

# TECHNICAL MEMORANDUM

## *SR 524 Corridor Planning Study Purpose and Need Statement*

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**Date:** April 10, 2017  
**To:** Judy Pizzo, FDOT  
**From:** Michelle Kendall, Alan Danaher, Nathan Silva, and Amy Dunham, WSP | PB

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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 (SR) 524 in Brevard County, Florida. The study will be conducted to a level of detail for the purpose of being used to develop transportation improvement alternatives for the Corridor. As shown in Figure 1, the limits of the SR 524 Study Area extend from Friday Road South to SR 501/Industry Road, a distance of approximately 3.15 miles.

This *SR 524 Purpose and Need Technical Memorandum* summarizes the Purpose and Need Statement for the SR 524 Corridor Study and proposed alternatives. This Memorandum includes an overview of the facility, historical growth and planned development, existing and future land use, existing and future capacity needs, a safety assessment, and a methodology for moving into the development of conceptual alternatives.

### **1.0 Purpose & Need**

The purpose of this Corridor Planning Study is to evaluate the need for potential multimodal transportation improvements along SR 524 in Brevard County, Florida. The need for this Corridor Planning Study is to respond to potential traffic increases along the Corridor from new developments and traffic generators, and to maintain efficient and safe traffic flow, safe pedestrian and bicyclist access, maintain land use balance, protect the environment, and promote economic development along the Corridor.

#### **Project Status**

There is over \$30.0 million slated for the widening from two- to four-lanes of SR 524 between I-95 and Industry Road in the Space Coast TPO 2017-2021 Transportation Improvement Plan (TIP). As of 2015, the widening would be funded as follows: \$1.74 million for a Project Development & Environmental Study (PD&E) in FY 2019, \$3.24 million for Final Design (FD) in FY 2021, \$4.49 million for Right of Way (ROW) in FY 2021, and \$22.47 million for construction in FY 2022.

Figure 1: SR 524 Study Corridor



### Existing and Future Capacity Needs

SR 524 bisects the City of Cocoa and unincorporated Brevard County, and is designated as an *Urban Minor Arterial*. From Friday Road South to Friday Road North, SR 524 consists of two travel lanes in each direction, and can be considered an Access Class 3 roadway. From Friday Road North east to Industry Road, SR 524 consists of one travel lane in each direction, and can be considered an Access Class 4 roadway.

There are seven major intersections along SR 524 (Friday Road South, I-95 Southbound Ramp, I-95 Northbound Ramp, Friday Road North, Cox Road, London Road, and Industry Road), with three of those (Cox Road, London Road, and Industry Road) being signalized. There is another signalized intersection between London Road and Industry Road serving the entrances of the Cocoa Commons and Coventry at Cocoa shopping centers.

For a Class I Undivided 2-Lane Arterial such as SR 524, the existing and future traffic segment volumes along SR 524 are listed in Table 1, along with their corresponding adjusted AADT and LOS classification. By 2040, the majority of the Corridor is projected to operate at LOS E with no geometric improvements to existing infrastructure (2-Lane Undivided Arterial), with two segments operating better than LOS E (Walmart to Cox Road; Westminster Drive to London Blvd). However, if SR 524 were to be expanded from an Undivided 2-Lane Arterial to a Divided 4-Lane Arterial, the entire Corridor would operate at LOS C or better. This analysis revealed that to provide an adequate LOS in the longer-term, four through lanes would be needed in the corridor.

**Table 1: SR 524 Segment LOS (2010 and 2040)**

Segment	2010		2040		
	AADT	LOS*	AADT	LOS* for Undivided 2-Lane Arterial	LOS* for Divided 4-Lane Arterial
Friday Road South to I-95 W	8,622	LOS C	21,090	LOS E	LOS C
I-95 W to I-95 E	9,062	LOS C	21,675	LOS E	LOS C
I-95 E to Friday Road North	9,917	LOS C	22,260	LOS E	LOS C
Friday Road North to Walmart Access Road	7,339	LOS C	18,570	LOS E	LOS C
Walmart Access Road to Cox Road	7,299	LOS C	16,490	LOS C	LOS C
Cox Road to Pinyon Drive	10,616	LOS C	18,740	LOS E	LOS C
Pinyon Drive to Westminster Drive	10,609	LOS C	18,820	LOS E	LOS C
Westminster Drive to London Blvd	9,277	LOS C	17,590	LOS D	LOS C
London Blvd to Shopping Center	14,248	LOS C	21,280	LOS E	LOS C
Shopping Center to Industry Road	14,420	LOS C	23,280	LOS E	LOS C

\* LOS calculated through FDOT [Generalized LOS Planning Tables](#). Page 195.

The existing and future traffic conditions at the eight main intersections along the Corridor are displayed in Table 2. The analysis indicates by 2038, the majority of the Corridor intersections (five out of eight) will be operating at a failing LOS with no geometric improvements to existing infrastructure, with particularly long delay at the I-95 Southbound and Friday Road North intersections. However, if SR 524 were to be expanded from an Undivided 2-Lane Arterial to a Divided 4-Lane Arterial, all intersections along the Corridor, except Industry Road, would operate at LOS C or better. To provide an adequate intersection LOS in the longer-term, four through lanes would be needed in the Corridor. To remedy operations at Industry Road, the 2014 *SR 501 PD&E Study* proposed the addition of a second eastbound left turn lane and westbound through lane at the Industry Road/SR 501 intersection to improve operations from a LOS F to a LOS D.

**Table 2: SR 524 Intersection PM LOS (2017 and 2038)**

Intersection	Control	2017		2038			
				Undivided 2-Lane Arterial		Divided 4-Lane Arterial	
		Delay	LOS	Delay	LOS	Delay	LOS
Friday Road South	TWSC*	25.0**	LOS D	5.7**	LOS A	27.8**	LOS C
I-95 SB Ramps	TWSC*	64.3**	LOS F	2,206.0**	LOS F	18.7**	LOS B
I-95 NB Ramps	TWSC*	21.8**	LOS C	147.6**	LOS F	20.2**	LOS C
Friday Road North	TWSC*	21.9**	LOS C	1,976.0**	LOS F	23.9**	LOS C
Walmart Access Road	Signalized	N/A****		7.8***	LOS A	7.4***	LOS A
Cox Road	Signalized	13.8***	LOS B	67.5***	LOS E	26.8***	LOS C
London Boulevard	Signalized	6.7***	LOS A	7.9***	LOS A	5.8***	LOS A
Industry Road	Signalized	19.5***	LOS B	469.6***	LOS F	72.2***	LOS F

**Source:** Analyzed using Synchro's HCM 2000 Unsignalized Intersection Capacity Analysis & Synchro's Lanes, Volumes, Timings Methodology. \*TWSC = Two-Way Stop Controlled.

\*\*Critical Movement Delay \*\*\*Average Intersection Delay

\*\*\*\*The Walmart Distribution Center has not been constructed yet, so there is no 2017 turning movement data.

### Land Use & Economic Development

The land uses along the SR 524 Corridor are primarily residential, vacant, industrial, and commercial, with a few institutional and recreational uses. The majority of developed residential land uses are located in subdivisions on the north side of SR 524 between Cox Road and Industry Road, however some individual residential lots are scattered throughout. Residential land uses make up 85 percent of the Study Area. The second-largest land use in the Study Area is vacant, accounting for 10 percent of the Study Area, located primarily along the south side of SR 524. The majority of industrial land uses (3 percent of Study Area) are located around Cox Road or adjacent to Industry Road. Commercial land uses (including retail/office) make up just over 1 percent of the Study Area, concentrated primarily in the Cocoa Commons and Coventry at Cocoa shopping centers.

Though the major land uses in the SR 524 Study Area are projected to remain as residential and industrial in the future, the proportion of each use is expected to change as new industrial and residential developments break ground. The largest planned developments in the Study Area include a 272-acre Walmart Distribution Center, to the west of Cox Road and south of SR 524, and a Flying J Travel Center proposed for just west of the Walmart Distribution Center and directly south of the Friday Road North intersection. The location of future commercial and industrial land uses remain clustered near existing development, on the western and eastern ends of the SR

524 Study Area. Planned industrial land uses along Cox Road and SR 524 are expected to generate a significant amount of freight traffic. In addition, there are three planned residential/retail developments along the south side of SR 524 to the east of Cox Road – London Cove, The Preserve, and Cocoa Landings, totaling 1,130 residential units.

**Table 3: Proposed Major Development in the Corridor**

Development Name	Type	Size/Units
Walmart Distribution Center	Industrial	460,000 SF warehouse
Flying J Travel Center	Commercial	14,789 SF
London Cove	Residential/Retail	6 commercial lots 61 townhomes
The Preserve	Residential	248 apartments
Cocoa Landings	Residential/Retail	100,000 SF retail/restaurant 172 townhomes 312 apartments
Adamson Creek	Residential	509 single-family homes
Emerald Lakes	Residential/Retail	44,000 SF retail/restaurant 159 single-family homes

### Modal Interrelationships

SR 524 is currently served by two Space Coast Area Transit (SCAT) bus routes – Route 6 and Route 8. Route 6 (Cocoa/Rockledge) connects SR 524 with Central/South Cocoa and Rockledge, and serves the east end of the SR 524 Study Area, making a loop in the Cocoa Commons (Publix) shopping center. Route 8 (West Cocoa) connects Western and Central Cocoa along SR 520, serving Friday Road South, just outside the SR 524 Study Area. Any proposed multimodal improvement along SR 524 will interface with and be designed to complement pedestrian and bicycle networks, local transit services (SCAT Routes 6 and 8), as well as access to Port Canaveral and Orlando International Airport. Additionally, if the proposed Cocoa Brightline Station moves forward, close coordination will be required between station design and any improvements proposed for SR 524.

### Safety

From 2010 to 2014, the average crash rate on SR 524 was greater than the average statewide crash rates on comparable roads. There were 124 crashes during that time, of which three were fatal, 60 involved injuries, and 61 were property damage only. The two segments with the highest number of crashes are between the two I-95 interchanges and between London Boulevard and Industry Road. The SR 524/I-95 interchanges have crash rates more than triple the statewide average (6.98 crashes/million vehicle miles traveled (MVMT) compared to 2.25).

As traffic volumes increase along SR 524, there is the potential for a proportionate increase in the number of crashes, particularly given the projected increases in freight traffic on the western side of the Study Area. However, design options can be considered to help reduce the potential crashes. For example, if SR 524 is widened from two to four lanes and divided with a median, there would be a significant reduction in projected crash rates (overall average crash rate of 2.59 for a divided 4-5 lane facility vs. 3.63 for an undivided 2-3 lane facility according to FDOT).

## 2.0 Needs Assessment

This Section consolidates and defines specific transportation needs within the SR 524 Corridor in order to contribute to the identification of improvement strategies and assessment of these alternatives. To build off of the baseline of data collected in the Existing Conditions Summary Report, discussions were held with key stakeholders to understand their insights into the Study Area, its current conditions, and their future vision for the Corridor. Following the stakeholder interviews, guiding principles were then developed to guide the goals and objectives for the Corridor, as identified in Table 4.

### Stakeholder Interviews

To gain local perspective and insight on the SR 524 Corridor, stakeholder interviews were held in mid-August 2016 with five of our Project Visioning Team (PVT) member agencies. The questions asked of the stakeholders were designed to gauge their sense of the project's purpose and need, modal travel patterns, recent or anticipated changes, corridor users, issues and challenges, and their vision for how SR 524 should look in the future. Specific representatives interviewed included:

- **City of Cocoa** – Steve Biel and Steve Bolden
- **Brevard County** – Erin Sterk
- **Space Coast Transportation Planning Organization** – Steven Bostel & Laura Carter
- **Space Coast Area Transit** (phone) – Jim Liesenfelt
- **Canaveral Port Authority** (phone) – Veronica Narvaez-Lugo

Each of the discussions provided a different perspective into the history, issues, and current conditions of the SR 524 Corridor, its existing travel patterns and challenges, and their personal or agency vision for the Corridor. Many of the interviews provided key insights into suggested goals and objectives for the Corridor. In summary, the following common themes were distilled from the interviews:

- The SR 524 Corridor is significant for both freight and local resident traffic, as well as multi-modal connections.
- The Corridor serves a mix of local, rural, residential traffic, some cut-through commuter traffic, and some freight traffic.
- The Corridor has not seen any development in the past few years, but several development plans are currently in process. However, there has been increased truck traffic and safety issues at the I-95 interchanges.
- The Corridor is expected to experience significant changes as a result of Walmart, Flying J, The Preserve, and two potential large projects in the northeast quadrant of the Corridor - Home Depot and Brightline station.
- There is a mix of local residents and through traffic using the Corridor; pedestrians using the shared pathway between Cox/Industry Road but not as many bicyclists; dangerous pedestrian conditions between Friday Road South and Cox Road.
- The Corridor experiences the most traffic volume between the Cox and Industry Road intersections.
- The Corridor will see bicycle/pedestrian use as long as facilities are provided in development plans.
- The Corridor will likely be four-lane divided highway with two segments, separated by Cox Road – industrial/freight access to the South, and residential/multi-modal to the North.

- The Corridor has several challenges that should be addressed: vehicular safety, bike/pedestrian safety, access management, truck movements, streetlights, and transit access.

### Guiding Principles

Building upon the data collected through the Existing Conditions Report and lessons learned from the stakeholder interviews and the first Public Meeting, it is evident SR 524 is a vital connector within the City of Cocoa and Brevard County, and its future should be carefully designed to incorporate and promote a variety of local, regional, and state goals and objectives

To move forward towards the development of conceptual alternatives, a list of five guiding principles were developed. These guiding principles speak to what the Cocoa community views as important as it relates to the multi-modal transportation vision and associated land use goals of the SR 524 Study Area, and they take the first attempt at defining the vision for SR 524. These guiding principles are listed in Table 4.

### Goals, Objectives and Evaluation Measures

The Goals and Objectives were designed to support the Guiding Principles and are also identified in Table 4. As the Study progresses, conceptual roadway alternatives will be developed and analyzed. The measures to evaluate the alternatives, also identified in Table 4, were developed to be consistent with the Guiding Principles, Goals and Objectives for the SR 524 Corridor.

**Table 4: Guiding Principles for SR 524**

Guiding Principle	Goal	Evaluation Measure
<b>Safety and Security</b>	To provide a safe and secure Corridor	Improvement In Estimated Crash Rate
		Improved Pedestrian Safety: Sidewalks Or Pathways
		Improved Bicyclist Safety: Bicycle Lanes
<b>Mobility, Connectivity, and Accessibility</b>	To facilitate the easy movement of people and goods, improve interconnectivity between activity centers, I-95, SR 520, and SR 528, and provide access to different modes of transportation	Provision Of Sufficient Travel Lanes
		Overall Access Management Strategy
		Improved Mobility: Sidewalk Connectivity
<b>Environmental Stewardship</b>	To protect the environment and the Cocoa Conservation Area	Impacts to Existing ROW Tied to Existing Stormwater and Drainage
		Impacts to Existing Drainage
<b>Economic Vitality</b>	To promote economic development, freight movement, and the development of a specialized economic hub along the Corridor	Promote Safe and Easy Access to Economic and Freight Activity Centers
		Promote Ancillary Development Adjacent To Freight Activity Centers, Supporting Retail, And Local Job Creation
<b>Land Use Coordination</b>	To promote livable communities and mixed use development along the Corridor	Promote Mixed-Use Adjacent To Existing Development To Promote Multi-Modal Access
		Promote Freight Or Industrial Land Uses Adjacent To Freight Activity Centers