

# 1 Executive Summary

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## 1.1 Project Background

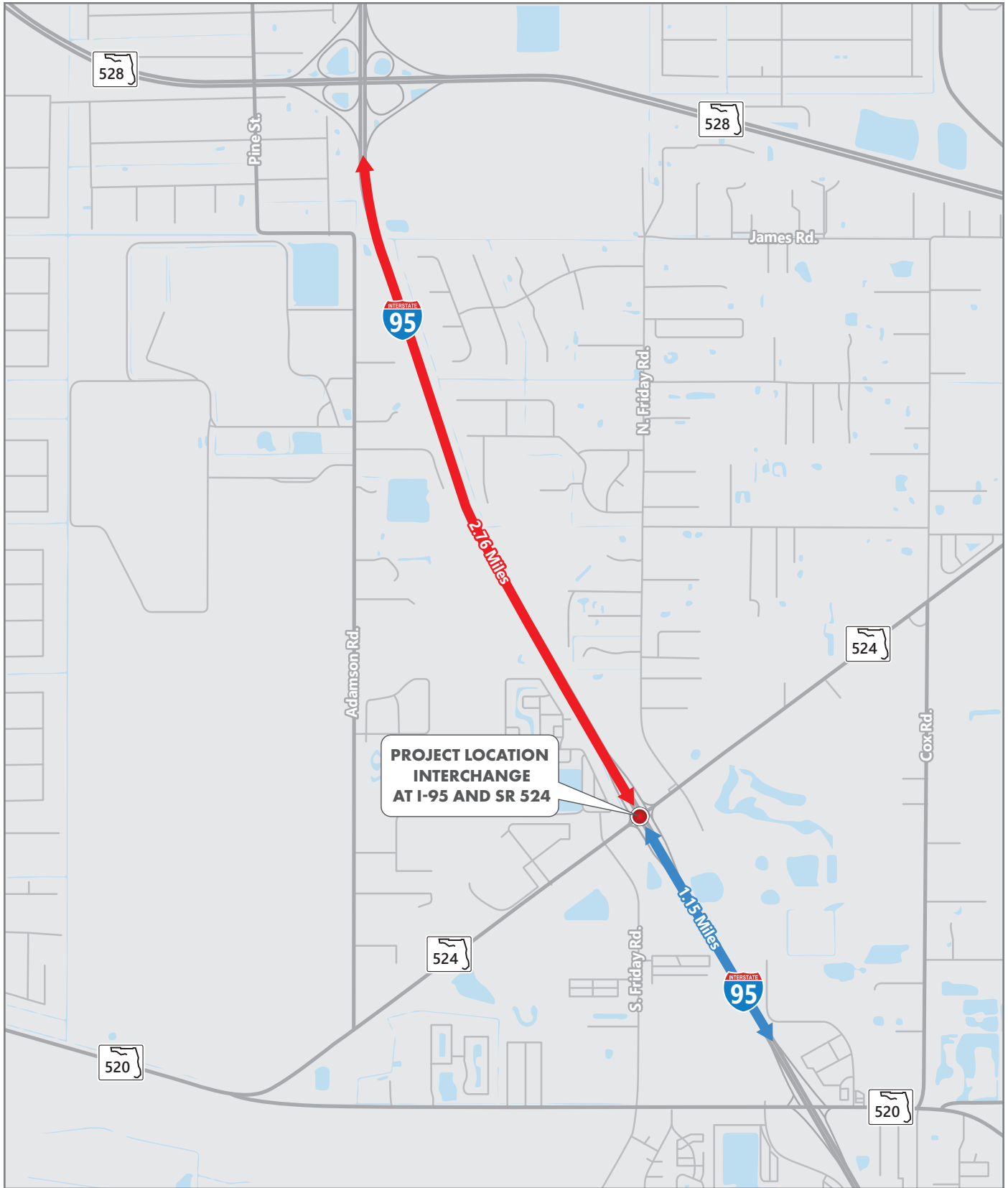
The Florida Department of Transportation (FDOT) District Five is conducting this IMR at the interchange of I-95 and SR 524, State Financial Project Number 437983-1, to evaluate the modification of the existing interchange at I-95 and SR 524, in Brevard County, Florida. This project is being conducted concurrently with the SR 524 Project Development and Environment (PD&E) Study, which evaluates the widening of SR 524 (Roadway ID: 70070000) from S. Friday Road (M.P 1.514) to Industry Road (M.P 4.649) for approximately 3.15 miles from a two-lane roadway to a four-lane divided facility. The purpose of the proposed improvements is to improve mobility in the SR 524 corridor to accommodate future projected traffic demand in the design year (2045) safely and efficiently.

This IMR for the I-95 at SR 524 interchange in Brevard County covers the documentation requirements agreed upon in the approved Methodology Letter of Understanding (MLOU). This report provides existing conditions data, future traffic forecasts, and the operational analysis for the existing (2019), opening year (2025), and design year (2045) conditions. The project location map is shown in **Figure A**.

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## 1.2 Purpose and Need

The SR 524 widening project has been requested by the Space Coast Transportation Planning Organization (SCTPO) to coordinate the development of a future vision for the SR 524 corridor that establishes a multi-modal approach to providing for future transportation needs. This project is part of an effort to improve the current conditions so that they will meet future targets of Level of Service (LOS), safety, traffic flow, as well as improve accessibility to not only large trucks but pedestrians and bicyclists too at the interchange of I-95 and SR 524. The following bullets explain the details of the purpose and need of this IMR.



● Project Location



**Figure A**

Project Location Map  
I-95 at SR 524 IMR

- **Accommodate Future Traffic Demand**

- The SR 524 corridor is projected to experience a significant increase in traffic demand because of the proposed developments along the corridor. To accommodate the traffic demand and maintain target LOS in the study area, SR 524 will be widened from 2 lanes to 4 lanes between S. Friday Road and Industry Road, including improvements to the interchange of I-95 at SR 524.
- With the current interchange configuration, both the ramp terminals and adjacent intersections (S. Friday Road and N. Friday Road) are projected to operate below the target LOS D by the design year 2045.

- **Improve Truck Traffic Accessibility**

- Along the southern portion of the corridor are a Flying J and a Walmart distribution center which bring in a heavy flow of truck traffic from I-95. One of the goals identified is to improve the accessibility from the I-95 interchange into these locations.

- **Improve Pedestrian and Bicycle Mobility**

- A major goal of the PD&E study is to create more paths for pedestrians and bicyclists, to increase connectivity safely throughout the SR 524 corridor. The improvements proposed as part of this IMR, will allow pedestrians and bicyclists safe access on SR 524 through the I-95 interchange from the future planned developments east and west of I-95.

- **Enhance Hurricane Evacuation Route Access**

- Both I-95 and SR 528 are categorized as official hurricane evacuation routes and SR 524 is a vital connection between these two roadways. The SR 524 widening and improvements to the interchange at I-95 will provide efficient access to the evacuation routes for all the existing and future residential areas along the corridor.

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### 1.3 Project Alternatives

A No-Build alternative and a Build alternative are considered as part of this IMR. The No-Build alternative will maintain the existing roadway and intersection configuration within the Area of Influence (AOI). As part of the Build alternative, a Diverging Diamond Interchange (DDI) is evaluated at I-95 and SR 524 along with a four-lane widening of SR 524 within the study limits.

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### 1.4 Compliance with Federal Highway Administration (FHWA) Policy Points

As demonstrated in the IMR study analysis results, the proposed interchange modification at the interchange of I-95 and SR 524 will efficiently accommodate future traffic demand including the heavy truck demand and provide improved levels of service and safety for all road users, and therefore meets the purpose and need of this IMR study. The two policy points per the FHWA Requirements and Guidelines were examined and addressed in this IMR as stated below:

**Policy Point 1:** *An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, and ramp intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis should, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (Title 23, Code of Federal Regulations (CFR), paragraphs 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, should be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access should include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute, and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request should also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).*

**Response:**

The proposed interchange modification will not adversely impact the safety or operations of the I-95 mainline and is expected to improve safety and operations at the interchange ramp terminal intersections. The following is a summary of the operational analysis that shows the justification for Policy Point 1.

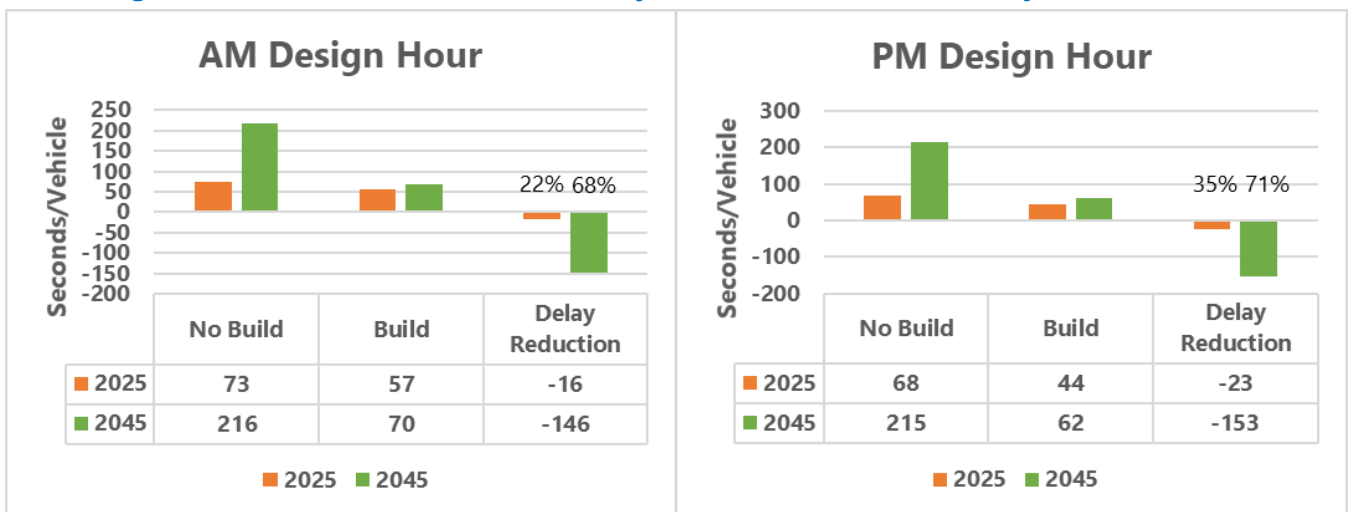
▪ **Freeway Operations**

- The number of lanes along the ramp at the existing gore points, as well as the location of the existing gore points, will not be modified as part of the interchange improvements.
- The I-95 basic, weave, and merge/diverge segments within the AOI are expected to operate within the target LOS D through the design year 2045 under the Build alternative.

▪ **SR 524 Intersection Operations**

- Under the No-Build alternative, all study intersections exceed the target LOS D by the design year 2045.
- Under the Build alternative, all the study intersections are anticipated to operate within the target LOS D through the design year 2045. Cumulative intersection delays (sum of overall study intersection delays) under the Build alternative show around 70% improvement in 2045 (AM and PM design hours) versus the No-Build alternative, which indicates noticeably improved traffic conditions in the Build alternative (see **Figure B**).

**Figure B: Cumulative Intersection Delay (seconds/vehicle) Summary for SR 524**



- **SR 524 Arterial Operations**

- SR 524 study segment within the AOI exceeds the target LOS D in the existing year 2019 except for the eastbound direction in the PM peak hour. Under the No-Build alternative, SR 524 study segment will exceed the target LOS D for both eastbound and westbound directions in both AM and PM design hours.
- Under the Build alternative, SR 524 study segment within the AOI is anticipated to operate within the target LOS D through the design year 2045.

- **Off-Ramp Queues**

- The off-ramp queues at the I-95 and SR 524 interchange reported for the Build alternative are well within the available ramp storage lengths. The proposed off-ramp improvements at both I-95 southbound and northbound ramp terminals will help avoid queue backups from the ramp terminals to the freeway mainline during the peak hours through the design year 2045.

- **Safety Improvement**

- The Build option provides improved safety benefits over the No-Build alternative. Based on predictive safety analysis and information contained in the Crash Modification Factor (CMF) Clearinghouse, the Build alternative is anticipated to:
  - Reduce the number of crashes by approximately 57 over a period of 20 years, and therefore save approximately \$14.3 million in crash costs (fatal, injuries, and property damage only) compared to the No-Build alternative.
  - Reduce interchange related crashes by approximately 14% because of the proposed conversion of the existing diamond configuration to a DDI.
  - A DDI will provide safety benefits to the interchange and adjacent intersections because of lower design speed within the AOI.

- **Conceptual Signing Plan**

- A conceptual signing plan is developed (see **Figure 12** in **Section 10**) for the proposed interchange modification alternative. Modifications to the existing roadway signs were evaluated in conjunction with the proposed modifications to ensure that a proper signing plan is implemented within the study area.

**Policy Point 2:** *The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access, such as managed lanes (e.g., transit or high occupancy vehicle and high occupancy toll lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)). In rare instances where all basic movements are not provided by the proposed design, the report should include a full-interchange option with a comparison of the operational and safety analyses to the partial-interchange option. The report should also include the mitigation proposed to compensate for the missing movements, including wayfinding signage, impacts on local intersections, mitigation of driver expectation leading to wrong-way movements on ramps, etc. The report should describe whether future provision of a full interchange is precluded by the proposed design.*

**Response:**

Full access interchange conditions, as offered by the existing interchange at I-95 and SR 524, will remain with the proposed modification improvements. This project will achieve benefits to the transportation system with no adverse impact to the public. The proposed improvements have been and will continue to be, coordinated with the public and local government agencies. The design of the proposed improvements will follow the applicable FHWA and FDOT design standards.

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## **1.5 Study Recommendation**

Based on a review of the traffic operational analysis results for the No-Build and Build alternatives, the following study conclusions are developed.

- The existing roadway and interchange configuration (aka No-Build alternative) will neither support the forecasted traffic demand within the AOI nor will satisfy the purpose and need of this project.
- The DDI improvement at the study interchange along with SR 524 widening from two to four lanes will satisfy the purpose and need as outlined in Section 1.2 and satisfies the two FHWA Policy Points. Therefore, the Build alternative improvements are recommended along SR 524 within the AOI.