Love's Travel Stop
Traffic Impact Study

Columbus, MN

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Prepared For:
Frank Ille
Manager of Development
Love's Travel Stops
& Country Stores, Inc.
PO Box 26210
Oklahoma City, OK 73126

Prepared By:
Jordan Schwarze, PE, RSP1
Alliant Engineering, Inc.
733 Marquette Avenue, Suite 700
Minneapolis, MN 55402

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1.0 Introduction

Alliant Engineering has completed a traffic impact study for the proposed Love's Travel Stop to be located off the southeast quadrant of the Interstate 35 (I-35) and Minnesota State Highway 97 (TH 97) interchange in Columbus, MN (see **Figure 1**: Project Location). The main objectives of this study are to evaluate the traffic impacts of the proposed Love's Travel Stop, particularly at the TH 97/Hornsby Street intersection, and recommend improvements to address any identified issues. The following provides the assumptions, analysis, and study conclusions offered for consideration.

2.0 Background

The City of Columbus anticipates future development immediately east of the I-35/TH 97 interchange. Hornsby Street, a north/south collector roadway running east of and parallel to I-35, is expected to provide access to the future development both north and south of TH 97. Prior to the year 2012, Hornsby Street intersected TH 97 approximately 350 feet east of the Northbound I-35 Ramps/TH 97 intersection. In the year 2012, the south leg of Hornsby Street was realigned to the east an additional 500 feet, creating offset T-intersections along TH 97. In the year 2019, the north leg of Hornsby Street was realigned to the east to once again create a four-leg TH 97/Hornsby Street intersection. In preparation for the year 2019 project, Spack Consulting prepared the *Trunk Highway 97 & Hornsby Street NE Traffic Impact Study* (dated February 28, 2018). The traffic impact study and the accompanying intersection control evaluation indicated that a traffic signal is the most viable option to accommodate future traffic growth while potentially improving safety. Late in the year 2020, the new traffic signal at the TH 97/Hornsby Street intersection was activated. The TH 97/Hornsby Street intersection currently exhibits the characteristics provided in **Table 1**.

Table 1. TH 97/Hornsby Street Intersection Characteristics

Intersection	Traffic Control	Lane Configurations by Approach[(1)]			
		EB	WB	NB	SB
TH 97 & Hornsby Street	Traffic Signal	L/T/T/R	L/T/T/R	L/T/R	L/T/R

(1) L=Left-Turn, T=Through, R=Right-Turn

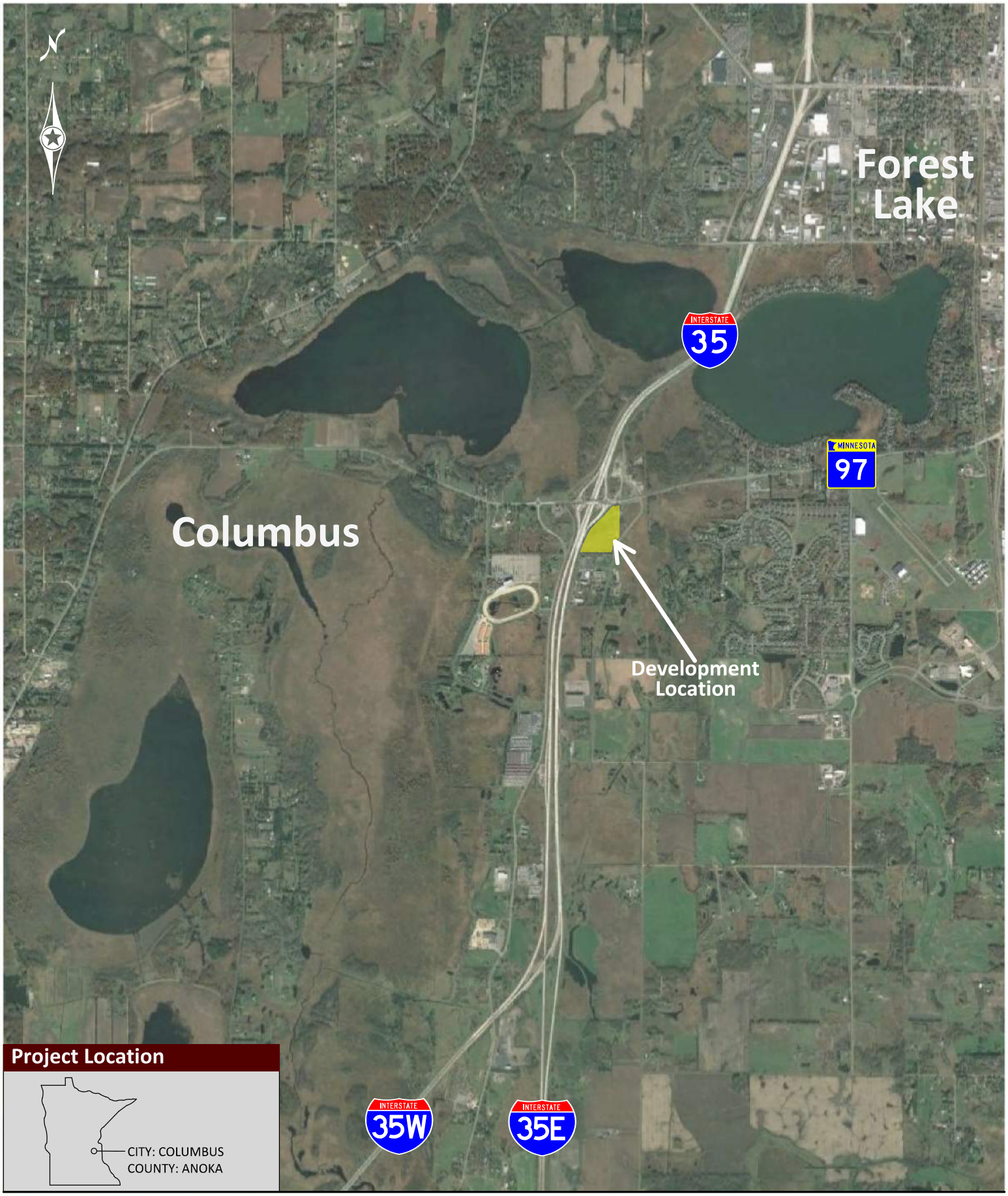

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Figure 1
Project Location

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In the *Trunk Highway 97 & Hornsby Street NE Traffic Impact Study*, several assumptions were made regarding anticipated land uses within the future development immediately east of the I-35/TH 97 interchange. Based on this original development concept, the trip generation estimates provided in **Table 2** were developed by Spack Consulting. The original trip generation estimates indicate the future development north of TH 97 was expected to generate approximately 553 a.m. peak hour trips, 791 p.m. peak hour trips, and 9,398 daily trips. Land uses south of TH 97 were expected to generate approximately 523 a.m. peak hour trips, 671 p.m. peak hour trips, and 8,314 daily trips. Combined, the total future development east of the I-35/TH 97 interchange was expected to generate approximately 1,076 a.m. peak hour trips, 1,462 p.m. peak hour trips, and 17,712 daily trips. It should be noted that a significant portion of these trips are expected to be from motorists already traveling along TH 97 who will now divert to the future development before continuing to their destination (i.e. pass-by trips). Development generated and pass-by trips were then combined with existing and background growth traffic to produce the forecast year 2040 peak hour traffic volumes shown in **Figure 2**.

Table 2. Original Development Concept - Trip Generation Estimates

Land Use (ITE Code)	Units	Size	AM Peak Hour Trips			PM Peak Hour Trips			Daily Trips	
			New In	New Out	Pass-By	New In	New Out	Pass-By	New	Pass-By
Development North of TH 97										
Day Care Center (565)	Gross Floor Area (SF)	10,000	42	35	0	36	42	0	334	0
Shopping Center (820)	Gross Floor Area (SF)	55,400	18	6	12	45	53	50	966	498
Drive-In Bank (912)	Gross Floor Area (SF)	5,000	9	9	16	19	19	34	186	165
Fast Casual Restaurant (930)	Gross Floor Area (SF)	8,000	6	0	5	28	17	34	1,006	759
High-Turnover Restaurant (932)	Gross Floor Area (SF)	28,000	69	42	84	87	22	82	1,254	945
Gas/Convenience Station (945)	Fueling Positions	16	44	44	112	49	49	125	1,444	1,841
North Development Trips			**188**	**136**	**229**	**264**	**202**	**325**	**5,190**	**4,208**
Development South of TH 97										
Day Care Center (565)	Gross Floor Area (SF)	9,900	41	35	0	35	42	0	330	0
Medical/Dental Office (720)	Gross Floor Area (SF)	5,600	10	1	0	3	11	0	136	0
Discount Superstore (813)	Gross Floor Area (SF)	96,025	45	45	35	105	105	81	2,454	954
Liquor Store (899)	Gross Floor Area (SF)	5,600	6	6	6	21	21	22	258	139
High-Turnover Restaurant (932)	Gross Floor Area (SF)	6,000	15	9	18	19	5	18	268	203
Coffee Shop w/ Drive-Thru (937)	Gross Floor Area (SF)	1,500	6	4	83	3	3	41	94	767
Truck Stop (950)	Gross Floor Area (SF)	8,500	35	35	88	30	30	76	1,192	1,519
South Development Trips			**158**	**135**	**230**	**216**	**217**	**238**	**4,732**	**3,582**
Combined Total Development Trips			**346**	**271**	**459**	**480**	**419**	**563**	**9,922**	**7,790**

Source: Trunk Highway 97 & Hornsby Street NE Traffic Impact Study - Columbus, MN (Spack Consulting - February 28, 2018)

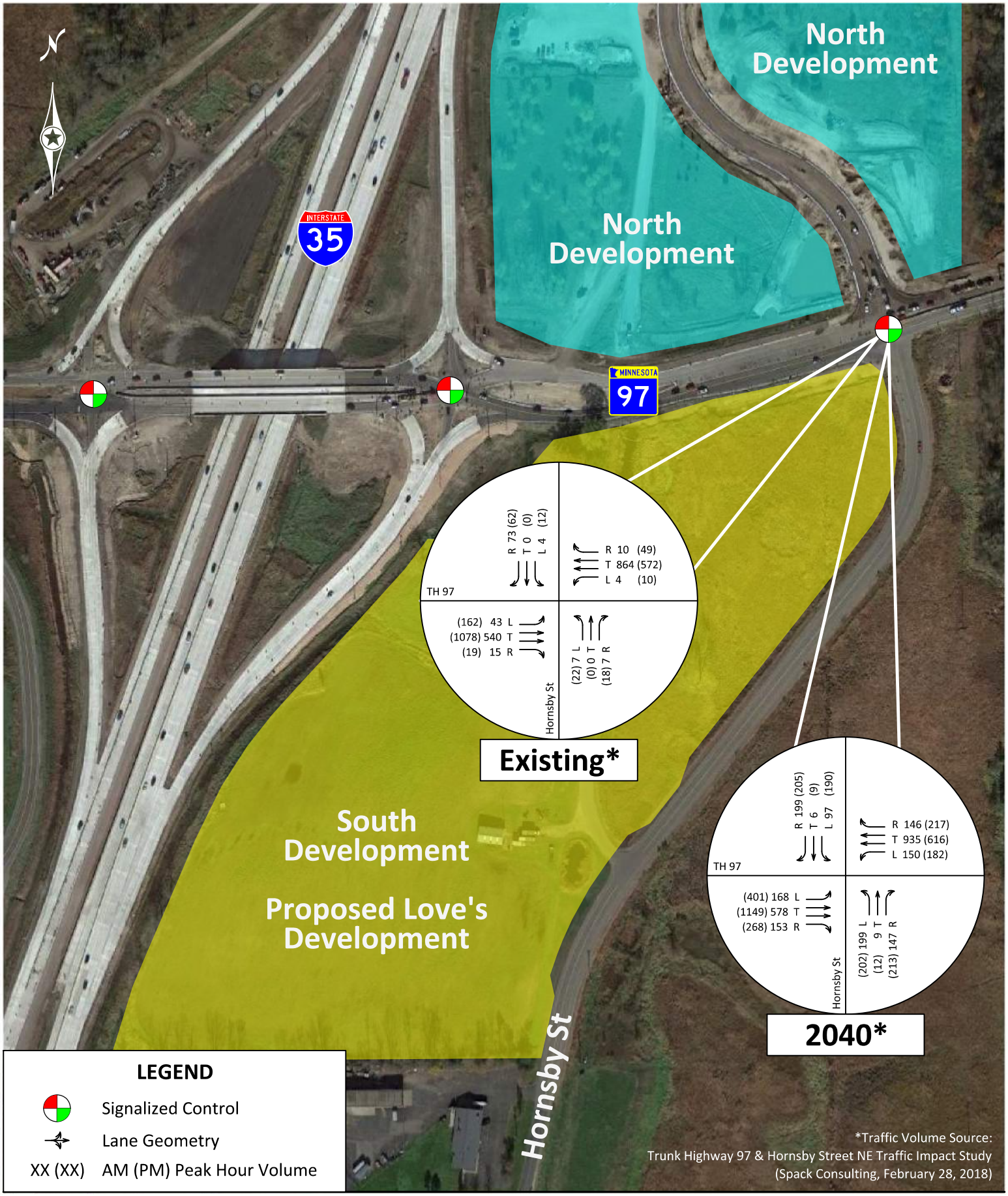

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Figure 2
Existing and Forecast 2040 Traffic Volumes

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3.0 Proposed Development

The proposed Love's Travel Stop development is expected to be constructed off the southeast quadrant I-35/TH 97 interchange and will replace all assumed land uses south of TH 97 from the previously noted original development concept. The current Love's Travel Stop development proposal (shown in **Figure 3**) consists of the following:

- Truck Stop/Convenience Store, including:
  - Fast-Food Restaurant(s) with Drive-Through
  - 16 Automobile Fueling Pumps
  - Nine (9) Truck Diesel Pumps
  - Truck Scale(s)
  - Truck Tire/Maintenance Shop

Access to the development is proposed at two (2) locations along the west side of Hornsby Street. The automobile access is expected to be located approximately 1,100 feet south of TH 97, while the truck access is expected to be located approximately 1,575 feet south of TH 97. The proposed automobile access is expected to replace an existing access road (Old Hornsby Street) located approximately 1,225 feet south of TH 97. A definitive timeline for construction of the proposed Love's Travel Stop is still to be determined; however, year 2040 conditions were analyzed in this traffic impact study to align with the future horizon year analysis of the previously completed *Trunk Highway 97 & Hornsby Street NE Traffic Impact Study*.

3.1 Trip Generation

To account for traffic impacts associated with the proposed development, trip generation estimates were developed for the weekday a.m. and p.m. peak hours as well as on a daily basis. Due to limited truck stop data available in the *ITE Trip Generation Manual, 10th Edition*, trip generation data previously collected from the existing Love's Travel Stop in Menomonee, WI was utilized. It should be noted that the Menomonee Love's Travel Stop offers similar amenities to the proposed Columbus development. For a previous study, 13-hour ingress/egress counts were collected at the existing Menomonee Love's Travel Stop during the week of February 11, 2019. The observed a.m. and p.m. peak hour trips, observed 13-hour trips, and estimated daily trips at the existing Love's Travel Stop in Menomonee, WI are summarized in **Table 3**.

Table 3. Observed Menomonee, WI Love's Travel Stop Trip Generation

Land Use	Vehicle Type	AM Peak Hour Trips			PM Peak Hour Trips			13-Hour Trips (6AM-7PM)	Estimated Daily Trips [1]
		Trips In	Trips Out	Total Trips	Trips In	Trips Out	Total Trips		
Love's Travel Stop	Auto	34	34	68	46	45	91	966	1,218
	Truck	38	52	90	46	41	87	1,184	1,494
Observed Trips		**72**	**86**	**158**	**92**	**86**	**178**	**2,150**	**2,712**

Source: Observations completed at the Menomonee, WI Love's Travel Stop during the week of February 11, 2019

(1) Daily trips estimated based on 24-hour volume distribution data presented in the ITE Trip Generation Manual, 10th Edition

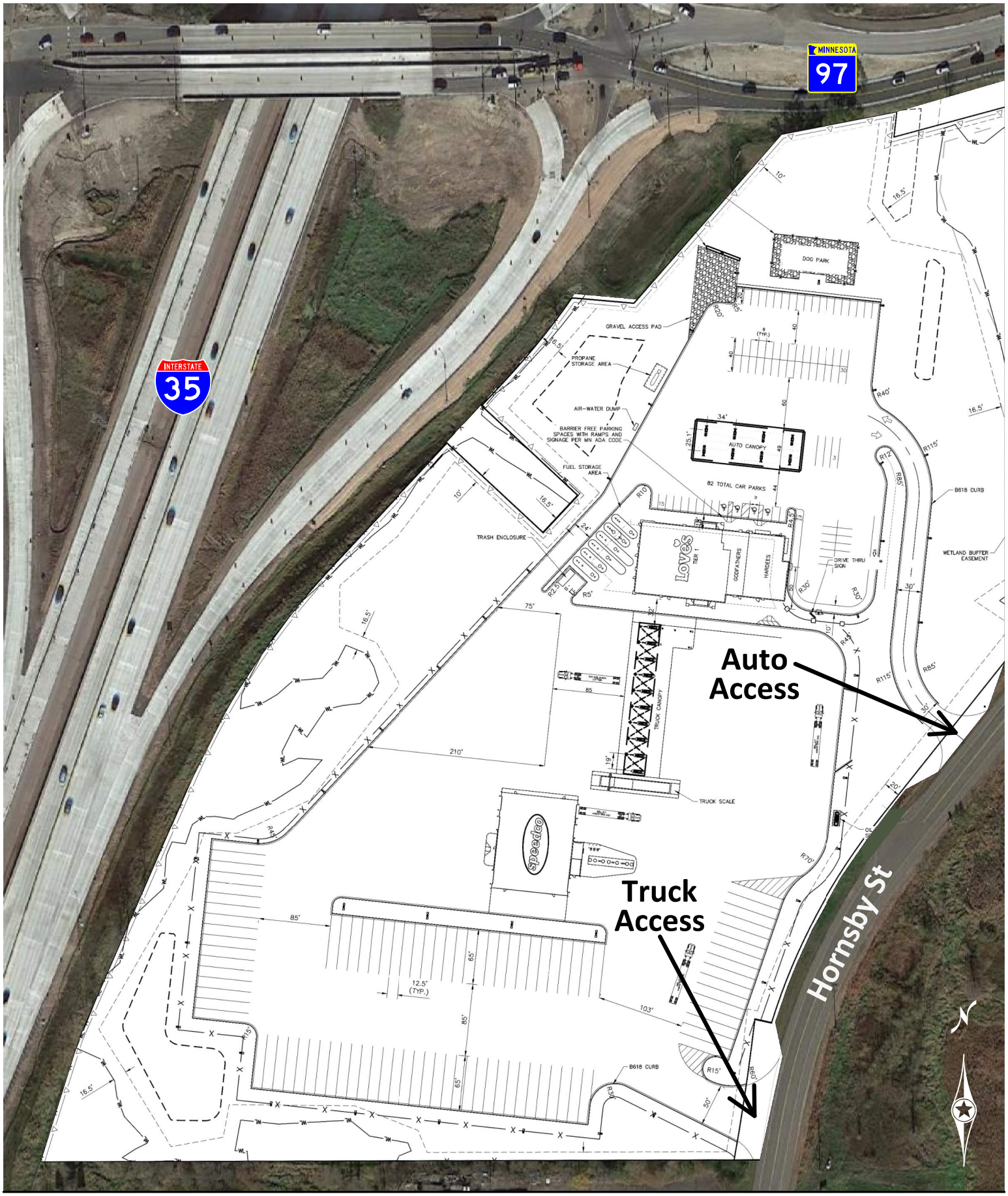

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Figure 3
Proposed Site Plan

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It should be noted that daily traffic volumes along I-94 near the Menomonee, WI Love's location (37,200 vehicles in the year 2018 according to the Wisconsin Department of Transportation) are approximately half of the daily traffic volumes along I-35 near Columbus, MN (79,000 vehicles in the year 2018 according to the Minnesota Department of Transportation). Therefore, to account for increased typical daily traffic volumes as well as seasonal recreational traffic volumes near the proposed Columbus Love's site, the observed Menomonee Love's trips were increased by a factor of 2.5 to estimate the trip generation potential of the proposed development. The resulting trip generation estimates provided in **Table 4** indicate the proposed development is expected to generate approximately 395 a.m. peak hour trips, 446 p.m. peak hour trips, and 6,780 daily trips. Compared to the original development concept south of TH 97, these estimates represent a trip generation reduction of (128) a.m. peak hour trips, (225) p.m. peak hour trips, and (1,534) daily trips.

Table 4. Proposed Love's Travel Stop Development – Trip Generation Estimates

Trip Type	Vehicle Type	AM Peak Hour Trips			PM Peak Hour Trips			13-Hour Trips (6AM-7PM)	Estimated Daily Trips [1]
		Trips In	Trips Out	Total Trips	Trips In	Trips Out	Total Trips		
Gross Trips	Auto	85	85	170	115	113	228	2,415	3,045
	Truck	95	130	225	115	103	218	2,960	3,735
	Total	**180**	**215**	**395**	**230**	**216**	**446**	**5,375**	**6,780**
Pass-By Trips [2] (36%)	Auto	(31)	(31)	(62)	(41)	(41)	(82)	(870)	(1,096)
	Truck	(41)	(41)	(82)	(39)	(39)	(78)	(1,066)	(1,344)
	Total	**(72)**	**(72)**	**(144)**	**(80)**	**(80)**	**(160)**	**(1,936)**	**(2,440)**
New Trips [3]	Auto	54	54	108	74	72	146	1,545	1,949
	Truck	54	89	143	76	64	140	1,894	2,391
	Total	**108**	**143**	**251**	**150**	**136**	**286**	**3,439**	**4,340**

(1) Daily trips estimated based on 24-hour volume distribution data presented in the ITE Trip Generation Manual, 10th Edition

(2) Pass-by trips percentage based on Trunk Highway 97 & Hornsby Street NE Traffic Impact Study - Columbus, MN (Spack Consulting - February 28, 2018)

(3) New trips consist of diverted link trips from I-35 and net new trips to the study area. Pass-by trips consist of trips already occurring along TH 97.

A majority of Love's trips are expected to be from motorists already traveling within the study area, along I-35 (i.e. diverted link trips) as well as TH 97 pass-by trips, who will now divert their trip to the proposed development before continuing to their destination. Similar to the trip generation estimates associated with the original development concept, 36 percent of Love's trips were assumed to be pass-by trips from motorists already traveling along TH 97. The remaining "new" trips are comprised of both net new trips to the study area and diverted link trips from I-35.

Combining land uses both north and south of TH 97, the total modified future development east of the I-35/TH 97 interchange is expected to generate approximately 948 a.m. peak hour trips, 1,237 p.m. peak hour trips, and 16,178 daily trips as shown in **Table 5**.

Table 5. Modified Development Concept - Trip Generation Estimates

Land Use (ITE Code)	Units	Size	AM Peak Hour Trips[1]			PM Peak Hour Trips[1]			Daily Trips[1]	
			New In	New Out	Pass-By	New In	New Out	Pass-By	New	Pass-By
[2]Development North of TH 97										
Day Care Center (565)	Gross Floor Area (SF)	10,000	42	35	0	36	42	0	334	0
Shopping Center (820)	Gross Floor Area (SF)	55,400	18	6	12	45	53	50	966	498
Drive-In Bank (912)	Gross Floor Area (SF)	5,000	9	9	16	19	19	34	186	165
Fast Casual Restaurant (930)	Gross Floor Area (SF)	8,000	6	0	5	28	17	34	1,006	759
High-Turnover Restaurant (932)	Gross Floor Area (SF)	28,000	69	42	84	87	22	82	1,254	945
Gas/Convenience Station (945)	Fueling Positions	16	44	44	112	49	49	125	1,444	1,841
North Development Trips			**188**	**136**	**229**	**264**	**202**	**325**	**5,190**	**4,208**
Development South of TH 97										
Love's Travel Stop	Auto		54	54	62	74	72	82	1,949	1,096
	Truck		54	89	82	76	64	78	2,391	1,344
South Development Trips			**108**	**143**	**144**	**150**	**136**	**160**	**4,340**	**2,440**
Combined Total Development Trips			**296**	**279**	**373**	**414**	**338**	**485**	**9,530**	**6,648**
			948			**1,237**			**16,178**	

Trip Generation Source: Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition.
(1) New trips consist of diverted link trips from I-35 and net new trips to the study area. Pass-by trips consist of trips already occurring along TH 97.
(2) Development north of TH 97 assumed to be unchanged from original development scenario.

3.2 Directional Distribution

The distribution of development generated traffic was estimated based on existing traffic volumes/ patterns near the proposed Columbus Love's site as well as information provided by the developer. The estimated directional distribution of proposed development trips is shown in **Figure 4**. These trip distribution percentages were applied to the estimated development generated traffic volumes to forecast year 2040 conditions, which are shown in **Figure 5**.

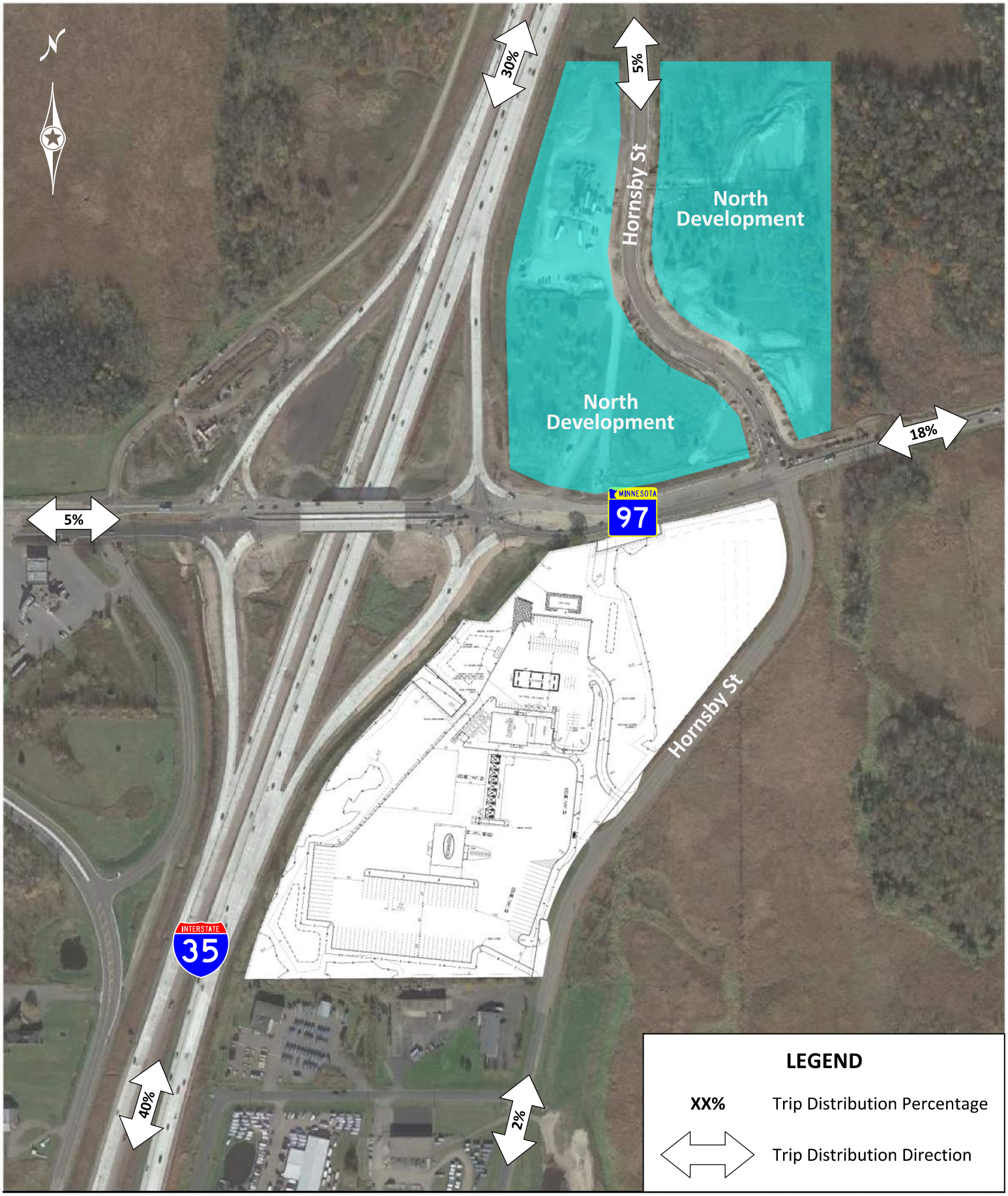

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Figure 4
Directional Distribution

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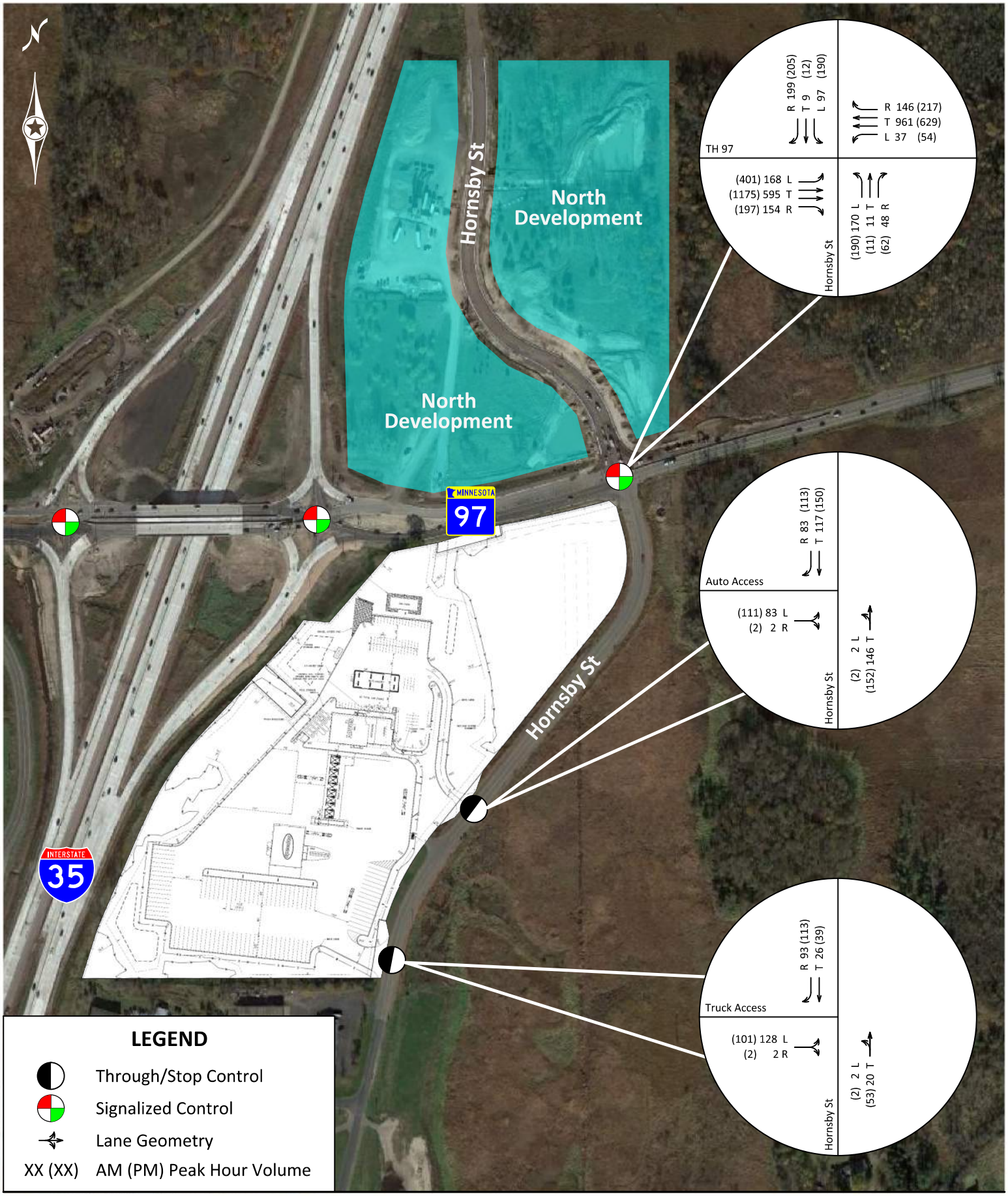

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Figure 5
Modified Forecast 2040 Traffic Volumes

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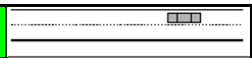
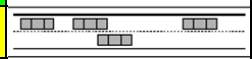
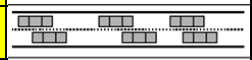
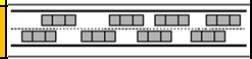
4.0 Year 2040 Conditions

Forecast year 2040 conditions were analyzed to identify any potential traffic impacts related to the proposed Love's Travel Stop. In addition to the TH 97/Hornsby Street intersection, the proposed development auto and truck accesses along Hornsby Street were evaluated. While the TH 97/ Hornsby Street intersection is signalized, the proposed development accesses are expected to be through/stop controlled. Per City of Columbus recommendations, each proposed development access along Hornsby Street is expected to have a dedicated southbound right-turn lane to accommodate entering traffic originating from TH 97 and I-35.

4.1 Intersection Operations Analysis

A year 2040 intersection operations analysis was completed using Synchro/SimTraffic modeling software to identify potential future operational impacts caused by proposed development trips. Operations analysis results identify a Level of Service (LOS), which indicates the quality of traffic flow through an intersection. Intersections are given a ranking from LOS A through LOS F. The LOS results are based on average delay per vehicle, which correspond to the delay threshold values provided in **Table 6**.

Table 6. LOS Definition

Level of Service		Description	Delay per Vehicle (seconds) Signalized Intersection	Delay per Vehicle (seconds) Unsignalized Intersection
A		**Free Flow:** Low volumes and no delays.	0 - 10	0 - 10
B		**Stable Flow:** Speeds restricted by travel conditions, minor delays.	> 10 - 20	> 10 - 15
C		**Stable Flow:** Speeds and maneuverability closely controlled due to higher volumes.	> 20 - 35	> 15 - 25
D		**Stable Flow:** Speeds considerably affected by change in operating conditions. High density traffic restricts maneuverability, volume near capacity.	> 35 - 55	> 25 - 35
E		**Unstable Flow:** Low speeds, considerable delay, volume at or slightly over capacity.	> 55 - 80	> 35 - 50
F		**Forced Flow:** Very low speeds, volume exceed capacity, long delays with stop and go traffic.	> 80	> 50

Source: Highway Capacity Manual, 6th Edition, Transportation Research Board, Exhibits 19-8, 20-2, 21-8, 22-8.

LOS A indicates the best traffic operation, with vehicles experiencing minimal delays. LOS F indicates an intersection where demand exceeds capacity, or a breakdown of traffic flow. For through/stop controlled intersections, a key measure of operational effectiveness is the side-street LOS. Long delays and poor LOS can occur on side-street approaches even if the overall intersection is functioning well, making side-street LOS a valuable design criterion.

After LOS, the second component of the operations analysis is a study of vehicular queuing, or the lineup of vehicles waiting to pass through an intersection. An intersection can operate with an acceptable LOS, but if queues from the intersection block entrances to turn lanes or adjacent driveways, unsafe operating conditions could result. The 95th percentile queue, or the length of queue with only a five percent probability of being exceeded during an analysis period, is considered the standard for design purposes.

Results of the year 2040 intersection operations analysis shown in **Table 7** indicate that the TH 97/Hornsby Street intersection is expected to operate at overall LOS C or better during the weekday peak hours, while the proposed access locations along Hornsby Street are expected to operate at overall LOS A during all time periods. Moderate side-street delays could be expected on the northbound approach to the TH 97/Hornsby Street intersection, particularly during the p.m. peak hour (42 seconds on average: LOS D). No side-street delay issues are anticipated at the proposed access locations. Detailed operations and queuing analysis results are presented in **Appendix A**.

Table 7. Year 2040 Intersection Operations Analysis

Intersection	AM Peak Hour		PM Peak Hour	
	LOS	Delay (s)	LOS	Delay (s)
TH 97 & Hornsby Street	B / C	14.4 / 23.4	C / D	20.7 / 42.1
Hornsby Street & Auto Access	A / A	2.3 / 5.7	A / A	2.5 / 6.3
Hornsby Street & Truck Access	A / A	3.2 / 6.4	A / A	2.2 / 6.1

LOS Results: Overall Intersection / Worst Approach Delay Results: Overall Intersection / Worst Approach

It should be noted that the signalized ramp terminal intersections of the I-35/TH 97 diverging diamond interchange (DDI) were included in the Synchro/SimTraffic models with the TH 97/ Hornsby Street intersection. Due to their proximity, these traffic signals are expected to operate in coordination with the TH 97/Hornsby Street intersection. Additionally, the TH 97/Everton Avenue signalized intersection was also included in the traffic simulation models, as the potential for coordination with signals to the east of the TH 97/Hornsby Street intersection also exists.

Since large trucks comprise a significant portion of Love's trips, queue lengths are of particular concern at the TH 97/Hornsby Street intersection. In conjunction with moderate side-street delays on the northbound approach of the TH 97/Hornsby Street intersection during peak periods under the forecasted year 2040 traffic volumes, moderate side-street queuing could also be expected. A majority of outbound Love's trips are anticipated to be destined to I-35; consequently, northbound left-turn queuing at the TH 97/Hornsby Street intersection is of specific interest. Anticipated 95th percentile queue lengths at the TH 97/Hornsby Street intersection for the forecast year 2040 peak hours are summarized in **Table 8**. It should be noted that the p.m. peak hour is expected to produce the longest queues on the northbound intersection approach.

Table 8. Northbound Queuing – TH 97/Hornsby Street – Year 2040 Conditions

Peak Period	Northbound 95th Percentile Queues (feet)		
	Left-Turn Lane	Through Lane	Right-Turn Lane
AM Peak Hour	233	35	52
PM Peak Hour	316	30	83

4.2 Turn Lane Recommendations

Recommended dimensions for turn lanes of significance to the proposed Love's Travel Stop development were determined based on the following considerations:

- In traffic engineering practice, it is generally recommended to provide turn lane storage for at least the anticipated 95th percentile queue length.
- Since motorists would typically be expected to slow significantly or stop on the side-street approach to a traffic signal, no additional deceleration length beyond queue storage is necessary.
- Right-turn lanes on uncontrolled approaches generally do not require storage length, as the associated right-turn maneuvers are typically performed without hindrance. If traffic simulation models produce no queuing, such right-turn lanes need only accommodate proper deceleration length.
    - It should be noted that no queuing was observed on the southbound approach to either the auto access or truck access along Hornsby Street in the traffic simulation models.
        - Southbound right-turn lanes at the proposed auto and truck accesses are not required from an operations standpoint. However, these turn lanes would be expected to provide a safety benefit in minimizing the potential for southbound rear-end crashes.
- Turn lane tapers should be provided at a ratio in the range of 10:1 to 15:1.

The existing turn lanes on the northbound approach to the TH 97/Hornsby Street intersection provide approximately 120 feet of full-width length in addition to 120 feet of taper length. These dimensions are expected to be adequate for the northbound right-turn movement. However, lengthening the northbound left-turn lane is recommended to accommodate forecasted year 2040 95th percentile queues. The recommended turn lane improvements at the TH 97/Hornsby Street intersection and proposed development accesses are provided in **Table 9**. It should be noted that existing turn lanes on the eastbound, westbound, and southbound approaches to the TH 97/ Hornsby Street intersection are expected to be adequate.

Table 9. Recommended Turn Lane Improvements

Intersection	Approach	Turn Lane	Minimum Taper Length (feet)	Minimum Full-Width Length (feet)
TH 97 & Hornsby Street	Northbound	Left-Turn	120	325
Hornsby Street & Auto Access	Southbound	Right-Turn(1)	120	190
Hornsby Street & Truck Access	Southbound	Right-Turn(1)	120	190

(1) Turn lane length based on MnDOT Road Design Manual Table 5-3.01A with assumed 50 mph design speed, 10 mph deceleration in the through lane, and 15 mph exit curve.

5.0 Site Plan/Access Review

A review of the proposed site plan was completed to identify any issues and recommended potential improvements regarding vehicle ingress/egress and internal traffic circulation/parking layout. The following key points are offered for consideration:

- A cursory sight distance review was completed at each proposed access location along Hornsby Street to ensure proper visibility for motorists on the side-street stop approaches. At an assumed mainline design speed of 50 miles per hour, the AASHTO Green Book[1] recommends a minimum intersection sight distance of 555 feet for passenger vehicles and 845 feet for large trucks to make a left-turn maneuver from a side-street stop.
    - Based on field observations, the minimum recommended 555 feet of intersection sight distance appears to be met at the proposed auto access. Furthermore, the minimum recommended 845 feet of intersection sight distance appears to be met at the proposed truck access.
- The proposed internal roadways and parking layout appear to adequately accommodate both typical automobiles and large trucks.
    - However, truck turning movements should be reviewed to ensure these vehicles have adequate accommodations to negotiate internal roadways.
    - Installation of wayfinding signing should be considered to properly direct truck drivers to the designated truck access in order to minimize potential internal conflicts with passenger vehicles.

[1] Section 9.5.3 Intersection Control, American Association of State Highway Transportation Officials, A Policy on Geometric Design of Highways and Streets, 7th Edition, 2018.

6.0 Conclusions

The following study conclusions are offered for consideration:

- The proposed Love's Travel Stop development consists of the following:
  - Truck Stop/Convenience Store, including:
    - Fast-Food Restaurant(s) with Drive-Through
    - 16 Automobile Fueling Pumps
    - Nine (9) Truck Diesel Pumps
    - Truck Scale(s)
    - Truck Tire/Maintenance Shop
- The proposed development is expected to generate approximately 395 a.m. peak hour trips, 446 p.m. peak hour trips, and 6,780 daily trips.
  - Compared to the original development concept south of TH 97 presented in the *Trunk Highway 97 & Hornsby Street NE Traffic Impact Study* (prepared by Spack Consulting on February 28, 2018), these estimates represent a trip generation reduction of (128) a.m. peak hour trips, (225) p.m. peak hour trips, and (1,534) daily trips.
- Results of the year 2040 intersection operations analysis indicate that the TH 97/ Hornsby Street intersection is expected to operate at overall LOS C or better during the weekday peak hours, while the proposed access locations along Hornsby Street are expected to operate at overall LOS A during all time periods. Moderate side-street delays and queuing could be expected on the northbound approach to the TH 97/Hornsby Street intersection, particularly during the p.m. peak hour. No side-street delay issues are anticipated at the proposed access locations.
- Recommended dimensions for turn lanes improvements are provided in **Section 4.2: Turn Lane Recommendations**.
- A review of the proposed site plan/access produced the following key points for consideration:
  - Sight distance at proposed access locations appears to meet minimum standards.
  - The proposed internal roadways and parking layout appear to adequately accommodate both typical automobiles and large trucks.
    - However, truck turning movements should be reviewed to ensure these vehicles have adequate accommodations to negotiate internal roadways.
    - Installation of wayfinding signing should be considered to properly direct truck drivers to the designated truck access in order to minimize potential internal conflicts with passenger vehicles.

Appendix A – Detailed Operations and Queueing Analysis

Forecast Year 2040 Conditions - AM Peak Hour

Traffic Control	Intersection	MOE	Eastbound Approach			Westbound Approach			Northbound Approach			Southbound Approach			Intersection Total
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Signal	TH 97 & Hornsby Street	Movement Delay (sec/veh)	20.9	9.1	2.6	15.5	15.6	4.3	29.2	16.8	4.4	30.3	37.4	17.3	14.4
		Movement LOS	C	A	A	B	B	A	C	B	A	C	D	B	B
		Movement 95th Queue (ft)	118	121	78	62	185	50	233	35	52	118	28	120	
		Approach Delay (sec/veh)	10.0			14.2			23.4			22.3			
		Approach LOS	B			B			C			C			

Traffic Control	Intersection	MOE	Eastbound Approach			Westbound Approach			Northbound Approach			Southbound Approach			Intersection Total
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Through/Stop	Hornsby Street & Auto Access	Movement Delay (sec/veh)	5.8	0.0	4.6	0.0	0.0	0.0	3.3	1.7	0.0	0.0	1.3	1.2	2.3
		Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
		Movement 95th Queue (ft)	41	0	41	0	0	0	6	6	0	0	0	0	
		Approach Delay (sec/veh)	5.7			0.0			1.7			1.3			
		Approach LOS	A			A			A			A			

Traffic Control	Intersection	MOE	Eastbound Approach			Westbound Approach			Northbound Approach			Southbound Approach			Intersection Total
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Through/Stop	Hornsby Street & Truck Access	Movement Delay (sec/veh)	6.4	0.0	4.8	0.0	0.0	0.0	2.4	0.5	0.0	0.0	0.3	0.3	3.2
		Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
		Movement 95th Queue (ft)	116	0	116	0	0	0	11	11	0	0	0	0	
		Approach Delay (sec/veh)	6.4			0.0			0.6			0.3			
		Approach LOS	A			A			A			A			

Forecast Year 2040 Conditions - PM Peak Hour

Traffic Control	Intersection	MOE	Eastbound Approach			Westbound Approach			Northbound Approach			Southbound Approach			Intersection Total
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Traffic Signal	TH 97 & Hornsby Street	Movement Delay (sec/veh)	24.7	11.7	3.9	27.1	29.5	10.5	50.0	40.8	19.0	46.2	49.4	13.5	20.7
		Movement LOS	C	B	A	C	C	B	D	D	B	D	D	B	C
		Movement 95th Queue (ft)	258	232	108	91	235	121	316	30	83	221	59	117	
		Approach Delay (sec/veh)	13.7			25.0			42.1			30.2			
		Approach LOS	B			C			D			C			

Traffic Control	Intersection	MOE	Eastbound Approach			Westbound Approach			Northbound Approach			Southbound Approach			Intersection Total
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Through/Stop	Hornsby Street & Auto Access	Movement Delay (sec/veh)	6.3	0.0	6.6	0.0	0.0	0.0	2.3	1.7	0.0	0.0	1.4	1.3	2.5
		Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
		Movement 95th Queue (ft)	50	0	50	0	0	0	7	7	0	0	0	0	
		Approach Delay (sec/veh)	6.3			0.0			1.7			1.4			
		Approach LOS	A			A			A			A			

Traffic Control	Intersection	MOE	Eastbound Approach			Westbound Approach			Northbound Approach			Southbound Approach			Intersection Total
			EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Through/Stop	Hornsby Street & Truck Access	Movement Delay (sec/veh)	6.1	0.0	6.5	0.0	0.0	0.0	1.2	0.6	0.0	0.0	0.3	0.4	2.2
		Movement LOS	A	A	A	A	A	A	A	A	A	A	A	A	A
		Movement 95th Queue (ft)	110	0	110	0	0	0	7	7	0	0	0	0	
		Approach Delay (sec/veh)	6.1			0.0			0.6			0.4			
		Approach LOS	A			A			A			A			