

### 6.3 FUTURE SAFETY EVALUATION

A safety analysis was conducted to study the future impacts of the proposed interchange modification on S.R. 50 and the local street network. The study area focused on the S.R. 50 arterial segments and major intersections between Woodbury Road and Lake Pickett Road, and the S.R. 408 freeway and ramp segments within the interchange AOI. The analysis was conducted using the predictive methods in Chapters 12 and 19 of the Highway Safety Manual (HSM), where available, and the Interchange Safety Analysis Tool (ISATe), which apply a combination of Safety Performance Functions (SPFs), crash modification factors (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 the National Cooperative Highway Research Program (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 Build.

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 **Table 6.21**. 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. The No Build is expected to have extensive congestion and queues which may potentially impact crashes. Predicted crashes for No Build would be higher than shown in **Table 6.21** if congestion and queuing impacts were considered. Consequently, cost savings would be higher than reported. Nevertheless, a summary of the crash estimates based on the available tools is presented.

The Build has 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, the S.R. 50 section west of S.R. 408 has higher traffic than No Build and is expected to have an increase in the number of crashes. However, the Build will relieve congestion at the S.R. 408 ramp terminal intersection and along S.R. 50 east of S.R. 408, which is expected to result in a 26 percent reduction in the number of potential crashes. Intersection improvements at Lake Pickett Road are also expected to reduce crashes. Based on these results, the Build alternative is predicted to have a 20-year crash cost savings of approximately \$56.2 Million compared to the No Build alternative, in 2017 present value. Detailed analysis tables are provided in **Appendix I**.

**SECTION SIX**

## Future Traffic Conditions

**Table 6.21**  
**Predicted Number of Crashes and Cost Savings from 2025 to 2045**

Site	No Build		Build	
	N <sub>predicted</sub> *	2017 Present Value	N <sub>predicted</sub> *	2017 Present Value
<b>S.R. 408</b>				
Freeway segments	202.4	\$10,638,387	280.5	\$14,796,384
Ramp segments	56.7	\$4,006,828	74.9	\$4,491,336
<i>SUBTOTAL</i>	<i>259.1</i>	<i>\$14,645,215</i>	<i>355.4</i>	<i>\$19,287,721</i>
<b>S.R. 50 Intersections</b>				
Woodbury Road	876.6	\$88,413,262	944.2	\$94,607,875
S.R. 408 northbound off-ramp	433.6	\$43,717,911	342.1	\$35,235,811
Bonneville Drive	929.0	\$93,796,587	709.7	\$73,420,962
Lake Pickett Road	964.3	\$96,987,002	615.1	\$63,605,290
<b>S.R. 50 Segments</b>				
Woodbury Road to S.R. 408 northbound off-ramp	59.0	\$5,980,735	70.7	\$7,052,030
S.R. 408 northbound off-ramp to Bonneville Drive	178.1	\$17,871,315	154.8	\$15,727,388
Bonneville Drive to Lake Pickett Road	263.9	\$26,825,859	223.9	\$23,098,729
<i>SUBTOTAL</i>	<i>3,704.4</i>	<i>\$373,592,672</i>	<i>3,060.4</i>	<i>\$312,748,085</i>
<b>TOTAL</b>	<b>3,963.6</b>	<b>\$388,237,887</b>	<b>3,415.8</b>	<b>\$332,035,805</b>
<b>CRASH COST SAVINGS</b>	<b>\$56,202,081</b>			

\*Predicted Crashes

Note: No Build crashes and cost savings would be higher if congestion and queuing impacts were considered.