# Traffic Impact Study (TIS) – Traffic Memorandum 16888 Elbert Road (Parcel 4122000002) – Special Uses Revision 6

Revision 6 2023-Dec-01 A full TIS is required for this project. Please remove Traffic Memorandum throughout the whole report.

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For a Community Commercial rezone a fullest and best use traffic analysis and TIS report must be provided beyond that of the initial limited commercial use types and business.

For a CC Rezone the TIS will need to be prepared and signed by a CO licensed traffic engineer

# **Signature Page**

Traffic Engineer's Statement The attached traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the eriteria established by the County for traffic reports. Request Need for Traffic Engineer Statement to be waived as the no need as generated traffic does not require any improvement to Elbert Road. Name, P.E. # Date Please remove this note as it is not Developer's Statement allowed, and traffic engineer's statement v behalf I, the Developer, have read and will comply with all is required. within this report.

Richard Holmes, Owner & Developer Holmes Enterprises LLC 16888 Elbert Road, Peyton, CO 80831 Mobile/Text: 719-963-0687 Email: holmesenterprisesllcco@gmail.com

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# Existing/Background Conditions Narrative

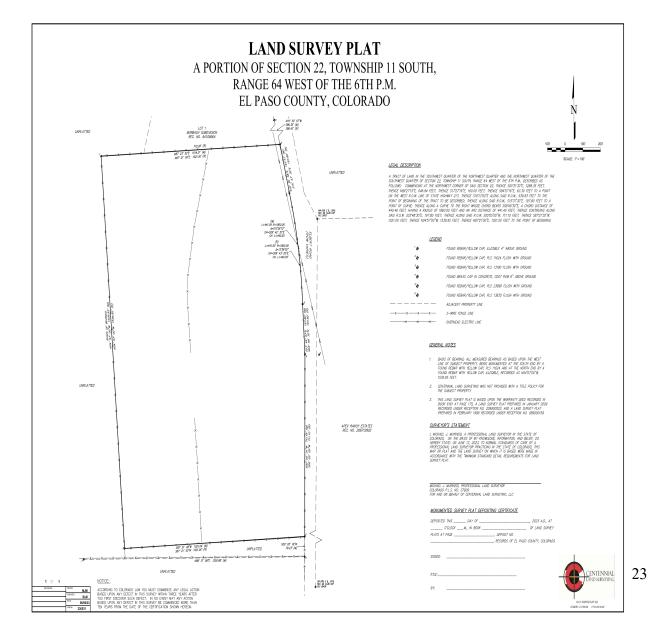
Please revise to be a description of proposed parcel.

# **Parcel Information**

TRACT IN SW4NW4 AND IN NW4SW4 SEC 22-11-64 DES AS FOLS; COM AT NW COR OF SD SEC, TH S 0<31'30" E 1288.35 FT, N 89<27'15" E 646.84 FT, S 17<27'16" E 160.0 FT, S 84<51'16" E 63.60 FT TO A PT ON W R/W LN OF HWY 217, S 19<13' E ALG SD R/W LN 939.83 FT FOR POB, TH ALG SD R/W LN S 15<37'30" E 197.8 FT, TH ALG A CUR TO R WHOSE CHORD BEARS S 8<49'30" E CHORD DIST 440.46 FT, HAVING A RAD OF 1860.0 FT AN ARC DIST OF 441.4 FT, S 3<48'30" E 197.8 FT, S 0<05' W 711.1 FT, S 87<21'30" W 1021.0 FT, N 4<57' W 1539.95 FT, N 87<21' E 1021.0 FT TO POB

# **Boundary Survey**

The following is the boundary survey completed on June 12, 2023



R

# **El Paso County Section Map**

rmrhregmaptools

https://rlmcony.users.earthengine.app/view/rmrhregmaptools?tool=plsstool&fips=08041&labe..



9/30/2023, 9:53 AM

1 of 1

# **Intersections Evaluated in the TIS**



Circles shows location of each intersection that is evaluated.

Please provide an overview of the project and site description.

# Study Area (Traffic Memorandum)

Adjacent roadways, intersections, and high-volume accesses

- Hopper Road and Elbert Road intersections
- Apex Ranch Road and Elbert Road intersections
- The 2 Sweet Road(east and west) and Elbert Road intersections
- Current parcel's driveway (16888 Elbert Road) and Elbert Road access point

#### Internal public roads

Internal road to service the 3 homes on the property and the Special Uses that are located nearest the entrance to the subdivision.

Pedestrian and Bicycle Continuity

As Elbert Road does not have facilities for Pedestrians and Bicycles, no continuity for those facilities to be added.

Access to most direct public transportation

Elbert Road is the most direct access to public transportation, however, Elbert Road does not provide public transportation.

## **Background Traffic**

#### Short-Range Volume Projections

Current peak A.M. and P.M. traffic for the subdivision's intersection with Elbert Road (using the traffic count data at the current 16888 Elbert Road driveway access point) is shown in the following table.

Traffic Count was derived by manually counting the vehicle traffic conducted by SMH consultants.

The 5 intersections were evaluated:

- 1. Hopper Road and Elbert Road
- 2. 16888 Elbert Road Driveway (count for subdivision intersection) and Elbert Road
- 3. Apex Ranch Road and Elbert Road
- 4. Sweet Road (west) and Elbert Road
- 5. Sweet Road (east) and Elbert Road

The peak times were measured as follows:

Weekend days: Sunday 3/19/2023

Peak A.M. 7:30am-9:45am

Peak Noon 11:30am-1:45pm

Peak P.M. 5:00pm-7:00pm

Week days: Wednesday 3/22/2023

Peak A.M. 6:30am-8:30am

Peak P.M. 5:30pm-7:30pm

Peak Time (2 hours each)	Traffic Count Northbound on Elbert Road	Traffic Count Southbound on Elbert Road
Weekday A.M.	7	11
Weekday P.M.	14	15
Weekend A.M.	13	11
Weekend Noon	16	19
Weekend P.M.	14	1
Average Peak	6.4	5.7

#### **Trip Generation Rate**

Each Home: 10 ADT, 1 peak hour, Total 3 Homes: 30 ADT, 3 peak

Special Uses are:

Combined Bed & Breakfast (B&B)/Assisted Living Facility with 8 rooms Business Event Center (BEC) (1,500 sq ft)

Using ITE 495 Community Center Trip Calculation (based building's sq ft)

Daily weekday trips per sq ft 0.0135

Daily weekend trips per sq ft 0.0289

#### BEC:

Daily weekday trips 43 ADT, 5 trips/peak hour

Daily weekend trips 22 ADT, 3 trips/peak hour

#### Combined B&B/Assisted Living:

Daily weekday trips 24 ADT, 2 trips/peak hour

Daily weekend trips 24 ADT, 2 trips/peak hour

Please include the existing transportation network showing the total ADT on each roadway.

#### Cumulative & Generated/Development Traffic

Table 1 shows the estimated vehicle-trips generated by the specials uses for the proposed intersection with Elbert Road.

Table 2 shows the measure background vehicle count at the proposed intersection with Elbert Road.

Table 1: Estimated Site Vehicle-Trip Generation for Elbert Road (Peak Hourly Trips)

Analysis Period	Weekday In	Weekday Out	Total
Weekday Morning	8	8	16
Weekday Afternoon	8	8	16
Weekend Morning	4	4	8
Weekend Afternoon	4	4	8

Table 2: Background Vehicle Count at Proposed Intersection with Elbert Road(Peak Hourly Vehicle Count)

Analysis Period	Northbound Traffic on Elbert Road	Southbound Traffic on Elbert Road	Total
Weekday Morning	7	11	18
Weekday Afternoon	14	15	29
Weekend Morning	13	11	24
Weekend Noon	16	19	35
Weekend Afternoon	14	14	28

#### Long-Range Volume Projections

The 2016 EPC MTCP shows the 2040-2060 the Elbert Road's Long-Range Plan as a Minor Arterial, a 2-lane road.

# **Other Studies Conducted**

Overlook at Homestead PCD File #SP238

This is a new planned 62 lot development to the east off Apex Ranch Road.

The following is the Traffic Impact details for the Overlook Homestead project.

TIS completed by LSC in June of 2023 assumes a max density of 0.2 DU/AC or 62 units on the 350 ac site. The TIS addresses the primary points of entry to the overall development area at the following locations:

- One existing stop-sign controlled intersection between Apex Ranch Road and Elbert Road. This assumes use of the two existing public street stubs provided from the Apex Ranch subdivision to the Overlook at Homestead property.
- One new public road connection intersection to be located 1,920 feet north of Sweet Road. This intersection will be stop-sign controlled.

It is anticipated this development would generate about 650 new driveway vehicle-trips on the average weekday with 13 vehicles entering and 36 vehicles exiting the site in the morning. 40 vehicles are anticipated to enter the site in the afternoon with 23 vehicles exiting.

Analysis of future traffic condition indicates that the addition of site-generated traffic is expected to create minimal impact to traffic operations for the existing and surrounding roadway system upon roadway and intersection control improvements assumed within this analysis. The nearby roads and intersections do meet the vehicles per hour requirements for the addition of auxiliary turn-lanes and according to this study no intersection modifications will be needed. All internal roadways are proposed to be public paved rural local residential streets.

# Views of All Intersections Evaluated in the Study

The following are the aerial views the intersections were evaluated.

# Hopper Road (runs east) and Elbert Road (north-south) Intersection

Hopper Road is an east-west 2 lane dirt road.



Proposed Apex Ranch "dirt" road (runs east) and Elbert Road (north-south) Intersection

The dirt road is a 1 lane road and is to align with subdivision's road. The subdivision road (runs west)



## Apex Ranch Road (runs east) and Elbert Road (north-south) Intersection

Apex Ranch Road is a 2-lane paved road, 30' wide with 5' shoulder on each side



# Sweet Road (runs west) and Elbert Road Intersection

Sweet Road is a 2-lane, paved and striped road.



## Sweet Road (runs east) and Elbert Road Intersection

Sweet Road is a 2-lane, paved and striped road.



# Descriptions, classification, and link ADT of major roads in Study Area

**Elbert Road** is a paved, "unimproved", two-lane Rural Minor Arterial that extends for 10 miles north from Judge Orr Road to El Paso County/Elbert County line. The roadway continues into Elbert County to State Highway 86 (in Elbert County). The posted speed limit at Elbert Road/Apex Ranch Road intersection is 55 miles per hour (mph). No auxiliary turn lanes currently exist at Elbert Road's intersections with Apex Ranch Road or Sweet Road.

#### From GIS, it appears

Apex Ranch Road is a paved Rural Local rcthat Apex Ranchvest for 0.5 miles betweenElbert Road and its terminus to the east. TheRoad is 30mph.nis paved road is 25 mph. Thewestbound approach to the Elbert Road intersection is stop-sign controlled with a single lane.nis paved road is 25 mph. The

**Sweet Road** is a Rural Collector extending generally east-to-west for 14.5 miles between Eastonville and Eurich Road. The segment of Sweet Road between Elbert Road and Eastonville is paved. Sweet Road is discontinuous at Elbert Road, with an offset of approximately 1,000 feet, between north and

south intersections with Elbert Road. No auxiliary turn lanes exist at either of the two Elbert Road intersections with Sweet Road.

# **MTCP Functional and Corridor Preservation Classifications**

Elbert Road is depicted as part of the 2040-2060 Corridor Preservation Plan as detailed in the 2016 MTCP pg 72-73 and Map #17.

# **Descriptions of Intersections Evaluated with Existing Controls**

#### Hopper Road & Elbert Road Intersection

Dirt road with 3-way intersection with Hopper Road running east-to-west from Elbert Road and is stopsign controlled with a single lane for traffic entering Elbert Road.

#### Parcel's Private Road & Elbert Road Intersection

The current 3-way intersection will become a 4-way intersection. Adding a stop sign is recommended for vehicle traffic existing the parcel's private road and entering Elbert Road.

#### Apex Ranch Road & Elbert Road Intersection

3-way intersection with Apex Ranch Road running eastward from Elbert Road. stop-sign controlled with a single lane is present on the Apex Ranch Road for traffic entering Elbert Road.

#### Sweet Road (west) & Elbert Road Intersection

3-way intersection with Sweet Road (west) running westward from Elbert Road. stop-sign controlled with a single lane is present on the Sweet Road (west) for traffic entering Elbert Road.

#### Sweet Road (east & Elbert Road Intersection

3-way intersection with Sweet Road (east) running westward from Elbert Road. stop-sign controlled with a single lane on the Sweet Road (east) for traffic entering Elbert Road.

# **Cross Section Standards for Road Segments**

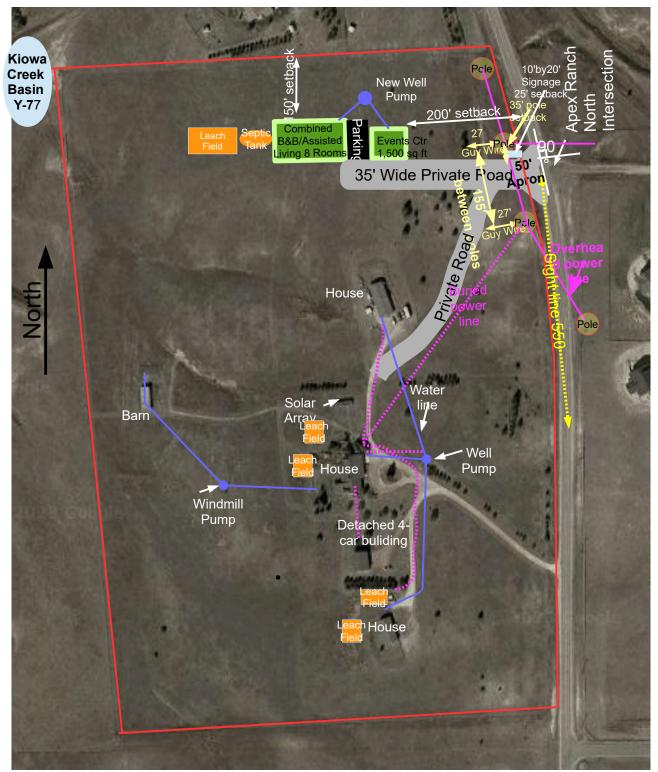
Pavement width of Elbert Road is 22 feet.

Major Collector roads have 32 ft. paved widths. The new entrance requires Construction Drawing (CD) detail. The CD is provided in the Construction Drawing set of reports.

# **Proposed Development and Trip Generation**

# Site Plan

Below is the proposed Site Plan.



# Land Use

The parcel is 37.5 acres A-35 zoned.

The Business Event Center (BEC) and combined Bed & Breakfast (B&B)/Assisted Living Facility, are both under EPC Special Uses land use guidelines. These two Special Uses are symbiotic uses helping to reduce peak traffic for guest that are connected or attending BEC events.

#### ITE Land Use Types and ITE Trip Generation

ITE Land Use Code	M-F A.M. Peak (Avg/Hr)	M-F P.M. Peak (Avg/Hr)	Sat-Sun A.M. Peak (Avg/Hr)	Sat-Sun Noon Peak (Avg/Hr)	Sat-Sun P.M. Peak (Avg/Hr)
215 Single-Family Attached Housing	6 (3)	6 (3)	6 (3)	6 (3)	6 (3)
312 B&B/Business Hotel & 254 Assisted Living Facility	4 (2)	4 (2)	4 (2)	4 (2)	4 (2)
495 Recreational Community Center	0 (0)	6 (3)	12 (6)	11 (6)	14 (6)
Left Turns	5 (2.5)	6 (3)	8 (4)	8 (4)	10 (5)

# **Adjustments to Trip Generation**

None.

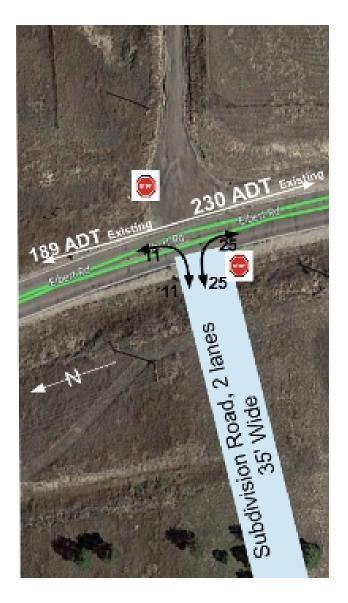
# **ADT for Each Intersection**

Intersection	Weekday ADT	Weekend ADT
16888 Elbert Road (Driveway/ Proposed Site)	1008	1214
Hopper Road	956	904
Apex Ranch Road	1092	1006
Sweet Road (west)	956	896
Sweet Road (east)	966	1018

# Trip Distribution Maps for Each Evaluated Intersection

ADT for New Intersection with Elbert Road

The following shows new intersection's existing ADT and generated ADT traffic counts.



230 SB Existing ADT 189 NB Existing ADT

Generated: ADT 71 25 RT onto SB lane 11 LT onto NB lane 11 RT from SB lane 25 LT from NB lane

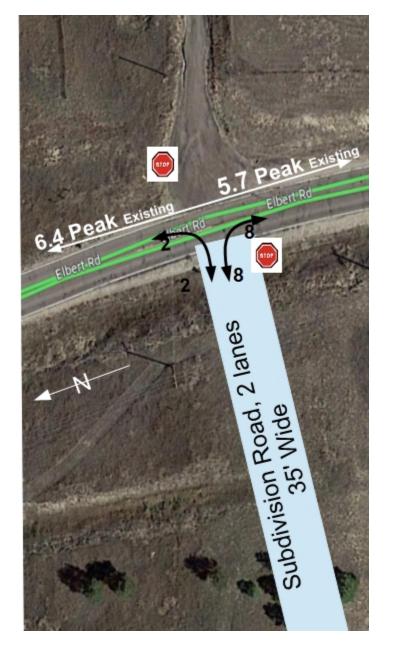
- NB Northbound Traffic
- SB Southbound Traffic
- RT Right Turn
- LT Left Turn



Stop-Sign Controlled

Please provide the entire transportation network of the proposed project, including the Average Daily Traffic (ADT) for the existing conditions, as well as projections for 2040 and 2060. Generated Peak Traffic at New Intersection with Elbert Road

The following shows the generated peak traffic counts for the new intersection with Elbert Road.



5.7 SB Existing Peak Traffic 6.4 NB Existing Peak Traffic

Generated Peak Traffic: 10 8 RT onto SB lane 2 LT onto NB lane 2 RT from SB lane 8 LT from NB lane

NB – Northbound Traffic

SB – Southbound Traffic

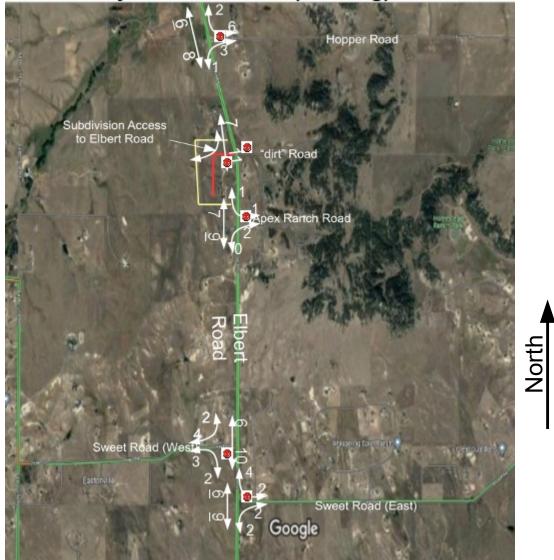
- RT Right Turn
- LT Left Turn



Stop-Sign Controlled

# Weekend Morning Peak Average Hourly Flows for Intersections

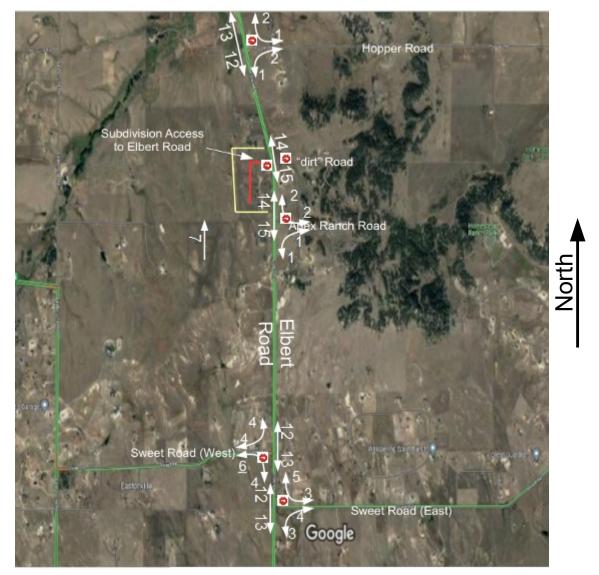
# Weekend Peak Morning Hourly Vehicle Counts (Existing)



# Stop-Sign Controlled

Weekend Noon Average Hourly Traffic Flow for Intersections

Weekend Peak Noon Hourly Vehicle Counts (Existing)





Weekend Afternoon Average Hourly Traffic Flow for Intersections

# Weekend Peak Afternoon Hourly Vehicle Counts (Existing)



Stop-Sign Controlled

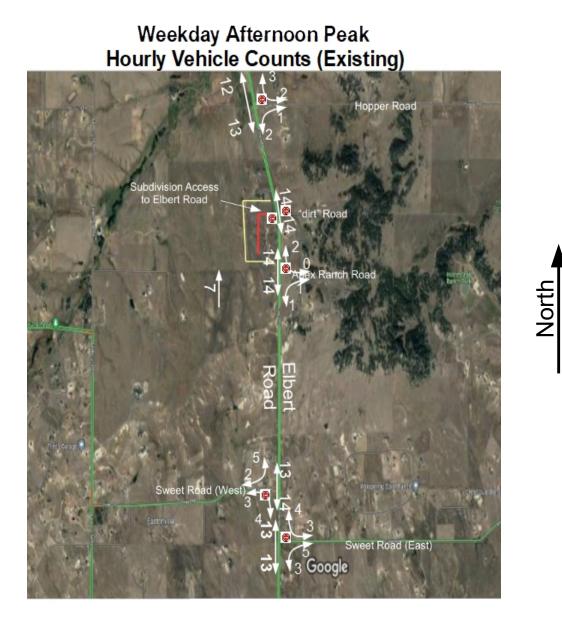
# Weekdays Morning Average Hourly Traffic Flow for Intersections

# Weekday Morning Peak Hourly Vehicle Counts (Existing)





# Weekday Afternoon Average Hourly Traffic Flow for Intersections



Stop-Sign Controlled

# **Expected Year of Completion**

The build out is expected to be completed in 5 years.

#### **Onsite Road Classification**

The onsite road classification is Private Road.

## **On-Site Traffic Control**

The 3 existing homes do not warrant the need for on-site traffic control on the private road. There is to be a stop sign on the south-east corner where the private road intersects Elbert Road for vehicle traffic entering Elbert Road.

## **Private Road Intersection Spacing**

Each home, combined Bed & Breakfast/Assisted Living, and Business Event Center to have their own driveway to access the private road. No issue with their intersection spacing found. The private road's intersection with Elbert Road is at least ¼ mile distance from nearest intersection located at Apex Ranch Road and Elbert Road.

## ECM Criteria for Stacking, Storage, & Tapering

As the generated traffic is with traffic Level of Service (LOS) C or B, the criteria for stacking, storage and tapering is met.

## Sight Distance

Per the El Paso County Engineering Criteria Manual (ECM) Table 2.35 (Entering Sight Distance for Driveways) and Table 2.34 (Roadway Grade Factor) the sight distance for 55 mph is 550 feet.

Two-Lane Approach	Roadway Grade	Grade Factor	Minimum Sight distance for 55 mph	Sight Distance Based on Grade Factor	Actual Sight Distance
Northbound	Upgrade 3.0 to 4.9%	0.9	550 ft	611 ft	Over 2,000 ft
Southbound	Downgrade 1.20%	1.2	550 ft	458 ft	560 ft

Entering Sight Distance for Driveways L

# **Evaluation and Mitigation of Impacts**

## Analysis Horizon

It is anticipated this development would generate about 67 new driveway vehicle-trips on the average weekday and 46 new driveway vehicle-trips on average weekend. 30 vehicles entering and 37 vehicles exiting the site in the morning and 37 vehicles entering and 30 vehicles same in the afternoon.

Analysis of future traffic condition indicates that the addition of site-generated traffic is expected to create minimal impact to traffic operations for the existing and surrounding roadway system upon roadway and intersection control improvements assumed within this analysis. The nearby roads and intersections do meet the vehicles per hour requirements for the addition of auxiliary turn-lanes and according to this study no intersection modifications will be needed. All internal roadways are proposed to be private roads.

#### Short-Term Horizon (5 years)

Build out completed with the proposed generated ADT.

#### **Intermediate Horizon (10 years)**

Increase in size of the events at the Business Events Center is planning. This would necessitate adding left turn lanes at the intersection with Elbert Road. TIS to be submitted.

#### Long-Range Horizon (15+ years)

Additional special uses to be added to the subdivision. This would necessitate updating the intersection facilities at intersection with Elbert Road. TIS to be submitted. Also, due to increased ADT traffic on Elbert Road (not from this subdivision), EPC would need to expand Elbert Road from 2 lanes to 4 lanes.

## **Capacity of Major Road Segments**

The capacity for subdivision and Special Uses ADT Short-Range

ADT for Business Events Center is limited to 50 attendees throughout the day (9am-4pm, 8pmmidnight).

Current ADT on Elbert Road is estimated (from traffic count data) to be 1750.

Elbert Road is a Local Major Collector road, with 2 lanes ADT Rural Design ADT of 3,000

Short-range (5 years) and Intermediate range (10 years) projected ADT traffic to remain under 3,000.

Long-range (15-20 years), ADT traffic on Elbert Road to require additional lanes.

## **Capacity for Signalized Intersections**

The private road intersecting Elbert Road does not require signalization. A stop sign will be required for the vehicle traffic entering Elbert Road.

## **Provision for Left-Turns**

Per ECM 2.3.7.D for Minor Arterials (Elbert Road) and Lower Classifications Left Turn Lane: A left turn lane is required for any access with a projected peak hour ingress turning volume of 25 VPH or greater. The projects expected VPH is less than 10 so as to not require a left-turn lane on Elbert Road.

## **Free Right Turns**

Per ECM 2.3.7.D for Minor Arterials (Elbert Road): A right turn lane is required for any access with a projected peak hour right turning volume of 50 VPH or greater. An acceleration lane is generally not required. The projects expected VPH is less than 10 so as to not require a free right-turn lane on Elbert Road.

## **Sub-Standard LOS Situations**

There is no sub-standard LOS situation identified.

# Safety-Based Warrants for Turn Lanes (unsignalized intersection)

No safety-based warrants needed.

## Weaving Analysis

Not applicable.

## **Summary of Necessary Turn Lanes**

As the number of left-turns during peak time is less than 25, no left turn lane(s) are needed. The number of attendees to any event is cap at 50. In the future, this 50-person cap may increase, at which time the TIS will be resubmitted to add left and/or right turn lanes as needed.

#### **Signal Warrant Analysis**

Not applicable.

## **Graphical Depiction of Improvements To Meet Level of Service**

Level of Service for Elbert Road is

#### **Trigger Points for Future Improvements**

Business Events Center events exceeds 25 Vehicle per (Peak) Hour - Left-turn lane required entering Elbert Road

Business Events Center events exceeds 50 Vehicle per (Peak) Hour – Right-turn lane required entering Elbert Road.

## **Summary of Accident History**

Accident/safety concerns (accident statistics): This section of Elbert Road is at 7250' elevation and, as a result, icy conditions do occur. This has lead to vehicles (when traveling too fast on the icy road) to slip off the roadway with a frequency of 1-2 times per winter season. Accidents do not occur in non-icy conditions.

#### **Pedestrian/Bicycle Needs**

Elbert Road has no safe space for bicycles and pedestrians - it is unsafe for bicycles to travel on Elbert Road.

#### **School and Pedestrian Plans**

Peyton School buses do service the area. School bus to use the subdivision's apron adjoining Elbert Road to pickup and drop off students.

# **Master Plan Trails**

No master plan trails.

## Short-Term / Long-Term Background Project Lanes

Short-Term Background Lanes on Elbert Road are not needed

Long-Term Background Lanes on Elbert Road will be needed when background ADT traffic exceeds 3,000. EPC Planning expects this to occur in 10-20 years. When this happens, Elbert Road will need to be expanded from 2 lanes to 4 lanes.

#### Summary of Subdivision & Special Uses Impact

The current vehicle access to Elbert Road to move and align with 1 lane "dirt" road on the north boundary of Apex Ranch Estates. This will change the intersection from a 3-way intersection to 4-way intersection. Recommend a stop sign be installed for vehicle traffic existing the property onto Elbert Road.

# **Recommendations and Conclusions**

- The Special Uses (Event Center and B&B/Assisted Living) will not contribute enough ADT and peak traffic to warrant any facility upgrades to the intersection of the private road and Elbert Road. Business Event Center's events not to exceed 50 attendees per event. When it becomes desirable to increase the people attending the events, another TIS will be submitted to consider adding a left-turn lane and/or right turn lanes on Elbert Road for vehicle traffic entering and existing Elbert Road.
- Recommend "Intersection Ahead" signage for Elbert Road traffic approaching the new intersection.
- Elbert Road will require re-striping and removal of passing striping at entrance.

#### **Final Plat**

No plat is needed as parcel is not to be subdivided. A site map showing the locations of the 3 existing homes (with their infrastructure), Business Event Center and combined Bed & Breakfast/Assisted Living Facility is included in this TIS

## **Major Transportation Corridors Plan (MTCP)**

No reimbursable improvements are applicable in the short-term.

No construction improvements are applicable in the short-term.

## **Road Impact Fees**

The following are the road impact fees.

Road Impact Fee Schedule

Land Use	Unit	Full Fee	-	Upfront Fee in 10 mill PID
Hotel/Motel	Room	\$2,806	\$2,153	\$1,498
General Commercial	1,000 sf	\$4,958	\$3,851	\$2,745

For the Business Event Center fee is:  $1,500 \ge 100 = 1000 = 100 = 100 = 100 = 100 = 100 =$ 

For 8 rooms B&B/Assisted Living Facility fee is: \$22,448.

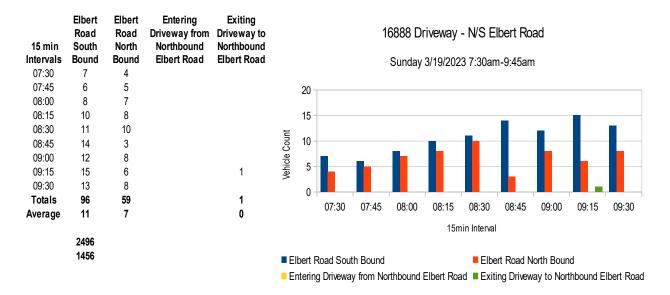
# **Financing Transportation Improvements**

Not applicable as no Elbert Road improvements needed. Financing for the private road comes from Equity Line of Credit.

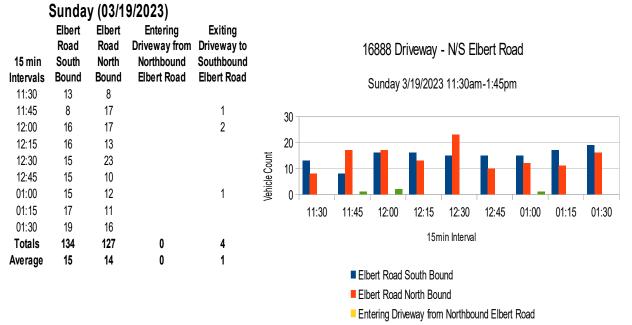
# Appendix A – Traffic Count Data

#### Traffic Count Sunday 3/19/2023 7:30am-9:45am

#### Sunday (03/19/2023)

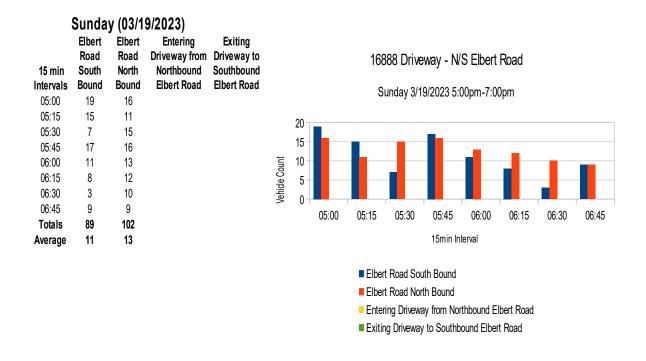


#### Traffic Count Sunday 3/19/2023 11:30am-1:45pm

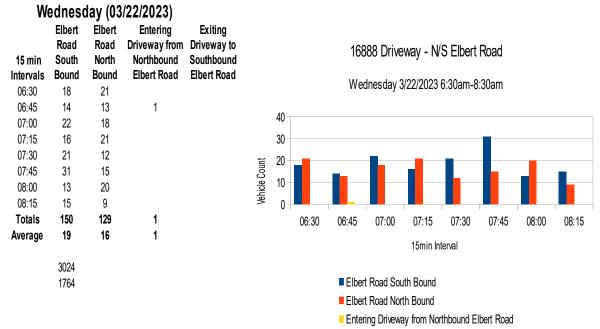


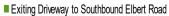
Exiting Driveway to Southbound Elbert Road

#### Traffic Count Sunday 3/19/2023 5:00pm-7:00pm

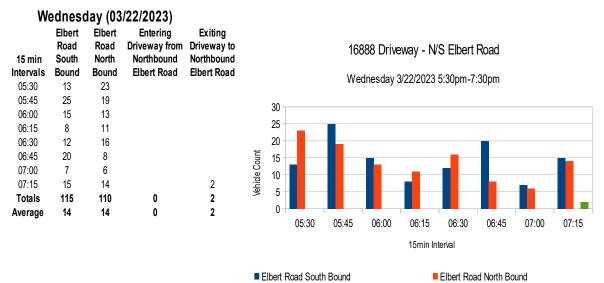


#### Traffic Count Wednesday 3/22/2023 6:30am-8:30am





#### Traffic Count Wednesday 3/22/2023 5:30pm-7:30pm



Entering Driveway from Northbound Elbert Road Exiting Driveway to Northbound Elbert Road

References

# High Capacity Manual, Transportation Research Board, National Research Council

**El Paso County Land Use Guidelines** 

El Paso County Engineering Design Manual, Revision 6 – Appendix B

**ITE Trip Generation Manual 11<sup>th</sup> Edition**