

Appendix A

Traffic Study

TRAFFIC REPORT

Interstate 49 Interchange at NE J Street Benton County



Prepared by:



2049 Joyce Boulevard #400
Fayetteville, AR 72703

December 2022

Garver Project No.: 21T21070

Contents

Introduction.....	1
Volume Development.....	1
I-49 Corridor Volumes.....	1
NE J Street Intersection Volumes.....	3
Operational Analysis	9
Freeway Analysis.....	10
Intersection Analysis	15
No-Action Conditions	15
Action Layout	16
Action Conditions – with Stop Control at NE J St at Tiger Blvd.....	21
Action Conditions – with Signal at NE J St at Tiger Blvd.....	26
Signal Warrant Analysis	29
Warrant 1 – Eight-Hour Vehicular Volume	30
Warrant 2 – Four-Hour Vehicular Volume	31
Warrant 3 – Peak Hour	31
Additional Considerations and Results	31
Safety Analysis of Existing Conditions	32
Summary	34

LIST OF FIGURES

Figure 1: Proposed Interchange at NE J Street	1
Figure 2: No-Action ADT Volumes	2
Figure 3: Action ADT Volumes	3
Figure 4: 2022 No-Action Intersection Volumes.....	4
Figure 5: 2045 No-Action Intersection Volumes.....	5
Figure 6: 2022 Action Intersection Volumes	6
Figure 7: 2026 Action Intersection Volumes	7
Figure 8: 2045 Action Intersection Volumes	8
Figure 9: Level -of-Service Categories.....	9
Figure 10: Action Lane Config. for NE J St at Tiger Blvd-Stop Control.....	17
Figure 11: Action Lane Config. for NE J St at Tiger Blvd-Signal.....	18
Figure 12: Action Lane Config. for NE J Street at Old NE J Street.....	19
Figure 13: Action Lane Config. for NE J Street at I-49 SB Ramps.....	20
Figure 14: Action Lane Config. for NE J Street at I-49 NB Ramps	21
Figure 15: I-49 Crash Manner (2016-2020)	33
Figure 16: All Severity Crash Ratios and KA Crashes	34

LIST OF TABLES

Table 1: LOS Criteria for Urban Freeway Facilities.....	10
Table 2: LOS Results for 2022 No-Action along I-49 NB	11
Table 3: LOS Results for 2022 No-Action along I-49 SB	11
Table 4: LOS Results for 2022 Action along I-49 NB	12
Table 5: LOS Results for 2022 Action along I-49 SB	12
Table 6: LOS Results for 2045 No-Action along I-49 NB	13
Table 7: LOS Results for 2045 No-Action along I-49 SB	13
Table 8: LOS Results for 2045 Action along I-49 NB	14
Table 9: LOS Results for 2045 Action along I-49 SB	14
Table 10: LOS Criteria for Intersections	15
Table 11: LOS Results for 2022 No-Action	16
Table 12: LOS Results for 2045 No-Action	16
Table 13: LOS Results for 2022 Action (stop at Tiger Blvd) – HCM Results	22
Table 14: LOS Results for 2022 Action (stop at Tiger Blvd) – SimTraffic Results	23
Table 15: LOS Results for 2026 Action (stop at Tiger Blvd) – HCM Results	23
Table 16: LOS Results for 2026 Action (stop at Tiger Blvd) – SimTraffic Results	24
Table 17: LOS Results for 2045 Action (stop at Tiger Blvd) – HCM Results	25
Table 18: LOS Results for 2045 Action (stop at Tiger Blvd) – SimTraffic Results	26
Table 19: LOS Results for 2026 Action (signal at Tiger Blvd) – HCM Results ...	27

Traffic ReportNE J Street Interchange

Table 20: LOS Results for 2026 Action (signal at Tiger Blvd) – SimTraffic Results	28
Table 21: LOS Results for 2045 Action (signal at Tiger Blvd) – HCM Results ...	28
Table 22: LOS Results for 2045 Action (signal at Tiger Blvd) – SimTraffic Results	29
Table 23: Signal Warrant Analysis Results for 2026 Action.....	32
Table 24: Crash Rates (2016-2020).....	32

LIST OF APPENDICES*

Appendix A – Operational Analysis Results

Appendix B – Signal Warrant Analysis Results

*Appendices are available upon request

INTRODUCTION

The purpose of this study is to evaluate the need for a new interchange on I-49 to provide access to NE J Street and the extension of NE J Street northward from Tiger Boulevard across Interstate 49 for approximately 1.1 miles. This study also evaluates the affected intersections along NE J Street to provide recommendations for their lane configurations and intersection controls. The proposed NE J Street will be a two-lane divided section north of Tiger Boulevard and transition to a four-lane boulevard at the intersection of the NE J Street extension with old NE J Street. The only changes to I-49 would be the addition of this new interchange. Plans to widen I-49 from two lanes per direction to three lanes per direction will be carried out separately from this project. Along I-49, the study area extends from north of Highway 71/North Walton Boulevard on the north end to south of Highway 72 on the south end. The proposed new I-49 interchange at NE J Street is shown in **Figure 1**.

Figure 1: Proposed Interchange at NE J Street



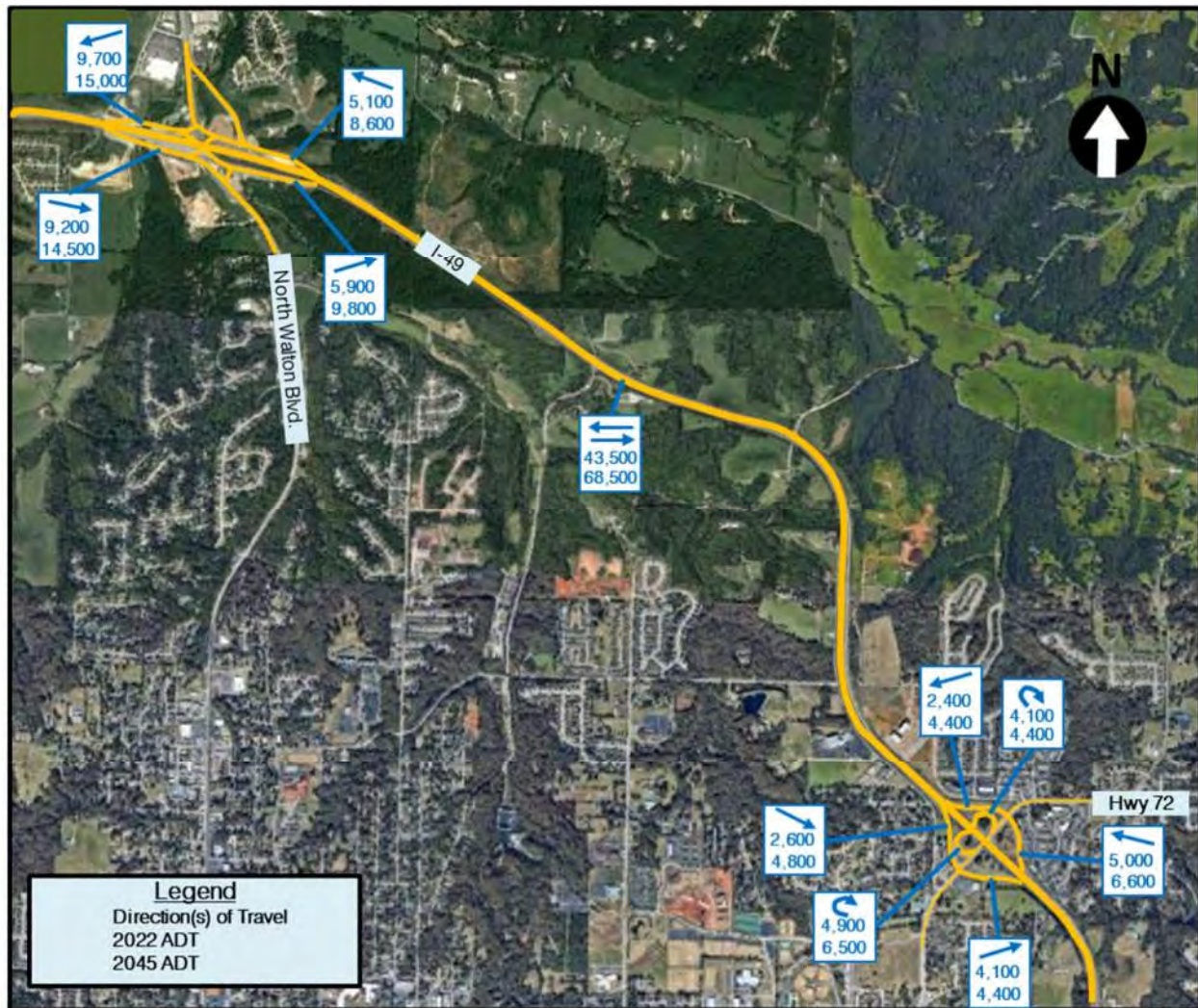
This Traffic Report was developed to identify needs for the new interchange along I-49 at NE J Street and the extension of NE J Street further north. To identify these needs, operational analyses were conducted for 2022 No-Action and Action scenarios, 2026 (opening year) Action scenario, and 2045 No-Action and Action scenarios. A safety analysis of existing conditions was also conducted. The results of these analyses are detailed within this report.

VOLUME DEVELOPMENT

To conduct operational analyses along the I-49 corridor and at the affected intersections along NE J Street, 2022 and 2045 design volumes were developed for No-Action conditions and for Action conditions. It should be noted that Tiger Boulevard is being extended with an overpass across I-49 as a separate project and is anticipated to be complete prior to completion of the NE J Street extension. The 2022 volumes do not include impacts from the Tiger Boulevard overpass since it is not currently open. Therefore, 2026 Action volumes were also developed to account for impacts from the Tiger Boulevard overpass in opening year. The 2045 No Action and 2045 Action volumes also include impacts from the Tiger Boulevard overpass.

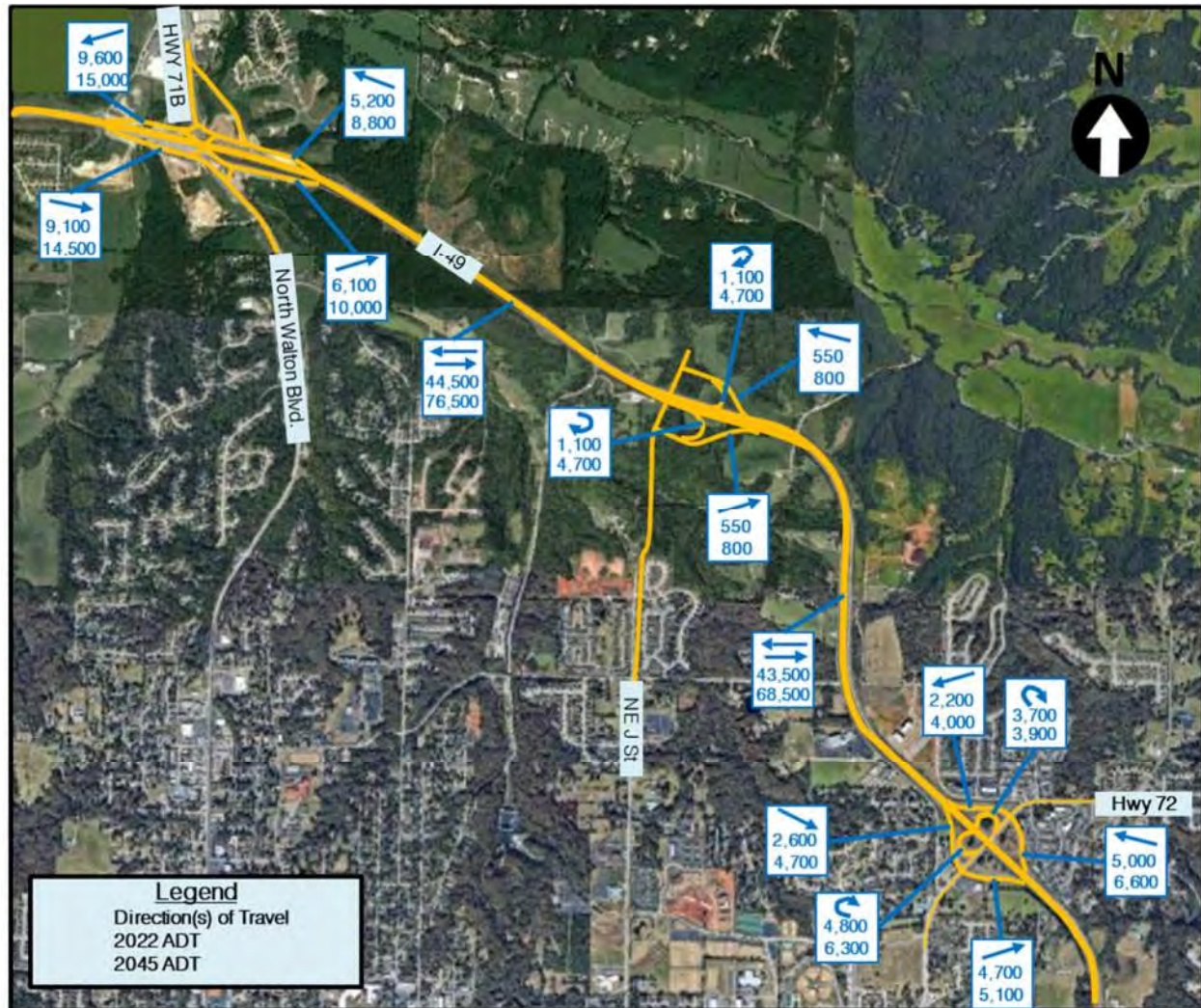
I-49 CORRIDOR VOLUMES

Traffic data along I-49 was obtained from a previous study, the Western North-South Connector Study (ARDOT Job 090573). This data was projected to 2022 using growth rates which were determined for each freeway facility segment based on historical data as well as travel demand models. The ADT volumes along I-49 for the No-Action scenarios are shown in **Figure 2**.

Figure 2: No-Action ADT Volumes

Travel demand models were utilized to determine how traffic would shift once the new interchange was developed at NE J Street. The resulting 2022 and 2045 Action ADT Volumes are shown in **Figure 3**. It should be noted that the extension of Tiger Boulevard with an overpass across I-49 which is being built separately from this project is not anticipated to have a significant effect on the volumes along the I-49 corridor; therefore, the opening year 2026 Action volumes were only analyzed for the intersection analysis along NE J Street and not the corridor analysis along I-49.

Figure 3: Action ADT Volumes

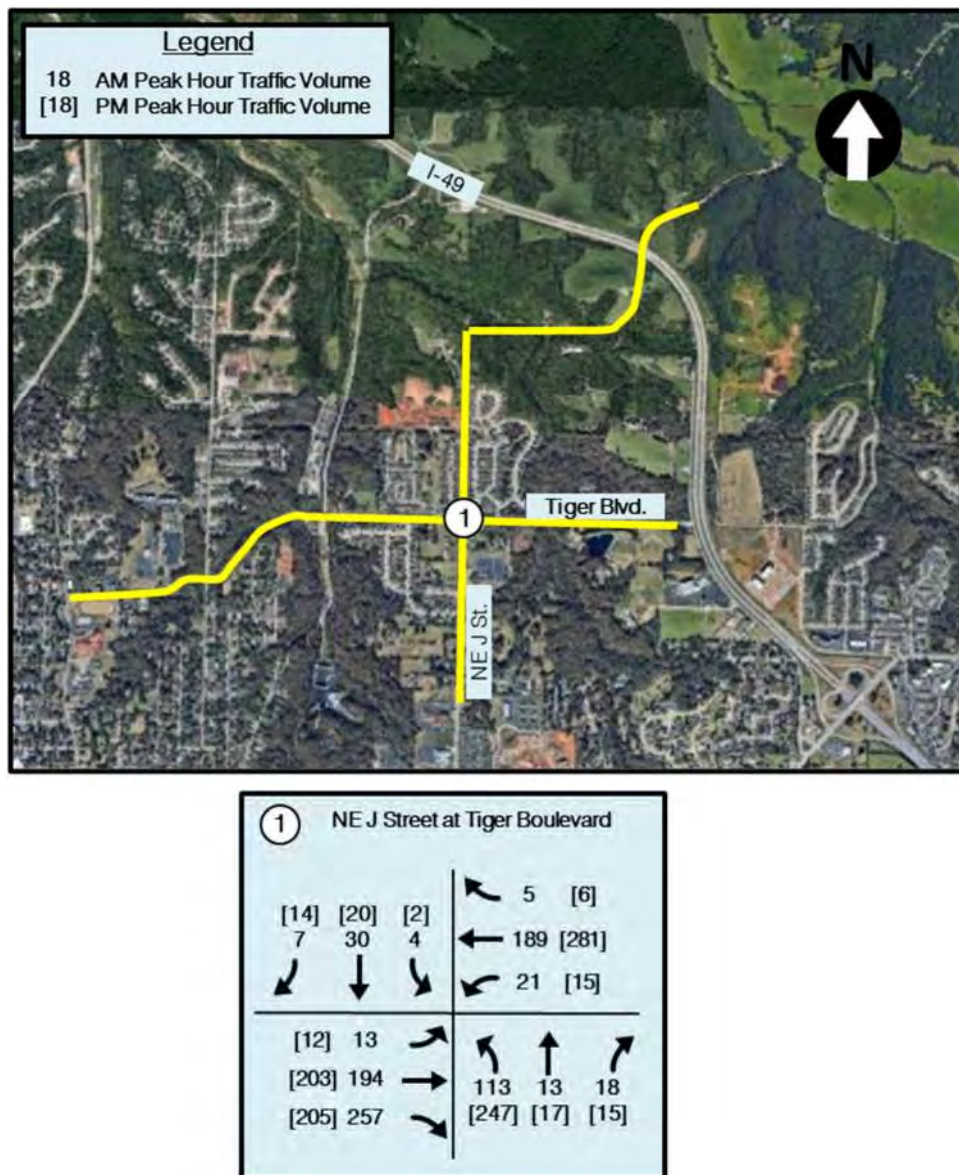


NE J STREET INTERSECTION VOLUMES

Peak Hour turning movement counts were collected at the intersection of NE J Street and Tiger Boulevard on September 14, 2021. These volumes were used to develop the 2022 No-Action volumes shown in **Figure 4**. The 2045 No-Action volumes were developed by utilizing a 2% annual growth rate (AGR) and then applying adjustments to affected movements to account for the future extension of Tiger Boulevard overpass across I-49. Adjustment factors to account for this Tiger

Boulevard overpass were determined based on the relative differences in travel demand models with and without this Tiger Boulevard overpass. The 2045 No-Action volumes are shown in **Figure 5**.

Figure 4: 2022 No-Action Intersection Volumes



Legend

18 AM Peak Hour Traffic Volume
[18] PM Peak Hour Traffic Volume

1 NE J Street at Tiger Boulevard

[23] 11	[32] 47	[3] 6	18 [22] 568 [651] 39 [90]
[19] [368] [323]	21 359 405	 	179 [389] 21 [27] 90 [129]

5

Figure 6: 2022 Action Intersection Volumes

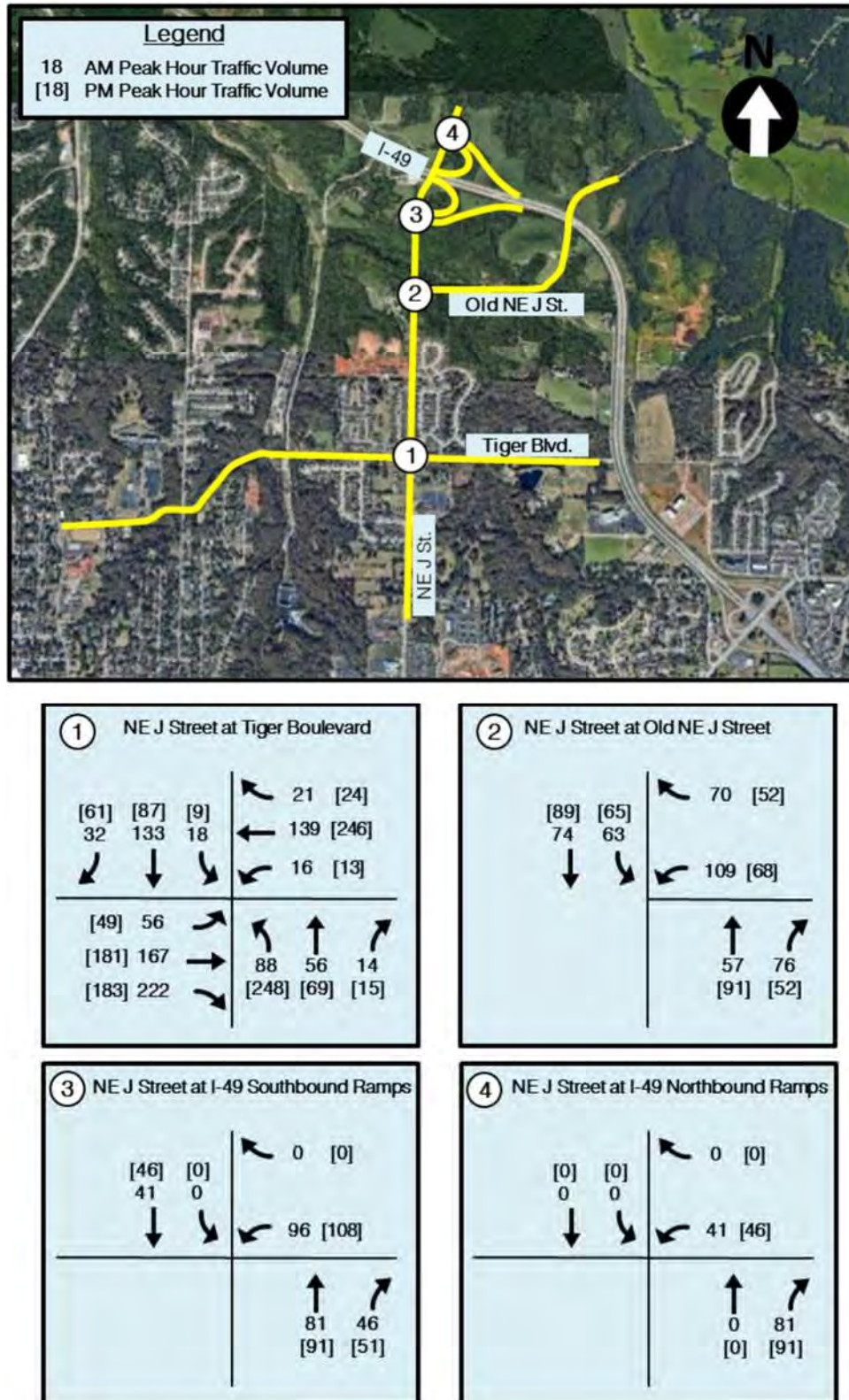


Figure 7: 2026 Action Intersection Volumes

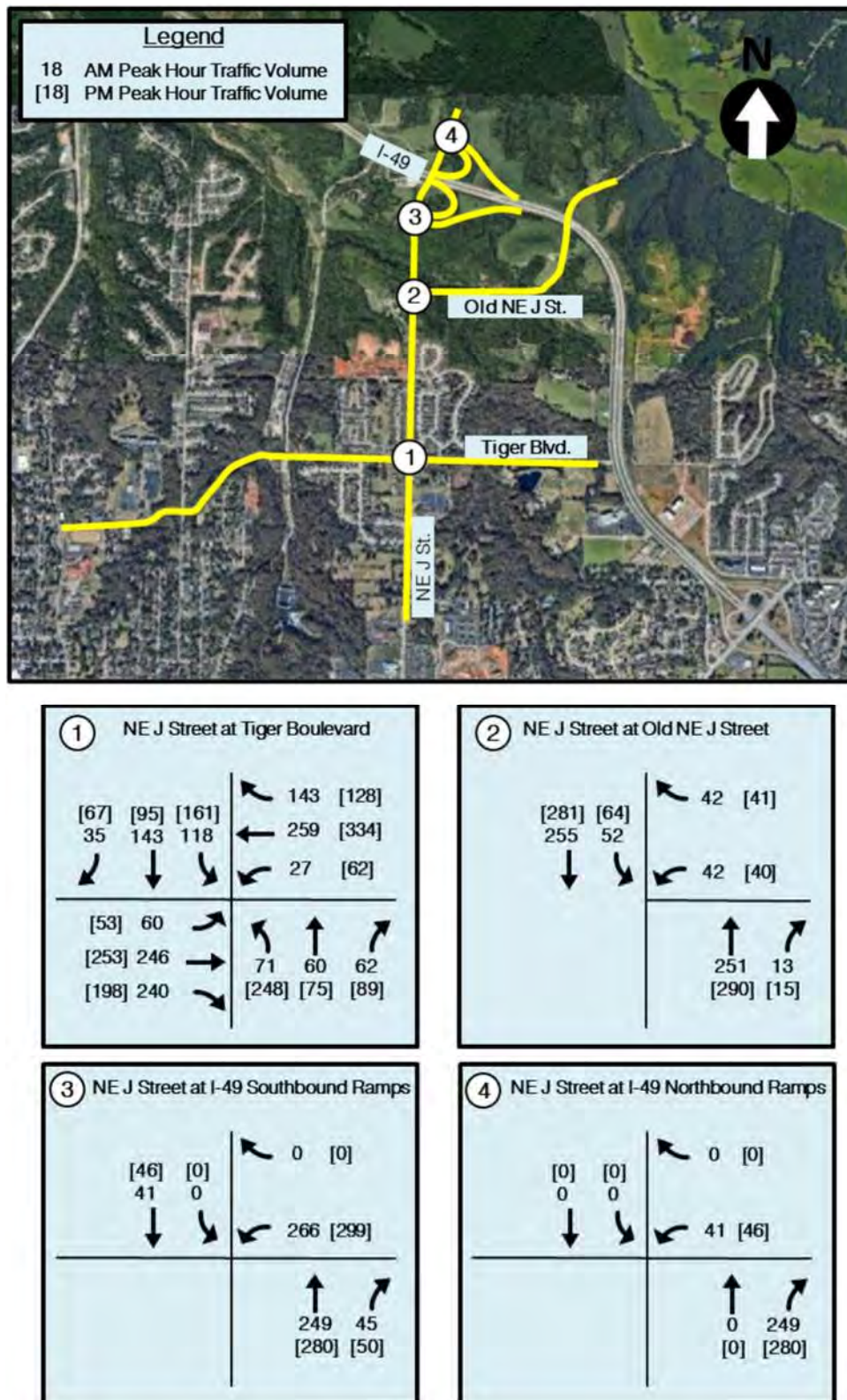
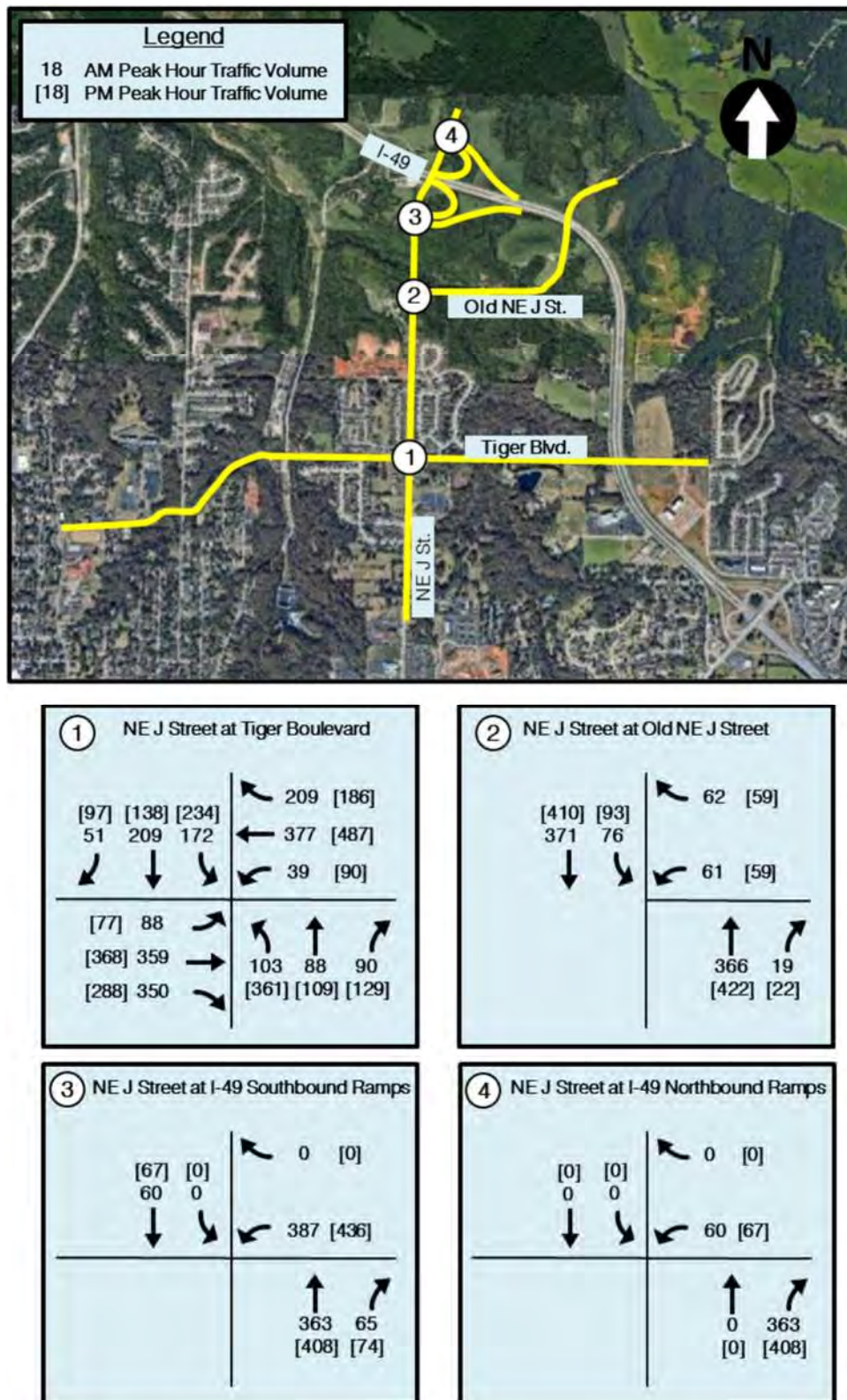


Figure 8: 2045 Action Intersection Volumes

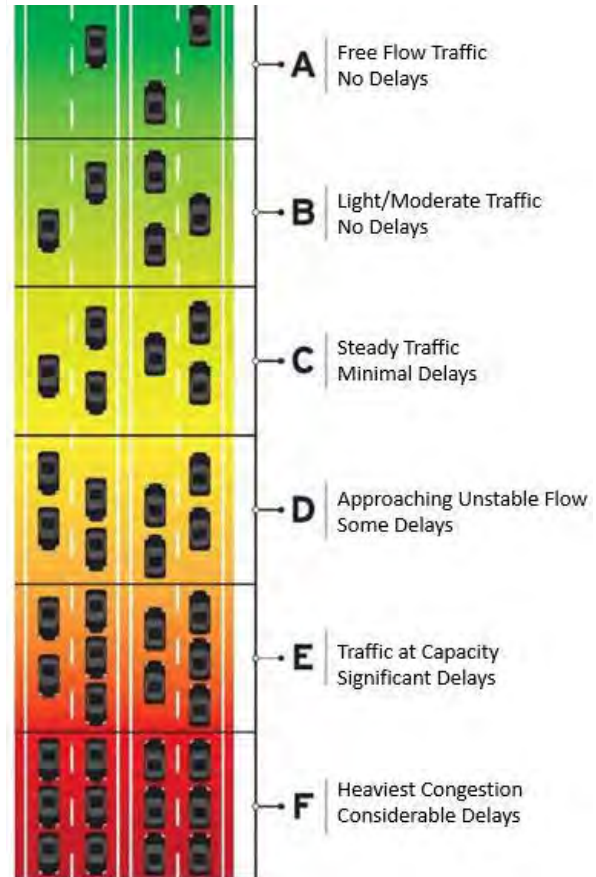


OPERATIONAL ANALYSIS

The I-49 freeway facility from north of Highway 71/North Walton Boulevard through south of Highway 72 was evaluated under 2022 No-Action, 2022 Action, 2045 No-Action, and 2045 Action conditions to identify any current or anticipated operational needs for the I-49 corridor during typical peak hours.

To quantify the operational needs for the study area, the *Highway Capacity Manual (HCM)* methodology was utilized via the freeway facilities module of the *Highway Capacity Software (HCS)*. The *HCM* qualitatively describes operating conditions within a traffic stream or at an intersection using a concept known as Level of Service (LOS). LOS is typically designated into six categories. These range from LOS A indicating free-flow, low density, or nearly negligible delay conditions to LOS F where demand exceeds capacity and large queues are experienced. A graphical representation of LOS is presented in **Figure 9**. The minimum acceptable LOS is generally set at LOS C for rural areas and LOS D for urban areas. For this study, LOS D is used as the threshold for acceptable LOS. The corridor analysis is discussed in **Section 3.1 – Freeway Analysis**.

Figure 9: Level -of-Service Categories



The intersections of NE J Street at Tiger Boulevard, NE J Street at Old NE J Street, and NE J Street with the new I-49 Ramps were evaluated using *Synchro* software

according to *HCM* methodology and *Synchro*'s companion *SimTraffic* software according to *SimTraffic*'s microsimulation methodology. This analysis is discussed in **Section 3.2- Intersection Analysis**.

FREEWAY ANALYSIS

Under 2022 conditions, I-49 is a four-lane, divided freeway with one-lane ramps. In 2045, I-49 will be widened to three lanes in each direction for both No-Action and Action scenarios. The Action scenario adds an interchange with off-ramp and on-ramp access to and from NE J Street for each direction of travel along I-49. The LOS criteria for various freeway segments are defined in *HCM Exhibits 12-15, 13-6, and 14-3*, as shown in **Table 1**.

Table 1: LOS Criteria for Urban Freeway Facilities

Level of Service	Density (pc/mi/ln)		
	Basic Freeway Segment	Merge/Diverge Segment	Freeway Weaving Segment
A	≤ 11	≤ 10	0 - 10
B	> 11 - 18	> 10 - 20	> 10 - 20
C	> 18 - 26	> 20 - 28	> 20 - 28
D	> 26 - 35	> 28 - 35	> 28 - 35
E	> 35 - 45	> 35	> 35 - 43
F	> 45 or Demand > Capacity	Demand > Capacity	> 43 or Demand > Capacity

The LOS results are provided in **Appendix A- Operational Analysis Results*** and are summarized in **Tables 2-9**. These results demonstrate that the I-49 freeway facility will operate acceptably in 2022 with LOS D or better. However, operational issues develop by 2045. The northbound on-ramp (PM peak) and southbound off-ramp (AM peak) at Highway 71/North Walton Boulevard experience LOS F

*Appendices are available upon request

Traffic Report

NE J Street Interchange

conditions under both No-Action and Action alternatives. These results demonstrate that the freeway facility will operate similarly under No-Action and Action scenarios even with the Action scenario serving higher volumes in some areas and providing direct access to NE J Street. By increasing access and volume served along I-49, the surrounding roadway network should experience some relief in demand and improved operations.

Table 2: LOS Results for 2022 No-Action along I-49 NB

I-49 NB		2022 No-Action	
Location	ADT	AM Peak - LOS	PM Peak - LOS
SE 8th St (Exit 87) to Hwy 72 (Exit 88)	56,500	B	C
Exit 88 Exit Ramp Hwy 72	5,000	B	C
Exit 88 Loop Exit Ramp Hwy 72	4,100	A	B
Exit 88 Entrance Ramp Hwy 72	2,400	A	C
Hwy 72 (Exit 88) to J Street (Exit 91 or 92)	43,500	A	C
Exit 89 Exit Ramp J Street	Future	Future	Future
Exit 89 Entrance Ramp J Street	Future	Future	Future
J Street (Exit 91 or 92) to Hwy 71 (Exit 93)	43,500	A	C
Exit 93 Exit Ramp Hwy 71	5,100	A	B
Exit 93 Entrance Ramp Hwy 71	9,700	A	C

Table 3: LOS Results for 2022 No-Action along I-49 SB

I-49 SB		2022 No-Action	
Location	ADT	AM Peak - LOS	PM Peak - LOS
Exit 93 Exit Ramp Hwy 71	9,200	D	B
Exit 93 Entrance Ramp Hwy 71	5,900	B	B
Hwy 71 (Exit 93) to J Street (Exit 91 or 92)	43,500	C	B
Exit 89 Exit Ramp J Street	Future	Future	Future
Exit 89 Entrance Ramp J Street	Future	Future	Future
J Street (Exit 91 or 92) to Hwy 72 (Exit 88)	43,500	C	B
Exit 88 Exit Ramp Hwy 72	2,600	C	B
Exit 88 Loop Entrance Ramp Hwy 72	4,900	B	A
Exit 88 Entrance Ramp Hwy 72	4,100	B	B
Hwy 72 (Exit 88) to SE 8th St (Exit 87)	56,500	B	B

Traffic Report

NE J Street Interchange

Table 4: LOS Results for 2022 Action along I-49 NB

I-49 NB	2022 Action		
Location	ADT	AM Peak - LOS	PM Peak - LOS
SE 8th St (Exit 87) to Hwy 72 (Exit 88)	57,000	A	C
Exit 88 Exit Ramp Hwy 72	5,000	B	C
Exit 88 Loop Exit Ramp Hwy 72	3,700	A	B
Exit 88 Entrance Ramp Hwy 72	2,200	A	C
Hwy 72 (Exit 88) to J Street (Exit 91 or 92)	43,500	A	C
Exit 89 Exit Ramp J Street	550	A	B
Exit 89 Entrance Ramp J Street	1,100	A	B
J Street (Exit 91 or 92) to Hwy 71 (Exit 93)	44,500	A	C
Exit 93 Exit Ramp Hwy 71	5,200	A	B
Exit 93 Entrance Ramp Hwy 71	9,600	A	C

Table 5: LOS Results for 2022 Action along I-49 SB

I-49 SB	2022 Action		
Location	ADT	AM Peak - LOS	PM Peak - LOS
Exit 93 Exit Ramp Hwy 71	9,100	D	B
Exit 93 Entrance Ramp Hwy 71	6,100	B	B
Hwy 71 (Exit 93) to J Street (Exit 91 or 92)	44,500	C	B
Exit 89 Exit Ramp J Street	1,100	C	B
Exit 89 Entrance Ramp J Street	550	C	B
J Street (Exit 91 or 92) to Hwy 72 (Exit 88)	43,500	C	B
Exit 88 Exit Ramp Hwy 72	2,600	C	B
Exit 88 Loop Entrance Ramp Hwy 72	4,800	B	A
Exit 88 Entrance Ramp Hwy 72	4,700	B	B
Hwy 72 (Exit 88) to SE 8th St (Exit 87)	57,000	C	B

Table 6: LOS Results for 2045 No-Action along I-49 NB

I-49 NB	2045 No-Action		
Location	ADT	AM Peak - LOS	PM Peak - LOS
SE 8th St (Exit 87) to Hwy 72 (Exit 88)	81,000	B	D
Exit 88 Exit Ramp Hwy 72	6,600	C	D
Exit 88 Loop Exit Ramp Hwy 72	4,400	A	B
Exit 88 Entrance Ramp Hwy 72	4,400	A	C
Hwy 72 (Exit 88) to J Street (Exit 91 or 92)	68,500	A	C
Exit 89 Exit Ramp J Street	Future	Future	Future
Exit 89 Entrance Ramp J Street	Future	Future	Future
J Street (Exit 91 or 92) to Hwy 71 (Exit 93)	68,500	A	C
Exit 93 Exit Ramp Hwy 71	8,600	A	B
Exit 93 Entrance Ramp Hwy 71	15,000	B	F

Table 7: LOS Results for 2045 No-Action along I-49 SB

I-49 SB	2045 No-Action		
Location	ADT	AM Peak - LOS	PM Peak - LOS
Exit 93 Exit Ramp Hwy 71	14,500	F	C
Exit 93 Entrance Ramp Hwy 71	9,800	C	B
Hwy 71 (Exit 93) to J Street (Exit 91 or 92)	68,500	C	B
Exit 89 Exit Ramp J Street	Future	Future	Future
Exit 89 Entrance Ramp J Street	Future	Future	Future
J Street (Exit 91 or 92) to Hwy 72 (Exit 88)	68,500	C	B
Exit 88 Exit Ramp Hwy 72	4,800	D	C
Exit 88 Loop Entrance Ramp Hwy 72	6,500	C	B
Exit 88 Entrance Ramp Hwy 72	4,400	C	C
Hwy 72 (Exit 88) to SE 8th St (Exit 87)	81,000	D	C

Table 8: LOS Results for 2045 Action along I-49 NB

I-49 NB	2045 Action		
Location	ADT	AM Peak - LOS	PM Peak - LOS
SE 8th St (Exit 87) to Hwy 72 (Exit 88)	81,500	B	D
Exit 88 Exit Ramp Hwy 72	6,600	C	D
Exit 88 Loop Exit Ramp Hwy 72	3,900	A	B
Exit 88 Entrance Ramp Hwy 72	4,000	A	C
Hwy 72 (Exit 88) to J Street (Exit 91 or 92)	68,500	A	C
Exit 89 Exit Ramp J Street	800	A	C
Exit 89 Entrance Ramp J Street	4,700	A	C
J Street (Exit 91 or 92) to Hwy 71 (Exit 93)	76,500	B	C
Exit 93 Exit Ramp Hwy 71	8,800	A	B
Exit 93 Entrance Ramp Hwy 71	15,000	B	F

Table 9: LOS Results for 2045 Action along I-49 SB

I-49 SB	2045 Action		
Location	ADT	AM Peak - LOS	PM Peak - LOS
Exit 93 Exit Ramp Hwy 71	14,500	F	C
Exit 93 Entrance Ramp Hwy 71	10,000	C	B
Hwy 71 (Exit 93) to J Street (Exit 91 or 92)	76,500	C	B
Exit 89 Exit Ramp J Street	4,700	C	B
Exit 89 Entrance Ramp J Street	800	B	B
J Street (Exit 91 or 92) to Hwy 72 (Exit 88)	68,500	C	B
Exit 88 Exit Ramp Hwy 72	4,700	D	B
Exit 88 Loop Entrance Ramp Hwy 72	6,300	C	B
Exit 88 Entrance Ramp Hwy 72	5,100	C	B
Hwy 72 (Exit 88) to SE 8th St (Exit 87)	81,500	D	C

INTERSECTION ANALYSIS

The intersection of NE J Street at Tiger Boulevard is a four-legged intersection with all-way stop control (AWSC). The northbound leg has a dedicated left turn lane and a shared right-through lane, while the other three approaches consist of a shared left-through-right lane. The LOS criteria for this type of intersection are identified in *HCM Exhibit 21-8*. The LOS Criteria for a signalized intersection is identified in *HCM Exhibit 19-8*. These criteria are summarized in **Table 10**. As shown, LOS for both types of intersections are based on delay.

Table 10: LOS Criteria for Intersections

Level of Service	Signalized Intersection	Stop Controlled Intersection
	Control Delay (sec/veh)	
A	0 to 10	0 to 10
B	> 10 to 20	> 10 to 15
C	> 20 to 35	> 15 to 25
D	> 35 to 55	> 25 to 35
E	> 55 to 80	> 35 to 50
F	> 80 or	> 50 or
	v/c > 1	v/c > 1

No-Action Conditions

Table 11 shows the delay and LOS results for the NE J Street/Tiger Boulevard intersection under 2022 No-Action conditions based on *HCM* and *SimTraffic* methodologies. Both methodologies demonstrate acceptable performance with LOS C or better for all movements during both peak periods.

Traffic Report

NE J Street Interchange

Table 11: LOS Results for 2022 No-Action

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
HCM																
NE J St at Tiger Blvd	AM	All-Way Stop	LOS	C			B			B	A		A			B
			Delay	15.7			11.0			11.8	9.1		9.7			13.5
	PM		LOS	C			C			C	A		B			C
			Delay	19.5			15.6			18.2	9.6		10.5			17.4
SimTraffic																
NE J St at Tiger Blvd	AM	All-Way Stop	LOS	B	B	A	A	A	A	A	A	A	A	A	A	A
			Delay	10.4	12.7	8.8	7.2	9.6	5.1	6.2	7.7	2.6	6.3	8.1	3.6	9.3
	PM		LOS	B	B	A	B	B	A	A	A	A	A	A	A	B
			Delay	10.3	12.7	8.9	10.2	11.3	6.3	8.8	9.2	3.9	2.7	9.1	3.6	10.2

Table 12 shows the NE J Street/Tiger Boulevard intersection results under 2045 No-Action conditions. According to both methodologies, the intersection will operate with failing overall LOS F during both peak hours by 2045. As displayed in the table, all the eastbound and westbound movements will experience unacceptable LOS F conditions during both peak hours.

Table 12: LOS Results for 2045 No-Action

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
HCM																
NE J St at Tiger Blvd	AM	All-Way Stop	LOS	F			F			C	B		C			F
			Delay	238.2			141.2			20.0	13.9		15.2			159.5
	PM		LOS	F			F			F	C		C			F
			Delay	275.0			352.2			77.1	16.5		18.7			239.7
SimTraffic																
NE J St at Tiger Blvd	AM	All-Way Stop	LOS	F	F	F	F	F	E	B	B	A	A	B	A	F
			Delay	198.5	205.7	190.7	52.3	50.2	37.1	10.3	10.8	5.3	7.0	10.5	6.3	106.9
	PM		LOS	F	F	F	F	F	F	D	B	A	A	B	A	F
			Delay	364.0	382.6	374.8	760.2	745.6	726.7	29.3	14.3	8.5	5.5	12.3	6.8	410.4

Action Layout

With the proposed new interchange at I-49, two ramp terminals and the intersection formed by the old NE J Street at the new extension of NE J Street were analyzed along with the existing intersection at NE J Street at Tiger Boulevard with the 2022, 2026, and 2045 Action conditions. The intersections were analyzed with the following lane configurations:

- NE J Street at Tiger Boulevard:

- The first alternative (shown in **Figure 10**) was analyzed with all-way stop control. The second alternative (shown in **Figure 11**) was analyzed with a signal. The lane configuration for both alternatives was identical.
- Northbound (NE J Street): one left turn lane with 400 feet of storage (within the TWLTL), one through-right lane
- Southbound (NE J Street): one left turn lane with 100 feet of storage, one through lane, one right turn lane with 100 feet of storage
- Westbound (Tiger Boulevard): one left turn lane with 300 feet of storage, one through-right lane
- Eastbound (Tiger Boulevard): one left turn lane with 125 feet of storage, one through lane, one right turn lane with 225 feet of storage

Figure 10: Action Lane Config. for NE J St at Tiger Blvd-Stop Control



Figure 11: Action Lane Config. for NE J St at Tiger Blvd-Signal

- NE J Street at Old NE J Street (shown in **Figure 12**):
 - stop control on the Old NE J Street (westbound) approach
 - Northbound (NE J Street): one through lane, one shared through-right lane with 85 feet of storage
 - Southbound (NE J Street): one through lane, one left-turn lane
 - Westbound (Old NE J Street): one left-right lane

Figure 12: Action Lane Config. for NE J Street at Old NE J Street

- NE J Street at I-49 Southbound Ramps (shown in **Figure 13**):
 - stop control on the I-49 Southbound off-ramp (westbound) approach
 - Northbound (NE J Street): one through lane, one shared through-right lane with yield-controlled channelized right turn
 - Southbound (NE J Street): two through lanes, one left-turn lane with 100 feet of storage
 - Westbound (I-49 Southbound off-ramp): two left-turn lanes with 300 feet of storage for the outside left turn lane, one right-turn lane with yield-controlled channelized right turn and 300 feet of storage

Figure 13: Action Lane Config. for NE J Street at I-49 SB Ramps

- NE J Street at I-49 Northbound Ramps (show in **Figure 14**):
 - stop control on the I-49 Northbound off-ramp (westbound) approach
 - Northbound (NE J Street): one through lane, one shared through-right lane with yield-controlled channelized right turn
 - Southbound (NE J Street): two through lanes, one left-turn lane with 100 feet of storage
 - Westbound (I-49 Northbound off-ramp): one left-turn lane, one right-turn lane with yield-controlled channelized right turn and 200 feet of storage

Figure 14: Action Lane Config. for NE J Street at I-49 NB Ramps**Action Conditions – with Stop Control at NE J St at Tiger Blvd**

The operational analysis results for the Action conditions with stop control are shown in **Tables 13 to 18** for 2022, 2026, and 2045 design years, respectively. Note that the 2022 Action scenario does not include the extension of Tiger Boulevard across I-49 which is being built as a separate project. This 2022 Action scenario is presented for the purpose of comparing Action versus Existing conditions. Since the Tiger Boulevard overpass is anticipated to be in place when the NE J Street extension opens in 2026, the 2026 Action and 2045 Action volumes include impacts from the Tiger Boulevard overpass and were utilized for developing recommendations on lane configurations and intersection controls. Complete results are provided in **Appendix A – Operational Analysis Results***.

Both methodologies show adequate performance with LOS C or better for all movements at the two I-49 ramp intersections and at the NE J Street at Old NE J Street intersection through the 2045 design year with one-way stop control.

*Appendices are available upon request

Traffic Report

NE J Street Interchange

The intersection of NE J Street at Tiger Boulevard shows adequate performance in 2022. However, changes in traffic patterns due to the Tiger Boulevard overpass will have a significant impact on operations at this intersection. Both methodologies show failing LOS F conditions for westbound through and right movements during one or both peak periods in 2026. By 2045, both methodologies show failing LOS F conditions for the overall intersection and for multiple movements during both peak periods. This demonstrates that the intersection of NE J Street at Tiger Boulevard will not operate acceptably with all-way stop control.

Table 13: LOS Results for 2022 Action (stop at Tiger Blvd) – HCM Results

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
NE J St at Tiger Blvd	AM	All-Way Stop	LOS	B	B	B	B	B	B	B	B	B	B	A	B	
			Delay	10.6	12.3	12.0	10.5	13.0	12.3	11.0	10.7	12.7	9.6	12.1		
	PM		LOS	B	C	B	B	C	C	B	B	B	B	C		
			Delay	12.2	16.1	14.2	11.5	23.7	24.1	12.3	12.1	13.8	12.0	18.3		
NE J St at old NE J Street	AM	One-Way Stop	LOS				B		B		n/a ¹	n/a ¹	A	n/a ¹		A
			Delay				11.4		11.4				7.6			5.6
	PM		LOS				B		B		n/a ¹	n/a ¹	A	n/a ¹		A
			Delay				10.8		10.8				7.7			4.3
NE J St at I-49 SB Ramps	AM	One-Way Stop	LOS	HCM does not support more than one exclusive lane on turning movements (dual westbound left turn lanes) with stop control.												
	Delay															
	PM		LOS													
NE J St at I-49 NB Ramps	AM	One-Way Stop	Delay													
			LOS				A		A		n/a ¹	n/a ¹	A	n/a ¹		A
	PM		Delay				8.9		0.0						0.0	
			LOS				A		A		n/a ¹	n/a ¹	A	n/a ¹		A
Delay				9.0		0.0			0.0				3.0			

n/a¹ – free movement, no delay reported

Traffic Report

NE J Street Interchange

Table 14: LOS Results for 2022 Action (stop at Tiger Blvd) – SimTraffic Results

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
NE J St at Tiger Blvd	AM	All-Way Stop	LOS	A	B	A	A	A	A	A	A	A	A	A	A	A
			Delay	8.5	10.6	6.5	6.3	9.7	6.5	6.8	8.2	3.1	6.2	9.7	4.3	8.3
	PM		LOS	A	B	A	A	C	B	B	A	A	A	B	A	B
			Delay	9.5	11.7	6.6	8.4	15.1	11.0	12.5	10.0	5.8	6.7	11.8	6.6	11.2
NE J St at old NE J Street	AM	One-Way Stop	LOS				A				A	A	A		A	
			Delay				8.6		7.5		0.2	0.3	4.0	0.7	4.0	
	PM		LOS				A		A		A	A	A	A	A	
			Delay				8.5		6.7		0.2	0.3	3.9	0.7	3.1	
NE J St at I-49 SB Ramps	AM	One-Way Stop	LOS				A		n/a ¹		A	A	n/a ¹	A	A	
			Delay				4.9		n/a ¹		2.6	4.2	n/a ¹	0.7	3.4	
	PM		LOS				A		n/a ¹		A	A	n/a ¹	A	A	
			Delay				4.9		n/a ¹		2.4	3.9	n/a ¹	0.7	3.4	
NE J St at I-49 NB Ramps	AM	One-Way Stop	LOS				A		n/a ¹		n/a ¹	A	n/a ¹	n/a ¹	A	
			Delay				4.0		n/a ¹		n/a ¹	2.7	n/a ¹	n/a ¹	3.2	
	PM		LOS				A		n/a ¹		n/a ¹	A	n/a ¹	n/a ¹	A	
			Delay				3.9		n/a ¹		n/a ¹	2.8	n/a ¹	n/a ¹	3.2	

n/a¹ - no volume modeled making this movement**Table 15: LOS Results for 2026 Action (stop at Tiger Blvd) – HCM Results**

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
NE J St at Tiger Blvd	AM	All-Way Stop	LOS	B	D	C	B	F	C	C	C	C	C	B	E	
			Delay	13.8	25.6	20.9	12.7	81.3	15.9	17.0	18.1	18.5	12.4	36.6		
			Queue (ft)	15	108	88	5	340	20	38	38	48	8	-		
	PM		LOS	C	E	C	C	F	E	C	D	C	C	F		
			Delay	16.4	40.8	24.6	16.1	222.0	45.7	22.5	27.7	19.1	16.2	80.6		
			Queue (ft)	15	148	80	18	633	155	60	73	30	18	-		
NE J St at old NE J Street	AM	One-Way Stop	LOS				B	B			n/a ¹	n/a ¹	A		A	
			Delay				11.7	11.7					8.0		n/a ¹	2.1
			Queue (ft)				13	13					3			-
	PM		LOS				B	B			n/a ¹	n/a ¹	A		A	
			Delay				12.2	12.2					8.1		n/a ¹	2.1
			Queue (ft)				13	13					5			-
NE J St at I-49 SB Ramps	AM	One-Way Stop	LOS	HCM does not support more than one exclusive lane on turning movements (dual westbound left turn lanes) with stop control.												
			Delay													
	PM		LOS													
			Queue (ft)													
NE J St at I-49 NB Ramps	AM	One-Way Stop	LOS				A	A			n/a ¹	n/a ¹	A		A	
			Delay				9.5	0.0					0.0		n/a ¹	1.3
			Queue (ft)				5	0					0			-
	PM		LOS				A	A			n/a ¹	n/a ¹	A		A	
			Delay				9.7	0.0					0.0		n/a ¹	1.4
			Queue (ft)				5	0					0			-

n/a¹ – free movement, no delay reported

Traffic Report

NE J Street Interchange

Table 20: LOS Results for 2026 Action (signal at Tiger Blvd) – SimTraffic Results

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
NE J St at Tiger Blvd	AM	Signal	LOS	B	B	A	B	B	B	B	B	A	B	B	A	B
			Delay	13.9	12.7	6.6	12.1	17.3	11.8	13.3	15.0	7.0	14.4	15.0	6.7	12.6
			Queue (ft)	52	121	76	46	188		60	77		90	89	46	-
	PM		LOS	B	B	A	B	B	B	B	B	A	B	C	A	B
			Delay	15.5	15.1	6.2	14.2	19.0	12.4	19.9	17.7	8.7	17.6	20.9	9.2	15.5
			Queue (ft)	61	137	66	61	222		146	89		105	90	58	-
NE J St at old NE J Street	AM	One-Way Stop	LOS				A		A		A	A	A	A		A
			Delay				8.8		6.7		0.3	0.4	4.4	1.2		1.9
			Queue (ft)				57		57		0		33	0		-
	PM		LOS				A		A		A	A	A	A		A
			Delay				10.0		6.7		0.4	0.5	5.5	1.2		2.0
			Queue (ft)				58		58		0		37	0		-
NE J St at I-49 SB Ramps	AM	One-Way Stop	LOS				A		n/a ¹		A	A	n/a ¹	A		A
			Delay				7.6				1.7	3.9		0.8		4.5
			Queue (ft)				93				0			0		-
	PM		LOS				A		n/a ¹		A	A	n/a ¹	A		A
			Delay				8.4				1.9	3.8		0.9		4.8
			Queue (ft)				98				8			0		-
NE J St at I-49 NB Ramps	AM	One-Way Stop	LOS				A		n/a ¹		n/a ¹	A	n/a ¹	n/a ¹		A
			Delay				4.1				n/a ¹	3.7				3.7
			Queue (ft)				50				0					-
	PM		LOS				A		n/a ¹		n/a ¹	A	n/a ¹	n/a ¹		A
			Delay				4.0				n/a ¹	4.0				4.0
			Queue (ft)				50				0					-

n/a¹ - no volume modeled making this movement**Table 21: LOS Results for 2045 Action (signal at Tiger Blvd) – HCM Results**

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall		
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
NE J St at Tiger Blvd	AM	Signal	LOS	B	B	B	B	C	C	C	C	C	C	C	C			
			Delay	14.7	13.8	11.6	10.1	29.3	21.6	26.8	23.9	30.6	22.8	22.7				
			Queue (ft)	33	165	53	13	363	60	90	108	158	5	-				
	PM		LOS	C	C	B	B	D	D	D	C	D	D	D	D			
			Delay	25.1	20.1	16.5	15.1	47.4	49.6	42.7	34.8	51.3	40.1	38.2				
			Queue (ft)	48	265	73	53	675	393	223	230	178	5	-				
NE J St at old NE J Street	AM	One-Way Stop	LOS				B				n/a ¹	n/a ¹	A	n/a ¹		A		
			Delay				14.6						8.4			2.5		
			Queue (ft)				25						5			-		
	PM		LOS				C				C		A	n/a ¹		A		
			Delay				15.9				15.9		8.7			2.5		
			Queue (ft)				28				28		8			-		
NE J St at I-49 SB Ramps	AM	One-Way Stop	LOS	HCM does not support more than one exclusive lane on turning movements (dual westbound left turn lanes) with stop control.														
			Delay															
	Queue (ft)																	
	PM		LOS															
			Delay															
Queue (ft)																		
NE J St at I-49 NB Ramps	AM	One-Way Stop	LOS				B				A		n/a ¹	n/a ¹	A	n/a ¹		A
			Delay				10.1				0.0				0.0			1.4
			Queue (ft)				7.5				7.5				0.0			-
	PM		LOS				B				A		n/a ¹	n/a ¹	A	n/a ¹		A
			Delay				10.4				0.0				0.0			1.5
			Queue (ft)				7.5				0.0				0.0			-

n/a¹ – free movement, no delay reported

Traffic Report

NE J Street Interchange

Table 16: LOS Results for 2026 Action (stop at Tiger Blvd) – SimTraffic Results

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
NE J St at Tiger Blvd	AM	All-Way Stop	LOS	B	B	A	A	C	B	A	B	A	B	B	A	B
			Delay	10.1	14.0	8.2	9.1	17.1	13.0	8.3	11.1	6.3	10.5	13.3	6.6	12.0
			Queue (ft)	48	95	84	46	166		51	60		73	79	51	-
	PM		LOS	B	C	A	D	F	F	C	C	A	B	C	B	D
			Delay	13.4	20.7	8.2	28.3	82.8	72.7	19.6	15.7	9.2	14.6	15.9	10.2	32.7
			Queue (ft)	55	130	75	377	676		135	75		93	71	57	-
NE J St at old NE J Street	AM	One-Way Stop	LOS				A		A		A	A	A	A		A
			Delay				8.9		6.6		0.3	0.4	4.8	1.2		2.0
			Queue (ft)				57		57		0		38	0		-
	PM		LOS				B		A		A	A	A	A		A
			Delay				10.2		6.9		0.4	0.4	5.5	1.3		2.1
			Queue (ft)				59		59		3		37	0		-
NE J St at I-49 SB Ramps	AM	One-Way Stop	LOS				A		n/a ¹		A	A		A		A
			Delay				7.6		n/a ¹		1.8	3.9	n/a ¹	0.8		4.6
			Queue (ft)				91				6			0		-
	PM		LOS				A		n/a ¹		A	A		A		A
			Delay				8.2		n/a ¹		1.8	3.6	n/a ¹	0.9		4.7
			Queue (ft)				96				4			0		-
NE J St at I-49 NB Ramps	AM	One-Way Stop	LOS				A		n/a ¹			A				A
			Delay				4.1		n/a ¹		n/a ¹	3.7	n/a ¹	n/a ¹		3.8
			Queue (ft)				49					0				-
	PM		LOS				A		n/a ¹			A				A
			Delay				4.0		n/a ¹		n/a ¹	3.8	n/a ¹	n/a ¹		3.9
			Queue (ft)				51					0				-

n/a¹ - no volume modeled making this movement

Traffic Report

NE J Street Interchange

Table 17: LOS Results for 2045 Action (stop at Tiger Blvd) – HCM Results

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
NE J St at Tiger Blvd	AM	All-Way Stop	LOS	C	F	F	C	F	C	D	D	E	C	F		
			Delay	19.8	109.4	78.3	16.2	440.5	24.1	32.2	33.3	38.9	17.0	164.0		
			Queue (ft)	28	315	260	13	1063	40	85	85	113	13	-		
	PM		LOS	C	F	F	C	F	F	F	F	D	C	F		
			Delay	23.8	193.9	82.3	23.6	691.7	217.5	59.4	77.3	32.6	24.4	266.1		
			Queue (ft)	28	403	218	38	1373	433	163	183	65	35	-		
NE J St at old NE J Street	AM	One-Way Stop	LOS				B				A				A	
			Delay				14.6				n/a ¹	n/a ¹	8.4	n/a ¹	2.5	
			Queue (ft)				25						5		-	
	PM		LOS				C				A				A	
			Delay				15.9				n/a ¹	n/a ¹	8.7	n/a ¹	2.5	
			Queue (ft)				28						8		-	
NE J St at I-49 SB Ramps	AM	One-Way Stop	LOS	HCM does not support more than one exclusive lane on turning movements (dual westbound left turn lanes) with stop control.												
			Delay													
	Queue (ft)															
	PM		LOS													
			Delay													
Queue (ft)																
NE J St at I-49 NB Ramps	AM	One-Way Stop	LOS				B				A				A	
			Delay				10.1				n/a ¹	n/a ¹	0.0	n/a ¹	1.4	
			Queue (ft)				7.5						0.0		-	
	PM		LOS				B				A				A	
			Delay				10.4				n/a ¹	n/a ¹	0.0	n/a ¹	1.5	
			Queue (ft)				7.5						0.0		-	

n/a¹ – free movement, no delay reported

Traffic Report

NE J Street Interchange

Table 18: LOS Results for 2045 Action (stop at Tiger Blvd) – SimTraffic Results

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
NE J St at Tiger Blvd	AM	All-Way Stop	LOS	C	E	C	F	F	F	B	C	A	C	C	A	F
			Delay	22.5	38.3	21.7	274.5	336.5	342.8	10.8	15.4	8.3	16.3	19.6	9.5	117.5
			Queue (ft)	152	421	261	551	3040	56	79	99	113	55	-		
	PM		LOS	F	F	F	F	F	F	F	F	F	C	C	B	F
			Delay	213.1	277.9	184.1	956.4	1039.5	1038.2	255.4	166.0	152.1	23.7	22.8	14.1	427.9
			Queue (ft)	317	2706	448	577	4098	542	2089	145	91	76	-		
NE J St at old NE J Street	AM	One-Way Stop	LOS				B	A		A		A	A	A		
			Delay				12.2	7.0		0.4		0.4	4.9	1.4	2.4	
			Queue (ft)				65	65		0		43	0	-		
	PM		LOS				B	A		A		A	A	A		
			Delay				13.9	7.9		0.4		0.6	5.8	1.5	2.6	
			Queue (ft)				72	72		0		47	0	-		
NE J St at I-49 SB Ramps	AM	One-Way Stop	LOS				B	n/a ¹		A		A	n/a ¹	A	A	
			Delay				11.4	n/a ¹		2.2		4.0	n/a ¹	1.0	6.4	
			Queue (ft)				135	n/a ¹		10			3	-		
	PM		LOS				B	n/a ¹		A		A	n/a ¹	A	A	
			Delay				11.6	n/a ¹		2.2		3.8	n/a ¹	1.0	6.9	
			Queue (ft)				144	n/a ¹		6			0	-		
NE J St at I-49 NB Ramps	AM	One-Way Stop	LOS				A	n/a ¹		n/a ¹		A	n/a ¹	n/a ¹	A	
			Delay				4.1	n/a ¹		n/a ¹		4.4	n/a ¹	n/a ¹	4.3	
			Queue (ft)				54	n/a ¹		0				-		
	PM		LOS				A	n/a ¹		n/a ¹		A	n/a ¹	n/a ¹	A	
			Delay				4.0	n/a ¹		n/a ¹		4.1	n/a ¹	n/a ¹	4.1	
			Queue (ft)				45	n/a ¹		0				-		

n/a¹ - no volume modeled making this movement**Action Conditions – with Signal at NE J St at Tiger Blvd**

The operational analysis results for the Action conditions with signal control at the intersection of NE J Street and Tiger Boulevard are shown in **Tables 19 to 22** for 2026 and 2045 design years, respectively. Complete results are provided in **Appendix A – Operational Analysis Results***. These results show acceptable performance for all movements at all intersections through the 2045 design year according to both methodologies.

*Appendices are available upon request

Traffic Report

NE J Street Interchange

Table 19: LOS Results for 2026 Action (signal at Tiger Blvd) – HCM Results

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
NE J St at Tiger Blvd	AM	Signal	LOS	B	B	A	A	B	B	B	B	C	A	B		
			Delay	10.4	11.8	9.7	9.1	19.2	14.6	18.8	15.0	20.1	0.0	16.1		
			Queue (ft)	15	73	8	5	163	25	33	43	63	0	-		
	PM		LOS	B	B	B	A	C	C	C	B	C	A	B		
			Delay	11.5	13.4	11.0	9.8	20.5	21.6	24.4	17.6	23.9	0.0	19.1		
			Queue (ft)	15	95	8	18	218	128	70	73	53	0	-		
NE J St at old NE J Street	AM	One-Way Stop	LOS				B				B				A	
			Delay				11.7				11.7				2.1	
			Queue (ft)				13				13				-	
	PM		LOS				B				B				A	
			Delay				12.2				12.2				2.1	
			Queue (ft)				13				13				-	
NE J St at I-49 SB Ramps	AM	One-Way Stop	LOS	HCM does not support more than one exclusive lane on turning movements (dual westbound left turn lanes) with stop control.											A	
			Delay													
	PM		LOS													
			Queue (ft)													
NE J St at I-49 NB Ramps	AM	One-Way Stop	LOS				A				A				A	
			Delay				9.5				0.0				1.3	
			Queue (ft)				5				0				-	
	PM		LOS				A				A				A	
			Delay				9.7				0.0				1.4	
			Queue (ft)				5				0				-	

n/a¹ – free movement, no delay reported

Table 22: LOS Results for 2045 Action (signal at Tiger Blvd) – SimTraffic Results

Intersection	Time Period	Control	MOE	EB Movement			WB Movement			NB Movement			SB Movement			Overall
				Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
NE J St at Tiger Blvd	AM	Signal	LOS	C	B	B	C	C	C	C	C	B	C	C	B	C
			Delay	25.0	15.6	10.3	21.2	30.2	25.8	23.2	23.1	11.1	29.6	26.4	10.9	21.5
			Queue (ft)	82	159	128	169	424		83	115		148	156	56	-
	PM		LOS	D	C	B	D	D	D	D	D	C	D	D	C	D
			Delay	41.7	25.5	10.4	36.9	53.2	47.7	49.2	39.4	24.1	36.7	46.0	20.6	37.5
			Queue (ft)	128	277	150	323	723		363	224		203	189	101	-
NE J St at old NE J Street	AM	One-Way Stop	LOS				B			A			A	A	A	A
			Delay				12.5			7.9			0.5	0.5	5.0	1.5
			Queue (ft)				74			74			3	47	0	-
	PM		LOS				B			A			A	A	A	A
			Delay				14.9			8.6			0.5	0.7	6.1	1.5
			Queue (ft)				73			73			0	48	0	-
NE J St at I-49 SB Ramps	AM	One-Way Stop	LOS				B			n/a ¹			A	A	A	A
			Delay				12.3			n/a ¹			2.4	4.1	n/a ¹	1.0
			Queue (ft)				139			n/a ¹			9		0	-
	PM		LOS				B			n/a ¹			A	A	A	A
			Delay				13.5			n/a ¹			2.4	4.0	n/a ¹	1.0
			Queue (ft)				148			n/a ¹			13		0	-
NE J St at I-49 NB Ramps	AM	One-Way Stop	LOS				A			n/a ¹			A			A
			Delay				4.1			n/a ¹			n/a ¹	4.5	n/a ¹	n/a ¹
			Queue (ft)				54			n/a ¹			0			-
	PM		LOS				A			n/a ¹			A			A
			Delay				4.0			n/a ¹			n/a ¹	4.8	n/a ¹	n/a ¹
			Queue (ft)				48			n/a ¹			0			-

n/a¹ - no volume modeled making this movement

SIGNAL WARRANT ANALYSIS

Signal warrant analysis was conducted for the four study intersections, including: NE J Street at Tiger Boulevard, NE J Street at Old NE J Street, NE J Street at I-49 Southbound Ramps, and NE J Street at I-49 Northbound Ramps. Analyses were conducted based on opening year 2026 Action design volumes. The *Manual on Uniform Traffic Control Devices* (MUTCD), 2009 Edition, lists the following as signal warrants.

- Warrant 1 – Eight-Hour Vehicular Volume
- Warrant 2 – Four-Hour Vehicular Volume
- Warrant 3 – Peak Hour

- Warrant 4 – Pedestrian Volume
- Warrant 5 – School Crossing
- Warrant 6 – Coordinated Signal System
- Warrant 7 – Crash Experience
- Warrant 8 – Roadway Network
- Warrant 9 – Intersection Near a Grade Crossing

To estimate the hourly turning movement volumes at each intersection from 7 AM to 7 PM, the hourly ratio of off-peak volume to peak hour volume for each movement was assumed to match the ratios observed at the existing NE J Street at Tiger Boulevard intersection. The *Highway Capacity Software (HCS7)* was used to compare the total intersection volumes against the criteria for signalization established in these warrants. Warrants 1 through 3 were determined to be applicable and are described in the following subsections.

Warrant 1 – Eight-Hour Vehicular Volume

Warrant 1 typically applies where the volume of intersecting traffic throughout the average day is significant or the intersecting traffic causes excessive delay to the minor street traffic. It is made up of two conditions. Condition A considers the volume of traffic crossing the intersection while Condition B considers the delay and number of conflicts for the minor street traffic. Conditions A and B are independent of one another in determining whether the warrant is satisfied. However, if neither condition is satisfied for 8 hours of an average day, a combination of the warrants may be considered at 80% of the required vehicles per hour (vph).

Warrant 2 – Four-Hour Vehicular Volume

Warrant 2 applies where the volume of intersecting traffic, usually during peak times, is the primary reason for considering a traffic signal. If it is found that, for any four hours of an average day, the side street traffic suffers undue delay which would be remedied by a traffic signal, then a signal may be justified.

Warrant 3 – Peak Hour

Warrant 3 typically applies only to facilities that attract or discharge large numbers of vehicles over a short time. It is made up of two conditions. For Condition A, three criteria must occur for this warrant to be met. First, the total stopped time delay for one side street approach must equal or exceed four vehicle-hours (one-lane approach) or five vehicle-hours (two-lane approach) in a single hour of the day. Second, the volume for this side street approach must exceed 100 vph (one lane approach) or 150 vph (two-lane approach). Finally, the total volume entering the intersection must exceed 650 vph (one-lane approach) or 800 vph (two-lane approach) for the same hour as the first two criteria. For Condition B, the warrant is determined graphically.

Additional Considerations and Results

According to the *MUTCD*, signal warrants should also be checked with right turn reductions applied to the minor street approaches to account for the fact that some of the volume is able to turn right on red.

The signal warrants were tested against the warrant thresholds using the full 2026 Action volumes. The signal warrant reports developed for this analysis are provided in **Appendix B – Signal Warrant Analysis Results***. These results, summarized in **Table 23**, show that only the intersection of NE J Street at Tiger

*Appendices are available upon request

Boulevard meets warrants for signalization. This intersection still meets Warrants 1, 2, and 3 even with right turn reductions applied to the minor approach volumes.

The operational analysis supports the need for signalization at the intersection of NE J Street and Tiger Boulevard to achieve acceptable performance from opening year 2026 through design year 2045.

Table 23: Signal Warrant Analysis Results for 2026 Action

Intersection	Warrant 1		Warrant 2		Warrant 3		Signalize?
	Full Volumes	Reduced Volumes	Full Volumes	Reduced Volumes	Full Volumes	Reduced Volumes	
NE J St. at Tiger Blvd.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NE J St. at Old NE J St.	No	-	No	-	No	-	No
NE J St. at I-49 SB Ramps	No	-	No	-	No	-	No
NE J St. at I-49 NB Ramps	No	-	No	-	No	-	No

SAFETY ANALYSIS OF EXISTING CONDITIONS

In addition to traffic operations, a historical safety analysis of Interstate 49 from 2016 - 2020 was conducted. Crash rates were compared to statewide averages for similar facilities as shown in **Table 24**.

Table 24: Crash Rates (2016-2020)

Route	Section	Log Miles		Weighted ADT	Total Crashes			KA Crashes		
		Begin LM	End LM		Number of Crashes	Crash Rate (per MVM) ¹	Statewide Average (per MVM) ¹	Number of Crashes	Crash Rate (per 100 MVM) ¹	Statewide Average (per 100 MVM) ¹
I-49 ²	29	87.56	91.45	39,000	220	0.80	0.78	8	2.89	2.95

¹MVM - Million Vehicle Miles

²Facility type: Urban 4-lane, divided, full control of access highway

The total and Fatal and Serious Injury (KA) crash rates for Interstate 49 are comparable to the statewide averages for similar facilities. As shown in **Figure 15**, single vehicle crash type collision was the leading crash type (44%) followed by rear end crashes (29%). Most crashes that occurred were No Apparent Injury (O) type crashes. Within the five (5) years, 22 Possible Injury (C), 16 Suspected Minor Injury (B), 7 Suspected Serious Injury (A), and 1 Fatal (K) crashes occurred within the study area. **Figure 16** shows the locations of the eight (8) KA crashes along I-49 and one (1) crash on Highway 71, along with crash ratios (all severity) for the study corridors.

Figure 15: I-49 Crash Manner (2016-2020)

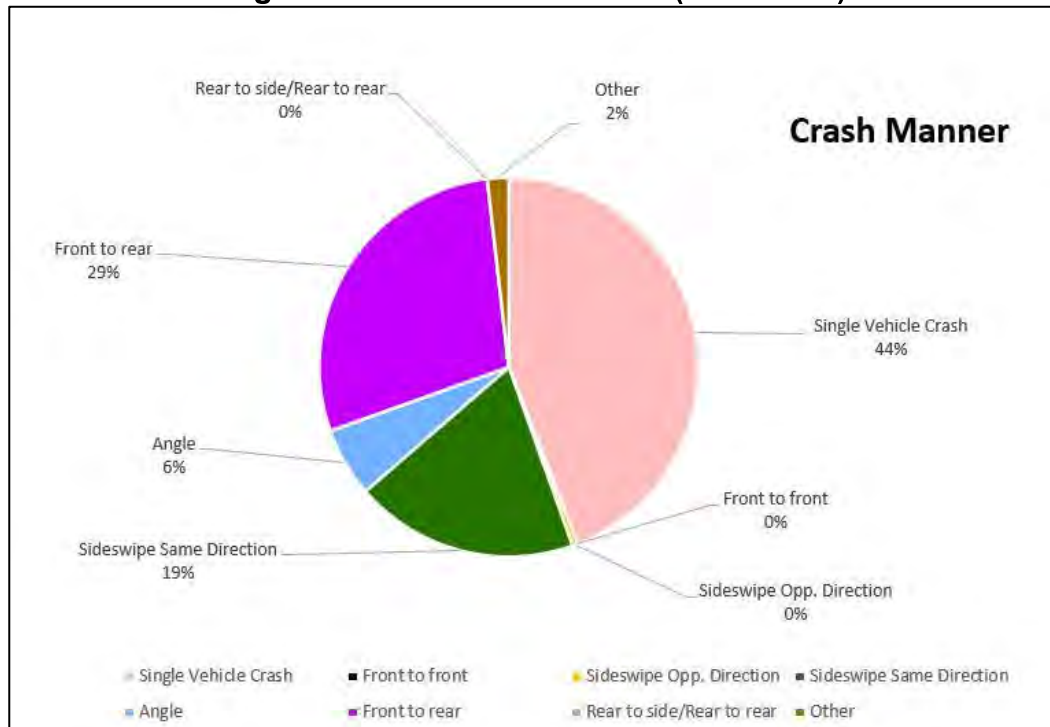
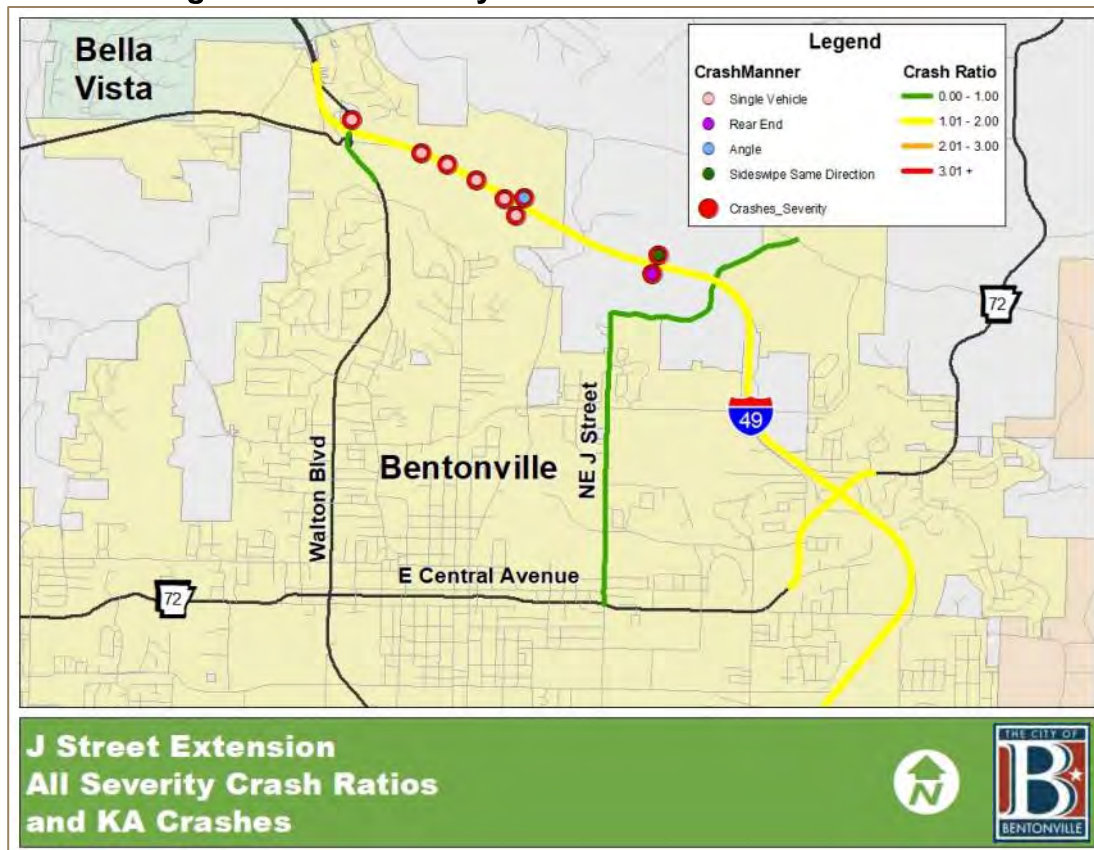


Figure 16: All Severity Crash Ratios and KA Crashes



SUMMARY

The study area included the I-49 freeway facility from north of Highway 71/North Walton Boulevard on the north end to south of Highway 72 on the south end and at key intersections along NE J Street. This study area was evaluated to determine the need for a new interchange along I-49 at NE J Street and the extension of NE J Street. Operational conditions under 2022 No-Action, 2022 Action, 2026 Action, 2045 No-Action, and 2045 Action scenarios were evaluated as well as safety and other considerations.

The operational analysis demonstrated some areas along I-49 that will not operate adequately by 2045, even with the addition of a third lane in each direction. The

added connectivity under the Action scenario would divert additional volume from the surrounding network onto I-49 without notably changing the level of service (LOS) along the freeway facility. Safety and other considerations did not establish any additional needs. The greatest need served by this project would be added connectivity within the study area.

Based on the intersection analysis, the following intersection controls and lane configurations are recommended for the four key intersections created or affected by this project:

- NE J Street at Tiger Boulevard:
 - Intersection control: signalize
 - Lane configuration:
 - Northbound (NE J Street):
 - one left turn lane with 400 feet of storage
 - one through-right lane
 - Southbound (NE J Street):
 - one left turn lane with 100 feet of storage
 - one through lane
 - one right turn lane with 100 feet of storage
 - Westbound (Tiger Boulevard):
 - one left turn lane with 300 feet of storage
 - one through-right lane
 - Eastbound (Tiger Boulevard):
 - one left turn lane with 125 feet of storage
 - one through lane
 - one right turn lane with 225 feet of storage

Traffic ReportNE J Street Interchange

- NE J Street at Old NE J Street:
 - Intersection Control: stop on Old NE J Street (westbound) approach
 - Lane Configuration:
 - Northbound (NE J Street):
 - one through lane
 - one shared through-right lane with 85 feet of storage
 - Southbound (NE J Street):
 - one through lane
 - one left-turn lane
 - Westbound (Old NE J Street):
 - one left-right lane

- NE J Street at I-49 Southbound Ramps:
 - Intersection control: stop on I-49 Southbound off-ramp (westbound) approach
 - Lane Configuration:
 - Northbound (NE J Street):
 - one through lane
 - one shared through-right lane with yield-controlled channelized right turn
 - Southbound (NE J Street):
 - two through lanes
 - one left-turn lane with 100 feet of storage
 - Westbound (I-49 Southbound off-ramp):
 - two left-turn lanes with 175 feet of storage for the outside left turn lane
 - one right-turn lane with yield-controlled channelized right turn and 175 feet of storage

- NE J Street at I-49 Northbound Ramps:
 - Intersection Control: stop on the I-49 Northbound off-ramp (westbound) approach
 - Lane Configuration:
 - Northbound (NE J Street):
 - one through lane
 - one shared through-right lane with yield-controlled channelized right turn
 - Southbound (NE J Street):
 - two through lanes
 - one left-turn lane with 100 feet of storage
 - Westbound (I-49 Northbound off-ramp):
 - one left-turn lane
 - one right-turn lane with yield-controlled channelized right turn and 175 feet of storage

With the recommended intersection controls and lane configurations, this improvement will provide added connectivity with adequate levels of service for all movements throughout the study area through the 2045 design year.