

1 INTRODUCTION

The Interstate 10 (I-10) interchange with State Road (SR) 121 serves as an important access point in Baker County, Florida. The I-10 and SR 121 interchange also provides primary access to commuters for the City of Macclenny to the north and Lake Butler to the south of I-10, as well as a key access point for trucks serving these communities. This section of SR 121 is an important link in Baker County's transportation network and provides major north-south connectivity.

This Interchange Operational Analysis Report (IOAR) has been prepared in accordance with FDOT Policy No. 000-525-015, FDOT Procedure No. 525-030-160, and the FDOT Traffic Forecasting Handbook (Procedure No. 525-030-120).

1.1 PURPOSE AND NEED

The purpose of this project is to provide interim alternatives to add capacity and improve traffic operations and safety near the SR 121 and I-10 interchange in Baker County while the ultimate build improvements described in the approved Interchange Modification Report (IMR) (May 2016) funds are procured. The approved IMR is provided in **Appendix A**.

The I-10 and SR 121 interchange is a partial cloverleaf configuration with nonstandard loops in the southeast and northwest quadrants. Under existing conditions, these loop ramps hinder normal traffic operations, especially in the westbound I-10 direction. The westbound I-10 off-ramp is currently a three center radii loop ramp that terminates at a stop-controlled intersection with SR 121. This configuration does not provide efficient operations and results in traffic backups, specifically during the AM and PM peak hours. Additionally, southbound drivers encounter poor sight distance due to the vertical curve over I-10.

In the year 2014, SR 121 carried an Annual Average Daily Traffic (AADT) of 7,500 vehicles to the south and 12,700 vehicles to the north of I-10 on a two-lane facility. The I-10 mainline within the project study area carried an AADT of 25,000 vehicles to the west of SR 121 and 19,300 vehicles to the east of SR 121 on a four-lane facility.

If no improvements are made to the interchange, traffic operations and safety within the interchange area will continue to deteriorate as traffic and freight movement to and from the City of Macclenny increases. For this reason, the ultimate build improvements were proposed to address operational and safety deficiencies of the study area. The details of ultimate build improvements are discussed in the approved IMR (May 2016) (**Appendix A**). However, the Florida Department of Transportation (FDOT) District Two wants to implement interim improvements before ultimate improvements were built out to alleviate traffic operations and safety deficiencies of the study area. This report analyzes two interim alternatives. The Build Alternative 1 includes adding a directional ramp to westbound I-10 to serve traffic heading northbound SR 121, improving SR 121 in the northbound direction, and installing a new traffic signal to control the northbound SR 121 and westbound I-10 off-ramp movements. The Build Alternative 2 is designed to utilize the existing geometry and install a new traffic signal at the westbound I-10 and SR 121 ramp terminal intersection.