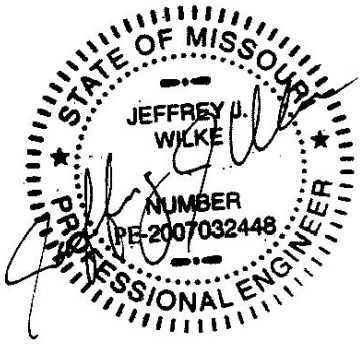
Traffic Impact Study

Home Depot C-Store

LEE'S SUMMIT, MISSOURI

MAY 2022



5/13/2022

Prepared By:

Kimley»Horn

Contents

TABLES

EXHIBITS (SEE APPENDIX A)

1.0 INTRODUCTION

This report serves as the traffic analysis for the Home Depot C-Store development, located at the southeast corner of the Hamblen Road and Oldham Parkway intersection in Lee's Summit, Missouri. The location of the development site is shown on **Exhibit 1** in **Appendix A**.

The following traffic analysis focused on two analysis years: The Existing Year (2022) and the Horizon Year (2042).

1.1 REPORT PURPOSE AND OBJECTIVES

The purpose of this study is to address traffic and transportation impacts of the proposed development on surrounding streets and intersections. This traffic impact study was prepared based on criteria set forth by the City of Lee's Summit. The following information is provided:

- A description and map of the existing and proposed street network to be affected by the proposed development. This information includes existing and proposed roadway characteristics as well as existing year (2022) and horizon year (2042) traffic volumes.
- Trip generation calculations based on the Institute of Traffic Engineers (ITE) *Trip Generation Manual*, 11th Edition, for the proposed development. In addition, projected trip distributions onto the street network are provided.
- Analysis of impacts of the traffic generated by the proposed development on the street network, including analysis of peak period levels of service (LOS), delay times, and queuing at study area intersections.
- Review of access management at the site driveway intersections.
- Discussion of potential improvements and traffic management measures identified to mitigate operational concerns.

In summary, the study is to determine the trip generation of the Home Depot C-Store development, assign new development trips to the street network, analyze various scenarios to determine the impacts of proposed site traffic, and identify potential mitigation measures needed to achieve acceptable operations at the study intersections.

2.0 EXISTING CONDITIONS

2.1 STUDY AREA

The proposed development site is located in a commercial area south of the US-50 Highway and Route 291 north junction. The site is currently a vacant pad site located to the west of the parking lot for the Home Depot store. The Home Depot store site developed more than 20 years ago and is located southeast of the site. The pad site has been vacant since the store was constructed. Another vacant pad site with an existing parking aisle is located directly south of the site. The surrounding area consist of commercial land uses. Several small buildings for different businesses and a contractor's office are located to the west of the site across Hamblen Road. To the north of the site across Oldham Parkway is an Aldi grocery store.

Through discussion with City staff, the following intersections were included within the study area for the traffic analysis. The list provides the existing intersection control for each of the study intersections.

- Hamblen Road & Oldham Parkway (Traffic Signal)
- Hamblen Road & Home Depot driveway (Side Street Stop)
- Oldham Parkway & Home Depot driveway (Side Street Stop)

2.2 STREET NETWORK

The existing street network within the study area includes Hamblen Road, Oldham Parkway and two driveways to the Home Depot parking lot. The following provides a summary of the existing street network within the study area:

Hamblen Road is a north-south minor arterial street along the west edge of the site. North of the site the street provides access to the regional highway system at a diamond interchange with US-50 Highway, where Hamblen Road becomes Route 291 Highway. Hamblen Road is a four-lane divided street with curbs and gutters and a short, raised median to the north of Oldham Parkway. South of Oldham Parkway the street narrows to three lanes with a center two-way left-turn lane. There are no sidewalks or bicycle facilities along Hamblen Road near the development site. The posted speed limit is 35 miles per hour (mph).

Improvements are currently being designed for the US-50 Highway and Route 291 north junction. The improvements will add capacity to the interchange and increase spacing between intersections on Route 291 Highway just north of the interchange. No capacity improvements are expected at the study intersections as part of the project, but the additional capacity at the nearby intersections should improve traffic flow and reduce congestion along the Hamblen Road/Route 291 corridor.

Oldham Parkway is an east-west commercial collector roadway located along the north edge of the proposed development site. Adjacent to the site the street has two lanes in the eastbound direction, one lane in the westbound direction. There are curbs and gutters and a raised median east of the Hamblen Road intersection. The raised median ends and a center two-way left-turn lane is provided to the east of the Home Depot driveway. Farther to the east the curb and gutter ends, the street narrows to two lanes, and Oldham Parkway serves as the frontage road along the south side of US-50 Highway. There are sidewalks along both sides of Oldham Parkway adjacent to the development site, but they are not continuous along the north side of the street. There are no bicycle facilities along Oldham Parkway. The posted speed limit is 40 mph.

Driveway 1 is located along the south edge of the development site and provides access to Home Depot. This existing private driveway along Hamblen Road is located 430 feet south of the Oldham Parkway

intersection, when measured between centerlines. The driveway is 40 feet wide, providing two exiting lanes and one entering lane. Driveway 1 has a throat length of 48 feet between Hamblen Road and the first drive aisle on the south side of the driveway. The distance to the first drive aisle along the north side of Driveway 1 is roughly 200 feet.

Driveway 2 is located east of the development site and provides access to Home Depot. This existing private driveway along Oldham Parkway is located 465 feet east of the Hamblen Road intersection, when measured between centerlines. The driveway is 30 feet wide, providing one exiting lane and one entering lane. Driveway 2 has a throat length of 67 feet between Oldham Parkway and the first drive aisle within the parking lot.

2.3 DATA COLLECTION

Turning Movement Counts (TMCs) were collected the study intersections on Thursday, March 31st, 2022. The turning movement count data collected is included in **Appendix B**. The AM peak hour occurred between 7:15 AM and 8:15 AM, and the PM peak hour occurred between 4:30 PM and 5:30 PM. The existing conditions peak hour turning movement volumes are shown on **Exhibit 2**. For analysis purposes, southbound U-Turn movements at Hamblen Road & Oldham Parkway were included in the southbound left-turn volume. The existing geometry with lane configurations and intersection control at the study intersections is shown on **Exhibit 3**.

3.0 PROPOSED DEVELOPMENT

3.1 SITE DESCRIPTION

The proposed Home Depot C-Store development includes a 6,250 square foot convenience store facing Hamblen Road. In front of the store there will be 16 gasoline fueling positions under a canopy. Parking will be provided along the front of the store. An east-west drive aisle with parking on each side will be located in the northeast portion of the site connecting to Driveway 2. The proposed development site plan is included in **Appendix C** for reference.

3.2 SITE CIRCULATION

The proposed development will be accessed from two access points along private driveways internal to the Home Depot site. One access at the south side of the site will connect to Driveway 1, just east of Hamblen Road aligning with an existing drive aisle on the south side of Driveway 1. The other access point is the drive aisle in the northeast portion of the site that will connect to Driveway 2.

3.3 TRIP GENERATION

Trip generation estimates were prepared using the ITE *Trip Generation Manual*, 11th Edition. **Table 1** shows the expected trips to be generated by the proposed development. The total trip generation is anticipated to be 5,532 daily trips, 506 trips during the AM peak hour (253 entering and 253 exiting), and 430 trips during the PM peak hour (215 entering and 215 exiting). **Appendix D** provides the calculations used to determine the trip generation of the proposed development.

TABLE 1: PROPOSED DEVELOPMENT TRIP GENERATION

Land Use Description	ITE LUC	Intensity / Units	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Convenience Store/Gas Station	945	16 Fueling Positions	5,532	253	253	506	215	215	430
Pass-By Trips			3,485	159	159	318	135	135	270
Net New Site Trips			2,968	94	94	188	80	80	160

Pass-by trips are common at gas stations. Pass-by trips occur when a driver already traveling on the street adjacent to the development makes a trip to the development while in route to another destination. For the purposes of this study, pass-by traffic would consist of existing traffic on Hamblen Road and on Oldham Parkway making a trip to the development. Therefore, pass-by trips do not add new trips to the street network, but they do increase turning movements in and out of the development site.

The errata to the *Trip Generation Handbook* published by ITE, dated February 6, 2018 indicates an average pass-by trip percentage of 63 percent during both peak hours for the Convenience Market with Gasoline Pumps land use. That pass-by trip percentage was applied to the trip generation for the proposed development as indicated in **Table 1**.

3.4 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The estimated new site trips generated by the proposed development were assigned to the street network based on the trip distribution summarized in **Table 2**. This distribution is based on existing traffic patterns,

the expected service area of the proposed development, and engineering judgment. The detailed distribution patterns through the study intersections are shown on **Exhibit 4**.

TABLE 2: PROPOSED DEVELOPMENT TRIP DISTRIBUTION

Direction To/From	Percentage
North on Hamblen Road	45%
South on Hamblen Road	30%
East on Oldham Parkway	25%
Total	**100%**

Pass-by trips were accounted for using percentages similar to the distributions in **Table 2**. **Exhibit 5** shows the development trip assignment, including the pass-by trips.

The proposed development trip assignments and pass-by trips were added to the Existing (Year 2022) traffic volumes. **Exhibit 6** illustrates the Existing plus Development peak hour traffic volumes.

4.0 ACCESS MANAGEMENT

The City of Lee's Summit *Access Management Code* (AMC) provides guidance for the design of driveways, access spacing, and the need for turn lanes at intersections. These items are discussed in the following paragraphs.

4.1 ACCESS SPACING

The AMC includes requirements for minimum spacing between street connections, depending on street classification. Along minor arterial roadways such as Hamblen Road, the minimum spacing is 400 feet, measured between centerlines. Driveway 1 meets the minimum spacing requirement from Oldham Parkway, but it is only 275 from the next driveway to the south. There are also existing private driveways on the west side of Hamblen Road that are less than the minimum spacing from Driveway 1. These are all existing driveways and there is no practical way to improve these connection spacings with the proposed development.

For commercial collectors, the minimum spacing is 300 feet. Driveway 2 meets the minimum spacing from Hamblen Road, but the next driveway to the east is 285 feet away. These driveways were like constructed before the AMC was adopted, and the spacings very nearly satisfy the minimum requirements. Driveway 2 is located to align with the driveway on the north side of Oldham Parkway, which is indicative of good access management.

4.2 DRIVEWAY THROAT LENGTH

A driveways throat length is the distance along a driveway from the intersecting roadway to the first location on site where a driver can make a turn. Adequate throat lengths minimize the potential for inbound traffic to queue onto the public street. The throat length also provides space for outbound traffic to queue without adversely impacting site circulation.

The throat length requirements in the AMC are based on the two-way traffic volume on the driveway and the adjacent street classification. Driveway 1 is projected to have 400 or more vehicles per hour during the peak hour. As such the minimum throat length is 150 feet. The existing driveway currently has a throat length of 48 feet to the drive aisle on the south side of the driveway, which does not meet the minimum throat length requirement. The access to the proposed development is planned to align with the existing drive aisle.

Consideration should be given to relocating the site access on Driveway 1 east to align with the drive aisle along the front of the proposed convenience store. This would increase the throat length to approximately 110 feet along the north side of the driveway. Queue lengths projected at the driveway will be discussed in the analysis section of this study.

Driveway 2 is projected to have a volume of less than 300 vehicles per hour during the peak hours. Therefore, the minimum throat length is 100 feet. The existing throat length is only 67 feet. The throat length cannot be increased without significant modifications to the existing Home Depot parking lot. Queue lengths projected at the driveway will be discussed in the analysis section of this study.

4.3 TURN LANE ANALYSIS

The AMC also provides requirements for right- and left-turn lanes based on traffic volumes and street classifications. At Hamblen Road and Driveway 1 there is already an existing southbound left-turn lane. On a minor arterial street, a right-turn lane is warranted if there are 60 or more right turns during a peak hour. The volumes in **Exhibit 6** indicate that 100 northbound right-turns are projected during each peak hour. Therefore, a northbound right-turn lane is warranted at the Hamblen Road and Driveway 1 intersection. The AMC indicates that a right-turn lane at this location should be a minimum of 150 feet in length plus taper. There is not enough distance between Driveway 1 and the next driveway to the south to accommodate a turn lane of that length. As a result, the northbound right-turn lane should be 100 feet in length plus a 60-foot taper.

Additionally, there is an existing curb inlet along the east side of Hamblen Road, approximately 100 feet south of Driveway 1. The large (7'x7') curb inlet has a 42-inch pipe, a 33-inch x 52-inch elliptical pipe, and a 15-inch pipe entering the structure. The curb inlet would be impacted by widening for a right-turn lane. Given that a standard length turn lane cannot be constructed, and it will impact a large existing curb inlet, the benefits of the right-turn lane may not outweigh the cost to construct the lane.

At Oldham Parkway and Driveway 2 there is an existing westbound left-turn lane. On a commercial collector street, a right-turn lane is warranted if there are 100 or more right-turns during a peak hour. The volumes in **Exhibit 6** indicate that 57 and 79 eastbound right-turns are projected during the AM and PM peak hours, respectively. Therefore, an eastbound right-turn lane is not warranted at Driveway 2.

The recommended geometry with lane configurations and intersection control at the study intersections for Existing plus Development conditions is shown on **Exhibit 7**.

5.0 FUTURE CONDITIONS

The traffic analysis focused on two analysis years: existing year (2022) and horizon year (2042). To develop the future conditions traffic volume projections, background traffic growth was added to the existing traffic volumes, then the proposed development site trips were added.

To estimate background traffic growth, the existing traffic volumes at the study intersections were assumed to increase at a rate of 1% per year. The annual growth rate was estimated from historical traffic volumes in the area provided on the Missouri Department of Transportation's website. The turning movements at the private driveway intersections were not increased. The Future (Year 2042) peak hour traffic volumes are shown on **Exhibit 8**.

6.0 INTERSECTION CAPACITY ANALYSIS

6.1 LEVEL OF SERVICE OVERVIEW

Intersection capacity analysis was performed at the study intersections for the following scenarios:

- Existing Conditions (Year 2022)
- Existing plus Development Conditions
- Future Conditions (Year 2042)

The capacity analysis was performed for the weekday AM and PM peak hours using Synchro traffic modeling software to determine intersection delay and level of service (LOS). Calculations were performed based on the methodologies outlined in the *Highway Capacity Manual (HCM)*, 6th Edition, which is published by the Transportation Research Board.

LOS is a quantitative measure used by traffic engineers to describe the operations of an intersection. It ranges from A to F, with A being the best and F being the worst level of operation. LOS A conditions are characterized by minimal vehicle delay and free-flow conditions, while LOS F is characterized by long vehicle delay – usually when demand exceeds available roadway capacity. **Table 3** shows the definition of LOS for unsignalized and signalized intersections.

TABLE 3: LEVEL OF SERVICE

Level of Service	Average Control Delay (seconds/vehicle) at:	
	Unsignalized Intersections	Signalized Intersections
A	0 – 10	0 – 10
B	> 10 – 15	> 10 – 20
C	> 15 – 25	> 20 – 35
D	> 25 – 35	> 35 – 55
E	> 35 – 50	> 55 – 80
F	> 50	> 80

Levels of service are evaluated based on the movement groupings which are required to yield to other traffic. Typically, these are left turns off the major street and the side street approaches for two-way stop-controlled intersections. For signalized intersections each movement grouping is evaluated, and LOS is evaluated for the intersection as a whole.

The City of Lee's Summit has adopted LOS C as the minimum desirable LOS. However, LOS D and E may be considered acceptable for low to moderate traffic volumes, the availability of alternate routes, and the duration of activity resulting in lower LOS.

Traffic queues were also evaluated as part of the analyses. Long traffic queues which extend beyond the amount of storage available, either between intersections or within turn lanes, can have significant impacts on operations. The 95th percentile vehicular queues were analyzed to ensure the analyses are reflective of the physical constraints of the study intersections and to identify if additional storage is needed for turn lanes. The 95th percentile queue represents the queue length that has only a 5% chance of being exceeded during the analysis period.

6.2 EXISTING (YEAR 2022) ANALYSIS

Capacity analysis was conducted for Existing (Year 2022) traffic conditions at the study intersections to determine baseline conditions for the existing analysis year. The analysis was performed for weekday AM and PM peak hours and is based on the lane configurations, traffic controls, and traffic volumes shown in **Exhibits 2** and **3**.

Table 4 provides a summary of the capacity analysis at the study intersections. The Synchro reports are provided in **Appendix E**.

TABLE 4: EXISTING (YEAR 2022) PEAK HOUR CONDITIONS

Intersection	Control	Movement	Operational Analysis Results					
			AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	95% Queue	Delay (sec/veh)	LOS	95% Queue
Hamblen Road & Driveway 1	Side Street Stop	WBL	15.1	C	< 50'	23.4	C	< 50'
		WBR	10.7	B	< 50'	11.9	B	< 50'
		SBL	8.2	A	< 50'	8.7	A	< 50'
Hamblen Road & Oldham Parkway	Traffic Signal	WBL	14.4	B	< 50'	17.6	B	57'
		WBR	12.0	B	< 50'	11.8	B	101'
		NBT/R	13.6	B	79'	20.9	C	142'
		SBL	8.3	A	< 50'	12.5	B	112'
		SBT	5.4	A	67'	7.9	A	137'
		Overall	**10.0**	**A**	--	**13.7**	**B**	--
Oldham Parkway & Driveway 2	Side Street Stop	NB	12.2	B	< 50'	20.0	C	< 50'
		EBL	7.7	A	< 50'	8.1	A	< 50'
		WBL	7.8	A	< 50'	8.1	A	< 50'
		SG	11.0	B	< 50'	13.9	B	< 50'

Based on the analysis results in **Table 4**, all intersections currently operate at acceptable LOS. The results indicate that all queues are contained within their respective turn lanes.

Some longer queues were observed on Hamblen Road during the counts during the PM peak hour. Between 5:00 PM and 5:30 PM, some long queues of northbound traffic extended back from the US-50 Highway interchange through Oldham Parkway and the intersection was blocked at times. One time during the PM peak hour the blockage resulted in the northbound through queue extending back to Driveway 1. This only occurred once during the traffic counts and the queue did clear during the next cycle of the signal. The improvements planned for the interchange should improve operations and alleviate the congestion observed on Hamblen Road.

6.3 EXISTING PLUS DEVELOPMENT ANALYSIS

Capacity analysis was conducted for Existing plus Development traffic conditions at the study intersections to determine the impact of site generated traffic from the proposed development. The analysis was performed for weekday AM and PM peak hours and is based on the lane configurations, traffic controls, and traffic volumes shown on **Exhibits 6** and **7**.

Table 5 provides a summary of the capacity analysis at the study intersections. The Synchro reports are provided in **Appendix E**.

TABLE 5: EXISTING PLUS DEVELOPMENT PEAK HOUR CONDITIONS

Intersection	Control	Movement	Operational Analysis Results					
			AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	95% Queue	Delay (sec/veh)	LOS	95% Queue
Hamblen Road & Driveway 1	Side Street Stop	WBL	22.5	C	< 50'	44.4	**E**	63'
		WBR	10.9	B	< 50'	12.3	B	< 50'
		SBL	8.6	A	< 50'	9.1	A	< 50'
Hamblen Road & Oldham Parkway	Traffic Signal	WBL	14.4	B	< 50'	18.1	B	60'
		WBR	11.9	B	< 50'	12.1	B	116'
		NBT/R	14.3	B	86'	21.4	C	157'
		SBL	8.6	A	50'	12.9	B	126'
		SBT	5.6	A	75'	8.2	A	149'
		Overall	**10.3**	**B**	--	**14.1**	**B**	--
Oldham Parkway & Driveway 2	Side Street Stop	NB	14.7	B	< 50'	30.7	**D**	70'
		EBL	7.6	A	< 50'	8.0	A	< 50'
		WBL	8.0	A	< 50'	8.3	A	< 50'
		SG	12.1	B	< 50'	15.2	C	< 50'

The analysis results in the table indicate that, most movements are projected to continue operating at acceptable LOS with the addition of traffic from the proposed development.

There are several movements that are projected to operate at undesirable levels of service in this scenario. The westbound left-turn movement at Hamblen Road & Driveway 1 is projected to operate at LOS E with 44.4 seconds of delay during the PM peak hour. Also, the northbound approach at Oldham Parkway & Driveway 2 is projected to operate at LOS D with 30.7 seconds of delay during the PM peak hour. While these LOS are lower for the PM peak hour, these movements operate acceptably during the AM peak hour. If these delays are unacceptable to drivers, alternate routes are available. Drivers can circulate through the Home Depot site to other driveways. Drivers can also make right turns out of the site instead of left turns and travel to the surrounding streets such as Century Drive and Bailey Road to reach the same destinations. For these reasons, no improvements are identified to mitigate the lower levels of service projected in this scenario.

The westbound queue lengths at Driveway 1 are projected to be 63 feet or less during both peak hours. This will block the proposed site access and existing drive aisle to the south. If the site access was shifted east as discussed in Section 4.2 of this study, the queues would not block the access.

Northbound queues at Driveway 2 are projected to be 70 feet during the PM peak hour, which will slightly exceed the throat length of the driveway. Inbound traffic will still be able to access the proposed gas station and Home Depot if 70-foot queues occur, therefore no operational concerns are expected in this scenario.

6.4 FUTURE (YEAR 2042) ANALYSIS

Capacity analysis was conducted for Future (Year 2042) traffic conditions at the study intersections to determine if improvements may be needed in the future. The analysis was performed for weekday AM and PM peak hours and is based on the traffic volumes shown on **Exhibit 8**. The lane configurations and traffic controls from the previous scenario shown on **Exhibit 7** were also used for this scenario.

Table 6 provides a summary of the capacity analysis at the study intersections. The Synchro reports are provided in **Appendix E**.

TABLE 6: FUTURE (YEAR 2042) PEAK HOUR CONDITIONS

Intersection	Control	Movement	Operational Analysis Results					
			AM Peak Hour			PM Peak Hour		
			Delay (sec/veh)	LOS	95% Queue	Delay (sec/veh)	LOS	95% Queue
Hamblen Road & Driveway 1	Side Street Stop	WBL	30.8	**D**	55'	90.7	**F**	108'
		WBR	11.8	B	< 50'	13.8	B	< 50'
		SBL	8.9	A	< 50'	9.6	A	< 50'
Hamblen Road & Oldham Parkway	Traffic Signal	WBL	15.5	B	< 50'	22.3	C	99'
		WBR	12.2	B	54'	14.2	B	224'
		NBT/R	16.7	B	113'	27.0	C	266'
		SBL	10.0	A	60'	18.3	B	278'
		SBT	6.4	A	94'	10.3	B	218'
		Overall	**11.7**	**B**	--	**18.0**	**B**	--
Oldham Parkway & Driveway 2	Side Street Stop	NB	17.1	C	< 50'	54.8	**F**	120'
		EBL	7.7	A	< 50'	8.2	A	< 50'
		WBL	8.1	A	< 50'	8.5	A	< 50'
		SG	12.5	B	< 50'	18.2	C	< 50'

The analysis results in **Table 6** indicate some lower levels of service are projected exiting the Home Depot driveways in the future. The westbound left-turn movement at Hamblen Road & Driveway 1 is projected to operate at LOS D and F during the AM and PM peak hours, respectively. The northbound approach at Oldham Parkway & Driveway 2 is projected to operate at LOS F during the PM peak hour. While these are lower levels of service, alternate routes to exit the site will be available to drivers. Along higher volume corridors it is not uncommon for stop-controlled side street movements to experience longer delays during peak times. Signalization is not appropriate at either of the driveways due to the proximity of the existing traffic signal at Hamblen Road & Oldham Parkway.

At the Hamblen Road & Oldham Parkway signalized intersection, the queues for the northbound through movement and southbound left-turn movement are projected to increase. If these queues become a concern, additional capacity and storage could be added for the southbound left-turn movement. The existing pavement is wide enough to allow for dual southbound left-turn lanes. Increasing the capacity of this movement would allow for signal timing changes that would decrease the queue lengths for the southbound left-turn and the northbound through movements.

The westbound queue lengths at Driveway 1 are projected to be 108 feet or less during both peak hours. This will block the proposed site access. If the access was shifted east as discussed in Section 4.2 of this study, the queues would be able to be contained on the driveway without blocking the site access.

Northbound queues at Driveway 2 are projected to be 120 feet during the PM peak hour, which will extend back into the parking aisles. If this level of queueing occurs in the future, consideration should be given to installing signage and pavement markings directing drivers not to block the internal intersection. Providing a short northbound right-turn lane on Driveway 2 would also reduce queue lengths.

6.0 CONCLUSIONS AND RECOMMENDATIONS

A traffic impact study for the Home Depot C-Store development has been prepared by Kimley-Horn. The proposed development site is located at the southeast corner of the Hamblen Road and Oldham Parkway intersection in Lee's Summit, Missouri. The purpose of this study was to assess the impact of the proposed development on the surrounding transportation system.

The following provides a summary of the analysis. Intersection capacity analysis was performed at the study intersections for the following scenarios:

- Existing (Year 2022)
- Existing plus Development
- Future (Year 2042)

Counts were collected in March 2022 to serve as the baseline for analysis. All study intersections were found to currently be operating at acceptable levels of service.

The proposed development is projected to generate 5,532 daily trips, with 506 trips during the AM peak hour and 430 trips during the PM peak hour. The site trips were added to the street network, and it was determined that a northbound right-turn lane will be warranted at Hamblen Road & Driveway 1. Given that a standard length turn lane cannot be constructed at this location, and a turn lane will impact a large existing curb inlet, the benefits of the right-turn lane may not outweigh the cost to construct the lane.

With the addition of development traffic most movements at the study intersections are projected to operate acceptably. No mitigations are identified for the movements that operate at lower levels of service. Queues on Driveway 1 are projected to block the proposed site access during the PM peak hour. Consideration should be given to relocating the site access east to align with the drive aisle along the front of the proposed convenience store.

In the Future (Year 2042) scenario, the existing traffic volumes were grown at a rate of 1% per year, and the proposed site trips were included. Overall, the study intersections are projected to operate similar to the previous scenario. Delays and queues are projected to increase for some movements exiting the Home Depot driveways. In the future, there may be a need for some modifications at the Oldham Parkway and Driveway 2 intersection if queues exceed the throat length of the driveway.