



SR 524 Corridor
PLANNING STUDY

SR 524 Existing Conditions Summary Report

August 2016

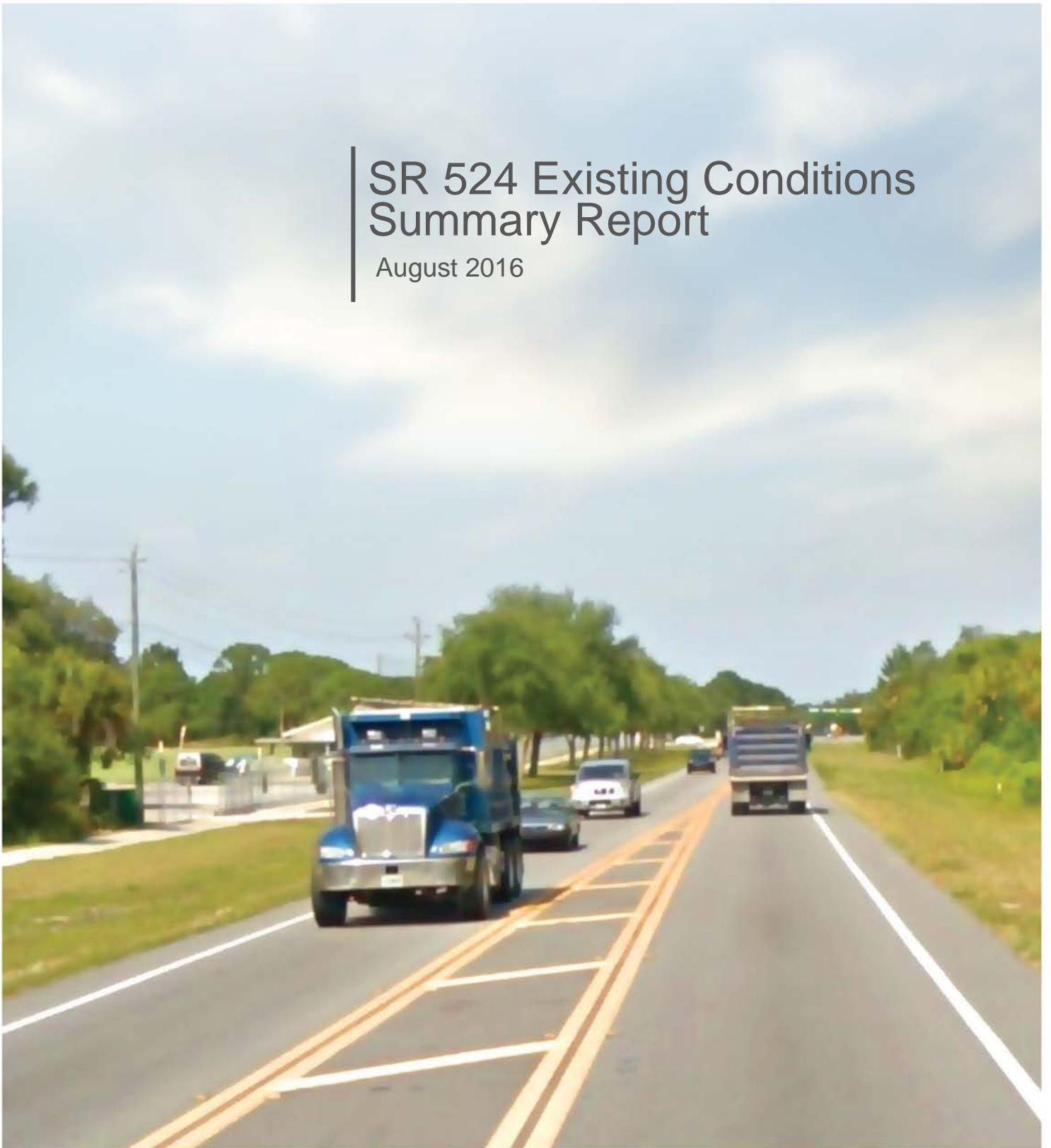


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1.0 Introduction

In February 2016, the Florida Department of Transportation (FDOT) initiated a Corridor Planning Study (“the Study”) to evaluate the need for potential multimodal transportation improvements along State Road (S.R.) 524 in Brevard County, Florida. As shown in Figure 1.1, the limits of the S.R. 524 Study Area extend from Friday Road South to Industry Road, a distance of approximately 3.150 miles.

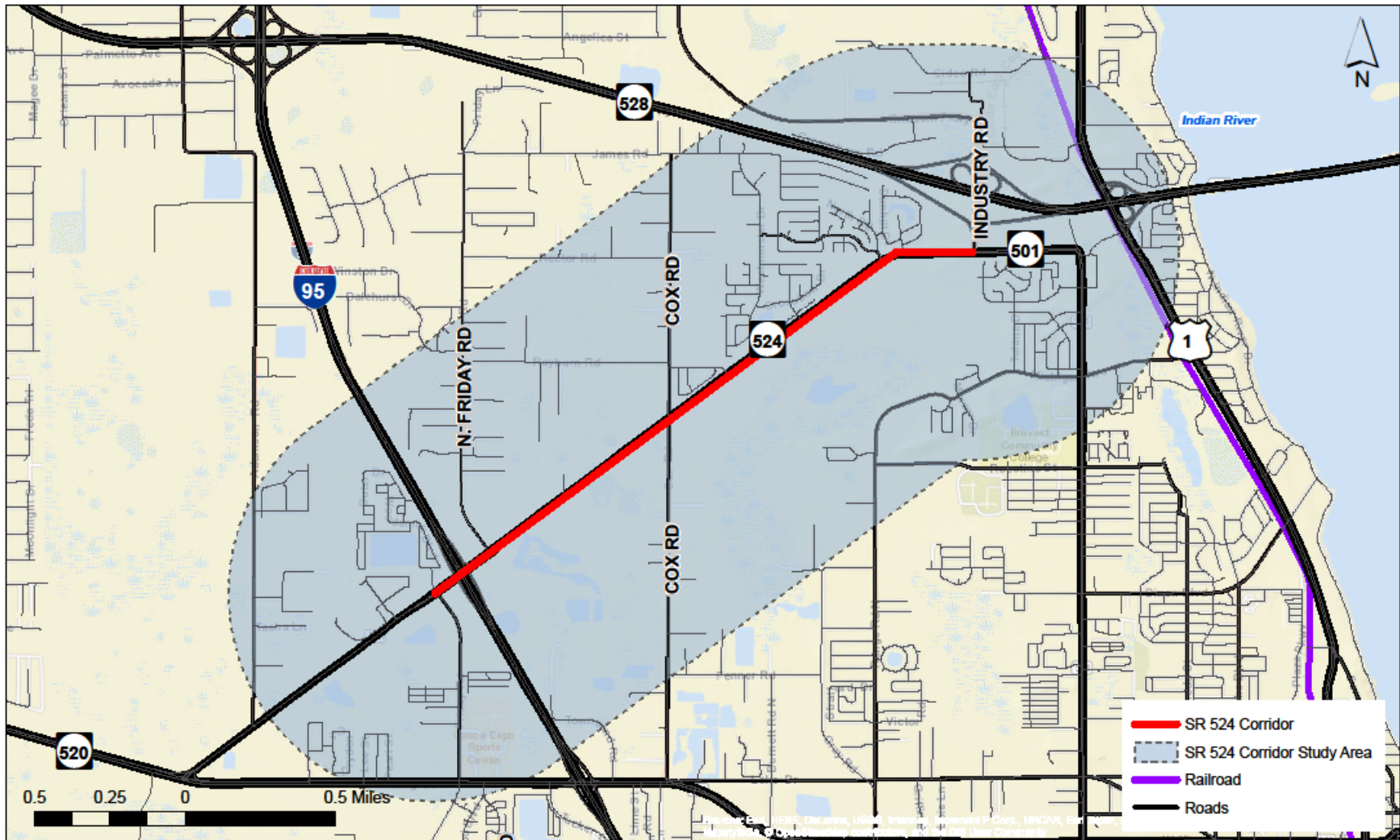
The *S.R. 524 Existing Conditions Summary Report* summarizes the existing transportation, land use and environmental conditions within and surrounding the Study Area. This Report includes documentation of transportation characteristics, vehicular traffic conditions, land use and demographic characteristics, existing developments, and a safety analysis of the corridor. In addition, this Report considers previous studies, planned and programmed improvements, as well as ongoing planning efforts by the City of Cocoa (“the City”), Brevard County (“the County”), the Space Coast TPO (“SCTPO”), and Space Coast Area Transit (“SCAT”). Listed below is a brief summary of each Section of the Report:

- **Transportation Characteristics:** This Section presents the existing roadway network, roadway cross section, intersection configurations, pedestrian and bicycle facilities, and transit service within the SR 524 Corridor.
- **Vehicular Traffic Conditions:** This Section presents vehicle classification counts, intersection turning movements, intersection traffic operations, local access conditions, field review, and an analysis of overall travel patterns.
- **Safety Analysis:** This Section presents crash history for the intersections within the Corridor, and analyzes the Corridor as compared with statewide averages.
- **Land Use and Demographic Characteristics:** This Section presents demographic data along the Corridor, including population, housing, income, race, language, employment, and commuting patterns, and also examines existing and future land use patterns within the Study Area.
- **Environmental Conditions:** This Section presents a review of the cultural resources, parklands, recreational areas, water quality, floodplain, contaminated sites, and threatened/endangered species within the Study Area.

Several documents were reviewed as part of the development of this Report, listed below:

- Clearlake Road (SR 501) Project Development and Environment Study (2016)
- Space Coast TPO 2040 Long Range Transportation Plan (2015)
- Space Coast TPO Intelligent Transportation Systems (ITS) Master Plan (2015)
- City of Cocoa 2010-2020 Long Range Transportation Plan (2010)
- S.R. 524 and Cox Road Feasibility Study (2009)
- Wal-Mart Distribution Center: Traffic Impact Study (2016)

Figure 1.1: Study Area



Transportation Characteristics

2.0 Transportation Characteristics

The purpose of this section is to present the existing transportation characteristics within the S.R. 524 Study Area and identify any changes to the existing transportation network that are currently planned, programmed, or under review by FDOT, Brevard County, City of Cocoa, or Space Coast TPO.

2.1 Roadway Network

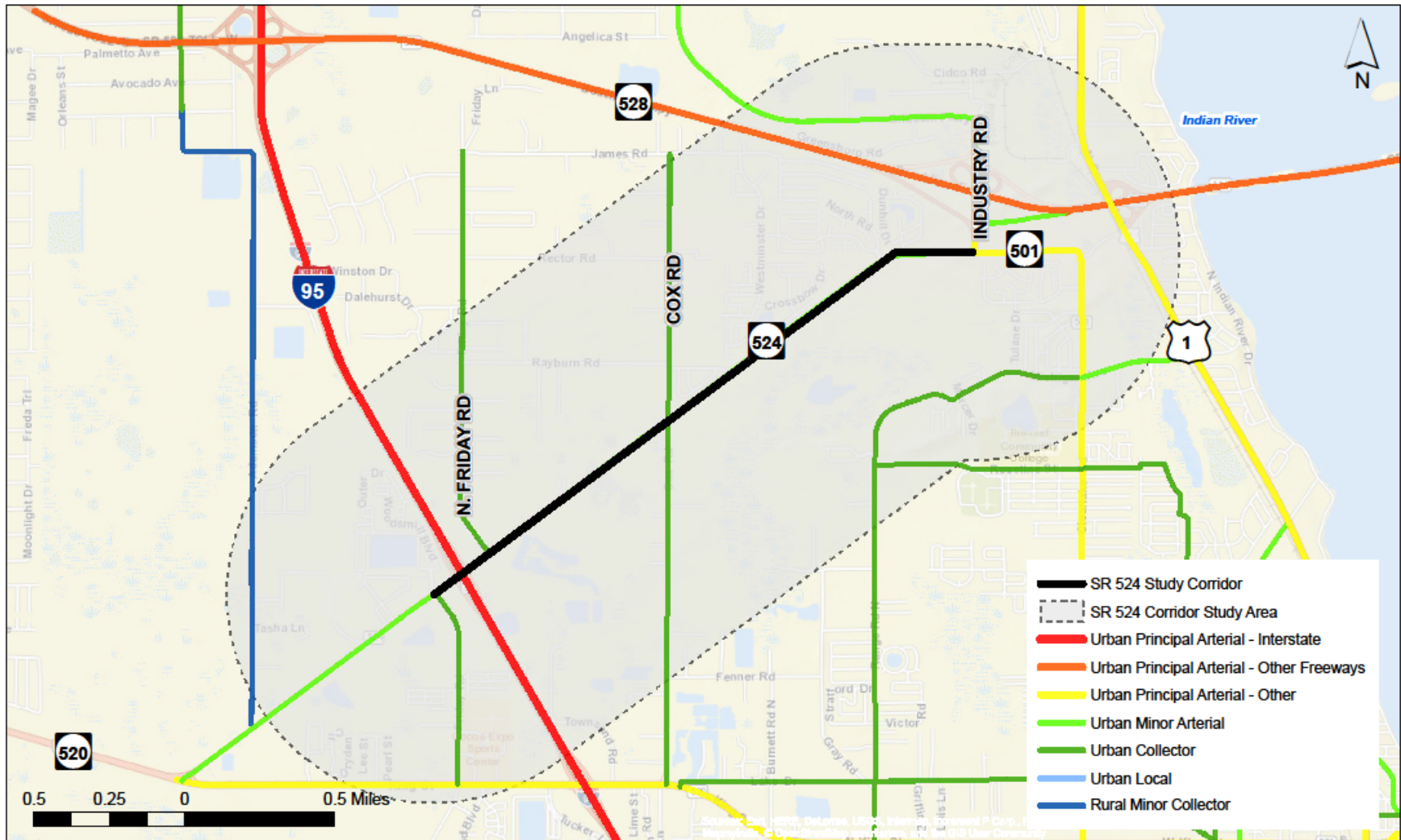
S.R. 524 is designated as an urban minor arterial and is intersected by several important roadways as listed below in Table 2.1 and shown in Figure 2.1:

Table 2.1: Roadways in Study Area by Type

Roadway	Designation	Jurisdiction	Minimum LOS
Interstate 95	Urban Principal Arterial	FDOT	E
S.R. 524	Urban Minor Arterial	FDOT	D
S.R. 528	Urban Principal Arterial	FDOT	D
S.R. 501	Urban Principal Arterial	FDOT	D
Industry Road	Urban Principal Arterial	Brevard County	E
Cox Road	Urban Collector	City of Cocoa	E
Friday Road North	Urban Collector	Brevard County	E
Friday Road South	Urban Collector	Brevard County	E

Source: Brevard County Property Appraiser, 2016; City of Cocoa Comprehensive Plan, 2010 (pg II-1)

Figure 2.1: Existing Roadway Network (Functional Classification)



Source: FDOT, 2016.

Planned/Programmed Facilities

The Space Coast TPO 2040 Long Range Transportation Plan (LRTP) outlines the region’s growth and development through 2040, and is key in identifying transportation needs and project funding. Some notable planned, programmed, or strategic corridors from the Space Coast TPO LRTP within or affecting the S.R. 524 Study Area are listed below and in Table 2.2:

- The widening of S.R. 524 between I-95 and Industry Road is listed as a Priority I Efficient Transportation Decision Making (ETDM) screening project.
 - The S.R. 524 widening project is funded as follows: \$3.24 million for PE, \$4.49 million for ROW, and \$22.47 for construction - all three phases will take place between 2021 and 2025.
- The widening of S.R. 501 between Michigan and Industry Road is listed as an “ETDM Screening Completed/Fully or Partially Funded” project.
 - The S.R. 501 widening project is funded as follows: \$1.66 million for ROW and \$6.65 million for construction – both phases taking place between 2021 and 2025.

Table 2.2: Space Coast TPO LRTP Planned/ Programmed Improvements

Period	Project Type	Facility	From	To	Description	Net Cost
2021-2035	Highway Capacity	Clearlake Road	Michigan	Industry Rd	Widen to 4 lanes	\$8.3 million
		S.R. 524	I-95 Interchange (South)	Industry Rd	Widen to 4 lanes	\$17.4 million
ITS Program	ITS	S.R. 501	S.R. 520	S.R. 528	ITS improvements	\$559,000
Multimodal Program	Bicycle/Ped	Clearlake Rd	2600' E of E Industry Rd	King Street	Designated Bicycle Lane	\$366,000
		Clearlake Rd	400' S of W King St	Range/Pluckebaum Rd	Paved Shoulder	\$68,000
		Friday Road North	Highway 524	2300' S of Hwy 524	Paved Shoulder	\$48,000
		Cox Rd	S.R. 524	600' N of W King Street	Sidewalk	\$218,000
		La Marche Dr	Otterbein Ave	Michigan Ave	Sidewalk	\$50,000
	Complete Streets	Michigan	Range	Clearlake	Complete Street	TBD
Unfunded	Transit	West Cocoa Circulator			New Fixed Route Service	\$300,000
		S.R. 520 Bus Rapid Transit	S.R. 524	S.R. A1A	New Bus Rapid Transit Service	\$1.5 billion

Source: Space Coast TPO 2040 LRTP, page 178.

Space Coast TPO Intelligent Transportation System (ITS) Master Plan (August 2015):

The Space Coast TPO also identifies the region's ITS needs and provides a substantial amount of existing data and research on ITS facilities within the County. In the existing conditions section, the ITS Master Plan identified ITS features along S.R. 524 in two places:

- S.R. 524 between I-95 and Industry Road has a 24 singlemode (sm)/12 multimode (mm) fiber optic network, owned by FDOT.
- S.R. 524 between I-95 and Industry Road has five Arterial Dynamic Messaging Signs (ADMS) and one closed-circuit television (CCTV) owned by FDOT.

2.2 Roadway Cross Section

Using FDOT's straight-line diagrams, Google Earth, field observations, and the Clearlake Road (SR 501) Project Development & Environment Study, existing typical cross-sections were identified along S.R. 524. As shown in Figure 2.2, the straight-line diagrams provided the paved roadway dimensions and the immediate grass shoulders along S.R. 524, whereas the outside areas of unpaved right-of-way were estimated using Google Earth. Based on review of existing documentation, the existing right-of-way width along S.R. 524 within the limits of the Study is approximately 200 feet.

Figure 2.2: Existing S.R. 524 Roadway Cross Sections: Friday Road South to Cox Rd.

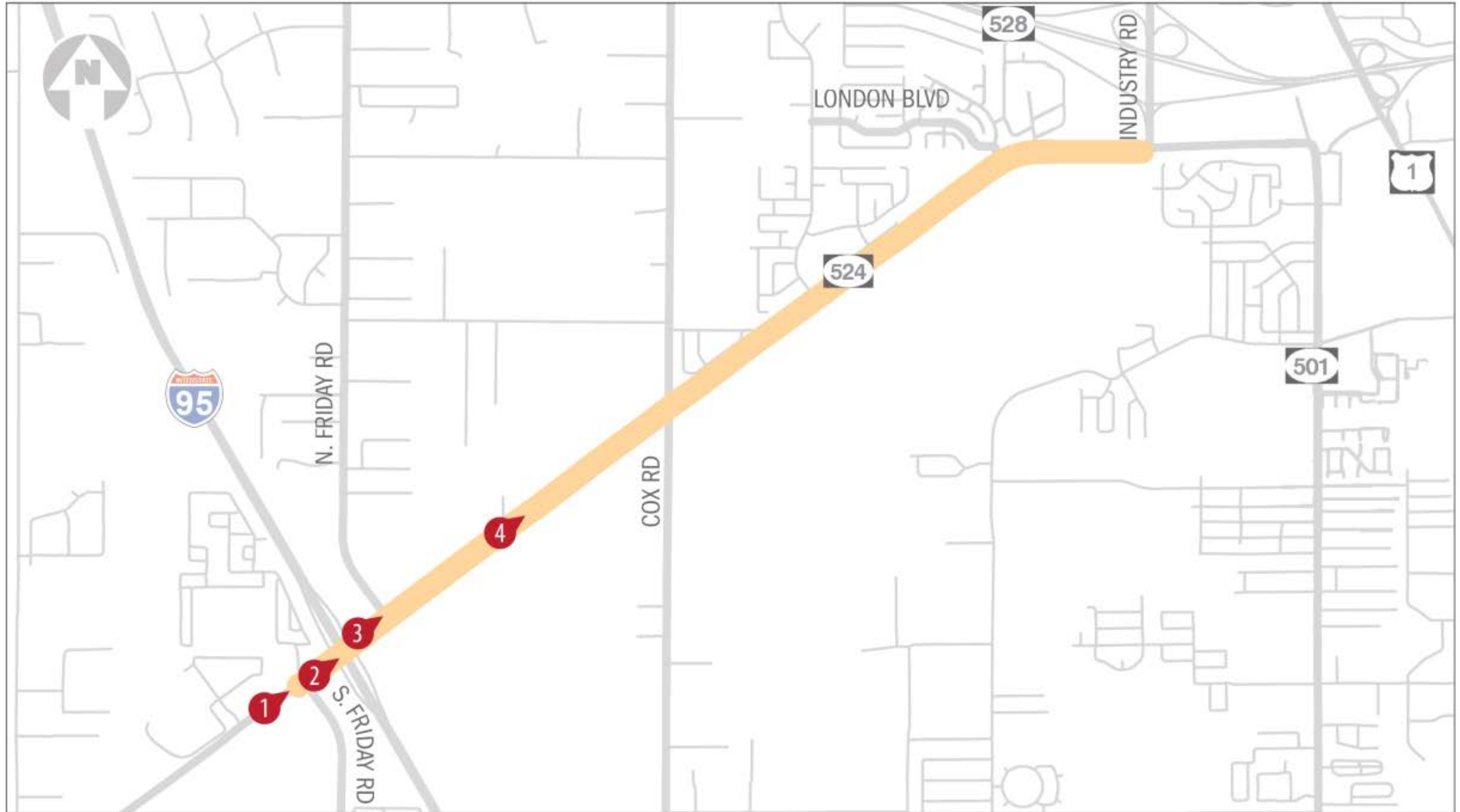
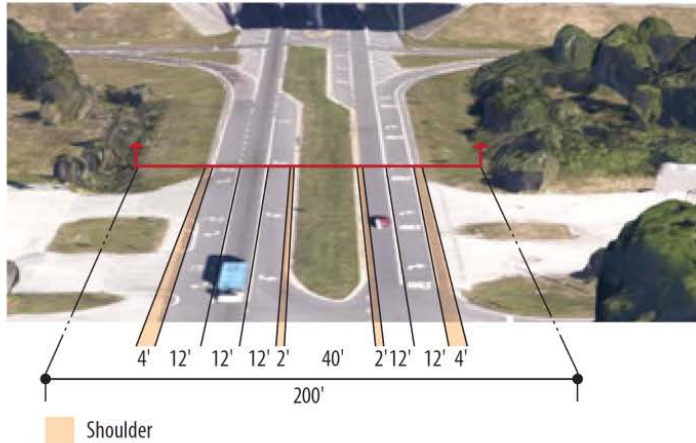
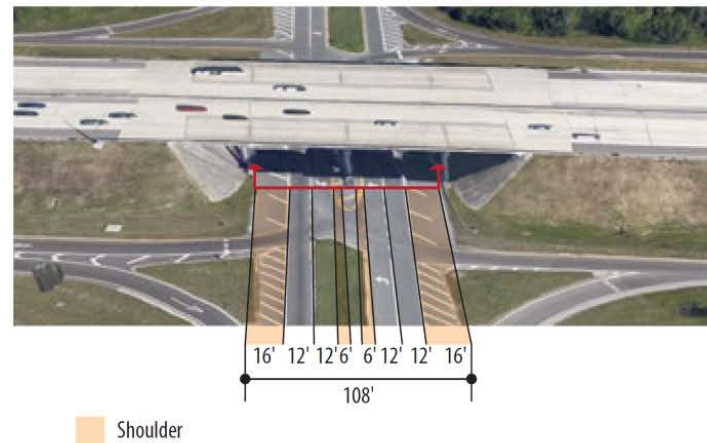


Figure 2.2 (continued): Existing S.R. 524 Roadway Cross Sections: Friday Road South to Cox Rd.

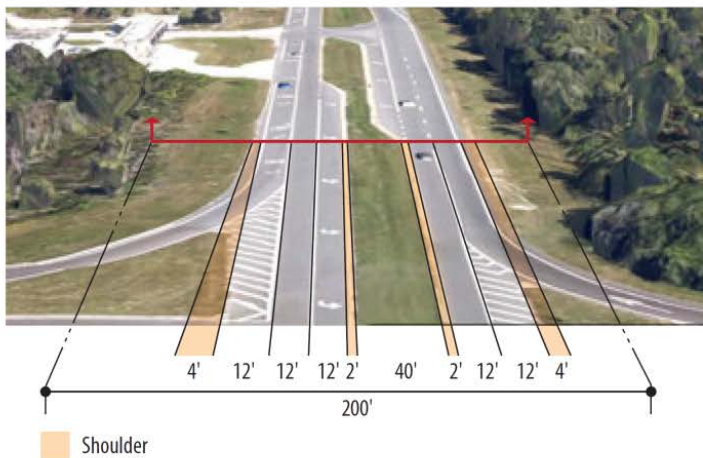
1 S. Friday Road to I-95



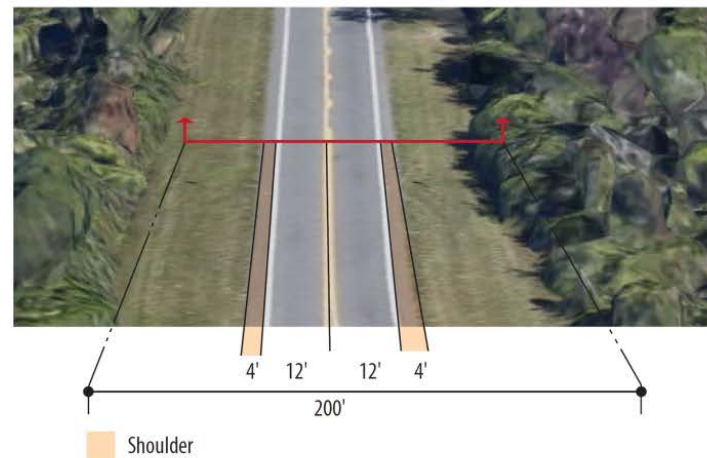
2 I-95 Southbound Ramps to I-95 Northbound Ramps



3 I-95 to N. Friday Road



4 N. Friday Road to Cox Road



Source: FDOT, 2016 & Google Earth.

Figure 2.3: Existing S.R. 524 Roadway Cross Sections: Cox Rd. to Industry Rd.

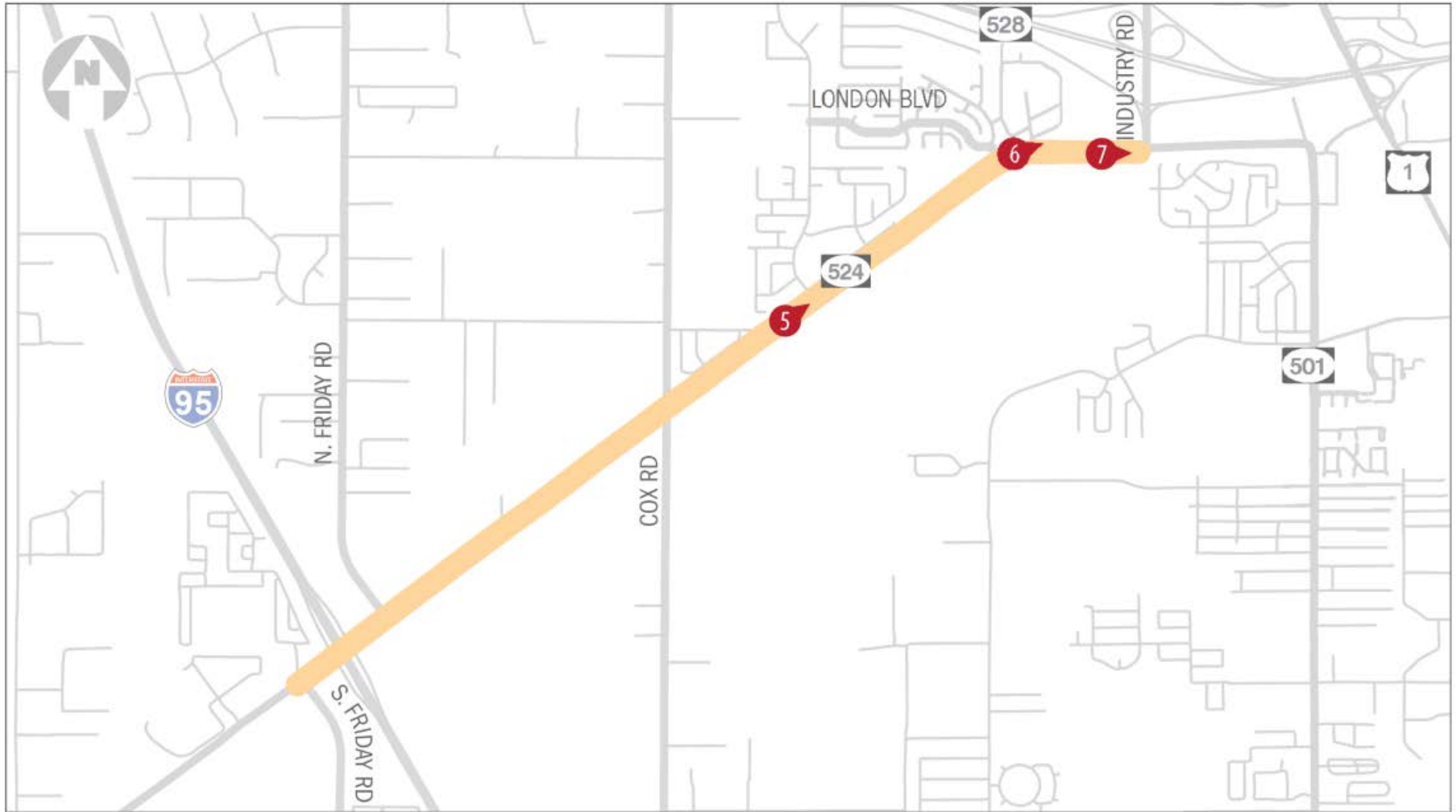
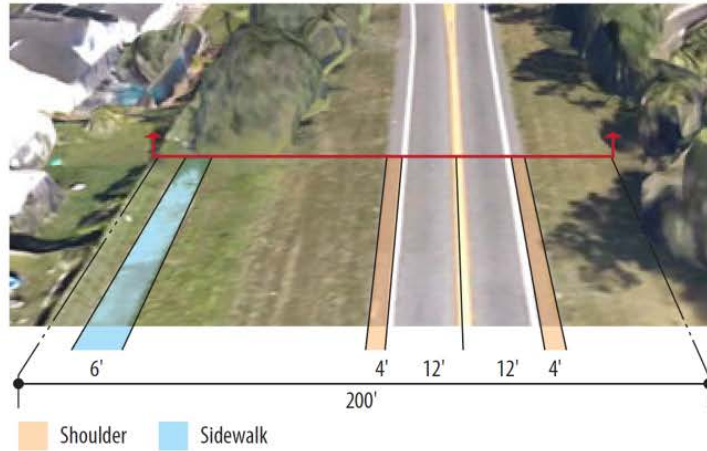
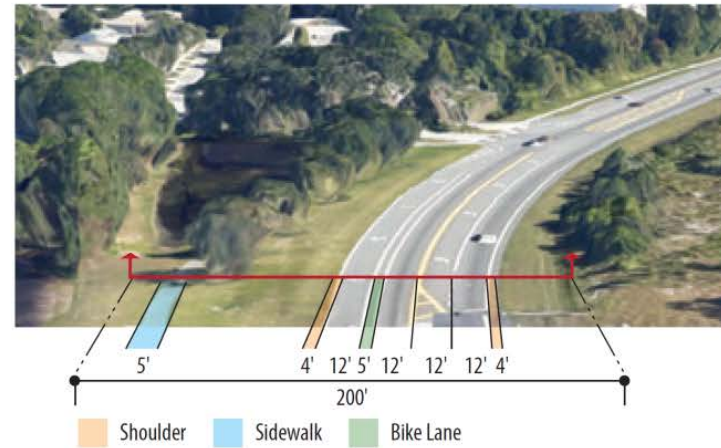


Figure 2.3 (continued): Existing S.R. 524 Roadway Cross Sections: Cox Rd. to Industry Rd

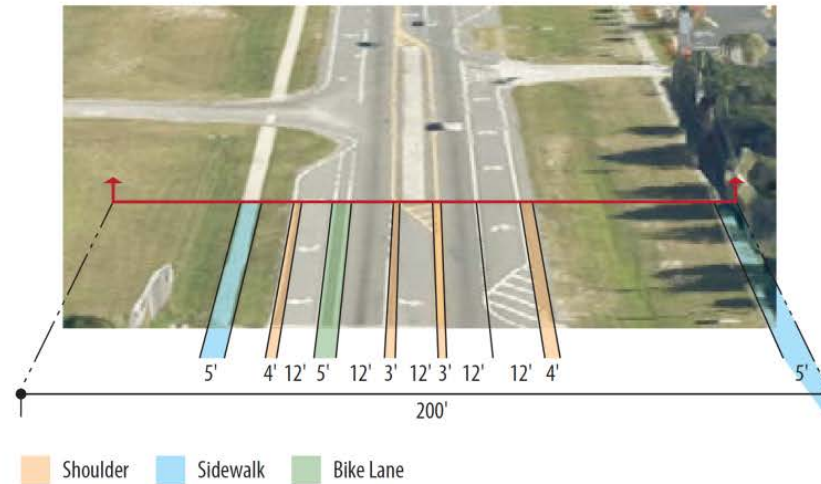
5 Cox Road to London Boulevard



6 London Boulevard to Shopping Center Intersection



7 Shopping Center Intersection to Industry Road



Source: FDOT, 2016 & Google Earth.

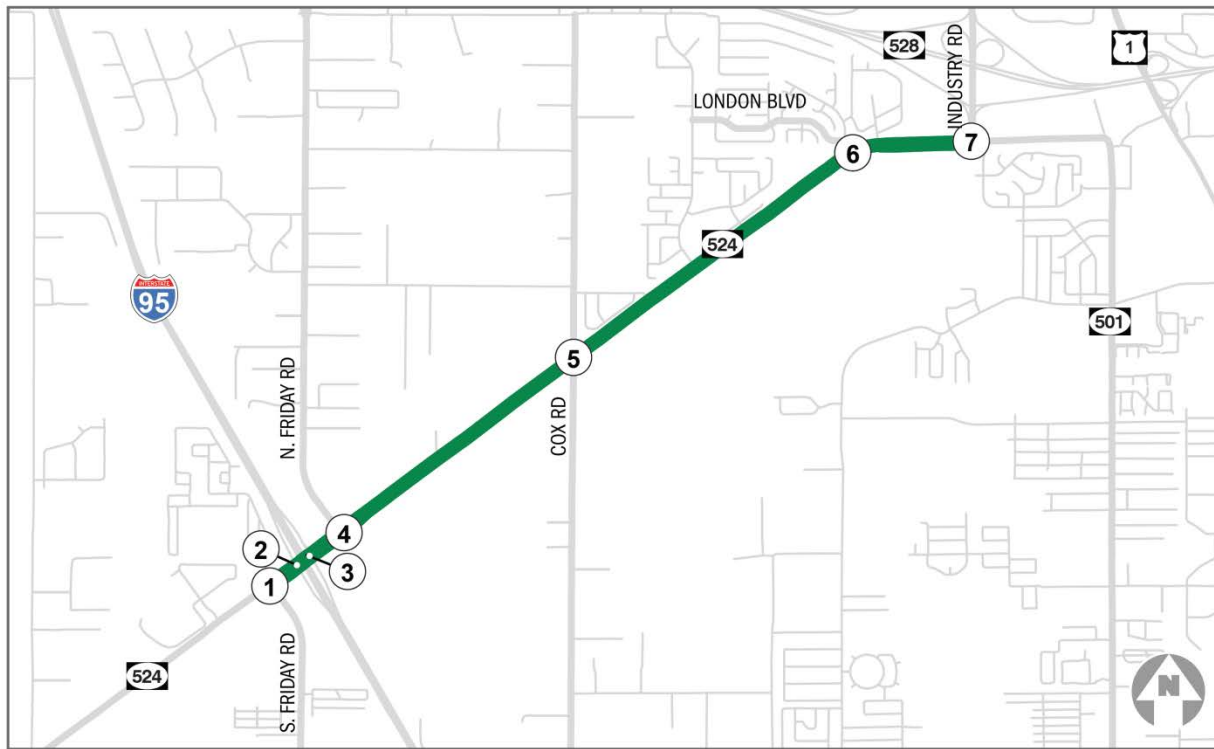
2.3 Intersection Configurations

Figure 2.4 identifies the existing lane configurations and traffic control at the seven major intersections along S.R. 524. These intersections include:

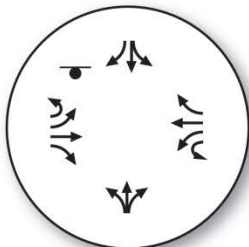
- Friday Road South
- I-95 Southbound Ramp
- I-95 Northbound Ramp
- Friday Road North
- Cox Road
- London Road
- Industry Road

The existing Cox Road, London Road and Industry Road intersections are signalized. There is another signalized intersection between London Road and Industry Road that serves the entrances of the Cocoa Commons and Coventry at Cocoa shopping centers. All other intersections in the corridor are un-signalized. The raised median on S.R. 524 on the west approach of Industry Road restricts access to driveways to right-in, right-out only movements between Industry Road and the signal serving both shopping centers. All intersections west of this raised median section have full movement access.

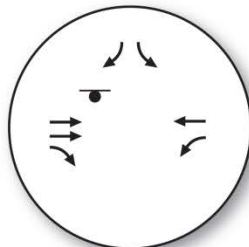
Figure 2.4: Existing Intersection Lane Configuration and Traffic Controls



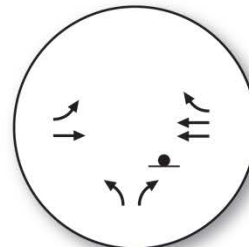
① SR 524 & S. Friday Rd.



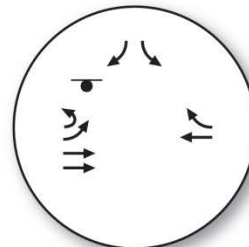
② SR 524 & I-95 SB Ramps



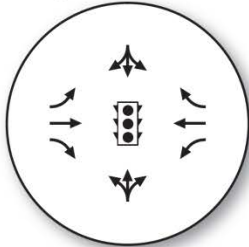
③ SR 524 & I-95 NB Ramps



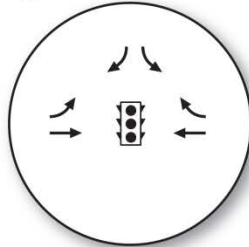
④ SR 524 & N. Friday Rd.



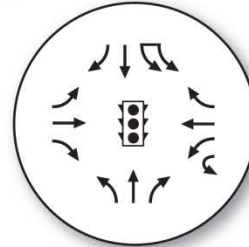
⑤ SR 524 & Cox Rd.



⑥ SR 524 & London Blvd.



⑦ SR 524 & Industry Rd.



 Traffic Signal
 Stop Sign

Source: VHB, 2016.

2.4 Pedestrian and Bicycle Facilities

Existing Facilities

There are limited existing pedestrian and bicycle facilities currently within the S.R. 524 Study Area. Figure 2.6 illustrates existing and future pedestrian/bicycle facilities on S.R. 524 and the surrounding road network (these facilities were observed by FDOT and Google Earth imagery). These features are also summarized in Table 2.3.

Table 2.3: Existing Pedestrian & Bicycle Facilities

Segment	Length	Pedestrian Facilities	Bicycle Facilities	Other Notes
1. Friday Rd South to Friday Road North	0.32 miles	None	None	Wide shoulder – could also be used as bicycle lane
2. Friday Road North to Cox Road	1.08 miles	None	None	Wide shoulder – could also be used as bicycle lane
2: Cox Road to Westminster Drive	0.57 miles	Sidewalk, north side only	None	Wide shoulder – could also be used as bicycle lane
3: Westminster Dr to Lance Blvd	0.23 miles	Sidewalk, north side only	None	Wide shoulder – could also be used as bicycle lane
4: Lance Blvd to London Blvd	0.49 miles	Sidewalk, north side only	None	Wide shoulder – could also be used as bicycle lane
5. London Blvd to Industry Road	0.49 miles	Sidewalk, north side only	Bicycle Lane, north side only	

Source: FDOT and Google Earth.

S.R. 524 – Friday Road South to Friday Road North

This is a rather small segment (0.32 miles), but nonetheless very important to the corridor and to the surrounding community as it contains the on and off ramps for I-95 north and south. This segment of roadway does not currently include any facilities for pedestrians or bicyclists, and has a posted speed limit of 45 mph. However, project stakeholders shared their concerns about the limited sight distance and frequent accidents at the I-95 interchange, particularly left turns from the southbound off ramp. The FDOT is currently conducting an Interchange Operational Analysis (IOAR) at this location to evaluate the need for signaling the ramp terminal intersections. In addition, the Traffic Impact Analysis (TIA) conducted for the Wal-Mart site also included a recommendation to signalize the I-95 ramp terminal intersections. These improvements, if implemented, would provide better protection for bicycle and pedestrian users.

S.R. 524 – Friday Road North to Cox Road

This section of S.R. 524 is about 1.08 miles long, and the posted speed limit increases from 45 mph to 55 mph just prior to a Traffic Monitoring Station (#411) just past Friday Road North. While this stretch of the road currently lacks pedestrian and bicycle facilities, there is sufficient existing right-of-way on both sides of S.R. 524 to include both bicycle lanes and sidewalks in potential future improvements.

S.R. 524 – Cox Road to Industry Road

The north side of S.R. 524 within this segment is dominated by several large residential neighborhood tracks, a golfing facility owned by Eastern Florida State College and other commercial land uses. There is a continuous sidewalk ranging from five to eight feet in width which starts at Cox Road and goes through the entire segment. There are six locations where bicycle lanes are provided on the north side of S.R. 524 which correspond with the right turn lanes at each intersection starting with the shopping center traffic signal and proceeding west to Cox Road.

The majority of south side of S.R. 524 within this segment is currently undeveloped and has only a small segment of sidewalk (five feet wide) which starts right before the traffic signal at the Cocoa Commons Shopping Center and extends through the east end of the corridor at Industry Road. This segment also has a bicycle lane adjacent to the right turning lane into the shopping center.

Stakeholders reported frequent pedestrian and bicycle activity on the north side of S.R. 524, though they noted that the current posted speeds and truck traffic (e.g. heavy trucks) can be intimidating for bicyclists trying to ride this stretch of road even with the bicycle lanes.

Intersecting Roadways – Bicycle and Pedestrian Facilities

North Cox Road and S.R. 501 have existing sidewalks, but no bicycle lanes. North of S.R. 524 for around a mile, Cox Road has sidewalks on the east side of the roadway, but south of S.R. 524, Cox Road has no sidewalks. The remaining major intersecting roads which currently lack these facilities, such as Friday Road South, Friday Road North, and Cox Road, have planned bicycle or pedestrian enhancements according to the Space Coast TPO (see Figure 2.6). Most of the neighborhoods on the north side of the corridor (east of Cox Road) have an inner sidewalk network which is connected to the existing sidewalk facilities on S.R. 524. However, the sidewalks do not extend into the shopping center parking lots.

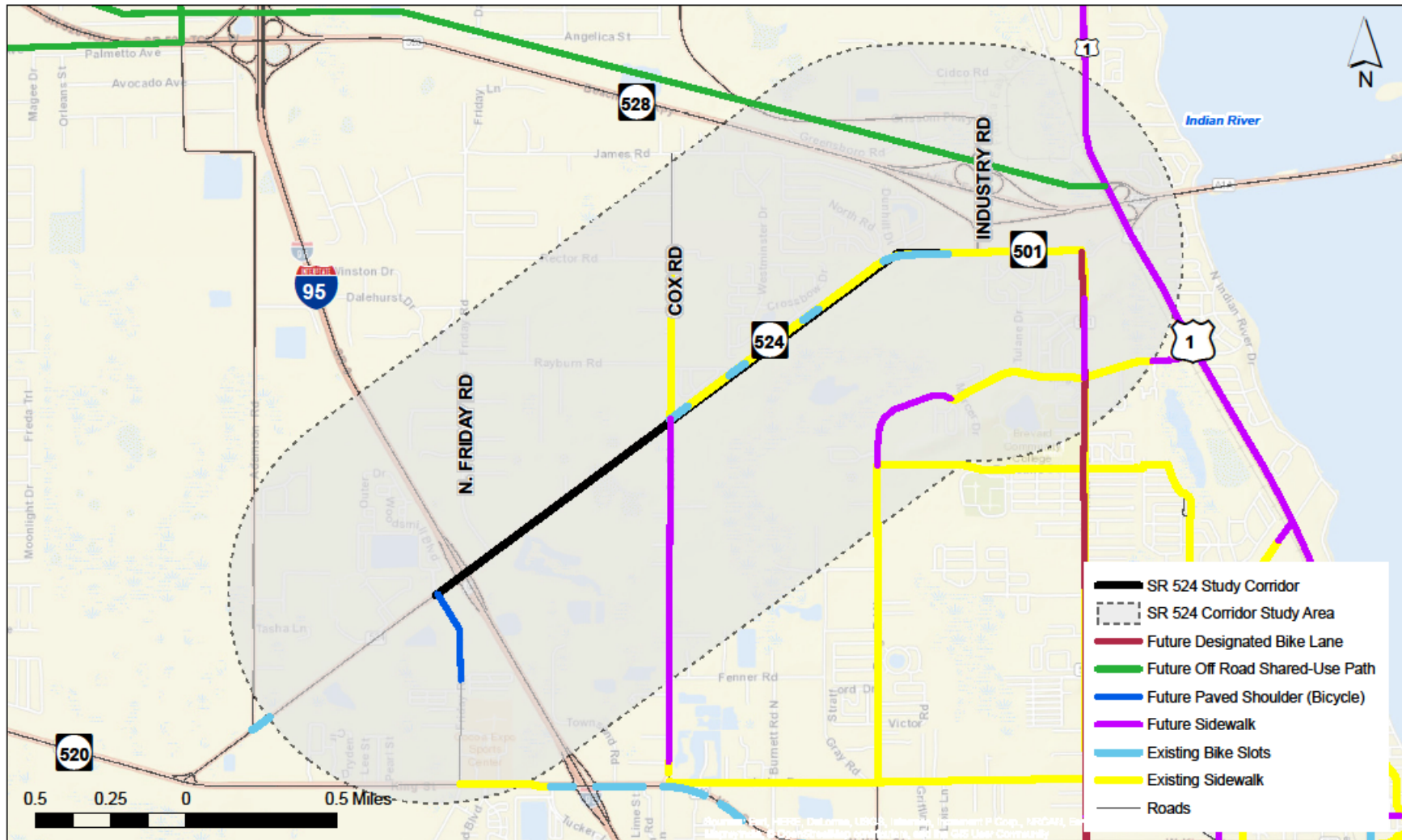
Crossing S.R. 524

There is currently only one marked connection between the north and south sides of S.R. 524 within the Study Area, which is located at the Cocoa Commons shopping center traffic signal on the east end. Since the south side of S.R. 524 is lightly developed, there are few existing connections between the south and north side. There are pedestrian refuge medians at select spots along S.R. 524 (e.g. the I-95 interchange area), but for the most part the corridor has painted medians or no medians at all. Most of the streets on the north side have marked crosswalks to make sure that drivers see pedestrians/bicyclists who are traveling east or west bound along these access points.

Planned/Programmed Facilities

The Space Coast TPO Bicycle and Pedestrian Mobility Plan establishes a planning framework and set of project priorities and program strategies to guide the Space Coast TPO and its partners toward development of a multimodal transportation network that complements local land use and economic development plans, and provides greater accessibility for regional and local transportation networks serving the community.

Figure 2.5: Pedestrian and Bicycle Facilities



Source: Space Coast Transportation Planning Organization, 2016.

2.5 Transit Service

Existing Service

The S.R. 524 Study Area is currently served by two Space Coast Area Transit (SCAT) bus routes – Route 6 and Route 8 (see Figure 2.7). Route 6 (Cocoa/Rockledge) connects S.R. 524 with Central/South Cocoa and Rockledge, and serves the east end of the S.R. 524 Study Area, making a loop in the Cocoa Commons (Publix) shopping center. Route 8 (West Cocoa) connects Western and Central Cocoa along S.R. 520, serving Friday Road South, just outside the S.R. 524 Study Area.

The frequency and span of service and average daily ridership of Routes 6 and 8 are shown in Table 2.4. Route 6 has strong ridership compared to other routes in the region, but Route 8 displays very low ridership numbers. Surveys collected from riders indicated that they were not satisfied with the frequency of SCAT service.

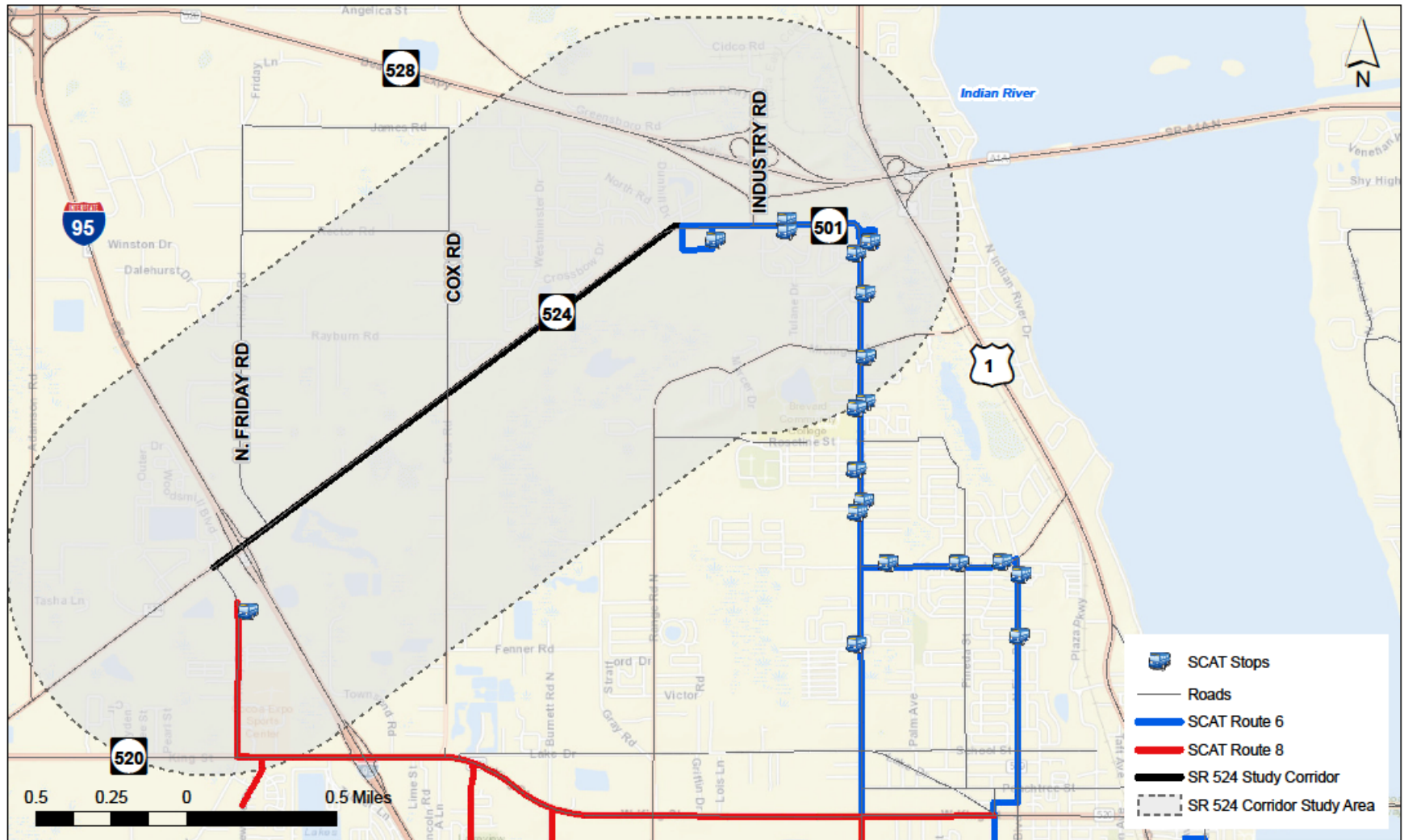
Table 2.4: Existing Transit Service

Route	Weekday Frequency (min.)	Weekday Daily Ridership (2013)	Weekday Span of Service	Saturday Span of Service
6	30 – 60 (M-F) 60 (S)	725	5:45 am – 8:12 pm	7:15 am – 6:10 pm
8	90 – 240 (M-F)	26*	6:45 am – 5:44 pm	N/A

Source: Space Coast Area Transit TDP, 2012 (pg. 37 & pg. 112).

**Based on 10 months of ridership data available.*

Figure 2.6: SCAT Transit Routes and Stops



Source: Space Coast Transportation Planning Organization, 2016.

Planned/Programmed Transit Service

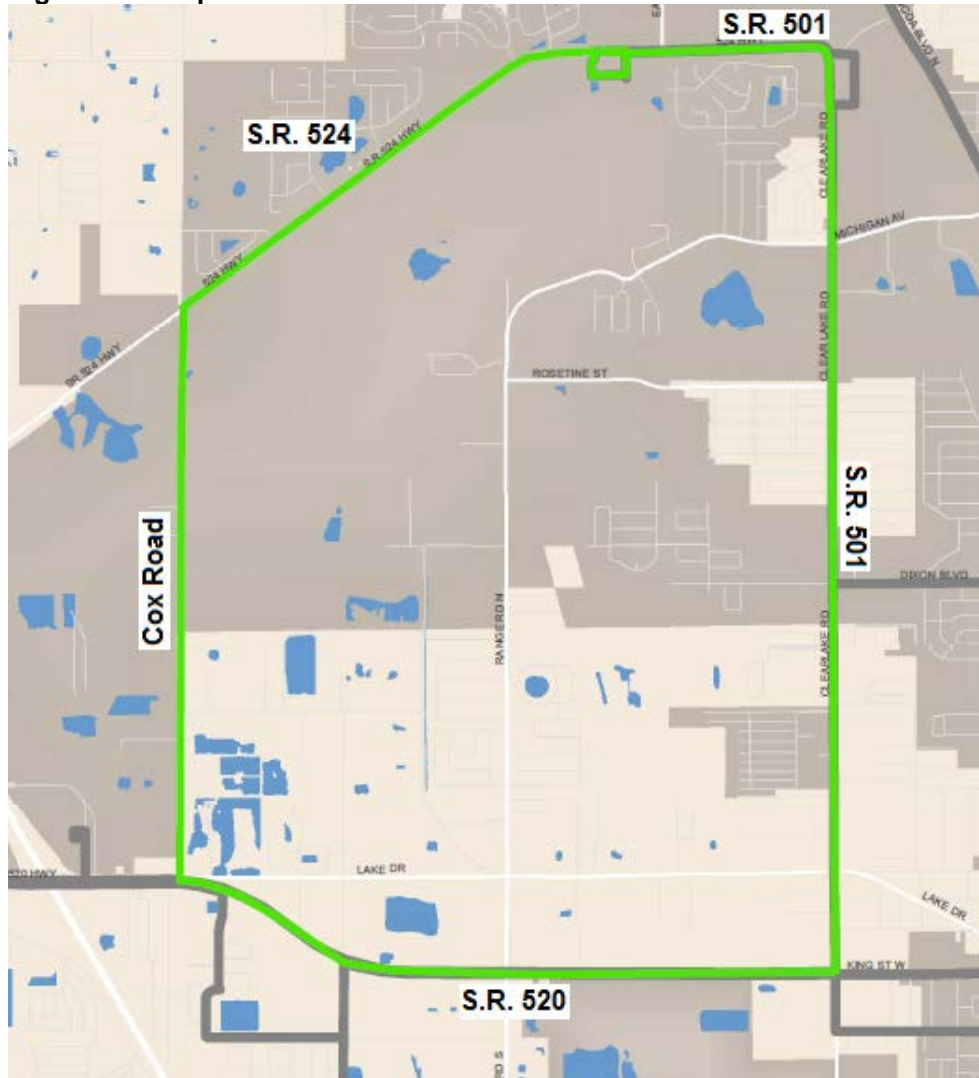
The County's transit vision includes regional multimodal and intermodal hubs, connected by roads, rail, and trails.

Local Service. The SCAT 2013-2022 Transportation Development Plan (TDP) outlines the Space Coast region's transit vision through 2022, and provides a variety of growth scenarios and proposed transit service. Using growth projections in West Cocoa and along S.R. 524, the TDP identifies a need for additional transit service in West Cocoa, also known as the *West Cocoa Circulator*. The West Cocoa Circulator, illustrated in Figure 2.8, would provide bus service along S.R. 524, S.R. 501, S.R. 520, and Friday Road South, covering a large share of the S.R. 524 Study Area. The SCAT Ten-Year TDP Operating Implementation Plan indicates that the West Cocoa Circulator could begin operation as early as 2021, pending the acquisition of operating funding.

In addition to the West Cocoa Circulator, the 2013-2022 TDP also proposes three other routes that would intersect the Study Area:

- Service from Friday Road South to the I-95 South Interchange.
- Service beginning at S.R. 528, cutting through S.R. 524 at Friday Road South, connecting to the Orlando International Airport.
- The "BCC Connector," would provide service from as far south at Palm Bay and as far north as Titusville.

Figure 2.7: Proposed SCAT West Coast Circulator



Source: Space Coast Area Transit TDP, 2012 (pg. 202).

Regional Service. In addition to local service within the region, the 2013-2022 TDP also outlines transportation trends along the East Coast of Florida that could have a significant impact on the S.R. 524 Study Area in the future. One of the largest potential impacts to the region could come from a new Brightline intercity rail station, located just outside of the S.R. 524 Study Area. Brightline is a high-speed rail network connecting Miami to Orlando, and is currently under construction by All Aboard Florida (AAF), along the existing rail corridor owned by Florida East Coast Railway (FECR). There are four confirmed Brightline station locations under construction, located in Miami, Fort Lauderdale, West Palm Beach, and at the Orlando International Airport (MCO); however, additional stations are likely to be developed and constructed along the rail corridor. AAF

is still determining the location of additional stations, through ridership analyses and discussions with regional and local agencies along the corridor.

In May 2016, the SCTPO and the Canaveral Port Authority announced their preference of S.R. 501 (Clearlake Road) as a potential Brightline station location, in a proposal to AAF, over eight other potential station sites in Brevard County.¹ The station location study criteria included available land, as well as proximity to highways and other key areas, such as Port Canaveral.² The proposed station location is displayed in Figure 2.9. The proposed Clearlake Road station would be developed on an 88-acre site near the railroad track southward curve, where trains would pass below S.R. 528 and begin traveling parallel with I-95 towards Miami. AAF already owns property at this curve, and FECR owns the Clearlake Road location parcel. SCTPO submitted their proposal to Brightline in May 2016 and AAF is currently working on a ridership study to determine if the Cocoa station location would be feasible.

Figure 2.8: Proposed Brightline Station Location: Cocoa



Source: <http://spacecoasttpo.com/wp-content/uploads/2015/10/AAF-Route-S.R.-528-Cocoa.pdf>

¹ <http://spacecoasttpo.com/wp-content/uploads/2015/11/RESOLUTION-16-14-Rail-Stations-revised3.pdf>

² <http://spacecoasttpo.com/wp-content/uploads/2016/06/AAF-Station-Report-final.pdf>

Vehicular Traffic Conditions

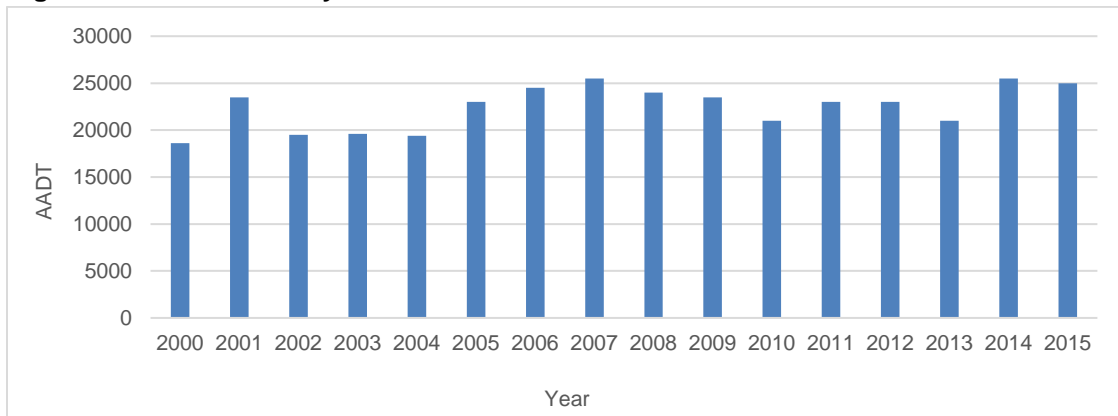
3.0 Vehicular Traffic Conditions

3.1 Overview

This section provides an analysis of the existing vehicular traffic conditions within the S.R. 524 Study Area and provides a foundation for potential areas where multi-modal facilities could best be implemented or enhanced. Historical Annual Average Daily Traffic (AADT) volumes, as documented by FDOT, are displayed in Figure 3.1 from 2000-2015, and in Table 3.1 by segment for the year 2015.

The amount of existing (2015) daily traffic along S.R. 524 within the Study Area range from a low of 4,800 vehicles/day west of the I-95 interchanges to 15,300 vehicles/day approaching the Industry Road intersection, as seen in Table 3.1. FDOT GIS data shows that there are currently two portable traffic monitoring sites on S.R. 524 within the corridor, one east of East Friday Road and the other near the Eastern State College Golf Academy. There are also traffic monitoring sites in close proximity to S.R. 524 including one on each of the I-95 ramps.

Figure 3.1: S.R. 524 Study Corridor AADT over Time



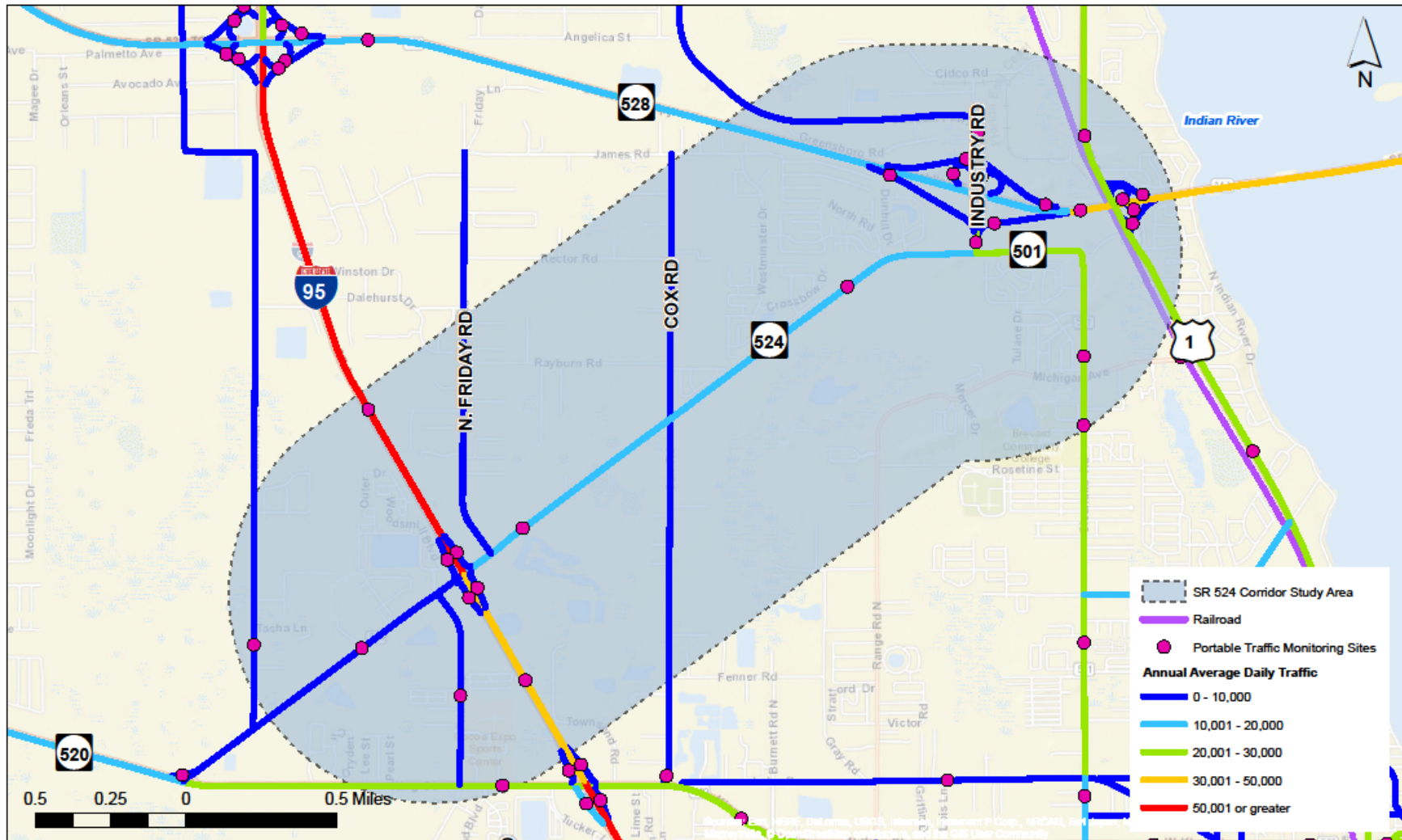
Source: FDOT Florida Traffic Online, 2015. <http://www2.dot.state.fl.us/floridatraficonline/viewer.html>

Table 3.1: S.R. 524 Study Corridor AADT (2015)

Segment	AADT	Truck AADT
Friday Road South to I-95 Interchanges	4,800	307 (6.4%)
I-95 Interchanges to Cox Road	10,700	856 (8.0%)
Cox Road to Industry Road	15,300	979 (6.4%)

Source: FDOT Florida Traffic Online, 2015. <http://www2.dot.state.fl.us/floridatraficonline/viewer.html>

Figure 3.2: Existing AADT & Traffic Monitoring Sites



Source: FDOT, 2016

3.2 Vehicle Classification Counts

Along S.R. 524, there is one portable traffic monitoring site that has been used by FDOT since 2000 and records vehicle classification counts. That site, Site 0411, is 0.2 miles east of the I-95 interchange along S.R. 524, and the vehicle classification data is listed below in Table 3.2. While overall AADT along the S.R. 524 corridor has generally increased in the last 5 years, the share of trucks has decreased since its record high value of 14.5 percent in 2013. Since then, the percentage of trucks on the corridor has averaged between 8.0 - 9.0 percent, with a small share of single-unit, combination, and multi-trailer trucks.

Table 3.2: Site 0411 Classification History Data

Year	AADT	Passenger Vehicles	Trucks	Single Unit Trucks	Combination Trailer Trucks	Multi Trailer Trucks
2015	10,700	92.0%	8.0%	4.0	4.0	0.0
2014	10,200	91.2%	8.8%	4.0	4.7	0.0
2013	10,100	85.5%	14.5%	6.0	8.1	0.4
2012	9,700	90.5%	9.5%	6.3	3.1	0.1
2011	9,900	90.8%	9.2%	6.8	2.5	0.0
2010	10,400	90.5%	9.5%	7.1%	2.4	0.0

Source: FDOT, 2016.

3.3 Intersection Turning Movement Counts

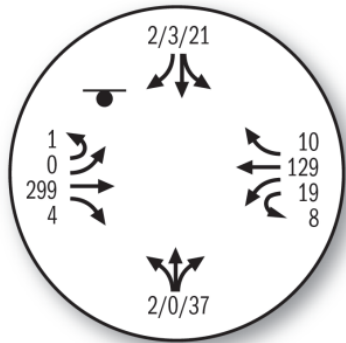
As part of the recent traffic impact study for the Wal-Mart Distribution Center on the south side of S.R. 524 east of I-95, weekday PM peak period traffic counts were obtained for the Friday Road South, I-95 Southbound Ramp, I-95 Northbound Ramp, Friday Road North, Cox Road, London Road, and Industry Road intersections. This was supplemented by weekday AM peak period counts obtained as part of the S.R. 524 Study for the similar intersections except for the two I-95 ramp intersections, which will be counted as part of the Interchange Operations and Access Report (IOAR) Study to be conducted by FDOT.

Traffic counts at Friday Road South, Friday Road North, London Road and Industry Road were obtained in May 2016. Traffic counts at Cox Road were obtained in March 2016 (PM) and August 2016 (AM). PM peak hour analysis results for the I-95 Southbound and Northbound Ramps were obtained from a previous traffic study conducted within the study area, as counts were not yet available. AM peak hour traffic volumes for the two I-95 ramp intersections are not yet available; AM peak hour analysis for these two intersections will be conducted later as part of the IOAR study. Seasonal factors were applied to the counts when appropriate.

Figures 3.3 and 3.4 present the adjusted weekday AM and PM peak hour intersection turning movements for 2016. The weekday AM peak hour generally occurs from 7 to 8 AM, with the weekday PM peak hour from 4:30 to 5:30 PM.

Figure 3.3: Existing AM Intersection Turning Movements

① SR 524 & S. Friday Rd.



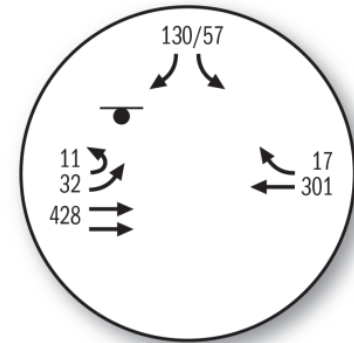
② SR 524 & I-95 SB Ramps



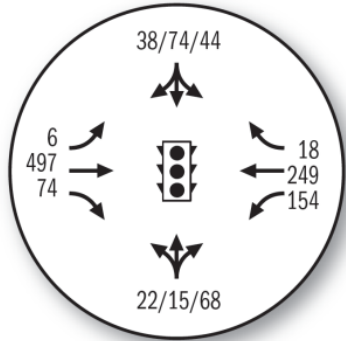
③ SR 524 & I-95 NB Ramps



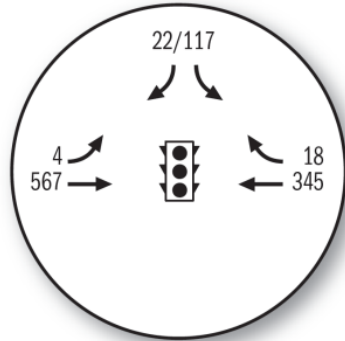
④ SR 524 & N. Friday Rd.



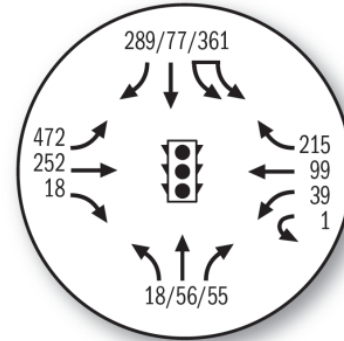
⑤ SR 524 & Cox Rd.



⑥ SR 524 & London Blvd.



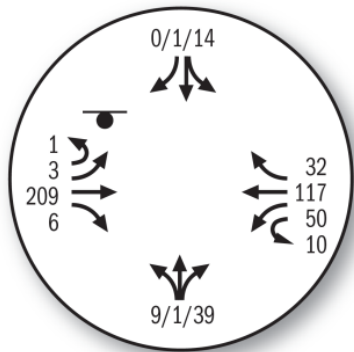
⑦ SR 524 & Industry Rd.



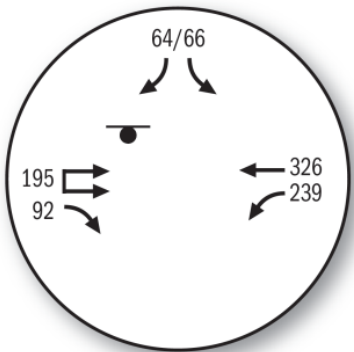
Source: VHB, 2016

Figure 3.4: Existing PM Intersection Turning Movements

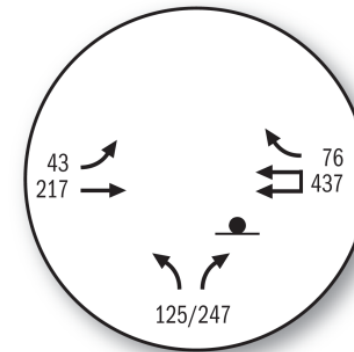
1 SR 524 & S. Friday Rd.



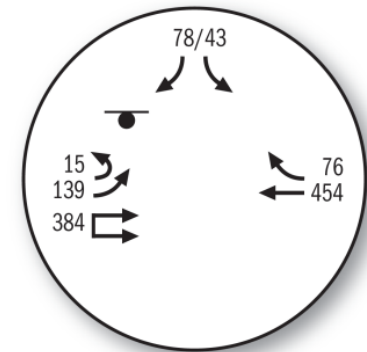
2 SR 524 & I-95 SB Ramps



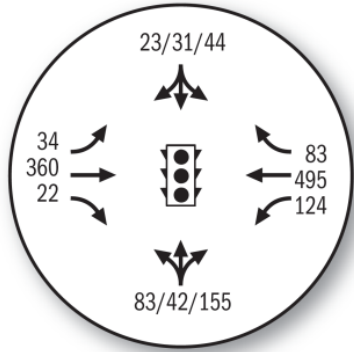
3 SR 524 & I-95 NB Ramps



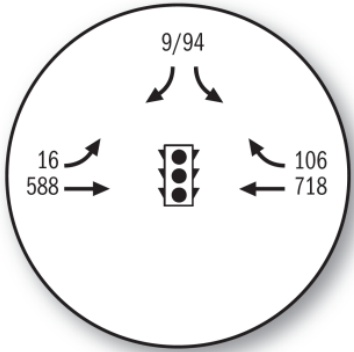
4 SR 524 & N. Friday Rd.



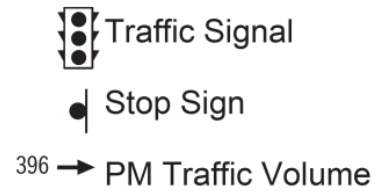
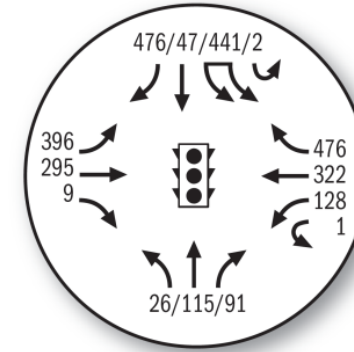
5 SR 524 & Cox Rd.



6 SR 524 & London Blvd.



7 SR 524 & Industry Rd.



Source: VHB, 2016

3.4 Intersection Traffic Operations Analysis

A traffic operations analysis was conducted for existing weekday AM and PM peak hour conditions at the seven major intersections listed below and as shown in Tables 3.3 and 3.4:

- Friday Road South
- I-95 SB Ramps
- I-95 NB Ramps
- Friday Road North
- Cox Road
- London Blvd
- Industry Road

In order to be more conservative, the traffic volume and corresponding truck percentage from each intersection's respective peak hour was used rather than assigning a constant peak hour to the entire corridor.

Intersection operations were analyzed using Synchro Version 9.1.908.56, in both the AM and PM peak hours. At signalized intersections, Synchro's "Lanes, Volumes, Timings" module was used to report intersection signal delay (in seconds per vehicle), the intersection volume to capacity (v/c) ratio, and the corresponding intersection level of service (LOS). At unsignalized intersections, Synchro's "HCM Unsignalized" module was used to report the intersection's critical movement and corresponding delay, (v/c) ratio, and LOS.

The Synchro analysis indicated that all of the Study Area intersections are currently operating at LOS D or better in the existing conditions. The analysis also showed that each of the signalized intersections is operating at LOS A or B in both the AM and PM peak hours and that none of the individual signalized movements are operating at a failing level of service. The only intersection that the analysis indicated was operating at LOS D was the unsignalized S.R. 524 at I-95 SB Ramps intersection. The analysis indicated that the critical movement (southbound left-turn) is operating at LOS D in the PM peak hour.

Table 3.3: Existing Weekday AM Peak Hour Intersection Operating Conditions

Synchro Intersection #	S.R. 524 Cross Street	Signalized Intersection MOEs			Unsignalized Intersection MOEs			
		Int LOS	Del	V/C	Critical Movement (CM)	CM LOS	CM Delay (s/veh)	CM (V/C)
1	Friday Road South	-	-	-	SBTL	B	12.0	0.05
2	I-95 SB Ramps	-	-	-	To be analyzed in interchange study			
3	I-95 NB Ramps	-	-	-				
4	Friday Road North	-	-	-	SBRL	B	13.2	0.30
5	Cox Road	B	12.4	0.55	-	-	-	-
6	London Road	A	9.6	0.53	-	-	-	-
7	East Industry Road	B	18.0	0.63	-	-	-	-

Source: Analyzed using Synchro's HCM 2000 Unsignalized Intersection Capacity Analysis & Synchro's Lanes, Volumes, Timings Methodology

Table 3.4: Existing Weekday PM Peak Hour Intersection Operating Conditions

Synchro Intersection #	S.R. 524 Cross Street	Signalized Intersection MOEs			Unsignalized Intersection MOEs			
		Int LOS	Del	V/C	Critical Movement (CM)	CM LOS	CM Delay (s/veh)	CM (V/C)
1	Friday Road South	-	-	-	SBTL	B	14.1	0.04
2	I-95 SB Ramps	-	-	-	SBL	D	25.8	0.28
3	I-95 NB Ramps	-	-	-	NBL	B	14.2	0.39
4	Friday Road North	-	-	-	SBRL	C	15.7	0.26
5	Cox Road	B	13.8	0.62	-	-	-	-
6	London Road	A	6.7	0.47	-	-	-	-
7	East Industry Road	B	19.5	0.70	-	-	-	-

Source: Analyzed using Synchro's HCM 2000 Unsignalized Intersection Capacity Analysis & Synchro's Lanes, Volumes, Timings Methodology

3.5 Local Access Conditions

All intersections in the S.R. 524 study corridor have full movement access except the two unsignalized driveways serving the existing shopping centers on both sides of S.R. 524 west of Industry Road. In addition to these and the other seven major intersections, there are five added local street intersections under stop sign control along the corridor:

- Thien Thai Lane
- Pinyon Drive
- Westminster Drive
- Lance Boulevard
- Coventry Court

3.6 Field Review Observations

The only existing potential traffic conflicts in the S.R. 524 study corridor are periodic backups of traffic in the eastbound left turn lane at Industry Road, and the short weaving section for traffic from the I-95 Northbound off-ramp to turn onto northbound Friday Road North (though this is a minor movement). Crash experience in the study corridor is presented in the next section.

3.7 Overall Travel Patterns

S.R. 524 is an important connector from Orlando to Port Canaveral. Existing posted speeds along S.R. 524 within the Study Area range from 45 to 55 miles/hour, and heavy truck traffic occurs along this stretch, coming to/from the Brevard County Central Disposal Facility (2250 Adamson Road) which is about a five mile drive from the corridor. According to 2014 U.S. Census Data, around 84 percent of the Study Area's population drives alone to work, around 10 percent carpool to work, and around 2 percent take transit to work, as seen in Table 3.5.

Table 3.5: Local Resident Travel Patterns

Census Tract	Jobs	Drive Alone	Carpool	Transit
621.03	1,120	1,000 (89%)	103 (9%)	0 (0%)
621.07	39	36 (93%)	1 (1%)	0 (0%)
623.02	281	225 (80%)	28 (10%)	0 (0%)
624	1,227	998 (81%)	136 (11%)	69 (6%)
625	263	202 (77%)	32 (12%)	2 (1%)
712	69	59 (85%)	6 (9%)	0 (0%)
715	45	36 (80%)	3 (7%)	0 (0%)
Total	3,044	2,555 (84%)	309 (10%)	70 (2%)

Source: American Community Survey, 2016

Safety Analysis

4.0 Safety Analysis

Crash data for the corridor was obtained from the FDOT Crash Analysis Reporting System (CARS) for the most recent four year period available (2010 to 2014). The data obtained from CARS was utilized for Table 4.1 and Figure 4.1, while the maps in Figures 4.2 and 4.3 were completed using shapefiles from the FDOT GIS online website.

4.1 Crash History

From 2010 to 2014, there were approximately 124 crashes along S.R. 524 within the Study Area. Of these crashes, three were fatal, 60 involved injuries and 61 involved only property damage. The overwhelming majority of crashes involved one or more vehicles, whereas pedestrian and bicycle involved crashes amounted to 3 percent of total crashes for this time period. Table 4.1 shows the crash type (users involved in the crash), the severity of the crash and the average crash rate for each segment of S.R. 524 in the corridor. Figure 4.1 displays the trend of each crash type from 2010 to 2014. While crash fatalities and crash injuries were somewhat stable, crashes that caused property damage increased steadily from 2010 to 2014.

4.2 Comparison to Statewide Average

The average crash rate on S.R. 524 within the Study Area was typically greater than the average rates that were recorded on comparable roads statewide. Crash rates within the I-95 interchange area were more than triple the statewide comparable rates. Friday Road South to I-95 and London Blvd. to S.R. 501 were also segments with crash rates greatly exceeding statewide averages (see Table 4.1). Figure 4.2 provides a visual of where crash rates are the greatest on average in the Study Area. A higher crash rate likely means that more crashes are occurring on a roadway segment per the estimated number of vehicles which are traveling on that segment during an average day.

Table 4.1: Crash Experience by Type (2010-2014)

Crash Location	Crashes	Impact Type						Location					
		Side Swipe	Angle	Rear End	Head-On	Other	Unkwn	On-Road	Median	Shoulder	Off-Road	Outside of ROW	Unkwn
Friday Road South to I-95	1	0	0	0	0	0	0	0	0	0	0	0	0
I-95 Interchange	23	1	6	2	1	8	1	10	0	2	3	0	4
I-95 to Friday Road North	12	0	2	1	1	4	0	6	0	0	0	0	2
North Friday Road to Cox Road	14	0	2	5	0	1	0	6	0	0	1	0	1
Cox Road to London Blvd	21	0	6	6	2	5	0	9	0	1	4	0	5
London Blvd. to S.R. 501	53	0	5	21	3	9	3	26	1	1	6	0	7
Total (2010-2014):	124	1	21	35	7	27	4	57	1	4	14	0	19

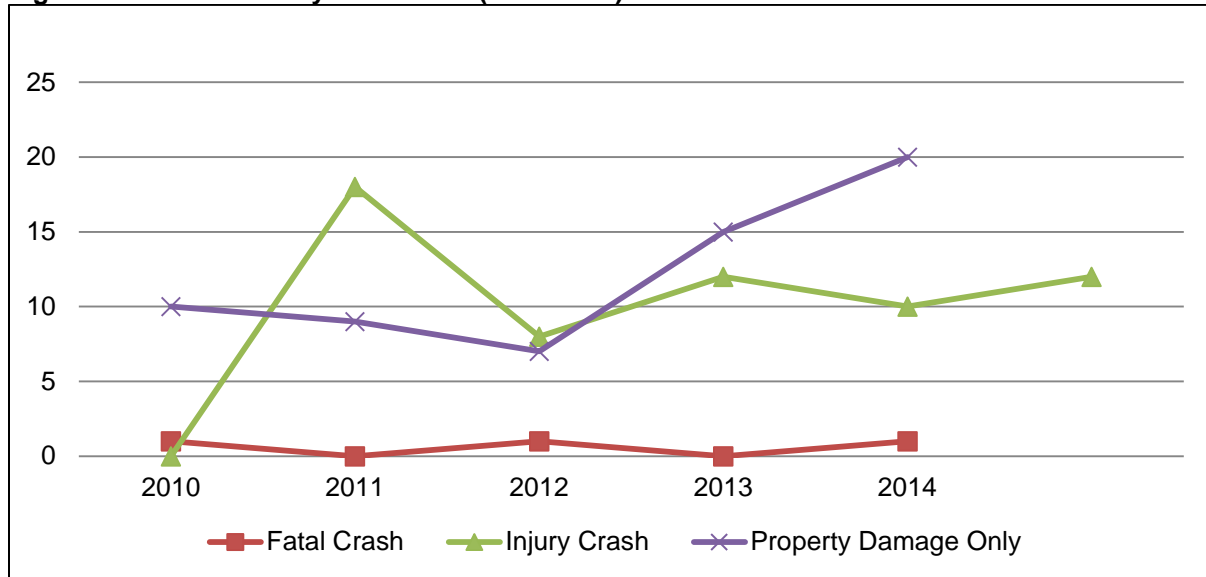
Source: FDOT CAR System, 2016.

Table 4.2: Crash Experience by Severity (2010-2014)

Crash Location	Crashes	Pedestrian Involved	Bicycle Involved	Crash Severity			*Average Crash Rate	
				Fatal	Injury	Property Damage Only	S.R. 524 Study Area	Statewide
Friday Road South to I-95	1	0	0	0	1	0	6.15	2.63
I-95 Interchange	23	0	0	1	11	11	6.98	2.25
I-95 to Friday Road North	12	1	0	0	6	6	4.30	2.63
North Friday Road to Cox Road	14	0	0	0	6	8	0.28	0.93
Cox Road to London Blvd	21	1	1	2	9	10	0.32	1.72
London Blvd. to S.R. 501	53	1	0	0	27	26	4.65	2.38
Total (2010-2014):	124	3	1	3	60	61		

Source: FDOT CAR System, 2016.

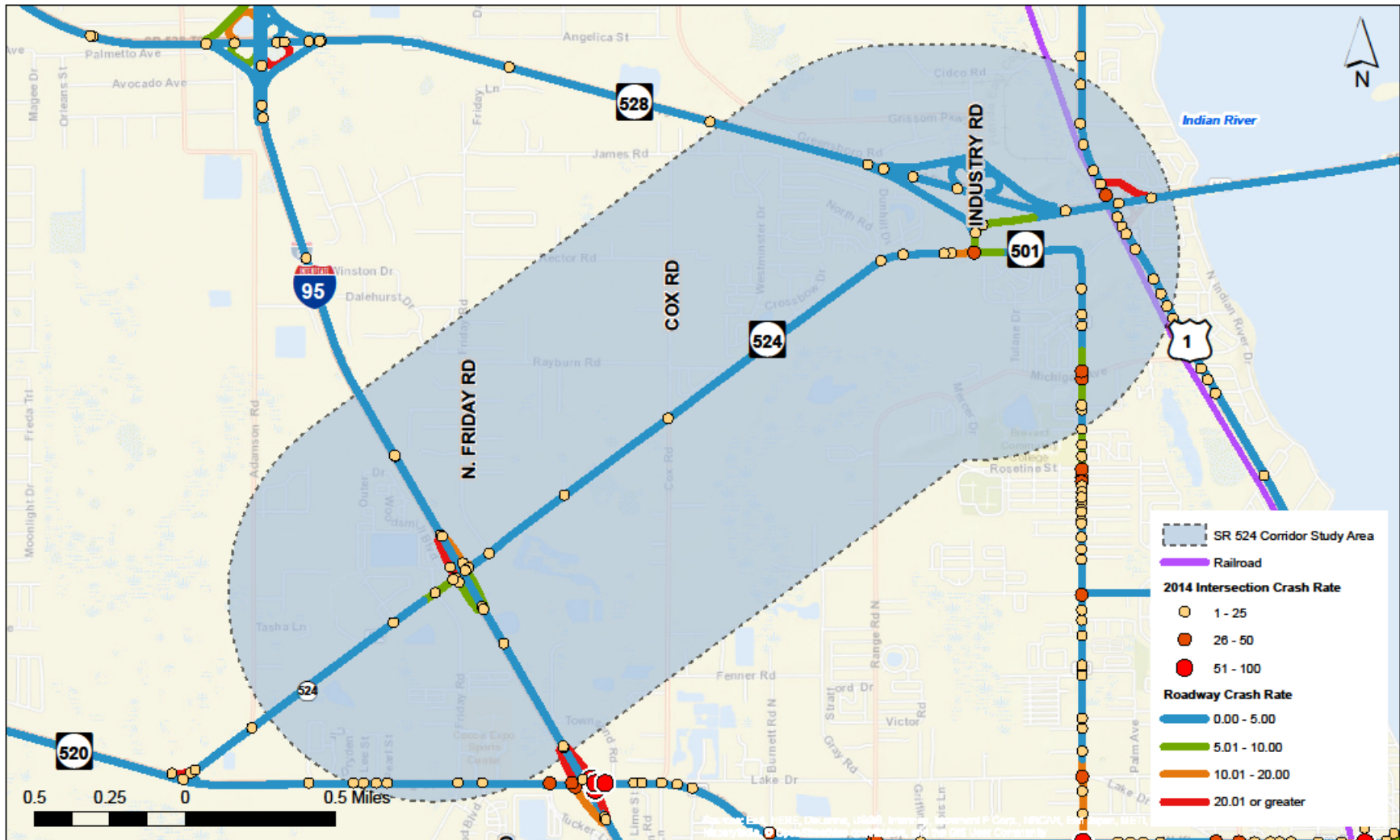
Figure 4.1: Crash History in Corridor (2010-2014)



Source: FDOT CAR System, 2016.

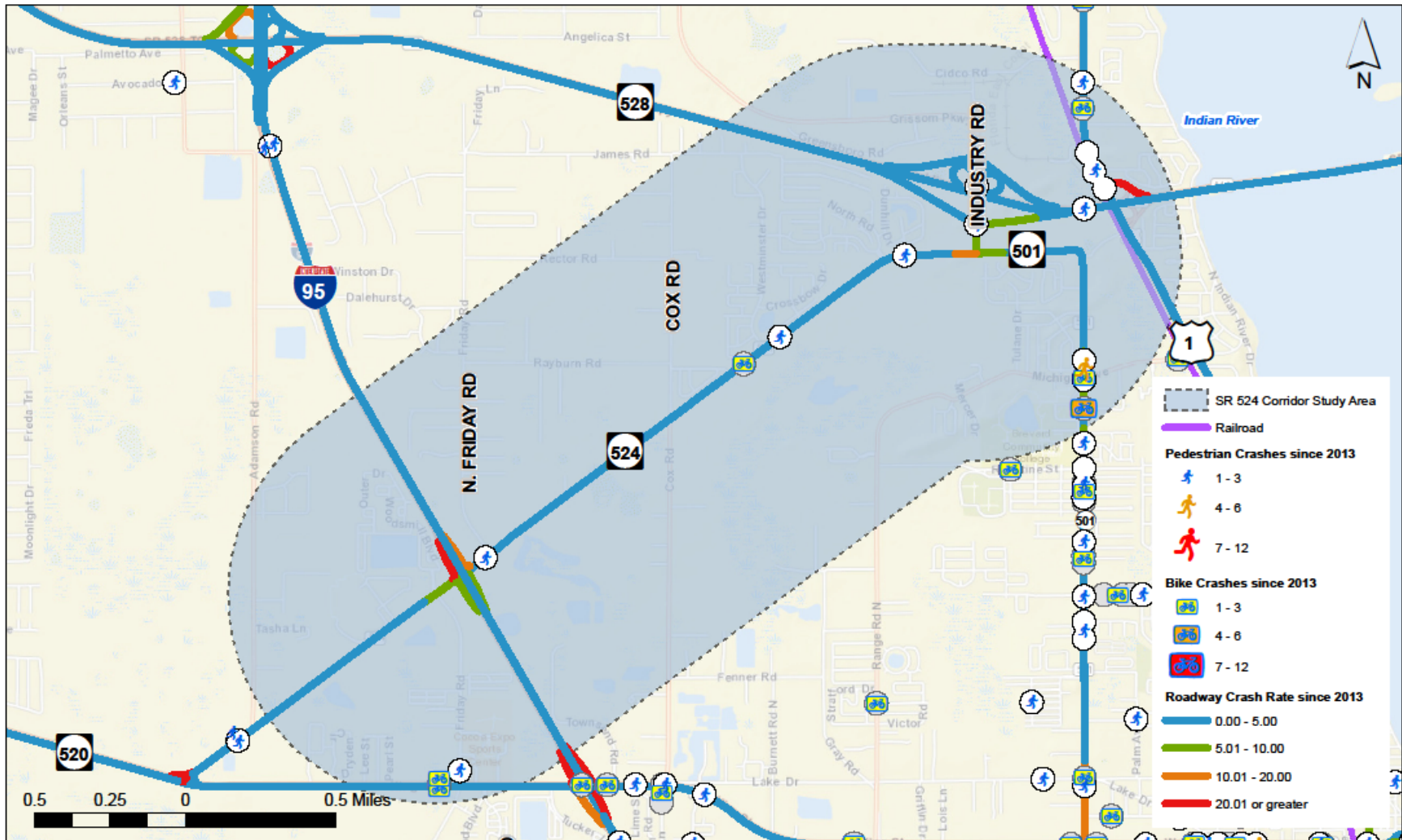
Figure 4.3 shows the locations of bicycle and pedestrian involved accidents from 2009 to 2013. There were three pedestrian crashes during this time period, near the Friday Road North intersection, between Westminster Drive and Lance Boulevard and one at the Coventry Court intersection. A bicycle involved crash was recorded in January 2013 in the CARS data just west of Westminster Drive at mile post 3.358, however this data point was not present in the latest FDOT GIS file available (“Bicyclist-Involved Crash Clusters and Counts in Florida from 2009 through 2013”) and was added as a graphic to Figure 4.3 below.

Figure 4.2: Vehicle Crash Rate & Intersection History Map (2010-2014)



Source: FDOT, 2016.

Figure 4.3: Pedestrian and Bicycle Crash History Map (2009-2013)



Source: FDOT, 2016.

Land Use and Demographic Characteristics

5.0 Land Use and Demographic Characteristics

5.1 Overview and Study Area

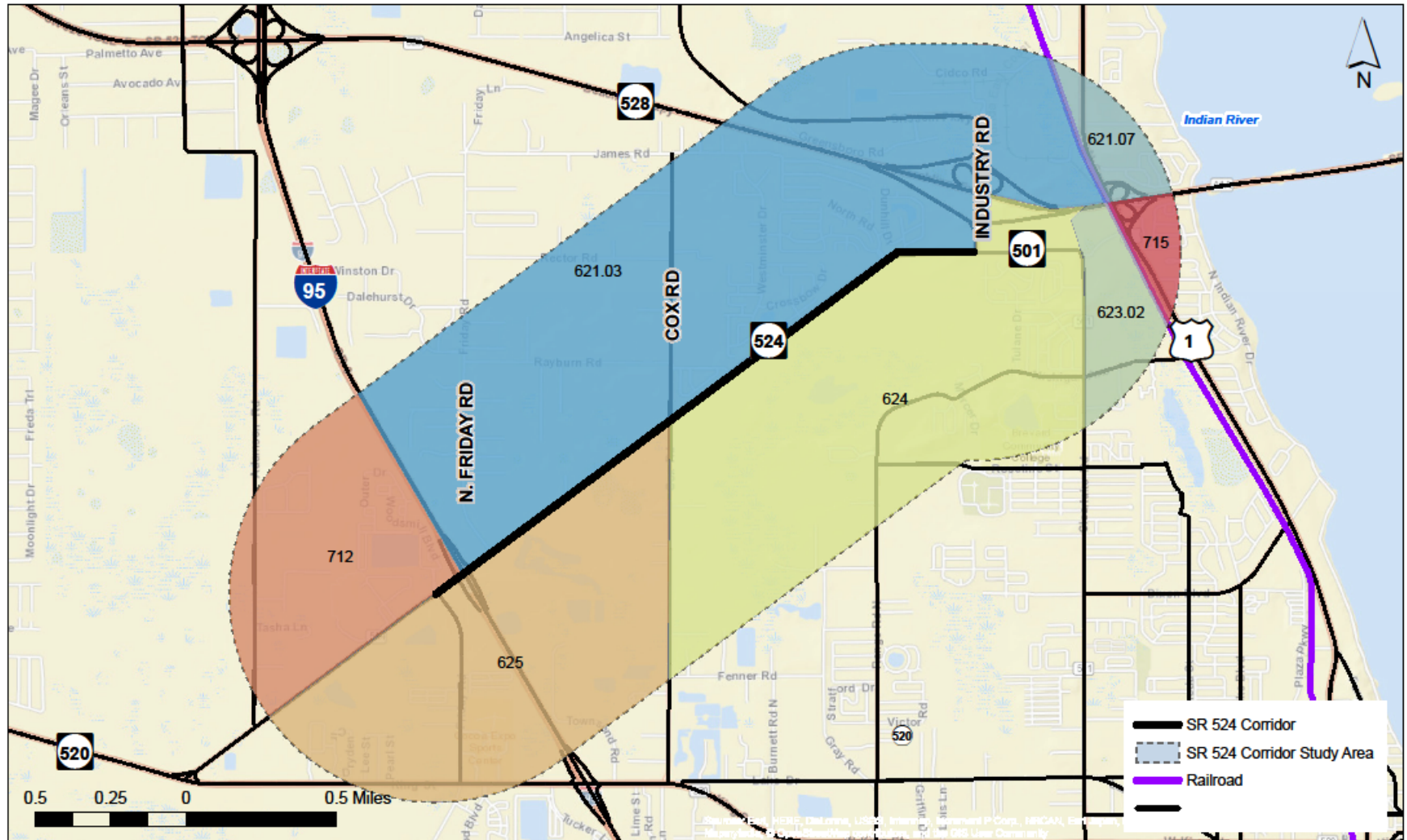
This chapter presents data on existing population, housing, income, employment, and land use data within the S.R. 524 Study Area. To define the Study Area, a one mile buffer was drawn around S.R. 524 between Friday Road South and Industry Road. A map of all Census Tracts in Brevard County was overlaid, and seven of those Census Tracts were found to intersect the one mile buffer. To further narrow down the Study Area, the seven Census Tracts were clipped to include only the portions within one mile of the S.R. 524 centerline, listed in Table 5.1. The final Study Area totals 12.2 square miles. The location of the Census Tracts and one mile buffer is displayed in Figure 5.1.

Table 5.1: Study Area

Census Tract	Total Area of Census Tracts (sq miles)	Total Area of Census Tracts within Study Area (sq miles)
621.03	14.298	4.642
621.07	7.327	0.239
623.02	1.423	0.365
624	6.191	3.135
625	13.455	2.377
712	111.045	1.283
715	4.307	0.159
Total	158.046	12.200

Source: U.S. Census American Community Survey, 2014

Figure 5.1: S.R. 524 Study Area



Source: U.S. Census American Community Survey, 2014.

5.1 Demographic Characteristics

Population & Housing

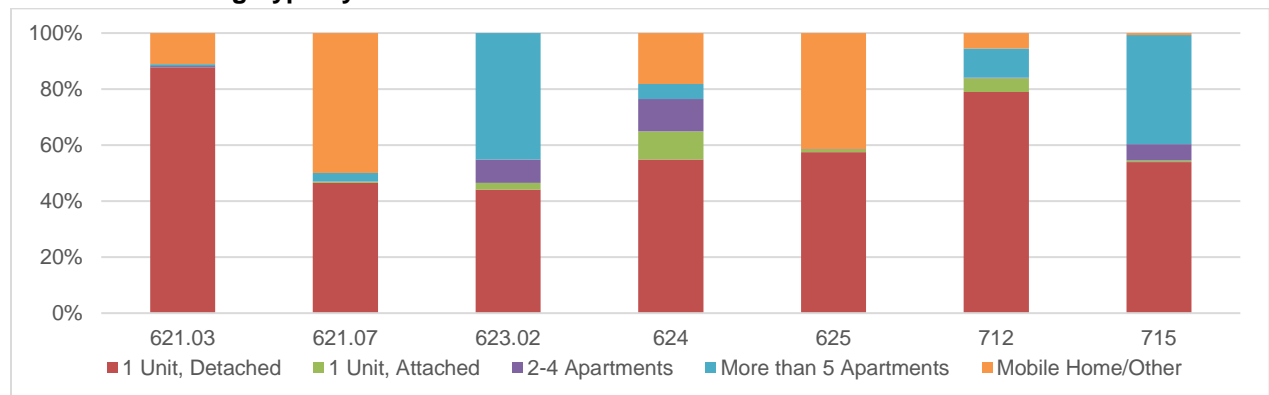
The S.R. 524 Study Area straddles the City of Cocoa (to the south of S.R. 524) and unincorporated Brevard County (to the north of S.R. 524). According to the 2014 Census data, there are an estimated 7,666 residents and 2,969 households within the Study Area (Table 5.2). Of the Study Area households, around 69 percent are owner-occupied, on par with County and State averages. The average median home value within the Study Area is \$130,242, significantly lower than both the County and State averages. The majority of housing types are detached single-family homes, while other areas have a higher share of multi-family housing or other types (Table 5.3). One distinguishing characteristic of the Study Area, however, is the significantly large share of mobile homes (as high as 49.9 percent in Census Tract 621.07 and averaging 18.1 percent), as compared with the County and State averages (7.3 and 8.4 percent, respectively).

Table 5.2: Population and Household by Census Tract

Census Tract	Population	Households	Owner-Occupied	Median Home Value	Mobile Home
621.03	2,541	952	894 (94%)	\$148,200	11.0%
621.07	94	41	32 (77%)	\$75,800	49.9%
623.02	813	341	119 (35%)	\$61,300	0.0%
624	3,150	1,222	739 (60%)	\$69,800	18.2%
625	809	308	214 (70%)	\$110,800	41.2%
712	163	60	47 (79%)	\$180,300	5.5%
715	97	46	32 (70%)	\$265,500	0.7%
Study Area Total	7,666	2,969	2,077 (69%)	\$130,242	18.1%
County Total	548,891	221,582	160,380 (72%)	\$148,200	7.3%
State Total	19,361,792	7,217,508	4,772,944 (66%)	\$165,200	8.4%

Source: U.S. Census American Community Survey, 2014

Table 5.3: Housing Type by Census Tract



Source: U.S. Census American Community Survey, 2014

Income, Race, and Language

Census data on income, race, and limited English proficiency within the S.R. 524 Study Area is summarized in Table 5.4. A significant number of households in the Study Area were classified as “low-income,” according to the 2015 Census, as high as 41.0 percent in Census Tract 623.02 and averaging 20.7 percent across the Study Area. The share of residents considered “minority” according to the Census, 19.4 percent, fell between the County and State averages of 16.8 and 23.8 percent, and the share of residents considered “limited English proficient,” 1.4 percent, fell below both the County and State average.

Table 5.4: Income, Race, and Language by Census Tract

Census Tract	Share of Study Area Residents Considered “Low-Income”	Share of Study Area Residents Considered “Minority”	Share of Study Area Residents Considered “Limited English Proficient”
621.03	9.3%	10.1%	1.3%
621.07	17.2%	4.5%	0.0%
623.02	41.0%	34.8%	0.5%
624	31.2%	24.0%	5.3%
625	29.9%	39.8%	1.1%
712	6.0%	13.0%	0.8%
715	10.5%	9.6%	0.6%
Study Area Average	20.7%	19.4%	1.4%
County Average	14.0%	16.8%	1.6%
State Average	16.7%	23.8%	6.8%

Source: U.S. Census American Community Survey, 2014.

Employment and Commuting

There are an estimated 3,044 employed residents in the Study Area, averaging a median income of \$46,795. Looking at Study Area jobs by occupation in Table 5.5, there is a higher share of Service jobs and Production/Transportation/Material Moving jobs, both slightly higher than the County and State averages. The Study Area also has a lower share of Management/Business/Science/Arts jobs, but is on par with other averages for Sales/Office and Natural Resource/Construction/Maintenance jobs. Looking at Study Area jobs by industry in Table 5.6, there is overall consistency of job types and industries with both Brevard County and State averages.

Table 5.5: Occupation by Census Tract

Census Tract	Management, Business, Science, Arts	Service	Sales/Office	Natural Resource, Construction, Maintenance	Production, Transportation, Material Moving
621.03	37.9%	13.5%	27.6%	10.9%	10.2%
621.07	30.0%	22.6%	21.6%	7.3%	18.6%
623.02	29.3%	29.4%	24.1%	2.6%	14.8%
624	13.5%	28.7%	25.8%	20.6%	11.3%
625	30.2%	24.2%	24.9%	10.4%	10.3%
712	42.9%	14.5%	26.7%	7.2%	8.8%
715	40.7%	22.8%	26.9%	4.6%	5.1%
Study Area Total	32.1%	22.2%	25.4%	9.1%	11.3%
County Total	36.9%	19.7%	25.6%	8.4%	9.3%
State Total	33.8%	20.7%	27.5%	9.0%	9.0%

Source: U.S. Census American Community Survey, 2014.

Table 5.6: Industry by Census Tract

Census Tract	Agriculture, Forestry, Fishing, Hunting, Mining	Construction	Manufacturing	Wholesale Trade	Retail Trade	Transportation, Warehousing, and Utilities	Information	Finance, Insurance, Real Estate, Rental, Leasing	Professional, Scientific, Management, Administrative	Education Services, Health Care, Social Assistance	Arts, Entertainment, Recreation, Accommodation, Food Services	Other Services	Public Administration
621.03	0.0	8.7	12.7	1.3	8.7	4.4	1.8	3.7	13.9	27.6	7.7	2.1	7.4
621.07	0.5	8.7	13.4	2.7	15.1	1.7	0.7	7.6	13.3	19.2	15.2	0.0	2.0
623.02	0.0	0.0	5.2	1.1	10.9	4.2	1.7	0.7	22.3	25.5	6.4	14.1	7.7
624	0.4	13.2	5.9	1.9	16.4	2.6	0.3	2.4	8.7	15.8	20.3	7.5	4.5
625	0.0	11.1	5.5	3.3	15.7	1.2	2.2	3.0	13.8	18.4	9.1	12.9	3.7
712	0.3	6.3	10.0	1.8	10.2	4.2	2.4	8.3	11.4	19.6	7.8	6.5	11.2
715	0.0	4.4	7.4	2.8	12.6	7.9	0.9	8.5	13.9	27.4	9.0	3.6	1.6
Study Area Total	0.2	7.5	8.6	2.1	12.8	3.7	1.4	4.9	13.9	21.9	10.8	6.7	5.4
County Total	0.4	6.1	10.7	2.0	13.4	3.9	1.7	5.2	13.5	21.5	10.4	5.1	6.1
State Total	1.1	6.5	5.3	2.9	13.4	5.0	2.0	7.6	12.6	21.4	12.0	5.4	4.8

Source: U.S. Census American Community Survey, 2014.

In terms of commuting patterns displayed in Table 5.7, the Study Area falls in line with typical patterns of Brevard County and the State, with the vast majority of workers driving alone (between 75-90%), a small number of workers carpooling (between 8-12%), and a smaller number using transit or alternative modes of transportation (less than 3-5%).

Table 5.7: Jobs, Industry, and Travel Time by Census Tract

Census Tract	Total Workers above 16	Median Income	Travel Time to Work	Workers Who Drive Alone	Workers Who Carpoled
621.03	1,120	\$53,627	26.8	89%	9%
621.07	39	\$50,037	20.3	93%	15%
623.02	281	\$21,042	22.0	80%	10%
624	1,227	\$30,345	22.8	81%	11%
625	263	\$35,646	19.0	77%	12%
712	69	\$74,937	29.6	85%	9%
715	45	\$62,935	20.9	80%	7%
Study Area Total	3,044	\$46,795	23.1	84%	10%
County Total	223,352	\$43,281	24.1	82%	9%
State Total	8,228,557	\$42,433	26.1	80%	10%

Source: U.S. Census American Community Survey, 2014.

5.2 Existing and Future Land Use in the Corridor

The S.R. 524 Study Area covers 12.2 square miles and 4,688 parcels of land, listed in Table 5.8. Existing and future land uses for each parcel are illustrated in Figure 5.2 and 5.3, and are further described in the following sections. As Brevard County grows between today and 2040, the makeup of land uses in the S.R. 524 Study Area is expected to change as new development occurs. The Study Area Future Land Use Map is illustrated in Figure 5.4. Though the major land uses in the Study Area are projected to remain the same, the proportions of the land uses will change with new industrial/commercial developments and new residential developments. Brevard County has zoned the majority of currently vacant sites as either low-density residential (5 units/acre maximum) or medium-density residential (12 units/acre maximum), with a larger share zoned low-density. The location of future commercial and industrial land uses remain clustered near existing commercial and industrial development, to the west/east ends of the Study Area.

Table 5.8: Existing Land Use by Type

Land Use Type	Total Parcels	Total Area (sq miles)	Vacant Parcels
Single-Family Residential	3,979 (85%)	4.642 (38%)	315
Vacant	483 (10%)	0.239 (2%)	-
Industrial	134 (3%)	0.365 (3%)	66
Commercial	51 (1%)	3.135 (26%)	67
Multi-Family Residential	0 (0.0%)	0	17
Institutional	30 (1%)	2.377 (19%)	2
Agricultural	11 (0.2%)	1.283 (11%)	0
Recreation	1 (0.0%)	0.159 (1%)	0
Other	0 (0.0%)	0	16
Total	4,688	12.200	483

Source: Brevard County Property Appraiser, 2016.

Residential Land Uses and Demographics

Developed residential land uses make up the majority of existing land uses amongst all available parcels within the S.R. 524 Study Area, at 85 percent of the parcels and 38 percent of the land area. Most of these residential sites are located in subdivisions on the north side of S.R. 524 between Friday Road South and Industry Road.

Vacant Land Uses

Vacant land uses make up the second largest share of the S.R. 524 Study Area in terms of parcels, summarized in Table 5.9. Vacant land uses account for 10 percent of the total parcels, but only 2 percent of the land area, indicating that the majority of the vacant parcels are small. Out of the 483 vacant parcels, the majority (315 parcels or 65.2 percent) are zoned “Single-Family Residential” and lie adjacent to existing residential land uses north of S.R. 524 between Friday Road South and Industry Road. There are 67 vacant commercial parcels in the Study Area (13.9 percent), averaging 2.4 acres each, and 66 vacant industrial parcels (13.7 percent), averaging 1.2 acres each. Based on current development patterns and the size of vacant parcels vs available area, the Study Area is expected to continue adding single-family residential units, stabilizing its presence as a residential area within Brevard County.

Table 5.9: Existing Vacant Parcels in Study Area

Land Use Type	Vacant Parcels	Median Parcel Size
Single-Family Residential	315	0.3 acres
Commercial	67	2.4 acres
Industrial	66	1.2 acres
Multi-Family Residential	17	4.8 acres
City Owned	8	14.8 acres
Other	7	29.2 acres
Institutional	2	5.2 acres
County Owned	1	17.4 acres
Total	483	

Source: Brevard County Property Appraiser, 2016.

Industrial Land Uses

Industrial land uses make up the third largest share in the Study Area, with 134 parcels and 2.9 percent. The majority of these industrial land uses are located in the northeast quadrant of the S.R. 524 Study Area, along S.R. 524 between S.R. 528 and US 1. The largest industrial parcel in the Study Area is Rinker Materials Corporation, who owns an asphalt/concrete plant on a 24.1 acre parcel just north of the S.R. 528 and Industry Road intersection. Other large industrial parcels are located directly north of the Rinker site, including a large mineral processing and refinery plant (16.8 acres), a crane and rigging machine shop (21.0 acres), and a small warehousing distribution and trucking terminal (5.2 acres). Many of the remaining industrial land uses are situated along Cox Road, south of the Study Area.

An important future land use feature to be considered is the planned development of a 270 acre Wal-Mart Distribution Center located along S.R. 524 southwest of the Cox Road intersection. The industrial parcel is currently owned by the Canaveral Port Authority, and is likely to change not only the land use makeup of the Study area, but also the vision and traffic conditions.

Commercial Land Uses

Commercial (including retail/office) land uses make up just over 1 percent of the parcels in the Study Area, but 26 percent of the land area, totaling 51 parcels. The size of most commercial parcels in the Study Area is significantly larger than that of any other land use. The largest concentration of commercial land uses is located along Friday Road South, Cox Road and west of Industry Road as it transitions into S.R. 501.

The majority of occupied commercial parcels directly adjacent to S.R. 524 within the Study Area are gas stations, hotels/motels, fast-food restaurants, and other small businesses. The east end of the Study Area serves two primary shopping centers:

Cocoa Commons on the south side (including Publix, PNC Bank, 7-Eleven, BP, Cocoa Veterinary Hospital, Pinch-a-Penny, Anytime Fitness, H&R Block, Beef O' Brady's, and Subway, and Sally Beauty Supply) and Coventry at Cocoa on the north side (CVS Pharmacy, McDonalds, and Great Wall Chinese). Just past the eastern end of the S.R. 524 as it turns into S.R. 501, there are larger establishments such as Wal-Mart, but also some pockets of smaller convenience uses, auto shops, and professional offices closer to U.S. Highway 1 (U.S. 1).

Institutional Land Uses

Institutional land uses make up less than one percent of the Study Area, with only 30 parcels, but cover 19 percent of the land area, indicating they are each large parcels. The majority of the institutional land uses are located south or southeast of S.R. 524, clustered towards the eastern end of the Study Area. The most notable institutional land uses within the Study Area are religious organizations, Eastern Florida State College (0.15 sq miles), Cocoa High School (0.14 sq miles), Florida Power & Light (0.11 sq miles), U.S. Postal Service. State of Florida. In addition, the Florida East Coast Railway owns several parcels between Industry Road and US 1 in the northeast quadrant of the Study Area, currently being considered as a future Brightline Station (0.02 acres).

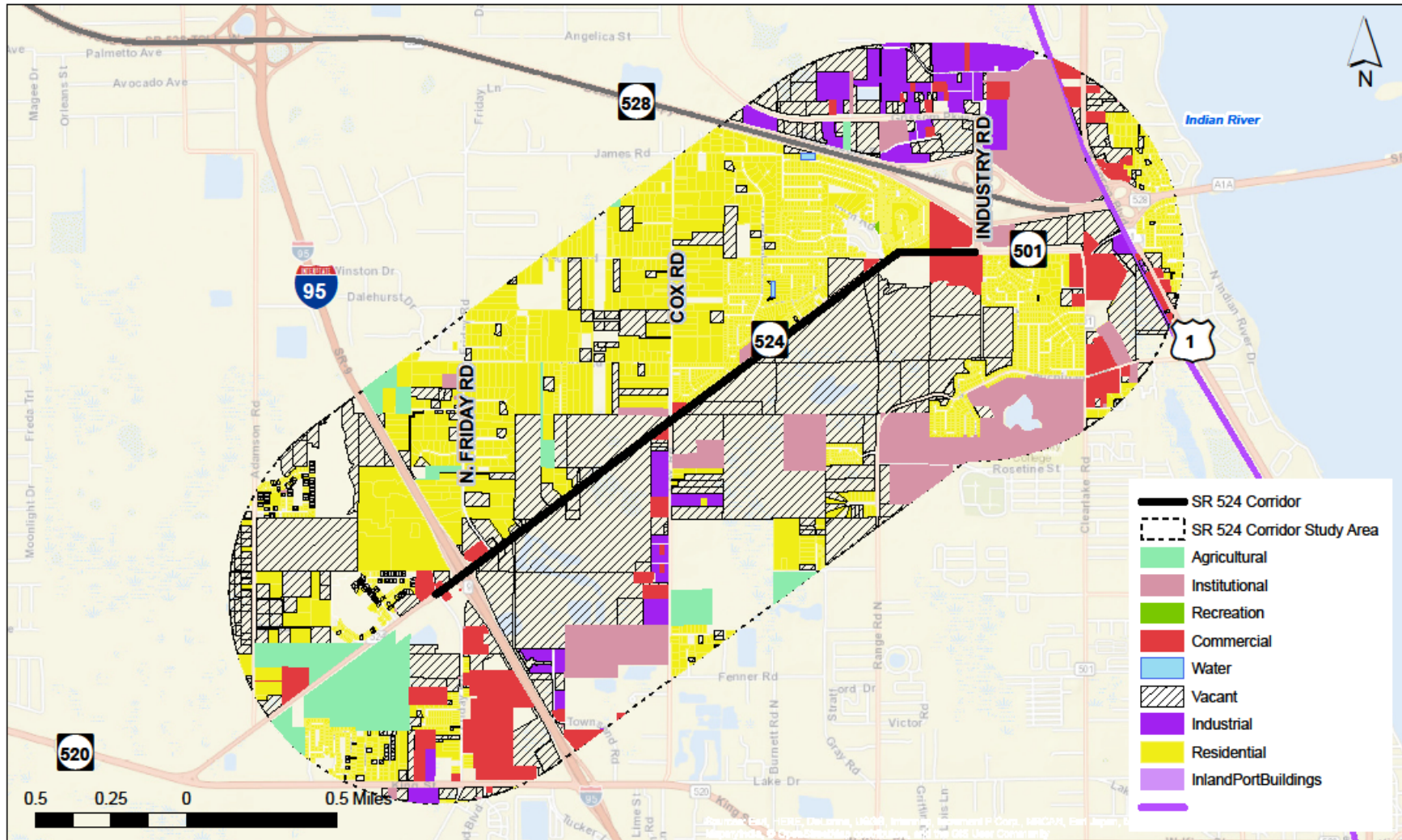
Agricultural Land Uses

Agricultural land uses make up less than one percent of the Study Area, with 11 parcels covering 1.28 sq miles (11 percent of land area).

Recreational Land Uses

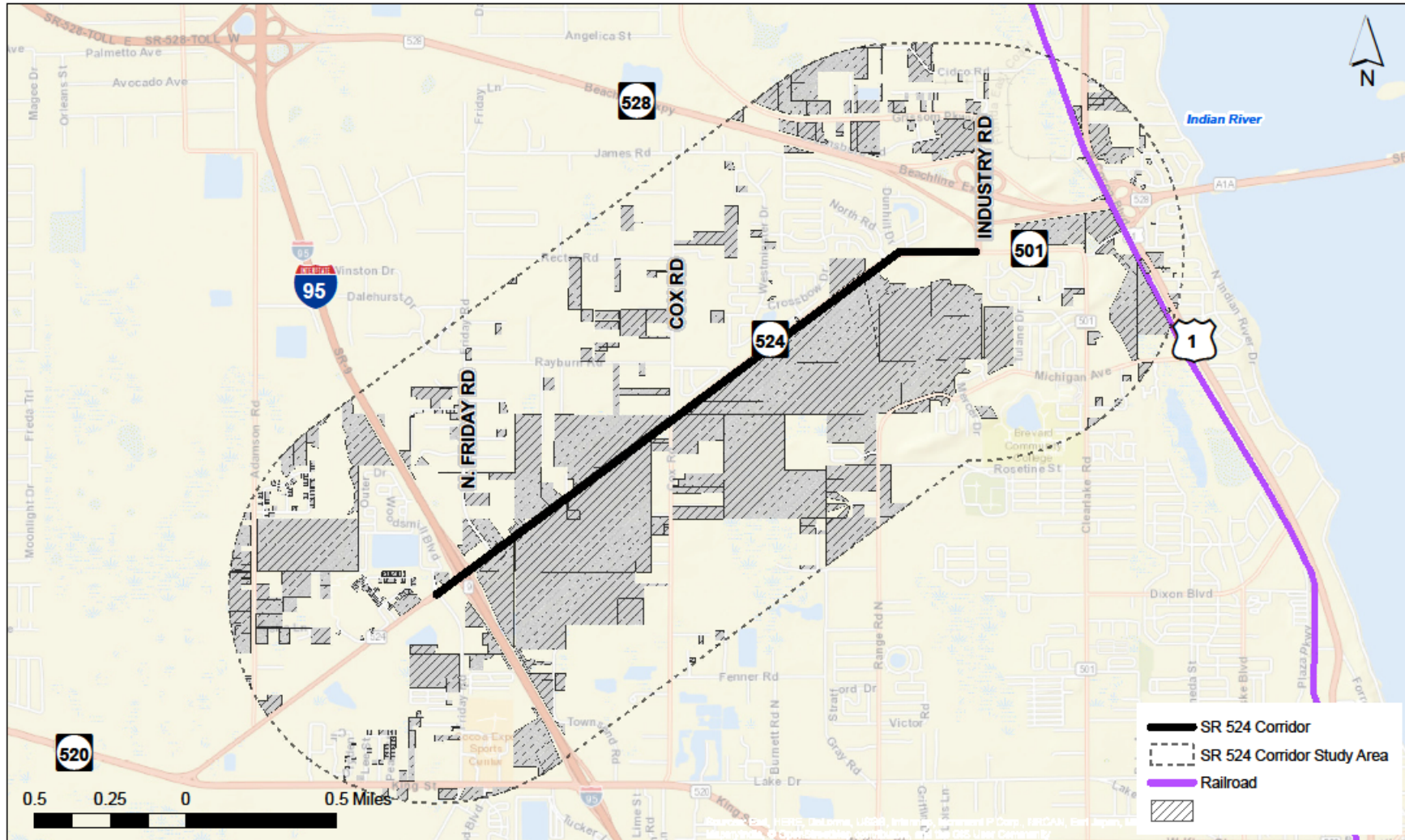
There are three recreational parcels within the Study Area - the Eastern Florida State College, the Fred Gray Golf Academy, and the Juny Ruiz Martinez Park. Just outside of the Study Area to the south is the Cocoa Expo Sports Center, which is considered a commercial property by the Brevard County Property Appraisers Office (BCPAO).

Figure 5.2: Existing Land Use



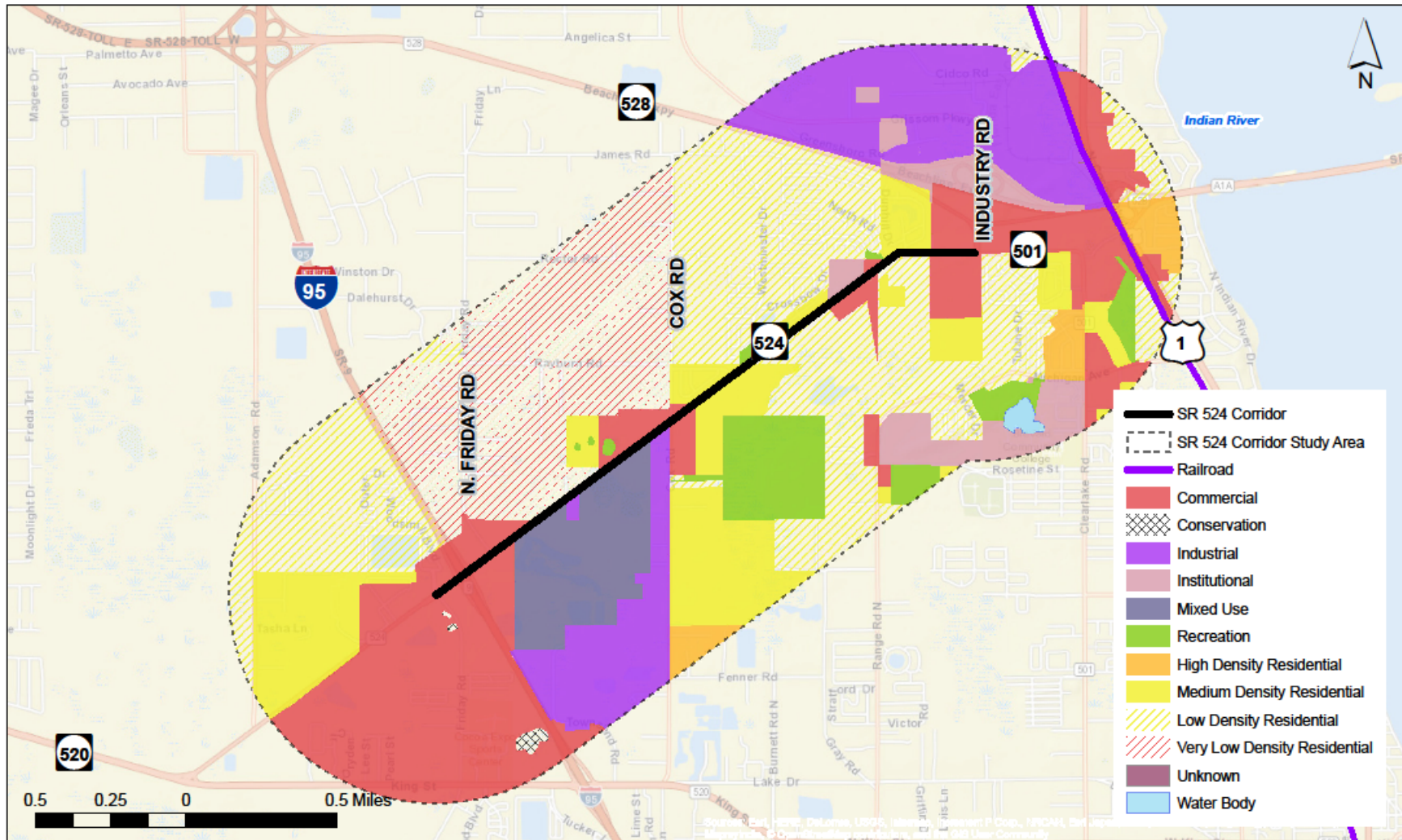
Source: Brevard County Property Appraiser, 2016.

Figure 5.3: Vacant Parcels within the Study Area



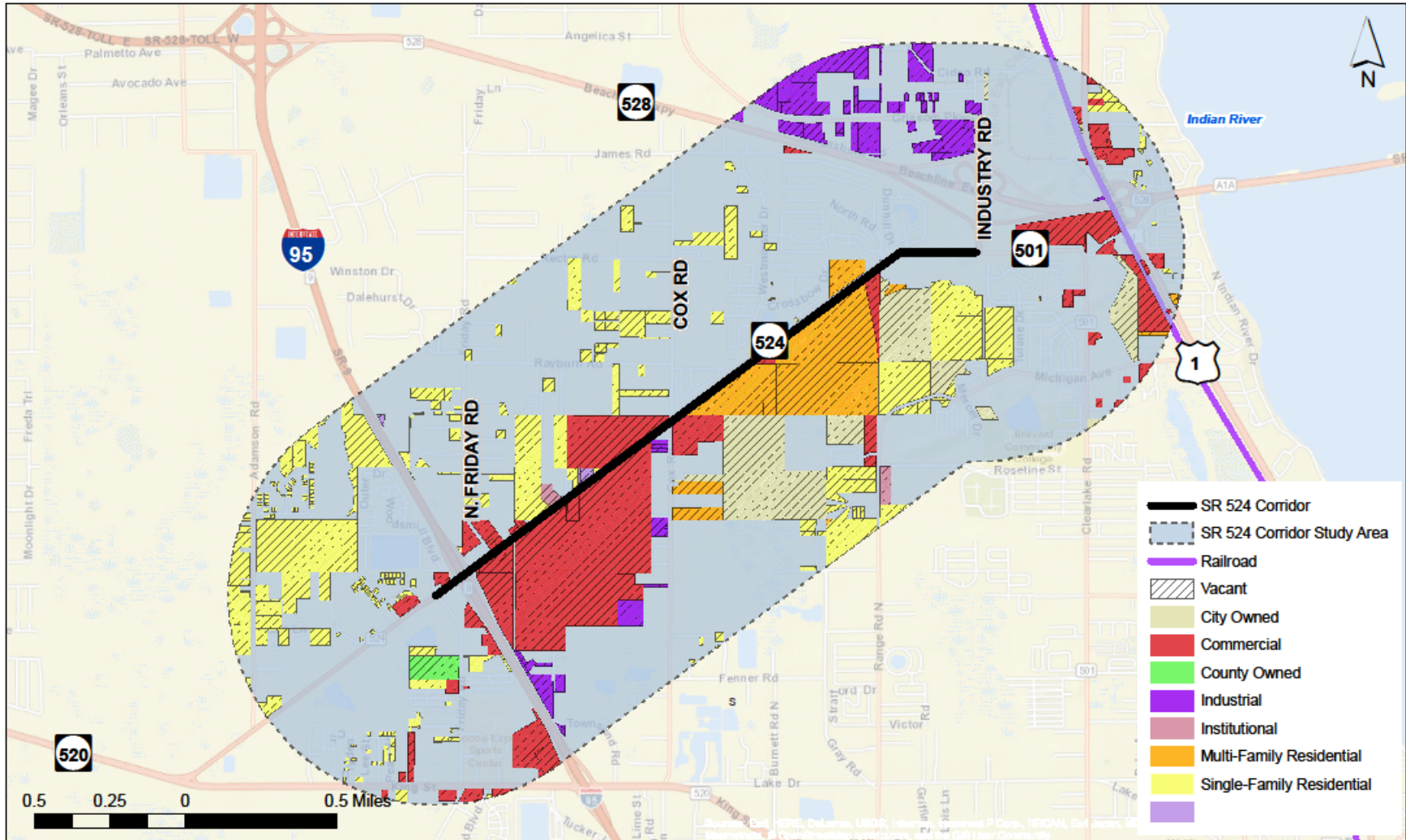
Source: Brevard County Property Appraiser, 2016.

Figure 5.4: Future Land Use



Source: Brevard County (2016) and East Central Florida Regional Planning Council (2011)

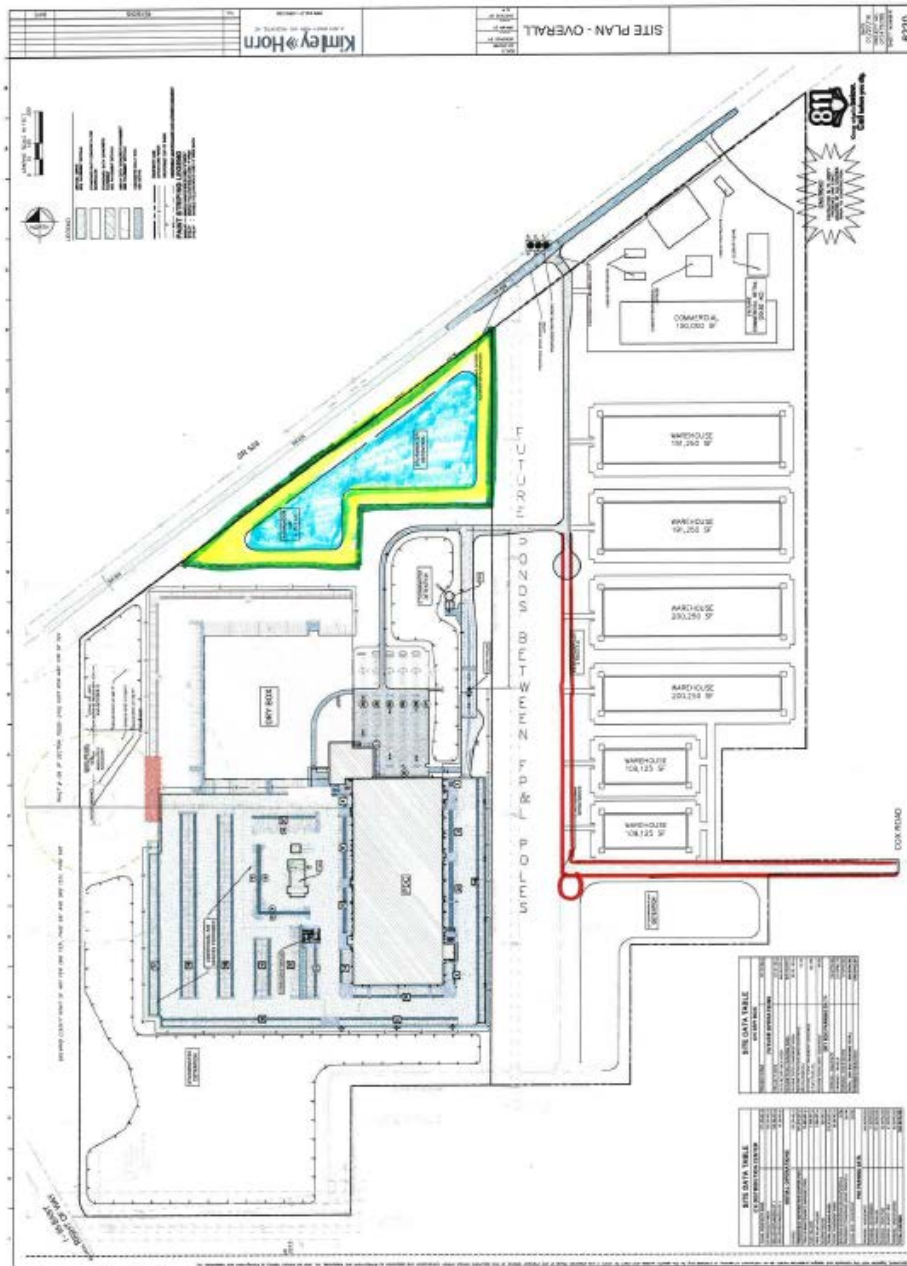
Figure 5.5: Future Zoning of Vacant Parcels within the Study Area



Source: Brevard County Property Appraiser, 2016

The largest factor that will affect future land use in the Study Area is the proposed Wal-Mart Distribution Center, proposed to take up the entirety of the vacant block of parcels south of S.R. 524, between Friday Road North and Cox Road. Wal-Mart’s plan is to construct 460,000 square feet of refrigerated warehouse/distribution space to service the Central Florida market. The current proposed site plan is shown in Figure 5.6.

Figure 5.6: Proposed Wal-Mart Distribution Center Site Plan



Source: Canaveral Port Authority, TIGER Grant Application, 2016.

Environmental Conditions

6.0 Environmental Conditions

6.1 Introduction

This Section provides an overview of the various cultural, recreational and environmentally sensitive resources within the SR 524 Study Area. The existing environmental conditions were identified and reviewed using Geographical Information Systems (GIS). Base line data reported in this section provides the basis upon which more detailed environmental assessments will be conducted in subsequent project development phases. The Florida Department of Transportation's (FDOT) Project Development and Environment (PD&E) Manual, as well as federal and state regulations, provides the basis for identifying these resources.

The remainder of this Section summarizes the following topics:

- Cultural Resources
- Parks and Recreational Areas
- Waters of the US
- Water Quality
- 100-Year Floodplain
- Contaminated Sites
- Threatened and Endangered Species

6.2 Cultural Resources

Cultural resources are defined by the National Historic Preservation Act (NHPA) of 1966 and governed by federal and state regulations. Section 106 of the NHPA provides a general process for cultural resource assessments and requires that historic and archaeological resources be considered in project planning for federally funded or permitted projects. Cultural resources or "historic properties" include any "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the *National Register of Historic Places (NRHP)*." The *NRHP* places high importance on its listed resources giving them higher priority for preservation.

A desktop evaluation of cultural resources was performed to identify cultural resource potential and previously recorded historic properties that are listed, or may be eligible for listing, in the *National Register of Historic Places (NRHP)*.

Florida Master Site File Review

The Florida Master Site File (FMSF) database, updated in July 2016, was reviewed to identify previously recorded resources within the one mile buffer of the S.R. 524 Study Area. Each resource type identified within the Study Area is discussed below.

No archaeological sites or historic resources are determined eligible, or considered potentially eligible for listing in the *NRHP* within the one mile buffer of the Study Area. Table 6.1 summarizes the resources found within the Study Area through this desktop review.

Table 6.1: Summary of Cultural Resources

Cultural Resources	Study Area
SHPO Structures	46
SHPO Bridges	1
SHPO Resource Groups	0
SHPO Cemeteries	0
Archaeological Sites	0
SHPO Surveys	25

Source: FMSF, Bureau of Historic Preservation (2016).

The Florida Division of Historical Resources created the GIS data evaluated by the State Historic Preservation Office (SHPO) including structures, bridges, cemeteries, and resource groups (historic districts, designed historic landscapes, linear resources/sites, and building complexes). This analysis reviewed the SHPO evaluation and included sites or areas that are eligible or potentially eligible for listing in the NRHP, as well as areas that have not been evaluated or have insufficient information.

No bridges, cemeteries, resource groups or archeological sites are present within the Study Area. As shown in Figure 6.1, several SHPO surveys were conducted within the Study Area:

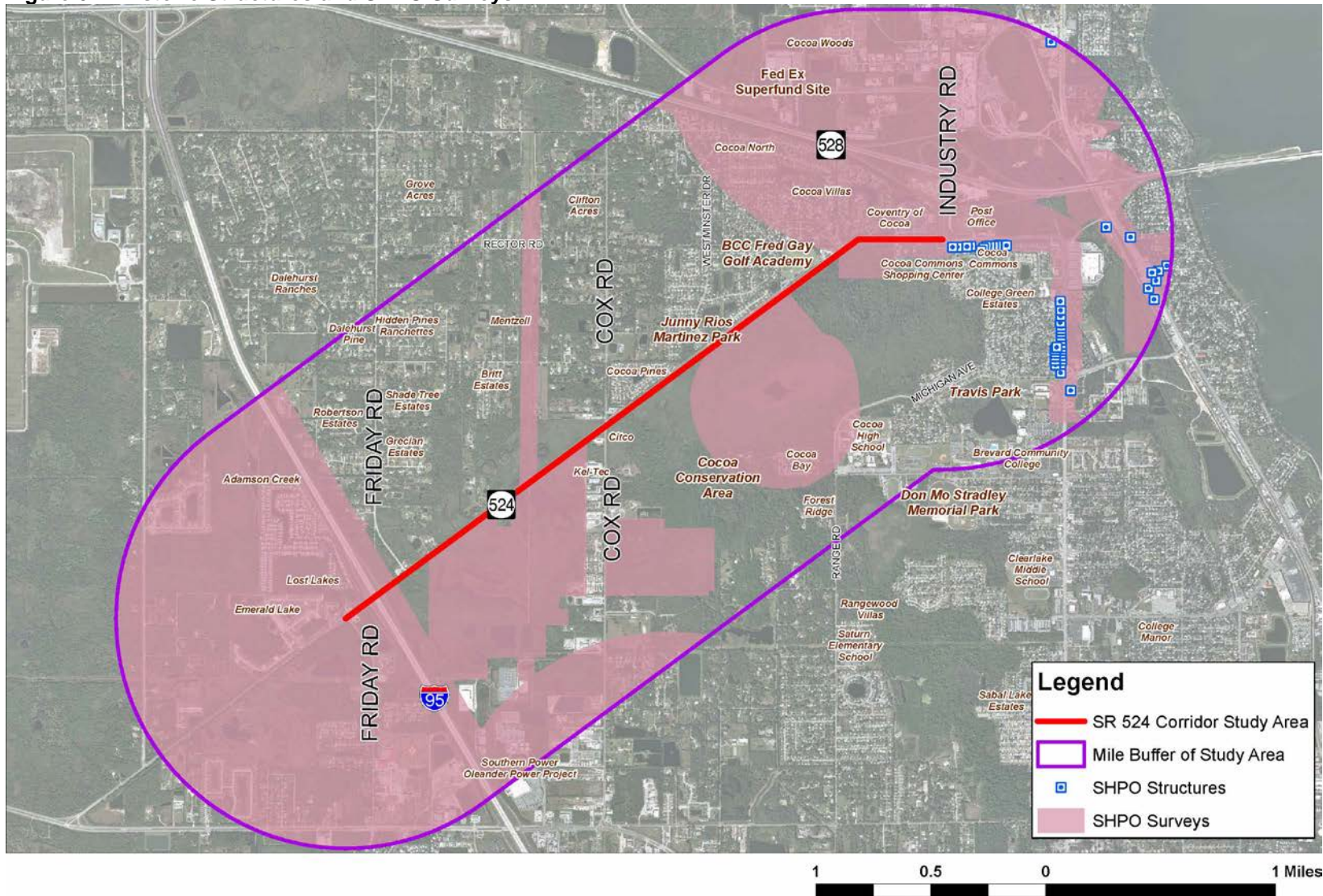
- Archaeological assessment of six selected areas in Brevard County: A first generation model
- Historic Properties Survey within the City of Cocoa, Florida
- Cultural Resource Assessment Survey (CRAS) of the proposed buccaneer gas pipeline, Florida [volume 1: final report of findings; volume 2: appendices]
- An intensive CRAS of the Brevard Crossing DRI Brevard County, Florida
- Cultural Resource Survey of the proposed Florida Gas Transmission staging area
- CRAS of S.R. 5 (US 1) from Barnes Boulevard to Cidco Road, Brevard County
- Archaeological reconnaissance survey of the Mud Lake restoration area, Brevard County, Florida
- A survey and evaluation of historic properties within the one-mile area of potential effect of the proposed cocoa telecommunications site, Brevard county, Florida
- A Cultural Resources Reconnaissance Survey of the Cidco Road Tower Site
- CRAS for the Interstate 95 PD&E study from State Road 514 to State Road 50, Brevard County, Florida
- An Archaeological Survey of the proposed Treetop Condominiums, Brevard County, Florida
- A CRAS of the Hammons parcel Brevard County, Florida
- CRAS of the S.R. 528/S.R. 524 and S.R. 528/US 1 interchange reconstruction: Addendum to CRAS of the S.R. 528 PD&E study from S.R. 520 to Port Canaveral's Terminal B interchange in Orange and Brevard County, Florida
- CRAS of the Santa Barbara development property, Brevard County, Florida

- CRAS of the Clearlake Cove development tract, Brevard County, Florida
- CRAS for the S.R. 528 PD&E study from S.R. 520 to the Port Canaveral Terminal B interchange, Orange and Brevard Counties
- An Archaeological Survey of the Adamson Road/Huang parcel, Brevard County, Florida
- A Cultural Resource Reconnaissance Survey of the Emerald Lake tract, Brevard County, Florida
- An Archaeological Survey of the Adamson Road Phase II development (Fleckinger parcel), Brevard County, Florida
- An Archaeological Survey of the Adamson Road Phase II development (Reis el Bara parcel), Brevard County, Florida
- An Archeological Reconnaissance Survey of the Santa Barbara preserve project, Brevard County, Florida
- Historic Structures Assessment Survey US 1 from Rosa I. Jones Drive to Pine Street and US 1 from Pine Street to Cidco Road, Brevard County, Florida
- Cultural Resource Assessment Report for the All Aboard Florida passenger rail project from Orlando to West Palm Beach
- Technical Memorandum: CRAS of eight proposed ponds in support of the improvements to Clearlake Road (S.R. 501), Brevard County, Florida
- CRAS of Clearlake Road (S.R. 501) from Michigan Avenue to Industry Road, Brevard County, Florida

Historic Structures

The FMSF database shows that 46 historic structures have been recorded within the one mile buffer of the study area. As shown on Figure 6.1, the historic structures are clustered in three areas east of the Study Area: Cocoa Commons, College Green Estates, Carleton Terrace. None of these structures were considered eligible for *NRHP*.

Figure 6.1: Historic Structures and SHPO Surveys



Source: FMSF Database, updated July 2016.

6.3 Parklands and Recreational Areas

Section 4(f) of the U.S. Transportation Act of 1966 provides protection of public parks, wildlife management areas, and other public lands. Public lands are considered parks, recreational areas, or wildlife and waterfowl refuges when the land has been designated by federal, state, or local officials having jurisdiction over the land. In addition, Section 6(f) of the Land and Water Conservation Act of 1972 provides protection of public lands that were purchased with funds from this program. Potential Section 4(f) properties are protected when federal funds are used to advance transportation improvements while Section 6(f) properties are protected regardless of funding source. Parklands and recreational areas that were reviewed for protection include:

- Areas of Critical Concern
- Conservation Lands
- Existing Trails
- Florida Managed Areas
- Florida Forever Lands
- Greenways Project
- Hiking Trail Opportunities
- Parks
- Park Boundaries
- Scenic Byways
- State Park Management Zones
- State Parks

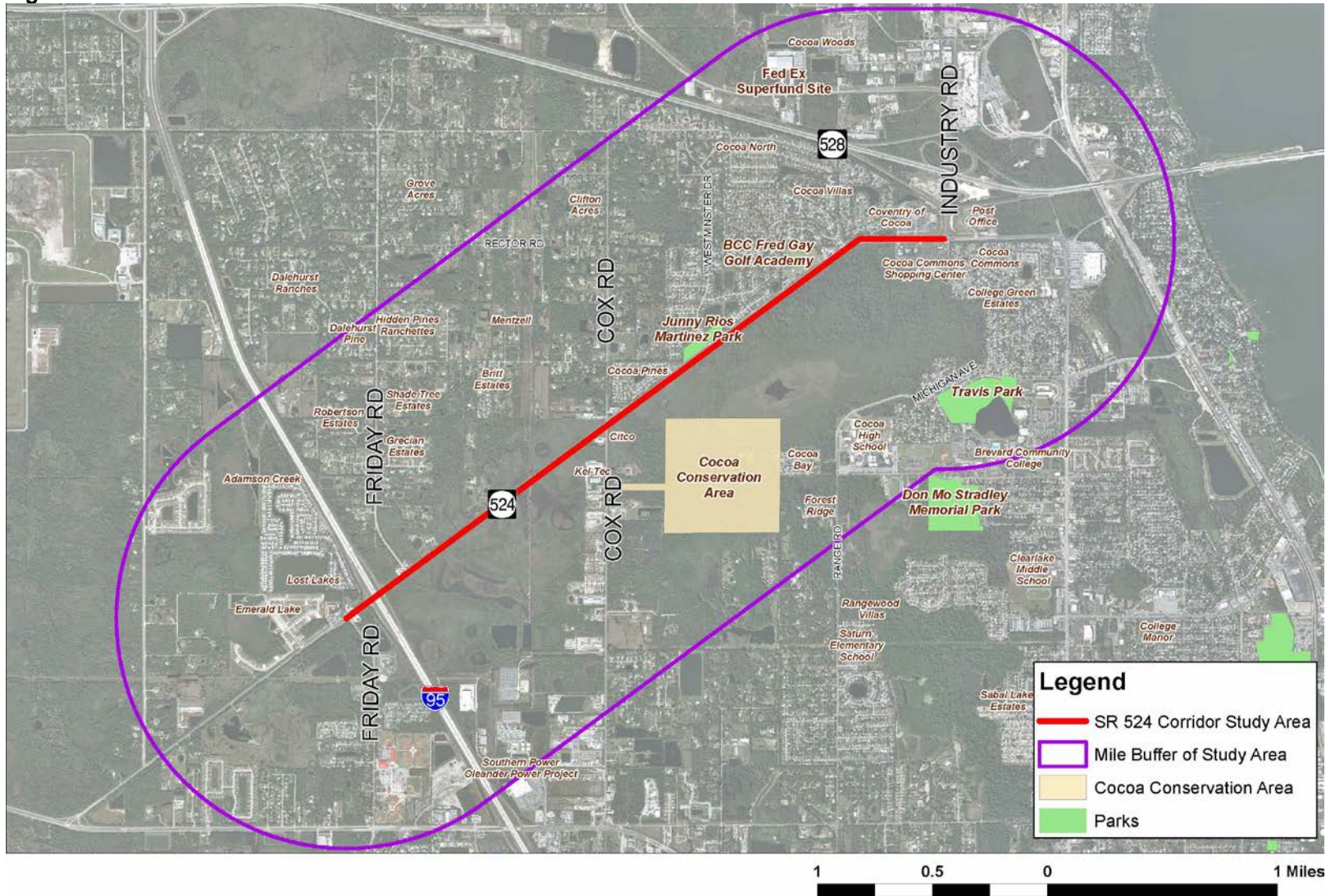
The Florida Natural Areas Inventory (FNAI) GIS database shows three local park and recreational lands within the study area (see Figure 6.2): Travis Park, Junny Rios Martinez Park and the Cocoa Conservation Area (see Table 6.2).

The Study Area does not contain any Florida Scenic Highways and Byways, planned greenway projects, state parks, Florida Forever Lands, or Areas of Critical Concern.

Table 6.2: Park and Recreational Properties

Name	Owner/Manager	Acreage
Travis Park	City of Cocoa	26.32
Cocoa Conservation Area	City of Cocoa	164.37
Junny Rios Martinez Park	Brevard County	5.98

Figure 6.2: Parks and Recreational Lands



Source: FMSF Database, updated July 2016.

6.4 Waters of the US

The U.S. Fish and Wildlife Service's (FWS) National Wetland Inventory (NWI) database was consulted to identify wetland and surface waters occurring within the Study Area (Figure 6.3). Several large wetland communities were identified within the Study Area classified as freshwater emergent, freshwater forested, and freshwater ponds. These classifications are based on substrate material, vegetation, and flooding regime. Table 6.3 summarizes the waters of the US within the one mile buffer of the Study Area.

Table 6.3: Summary of Waters in the US

Waters of the US	Study Area
Wetlands	269 (1,462.32 acres)
Freshwater Ponds	102 (143.95 acres)
Freshwater Emergent	106 (570.73 acres)
Freshwater Forested	61 (747.64 acres)

Source: USFWS National Wetlands Inventory, 2014

6.5 Water Quality

Water quality is also protected under the Clean Water Act of 1972. Potential environmental effects of the proposed project include impacts on water quality. To determine poor water quality within the study area, the GIS analysis included a review of the verified Impaired Waters in the State of Florida. These are water bodies that fail to attain any of its designated uses and/or meet the minimum criteria for surface waters established in the Surface Water Quality Standards (Section 62-302, F.A.C.) and the Impaired Waters Rule (Section 62-303, F.A.C.). Outstanding Florida Waters (OFW) are waters designated worthy of special protection because of their natural attributes.

Table 6.4 summarizes the impaired wetlands within the one mile buffer of the Study Area. These wetlands, shown on Figure 6.4, are located within the Upper St. Johns River Basin verified by the FDEP in October 2014 for containing fecal coliform, dissolved oxygen and mercury in fish tissue.

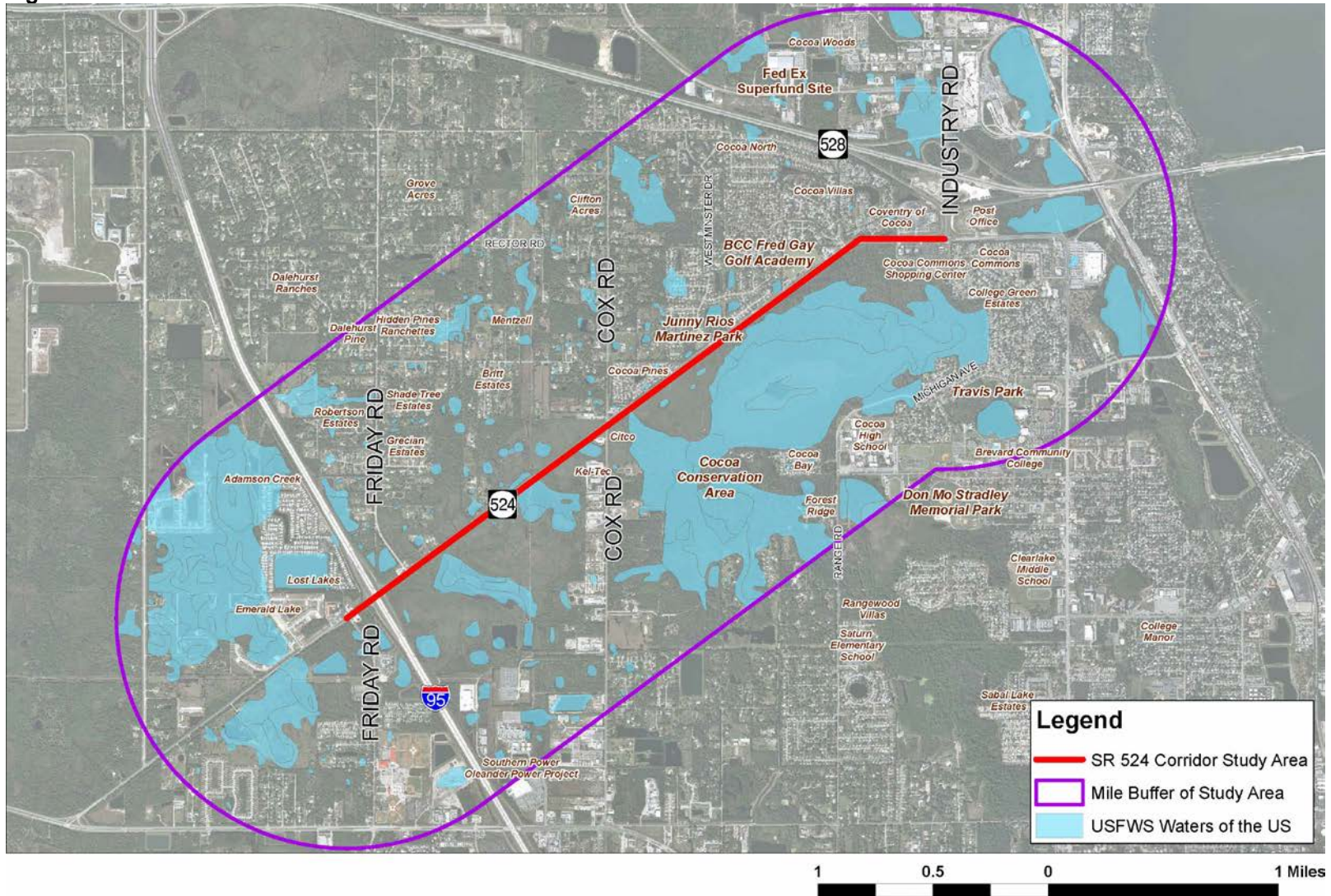
No OFWs occur within the study area.

Table 6.4: Summary of Impaired and Outstanding Waters

Water Quality Designation	Within Study Area
Impaired Waters	546.51 acres
Outstanding Florida Waters	0 acres

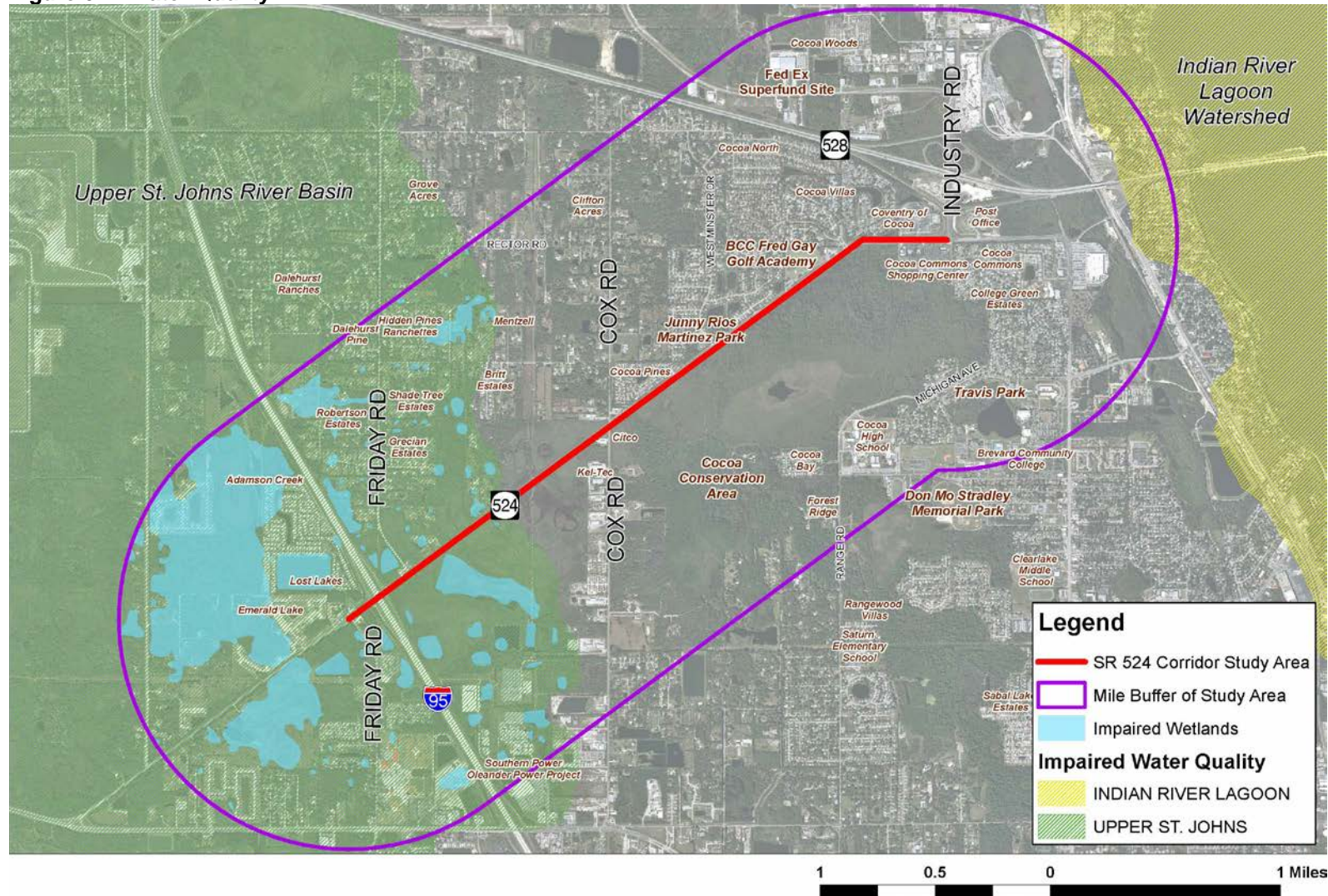
Source: Florida Department of Environmental Protection, 2012

Figure 6.3: Wetlands



Source: USFWS National Wetlands Inventory October 2014.

Figure 6.4: Water Quality



Source: USFWS National Wetlands Inventory October 2014.

6.6 100-Year Floodplain

Floodplains and floodways are protected by Executive Order 11988, “Floodplain Management”, USDOT Order 5650.2, “Floodplain Management and Protection”, and Federal-Aid Policy Guide 23 CFR 650A. The regulations are intended to avoid or minimize highway encroachments within the 100-year floodplains and to avoid supporting land use development that may impact the floodplain values.

To identify 100-year floodplain regions within the Study Area, a GIS review was conducted using the Florida Digital Flood Insurance Rate Maps (DFIRM) – May 2016. The DFIRM data is used by the Federal Emergency Management Agency (FEMA) to designate the Special Flood Hazard Areas (SFHAs). The primary risk classification for SFHAs used is the one-percent-annual-chance flood event, or 100-year floodplain. The flood zone designations that depict 100-year floodplain include flood zones A, AE, and AH. Zone A is an approximate method of analysis, Zone AE is determined by detailed methods of analysis using base flood elevations, and Zone AH is annual chance shallow flooding with a constant water-surface elevation where average depths are between one and three feet.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), the entire study area is designated as part of the 100-year floodplain including Type A and AE zones (Figure 6.5). Potential impacts to floodplains will be assessed further as part of the next phase of project development.

6.7 Contaminated Sites

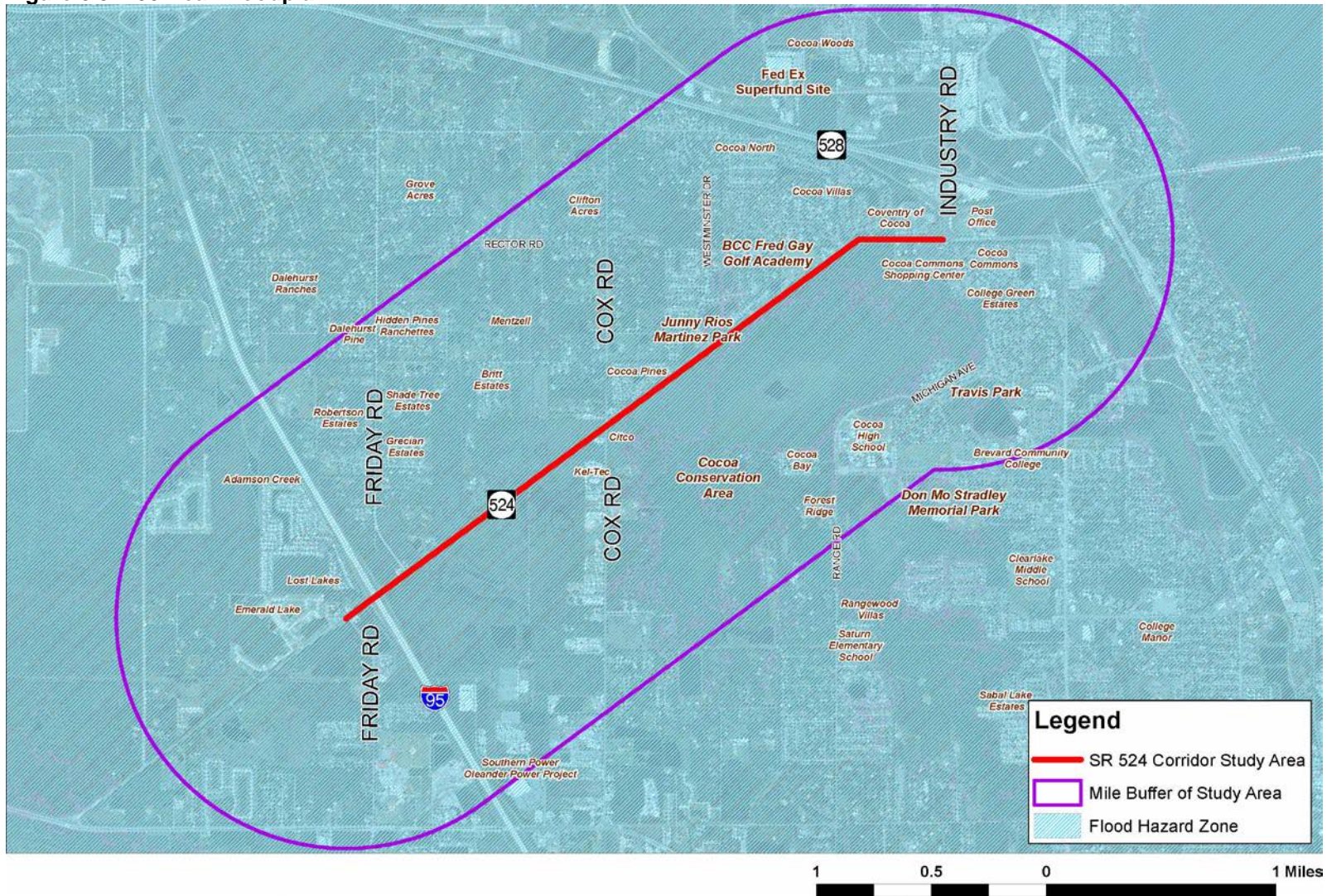
A contamination screening generally follows the Federal Highway Administration’s Technical Advisory T 6640.8A, dated October 30, 1987 and the FDOT’s Project Development and Environmental Manual, Part 2, Chapter 22, dated January 2008. Contamination screening of the study area will help to determine the potential for contamination from adjacent facilities, sites or places. The GIS review for the S.R. 524 Study Area identified facilities, sites or places subject to environmental regulation or of environmental interest via the following environmental programs:

- Federal National Priorities List (NPL) (Superfund)
- Resource Conservation and Recovery Act (RCRA) Large Quantity Generators (LQGs)
- Florida Department of Environmental Protection (FDEP) Site Investigation Sites (SIS) Bureau of Waste Cleanup, Division of Waste Management. - none
- FDEP Compliance/Enforcement Tracking System (COMET)
- FDEP Storage Tank & Petroleum Contamination/Cleanup Monitoring (STCM)
- FDEP Hazardous Waste (HAZARD) - none
- FDEP Fuel Facility Registry
- State and Local Brownfield Sites Databases - none
- State and Local Solid Waste Disposal Site Inventories

- EPA Clean Energy Department Emissions & Generation Resource Integrated Database

Within the study area, 33 contaminated/cleanup sites were identified consisting of petroleum cleanup sites. Tables 6.5 through 6.11 list Federal and State NPL Superfund Site, Solid Waste Facilities, Fuel Facilities, STCM, COMET and RCRA LQGs. Figures 6.6 and 6.7 presents the Contaminated and Potentially Contaminated sites within the study area. No FDEP SIS sites, Hazardous Waste or Brownfield sites exist within the Study Area. Highlighted sites are those that are adjacent to SR 524 within the Study Area.

Figure 6.5: 100-Year Floodplain



Source: FEMA FGDL Database, May 2016

Table 6.5: National Priority List (NPL) Superfund Sites

Site	Address	City
Fed Ex Cocoa	3155 Grissom Parkway	Cocoa Beach

Source: US EPA FGDL Database, March 2016

Table 6.6: Resource Conservation and Recovery Act Large Quantity Generators

Site	Address	City
Beyel Brothers Inc	1435 Cox Rd	Cocoa
Beyel Brothers Inc	550 Cidco Rd	Cocoa
Braden Kitchens Inc	515 Industry Rd S	Cocoa
Brevard Community College	1519 Clearlake Rd	Cocoa
Brevard County Cocoa High School	2000 Tiger Trail	Cocoa
Brevard Robotics Inc	1485 Cox Rd	Cocoa
Camping World Inc	4700 King St	Cocoa
Cemex Construction Materials Florida LLC	3345 E Industry Rd	Cocoa
Climatrol Inc	529 S Industry Rd	Cocoa
Cocoa Auto Salvage	810 S Industry Rd	Cocoa
City of Cocoa	28400 East SR 520	Cocoa
CSC Holding Corp	605 Townsend Rd	Cocoa
CVS Pharmacy #4280	2324 State Road #524	Cocoa
Diamond Back Airboats	4125 Pine Tree Pl	Cocoa
Diamondback Manufacturing, LLC	1060 Cox Road	Cocoa
Federal Express Ground	3155 Grissom Pkwy	Cocoa
Florida Dep HWCS 0957 #092	2409 North Cocoa Boulevard	Cocoa
Florida Dep HWCS Site H055 #168	529 Industry Rd S	Cocoa
Florida East Coast Railway LLC	3321 Beau Geste Rd	Cocoa
Florida Spill Response Corp	605 Townsend Rd # A	Cocoa
FPL Brevard Substation	880 Cox Rd	Cocoa
FPL City Point Substation	3303 Beau Geste Rd	Cocoa
Hess Corporation	1600 Clearlake Rd	Cocoa
Huntley Jiffy Food Stores #526	1990 Michigan Ave	Cocoa
J B Airboats	4105 Pine Tree Pl	Cocoa
Larrys Pollution Solutions LLC	730 Cidco Rd	Cocoa
Mobil Oil Corp Ss #Cn8	5555 SR 524	Cocoa
Newlube Environmental Services Inc	771 Industry Rd S	Cocoa
Oleander Power Project, LP	555 Townsend Road	Cocoa
Portable Air	555 Industry Rd S	Cocoa
Procter & Gamble - Vacant Lot	Corner Of Jimbo Rd & Satellite Rd	Cocoa
Recovery Corporation of Florida	755 Industry Rd S	Cocoa
Skipper's III Inc	2409 North Cocoa Blvd	Cocoa
Sloan Construction Co Inc	800 Industry Rd S	Cocoa

Table 6.6: Resource Conservation and Recovery Act Large Quantity Generators (Continued)

Site	Address	City
Sloan Construction Co Inc	110 Greensboro Road	Cocoa
Space Exploration Technologies Inc	550 Cidco Rd #1	Cocoa
Sunoco Service Station #08754277	5000 W SR 520	Cocoa
Sunset Wire & Cable Inc	518 Industry Rd S	Cocoa
W & J Construction Corp	700 Cox Rd	Cocoa
Wal-Mart #0174-03	2800 Clearlake Rd	Cocoa
Watson Paving Inc	1445 Cox Rd	Cocoa
Zippy Mart FI516	4875 W Hwy 520	Cocoa
Zippy Mart FI522	4900 SR 524	Cocoa

Source: FDEP FGDL Database, June 2016

Table 6.7: FDEP Compliance/Enforcement Tracking System

Site	Address	City
Scala, Steven	SR 520	Cocoa
Oleander Power Plant (Erp)	555 Townsend Road	Cocoa
Brown, Donnie And Robin	2565 Fairfield Drive	Cocoa
Nugent, Steven	4915 Shade Tree St.	Cocoa
Rust, William & Pat (Erp)	2655 Cox Road	Cocoa
Harrison, John And Doreen	4300 Rector Road	Cocoa
Hart, James	4955 Shade Tree Street	Cocoa
Fackler, Darin L (ERP)	4280 Rayburn	Cocoa
Jones, Edward (ERP)	Adamson Road	Cocoa
Michael Grove	4135 Rayburn Rd. (Activity Location)	Cocoa
Smith, Stacie M (ERP)	1151 Gary Hunt Rd	Cocoa
Chamberlin, Yvette (ERP)	P.O. Box 237462	Cocoa
Smith, Brandon (ERP)	1956 Quail Ridge Court, #1804	Cocoa
Crescini, Bruce (ERP)	1375 Friday Road	Cocoa
Wood, Christina (ERP)	2905 Plaza Way	Melbourne
My Place Realty (ERP)	501 W. King Street	Cocoa
Clark, Rosita (ERP)	1229 Holmes Street	Cocoa
ERA Showcase Properties & Investments (ERP)	835 Executive Lane, Suite 110	Rockledge
Habenicht, Karl (ERP)	P.O. Box 954	Sharpes
Yates, Linda (ERP)	5032 Fleetwood Place	Cocoa
Rd Development/Pear St Lot 17 (ERP)	Lot 17 Pearl St	Cocoa

Table 6.7: FDEP Compliance/Enforcement Tracking System (Continued)

Site	Address	City
Morato, Jose (ERP)	P.O. Box 320694	Cocoa Beach
Moslemian, Davood & Shahrzad (ERP)	Pearl Street	Cocoa
Lebida, Roger & Susan (ERP)	Lot 16 Pearl	Cocoa
Re/Max Aerospace Realty (ERP)	1311 S. US Highway 1	Rockledge
Atkinson, Renee (ERP)	755 Adamson Road	Cocoa
Rd Development/Lot 14 (ERP)	Lot 14 Pearl Street	Cocoa
Stephenson, William H. (ERP)	2540 Fairfield Drive	Cocoa
Messer Construction Corp (ERP)	4131 Rector Road	Cocoa
Glenn, Amos J. (ERP)	2527 Stratford Drive	Cocoa

Source: FDEP FGDL Database, June 2016

Table 6.8: Fuel Facilities (Potential Contamination)

Site	Address	City
Sunshine Food Mart #45	402 High Point Drive, Suite 101	Cocoa
Sunoco #0611-6792	10 Industrial Hwy, Building G N Loop Rd	Cocoa
Sunrise Food Mart #62	380 Commerce Pkwy	Cocoa
Cocoa Mobil	21 W Fee Ave	Cocoa
Sunrise Food Mart #88	380 Commerce Pkwy	Cocoa
Hess #09479	1 Hess Plaza	Cocoa
Sunshine Food Mart #121	402 High Point Drive	Cocoa
Sunrise Food #83	380 Commerce Pkwy	Cocoa
Kwik Stop	5000 W Sr 520	Cocoa
Sunrise Food Mart #118	380 Commerce Pkwy	Cocoa
Sunshine Food Mart #347	402 Highpoint Dr	Cocoa

Source: FDEP GeoData Directories for Fuel Facilities, October 2014

Table 6.9: Solid Waste Facilities

Site	Address	City
RMD Americas of Florida, LLC	550 Cideo Road	Cocoa
Progressive Recycling	520 Cidco Road	Cocoa
Cocoa Expo Sports Center	500 Friday Road	Cocoa

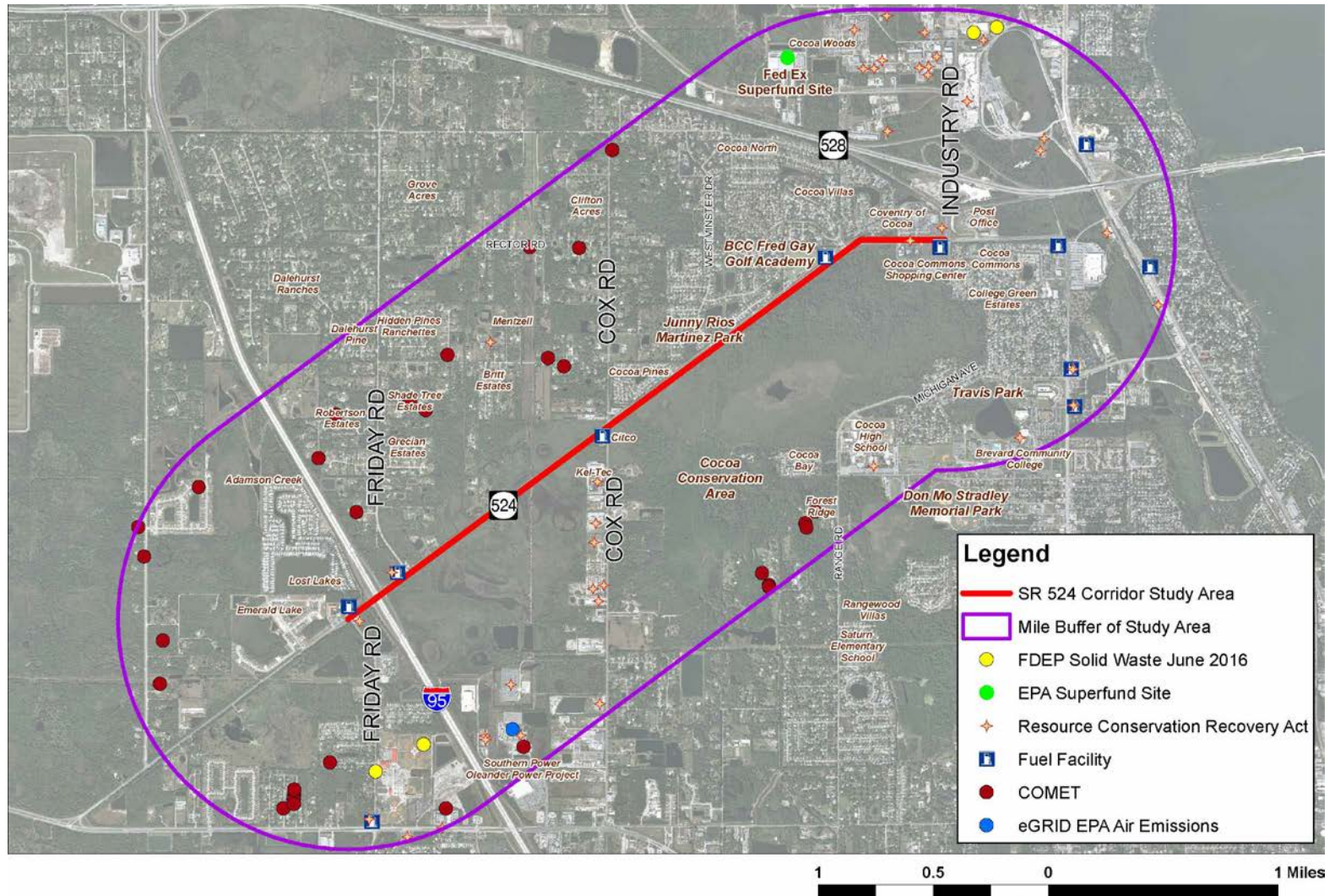
Source: FDEP FGDL Database, June 2016

Table 6.10: EPA Emissions & Generation Resource Integrated Database

Site	Address	City
Southern Power Oleander Power Project	605 Townsend Road	Cocoa

Source: EPA Clean Energy Department, 2012

Figure 6.6: Fuel and Potential Contaminated Sites



Source: FEMA FGDL Database, May 2016.

Table 6.11: FDEP Storage Tank & Petroleum Contamination/Cleanup Monitoring

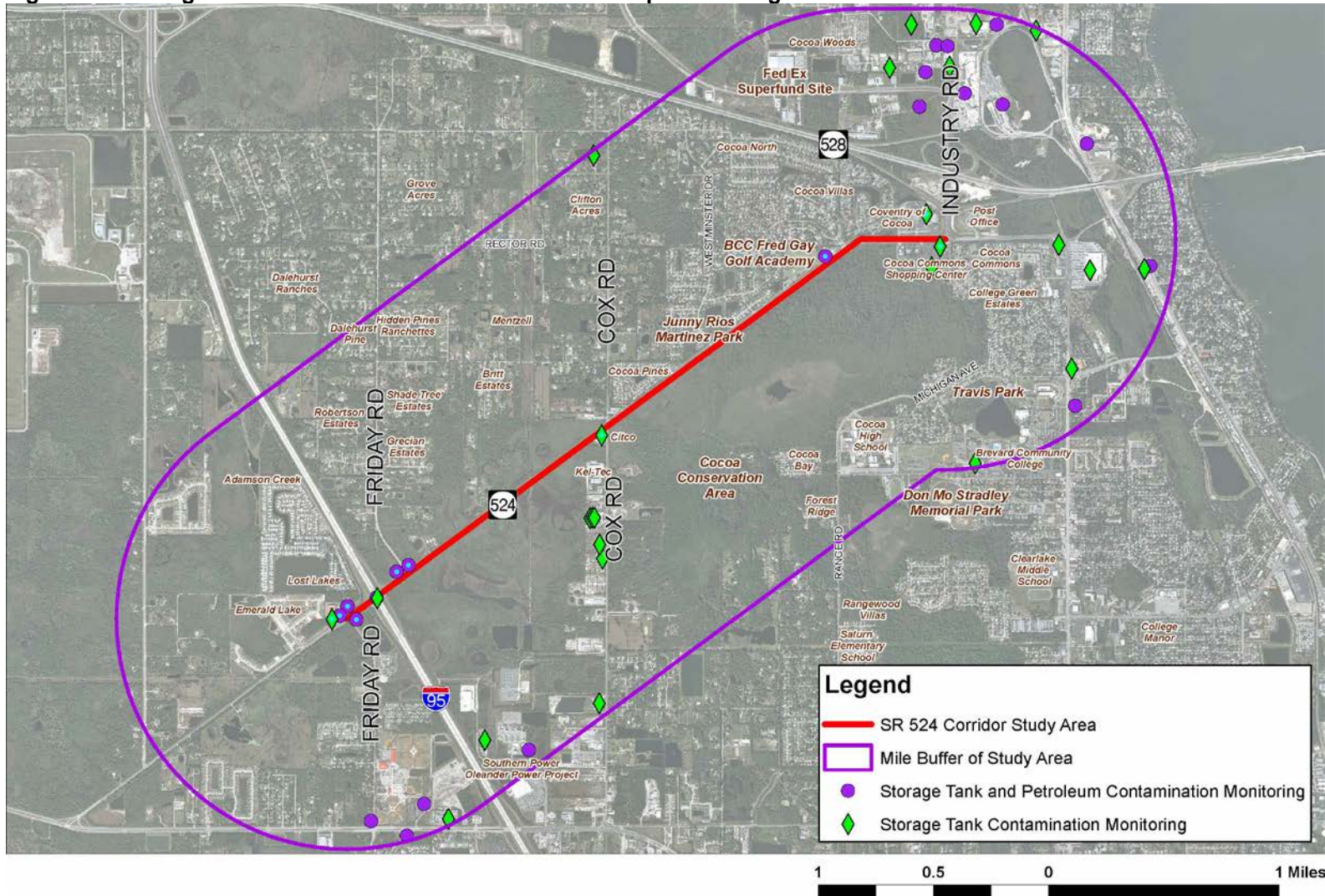
Site	Address	City
Florida Spill Response Corp	605 Townsend Rd	Cocoa
Wal-Mart Supercenter #174	2700 Clearlake Rd	Cocoa
60 Minute Cleaners	2300 Hwy 524 #102	Cocoa
Beyel Bros Inc	1435 Cox Rd	Cocoa
Brevard Ohio Corp	5580 SR 524	Cocoa
Cemex - Cocoa / City Point	3345 E Industry Rd	Cocoa
Central Sand Co	3360 E Industrial Rd	Cocoa
Church On The Way	4680 S King St	Cocoa
Climatrol Inc	529 S Industry Rd	Cocoa
Danella Construction	717 Industry Rd S	Cocoa
Division Of Forestry	4800 W Hwy 520	Cocoa
FL East Coast Railway	3325 N US Hwy 1	Cocoa
FL Rentals	2600 Cox Rd	Cocoa
Goodson Paving Inc	630 Cidco Rd	Cocoa
National Car Rental System	2705 N Cocoa Blvd	Cocoa
Poinsett Charter Service	4500 Pine Cone Pl	Cocoa
Publix Super Market	2301 SR 524 #150	Cocoa
Schenck Co Of Cocoa	603 Cidco Rd	Cocoa
Scott Property	581 E Industry Rd	Cocoa
Tarmac FL Inc-Glover Oil Co Inc	445 Cidco Rd	Cocoa
W & J Construction Corp	700 Cox Rd	Cocoa
Watson Paving Inc	1445 Cox Rd	Cocoa
Watson Paving-Glover Oil Co	1450 Cox Rd	Cocoa
Beyel Brothers Inc	550 Cidco Rd	Cocoa
Container Recovery Corp	520 Cidco Rd	Cocoa
Oleander Cocoa Power Plt	555 Townsend Rd	Cocoa
7-Eleven Store #37235	2201 Hwy 524	Cocoa
Chevron #47061	I 95 & SR 524	Cocoa
Days Inn	5600 Hwy 524	Cocoa
Kwik Stop	5000 W Hwy 520	Cocoa
Mobil #02-Cn8	5555 Hwy 524	Cocoa
Speedway #6591	1600 Clearlake Rd	Cocoa
Sunoco #0611-6792	3500 SR 524	Cocoa
Sunrise Food Mart #118	5550 Hwy 524	Cocoa
Sunrise Food Mart #62	4301 Hwy 524	Cocoa
Sunrise Food Mart #83	2700 N US 1	Cocoa
Sunrise Food Mart #88	1990 Michigan Ave	Cocoa
Sunshine Food Mart #121	1907 Hwy 524	Cocoa

Table 6.11: FDEP Storage Tank & Petroleum Contamination/Cleanup Monitoring (Continued)

Site	Address	City
Sunshine Food Mart #347	3230 N Cocoa Blvd	Cocoa
Sunshine Food Mart #45	4900 Hwy 524	Cocoa
Zippy Mart #516	4875 W Hwy 520	Cocoa
Brevard Community College	1519 Clearlake Rd	Cocoa

Source: FDEP GeoData Directories for Fuel Facilities, October 2014

Figure 6.7: Storage Tank & Petroleum Contamination/Cleanup Monitoring



Source: FEMA FGDL Database, May 2016.

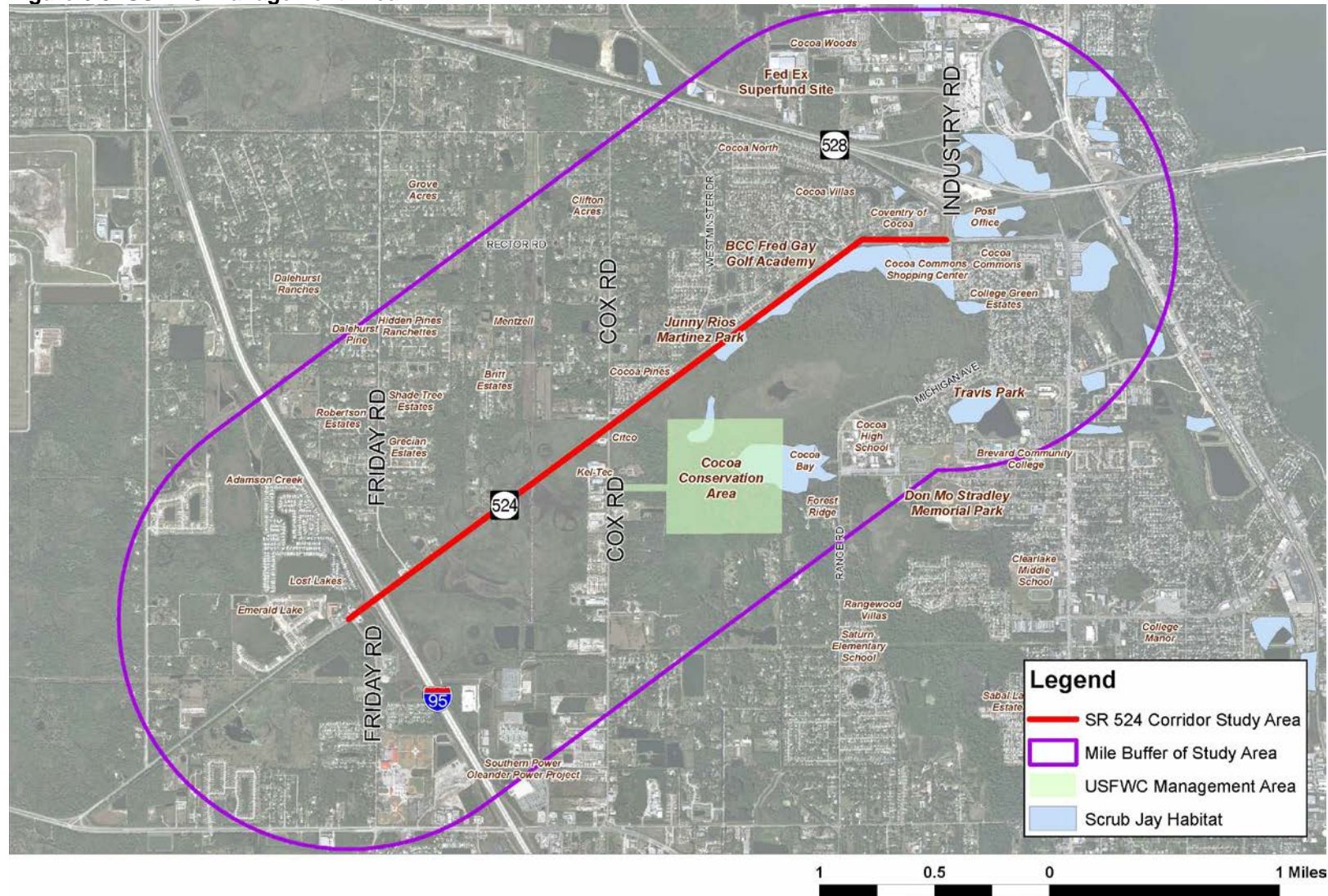
6.8 Threatened and Endangered Species

A review of the available GIS and published information from both FWS and Florida Fish and Wildlife Conservation Commission (FWCC) was performed to identify any potential for threatened or endangered species to occur within the Study Area (Figure 6.8).

Several federally listed species were found to have the potential to occur within the study area. The entire study area is located within the Woodstork (*Mycteria americana*) Core Foraging Area and Snail Kite Consultation Area. Tracts of suitable or restorable habitat for the Florida scrub jay (*Aphelocoma coerulescens*) occur within the study area and the FWS lists the red-cockaded woodpecker (*Picoides borealis*), Audobon's Crested Caracara (*Polyborus plancus audubonii*) and the Eastern indigo snake (*Dymarchon corais couperi*) as having the potential to occur. The state listed gopher tortoise (*Gopherus polyphemus*) has been documented to occur within the study area. No eagle nests occur within the one mile buffer.

The FWS lists Carter's mustard (*Warea carteri*) as having the potential to occur. The Cocoa Conservation Area is listed as a FWC Wildlife Management Area.

Figure 6.8: USFWC Management Area



Source: FEMA FGDL Database, May 2016.

Conclusion

7.0 Conclusion

The *State Road (S.R.) 524 Corridor Existing Conditions Summary Report* summarizes existing conditions within and surrounding the S.R. 524 Study Area, extending from Friday Road South to Industry Road. The following summarizes the key findings from each Section:

- **Transportation Characteristics**
 - S.R. 524 is a critical traffic corridor in the Brevard County and Space Coast region, connecting I-95, S.R. 520, S.R. 528, US 1, and Cape Canaveral.
 - The vast majority of the existing 3.1 mile corridor is a two-lane undivided cross-section. There are twelve (12) intersections along the Corridor, as follows:
 - Three are signalized (Cox Road, London Road, Industry Road)
 - Four are stop-controlled (Friday Road South, I-95 SB, I-95 NB, Friday Road North)
 - Five are local stop-controlled (Thien Thai Lane, Pinyon Drive, Westminster Drive, Lance Boulevard, and Coventry Court)
 - There are limited pedestrian and bicycle facilities along the Corridor, and limited transit access through SCAT Routes 6 and 8.
- **Vehicular Traffic Conditions**
 - Across the Study Area, the highest traffic volume occurs between Cox and Industry Road (15,300 AADT in 2015).
 - The three signalized intersections along the Corridor have a high LOS. The four un-signalized intersections along the Corridor have average LOS, with the lowest being the I-95 southbound ramps in PM (LOS D).
- **Safety Analysis**
 - From 2010 to 2014, there were 124 crashes in the Study Area. The average crash rate was greater than comparable roads statewide overall, and more than triple statewide comparable rates at the I-95 interchange area.
 - There were three bicycle/pedestrian accidents from 2009 to 2013.
- **Land Use and Demographic Characteristics**
 - There are approximately 7,666 residents and 2,969 households within one mile of the S.R. 524 Corridor. A significant amount of households can be considered “low-income” within the Study Area, but the share of minority or limited English proficient households fell within regional and state averages.
 - The vast majority (85 percent) of parcels in the Study Area are zoned single-family residential, followed by a significant share of vacant parcels (10 percent).
 - The majority of vacant parcels in the Study Area are zoned single-family residential, commercial, and industrial.
- **Environmental Conditions**
 - Based on the results of GIS based desktop review of the natural and physical environmental resources adjacent to or in the vicinity of the corridor, key features to be considered during future planning phases include: cultural resources,

wetlands, water quality and floodplains, potential contaminated sites, and listed species habitat.

- The resource conditions are identified based upon a desktop review of readily available state and regional data for these resources, consistent with the FDOT Environmental Screening Tool datasets. In subsequent project development phases, more detailed analyses will be conducted in accordance with the appropriate chapters of the PD&E Manual.

Appendix

8.0 Appendix: Synchro Outputs

Lanes, Volumes, Timings
7: E Industry Rd & SR 524

SR 524 Corridor Study
2016 Existing AM Peak

Lane Group	SBR
Lane Configurations	↕
Traffic Volume (vph)	289
Future Volume (vph)	289
Ideal Flow (vphpl)	1900
Storage Length (ft)	0
Storage Lanes	1
Taper Length (ft)	
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1559
Right Turn on Red	Yes
Satd. Flow (RTOR)	289
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Lane Group Flow (vph)	289
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Total Split (s)	33.7
Total Lost Time (s)	5.7
Act Effct Green (s)	14.3
Actuated g/C Ratio	0.14
v/c Ratio	0.61
Control Delay	11.1
Queue Delay	0.0
Total Delay	11.1
LOS	B
Approach Delay	
Approach LOS	
Intersection Summary	

Lanes, Volumes, Timings 7: E Industry Rd & SR 524

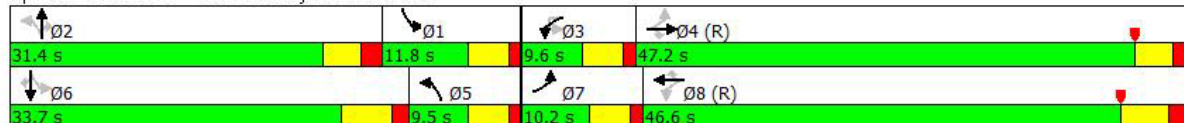
SR 524 Corridor Study
2016 Existing AMPeak

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖	↖		↖	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (vph)	472	252	18	1	39	99	215	18	56	55	361	77
Future Volume (vph)	472	252	18	1	39	99	215	18	56	55	361	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		325		475		0	250		250		0
Storage Lanes	1		1		1		1	1		1		2
Taper Length (ft)	50				50			50				50
Satd. Flow (prot)	1656	1863	1615	0	1805	1792	1553	1805	1827	1615	3367	1900
Flt Permitted	0.630				0.603			0.707			0.720	
Satd. Flow (perm)	1098	1863	1571	0	1146	1792	1553	1343	1827	1592	2552	1900
Right Turn on Red			Yes				Yes		Yes			
Satd. Flow (RTOR)			120				215			133		
Link Speed (mph)		45				40			45			45
Link Distance (ft)		728				962			606			679
Travel Time (s)		11.0				16.4			9.2			10.3
Lane Group Flow (vph)	472	252	18	0	40	99	215	18	56	55	361	77
Turn Type	pm+pt	NA	Perm	custom	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	7	4			3	8		5	2		1	6
Permitted Phases	4		4	3	8		8	2		2	6	
Total Split (s)	10.2	47.2	47.2	9.6	9.6	46.6	46.6	9.5	31.4	31.4	11.8	33.7
Total Lost Time (s)	4.5	5.0	5.0		4.5	6.2	6.2	4.5	5.0	5.0	4.5	5.7
Act Effct Green (s)	71.4	64.2	64.2		54.4	46.6	46.6	12.3	7.6	7.6	19.4	14.3
Actuated g/C Ratio	0.71	0.64	0.64		0.54	0.47	0.47	0.12	0.08	0.08	0.19	0.14
w/c Ratio	0.53	0.21	0.02		0.06	0.12	0.26	0.09	0.41	0.23	0.63	0.28
Control Delay	8.7	9.9	0.1		8.2	20.1	4.5	30.6	52.6	2.2	42.1	40.8
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	9.9	0.1		8.2	20.1	4.5	30.6	52.6	2.2	42.1	40.8
LOS	A	A	A		A	C	A	C	D	A	D	D
Approach Delay		8.9				9.3			28.0			29.6
Approach LOS		A				A			C			C

Intersection Summary

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow
Control Type:	Actuated-Coordinated
Maximum w/c Ratio:	0.63
Intersection Signal Delay:	18.0
Intersection LOS:	B
Intersection Capacity Utilization:	61.6%
ICU Level of Service:	B
Analysis Period (min):	60

Splits and Phases: 7: E Industry Rd & SR 524



Lanes, Volumes, Timings
6: SR 524 & London Blvd

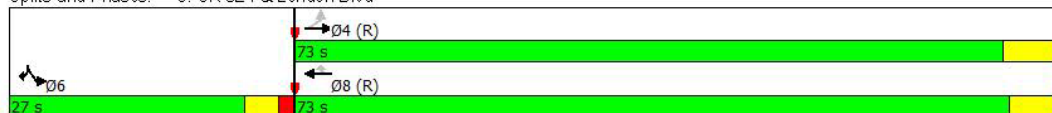
SR 524 Corridor Study
 2016 Existing AM Peak

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↗	↖	↖	↗
Traffic Volume (vph)	4	567	345	18	117	22
Future Volume (vph)	4	567	345	18	117	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			400	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	50				50	
Satd. Flow (prot)	1805	1776	1759	1615	1805	1553
Flt Permitted	0.554				0.950	
Satd. Flow (perm)	1042	1776	1759	1584	1805	1553
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				18		22
Link Speed (mph)		55	45		30	
Link Distance (ft)		6754	426		449	
Travel Time (s)		83.7	6.5		10.2	
Lane Group Flow (vph)	4	567	345	18	117	22
Turn Type	Perm	NA	NA	Perm	Prot	Prot
Protected Phases		4	8		6	6
Permitted Phases	4			8		
Total Split (s)	73.0	73.0	73.0	73.0	27.0	27.0
Total Lost Time (s)	6.0	6.0	5.3	5.3	4.7	4.7
Act Effect Green (s)	77.0	77.0	77.7	77.7	12.3	12.3
Actuated g/C Ratio	0.77	0.77	0.78	0.78	0.12	0.12
w/c Ratio	0.00	0.42	0.25	0.01	0.53	0.10
Control Delay	3.2	5.3	3.3	0.4	49.6	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.2	5.3	3.3	0.4	49.6	16.0
LOS	A	A	A	A	D	B
Approach Delay		5.3	3.2		44.3	
Approach LOS		A	A		D	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 78 (78%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.53
 Intersection Signal Delay: 9.6
 Intersection LOS: A
 Intersection Capacity Utilization 47.1%
 ICU Level of Service A
 Analysis Period (min) 60

Splits and Phases: 6: SR 524 & London Blvd



Lanes, Volumes, Timings
5: Cox Rd & SR 524

SR 524 Corridor Study
2016 Existing AMPeak

	↖	→	↘	↙	←	↖	↙	↑	↘	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗		↕			↕	
Traffic Volume (vph)	6	497	74	154	249	18	22	15	68	44	74	38
Future Volume (vph)	6	497	74	154	249	18	22	15	68	44	74	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		300	200		300	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	0	1684	0	0	1776	0
Flt Permitted	0.605			0.288				0.913			0.881	
Satd. Flow (perm)	1127	1863	1583	536	1863	1583	0	1553	0	0	1587	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			151			42		68			28	
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		5722			6754			1094			1090	
Travel Time (s)		70.9			83.7			16.6			16.5	
Lane Group Flow (vph)	6	497	74	154	249	18	0	105	0	0	156	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8		8	2			6		
Total Split (s)	25.7	25.7	25.7	11.0	36.7	36.7	23.3	23.3		23.3	23.3	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.3			5.3	
Act Effect Green (s)	23.1	23.1	23.1	29.5	31.3	31.3		10.2			10.2	
Actuated g/C Ratio	0.49	0.49	0.49	0.62	0.66	0.66		0.22			0.22	
w/c Ratio	0.01	0.55	0.09	0.33	0.20	0.02		0.27			0.43	
Control Delay	11.3	17.5	0.6	7.4	6.0	1.0		10.4			19.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	11.3	17.5	0.6	7.4	6.0	1.0		10.4			19.4	
LOS	B	B	A	A	A	A		B			B	
Approach Delay		15.3			6.3			10.4			19.4	
Approach LOS		B			A			B			B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 47.4
 Control Type: Actuated-Uncoordinated
 Maximum w/c Ratio: 0.55
 Intersection Signal Delay: 12.4
 Intersection LOS: B
 Intersection Capacity Utilization 62.1%
 ICU Level of Service B
 Analysis Period (min) 60

Splits and Phases: 5: Cox Rd & SR 524

↖ Ø2 23.3 s	↘ Ø3 11 s	↕ Ø4 25.7 s
↘ Ø6 23.3 s	↙ Ø8 36.7 s	

HCM Unsignalized Intersection Capacity Analysis
4: SR 524 & E. Friday Rd

SR 524 Corridor Study
2016 Existing AM Peak

	↩	↗	→	←	↖	↘	↙
Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↘	↗↗	↗	↘	↘	
Traffic Volume (veh/h)	11	32	428	301	17	57	130
Future Volume (Veh/h)	11	32	428	301	17	57	130
Sign Control			Free	Free		Stop	
Grade			0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	32	428	301	17	57	130
Pedestrians			11				
Lane Width (ft)			12.0				
Walking Speed (ft/s)			3.5				
Percent Blockage			1				
Right turn flare (veh)							
Median type			Raised	None			
Median storage (veh)			1				
Upstream signal (ft)							
pX, platoon unblocked	0.00						
vC, conflicting volume	0	318				579	312
vC1, stage 1 conf vol						301	
vC2, stage 2 conf vol						278	
vCu, unblocked vol	0	318				579	312
tC, single (s)	0.0	4.2				6.8	6.9
tC, 2 stage (s)						5.8	
tF (s)	0.0	2.2				3.5	3.3
p0 queue free %	0	97				89	81
cM capacity (veh/h)	0	1217				529	683
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	
Volume Total	32	214	214	301	17	187	
Volume Left	32	0	0	0	0	57	
Volume Right	0	0	0	0	17	130	
cSH	1217	1700	1700	1700	1700	627	
Volume to Capacity	0.03	0.13	0.13	0.18	0.01	0.30	
Queue Length 95th (ft)	2	0	0	0	0	32	
Control Delay (s)	8.0	0.0	0.0	0.0	0.0	13.2	
Lane LOS	A					B	
Approach Delay (s)	0.6			0.0		13.2	
Approach LOS						B	
Intersection Summary							
Average Delay			2.8				
Intersection Capacity Utilization			41.5%		ICU Level of Service		A
Analysis Period (min)			60				

Lanes, Volumes, Timings
4: SR 524 & E. Friday Rd

SR 524 Corridor Study
2016 Existing AM Peak

	↶	↷	→	←	↶	↷	
Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↶↶	↶	↶	↶	
Traffic Volume (vph)	11	32	428	301	17	57	130
Future Volume (vph)	11	32	428	301	17	57	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		350			350	0	0
Storage Lanes		1			1	1	0
Taper Length (ft)		50				50	
Satd. Flow (prot)	0	1740	3343	1743	1455	1685	0
Flt Permitted		0.950				0.985	
Satd. Flow (perm)	0	1740	3343	1743	1455	1685	0
Link Speed (mph)			45	55		30	
Link Distance (ft)			750	5722		1106	
Travel Time (s)			11.4	70.9		25.1	
Lane Group Flow (vph)	0	43	428	301	17	187	0
Sign Control			Free	Free		Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 41.5%

ICU Level of Service A

Analysis Period (min) 60

HCM Unsignalized Intersection Capacity Analysis
3: I-95 NB Ramps & SR 524

SR 524 Corridor Study
 2016 Existing AM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↗		↘	↗	↘	↘	↗	↗			
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)										3		
Median type	None			Raised								
Median storage (veh)						1						
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0		0		0		0		0		0	
vC1, stage 1 conf vol							0		0		0	
vC2, stage 2 conf vol							0		0		0	
vCu, unblocked vol	0		0		0		0		0		0	
tC, single (s)	4.1		4.1		7.1		6.5		6.2		6.2	
tC, 2 stage (s)							6.1		5.5		5.5	
tF (s)	2.2		2.2		3.5		4.0		3.3		3.3	
p0 queue free %	100		100		100		100		100		100	
cM capacity (veh/h)	1623		1623		1023		896		1085		1085	
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1						
Volume Total	0	0	0	0	0	0						
Volume Left	0	0	0	0	0	0						
Volume Right	0	0	0	0	0	0						
cSH	1700	1700	1700	1700	1700	1700						
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00						
Queue Length 95th (ft)	0	0	0	0	0	0						
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Lane LOS							A					
Approach Delay (s)	0.0		0.0		0.0							
Approach LOS							A					
Intersection Summary												
Average Delay			0.0									
Intersection Capacity Utilization			0.0%		ICU Level of Service		A					
Analysis Period (min)			60									

Lanes, Volumes, Timings
3: I-95 NB Ramps & SR 524

SR 524 Corridor Study
 2016 Existing AM Peak

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑		↖	↑	↖	↖		↖			↖
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	475		0	0		80	0		0
Storage Lanes	1		0	1		1	1		1	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1863	1863	0	1863	1863	1863	1863	0	1863	0	0	0
Flt Permitted												
Satd. Flow (perm)	1863	1863	0	1863	1863	1863	1863	0	1863	0	0	0
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		319			750			648			561	
Travel Time (s)		4.8			11.4			11.0			9.6	
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0%
	ICU Level of Service A
Analysis Period (min)	60

HCM Unsignalized Intersection Capacity Analysis
2: SR 524 & I-95 SB Ramps

SR 524 Corridor Study
 2016 Existing AM Peak

Intersection Sign configuration not allowed in HCM analysis.

Lanes, Volumes, Timings
2: SR 524 & I-95 SB Ramps

SR 524 Corridor Study
 2016 Existing AM Peak

	↖	→	↘	↙	←	↖	↘	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↖	↖	↑					↖		↖
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1863	1863	1863	1863	1863	0	0	0	0	1863	0	1863
Flt Permitted												
Satd. Flow (perm)	1863	1863	1863	1863	1863	0	0	0	0	1863	0	1863
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		663			319			594			488	
Travel Time (s)		10.0			4.8			10.1			8.3	
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0%
	ICU Level of Service A
Analysis Period (min)	60

HCM Unsignalized Intersection Capacity Analysis
1: W. Friday Rd & SR 524

SR 524 Corridor Study
2016 Existing AM Peak

Movement	SBT	SBR
Lane Configurations	↕	↗
Traffic Volume (veh/h)	3	2
Future Volume (Veh/h)	3	2
Sign Control	Stop	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	3	2
Pedestrians	2	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	3.5	
Percent Blockage	0	
Right turn flare (veh)		9
Median type		
Median storage (veh)		
Upstream signal (ft)		
pX, platoon unblocked		
vC, conflicting volume	472	136
vC1, stage 1 conf vol	169	
vC2, stage 2 conf vol	303	
vCu, unblocked vol	472	136
tC, single (s)	6.5	6.2
tC, 2 stage (s)	5.5	
tF (s)	4.0	3.3
p0 queue free %	99	100
cM capacity (veh/h)	535	912
Direction, Lane #		

HCM Unsignalized Intersection Capacity Analysis
1: W. Friday Rd & SR 524

SR 524 Corridor Study
 2016 Existing AM Peak

	↩	↗	→	↘	↩	↗	→	↘	↩	↗	→	↘
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↗	↗	↗		↗	↗	↗		↗	↗	
Traffic Volume (veh/h)	1	0	299	4	8	19	129	10	2	0	37	21
Future Volume (Veh/h)	1	0	299	4	8	19	129	10	2	0	37	21
Sign Control			Free				Free			Stop		
Grade			0%				0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	299	4	0	19	129	10	2	0	37	21
Pedestrians			5				2					
Lane Width (ft)			12.0				12.0					
Walking Speed (ft/s)			3.5				3.5					
Percent Blockage			0				0					
Right turn flare (veh)												
Median type			Raised				Raised					
Median storage (veh)			1				1					
Upstream signal (ft)												
pX, platoon unblocked	0.00				0.00							
vC, conflicting volume	0	141			0	303			474	478	301	507
vC1, stage 1 conf vol									299	299		169
vC2, stage 2 conf vol									174	179		338
vCu, unblocked vol	0	141			0	303			474	478	301	507
tC, single (s)	0.0	4.1			0.0	4.1			7.1	6.5	6.2	7.1
tC, 2 stage (s)									6.1	5.5		6.1
tF (s)	0.0	2.2			0.0	2.2			3.5	4.0	3.3	3.5
p0 queue free %	0	100			0	98			100	100	95	96
cM capacity (veh/h)	0	1452			0	1247			569	539	735	519
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	0	299	4	19	129	10	39	26				
Volume Left	0	0	0	19	0	0	2	21				
Volume Right	0	0	4	0	0	10	37	2				
cSH	1700	1700	1700	1247	1700	1700	724	564				
Volume to Capacity	0.00	0.18	0.00	0.02	0.08	0.01	0.05	0.05				
Queue Length 95th (ft)	0	0	0	1	0	0	4	4				
Control Delay (s)	0.0	0.0	0.0	7.9	0.0	0.0	10.3	12.0				
Lane LOS				A			B	B				
Approach Delay (s)	0.0			1.0			10.3	12.0				
Approach LOS							B	B				
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			37.9%		ICU Level of Service		A					
Analysis Period (min)			60									

Lanes, Volumes, Timings
1: W. Friday Rd & SR 524

SR 524 Corridor Study
 2016 Existing AM Peak

Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	1	0	299	4	8	19	129	10	2	0	37	21
Future Volume (vph)	1	0	299	4	8	19	129	10	2	0	37	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		275		400		0	0		0	0
Storage Lanes		1		1		1		1	0		0	0
Taper Length (ft)		50				50			50			50
Satd. Flow (prot)	0	1805	1681	1615	0	1756	1532	1468	0	1606	0	0
Flt Permitted		0.950				0.950				0.997		
Satd. Flow (perm)	0	1805	1681	1615	0	1756	1532	1468	0	1606	0	0
Link Speed (mph)			45				45			30		
Link Distance (ft)			723				663			505		
Travel Time (s)			11.0				10.0			11.5		
Lane Group Flow (vph)	0	1	299	4	0	27	129	10	0	39	0	0
Sign Control			Free				Free			Stop		

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 37.9% ICU Level of Service A
 Analysis Period (min) 60

Lane Group	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	3	2
Future Volume (vph)	3	2
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		220
Storage Lanes		1
Taper Length (ft)		
Satd. Flow (prot)	1820	1615
Flt Permitted	0.958	
Satd. Flow (perm)	1820	1615
Link Speed (mph)	30	
Link Distance (ft)	597	
Travel Time (s)	13.6	
Lane Group Flow (vph)	24	2
Sign Control	Stop	

Intersection Summary

Lanes, Volumes, Timings
2: SR 524 & I-95 SB Ramps

SR 524 Corridor Study
 2016 Existing PM Peak

	↖	→	↘	↙	←	↖	↘	↑	↖	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↘	↙	↑					↖		↙
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	175		0	0		0	0		0	0		0
Storage Lanes	1		1	1		0	0		0	1		1
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1863	1863	1863	1863	1863	0	0	0	0	1863	0	1863
Flt Permitted												
Satd. Flow (perm)	1863	1863	1863	1863	1863	0	0	0	0	1863	0	1863
Link Speed (mph)		45			45				40			40
Link Distance (ft)		663			319				594			488
Travel Time (s)		10.0			4.8				10.1			8.3
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Stop				Stop			Stop

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0%
	ICU Level of Service A
Analysis Period (min)	60

HCM Unsignalized Intersection Capacity Analysis
1: W. Friday Rd & SR 524

SR 524 Corridor Study
 2016 Existing PM Peak

	↓	↙
Movement	SBT	SBR
Lane Configurations	↖	↘
Traffic Volume (veh/h)	1	0
Future Volume (Veh/h)	1	0
Sign Control	Stop	
Grade	0%	
Peak Hour Factor	1.00	1.00
Hourly flow rate (vph)	1	0
Pedestrians	7	
Lane Width (ft)	12.0	
Walking Speed (ft/s)	3.5	
Percent Blockage	1	
Right turn flare (veh)		9
Median type		
Median storage (veh)		
Upstream signal (ft)		
pX, platoon unblocked		
vC, conflicting volume	448	129
vC1, stage 1 conf vol	224	
vC2, stage 2 conf vol	224	
vCu, unblocked vol	448	129
tC, single (s)	6.5	6.2
tC, 2 stage (s)	5.5	
tF (s)	4.0	3.3
p0 queue free %	100	100
cM capacity (veh/h)	531	916
Direction, Lane #		

HCM Unsignalized Intersection Capacity Analysis 1: W. Friday Rd & SR 524

SR 524 Corridor Study
2016 Existing PM Peak

	↵	↗	→	↘	↶	↙	←	↖	↗	↑	↘	↙
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↘	↗	↗		↘	↗	↗		↗		
Traffic Volume (veh/h)	1	3	209	6	10	50	117	32	9	1	39	14
Future Volume (Veh/h)	1	3	209	6	10	50	117	32	9	1	39	14
Sign Control			Free				Free			Stop		
Grade			0%				0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	3	209	6	0	50	117	32	9	1	39	14
Pedestrians			5				8			3		
Lane Width (ft)			12.0				12.0			12.0		
Walking Speed (ft/s)			3.5				3.5			3.5		
Percent Blockage			0				1			0		
Right turn flare (veh)												
Median type			Raised				Raised					
Median storage (veh)			1				1					
Upstream signal (ft)												
pX, platoon unblocked	0.00				0.00							
vC, conflicting volume	0	156			0	218			440	474	220	486
vC1, stage 1 conf vol									218	218		224
vC2, stage 2 conf vol									222	256		262
vCu, unblocked vol	0	156			0	218			440	474	220	486
tC, single (s)	0.0	4.1			0.0	4.1			7.2	6.5	6.2	7.1
tC, 2 stage (s)									6.2	5.5		6.1
tF (s)	0.0	2.2			0.0	2.2			3.6	4.0	3.3	3.5
p0 queue free %	0	100			0	96			98	100	95	97
cM capacity (veh/h)	0	1427			0	1348			561	529	804	519
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	3	209	6	50	117	32	49	15				
Volume Left	3	0	0	50	0	0	9	14				
Volume Right	0	0	6	0	0	32	39	0				
cSH	1427	1700	1700	1348	1700	1700	737	411				
Volume to Capacity	0.00	0.12	0.00	0.04	0.07	0.02	0.07	0.04				
Queue Length 95th (ft)	0	0	0	3	0	0	5	3				
Control Delay (s)	7.5	0.0	0.0	7.8	0.0	0.0	10.2	14.1				
Lane LOS	A			A			B	B				
Approach Delay (s)	0.1			2.0			10.2	14.1				
Approach LOS							B	B				
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			34.5%	ICU Level of Service	A							
Analysis Period (min)			60									

Lanes, Volumes, Timings
1: W. Friday Rd & SR 524

SR 524 Corridor Study
2016 Existing PM Peak

	↩	↗	→	↘	↩	↗	←	↘	↗	↩	↘	↘
Lane Group	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations		↘	↗	↗		↘	↗	↗		↗		
Traffic Volume (vph)	1	3	209	6	10	50	117	32	9	1	39	14
Future Volume (vph)	1	3	209	6	10	50	117	32	9	1	39	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		120		275		400		0	0		0	0
Storage Lanes		1		1		1		1	0		0	0
Taper Length (ft)		50				50			50			50
Satd. Flow (prot)	0	1805	1681	1615	0	1775	1827	1615	0	1586	0	0
Flt Permitted		0.950				0.950				0.991		
Satd. Flow (perm)	0	1805	1681	1615	0	1775	1827	1615	0	1586	0	0
Link Speed (mph)			45				45			30		
Link Distance (ft)			723				663			505		
Travel Time (s)			11.0				10.0			11.5		
Lane Group Flow (vph)	0	4	209	6	0	60	117	32	0	49	0	0
Sign Control			Free				Free			Stop		

Intersection Summary

Area Type: Other
 Control Type: Unsignalized
 Intersection Capacity Utilization 34.5% ICU Level of Service A
 Analysis Period (min) 60

	↓	↘
Lane Group	SBT	SBR
Lane Configurations	↘	↘
Traffic Volume (vph)	1	0
Future Volume (vph)	1	0
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		220
Storage Lanes		1
Taper Length (ft)		
Satd. Flow (prot)	1814	1900
Flt Permitted	0.955	
Satd. Flow (perm)	1814	1900
Link Speed (mph)		30
Link Distance (ft)		597
Travel Time (s)		13.6
Lane Group Flow (vph)	15	0
Sign Control	Stop	

Intersection Summary

Lanes, Volumes, Timings
7: E Industry Rd & SR 524

SR 524 Corridor Study
2016 Existing PM Peak

	↓	↙
Lane Group	SBT	SBR
Lane Configurations	↑	↗
Traffic Volume (vph)	147	476
Future Volume (vph)	147	476
Ideal Flow (vphpl)	1900	1900
Storage Length (ft)		0
Storage Lanes		1
Taper Length (ft)		
Satd. Flow (prot)	1881	1568
Flt Permitted		
Satd. Flow (perm)	1881	1537
Right Turn on Red		Yes
Satd. Flow (RTOR)		476
Link Speed (mph)	45	
Link Distance (ft)	679	
Travel Time (s)	10.3	
Lane Group Flow (vph)	147	476
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Total Split (s)	33.7	33.7
Total Lost Time (s)	5.7	5.7
Act Effct Green (s)	25.8	25.8
Actuated g/C Ratio	0.26	0.26
v/c Ratio	0.30	0.64
Control Delay	31.8	7.3
Queue Delay	0.0	0.0
Total Delay	31.8	7.3
LOS	C	A
Approach Delay	19.6	
Approach LOS	B	
Intersection Summary		

Lanes, Volumes, Timings
7: E Industry Rd & SR 524

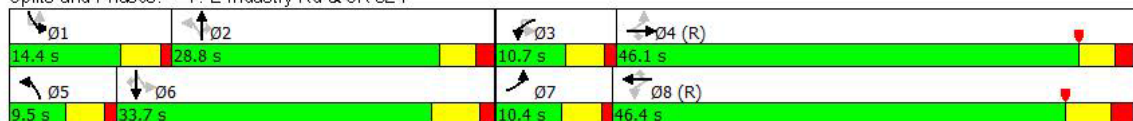
SR 524 Corridor Study
 2016 Existing PM Peak

	↖	→	↘	↙	↘	←	↖	↖	↑	↗	↗	↘
Lane Group	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↖	↑	↘		↖	↑	↘	↖	↑	↘		↘
Traffic Volume (vph)	396	295	9	1	128	322	476	26	115	91	2	441
Future Volume (vph)	396	295	9	1	128	322	476	26	115	91	2	441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		325		475		0	250		250		0
Storage Lanes	1		1		1		1	1		1		2
Taper Length (ft)	50				50			50				50
Satd. Flow (prot)	1641	1863	1615	0	1805	1863	1599	1805	1863	1615	0	3400
Flt Permitted	0.361				0.580			0.663				0.460
Satd. Flow (perm)	622	1863	1562	0	1100	1863	1576	1255	1863	1583	0	1642
Right Turn on Red			Yes				Yes			Yes		
Satd. Flow (RTOR)			177				476			182		
Link Speed (mph)		45				40			45			
Link Distance (ft)		728				737			606			
Travel Time (s)		11.0				12.6			9.2			
Lane Group Flow (vph)	396	295	9	0	129	322	476	26	115	91	0	443
Turn Type	pm+pt	NA	Perm	custom	pm+pt	NA	Perm	pm+pt	NA	Perm	custom	pm+pt
Protected Phases	7	4			3	8		5	2			1
Permitted Phases	4		4	3	8		8	2		2	1	6
Total Split (s)	10.4	46.1	46.1	10.7	10.7	46.4	46.4	9.5	28.8	28.8	14.4	14.4
Total Lost Time (s)	4.5	5.0	5.0		4.5	6.2	6.2	4.5	5.0	5.0		4.5
Act Effect Green (s)	59.3	45.5	45.5		44.2	33.8	33.8	17.2	10.2	10.2		31.7
Actuated g/C Ratio	0.59	0.46	0.46		0.44	0.34	0.34	0.17	0.10	0.10		0.32
v/c Ratio	0.70	0.35	0.01		0.24	0.51	0.56	0.10	0.61	0.28		0.55
Control Delay	20.1	20.7	0.0		12.9	32.4	5.8	23.1	56.5	2.2		28.7
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	20.1	20.7	0.0		12.9	32.4	5.8	23.1	56.5	2.2		28.7
LOS	C	C	A		B	C	A	C	E	A		C
Approach Delay		20.1				16.0			31.4			
Approach LOS		C				B			C			

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 96 (96%), Referenced to phase 4:EBTL and 8:WBTL, Start of Yellow
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.70
 Intersection Signal Delay: 19.5 Intersection LOS: B
 Intersection Capacity Utilization 90.0% ICU Level of Service E
 Analysis Period (min) 60

Splits and Phases: 7: E Industry Rd & SR 524



Lanes, Volumes, Timings
6: SR 524 & London Blvd

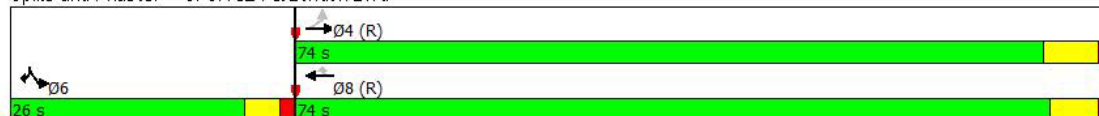
SR 524 Corridor Study
2016 Existing PMPeak

	↖	→	←	↗	↘	↙
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↑	↗	↖	↗
Traffic Volume (vph)	16	588	718	106	94	9
Future Volume (vph)	16	588	718	106	94	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	300			400	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	50				50	
Satd. Flow (prot)	1805	1827	1863	1615	1805	1583
Flt Permitted	0.355				0.950	
Satd. Flow (perm)	673	1827	1863	1584	1780	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				106		9
Link Speed (mph)		55	45		30	
Link Distance (ft)		6754	426		449	
Travel Time (s)		83.7	6.5		10.2	
Lane Group Flow (vph)	16	588	718	106	94	9
Turn Type	Perm	NA	NA	Perm	Prot	Prot
Protected Phases		4	8		6	6
Permitted Phases	4			8		
Total Split (s)	74.0	74.0	74.0	74.0	26.0	26.0
Total Lost Time (s)	6.0	6.0	5.3	5.3	4.7	4.7
Act Effct Green (s)	82.0	82.0	82.5	82.5	11.5	11.5
Actuated g/C Ratio	0.82	0.82	0.82	0.82	0.12	0.12
w/c Ratio	0.03	0.39	0.47	0.08	0.46	0.05
Control Delay	3.1	4.3	4.1	0.3	48.4	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	4.3	4.1	0.3	48.4	20.8
LOS	A	A	A	A	D	C
Approach Delay		4.3	3.6		46.0	
Approach LOS		A	A		D	

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 88 (88%), Referenced to phase 4:EBTL and 8:WBT, Start of Green
 Control Type: Actuated-Coordinated
 Maximum w/c Ratio: 0.47
 Intersection Signal Delay: 6.7
 Intersection Capacity Utilization 54.5%
 Analysis Period (min) 60
 Intersection LOS: A
 ICU Level of Service A

Splits and Phases: 6: SR 524 & London Blvd



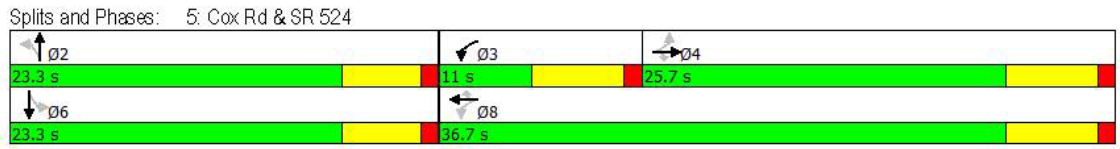
Lanes, Volumes, Timings
5: Cox Rd & SR 524

SR 524 Corridor Study
 2016 Existing PMPeak

	↖	→	↘	↙	←	↗	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↘	↙	↖	↗	↖	↗	↖	↗	↘	↙
Traffic Volume (vph)	34	360	22	124	495	83	83	42	155	44	31	23
Future Volume (vph)	34	360	22	124	495	83	83	42	155	44	31	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		300	200		300	0		0	0		0
Storage Lanes	1		1	1		1	0		0	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1805	1827	1615	1770	1863	1615	0	1712	0	0	1799	0
Flt Permitted	0.482			0.338				0.865			0.767	
Satd. Flow (perm)	916	1827	1615	630	1863	1615	0	1504	0	0	1411	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			151			83		106			23	
Link Speed (mph)		55			55			45			45	
Link Distance (ft)		5722			6754			604			1090	
Travel Time (s)		70.9			83.7			9.2			16.5	
Lane Group Flow (vph)	34	360	22	124	495	83	0	280	0	0	98	0
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4		3	8		2	2			6	6
Permitted Phases	4		4	8		8	2			6		
Total Split (s)	25.7	25.7	25.7	11.0	36.7	36.7	23.3	23.3		23.3	23.3	
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0		5.3			5.3	
Act Effct Green (s)	15.6	15.6	15.6	23.9	23.9	23.9		11.8			11.8	
Actuated g/C Ratio	0.33	0.33	0.33	0.50	0.50	0.50		0.25			0.25	
v/c Ratio	0.11	0.60	0.03	0.28	0.53	0.10		0.62			0.27	
Control Delay	14.6	20.1	0.1	8.5	10.8	2.4		17.6			14.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0			0.0	
Total Delay	14.6	20.1	0.1	8.5	10.8	2.4		17.6			14.7	
LOS	B	C	A	A	B	A		B			B	
Approach Delay		18.6			9.4			17.6			14.7	
Approach LOS		B			A			B			B	

Intersection Summary

Area Type: Other
 Cycle Length: 60
 Actuated Cycle Length: 47.6
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.62
 Intersection Signal Delay: 13.8 Intersection LOS: B
 Intersection Capacity Utilization 67.3% ICU Level of Service C
 Analysis Period (min) 60



HCM Unsignalized Intersection Capacity Analysis
4: SR 524 & E. Friday Rd

SR 524 Corridor Study
2016 Existing PM Peak

	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Movement							
Lane Configurations		↘	↕	↕	↕	↘	↘
Traffic Volume (veh/h)	15	139	384	454	76	43	78
Future Volume (Veh/h)	15	139	384	454	76	43	78
Sign Control			Free	Free		Stop	
Grade			0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	139	384	454	76	43	78
Pedestrians							
Lane Width (ft)							
Walking Speed (ft/s)							
Percent Blockage							
Right turn flare (veh)							
Median type			Raised	None			
Median storage (veh)			1				
Upstream signal (ft)							
pX, platoon unblocked	0.00						
vC, conflicting volume	0	530				924	454
vC1, stage 1 conf vol						454	
vC2, stage 2 conf vol						470	
vCu, unblocked vol	0	530				924	454
tC, single (s)	0.0	4.2				6.8	6.9
tC, 2 stage (s)						5.8	
tF (s)	0.0	2.3				3.5	3.3
p0 queue free %	0	86				88	86
cM capacity (veh/h)	0	1006				362	556
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1	
Volume Total	139	192	192	454	76	121	
Volume Left	139	0	0	0	0	43	
Volume Right	0	0	0	0	76	78	
cSH	1006	1700	1700	1700	1700	467	
Volume to Capacity	0.14	0.11	0.11	0.27	0.04	0.26	
Queue Length 95th (ft)	12	0	0	0	0	26	
Control Delay (s)	9.2	0.0	0.0	0.0	0.0	15.4	
Lane LOS	A					C	
Approach Delay (s)	2.4			0.0		15.4	
Approach LOS						C	
Intersection Summary							
Average Delay			2.7				
Intersection Capacity Utilization			49.6%		ICU Level of Service		A
Analysis Period (min)			60				

Lanes, Volumes, Timings
4: SR 524 & E. Friday Rd

SR 524 Corridor Study
2016 Existing PM Peak

Lane Group	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↘	↕	↗	↘	↘	
Traffic Volume (vph)	15	139	384	454	76	43	78
Future Volume (vph)	15	139	384	454	76	43	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)		350			350	0	0
Storage Lanes		1			1	1	0
Taper Length (ft)		50				50	
Satd. Flow (prot)	0	1712	3610	1881	1615	1694	0
Flt Permitted		0.950				0.983	
Satd. Flow (perh)	0	1712	3610	1881	1615	1694	0
Link Speed (mph)			45	55		30	
Link Distance (ft)			750	5722		1106	
Travel Time (s)			11.4	70.9		25.1	
Lane Group Flow (vph)	0	154	384	454	76	121	0
Sign Control			Free	Free		Stop	

Intersection Summary

Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	49.6%
ICU Level of Service	A
Analysis Period (min)	60

HCM Unsignalized Intersection Capacity Analysis 3: I-95 NB Ramps & SR 524

SR 524 Corridor Study
2016 Existing PM Peak

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)										3		
Median type	None				Raised							
Median storage (veh)					1							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			0			0	0	0	0	0	0
vC1, stage 1 conf vol							0	0		0	0	
vC2, stage 2 conf vol							0	0		0	0	
vCu, unblocked vol	0			0			0	0	0	0	0	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1623			1023	896	1085	1023	896	1085
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1						
Volume Total	0	0	0	0	0	0						
Volume Left	0	0	0	0	0	0						
Volume Right	0	0	0	0	0	0						
cSH	1700	1700	1700	1700	1700	1700						
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00						
Queue Length 95th (ft)	0	0	0	0	0	0						
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0						
Lane LOS							A					
Approach Delay (s)	0.0		0.0									
Approach LOS							A					
Intersection Summary												
Average Delay			0.0									
Intersection Capacity Utilization			0.0%		ICU Level of Service		A					
Analysis Period (min)			60									

Lanes, Volumes, Timings
3: I-95 NB Ramps & SR 524

SR 524 Corridor Study
 2016 Existing PM Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Future Volume (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	475		0	0		80	0		0
Storage Lanes	1		0	1		1	1		1	0		0
Taper Length (ft)	50			50			50			50		
Satd. Flow (prot)	1863	1863	0	1863	1863	1863	1863	0	1863	0	0	0
Flt Permitted												
Satd. Flow (perm)	1863	1863	0	1863	1863	1863	1863	0	1863	0	0	0
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		319			750			648			561	
Travel Time (s)		4.8			11.4			11.0			9.6	
Lane Group Flow (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	0.0%
	ICU Level of Service A
Analysis Period (min)	60

HCM Unsignalized Intersection Capacity Analysis
2: SR 524 & I-95 SB Ramps

SR 524 Corridor Study
 2016 Existing PM Peak

Intersection Sign configuration not allowed in HCM analysis.



DISTRICT 5

719 S. Woodland Blvd.
DeLand, FL 32720