

Table 5.24  
Comparison of No-Build and Build – Okeechobee Road

Arterial	Signal Controlled Intersections	2045	
		No-Build	Build
		LOS (Delay)	LOS (Delay)
<b>AM Peak</b>			
Okeechobee Road (SR 70) (MP 152)	Turnpike Ramps	F (236.7)	E (61.4)
	Crossroads Parkway	C (29.8)	C (29.6)
	Turnpike Southbound Ramps		D (44.9)
	I-95 Southbound Ramps	B (16.8)	C (21.8)
	I-95 Northbound Ramps	F (99.7)	F (88.9)
<b>PM Peak</b>			
Okeechobee Road (SR 70) (MP 152)	Turnpike Ramps	F (216.3)	D (47.5)
	Crossroads Parkway	D (35.5)	D (48.1)
	Turnpike Southbound Ramps		C (27.1)
	I-95 Southbound Ramps	C (23.3)	B (17.2)
	I-95 Northbound Ramps	C (31.2)	C (26.3)

Synchro Version 11 Build 168. HCM6 output used for unsignalized intersections due to limitations in Synchro.

Level of Service notes:

Delay is in sec/veh units

■ = Level of service (LOS) E reflecting at capacity operations

■ = Level of service (LOS) F reflecting over capacity operations

## 5.4 SAFETY ANALYSIS OF THE 2045 NO-BUILD AND BUILD ALTERNATIVES

### 5.4.1 HSM Analysis

A safety analysis was conducted to study the impacts of the proposed Build alternative on the local street network within the AOI. The study area focused on the Florida’s Turnpike freeway segments, ramp terminals and ramp segments, and segment and major intersections along the arterials. The analysis was conducted using the predictive methods in Chapters 12 and 19 of the HSM, where available, and the ISATe, which apply a combination of SPFs, CMFs, and calibration factors to estimate frequency and cost of crashes for each segment and intersection.

It is important to note that the current edition of the HSM does not include a predictive method for arterial segments with six or more lanes. A research effort under NCHRP Project 17-58 is underway to develop predictive methods for six-lane urban and suburban arterials and will be included in the next edition of the HSM (Chapter 12). The analysis was conducted assuming the predictive methods for four-lane divided arterials for both the No-Build and the Build alternatives. Also, ISATe has some limitations, such as not supporting toll plazas, a crossroad ramp terminal with three or more left-turn lanes on a crossroad approach, a crossroad speed-change lane, etc.

Future No-Build and Build scenarios assumed widening on the Florida's Turnpike mainline to an eight-lane section. In addition to the proposed operational improvement alternatives at the two existing interchange locations at Port St. Lucie Boulevard and Okeechobee Road (SR 70), two proposed new interchange locations were developed. The two new interchange locations are at Crosstown Parkway (MP 145) and Midway Road (MP 150).

The No-Build and Build alternatives were evaluated, and the predicted number of crashes and associated costs were compared for the 2025 to 2045 analysis period. The results of the safety analysis are summarized in **Tables 5.25** through **5.28**. It is important to note that the safety analysis tools available to date are deterministic in nature and estimate future crashes mainly based on AADT and roadway characteristics. These tools do not account for vehicle interactions (driver behaviors). Detailed analysis tables are provided in **Appendix L**.

Following crash severity level costs were used for the crash cost saving analysis (Source: FDOT 2020 Design Manual Crash Cost Table 122.6.2)

- Fatal (K) \$10,670,000
- Severe Injury (A) \$872,612
- Moderate Injury (B) \$174,018
- Minor Injury (C) \$106,215
- Property damage Only (O) \$7,700

#### *Port St. Lucie Interchange*

The existing SW Port St. Lucie interchange has a trumpet configuration. The preferred Build alternative at this interchange was developed by the reconfiguration of the ramps and ramp terminal. The northbound off-ramp terminates at the signalized intersection of Bayshore Boulevard and SW Port St. Lucie. The northbound on-ramp and southbound off-ramp intersect at a newly proposed intersection along Bayshore Boulevard. For drivers traveling eastbound and westbound along SW Port St. Lucie to the Turnpike southbound on-ramp will have separate ramps. The enhanced ramps reconfigurations under the Build alternative are anticipated to provide safer operations with less congested traffic and smooth merging/diverging. Relief in congestion, redistribution of traffic at the intersection, and modified ramp segments are expected to result in a reduction in the number of potential crashes by an average of 7.2 percent (189.4/2639.9). The overall predicted crashes are lower for Build compared to No-Build. Based on these results, the Build alternative is predicted to have a 21-year crash cost savings of approximately \$11 Million compared to the No-Build alternative, in 2019 present value. The results of the safety analysis are summarized in **Table 5.25**.

**Table 5.25**  
**2025 to 2045 Predicted Number of Crashes and Cost Saving (SW Port St. Lucie)**

Site	No-Build		Build	
	N <sub>predicted</sub> *	2019 Present Value	N <sub>predicted</sub> *	2019 Present Value
<b>Port St Lucie Interchange</b>				
Freeway Segments (MP 140 to MP 144.5)	1,199.30	\$109,254,283.97	1,323.15	\$120,401,410.62
Ramp Segments	515.40	\$39,415,873.91	138.56	\$10,581,990.46
Ramp Terminals	195.46	\$20,412,822.88	290.17	\$30,508,620.04
<b>Subtotal</b>	<b>1,910.15</b>	<b>\$169,082,980.76</b>	<b>1,751.88</b>	<b>\$161,492,021.12</b>
<b>Port St. Lucie Boulevard Intersection</b>				
SW Cameo Boulevard	550.10	\$64,731,416.09	518.12	\$61,310,408.48
<b>Port St. Lucie Boulevard Segment</b>				
Between SW Cameo Boulevard and SW Bayshore Boulevard	179.61	\$21,134,915.71	180.45	\$21,298,293.67
<b>Subtotal</b>	<b>729.71</b>	<b>\$85,866,331.81</b>	<b>698.57</b>	<b>\$82,608,702.14</b>
<b>Total</b>	<b>2,639.9</b>	<b>\$254,949,312.57</b>	<b>2,450.4</b>	<b>\$244,100,723.27</b>
<b>Crash Costs Saving</b>	<b>\$10,848,589.30</b>			

\*Predicted Crashes; Source: FDOT 2020 Design Manual Crash Cost Table 122.6.2 and HSM Crash Distribution for Florida Table 122.6.4

*Crosstown Parkway New Partial Interchange*

A new partial interchange has been proposed at Crosstown Parkway. Though the new interchange expected number of crashes increase along the Turnpike (crashes associated mainly with left side exits) and arterials, the partial interchange alleviates congestion at the SW Port St. Lucie interchange and enhances emergency evacuation operations by providing alternative regional access. The results of the safety analysis are summarized in **Table 5.26**.

**Table 5.26**  
2025 to 2045 Predicted Number of Crashes and Cost Saving (Crosstown Parkway)

Site	No-Build		Build	
	N <sub>predicted</sub> *	2019 Present Value	N <sub>predicted</sub> *	2019 Present Value
<b>Crosstown Parkway Interchange</b>				
Freeway Segments (MP 144.5 to MP147.5)	744.97	\$67,690,208.24	909.62	\$82,693,257.80
Ramp Segments	0.00	\$0.00	52.97	\$4,046,746.38
Ramp Terminals	0.00	\$0.00	See Note 1	
<b>Subtotal</b>	<b>744.97</b>	<b>\$67,690,208.24</b>	<b>962.59</b>	<b>\$86,740,004.18</b>
<b>Crosstown Parkway Intersections</b>				
Cameo Boulevard	277.29	\$32,166,065.71	374.17	\$43,258,016.45
Bayshore Boulevard	510.46	\$59,467,595.24	553.85	\$64,034,930.50
Cameo Boulevard and St. Lucie West High School	0.00	\$0.00	139.61	\$16,129,397.91
<b>Crosstown Parkway Segments</b>				
Between Cameo Boulevard and Bayshore Boulevard	45.00	\$5,223,367.59	52.21	\$6,038,191.05
<b>Cameo Boulevard</b>				
Between St. Lucie West High School and Crosstown Parkway	3.26	\$409,184.36	11.37	\$1,414,476.10
<b>Subtotal</b>	<b>836.01</b>	<b>\$97,266,212.91</b>	<b>1,131.22</b>	<b>\$130,875,012.01</b>
<b>Total</b>	<b>1,580.99</b>	<b>\$164,956,421.15</b>	<b>2,093.81</b>	<b>\$217,615,016.19</b>
<b>Difference in Crash Costs</b>	<b>-\$52,658,595.04</b>			

\*Predicted Crash; Source: FDOT 2020 Design Manual Crash Cost Table 122.6.2 and HSM Crash Distribution for Florida Table 122.6.4

Note 1: Ramps terminate at the intersection of St Lucie West High School entrance and Cameo Boulevard signalized intersection

*Midway Road New Full Interchange*

A full new interchange has been proposed at Midway Road. The northbound on-ramp and off-ramp intersect Midway Road at Corporate Way with a proposed signalized intersection. The southbound on-ramp and off-ramp intersect Midway Road at a new proposed signalized intersection. A full interchange has been proposed to relieve congestion at the Okeechobee Road (SR 70) interchange, provide alternative regional access, and enhance emergency evacuation operations. Redistribution of the traffic at the intersections is also anticipated to reduce crashes. The overall predicted crashes for the arterial are lower for Build compared to the No-Build. Based on these results, the Build alternative is predicted to have a 21-year crash cost savings of approximately \$2 Million compared to the No-Build alternative, in 2019 present value. The results of the safety analysis are summarized in **Table 5.27**.

Note that the projected AADT between Crosstown Parkway and Midway Road under No-Build alternative are the same as there are no new access points in between these interchange under the No-Build alternative (See **Table 4.1**).

**Table 5.27**  
2025 to 2045 Predicted Number of Crashes and Cost Saving (Midway Road)

Site	No-Build		Build	
	N <sub>predicted</sub> *	2019 Present Value	N <sub>predicted</sub> *	2019 Present Value
<b>Midway Road Interchange</b>				
Freeway segments	869.14	\$78,971,908.76	890.64	\$80,960,167.18
Ramp segments	0.00	\$0.00	33.52	\$5,495,044.97
Ramp Terminals	0.00	\$0.00	119.60	\$4,859,108.71
<b>Subtotal</b>	<b>869.14</b>	<b>\$78,971,908.76</b>	<b>1,043.76</b>	<b>\$91,314,320.86</b>
<b>Midway Road Intersections</b>				
Glades Cut Off Road	209.80	\$24,585,197.60	174.09	\$20,352,386.93
NW East Torino Parkway	285.44	\$33,489,781.88	242.23	\$28,113,318.83
Midway Road/South Jenkins Road	124.91	\$14,722,128.30	141.58	\$16,599,874.51
<b>Midway Road Segments</b>				
Between Glades Cut Off Road and NW East Torino Parkway	37.35	\$4,380,586.34	29.86	\$3,448,705.96
Between NW East Torino Parkway and South Jenkins Road	105.68	\$12,394,558.20	54.85	\$6,346,647.22
<b>Subtotal</b>	<b>763.18</b>	<b>\$89,572,252.32</b>	<b>642.61</b>	<b>\$74,860,933.45</b>
<b>Total</b>	<b>1632.3</b>	<b>\$168,544,161.08</b>	<b>1686.4</b>	<b>\$166,175,254.30</b>
<b>Crash Cost Saving</b>	<b>\$2,368,906.78</b>			

\*Predicted Crashes; Source: FDOT 2020 Design Manual Crash Cost Table 122.6.2 and HSM Crash Distribution for Florida Table 122.6.4

Although, total crashes under Build showed higher than No-Build for Midway Road, the overall crash cost decrease as the crash costs depend on the type of crashes not the number of crashes (See Section 5.4.1).

*Okeechobee Road (SR 70) Interchange*

The Turnpike interchange has a trumpet configuration with ramps that connect to Okeechobee Road (SR 70) at a single four-legged intersection. The existing northbound off-ramp and on-ramp will not be modified with the proposed interchange alternative and will intersect at the intersection of Okeechobee Road (SR 70) and South Kings Highway. The realignment of southbound on-ramp and off-ramp is anticipated to enhance safety with less congested traffic along the ramps and smooth merging/diverging movements. The southbound on-ramps and off-ramps intersect at the Gordy Road and Okeechobee Road (SR 70) intersection. The redistribution and reduction of traffic along the arterial and at the intersections is anticipated to reduce crashes. In general, relief in congestion, redistribution of traffic, and a modified interchange are expected to result in a reduction in the number of potential crashes by an average of 4 percent. The overall predicted crashes are lower for Build compared to No-Build. Based

on these results, the Build alternative is predicted to have a 21-year crash cost savings of approximately \$5 Million compared to the No-Build alternative, in 2019 present value. The results of the safety analysis are summarized in **Table 5.28**.

**Table 5.28**  
**2025 to 2045 Predicted Number of Crashes and Cost Saving (Okeechobee Road [SR 70])**

Site	No-Build		Build	
	N <sub>predicted</sub> *	2019 Present Value	N <sub>predicted</sub> *	2019 Present Value
<b>O keechobee Road (SR 70) Interchange</b>				
Freeway Segments (MP 151 to MP 154.15)	690.96	\$62,801,428.24	684.12	\$62,180,613.59
Ramp Segments	294.99	\$22,571,950.73	176.30	\$13,483,379.24
Ramp Terminals	299.33	\$31,252,964.11	395.91	\$41,360,235.68
<b>Subtotal</b>	<b>1,285.27</b>	<b>\$116,626,343.08</b>	<b>1,256.32</b>	<b>\$117,024,228.51</b>
<b>O keechobee Road (SR 70) Intersection</b>				
Gordy Road	33.89	\$3,861,717.52	See Note 1	
Crossroads Parkway	462.21	\$53,232,918.15	443.37	\$51,513,712.92
<b>O keechobee Road (SR 70) Segments</b>				
Between Gordy Road and South Kings Highway	61.00	\$7,062,267.33	88.33	\$10,272,381.98
Between South Kings Highway and Crossroads Parkway	190.96	\$22,074,602.82	166.85	\$19,374,666.84
<b>Subtotal (Segment)</b>	<b>748.06</b>	<b>\$86,231,505.82</b>	<b>698.55</b>	<b>\$81,160,761.73</b>
<b>Total</b>	<b>2,033.33</b>	<b>\$202,857,848.90</b>	<b>1,954.87</b>	<b>\$198,184,990.24</b>
<b>Crash Cost Saving</b>	<b>\$4,672,858.66</b>			

\*Predicted Crashes; Source: FDOT 2020 Design Manual Crash Cost Table 122.6.2 and HSM Crash Distribution for Florida Table 122.6.4

Note 1: Southbound on-ramp and off-ramp intersect at SR 70 and Gordy Road intersection. Included under ramp terminal.

The Build alternatives at Crosstown Parkway and Midway Road interchanges have an additional merge/diverge segment and new access points along the freeway when compared to the No-Build, which results in a higher prediction of potential crashes. Also, due to redistribution of traffic, roadway segments and intersections along Crosstown Parkway are expected to have an increase in the number of crashes.

Overall, predicted crash costs are lower for Build compared to No-Build due to the elimination of weaving between the northbound and southbound traffic at the SW Port St. Lucie and Okeechobee Road (SR 70) interchanges, added capacity along the Florida’s Turnpike mainline, ramps and intersections. Based on these results, the Build alternative is predicted to have a 20-year crash cost savings of approximately \$17.9 Million for Port St. Lucie, Midway Road and Okeechobee Road (SR 70) interchanges, in 2019 present value.