

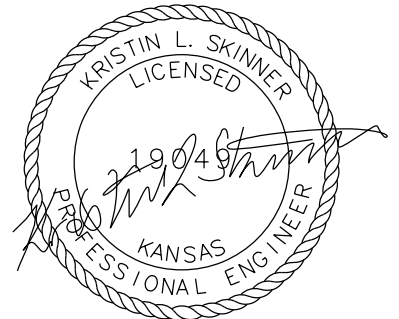
Oddo Cedar Creek Apartments

TRAFFIC IMPACT ANALYSIS

December 15, 2023

Prepared For:
Oddo Development

Prepared By:
Priority Engineers, Inc.
PO Box 563
Garden City, MO 64747



12-15-23



December 15, 2023

Mr. Rick Oddo
Oddo Development

RE: Oddo Cedar Creek Apartments Traffic Impact Study – Olathe, KS

Dear Mr. Oddo,

In response to your request, Priority Engineers, Inc. has completed a traffic impact analysis for the above referenced project. The purpose of the analysis is to determine the potential traffic impacts associated with this development on the intersections and streets surrounding this site, primarily during the AM and PM peak hours. The following report documents our analysis and recommendations.

We appreciate the opportunity to work with you on this project. Please contact us with any questions or if you require additional information.

Sincerely,

PRIORITY ENGINEERS, INC.

A handwritten signature in blue ink that reads 'Kristin L. Skinner'.

Kristin L. Skinner, P.E., PTOE
President

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1) INTRODUCTION

The purpose of this study is to examine the potential traffic impacts associated with the proposed Oddo Cedar Creek Apartments. The proposed development site is located approximately .3 miles south of the K-10 interchange with Cedar Creek Parkway in Olathe, Kansas.

The study area is shown in Figure 1 and the site plan is shown in Figure 2 of Appendix 1.

2) EXISTING CONDITIONS

The existing site is located within the municipal limits of the City of Olathe, KS and is located on ground that has not been previously developed. The proposed development is located between Valley Parkway and W 103rd Street. The development is located on the west side of S Shadow Ridge Drive.

Cedar Creek Parkway, within the study area, has a four-lane cross section with curb and gutter and an enclosed drainage system. Cedar Creek Parkway has median separation between northbound and southbound traffic and has existing median breaks at the study intersections located at Valley Parkway and W 103rd Street. Cedar Creek Parkway, within the study area, has a posted speed limit of 35 MPH. The Mid-America Regional Council (MARC) has given this facility a functional classification of a Minor Collector to the south of K-10 and a Functional Classification of Minor Arterial to the north of K-10. The Olathe Major Street Map identifies Cedar Creek Parkway as a Major Arterial.

Valley Parkway, within the study area, has a four-lane cross section with curb and gutter and an enclosed drainage system. Valley Parkway has a posted speed limit of 35 MPH. MARC has assigned this facility a functional classification of Major Collector. The intersection of Valley Parkway and Cedar Creek Parkway is controlled by STOP control on Valley Parkway and Cedar Creek Parkway. The intersection of Valley Parkway and S Shadow Ridge Drive is STOP controlled on the minor movements. The Olathe Major Street Map identifies Valley Parkway as a Major Arterial.

W 103rd Street, within the study area, has a two-lane cross section with curb and gutter and an enclosed drainage system. W 103rd Street has a posted speed limit of 30 MPH. MARC has assigned this facility a functional classification of Local Road by default to the east of Cedar Creek Parkway. To the west of Cedar Creek Parkway, the designation of this roadway changes to S Cedar Niles Boulevard. MARC has assigned S Cedar Niles Boulevard a functional classification of Minor Collector. The intersection of W 103rd Street / W Cedar Niles Boulevard and Cedar Creek Parkway is controlled by STOP control on both W 103rd Street / S Cedar Niles Boulevard and Cedar Creek Parkway. The study intersection of S Shadow Ridge Drive and W 103rd Street is STOP controlled on the minor movements. The Olathe Major Street Map identifies W 103rd Street as being classified as a Collector.

S Shadow Ridge Drive is a two-lane facility with curb and gutter and an enclosed drainage system. S Shadow Ridge Drive did not have a posted speed limit but was assumed to have a speed limit of 25 MPH for the purposes of the study. Both MARC and the Olathe Major Street Map assign S Shadow Ridge Drive a functional classification of Local Road.

The turning movement counts were collected at the following study intersections: Cedar Creek Parkway and Valley Parkway, Cedar Creek Parkway and W 103rd Street / S Cedar Niles

Boulevard, W 103rd Street and S Shadow Ridge Drive, and Valley Parkway and S Shadow Ridge Drive. The turning movement counts were collected between 7-9 AM and 4-6 PM on Wednesday, November 29th, of this year. Figures 3 and 4 of Appendix I show AM and PM Peak Hour traffic volumes. The AM Peak Hour was found to be 7:45-8:45 AM and the PM Peak Hour was found to be 4:45-5:45 PM.

3) PROPOSED DEVELOPMENT

The proposed development is multi-use in nature with residential, retail, office space and restaurants. At final buildout there will be 300 units of multifamily housing, 12,500 SF of office space, 19,500 SF of retail space and 7,000 SF for sit down restaurants.

The proposed development’s primary access is located on S Shadow Ridge Drive to the north of W 102nd Terrace with two full access entrances being proposed. There is another proposed access to the south of W 102nd Terrace for fire access purposes.

4) TRIP GENERATION

The vehicle trips generated by the proposed development were estimated, using the Institute of Transportation Engineers’ (ITE) Trip Generation, 11th Edition. The ITE land use identified for the residential component of the development is 221 (Multi-family Housing (Mid Rise)). The ITE land uses identified for the commercial development component of the site include: “710 (General Office Building), 822 (Strip Retail (<40K)), and 932 (High Turnover (Sit-Down) Restaurant),. The estimated AM and PM peak hour traffic volumes associated with the full buildout of this development are shown in Table 1 below.

Table 1: Trip Generation								
Land Use	Intensity	Daily	AM Peak			PM Peak		
			Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	300 Units	1385	120	28	92	117	72	45
General Office Building	12,500 SF	190	28	25	3	30	5	25
Strip Retail Plaza (<40k)	19,500 SF	1053	45	27	18	125	63	62
High-Turnover (Sit-Down) Restaurant	7,000 SF	750	67	37	30	63	39	24
Total		3378	260	117	143	335	179	156

Internal capture rate is defined by in the ITE Trip Generation Handbook, 3rd Edition as a percentage reduction that can be applied to the trip generation estimates for individual land uses to account for trips internal to the site. Typically, this rate is applied to a new development that contains various uses. As recommended by the ITE Trip Generation Handbook 3rd edition, the National Cooperative Highway Research Program (NCHRP) Report 684 methodologies were used to calculate the internal capture between the office, restaurant, residential, and retail components of the proposed development. The internal capture reductions are illustrated in

Table 2 below. The NCHRP Report 684 worksheets and calculations are included in Appendix II.

Table 2: Trip Generation with Internal Capture Reductions								
<i>Land Use</i>	<i>Intensity</i>	<i>ITE Code</i>	<i>AM Peak</i>			<i>PM Peak</i>		
			<i>Total</i>	<i>In</i>	<i>Out</i>	<i>Total</i>	<i>In</i>	<i>Out</i>
Multifamily Housing (Mid-Rise)	300 Units	221	120	28	92	117	72	45
			-11	-2	-9	-34	-21	-13
General Office Building	12,500 SF	710	28	25	3	30	5	25
			-8	-6	-2	-11	-4	-7
Strip Retail Plaza (<40k)	19,500 SF	822	45	27	18	125	63	62
			-8	-4	-4	-49	-21	-28
High-Turnover (Sit-Down) Restaurant	7,000 SF	932	67	37	30	63	39	24
			-17	-10	-7	-32	-17	-15
Subtotal			260	117	143	335	179	156
<i>Internal Capture</i>			-44	-22	-22	-126	-63	-63
Total External Trips			216	95	121	209	116	93

5) TRIP DISTRIBUTION AND ASSIGNMENT

Trips generated by the proposed Oddo Cedar Creek Apartments were distributed based on existing traffic flows and a general analysis of the site and surrounding roadway network. The trips were distributed onto the existing street system approximately as follows for the development:

All Phases

- 10 percent to and from the east via Valley Parkway
- 3 percent to and from the east via W 103rd Street
- 3 percent to and from the west via Valley Parkway
- 4 percent to and from the west via W 103rd Street
- 80 percent to and from the north via Cedar Creek Parkway

6) LEVEL OF SERVICE AND VOLUME/CAPACITY ANALYSES

Capacity analysis was used to quantify the impacts of the increased traffic on the intersections studied. The methodology outlined in the Highway Capacity Manual, 6th Edition, was used as a basis to perform the analysis for this study. Capacity analysis defines the quality of traffic operation for an intersection using a grading system called Level of Service (LOS). The LOS is

defined in terms of average vehicle delay. Levels of service A through F have been established with A representing the best and F the worst.

Table 3: Level of Service Definitions		
Level of Service	Unsignalized Intersection	Signalized Intersection
A	< 10 Seconds	< 10 Seconds
B	< 15 Seconds	< 20 Seconds
C	< 25 Seconds	< 35 Seconds
D	< 35 Seconds	< 55 Seconds
E	< 50 Seconds	< 80 Seconds
F	≥ 50 Seconds	≥ 80 Seconds

The study intersections were evaluated using Synchro software, which is based in part on Highway Capacity Manual methods. The analysis reports are included in Appendix II. The existing lane configuration at the intersections of Cedar Creek Parkway with Valley Parkway and Cedar Creek Parkway and S Cedar Niles Road / W 103rd Street are not supported by more recent versions of the Highway Capacity Manual than the 2000 edition. In order to analyze these intersections with the most current methodology, these intersections were more conservatively evaluated with a single through lane in each direction.

Existing Conditions

The levels of service, lane configuration, and queue lengths for existing conditions are shown in Figures 5 and 6 in Appendix I.

The level of service for STOP controlled minor movements on Shadow Ridge Drive is an A in both Peak Hours. The design queue lengths for both Peak Hours is minimal for STOP controlled minor movements.

Both all way STOP controlled intersections on Cedar Creek Parkway operate with individual movement groups experiencing a level of service B or better for both the AM and the PM Peak Hour. Both Peak Hours have all individual movement groups experiencing minimal design queue lengths.

Existing + Proposed Development

The levels of service, lane configuration, and queue lengths for this scenario are shown in Figures 9 and 10 in Appendix I. With the addition of the projected development traffic, the level of service can be described as follows:

The STOP controlled minor movements on Shadow Ridge Drive, including the proposed entrances into the development, are a level of service an A in both Peak Hours. The design queue lengths for both Peak Hours is minimal for STOP controlled minor movements.

Both all way STOP controlled intersections on Cedar Creek Parkway continue to operate with individual movement groups experiencing a level of service B or better for both the AM and the PM Peak Hour. Both Peak Hours have all individual movement groups experiencing minimal design queue lengths.

Future Conditions

The background growth for existing traffic within the study area was evaluated with a future horizon year of 2043. While the MARC projections for Olathe indicate a lesser growth rate, a growth rate of 2 percent per year was applied to the background traffic due to the amount of undeveloped land in the vicinity of the study area. This equates to a 48.5 percent increase in traffic.

Figures 13 and 14 of Appendix I depict the levels of service, lane configuration, and queue lengths for this scenario. With the addition of the additional traffic projected by the proposed development, the level of service can be described as follows:

The level of service for STOP controlled minor movements on Shadow Ridge Drive is a B or better in both Peak Hours. The design queue lengths for both Peak Hours are minimal for STOP controlled minor movements.

Both all-way STOP controlled intersections on Cedar Creek Parkway operate with individual movement groups experiencing a level of service C or better for both the AM and the PM Peak Hour. Both Peak Hours have all individual movement groups experiencing minimal design queue lengths.

7) ACCESS MANAGEMENT

The Olathe Access Management Plan (AMP) specifies that no street shall be allowed within the influence area of an intersection, and the AMP further identifies the influence area for an intersection of a Residential Street with another Residential Street as a minimum of 50' in all directions. Both the proposed fire access and the south drive exceed this requirement. The influence area on a Residential Street at an intersection with an Arterial is defined in the AMP as 150'. The north drive of the proposed development's internal roadway network exceeds this minimum spacing from the intersection of Valley Parkway and Shadow Creek Drive.

The AMP recommends a minimum throat length of 50' for private drives off of Residential streets. The throat length for both drives exceeds this minimum throat length.

The AMP specifies 8 to 10 seconds of intersection sight distance for vehicles. Due to the slope of Shadow Creek Drive, a 10-second sight distance interval was selected (most conservative). This equates to a sight distance of 370 feet. Table 4 below documents the intersection sight distances measured at the approximate locations of the proposed drives.

Table 4: Intersection Sight Distance Values		
	Measured Intersection Sight Distance	Intersection Sight Distance (25 mph, 10 second interval)
North Drive		
To the north	to intersection	370'
To the south	>400'	370'
South Drive		
To the north	>600'	370'
To the south	>600'	370'
Fire Access		
To the north	380'	370'
To the south	>400'	370'

8) RECOMMENDATIONS & CONCLUSIONS

This study documents the impact of the proposed development on the surrounding roadway network.

The proposed full buildout development scenario performs well. With the growth in background traffic in the future scenario, the study intersections continue to operate with good levels of service. The proposed development site conforms with the Olathe Access Management Plan.

No additional improvements are necessary as a result of this development.