

### 5.2.2 Build Alternative 2 – Shared Left & Right Alternative

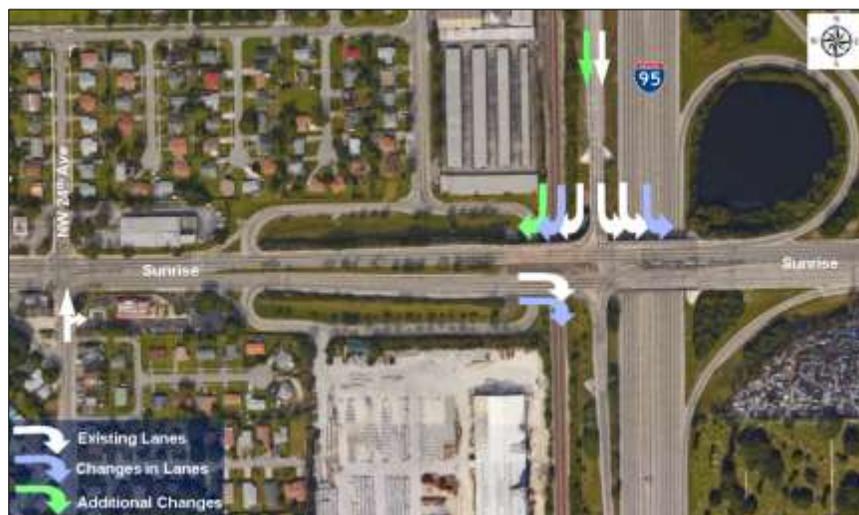
Build Alternative 2 was developed based on Build Alternative 1. It proposes to add a second lane to the SB off-ramp and convert the third left-turn lane on SB off-ramp terminal to a shared left- and right-turn lane. It also proposes to eliminate the exclusive right-turn lane on NB NW 24<sup>th</sup> Avenue in Alternative 1 and keep the existing shared through/right lane configuration. Build Alternative 2 is illustrated in **Figure 5-2**.



**Figure 5-2 Lane Configuration for Build Alternative 2**

### 5.2.3 Build Alternative 3 – Triple Right and Triple Left Alternative

Build Alternative 3 is similar to Build Alternative 2. However, instead of converting a left-turn lane to a shared left-right turn lane, it proposes to add a third right-turn lane to make it triple right- and triple left-turns on the SB off-ramp. Build Alternative is depicted in **Figure 5-3**.



**Figure 5-3 Lane Configuration for Build Alternative 3**

the proposed signal phasing as the eastbound vehicles would be permitted to make a right-turn onto the I-95 SB on-ramp concurrently. To resolve this conflict, the overlapping eastbound right-turn movement was disabled (i.e. display red and move with eastbound through phase only) during the southbound off-ramp green phase. However, removing the conflict did not improve the LOS for the approach.

Detailed results of the capacity analysis are included in **Tables 6-1 to 6-4**, providing delays for individual movements at the two intersections, as well the projected 95th percentile queues. As mentioned earlier, the delays and LOS are based on HCM 2000 outputs, and the 95th percentile queues are based on Synchro outputs.

### **6.2.3 Build Alternative 3**

Build Alternative 3 (Triple Right Alternative) was analyzed in a similar fashion to Build Alternative 2 with adjustments to cycle lengths, splits and offsets to minimize delay at all approaches. The I-95 SB off-ramp approach was analyzed with a restrictive RTOR (i.e. No RTOR allowed) due to the triple right-turn operation.

Compared to the previous two alternatives, the Triple Right-Turn Alternative provides an additional approach lane at the SB I-95 off-ramp. As such, equal or better LOS over the other alternatives is expected with the increased capacity. **Tables 6-1 to 6-4** show LOS 'C' for all analysis time periods for both intersections in year 2020, while LOS 'D' or better is expected at the intersections in the year 2040. This Alternative is also expected to eliminate LOS 'F' movements calculated for the other two alternatives and shorten vehicle queues at the I-95 SB off-ramp by approximately 150ft in the design year.

are significantly longer than those for Build Alternative 1. For example, the delays for SB left-turns are 61.1 seconds for Build Alternative 2 compared to 46.2 seconds for Build Alternative 1 during the PM Peak Period. The queue length is 465 feet for Build Alternative 2, which is almost 50% longer than the 305 feet for Build Alternative 1. The AM Peak Period shows the similar pattern. With the additional capacity to make right turns, it is expected that the SB right-turns would operate better in Build Alternative 2. However, due to restrictions on Right-Turn-on-Red, vehicles in the shared left- and right-turn lane would have fewer opportunities to make left turns, and this effectively reduces the capacity to make left-runs for all vehicles.

Build Alternative 3 has the lowest delays among the three build alternatives. In terms of queue length, Alternative 3 could lead to 150ft or more reduction for southbound right-turns compared to the Build Alternative 1, the next best alternative. The reduction in delay and queue lengths could result in significant decrease in rear-end collisions which is the leading type of crashes on the ramp.

Even though Build Alternative 3 has the lowest B/C ratio compared to the other two alternatives, the differences are small. An additional \$920,000 could bring significant operational improvement while reducing the likelihood of accidents. Therefore, the Triple Right Alternative is recommended to be the preferred alternative. Specifically, the Triple Right Alternative includes the following changes:

- Add an additional lane to I-95 SB Off-Ramp to make it a two-lane exit ramp;
- Provide additional turning lanes at SB Ramp Terminal to include triple SB to WB RT lanes and triple SB-EB LT Lanes. Turning lanes should provide minimum storage length of 500ft.
- Add an additional eastbound right-turn lane to access the I-95 southbound on-ramp.

Additionally, even though beyond the scope for the IOAR, the following changes are suggested to the Broward Interchange PD&E team:

- Conduct weaving analysis on I-95 SB between Sunrise and Broward Boulevard
- Consider move NB loop ramp termini of the NB Off-Ramp eastward to current signal
- Add an additional left-turn lane for WB Sunrise left-turn to I-95 southbound movement to make it triple left-turn lanes, and have three receiving lanes on SB on-ramp

## 9.1 Schedule

This project is funded in the FDOT Work Program for the next phases of design for Fiscal Year 2017. The procurement process will begin in October 2016 and construction could begin as early as Fiscal Year 2018 or 2019.

## 9.2 Funding

Funding for the proposed concept plans for construction may qualify for SIS funds and possibly other county or local sources.