

Koinonia Ranch Minor Subdivision

Transportation Memorandum

Prepared for:
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OCTOBER 21, 2021

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LSC #204710



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October 21, 2021

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RE: Koinonia Ranch Minor Subdivision
Transportation Memorandum
El Paso County, CO
LSC #204710

Dear Ms. Bartels,

LSC Transportation Consultants, Inc. has prepared this transportation memorandum for the proposed Koinonia Ranch residential development located in El Paso County, Colorado. The proposed development will be located on El Paso County parcel 5219000059. The site is north of Old Ranch Road approximately 3,500 feet west of the intersection with Black Forest Road.

The parcel is proposed to be subdivided into six single-family lots. The existing home on the site will remain on one of the subdivision lots. This report presents the estimated vehicle-trip generation and roadway impacts of the proposed development. This report has been prepared for submittal to El Paso County.

REPORT CONTENTS

The preparation of this report included the following:

- Inventory of the existing adjacent and nearby roadway system. This includes functional classifications, roadway width and surface condition, posted speed limit, intersection/access spacing, intersection sight distance, etc.;
- A review of the proposed site land use and access location;
- Crash history at the intersection of Black Forest Road/Old Ranch Road;
- Estimates of current traffic volumes on Old Ranch Road adjacent to the site;
- Estimates of the net new and total daily and peak-hour trip generation for the proposed subdivision;
- The estimated directional distribution of site-generated vehicle trips;
- Projections of additional daily trips on Old Ranch Road in the vicinity of the site;
- Projections of peak-hour site-generated turning-movement traffic volumes at the site-access intersection;

- Evaluation of the post-development traffic volumes on Old Ranch Road in the vicinity of the site and at the site-access intersection; and
- Findings and recommendations.

RECENT TRAFFIC REPORTS

LSC is not aware of any traffic studies completed within the study area in the last five years.

PROPOSED LAND USE/SITE ACCESS

Figure 1 shows the site location relative to the adjacent and nearby roadways. The site is located north of Old Ranch Road approximately 3,500 feet west of the intersection with Black Forest Road. There is currently an existing driveway to the existing single-family home on the parcel located 3,575 feet west of Black Forest Road (centerline-to-centerline).

Figure 2 shows the site plan and proposed access point. As shown, the proposed subdivision road to serve the development is planned to be located approximately 190 feet west of the existing driveway. The proposed subdivision road will replace the existing residential driveway, which will be closed. This subdivision access/proposed road intersection with Old Ranch Road is proposed to be full-movement.

ROAD AND TRAFFIC CONDITIONS

Streets adjacent to the site are identified below, followed by a brief description of each:

Old Ranch Road is a gravel road with a Rural Major Collector classification in the vicinity of the site. The roadway extends approximately 5,700 feet to the west from Black Forest Road where it ends at the intersection with Forest Drive. Approximately one mile west of the end of Old Ranch Road, there is another segment of Old Ranch Road that extends from Milam Road to west of Voyager Parkway. This western segment of Old Ranch Road is paved. It is anticipated that the two segments of Old Ranch Road may be connected in the future, although it is not shown in any long-term plans.

Black Forest Road is a two-lane minor arterial. The roadway extends from just south of Woodmen Road north to the county line. The intersection with Old Ranch Road is stop-controlled. The roadway is planned for improvements between Hodgen Road and Stapleton Drive per the 2016 *Major Transportation Corridors Plan (MTCP)*. The posted speed limit is 55 miles per hour (mph) approaching Old Ranch Road in the northbound direction and drops to 40 mph immediately prior to the intersection. In the southbound direction the speed limit is 40 mph.

Existing Traffic Volumes

Figure 3 shows the estimated existing traffic volumes on Old Ranch Road adjacent to the site and at the existing property access driveway.

Crash History

Three years of crash history were analyzed at the intersection of Old Ranch Road/Black Forest Road. Only one crash was recorded during the study period, which was a rear-end crash that did not result in any injuries.

SITE ACCESS

Per the El Paso County *Engineering Criteria Manual*, intersections on a collector are required to have a minimum spacing of ¼ mile. The proposed access location will meet this minimum in both directions.

The intersection will have a required sight distance of 335 feet assuming a posted speed limit of 25 mph. The proposed subdivision road/access intersection with Old Ranch Road is anticipated to meet the required minimum sight distance in both directions. The required intersection line-of-sight “triangles” should be maintained and free of site improvements (that would limit the line of sight needed to maintain prescribed sight distance). Examples of site improvements include site grading, structures, landscaping, monument signs, parking areas, berms, etc.

OLD RANCH ROAD CONNECTION SCENARIO

As mentioned previously, there is a potential for the two segments of Old Ranch Road to be connected in the future. An analysis was completed to determine the long-term impacts of the proposed development, should such a connection occur in the future. To forecast the volume of traffic traveling on Old Ranch Road, the Pikes Peak Area Council of Government (PPACG) travel demand model was modified (by LSC) with the connection. Based on LSC model projections, it is estimated that Old Ranch Road will carry 4,500 vehicles per day. Historical count data on the west segment of Old Ranch Road was used to estimate the peak-hour directional traffic.

TRIP GENERATION ESTIMATE

Estimates of the vehicle trips projected to be generated by the proposed site have been made using the nationally-published average trip-generation rates in *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). The land use code 210 Single-Family Housing was used to calculate site-generated traffic.

Table 1 below presents a summary of the estimated site trip generation for the proposed development. A detailed trip-generation estimate for the site, including ITE rates, is presented in Table 4 (attached).

Table 1: Estimated Site Vehicle-Trip Generation

Analysis Period	Weekday		
	In	Out	Total
Morning peak hour (vehicle trips/hour)	2	5	7
Evening peak hour (vehicle trips/hour)	5	3	8
Weekday – 24-hour total (vehicle trips/day)	39	39	78

Based on the ITE estimate for the proposed development, the site would generate approximately 78 vehicle trips on the average weekday, with half entering and half exiting the site. Approximately 2 entering vehicles and 5 exiting vehicles are projected for the weekday morning peak hour and 5 entering vehicles and 3 exiting vehicles are projected for the weekday evening peak hour.

TRIP DIRECTIONAL DISTRIBUTION & SITE-GENERATED TRAFFIC

Site-Generated Traffic Volumes Prior to the Potential Future Old Ranch Connection

Figure 4 shows the directional-distribution estimate for the proposed development. This assumes almost all trips oriented to/from the east.

Site-generated traffic volumes at the access intersection have been calculated by applying the directional-distribution percentages estimated by LSC to the trip-generation estimates (from Table 4). Figure 4 also shows estimates of the site-generated traffic.

Site-Generated Traffic Volumes with Potential Future Old Ranch Connection

Appendix Figure 1 shows (for reference) the projected directional-distribution estimate and the site-generated traffic volumes at the access intersection if and when Old Ranch is extended west to Milam Road. Trip-distribution estimates for this scenario have been based on the following factors: the area roadway system and the *Pikes Peak Area Council of Governments* (PPACG) travel demand model. As shown, it has been assumed that 66 percent of site-generated traffic would travel to/from the west via Old Ranch Road.

Post-Development Projected Total Volumes

Figure 5 shows the projected post-development (“build”) traffic volumes adjacent to the site and at the proposed site-access intersection. These are the sum of estimated existing volumes plus the site-generated traffic volumes. These volumes assume Old Ranch Road prior to a possible future extension to Milam Road.

Appendix Figure 2 shows the projected long term total volumes at the site access if and when Old Ranch is extended west to Milam Road.

INTERSECTION LEVEL OF SERVICE ANALYSIS

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection and is indicated on a scale from “A” to “F.” LOS A is indicative of little congestion or delay. LOS F indicates a high level of congestion or delay. Table 3 shows the level of service delay ranges for signalized and unsignalized intersections.

Table 3: Intersection Levels of Service Delay Ranges

Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle) ⁽¹⁾
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more

(1) For unsignalized intersections if V/C ratio is greater than 1.0 the level of service is LOS F regardless of the projected average control delay per vehicle.

Old Ranch Road/Site Access

The site access intersection has been analyzed to determine the projected control delay and corresponding levels of service for turning movements. Figure 5 provides the levels of service for the projected post-development (“build”) traffic scenario. The level of service would be “A.”

As shown in Appendix Figure 2, all yielding turning movements at the site access are projected to operate at LOS B or better during both peak hours in the long term, assuming the future Old Ranch Road connection.

OLD RANCH ROAD LINK LOS

As mentioned previously, there is not a current project planned to connect the two segments of Old Ranch Road. Prior to this connection, all site-generated traffic, as well as all traffic generated by parcels accessing Old Ranch Road, will use the Old Ranch Road/Black Forest intersection. Note: The Wolf Ranch Master Plan (copy attached for reference) shows an Old Ranch Road realignment just west of Black Forest Road. This would be completed by the Wolf Ranch development.

A trip-generation estimate was prepared for the total number of parcels that would access Old Ranch Road with the addition of this development. Table 1 below presents a summary of the

estimated total traffic that will access Black Forest Road via Old Ranch Road. A detailed trip-generation estimate is presented in Table 5 (attached).

Table 2: Estimated Site Vehicle-Trip Generation

Analysis Period	Weekday		
	In	Out	Total
Morning peak hour (vehicle trips/hour)	7	21	28
Evening peak hour (vehicle trips/hour)	23	13	36
Weekday – 24-hour total (vehicle trips/day)	177	177	354

As shown, all parcels with access to Old Ranch Road, including the proposed development, are projected to generate less than 25 vehicles inbound or outbound during the peak hours. This indicates that with the current configuration of Old Ranch Road, no thresholds for auxiliary lanes would be met at the intersection of Old Ranch Road/Black Forest Road, with or without the proposed development. As indicated above, three years of crash history were analyzed at the intersection of Old Ranch Road/Black Forest Road. Only one crash was recorded during the study period, which was a rear-end crash that did not result in any injuries.

The projected total ADT adjacent to and just east of the site is not anticipated to exceed the design ADT of a Rural Gravel Roadway. Based on estimated ADT (based on ITE rates) just west of Black Forest Road (but east of the easternmost residential driveway), both the existing (estimated) and post-development (build) ADT would be over 200 vpd, but less than 300 vpd. This is based on ITE trip generation for ten single-family homes to the east with access to Old Ranch between the site and Black Forest Road (about 100 background trips generated).

AUXILIARY TURN LANES

No additional auxiliary lanes are necessary with this proposed development.

MTCP ROADWAY IMPROVEMENTS

The *2016 El Paso County Major Transportation Corridor Plan* shows that Black Forest Road between Hodgen Road and Stapleton Drive is planned to be improved.

PEDESTRIAN AND BICYCLE ACCOMMODATION

There are currently no sidewalks, bike lanes, or trails in the vicinity of the site. The subdivision road will be a rural gravel road and sidewalks are not required.

COUNTY ROAD IMPROVEMENT FEE PROGRAM

Reimbursable MTCP Improvements

There are no apparent reimbursable improvements programmed in the *MTCP* in the general vicinity of this site.

DEVIATIONS

A deviation for length of cul-de-sac has been prepared as part of this application. Please refer to the separate deviation request form document.

FINDINGS AND CONCLUSIONS

Trip Generation

- The development is expected to generate approximately 78 vehicle trips on the average weekday, with approximately 7 trips occurring during the morning peak hour and 8 trips during the evening peak hour.

Recommendations

- No additional auxiliary lanes or other improvements are required for the proposed development.

* * * * *

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Please contact me if you have any questions.

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By Jeffrey C. Hodsdon, P.E.
Principal

JCH:jas

Enclosures: Tables 4-5
Figures 1-4
Appendix Figure 1
Level of Service Reports
The Wolf Ranch Master Plan

References:

Trip Generation, 10th Edition, 2017, Institute of Transportation Engineers
El Paso County Major Transportation Corridors Plan, 2016
Engineering Criteria Manual, 2016, El Paso County

Tables

Table 4: Detailed Trip Generation – Proposed Subdivision

Land Use Code	Land Use Description	Trip Generation Units ⁽²⁾	Trip Generation Rates ⁽¹⁾						Total Trips Generated			
			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour	
				In	Out	In	Out		In	Out	In	Out
210	Single Family Housing	6 DU	13.02	0.27	0.77	0.81	0.45	78	2	5	5	3
Notes: (1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE) (2) DU = dwelling unit												
Source: LSC Transportation Consultants, Inc.												

Table 5: Detailed Trip Generation – Total Traffic Accessing Old Ranch Road

Land Use Code	Land Use Description	Trip Generation Units ⁽²⁾	Trip Generation Rates ⁽¹⁾						Total Trips Generated			
			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour	
				In	Out	In	Out		In	Out	In	Out
210	Single Family Housing	31 DU	11.42	0.23	0.66	0.73	0.41	354	7	21	23	13

Notes:
(1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)
(2) DU = dwelling unit

Source: LSC Transportation Consultants, Inc.

Figures

