

# **SR-101L / 75th Avenue Service Traffic Interchange**

## **Feasibility Analysis**

Prepared for



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## 1.0 Introduction

The State Route SR-101L (SR-101L) and 75th Avenue Service Traffic Interchange (TI) Feasibility Analysis is being conducted by the Maricopa Association of Governments (MAG) to evaluate the feasibility of improving intersection operations. The Study Planning Partners include MAG, city of Glendale (Glendale), city of Peoria (Peoria), the Arizona Department of Transportation (ADOT), and the Maricopa County Department of Transportation (MCDOT). The analysis is preliminary in nature; the Federal Highway Administration (FHWA) will be engaged during the next steps of project development.

### 1.1 Study Overview

The current study identifies feasible alternatives to improve intersection operations at the SR-101L/75th Avenue TI based on the recommendation of the *SR-101L Northwest Area Intersections Traffic Analysis* study completed by MAG in June 2019 and included in **Appendix A**. Four concepts at the SR-101L/75th Avenue TI were identified and evaluated during the study: (1) a diamond interchange with three southbound left turn lanes with braided mainline ramps; (2) a diamond interchange with three southbound left turn lanes with consolidated mainline exit ramps; (3) a diverging diamond interchange (DDI) with braided mainline ramps; and (4) a southbound to eastbound flyover ramp from 75th Avenue.

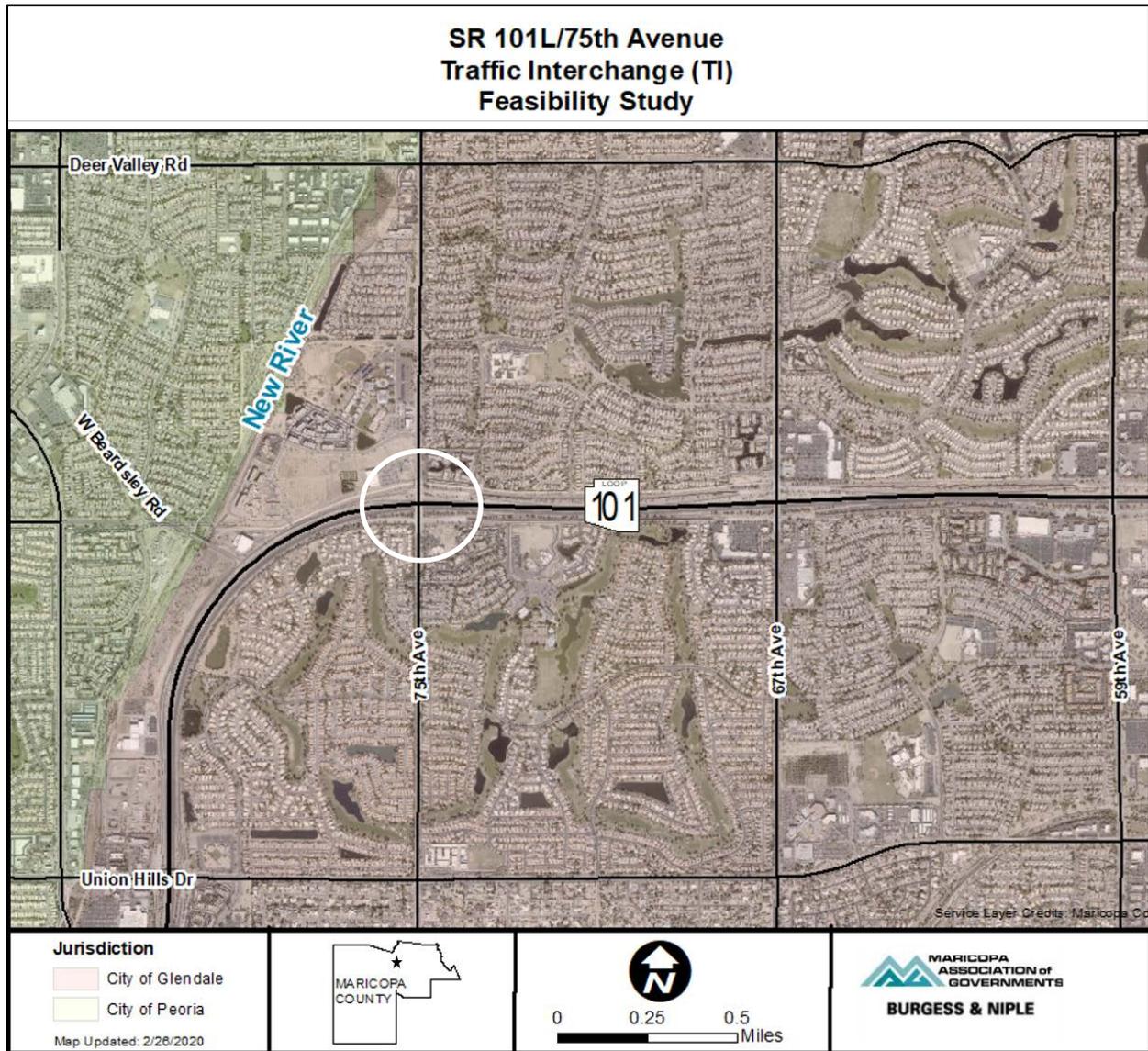
Additionally, concepts were considered at the SR-101L/67th Avenue TI. **Appendix B** includes a brief analysis of intersection operations at the 67th Avenue TI, which displays similar characteristics to the study TI. Four concepts at the SR-101L/67th Avenue TI were identified and evaluated during the study: (1) a diamond interchange with three southbound left turn lanes, (2) dual roundabouts, (3) a DDI, and (4) a continuous flow interchange (CFI).

### 1.2 Study Area

The Study Area consists of the SR-101L service TI at 75th Avenue. The region for traffic analysis is bound by 83rd Avenue to the west, 59th Avenue to the east, Deer Valley Road to the north, and Beardsley Road to the south. The geometric design area is bound by the Union Hills TI to the west and 59th Avenue to the east. The Study Area is within both the cities of Glendale and Peoria. The existing TI at 75th Avenue is a traditional diamond interchange.

A map of the Study Area is included as **Figure 1.1**.

**Figure 1.1 – Study Area Map**



## 2.0 Study Approach

### 2.1 Background Information

The current study identifies feasible alternatives to improve intersection operations at the SR-101L/75th Avenue TI. These alternatives are planned with the future SR-101L general purpose lane (GPL) widening project in mind. Funding for this project is programmed for FY 2021.

MAG completed the SR-101L Northwest Area Intersections Traffic Analysis in June 2019. This study established capacity and operational needs for TIs along SR-101L between Thunderbird Road and 67th Avenue based on 2018 existing and 2040 no-build conditions. The SR-101/75th Avenue TI study uses the existing and future traffic volumes results from the Northwest Area Intersections study.

### 2.2 Stakeholder Engagement

A kickoff meeting and a progress meeting were conducted with the project stakeholders.

#### 2.2.1 Kickoff Meeting

The kickoff meeting took place on October 23, 2019, in the MAG Ironwood conference room. Representatives from MAG, city of Glendale, city of Peoria, ADOT, MCDOT, and the design team attended the meeting. The meeting purpose was to introduce the study, provide an overview of the background information, review Study Area issues, and to initiate improvement alternatives development. Study Area issues included the most congested movement through the TI identified as the southbound 75th Avenue to eastbound SR-101L left-turn movement, maintaining Beardsley Road (frontage road) access, maintaining apartment access, and utilizing the existing bridge structure. The stakeholders briefly discussed the TI at SR-101L and 67th Avenue, which, while not within the direct project scope, exhibits the same traffic patterns as at 75th Avenue. The stakeholders agreed on four alternatives to be analyzed for feasibility and refined through preliminary traffic modelling at both TIs. The no-build condition would also be included as a baseline for review.

Meeting materials for the following meetings, including agenda, presentation, and summary, are provided in **Appendix C**.

### **2.2.2 Planning Partners Meeting**

The planning partners meeting took place on January 23, 2020, in the MAG Ironwood conference room. Representatives from MAG, the city of Glendale, city of Peoria, ADOT, MCDOT, and the design team attended the meeting. The meeting purpose was to preview the results of the study and discuss developed alternatives for the 75th and 67th Avenue TIs, including geometric and operational constraints.

Alternatives for the 75th Avenue TI included triple southbound left turns with a ramp braid, a DDI with a ramp braid, a flyover from southbound 75th Avenue to eastbound SR-101L, triple southbound left turns with consolidation of the exit ramps to 75th and 67th Avenues, and a flyover from eastbound Beardsley Road to eastbound SR-101L.

Alternatives for the 67th Avenue TI included triple southbound left turns with a ramp braid, dual roundabouts, a DDI, and a CFI.

## 2.3 Crash Analysis

Crash data for the five-year period from January 1, 2014 to December 31, 2018 was obtained from the Arizona Department of Transportation (ADOT) Accident Location Incident Surveillance System (ALISS) database for the interchanges associated with SR-101L at 75th Avenue.

Within the analysis period, 204 crashes occurred near the 75th Avenue TI. There was one fatal crash that was reported as "other"; further analysis indicated it was a pedestrian fatality. The fatality occurred at West Beardsley Road near the SR-101L entrance ramp in 2014. The incapacitating crashes included two rear-end collisions and a fixed object crash. A summary of total crashes is provided in **Table 1**. **Table 2** provides a more detailed list of the crash severity at the 75th Avenue TI. Comparisons are offered based upon the *Arizona Motor Vehicle Crash Facts* (Crash Facts) published by ADOT in June 2018. This is the best available comparison.

<b>Table 1: 75th Avenue TI Crash Severity Summary 2014-2018</b>			
<b>Crash Severity</b>	<b>Number</b>	<b>Percent of Total</b>	<b>2018 Statewide Urban Average</b>
Property Damage Only	160	78.4%	70.6%
Injury	43	21.1%	28.7%
Fatal	1	0.5%	0.7%
<b>Grand Total</b>	<b>204</b>	<b>100.0%</b>	<b>100.0%</b>

<b>Table 2: 75th Avenue TI Detailed Crash Severity 2014-2018</b>						
<b>Crash Severity</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>Total</b>
Fatal	1	0	0	0	0	1
Incapacitating	2	0	1	0	0	3
Non-incapacitating	3	1	0	3	5	12
Possible Injury	10	6	4	3	5	28
Property Damage Only	37	23	26	31	43	160
<b>Total</b>	<b>53</b>	<b>30</b>	<b>31</b>	<b>37</b>	<b>53</b>	<b>204</b>

A crash map detailing crash severity and location is shown in **Figure 2.1**. As shown in **Table 3**, there is a higher occurrence of crashes involving other vehicles, crashes with fixed objects, and overturning compared to the urban statewide average. Collisions with fixed objects and overturning were particularly high at nearly 1.7 and 1.3 times greater than the

statewide average, respectively. Most fixed object crashes occur in the vicinity of the intersections with the ramps.

**Figure 2.1 – 75th Avenue Crash Severity Map**



<b>Table 3: First Harmful Event</b>			
<b>Collision Manner</b>	<b>Number</b>	<b>Percent</b>	<b>Statewide Urban %</b>
Collision with Motor Vehicle in Transport	174	<b>85.3%</b>	80.5%
Overturning	2	<b>1.0%</b>	0.8%
Collision with Pedestrian	1	0.5%	1.4%
Collision with Pedalcyclist	1	0.5%	1.1%
Collision with Animal	0	0.0%	0.3%
Collision with Fixed Object	26	<b>12.7%</b>	7.7%
Collision with Non-Fixed Object*	0	0.0%	4.3%
Vehicle Fire or Explosion	0	0.0%	0.1%
Other Non-Collision**	0	0.0%	0.2%
Unknown	0	0.0%	3.7%
<b>Total</b>	<b>204</b>	<b>100.0%</b>	<b>100.0%</b>
* Includes Collision with parked Vehicles, Trains, Railway Vehicles, and Work Zone Equipment			
** Includes Vehicle Immersion, Jackknife, and Cargo Loss or Shift			
Note: Cells with bold, red text denote percentages above the statewide average			

**Table 4** details the manner of collision for multiple vehicle crashes within the Study Area. Rear end crashes are the only crash type that exceeds the statewide average, at 1.4 times greater.

<b>Table 4: Manner of Collision in Multi-Vehicle Crashes</b>			
<b>Type of Crash</b>	<b>Number of Crashes</b>	<b>Percent of Total</b>	<b>2018 Statewide Average</b>
Angle	14	8.0%	14.5%
Left Turn	19	10.8%	16.5%
Rear End	112	<b>63.6%</b>	44.4%
Head-On	0	0.0%	1.7%
Sideswipe Same Direction	26	14.8%	15.5%
Sideswipe Opposite Direction	0	0.0%	1.4%
Other*	4	2.3%	5.2%
Unknown	1	0.6%	0.7%
<b>Total</b>	<b>176</b>	<b>100.0%</b>	<b>100.0%</b>
*Other includes pedestrian, pedalcyclist, and rear to side crashes			
Note: Cells with bold, red text denote percentages above the statewide average			

Based on crash frequency and severity, more detailed analysis was performed for the intersections with the TI ramps at 75th Avenue. Additionally, the intersection of 75th Avenue and Aspera Boulevard was assessed. **Table 5** depicts the number of crashes and their severity for the previously mentioned intersections.

**Table 5: Intersections of Interest**

<b>Intersection</b>	<b>No. Crashes</b>	<b>Fatal Crashes</b>	<b>Incapacitating Injury</b>	<b>Non-Incapacitating Injury</b>	<b>Possible Injury</b>	<b>PDO</b>	<b>Percent of Area Total</b>
75th Avenue & Westbound Beardsley Road	74	0	0	3	11	60	36.3%
75th Avenue & Eastbound Beardsley Road	53	0	2	5	5	41	20.1%
75th Avenue & Aspera Boulevard	23	0	1	0	5	17	11.3%
<b>Total</b>	<b>150</b>	<b>0</b>	<b>3</b>	<b>8</b>	<b>21</b>	<b>118</b>	<b>73.5%</b>

### 2.3.1 75th Avenue and Westbound Beardsley Road Intersection

There was a total of 74 crashes at the 75th Avenue and westbound Beardsley Road intersection. This included 12 single vehicle crashes; 10 of these were fixed object crashes, one was overturning, and one was pedalcycle. Rear-end crashes were the most common crash type; 38 (60.3%) occurred at the intersection at rate nearly 1.4 times greater than the statewide average. **Table 6** lists the manner of collision in multi-vehicle crashes for the 75th Avenue and westbound Beardsley Road intersection.

<b>Table 6: Manner of Collision in Multi-Vehicle Crashes at 75th Avenue &amp; Westbound Beardsley Road Intersection</b>			
<b>Type of Crash</b>	<b>Number of Crashes</b>	<b>Percent of Total</b>	<b>2018 Statewide Average</b>
Angle	4	6.3%	14.5%
Left Turn	11	17.5%	16.5%
Rear End	38	<b>60.3%</b>	44.4%
Head-On	0	0.0%	1.7%
Sideswipe Same Direction	9	14.3%	15.5%
Sideswipe Opposite Direction	0	0.0%	1.4%
Other*	1	1.6%	5.2%
Unknown	0	0.0%	0.7%
<b>Total</b>	<b>63</b>	<b>100.0%</b>	<b>100.0%</b>
*Pedalcyclist crash coded as a multi-vehicle crash			
Note: Cells with bold, red text denote percentages above the statewide average			

### 2.3.2 75th Avenue and Eastbound Beardsley Road Intersection

There was a total of 53 crashes at the 75th Avenue and eastbound Beardsley Road intersection. This included eight single vehicle crashes, all of which were with fixed objects. Rear-end crashes were the most common crash type; 24 (53.3%) occurred at the intersection at a rate of 1.2 times greater than the statewide average. **Table 7** lists the manner of collision in multi-vehicle crashes for the 75th Avenue and eastbound Beardsley Road intersection.

<b>Table 7 : Manner of Collision in Multi-Vehicle Crashes at 75th Avenue &amp; Eastbound Beardsley Road Intersection</b>			
<b>Type of Crash</b>	<b>Number of Crashes</b>	<b>Percent of Total</b>	<b>2018 Statewide Average</b>
Angle	5	11.1%	14.5%
Left Turn	5	11.1%	16.5%
Rear End	24	<b>53.4%</b>	44.4%
Head-On	0	0.0%	1.7%
Sideswipe Same Direction	8	17.8%	15.5%
Sideswipe Opposite Direction	0	0.0%	1.4%
Other*	2	4.4%	5.2%
Unknown	1	<b>2.2%</b>	0.7%
<b>Total</b>	<b>45</b>	<b>100.0%</b>	<b>100.0%</b>
*Other includes other and rear to side crashes			
Note: Cells with bold, red text denote percentages above the statewide average			

### 2.3.3 75th Avenue and Aspera Boulevard

There was a total of 23 crashes at the 75th Avenue and Aspera Boulevard intersection. Rear-end crashes were the most common crash type; 19 (82.6%) occurred at the intersection at a rate nearly 1.9 times greater than the statewide average. **Table 8** lists the manner of collision in multi-vehicle crashes for the 75th Avenue and Aspera Boulevard intersection.

<b>Table 8: Manner of Collision in Multi-Vehicle Crashes at 75th Avenue &amp; Aspera Boulevard Intersection</b>			
<b>Type of Crash</b>	<b>Number of Crashes</b>	<b>Percent of Total</b>	<b>2018 Statewide Average</b>
Angle	2	8.7%	14.5%
Left Turn	1	4.4%	16.5%
Rear End	19	<b>82.6%</b>	44.4%
Head-On	0	0.0%	1.7%
Sideswipe Same Direction	1	4.4%	15.5%
Sideswipe Opposite Direction	0	0.0%	1.4%
Other	0	0.0%	5.2%
Unknown	0	0.0%	0.7%
<b>Total</b>	<b>23</b>	<b>100.0%</b>	<b>100.0%</b>
Note: Cells with bold, red text denote percentages above the statewide average			

### 2.3.4 Cluster Analysis

There were two other crash cluster locations. One cluster of fourteen crashes is located at the westbound exit ramp approaching the merge with westbound Beardsley Road. Of these, nine crashes were PDO and five crashes were possible injury. Crash types included twelve rear-end, one sideswipe same direction, and one single vehicle fixed object.

Another cluster of eight crashes is located near the ramp meters on the eastbound entrance ramp. Of these, seven crashes were PDO and one crash was non-incapacitating injury. Crash types included four rear-end and four sideswipe same direction.

## 2.4 Operational Analysis Methodology

The existing and future turning movement counts identified in the SR-101L Northwest Area Intersections Traffic Analysis were used in this study. For the data collection and estimation methodology, see **Section 4.4** of the *SR-101L Northwest Area Intersections Traffic Analysis*, included as **Appendix A**. Existing and future turning movement counts are provided in **Appendix D**.

Capacity analyses for existing, future no-build, and future build conditions were conducted using Synchro (Version 10) and Vissim software. Existing signal timings were received from ADOT to provide baseline analysis. Modified signal timings were then generated in Synchro based on intersection volumes and lane configurations. The Synchro reports are included in **Appendix E**.

The Synchro timings were imported to Vissim and refined to optimize operations. The Vissim analysis supplements the analysis conducted in Synchro; it analyzed the interactions between the closely spaced ramp terminal intersections. Further, Vissim can analyze complex operations associated with innovative interchange concepts such as a DDI, CFI and dumb-bell (dual roundabouts).

The analysis was conducted using delay-based level of service (LOS) thresholds established in the Highway Capacity Manual (HCM) for evaluating signalized intersections, presented in **Table 9**. For the purposes of the study, a LOS of D or above is considered an "acceptable" LOS.

**Table 9: Capacity Analysis Results**

Level of Service	Control Delay (s)
A	≤ 10
B	10 to 20
C	20 to 35
D	35 to 55
E	55 to 80
F	> 80

The forecasted approach and intersection LOS for each alternative is included in **Appendix F**, unless otherwise stated. Cells colored orange indicate LOS E; cells colored red indicate LOS F.

## 2.5 Highway Access at 75th Avenue

Planning level analysis and design were performed to evaluate alternatives. The goal of improving intersection operations was weighed against the constraints of preserving Beardsley Road access and salvaging the existing structure over SR-101L. Cost estimates were developed for all alternatives that had geometrics drafted.

Future turning movements indicated a high volume of southbound-lefts in the a.m. peak hour, and a high volume of westbound-rights, northbound-throughs, and southbound-throughs in the p.m. peak hour.

Presently, the existing intersections operate at LOS E/D at westbound Beardsley Road and LOS F/D at eastbound Beardsley Road in the a.m. and p.m. peak hours, respectively.

Itemized cost estimates for each alternative are included in **Appendix G**.

Exhibits depicting the alternatives are included in **Appendix H**.

Except for the flyover at 75th Avenue, each alternative is geometrically compatible with the southbound triple left turn alternative at the 67th Avenue TI as described in **Appendix B**.

Preliminary analysis was performed for a Beardsley Road Flyover alternative, which is included in **Appendix I**.

All build alternatives improve capacity and should therefore decrease the frequency of the congestion related rear end collisions.

### 2.5.1 No Build

This alternative analyzes the no build conditions. Future volumes are analyzed with existing signal timings.

The existing intersections operate at LOS F/E at westbound Beardsley Road and LOS F/D at eastbound Beardsley Road in the 2040 a.m. and p.m. peak hours, respectively. The failing a.m. peak hour LOS is driven by the southbound approaches, both of which are forecasted to experience over 120 seconds of delay per vehicle.

### 2.5.2 Triple Left Turn

This alternative analyzes triple southbound left turn lanes. A third southbound left turn storage lane is added across the bridge. The additional lane is accommodated on the existing bridge by removing the median and adjusting the existing lanes.

Beardsley Road access and the existing structure over SR-101L are preserved.

Two scenarios were evaluated to address weaving on the mainline SR-101L between 75th and 67th Avenues. Both preserve the existing access configuration to the Laguna at Arrowhead Ranch community.

#### Braided Ramps

A high percentage of the southbound left-turning vehicles are destined for SR-101L eastbound. To ensure that all three left turn lanes are utilized, all three lanes feed onto the entrance ramp to SR-101L, but the entrance ramp still enters the mainline as a single lane. The distance needed along the ramp to reduce the number of lanes from three to one result in the new entrance ramp gore location approximately 500-feet from the existing 67th Avenue exit ramp gore location.

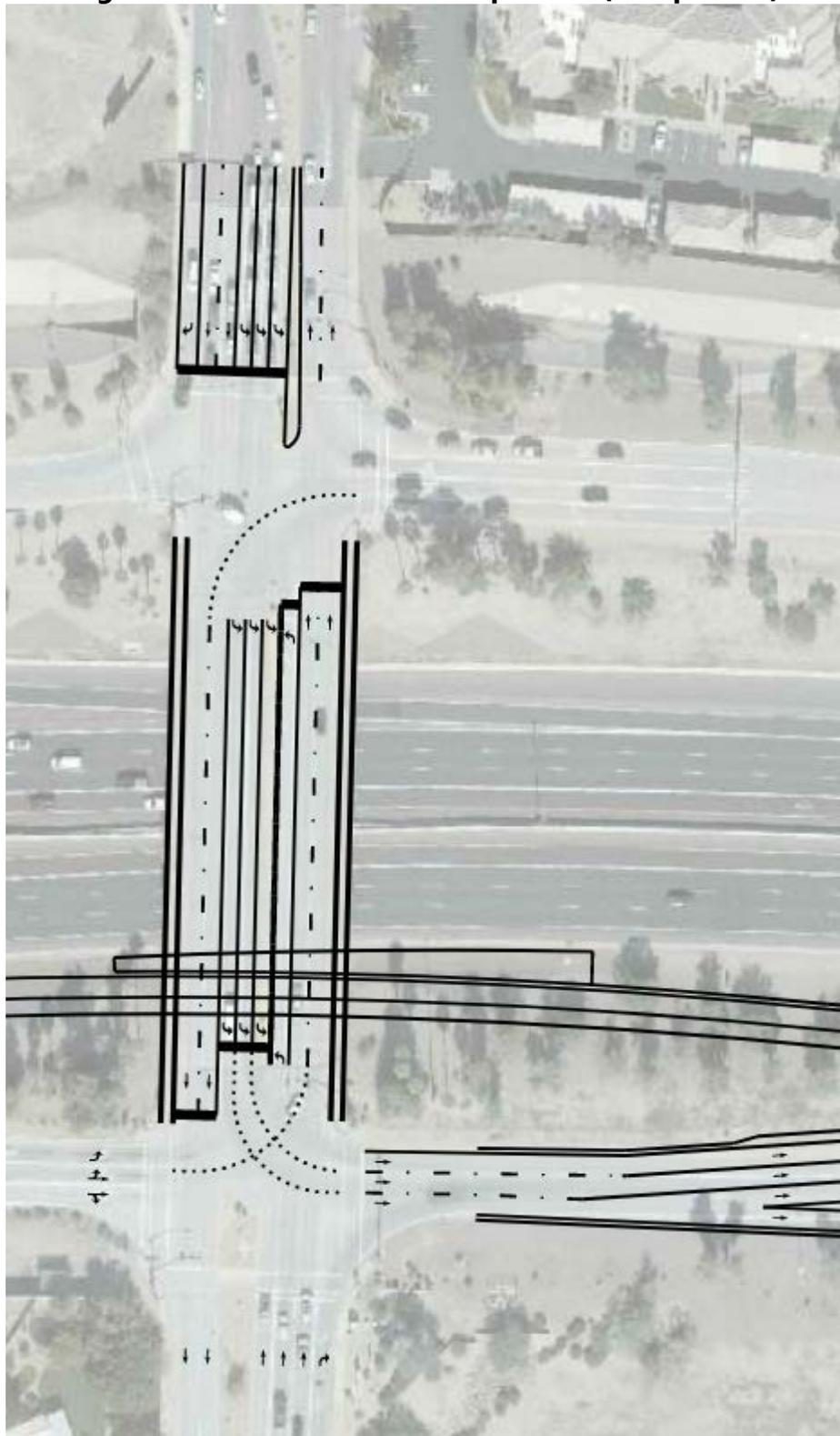
To avoid failing weave operations along SR-101L between 75th and 67th Avenues, the eastbound 67th Avenue exit ramp gore is shifted to the west to create a braided ramp between the 67th Avenue exit ramp and the overlapping 75th Avenue entrance ramp. A 400-foot long, high-skew structure is necessary to convey the entrance ramp from 75th Avenue over the exit ramp to 67th Avenue.

The intersections operate at LOS C/C at westbound Beardsley Road and LOS C/C at eastbound Beardsley Road in the 2040 a.m. and p.m. peak hours, respectively. The most congested movements are southbound left and northbound right turns at the eastbound terminal intersection.

The estimated cost of this alternative is \$36,681,000. The itemized cost estimate is included in **Appendix G**.

Intersection improvements at 75th Avenue are shown in **Figure 2.2**. For the full design of this alternative, see **Appendix H**.

**Figure 2.2 – 75th Avenue TI Triple Left (Ramp Braid)**



### 67th Avenue TI Exit Ramp Consolidation

In this scenario, the 67th Avenue TI Eastbound exit ramp is consolidated with the exit ramp at 75th Avenue. The vehicles destined for 67th Avenue travel through the intersection at 75th Avenue to access 67th Avenue via eastbound Beardsley Road. There are 950 and 1,200 additional vehicles going eastbound through the intersection in the a.m. and p.m. peak hours, respectively. Mainline signing west of the project area would need to be revised to communicate the ramp consolidation.

Similar ramp consolidations in the region are found at SR-202L to 40th Street and 44th Street, and I-17 to Yorkshire Drive and Union Hills Drive.

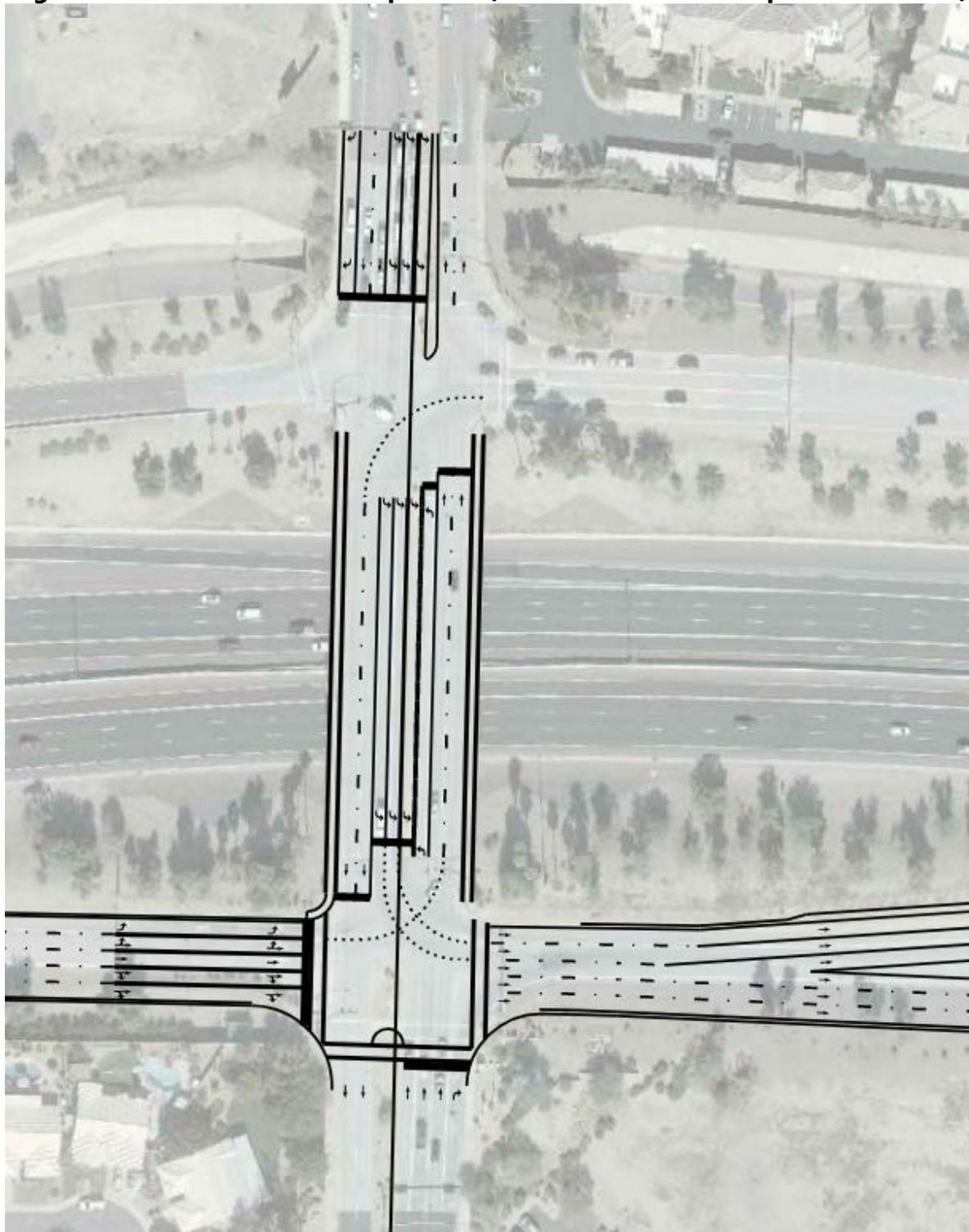
The eastbound approach is modified to have two designated left turn lanes, two thru lanes, and one thru-right lane. The eastbound departure is expanded to five receiving lanes, to accommodate the three southbound left turn lanes and the two eastbound thru lanes.

The intersections operate at LOS C/C at westbound Beardsley Road and LOS C/C at eastbound Beardsley Road in the 2040 a.m. and p.m. peak hours, respectively. The most congested movements are southbound left and northbound right turns at the eastbound terminal intersection.

The estimated cost of this alternative is \$25,849,000. The itemized cost estimate is included in **Appendix G**.

Intersection improvements at 75th Avenue are shown in **Figure 2.3**. For the full design of this alternative, see **Appendix H**.

**Figure 2.3 – 75th Avenue TI Triple Left (67th Avenue Exit Ramp Consolidation)**



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### 2.5.3 Diverging Diamond Interchange (DDI)

This alternative analyzes a DDI modified to accommodate thru access to Beardsley Road.

Beardsley Road access and the existing structure over SR-101L are preserved.

A benefit of the DDI is the flexibility to have the turning movements from 75th Avenue onto the eastbound entrance ramp operate simultaneously. To ensure proper operations, both southbound left turn lanes and the northbound right turn lane feed onto the entrance ramp to SR-101L, but the entrance ramp still enters the mainline as a single lane. The distance needed along the ramp to reduce the number of lanes from three to one result in the new entrance ramp gore location approximately 500-feet from the existing 67th Avenue exit ramp gore location.

To avoid failing weave operations along SR-101L between 75th and 67th Avenues, the eastbound 67th Avenue exit ramp gore is shifted to the west to create a braided ramp between the 67th Avenue exit ramp and the overlapping 75th Avenue entrance ramp. A 460-foot long, high-skew structure is necessary to convey the entrance ramp from 75th Avenue over the exit ramp to 67th Avenue.

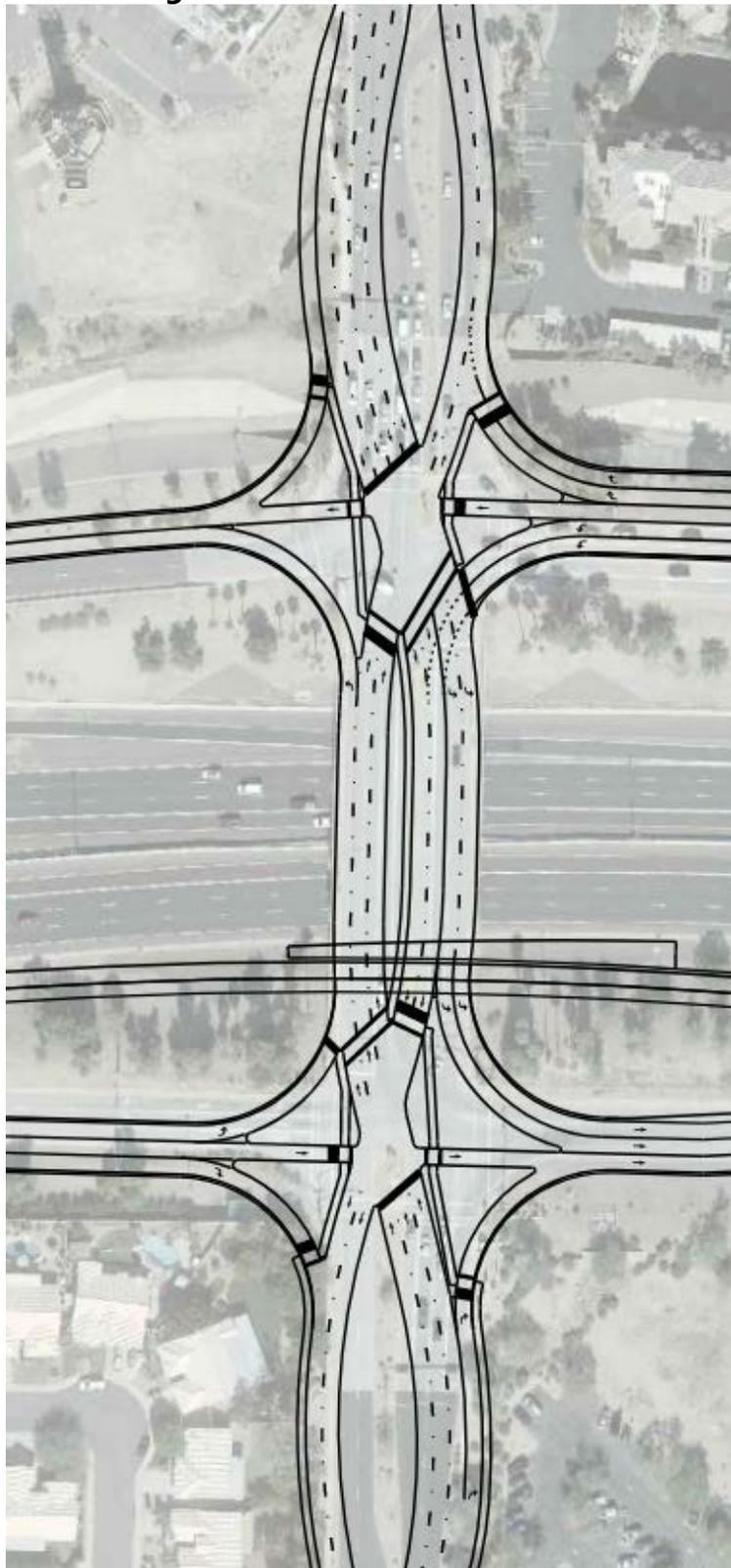
The intersections operate at LOS D/B at westbound Beardsley Road and LOS B/B at eastbound Beardsley Road in the 2040 a.m. and p.m. peak hours, respectively. Each approach is forecasted to operate at a passing LOS.

The proposed improvements will likely require the reconfiguration of the access to the Laguna at Arrowhead Ranch community.

The estimated cost of this alternative is \$43,857,000. The itemized cost estimate is included in **Appendix G**.

Intersection improvements at 75th Avenue are shown in **Figure 2.4**. For the full design of this alternative, see **Appendix H**.

**Figure 2.4 – 75th Avenue TI DDI**



**2.5.4 75th Avenue TI Flyover**

This alternative analyzes a flyover from southbound 75th Avenue to eastbound SR-101L. The single-lane flyover separates from the westmost lane of 75th Avenue just north of Aspera Boulevard and joins with the outside auxiliary lane of SR-101L approximately 1,700 feet east of the 75th Avenue TI. The existing and proposed lane assignments at the flyover access point are shown in **Figure 2.5**. If this alternative is advanced further, a sign prohibiting northbound 75th Avenue from completing U-turns at the Aspera Boulevard intersection should be considered.

**Figure 2.5 – Existing and Proposed Lane Assignments**



Beardsley Road access and the existing structure over SR-101L are preserved.

At its highest point, the flyover ramp will be approximately 35 feet above the existing 75th Avenue structure over SR-101L. The planning partners indicated that the viewshed changes due to the profile of the ramp will need to be considered if the flyover alternative is developed further. Viewshed changes to be considered include at a minimum real or perceived reduction in privacy to nearby residences and impacts to the visibility of businesses.

Weaving is reduced on the mainline SR-101L between 75th and 67th Avenues by shifting the eastbound 67th Avenue exit ramp to the west to create a braided ramp between the 67th Avenue exit ramp and the overlapping 75th Avenue flyover entrance ramp. A Texas

X configuration is utilized for the exit ramp from SR-101L eastbound to 67th Avenue and the entrance ramp to SR-101L eastbound from Beardsley Road. The entrance ramp from eastbound Beardsley Road is servicing traffic mainly from northbound 75th Avenue.

The flyover allows the vehicles making southbound left turns to bypass the interchange, 1,260 and 820 vehicles in the a.m. and p.m. peak hours respectively. Southbound left turns are still permitted at the eastbound Beardsley Road intersection to access eastbound SR-101L and eastbound Beardsley Road. Specifically, vehicles exiting the Laguna at Arrowhead Ranch apartment complex on the northeast corner of the TI will not have access to the flyover. For operational analysis, the count of southbound left turning vehicles in the TI was approximated at 160 vehicles per hour. This is the number of units in the Laguna at Arrowhead Ranch apartment complex and a conservative 12% of the forecasted a.m. peak hour volume for the southbound left turn movement.

The intersections operate at LOS B/C at westbound Beardsley Road and LOS C/C at eastbound Beardsley Road in the 2040 a.m. and p.m. peak hours, respectively. Each approach is forecasted to operate at a passing LOS.

The alternative preserves the existing access configuration to the Laguna at Arrowhead Ranch community.

The estimated cost of this alternative is \$43,757,000. The itemized cost estimate is included in **Appendix G**.

Intersection improvements at 75th Avenue are shown in **Figure 2.6**. For the full design of this alternative, see **Appendix H**.

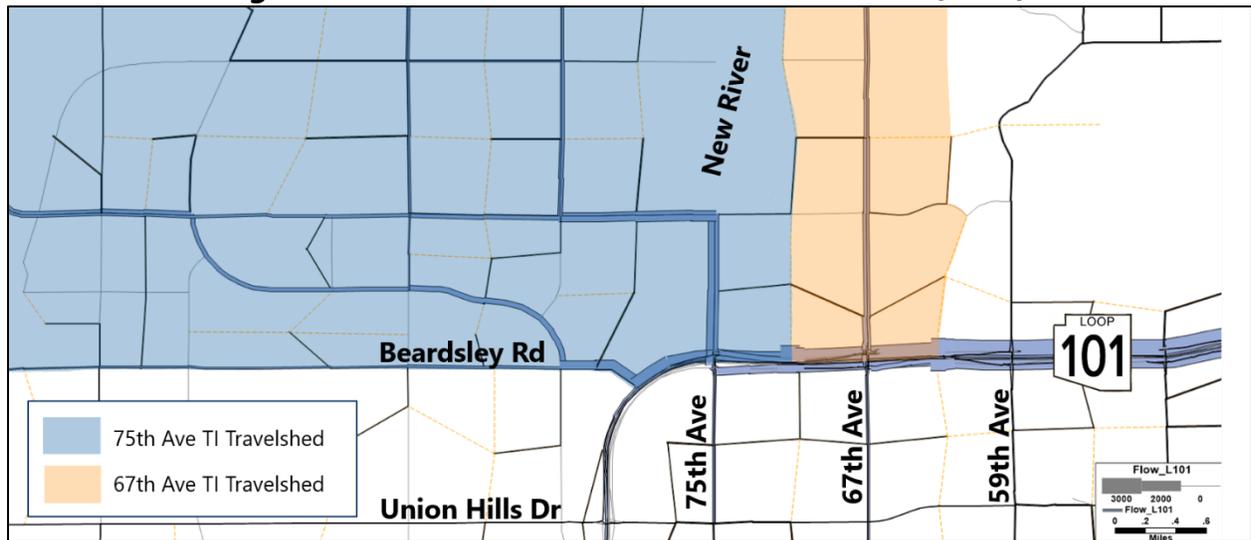
**Figure 2.6 – 75th Avenue TI Flyover**



The regional impact of this flyover was analyzed using travel demand software, TransCAD, and data from the MAG model. Identified travel patterns indicate that the flyover at 75th Avenue is not expected to attract vehicles headed to the 67th Avenue TI.

**Figure 2.7** shows the travelsheds for the 75th and 67th Avenue TIs based on combined a.m. and p.m. peak hour traffic flows in 2040 with the existing road network. The thickness of the blue line corresponds to the projected traffic volume.

**Figure 2.7 – Combined Peak Hour Traffic Flows (2040)**



### 3.0 Preferred Alternative

**Table 10** provides a summary of the improvement alternatives investigated for the SR-101L/75th Avenue TI.

**Table 10: Summary of Alternatives**

Alternative	Cost	Notes
Southbound Triple Left Turn (Ramp Braid)	\$36.7M	<ul style="list-style-type: none"> <li>• TI intersections operate at LOS C in both a.m. and p.m. in design year</li> <li>• Braids 75th Avenue EB entrance ramp and 67th Avenue EB exit ramp.</li> </ul>
Southbound Triple Left Turn (Consolidate exit ramps to 75th and 67th Avenues)	\$25.8M	<ul style="list-style-type: none"> <li>• TI intersections operate at LOS C in both a.m. and p.m. in design year</li> <li>• Combines 75th and 67th Avenues TIs EB exit ramps.</li> </ul>
DDI (Ramp Braid)	\$43.9M	<ul style="list-style-type: none"> <li>• TI intersections operate at LOS D or better in both a.m. and p.m. in design year</li> <li>• Braids 75th Avenue EB entrance ramp and 67th Avenue EB exit ramp.</li> </ul>
75th Avenue Flyover TI	\$43.8M	<ul style="list-style-type: none"> <li>• Anticipated to remove 88% percent of southbound left turning vehicles from the TI in the a.m. peak</li> <li>• Introduces weave on Beardsley Road.</li> </ul>

The analyzed alternatives were presented to the planning partners during a meeting on January 23. While the planning partners did not select a single alternative to advance, the partners did indicate that the two triple left turn alternatives at a minimum should be advanced.

## **4.0 Conclusion**

This study identified that the two triple left turn alternatives at a minimum should be advanced for further study and evaluation. These alternatives enhance regional travel and mitigate safety issues.