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Falcon Marketplace  
Traffic Impact Study Addendum Memo  
PCD#: SP-17-001 and CDR-16-007  
(LSC #164351)  
August 31, 2020

**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.

\_\_\_\_\_

\_\_\_\_\_  
Date



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## MEMORANDUM

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DATE: August 31, 2020

TO: Kari Parsons – El Paso County Planning & Community Development

FROM: Jeff Hodsdon

SUBJECT: Falcon Marketplace  
TIS Report Addendum  
LSC #164351  
PCD#: SP-17-001 and CDR-16-007

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LSC has prepared this addendum to the Traffic Impact Study (TIS) report for Falcon Marketplace, dated October 23, 2017 (**September 5, 2018 revision**). For reference, the EPC PCD File numbers for that report are SP-17-001 and CDR-16-007.

This addendum memo has been prepared to address final plat/construction drawing comments. Also, please refer to the attached itemized responses to comments.

### **Meridian/Eastonville Intersection**

#### Southbound Left-Turn Phasing

The level of service and queuing analysis sheets for this intersection have been updated to reflect **protected-only southbound left-turn phasing** at this intersection. The revised analysis sheets are attached. The 2018 TIS report showed protected-permissive left-turn phasing. This change has been made in response to the comments regarding the negatively offset alignment of the southbound left-turn lane.

The results show similar results to the original TIS report, except for the southbound left-turn individual movement level of service. This turning movement would have a higher average vehicular delay with protected-only phasing, but would operate acceptably. The movement would be below capacity.

### Southbound Right-Turn Lane Length

The length of the southbound right-turn lane has been updated and includes:

- Fifty feet of storage distance in addition to the deceleration distance. This matches the 2040 projected 95<sup>th</sup>-percentile queue for this turning movement and provides the minimum storage for turn lanes in the ECM.
- Longer deceleration and taper lengths assuming an anticipated post-development speed of 50 mph (55 mph design speed).
- The updated lengths are consistent with the construction plans.

### Westbound Approach Lane Configuration

The attached analysis sheets also show the levels of service and queues for the westbound approach at this intersection. For this approach, there are essentially no changes to the assumptions from the 2018 TIS report, as a westbound single left turn and protected-permissive left-turn phasing have been assumed. Please refer to the plans prepared by Drexel Barrell for details on the improvements on this approach and leg of the intersection, including the detailed striping/pavement markings. The projected queues are projected to periodically back through the intersection of Eastonville/Bullet, due to the close spacing from Meridian Road. LSC recommends the addition of signs and potentially pavement markings indicating “DO NOT BLOCK INTERSECTION” on the westbound approach to Eastonville/Bullet.

### Updated Figures and Tables

Please refer to the attached **updates** to the following figures and tables from the original report:

- Figure 18c – Level of Service
- Table 4 – Level of Service
- Table 6 – Queuing
- Table 7b – Improvements
- Figure 23 – Acceleration/Deceleration Distances for Meridian Road north of Woodmen

### Updated Level of Service and Queuing Analysis Sheets (attached)

- Revised applicable LOS sheets for the Meridian/Eastonville intersection
- Revised applicable queuing analysis sheets for the Meridian/Eastonville intersection

## Figures

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Figure 18c - Level of Service

Figure 23 - Accel/Decel distances for Meridian Road north of Woodmen Road

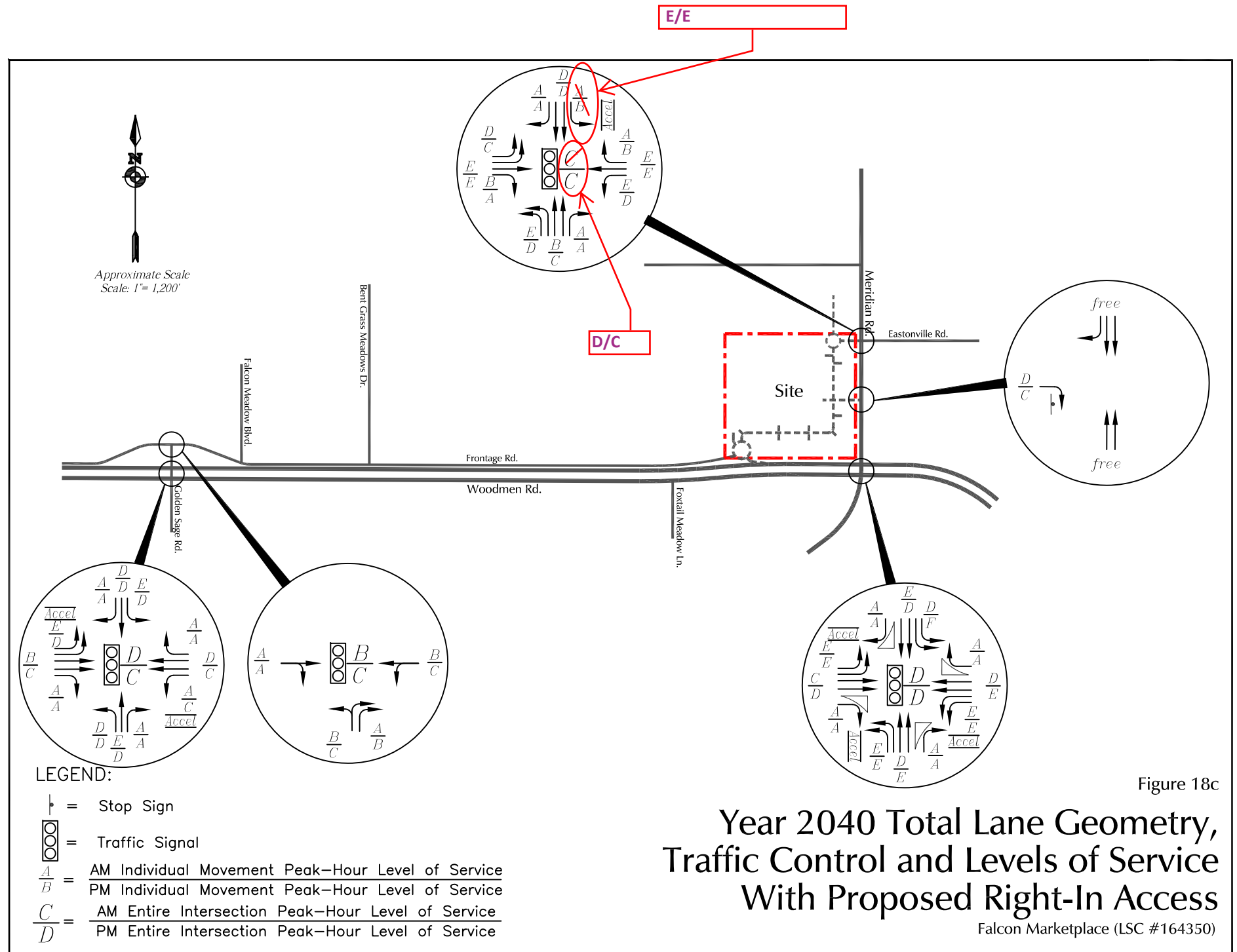
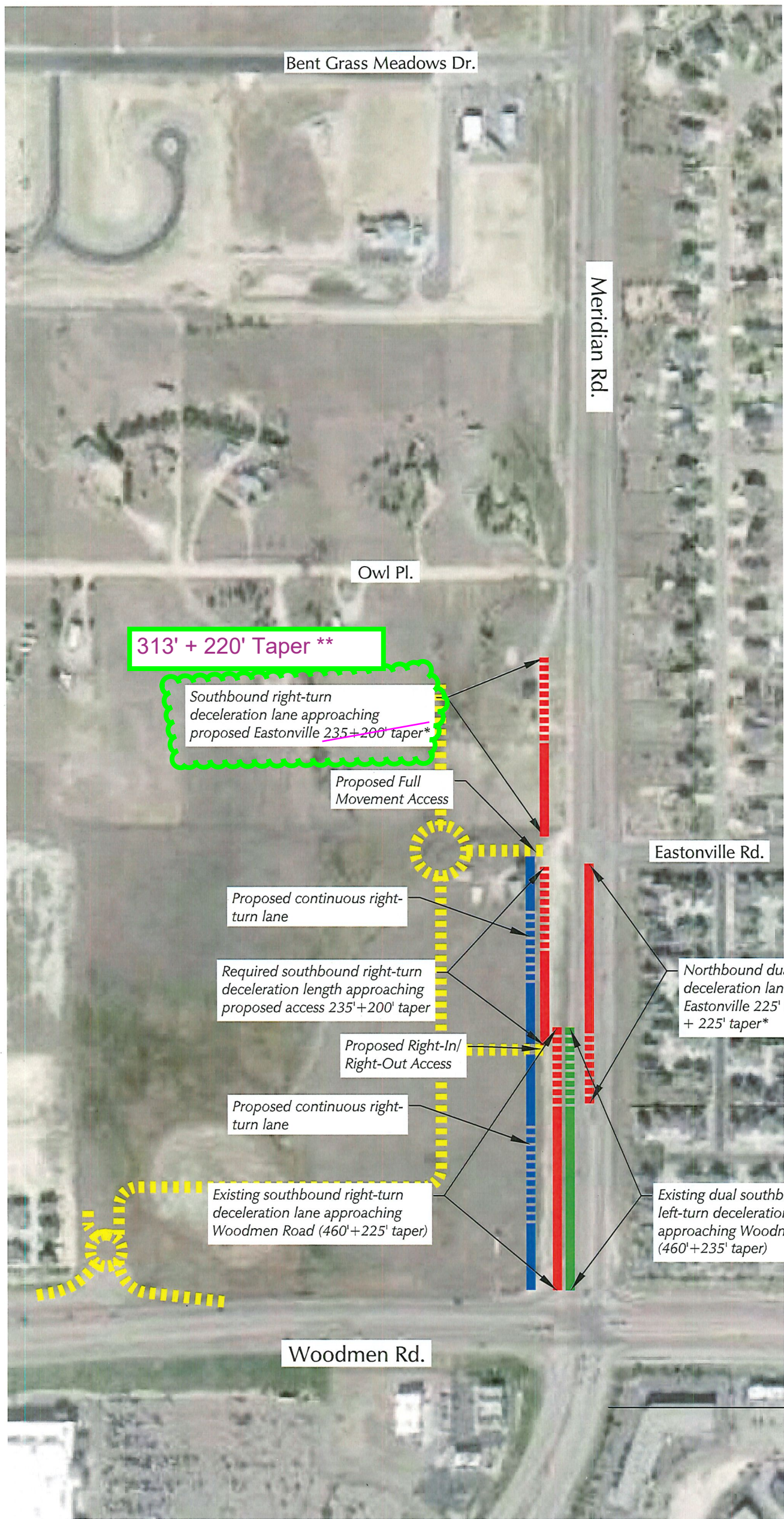


Figure 18c







# Tables

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Table 4 – Level of Service

Table 6 – Queuing

Table 7b – Improvements

**Table 4**  
**2040 Projected Total Traffic Level of Service E and F Movements**  
**Falcon Marketplace**

Intersection Movement	AM				PM			
	Volume	LOS	Delay	V/C	Volume	LOS	Delay	V/C
<b>Scenario: <u>Without</u> Proposed Right-in Access to Woodmen Road</b>								
<b>Woodmen Road/Meridian Road</b>								
Eastbound Left	468	E	70.1	0.90	775	E	73.7	0.98
Westbound Left	150	E	55.1	0.46	225	E	60.2	0.64
Westbound Through	804	D	48.1	0.83	561	E	58.8	0.84
Northbound Left	250	E	61.4	0.69	350	D	54.9	0.69
Northbound Through	422	D	38.6	0.46	1008	F*	103.4	1.10*
Southbound Left	294	D	54.1	0.63	483	F	80.5	0.96
Southbound Through	941	D	54.4	0.92	704	D	48.1	0.77
<b>Overall</b>	<b>---</b>	<b>D</b>	<b>37.4</b>	<b>---</b>	<b>---</b>	<b>D</b>	<b>53.2</b>	<b>---</b>
<b>Eastonville Road/Meridian Road</b>								
Eastbound Through	73	E	54.9	0.45	197	E	56.1	0.68
Westbound Left	250	E	61.8	0.82	200	D	47.0	0.72
Westbound Through	113	E	55.9	0.50	136	E	55.7	0.57
Northbound Left	387	E	70.3	0.87	644	F*	106.7	1.09*
<b>Overall</b>	<b>---</b>	<b>D</b>	<b>38.2</b>	<b>---</b>	<b>---</b>	<b>D</b>	<b>40.0</b>	<b>---</b>
<b>Woodmen Road/Golden Sage Rd</b>								
Eastbound Left	422	E	79.2	0.94	404	D	50.3	0.72
Northbound Through	19	E	56.4	0.17	39	D	52.8	0.26
Southbound Left	251	E	63.9	0.73	191	D	53.2	0.69
Southbound Through	21	D	52.7	0.15	26	D	53.1	0.19
<b>Overall</b>	<b>---</b>	<b>D</b>	<b>38.6</b>	<b>---</b>	<b>---</b>	<b>C</b>	<b>24.6</b>	<b>---</b>
<b>Scenario: <u>With</u> Proposed Right-in Access to Woodmen Road</b>								
<b>Woodmen Road/Meridian Road</b>								
Eastbound Left	472	E	74.5	0.92	785	E	78.0	1.00
Westbound Left	150	E	55.7	0.47	225	E	60.4	0.64
Westbound Through	884	D	53.5	0.90	665	E	77.9	0.98
Northbound Left	328	E	78.3	0.89	465	E	60.4	0.82
Northbound Through	344	D	37.5	0.37	893	E	69.7	0.98
Southbound Left	294	D	54.9	0.64	483	F	81.7	0.96
Southbound Through	941	E	55.9	0.93	704	D	53.0	0.83
<b>Overall</b>	<b>---</b>	<b>D</b>	<b>40.3</b>	<b>---</b>	<b>---</b>	<b>D</b>	<b>50.8</b>	<b>---</b>
<b>Eastonville Road/Meridian Road</b>								
Eastbound Through	73	E	59.3	0.45	197	E	55.6	0.67
Westbound Left	250	E	61.4	0.82	200	D	46.3	0.71
Westbound Through	113	E	55.8	0.50	136	E	55.6	0.56
Northbound Left	222	E	62.5	0.69	415	D	54.5	0.76
<b>Southbound Left</b>	<b>100</b>	<b>E</b>	<b>68.5</b>	<b>0.63</b>	<b>100</b>	<b>E</b>	<b>56.1</b>	<b>0.50</b>
<b>Overall</b>	<b>---</b>	<b>D</b>	<b>36.4</b>	<b>---</b>	<b>---</b>	<b>C</b>	<b>34.4</b>	<b>---</b>
<b>Woodmen Road/Golden Sage Rd</b>								
Eastbound Left	418	E	77.7	0.93	394	D	50.1	0.71
Northbound Through	19	E	56.4	0.17	39	D	52.9	0.26
Southbound Left	251	E	63.9	0.73	191	D	53.5	0.70
Southbound Through	21	D	52.7	0.15	26	D	53.2	0.19
<b>Overall</b>	<b>---</b>	<b>D</b>	<b>39.4</b>	<b>---</b>	<b>---</b>	<b>C</b>	<b>24.7</b>	<b>---</b>

Notes:

\* Volume exceeds capacity - queuing analysis indicates queues will overspill the left turn lane into the adjacent through lane.

**7/20/20 - Noted: Updated the Meridian/Eastonville intersection for the Scenario WITH the right-in**

Source: LSC Transportation Consultants, Inc.

rev. 7/20/20



**Table 6  
Projected Queue Lengths  
Falcon Marketplace**

Intersection Movement	Lane Length	Projected Queue Lengths						Lane Length	Projected Queue Lengths				
		Short-Term							2040 Total Traffic				
		Background Traffic		Total Traffic					Without Right-In		With Right-In		
		Without Right-In		Without Right-In		With Right-In			Without Right-In		With Right-In		
		AM	PM	AM	PM	AM	PM		AM	PM	AM	PM	
Eastonville Road/Meridian Road													
Northbound Left	425'	58	59	357	415	128	174	425'	259	430 <sup>(1)</sup>	148	236	
Southbound Left	375							375			475 <sup>(2)</sup>	207	
Southbound Right	313'							313'			18 <sup>(6)</sup>	51 <sup>(6)</sup>	
Westbound Left	105'							105'			204 <sup>(3)</sup>	196 <sup>(3)</sup>	
Westbound Thru	220'(4)							220 <sup>(4)</sup>			292'	334'	
Woodmen Road/Meridian Road													
Eastbound Left	500' dual section + 215' (single)	168	361	193	368	173	443	Modeled with sufficient length to determine needed length	382	865 <sup>(5)</sup>	358	840	
Westbound Left	435'	108	160	112	150	120	146	435'	129	177	217	318	
Northbound Left	Modeled with sufficient length to determine needed length	142	140	139	163	162	220	Modeled with sufficient length to determine needed length	217	392	281	346	
	315' dual section +145' Single	161	176	167	176	196	275	(400' dual section + 360' single)	243	929	307	391	
Southbound Left	475'	147	137	151	152	184	202	475'	171	407	170	440	
Woodmen Road/Golden Sage Road													
Eastbound Left	465'	90	107	122	149	108	145	465'	421	297	437	238	
Notes:													
(1) Projected queue exceeds future available storage length/capacity. The queue is projected to extend beyond the storage length about 21% of the time.													
(2) The 375' of lane will be sufficient to accommodate the projected 100 vph; The queue reports reflect 34% upstream block time during the morning peak hour and 2% during the afternoon peak hour. The reported 475' max queue during the morning peak includes left turning vehicles in the through lane queue upstream of the start of the left turn lane.													
(3) The queue for the WB Thru includes WB Left turning vehicles as well due to the reported 39 (am)/22 (pm) percent storage block time percentages.													
(4) The westbound through lane stacking distance between the Meridian and Bullet intersections;													
(5) Queue length shown assumes the queue for the northbound left-turn at Eastonville/Meridian does not impede eastbound left-turning vehicles from turning onto Meridian Road from Woodmen Road.													
(6) SB RT Queue: The queues are based on long term right turn volume, which includes turning movements associated with the future development on the parcel to the north.													
Source: LSC Transportation Consultants, Inc.								Yellow Highlighted items added: 2-22-2020					
								Blue Highlighted Items added: 8-31-2020					

Table 7b - Updated Falcon Marketplace Roadway Improvements With Proposed Right-In Access to Woodmen Road					
Item #	Improvement	Timing	MORE DETAILED TIMING	ADT that will warrant/TRIGGER the Improvement	Responsibility
Countywide Road Impact Fee Program Fees and Taxes					
1	Woodmen Road Metropolitan District fees and taxes to be paid in lieu of Countywide Road Impact Fee Program fees and taxes. Woodmen Road has already been completed, but this project is joining the district.	District fees payable at platting	WITH PLAT & EACH BUILDING PERMIT	BASED ON WOODMEN ROAD DISTRICT REQUIREMENTS	Falcon Marketplace
Meridian/Eastonville and Meridian Right-In/Right-Out Intersections					
2	Signalization of Meridian Road/Eastonville Road intersection.	Design and installation with the development of Falcon Marketplace once allowed by El Paso County.	PHASE 1	TRIGGER FOR INSTALL IS ONCE WARRANTS ARE MET - HOWEVER, IF NOT ALLOWED TO INSTALL W/PHASE 1, EPC WILL REQUIRE ESCROW FOR FULL AMOUNT W PHASE 1	Falcon Marketplace
3	Reconstruction of the Meridian center median south of Eastonville Road to achieve major street left-turn sight distance for the option of northbound/southbound protected/permissive left-turn signal phasing with interim single left-turn lanes northbound and southbound and to accommodate future northbound dual left-turn lanes if needed in the future. This lane should be 425 feet long plus a 200-foot taper. The taper would be back-to-back with the southbound dual left-turn taper.	Design and installation with the development of Falcon Marketplace.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
4*	Southbound right-turn deceleration lane on Meridian Road approaching Eastonville Road. This lane should be 313 feet long plus a 220-foot taper.	Design and installation with the develoment of Falcon Marketplace.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
5	Design and construction of continuous southbound right-turn lanes and shoulder/bike lane on Meridian Road from Eastonville Road south to the proposed right-in/right-out and from the right-in/right-out south to Woodmen Road. (Note: Also please refer to related item #16 below.)	Design and installation with the develoment of Falcon Marketplace.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
6	Widening of Eastonville Road east of Meridian Road to add a westbound through lane and add width as feasible between the westbound left-turn lane and the westbound through lane due to the proposed dual left-turn lanes on the west side of the intersection. This added width would allow for through lane alignment (with an acceptable offset across the intersection).	Design and installation with the development of Falcon Marketplace. Extent of this off-site improvement may be limited by available right-of-way and/or other existing constraints.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
6a (7/21/20)	Add signs and potentially pavement markings indicating "DO NOT BLOCK INTERSECTION" on the westbound approach to Eastonville/Bullet (just east of the Meridian/Eastonville intersection)	Design and installation with the develoment of Falcon Marketplace.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
7	Design and construction of the proposed extension of Eastonville Road between Meridian and the proposed roundabout.	Design and installation with the develoment of Falcon Marketplace.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
On-Site Improvements					
8	Design and construction of the public street connection through the site (Falcon Market Place).	Design and installation with the development of Falcon Marketplace.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
9	Design and construction of the proposed roundabout on-site west of the Meridian/Eastonville intersection. This would include a "stub" to the north for the anticipated future street connection north to Bent Grass Meadows Drive.	Design and installation with the develoment of Falcon Marketplace.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
10	Design and construction of the proposed roundabout on-site at the east terminus of the Woodmen Frontage Road.	Design and installation with the develoment of Falcon Marketplace.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
Woodmen/Meridian Intersection					
11	Extend existing westbound right-turn acceleration lane on Woodmen Road at Meridian Road to provide a continuous right-turn lane between Meridian Road and the proposed right-in-only access.	Design and installation with the develoment of Falcon Marketplace.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
12	Lengthening of <b>Woodmen eastbound dual left-turn lanes</b> . Lengthening of eastbound left-turn lanes and potential further future lengthening to provide a 240-foot lane transition taper, 290 feet of deceleration distance plus sufficient vehicle stacking distance. <b>CURRENT</b> lane length: 500 feet of dual left-turn lane and 425-foot taper. Of this taper, 215 feet is full-width "decel" distance. Remaining 20 feet of the required 235-foot decel distance occurs in the first 20 feet of the 500-foot dual left-turn lanes. The remainder of the dual left-turn lanes is stacking distance - 480 feet. <b>SHORT TERM:</b> Based on the short-term analysis, the existing lane provides sufficient stacking distance. <b>LONG TERM:</b> This lane will likely need to be extended to provide a total of 840 feet of dual left storage distance plus 235 feet of deceleration length plus a 200-foot taper.	Future extension of existing dual left-turn lanes once traffic queues regularly extend beyond the 480-foot stacking distance.	<b>PAYMENT WITH DEVELOPMENT PLAN FOR EACH INDIVIDUAL LOT, WITH REGARDS TO THE TIMING OF THE IMPROVEMENT:</b> "once traffic queues regularly extend beyond the 480-foot stacking distance." This is estimated to be approximately 65 PM peak hour eastbound left turns above the estimated short term total volume from Figure 16a of the TIS. Note: Short term total volumes assume the Meridian extension to Highway 24 to be open.	<b>PAYMENT OF PRO RATA SHARE WITH EACH LOT DEVELOPMENT PLAN:</b> The estimated "trigger" of 65 PM peak hour eastbound left turns above the estimated short term total volume (from Figure 16a of the TIS) approximately translates to an additional 957 directional ADT for residential trips (based on the ITE single family trip ratio). This estimated threshold may be reached with a combination of Falcon Marketplace trips and background trips. Falcon Marketplace daily trip to afternoon peak hour trip ratio is about 23:1 but would need to be adjusted for passby trips.	Falcon Marketplace will pay its pro-rata share by (based on total traffic volumes) of the cost of the improvements. <b>The payment amount will be determined on an individual-lot basis in the form of an escrow amount payable at the time of site development plan for each individual lot.</b>
13	<b>Meridian northbound dual left-turn lanes:</b> Lengthening of northbound left-turn lanes and potential further future lengthening to provide a 200-foot lane transition taper, 235 feet of deceleration distance plus sufficient vehicle stacking distance. <b>CURRENT</b> lane configuration: 315 feet of dual left-turn lane length, 145 feet of single left-turn lane length and a 150-foot lane transition taper from the through lane to the single left-turn lane. This provides a 150-foot taper, 235 feet of deceleration distance, and 225 feet of dual left stacking. <b>SHORT TERM:</b> The 315-foot dual left-turn lanes would accommodate the projected short-term queues. The deceleration distance (235 feet) plus a 200-foot taper will need to be provided south of the end of the existing 315-foot dual left stacking lanes. For the deceleration distance, 235 feet of at least single-lane width for deceleration length would flare to the north to connect to the existing dual lane width to the north. South of the deceleration portion of the lane, a standard 200-foot taper will need to be added in the median. These modifications will involve median reconstruction and restriping south of the existing dual left-turn lanes. This would result in a 200-foot taper, 235-foot deceleration distance, and 315 feet of dual left-turn stacking.	With the development of Falcon Marketplace, extend the northbound left-turn lane as described in the column to the left and as shown in Figure 25.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Short Term - Falcon Marketplace
14	<b>Meridian northbound dual left-turn lanes. LONG TERM:</b> Potentially, additional growth in the Falcon Area and east along Falcon Highway will add left-turning traffic demand. Long-term analysis indicates the potential future need for 400 feet of stacking distance plus the 235 feet of deceleration distance and the 200-foot taper.	Future (if necessary -- Add additional lane length beyond #13 to provide additional stacking if/when needed (as shown in Figure 26).			By other future developments impacting this turn lane. Potential for fee program credit for improvements completed as this is a regional intersection.
Golden Sage Intersections					
15	Directional wayfinding sign(s) on eastbound Woodmen Road upstream of Golden Sage - notifying/reminding eastbound motorists of the option to enter Falcon Marketplace via the Woodmen Frontage Road.	Design and installation with the development of Falcon Marketplace.	PHASE 1	PLANNED TO BE COMPLETED WITH PHASE 1	Falcon Marketplace
16	Lengthening of the current eastbound single left-turn deceleration lane on Woodmen approaching Golden Sage Road to provide a 240-foot transition taper (20:1 taper ratio), 290 feet of deceleration distance plus sufficient vehicle stacking distance. <b>CURRENT:</b> 175-foot taper plus a 465-foot left-turn lane which translates to a 175-foot taper, 290-foot deceleration distance, and 175 feet of stacking distance. <b>SHORT TERM:</b> Adequate stacking is available in the current turn lane - calculated queue length 141 feet. <b>LONG TERM:</b> Lengthen single left-turn lane and/or future implementation of dual left-turn lanes (if capacity needs dictate) to maintain 290 feet of deceleration length, a 240-foot lane taper (20:1 taper ratio) plus provide sufficient vehicle stacking length - model indicates 471 feet of dual left stacking distance based on morning peak-hour projected volumes. If a dual left is implemented in the future, consideration will need to be given to the configuration on Golden Sage and at the Golden Sage/Woodmen Frontage Road intersection to receive the dual left-turn movement.	Short Term: The existing lane is adequate based on the short-term analysis. Long Term: Future with additional development served by the north frontage road - extension of existing single left-turn lane and potentially widening in the median to provide dual left-turn lanes to provide additional vehicle stacking distance as described in the column to the left.	<b>PAYMENT WITH DEVELOPMENT PLAN FOR EACH INDIVIDUAL LOT, WITH REGARDS TO THE TIMING OF THE IMPROVEMENT: AS NEEDED TO MAINTAIN ADEQUATE LEVEL OF SERVICE AND VEHICLE STACKING DISTANCE. "</b> This is estimated to be when the eastbound left turn turning volume reaches approximately 200 vehicles per hour during the PM peak. This translates to about 40 vehicles per hour over the estimated short term total volume from Figure 16a of the TIS. Note: Short term total volumes assume the Meridian extension to Highway 24 to be open.	<b>PAYMENT OF PRO RATA SHARE WITH EACH LOT DEVELOPMENT PLAN:</b> The estimated "trigger" of 40 PM peak hour eastbound left turns above the estimated short term total volume (from Figure 16a of the TIS) approximately translates to and additional 589 directional ADT for residential trips making this turning movement (based on the ITE single family trip ratio). This estimated threshold may be reached with a combination of Falcon Marketplace trips and background trips. Falcon Marketplace daily trip to afternoon peak hour trip ratio is about 23:1 but would need to be adjusted for passby trips.	Falcon Marketplace will pay its pro-rata share by (based on total traffic volumes) of the cost of the improvements. <b>The payment amount will be determined on an individual-lot basis in the form of an escrow amount payable at the time of site development plan for each individual lot.</b>
16a (7/21/20)	Add protected/permitted phasing for left-turn movements	Prepare a traffic signal modification plan and furnish/install new traffic signal heads for protected-permissive phasing and other necessary hardware, software needed to implement this phase; modify existing signal timing plan.	If/when needed to maintain acceptable level of service/traffic operations and/or to control vehicle queues. .	--Prior to the opening of the Bent Grass Meadows Boulevard to the public, signal modification plans should be prepared, and coordination with EPC DPW (and possibly the City of Colorado Springs) will be a necessary step(s) toward future implementation of this left turn phase. Steps should be taken such that the phase can be implemented shortly after it has been determined that it should be implemented. This determination would be made by monitoring the traffic volumes and operations once Bent Grass Meadows Drive connection is opened to traffic to determine if the phase should be added at that time.	Falcon Marketplace will pay its pro-rata share by (based on total traffic volumes) of the cost of the improvements. <b>The payment amount will be determined on an individual-lot basis in the form of an escrow amount payable at the time of site development plan for each individual lot.</b>
17	Southbound exclusive right-turn lane on Golden Sage Road approaching Woodmen Road (a continuous right-turn lane within the 150 feet between the Woodmen Frontage Road and Woodmen Road).	If/when needed to maintain acceptable level of service/traffic operations and/or to control vehicle queues.	<b>PAYMENT WITH DEVELOPMENT PLAN FOR EACH INDIVIDUAL LOT, WITH REGARDS TO THE TIMING OF THE IMPROVEMENT: AS NEEDED TO MAINTAIN ADEQUATE LEVEL OF SERVICE AND VEHICLE STACKING DISTANCE. "</b> A preliminary trigger could be a southbound right turn volume of about 150-175 vehicles per hour. This translates to about 5 to 30 vehicles per hour over the projected short term volume from Figure 16a of the TIS. This may be conservative due to the westbound right turn acceleration lane on Woodmen Road. Additional study may indicate a higher threshold based on empirical data collection and analysis.	<b>PAYMENT OF PRO RATA SHARE WITH EACH LOT DEVELOPMENT PLAN:</b> The estimated "trigger" of 5-30 AM peak hour southbound right turns above the estimated short term total volume (from Figure 16a of the TIS) approximately translates to an additional 85-510 directional ADT for residential trips making this turning movement (based on the ITE single family trip ratio). This estimated threshold may be reached with a combination of Falcon Marketplace trips and background trips. Falcon Marketplace daily trip to afternoon peak hour trip ratio is about 45:1 but would need to be adjusted for passby trips.	Falcon Marketplace will pay its pro-rata share by (based on total traffic volumes) of the cost of the improvements. <b>The payment amount will be determined on an individual-lot basis in the form of an escrow amount payable at the time of site development plan for each individual lot.</b>
18	Signalization of Golden Sage Road/Woodmen Frontage Road or reconstruction as a modern roundabout; Future additional laneage may be necessary at this intersection to accommodate vehicle queues and for traffic operations.	Please refer to the attached sheet.	Please refer to the attached sheet.	PAYMENT OF PRO RATA SIGNAL ESCROW WITH EACH LOT DEVELOPMENT PLAN;	Falcon Marketplace will pay its pro-rata share by (based on total traffic volumes) of the cost of the improvements. <b>The payment amount will be determined on an individual-lot basis in the form of an escrow amount payable at the time of site development plan for each individual lot.</b>

## Revised Applicable Level of Service Sheets

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



















Meridian/Eastonville intersection

- westbound approach, southbound left turn (from July 2020 memo)



Timings  
2: Meridian Rd & Eastonville Rd

2040 Total Traffic WITH Right-in Access  
AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	73	138	250	113	125	222	596	150	100	1807	86
Future Volume (vph)	122	73	138	250	113	125	222	596	150	100	1807	86
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	11.5	11.5	10.0	11.5	11.5	10.0	11.5	11.5	10.0	11.5	11.5
Total Split (s)	15.0	17.0	17.0	18.0	20.0	20.0	16.0	69.0	69.0	16.0	69.0	69.0
Total Split (%)	12.5%	14.2%	14.2%	15.0%	16.7%	16.7%	13.3%	57.5%	57.5%	13.3%	57.5%	57.5%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effect Green (s)	20.4	10.8	10.8	28.4	15.1	15.1	11.7	64.1	64.1	11.1	63.5	63.5
Actuated g/C Ratio	0.17	0.09	0.09	0.24	0.13	0.13	0.10	0.55	0.55	0.09	0.54	0.54
v/c Ratio	0.25	0.45	0.53	0.82	0.50	0.42	0.69	0.32	0.17	0.63	0.96	0.10
Control Delay	36.3	59.3	15.3	61.4	55.8	12.2	62.5	15.6	2.6	68.5	40.3	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	59.3	15.3	61.4	55.8	12.2	62.5	15.6	2.6	68.5	40.3	2.0
LOS	D	E	B	E	E	B	E	B	A	E	D	A
Approach Delay		32.7			47.5			24.5			40.1	
Approach LOS		C			D			C			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 117.5

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 36.4

Intersection LOS: D

Intersection Capacity Utilization 88.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 2: Meridian Rd & Eastonville Rd

























			
Ø1	Ø2	Ø3	Ø4
16 s	69 s	18 s	17 s
			
Ø5	Ø6	Ø7	Ø8
16 s	69 s	15 s	20 s

# Timings

## 2: Meridian Rd & Eastonville Rd

# 2040 Total Traffic WITH Right-in Access

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	339	197	228	200	136	225	415	1246	250	100	1203	134
Future Volume (vph)	339	197	228	200	136	225	415	1246	250	100	1203	134
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Detector Phase	7	4	4	3	8	8	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	11.5	11.5	10.0	11.5	11.5
Total Split (s)	21.0	27.0	27.0	16.0	22.0	22.0	24.0	54.0	54.0	23.0	53.0	53.0
Total Split (%)	17.5%	22.5%	22.5%	13.3%	18.3%	18.3%	20.0%	45.0%	45.0%	19.2%	44.2%	44.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.5	5.5	4.0	5.5	5.5
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	Min	Min	None	Min	Min
Act Effect Green (s)	33.0	18.3	18.3	26.8	15.1	15.1	18.5	49.5	49.5	13.0	44.0	44.0
Actuated g/C Ratio	0.30	0.17	0.17	0.24	0.14	0.14	0.17	0.45	0.45	0.12	0.40	0.40
v/c Ratio	0.51	0.67	0.52	0.71	0.56	0.56	0.76	0.80	0.31	0.50	0.87	0.20
Control Delay	32.8	55.6	9.6	46.3	55.6	11.5	54.5	32.0	3.7	56.1	39.1	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	55.6	9.6	46.3	55.6	11.5	54.5	32.0	3.7	56.1	39.1	6.7
LOS	C	E	A	D	E	B	D	C	A	E	D	A
Approach Delay		31.8			34.6			33.2			37.2	
Approach LOS		C			C			C			D	

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 110.4

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 34.4

Intersection LOS: C

Intersection Capacity Utilization 81.1%

ICU Level of Service D

Analysis Period (min) 15

## Splits and Phases: 2: Meridian Rd & Eastonville Rd





# Revised Applicable Queuing Analysis Sheets

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Meridian/Eastonville intersection

- westbound approach, southbound left turn (from July 2020 memo)



## Queuing and Blocking Report

## Intersection: 2: Meridian Rd &amp; Eastonville Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	144	89	132	137	204	412	208	147	152	170	168	78
Average Queue (ft)	77	12	61	49	158	158	56	76	88	66	80	18
95th Queue (ft)	129	47	113	97	226	339	173	132	142	161	168	49
Link Distance (ft)	261	261	261	261		796				444	444	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					105		200	425	425			525
Storage Blk Time (%)					39	6						
Queuing Penalty (veh)					93	23						

## Intersection: 2: Meridian Rd &amp; Eastonville Rd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	475	1402	1422	1401
Average Queue (ft)	197	1075	1145	563
95th Queue (ft)	500	1638	1635	1636
Link Distance (ft)		1380	1380	1380
Upstream Blk Time (%)		12	29	15
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)	375			
Storage Blk Time (%)	0	34		
Queuing Penalty (veh)	0	34		

## Queuing and Blocking Report

## Intersection: 2: Meridian Rd &amp; Eastonville Rd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	NB
Directions Served	L	L	T	R	L	T	R	L	L	T	T	R
Maximum Queue (ft)	244	178	251	179	196	355	217	218	272	411	415	118
Average Queue (ft)	156	84	130	71	119	124	59	125	141	218	231	45
95th Queue (ft)	228	178	211	130	195	286	160	195	219	377	385	96
Link Distance (ft)	261	261	261	261		796				444	444	
Upstream Blk Time (%)	0		0							0	0	
Queuing Penalty (veh)	0		0							0	0	
Storage Bay Dist (ft)					105		200	425	425			525
Storage Blk Time (%)					22	12				0	0	
Queuing Penalty (veh)					82	50				0	0	

## Intersection: 2: Meridian Rd &amp; Eastonville Rd

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	207	448	481	90
Average Queue (ft)	76	297	310	38
95th Queue (ft)	150	429	446	69
Link Distance (ft)		1380	1380	1380
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	375			
Storage Blk Time (%)	0	2		
Queuing Penalty (veh)	0	2		

# Revised Applicable Queuing Analysis Sheets

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Meridian/Eastonville intersection - southbound right-turn queue















## Queues

## 2040 Total Traffic WITH Right-in Access

## 2: Meridian Rd &amp; Eastonville Rd

AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	128	77	145	263	119	132	234	608	158	105	1844	91
v/c Ratio	0.25	0.45	0.53	0.82	0.50	0.42	0.69	0.32	0.17	0.63	0.96	0.10
Control Delay	36.3	59.3	15.3	61.4	55.8	12.2	62.5	15.6	2.6	68.5	40.3	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	59.3	15.3	61.4	55.8	12.2	62.5	15.6	2.6	68.5	40.3	2.0
Queue Length 50th (ft)	39	56	0	178	86	0	90	131	0	78	686	0
Queue Length 95th (ft)	65	106	61	#310	148	57	135	174	32	139	#908	18
Internal Link Dist (ft)		248			783			446			1355	
Turn Bay Length (ft)				105		200	425		525	375		
Base Capacity (vph)	546	205	304	320	254	329	350	1930	935	181	1913	905
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.38	0.48	0.82	0.47	0.40	0.67	0.32	0.17	0.58	0.96	0.10

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.















## Queues

## 2040 Total Traffic WITH Right-in Access

## 2: Meridian Rd &amp; Eastonville Rd

PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	357	207	240	211	143	237	437	1271	263	105	1228	141
v/c Ratio	0.51	0.67	0.52	0.71	0.56	0.56	0.76	0.80	0.31	0.50	0.87	0.20
Control Delay	32.8	55.6	9.6	46.3	55.6	11.5	54.5	32.0	3.7	56.1	39.1	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	55.6	9.6	46.3	55.6	11.5	54.5	32.0	3.7	56.1	39.1	6.7
Queue Length 50th (ft)	107	147	0	125	102	0	161	403	0	75	429	10
Queue Length 95th (ft)	147	229	70	#204	172	73	226	569	51	131	556	51
Internal Link Dist (ft)		248			783			446			1355	
Turn Bay Length (ft)				105		170	425		525	375		
Base Capacity (vph)	755	393	523	304	307	459	630	1658	881	308	1543	757
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.53	0.46	0.69	0.47	0.52	0.69	0.77	0.30	0.34	0.80	0.19

## Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.