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## Meadowlake Ranch Traffic Impact Analysis (LSC #184600) August 27, 2018

### **Traffic Engineer's Statement**

This 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 criteria established by the County for traffic reports.

### **Developer's Statement**

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

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Date



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August 27, 2018

Mr. Dan Ferguson  
13202 Judge Orr Road  
Peyton, CO 80831

RE: Meadowlake Ranch  
El Paso County, Colorado  
Traffic Impact Analysis  
LSC #184600

Dear Mr. Ferguson:

**SKP-18-004**

In response to your request, LSC Transportation Consultants, Inc. has prepared this Sketch-Plan-level traffic impact analysis for the Meadowlake Ranch mixed-use development in El Paso County, Colorado. As shown in Figure 1, the site is located north of Judge Orr Road between Eastonville Road and US Highway 24 in El Paso County, Colorado.

## **REPORT CONTENTS**

This report is being prepared as part of a submittal to El Paso County. It identifies the traffic impacts of the Meadowlake Ranch mixed-use development. The report contains the following:

- The traffic count data and street conditions.
- Short-term and 2040 baseline/background traffic volume estimates.
- The projected average weekday and peak-hour vehicle-trips to be generated by the site.
- The assignment of the site's projected traffic volumes to the key area streets and intersections for the short and long term and the resulting total traffic volumes for the short and long term.
- The resulting traffic impacts including level of service analysis at key intersections.
- Findings and recommendations

## **LAND USE AND ACCESS**

Figure 2 shows the proposed site plan (Sketch Plan). The 307.3-acre site is planned to be developed with a mix of residential, commercial, and industrial uses. At buildout the site is assumed to include about 400 lots for single-family homes, about 660,000 square feet of floor space for industrial uses and about 173,000 square feet of floor space for commercial uses.

Full-movement access is proposed to Judge Orr Road about 1,355 feet west of US Highway 24 and to Eastonville Road about 1,350 feet south of Bandanero Drive. Two additional full-movement access points are proposed to Bandanero Drive.

## ROADWAY AND TRAFFIC CONDITIONS

### Area Roadways

The major roadways in the site's vicinity are shown on Figure 1 and are described below.

- **Judge Orr Road** is a two-lane roadway that extends east from Eastonville Road across most of El Paso County. It is shown on the El Paso County 2040 *Major Transportation Corridors Plan (MTCP)* and the *Preserved Corridor Network Plan* as a four-lane Minor Arterial adjacent to the site. The posted speed limit adjacent to the site is 45 miles per hour (mph). The intersection of US 24/Judge Orr is currently signalized. Due to the oblique angle of this intersection, the eastbound and westbound approaches are split phased. The *US 24 Final Planning and Environmental Linkage Study (PEL)* dated March 2018 shows the intersection of US 24/Judge Orr realigned to provide an intersection angle closer to 90 degrees. This is consistent with the US 24 access control plan. The PEL identifies this project as a high priority with a time line of less than five years. **A conceptual alignment of Judge Orr with Highway 24 intersection will need to be called out here and shown on the plans**
- **Eastonville Road** extends northeast from Meridian Road to past Hodgen Road. It is shown as a two-lane Minor Arterial on the El Paso County *Major Transportation Corridors Plan and the Preserved Corridor Network Plan*. Eastonville Road has a three-lane cross-section (one through lane in each direction plus a center-two-way, left-turn lane) from Woodmen Hills Drive to Snaffle Bit Road (approximately midway between Judge Orr Road and Stapleton Road). Eastonville Road is a two-lane roadway north and south of this section. PPRTA-funded improvements are anticipated in the future at the intersection of Eastonville Road and Stapleton Drive that would likely add northbound and southbound left-turn lanes. The posted speed limit adjacent to the site is 35 mph.
- **US Highway 24 (US 24)** is generally a two-lane State Highway extending east/west across Colorado connecting the Buena Vista, Colorado Springs, and Limon areas. US 24 is planned to be widened to four lanes through the Falcon area. The US 24 PEL identifies this widening as a high priority with a time line of less than 10 years. US 24 in the vicinity is classified as an EX – Expressway/Major Bypass by the Colorado Department of Transportation (CDOT). US 24 is shown as a four-lane Principal Arterial on the *MTCP* and the *Preserved Corridor Network Plan*. The posted speed limit on US 24 transitions from 65 mph to 55 mph just north of Judge Orr Road (for westbound traffic).
- **Stapleton Drive** is shown as an Urban four-lane Principal Arterial on the El Paso County *Major Transportation Corridors Plan* and El Paso County *Corridor Preservation Plan (CPP)*. Stapleton Drive extends east from Towner Drive to US Highway (US) 24. Stapleton continues southeast, then south as Curtis Road. It is planned to be ultimately extended west to connect with the Briargate Parkway extension. Stapleton Drive currently is a half-section of a four-lane

Principal Arterial street (one through lane in each direction) between Meridian Road and US 24. The posted speed limit between Eastonville Road and US 24 is 45 mph.

### Existing Traffic Volumes

Figure 3 shows the existing traffic volumes at key intersections in the vicinity of the site. These volumes are based on manual intersection turning movement counts conducted by LSC in May and June 2017 and June and July 2018. The intersection counts conducted in June and July have been adjusted to “school year” volumes based on the May 2017 counts. The count data sheets are attached for reference. Figure 3 also shows the Colorado Department of Transportation Average Annual Daily Traffic volumes (AADT) on US 24 in the vicinity of the site and an estimate of the average weekday traffic volumes on key street segments based on the peak-hour counts.

### Existing Levels of Service

Level of service (LOS) is a quantitative measure of the level of delay at an intersection. Level of service is indicated on a scale from “A” to “F.” LOS A represents control delay of less than 10 seconds for unsignalized and signalized intersections. LOS F represents control delay of more than 50 seconds for unsignalized intersections and more than 80 seconds for signalized intersections. Table 1 shows the level of service delay ranges.

<b>Table 1</b>			
<b>Intersection Levels of Service Delay Ranges</b>			
<b>Level of Service</b>	<b>Signalized Intersections</b>		<b>Unsignalized Intersections</b>
	<b>Average Control Delay (seconds per vehicle)</b>	<b>V/C<sup>(1)</sup></b>	<b>Average Control Delay (seconds per vehicle)<sup>(2)</sup></b>
A	10.0 sec or less	less than 0.60	10.0 sec or less
B	10.1-20.0 sec	0.60-0.69	10.1-15.0 sec
C	20.1-35.0 sec	0.70-0.79	15.1-25.0 sec
D	35.1-55.0 sec	0.80-0.89	25.1-35.0 sec
E	55.1-80.0 sec	0.90-0.99	35.1-50.0 sec
F	80.1 sec or more	1.00 and greater	50.1 sec or more
(1) Source: <i>Transportation Research Circular 212</i>			
(2) 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.			

Figure 3 presents the results of the existing intersection level of service analysis. The intersection of US 24/Judge Orr was analyzed using Synchro. All other intersections were analyzed based on the unsignalized method of analysis procedures from the *Highway Capacity Manual, 6<sup>th</sup> Edition* by the Transportation Research Board. The level of service reports are attached.

All movements at the signalized intersection of Judge Orr/US 24 are currently operating at LOS D or better during the peak hours.

All movements at the all-way, stop-sign-controlled intersection of Judge Orr/Meridian Ranch/Eastonville are currently operating at LOS C or better during the peak hours.

The eastbound approach at the two-way stop-sign-controlled intersection of Stapleton/Eastonville is currently operating at LOS F during the morning peak hour. All other movements are currently operating at a LOS D or better during the peak hours.

All movements at the two-way stop-sign-controlled intersections of Bandanero/Eastonville and Bandanero/Stapleton are currently operating at LOS C or better during the peak hours.

### **SHORT-TERM (YEAR 2023) BACKGROUND TRAFFIC**

Background traffic is the traffic estimated to be on the adjacent roadways and at adjacent intersections without the proposed development's trip generation of site-generated traffic volumes. Background traffic includes the through traffic and the traffic generated by nearby developments but assumes zero traffic generated by the site. Figure 4 shows the projected background traffic volumes for the short term (2023). These background traffic volumes have been based on the existing traffic volumes (from Figure 3) plus increases in traffic due to regional growth including buildout of existing and currently proposed subdivisions within the Waterbury development located northeast of the intersection of Eastonville/Stapleton, Meridian Ranch Filings 1-3 and Filings 6-8, Estates Filings 2-3, Meridian Ranch Filing 11, Stonebridge Filings 1, 2, and 3, Meridian Ranch Filing 9, the Vistas at Meridian Ranch Filing 1, WindingWalk at Meridian Ranch Filing 1, The Enclave at Stonebridge at Meridian Ranch, and the Liberty Tree Academy to be located just east of the intersection of Eastonville Road and Motley Road.

Figure 4 also shows the lane geometry, traffic control, and level of service at the key area intersections based on the short-term background volumes.

### **2040 BACKGROUND TRAFFIC**

Figure 5 shows the projected 20-year background traffic volumes for the year 2040. The 2040 background/baseline traffic volumes are based on the *Colorado Department of Transportation US 24 Planning and Environmental Linkages Study Final Corridor Conditions Report* dated December 2016 and on previous work completed by LSC in the area including work done for the Meridian Ranch and Waterbury developments. The 2040 background traffic volumes do not include traffic from Meadowlake Ranch.

Figure 5 also shows the lane geometry, traffic control, and level of service at the intersections in the vicinity of the site based on the 2040 background volumes.

## **TRIP GENERATION**

The site-generated vehicle-trips were estimated using the nationally published trip generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 2 shows the trip generation estimates.

The total number of vehicle-trips generated by the land uses has been reduced to account for the internal vehicle-trips made within the site between land uses, without use of the external streets surrounding the site. Table 2 shows the percentage of trips assumed to be internal to the site for each land use.

The total number of external new impact vehicle-trips generated by the site has been reduced to take into account the “pass-by” and “diverted link” phenomena. A pass-by trip is made by a motorist who would already be on the adjacent roadways regardless of the proposed development, but who stops in at the site while passing by. The motorist would then continue on his or her way to a final destination in the original direction. A diverted link trip is one made by a motorist who would already be traveling on a nearby (but not adjacent) roadway regardless of this development who now uses another roadway to access the site before continuing on his or her way to a final destination in the original direction. About 34 percent of the site-generated trips were assumed to be either pass-by trips from Judge Orr Road or diverted link trips from US 24 based on the percentages shown in the *Trip Generation Handbook - An ITE Proposed Recommended Practice, 3rd Edition, 2014* by ITE.

Meadowlake Ranch is expected to generate about 9,606 vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 307 vehicles would enter and 304 vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:15 and 6:15 p.m., about 574 vehicles would enter and 589 vehicles would exit the site.

## **DIRECTIONAL DISTRIBUTION AND ASSIGNMENT**

The directional distribution of the site-generated traffic volumes on the area roadways is an important factor in determining the site’s traffic impacts. Figure 6 shows the directional distribution estimates for the site-generated traffic volumes. The estimates have been based on the following factors: the recent traffic count data; the site’s location with respect to the nearby employment, commercial, and activity centers and the balance of the Falcon and Colorado Springs metropolitan area; the site’s proposed land use; the site’s proposed access points; and the phasing of the existing and future roadway system serving the site.

When the distribution percentages (from Figure 6) were applied to the trip generation estimates (from Table 2), the site-generated traffic volumes on the area roadways were determined. Figure 7 shows the site-generated traffic volumes.

## **TOTAL TRAFFIC**

Figure 8a shows the projected short-term total traffic volumes. The short-term total traffic volumes are the sum of the short-term background traffic volumes (from Figure 4) plus the site-generated traffic volumes (from Figure 7).

Figure 8b shows the projected level of service based on the short-term total volumes for the key intersections in the vicinity of the site.

Figure 9a shows the projected 2040 total traffic volumes. The 2040 total traffic volumes are the sum of the 2040 background traffic volumes (from Figure 5) plus the site-generated traffic volumes (from Figure 7).

Figure 9b shows the projected level of service based on the 2040 total volumes for the key intersections in the vicinity of the site.

## **PROJECTED LEVELS OF SERVICE**

The key area intersections and site access points have been analyzed to determine the projected future levels of service based on the unsignalized method of analysis procedures from the *Highway Capacity Manual, 6<sup>th</sup> Edition* by the Transportation Research Board and Synchro signalized intersection procedures. Figures 4, 5, 8b, and 9b show the level of service analysis results. The laneage and traffic control assumed in the analysis are depicted on the figures. The level of service reports are attached.

### **Stapleton/Eastonville**

The eastbound approach at the intersection of Stapleton/Eastonville is currently operating at LOS F during the morning peak hour. The eastbound and westbound approaches are projected to operate at LOS F during the morning peak hour based on the short-term background and total projected traffic volumes. It is not uncommon for the minor approach volumes to operate at LOS E or LOS F during the peak hours as the volumes approach the thresholds for a traffic signal warrant. This intersection is planned to be signalized in the future. Once signalized, all movements at this intersection are projected to operate at level of service D or better based on the projected short-term and 2040 total traffic volumes.

### **Judge Orr/US 24**

The intersection of US 24/Judge Orr is currently signalized. Due to the oblique angle of this intersection, the eastbound and westbound approaches are split phased. The *US 24 Access Control Plan* shows this intersection realigned to one of two alternate alignments that would provide an intersection angle closer to 90 degrees. All movements at this intersection are currently operating at LOS D or better during the peak hours. The short-term (year 2023) analysis assumes the proposed realignment has not yet been constructed. Based on the total traffic volumes, the single lane eastbound and westbound approaches and the northbound left-turn

movement are projected to operate at LOS E during the peak hours. If an eastbound right-turn lane is constructed on Judge Orr Road approaching US 24 all movements at this intersection are projected to operate at LOS D or better during the peak hours. The US 24 PEL study identifies this lane as a short-term improvement that may be needed prior to the study project recommendations.

By 2040 it was assumed that this intersection would be realigned and both Judge Orr Road and US 24 would be widened to provide two through lanes in each direction. Based on the projected 2040 background and total traffic volumes and the lane geometry shown in Figures 5 and 9b, this intersection is projected to operate at an overall LOS D during the peak hours. Some of the minor movements are projected to operate at LOS E during the peak hours. These movements have projected delays in the LOS E range simply because of the likelihood of arrival at the traffic signal at the beginning of the red phase at an intersection with many phases and a long cycle length. This movement would not be considered “failing” since the volume-to-capacity ratio is less than one. The justification is that to progress through traffic along an arterial corridor, the traffic signal offsets and left-turn and side street phase times have been adjusted to favor the through traffic band, which can often result in higher delay for the left-turn movements even though there is sufficient capacity for them.

#### **Judge Orr/Meridian Ranch/Eastonville**

The intersection of Judge Orr/Meridian Ranch/Eastonville is currently all-way, stop-sign controlled. All movements at this intersection are currently operating at LOS C or better during the peak hours. The northbound and southbound through movements at this intersection are projected to operate at LOS F during the peak hours based on the projected short-term total volumes. By 2040, the northbound and southbound through movements are projected to operate at LOS F during the peak hours based on both background and total traffic volumes. If this intersection were either reconstructed as a modern one-lane roundabout or signal controlled all movements are projected to operate at LOS D or better.

#### **Site Access to Judge Orr Road**

The site access point to Judge Orr Road is projected to operate at LOS F during the afternoon peak hour based on the projected short-term total traffic if this access is stop-sign controlled. If this intersection is either constructed as a modern two-lane roundabout or traffic signal controlled all movements are projected to operate at LOS D or better during the peak hours based on the projected 2040 total traffic volumes.

#### **Site Access to Eastonville Road**

The proposed site access point to Eastonville Road is projected to operate at LOS C or better for all movements based on the projected 2040 peak-hour traffic volumes assuming this access point is two-way stop-sign controlled.



### **Bandanero/Eastonville**

The eastbound and westbound approaches at the intersection of Bandanero/Eastonville are projected to operate at LOS E during the morning peak hour. The future traffic signal at the intersection of Stapleton/Eastonville will likely create gaps in the through traffic for this movement to more easily occur.

### **Bandanero/Stapleton**

All movements at the two-way stop-sign-controlled intersection of Bandanero/Stapleton are projected to operate at LOS C or better during the peak hours based on the projected short-term total traffic volumes. By 2040 the northbound and southbound approaches are projected to operate at LOS F during the afternoon peak hour. The future traffic signals at the intersections of Stapleton/Eastonville and Stapleton/Wading Brook Drive (planned future Waterbury access) may create gaps in the through traffic for this movement to more easily occur.

## **TRAFFIC SIGNAL WARRANT ANALYSIS**

The intersections of Stapleton/Eastonville, Judge Orr/Eastonville and the proposed site access to Judge Orr were analyzed to determine when Four-Hour Vehicular Volume Traffic Signal Warrant thresholds would be reached or exceeded based on the projected peak-hour traffic volumes. This analysis using the peak hours is intended to provide an indication that a warrant may be met or is close to being met. In order for a Four-Hour Traffic Signal Warrant to be satisfied, the volume threshold would need to be met for two additional hours of the day. For example, the four-hour warrant would be satisfied with the volume thresholds met for one hour in the morning, two hours (instead of the one-hour peak) during the afternoon peak period, and an hour during the mid-afternoon. The satisfaction of warrants does not indicate that a signal must be installed. The decision to require a signal to be installed rests with the County.

### **Stapleton/Eastonville**

Table 3 shows the results of the analysis for the intersection of Stapleton/Eastonville. The minor approach volumes were assumed to include either the eastbound left-turn, through, and right-turn movements or the westbound left-turn and through movements (the right-turn movements were excluded as there is an exclusive right-turn lane). Even if the threshold is met based on both the eastbound and westbound approaches it would only be considered to be met once for that hour. As shown in the Table 4, the thresholds for a Four-Hour Vehicular Volume Traffic Signal Warrant are projected to be exceeded based on the morning peak hour and the afternoon peak hour based on the projected short-term background and total traffic.

### **Judge Orr/Eastonville**

Table 4 shows the results of the analysis for the intersection of Judge Orr/Eastonville. The minor approach volumes were assumed to include either the eastbound left-turn, through, and right-turn movements or the westbound left-turn and through movements (the right-turn movements

were excluded as there is an exclusive right-turn lane). Even if the threshold is met based on both the eastbound and westbound approaches it would only be considered to be met once for that hour. As shown in the Table 4, the thresholds for a Four-Hour Vehicular Volume Traffic Signal Warrant are projected to be exceeded based on the projected short-term total traffic during both the morning and afternoon peak.

### **Judge Orr/Site Access Point**

Table 5 shows the results of the analysis for the proposed site access to Judge Orr. The minor approach volumes were assumed to include either the northbound left-turn or southbound left-turn movements. Even if the threshold is met based on both the northbound and southbound approaches it would only be considered to be met once for that hour. As shown in Table 5, the thresholds for a Four-Hour Vehicular Volume Traffic Signal Warrant are projected to be exceeded based on the projected short-term total traffic during the afternoon peak hour but not the morning peak hour. By 2040 the thresholds are projected to be exceeded for both the morning and afternoon peak hours based on the total traffic volumes.

### **FUNCTIONAL CLASSIFICATIONS AND LANEAGE**

Figure 10 shows the recommended functional classifications and number of through lanes for the roadways (Collector and above) in the vicinity of the site. The functional classifications and number of through lanes are consistent with the current El Paso County *MTCP*.

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **Trip Generation**

- Meadowlake Ranch is expected to generate about 9,606 new external vehicle-trips on the average weekday, with about half entering and half exiting the site during a 24-hour period. During the morning peak hour about 307 vehicles would enter and 304 vehicles would exit the site. During the afternoon peak hour about 574 vehicles would enter and 589 vehicles would exit the site.

#### **Required Improvements**

- A list of all improvements in the vicinity of the site is presented in **Table 6**.
  - Based on the existing traffic volumes shown in Figure 3 and the criteria contained in the *State of Colorado Highway Access Code*, southbound right-turn deceleration and acceleration lanes are warranted on US 24 approaching Judge Orr Road. This is an existing deficiency. Based on a posted speed limit of 55 miles per hour (mph), the prescribed lane length for the deceleration lane is 600 feet long plus a 222-foot taper. The prescribed lane length for the acceleration lane is 960 feet long plus a 222-foot taper. The *US 24 Access Control Plan* shows this intersection realigned to provide an intersection angle closer to

90 degrees. Prior to planning and constructing any auxiliary lanes, the timing of this project should be determined to avoid any short-term “throwaway” improvements.

- Based on the existing traffic volumes shown in Figure 3 and the criteria contained in the El Paso County *Engineering Criteria Manual (ECM)*, eastbound left-turn and right-turn deceleration lanes are warranted on Judge Orr Road approaching US 24. This is an existing deficiency. Based on a posted speed limit of 45 mph and the projected 2040 total traffic volumes shown in Figure 9a, the eastbound left-turn lane should be 455 feet long plus a 200-foot taper. The eastbound right-turn lane should be 235 feet long plus a 200-foot taper. Prior to planning and constructing any auxiliary lanes, the timing of the realignment of Judge Orr/US 24 should be determined to avoid any short-term “throwaway” improvements. The US 24 *PEL* identifies an eastbound right-turn deceleration lane on Judge Orr approaching US 24 as a short-term improvement that may occur prior to the study recommendations. [See comment next page.](#)
- Based on the short-term background and total traffic volumes and the criteria contained in the El Paso County *Engineering Criteria Manual (ECM)*, a northbound left-turn lane is projected to be warranted on Eastonville Road approaching Stapleton Drive. This lane is anticipated by LSC to be part of the PPRTA-funded Eastonville Road improvements.
- Based on the existing traffic volumes and the criteria contained in the ECM, an eastbound left-turn lane is currently warranted on Stapleton Drive approaching Eastonville Road and a westbound left-turn lane is very close to being warranted. However, these approaches are currently stop-sign controlled. The westbound left-turn lane, which has already been constructed as part of the northern half-section of Stapleton, will be able to be placed into service with the completion of the southern (eastbound) half of the intersection. The future construction of the eastbound left-turn lane will be completed with the south (eastbound) half of the intersection.
- Based on the projected short-term total traffic volumes shown in Figure 8a and the criteria contained in the ECM, an eastbound left-turn lane would be warranted on Judge Orr Road approaching the proposed site access. This lane should be 410 feet long plus a 200-foot taper.
- Based on the projected short-term total traffic volumes shown in Figure 8a and the criteria contained in the ECM, a westbound right-turn deceleration lane would be warranted on Judge Orr Road approaching the proposed site access. This lane should be 235 feet long plus a 200-foot taper.
- Based on the existing traffic volumes shown in Figure 3 and the criteria contained in the ECM, a northbound right-turn deceleration lane would be warranted on Eastonville Road approaching Judge Orr Road. This lane should be 155 feet long plus a 160-foot taper.

- Based on the projected short-term total traffic volumes shown in Figure 8a and the criteria contained in the ECM, a southbound left-turn lane would be required on Eastonville Road approaching the proposed site access. Eastonville Road currently has a three-lane cross-section (one through lane in each direction plus a center two-way left-turn lane) south of Snaffle Bit Road. LSC recommends Eastonville Road be improved between Snaffle Bit Road and Bandanero Drive adjacent to the site to match the three-lane cross-section to the south.
- Although a southbound left-turn lane would not be warranted on Eastonville Road approaching Bandanero Drive, a left-turn lane should be included in the design of the improvements to the south as part of this development and the northbound and southbound left-turn lanes anticipated at the intersection of Stapleton/Eastonville.
- Based on the projected 2040 total traffic volumes shown in Figure 9a and the criteria contained in the ECM, northbound right-turn deceleration lanes would **not** be required on Eastonville Road approaching the proposed site access and Bandanero Drive.
- Based on the projected 2040 total traffic volumes shown in Figure 9a and the criteria contained in the ECM, no auxiliary turn lanes would be required on Bandanero Drive approaching the site access points.
- The intersections of Eastonville/Stapleton and Eastonville/Judge Orr/Meridian Ranch and the proposed access point to Judge Orr Road will likely meet warrants for signalization in the future. Please see the above sections for traffic signal warrant analysis. Fair share contributions towards these potential future traffic signals should be determined at the Preliminary Plat stage of the development.

\* \* \* \* \*

Please contact me if you have any questions or need further assistance.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By: Jeffrey C. Hodsdon, P.E., PTOE  
Principal

JCH:KDF:bjwb

Enclosures: Tables 2-6  
Figures 1-10  
Traffic Count Reports  
Level of Service Reports

Include in this report the latest exhibit that shows the Judge Orr and Highway 24 intersection improvements. (CDOT's conceptual design).

**Table 2**  
**Trip Generation Estimate**  
**Meadowlake Ranch**

New External Trips Generated																						
Land Use Code	Land Use Description	Area (Acres)	Density or FAR <sup>(2)</sup>	Trip Generation Units	Trip Generation Rates <sup>(1)</sup>				Total Trips Generated					Daily Internal Trips <sup>(2)</sup>	Total "External" Trips Generated					Pass-By Trips <sup>(3)</sup>	New External Trips Generated	
					Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour			Average Weekday Traffic	
						In	Out	In	Out		In	Out	In			Out	In	Out				
210	Single-Family Detached Housing	38.0	0.4	38 DU <sup>(4)</sup>	9.44	0.19	0.56	0.62	0.37	359	7	21	24	14	4%	346	7	21	23	13	0%	346
210	Single-Family Detached Housing	362.0	3.5	362 DU	9.44	0.19	0.56	0.62	0.37	3,417	67	201	226	133	4%	3,280	66	198	219	128	0%	3,280
110	General Light Industrial	60.6	0.25	330 KSF <sup>(5)</sup>	3.97	0.29	0.04	0.03	0.22	1,309	95	13	11	73	4%	1,251	93	12	9	70	0%	1,251
150	Warehousing		0.25	330 KSF	1.74	0.13	0.04	0.05	0.14	574	43	13	17	46	5%	548	43	13	16	45	0%	548
820	Shopping Center	24.8	0.16	173 KSF	37.75	0.58	0.36	1.83	1.98	6,531	101	62	316	343	3%	6,335	98	60	307	333	34%	4,181
										12,190	313	310	594	609		11,760	307	304	574	589		9,606

Notes:
(1) Source: " <i>Trip Generation, 10th Edition, 2017</i> " by the Institute of Transportation Engineers (ITE)
(2) The residential internal trips have been balanced with the estimated non-residential internal trips
(3) Source: " <i>Trip Generation Handbook - An ITE Proposed Recommended Practice, 3rd Edition, 2017</i> " by ITE
(4) DU = dwelling unit
(5) KSF = thousand square feet of floor area

Source: LSC Transportation Consultants, Inc.

**Table 3**  
**Meadowlake Ranch**  
**Traffic Signal Warrant Analysis of Eastonville/Stapleton**  
**Peak-Hour Four-Hour Vehicular Volume Evaluation**

Year	AM Peak Hour						PM Peak Hour					
	Peak-Hour Traffic Volumes			Volume Evaluation <sup>(1)</sup>			Peak-Hour Traffic Volumes			Volume Evaluation <sup>(1)</sup>		
	Major <sup>(2)</sup>	Minor		Minor St Minimum	EB Met?	WB Met?	Major <sup>(2)</sup>	Minor		Minor St Minimum	EB Met?	WB Met?
		EB <sup>(3)</sup>	WB <sup>(4)</sup>					EB <sup>(3)</sup>	WB <sup>(4)</sup>			
<b>2023 Background</b>	834	406	227	192	Yes	Yes	527	303	381	327	No	Yes
<b>2023 Total</b>	941	445	230	165	Yes	Yes	719	364	387	241	Yes	Yes

Notes:

(1) Based on 2 lanes on major approach and 1 lane on minor approach.

(2) The major street volumes include all (left/through/right) movements on Eastonville Road.

(3) The EB minor street volumes include all easbound movements (left, through, and right) on Stapleton Drive.

(4) The WB minor street volumes include only the left and through westbound movements on Stapleton Dr. The right-turn movements have been excluded because there is an existing exclusive right-turn lane on this approach.

Source: LSC Transportation Consultants, Inc.

**Table 4**  
**Meadowlake Ranch**  
**Traffic Signal Warrant Analysis of Eastonville/Judge Orr**  
**Peak-Hour Four-Hour Vehicular Volume Evaluation**

Year	AM Peak Hour						PM Peak Hour					
	Peak-Hour Traffic Volumes			Volume Evaluation <sup>(1)</sup>			Peak-Hour Traffic Volumes			Volume Evaluation <sup>(1)</sup>		
	Major <sup>(2)</sup>	Minor		Minor St Minimum	EB Met?	WB Met?	Major <sup>(2)</sup>	Minor		Minor St Minimum	EB Met?	WB Met?
		EB <sup>(3)</sup>	WB <sup>(4)</sup>					EB <sup>(3)</sup>	WB <sup>(4)</sup>			
<b>2023 Background</b>	813	237	28	270	No	No	768	108	152	296	No	No
<b>2023 Total</b>	948	261	84	221	Yes	No	952	139	248	219	No	Yes
<b>2040 Background</b>	1116	253	45	162	Yes	No	1098	129	222	166	No	Yes
<b>2040 Total</b>	1315	283	101	115	Yes	No	1318	161	318	115	Yes	Yes

Notes:

(1) Based on 2 lanes on major approach and 2 lanes on minor approach.

(2) The major street volumes include all (left/through/right) movements on Eastonville Road.

(3) The EB minor street volumes include all easbound movements (left, through, and right) on Judge Orr Rd.

(4) The WB minor street volumes include only the left and through westbound movements on Judge Orr Rd. The right-turn movements have been excluded because there is an existing exclusive right-turn lane on this approach.

Source: LSC Transportation Consultants, Inc.

**Table 5**  
**Meadowlake Ranch**  
**Traffic Signal Warrant Analysis of Judge Orr Site Access**  
**Peak-Hour Four-Hour Vehicular Volume Evaluation**

Year	AM Peak Hour						PM Peak Hour					
	Peak-Hour Traffic Volumes			Volume Evaluation <sup>(1)</sup>			Peak-Hour Traffic Volumes			Volume Evaluation <sup>(1)</sup>		
	Major <sup>(2)</sup>	Minor		Minor St Minimum	SB Met?	NB Met?	Major <sup>(2)</sup>	Minor		Minor St Minimum	SB Met?	NB Met?
		SB <sup>(3)</sup>	NB <sup>(4)</sup>					SB <sup>(3)</sup>	NB <sup>(4)</sup>			
<b>2023 Total</b>	514	136	---	160	No	---	759	314	---	88	Yes	---
<b>2040 Background</b>	623	0	32	123	---	No	659	---	178	112	---	Yes
<b>2040 Total</b>	891	136	32	66	Yes	No	1106	314	178	60	Yes	Yes

Notes:

- (1) Based on 2 lanes on major approach and 1 lane on minor approach and a posted speed limit of greater than 40 mph on the major street.
- (2) The major street volumes include all (left/through/right) movements on Judge Orr Road.
- (3) The SB minor street volumes include the southbound left-turn volume only.
- (4) The NB minor street volumes include the northbound left-turn volume only.

Source: LSC Transportation Consultants, Inc.



Add to these improvements the Eastonville Road access Intersection, that is the responsibility of Meadowlake Ranch to construct. Additionally add Meadowlake Ranch as responsible to the design the section of Eastonville Road from Snaffle Bit Road to Stapleton Road.

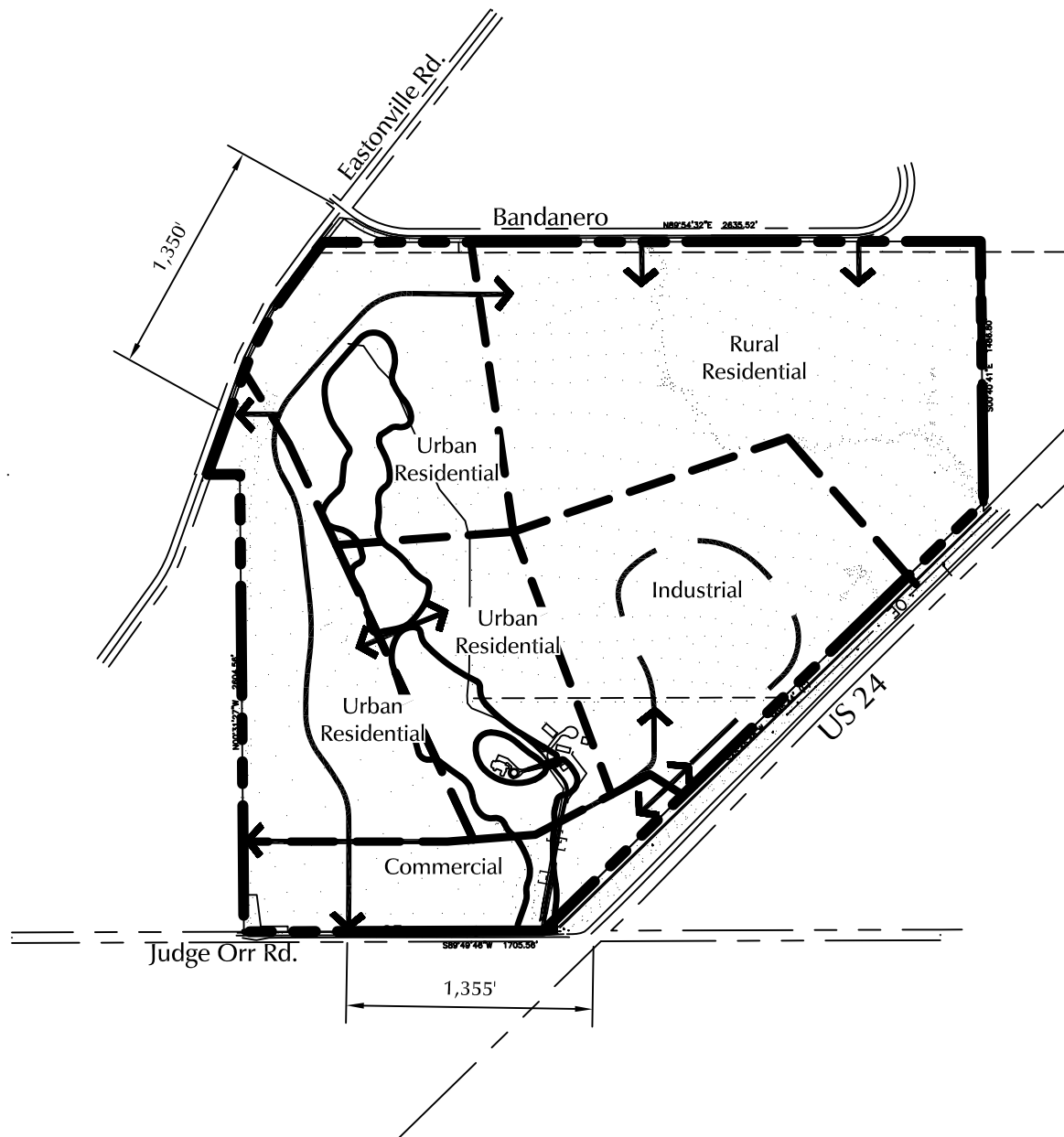
Table 6 Meadowlake Ranch Roadway Improvements			
Item #	Improvement	Timing	Responsibility
Roadway Segment Improvements			
1	Widen Judge Orr Road to provide two lanes in each direction.	Shown in 2040 MTCP	Adjacent developments (with Traffic Impact Fee program credit according to the program provisions and guidelines)
2	Widen US 24 to provide two lanes in each direction.	Shown in 2040 MTCP	CDOT
Judge Orr/US 24 Intersection			
3	Realign US 24/Judge Orr Road per CDOT Hwy 24 PEL Study	Future (the PEL study identified this as high priority project with a time frame of less than 5 years)	CDOT
4	Construct southwest-bound right-turn deceleration lane on US 24 approaching Judge Orr Road.	With realignment of US 24/ Judge Orr	CDOT with Judge Orr project or construction or escrow amount may be required by CDOT of development project(s) through access permit process if this occurs sooner than the CDOT project.
5	Construct southwest-bound right-turn acceleration lane on US 24 at Judge Orr Road.	With realignment of US 24/ Judge Orr	CDOT with Judge Orr project or construction or escrow amount may be required by CDOT of development project(s) through access permit process if this occurs sooner than the CDOT project.
6	Construct eastbound left-turn lane on Judge Orr Road approaching US 24.	With realignment of US 24/ Judge Orr	CDOT
7	Construct eastbound right-turn deceleration lane on Judge Orr Road approaching US 24.	With site development	CDOT with Judge Orr project or construction or escrow amount may be required by CDOT of development project(s) through access permit process if this occurs sooner than the CDOT project.
Eastonville/Stapleton			
8	Construct northbound and southbound left-turn lanes on Eastonville Rd. approaching Stapleton Dr.	Short-Term	PPRTA/EI Paso County <sup>(1)</sup>
9	Signalization of the intersection of Stapleton/Eastonville.	Once warrants are met. The decision on timing of traffic signal installation rests with El Paso County Public Works.	PPRTA, <b>or</b> if not included with the Eastonville PPRTA project, EPC with participation via escrow collected by area developments impacting this intersection, including Meadowlake Ranch
10	Complete southern (eastbound) half of Stapleton Drive.	Future	El Paso County west of Eastonville Road; Waterbury Metro District east of Eastonville Road.
Judge Orr/Site Access Intersection			
11	Construct eastbound left-turn lane on Judge Orr Road approaching the site access (not needed if the access is constructed as a modern two-lane roundabout).	With site development	Meadowlake Ranch
12	Construct westbound right-turn deceleration lane on Judge Orr Road approaching the site access (not needed if the access is constructed as a modern two-lane roundabout).	With site development	Meadowlake Ranch
13	Install traffic signal at the site access to Judge Orr Road or construct as a modern two-lane roundabout.	Once warrants are met. The decision on timing of traffic signal installation rests with El Paso County Public Works.	Meadowlake Ranch (with possible contributions from others if/when the parcels south of Judge Orr Road are developed)
Judge Orr/Eastonville/Meridian Ranch Boulevard Intersection			
14	Construct northbound right-turn deceleration lane on Eastonville Road approaching Judge Orr Road (not needed if the intersection of Judge Orr/Eastonville/Meridian Ranch is reconstructed as a modern one-lane roundabout)	With site development	Meadowlake Ranch
15	Install traffic signal at the intersection of Judge Orr/Eastonville/Meridian Ranch or reconstruct as a modern one-lane roundabout	Once warrants are met. The decision on timing of traffic signal installation rests with El Paso County Public Works.	EPC with participation via escrow collected by area developments impacting this intersection, including Meadowlake Ranch; or signal installation if warranted by actual significant project development on Meadowlake Ranch (in which case Meadowlake Ranch may file for cost recovery and/or release of escrow from other area developements and/or County Road Impact Fee Program credit - if applicable)
Stapleton/Bandanero Intersection			
16	Intersection reconfiguration improvements at Stapleton/Bandanero to be deferred until traffic volumes on Stapleton increase to the point where restriction of the intersection to three-quarter movement or right-in/right-out become necessary.		
Notes:			
(1) The design of Eastonville Road will be performed by the Meridian Ranch developer. LSC anticipates that these turn lanes will be included in the project design. The project will be constructed by El Paso County as PPRTA project.			
Source: LSC Transportation Consultants, Inc.			



Approximate Scale  
Scale: 1" = 4,000'

Figure 1  
**Vicinity  
Map**

Meadowlake Ranch (LSC #184600)



Approximate Scale  
Scale: 1" = 1,000'

Figure 2  
Site Plan

Meadowlake Ranch (LSC #184600)



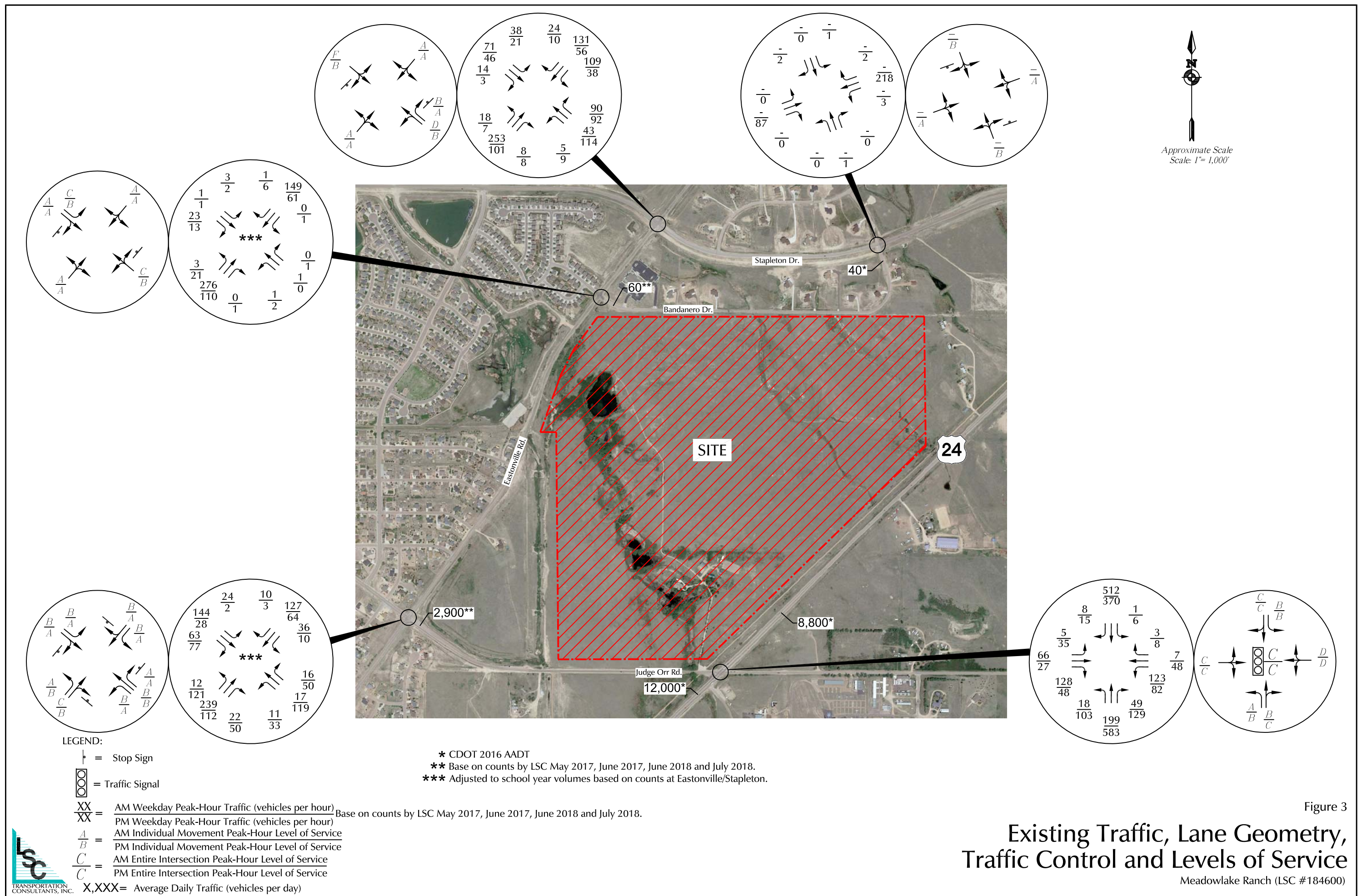
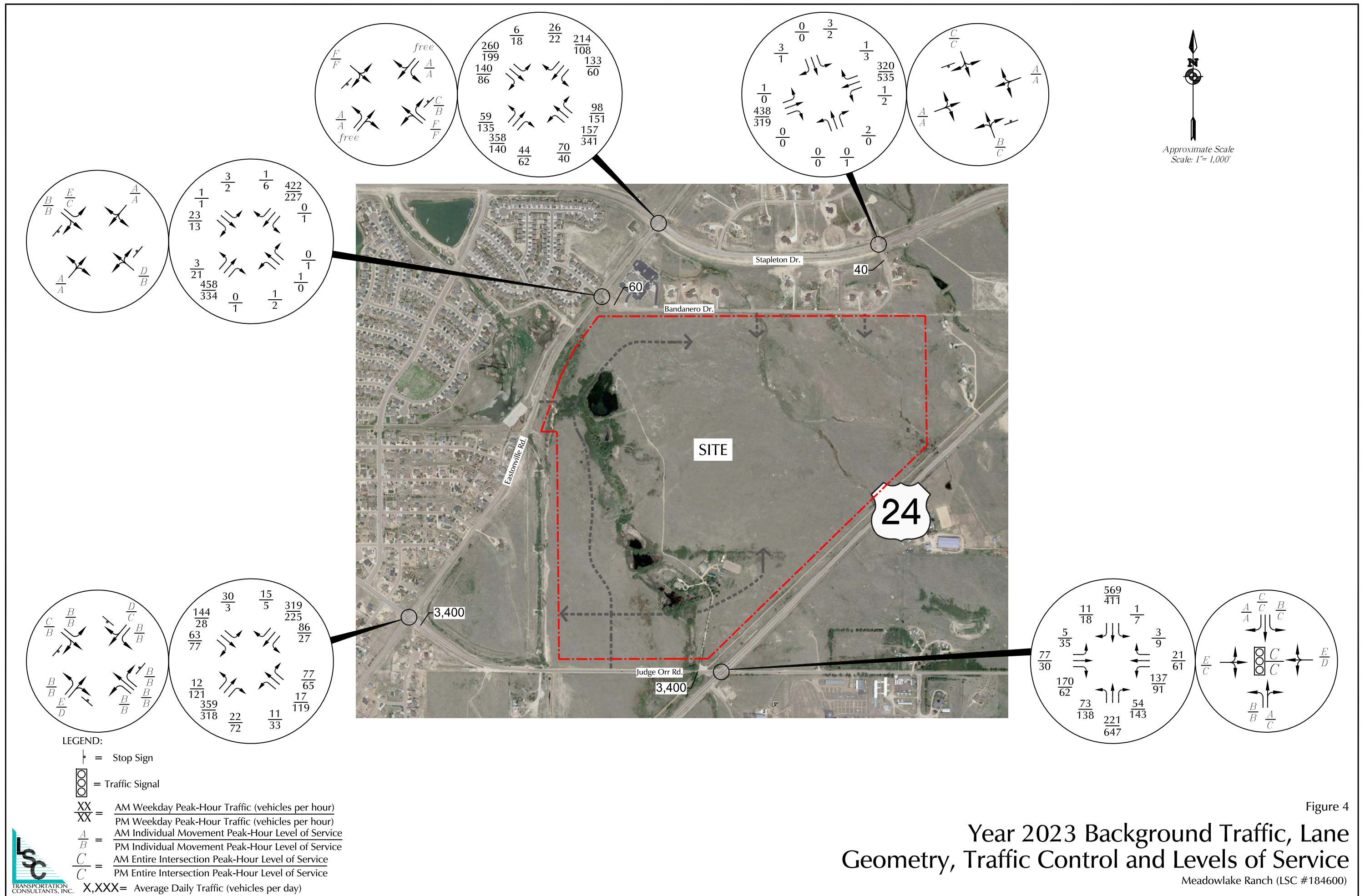


Figure 3

## Existing Traffic, Lane Geometry, Traffic Control and Levels of Service

Meadowlake Ranch (LSC #184600)







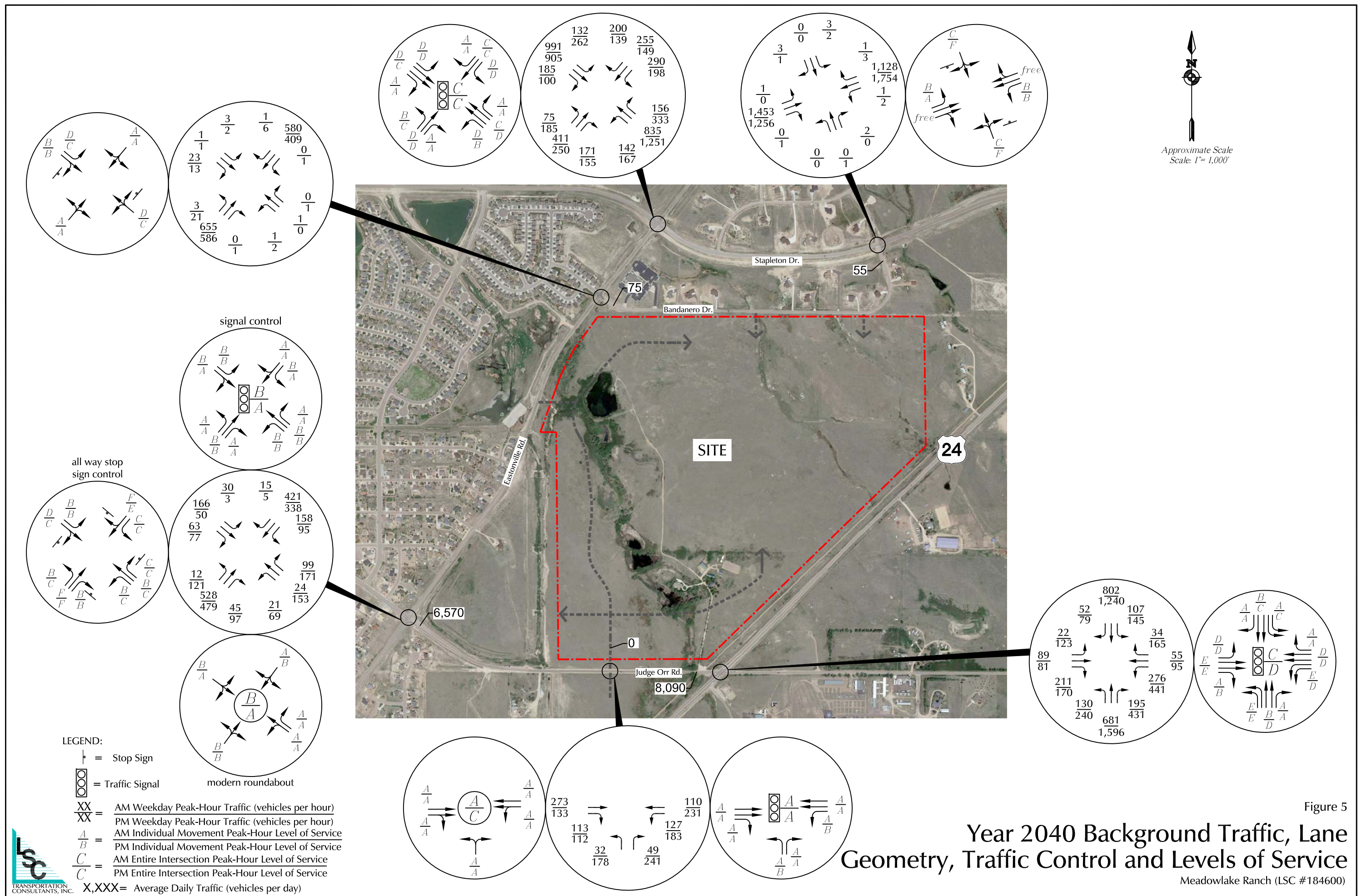


Figure 5  
**Year 2040 Background Traffic, Lane Geometry, Traffic Control and Levels of Service**  
 Meadowlake Ranch (LSC #184600)





Approximate Scale  
Scale: 1" = 4,000'



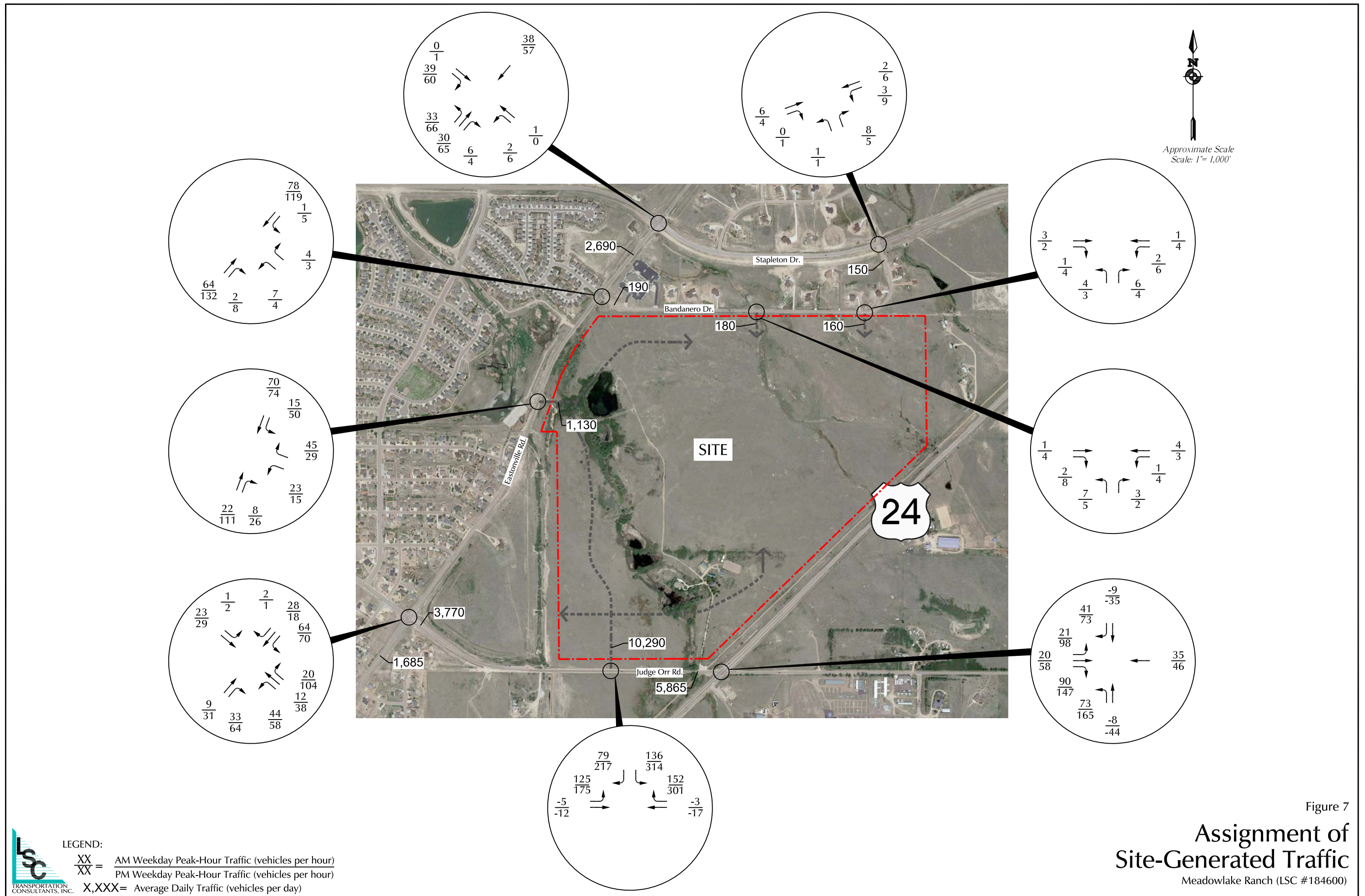
LEGEND:  
 $\frac{XX\%}{XX\%}$  = Residential Percent Directional Distribution  
 Non-Residential Percent Directional Distribution

## Directional Distribution of Site-Generated Traffic

Meadowlake Ranch (LSC #184600)

Figure 6







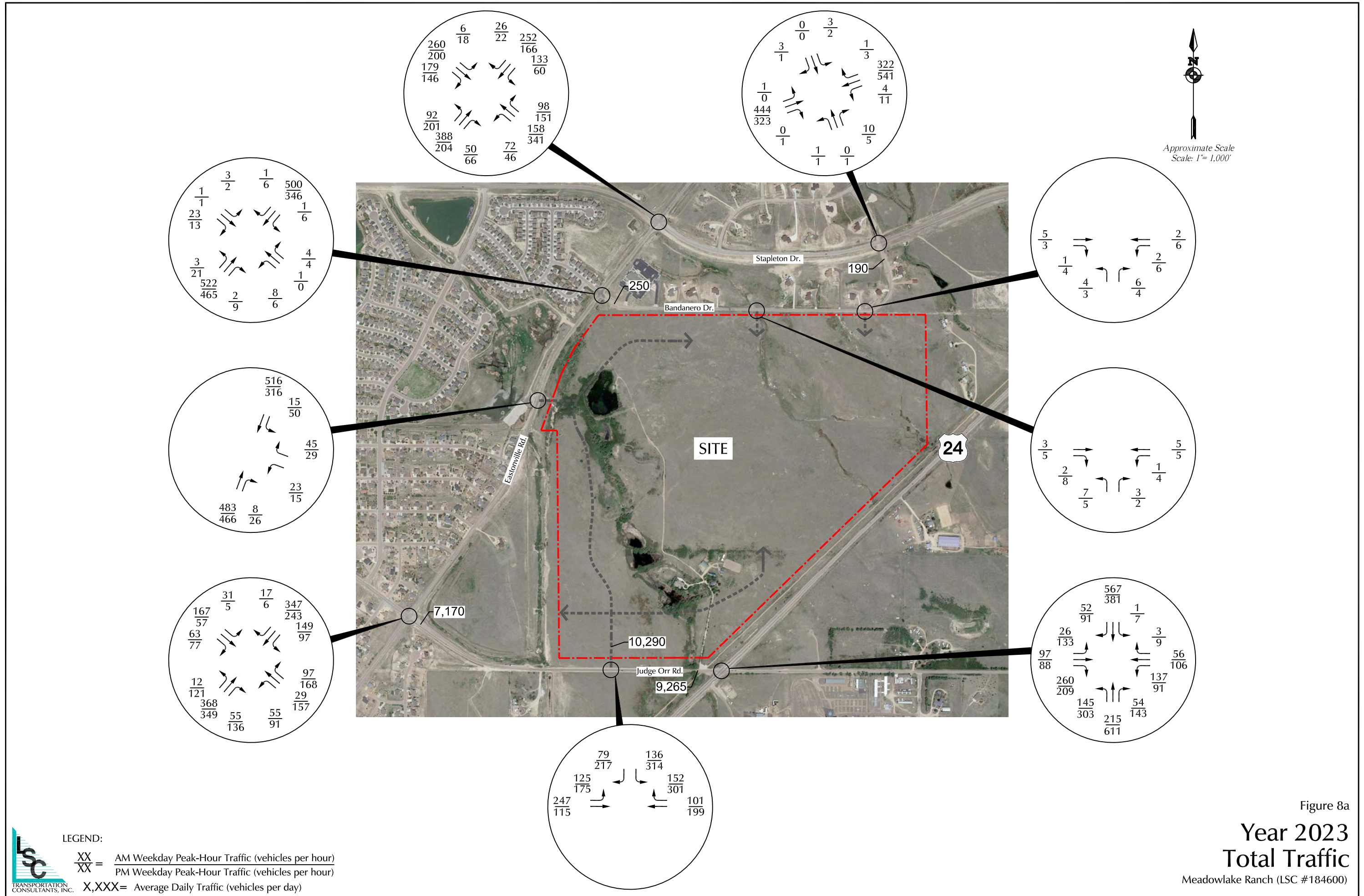
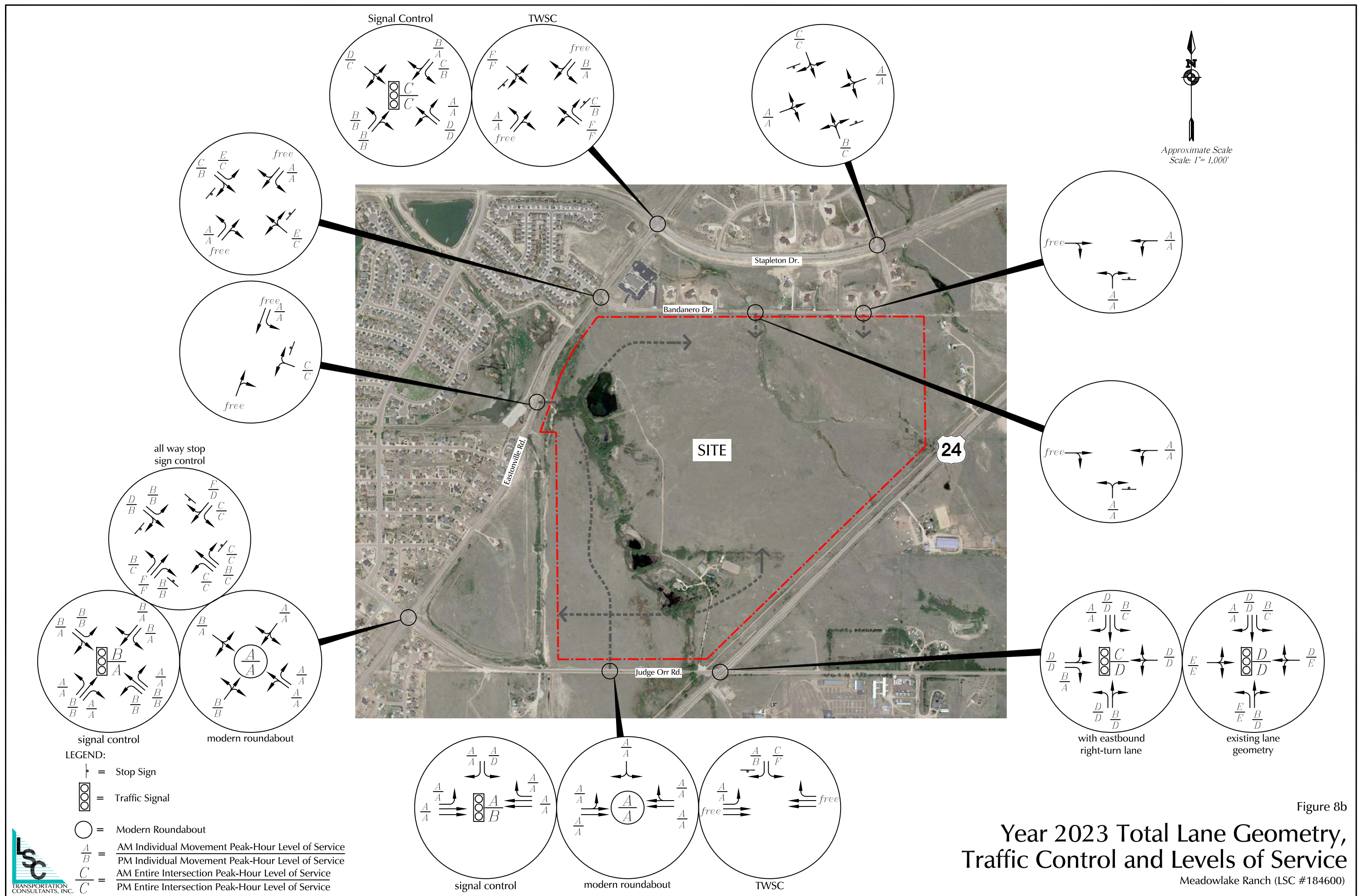
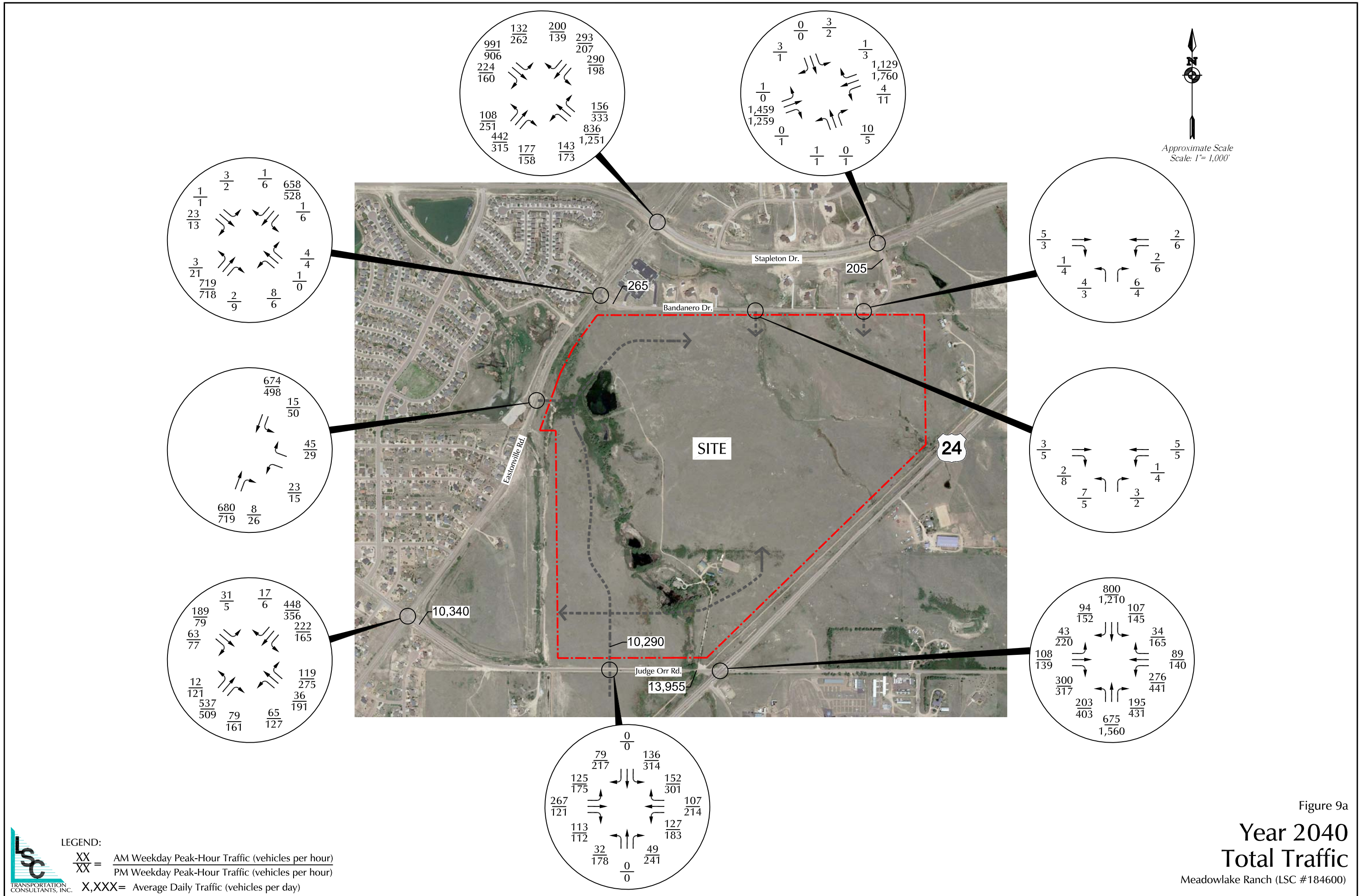


Figure 8a  
**Year 2023**  
**Total Traffic**  
 Meadowlake Ranch (LSC #184600)

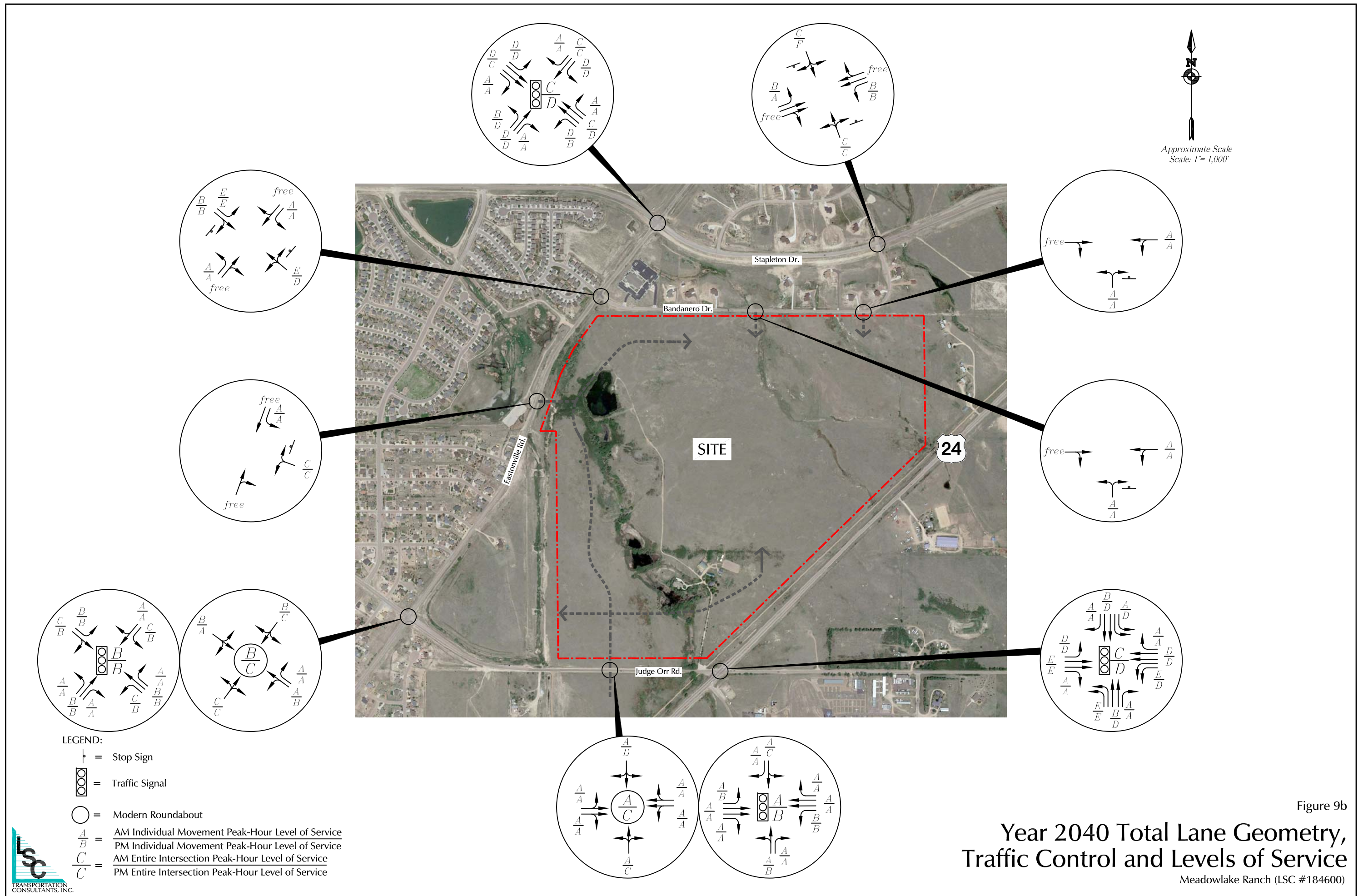




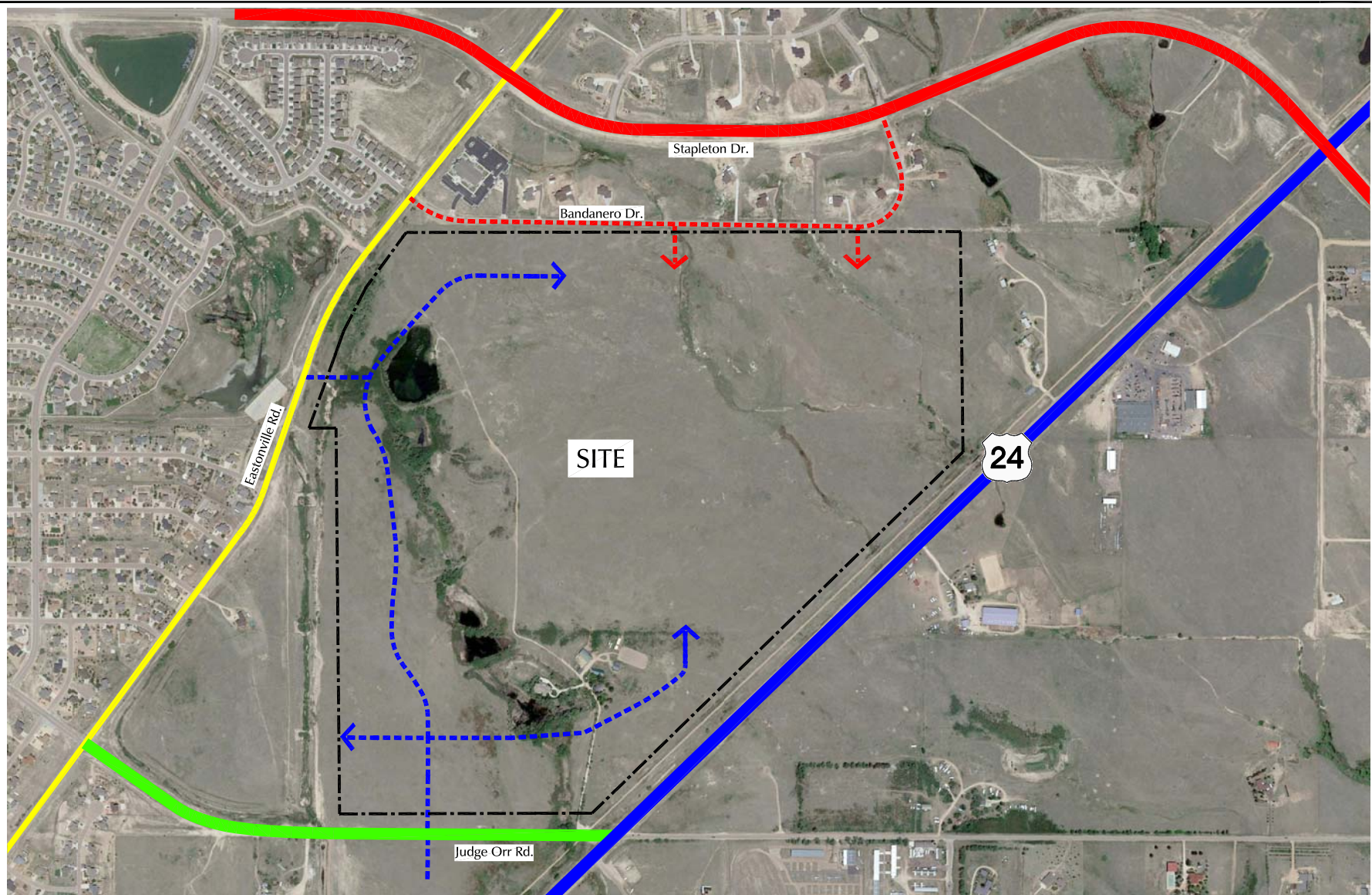












LEGEND:

- = Expressway
- = Urban Four-Lane Principal Arterial
- = Urban Four-Lane Minor Arterial
- = Urban Two-Lane Minor Arterial
- - - = Urban Non-Residential Collector
- - - = Urban Local



Figure 10

## Recommended Street Classifications

Meadowlake Ranch (LSC #184600)

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Steve Kuehster (8)

term background and total traffic volumes by Engineering Criteria Manual (ECM), a warranted on Eastonville Road approaching St. to be part of the PPRTA-funded Eastonville I

See comment next page.

1



Add to these improvements the Eastonville Road access Intersection, that is the responsibility of Meadowlake Ranch to construct. Additionally add Meadowlake Ranch as responsible to the design the section of Eastonville Road from Snaffle Bit Road to Stapleton Road.

SKP-18-004

Include in this report the latest exhibit that shows the Judge Orr and Highway 24 intersection improvements. (CDOT's conceptual design.

A conceptual alignment of Judge Orr with Highway 24 intersection will need to be called out here and shown on the plans