

# **Love's Sunport Station**

Albuquerque, New Mexico | 3200 BROADWAY BLVD SE

**Traffic Impact Study** 

September 19, 2023

## FINAL

HT#M14D038 Received 9/20/2023



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### Love's Sunport Station 3200 Broadway Blvd. SE- Albuquerque, NM Traffic Impact Study

### **Executive Summary**

The purpose of this Traffic Impact Study (TIS) is to evaluate the transportation conditions before and after implementation of the proposed Love's Sunport Station to determine the impact of the development on the adjacent transportation system and recommend mitigation measures where necessary. This study is prepared in accordance with the requirements of the City of Albuquerque (COA), Bernalillo County (BERNCO), and the New Mexico Department of Transportation, District 3 (NMDOT). The scoping summary for this TIS is in Appendix pages A-119 thru A-120.

### Site Location and Study Area

The proposed Love's Sunport Station is to be in the southeast quadrant of Woodward Rd./Sunport Blvd.& Broadway Blvd. in the City of Albuquerque, NM at 3200 BROADWAY BLVD SE ALBUQUERQUE NM. See the IDO Zone Atlas map below for the site location.



The study area includes the nine intersections listed below and shown on the following map:

- 1. Woodward Rd./Sunport Blvd. & Broadway Blvd. (Signalized, Existing)
- 2. Sunport Blvd. & Arno Rd. (unsignalized, Under Construction)
- 3. Sunport Blvd. & I-25 SB Ramp
- 4. Sunport Blvd. & I-25 NB Ramp
- 5. Driveway 'A' & Arno St. (Unsignalized, Proposed)
- 6. Driveway 'B' & Arno St. (Unsignalized, Proposed)
- 7. Driveway 'C' & Broadway (Unsignalized, Existing)
- 8. Driveway 'D' & Broadway Blvd. (Unsignalized, Existing
- 9. Rio Bravo Blvd. & Broadway Blvd. (Signalized, Existing)



The roadways in the vicinity of the project are in three jurisdictions: City of Albuquerque, Bernalillo County, and the NMDOT (District 3). Broadway Blvd. north of railroad tracks Woodward Rd., and the new Sunport Blvd. Extension west of Arno St. are within the City of Albuquerque but are maintained by Bernalillo County. Arno St. and Sunport Blvd. east of Arno St are within the unincorporated areas of Bernalillo County and are maintained by Bernalillo County. Broadway Blvd. south of the railroad tracks and Rio Bravo Blvd. are in Bernalillo County but are maintained by the NMDOT. Below is a map illustrating the jurisdictions of the roadways in the vicinity of the project.



### **Development Description**

The proposed project is to be developed as Convenience Market / Gas Station (ITE Land Use 945) w/17 fueling positions and 8725 square feet of floor area. The land for the project is currently developed and the study area is mostly developed. There are two proposed access driveways (Driveway 'A and' Driveway 'B') and two existing driveways (Driveway 'C' and Driveway 'D'). Driveway 'A' is to be entrance-only access located on the west side of Arno St. 384-feet south of Sunport Blvd.(centerline to centerline). Driveway 'B' is a proposed full access unsignalized driveway 181-ft south of Driveway 'A' on Arno St. Driveway 'C' is to be a right-in/right-out access on the east side of Broadway Blvd., 231-feet south of Sunport Blvd. (centerline to centerline). Driveway 'D' is to be a full-access driveway on the east side of Broadway Blvd., 299-feet south of Driveway 'C'. The proposed site plan, with the access points identified, is shown below. The full site plan is in Appendix pg. A-2.



The full build out anticipated implementation year for this project is 2023 and the horizon year is 2033.

**Trips Generated by the project**: According to the Institute of Traffic Engineers Trip Generation Manual, 11<sup>th</sup> Edition, the project is anticipated to generate 134 new entering trips and 134 new exiting trips during the weekday AM Peak Hour period and 114 new entering trips and 114 new exiting trips during the PM Peak Hour period. A 50% pass-by trip rate reduction is included in the trips generated. These trips and pass-by rates were agreed to in the scoping meeting for the project.

There are no other recent or planned developments in the study area, however, Bernalillo County has authorized a major transportation project along Sunport Blvd. and a transportation plan (Sunport Commerce Center Transportation Plan) that, when implemented, will improve the transportation network of an 800-acre area east and south of the project. The new Sunport Blvd. Extension project is currently under construction. The project involves creating an extension of Sunport Blvd. from the I-25 southbound ramp west to Broadway Blvd., extending the southbound left-turn lane on Broadway Blvd. and modifying the median on Broadway Blvd. south of Sunport Blvd. Base lane geometries and traffic volumes are based on the completed project. The intent of the Sunport Commerce Center Transportation Plan is to improve access to vacant properties, enhance safety and traffic flow, provide for rail and truck freight, ensure multimodal connectivity, and promote economic development opportunities near the Albuquerque International Airport.

### Traffic Volumes

As agreed in the scoping meeting for the project, **Existing traffic volumes** along Woodward Rd./Sunport Blvd. and Broadway Blvd. are based on 2022 traffic volumes published in the Traffic Volume Forecasts related to the Sunport Blvd. Extension project prepared by AECOM for Bernalillo County on November, 2017 (See Appendix pages A-97 thru A-118). New traffic counts were not collected due to extended construction activity on these roadways and significant geometric modifications to the existing infrastructure currently underway. Base volumes for the thru traffic at the driveway intersections were extrapolated from the forecasted volumes at the Sunport & Broadway intersection. Existing traffic volumes for the Rio Bravo Blvd. & Broadway Blvd. intersection were counted in the field on January 25, 2023 (Appendix page A-93)

**Background traffic volumes** are calculated by applying historical annual background traffic growth rates to the existing traffic volumes for the implementation year. As agreed in the scoping meeting, the growth rates for the study are based on 2020 -2040 Traffic Flows (ADT) published in the AECOM report referenced above. The table on the following page is a summary of the data and calculated growth rates for each roadway in the study area.

#### Love's Sunport Station TIS Growth Rates in Study Area

Based on 2020-2040 AADT from the Technical Memorandum for the Sunport Blv. Extension by AECOM (11/2017, to Bernalillo County), pdh page pg. 14

Sunport Blvd./W	Volume			
	AADT		Annual	Weighted
LEG	2020	2040	Growth(%)	Growth
EAST LEG	6500	11000	2.0%	0.40%
WEST LEG	4300	7300	2.1%	0.27%
NORTH LEG	11800	12700	0.4%	0.10%
SOUTH LEG	15200	16400	0.4%	0.13%
TOTAL	39820	49440		0.9%

Use 2% for East-West legs (Woodward/Sunport) Use 0.5% for North-South legs (Broadway)

Sunport Blvd. & I	-25 NB & SB Rar	nps		Volume
	AADT	Γ	Annual	Weighted
LEG	2020	2040	Growth(%)	Growth
NB Entrance	9500	12400	1.2%	0.50%
NB Exit	1200	2400	2.5%	0.18%
SB Entrance	1600	2200	1.4%	0.10%
SB Exit	7600	10400	1.3%	0.47%
TOTAL	21920	29440		1.2%

Use 2.5 % for I-25 NB Ramp Intersection Use 1.5 % for I-25 SB Ramp Intersection

#### Rio Bravo & Broadway

	AADT	AADT		
LEG	2015	2040	Growth(%)	
Rio Bravo	27225	39626	1.6%	
TOTAL	29240	41666		

### Traffic Analysis

A capacity analysis of the study area intersections was conducted in accordance with the Highway Capacity Manual (HCM6) V.6. The intersection of Broadway Blvd. & Rio Bravo Blvd. was analyzed using The Highway Capacity Software (HCS), Version 8.2, because several movements had Volume to Capacity Ratios (V/Cs) greater than 1 which required a multiple period analysis of the intersection. A single period analysis was conducted on the remaining intersections using Synchro 11 (Build 11.1.2.9) modeling software. See Appendix pages A-30 thru A-89 for detailed results of the analysis. Summaries of the analysis results for the 2023 Implementation Year and 2033 Horizon Year are presented in the following table:

	Love's Sunport Station - Sunport Blvd./Broadway Blvd., Albuquerque, NM												
				2023 Co	nditions	2033 Co	nditions	2023 Queueing				2033 Que	eueing
				Level of	Service (LO	S) - Delay (	s/vehicle)	Approa	ches w/		Approa	iches w/	
	Intersection No. / Name	Signalization	Case	AM Peak	PM Peak	AM Peak	PM Peak	V/C >1 <sup>1</sup>	QSR>1 <sup>2</sup>	Additional Lane Length Required (ft)	V/C >1 <sup>1</sup>	QSR>1 <sup>2</sup>	Additional Lane Length Required (ft)
	1: Broadway Blvd. &	Signalized	NO BUILD	C - 23.5	C - 22.1	C - 28.7	C - 27.3	-	-	0	-	EBR	63
	Woodward Rd./Sunport	olghall260	BUILD	C - 25.7	C - 24.3	C - 34.2	C - 29.1	-	-	0	-	(AM)	85
	2: Arno St. & Sunnort Blvd	Insignalized	NO BUILD	B-13.2	C-16.2	B-14.2	C-18.4	-	-	0	-		0
0 11		onoignaii26a	BUILD	B-11.9	B-15.4	B-12.6	C-18.0	-	-	0	-		0
Juchr	3: Sunport Blvd. & I-25 SB	Signalized	NO BUILD	B - 14.3	B - 14.2	B - 16.3	B - 15.3	-	-	0	-		0
g Syı	Ramp	oignail26a	BUILD	B - 13.7	B - 14.3	B - 13.3	B - 15.2	-	-	0	-		0
Jsinç	4 - Sunport Blvd. & I-25	Signalized	NO BUILD	B - 18.2	B - 19.4	B - 12.5	B - 18.9	-	-	0	-		0
sis L	NB Ramp	oignail26a	BUILD	B - 13.7	B - 19.0	B - 16.2	B - 18.4	-	-	0	-		0
y	5: Arno St & Driveway 'A'	Unsignalized	NO BUILD	-	-	-	-	-	-	0	-		0
dAr	o.ruio oli a Binoway ri	onoignaii20a	BUILD	A-0.0	A-0.0	A-0.0	A-0.0	-	-	0	-		0
erio	6: Arno St & Driveway 'A'	Unsignalized	NO BUILD	-	-	-	-	-	-	0	-		0
gle F	o. Ano ol. a Driveway A onsignalized	orrorginalizoa	BUILD	A-9.2	A-9.2	A-9.2	A-9.2	-	-	0	-		0
Sinç	7 - Broadway Blvd. &	Unsignalized	NO BUILD	-	-	-	-	-	-	0	-		0
	Driveway'C'	01101.g.1.0.1	BUILD	C-16.2	B-12.3	B-16.8	B-12.5	-	-	0	-		0
	8: Broadway Blvd. &	Unsignalized	NO BUILD	-	-	-	-	-	-	0	-		0
	Driveway 'D'	onoignaiizoa	BUILD	D-27.3	B-12.3	C-21.1	C-23.6	-	-	0	-		0
			NO BUILD	C-31.4	C-32.8	C-32.5	E - 66.8	-	-	0	-	NBR	413
~								-	-			SBL	51
HCS								-	-			SBR	255
ing l			BUILD	C-31.3	C - 33.3	C-32.8	E - 68.8	-	-	0	-	NBR	370
Us								-	-			SBL	51
lysis	9: Rio Bravo Blvd. &	Cianolizod							-			SBR	306
Ana	Broadway Blvd.	Signalizeu	BUILD	C-29.2	C-29.9	C-34.8	E - 65.0			0	-	SBL	51
iod			Mitigated									SBR	268
Per			Reduce to 1 WBL & 1										
lipl€			EBL w/										
Mu			permitted/protected										
			left-turn phasing										

### **Executive Summary Results Table**

1. V/C = Volume to Capacity Ratio

2. QSR = Queue Storage Ratio

CONDITION WITH MOST ADDITIONAL LANE LENGTH REQUIRED FOR MOVEMENT

### Auxillary Lane Warrant Analysis

Auxiliary Lane Warrant Analysis was conducted for the driveway intersections and the Broadway & Arno St. intersection. Analysis for the Arno St. intersections was performed using the City of Albuquerque DPM criteria. Analysis of the driveways on Broadway Blvd. were performed using the NMDOT Auxiliary Lane Warrant Analysis criteria. Below is a summary of the results.

	Love's Sunport Station											
				Left T	urn Warran	t		Right Turn Warrant				
Access	Major Street	Speed Limit (Mph)	Left Turn Warrant Volume (veh/hr) <sup>1</sup>	Maximum Left Turn Volume (Veh/hr)	Left Turn Lane Warranted ?	Minimum Storage Length (ft)4	Minimum Left-turn Transition Length (ft) <sup>2</sup>	Right Turn Warrant Volume (veh/hr) <sup>1</sup>	Maximum Right Turn Volume (Veh/hr)	Right Turn Lane Warranted?	Minimum Storage Length (ft) <sup>3</sup>	Minimum Right-turn Transition Length (ft) <sup>2</sup>
City of Albud	querque Auxillary	Lane Wa	rrant Analysis									
Driveway 'A'	Arno St.	35	40	0	No	-	-	50	61	Yes	240	300/150
Driveway 'B	' Arno St.	35	40	0	No	-	-	50	33	No	-	-
Arno St.6	Sunport Blvd.	35	40	51	Yes	50	300/150	50	41	No	-	-
NMDOT Aux	killary Lane Warra	nt Analysi	s <sup>5</sup>									
Driveway 'C	' Broadway Blvd.	35	NOT REQ.	0	N/A		-	NOT REQ.	<5	No	-	-
Driveway 'D	' Broadway Blvd.	35	1	78	Yes	250	8:1 Taper	1	106	Yes	230	8:1 Taper

### Summary of Auxillary Lane Warrant Analysis

1. City of Albuquerque DPM, Table 7.4.67

2. City of Albuquerque DPM, Table 7.4.70

3. City of Albuquerque DPM, Table 7.4.68

4. Storage Length based on maximum 2033 left-turn queue length

5. See NMDOT Auxillary Lane Warrant Analysis in Appendix pages A- thru A-.

6. Construction plans for the new Sunport Blvd. extention show a 150-ft left-turn lane plus a 300/150 transition

A summary of the impacts and recommendations based on the results of the analysis, are stated below.

### Summary of Impacts

# Intersection 1 - Woodward Rd./Sunport Blvd. & Broadway Blvd. (Signalized, Existing w/ Major Modifications)

- 2023 LOS Analysis of Intersection 1 demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. LOS remains at C or better for all movements in the intersection. Intersection LOS remains at LOS=C for the NO BUILD and BUILD conditions with less than 2 seconds per vehicle increase in delays. LOS for each movement is C or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions.
- 2033 LOS Analysis of Intersection 1 demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. LOS remains at C or better for all movements in the intersection. Intersection LOS remains at LOS=C for the NO BUILD and BUILD conditions with less than 6 seconds per vehicle increase in delays. LOS for each movement is D or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions.
- **2023 Queueing Analysis** demonstrates that based on the geometry of the intersection presented on the Sunport Blvd. Extension construction plans, no additional queueing capacity is required at Intersection 1 and the northbound queues will not block Driveway 'C' to the south of the intersection. V/C are less than 1 for all movements and lane capacities are greater than calculated queues.
- **2033 Queueing Analysis** demonstrates that based on the geometry of the intersection presented on the Sunport Blvd. Extension construction plans, an additional 85-ft of queueing capacity is required for the eastbound thru/right turn lane, however, there is insufficient Right of Way (ROW) to extend the lane and this condition only occurs during the AM 2033 peak hour. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

### Intersection 2 - Sunport Blvd. & Arno St. (Unsignalized, Currently Under Construction)

- 2023 and 2033 LOS Analysis of this intersection demonstrates that the proposed Love's Sunport Station will not significantly impact the LOS or delays at this intersection. In fact, intersection delays decrease with additional traffic from the development because in the weighted average calculation for delays, traffic is being introduced to movements with LOS=A, thereby improving the overall delay of the intersection.
- **2023 and 2033 Queueing Analysis** demonstrates that based on the geometry of the intersection presented on the Sunport Blvd. Extension construction plans, no additional queueing capacity is required. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.
- **City of Albuquerque Deceleration Lane Warrant Analysis** shows that a westbound left-turn lane with 50-ft of queueing capacity and a 300/150 transition is warranted at this intersection, however, Sunport Blvd. Extension construction plans show a westbound left-turn lane with 150-ft of capacity so no additional capacity is required on the part of the development.

### Intersections 3 & 4 - Sunport Blvd. & I-25 NB & SB Ramp Intersections (Signalized, Existing w/ Major Modifications)

- 2023 and 2033 LOS Analysis of these intersections demonstrate that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. Intersection LOS remains at LOS=C for the NO BUILD and BUILD conditions with less than 2 seconds per vehicle increase in average control delays. LOS for each movement is C or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions. In fact, for 2033 intersection delays decrease with additional traffic from the development because in the weighted average calculation for delays, traffic is being introduced to movements with LOS=A, thereby improving the overall delay of the intersection.
- 2023 and 2033 Queueing Analysis demonstrates that based on the geometry of the intersections presented on the Sunport Blvd. Extension construction plans, no additional queueing capacity is required. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

### Intersection 5 (Enter ONLY) - Driveway 'A' & Arno St. (Unsignalized, Proposed)

- **2023 and 2033 LOS Analysis** of this intersection demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions. Intersection LOS is LOS=A for the BUILD conditions.
- **2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at this intersection. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.
- **City of Albuquerque Deceleration Lane Warrant Analysis** shows that a southbound right-turn lane 240-ft long including a 300/150 transition is warranted at Driveway 'A', however, inspection of survey maps and aerial images indicate that there may be insufficient ROW north of Driveway 'A' to construct a deceleration lane. Further field inspection and title searches is required to establish the location of the ROW prior to construction of the lane.

### Intersection 6 (FULL ACCESS) - Driveway 'B' & Arno (Unsignalized, Proposed)

- **2023 and 2033 LOS Analysis** of this intersection demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. Intersection LOS is LOS=A for the BUILD conditions.
- **2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at this intersection. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.
- **City of Albuquerque Deceleration Lane Warrant Analysis** shows that no deceleration lanes are warranted at this intersection.

### Intersection 7 (Right-in/Right-out Only) - Driveway 'C' Broadway Blvd.

• **2023 and 2033 LOS Analysis** of these intersections demonstrate that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions. Intersection LOS remains at LOS=C for the NO BUILD and BUILD conditions with less than 2 seconds

per vehicle increase in delays. LOS for each movement is C or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions.

- **2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at these intersections. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.
- **NMDOT Deceleration Lane Warrant Analysis** shows that <u>no</u> turn lanes are warranted at Driveway 'C'.

### Intersection 8 (Full Access) - Driveway 'D' & Broadway Blvd. (Unsignalized, Proposed)

- **2023 and 2033 LOS Analysis** of these intersections demonstrate that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions. LOS=C for the intersection and LOS=C or better for all movements in the intersection.
- **2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at these intersections. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.
- **NMDOT Deceleration Lane Warrant Analysis** shows that a southbound left-turn lane, 250-ft long plus an 8:1 taper transition and a northbound right-turn lane, 230-ft long (including transition) are warranted at the Driveway 'D' Intersection.

### Intersection 9 Rio Bravo Bld. & Broadway Blvd. (Signalized, Existing)

- 2023 LOS Analysis of these intersections demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions; LOS remains the same for the NO BUILD and BUILD conditions. LOS also remains the same for all movements in the intersection. The eastbound left turn movement has LOS=E for the NO BUILD and BUILD conditions.
- 2033 LOS Analysis of these intersections demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions; LOS and delays remain the same for the NO BUILD and BUILD conditions. Based on the analysis, by 2033 conditions at the intersection degrade significantly especially during the PM peak hour. LOS for EBL, EBT, WBL, WBR and NBT movements are LOS=E or F.
- **2023 and 2033 Queueing Analysis** demonstrates that additional queueing capacity is required at this intersection for most of the turn lanes by 2033. V/C ratios (a measure of congestion) are less than 1 for all movements except for the NBL in 2033. Lane capacities are less than calculated queues for the EBL, NBR, SBL, and SBR turn lanes.
- **Mitigation:** The poor LOS and queuing issues revealed by the 2023 and 2033 HCM analysis are existing problems not made significantly worse by the development, so no mitigation is recommended by the development. However, a mitigated case has been provided to the NMDOT as a courtesy to demonstrate that LOS and queuing conditions improve if signal phasing for the Eastbound Left-turn (EBL) and Westbound Left-turn (WBL) movements are changed from "Protected" to "Permitted/Protected". Since dual lefts are not recommended for this type of phasing, the WBL and EBL geometry would have to be reduced from dual left-turn lanes to single left-turn lanes. Queuing issues for the for the NBR are resolved and EBL and WBL capacities remain adequate with the

proposed mitigation, however the SBL and SBR queue capacities remain insufficient, and the V/C ratio remains >1 for the WBT movement.

### Access Spacing

All driveways meet the minimum access spacing requirements of the COA and the NMDOT except Driveway 'C', however, this is an existing driveway which has been reconstructed as a full-access driveway this year by NMDOT as part of the Sunport Blvd. Extension Project (NM Project NO. A300160). Also, the Love's Sunport Station project is proposing to improve safety at this access intersection by converting it from a full-Access driveway to a restricted access driveway, thereby significantly reducing the number of conflict points. Additionally, Driveway "C" provides for separation of passenger car vehicles from heavy commercial vehicles to a large degree, thus improving safety of the project.

In summary, the proposed Love's Sunport Station will have minimal adverse impact to the adjacent transportation system provided the recommendations below are implemented.

### Recommendations (Refer to Site Plan on the following page)

### 1. <u>Arno St. S.</u>

Construct Arno St. S. as an asphalt paved 2-lane roadway, at least 568-ft long, from the new curb return on Sunport Blvd. south to the curb return south of Driveway 'B' in accordance with the City of Albuquerque construction standards. Include sidewalk, curb, & gutter along entire project frontage.

### 2. Driveway "A"

- a) Driveway "A" should be designed and constructed as an unsignalized enter-only access with one entering lane.
- b) Driveway 'A' should be designed to accommodate WB-60 trucks.
- c) Construct a southbound right-turn deceleration lane 240-ft long including a 300/150 transition at Driveway 'A' or to the extent ROW is available.

### 3. Driveway "B"

- a) Driveway 'B' should be designed as an unsignalized full access driveway with at least one entering lane and one exiting lane.
- b) Onsite queue storage at Driveway "B" should be at least 100 feet long. (150 feet preferrable to provide some buffer).
- c) Driveway 'B' should be designed to accommodate WB-60 trucks.

### 4. Driveway 'C'

- a) Driveway "C" should be designed and constructed as an unsignalized right-in/right-out only access with one entering lane and one exiting lane.
- b) Onsite queue storage at Driveway "C" should be at least 100 feet long. (150 feet preferrable to provide some buffer).
- c) Driveway 'C' should be designed to accommodate WB-60 trucks.

### 5. Driveway 'D'

- a) Driveway "D" should be designed and constructed as an unsignalized full access driveway with one entering lane and two exiting lanes.
- b) Construct a new southbound left-turn deceleration lane at least 250-ft long including an 8:1 transition taper.
- c) Construct a new northbound right-turn deceleration lane at least 230-ft long including an 8:1 transition taper.
- d) Onsite queue storage at Driveway "D" should be at least 100 feet long. (150 feet preferrable to provide some buffer).
- e) Driveway 'D' should be designed to accommodate WB-60 trucks.

### 6. Pedestrian features, Bike Lanes, & Curbing

- a) Construct curbs and gutters along the project frontage of Arno St. and Broadway Blvd.
- b) Construct an 8-ft wide asphalt paved bike/pedestrian path, including a 3-foot-wide landscaped buffer between the back of curb and the path, along the project frontage of Broadway Blvd. Connect the path to the new bike lane (by others) along Sunport Blvd.
- c) Construct a 5-ft wide concrete sidewalk along the project frontage of Arno St.
- 7. The developer shall coordinate site plan development and roadway design with COA and Bernalillo County.



### Love's Sunport Station 3200 Broadway Blvd. SE- Albuquerque, NM Traffic Impact Study

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### Introduction

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- 4. Sunport Blvd. & I-25 NB Ramp
- 5. Driveway 'A' & Arno St. (Unsignalized, Proposed)
- 6. Driveway 'B' & Arno St. (Unsignalized, Proposed)
- 7. Driveway 'C' & Broadway (Unsignalized, Existing)
- 8. Driveway 'D' & Broadway Blvd. (Unsignalized, Existing
- 9. Rio Bravo Blvd. & Broadway Blvd. (Signalized, Existing)



### **Development Description**

The proposed project is to be developed as Convenience Market / Gas Station (ITE Land Use 945) w/17 fueling positions and 8725 square feet of floor area. The land for the project is currently developed and the study area is mostly developed. There are two proposed access driveways (Driveway 'A and' Driveway 'B') and two existing driveways (Driveway 'C' and Driveway 'D'). Driveway 'A' is to be entrance-only access located on the west side of Arno St. 384-feet south of Sunport Blvd.(centerline to centerline). Driveway 'B' is a proposed full access unsignalized driveway 181-ft south of Driveway 'A' on Arno St. Driveway 'C' is to be a right-in/right-out access along the east side of Broadway Blvd., 231-feet south of Sunport Blvd. (centerline to centerline). Driveway 'D' is to be a full-access driveway along the east side of Broadway Blvd. 299-feet south of Driveway 'C'. The proposed site plan, with the access points identified, is shown below. The full site plan is in Appendix pg. A-2.



#### Site Access

There are two proposed access driveways (Driveway 'A', Driveway 'B') and two existing driveways (Driveway 'C' and Driveway 'D'). Driveway 'A' is to be entrance-only access located on the west side of Arno St. 384-feet south of Sunport Blvd.(centerline to centerline). Driveway 'B' is a proposed full access unsignalized driveway 181-ft south of Driveway 'A' on Arno St. Driveway 'C' is to be a right-in/right-out access along the east side of Broadway Blvd., 231-feet south of Sunport Blvd. (centerline). Driveway 'D' is to be a full-access driveway along the east side of Broadway Blvd., 299-feet south of Driveway 'C'. See Site Plan on page 4.

### **Development Phasing and Timing**

The development will be built in one phase. The anticipated implementation year for this project is 2023. The horizon year is 2033.

**Trips Generated by the project**: According to the Institute of Traffic Engineers Trip Generation Manual, 11<sup>th</sup> Edition, the project is anticipated to generate 134 new entering trips and 134 new exiting trips during the weekday AM Peak Hour period and 114 new entering trips and 114 new exiting trips during the PM Peak Hour period. A 50%pass-by trip rate reduction is included in the trips generated. These trips and pass-by rates were agreed to in the scoping meeting for the project. The percentage of Trucks along Broadway Blvd. and Sunport Blvd. is assumed to be 20%. The percentage of Trucks along Rio Bravo is assumed to be 10%. The percentage of trucks Entering Driveways B, C, and D is assumed to be 30%. The percent of trucks Entering Driveway A is assumed to be 80%. Exiting trips are assumed to be 50% trucks at all driveways.

### **Study Area Conditions**

### Land Use and Intensity

The land for the project is currently 80% developed as an industrial site and the study area is approximately 75% developed. The parcel will be 100% developed as a retail site when the proposed project is complete. The parcel is currently zoned NR-LM, Non-Residential, Light Manufacturing according to City of Albuquerque Zoning Maps. There are also three Airport Protection Overlay Zones over the site as listed below. See Zone Atlas Map on page 2.

Zone Districts	COA Subsection
Albuquerque International Sunport / Air Space Protection Sub-area	<u>14-16-3-3(B)(1)(a)</u>
Albuquerque International Sunport / Runway Protection Sub-area	<u>14-16-3-3(B)(2)(a)</u>
Albuquerque International Sunport / Noise Contour Sub-area	<u>14-16-3-3(B)(3)(a)</u>

### Other Planned or Approved Development and Transportation Improvements

There are no other recent or planned developments in the study area, however, Bernalillo County has authorized a major transportation project along Sunport Blvd. and a transportation plan (Sunport Commerce Center Transportation Plan) that, when implemented, will improve the transportation network of an 800-acre area east and south of the project.

The new Sunport Blvd. Extension project is currently under construction. The project involves creating an extension of Sunport Blvd. from the I-25 southbound ramp west to Broadway Blvd., extending the southbound left-turn lane on Broadway Blvd. and modifying the median on Broadway Blvd. south of Sunport Blvd. Base lane geometries and traffic volumes are based on the completed project. See Appendix pages A-97 thru A-118 for the Permanent Signing and Striping plans for the project.

The intent of the Sunport Commerce Center Transportation Plan <u>Sunport-Commerce-Center-Transportation-Plan-Final.pdf (bernco.gov)</u> is to improve access to vacant properties, enhance safety and traffic flow, provide for rail and truck freight, ensure multimodal connectivity, and promote economic development opportunities near the Albuquerque International Airport. Under the plan, Arno St. is proposed as 2-lane Local Roadway with sidewalks.

### Site Accessibility

The site is accessible from the east side of Broadway Blvd. and the south side of Sunport Blvd.

### Existing and Future Area Roadways and Bikeways

The roadways in the vicinity of the project are in three jurisdictions: City of Albuquerque, Bernalillo County, and the NMDOT (District 3). Broadway Blvd. north of railroad tracks Woodward Rd., and the new Sunport Blvd. Extension west of Arno St. are within the City of Albuquerque but are maintained by Bernalillo County. Arno St. and Sunport Blvd. east of Arno St are within the unincorporated areas of Bernalillo County and are maintained by Bernalillo County. Broadway south of the railroad tracks and Rio Bravo Blvd. are in Bernalillo County. Below is a map illustrating the jurisdictions of the roadways in the vicinity of the project.



<u>Sunport Blvd.</u> is classified as a **Regional Principal Arterial** roadway on the Mid-Region Council of Governments Long Range Roadway System map that currently runs east-west from I-25 to the Albuquerque International Sunport. The new Sunport Blvd. Extension Project will extend Sunport Blvd. west from I-25 to Broadway Blvd. East of I-25, it is a six-lane roadway with a raised divided median, curbs, and gutters but no pedestrian facilities or bike lanes. West of I-25, construction plans show it as a 2-lane roadway with a raised divided median, curbs, gutters, barrier protected bike lanes on the north and south sides but no sidewalks. The posted speed limit is 35-mph. West of Broadway Blvd. Sunport becomes Woodward Rd.

<u>Woodward Rd.</u> is classified a **Minor Collector** roadway on the Mid-Region Council of Governments Long Range Roadway System map that runs east-west from 2<sup>nd</sup> Street to Broadway Blvd. It is a two-lane roadway with a center two-way left turn lane, curbs, and gutters, sidewalks, and bikes lanes. The posted speed limit is 35-mph. East of Broadway Blvd. Woodward Rd. becomes Sunport Blvd.

<u>Broadway Blvd.</u> is classified as a **Regional Principal Arterial** roadway on the Mid-Region Council of Governments Long Range Roadway System map that runs north-south. It is a four-lane roadway with no median, curbs, or gutters except in the vicinity of the Sunport Blvd. intersection where construction plans

show a raised median, curbs, and gutters. There are no sidewalks or bike lanes existing or shown on the Sunport Blvd. Extension construction plans although 2040 Long-Range Bikeway System Plans show a proposed on-street bike lane. The posted speed limit is 35-mph in the vicinity of the project which increases to 55 mph approximately 1-mile south of the project.

<u>Rio Bravo Blvd.</u> is classified as a **Regional Principal Arterial** roadway on the Mid-Region Council of Governments Long Range Roadway System map that runs east-west from I-25 to Coors Blvd. It is a sixlane roadway with raised median, curbs, and gutters. There are no sidewalks but there are on-street bike lanes on both approaches. The posted speed limit is 45-mph.

<u>Arno St.</u> is classified a **local unclassified** roadway on the Mid-Region Council of Governments Long Range Roadway System map. Arno St. South is platted but not constructed south of Sunport Blvd. The Love's Sunport Station Development will extend Arno St. from Driveway 'B' to Sunport Blvd. It will be constructed as a two-lane roadway with curbs, gutters, and sidewalks, but no bikes lanes. The posted speed limit will be 25-mph.

All existing intersections in the study area have adequate **lighting**.

Following are portions of the following regional transportation maps for more information. These include the 2019 Traffic Flow Map, Futures 2040 Long Range Roadway System, and Futures 2040 Long Range Bikeway System Map. As shown on the Futures 2040 Long Range Bikeway System Map, a bike lane is



proposed along Woodward Rd./Sunport Blvd. and Broadway Blvd. fronting the project. Current construction plans have included bike lanes along Sunport Blvd., but no bike lanes are planned for Broadway Blvd.





### **Analysis of Existing Conditions**

Since the implementation year (2023) is the year of this study, no analysis of existing conditions was performed.

### Analysis of Implementation Year and Horizon Year Conditions

### Traffic Counts

As agreed in the scoping meeting for the project, **Base traffic volumes** along Woodward Rd./Sunport Blvd. and Broadway Blvd. are based on 2022 traffic volumes published in the Traffic Volume Forecasts related to the Sunport Blvd. Extension project prepared by AECOM for Bernalillo County on November, 2017 (See Appendix pages A-90 thru A-92). New traffic counts were not collected due to extended construction activity on these roadways and significant geometric modifications to the existing infrastructure. Base volumes for the thru traffic at the driveway intersections were extrapolated from the forecasted volumes at the Sunport & Broadway intersection. Existing traffic volumes for the Rio Bravo Blvd. & Broadway Blvd. intersection were counted in the field on January 25, 2023.

**Background traffic volumes** are calculated by applying historical annual background traffic growth rates to the existing traffic volumes for the implementation year. As agreed in the scoping meeting, the growth

rates for the study are based on 2020 -2040 Traffic Flows (ADT) published in the AECOM report referenced above. Below is a summary of the data and calculated growth rates for each roadway in the study area.

### Love's Sunport Station TIS Growth Rates in Study Area

Based on 2020-2040 AADT from the Technical Memorandum for the Sunport Blv. Extension by AECOM (11/2017, to Bernalillo County), pdh page pg. 14

Sunport Blvd./W	Volume			
	AADT	-	Annual	Weighted
LEG	2020	2040	Growth(%)	Growth
EAST LEG	6500	11000	2.0%	0.40%
WEST LEG	4300	7300	2.1%	0.27%
NORTH LEG	11800	12700	0.4%	0.10%
SOUTH LEG	15200	16400	0.4%	0.13%
TOTAL	39820	49440		0.9%

Use 2% for East-West legs (Woodward/Sunport) Use 0.5% for North-South legs (Broadway)

Sunport Blvd. & I-2	<b>25 NB &amp; SB Ran</b> AADT	Annual	Volume Weighted	
LEG	2020	2040	Growth(%)	Growth
NB Entrance	9500	12400	1.2%	0.50%
NB Exit	1200	2400	2.5%	0.18%
SB Entrance	1600	2200	1.4%	0.10%
SB Exit	7600	10400	1.3%	0.47%
TOTAL	21920	29440		1.2%

Use 2.5 % for I-25 NB Ramp Intersection Use 1.5 % for I-25 SB Ramp Intersection

#### Rio Bravo & Broadway

	AADT		Annual
LEG	2015	2040	Growth(%)
Rio Bravo	27225	39626	1.6%
TOTAL	29240	41666	

### Signal Timing

Below is a summary of the signalization characteristics of the intersections in the study area. Signal timing for each signalized intersection is optimized to 1) approximate the new adaptive signal control system on Rio Bravo and 2) model future signal timing at Broadway and the I-25 Ramp intersections when the Sunport Blvd. Extension project is complete. Since the Sunport Blvd. intersections are currently undergoing significant geometric modifications, use existing signal timing for intersections 1, 3, and 4 is not applicable for analysis.

Traffic Signal Summary Table Love's Sunport Station											
22-Mar	22-Mar										
Intersection No.	Intersection Name	Control Type	Detection	EB/WB Lefts	NB/SB Lefts						
1	Broadway Blvd. & Woodward Rd./Sunport Blvd.	Signalized	Actuated-Uncoordinated	Permissive/ Protected	Permissive/ Protected						
2	Arno St. & Sunport Blvd.	Unsignalized/ Two-way Stop	-	-	-						
3	Sunport Blvd. & I-25 SB Ramp	Signalized	Actuated-Coordinated	Permissive/ Protected	Protected						
4	Sunport Blvd. & I-25 NB Ramp	Signalized	Actuated-Coordinated	Permissive/ Protected	Permitted						
5	Arno St. & Driveway 'A'	Unsignalized/ Two-way Stop	-	-	-						
6	Arno St. & Drive way 'B'	Unsignalized/ Two-way Stop	-	-	-						
7	Broadway Blvd. & Driveway 'C'	Unsignalized/ Two-way Stop	-	-	-						
8	Broadway Blvd. & Driveway 'D'	Unsignalized/ Two-way Stop	-	-	-						
9	Rio Bravo Blvd. & Broadway Blvd.	Signalized	Coordinated Addaptive Signal Control System	Protected	Permissive/ Protected						

### Summary of Assumptions

The following assumptions as agreed upon in the project scoping meeting and included in the scope of work were made in preparation of this study.

- 1. Base traffic volumes for intersection along Woodward Rd./Sunport Blvd. and Broadway Blvd. are based on 2022 traffic volumes published in the Traffic Volume Forecasts related to the Sunport Blvd. Extension project prepared by AECOM for Bernalillo County on November, 2017 (See Appendix pages A-90 thru A-92). New traffic counts were not collected due to extended construction activity on these roadways and significant geometric modifications to the existing infrastructure currently underway. Base volumes for the thru traffic at the driveway intersections were extrapolated from the forecasted volumes at the Sunport & Broadway intersection.
- 2. Base traffic volumes for the Rio Bravo Blvd. & Broadway Blvd. intersection were counted in the field on January 25, 2023.
- 3. **Trip Generation traffic volumes** are based on site plan provided by the developer or developer's representative (square footage of building proposed and other land uses on site as defined on site plan.) and ITE Trip Generation Data from the 11<sup>th</sup> Edition.
- 4. **Trip Distribution and Trip Assignments** of the newly generated traffic are based on interpolated 2016 and 2040 Socioeconomic Forecasts by Data Analysis Subzones (DASZ) for the Mid-Region of

New Mexico as published by the Mid-Region Council of Governments (MRCOG). (Population-2-mile radius.

- 5. AM (7:00am to 9:00am) and PM (4:00pm to 6:00pm) Peak Hour analyses are performed.
- 6. **Signal timing** for each signalized intersection is optimized to 1) approximate the new adaptive signal control system on Rio Bravo and 2) model future signal timing at Broadway and the I-25 Ramp intersections when the Sunport Blvd. Extension project is complete.
- 7. **Background traffic volumes** are calculated by applying historical annual background traffic growth rates to the base traffic volumes for the implementation year. The growth rates for the study are based on 2020 -2040 Traffic Flows (ADT) published in the AECOM report referenced above.

### Level of Service (LOS)

According to the City of Albuquerque, Design Process Manual (DPM), LOS standards are defined by Access Category. Table 7.5.89 identifies the minimum acceptable LOS standards according to Functional Classification & Roadway Type and City of Albuquerque's ABC Comp Plan Type (see below). Because Broadway Blvd. and Sunport Blvd., in the vicinity of the project, are outside of defined center, intersections along these corridors must have a LOS=D or better or mitigated to maintain the LOS at base (NO BUILD) condition levels.

TABLE 7.5.88 Desired LOS by Location and Corridor Type										
		ABC Comp Plan Center Type								
Functional Classification & Roadway Type	Transit Station Area	Downtown	Urban Center	Activity Center	Village Center	Employment Center	Outside Center			
Premium Transit	E-F	E-F	E-F	E-F	E-F	E-F	E-F			
Major Transit	E	E-F	E	E	D-E	D-E	D-E			
Multi-modal	Е	E	E	Е	D-E	D-E	D-E			
Commuter	E	E	D-E	D-E	D-E	D-E	D			
Other Arterial	Е	E	E	D-E	D-E	D-E	D			
Minor Arterial	Е	Е	D-E	D-E	D-E	D	D			
Collector	E	D-E	D	D	C-D	C-D	C-D			

According to the NMDOT State Highway Access Management Requirements, LOS standards are defined by Access Category. Table 15.C-1 identifies the minimum acceptable LOS standards by access category and facility type (see below). Level of service (LOS) F shall not be accepted for individual movements.

Table 15.C-1           Minimum Acceptable Level of Service Standards								
Facility Type <sup>1</sup>	Access Categories (see Sub-Section 10.D)							
	UINT	UPA	UMA	UCOL	RINT	RPA	RMA	RCOL
Freeway Sections	D	-			С	-		(10)
Ramp Junctions	D	- 2	- 2	- 2	С	- 2	- 2	- 2
Weaving Areas	D	- 2	- <sup>2</sup>	- 2	С	- 2	- 2	- 2
Multi-lane Highways	4	D	D	С		С	С	B
Two-Lane Highways		D	D	С		С	С	B
Signalized Intersections	-	D	D	D	-	С	С	С
Unsignalized Intersections	. •	D	D	D	3	D	D	С

Notes: 1. The Facility Types are per the Highway Capacity Manual.
2. Evaluate safety and operational concerns using the best available technique.

As shown in Table 15.C-1, all urban roadways (or intersections) in the study area should have a LOS of D or better or mitigated to maintain the LOS at existing (NO BUILD) condition levels.

### **Traffic Projections**

As agreed in the scoping meeting, the growth rates for the study are based on 2020 -2040 Traffic Flows (ADT) published in the AECOM report referenced above. The table on the following page is a summary of the data and calculated growth rates for each roadway in the study area.

#### Love's Sunport Station TIS Growth Rates in Study Area

Based on 2020-2040 AADT from the Technical Memorandum for the Sunport Blv. Extension by AECOM (11/2017, to Bernalillo County), pdh page pg. 14

Sunport Blvd./W	Volume					
AADT		Г	Annual	Weighted		
LEG	2020	2040	Growth(%)	Growth		
EAST LEG	6500	11000	2.0%	0.40%		
WEST LEG	4300	7300	2.1%	0.27%		
NORTH LEG	11800	12700	0.4%	0.10%		
SOUTH LEG	15200	16400	0.4%	0.13%		
TOTAL	39820	49440		0.9%		

Use 2% for East-West legs (Woodward/Sunport) Use 0.5% for North-South legs (Broadway)

Sunport Blvd. & I		Volume				
	AAD	Т	Annual	Weighted		
LEG	2020	2040	Growth(%)	Growth		
NB Entrance	9500	12400	1.2%	0.50%		
NB Exit	1200	2400	2.5%	0.18%		
SB Entrance	1600	2200	1.4%	0.10%		
SB Exit	7600	10400	1.3%	0.47%		
TOTAL	21920	29440		1.2%		

Use 2.5 % for I-25 NB Ramp Intersection Use 1.5 % for I-25 SB Ramp Intersection

Rio Bravo & Broadway						
	AADT	AADT				
LEG	2015	2040	Growth(%)			
Rio Bravo	27225	39626	1.6%			
TOTAL	29240	41666				

### **Base Traffic Volumes**

As agreed in the scoping meeting for the project, **Base traffic volumes** along Woodward Rd./Sunport Blvd. and Broadway Blvd. are based on 2022 traffic volumes published in the Traffic Volume Forecasts related to the Sunport Blvd. Extension project prepared by AECOM for Bernalillo County on November, 2017 (See Appendix pages A-90 thru A-92). New traffic counts were not collected due to extended construction activity on these roadways and significant geometric modifications to the base infrastructure currently underway. Base volumes for the thru traffic at the driveway intersections were extrapolated from the forecasted volumes at the Sunport & Broadway intersection. Base traffic volumes for the Rio Bravo Blvd. & Broadway Blvd. intersection were counted in the field on January 25, 2023.

### **Demand Traffic Volumes**

Demand volumes were calculated for Intersection 9, Rio Bravo Blvd. & Broadway. Demand volumes are a measure of the traffic volume for each approach that arrives at the intersection each 15-minute period.

Field measurements of the through volume queues are added to the traffic counts to produce the demand volumes. See the Projected Turning Movements Worksheet in Appendix pages A-94 thru A-95 for the demand volumes that were used in the analysis.

### Background Traffic Volumes

Background traffic volumes are calculated by applying historical annual background traffic growth rates (see table on page 11) to the base traffic volumes for the implementation year and the horizon year.

### Trips Generated by the Project

According to the Institute of Traffic Engineers Trip Generation Manual, 11<sup>th</sup> Edition, the project (Convenience Market / Gas Station with ITE Land Use 945) is anticipated to generate 134 new entering trips and 134 new exiting trips during the weekday AM Peak Hour period and 114 new entering trips and 114 new exiting trips during the PM Peak Hour period. A 50% pass-by trip rate reduction is included in the trips generated. See the table below.

# Loves Travel Stop (Broadway Blvd. / Sunport Blvd.)

### Trip Generation Data (ITE Trip Generation Manual - 11th Edition)

USE (ITE CODE)		24 HR VOL	A. M. PEAK HR.		P. M. PEAK HR.	
DESCRIPTION		GROSS	ENTER	EXIT	ENTER	EXIT
Summary Sheet	Units					
Convenience Store / Gas Station - GFA 5.5-10K (945)	17	5,878	269	269	229	229
Subtotal		5,878	269	269	229	229
Pass-By Trips	50%		-135	-135	-115	-115
Total Primary Trips			134	134	114	114

### NO BUILD and BUILD Traffic Volumes

NO BUILD volumes were generated by adjusting the base volumes with the annual background traffic growth. BUILD volumes were calculated by increasing the NO BUILD volumes by the trips generated by the project. The trip assignment percentages were used to distribute the trips generated to the individual traffic movements at each intersection. The turning movement counts for the **2023 and 2033 AM and PM Peak Hour, NO BUILD, and BUILD** conditions for each movement in each intersection the study area are provided in the Appendix on Pages A-16 thru A-23.

### Trip Distribution and Trip Assignments

Trip Distribution and Trip Assignments of the newly generated traffic are based on interpolated 2016 and 2040 Socioeconomic Forecasts by Data Analysis Subzones (DASZ) for the Mid-Region of New Mexico as published by the Mid-Region Council of Governments (MRCOG). New Trips were distributed proportionally based on distribution of population withing a two-mile radius of the project. (See Appendix page A-5 thru A-15).

**Trip assignments percentages** for vehicles entering and exiting are derived from data established in the trip distribution determination process and logical routing. See the turning movement maps below for the distribution of entering and exiting traffic volumes.





**Pass-by Trip Percentages** are the percentages of vehicles that enter the new development that currently exist as thru traffic. See the turning movement map below for the distribution of pass-by trips entering and exiting the site.



### Traffic Analysis

A capacity analysis of the study area intersections was conducted in accordance with the Highway Capacity Manual (HCM6) V.6. The intersection of Broadway Blvd. & Rio Bravo Blvd. was analyzed using Highway Capacity Software (HCS), Version 8.2, because some movements had Volume to Capacity Ratios (V/Cs) greater than 1 which required a multiple period analysis of the intersection. A single period analysis was conducted on the remaining intersections using Synchro 11 (Build 11.1.2.9) modeling software. See Appendix pages A-30 thru A-89 for detailed results of the analysis. Summaries of the analysis results for the 2023 Implementation Year and 2033 Horizon Year are presented in a table on page vii of the executive summary.

The following tables and diagrams summarize the 2023 Implementation Year and 2033 Horizon Year HCM Capacity and Queueing analysis results for the intersections in the study area. Cells highlighted in Red indicate values that exceed acceptable standards. The Lanes / Volumes / Analysis Diagrams show:

1) Diagram of the transportation study area (including intersections to be evaluated)

2) AM and PM Peak Hour volumes (i.e., turning movements volumes) associated with the 2023 NO BUILD Conditions and the 2023 BUILD Conditions.

3) AM and PM Peak Hour Lane group calculated levels-of-service (A, B, C, D, E, or F)

4) Overall intersection calculated levels-of-service for the overall intersection (signalized intersections only).

<u>INTERSECTION 1 – Woodward Rd./Sunport Blvd.(East/West) & Broadway Blvd. (North/South)</u> (Signalized, Existing with Future Improvements)



**2023 LOS Analysis** of Intersection 1 demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. LOS remains at C or better for all movements in the intersection. Intersection LOS remains at LOS=C for the NO BUILD and BUILD conditions with less than 2 seconds per vehicle increase in delays. LOS for each movement is C or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions.

**2033 LOS Analysis** of Intersection 1 demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. LOS remains at C or better for all movements in the intersection. Intersection LOS remains at LOS=C for the NO BUILD and BUILD conditions with less than 6 seconds per vehicle increase in delays. LOS for each movement is D or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions.

See Appendix pages A-30 thru A-37 for the HCM Synchro reports.

**2023 Queueing Analysis** demonstrates that based on the geometry of the intersection presented on the Sunport Blvd. Extension construction plans, no additional queueing capacity is required at Intersection 1 and the northbound queues will not block Driveway 'C' to the south of the intersection. V/C are less than 1 for all movements and lane capacities are greater than calculated queues.

**2033 Queueing Analysis** demonstrates that an additional 85-ft of queueing capacity is required for the eastbound thru/right-turn lane to prevent spill over into the eastbound thru lane. This problem exists only during the AM peak hour for the 2033 Horizon Year. However, based on inspection of aerial images and Bernalillo County assessor maps, there appears to be insufficient right-of-way (ROW) to extend the lane, so no mitigation is recommended on behalf of the project. V/C ratios (a measure of congestion) are less than 1 for all movements.


#### Signalized

	EB	EB (Woodward			(Woodw	/ard						
Woodward Rd./Sunport Blvd.	Rd./S	Sunport I	Blvd.)	Rd./S	Sunport I	Blvd.)	NB (B	roadway	Blvd.)	SB (B	roadway	Blvd.)
Broadway Blvd.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1	2>	0	1	1	1	1	2	1	1	2	1
AM Peak Hour												
AM NO BUILD Vols. (Veh/hr)	32	32	191	170	11	32	122	660	71	233	71	10
V/C Ratio	0.09	0.12	0.77	0.61	0.03	0.07	0.22	0.75	0.14	0.76	0.08	
Level-of-Service	С	С	С	С	В	В	В	С	В	С	В	
Control Delay (Seconds)	19.8	20.9	28.7	24.7	17.9	14.1	13.4	25.3	13.5	26.3	15.2	0.0
Intersection LOS						C - 2	23.5					
95th Percentile Queue (veh)	0.6	0.7	4.9	3.7	0.2	0.5	1.8	7.9	1.2	5.0	0.6	0.0
QSR	0.1		1.0	0.3		0.0	0.5			0.5		0.0
Existing Storage Length (ft)	120.0		120.0	350.0		600.0	100.0			240.0		150.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AM BUILD Vols. (Veh/hr)	38	36	200	197	11	32	138	708	124	246	98	10
V/C Ratio	0.10	0.13	0.79	0.76	0.03	0.08	0.25	0.78	0.25	0.85	0.11	
Level-of-Service	В	В	С	D	В	В	В	С	В	D	В	
Control Delay (Seconds)	18.7	20.0	28.1	35.1	17.9	14.8	12.7	25.0	14.4	39.3	15.0	0.0
Intersection LOS						C - 2	25.7					
95th Percentile Queue (veh)	0.7	0.7	4.9	3.5	0.2	0.5	2.0	8.1	2.1	5.3	0.8	0.0
QSR	0.1		1.0	0.3		0.0	0.5			0.6		0.0
Existing Storage Length (ft)	120.0	0.0	120.0	350.0	0.0	600.0	100.0	0.0	0.0	240.0	0.0	150.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PM Peak Hour												
PM NO BUILD Vols. (Veh/hr)	43	43	138	287	170	74	91	294	152	81	700	10
V/C Ratio	0.14	0.20	0.72	0.68	0.39	0.17	0.40	0.34	0.24	0.23	0.80	
Level-of-Service	С	С	С	С	В	В	В	В	В	В	С	
	04.4	00.7	00.0	01.0	40.0	45.0	4 - 0	40.0	11.0	4 - 4	07.0	0.0

V/C Ratio	0.14	0.20	0.72	0.68	0.39	0.17	0.40	0.34	0.24	0.23	0.80	
Level-of-Service	С	С	С	С	В	В	В	В	В	В	С	
Control Delay (Seconds)	21.4	23.7	30.3	21.0	18.6	15.3	17.8	18.2	11.0	15.1	27.8	0.0
Intersection LOS						C - 2	22.1					
95th Percentile Queue (veh)	0.9	1.0	3.7	6.0	3.3	1.2	1.6	2.9	2.2	1.3	8.7	0.0
QSR	0.2		0.8	0.4		0.1	0.4			0.1		0.0
Existing Storage Length (ft)	120.0	0.0	120.0	350.0	0.0	600.0	100.0	0.0	0.0	240.0	0.0	150.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PM BUILD Vols. (Veh/hr)	43	46	146	310	170	74	108	341	189	92	723	10
V/C Ratio	0.13	0.21	0.73	0.83	0.41	0.17	0.41	0.38	0.32	0.25	0.83	
Level-of-Service	С	С	С	С	В	В	В	В	В	В	С	
Control Delay (Seconds)	21.1	23.4	30.1	34.1	19.6	15.4	16.6	18.3	12.8	14.5	29.4	0.0
Intersection LOS						C - 2	24.3					
95th Percentile Queue (veh)	0.9	1.0	3.9	8.3	3.4	1.2	1.8	3.3	3.0	1.5	9.2	0.0
QSR	0.2		0.8	0.6		0.1	0.5			0.2		0.0
Existing Storage Length (ft)	120.0	0.0	120.0	350.0	0.0	600.0	100.0	0.0	0.0	240.0	0.0	150.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

September 19, 2023



#### Signalized

	EB (Woodward		WB	(Woodw	ard							
Woodward Rd./Sunport Blvd.	Rd./S	Sunport E	Blvd.)	Rd./S	Sunport I	Blvd.)	NB (B	roadway	Blvd.)	SB (B	roadway	Blvd.)
Broadway Blvd.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1	2>	0	1	1	1	1	2	1	1	2	1
AM Peak Hour												
AM NO BUILD Vols. (Veh/hr)	38	38	229	204	13	38	128	692	75	245	75	11
V/C Ratio	0.10	0.12	0.84	0.81	0.03	0.08	0.23	0.81	0.16	0.75	0.08	
Level-of-Service	С	С	D	D	В	В	В	С	В	С	В	
Control Delay (Seconds)	20.3	21.7	37.3	42.3	18.9	14.0	14.8	30.0	15.4	26.1	16.0	0.0
Intersection LOS						C - 2	28.7					
95th Percentile Queue (veh)	0.8	0.8	7.3	4.4	0.3	0.6	2.2	9.3	1.4	5.7	0.7	0.0
QSR	0.2		1.5	0.3		0.0	0.6			0.6		0.0
Existing Storage Length (ft)	120.0		120.0	350.0		600.0	100.0			240.0		150.0
Additional Storage Length Required (ft)	0.0	0.0	62.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AM BUILD Vols. (Veh/hr)	38	42	238	231	13	38	144	740	128	258	102	11
V/C Ratio	0.10	0.13	0.85	0.87	0.03	0.07	0.27	0.88	0.26	0.86	0.11	
Level-of-Service	С	С	D	D	В	В	В	D	В	D	В	
Control Delay (Seconds)	20.6	22.1	42.3	49.2	18.5	13.7	15.7	36.5	16.7	40.3	17.1	0.0
Intersection LOS						34.2						
95th Percentile Queue (veh)	0.8	0.9	8.2	5.6	0.3	0.6	2.6	10.9	2.6	7.8	1.0	0.0
QSR	0.2		1.7	0.4		0.0	0.7			0.8		0.0
Existing Storage Length (ft)	120.0	0.0	120.0	350.0	0.0	600.0	100.0	0.0	0.0	240.0	0.0	150.0
Additional Storage Length Required (ft)	0.0	0.0	85.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

#### PM Peak Hour

PM NO BUILD Vols. (Veh/hr)	51	51	165	344	204	89	96	309	160	85	735	11
V/C Ratio	0.16	0.21	0.76	0.94	0.50	0.21	0.39	0.34	0.27	0.23	0.81	
Level-of-Service	С	С	С	D	С	В	В	В	В	В	С	
Control Delay (Seconds)	20.8	23.2	30.5	52.9	20.9	16.3	16.9	18.2	12.5	14.5	28.4	0.0
Intersection LOS						C - 3	27.3					
95th Percentile Queue (veh)	1.1	1.1	4.5	8.0	4.3	1.6	1.6	3.0	2.5	1.4	9.2	0.0
QSR	0.2		0.9	0.6		0.1	0.4			0.1		0.0
Existing Storage Length (ft)	120.0	0.0	120.0	350.0	0.0	600.0	100.0	0.0	0.0	240.0	0.0	150.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PM BUILD Vols. (Veh/hr)	51	54	173	367	204	89	113	356	197	96	758	11
V/C Ratio	0.16	0.22	0.79	0.93	0.44	0.19	0.47	0.39	0.31	0.28	0.85	
Level-of-Service	С	С	D	D	С	В	В	С	В	В	С	
Control Delay (Seconds)	23.3	25.9	35.5	51.0	20.6	15.8	19.3	20.7	13.1	16.2	32.8	0.0
Intersection LOS						C - 2	29.1					
95th Percentile Queue (veh)	1.1	1.2	4.7	10.8	4.3	1.5	2.0	3.7	3.3	1.6	10.6	0.0
QSR	0.2		1.0	0.8		0.1	0.5			0.2		0.0
Existing Storage Length (ft)	120.0	0.0	120.0	350.0	0.0	600.0	100.0	0.0	0.0	240.0	0.0	150.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

September 19, 2023

# INTERSECTION 2 – Sunport Blvd. (East/West) /Arno St. (North/South)

(Unsignalized, Future)



**2023 and 2033 LOS Analysis** of this intersection demonstrates that the proposed Love' Sunport Station will not impact the LOS or delays at this intersection. In fact, intersection delays decrease with additional traffic from the development because in the weighted average calculation for delays, traffic is being introduced to movements with LOS=A, thereby improving the overall delay of the intersection.

**2023 and 2033 Queueing Analysis** demonstrates that based on the geometry of the intersection presented on the Sunport Blvd. Extension construction plans, no additional queueing capacity is required. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

**City of Albuquerque Deceleration Lane Warrant Analysis** shows that a westbound left-turn lane with 50-ft of queueing capacity and a 300/150 transition is warranted at this intersection, however, Sunport Blvd. Extension construction plans show a westbound left-turn lane with 150-ft of capacity so no additional capacity is required on the part of the development.

See Appendix pages A-38 thru A-45 for the HCM Synchro reports.



Sunport Blvd.	EB (	Sunport I	Blvd.)	WB (	Sunport I	Blvd.)	N	3 (Arno S	it.)	S	3 (Arno S	it.)
Arno St.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1	2>	0	1	2	1	0	<1>	0	0	<1>	0
AM Peak Hour												
AM NO BUILD Vols. (Veh/hr)	21	330	0	0	213	21	0	2	0	21	2	21
V/C Ratio	0.02							0.01			0.07	
Level-of-Service	Α			Α				В			В	
Control Delay (Seconds)	8.0			0.0				13.2			10.9	
Intersection LOS						B-1	3.2					
95th Percentile Queue (veh)	0.1			0.0				0.0			0.2	
AM BUILD Vols. (Veh/hr)	21	348	41	51	224	21	7	2	34	21	2	21
V/C Ratio	0.02			0.05				0.07			0.08	
Level-of-Service	Α			Α				В			В	
Control Delay (Seconds)	8.1			8.6				11.1			11.9	
Intersection LOS						B-1	1.9					
95th Percentile Queue (veh)	0.1			0.2				0.2			0.3	

PM NO BUILD Vols. (Veh/hr)	32	298	0	0	532	32	0	3	0	31	3	31
V/C Ratio	0.04							0.01			0.14	
Level-of-Service	Α			Α				С			В	
Control Delay (Seconds)	9.2			0.0				16.2			14.2	
Intersection LOS						C-1	6.2					
95th Percentile Queue (veh)	0.1			0.0				0.0			0.5	
Untitled Volumes	32	319	29	44	531	32	6	3	29	31	3	31
V/C Ratio	0.04			0.04				0.07			0.16	
Level-of-Service	Α			Α				В			С	
Control Delay (Seconds)	9.2			8.4				11.6			15.4	
Intersection LOS						B-1	5.4					
95th Percentile Queue (veh)	0.1			0.1				0.2			0.6	

Sunport Blvd.	EB (S	Sunport E	Blvd.)	WB (	Sunport E	Blvd.)	N	B (Arno S	it.)	S	B (Arno S	it.)
Arno St.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1	2>	0	1	2	1	0	<1>	0	0	<1>	0
AM Peak Hour												
AM NO BUILD Vols. (Veh/hr)	25	395	0	0	255	25	0	2	0	24	2	24
V/C Ratio	0.02							0.01			0.08	
Level-of-Service	Α			А				В			В	
Control Delay (Seconds)	8.2			0.0				14.2			11.5	
Intersection LOS				•		<b>B-1</b>	4.2				•	
95th Percentile Queue (veh)	0.1			0.0				0.0			0.3	
AM BUILD Vols. (Veh/hr)	25	413	41	51	266	25	7	2	34	24	2	24
V/C Ratio	0.02			0.05				0.07			0.10	
Level-of-Service	Α			Α				В			В	
Control Delay (Seconds)	8.2			8.8				11.5			12.6	
Intersection LOS						B-1	2.6					
95th Percentile Queue (veh)	0.1			0.1				0.2			0.3	
PM Peak Hour												
PM NO BUILD Vols. (Veh/hr)	38	356	0	0	637	38	0	4	0	36	4	36
V/C Ratio	0.05							0.02			0.19	
Level-of-Service	Α			А				С			С	
Control Delay (Seconds)	9.7			0.0				18.4			16.3	
Intersection LOS						<b>C-1</b>	8.4					
95th Percentile Queue (veh)	0.1			0.0				0.0			0.6	
Untitled Volumes	38	377	29	44	636	38	6	4	29	36	4	36
V/C Ratio	0.05			0.04				0.08			0.22	
Level-of-Service	Α			Α				В			С	
Control Delay (Seconds)	9.7			8.6				12.6			18.0	
Intersection LOS				•		C-1	8.0	-			-	
95th Percentile Queue (veh)	0.1			0.1				0.2			0.7	



Sunport Blvd.	EB (S	Sunport I	3lvd.)	WB (	Sunport I	Blvd.)	N	3 (Arno S	it.)	SI	3 (Arno S	it.)
Arno St.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1	2>	0	1	2	1	0	<1>	0	0	<1>	0
AM Peak Hour												
AM NO BUILD Vols. (Veh/hr)	25	395	0	0	255	25	0	2	0	24	2	24
V/C Ratio	0.02							0.01			0.08	
Level-of-Service	Α			Α				В			В	
Control Delay (Seconds)	8.2			0.0				14.2			11.5	
Intersection LOS						B-1	4.2					
95th Percentile Queue (veh)	0.1			0.0				0.0			0.3	
AM BUILD Vols. (Veh/hr)	25	413	41	51	266	25	7	2	34	24	2	24
V/C Ratio	0.02			0.05				0.07			0.10	
Level-of-Service	Α			Α				В			В	
Control Delay (Seconds)	8.2			8.8				11.5			12.6	
Intersection LOS						B-1	2.6					
95th Percentile Queue (veh)	0.1			0.1				0.2			0.3	

PM NO BUILD Vols. (Veh/hr)	38	356	0	0	637	38	0	4	0	36	4	36
V/C Ratio	0.05							0.02			0.19	
Level-of-Service	Α			Α				С			С	
Control Delay (Seconds)	9.7			0.0				18.4			16.3	
Intersection LOS						C-1	8.4					
95th Percentile Queue (veh)	0.1			0.0				0.0			0.6	
Untitled Volumes	38	377	29	44	636	38	6	4	29	36	4	36
V/C Ratio	0.05			0.04				0.08			0.22	
Level-of-Service	Α			Α				В			С	
Control Delay (Seconds)	9.7			8.6				12.6			18.0	
Intersection LOS						B-1	8.0					
95th Percentile Queue (veh)	0.1			0.1				0.2			0.7	

<u>INTERSECTION 3 – Sunport Blvd. East/West) /I-25 Southbound Ramp (North/South)</u> (Signalized, Existing with Future Improvements)



**2023 and 2033 LOS Analysis** of this intersection demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions. Intersection LOS remains unchanged at LOS=B for the AM and PM conditions. Intersection delays become worse by less than 1 second per vehicle due to the increased traffic from the development. LOS for each movement is D or better for all conditions.

**2023 and 2033 Queueing Analysis** demonstrates that based on the geometry of the intersections presented on the Sunport Blvd. Extension construction plans, no additional queueing capacity is required. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

See Appendix pages A-46 thru A-53 for the HCM Synchro reports.



Signalized

Sunport Blvd.	EB (S	Sunport I	Blvd.)	WB (	Sunport I	Blvd.)	NB (	-25 SB R	amp)	SB (I	-25 SB R	amp)
I-25 SB Ramp	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	0	2	1	1	<2	0	0	0	0	1	<1	1
AM Peak Hour												
AM NO BUILD Vols. (Veh/hr)	0	298	32	53	159	0	0	0	0	617	10	73
V/C Ratio	0.00	0.66	0.16	0.24	0.19	0.00				0.38	0.00	0.10
Level-of-Service	Α	С	С	С	В	Α				Α	Α	Α
Control Delay (Seconds)	0.0	25.8	22.7	20.1	16.7	0.0				8.1	0.0	6.7
Intersection LOS						<b>B</b> - 1	14.3					
95th Percentile Queue (veh)	0.0	3.5	0.7	1.0	1.4	0.0				3.4	0.0	0.7
QSR			0.1	0.1						0.1		0.0
Existing Storage Length (ft)			150.0	275.0						675.0		675.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
AM BUILD Vols. (Veh/hr)	0	333	59	53	194	0	0	0	0	617	10	100
V/C Ratio	0.00	0.68	0.27	0.24	0.22	0.00				0.39	0.00	0.14
Level-of-Service	Α	С	С	В	Α	Α				Α	Α	Α
Control Delay (Seconds)	0.0	25.3	22.7	18.8	9.5	0.0				8.6	0.0	7.3
Intersection LOS			-			B - 1	13.7					
95th Percentile Queue (veh)	0.0	3.8	1.3	1.0	1.0	0.0				3.6	0.0	1.0
QSR			0.2	0.1						0.1		0.0
Existing Storage Length (ft)			150.0	275.0						675.0		675.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

PM NO BUILD Vols. (Veh/hr)	0	255	43	244	351	0	0	0	0	408	10	178
V/C Ratio	0.00	0.63	0.24	0.63	0.31	0.00				0.30	0.00	0.29
Level-of-Service	Α	С	С	С	Α	Α				В	А	В
Control Delay (Seconds)	0.0	26.2	24.0	21.3	5.5	0.0				10.6	0.0	10.7
Intersection LOS						В-1	14.2					
95th Percentile Queue (veh)	0.0	3.0	1.0	4.8	1.1	0.0				2.7	0.0	2.4
QSR			0.2	0.4						0.1		0.1
Existing Storage Length (ft)			150.0	275.0						675.0		675.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Untitled Volumes	0	285	66	244	381	0	0	0	0	408	10	201
V/C Ratio	0.00	0.65	0.34	0.63	0.33	0.00				0.31	0.00	0.34
Level-of-Service	Α	С	С	С	Α	Α				В	А	В
Control Delay (Seconds)	0.0	25.8	24.0	20.9	5.0	0.0				11.1	0.0	11.4
Intersection LOS						В-1	14.3					
95th Percentile Queue (veh)	0.0	3.3	1.5	4.7	1.1	0.0				2.8	0.0	2.8
QSR			0.3	0.4						0.1		0.1
Existing Storage Length (ft)			150.0	275.0						675.0		675.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



#### Signalized

Sunport Blvd.	EB (S	Sunport I	Blvd.)	WB (	Sunport I	Blvd.)	NB (I	-25 SB R	amp)	SB (	-25 SB R	lamp)
I-25 SB Ramp	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	0	2	1	1	<2	0	0	0	0	1	<1	1
AM Peak Hour												
AM NO BUILD Vols. (Veh/hr)	0	356	38	64	191	0	0	0	0	705	12	84
V/C Ratio	0.00	0.69	0.17	0.85	0.20	0.00				0.46	0.00	0.12
Level-of-Service	Α	С	С	D	В	Α				Α	Α	Α
Control Delay (Seconds)	0.0	25.1	21.6	50.3	15.3	0.0				9.7	0.0	7.9
Intersection LOS						<b>B</b> - 1	16.3					
95th Percentile Queue (veh)	0.0	4.1	0.8	2.4	1.6	0.0				4.5	0.0	0.9
QSR			0.1	0.2						0.2		0.0
Existing Storage Length (ft)			150.0	275.0						675.0		675.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
AM BUILD Vols. (Veh/hr)	0	391	65	64	226	0	0	0	0	705	12	111
V/C Ratio	0.00	0.68	0.25	0.25	0.22	0.00				0.50	0.00	0.17
Level-of-Service	Α	С	В	В	Α	Α				В	Α	A
Control Delay (Seconds)	0.0	22.2	19.5	15.9	6.6	0.0				10.4	0.0	8.6
Intersection LOS				-		B - 1	13.3		-			
95th Percentile Queue (veh)	0.0	4.0	1.2	1.0	0.8	0.0				4.5	0.0	1.2
QSR			0.2	0.1						0.2		0.0
Existing Storage Length (ft)			150.0	275.0						675.0		675.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

PM NO BUILD Vols. (Veh/hr)	0	306	51	293	420	0	0	0	0	466	12	203
V/C Ratio	0.00	0.66	0.25	0.76	0.36	0.00				0.36	0.00	0.35
Level-of-Service	Α	С	С	С	Α	Α				В	Α	В
Control Delay (Seconds)	0.0	25.6	23.0	26.9	4.7	0.0				11.6	0.0	11.8
Intersection LOS						В-1	15.3					
95th Percentile Queue (veh)	0.0	3.6	1.1	6.3	1.1	0.0				3.4	0.0	2.9
QSR			0.2	0.6						0.1		0.1
Existing Storage Length (ft)			150.0	275.0						675.0		675.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Untitled Volumes	0	336	74	293	450	0	0	0	0	466	12	226
V/C Ratio	0.00	0.67	0.33	0.76	0.37	0.00				0.37	0.00	0.40
Level-of-Service	Α	С	С	С	Α	Α				В	Α	В
Control Delay (Seconds)	0.0	25.2	23.1	26.0	4.1	0.0				12.1	0.0	12.6
Intersection LOS						B - 1	15.2					
95th Percentile Queue (veh)	0.0	3.9	1.6	6.1	1.1	0.0				3.5	0.0	3.4
QSR			0.3	0.6						0.1		0.1
Existing Storage Length (ft)			150.0	275.0						675.0		675.0
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

<u>INTERSECTION 4 – Sunport Blvd. (East/West) / I-25 Northbound Ramp (North/South)</u> Signalized, Existing



**2023 and 2033 LOS Analysis** of this intersection demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions. Intersection LOS remains unchanged at LOS=B for the NO BUILD and BUILD conditions with less than 1 second per vehicle increase in delay. LOS for each movement is C or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions.

**2023 and 2033 Queueing Analysis** demonstrates that based on the geometry of the intersections presented on the Sunport Blvd. Extension construction plans, no additional queueing capacity is required. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

See Appendix pages A-54thru A-61 for the HCM Synchro reports.



Signalized												
Sunport Blvd.	EB (	Sunport I	Blvd.)	WB (	Sunport	Blvd.)	NB (1	-25 NB F	lamp)	SB (1	I-25 NB F	Ramp)
1-25 NB Ramp	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1	2	0	0	3	1	0	<1	1	0	0	0
AM Peak Hour												
AM NO BUILD Vols. (Veh/hr)	106	819	0	0	149	415	65	2	161	0	0	0
V/C Ratio	0.27	0.77	0.00	0.00	0.18		0.09	0.00				
Level-of-Service	В	В	Α	Α	С		Α	Α				
Control Delay (Seconds)	16.6	18.8	0.0	0.0	20.7	0.0	9.2	0.0	0.0			
Intersection LOS						B - 1	18.2					
95th Percentile Queue (veh)	1.8	7.8	0.0	0.0	1.0	0.0	0.8	0.0	0.0			
QSR	0.5	0.7		0.0		0.0	0.0		0.0			
Existing Storage Length (ft)	100.0	300.0		150.0		280.0	900.0		690.0			
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AM BUILD Vols. (Veh/hr)	127	832	0	0	162	415	86	2	161	0	0	0
V/C Ratio	0.34	0.84	0.00	0.00	0.25		0.12	0.00				
Level-of-Service	В	В	Α	Α	С		Α	Α				
Control Delay (Seconds)	16.5	11.9	0.0	0.0	22.9	0.0	8.5	0.0	0.0			
Intersection LOS	B - 13.7									•		
95th Percentile Queue (veh)	2.1	4.3	0.0	0.0	1.1	0.0	1.1	0.0	0.0			
QSR	0.5	0.4		0.0		0.0	0.0		0.0			
Existing Storage Length (ft)	100.0	300.0		150.0		280.0	900.0		690.0			
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

N/L	Dook	Hour	
111	L Cav	I IUUI	
	М	M Peak	M Peak Hour

PM NO BUILD Vols. (Veh/hr)	64	606	0	0	542	819	54	2	65	0	0	0
V/C Ratio	0.25	0.59	0.00	0.00	0.65		0.08	0.00				
Level-of-Service	В	В	Α	Α	С		Α	Α				
Control Delay (Seconds)	17.5	17.0	0.0	0.0	23.4	0.0	8.6	0.0	0.0			
Intersection LOS						B - '	19.4					
95th Percentile Queue (veh)	1.1	5.6	0.0	0.0	4.0	0.0	0.7	0.0	0.0			
QSR	0.3	0.5		0.0		0.0	0.0		0.0			
Existing Storage Length (ft)	100.0	300.0		150.0		280.0	900.0		690.0			
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Untitled Volumes	82	617	0	0	553	819	72	2	65	0	0	0
V/C Ratio	0.30	0.59	0.00	0.00	0.66		0.10	0.00				
Level-of-Service	В	В	Α	Α	С		Α	Α				
Control Delay (Seconds)	17.4	16.6	0.0	0.0	23.3	0.0	9.1	0.0	0.0			
Intersection LOS						В-1	19.0					
95th Percentile Queue (veh)	1.4	5.6	0.0	0.0	4.0	0.0	0.9	0.0	0.0			
QSR	0.4	0.5		0.0		0.0	0.0		0.0			
Existing Storage Length (ft)	100.0	300.0		150.0		280.0	900.0		690.0			
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

September 19, 2023



#### Signalized

Sunport Blvd.	EB (	Sunport I	Blvd.)	WB (	Sunport	Blvd.)	NB (1	-25 NB F	Ramp)	SB (1	-25 NB F	tamp)
1-25 NB Ramp	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1	2	0	0	3	1	0	<1	1	0	0	0
AM Peak Hour												
AM NO BUILD Vols. (Veh/hr)	127	980	0	0	178	496	80	3	199	0	0	0
V/C Ratio	0.31	0.88	0.00	0.00	0.21		0.12	0.00				
Level-of-Service	В	В	Α	Α	С		Α	Α				
Control Delay (Seconds)	14.7	11.0	0.0	0.0	20.6	0.0	9.7	0.0	0.0			
Intersection LOS					•	В-	12.5		•		•	•
95th Percentile Queue (veh)	2.0	4.3	0.0	0.0	1.2	0.0	1.0	0.0	0.0			
QSR	0.5	0.4		0.0		0.0	0.0		0.0			
Existing Storage Length (ft)	100.0	300.0		150.0		280.0	900.0		690.0			
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AM BUILD Vols. (Veh/hr)	148	993	0	0	191	496	101	3	199	0	0	0
V/C Ratio	0.34	0.81	0.00	0.00	0.18		0.17	0.00				
Level-of-Service	В	В	Α	Α	В		В	Α				
Control Delay (Seconds)	14.1	16.9	0.0	0.0	16.7	0.0	11.4	0.0	0.0			
Intersection LOS						В-	16.2					-
95th Percentile Queue (veh)	2.1	8.1	0.0	0.0	1.0	0.0	1.5	0.0	0.0			
QSR	0.5	0.7		0.0		0.0	0.0		0.0			
Existing Storage Length (ft)	100.0	300.0		150.0		280.0	900.0		690.0			
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PM Peak Hour												
PM NO BUILD Vols. (Veh/hr)	64	726	0	0	649	980	66	3	80	0	0	0
V/C Ratio	0.25	0.66	0.00	0.00	0.69		0.10	0.00				İ

PM NO BUILD Vois. (Veh/hr)	64	726	0	0	649	980	66	3	80	0	0	0
V/C Ratio	0.25	0.66	0.00	0.00	0.69		0.10	0.00				
Level-of-Service	В	В	Α	Α	С		А	Α				
Control Delay (Seconds)	16.6	16.6	0.0	0.0	22.6	0.0	9.6	0.0	0.0			
Intersection LOS						B - 1	18.9					
95th Percentile Queue (veh)	1.1	6.6	0.0	0.0	4.7	0.0	0.9	0.0	0.0			
QSR	0.3	0.6		0.0		0.0	0.0		0.0			
Existing Storage Length (ft)	100.0	300.0		150.0		280.0	900.0		690.0			
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Untitled Volumes	94	737	0	0	660	980	84	3	80	0	0	0
V/C Ratio	0.34	0.64	0.00	0.00	0.69		0.13	0.00				
Level-of-Service	В	В	Α	Α	С		В	Α				
Control Delay (Seconds)	16.6	15.9	0.0	0.0	22.5	0.0	10.3	0.0	0.0			
Intersection LOS						B - 1	18.4					
95th Percentile Queue (veh)	1.6	6.5	0.0	0.0	4.8	0.0	1.2	0.0	0.0			
QSR	0.4	0.5		0.0		0.0	0.0		0.0			
Existing Storage Length (ft)	100.0	300.0		150.0		280.0	900.0		690.0			
Additional Storage Length Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

<u>INTERSECTION 5 – Driveway 'A' (East/West) / Arno St. (North/South)</u> Unsignalized, Proposed, Enter Only



Driveway 'A' is a proposed **entrance-only driveway** to be located on the west side of Arno St. S., 384ft south of Sunport Blvd. (centerline to centerline) which meets the access spacing requirement of the COA DPM.

**2023 and 2033 LOS Analysis** of this intersection demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. Intersection LOS is LOS=A for the BUILD conditions.

**2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at this intersection. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

**City of Albuquerque Deceleration Lane Warrant Analysis** shows that a southbound right-turn lane 240-ft long including a 300/150 transition is warranted at this intersection, however, inspection of survey maps and aerial images indicate that there may be insufficient ROW north of Driveway 'A' to construct a deceleration lane. Further field inspection and title searches is required to establish the location of the ROW prior to construction of the lane.

See Appendix pages A-62 thru A-65 for the HCM Synchro reports.



Driveway 'A'	EB	(Driveway	'A')	WB	(Driveway	'A')	N	IB (Arno S	t.)	S	B (Arno St	)
Arno St.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1>		0				0	<1			1>	0
AM Peak Hour												
AM BUILD Vols. (Veh/hr)	0		0				0	27			19	61
V/C Ratio												
Level-of-Service	Α						Α					
Control Delay (Seconds)	0.0						0.0					
Intersection LOS	A-0.0											
95th Percentile Queue (veh)							0.0					

PM BUILD Vols. (Veh/hr)	0		0				0	23			16	53	
V/C Ratio													
Level-of-Service	Α						Α						
Control Delay (Seconds)	0.0						0.0						
Intersection LOS	A-0.0												
95th Percentile Queue (veh)							0.0						



Driveway 'A'	EB	(Driveway	'A')	WB	(Driveway	'A')	N	IB (Arno S	t.)	S	B (Arno St	)
Arno St.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1>		0				0	<1			1>	0
AM Peak Hour												
AM BUILD Vols. (Veh/hr)	0		0				0	27			19	61
V/C Ratio												
Level-of-Service	Α						Α					
Control Delay (Seconds)	0.0						0.0					
Intersection LOS	A-0.0											
95th Percentile Queue (veh)							0.0					

PM BUILD Vols. (Veh/hr)	0		0				0	23			16	53	
V/C Ratio													
Level-of-Service	Α						Α						
Control Delay (Seconds)	0.0						0.0						
Intersection LOS	A-0.0												
95th Percentile Queue (veh)							0.0						

<u>INTERSECTION 6 – Driveway 'B' (East/West) /Arno St. (North/South)</u> Unsignalized, Proposed, Full-Access



Driveway 'B' is a proposed **entrance-only driveway** to be located on the west side of Arno St. S., 181ft south of Driveway 'A' (centerline to centerline), or 585-ft south of Sunport Blvd. (centerline to centerline) which meets the requirements stated in the COA DPM.

**2023 and 2033 LOS Analysis** of this intersection demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. Intersection LOS is LOS=A for the BUILD conditions.

**2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at this intersection. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

**City of Albuquerque Deceleration Lane Warrant Analysis** shows that no deceleration lanes are warranted at Driveway 'B'.

See Appendix pages A-66 thru A-69 for the HCM Synchro reports.



Driveway 'B'	EB (Driveway 'B')			WB	(Driveway	/ 'B')	N	3 (Arno S	St.)	S	B (Arno S	St.)
Arno St.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1>		0				0	<1			1>	0
AM Peak Hour												
AM BUILD Vols. (Veh/hr)	41		0				0	0			0	33
V/C Ratio	0.05											
Level-of-Service	Α						А					
Control Delay (Seconds)	9.2						0.0					
Intersection LOS	A-9.2											
95th Percentile Queue (veh)	0.1						0.0					

PM BUILD Vols. (Veh/hr)	41		0				0	0			0	33
V/C Ratio	0.05											
Level-of-Service	Α						Α					
Control Delay (Seconds)	9.2						0.0					
Intersection LOS	A-9.2											
95th Percentile Queue (veh)	0.1						0.0					



Driveway 'B'	EB	(Driveway	/ 'B')	WB	(Driveway	y 'B')	N	3 (Arno S	St.)	S	B (Arno S	St.)
Arno St.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	1>		0				0	<1			1>	0
AM Peak Hour												
AM BUILD Vols. (Veh/hr)	41		0				0	0			0	33
V/C Ratio	0.04											
Level-of-Service	А						Α					
Control Delay (Seconds)	9.2						0.0					
Intersection LOS	A-9.2											
95th Percentile Queue (veh)	0.1						0.0					

PM BUILD Vols. (Veh/hr)	35		0				0	0			0	30
V/C Ratio	0.04											
Level-of-Service	Α						Α					
Control Delay (Seconds)	9.2						0.0					
Intersection LOS	A-9.2											
95th Percentile Queue (veh)	0.1						0.0					

<u>INTERSECTION 7 – Driveway 'C' (East/West) / Broadway Blvd. (North/South)</u> Unsignalized, Existing, Right-in/Right-out



Driveway 'C' is currently a full access driveway. For the new development it is proposed as restricted access (right-in/right-out only) driveway located on the east side of Broadway Blvd., 231-ft south of Broadway Blvd. (centerline to centerline).

**2023 and 2033 LOS Analysis** of these intersections demonstrate that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions. LOS=B for the intersection and all movements in the intersection.

**2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at these intersections. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

NMDOT Deceleration Lane Warrant Analysis shows that no turn lanes are warranted at Driveway 'C'.

See Appendix pages A-70 thru A-73 for the HCM Synchro reports.



Driveway 'C'	EB	(Driveway	/ 'C')	WB	(Driveway	y 'C')	NB (B	roadway	Blvd.)	SB (B	roadway	Blvd.)
Broadway Blvd.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry				0		1		2	1	0	2	
AM Peak Hour												
AM BUILD Vols. (Veh/hr)				0		142		853	3	0	479	
V/C Ratio						0.31						
Level-of-Service						С						
Control Delay (Seconds)						16.2						
Intersection LOS	C-16.2											
95th Percentile Queue (veh)						1.3						

PM BUILD Vols. (Veh/hr)				0		108		538	2	0	1,160	
V/C Ratio						0.18						
Level-of-Service						В						
Control Delay (Seconds)						12.3						
Intersection LOS	B-12.3											
95th Percentile Queue (veh)						0.6						



Driveway 'C'	EB	(Driveway	/ 'C')	WB	(Driveway	/ 'C')	NB (B	roadway	Blvd.)	SB (B	roadway	Blvd.)
Broadway Blvd.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry				0		1		2	1	0	2	
AM Peak Hour												
AM BUILD Vols. (Veh/hr)				0		142		895	3	0	500	
V/C Ratio						0.32						
Level-of-Service						С						
Control Delay (Seconds)						16.8						
Intersection LOS	B-16.8											
95th Percentile Queue (veh)	1.4											

PM BUILD Vols. (Veh/hr)				0		108		564	2	0	1,215	
V/C Ratio						0.18						
Level-of-Service						В						
Control Delay (Seconds)						12.5						
Intersection LOS	B-12.5											
95th Percentile Queue (veh)						0.7						

<u>INTERSECTION 8 – Driveway 'D' (East/West) / Broadway Blvd. (North/South)</u> Unsignalized, Proposed, Full access.



Driveway 'D' is a proposed full-access driveway located on the east side of Broadway Blvd., 299-ft south of Driveway 'C' (centerline to centerline), 530-ft south of Sunport Blvd. (centerline to centerline).

**2023 and 2033 LOS Analysis** of these intersections demonstrate that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions. LOS=C for the intersection and LOS=C or better for all movements in the intersection.

**2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at these intersections. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

**NMDOT Deceleration Lane Warrant Analysis** shows that a southbound left-turn lane, 250-ft long plus an 8:1 taper transition and a northbound right-turn lane, 230-ft long (including transition) are warranted at the Driveway 'D' Intersection.

See Appendix pages A-74 thru A-77 for the Synchro reports.



onaighailzea												
Driveway 'D'	EB (	Drivewa	y 'D')	WB (	Drivewa	y 'D')	NB (B	roadway	Blvd.)	SB (Bi	roadway	Blvd.)
Broadway Blvd.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry				1		1		2	1	1	2	
AM Peak Hour			_									
AM BUILD Vols. (Veh/hr)				19		8		856	16	63	416	
V/C Ratio	1			0.07		0.01		-		0.08		
Level-of-Service				С		В				B		
Control Delay (Seconds)				18.6		11.3				10.1		
Intersection LOS	C-18.6											
95th Percentile Queue (veh)				0.2		0.0	-			0.3		

PM BUILD Vols. (Veh/hr)	16	7	540	14	54	1,106	
V/C Ratio	0.05	0.01			0.05		
Level-of-Service	C	B			Α		
Control Delay (Seconds)	17.6	10.0			8.8		
Intersection LOS	an an	C-17.6	0.	S	W		
95th Percentile Queue (veh)	0.2	0.0			0.2		



Driveway 'D'	EB	(Driveway	/ 'D')	WB	(Driveway	y 'D')	NB (B	roadway	Blvd.)	SB (B	roadway	Blvd.)
Broadway Blvd.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry				1		1		2	1	1	2	
AM Peak Hour												
AM BUILD Vols. (Veh/hr)				51		35		836	78	95	405	
V/C Ratio				0.19		0.06				0.13		
Level-of-Service				С		В				В		
Control Delay (Seconds)				21.1		11.6				10.6		
Intersection LOS	C-21.1											
95th Percentile Queue (veh)				0.7		0.2				0.4		

PM BUILD Vols. (Veh/hr)		68		19		541	39	106	1,109	
V/C Ratio		0.26		0.03				0.11		
Level-of-Service		С		В				Α		
Control Delay (Seconds)		23.6		10.1				9.1		
Intersection LOS	C-23.6									
95th Percentile Queue (veh)		1.0		0.1				0.4		

<u>INTERSECTION 9 – Rio Bravo Blvd../Broadway Blvd</u> (Signalized, Existing)



**2023 LOS Analysis** of Intersection 9 demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions; LOS remains the same for the NO BUILD and BUILD conditions. LOS also remains the same for all movements in the intersection. The eastbound left turn movement has LOS=E for the NO BUILD and BUILD conditions.

**2033 LOS Analysis** of Intersection 9 demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions; LOS and delays remain the same for the NO BUILD and BUILD conditions. Based on the analysis, by 2033, NO BUILD conditions at the intersection degrade significantly (LOS=F) especially during the PM peak hour. EBL, EBT, WBL, WBR and NBT movements will have LOS=E or F.

**2023 and 2033 Queueing Analysis** demonstrates that additional queueing capacity is required at this intersection for most of the turn lanes by 2033. V/C ratios (a measure of congestion) are less than 1 for all movements except for the WBT approach during the PM peak hour in 2033. Lane capacities are less than calculated queues for the NBR, SBL, and SBR turn lanes. But these are existing problems not made significantly worse by the development so no mitigation is recommended by the development.

**Mitigation:** The poor LOS and queuing issues revealed in the 2023 and 2033 HCM analysis are existing problems not made significantly worse by the development, so no mitigation is recommended by the development. However, a mitigated case has been provided to the NMDOT as a courtesy to demonstrate that LOS and queuing conditions improve if signal phasing for the Eastbound Left-turn (EBL) and Westbound Left-turn (WBL) movements are changed from "Protected" to "Permitted/Protected". Since dual lefts are not recommended for this type of phasing, the WBL and EBL geometry would have to be reduced from dual left-turn lanes to single left-turn lanes. Queuing issues for the for the NBR are resolved and EBL and WBL capacities remain adequate with the proposed mitigation, however the SBL and SBR queue capacities remain insufficient, and the V/C ratio remains >1 for the WBT movement.

See Appendix pages A-78 thru A-89 for the full HCS reports.

2023 BUILD







Signalized					2023							
Rio Bravo Blvd.	EB (F	Rio Bravo I	Blvd.)	WB (I	Rio Bravo	Blvd.)	NB (	Broadway	Blvd.)	SB (E	Broadway	Blvd.)
Broadway Blvd.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	2	3	1	2	3	1	1	2	1	1	2	1
AM Peak Period (7:00-7:15 AM)												
AM NO BUILD Demand Vols.		4 004	100		500			100	004	50		
(Ven/nr)	116	1,304	160	392	596	44	80	120	284	56	112	68
V/C Ratio	0.67	0.58	0.21 P	0.85	0.22 P	0.05	0.27	0.22	0.62	0.21	0.23	0.23
Control Delay (Seconds)	57.6	26.4	D 17 9	52.5	D 15.7	D 12.1	41.5	44.6	39.2	42.3	46.0	41.3
Intersection LOS	57.0	20.4	11.5	52.5	15.7	C-3	31.4	44.0	00.2	42.0	40.0	41.0
95th Percentile Queue (veh)	3.2	0.0	4.7	9.9	0.0	0.0	3.5	0.0	11.6	2.5	0.0	3.1
QSR	0.3	0.0	0.5	0.7	0.0	0.0	0.2	0.0	0.4	0.6	0.0	0.2
Existing Storage Length (ft)	275.0	0.0	250.0	380.0	0.0	0.0	580.0	0.0	725.0	100.0	0.0	425.0
Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AM Peak Period (7:00-7:15 AM)												
AM BUILD Demand Vols.												
(Veh/hr)	132	1,304	160	392	596	44	80	124	284	56	116	84
V/C Ratio	0.69	0.56	0.20	0.85	0.22	0.05	0.30	0.26	0.66	0.24	0.27	0.30
Level-of-Service	E	С	В	D	В	В	D	D	D	D	D	D
Control Delay (Seconds)	57.3	24.8	16.7	52.5	14.9	11.4	43.2	46.5	42.1	44.1	48.0	43.1
Intersection LOS	2.0	0.0	4.5	0.0	0.0	C-3	31.3	0.0	40.0	0.0	0.0	
95th Percentile Queue (ven)	3.6	0.0	4.5	9.9	0.0	0.0	3.7	0.0	12.2	2.6	0.0	3.9
USK Evicting Starsge Longth (#)	0.3	0.0	0.5	0.7	0.0	0.0	0.2	0.0	0.4	0.6	0.0	0.2
Required (ff)	275.0	0.0	250.0	360.0	0.0	0.0	0.0	0.0	125.0	0.0	0.0	425.0
Mitigage Lane Geometry	0.0	3	0.0	0.0	3	1	0.0	2	0.0	0.0	2	0.0
AM BLIII D Demand Vols	132	1 304	160	392	596	44	80	124	284	56	116	84
V/C Ratio	0.26	0.61	0.21	0.93	0.23	0.05	0.28	0.23	0.59	0.22	0.23	0.27
Level-of-Service	B	C	В	D	В	В	D	D	D	D	D	D
Control Delay (Seconds)	17.5	28.1	19.1	40.0	16.2	12.5	41.5	44.7	36.8	42.3	46.1	40.9
Intersection LOS		1		4		C-2	29.2	ļ	1			
95th Percentile Queue (veh)	3.6	0.0	4.9	12.6	0.0	0.0	3.5	0.0	11.3	2.5	0.0	3.7
QSR	0.3	0.0	0.5	0.8	0.0	0.0	0.2	0.0	0.4	0.6	0.0	0.2
Existing Storage Length (ft)	275.0	0.0	250.0	380.0	0.0	0.0	580.0	0.0	725.0	100.0	0.0	425.0
Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PM Peak Period (4:30-4:45pm)	140	644	02	260	1 1 1 4	26	220	160	260	44	10/	120
PM NO BUILD Demand Vols.	0.71	0.21	92	260	1,144	30	228	0.20	300	44	0.29	132
	0.71	0.31	0.11	0.79	0.51	0.05	0.59	0.20	0.70	0.15	0.30	0.42
Control Delay (Seconds)	57.0	24.5	14.2	54.8	24.9	17.1	36.7	37.4	36.1	42.6	47.3	42.5
Intersection LOS	01.0	21.0	11.2	01.0	21.0	C-3	32.8	01.1	00.1	12.0	11.0	12.0
95th Percentile Queue (veh)	4.1	0.0	2.3	7.0	0.0	0.0	9.3	0.0	13.9	2.0	0.0	6.1
QSR	0.4	0.0	0.2	0.5	0.0	0.0	0.4	0.0	0.5	0.5	0.0	0.4
Existing Storage Length (ft)	275.0	0.0	250.0	380.0	0.0	0.0	580.0	0.0	725.0	100.0	0.0	425.0
Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PM Peak Period (4:30-4:45pm)												
PM BUILD Demand Vols.	164	644	92	260	1,144	36	228	164	360	44	188	148
V/C Ratio	0.72	0.31	0.14	0.79	0.52	0.05	0.59	0.20	0.70	0.15	0.38	0.46
Level-of-Service	E	C	C	D	С	В	D	D	D	D	D	D
Control Delay (Seconds)	56.6	24.6	22.9	54.7	25.5	17.5	36.7	37.4	36.1	42.5	47.3	42.4
05th Perceptile Queue (yeb)	4.5	0.0	2.1	7.0	0.0	0.0	33.3	0.0	12.6	2.0	0.0	6.8
	4.5	0.0	0.3	0.5	0.0	0.0	9.3	0.0	0.5	0.5	0.0	0.0
Existing Storage Length (ft)	275.0	0.0	250.0	380.0	0.0	0.0	580.0	0.0	725.0	100.0	0.0	425.0
Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mitigage Lane Geometry	1	3	1	1	3	1	1	2	1	1	2	1
PM Peak Period (5:00-5:15pm)												
PM BUILD Demand Vols.	112	592	64	152	920	20	200	152	440	60	184	192
V/C Ratio	0.37	0.32	0.09	0.35	0.46	0.03	0.45	0.15	0.77	0.15	0.24	0.45
Level-of-Service	С	С	В	С	С	В	С	С	D	С	D	D
Control Delay (Seconds)	22.9	27.8	18.0	20.7	27.8	19.9	30.6	32.6	35.2	35.0	39.2	36.8
Intersection LOS						C-2	29.9	. <u> </u>				
95th Percentile Queue (veh)	3.5	0.0	1.8	4.6	0.0	0.0	7.7	0.0	16.2	2.4	0.0	8.2
QSR	0.3	0.0	0.2	0.3	0.0	0.0	0.3	0.0	0.6	0.6	0.0	0.5
Existing Storage Length (ft)	275.0	0.0	250.0	380.0	0.0	0.0	580.0	0.0	725.0	100.0	0.0	425.0
Required (#)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	U.U	0.0	0.0	0.0	U.U	U.U	U.U	U.U	U.U	U.U	0.0	U.U

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Love's Sunport Station Traffic Impact Study



Unsignalized				2	033							
Rio Bravo Blvd.	EB (F	Rio Bravo I	Blvd.)	WB (	Rio Bravo	Blvd.)	NB (E	Broadway	Blvd.)	SB (I	Broadway	Blvd.)
Broadway Blvd.	L	Т	R	L	Т	R	L	Т	R	L	Т	R
Existing Lane Geometry	2	3	1	1	3	1	1	2	1	1	2	1
AM Peak Period (7:00-7:15 AM)												
AM NO BUILD Demand Vols.												
(Veh/hr)	136	1,512	184	456	692	52	84	128	300	60	116	72
V/C Ratio	0.69	0.68	0.24	0.87	0.26	0.06	0.31	0.27	0.66	0.25	0.27	0.26
Level-of-Service	E	D	В	D	В	В	D	D	D	D	D	D
Control Delay (Seconds)	57.2	28.7	18.2	53.8	15.4	11.4	43.3	46.8	40.6	44.2	48.2	42.9
Intersection LOS						C-3	32.5					
95th Percentile Queue (veh)	3.7	0.0	5.5	11.2	0.0	0.0	3.7	0.0	12.5	2.8	0.0	3.2
QSR	0.3	0.0	0.6	0.7	0.0	0.0	0.2	0.0	0.4	0.7	0.0	0.2
Existing Storage Length (ft)	275.0	0.0	250.0	380.0	0.0	0.0	580.0	0.0	725.0	100.0	0.0	425.0
Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AM BUILD Demand Vols.												
(Veh/hr)	152	1,512	184	456	692	52	84	132	300	60	120	88
V/C Ratio	0.71	0.68	0.24	0.87	0.26	0.06	0.31	0.28	0.66	0.25	0.28	0.31
Level-of-Service	E	C	B	D	В	B	D	D	D	D	D	D
Control Delay (Seconds)	56.8	28.7	18.2	53.8	15.7	11.7	43.3	46.9	40.6	44.2	48.3	42.8
	10			44.0		C-3	02.8		10.5			
95th Percentile Queue (ven)	4.2	0.0	5.5	11.2	0.0	0.0	3.7	0.0	12.5	2.8	0.0	4.1
USR	0.4	0.0	0.6	0.7	0.0	0.0	0.2	0.0	0.4	0.7	0.0	0.2
Existing Storage Length (it)	275.0	0.0	250.0	360.0	0.0	0.0	0.00	0.0	725.0	100.0	0.0	425.0
Mitaga Long Coometry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AM PLIL D Demand Vala	150	J 1 510	10/	456	00	50	94	120	200	60	120	00
AW BUILD Demand Vols.	102	1,512	0.27	400	0.26	52 0.06	04	0.28	300	0.25	0.28	00
	0.55	0.79	0.27	0.95	0.20	0.00	0.31	0.20	0.04	0.25	0.20	0.29
Control Dolay (Seconds)	20.3	26.7	23.1	E 59.7	D 16.2	D 12.1	/2 2	16.0	22.1	44.2	19.3	12.0
	20.3	30.7	20.1	30.7	10.2	12.1 C-3	40.0	40.5	JZ. 1	44.2	40.5	42.0
	16	0.0	63	22.3	0.0	0.0	27	0.0	11.0	2.8	0.0	3.0
OSR	0.4	0.0	0.0	1.5	0.0	0.0	0.2	0.0	0.4	0.7	0.0	0.0
Existing Storage Length (ft)	275.0	0.0	250.0	380.0	0.0	0.0	580.0	0.0	725.0	100.0	0.0	425.0
Required (ft)	0.0	0.0	0.0	201.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PM Peak Period (4:15-4:30pm)												
PM NO BUILD Demand Vols.	88	684	120	172	1,552	12	340	288	740	172	672	548
V/C Ratio	0.64	0.56	0.21	0.60	1.07	0.02	0.85	0.21	0.99	0.35	0.60	0.97
Level-of-Service	E	D	С	D	F	С	D	С	F	С	D	E
Control Delay (Seconds)	59.4	41.8	27.0	53.8	89.1	27.0	49.6	24.3	114.6	27.1	35.2	68.9
Intersection LOS						E - (	66.8					
95th Percentile Queue (veh)	5.1	0.0	3.8	7.6	0.0	0.0	16.9	0.0	35.7	6.2	0.0	20.7
QSR	0.5	0.0	0.4	0.5	0.0	0.0	0.7	0.0	1.23	1.6	0.0	1.2
Existing Storage Length (ft)	275.0	0.0	250.0	380.0	0.0	0.0	580.0	0.0	725.0	100.0	0.0	425.0
Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	166.8	56.0	0.0	93.5
PM BUILD Demand Vols.	104	684	120	172	1,552	12	340	292	740	172	676	564
V/C Ratio	0.67	0.56	0.21	0.60	1.09	0.02	0.85	0.21	0.99	0.35	0.60	0.99
Level-of-Service	E	D	С	E	F	С	D	С	F	С	D	E
Control Delay (Seconds)	65.8	41.8	27.0	55.5	97.2	27.4	51.4	24.3	106.1	27.1	35.6	75.2
Intersection LOS						E - (	68.8					
95th Percentile Queue (veh)	3.2	0.0	4.5	4.7	0.0	0.0	13.9	0.0	43.8	6.0	0.0	29.2
USR	0.3	0.0	0.5	0.3	0.0	0.0	0.6	0.0	1.51	1.5	0.0	1.7
Existing Storage Length (tt)	275.0	0.0	250.0	380.0	0.0	0.0	580.0	0.0	725.0	100.0	0.0	425.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	369.8	51.0	0.0	306.0
	1	3	1	470	3	1	1	2	740	470	2	1
AM BUILD Demand Vols.	104	684	120	1/2	1,552	12	340	292	/40	1/2	6/6	564
V/G Ratio	0.71	0.58	0.21	0.50	1.11	0.02	0.85	0.21	0.96	0.35	0.60	0.98
	D 51.0	U 42.0	0	U 22.2	F	07.0	U 54.4	0	D 52.0	07.4	D 25.0	E 69.5
Unitor Delay (Seconds)	01.0	43.Z	20.0	33.3	113.9	21.8	51.4 55.0	24.3	53.9	27.1	30.0	00.5
	5.2	0.0	16	7.0	0.0		12.0	0.0	21.0	6.0	0.0	77 7
	0.5	0.0	4.0	1.0	0.0	0.0	13.9	0.0	31.9 1.1	0.0	0.0	16
WOR Existing Storage Length (4)	0.0	0.0	250.0	0.0	0.0	0.0	580.0	0.0	1.1	1.0	0.0	1.0
Additional Storage Length	210.0	0.0	200.0	300.0	0.0	0.0	000.0	0.0	120.0	100.0	0.0	423.0
Required (ft)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	72.5	51.0	0.0	267.8

September 19, 2023

# **Determination of Warrants for Deceleration Lanes**

Determination of Warrants for Deceleration Lanes for Driveway 'A,' Driveway 'B', Driveway 'C', and 'D' were conducted in accordance with the City of Albuquerque Development Process Manual (DPM) Criteria for Driveways 'A' and 'B' on Arno St. South and in accordance with the NMDOT Auxiliary Lane Warrant Analysis for Driveways 'C' and 'D' on Broadway Blvd. See Appendix pages A-121 & A-122 for the NMDOT Determination of Warrants for Auxiliary Lane Warrants. The following tables define the City's warrant criteria and the NMDOT's criteria for right and left turn lanes at driveways:

TABLE 7.4.67 Turn Lane Warrants							
Left Turn		Right Turn					
Design Speed (MPH)	Turning Volume per Hour	Design Speed (MPH)	Turning Volume per Hour				
25	50	25	60				
30-40	40	30-40	50				
45	30	45	45				

# City of Albuquerque DPM



2. The volume in the adjacent through lane includes through vehicles and turning vehicles.

**Determination of Warrants for Deceleration Lanes** for Driveway 'A', Driveway 'B', Driveway 'C', and Driveway 'D' indicate the following:

			Left Turn Warrant				Right Turn Warrant					
Access	Major Street	Speed Limit (Mph)	Left Turn Warrant Volume (veh/hr) <sup>1</sup>	Maximum Left Turn Volume (Veh/hr)	Left Turn Lane Warranted ?	Minimum Storage Length (ft)4	Minimum Left-tum Transition Length (ft) <sup>2</sup>	Right Turn Warrant Volume (veh/hr) <sup>1</sup>	Maximum Right Turn Volume (Veh/hr)	Right Tum Lane Warranted?	Minimum Storage Length (ft) <sup>3</sup>	Minimum Right-turn Transition Length (ft) <sup>2</sup>
City of Albuquerque Auxillary Lane Warrant Analysis												
Driveway 'A'	Arno St.	35	40	0	No	1	-	50	61	Yes	240	300/150
Driveway 'B'	Arno St.	35	40	0	No	-	-	50	33	No	-	-
Amo St.6	Sunport Blvd.	35	40	51	Yes	50	300/150	50	41	No	-	1
NMDOT Auxillary Lane Warrant Analysis <sup>5</sup>												
Driveway 'C'	Broadway Blvd.	35	NOT REQ.	0	N/A		-	NOT REQ.	<5	No	-	-
Driveway 'D'	Broadway Blvd.	35	1	78	Yes	250	8:1 Taper	1	106	Yes	230	8:1 Taper

## Summary of Auxillary Lane Warrant Analysis

Love's Sunport Station

1. City of Albuquerque DPM, Table 7.4.67

2. City of Albuquerque DPM, Table 7.4.70

3. City of Albuquerque DPM, Table 7.4.68

4. Storage Length based on maximum 2033 left-turn queue length

5. See NMDOT Auxillary Lane Warrant Analysis in Appendix pages A- thru A-.

6. Construction plans for the new Sunport Blvd. extention show a 150-ft left-turn lane plus a 300/150 transition

- **Driveway 'A' City of Albuquerque Deceleration Lane Warrant Analysis** shows that a southbound right-turn lane 240-ft long including a 300/150 transition is warranted at Driveway 'A', however, inspection of survey maps and aerial images indicate that there may be insufficient ROW north of Driveway 'A' to construct a deceleration lane. Further field inspection and title searches should be conducted to establish the location of the ROW prior to construction of the lane.
- Driveway 'B' City of Albuquerque Deceleration Lane Warrant Analysis shows that no deceleration lanes are warranted at this intersection.
- Driveway 'C' NMDOT Deceleration Lane Warrant Analysis shows that no turn lanes are warranted at Driveway 'C'.
- **Driveway 'D' NMDOT Deceleration Lane Warrant Analysis** shows that a southbound left-turn lane, 250-ft long plus an 8:1 taper transition and a northbound right-turn lane, 230-ft long (including transition) are warranted at the Driveway 'D' Intersection.

Where existing driveways, intersections, and/or availability of right-of-way restricts lengths of new deceleration lanes, the developer shall maximize the length in the space available and provide graphical evidence to the City's Design Review Committee for the reduced turn lane length.

# **Access Design Specifications**

Sight distances at Driveway 'A', Driveway 'B', and Driveway 'C' are greater than 500-feet at each driveway. There are no vertical or horizontal curves that impede site distances along this portion of Woodward Rd./Sunport Blvd. and Broadway Blvd., and there are no structures blocking sight distance into and out of the driveway.

All driveways meet the minimum access spacing requirements of the COA and the NMDOT except Driveway 'C'. See 18.C-1 from State Access Management Manual (SAMM) and Table 7.4.45 from the COA DPM. The COA DPM standard is used for the driveways on Arno St. S (Driveways 'A' and 'B'). The SAMM standard is used for the driveways on Broadway Blvd. (Driveways 'C' and 'D'). Although the spacing for Driveway 'C' does not meet the access spacing requirements specified in the SAMM (see Table 18.C-1, 325-ft), this is an existing driveway which has been reconstructed as a full-access driveway this year by NMDOT as part of the Sunport Blvd. Extension Project (NM Project NO. A300160). Also, the Love's Sunport Station project is proposing to improve safety at this access intersection by converting it from a full-access to a restricted-access, thereby significantly reducing the number of conflict points.

Table 18.C-1   Access Spacing Standards for Intersections and Driveways   (centerline to centerline spacing in feet)									
		Intersection S	Spacing (feet) <sup>1</sup>	Driveway Spacing (feet) <sup>2</sup>					
Access	Posted			Non-Travers	able Median Partial	Traversable Median <sup>4</sup>			
Category Speed (mph		Signalized	Unsignalized	Full Access	Access				
Controlled- Access, Non-Interstate Highways	All Speeds	5,280	2,640	2,640	2,640	-NA-			
UPA	$\leq 30 \text{ mph}$	2,640	1,320	1,320	200	200			
	35 to 40 mph	2,640	1,320	1,320	325	325			
	45 to 50 mph	2,640	1,320	1,320	450	450			
	$\geq 55 \text{ mph}$	5,280	1,320	1,320	625	625			

# City of Albuquerque Minimum Access Spacing Requirements COA DPM



# **TABLE 7.4.45 Minimum Distance Between Commercial Site Access and Intersection**

	Cross Street Classes								
Type of Street	Arteria	ıl	Collect	tor	Local				
	A	D	A	D	A	D			
Principal Arterial	300 ft.	200 ft.	200 ft.	150 ft.	150 ft.	100 ft.			
Minor Arterial	200 ft.	150 ft.	150 ft.	100 ft.	100 ft.	100 ft.			
Major Collector	150 ft.	150 ft.	100 ft.	100 ft.	75 ft.	75 ft.			
Minor Collector	150 ft.	150 ft.	100 ft.	100 ft.	75 ft.	75 ft.			
Local (additional distance may be required for queuing)	75 ft.	75 ft.	50 ft.	50 ft.	25 ft.	25 ft.			

# **Summary of Impacts and Recommendations**

**In summary**, the proposed Love's Sunport Station will have minimal adverse impact to the adjacent transportation system with implementation of the recommended mitigation measures presented in this report. A summary of the impacts and recommendations based on the results of the analysis, are stated below.

# Summary of Impacts

# Intersection 1 - Woodward Rd./Sunport Blvd. & Broadway Blvd. (Signalized, Existing w/ Major Modifications)

- 2023 LOS Analysis of Intersection 1 demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. LOS remains at C or better for all movements in the intersection. Intersection LOS remains at LOS=C for the NO BUILD and BUILD conditions with less than 2 seconds per vehicle increase in delays. LOS for each movement is C or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions.
- 2033 LOS Analysis of Intersection 1 demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. LOS remains at C or better for all movements in the intersection. Intersection LOS remains at LOS=C for the NO BUILD and BUILD conditions with less than 6 seconds per vehicle increase in delays. LOS for each movement is D or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions.
- **2023 Queueing Analysis** demonstrates that based on the geometry of the intersection presented on the Sunport Blvd. Extension construction plans, no additional queueing capacity is required at Intersection 1 and the northbound queues will not block Driveway 'C' to the south of the intersection. V/C are less than 1 for all movements and lane capacities are greater than calculated queues.
- 2033 Queueing Analysis demonstrates that based on the geometry of the intersection presented on the Sunport Blvd. Extension construction plans, an additional 85-ft of queueing capacity is required for the eastbound thru/right turn lane, however, there is insufficient Right of Way (ROW) to extend the lane and this condition only occurs during the AM 2033 peak hour. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

### Intersection 2 - Sunport Blvd. & Arno St. (Unsignalized, Currently Under Construction)

- 2023 and 2033 LOS Analysis of this intersection demonstrates that the proposed Love's Sunport Station will not significantly impact the LOS or delays at this intersection. In fact, intersection delays decrease with additional traffic from the development because in the weighted average calculation for delays, traffic is being introduced to movements with LOS=A, thereby improving the overall delay of the intersection.
- 2023 and 2033 Queueing Analysis demonstrates that based on the geometry of the intersection presented on the Sunport Blvd. Extension construction plans, no additional queueing capacity is required. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

• **City of Albuquerque Deceleration Lane Warrant Analysis** shows that a westbound left-turn lane with 50-ft of queueing capacity and a 300/150 transition is warranted at this intersection, however, Sunport Blvd. Extension construction plans show a westbound left-turn lane with 150-ft of capacity so no additional capacity is required on the part of the development.

# Intersections 3 & 4 - Sunport Blvd. & I-25 NB & SB Ramp Intersections (Signalized, Existing w/ Major Modifications)

- 2023 and 2033 LOS Analysis of these intersections demonstrate that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. Intersection LOS remains at LOS=C for the NO BUILD and BUILD conditions with less than 2 seconds per vehicle increase in average control delays. LOS for each movement is C or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions. In fact, for 2033 intersection delays decrease with additional traffic from the development because in the weighted average calculation for delays, traffic is being introduced to movements with LOS=A, thereby improving the overall delay of the intersection.
- **2023 and 2033 Queueing Analysis** demonstrates that based on the geometry of the intersections presented on the Sunport Blvd. Extension construction plans, no additional queueing capacity is required. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.

# Intersection 5 (Enter ONLY) - Driveway 'A' & Arno St. (Unsignalized, Proposed)

- **2023 and 2033 LOS Analysis** of this intersection demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions. Intersection LOS is LOS=A for the BUILD conditions.
- **2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at this intersection. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.
- **City of Albuquerque Deceleration Lane Warrant Analysis** shows that a southbound right-turn lane 240-ft long including a 300/150 transition is warranted at Driveway 'A', however, inspection of survey maps and aerial images indicate that there may be insufficient ROW north of Driveway 'A' to construct a deceleration lane. Further field inspection and title searches is required to establish the location of the ROW prior to construction of the lane.

# Intersection 6 (FULL ACCESS) - Driveway 'B' & Arno (Unsignalized, Proposed)

- **2023 and 2033 LOS Analysis** of this intersection demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 and 2033 AM and PM BUILD conditions. Intersection LOS is LOS=A for the BUILD conditions.
- **2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at this intersection. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.
- **City of Albuquerque Deceleration Lane Warrant Analysis** shows that no deceleration lanes are warranted at this intersection.

# Intersection 7 (Right-in/Right-out Only) - Driveway 'C' Broadway Blvd.

- 2023 and 2033 LOS Analysis of these intersections demonstrate that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions. Intersection LOS remains at LOS=C for the NO BUILD and BUILD conditions with less than 2 seconds per vehicle increase in delays. LOS for each movement is C or better for all conditions with no significant degradation of delays from the NO BUILD to BUILD Conditions.
- **2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at these intersections. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.
- **NMDOT Deceleration Lane Warrant Analysis** shows that <u>no</u> turn lanes are warranted at Driveway 'C'.

# Intersection 8 (Full Access) - Driveway 'D' & Broadway Blvd. (Unsignalized, Proposed)

- **2023 and 2033 LOS Analysis** of these intersections demonstrate that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions. LOS=C for the intersection and LOS=C or better for all movements in the intersection.
- **2023 and 2033 Queueing Analysis** demonstrates that no additional queueing capacity is required at these intersections. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues.
- **NMDOT Deceleration Lane Warrant Analysis** shows that a southbound left-turn lane, 250-ft long plus an 8:1 taper transition and a northbound right-turn lane, 230-ft long (including transition) are warranted at the Driveway 'D' Intersection.

# Intersection 9 Rio Bravo Bld. & Broadway Blvd. (Signalized, Existing)

- 2023 LOS Analysis of these intersections demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions; LOS remains the same for the NO BUILD and BUILD conditions. LOS also remains the same for all movements in the intersection. The eastbound left turn movement has LOS=E for the NO BUILD and BUILD conditions.
- 2033 LOS Analysis of these intersections demonstrates that the proposed Love's Sunport Station will have minimal impact on the LOS and delays for the 2023 AM and PM BUILD conditions; LOS and delays remain the same for the NO BUILD and BUILD conditions. Based on the analysis, by 2033 conditions at the intersection degrade significantly especially during the PM peak hour. LOS for EBL, EBT, WBL, WBR and NBT movements are LOS=E or F.
- **2023 and 2033 Queueing Analysis** demonstrates that additional queueing capacity is required at this intersection for most of the turn lanes by 2033. V/C ratios (a measure of congestion) are less than 1 for all movements except for the NBL in 2033. Lane capacities are less than calculated queues for the EBL, NBR, SBL, and SBR turn lanes.
- **Mitigation:** The poor LOS and queuing issues revealed in the 2023 and 2033 HCM analysis are existing problems not made significantly worse by the development, so no mitigation is recommended by the development. However, a mitigated case has been provided to the NMDOT as a courtesy to demonstrate that LOS and queuing conditions improve if signal phasing for the Eastbound Left-turn (EBL) and Westbound Left-turn (WBL) movements are changed from "Protected" to
"Permitted/Protected". Since dual lefts are not recommended for this type of phasing, the WBL and EBL geometry would have to be reduced from dual left-turn lanes to single left-turn lanes. Queuing issues for the for the NBR are resolved and EBL and WBL capacities remain adequate with the proposed mitigation, however the SBL and SBR queue capacities remain insufficient, and the V/C ratio remains >1 for the WBT movement.

#### Access Spacing

All driveways meet the minimum access spacing requirements of the COA and the NMDOT except Driveway 'C', however, this is an existing driveway which has been reconstructed as a full-access driveway this year by NMDOT as part of the Sunport Blvd. Extension Project (NM Project NO. A300160). Also, the Love's Sunport Station project is proposing to improve safety at this access intersection by converting it from a full-Access driveway to a restricted access driveway, thereby significantly reducing the number of conflict points. Additionally, Driveway "C" provides for separation of passenger car vehicles from heavy commercial vehicles to a large degree, thus improving safety of the project.

In summary, the proposed Love's Sunport Station will have minimal adverse impact to the adjacent transportation system provided the recommendations below are implemented.

#### Recommendations (Refer to Site Plan on the following page)

#### 1. <u>Arno St. S.</u>

Construct Arno St. S. as an asphalt paved 2-lane roadway, at least 568-ft long, from the new curb return on Sunport Blvd. south to the curb return south of Driveway 'B' in accordance with the City of Albuquerque construction standards. Include sidewalk, curb, & gutter along entire project frontage.

#### 2. Driveway "A"

- a) Driveway "A" should be designed and constructed as an unsignalized enter-only access with one entering lane.
- b) Driveway 'A' should be designed to accommodate WB-60 trucks.
- c) Construct a southbound right-turn deceleration lane 240-ft long including a 300/150 transition at Driveway 'A' or to the extent ROW is available.

#### 3. Driveway "B"

- a) Driveway 'B' should be designed as an unsignalized full access driveway with at least one entering lane and one exiting lane.
- b) Onsite queue storage at Driveway "B" should be at least 100 feet long. (150 feet preferrable to provide some buffer).
- c) Driveway 'B' should be designed to accommodate WB-60 trucks.

#### 4. Driveway 'C'

- a) Driveway "C" should be designed and constructed as an unsignalized right-in/right-out only access with one entering lane and one exiting lane.
- b) Onsite queue storage at Driveway "C" should be at least 100 feet long. (150 feet preferrable to provide some buffer).
- c) Driveway 'C' should be designed to accommodate WB-60 trucks.

#### 5. Driveway 'D'

- a) Driveway "D" should be designed and constructed as an unsignalized full access driveway with one entering lane and two exiting lanes.
- b) Construct a new southbound left-turn deceleration lane at least 250-ft long including an 8:1 transition taper.
- c) Construct a new northbound right-turn deceleration lane at least 230-ft long including an 8:1 transition taper.
- d) Onsite queue storage at Driveway "D" should be at least 100 feet long. (150 feet preferrable to provide some buffer).
- e) Driveway 'D' should be designed to accommodate WB-60 trucks.

### 6. Pedestrian features, Bike Lanes, & Curbing

- a) Construct curbs and gutters along the project frontage of Arno St. and Broadway Blvd.
- b) Construct an 8-ft wide asphalt paved bike/pedestrian path, including a 3-foot-wide landscaped buffer between the back of curb and the path, along the project frontage of Broadway Blvd. Connect the path to the new bike lane (by others) along Sunport Blvd.
- c) Construct a 5-ft wide concrete sidewalk along the project frontage of Arno St.
- 7. The developer shall coordinate site plan development and roadway design with COA. Once a project CPN number is assigned by the COA, it will be sent to the appropriate parties.



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