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Meridian Crossing Filing No. 1A
EPC #PPR 18-016
Transportation Memorandum
(LSC #184190)
July 31, 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.



8-1-18

Date



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July 31, 2018

Ms. Elizabeth Nijkamp
Engineering Review Manager
El Paso County Planning & Community Development
2880 International Circle, Suite 110
Colorado Springs, CO 80910

RE: Meridian Crossing Filing No. 1A
Transportation Memorandum
El Paso County, CO
EPC #PPR 18-016
LSC #184190

Dear Ms. Nijkamp:

LSC Transportation Consultants, Inc. has prepared this transportation memorandum to accompany the submittal for the proposed tire store to be located on Lots 3 and 4 of Meridian Crossing Filing No. 1. The proposed plat name is Meridian Crossings Filing No. 1A. Meridian Crossing is located between McLaughlin Road and Meridian Road south of Woodmen Road in El Paso County, Colorado. The site location is shown on Figure 1. LSC prepared a traffic report for Meridian Crossing development dated March 12, 2008 and updated May 21, 2008.

SITE PLAN AND ACCESS

Land Use

The 2008 traffic study for Meridian Crossing assumed the 9.5-acre development would be developed with four fast-food restaurants (at an average of 3,500 square feet each) and 33,000 square feet of retail floor space. Since completion of that study a 3,790-square-foot fast-food restaurant has been built on Lot 1 and a 13,048-square-foot liquor store has been built on Lot 6. A 12,813-square-foot tire store is currently proposed for Lots 3 and 4. There are currently no proposed plans for the 1.09-acre Lot 2 and 2.13-acre Lot 5. For this study it was assumed that Lot 2 will be developed with a fast-food restaurant and Lot 5 will be developed with a quick serve casual restaurant and an automotive parts store. The site plan is shown on Figure 2.

Site Access

The existing Meridian Crossing access points to the adjacent public streets are in conformance with the overall prior LSC traffic study. These access points include a right-in-only access and a three-quarter-

movement (left-in/right-in/right-out only) access to Meridian Road about 480 and 925 feet north of Rolling Thunder Way, respectively, and two full-movement site access points to McLaughlin Road. The internal driveway connection to the shared internal access drive has shifted to the north from what was shown in the previously approved plan. As the internal access drive on the north boundary of the site extends from a right-in-only intersection and the new location of the driveway is on a section of the internal road that is only wide enough for one-way traffic it will be necessary to restrict this access to right-in/right-out only.

Sight Distance

Figure 3 shows the estimated and required lines-of-sight at the north driveway connection to the internal access drive. The El Paso County *Engineering Criteria Manual (ECM)* contains general criteria for intersection sight distance based on left turning vehicles from a stop condition. The American Association of State Highway and Transportation Officials (AASHTO) standard for this condition is a 7.5 second gap. The ECM standards are consistent with this gap. As the internal access drive on the north boundary of the site extends from a right-in-only intersection and the north driveway to that internal access drive is located on a section that is only wide enough for one-way traffic, the north driveway will need to be restricted to right-in/right-out only. The AASHTO standard for "right turns from a stop" is 6.5 seconds. The AASHTO criteria further assumes that vehicles on the street travel at a constant speed. However, vehicles approaching the north access will be traveling at a slower speed as they maneuver through the right-in-only access off of Meridian Road. Table 1 shows a summary of the sight distance analysis based on the AASTHO criteria and the estimated speeds for each segment of the vehicle path. These segments include decelerating on Meridian Road as vehicles approach the intersection, traveling at a constant speed of 15 miles per hour around the curve and then accelerating along the internal access drive.

TRIP GENERATION

Estimates of the traffic volumes expected to be generated by the proposed tire store has been made using the nationally published trip generation rates found in *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 2 shows the results of the trip generation estimates. Table 2 also shows the estimated trip generation for the existing and future land uses within the entire Meridian Crossing development and a comparison to the trip generation estimate assumed in the 2008 traffic impact study. The trip generation for the existing land uses are based on the ITE trip generation rates for the average weekday and morning peak hour. The afternoon peak hour estimate is based on traffic counts conducted by LSC at the site access points in March 2018. The trip generation estimate for future development (Lots 2 and 6) were based on the ITE trip generation rates assuming these lots are developed with a fast-food restaurant, a quick casual restaurant, and an automobile parts store.

The total number of vehicle-trips generated has been reduced to take into account the "pass-by" 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. The pass-by rates

shown on Table 2 are from the *Trip Generation Handbook - An ITE Proposed Recommended Practice, 3rd Edition, 2014* by ITE.

As shown in Table 2, the proposed tire store is projected to generate about 263 new vehicle-trips on the average weekday, with about one-half of the vehicles entering and one-half of the vehicles exiting in a 24-hour period. During the morning peak hour, which generally occurs for one hour between 6:30 and 8:30 a.m., about 22 vehicles would enter and 13 vehicles would exit the site. During the afternoon peak hour, which generally occurs for one hour between 4:30 and 6:30 p.m., about 22 vehicles would enter and 29 vehicles would exit the site.

At buildout the Meridian Crossing development is projected to generate about 4,067 new vehicle-trips. This is about 865 fewer trips than was estimated in the 2008 traffic study. During the morning peak hour about 222 vehicles would enter and site and 199 vehicles would exit the site. This is about 200 fewer entering vehicles and 193 fewer exiting vehicles than was assumed in the 2008 traffic study. During the afternoon peak hour about 380 vehicles would enter and site and 372 vehicles would exit the site. This is about 58 fewer entering vehicles and 65 fewer exiting vehicles than was assumed in the 2008 traffic study.

The 2008 traffic study assumed this site would be developed with four fast-food restaurants and general retail uses but did not identify which specific lots were assumed for each use. The reduction in the trip generation estimate from the 2008 study is the result of a combination of factors. First, the proposed tire store has lower trip generation rates than the "Shopping Center" rates shown in the May 2008 TIA and much lower trip generation rates than a "Fast-Food Restaurant with Drive-Through Window." Secondly, based on current development trends, it seems unlikely that four fast-food restaurants would be constructed in this location. It seems more likely that at least one of these restaurants would instead be a "Fast Casual Restaurant". This new land use category in the *Trip Generation* manual has lower peak-hour trip generation rates than for Fast Food. Thirdly, although the existing liquor store has higher trip generation rates than the "Shopping Center" rates shown in the 2008 study, they are much lower than a fast-food restaurant. Finally, based on the lot sizes of the liquor store and proposed tire store, only a small amount of land would be left to assume for general retail uses. Based on the small size and other area developments, it seems likely that this parcel would be developed for a fairly low-intensity use such as auto parts sales.

TRIP DISTRIBUTION AND ASSIGNMENT

The estimated directional distribution of the site-generated traffic volumes on the adjacent road-ways is an important factor in determining the site's traffic impacts. Figure 4 shows the directional distribution estimates for the primary site-generated traffic. The estimates have been based on the following factors: the land use proposed for the site and its location, the existing and planned street and roadway system in the vicinity; and the existing/projected traffic volumes.

The pass-by trips from Meridian Road and the diverted trips from Woodmen Road and US Highway 24 were assigned based in large part on the magnitude and direction of the existing and projected background traffic volumes on the adjacent roadways.

When the distribution percentages (from Figure 4) were applied to the trip generation estimates (from Table 2), the site-generated traffic volumes at the Meridian Crossing access points were determined. Figure 5 shows the site-generated traffic volumes.

TOTAL TRAFFIC

Please refer to the dated *Meridian Crossing Updated Traffic Impact Analysis* dated March 12, 2008 and updated May 21, 2008 for the projected long-term total traffic volumes and level of service analysis. As the currently projected Meridian Crossing-generated traffic volumes are projected to be lower than what was assumed in the 2008 study, these volumes will be conservative.

ROADWAY IMPROVEMENT FEE PROGRAM

The proposed tire store would be subject to Woodmen Road District platting fees and mills.

CONCLUSIONS

- The proposed tire store is projected to generate about 263 new vehicle-trips on the average weekday, with about one-half of the vehicles entering and one-half of the vehicles exiting in a 24-hour period. During the morning peak hour about 22 vehicles would enter and 13 vehicles would exit the site. During the afternoon peak hour about 22 vehicles would enter and 29 vehicles would exit the site.
- Based on the projected long-term total traffic volumes shown in the 2008 Meridian Crossing TIA, the existing auxiliary turn lanes approaching the site access points could accommodate the projected traffic due to the proposed tire store.
- The internal access drive that forms the north boundary of the site is restricted to one-way traffic as it extends east from a right-in-only intersection. The north driveway to this internal access drive has been relocated to a section of this internal access drive that is only wide enough for one-way traffic and should be restricted to right-in/right-out only. Figure 6 shows the existing signage along the internal access drive that forms the north boundary of the site. The relocation of the north driveway will require modifications to this signage. Figure 7 shows the recommended modifications. This plan will need to be updated with the development of the lot to the north and the opening of that lot's south access.

* * * * *

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

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By Kirstin Day Ferrin, P.E.
Senior Transportation Engineer

JCH:KDF:bjwb

Enclosures: Tables 1-2
Figures 1-7

Table 1
Meridian Crossing Filing No. 1A
Sight Distance Travel Times
Right-in Only Access off Meridian Road

Segment	Speed				Distance (ft)	Time (seconds)
	Start		End			
	mph	ft/s	mph	ft/s		
ECM Required Sight Distance⁽¹⁾	25	36.7	25	36.7	280	7.6
Required Sight Distance For Right-Turn Vehicles Adjusted Based on Travel Speed Around A Corner⁽²⁾						
Decelerate approaching turn	30	43.8	15.0	22.0	44	1.3
Turn at the access	15	22.0	15.0	22.0	65	3.0
Accelerate to posted limit	15	22.0	25.0	36.7	65	2.2
Total Travel					174	6.5
Notes:						
(1) The ECM-required sight distance is a general criteria that covers the "left turns from a stop" condition. <i>The American Association of State Highway and Transportation Officials (AASHTO)</i> standard for this condition is a 7.5-second gap.						
(2) The AASHTO standard for "right turns from a stop" is 6.5 seconds. This condition applies because the access will be restricted to right-turn only						
Source: LSC Transportation Consultants, Inc.						

**Table 2
Trip Generation Estimate
Meridian Crossing Filing No. 1A**

Meridian Crossing Filing No. 1 Lot Number	Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates ⁽¹⁾					Total Trips Generated					Pass-By Trips ⁽²⁾	New External Trips Generated Average Weekday Traffic		
				Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour					
					In	Out	In	Out		In	Out	In	Out				
Trip Generation Estimate Based on Existing, Currently Proposed and Future Potential Land Uses																	
Currently Proposed Land Use																	
3 & 4	848	Tire Store	12.813 KSF	28.52	1.74	0.98	1.71	2.27	365	22	13	22	29	28%	263		
Existing Land Uses																	
Based on manual turning movement counts by LSC March 2018																	
1	934	Fast-Food Restaurant with Drive-Through Window	3,790 KSF ⁽³⁾	---	---	---	---	---	---	---	---	178	165	---	---		
6	899	Liquor Store	13,048 KSF	---	---	---	---	---	---	---	---	---	---	---	---		
Based on ITE Trip Generation Rates																	
1	934	Fast-Food Restaurant with Drive-Through Window	3,790 KSF	470.95	20.50	19.69	16.99	15.68	1,785	78	75	64	59	50%	893		
6	899	Liquor Store	13,048 KSF	101.49	2.19	2.10	5.54	6.39	1,324	29	27	72	83	34%	874		
									Total Lots 1 & 6		3,109		107	102	136	142	2,030
Future Land Uses																	
2	934	Fast-Food Restaurant with Drive-Through Window	3.5 KSF	470.95	20.50	19.69	16.99	15.68	1,648	72	69	59	55	50%	824		
5	930	Fast Casual Restaurant	5 KSF	315.17	1.39	0.68	7.77	6.36	1,576	7	3	39	32	43%	898		
	843	Automobile Parts Sales	10 KSF	55.34	1.42	1.17	2.36	2.55	553	14	12	24	26	43%	315		
									Total Lots 2 & 5		3,224		79	72	98	87	1,722
Total Meridian Crossing Filing No. 1⁽⁴⁾									7,252	222	199	322	307		4,067		
Trip Generation Estimate From "Meridian Crossing Traffic Impact Analysis" by LSC dated March 12, 2008 (Updated May 21, 2008)																	
---	820	Shopping Center	33 KSF	88.45	1.29	0.83	3.88	4.21	2,919	43	27	128	139	50%	1,459		
---	934	Fast-Food Restaurant with Drive-Through Window	14 KSF	496.12	27.09	26.02	18.01	16.63	6,946	379	364	252	233	50%	3,473		
									9,865	422	392	380	372		4,932		
Change in Trip Generation Estimate									-2,612	-200	-193	-58	-65		-865		
Notes:																	
(1) Source: "Trip Generation, 10 th Edition", September 2017 by the Institute of Transportation Engineers (ITE)																	
(2) Source: "Trip Generation Handbook - An ITE Proposed Recommended Practice, 3 rd Edition" by ITE																	
(3) KSF = one thousand square feet of floor space																	
(4) Trip generation estimate for Lots 1 & 6 are based on ITE rates for the average weekday and morning peak hour and existing counts for the afternoon peak hour																	
Source: LSC Transportation Consultants, Inc.																	



Approximate Scale
Scale: 1" = 1,200'

Figure 1

Vicinity Map

Meridian Crossing Filing No. 1A (LSC #184190)

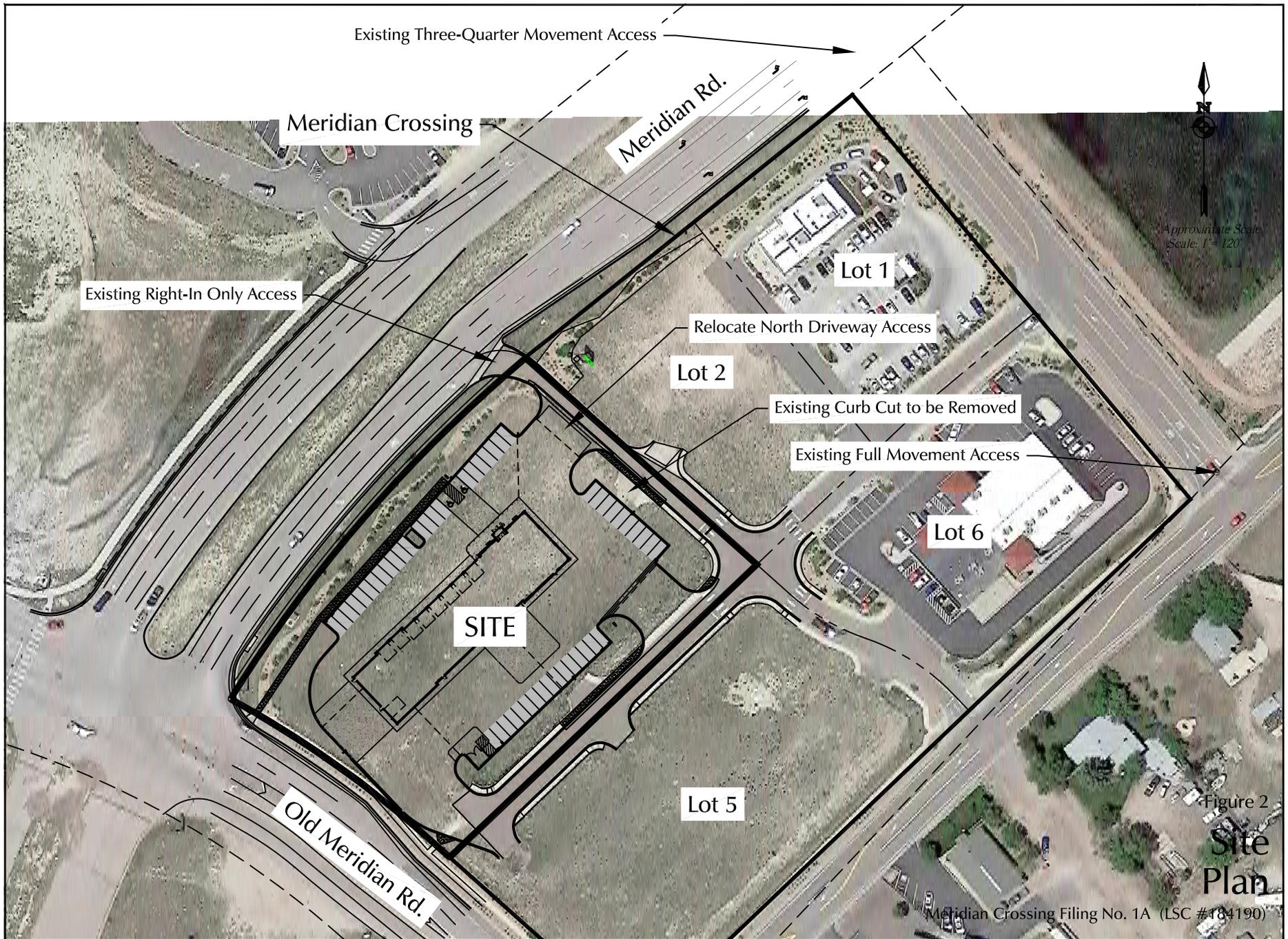


Figure 2
Site Plan

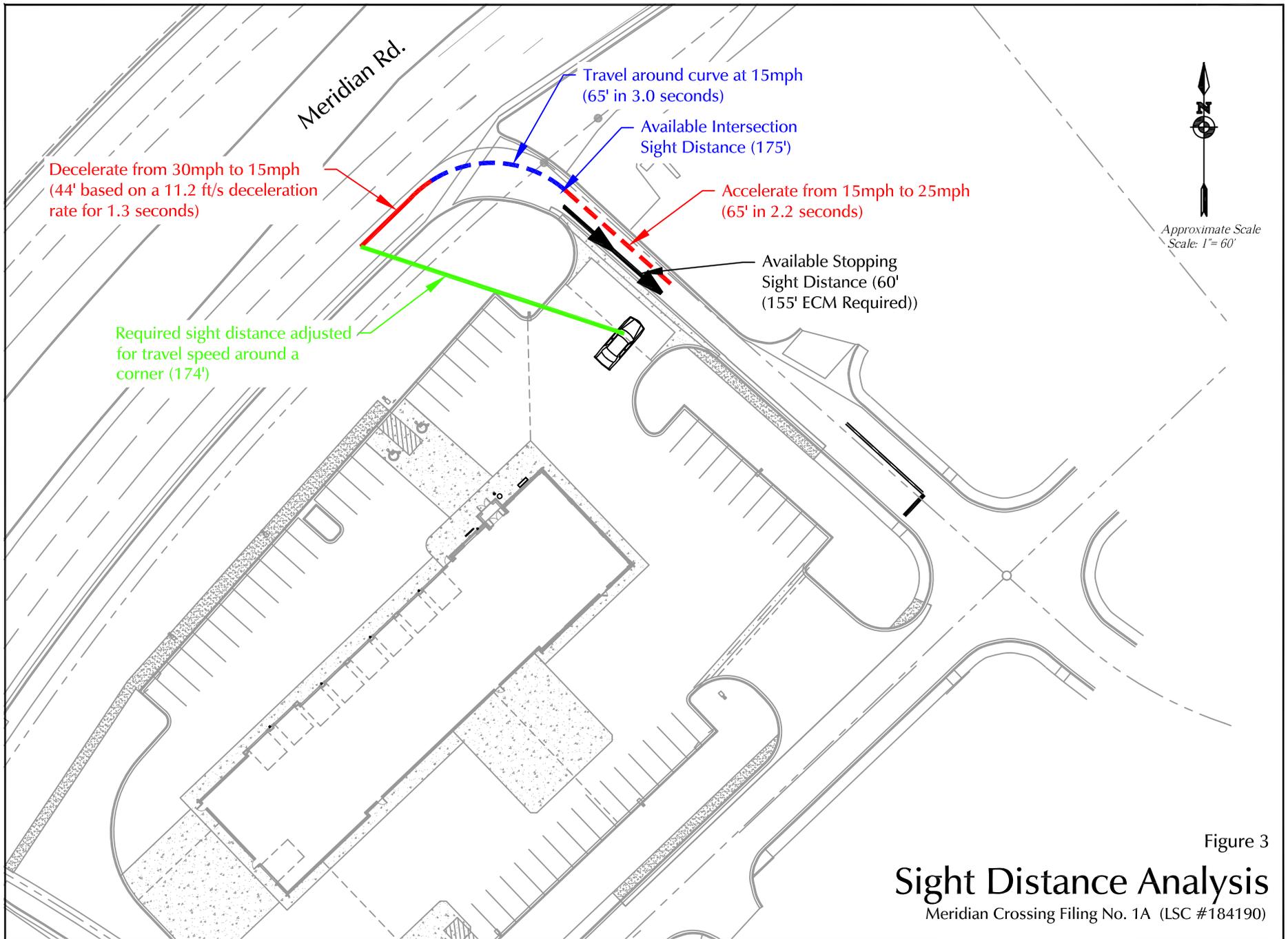


Figure 3

Sight Distance Analysis

Meridian Crossing Filing No. 1A (LSC #184190)

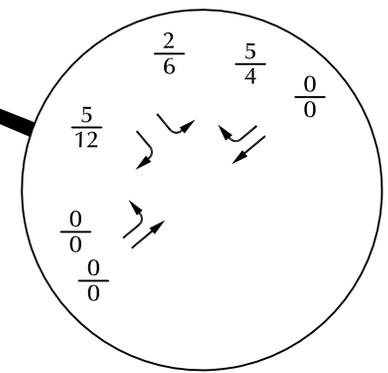
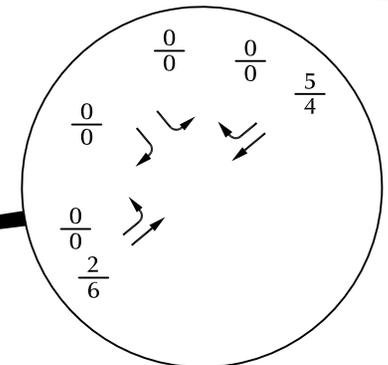
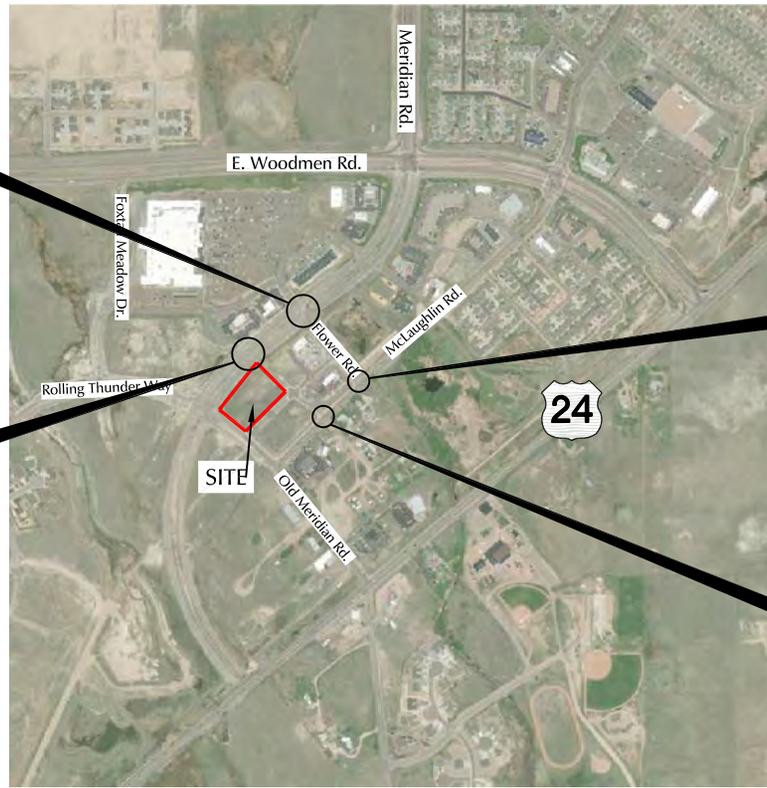
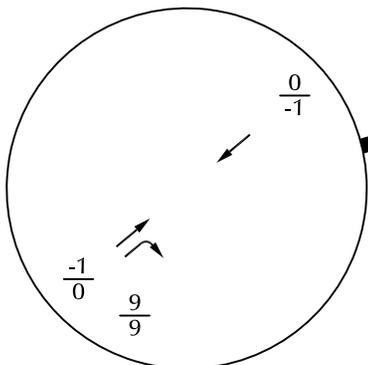
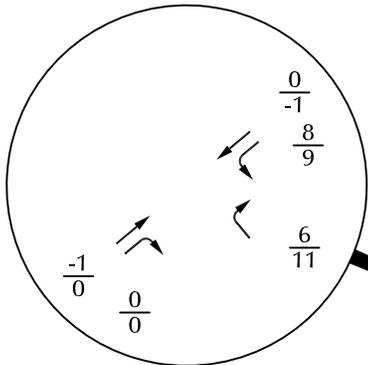



 Approximate Scale
 Scale: 1" = 1,200'

LEGEND:

 XX% = Percent Directional Distribution

Figure 4
**Directional Distribution
 of Site-Generated Traffic**
 Meridian Crossing Filing No. 1A (LSC #184190)



Approximate Scale
Scale: 1" = 1,200'

LEGEND:
 $\frac{XX}{XX}$ = AM Weekday Peak-Hour Traffic (vehicles per hour)
 $\frac{XX}{XX}$ = PM Weekday Peak-Hour Traffic (vehicles per hour)

X,XXX= Average Daily Traffic (vehicles per day) Estimates by LSC unless otherwise noted.

Figure 5
Assignment of Site-Generated Traffic
 Meridian Crossing Filing No. 1A (LSC #184190)

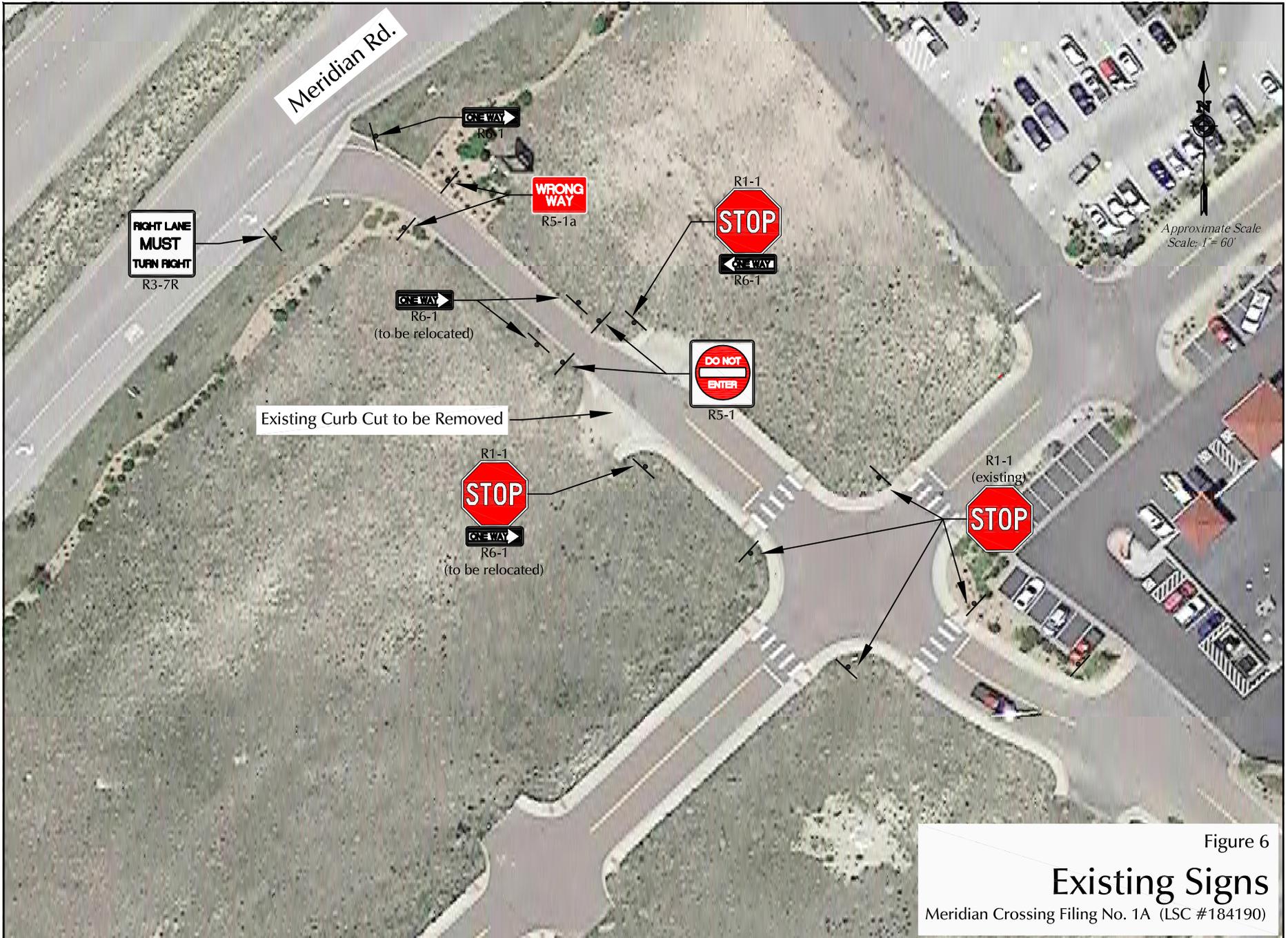


Figure 6
Existing Signs
 Meridian Crossing Filing No. 1A (LSC #184190)

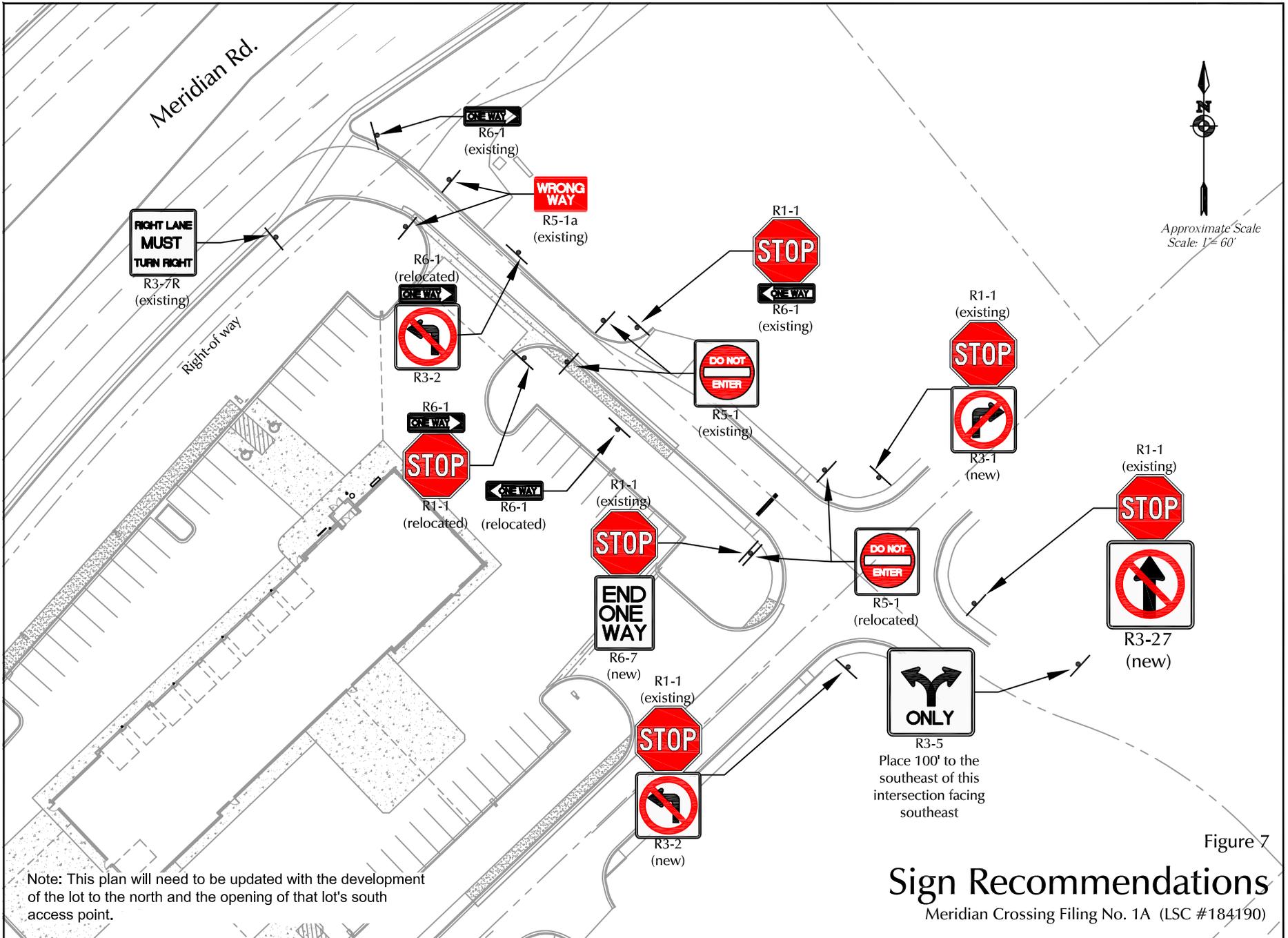


Figure 7
Sign Recommendations
 Meridian Crossing Filing No. 1A (LSC #184190)