islands at the Crosstown Trail and NW 2nd Avenue Crossings



*Pedestrian Crossover Islands are now an accepted FDOT design. This islands significantly improve pedestrian crossing safety by adding a refuge area that allows pedestrian to cross one direction of lanes at a time allowing. These are appropriate treatments where enhanced crossing controls such as signal control (RRFBs, HAWK, Traffic Signals) are not warranted.*





*Enhanced midblock crossings, such as this example using Rectangular Rapid Flash Beacons (RRFBs), are recommended at US 19 and the Crosstown Trail and at US 19 at NW 2nd Avenue should FDOT's requirements be met.*

# CITRUS AVENUE

## Introduction

The evaluation of Citrus Avenue at US 19 included three elements:

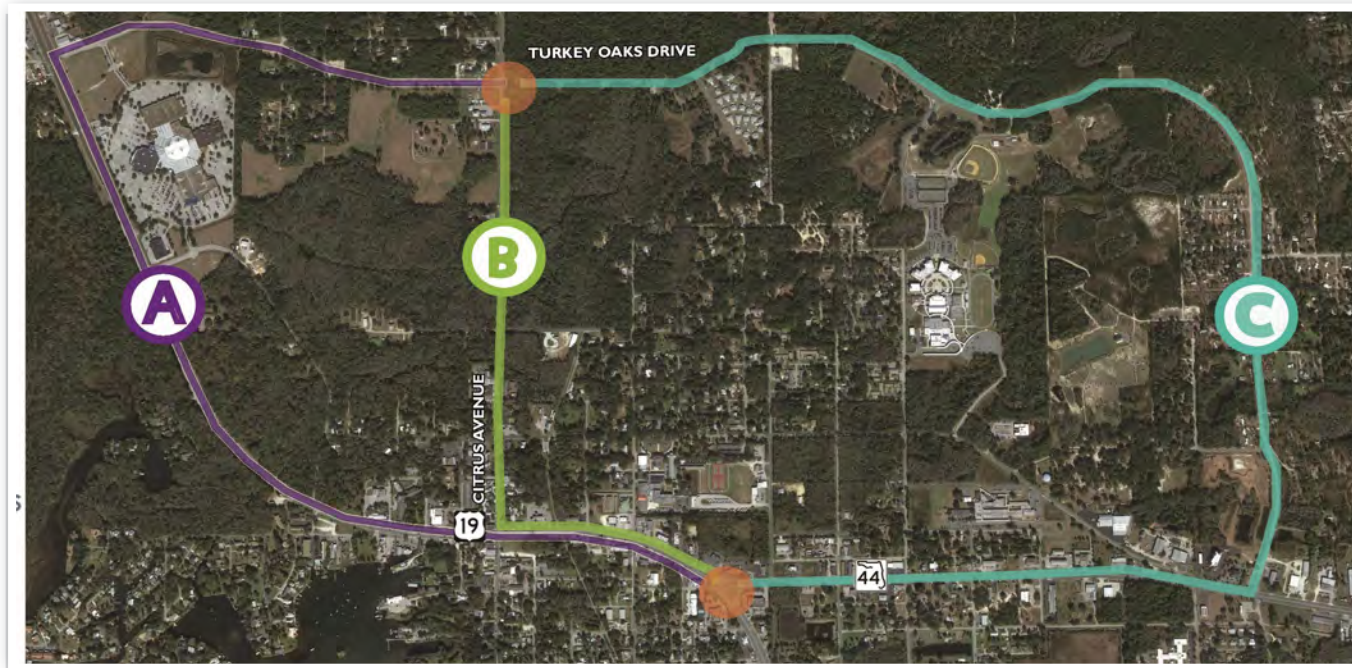
- Truck Rerouting
- Traffic Operations
- Pedestrian Crossings

These elements are described in greater detail on the following pages.

Two potential truck rerouting options were evaluated to potentially relocate thru trucks off of Citrus Avenue (B) south of Turkey Oaks Drive. The first option (A) routes the trucks east via US 19 and Turkey Oaks Drive. The second option (C) routes the trucks east via SR 44 and Turkey Oaks Drive. The potential rerouting option is highly dependent on two factors:

- 1) The ultimate origin and destination of trips
- 2) The potential added delay (Travel distance, speed limits, number of turns etc).

The options were evaluated using the matrix on page 25. In conclusion, option A (west) had medium to high diversion potential for trucks with an origin or destination south of SR 44 via US 19; while option B (east) had medium to high diversion potential for trucks with an origin or destination east of US 19 via SR 44 via. As such, it is recommended that City work in partnership with the County and FDOT to implement the diversion routes. Implementation on the diversion routes should consider the phasing recommendations provided on page 26.



*The evaluation considered alternatives to Citrus Avenue (B). Both alternatives re-route traffic to Turkey Oaks Drive via US 19 to the west and SR 44 to the east.*

# Truck Routing Evaluation

# CITRUS AVENUE

| Diversion Alternatives Evaluation - Origin or Destination South of SR 44 via US 19 |                      |               |                      |                      |               |                      |
|--|----------------------|---------------|----------------------|----------------------|---------------|----------------------|
| Route  | Traveling Northbound |               |                      | Traveling Southbound |               |                      |
|  | Alternative "A"      | Existing "B"  | Alternative "C"      | Alternative "A"      | Existing "B"  | Alternative "C"      |
|  | West                 | Via           | East                 | West                 | Via           | East                 |
|  | Via Turkey Oak Drive | Citrus Avenue | Via Turkey Oak Drive | Via Turkey Oak Drive | Citrus Avenue | Via Turkey Oak Drive |
| Diversion Potential  | Medium               | N/A           | Low                  | High                 | N/A           | Low                  |
| Distance   | 2.8                  | 1.4           | 3.4                  | 2.8                  | 1.4           | 3.4                  |
| Increase in Distance   | 200%                 | 0%            | 242%                 | 200%                 | 0%            | 242%                 |
| Left Turns   | 1                    | 0             | 1                    | 1                    | 1             | 2                    |
| Right Turns  | 1                    | 1             | 2                    | 1                    | 0             | 1                    |
| Total Turns  | 2                    | 1             | 3                    | 2                    | 1             | 3                    |
| Speed Limit (MPH - Non US 19/ SR 44)   | 35                   | 30/45         | 40                   | 35                   | 45/30         | 40                   |

| Diversion Alternatives Evaluation - Origin or Destination East of Turkey Oaks Dr via SR 44 |                      |               |                      |                      |               |                      |
|--|----------------------|---------------|----------------------|----------------------|---------------|----------------------|
| Route  | Traveling Northbound |               |                      | Traveling Southbound |               |                      |
|  | Alternative "A"      | Existing "B"  | Alternative "C"      | Alternative "A"      | Existing "B"  | Alternative "C"      |
|  | West                 | Via           | East                 | West                 | Via           | East                 |
|  | Via Turkey Oak Drive | Citrus Avenue | Via Turkey Oak Drive | Via Turkey Oak Drive | Citrus Avenue | Via Turkey Oak Drive |
| Diversion Potential  | Extremely Low        | N/A           | Medium/High          | Extremely Low        | N/A           | Medium/High          |
| Distance   | 3.7                  | 2.4           | 2.4                  | 3.7                  | 2.4           | 2.4                  |
| Increase in Distance   | 154%                 | 0%            | 0%                   | 154%                 | 0%            | 0%                   |
| Left Turns   | 1                    | 0             | 0                    | 2                    | 2             | 2                    |
| Right Turns  | 2                    | 2             | 2                    | 1                    | 1             | 0                    |
| Total Turns  | 3                    | 2             | 2                    | 3                    | 3             | 2                    |
| Speed Limit (MPH - Non US 19/ SR 44)   | 35                   | 30/45         | 40                   | 35                   | 45/30         | 40                   |

*Evaluation criteria was use to consider diversion potential.*

# CITRUS AVENUE

## Truck Routing Implementation



### Phase 1

- Guide Signage for Westward Turkey Oak Drive Route (US 19)
- Guide Signage for Eastward Turkey Oak Drive Route (SR 44)



### Phase 2

- Add Eastbound to Northbound Left Turn Lane and signal phasing at Turkey Oak Drive and Citrus Avenue
- Evaluate Widening/Paved Shoulders on Turkey Oak Drive between US 19 and Citrus Avenue



### Phase 3

- Evaluate Widening/Paved Shoulders on Turkey Oak Drive between Citrus Avenue and SR 44



### Phase 4

- Prohibit Thru Trucks on Citrus Avenue

*Implementation of the truck rerouting options should address the geometric and operational improvements identified in the above phasing of improvements. This will require an additional study.*

### *Intersection of Citrus Avenue at US 19 – Traffic Operations*

Traffic operations were evaluated at the intersection of Citrus Avenue at US 19. This intersection becomes congested during peak periods and has been cited as a challenging intersection for pedestrian to cross US 19. Traffic count data was collected and intersection alternatives were evaluated to identify potential traffic signal timing and intersection operation improvements. Currently, the northbound and southbound movements of the intersection operate “split phase” in that all of the northbound movements (right turn, thru, and left turn) receive green and then all of the southbound movements are allowed where as typically opposing left turns run followed by the thru and right turn movements. Split phase signals tend to be very inefficient from a traffic operations perspective and contribute added delay at the intersection. A result of the evaluation, concluded that the existing split phase operation is the most efficient traffic signal timing at the intersection and that none of the four alternatives evaluated provided sufficient benefit to outweigh their costs or impacts to the adjacent properties.

### *Intersection of Citrus Avenue at US 19 – Pedestrian Crossings*

Concerns were raised at the beginning of the project relative to the difficulty pedestrians have crossing US 19 at Citrus Avenue. Comments were made that the traffic on US 19 made pedestrian crossings difficult. Observations of pedestrian and vehicle interaction at the intersection, identified that the following movements significantly conflict with pedestrian crossings at the intersection:

- Northbound to westbound left turns on green
- Southbound to eastbound left turns on green
- Westbound to northbound right turns on red

Recommended mitigation measures for the pedestrian crossing conflicts include signal retiming to allow for pedestrian leading green indications which will result in pedestrians receiving the green crosswalk signal typically five seconds before the vehicle green indication. This allows the pedestrians to be in the crossing before the vehicles are allowed to turn on green and clearly establishes the pedestrians as having the right of way (requiring the vehicles to yield to them). The second measure is the installation of a pedestrian LED blankout sign on the westbound approach. This dynamic blankout sign would prohibit right turns on red when a pedestrian movement is being provided across the east leg of the intersection and would display “Yield to Peds” when the westbound signal is green.

# CITRUS AVENUE

## Other Recommendations

### *Intersection of Citrus Avenue at US 19 – Northeast Quadrant Sidewalks and Crosswalk Ramps*

The current design of the northeastern corner of the intersection has a tight turning radius and narrow depth sidewalk/crosswalk ramp. Larger vehicles including busses, single unit trucks, and tractor trailer trucks frequently track their rear tires across the sidewalk/crosswalk ramp and then drop back down to the roadway surface. The tire marks in the pictures to the right highlight the frequency of the encroachment of large vehicles in the pedestrian space at this corner. It is recommended that the northeast corner be redesigned and reconstructed to slightly increase the turn radius and to increase the depth of the sidewalk/pedestrian crosswalk at this location.



*Northeast corner of US 19 at Citrus Avenue looking north showing tire scuff marks on the curblines and drainage inlet.*



*Northeast corner of US 19 at Citrus Avenue looking south showing tire scuff marks over 20 feet away from the intersection.*

# CRYSTAL RIVER MIDDLE SCHOOL

## Introduction

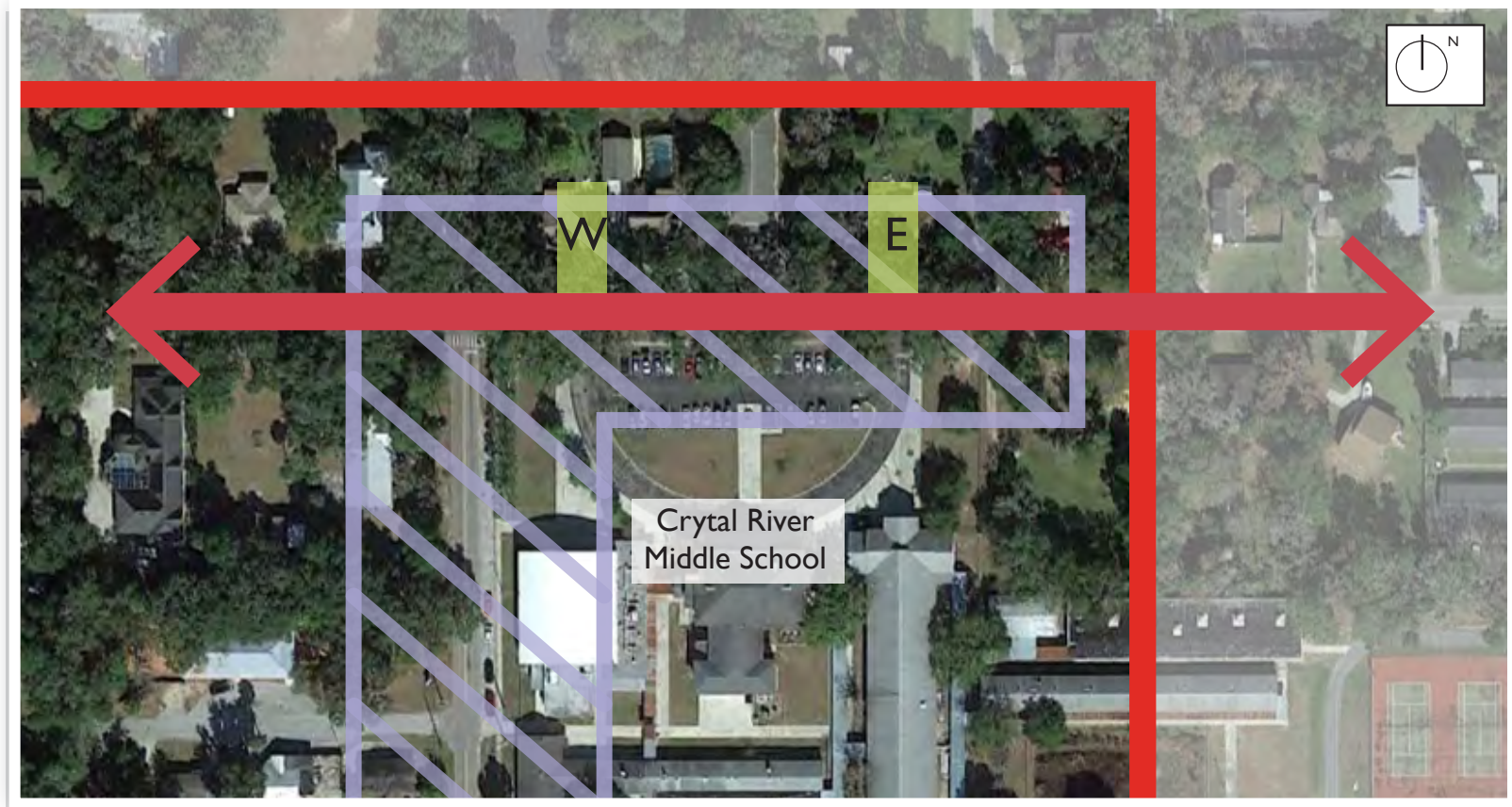
Concerns have been raised regarding the traffic operations at the Crystal River Middle School which is located just east of downtown and south of NE Crystal Street. These concerns centered around the interaction of the parent carline, busses, and local traffic. Two sets of observations were made of the carline activity, one which focused on counting the number of vehicles passing or turning in/out of the school during the morning arrival and afternoon dismissal.

The number of observed turning vehicles is illustrated in the figure on page 31. Concerns were also raised relative to bus and carline conflicts. This issue was not observed, likely due to the parent and bus carlines being separate. The bus carline operates out of the eastside of the campus while the primary parent carline operates on the northside of the campus with a secondary carline operating on the westside of the campus.

NE 3RD AVENUE

# CRYSTAL RIVER MIDDLE SCHOOL

## Travel Demand



TOTAL (AM, Midday)

|              |            |            |
|--------------|------------|------------|
| AM           | 372        | 388        |
| Midday       | 336        | 331        |
| <b>TOTAL</b> | <b>708</b> | <b>719</b> |

*Traffic created by the Crystal River Middle School during morning arrival and afternoon dismissal was counted during a typical school day.*

# Observations and Recommendations

## CRYSTAL RIVER MIDDLE SCHOOL

The operation of the carline arrival and dismissal is being conducted in a highly efficient fashion through an observed partnership between the middle school staff and the assigned school resource officer. The opportunities for significant reduction of vehicle queuing on NE Crystal Street are limited given the constraints of the physical infrastructure. Minor issues were observed that could be addressed to reduce the impacts, especially of the afternoon dismissal carline.

### *Staff Safety*

Staff members were observed directing traffic on NE Crystal Street. This included directing thru westbound traffic around the queued vehicles using the eastbound lanes. This redirection in the counter flow direction should be avoided. Additionally, staff who are working within the roadway right of way to direct traffic should wear appropriate safety vests that include retroreflective materials.

### *Parent/Guardian Carline Education*

Adults picking up students in the afternoon have a significant impact on the efficiency of the carline and avoidance of queues. Three key topics should be shared with parents at the beginning of the year and recommunicated on a frequent basis:

- **Keep it close:** Once in the carline, minimal separation should be maintained between vehicles. This reduces the length of the carline.
- **Parent arrival time:** The first student departed in a vehicle from the carline nearly four minutes after dismissal. It is not necessary to arrive significantly before or at dismissal.

- **Know your student:** In contrast to elementary schools where dismissal is tightly controlled, middle school carline can be adversely impacted by the time the student controls between leaving class and arriving at carline. Parents and students should be mindful of this and coordinate the parent's arrival within a reasonable timeframe of when the student will be available for pickup. When students do not arrive to carline in a reasonable period of time, the waiting vehicles significantly impact the efficiency of the carline and increase delay.

### *High School Student Dismissal Conflicts*

Crystal River High School (east of Crystal River Middle School) dismisses students shortly before the middle school dismissal. Both vehicle and pedestrian traffic from the high school impact the middle school carline and a significant number of high school students were observed passing through the middle school campus. While it would be desirable to provide a greater separation between dismissal times, such schedule modification is unlikely due to the joint use bussing used by the high school and middle school.

### *Sight Obstructions*

Initial field reviews of the campus noted that vegetation at some locations adversely impacted clear sight distance from driveways departing the campus. Subsequent observations indicated that the sight obstructions had been cleared. It would be a best practice to routinely review the school drives for potential sight obstructions.



*Short term improvements include discouraging arriving and departing students from crossing directly through the carline immediately in-front of the main entrance of the school. This will require the construction of a short section of sidewalk from the eastside of the carline loop west to the center as well as the construction of a crosswalk and associated ramps. Crossing students at this location is preferred since it is located where a staff member controls the discharge of traffic.*



*Long term improvements should consider extending the southern carline loop to the east on land recently purchased by the school district. This would significantly reduce afternoon dismissal carline vehicles queuing up on NE Crystal Street. This would also allow for the construction of a covered sidewalk adjacent to the carline. The current carline location does not have a covered sidewalk in the loading area due to the historic nature of the main school building.*



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