



**Table 28: Design Year 2036 Build Peak Hour Intersection Level of Service (Continued)**

Intersection	Lane Group	AM Peak Hour			PM Peak Hour			Existing Storage Length
		Delay (sec/veh)	LOS	95 <sup>TH</sup> % Queue (ft) <sup>1</sup>	Delay (sec/veh)	LOS	95 <sup>TH</sup> % Queue (ft) <sup>1</sup>	
SR 559 and CR 559A (C. Fred Jones Blvd.) (Signalized) <sup>3</sup>	EB Left	45.9	D	400	35.7	D	325	590
	EB Right	15.8	B	50	16.2	B	50	300
	WB Left	17.0	B	50	17.6	B	50	410
	WB Right	33.1	C	375	27.0	C	300	335
	NB Left	32.7	C	75	23.1	C	50	250
	NB Right	30.7	C	100	31.9	C	75	250
	SB Left	89.3	F	300	124.0	F	425	430
	SB Right	0	A	0	0	A	0	280
	<b>Overall</b>		<b>41.1</b>	<b>D</b>	<b>-</b>	<b>42.8</b>	<b>D</b>	<b>-</b>

Notes: 1. 95th percentile queue lengths computed using 25 ft/vehicle and rounded up to the nearest 25 ft  
2. SR 559 inside Northbound through lane becomes a lane drop just north of the Eastbound Ramp terminal  
3. CR 559A outside Eastbound through lane becomes a lane drop at SR 559  
4. The full length of the off-ramp segment serves as storage; for the WB ramp an additional 700 feet is available and for the EB ramp, an additional 970 feet.

## 5.5 Future Safety Analysis

The safety impacts due to the proposed build alternative were evaluated for the I-4 and SR 559 ramp terminal intersections. The future safety analysis was based on applying a crash modification factor (CMF) to the observed crash history. The CMF was obtained from Table 14-7 of the Highway Safety Manual (HSM, 1<sup>st</sup> Ed. 2010). The CMF for converting an intersection from stop control to signal control is 0.56, resulting in a potential 44% reduction of all crash types and severities. With the build alternative, the estimated crash frequency is 3.3 crashes/year at the Westbound ramp terminal, and 3.9 crashes/year at the Eastbound ramp terminal. The results of the ramp terminal intersections CMF analysis are summarized in **Table 29**.

**Table 29: Build Alternative Crash Frequency Analysis**

Intersection	5-Year Observed Crashes (2015-2019)	Annual Observed Crashes	CMF <sup>1</sup>	Std. Error <sup>1</sup>	Annual Estimated Crashes	95% Confidence Interval (C.I.) <sup>2</sup>
SR 559 and I-4 WB	29	5.8	0.56	0.03	3.3	2.91 to 3.59
SR 559 and I-4 EB	35	7	0.56	0.03	3.9	3.51 to 4.33

Notes: 1. CMF and Std. Error values from HSM Table 14-7  
2. 95% C.I. =  $CMF \pm (SE * 1.96)$ , where SE=Standard Error, 1.96=Statistical Multiplier for given C.I.



In addition to the preceding CMF analysis, a qualitative safety analysis is provided for the I-4 ramp terminal intersections. Signalization of both ramp terminals provides a protected green phase for left turn movements exiting from the off-ramps. The signal assigns right-of-way to the intersection rather than relying on the exit ramp drivers to identify an appropriate gap in traffic, reducing the number of conflicts at the intersections. Additionally, at the Eastbound ramp terminal, the existing exit ramp configuration provides a channelized right turn with a large right turn radius and a wide entry angle for right turning vehicles. The proposed build alternative design concept includes the following countermeasures to improve sight distance for the Eastbound approach: removal of the striped channelized island, adjustment of the stop bar position and additional pavement markings around the radius to help delineate right turns. The pavement marking delineation provides a tighter radius that is conducive to slower vehicle approach speeds. It also reduces the entry angle which along with the proposed stop bar location positions right turning vehicles nearly perpendicular to the conflicting southbound through vehicle flow, reducing the need for drivers to use an excessive head turn to check for upstream oncoming traffic. In addition, the future year operational analysis assumed that right turns on red are restricted for the Eastbound right turn movements. This operation addresses sight distance issues by assigning right-of-way to eastbound vehicles during the eastbound approach green phase, eliminating the need for eastbound vehicles to identify appropriate gaps in the southbound traffic.