

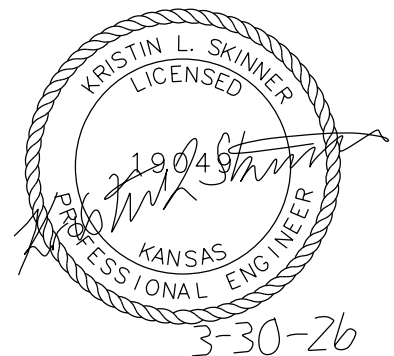
Boulder Hills

TRAFFIC IMPACT ANALYSIS

March 30, 2026

Prepared For:
CRG Residential
805 City Center Drive, Suite 160
Carmel, IN 46032

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





March 30, 2026

Mr. Peter DeLee
CRG Residential
805 City Center Drive, Suite 160
Carmel, IN 46032

RE: Boulder Hills Traffic Impact Study – Olathe, KS

Dear Mr. DeLee,

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 Boulder Hills residential development. The proposed development site is located approximately 2.5 miles east of the intersection of US-169 and W 175th Street 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 S Legler Road and Black Bob Road. The development is located on the north side of W 175th Street.

W 175th Street, within the study area, has a two-lane cross section with paved shoulders and an open drainage system. W 175th Street, within the study area, has a posted speed limit of 50 MPH. The Mid-America Regional Council (MARC) has given this facility a functional classification of Major Collector. The Olathe Major Street Map identifies W 175th Street as an Expressway.

S Black Bob Road, within the study area, has a two-lane cross section with earthen shoulders and an open drainage system. S Black Bob Road has a posted speed limit of 45 MPH. MARC has assigned this facility a functional classification of Major Collector north of W 167th Street and that of a Local Road south of W 167th Street. The intersection of W 175th Street and S Black Bob Road is STOP controlled for minor movements. The Olathe Major Street Map identifies S Black Bob Road as an Arterial. Currently, there is construction on S Black Bob Road north of the study area that is impacting traffic patterns and volumes with the reconstruction of the intersection of W 167th Street and S Black Bob Road into a roundabout configuration.

S Legler Road, W 173rd Terrace, and W 172nd Terrace all have two-lane cross sections with curb and gutter and an enclosed drainage system. All three roadways have a posted speed limit of 30 MPH. MARC has assigned these facilities a functional classification of Local Road by default. The Olathe Major Street Map identifies these roadways as either Collector or a Future Collector. The minor movements at the intersection of W 175th Street and S Legler Road, S Legler Road and W 173rd Terrace, W 173rd Terrace and W 172nd Terrace, and W 172nd Terrace and S Black Bob Road are all STOP controlled for the minor movement.

The turning movement counts were collected at the following study intersections: W 175th Street and S Legler Road, S Legler Road and W 173rd Terrace, W 173rd Terrace and S Allman Road, W 173rd Terrace and W 172nd Terrace, W 172nd Terrace and S Black Bob Road, and S Black Bob Road and W 175th Street. The turning movement counts were collected between 7-9 AM and 4-6 PM on Tuesday February 3rd and Wednesday February 4th Wednesday, 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 7:15-8:15 AM and the PM Peak Hour was found to be 4:30-5:30 PM.

3) APPROVED DEVELOPMENT

Currently, the Boulder Hills Villa development is being constructed on the north side of W 175th Street, east of the proposed development. Staff with the City of Olathe also indicated the following developments as having been approved and could be considered for the Future Conditions analysis:

- Stonebridge Meadows
- Stonebridge Crossing
- Stonebridge South
- Stonebridge Villas
- Hilltop Farms
- Boulder Hills MF Development
- Stonebridge Court
- Palisade Park
- Wolf Creek (Overland Park)
- Schlagel Farms (Overland Park)

City Staff was unable to provide copies of any approved TIS or trip generation estimates and distributions for the approved developments. Olathe, however, does have an Access Management Plan that requires the following:

- left turn lanes on expressways at intersecting streets, 300' minimum length plus taper
- right turn lanes on expressways at intersecting streets, 300' minimum length plus taper
- left turn lanes on arterial streets, 250' minimum plus taper (at arterial intersections) or 200' plus taper at other locations
- right turn lanes on arterial streets, 250' minimum plus taper (at arterial intersections) or 150' plus taper at other locations

The following intersections were observed to have features not compliant with the Olathe AMP and in need of improvements:

- W 175th Street at S Black Bob Road, left tun lane is approximately 110' (300' required)
- W 175th Street at S Black Bob Road (300' required)
- No right or left turn lane on S Black Bob Road at the intersection with W 175th Street, 250' minimum plus taper required.
- The left turn lane on S Black Bob Road at the intersection of W 172nd Terrace are less than AMP required minimum

For the purposes of this study, it was assumed that all of these improvements have previously been identified and programmed, or that there has been variance(s) granted for deviations from the AMP.

4) PROPOSED DEVELOPMENT

The proposed development will construct 318 units of multi-family housing with two full access intersections from the development's internal street network. One intersection will occur on W 173rd Terrace at S Allman Road, constructing the south leg of this intersection. The second intersection will be on the yet to be constructed extension of W 172nd Terrace, between the intersection with W 173rd Terrace and the intersection with W 175th Street.

5) TRIP GENERATION

The vehicle trips generated by the proposed development were estimated, using the Institute of Transportation Engineers' (ITE) Trip Generation, 12th Edition. The ITE land use identified for the residential component of the development is 220, Multi-family Housing (Low-Rise). 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								
<i>Land Use</i>	<i>Intensity</i>	<i>Daily</i>	<i>AM Peak Hour</i>			<i>PM Peak Hour</i>		
			<i>Total</i>	<i>In</i>	<i>Out</i>	<i>Total</i>	<i>In</i>	<i>Out</i>
Multifamily Housing (Low-Rise)	318 Units	1911	124	30	94	160	99	61
Total		1911	124	30	94	160	99	61

6) TRIP DISTRIBUTION AND ASSIGNMENT

Trips generated by the proposed Boulder Hills development 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:

- 35 percent to and from the north via S Black Bob Road
- 30 percent to and from the east via W 175th Street
- 20 percent to and from the west via W 175th Street
- 15 percent to and from the north via W S Legler Road

7) 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, 7th 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 2: Level of Service Definitions		
<i>Level of Service</i>	<i>Unsignalized Intersection</i>	<i>Signalized Intersection</i>
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.

Existing Conditions

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

All STOP controlled minor movements are anticipated to operate with a level of service C or better in both Peak Hours with 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:

All STOP controlled movements with the exception of the southbound movement group on S Black Bob Road in the PM Peak Hour are anticipated to have a level of service C or better. The southbound movement group on S Black Bob is anticipated to have a level of service D in the PM Peak Hour. All STOP controlled minor movement groups are anticipated to have minimal design queue lengths.

The approved Boulder Hills Villa development to the east of the proposed development will add additional traffic to the intersection of W 173rd Terrace and W 172nd Terrace, the intersection of the east entrance into the proposed development and W 172nd Street, and the intersection of W 172nd Terrace and W 175th Street. This additional traffic is not factored into the capacity analysis for these intersections.

Future Conditions

The background growth for existing traffic within the study area was evaluated with a future horizon year of 2046, While the MARC projections for Olathe indicate a lesser growth rate, a growth rate 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 STOP controlled minor movements on S Black Bob Road will have undesirable levels of service (E or F) in both Peak hours for both northbound and southbound traffic with design queue length of less than six vehicles.

The southbound left turning movement group on S Leger Road at W 175th Street is anticipated to have an unacceptable level of service E in both peak hours with a design queue length less than 3 vehicles.

All other STOP controlled minor movements are anticipated to operate with acceptable levels of service and minimal design queue lengths.

8) ACCESS MANAGEMENT

The Olathe Access Management Plan (AMP) specifies that no street shall be allowed within influence area of an intersection, and the AMP further identifies the influence area for an intersection of a Residential Street with another Residential Street is a minimum of 50' in all directions. Both the proposed S Allman Road intersection with W 173rd and the proposed east drive intersecting with W 172nd Terrace exceeds this requirement.

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. This equates to an intersection sight distance of 352' to 440' at 30 MPH. Sight distance at the intersection of W 173rd Terrace and S Allman Road was measured for the south leg of the intersection. Field measurements resulted in an intersection sight distance in excess 500' to the west and to the intersection with 172nd Terrace to the east.

The intersection of the east drive and W 172nd Terrace will need to be verified to have sufficient sight distance by the civil site designer as part of the design process.

If not previously planned by the Boulder Hills Villa development, the future intersection of W 172nd Terrace and W 175th Street will require both a 150' plus taper westbound right turn lane and a 200' plus taper eastbound left turn lane.

9) SIGNAL WARRANT

The intersection of S Black Bob Road and W 175th Street is anticipated to have unacceptable levels of service in both the future AM and PM Peak Hours. Warrant Two (Four-Hour Vehicular Volume) of the MUTCD was reviewed for the four hours that traffic data was available. Due to the posted speed limit of W 175th Street, it is appropriate to evaluate this warrant at the 70% factor. Under existing conditions, with S Black Bob Road having construction impacting traffic patterns north of W 172nd Terrace, the warrant is met in the 7:00 to 8:00 AM hour and the 8:00 to 9:00 AM Hour. From 4:00 to 5:00 PM either seven additional northbound vehicles or nineteen additional southbound vehicles are needed to meet the warrant. From 5:00 to 6:00 PM either sixteen additional northbound vehicles or eighteen additional southbound vehicles are needed.

It is likely that after the additional approved developments are constructed, or if any additional traffic is distributed onto either northbound or southbound Black Bob Road, the warrant threshold will be met. In the event the traffic is not increased by other developments, the warrant will be met by increases in background traffic in the future scenario. This emerging need is not a result of this development.

10) RECOMMENDATIONS & CONCLUSIONS

This study documents the impact of the proposed development on the surrounding roadway network. This analysis does not factor in any of the various approved developments in the region, as they were not available for inclusion in this report.

The proposed full buildout development scenario performs well. Additional delays and lower levels of service may be experienced at the intersections on W 175th Street and on Black Bob Road when traffic volumes from approved studies are considered. Approved study volumes are not expected to have a significant impact on the intersections immediately adjacent to the proposed Boulder Hills development.

The proposed development site conforms with the Olathe Access Management Plan.

If not previously identified as part of the Boulder Hills Villas development, the proposed intersection of W 172nd Terrace and W 175th Street should have a westbound right and an eastbound left turn lane constructed as required by the AMP.

Currently the intersection of S Black Bob Road and W 175th Street does not conform with the AMP as identified in section 3 of this report. If a variance has not been granted or construction anticipated with other projects, these improvements are needed to conform with the AMP with existing conditions. Similarly, the intersection of W 172nd Terrace and S Black Bob Road has a left turn lane that is less than required by the AMP.

The intersection of S Black Bob Road and W 175th Street exceeds the MUTCD Warrant Two thresholds in both AM hours with traffic data and approaches the thresholds in PM hours with traffic data. It is likely that this volume will be met after construction impacts on S Black Bob abate or there is a slight increase in background traffic. Traffic volumes should be monitored for the programming and construction of a signal at this location.

The intersection of the East Drive and W 172nd Terrace will need to be verified to have sufficient sight distance by the civil site designer as part of the design process.

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