Traffic Impact Analysis

Austin Oaks

Austin, Texas

Prepared for:
Spire Realty Group, LP

Prepared by:

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KH Project No. 061277705

April 21, 2016

Austin Oaks TIA

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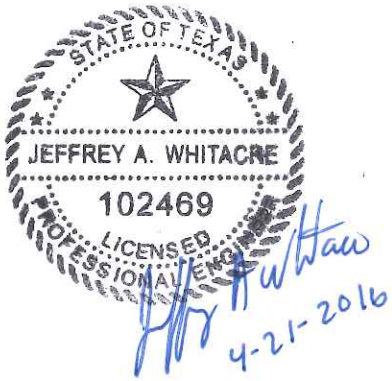
Prepared By:



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EXECUTIVE SUMMARY

A. INTRODUCTION

Kimley-Horn and Associates, Inc. was retained by Spire Realty Group, LP to perform a Traffic Impact Analysis (TIA) for the proposed Austin Oaks Development. This study is intended to determine and address potential traffic impacts of the proposed development on the surrounding roadway network and intersections. This traffic impact study was prepared based on criteria set forth by the City of Austin through a scoping meeting methodology, see ***Appendix A***.

The proposed development is located on the southwest corner of Mopac (Loop 1) and Spicewood Springs Road within the City of Austin limits. The land uses for the existing and proposed development are shown in ***Table I.***

Table I– Existing and Proposed Land Use

Land Uses	Comprehensive Size	ITE Code
Existing		
General Office Building	445,322 SF	710
Proposed		
Apartment	250 DU	220
Hotel	100 Rooms	310
General Office Building	672,995 SF	710
Medical-Dental Office Building	169,000 SF	720
Retail/High-Turnover (Sit-Down) Restaurant	46,700 SF	932

B. ANALYSIS METHODOLOGY

The proposed development is anticipated to be developed in phases. The traffic evaluation is comprised of 2016 existing conditions analyses and separate future condition analyses for years 2018, 2020, 2022, and 2024. Detailed descriptions of the methodology assumptions and conditions used to evaluate each scenario is provided in the body of the report. This summary gives a brief overview of the recommended improvements based on a peak hour level of service (LOS) analysis for each analysis years.

C. EXISTING AND PROPOSED DEVELOPMENT ASSUMPTIONS (BY PHASE)

The Austin Oaks development will be constructed in phases. Similarly, the existing office development will be removed in phases concurrently with the construction of the proposed development. ***Table II*** displays the addition (or removal) of land use for each phase of development.

Table II– Change in Land Use (By Phase)

Development		Existing Office		Proposed Austin Oaks Land Use				
Phase	Year	Removed	Remaining	General Office	Medical Office	Restaurant	Apartment	Hotel
Existing	2016	-	445,322 SF	-	-	-	-	-
Phase I	2018	87,837 SF	357,485 SF	215,000 SF	55,000 SF	0 SF	0	0
Phase II	2020	105,893 SF	339,429 SF	0 SF	0 SF	15,000 SF	250 DU	0
Phase III	2022	149,822 SF	295,500 SF	207,000 SF	55,000 SF	31,700 SF	0	100 Rooms
Phase IV	2024	101,770 SF	343,552 SF	250,995 SF	59,000 SF	0 SF	0	0
Total		**445,322 SF**	**-**	**672,995 SF**	**169,000 SF**	**46,700 SF**	**250 DU**	**100 Rooms**

Twelve (12) driveways are proposed as part of the Austin Oaks development; ten intersecting Executive Center Drive and two intersecting Wood Hollow Drive. All driveways are full-access, stop-controlled, and will be constructed in phases.

D. EXISTING AND FUTURE IMPROVEMENTS

The Austin Oaks Traffic Impact Study identifies nine (9) specific existing improvements and eleven (11) future improvements. The improvements' costs have been broken up by pro-rated shares. For the identified improvements, the developer's pro rata share is anticipated to be approximately $1,460,000. These funds will be allocated to construct a traffic signal at Spicewood Springs Road and Hart Lane, as well as other improvements to be determined through a discussion with City of Austin staff.

A. 2016 EXISTING ANALYSIS RESULTS AND RECOMMENDATIONS

An analysis of Existing conditions was performed using the 2016 Existing Lane Assignments and Traffic Control and 2016 Existing Volumes. Based on the results of the 2016 Existing analysis, the following nine (9) improvements (shown by numbers in ***Exhibit I***) are recommended prior to construction of the proposed development:

2016 Improvements (9):

- *Spicewood Springs Road & Hart Lane (1).* Install a fully actuated traffic signal at the intersection of Spicewood Springs Road and Hart Lane.

- *Spicewood Springs Road & Wood Hollow Drive (2)*. Extend the westbound left-turn bay of Spicewood Springs Road to Wood Hollow Drive to provide adequate storage for vehicles making a left-turn movement and prevent spill-back into the adjacent lane.

- *Spicewood Springs Road & Wood Hollow Drive (3).* Provide a right-turn overlap operation at the northbound right-turn movement of Wood Hollow Drive to Spicewood Springs Road. This will allow the northbound right-turn phase and the westbound left-turn phase to operate simultaneously and decrease delay at the northbound approach of Wood Hollow Drive.

- *Spicewood Springs Road & Loop 1 SBFR* (4). Provide striping and vertical panels (or other physical barrier) at the southbound receiving lanes of Loop 1 SBFR to facilitate a FREE eastbound right-turn movement from Spicewood Springs Road to Loop 1 SBFR. This movement is currently channelized and a merge with Loop 1 SBFR can be accomplished with existing pavement.

- *Executive Center Drive & Loop 1 SBFR (5)*. Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Executive Center Drive). Additionally, install vertical panels (or other physical barrier) along Loop 1 Southbound Off-Ramp to prevent access to Executive Center Drive from southbound Loop 1 Southbound Off-Ramp and reduce weaving in this section of the frontage road.

- *Greystone Drive & Loop 1 SBFR (6)*. Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Greystone Drive).

- *Far West Boulevard & Hart Lane (7).* Widen the northbound approach of Hart Lane to a five-lane cross-section at the intersection of Far West Boulevard. The northbound approach should include an exclusive left-turn lane, exclusive thru lane, and exclusive right-turn lane; two southbound receiving lanes with remain. Restripe the southbound approach of Hart Lane to include an exclusive left-turn lane, exclusive thru lane, and shared thru-right lane; a single northbound receiving lane will remain.

- *Far West Boulevard & Wood Hollow Drive (8)*. Provide a right-turn overlap operation at the northbound right-turn movement from Wood Hollow Drive to Far West Boulevard. To maximize the benefits of this improvement, restripe the northbound approach to extend the existing right-turn lane.

- *Far West Boulevard & Loop 1 SBFR (9)*. Provide a FREE, channelized operation at the southbound right-turn movement from Loop 1 SBFR to Far West Boulevard (westbound). The existing lane configurations can accommodate a FREE operation because there are three westbound receiving lanes. The right-turn-only lane along Far West Boulevard is recommended to be restriped as a shared thru-right lane between Loop 1 and the first driveway (approximately 400').

Exhibits showing 2016 Improvements at a conceptual level are provided in ***Appendix H***.

B. EXISTING AND FUTURE REGIONAL IMPACTS

Loop 1 provides connectivity to regions north of Austin and is used by commuters traveling into Austin from the surrounding regions. Traffic volumes along Loop 1 within the study area are expected to increase as a result of traffic generated by developments beyond the Austin City Limits. Development sprawl occurring north of Austin provides a majority of the increase of traffic on Loop 1. Therefore, the impacts of regional background growth on traffic operations at intersections along Loop 1 will far exceed the impacts of local development. Issues along Loop 1 should be addressed at a regional level. The managed lanes currently being constructed on Loop 1 is a starting point for these regional improvements. Future regional improvements such as improved transit are some necessary improvements needed for travel demand management.

The previously recommended 2016 Improvements recommended at intersections along Loop 1 reduce delay but capacity issues remain. Regional improvements are required to achieve an acceptable LOS at the intersections along Loop 1. Determining these regional improvements is beyond the scope of mitigation for a local development. Although major improvements are necessary at intersections along Loop 1, such improvements were not incorporated because they are not expected to be constructed in the foreseeable future.

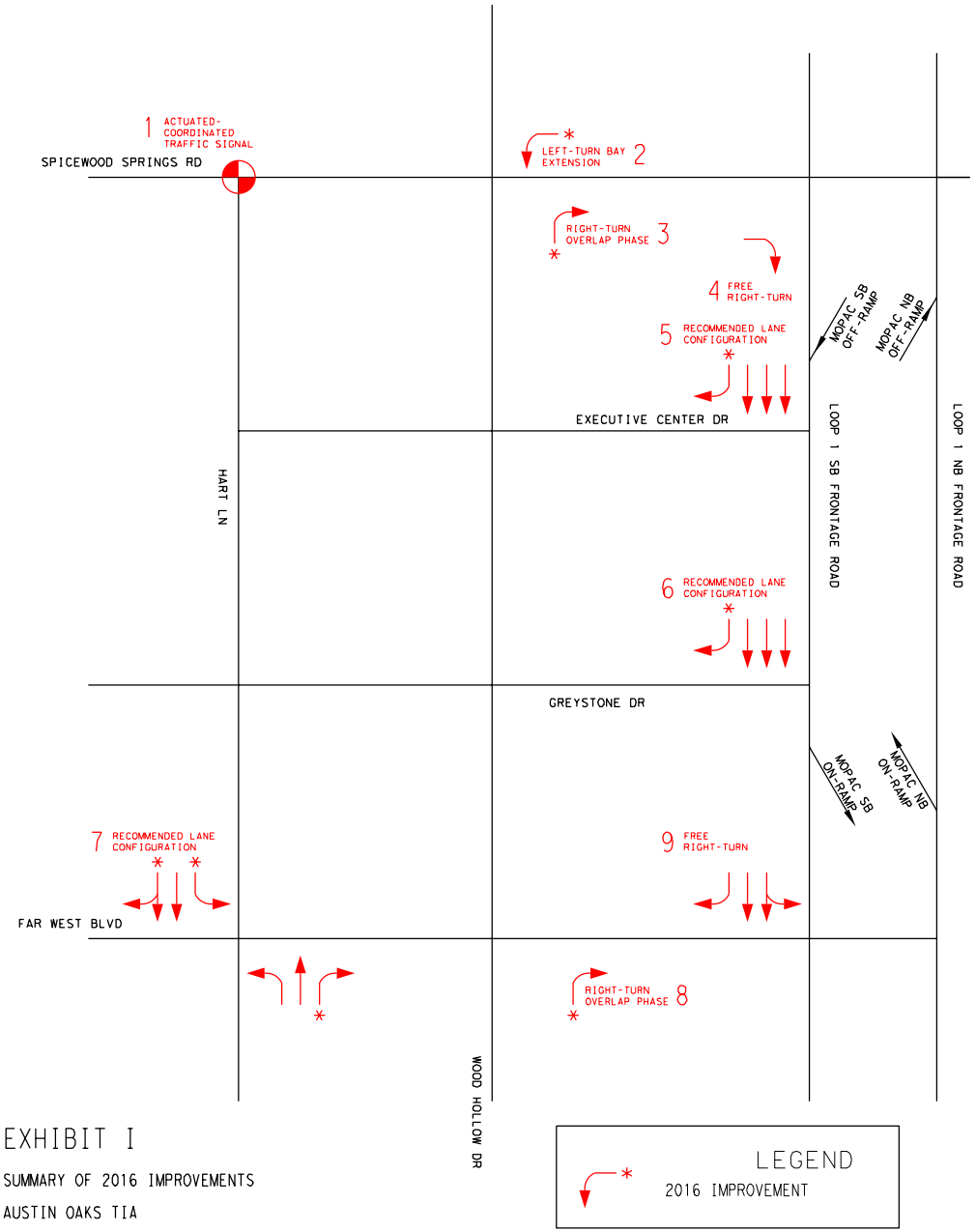

EXHIBIT I

SUMMARY OF 2016 IMPROVEMENTS

AUSTIN OAKS TIA

Improvement Name	Improvement Description	Opinion of Probable Cost ($)	Improvement Exhibit Index
1. Spicewood Springs Road & Hart Lane (2016)	Install a fully actuated traffic signal at the intersection of Spicewood Springs Road and Hart Lane.	$ 420,000	2016 A
2. Spicewood Springs Road & Wood Hollow Drive (2016)	Extend the westbound left-turn bay of Spicewood Springs Road to Wood Hollow Drive.	$ 50,000	2016 B
3. Spicewood Springs Road & Wood Hollow Drive (2016)	Provide a right-turn overlap operation at the northbound right-turn movement of Wood Hollow Drive to Spicewood Springs Road.	$ 10,000	2016 B
4. Spicewood Springs Road & Loop 1 SBFR (2016)	Provide a FREE eastbound right-turn movement from Spicewood Springs Road to Loop 1 SBFR	$ 25,000	2016 C
5. Executive Center Drive & Loop 1 SBFR (2016)	Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Executive Center Drive).	$ 150,000	2016 D
6. Greystone Drive & Loop 1 SBFR (2016)	Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Greystone Drive).	$ 150,000	2016 E
7. Far West Boulevard & Hart Lane (2016)	Widen the northbound approach and restripe the southbound approach of Hart Lane at the intersection of Far West Boulevard.	$ 95,000	2016 F
8. Far West Boulevard & Wood Hollow Drive (2016)	Provide a right-turn overlap operation at the northbound right-turn movement from Wood Hollow Drive to Far West Boulevard.	$ 20,000	2016 G
9. Far West Boulevard & Loop 1 SBFR (2016)	Provide a FREE, channelized operation at the southbound right-turn movement from Loop 1 SBFR to Far West Boulevard (westbound)	$ 150,000	2016 H

THE ENGINEER HAS NO CONTROL OVER THE COST OF LABOR, MATERIALS, EQUIPMENT, OR OVER THE CONTRACTOR'S METHODS OF DETERMINING PRICES OR OVER COMPETITIVE BIDDING OR MARKET CONDITIONS. OPINIONS OF PROBABLE COSTS PROVIDED HEREIN ARE BASED ON THE INFORMATION KNOWN TO ENGINEER AT THIS TIME AND REPRESENT ONLY THE ENGINEER'S JUDGMENT AS A DESIGN PROFESSIONAL FAMILIAR WITH THE CONSTRUCTION INDUSTRY. THE ENGINEER CANNOT AND DOES NOT GUARANTEE THAT PROPOSALS, BIDS, OR ACTUAL CONSTRUCTION COSTS WILL NOT VARY FROM ITS OPINIONS OF PROBABLE COSTS.

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A. FUTURE ANALYSIS RESULTS AND RECOMMENDATIONS

The analysis of future conditions was performed for No Build. Build, and Mitigated scenarios for analysis years 2018, 2020, 2022, and 2024. The development, roadway, and traffic volume assumptions used for the analyses are unique to each scenario and described at length in the report. The 2024 Build Out assumes the completion of Phases I, II, III, and IV of the Austin Oaks development. ***Table III*** summarizes the Daily, and Weekday AM and PM peak hour trip generation the 2024 Build Out based on ITE methodology.

Table III– 2024 Build-Out Trip Generation

Land Use	Amount	Units	ITE Code	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
					In	Out	Total	In	Out	Total
Existing General Office Building	445.322	1,000 Sq Ft	710	4,086	556	76	632	98	479	577
Existing General Office Building (To Remain)	0	1,000 Sq Ft	710	0	0	0	0	0	0	0
Reduction in Existing Office Trips				4,086	556	76	632	98	479	577
Apartment	250	Dwelling Unit(s)	220	1,640	25	101	126	101	54	155
Hotel	100	Room(s)	310	818	31	22	53	31	29	60
General Office Building	672.995	1,000 Sq Ft	710	5,591	774	106	880	141	691	832
Medical-Dental Office Building	169.000	1,000 Sq Ft	720	6,695	319	85	404	131	336	467
Retail/High-Turnover (Sit-Down) Restaurant	46.700	1,000 Sq Ft	932	5,938	278	227	505	276	184	460
2024 Net New Trips				16,596	871	465	1,336	582	815	1,397
Internal Capture Trip Reduction (5%):				1,034	71	27	98	34	65	99
2024 Net New External Trips				**15,562**	**800**	**438**	**1,238**	**548**	**750**	**1,298**

Improvements were recommended in each analysis year to mitigate observable impacts and incorporated in the analysis of subsequent years. The analysis of 2024 Build Out indicate eleven (11) improvements (shown in ***Exhibit II***) are recommended concurrently with the construction of the proposed development to provide adequate traffic operations in the study area:

2018 Improvements (5):

- *Spicewood Springs Road & Wood Hollow Drive (1).* Adjust signal timing at the intersection of Spicewood Springs Road and Wood Hollow Drive. A half-cycle length was not implemented but should be considered by the City to accommodate future traffic volumes.

- *Executive Center Drive & Wood Hollow Drive (2)*. Construct a multi-lane roundabout at intersection of Executive Center Drive and Wood Hollow Drive. The northbound and southbound approaches will be flared (expanding from one to two lanes) and the roundabout design should accommodate pedestrian and bicycle facilities. The roundabout improvement requires right-of-way and could be a substantial cost. A roundabout is optimal ultimate solution by year 2024; however, an interim all way stop could be implemented and monitored until the ultimate rounded is necessary. An all-way stop and restriping would improve the operations as compared to existing conditions, but does not result in the LOS as a roundabout. For analysis purposes a roundabout was assumed at the intersection of Executive Center Drive and Wood Hollow Drive in year 2018 since it is ultimately necessary.

- *Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road (3)*. Concurrently with the roundabout construction, restripe Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road to allow two northbound lanes, one southbound lane, and bike lanes on both sides of the roadway. Restricting parking and extending the northbound right-turn lane will maximize the operations at the northbound approach of Wood Hollow Drive at Spicewood Springs Road.

- *Executive Center Drive at Loop 1 SBFR (4)*. Construct a southbound acceleration lane on Loop 1 SBFR, downstream of Executive Center Drive to provide a FREE operation at the eastbound right-turn movement of Executive Center Drive.

- *Far West Boulevard & Wood Hollow Drive (5)*. Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.

2020 Improvement (1):

- *Far West Boulevard & Wood Hollow Drive* (1) Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.

2022 1 Improvement (1):

- *Far West Boulevard & Wood Hollow Drive (*1). Restripe the eastbound approach of Far West Boulevard at Wood Hollow Drive. The outside lane of the eastbound approach is currently striped as an exclusive right-turn lane and there are three eastbound receiving lanes. To prevent weaving downstream of Wood Hollow Drive the City should consider restriping the outside lane of Far West Boulevard as a shared thru-right until Loop 1 SBFR.

2024 Improvements (4):

- *Executive Center Drive & Hart Lane (1a).* Restripe the westbound approach of Executive Center Drive at Hart Lane to include two lanes: exclusive left-turn lane and exclusive right-turn lane. This improvement will allow the left-turn and right-turn movements to operate independently and improve the LOS of this approach.

- *Hart Lane between Executive Center Drive and Spicewood Springs Road (1b).* Restripe Hart Lane between Executive Center Drive and Spicewood Springs Road to provide a southbound left-turn bay from Hart Lane to Executive Center Drive. The storage provided in this bay will be minimum as space must be preserved to accommodate the northbound left-turn bay from Hart Lane to Spicewood Springs Road.

- *Greystone Drive & Hart Lane (2)*. Restripe the southbound approach of Hart Lane at Greystone Drive to include two thru lanes. This will require the south-leg of the intersection to be restriped to provide two receiving lanes. A cross-section which will accommodate three travel lanes and two bike lanes can be accomplished using existing pavement. We recommend that this improvement not be implement until necessary based on actual (not projected) traffic demands require it. It should be noted that, based on turning movement volumes, a single-lane roundabout would perform better and was evaluated at this location. However, due to right-of-way ROW) constraints a roundabout is not feasible nor recommended.

- *Greystone Drive & Wood Hollow Drive (3)*. Restripe the northbound approach of Wood Hollow Drive at Greystone Drive to include two thru lanes. This will require the north-leg of the intersection to be restriped to provide two receiving lanes. A cross-section which will accommodate three travel lanes and two bike lanes can be accomplished using existing pavement. We recommend that this improvement not be implement until necessary based on actual (not projected) traffic demands require it. It should be noted that, based on turning movement volumes, a single-lane roundabout would perform better and was evaluated at this location. However, due to ROW constraints a roundabout is not feasible nor recommended.

- *Far West Boulevard & Wood Hollow Drive. (4)* Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.

Exhibits showing future improvements at a conceptual level are provided in ***Appendices I, J, & K***.

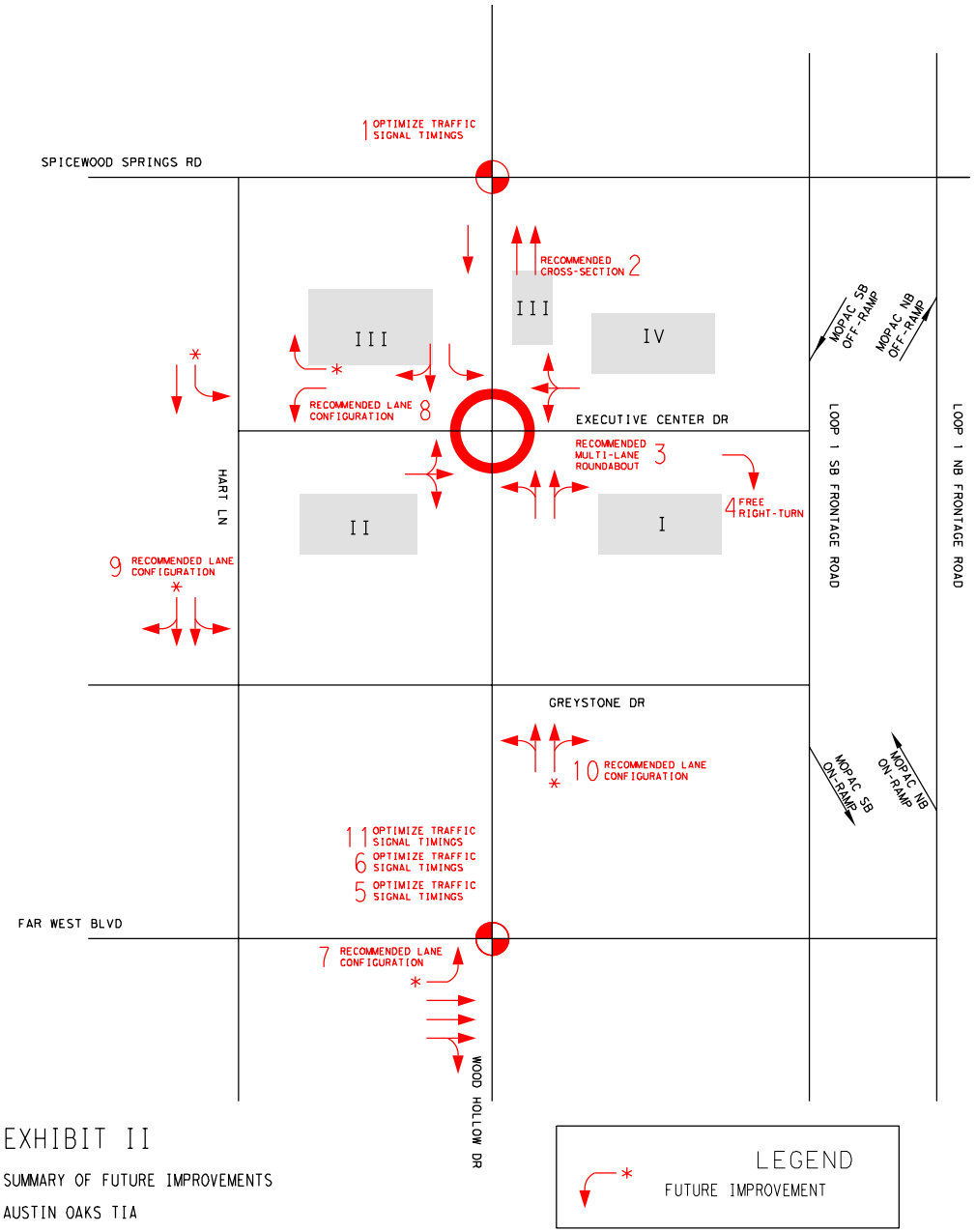

EXHIBIT II

SUMMARY OF FUTURE IMPROVEMENTS

AUSTIN OAKS TIA

Improvement Name	Improvement Description	Opinion of Probable Cost ($)	Improvement Exhibit Index
1. Spicewood Springs Road & Wood Hollow Drive (2018)	Adjust signal timing at the intersection of Spicewood Springs Road and Wood Hollow Drive.	$ 10,000	No Exhibit
2. Executive Center Drive & Wood Hollow Drive (2018)	Construct a multi-lane roundabout at intersection of Executive Center Drive and Wood Hollow Drive.	$ 2,000,000	2018 A
3. Executive Center Drive & Wood Hollow Drive (2018)	Restripe Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road.	$ 20,000	2018 B
4. Executive Center Drive & Loop 1 SBFR (2018)	Construct a southbound accceleration lane on Loop 1 SBFR (downstream of Executive Center Drive).	$ 120,000	2018 C
5. Far West Boulevard & Wood Hollow Drive (2018)	Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.	$ 10,000	No Exhibit
6. Far West Boulevard & Wood Hollow Drive (2020)	Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.	$ 10,000	No Exhibit
7. Far West Boulevard & Wood Hollow Drive (2022)	Restripe the eastbound approach of Far West Boulevard at Wood Hollow Drive.	$ 10,000	2022 A
8. Executive Center Drive & Hart Lane (2024)	Restripe the westbound approach of Executive Center Drive at Hart Lane (1a) and restripe Hart Lane between Executive Center Drive and Spicewood Springs Road (1b).	$ 20,000	2024 A
9. Greystone Drive & Hart Lane (2024)	Restripe the southbound approach of Hart Lane at Greystone Drive.	$ 20,000	2024 B
10. Greystone Drive & Wood Hollow Drive (2024)	Restripe the northbound approach of Wood Hollow Drive at Greystone Drive.	$ 20,000	2024 C
11. Far West Boulevard & Wood Hollow Drive (2024)	Adjust signal timing at the intersection of Spicewood Springs Road and Wood Hollow Drive.	$ 10,000	No Exhibit

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INTRODUCTION

A. PURPOSE

Kimley-Horn and Associates, Inc. (Kimley-Horn) was retained by Spire Realty Group, LP to perform a Traffic Impact Analysis (TIA) for the proposed Austin Oaks Development. The proposed development is located on the southwest corner of Mopac (Loop 1) and Spicewood Springs Road within the City of Austin limits. The site is currently occupied by approximately 445,000 square-feet of office that generates traffic. A site vicinity map is provided in ***Exhibit 1.***

This study is intended to determine and address potential traffic impacts of the proposed development on the surrounding roadway network and intersections. The specific objectives of this study are to determine existing and future levels of service (LOS) at the various study intersections and recommend any capacity or operational related improvements. This traffic impact study was prepared based on criteria set forth by the City of Austin through a scoping meeting methodology, see ***Appendix A***.

B. EXISTING AND PROPOSED LAND USES

The proposed mixed-use development will replace an existing office development. The comprehensive size of the existing and proposed land-uses for Austin Oaks are summarized in ***Table 1***. The conceptual site plan for the proposed development is shown in ***Exhibit 2.***

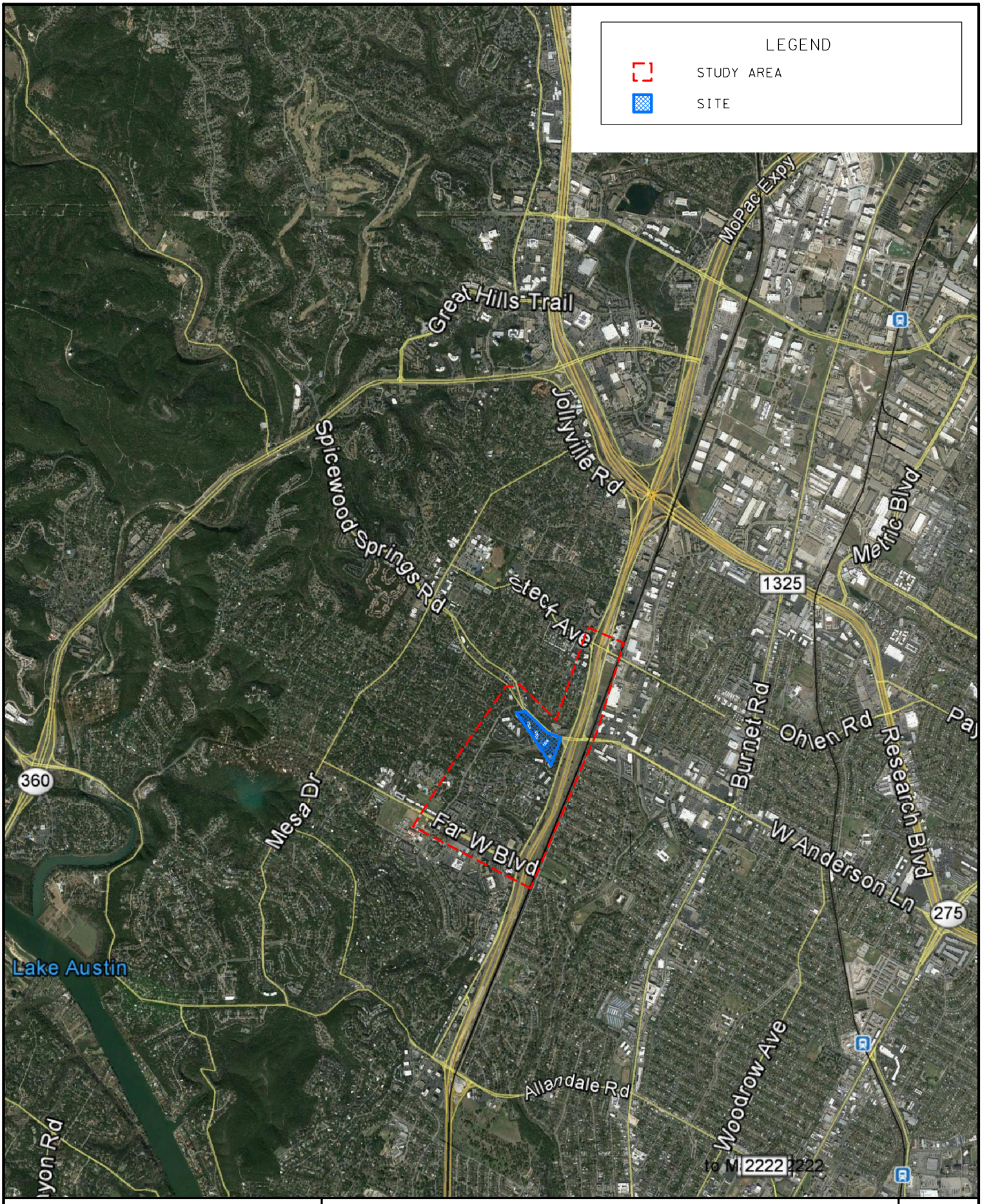
Table 1 – Existing and Proposed Land Use

Land Uses	Comprehensive Size	ITE Code
Existing		
General Office Building	445,322 SF	710
Proposed		
Apartment	250 DU	220
Hotel	100 Rooms	310
General Office Building	672,995 SF	710
Medical-Dental Office Building	169,000 SF	720
Retail/High-Turnover (Sit-Down) Restaurant	46,700 SF	932

C. ANALYSIS METHODOLOGY

The proposed development is anticipated to be developed in phases. The traffic evaluation is comprised of 2016 existing conditions analyses and separate future condition analyses for years 2018, 2020, 2022, and 2024. Future condition analyses consisted of three (3) scenarios for each analysis year: No Build, Build, and Mitigated. Weekday AM and PM peak hour LOS analyses were performed for all scenarios using Synchro 8™ software. ***Table 2*** provides the development, roadway, and traffic volume assumptions for the 2016 existing scenario and a general summary of assumptions used for the analysis of future years.

DATE: 4/18/2016



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VICINITY MAP

EXHIBIT 1

EXHIBIT 2

CONCEPTUAL SITE PLAN

AUSTIN OAKS TIA

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TABLE 2

SCENARIO ASSUMPTIONS

AUSTIN OAKS TIA

Scenario	Development	Roadway	Traffic Volume
2016 Existing	Existing **Austin Oaks Office**	Existing	Existing **Austin Oaks Office Site Trips**
2016 Mitigated	Existing **Austin Oaks Office**	Existing Conditions + **2016 Roadway Improvements**	2016 Existing Conditions
2018 No Build	2016 Existing Conditions	2016 Existing Conditions	2016 Existing Conditions + **2 Years of Background Growth (2% Annually)**
2018 Build	Existing Conditions + **Net Development (Phase I)**	Existing Conditions	2018 No Build Conditions + **Net Development Volumes (Phase I)**
2018 Mitigated	2018 Build Conditions	Existing Conditions + **2018 Roadway Improvements**	2018 Build Conditions
2020 No Build	2016 Existing Conditions	2016 Existing Conditions	2016 Existing Conditions + **4 Years of Background Growth (2% Annually)**
2020 Build	Existing Conditions + **Net Development (Phases I&II)**	2018 Mitigated Conditions	2020 No Build Conditions + **Net Development Volumes (Phases I&II)**
2020 Mitigated	2020 Build Conditions	2020 Build Conditions + **2020 Roadway Improvements**	2020 Build Conditions
2022 No Build	2016 Existing Conditions	2016 Existing Conditions	2016 Existing Conditions + **6 Years of Background Growth (2% Annually)**
2022 Build	Existing Conditions + **Net Development (Phases I,II&III)**	2020 Mitigated Conditions	2022 No Build Conditions + **Net Development Volumes (Phases I,II&III)**
2022 Mitigated	2022 Build Conditions	2022 Build Conditions + **2022 Roadway Improvements**	2022 Build Conditions
2024 No Build	2016 Existing Conditions	2016 Existing Conditions	2016 Existing Conditions + 8 **Years of Background Growth (2% Annually)**
2024 Build	Existing Conditions + **Net Development (Phases I,II,III&IV)**	2022 Mitigated Conditions	2024 No Build Conditions + **Net Development Volumes (Phases I,II,III&IV)**
2024 Mitigated	2024 Build Conditions	2024 Build Conditions + **2024 Roadway Improvements**	2024 Build Conditions

EXISTING CONDITIONS

A. SITE LOCATION / STUDY AREA

The proposed development is located on the southwest corner of Mopac (Loop 1) and Spicewood Springs Road within the City of Austin limits. The site is currently occupied by approximately 445,000 square-feet of office that generates traffic. The trips from the existing office development will be removed in phases as the existing office buildings are reconstructed. Trips associated with the existing office are currently on the roadway network and were accounted for in all analyses to most accurately determine the impact of the proposed development on traffic operations in the study area. The study area was developed based on discussions with the City; study-area intersections are listed below:

Required Study Area

- Spicewood Springs Road & Hart Lane
- Spicewood Springs Road & Wood Hollow Drive
- Spicewood Springs Road & Loop 1 SBFR
- Spicewood Springs Road & Loop 1 NBFR
- Executive Center Drive & Hart Lane
- Executive Center Drive & Wood Hollow Drive
- Executive Center Drive & Loop 1 SBFR
- Greystone Drive & Hart Lane
- Greystone Drive & Wood Hollow Drive
- Greystone Drive & Loop 1 SBFR
- Far W Boulevard & Hart Lane
- Far W Boulevard & Wood Hollow Drive
- Far W Boulevard & Loop 1 SBFR
- Far W Boulevard & Loop 1 NBFR
- Steck Avenue & Loop 1 SBFR
- Steck Avenue & Loop 1 NBFR
- All site driveways

B. EXISTING ROADWAY CHARACTERISTICS

Exhibit 3 displays the existing lane assignments and traffic control at intersections within the study area. This study has assumed these roadway characteristics for the analysis of 2016 Existing and all No Build scenarios. Characteristics for roadways in the study area as they exist today are listed in ***Table 3*** and a general description of major roadways in the study are as follows:

LOOP 1 FRONTAGE ROADS run northbound and southbound, parallel with Loop 1. The *2025 Austin Metropolitan Area Transportation Plan (AMATP)* identifies Loop 1 Frontage Roads as a **FWY**. Each frontage road is a three-lane, undivided, one-way facility. The NBFR provides access to the site via an off ramp south of Spicewood Springs Road. The SBFR provides access to the site via off ramps located north of Steck Avenue and north of Far West Boulevard. The posted speed limit is 50 miles per hour (mph).

SPICEWOOD SPRINGS ROAD runs in an east-west direction and is identified as a **MAD 6** in the *AMATP*. In the study area Spicewood Springs Road is primarily five-lane (thee lanes eastbound and two lanes westbound), median-divided facility with bike lanes on either side. The posted speed

limit is 35 mph and speed data collected along Spicewood Springs Road near Hart Lane indicated the 85th percentile speed to be greater than 40 mph.

FAR WEST BOULEVARD runs in an east-west direction and has a change in cross-section at the intersection of Hart Lane. In the *AMATP* Far West Boulevard is identified as a **MAD 6** east of Hart Lane and a **MAU 4** west of Hart Lane. Bike lanes exist on both sides of Far West Boulevard west of Hart Lane. The posted speed limit is 35 mph.

STCEK AVENUE runs in an east-west direction and is identified as a **MAU 4** in the *AMATP*. Steck Avene is currently a two-lane undivided roadway west of Loop 1 and east of Loop 1 is a two-lane roadway with a two-way-left-turn-lane (TWLTL). In the study area, bike lanes exist on both sides of Steck Avenue and the posted speed limit is 30 mph.

Table 3 – Existing Roadway Characteristics

Existing Roadway	Roadway Classification	Direction	# of Lanes	Median Type	Speed Limit (mph)
Loop 1 Frontage Roads	Frontage Road (FWY)	North-South	3	One-Way	50
Spicewood Springs Road	Major Arterial (MAD 6)	East-West	4	Raised	35
Far West Boulevard	Major Arterial (MAD 6/MAU 4)	East-West	6/4	Raised	35
Steck Avenue	Major Arterial (MAU 4)	East-West	2/3	Undivided	30
Executive Center Drive	Neighborhood Collector	East-West	2	Undivided	30
Greystone Drive	Neighborhood Collector	East-West	2	Undivided	30
Hart Lane	Neighborhood Collector	North-South	2	Undivided	30
Wood Hollow Drive	Neighborhood Collector	North-South	2	Undivided	30

C. EXISTING TRAFFIC VOLUMES

Weekday AM and PM peak period turning movement counts (TMCs) were collected in March 2014 at the required study area intersections while schools were in session. These counts were grown at 2% annually to estimate 2016 volumes. 24-Hour recording machine counts were collected in March 2016 to confirm that the March 2014 counts grown at 2% were accurate. An additional TMC was collected at the intersection of Steck Avenue and Loop 1 frontage roads in April of 2016 while schools were in session; these counts were not adjusted as they were collected in year 2016. ***Exhibit 4*** shows existing weekday AM and PM peak hour traffic volumes used for the analysis of 2016 Existing Scenario. The raw traffic counts are provided in ***Appendix E.***

D. BACKGROUND TRAFFIC GROWTH

In order to obtain background traffic projections, the existing traffic counts and historic counts near the site were compared to find expected growth trends within the study area. Based on count data from TxDOT, traffic volumes around the study area have an average annual growth rate of 2%. Per City's recommendation, traffic volume was assumed to increase at a growth rate of two (2) percent per year for all future scenarios. Based on discussions with the City, no planned developments were included in this analysis.

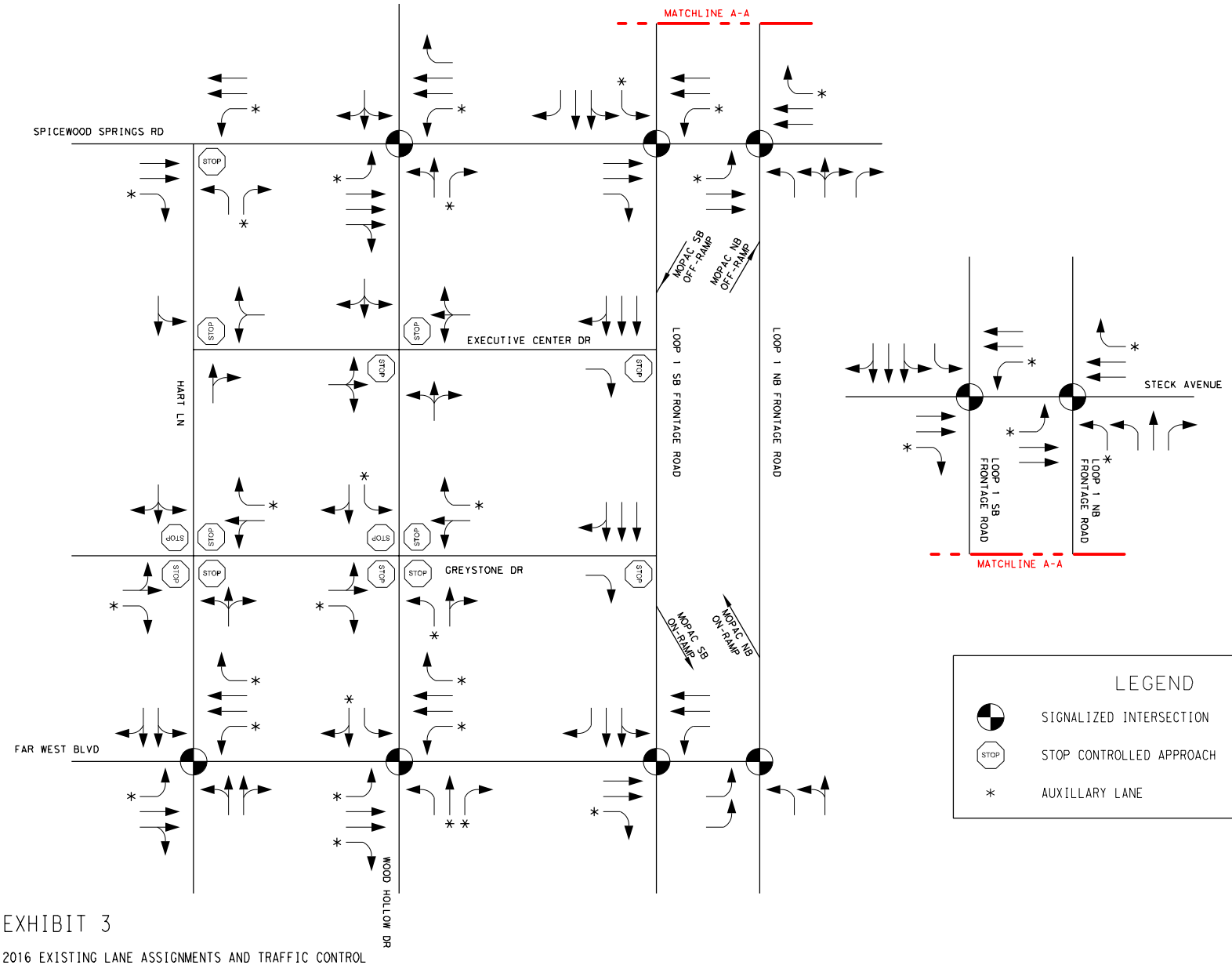


EXHIBIT 3

2016 EXISTING LANE ASSIGNMENTS AND TRAFFIC CONTROL

AUSTIN OAKS TIA

Kimley»Horn

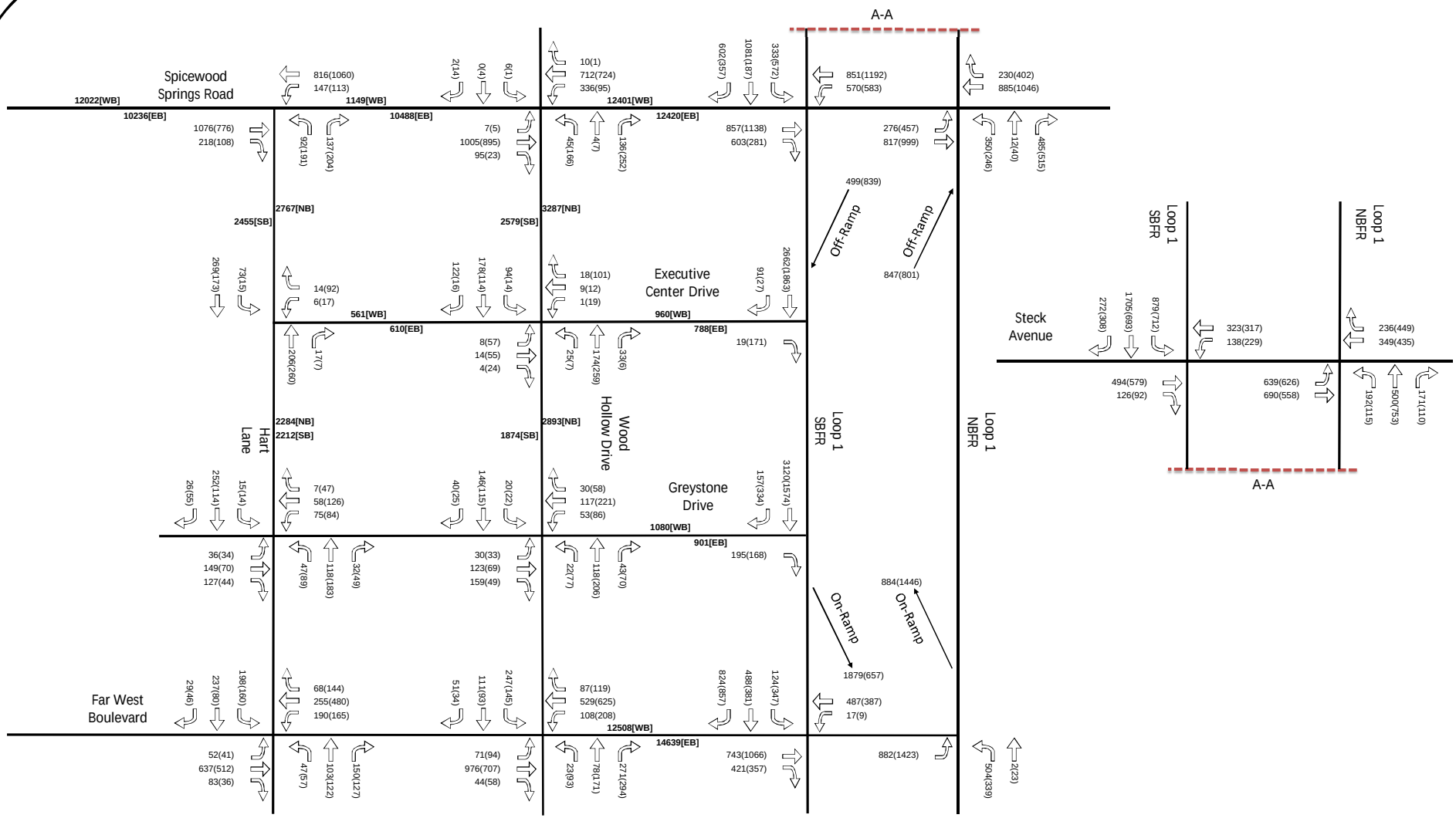


EXHIBIT 4

2016 EXISTING VOLUMES

AUSTIN OAKS TIA

LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
X [Y]
X = 2016 AADT
Y = DIRECTION OF AADT COUNT
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

Kimley»Horn

4/18/2016

2016 ANALYSIS

A. LOS ANALYSIS METHODOLOGY

Kimley-Horn conducted a traffic operations analysis to determine potential capacity deficiencies at the study-area intersections in all analysis years. The acknowledged source for determining overall capacity is the current edition of the Highway Capacity Manual.

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from "A" (very little delay) to "F" (long delays and congestion). ***Table 8*** shows the definition of level of service for signalized and unsignalized intersections. LOS D is considered the threshold for acceptable operations for signalized intersections.

Table 4 – Level of Service

Level of Service	Signalized Intersection Average Total Delay (Sec/Veh)	Unsignalized Intersection Average Total Delay (Sec/Veh)
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Definitions provided from the Highway Capacity Manual, Special Report 209, Transportation Research Board, 2010.

Study area intersections were analyzed based on average total delay analysis for signalized intersections. For the unsignalized analysis, the level of service (LOS) is defined for each controlled approach. HCM 2010 calculations were used to report delay at all-way stop-controlled intersections and roundabouts. The HCM 2010 calculations do not support the analysis of diamond intersections and frontage roads. Therefore, HCM 2000 calculations were used to report delay at signalized intersections and two-way stop-controlled intersections. Synchro calculations were used to report the 95th percentile queue length at signalized intersections.

Intersection LOS is a well-rounded metric for traffic signal operation because it is a weighted average of approach delay and approach volume. On arterial type of facilities with coordinating timing is programmed to minimize delay on the major street and allow the minor street to experience a potential lower LOS. If signal timing splits are optimized without regard for the coordinated system an acceptable LOS can be achieved at all approaches but the intersection LOS is worse. Based on discussions with the City; LOS is looked at by specific effected movements, and mitigation, including signal timing adjustments, is required to restore approach delay to an acceptable LOS.

B. 2016 EXISTING ANALYSIS RESULTS

The analysis was performed using the 2016 Existing Lane Assignments and Traffic Control (***Exhibit 3)*** and 2016 Existing Volumes (***Exhibit 4).*** The existing signal timings (included as ***Appendix F***), provided by the City, were used for the analysis. ***Table 5*** and ***Table 6*** summarize the intersection operations for the 2016 Existing scenario AM and PM peak hours, respectively. Synchro reports for all 2016 analyses are provided as ***Appendix M.*** Noteworthy traffic operations at intersections are as follows:

Existing (2016) Observations:

- *Spicewood Springs Road & Hart Lane*. Vehicles making the northbound left-turn movement from Hart Lane onto Spicewood Springs Road have difficulty finding acceptable gaps. As stop-controlled, the northbound approach experiences an unacceptable LOS (delay of 111.8 sec/veh) in the PM peak hour. Furthermore, the westbound left-turn movement is stopped-controlled* which is atypical for an intersection of this configuration.

- *Spicewood Springs Road & Wood Hollow Drive.* The queue length (95th percentile) reported at the westbound left-turn movement (261' in the AM peak hour) of Spicewood Springs Road to Wood Hollow Drive exceeds the existing bay length (approximately 160').

- *Spicewood Springs Road & Wood Hollow Drive*. The northbound approach of Wood Hollow Drive at Spicewood Springs Road experiences an unacceptable LOS (delay of 64.2 sec/veh) in the PM peak hour due to the high volume at this approach.

- *Spicewood Springs Road & Loop 1 SBFR.* The eastbound approach of Spicewood Springs Road at Loop 1 SBFR experiences an unacceptable LOS in both peak hours. Delay at this approach is increased because the right-turn movement operates as a stop-controlled movement.

- *Executive Center Drive & Loop 1 SBFR.* The southbound right-turn volume from Loop 1 SBFR to Executive Center Drive is 91 vehicles in the AM peak hour. This volume exceeds the threshold at which a deceleration lane should be considered (50 vehicles per hour (vph)) per TxDOT Access Management Requirements.
.
- *Greystone Drive Executive Center Drive & Loop 1 SBFR.* The southbound right-turn volume from Loop 1 SBFR to Greystone Drive is 334 vehicles in the AM peak hour. This volume exceeds the threshold at which a deceleration lane should be considered (50 vph) per TxDOT Access Management Requirements.

- Far West Boulevard & Hart Lane. The northbound and southbound approaches of Hart Lane** experience an unacceptable LOS at the intersection of Far West Boulevard. There is delay at these approaches because majority of the signal's green time is allocated to the major roadway (Far West Boulevard).

- *Far West Boulevard & Wood Hollow Drive.* The northbound approach of Wood Hollow Drive at Far West Boulevard experiences an unacceptable LOS due to the high northbound right-turn volume.

- *Far West Boulevard & Loop 1 SBFR*. The southbound approach of Loop 1 SBFR at Far West Boulevard experiences an unacceptable LOS due to the high volume at this approach.

- *Loop 1 Interchanges*. Loop 1 provides connectivity to regions north of Austin is used by commuters traveling into Austin from the surrounding regions. Traffic volumes along Loop 1

within the study area are expected to increase in proportion to the traffic impacts occurring from developments beyond the Austin City Limits. Development sprawl occurring north of Austin provides a majority of the increase of traffic on Loop 1. Therefore, the impacts of existing traffic and regional background growth on traffic operations at intersections along Loop 1 will far exceed the impacts of local development (see Existing (2016) Mitigated Analysis)

*Due to Synchro limitations the westbound approach of Spicewood Springs Road at Hart Lane cannot be modeled with an uncontrolled thru movement and a stop-controlled left-turn movement. The left-turn movement turning speed was reduced to most accurately represent the operations at this unique intersection configuration.

**The intersection of Hart Lane and Far West Boulevard has permitted-protected signal heads installed at all approaches. During peak hours, the minor street operates as split phased. Because the minor street approaches have a shared thru-left lane configuration, Synchro was artificially increasing the effective green time of the left-turn movements when these approaches were modeled with permitted-protected phasing. Therefore, the northbound and southbound approaches were molded with split phasing where the shared thru-left lane configuration existed.

C. *TRAFFIC SIGNAL WARRANT ANALYSIS*

As part of the analysis of 2016 Existing conditions, a traffic signal warrant analysis (TSWA) was performed at the intersection of Spicewood Springs Road and Hart Lane. The TSWA followed procedures outlined in the 2011 *Texas Manual on Uniform Traffic Control Devices* (TxMUTCD). Several variables affect the thresholds needed to meet the nine signal warrants in the 2011 TxMUTCD. For example, speed on the major road, population characteristics of the surrounding area, and distance to the nearest signal all impact the conditions needed to warrant a traffic signal.

24-Hour recording machine counts collected at all approaches of the intersection and spot speed data collected along Spicewood Springs Road were used for this analysis. The raw traffic counts and speed data are provided in ***Appendix E***. Although the posted speed limit on Spicewood Springs Road is 35 mph, the spot speed data collected for purposes of this analysis indicate the 85th percentile speed to be greater than 40 mph. Therefore, the '>40 mph' volume thresholds were used for this TSWA.

Furthermore, the right turns associated with the northbound approach of Hart Lane at Spicewood Springs Road were deducted from the total hourly approach volumes as the northbound right-turn is a FREE movement and there is no conflict between this movement and the major street. Based on TMCs previously collected at the approach, 55% of the approach volume was assumed to be turning right at the intersection. Therefore, the hourly approach volume used for this analysis is 45% of the hourly counts collected at this approach.

The number of vehicles at the northbound approach of Hart Lane throughout the day is consistently above the minor street volume threshold for warranting a signal. A traffic signal is warranted based on the 2016 Traffic Volumes at the intersection. Results of the TSWA are summarized in the worksheets included in ***Appendix S.***

D. EXISTING (2016) IMPROVEMENTS

Based on the results of the 2016 Existing analysis, the following improvements (shown by numbers in ***Exhibit 5***) are recommended:

- *Spicewood Springs Road & Hart Lane (1).* Install a fully actuated traffic signal at the intersection of Spicewood Springs Road and Hart Lane.

- *Spicewood Springs Road & Wood Hollow Drive (2)*. Extend the westbound left-turn bay of Spicewood Springs Road to Wood Hollow Drive to provide adequate storage for vehicles making a left-turn movement and prevent spill-back into the adjacent lane.

- *Spicewood Springs Road & Wood Hollow Drive (3).* Provide a right-turn overlap phase at the northbound right-turn movement of Wood Hollow Drive to Spicewood Springs Road. This will allow the northbound right-turn phase and the westbound left-turn phase to operate simultaneously and decrease delay at the northbound approach of Wood Hollow Drive.

- *Spicewood Springs Road & Loop 1 SBFR* (4). Provide striping and vertical panels (or other physical barrier) at the southbound receiving lanes of Loop 1 SBFR to facilitate a FREE, eastbound right-turn movement from Spicewood Springs Road to Loop 1 SBFR. This movement is currently channelized and a merge with Loop 1 SBFR can be accomplished with existing pavement.

- *Executive Center Drive & Loop 1 SBFR (5)*. Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Executive Center Drive). Additionally, install vertical panels (or other physical barrier) along Loop 1 Southbound Off-Ramp to prevent access to Executive Center Drive from southbound Loop 1 Southbound Off-Ramp and reduce weaving in this section of the frontage road.

- *Greystone Drive & Loop 1 SBFR (6)* . Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Greystone Drive).

- *Far West Boulevard & Hart Lane (7).* Widen the northbound approach of Hart Lane to a five-lane cross-section at the intersection of Far West Boulevard. The northbound approach should include an exclusive left-turn lane, exclusive thru lane, and exclusive right-turn lane; two southbound receiving lanes with remain. Restripe the southbound approach of Hart Lane to include an exclusive left-turn lane, exclusive thru lane, and shared thru-right lane; a single northbound receiving lane will remain.

- *Far West Boulevard & Wood Hollow Drive (8)*. Provide a right-turn overlap operation at the northbound right-turn movement from Wood Hollow Drive to Far West Boulevard. To maximize the benefits of this improvement, restripe the northbound approach to extend the existing right-turn lane.

- *Far West Boulevard & Loop 1 SBFR (9)*. Provide a FREE, channelized operation at the southbound right-turn movement from Loop 1 SBFR to Far West Boulevard (westbound). The existing lane configurations can accommodate a FREE operation because there are three westbound receiving lanes. The right-turn-only lane along Far West Boulevard is recommended to be restriped as a shared thru-right lane between Loop 1 and the first driveway (approximately 400').

Exhibits showing 2016 Improvements at a conceptual level are provided as ***Appendix H***.

E. EXISTING (2016) MITIGATED ANALYSIS RESULTS

The 2016 Mitigated analysis was performed using the 2016 Existing Volumes and incorporates the 2016 Improvements enumerated above. ***Table 5*** and ***Table 6*** summarize the intersection operations for the 2016 Mitigated scenario AM and PM peak hours, respectively. The 2016 Improvements reduce delay such that all approaches in the study area operate at an acceptable LOS with the exception of the following intersections along Loop 1:

- Spicewood Springs Road & Loop 1
- Greystone Drive & Loop 1 SBFR
- Far W Boulevard & Loop 1
- Steck Avenue & Loop 1

Loop 1 provides connectivity to regions north of Austin and is used by commuters traveling into Austin from the surrounding regions. Traffic volumes along Loop 1 within the study area are expected to increase as a result of traffic generated by developments beyond the Austin City Limits. Development sprawl occurring north of Austin provides a majority of the increase of traffic on Loop 1. Therefore, the impacts of existing traffic and regional background growth on traffic operations at intersections along Loop 1 will far exceed the impacts of local development. Issues along Loop 1 should be addressed at a regional level. The managed lanes currently being constructed on Loop 1 is a starting point for these regional improvements. Future regional improvements such as improved transit are some necessary improvements needed for travel demand management.

As illustrated in ***Table 5*** existing capacity concerns are identified along the Loop 1 corridor. The impacts of these regional issues were observed at intersections in the study area in the Existing (2016) analysis. Although major improvements are necessary at intersections along Loop 1, such improvements were not incorporated because they are not expected to be constructed in the foreseeable future.

The previously recommended 2016 Improvements recommended at intersections along Loop 1 reduce delay but capacity issues remain. Regional improvements are required to achieve an acceptable LOS at the intersections along Loop 1. Determining these regional improvements is beyond the scope of mitigation for a local development. The following are issues that will persist and can be observed in each future scenario:

- *Spicewood Springs Road & Loop 1 SBFR* .High delays are reported at multiple approaches of the diamond interchange of Spicewood Springs Road and Loop 1 Frontage Roads. The internal left-turn volumes on the bridge are extremely high as are the external eastbound and westbound approach volumes. Major geometric improvements are required to achieve an acceptable LOS at the intersection which may include an innovative intersection configuration.

- *Greystone Drive & Loop 1 SBFR* The eastbound approach of Greystone Drive at Loop 1 SBFR experiences an unacceptable LOS.

- *Loop 1 SBFR.* The Loop 1 SBFR is oversaturated particularly between the Loop 1 southbound on-ramp and off-ramp between Spicewood Springs Road and Far West Boulevard. Based on existing AM peak hour volumes (>3,000 vehicles in AM peak), increased capacity is needed to accommodate the volume of vehicles traveling southbound along Loop 1.

- *Farwest Boulevard & Loop 1 SBFR.* The southbound approach of Loop 1 SBFR at Far West Boulevard experiences an unacceptable LOS due to the high volume at the southbound left-turn movement. All vehicles making a left-turn movement at this approach are destined to go north on Loop 1. Constructing an exclusive U-turn lane north of the existing Far West Boulevard bridge would remove vehicles making a southbound left-turn movement from this approach. Additionally, these vehicles will also be removed from the eastbound left-turn movement.

- *Steck Avenue & Loop 1 SBFR/NBFR.* The southbound and eastbound approaches of Loop 1 SBFR at Steck Avenue experience an unacceptable LOS in AM and PM peak hours. Similarly, the northbound and westbound approaches of Loop 1 NBFR at Steck Avenue experience an unacceptable LOS. The high delays reported at the external approaches of the diamond indicate the interchange is oversaturated. Additional capacity is needed at the intersection to provide adequate traffic operations.

TABLE 5

2016 AM PEAK HOUR ANALYSIS RESULTS

AUSTIN OAKS TIA

Required Study Area			2016 No Build Condition				2016 Mitigated Condition			
Intersection	**Traffic Control**	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Spicewood Springs Road & Hart Lane	TWSC/ Signalized	EB	0	0.33	0	FREE	406	0.61	22.7	C
		WB	24	0.25	1.9	STOP*	196	0.31	5.9	A
		NB	84	0.56	29.8	D	129	0.59	24.3	C
		INT							16.4	B
Spicewood Springs Road & Wood Hollow Drive	Signalized	EB	249	0.41	17.2	B	380	0.41	19.3	B
		WB	m261	0.82	17.2	B	m230	0.82	17.2	B
		NB	76	0.2	45.1	D	81	0.2	34.9	C
		SB	0	0.01	43.3	D	0	0.01	43.3	D
		INT			19.5	B			19.6	B
Spicewood Springs Road & Loop 1 SBFR	Signalized	EB	***#622***	***1.45***	***229.5***	***F***	***#622***	***1.2***	***106.3***	***F***
		WB	m557	0.85	16.5	B	m557	0.85	16.5	B
		SB	***m182***	***1.19***	***97***	***F***	***m182***	***1.19***	***97***	***F***
		INT			***113.2***	***F***			***76.4***	***E***
Spicewood Springs Road & Loop 1 NBFR	Signalized	EB	m28	0.43	1.4	A	m28	0.43	1.4	A
		WB	440	0.76	38.7	D	440	0.76	38.7	D
		NB	***#396***	***1.31***	***100.1***	***F***	***#396***	***1.31***	***99.5***	***F***
		INT			42.4	D			42.2	D
Executive Center Drive & Hart Lane	TWSC	WB	3	0.04	11.5	B	3	0.04	11.5	B
		NB	0	0.16	0	FREE	0	0.16	0	FREE
		SB	5	0.07	2.2	FREE	5	0.07	2.2	FREE
Executive Center Drive & Wood Hollow Drive	TWSC	EB	8	0.09	17.4	C	8	0.09	17.4	C
		WB	5	0.07	13	B	5	0.07	13	B
		NB	2	0.02	1.1	FREE	2	0.02	1.1	FREE
		SB	7	0.08	2.5	FREE	7	0.08	2.5	FREE
Executive Center Dr. & Loop 1 SBFR	TWSC	EB	2	0.02	9.4	A	2	0.02	9.4	A
		SB	0	0.66	0	FREE	0	0.55	0	FREE
Greystone Drive & Hart Lane	AWSC	EB	44	0.442	13.6	B	2.2	0.442	13.6	B
		WB	30	0.343	14	B	1.5	0.343	14	B
		NB	44	0.435	14.3	B	2.2	0.435	14.3	B
		SB	84	0.618	18.8	C	4.2	0.618	18.8	C
		INT			15.4	B			15.4	B
Greystone Drive & Wood Hollow Drive	AWSC	EB	26	0.302	11.1	B	1.3	0.302	11.1	B
		WB	30	0.347	12.2	B	1.5	0.347	12.2	B
		NB	26	0.319	11.9	B	1.3	0.319	11.9	B
		SB	34	0.367	12.5	B	1.7	0.367	12.5	B
		INT			11.8	B			11.8	B
Greystone Drive & Loop 1 SBFR	TWSC	EB	***244***	***1.08***	***142.1***	***F***	***204***	***0.96***	***98.1***	***F***
		SB	0	0.76	0	FREE	0	0.64	0	FREE
Faw West Boulevard & Hart Lane	Signalized	EB	357	0.65	34.7	C	340	0.53	24.7	C
		WB	206	0.58	37.5	D	206	0.49	23	C
		NB	***190***	***0.8***	***62.9***	***E***	170	0.67	51.3	D
		SB	***282***	***0.89***	***65.6***	***E***	***242***	***0.81***	***55.7***	***E***
		INT			46.5	D			35.2	D
Faw West Boulevard & Wood Hollow Drive	Signalized	EB	478	0.57	30.2	C	537	0.54	28.5	C
		WB	m180	0.49	29.4	C	203	0.37	43	D
		NB	***#208***	***0.72***	***68.8***	***E***	***152***	***0.79***	***65.7***	***E***
		SB	303	0.67	45.6	D	292	0.8	54.5	D
		INT			37.9	D			40.8	D
Faw West Boulevard & Loop 1 SBFR	Signalized	EB	373	0.57	20.2	C	394	0.54	19.9	B
		WB	0	0.41	2.8	A	54	0.38	8.9	A
		SB	m202	0.89	30.2	C	m160	0.54	11.2	B
		INT			22	C			14.1	B
Faw West Blvd. & Loop 1 NBFR	Signalized	EB	13	0.42	3.2	A	22	0.48	6.8	A
		NB	306	0.57	41	D	286	0.43	30.8	C
		INT			17	B			15.5	B
Steck Avenue & Loop 1 SBFR	Signalized	EB	***#325***	***0.88***	***62***	***E***	***#325***	***0.88***	***62***	***E***
		WB	m42	0.4	5.2	A	m42	0.4	5.2	A
		SB	***#1445***	***1.3***	***143.8***	***F***	***#1445***	***1.3***	***143.8***	***F***
		INT			***114.7***	***F***			***114.7***	***F***
Steck Avenue & Loop 1 NBFR	Signalized	EB	m122	0.61	4.1	A	m122	0.61	4.1	A
		WB	208	0.73	54.8	D	208	0.73	54.8	D
		NB	***m#1195***	***2.58***	***608.2***	***F***	***m#1195***	***2.58***	***608.2***	***F***
		INT			***202.4***	***F***			***202.4***	***F***

TABLE 6

2016 PM PEAK HOUR ANALYSIS RESULTS

AUSTIN OAKS TIA

Required Study Area			2016 No Build Condition				2016 Mitigated Condition			
Intersection	**Traffic Control**	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Spicewood Springs Road & Hart Lane	TWSC/ Signalized	EB	0	0.25	0	FREE	290	0.83	30.9	C
		WB	14	0.35	1	STOP*	m83	0.33	1.5	A
		NB	***398***	***1.11***	***111.8***	***F***	146	0.67	16.1	B
		INT							14.4	B
Spicewood Springs Road & Wood Hollow Drive	Signalized	EB	187	0.31	11.5	B	Q_Err	0.31	10.9	B
		WB	m164	0.34	9.2	A	m164	0.34	9.2	A
		NB	***#291***	***0.76***	***64.2***	***E***	***#291***	***0.76***	***60.3***	***E***
		SB	30	0.03	49.1	D	30	0.03	49.1	D
		INT			21.2	C			20.2	C
Spicewood Springs Road & Loop 1 SBFR	Signalized	EB	***#962***	***1.35***	***190.2***	***F***	***#963***	***1.35***	***179.4***	***F***
		WB	m583	0.74	12.6	B	m583	0.74	12.6	B
		SB	***#582***	***1.09***	***94.8***	***F***	***#582***	***1.09***	***94.8***	***F***
		INT			***92.4***	***F***			***88.8***	***F***
Spicewood Springs Road & Loop 1 NBFR	Signalized	EB	m106	0.77	6.6	A	m106	0.77	6.6	A
		WB	545	0.72	34.3	C	545	0.72	34.3	C
		NB	***#534***	***1.35***	***161.1***	***F***	***#534***	***1.35***	***161.1***	***F***
		INT			50.8	D			50.8	D
Executive Center Drive & Hart Lane	TWSC	WB	22	0.23	12.3	B	22	0.23	12.3	B
		NB	0	0.21	0	FREE	0	0.21	0	FREE
		SB	1	0.02	0.8	FREE	1	0.02	0.8	FREE
Executive Center Drive & Wood Hollow Drive	TWSC	EB	63	0.48	23.3	C	63	0.48	23.3	C
		WB	32	0.3	14.1	B	32	0.3	14.1	B
		NB	0	0.01	0.3	FREE	0	0.01	0.3	FREE
		SB	1	0.02	0.9	FREE	1	0.02	0.9	FREE
Executive Center Dr. & Loop 1 SBFR	TWSC	EB	65	0.49	23.1	C	63	0.48	22.4	C
		SB	0	0.48	0	FREE	0	0.4	0	FREE
Greystone Drive & Hart Lane	AWSC	EB	16	0.209	10.6	B	0.8	0.209	10.6	B
		WB	40	0.405	12.8	B	2	0.405	12.8	B
		NB	62	0.525	14.6	B	3.1	0.525	14.6	B
		SB	26	0.309	11.3	B	1.3	0.309	11.3	B
		INT			12.8	B			12.8	B
Greystone Drive & Wood Hollow Drive	AWSC	EB	14	0.2	10.8	B	0.7	0.2	10.8	B
		WB	70	0.562	16.1	C	3.5	0.562	16.1	C
		NB	52	0.486	13.9	B	2.6	0.486	13.9	B
		SB	20	0.263	11.6	B	1	0.263	11.6	B
		INT			13.9	B			13.9	B
Greystone Drive & Loop 1 SBFR	TWSC	EB	88	0.58	30.1	D	54	0.44	19.3	C
		SB	0	0.44	0	FREE	0	0.35	0	FREE
Faw West Boulevard & Hart Lane	Signalized	EB	207	0.32	18.8	B	186	0.29	15.1	B
		WB	63	0.32	6.3	A	244	0.29	29.9	C
		NB	***182***	***0.75***	***60.7***	***E***	165	0.67	54.6	D
		SB	***171***	***0.73***	***60.5***	***E***	***198***	***0.71***	***55.7***	***E***
		INT			26.3	C			33.1	C
Faw West Boulevard & Wood Hollow Drive	Signalized	EB	199	0.45	15.7	B	315	0.45	31.2	C
		WB	m184	0.76	30.3	C	307	0.76	40.3	D
		NB	***#260***	***0.82***	***65.2***	***E***	228	0.82	54.9	D
		SB	***202***	***0.75***	***65.9***	***E***	***202***	***0.75***	***65.9***	***E***
		INT			36.6	D			43.1	D
Faw West Boulevard & Loop 1 SBFR	Signalized	EB	538	0.68	18.6	B	541	0.68	18.4	B
		WB	16	0.25	3.7	A	16	0.25	3.7	A
		SB	***#889***	***1.38***	***151.5***	***F***	445	0.88	26.1	C
		INT			***78.7***	***E***			20.3	C
Faw West Blvd. & Loop 1 NBFR	Signalized	EB	736	0.93	32.2	C	736	0.93	31.9	C
		NB	181	0.29	25.4	C	181	0.29	25.4	C
		INT			30.8	C			30.6	C
Steck Avenue & Loop 1 SBFR	Signalized	EB	***#351***	***0.87***	***59.4***	***E***	***#351***	***0.87***	***59.4***	***E***
		WB	7	0.31	0.7	A	7	0.31	0.7	A
		SB	***#952***	***1.34***	***202.5***	***F***	***#952***	***1.34***	***202.5***	***F***
		INT			***132.2***	***F***			***132.2***	***F***
Steck Avenue & Loop 1 NBFR	Signalized	EB	m376	0.97	15.9	B	m376	0.97	15.9	B
		WB	***#503***	***0.91***	***56.9***	***E***	***#503***	***0.91***	***56.9***	***E***
		NB	***#1460***	***2.02***	***458.2***	***F***	***#1460***	***2.02***	***458.2***	***F***
		INT			***169.8***	***F***			***169.8***	***F***

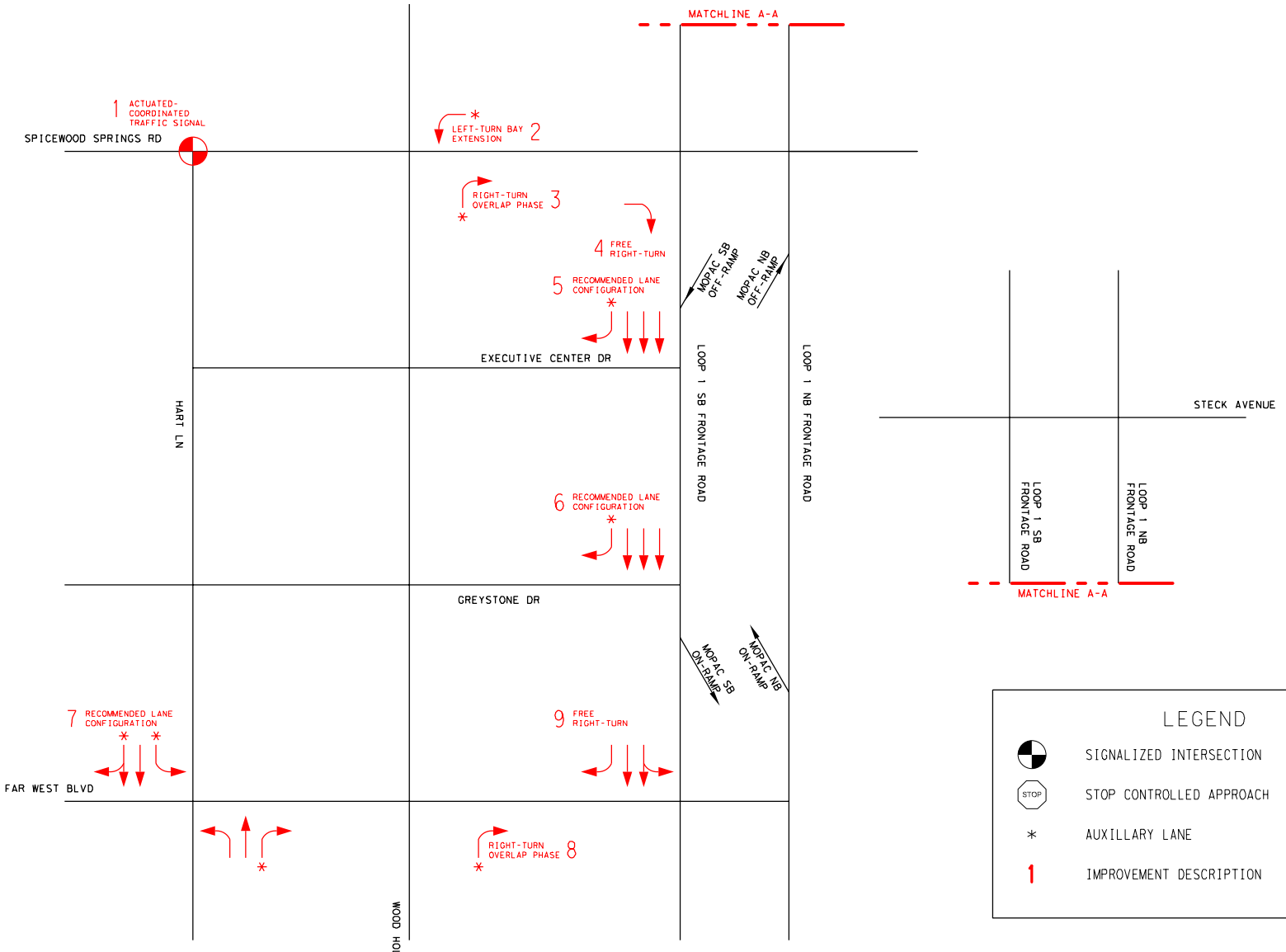


EXHIBIT 5

2016 IMPROVEMENTS

AUSTIN OAKS TIA

Kimley»Horn

FUTURE CONDITIONS

A. EXISTING AND PROPOSED DEVELOPMENT ASSUMPTIONS (BY PHASE)

The Austin Oaks development will be constructed in phases. Similarly, the existing office development will be removed in phases concurrently with the construction of the proposed development. ***Table 7*** displays the addition (or removal) of land use for each phase of development.

Table 7 – Change in Land Use (By Phase)

Development		Existing Office		Proposed Austin Oaks Land Use				
Phase	Year	Removed	Remaining	General Office	Medical Office	Restaurant	Apartment	Hotel
Existing	2016	-	445,322 SF	-	-	-	-	-
Phase I	2018	87,837 SF	357,485 SF	215,000 SF	55,000 SF	0 SF	0	0
Phase II	2020	105,893 SF	339,429 SF	0 SF	0 SF	15,000 SF	250 DU	0
Phase III	2022	149,822 SF	295,500 SF	207,000 SF	55,000 SF	31,700 SF	0	100 Rooms
Phase IV	2024	101,770 SF	343,552 SF	250,995 SF	59,000 SF	0 SF	0	0
Total		**445,322 SF**	**-**	**672,995 SF**	**169,000 SF**	**46,700 SF**	**250 DU**	**100 Rooms**

Twelve (12) driveways are proposed as part of the Austin Oaks development; ten intersecting Executive Center Drive and two intersecting Wood Hollow Drive. All driveways are full-access, stop-controlled, and will be constructed in phases.

B. EXISTING AND PROPOSED TRIP GENERATION METHODOLOGY

Site-generated traffic estimates are determined through a process known as trip generation. Rates (and equations) are applied to each proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the 9th edition of *Trip Generation Manual* published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. The trips indicated are actually one-way trips or *trip ends*, where one vehicle entering and exiting the site is counted as two trips (one inbound trip and one outbound trip).

Internal capture is the tendency for customers or residents to visit several parts of a mixed-use development in one trip, but be counted twice in the trip generation since the formulae assumes the land uses are isolated. Trips generated by a land use that are not captured internally are referred to as “external trips”.

Based on discussions with the City, a 5% reduction was used to calculate trips captured internally for each analysis year. A 5% maximum reduction was determined by City staff based on the isolated nature of the site, both geographically relative to the city center and in relation to surrounding land uses. Although the internal capture reduction can be determined at the discretion of the engineer, a 5% internal capture reduction results in far more trips generated by the proposed development as compared to ITE internal capture methodology. As a results this analysis has 2,126 more daily trips than potentially could be expected. Details of the ITE methodology for internal capture are provided in ***Appendix G***.

Per the City of Austin Transportation Criteria Manual, the trips generated by the existing development can be estimated using accepted trip generation methods. Because these trips are already on the roadway network they are incorporated into the existing and background traffic volumes at intersections in the study area. Existing development trips are subtracted from proposed development trips to calculate "Net New Trips"; *Net New Trips = Proposed Office Trips – Existing Office Trips*.

To most accurately determine the impact of the proposed development on intersections in the study area net new trips, the difference between trips generated by the proposed and existing development, are added to No Build Volumes to determine Build Volumes. This prevents trips associated with the existing office development from being "double counted" in the analysis of future conditions. At site driveways, the full trip generation (as opposed to Net New Trips) is used because these movements do not have trips associated with existing volumes. The ITE trip generation rates/equations assumed for existing and proposed land uses are shown in ***Table 5***.

Table 8 – ITE Trip Generation Rate

Land Use	AM Peak		PM Peak		Weekday	
	Rate	In:Out Split (%)	Rate	In:Out Split (%)	Rate	In:Out Split (%)
Apartment (220)	T = 0.49(Y) + 3.73	20:80	T = 0.55(Y) + 17.65	65:35	T = 6.06(Y) + 123.56	50:50
Hotel (310)	T = 0.53(Z)	59:41	T = 0.60(Z)	51:49	T = 8.17(Z)	50:50
General Office Building (710)	Ln(T) = 0.80Ln(X) + 1.57	88:12	T = 1.12(X) + 78.45	17:83	Ln(T) = 0.76Ln(X) + 3.68	50:50
Medical-Dental Office Building (720)	T = 2.39(X)	79:21	Ln(T) = 0.90Ln(X) + 1.53	28:72	T = 40.89(X) - 214.97	50:50
Retail/High-Turnover (Sit-Down) Restaurant	T = 10.81(X)	55:45	T = 9.85(X)	60:40	T = 127.15(X)	50:50
Number of Trips Generated (T) = Trip Rate (Development Unit) X= 1,000 Sq. Ft. GFA Y= Dwelling Units Z= Rooms						

C. TRIP DISTRIBUTION AND ASSIGNMENT

The trip distribution of site-generated traffic to/from the study area roadway network was developed to reflect the anticipated traffic patterns. Two categories of distribution were used to characterize site-generated traffic for each analysis year: global trip distribution and local trip distribution.

Roadway characteristics, traffic patterns, as well as the 'Journey to Work' concept, were considered in order to determine the global trip distribution. The global trip distribution is not greatly influenced by increased development and the addition of site driveways. Therefore, a single distribution was applied to all analysis scenarios. ***Table 9*** displays the global directional distribution percentages assumed for the Austin Oaks development.

Table 9 – Global Directional Distribution Percentages

Direction	Roadway	Site Traffic
From the north	Mo-Pac/Loop 1	25%
From the south	Hart Ln.	5%
From the south	Mo-Pac/Loop 1	25%
From the east	Anderson Ln.	20%
From the west	Spicewood Springs Rd.	20%
From the west	Far West Blvd.	5%

The Global Trip Distribution, shown in ***Exhibit 6,*** displays the percent of site traffic expected at each movement for all intersections in the study area with the exception of Executive Center Drive & Wood Hollow Drive. A local trip distribution, which is influenced by the intensity of development and the location of proposed driveways, was developed for each analysis year. An exhibit showing local trip distribution percentages for site driveways and the intersection of Executive Center Drive & Wood Hollow Drive is provided for each analysis year.

Trip distribution percentages (global and local) are multiplied by the proposed trip generation to calculate trip assignment volumes. Although the global trip distribution is expected to be uniform for all analysis years, the global trip assignment volumes are unique for each analysis year due to the changes in proposed trip generation.

D. NO BUILD SCENARIOS (ALL FUTURE ANALYSIS YEARS)

Development and roadway conditions for the analysis of all No Build scenarios were kept the same as 2016 Existing scenario. No Build scenario traffic volumes are calculated by increasing the 2016 Existing scenario volumes by 2% annually. No Build traffic volume conditions are unique to each analysis year and shown in ***Exhibits 7, 15, 23, and 31***. For each analysis year, No Build volumes are added to the net new trips generated by the proposed development to determine the traffic volumes used in the analysis of the Build and Mitigated scenarios.

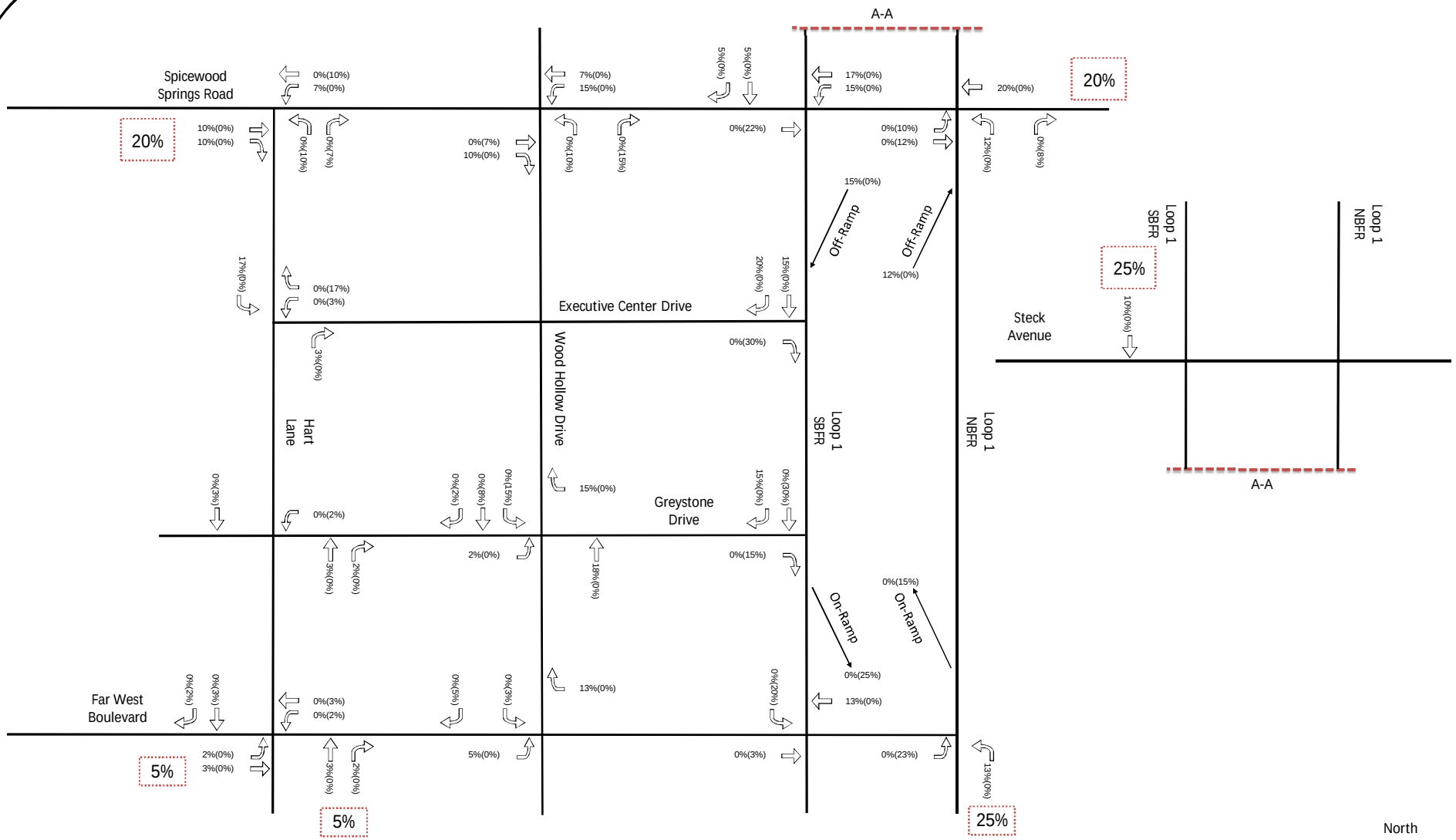


EXHIBIT 6

GLOBAL TRIP DISTRIBUTION

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

2018 ANALYSIS

A. TRAFFIC VOLUME CONDITIONS

TRIP GENERATION

The 2018 Build Scenario assumes the completion of Phase I of the Austin Oaks development. ***Table 10*** summarizes the Daily, and Weekday AM and PM peak hour trip generation the 2018 Build Scenario based on ITE methodology. 2018 Net New External Trips represent the comprehensive site traffic added to the adjacent roadway network after the completion of Phase I.

Table 10 – 2018 Build Trip Generation

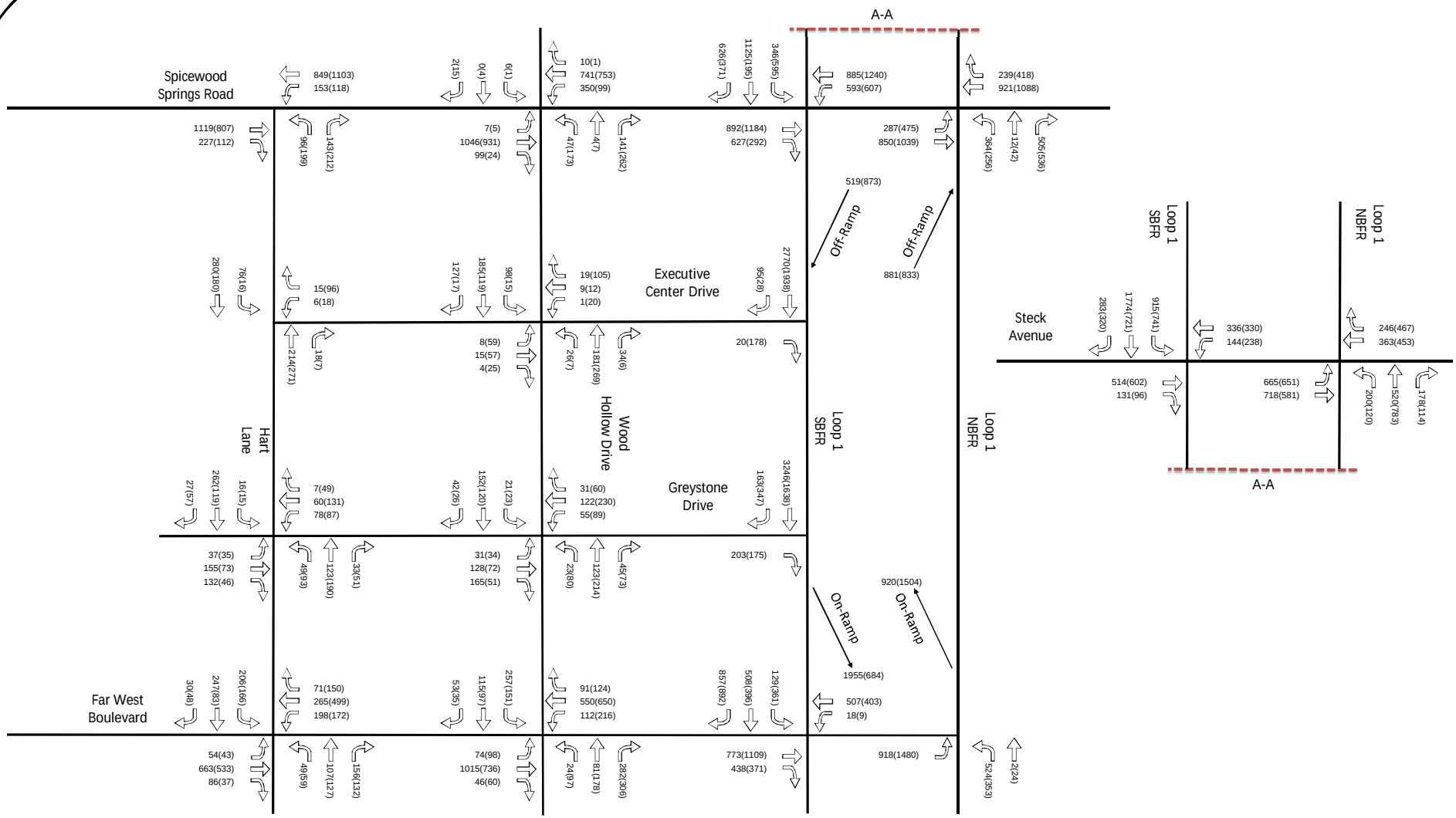
Land Use	Amount	Units	ITE Code	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
					In	Out	Total	In	Out	Total
Existing General Office Building	445.322	1,000 Sq Ft	710	4,086	556	76	632	98	479	577
Existing General Office Building (To Remain)	357.485	1,000 Sq Ft	710	3,458	467	63	530	81	398	479
Reduction in Existing Office Trips				628	89	13	102	17	81	98
General Office Building	215.000	1,000 Sq Ft	710	2,349	311	42	353	54	265	319
Medical-Dental Office Building	55.000	1,000 Sq Ft	720	2,034	103	28	131	48	122	170
2020 Net New Trips				3,755	325	57	382	85	306	391
Internal Capture Trip Reduction (0%):				0	0	0	0	0	0	0
2018 Net New External Trips				**3,755**	**325**	**57**	**382**	**85**	**306**	**391**

TRIP DISTRIBUTION AND ASSIGNMENT

The 2018 Global Trip Assignment Volumes, shown as ***Exhibit 8,*** are the product of the Global Trip Distribution Percentages and 2018 Net New External Trips. The 2018 Local Trip Distribution Percentages, as shown as ***Exhibit 9***, were developed based on the size and location of the Austin Oaks development expected to be completed by year 2018. Similar to the global assignment volumes, local percentages were applied to the net external trips to calculate the 2018 Local Trip Assignment Volumes (shown as ***Exhibit 10***).

TOTAL TRAFFIC VOLUMES

The assignment volumes were added to 2018 No Build Volumes (***Exhibit 7***) to determine the 2018 Build Traffic Volumes. Existing office trips were not assumed at site driveways, therefor the in and out movements to/from these driveways do not include the Reduction in Existing Office Trips. The weekday AM and PM peak hour traffic volumes used for the analysis of the 2018 Build and Mitigated Scenarios are shown in ***Exhibit 11*** and ***Exhibit 12*** for global and local volumes, respectively.



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

EXHIBIT 7

2018 BACKGROUND VOLUMES

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

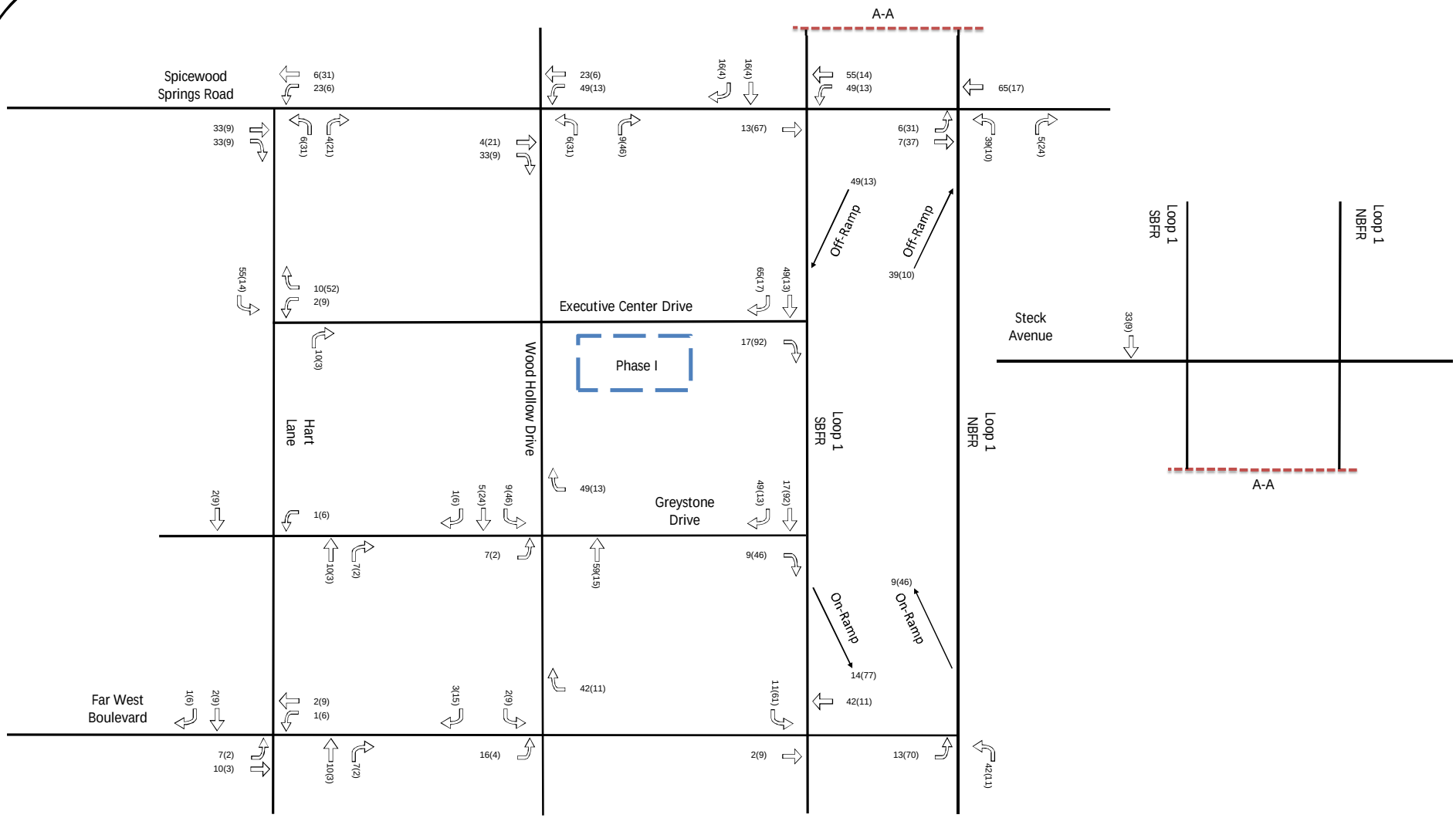


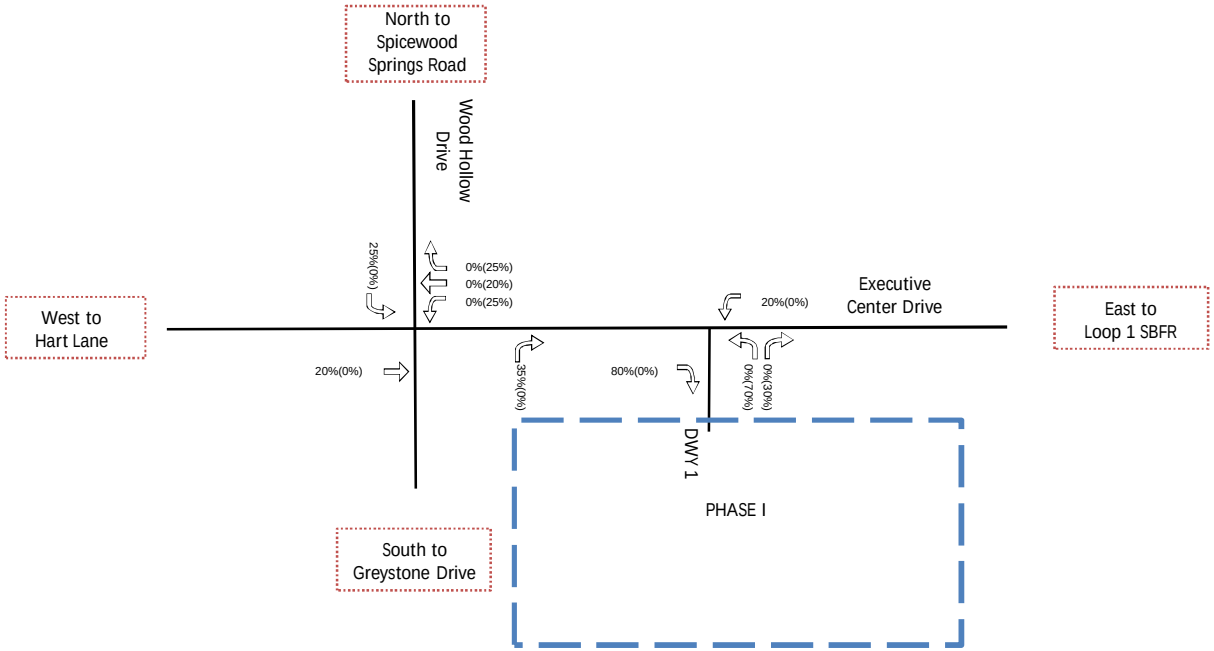
EXHIBIT 8

2018 GLOBAL TRIP ASSIGNMENT

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



North

Not To Scale

LEGEND:
X% (Y%)
X% = Percentage of Inbound Site-Generated Traffic
Y% = Percentage of Outbound Site-Generated Traffic

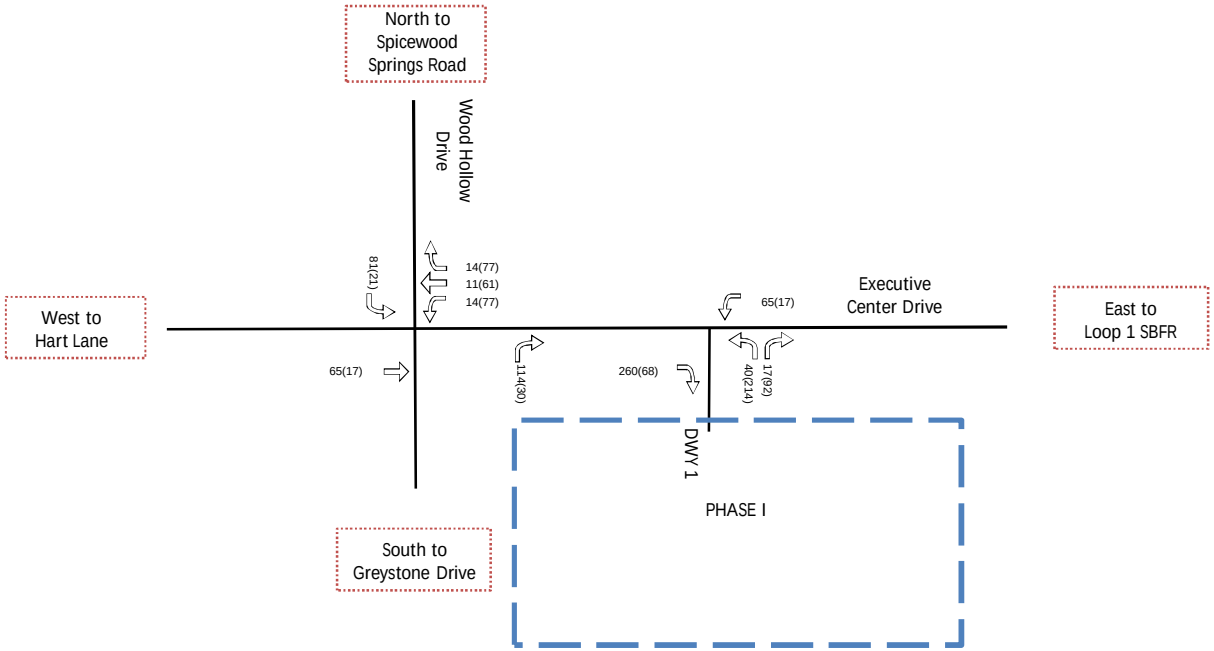
EXHIBIT 9

2018 LOCAL TRIP DISTRIBUTION

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



North

Not To Scale

LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements

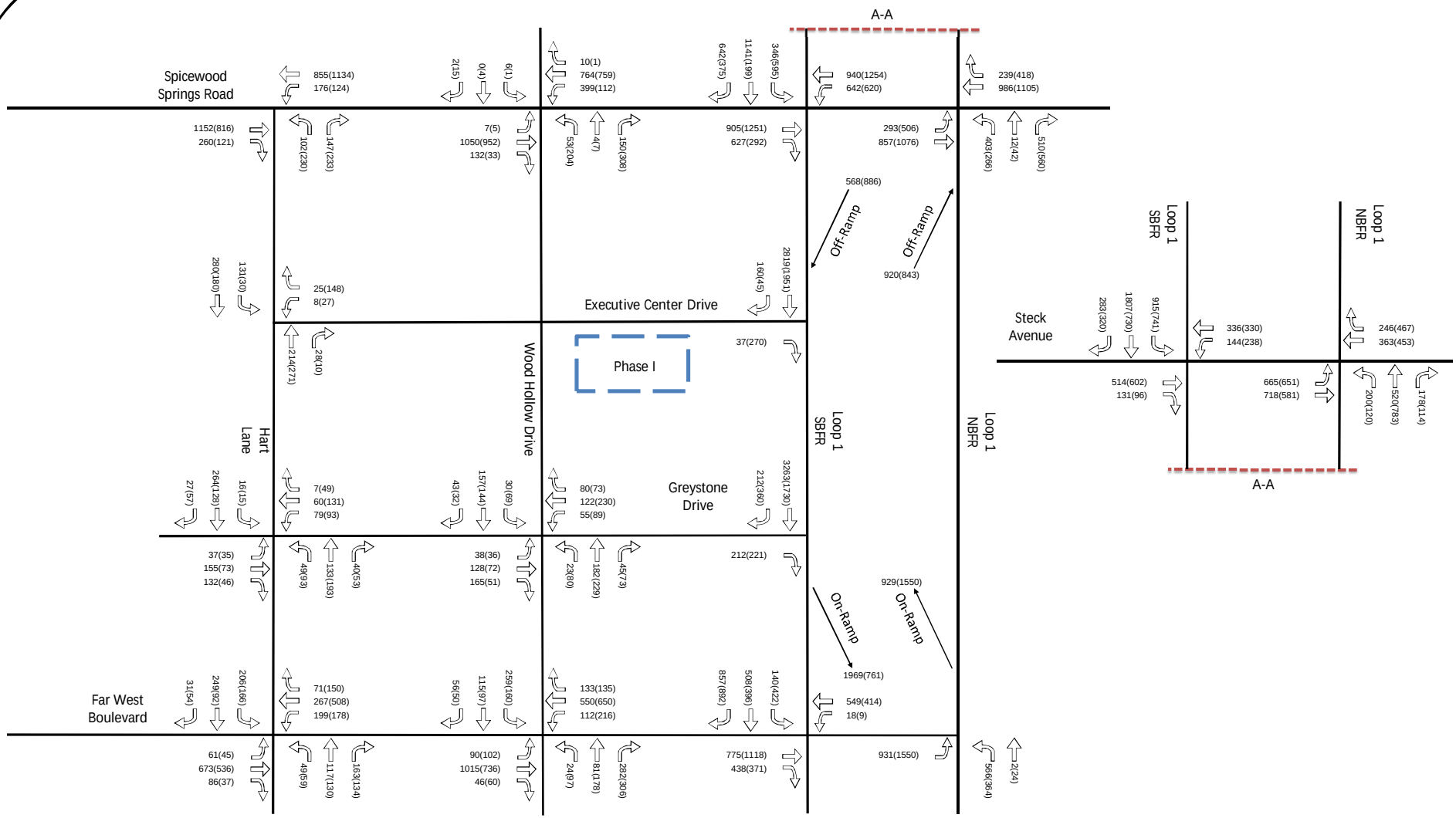
EXHIBIT 10

2018 LOCAL TRIP ASSIGNMENT

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

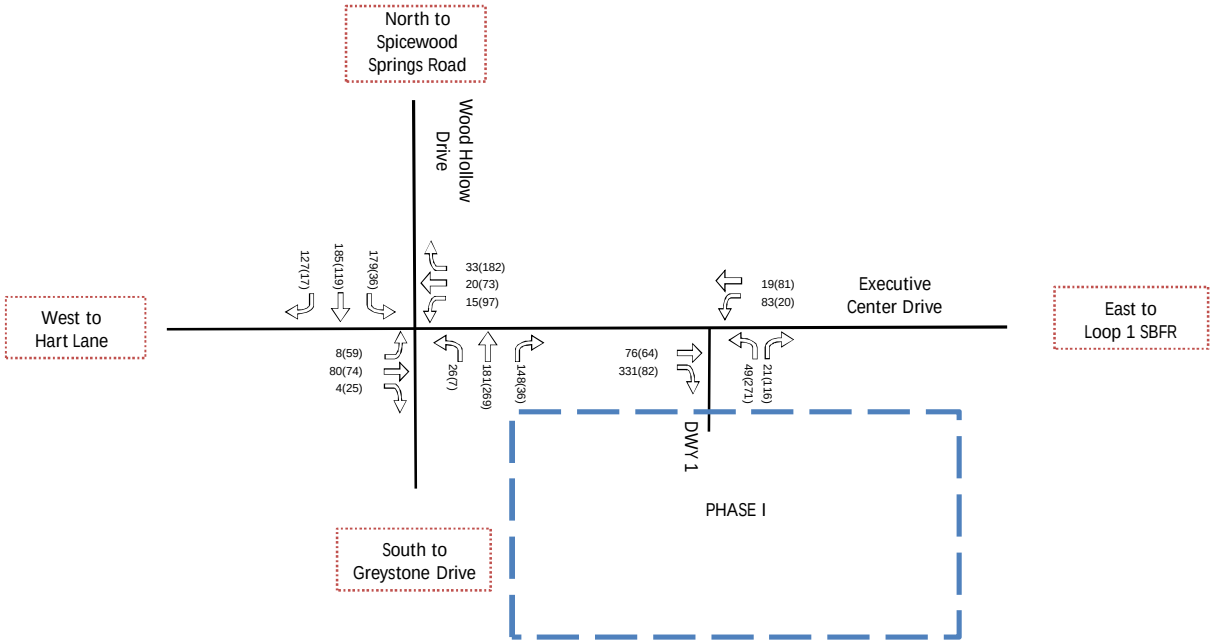
EXHIBIT 11

2018 BUILD VOLUMES (GLOBAL)

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



North

Not To Scale

LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding
and presence of smaller driveways not included in analysis.

EXHIBIT 12

2018 BUILD VOLUMES (LOCAL)

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

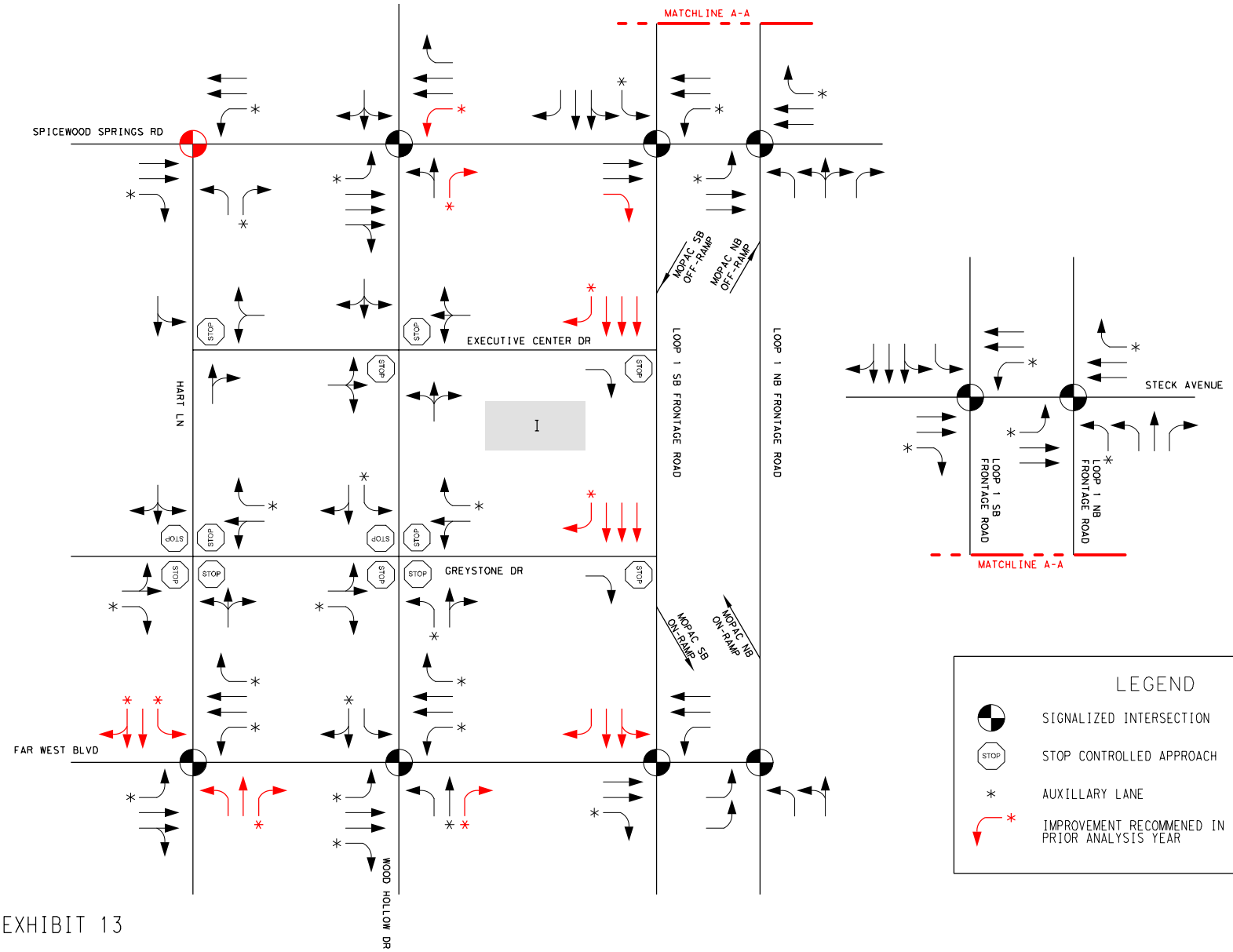


EXHIBIT 13

2018 BUILD LANE ASSIGNMENTS AND TRAFFIC CONTROL

AUSTIN OAKS TIA

Kimley»Horn

B. 2018 BUILD ANALYSIS RESULTS

The analysis was performed using the 2018 Build Lane Assignments and Traffic Control, shown as ***Exhibit 13***, which incorporates the 2016 Improvements recommended based on the 2016 Existing analysis. ***Table 11*** and ***Table 12*** summarize the intersection operations for the 2018 Build Scenario AM and PM peak hours, respectively. Synchro reports for all 2018 analyses are provided as ***Appendix N.*** Noteworthy traffic operations at intersections are as follows:

- *Spicewood Springs Road & Wood Hollow Drive*. The northbound approach of Wood Hollow Drive at Spicewood Springs Road experiences an unacceptable LOS in the PM peak hour. The volume of the northbound approach, the signal timing splits, and a 150 second cycle length are all factors which contribute to the delay at this approach.

- *Executive Center Drive & Wood Hollow Drive*. The stop-controlled approaches of Executive Center Drive at Wood Hollow Drive experience an unacceptable LOS due to the high volume expected at these approaches and the conflicting volume along Wood Hollow Drive.

- *Executive Center Drive & Loop 1 SBFR*. Vehicles making the eastbound right-turn movement from Executive Center Drive have difficulty finding gaps onto Loop 1 SBFR due to the southbound volume and travel speed of Loop 1 SBFR. As stop-controlled, the eastbound approach experiences an unacceptable LOS.

- *Far West Boulevard & Executive Center Drive*. The northbound and southbound approaches of Wood Hollow Drive experience an unacceptable LOS at the intersection of Far West Boulevard. The delay at these approaches is caused by the relatively high volumes of the northbound and southbound approaches compared to the green time allocated to these approaches.

- *Spicewood Springs Road & Loop 1*. Similar to existing conditions the intersection of Spicewood Springs Road and Loop 1 continues to operate at an unacceptable LOS (see Existing (2016) Analysis Mitigation Results).

- *Greystone Drive & Loop 1.* Similar to existing conditions the eastbound approach of Greystone Drive at Loop 1 SBFR continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Fart West Boulevard & Hart Lane*. The southbound approach of Hart Lane experience an unacceptable LOS at the intersection of Far West Boulevard. However, because of the improvement (recommended previously) at this intersection the delay reported in the Build scenario is less than the delay reported in the No Build scenario and no additional mitigation is required.

- *Far West Boulevard & Loop 1*. Similar to existing conditions the intersection of Far West Boulevard and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Steck Avenue & Loop 1*. Similar to existing conditions the intersection of Steck Avenue and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

C. 2018 IMPROVEMENTS

Based on the results of the 2018 Build analysis, the following improvements (shown in ***Exhibit 14***) are recommended:

- *Spicewood Springs Road & Wood Hollow Drive (1).* Adjust signal timing at the intersection of Spicewood Springs Road and Wood Hollow Drive. A half-cycle length was not implemented but should be considered by the City to accommodate future traffic volumes.

- *Executive Center Drive & Wood Hollow Drive (2)*. Construct a multi-lane roundabout at intersection of Executive Center Drive and Wood Hollow Drive. The northbound and southbound approaches will be flared (expanding from one to two lanes) and the roundabout design should accommodate pedestrian and bicycle facilities. The roundabout improvement requires right-of-way and could be a substantial cost. A roundabout is optimal ultimate solution by year 2024; however, an interim all way stop could be implemented and monitored until the ultimate rounded is necessary. An all-way stop and restriping would improve the operations as compared to existing conditions, but does not result in the LOS as a roundabout. For analysis purposes a roundabout was assumed at the intersection of Executive Center Drive and Wood Hollow Drive in year 2018 since it is ultimately necessary.

- *Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road (3)*. Concurrently with the roundabout construction, restripe Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road to allow two northbound lanes, one southbound lane, and bike lanes on both sides of the roadway. Restricting parking and extending the northbound right-turn lane will maximize the operations at the northbound approach of Wood Hollow Drive at Spicewood Springs Road.

- *Executive Center Drive at Loop 1 SBFR (4)*. Construct a southbound acceleration lane on Loop 1 SBFR, downstream of Executive Center Drive to provide a FREE operation at the eastbound right-turn movement of Executive Center Drive.

- *Far West Boulevard & Wood Hollow Drive (5)*. Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive. Geometric improvements should be considered at this intersection.

Exhibits showing 2018 Improvements at a conceptual level are provided as ***Appendix I***.

D. 2018 MITIGATED ANALYSIS RESULTS

The 2018 Mitigated analysis was performed using the 2018 Build Traffic Volumes and incorporates the 2018 Improvements enumerated above. ***Table 11*** and ***Table 12*** summarize the intersection operations for the 2018 Mitigated Scenario AM and PM peak hours, respectively. The 2018 improvements reduce delay such that all approaches in the study area, with the exception of intersections along Loop 1, operate at an acceptable LOS or report delay less than the No Build scenario.

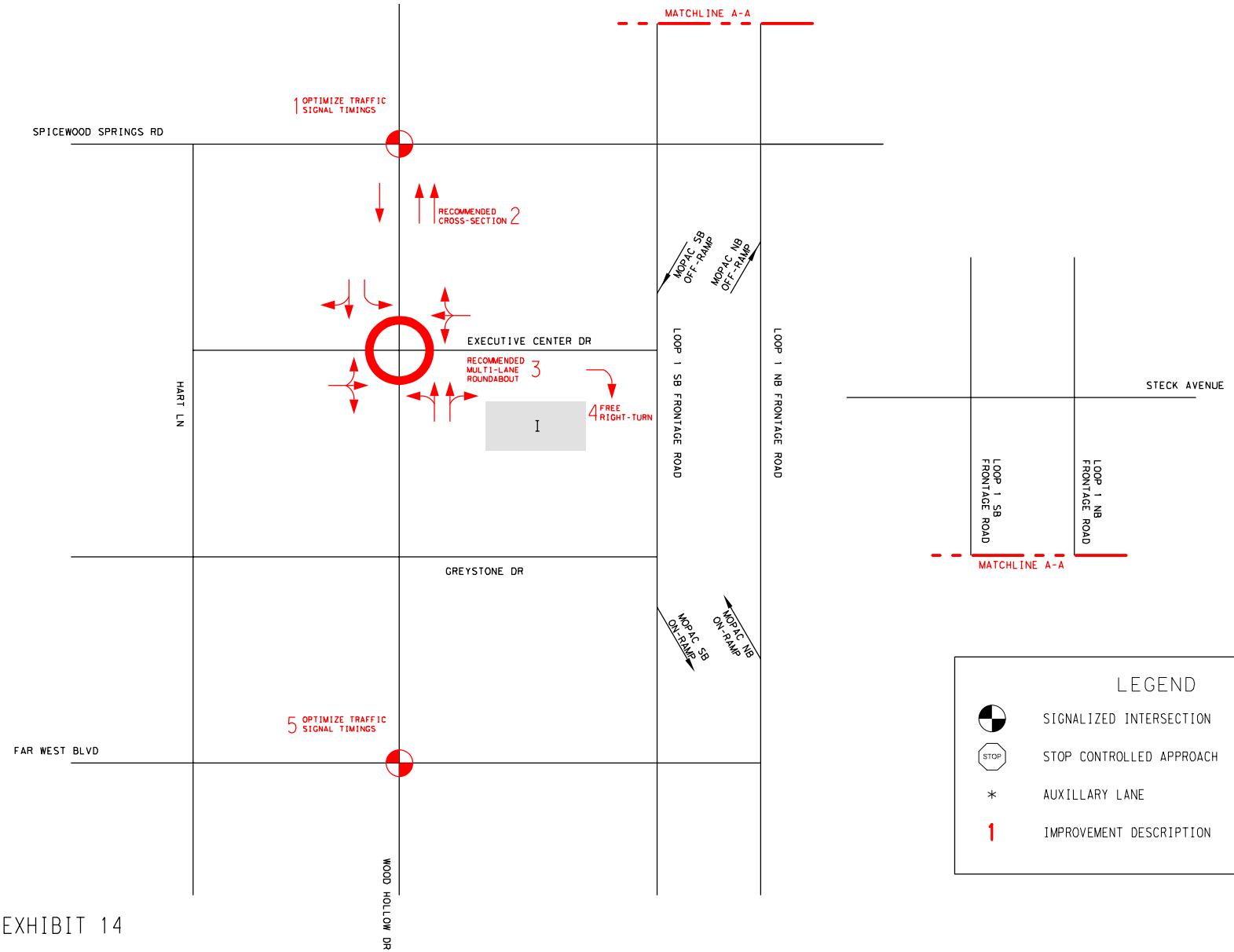


EXHIBIT 14

2018 IMPROVEMENTS

AUSTIN OAKS TIA

Kimley»Horn

TABLE 11

2018 INTERSECTION AM PEAK HOUR ANALYSIS RESULTS

AUSTIN OAKS TIA

Required Study Area			2018 No Build Condition				2018 Build Condition				2018 Mitigated Condition			
Intersection	**Traffic Control**	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Spicewood Springs Road & Hart Lane	TWSC/ Signalized	EB	0	0.34	0	FREE	447	0.65	23.6	C	447	0.65	23.6	C
		WB	26	0.26	2	STOP*	229	0.37	6.8	A	216	0.37	6.5	A
		NB	103	0.63	33.9	D	142	0.62	25	C	142	0.62	25	C
		INT							17.3	B			17.2	B
Spicewood Springs Road & Wood Hollow Drive	Signalized	EB	261	0.44	18.7	B	415	0.47	23.9	C	447	0.55	27.1	C
		WB	m230	0.84	18.7	B	m224	0.92	22.8	C	m184	0.9	24.9	C
		NB	78	0.2	45.1	D	98	0.23	33.1	C	80	0.18	27.5	C
		SB	0	0.01	43.3	D	0	0.01	43.3	D	0	0.01	38.5	D
		INT			20.8	C			24.2	C			26.2	C
Spicewood Springs Road & Loop 1 SBFR	Signalized	EB	***#658***	***1.52***	***253.2***	***F***	***#668***	***1.27***	***121.1***	***F***	***#668***	***1.27***	***120***	***F***
		WB	m567	0.88	17.5	B	m#634	0.95	21.1	C	m#634	0.95	21.1	C
		SB	***m182***	***1.24***	***114.2***	***F***	***m181***	***1.26***	***124.5***	***F***	***m181***	***1.26***	***124.5***	***F***
		INT			***127.6***	***F***			***92.3***	***F***			***92***	***F***
Spicewood Springs Road & Loop 1 NBFR	Signalized	EB	m29	0.45	1.5	A	m29	0.45	1.6	A	m29	0.45	1.6	A
		WB	462	0.79	39.8	D	506	0.85	42.5	D	506	0.85	42.5	D
		NB	***#419***	***1.36***	***111.6***	***F***	***#498***	***1.43***	***139.8***	***F***	***#498***	***1.43***	***139.8***	***F***
		INT			46	D			***55.5***	***E***			***55.5***	***E***
Executive Center Drive & Hart Lane	TWSC	WB	3	0.04	11.7	B	6	0.07	12.4	B	6	0.07	12.4	B
		NB	0	0.16	0	FREE	0	0.17	0	FREE	0	0.17	0	FREE
		SB	6	0.07	2.3	FREE	10	0.12	3.5	FREE	10	0.12	3.5	FREE
Executive Center Drive & Wood Hollow Drive	TWSC/ Roundabout	EB	8	0.1	18.3	C	***91***	***0.65***	***60.9***	***F***	20	0.147	6.6	A
		WB	6	0.07	13.2	B	42	0.39	33.8	D	0	0.09	5	A
		NB	2	0.02	1.1	FREE	2	0.02	0.8	FREE	20	0.291	7.2	A
		SB	7	0.08	2.6	FREE	15	0.17	4.4	FREE	40	0.343	6.4	A
Executive Center Dr. & Loop 1 SBFR	TWSC	EB	2	0.03	9.7	A	4	0.05	9.5	A	FREE	FREE	FREE	FREE
		SB	0	0.69	0	FREE	0	0.58	0	FREE	FREE	FREE	FREE	FREE
Greystone Drive & Hart Lane	AWSC	EB	50	0.469	14.3	B	50	0.476	14.5	B	50	0.476	14.5	B
		WB	34	0.364	14.6	B	34	0.376	14.9	B	34	0.376	14.9	B
		NB	48	0.463	15.2	C	56	0.505	16.3	C	56	0.505	16.3	C
		SB	96	0.659	20.8	C	102	0.671	21.7	C	102	0.671	21.7	C
		INT			16.6	B			17.2	B			17.2	B
Greystone Drive & Wood Hollow Drive	AWSC	EB	28	0.32	11.4	B	32	0.36	12.8	B	32	0.36	12.8	B
		WB	34	0.368	12.6	B	38	0.394	13.2	B	38	0.394	13.2	B
		NB	30	0.338	12.2	B	52	0.485	15.5	C	52	0.485	15.5	C
		SB	36	0.39	13	B	42	0.429	14.4	B	42	0.429	14.4	B
		INT			12.2	B			13.9	B			13.9	B
Greystone Drive & Loop 1 SBFR	TWSC	EB	***289***	***1.21***	***190.7***	***F***	***268***	***1.12***	***150.8***	***F***	***268***	***1.12***	***150.8***	***F***
		SB	0	0.8	0	FREE	0	0.67	0	FREE	0	0.67	0	FREE
Faw West Boulevard & Hart Lane	Signalized	EB	375	0.69	36.4	D	369	0.57	26.1	C	369	0.57	26.1	C
		WB	215	0.63	41	D	215	0.54	26.5	C	215	0.54	25.9	C
		NB	***197***	***0.81***	***64.1***	***E***	180	0.69	51.3	D	180	0.69	51.3	D
		SB	***294***	***0.9***	***67***	***E***	***248***	***0.82***	***55.2***	***E***	***248***	***0.82***	***55.2***	***E***
		INT			48.5	D			38.1	D			36.4	D
Faw West Boulevard & Wood Hollow Drive	Signalized	EB	497	0.61	31.5	C	558	0.58	29.7	C	562	0.58	29.7	C
		WB	m181	0.54	30	C	217	0.39	32.3	C	227	0.4	33.3	C
		NB	***#242***	***0.81***	***75.9***	***E***	***159***	***0.81***	***66.6***	***E***	***156***	***0.81***	***66.6***	***E***
		SB	#325	0.68	44.9	D	***307***	***0.82***	***55.3***	***E***	304	0.81	54.9	D
		INT			39.5	D			39.6	D			39.8	D
Faw West Boulevard & Loop 1 SBFR	Signalized	EB	m390	0.6	20	B	387	0.58	20.4	C	383	0.58	20.3	C
		WB	0	0.43	1.7	A	m12	0.45	8.5	A	m12	0.45	8.5	A
		SB	m274	0.96	36.1	D	m171	0.56	11.4	B	m185	0.56	11.8	B
		INT			24.5	C			13.9	B			14.4	B
Faw West Blvd. & Loop 1 NBFR	Signalized	EB	13	0.42	3	A	21	0.5	6.2	A	20	0.5	6.1	A
		NB	320	0.62	44.3	D	333	0.5	33.2	C	333	0.5	33.2	C
		INT			18	B			16.4	B			16.4	B
Steck Avenue & Loop 1 SBFR	Signalized	EB	***#345***	***0.91***	***66.2***	***E***	***#345***	***0.91***	***66.2***	***E***	***#345***	***0.91***	***66.2***	***E***
		WB	m44	0.42	5.4	A	m44	0.42	5.4	A	m44	0.42	5.4	A
		SB	***#1529***	***1.35***	***164.1***	***F***	***#1562***	***1.37***	***171***	***F***	***#1562***	***1.37***	***171***	***F***
		INT			***130.1***	***F***			***135.4***	***F***			***135.4***	***F***
Steck Avenue & Loop 1 NBFR	Signalized	EB	m123	0.64	4.2	A	m123	0.64	4.2	A	m123	0.64	4.2	A
		WB	***216***	***0.76***	***56.1***	***E***	***216***	***0.76***	***56.1***	***E***	***216***	***0.76***	***56.1***	***E***
		NB	***m#1250***	***2.7***	***647***	***F***	***m#1248***	***2.7***	***646.7***	***F***	***m#1248***	***2.7***	***646.7***	***F***
		INT			***214.9***	***F***			***214.8***	***F***			***214.8***	***F***
Site Driveways (Stop-Controlled Approach Only)			**2018 No Build Condition**				**2018 Build Condition**				**2018 Mitigated Condition**			
Intersection		**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Driveway 1 (Phase I)		NB	N/A	N/A	N/A	N/A	11	0.13	12.3	B	11	0.13	12.3	B

TABLE 12

2018 INTERSECTION PM PEAK HOUR ANALYSIS RESULTS

AUSTIN OAKS TIA

Required Study Area			2018 No Build Condition				2018 Build Condition				2018 Mitigated Condition			
Intersection	**Traffic Control**	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Spicewood Springs Road & Hart Lane	TWSC/ Signalized	EB	0	0.26	0	FREE	#314	0.87	33.4	C	#314	0.87	33.4	C
		WB	16	0.36	1	STOP*	m84	0.36	1.6	A	97	0.36	1.9	A
		NB	***533***	***1.3***	***187***	***F***	176	0.74	17.7	B	176	0.74	17.7	B
		INT							15.6	B			15.8	B
Spicewood Springs Road & Wood Hollow Drive	Signalized	EB	197	0.33	11.7	B	230	0.34	11.5	B	247	0.46	15.3	B
		WB	m179	0.36	9.5	A	m184	0.38	9.7	A	m250	0.49	15.6	B
		NB	***#310***	***0.79***	***66.1***	***E***	***#390***	***0.93***	***72.4***	***E***	267	0.51	35.7	D
		SB	31	0.03	49.1	D	31	0.03	49.1	D	25	0.02	31.6	C
		INT			21.8	C			24.3	C			20	B
Spicewood Springs Road & Loop 1 SBFR	Signalized	EB	***#1016***	***1.41***	***209.2***	***F***	***#1095***	***1.49***	***230.5***	***F***	***#1105***	***1.49***	***225.3***	***F***
		WB	m609	0.77	13.1	B	m624	0.79	13.4	B	m624	0.79	13.4	B
		SB	***#609***	***1.13***	***106***	***F***	***#609***	***1.13***	***108.3***	***F***	***#609***	***1.13***	***108.3***	***F***
		INT			***101.7***	***F***			***110.7***	***F***			***108.9***	***F***
Spicewood Springs Road & Loop 1 NBFR	Signalized	EB	m106	0.8	6.9	A	m105	0.85	7.3	A	m105	0.85	7.3	A
		WB	576	0.75	35.2	D	588	0.76	35.6	D	588	0.76	35.6	D
		NB	***#564***	***1.42***	***177.9***	***F***	***#591***	***1.48***	***192***	***F***	***#591***	***1.48***	***192***	***F***
		INT			55	D			***58.5***	***E***			***58.5***	***E***
Executive Center Drive & Hart Lane	TWSC	WB	24	0.24	12.7	B	45	0.38	14.5	B	45	0.38	14.5	B
		NB	0	0.22	0	FREE	0	0.22	0	FREE	0	0.22	0	FREE
		SB	1	0.02	0.8	FREE	3	0.03	1.4	FREE	3	0.03	1.4	FREE
Executive Center Drive & Wood Hollow Drive	TWSC/ Roundabout	EB	72	0.52	25.6	D	***209***	***0.97***	***99.5***	***F***	20	0.265	7.5	A
		WB	35	0.33	14.6	B	***436***	***1.15***	***122.8***	***F***	100	0.657	17.6	C
		NB	0	0.01	0.3	FREE	0	0.01	0.2	FREE	40	0.411	8.4	A
		SB	1	0.02	0.9	FREE	3	0.04	2	FREE	20	0.204	5.9	A
Executive Center Dr. & Loop 1 SBFR	TWSC	EB	75	0.53	25.4	D	***170***	***0.79***	***43.2***	***E***	FREE	FREE	FREE	FREE
		SB	0	0.5	0	FREE	0	0.42	0	FREE	FREE	FREE	FREE	FREE
Greystone Drive & Hart Lane	AWSC	EB	16	0.22	10.8	B	16	0.223	11	B	16	0.223	11	B
		WB	42	0.43	13.3	B	46	0.446	13.8	B	46	0.446	13.8	B
		NB	68	0.555	15.6	C	72	0.572	16	C	72	0.572	16	C
		SB	28	0.328	11.7	B	30	0.349	12	B	30	0.349	12	B
		INT			13.4	B			13.8	B			13.8	B
Greystone Drive & Wood Hollow Drive	AWSC	EB	16	0.212	11.1	B	18	0.231	11.8	B	18	0.231	11.8	B
		WB	76	0.595	17.2	C	86	0.629	19	C	86	0.629	19	C
		NB	58	0.513	14.7	B	72	0.568	16.7	C	72	0.568	16.7	C
		SB	22	0.278	12	B	30	0.349	13	B	30	0.349	13	B
		INT			14.6	B			16	B			16	B
Greystone Drive & Loop 1 SBFR	TWSC	EB	103	0.64	34.7	D	104	0.63	27.9	D	104	0.63	27.9	D
		SB	0	0.46	0	FREE	0	0.39	0	FREE	0	0.39	0	FREE
Faw West Boulevard & Hart Lane	Signalized	EB	219	0.33	19.5	B	198	0.3	15.5	B	198	0.3	15.5	B
		WB	67	0.34	6.7	A	253	0.33	30.6	C	253	0.33	26.1	C
		NB	***187***	***0.75***	***60.6***	***E***	173	0.68	54.6	D	173	0.68	54.6	D
		SB	***176***	***0.74***	***60.6***	***E***	***204***	***0.72***	***55.4***	***E***	***204***	***0.72***	***55.4***	***E***
		INT			26.7	C			33.6	C			31.8	C
Faw West Boulevard & Wood Hollow Drive	Signalized	EB	190	0.47	16.2	B	329	0.47	32	C	430	0.52	33.7	C
		WB	m185	0.82	31.6	C	321	0.83	44.4	D	328	0.71	35.6	D
		NB	***#287***	***0.83***	***68.2***	***E***	***262***	***0.85***	***56.9***	***E***	237	0.79	51.2	D
		SB	***210***	***0.77***	***66.5***	***E***	***221***	***0.79***	***68.1***	***E***	***219***	***0.78***	***66.5***	***E***
		INT			37.9	D			45.6	D			41.6	D
Faw West Boulevard & Loop 1 SBFR	Signalized	EB	568	0.72	19.4	B	580	0.73	20.2	C	604	0.73	20.7	C
		WB	16	0.26	3.7	A	16	0.26	3.6	A	16	0.26	3.6	A
		SB	***#977***	***1.5***	***180.1***	***F***	#540	0.99	36.6	D	#540	0.99	36.6	D
		INT			***92.4***	***F***			26	C			26.2	C
Faw West Blvd. & Loop 1 NBFR	Signalized	EB	#835	0.97	36.5	D	m#879	1.01	46.9	D	m#879	1.01	47.1	D
		NB	187	0.31	25.5	C	193	0.32	25.6	C	193	0.32	25.6	C
		INT			34.3	C			42.6	D			42.8	D
Steck Avenue & Loop 1 SBFR	Signalized	EB	***#373***	***0.9***	***63.1***	***E***	***#373***	***0.9***	***63.1***	***E***	***#373***	***0.9***	***63.1***	***E***
		WB	7	0.32	0.7	A	7	0.32	0.7	A	7	0.32	0.7	A
		SB	***#998***	***1.4***	***226.1***	***F***	***#1012***	***1.41***	***229.1***	***F***	***#1012***	***1.41***	***229.1***	***F***
		INT			***146.8***	***F***			***148.8***	***F***			***148.8***	***F***
Steck Avenue & Loop 1 NBFR	Signalized	EB	m373	1.01	19.8	B	m361	1.01	19.8	B	m361	1.01	19.8	B
		WB	***#540***	***0.96***	***62.6***	***E***	***#540***	***0.96***	***62.6***	***E***	***#540***	***0.96***	***62.6***	***E***
		NB	***#1524***	***2.09***	***488.8***	***F***	***#1524***	***2.09***	***488.8***	***F***	***#1524***	***2.09***	***488.8***	***F***
		INT			***182.7***	***F***			***182.7***	***F***			***182.7***	***F***

Site Driveways (Stop-Controlled Approach Only)		2018 No Build Condition				2018 Build Condition				2018 Mitigated Condition			
Intersection	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Driveway 1 (Phase I)	NB	N/A	N/A	N/A	N/A	81	0.54	14.8	B	81	0.54	14.8	B

2020 ANALYSIS

A. TRAFFIC VOLUME CONDITIONS

TRIP GENERATION

The 2020 Build Scenario assumes the completion of Phases I and II of the Austin Oaks development. ***Table 13*** summarizes the Daily, and Weekday AM and PM peak hour trip generation the 2020 Build Scenario based on ITE methodology. 2020 Net New External Trips represent the comprehensive site traffic added to the adjacent roadway network after the completion of Phase I and II.

Table 13 – 2020 Build Trip Generation

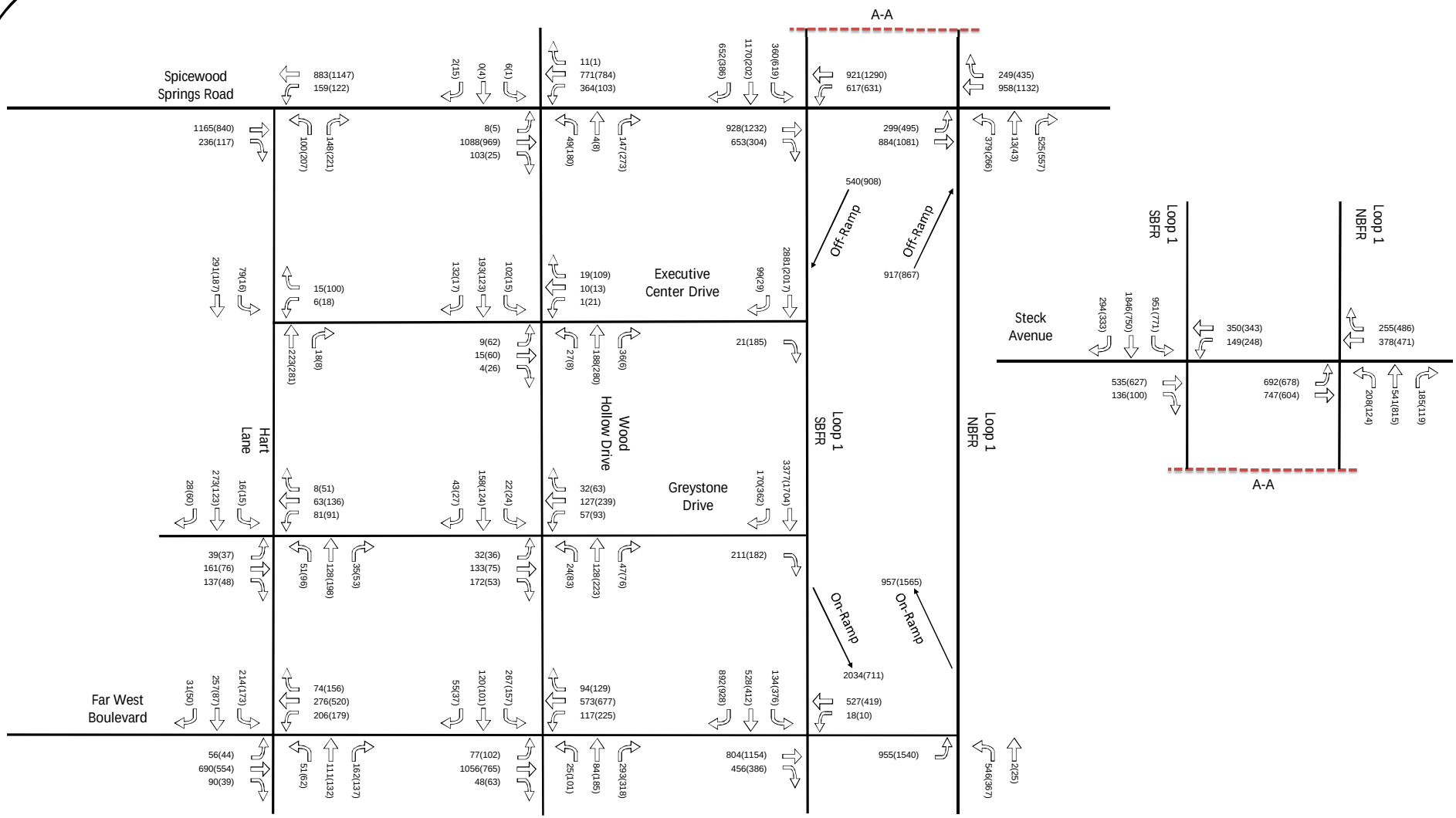
Land Use	Amount	Units	ITE Code	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
					In	Out	Total	In	Out	Total
Existing General Office Building	445.322	1,000 Sq Ft	710	4,086	556	76	632	98	479	577
Existing General Office Building (To Remain)	251.592	1,000 Sq Ft	710	2,648	352	48	400	61	299	360
Reduction in Existing Office Trips				1,438	204	28	232	37	180	217
Apartment	250	Dwelling Unit(s)	220	1,640	25	101	126	101	54	155
General Office Building	215.000	1,000 Sq Ft	710	2,349	311	42	353	54	265	319
Medical-Dental Office Building	55.000	1,000 Sq Ft	720	2,034	103	28	131	48	122	170
Retail/High-Turnover (Sit-Down) Restaurant	15.000	1,000 Sq Ft	932	1,908	89	73	162	89	59	148
2020 Net New Trips				6,494	324	216	540	255	320	575
Internal Capture Trip Reduction (5%):				468	37	14	50	16	34	50
2020 Net New External Trips				**6,026**	**287**	**202**	**490**	**239**	**286**	**525**

TRIP DISTRIBUTION AND ASSIGNMENT

The 2020 Global Trip Assignment Volumes, shown as ***Exhibit 16,*** are the product of the Global Trip Distribution Percentages (***Exhibit 6)*** and 2020 Net New External Trips. The 2020 Local Trip Distribution Percentages, shown as ***Exhibit 17***, were developed based on the size and location of the Austin Oaks development expected to be completed by year 2020. Similar to the global assignment volumes, local percentages were applied to the net external trips to calculate the 2020 Local Trip Assignment Volumes (shown as ***Exhibit 18***).

TOTAL TRAFFIC VOLUMES

The assignment volumes were added to 2020 No Build Volumes (***Exhibit 15***) to determine the 2020 Build Traffic Volumes. Existing office trips were not assumed at site driveways, therefor the in and out movements to/from these driveways do not include the Reduction in Existing Office Trips. The weekday AM and PM peak hour traffic volumes used for the analysis of the 2020 Build and Mitigated scenarios shown in ***Exhibit 19*** and ***Exhibit 20*** for global and local volumes, respectively.



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

EXHIBIT 15

2020 BACKGROUND VOLUMES

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

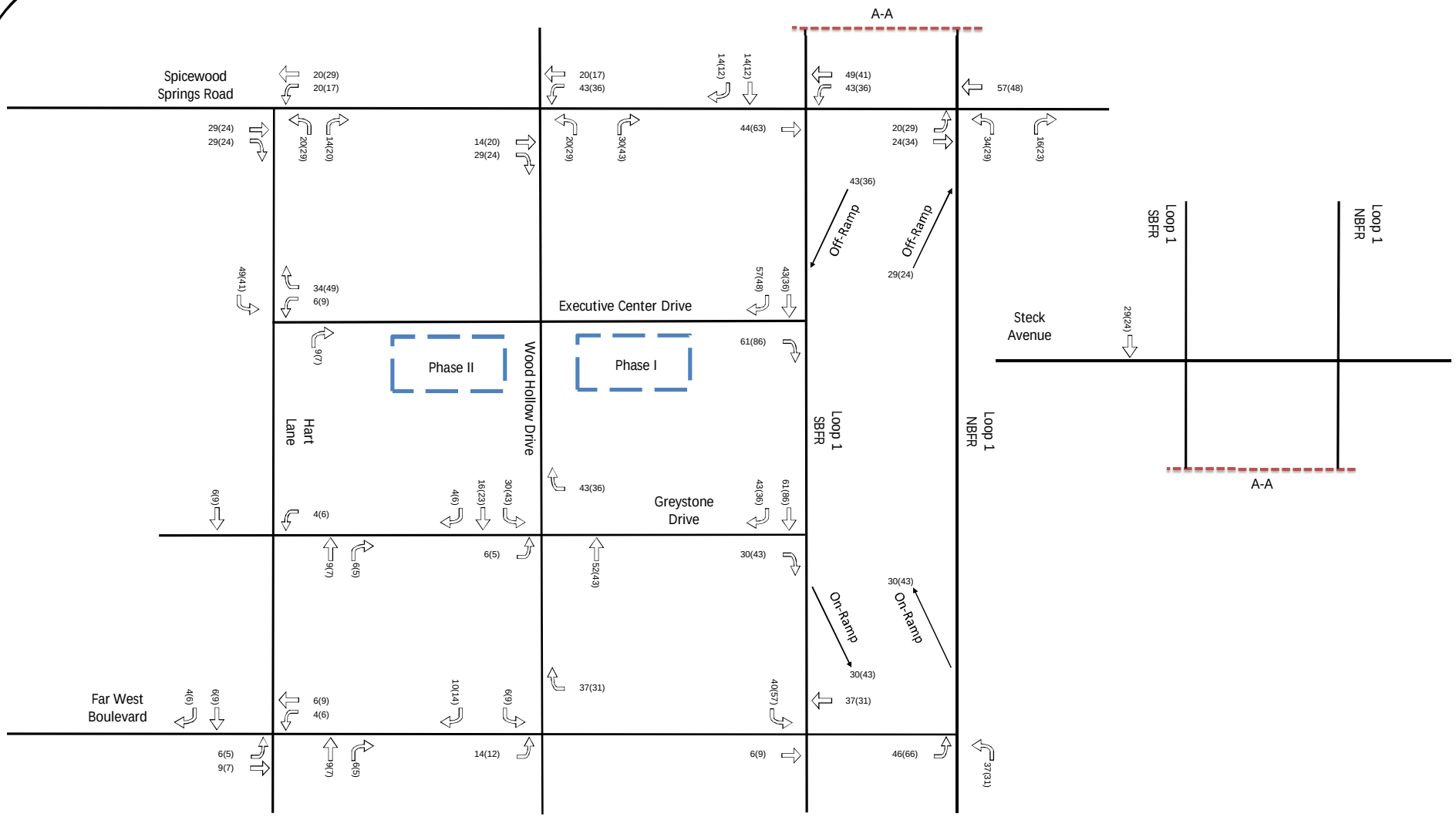


EXHIBIT 16

2020 GLOBAL TRIP ASSIGNMENT

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

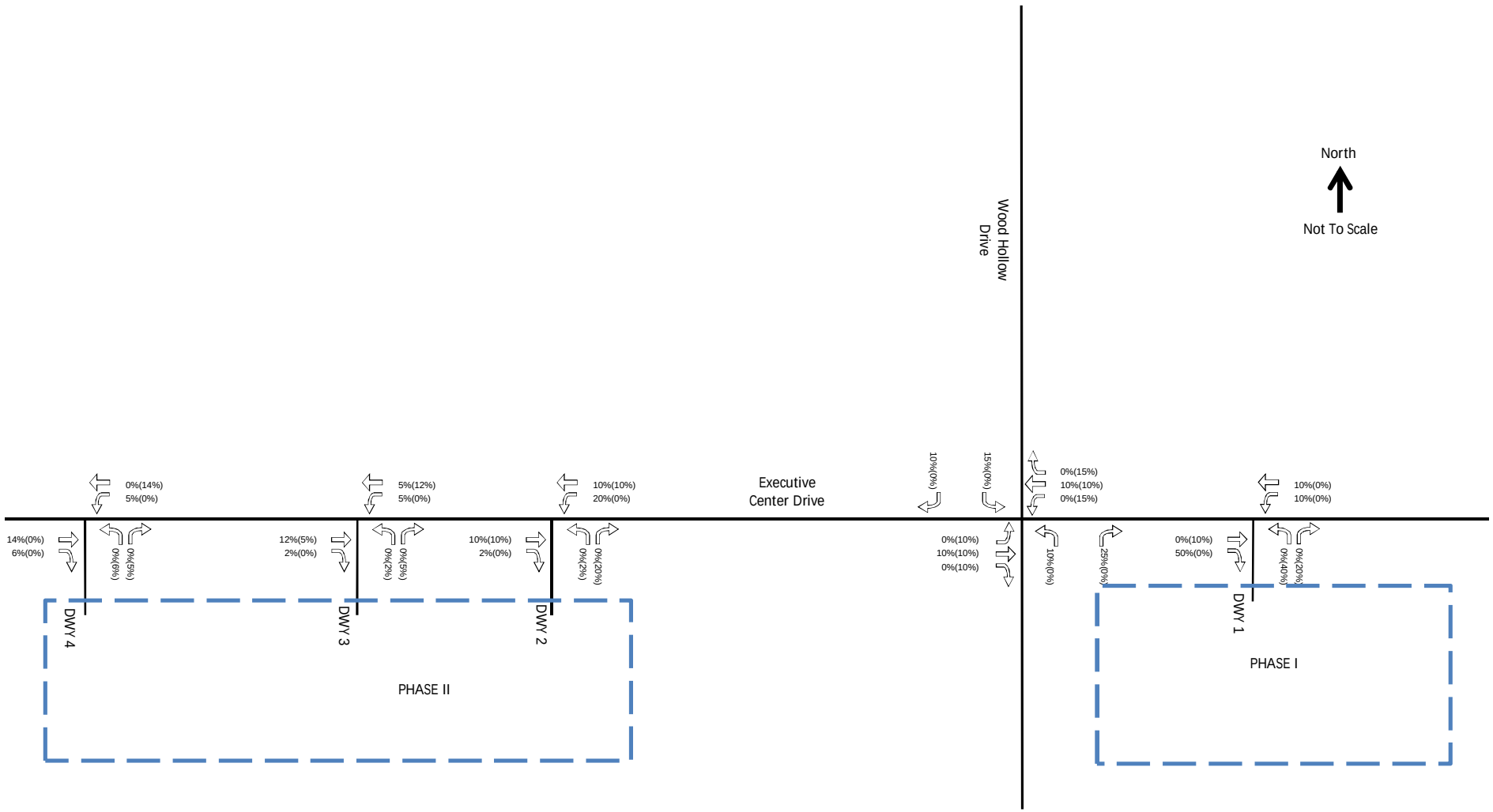


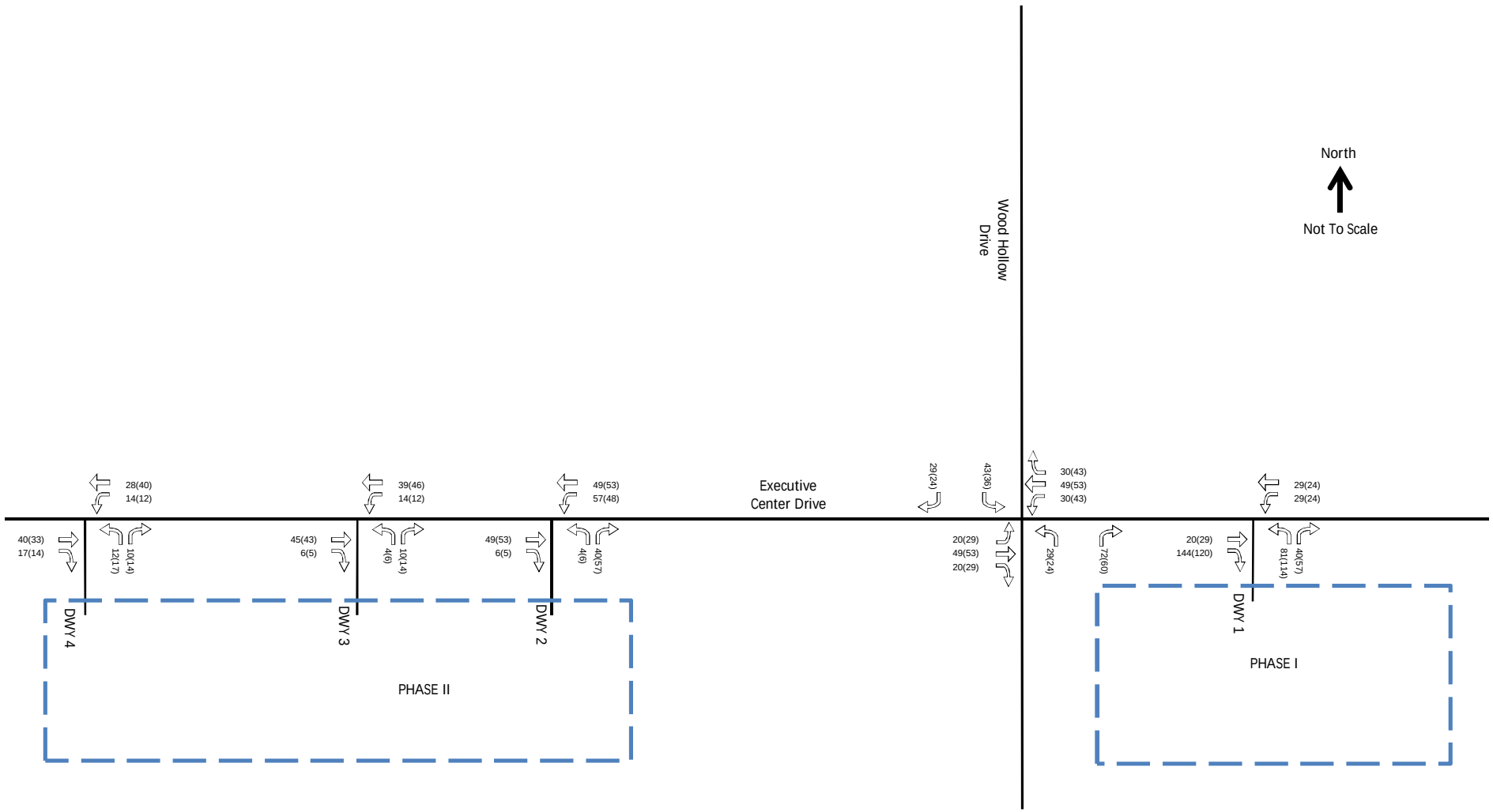
EXHIBIT 17

2020 LOCAL TRIP DISTRIBUTION

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements

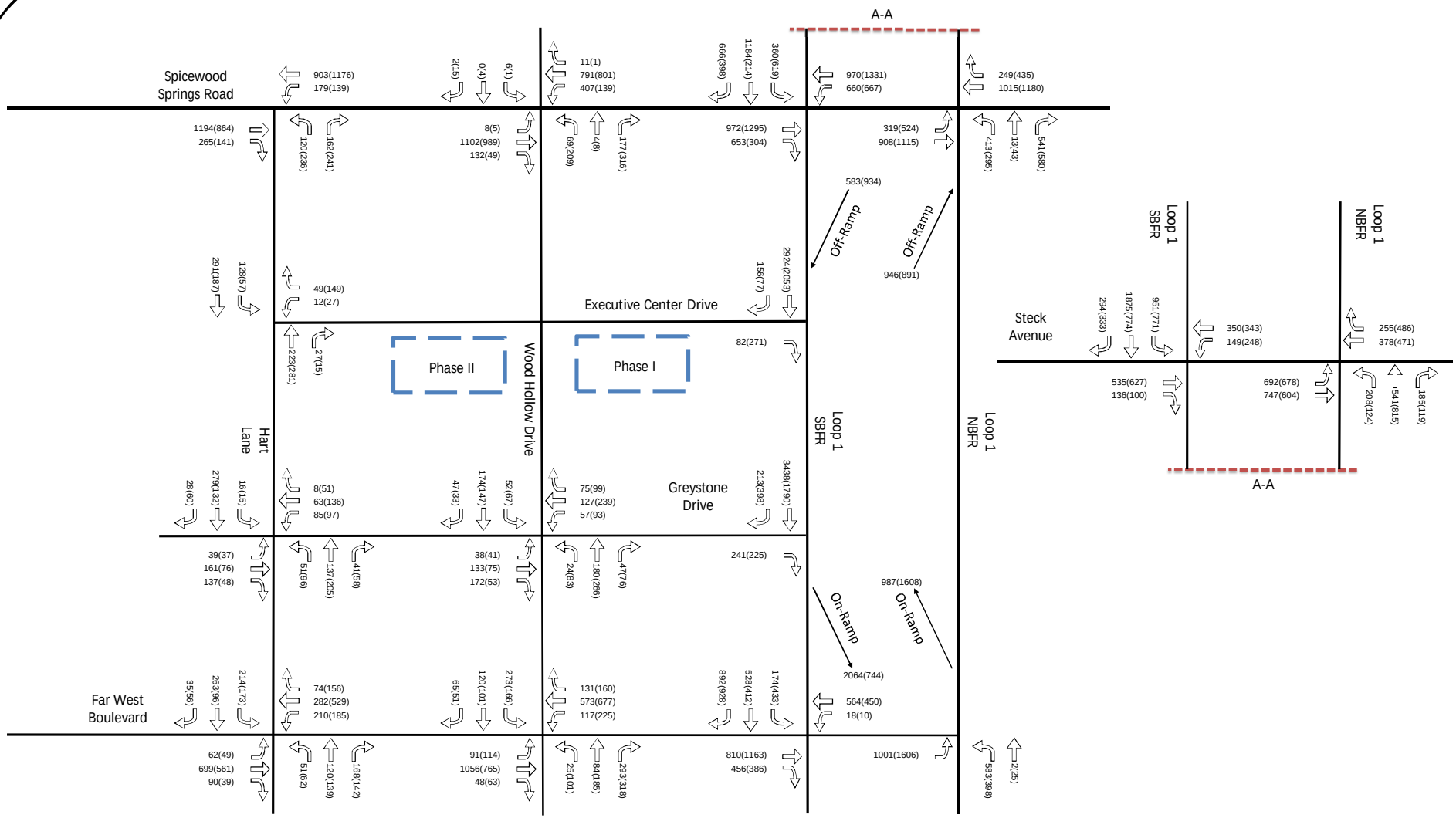
EXHIBIT 18

2020 LOCAL TRIP ASSIGNMENT

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

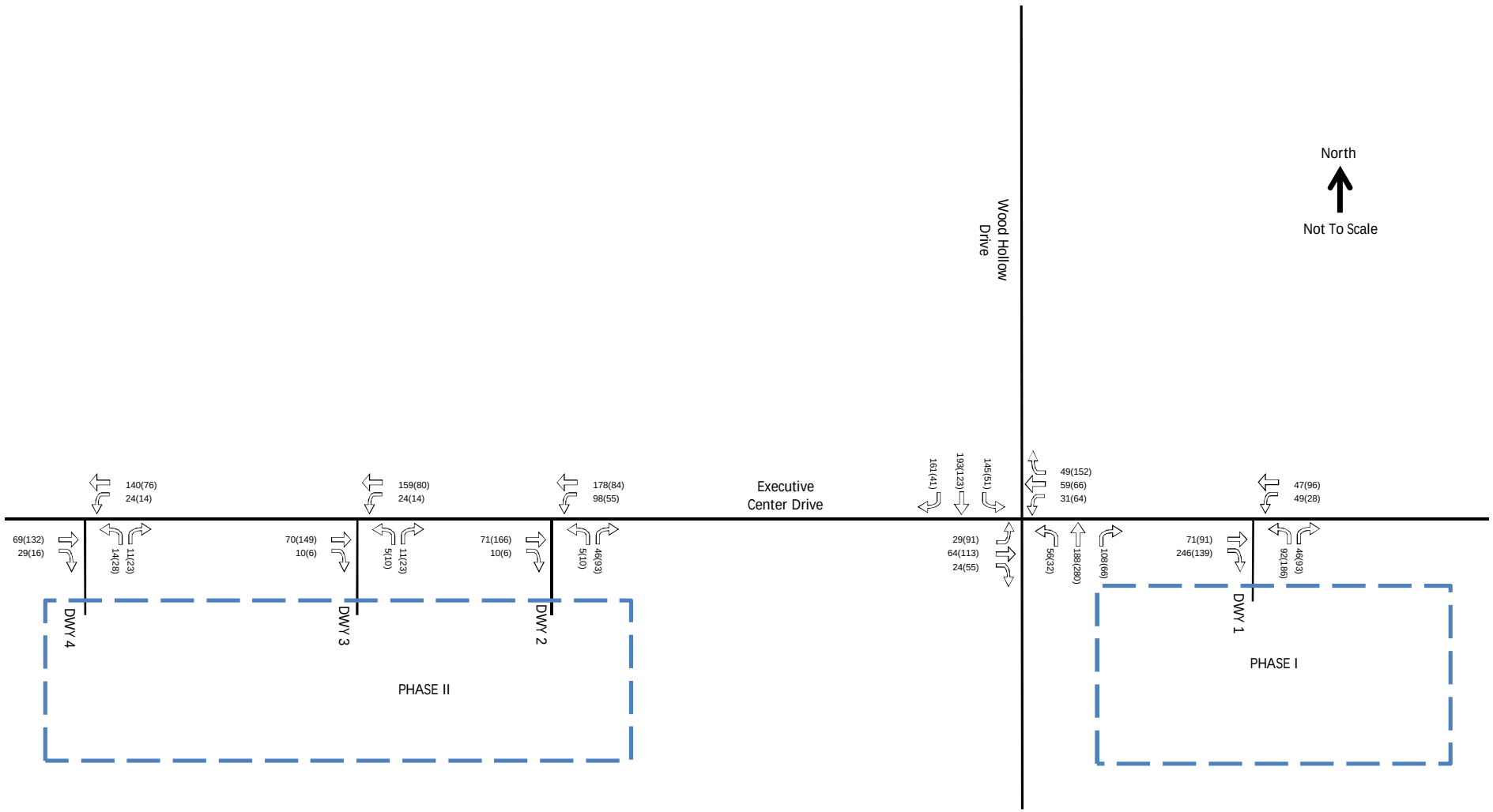
EXHIBIT 19

2020 BUILD VOLUMES (GLOBAL)

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

EXHIBIT 20

2020 BUILD VOLUMES (LOCAL)

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

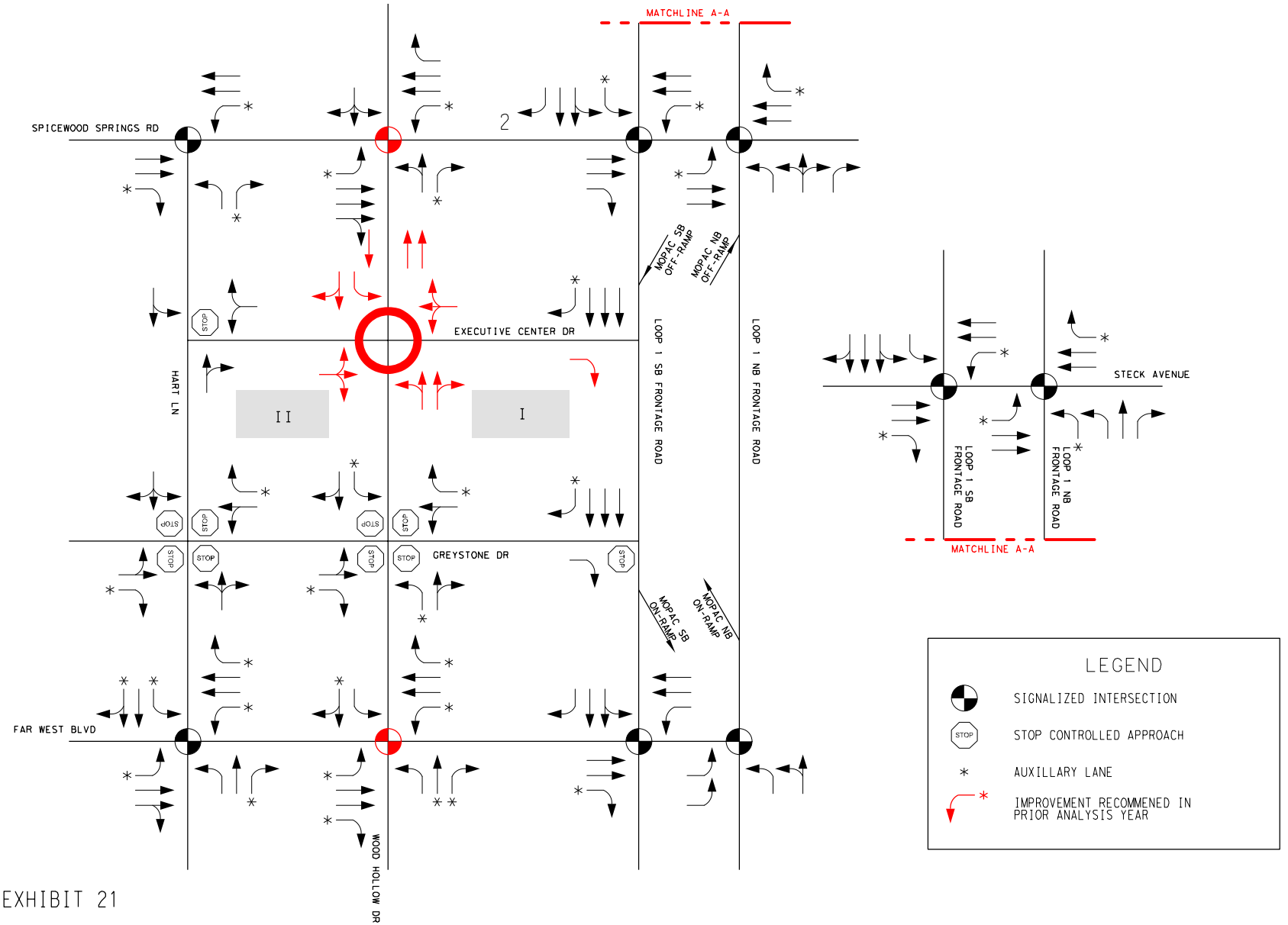


EXHIBIT 21

2020 BUILD LANE ASSIGNMENTS AND TRAFFIC CONTROL

AUSTIN OAKS TIA

Kimley»Horn

B. 2020 BUILD ANALYSIS RESULTS

The analysis was performed using the 2020 Build Lane Assignments and Traffic Control, shown as ***Exhibit 21***, which incorporates improvements recommended in analysis years prior to 2020. ***Table 14*** and ***Table 15*** summarize the intersection operations for the 2020 Build Scenario AM and PM peak hours, respectively. Synchro reports for all 2018 analyses are provided as ***Appendix O.*** Noteworthy traffic operations at intersections are as follows:

- *Far West Boulevard & Wood Hollow Drive*. The northbound and southbound approaches of Wood Hollow Drive experience an unacceptable LOS at the intersection of Far West Boulevard. The delay at these approaches is caused by the relatively high volumes of the northbound and southbound approaches compared to the green time allocated to these approaches.

- *Far West Boulevard & Hart Lane*. The southbound approach of Hart Lane experience an unacceptable LOS at the intersection of Far West Boulevard. However, because of the improvement (recommended previously) at this intersection the delay reported in the Build scenario is less than the delay reported in the No Build scenario and no additional mitigation is required.

- *Spicewood Springs Road & Loop 1*. Similar to existing conditions the intersection of Spicewood Springs Road and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Greystone Drive & Loop 1.* Similar to existing conditions the eastbound approach of Greystone Drive at Loop 1 SBFR continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Far West Boulevard & Loop 1*. Similar to existing conditions the intersection of Far West Boulevard and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Steck Avenue & Loop 1*. Similar to existing conditions the intersection of Steck Avenue and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

C. 2020 IMPROVEMENTS

Based on the results of the 2020 Build analysis, the following improvement (shown in ***Exhibit 22)*** is recommended:

- *Far West Boulevard & Wood Hollow Drive* (1) Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.

D. 2020 MITIGATED ANALYSIS RESULTS

The 2020 Mitigated analysis was performed using the 2020 Build Traffic Volumes and incorporates the 2020 Improvements enumerated above. ***Table 14*** and ***Table 15*** summarize the intersection operations for the 2020 Mitigated Scenario AM and PM peak hours, respectively. The 2020 improvements reduce delay such that all approaches in the study area, with the exception of intersections along Loop 1, operate at an acceptable LOS or report delay less than the No Build scenario.

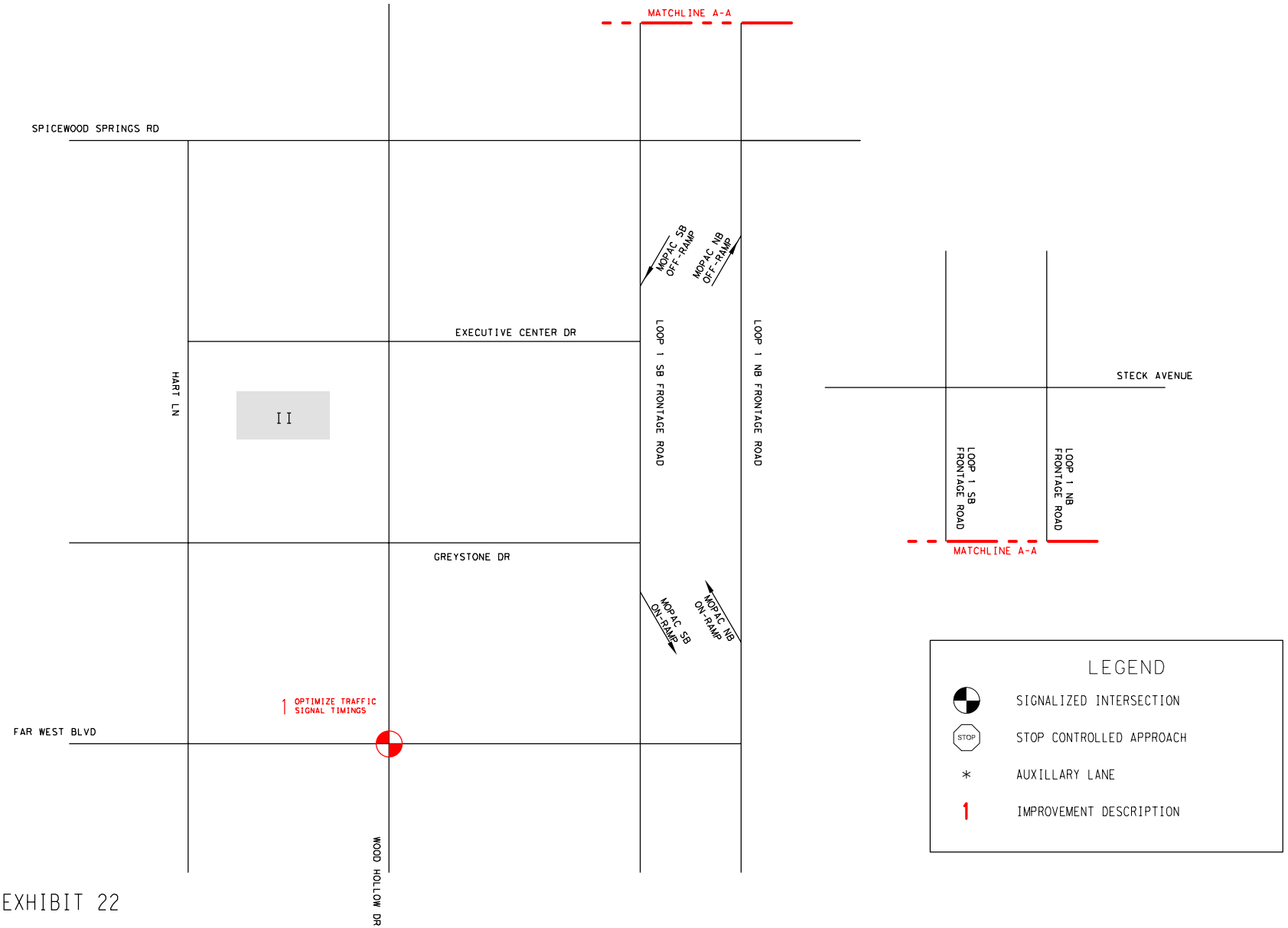


EXHIBIT 22

2020 IMPROVEMENTS

AUSTIN OAKS TIA

Kimley»Horn

TABLE 14

2020 INTERSECTION AM PEAK HOUR ANALYSIS RESULTS

AUSTIN OAKS TIA

Required Study Area			2020 No Build Condition				2020 Build Condition				2020 Mitigated Condition			
Intersection	**Traffic Control**	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Spicewood Springs Road & Hart Lane	TWSC/ Signalized	EB	0	0.35	0	FREE	472	0.68	24.2	C	472	0.68	24.2	C
		WB	29	0.28	2.1	STOP*	223	0.39	6.6	A	223	0.39	6.6	A
		NB	***127***	***0.7***	***39.6***	***E***	163	0.68	27.2	C	163	0.68	27.2	C
		INT							17.7	B			17.7	B
Spicewood Springs Road & Wood Hollow Drive	Signalized	EB	275	0.47	20.1	C	465	0.58	28	C	465	0.58	28	C
		WB	m226	0.86	19.5	B	m186	0.92	26.3	C	m186	0.92	26.3	C
		NB	80	0.21	45.2	D	98	0.24	28.2	C	98	0.24	28.2	C
		SB	0	0.01	43.3	D	0	0.01	38.5	D	0	0.01	38.5	D
		INT			21.9	C			27.3	C			27.3	C
Spicewood Springs Road & Loop 1 SBFR	Signalized	EB	***#695***	***1.6***	***279.6***	***F***	***#736***	***1.36***	***144.9***	***F***	***#736***	***1.36***	***144.9***	***F***
		WB	m#598	0.92	18.9	B	m#632	0.98	22.7	C	m#632	0.98	22.7	C
		SB	***m181***	***1.29***	***134.8***	***F***	***m179***	***1.31***	***144.4***	***F***	***m179***	***1.31***	***144.4***	***F***
		INT			***144.4***	***F***			***108.3***	***F***			***108.3***	***F***
Spicewood Springs Road & Loop 1 NBFR	Signalized	EB	m31	0.46	1.7	A	m30	0.48	1.9	A	m30	0.48	1.9	A
		WB	487	0.83	41.2	D	526	0.87	44.1	D	526	0.87	44.1	D
		NB	***#448***	***1.41***	***126***	***F***	***#527***	***1.49***	***156.8***	***F***	***#527***	***1.49***	***156.8***	***F***
		INT			50.6	D			***60.6***	***E***			***60.6***	***E***
Executive Center Drive & Hart Lane	TWSC	WB	4	0.05	11.9	B	11	0.13	12.5	B	11	0.13	12.5	B
		NB	0	0.17	0	FREE	0	0.18	0	FREE	0	0.18	0	FREE
		SB	6	0.07	2.3	FREE	10	0.12	3.4	FREE	10	0.12	3.4	FREE
Executive Center Drive & Wood Hollow Drive	TWSC/ Roundabout	EB	9	0.11	19.3	C	20	0.184	7.1	A	20	0.184	7.1	A
		WB	6	0.08	13.9	B	20	0.196	6.5	A	20	0.196	6.5	A
		NB	2	0.03	1.1	FREE	20	0.33	7.3	A	20	0.33	7.3	A
		SB	7	0.09	2.6	FREE	40	0.43	7.9	A	40	0.43	7.9	A
Executive Center Dr. & Loop 1 SBFR	TWSC	EB	2	0.03	10.1	B	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
		SB	0	0.71	0	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
Greystone Drive & Hart Lane	AWSC	EB	56	0.503	15.1	C	58	0.514	15.6	C	58	0.514	15.6	C
		WB	36	0.393	15.4	C	40	0.41	16	C	40	0.41	16	C
		NB	54	0.497	16.4	C	64	0.541	17.7	C	64	0.541	17.7	C
		SB	112	0.703	23.5	C	122	0.731	25.5	D	122	0.731	25.5	D
		INT			18	B			19.2	B			19.2	B
Greystone Drive & Wood Hollow Drive	AWSC	EB	30	0.336	11.8	B	36	0.383	13.5	B	36	0.383	13.5	B
		WB	36	0.389	13.1	B	42	0.423	14.1	B	42	0.423	14.1	B
		NB	32	0.357	12.7	B	56	0.5	16.3	C	56	0.5	16.3	C
		SB	40	0.409	13.5	B	52	0.484	15.5	C	52	0.484	15.5	C
		INT			12.7	B			14.7	B			14.7	B
Greystone Drive & Loop 1 SBFR	TWSC	EB	***336***	***1.36***	***251.5***	***F***	***380***	***1.4***	***259.9***	***F***	***380***	***1.4***	***259.9***	***F***
		SB	0	0.83	0	FREE	0	0.7	0	FREE	0	0.7	0	FREE
Faw West Boulevard & Hart Lane	Signalized	EB	394	0.73	37.9	D	392	0.59	27.2	C	392	0.59	27.2	C
		WB	224	0.68	44.5	D	225	0.59	27.9	C	111	0.59	34.9	C
		NB	***204***	***0.83***	***65.5***	***E***	185	0.7	51.3	D	185	0.7	51.3	D
		SB	***#321***	***0.92***	***69.7***	***E***	***255***	***0.83***	***55.2***	***E***	***255***	***0.83***	***55.2***	***E***
		INT			50.8	D			37.3	D			37.3	D
Faw West Boulevard & Wood Hollow Drive	Signalized	EB	m516	0.65	32.9	C	584	0.62	31.3	C	567	0.65	35.4	D
		WB	m182	0.62	33.7	C	237	0.43	34.1	C	250	0.59	42.9	D
		NB	***#279***	***0.88***	***86.1***	***F***	***163***	***0.82***	***67***	***E***	***#202***	***0.9***	***78.4***	***E***
		SB	#359	0.69	44.3	D	***319***	***0.83***	***55.6***	***E***	#369	0.7	45.5	D
		INT			42.6	D			40.9	D			45.2	D
Faw West Boulevard & Loop 1 SBFR	Signalized	EB	m404	0.62	19.9	B	384	0.61	20.3	C	m426	0.61	19.6	B
		WB	0	0.44	1.8	A	m15	0.46	7.3	A	m15	0.46	7.3	A
		SB	m354	1.02	45.8	D	m206	0.58	12.4	B	m206	0.58	12.4	B
		INT			28.9	C			14.4	B			14.4	B
Faw West Blvd. & Loop 1 NBFR	Signalized	EB	14	0.44	3	A	20	0.52	6	A	20	0.52	6	A
		NB	334	0.65	45.3	D	357	0.54	35.6	D	357	0.54	35.6	D
		INT			18.4	B			16.9	B			16.9	B
Steck Avenue & Loop 1 SBFR	Signalized	EB	***#367***	***0.95***	***71.8***	***E***	***#367***	***0.95***	***71.8***	***E***	***#367***	***0.95***	***71.8***	***E***
		WB	m45	0.43	5.6	A	m45	0.43	5.6	A	m45	0.43	5.6	A
		SB	***#1618***	***1.41***	***186.1***	***F***	***#1648***	***1.43***	***192.2***	***F***	***#1648***	***1.43***	***192.2***	***F***
		INT			***147***	***F***			***151.6***	***F***			***151.6***	***F***
Steck Avenue & Loop 1 NBFR	Signalized	EB	m123	0.66	4.4	A	m123	0.66	4.4	A	m123	0.66	4.4	A
		WB	***#234***	***0.79***	***57.7***	***E***	***#234***	***0.79***	***57.7***	***E***	***#234***	***0.79***	***57.7***	***E***
		NB	***m#1300***	***2.8***	***684.2***	***F***	***m#1287***	***2.8***	***683.2***	***F***	***m#1287***	***2.8***	***683.2***	***F***
		INT			***226.9***	***F***			***226.5***	***F***			***226.5***	***F***
Site Driveways (Stop-Controlled Approach Only)			**2020 No Build Condition**				**2020 Build Condition**				**2020 Mitigated Condition**			
Intersection		**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Driveway 1 (Phase I)		NB	N/A	N/A	N/A	N/A	22	0.23	12	B	22	0.23	12	B
Driveway 2 (Phase II)		NB	N/A	N/A	N/A	N/A	5	0.06	9.3	A	5	0.06	9.3	A
Driveway 3 (Phase II)		NB	N/A	N/A	N/A	N/A	2	0.02	9.3	A	2	0.02	9.3	A
Driveway 4 (Phase II)		NB	N/A	N/A	N/A	N/A	3	0.03	9.8	A	3	0.03	9.8	A

TABLE 15

2020 INTERSECTION PM PEAK HOUR ANALYSIS RESULTS

AUSTIN OAKS TIA

Required Study Area			2020 No Build Condition				2020 Build Condition				2020 Mitigated Condition			
Intersection	**Traffic Control**	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Spicewood Springs Road & Hart Lane	TWSC/ Signalized	EB	0	0.27	0	FREE	#344	0.92	37.7	D	#344	0.92	37.7	D
		WB	17	0.37	1.1	STOP*	110	0.37	2.1	A	110	0.37	2.1	A
		NB	***655***	***1.48***	***264.1***	***F***	180	0.75	17.7	B	180	0.75	17.7	B
		INT							17.6	B			17.6	B
Spicewood Springs Road & Wood Hollow Drive	Signalized	EB	208	0.34	11.9	B	m261	0.5	16.4	B	m261	0.5	16.4	B
		WB	m194	0.37	9.8	A	m276	0.61	17.2	B	m276	0.61	17.2	B
		NB	***#330***	***0.83***	***68.5***	***E***	276	0.52	35.2	D	276	0.52	35.2	D
		SB	31	0.03	49.1	D	25	0.02	31.6	C	25	0.02	31.6	C
		INT			22.4	C			20.8	C			20.8	C
Spicewood Springs Road & Loop 1 SBFR	Signalized	EB	***#1073***	***1.46***	***229.1***	***F***	***#1155***	***1.54***	***243.5***	***F***	***#1155***	***1.54***	***243.5***	***F***
		WB	m628	0.8	13.6	B	m677	0.85	14.9	B	m677	0.85	14.9	B
		SB	***#642***	***1.18***	***120.4***	***F***	***#642***	***1.18***	***126.5***	***F***	***#642***	***1.18***	***126.5***	***F***
		INT			***112.2***	***F***			***119***	***F***			***119***	***F***
Spicewood Springs Road & Loop 1 NBFR	Signalized	EB	m106	0.83	7.2	A	m105	0.88	7.7	A	m105	0.88	7.7	A
		WB	610	0.78	36.3	D	647	0.81	37.6	D	647	0.81	37.6	D
		NB	***#595***	***1.49***	***194***	***F***	***#628***	***1.57***	***225.4***	***F***	***#628***	***1.57***	***225.4***	***F***
		INT			***58.9***	***E***			***67.2***	***E***			***67.2***	***E***
Executive Center Drive & Hart Lane	TWSC	WB	26	0.26	12.9	B	49	0.41	15.4	C	49	0.41	15.4	C
		NB	0	0.23	0	FREE	0	0.23	0	FREE	0	0.23	0	FREE
		SB	1	0.02	0.8	FREE	5	0.07	2.4	FREE	5	0.07	2.4	FREE
Executive Center Drive & Wood Hollow Drive	TWSC/ Roundabout	EB	85	0.57	29	D	40	0.422	9.8	A	40	0.422	9.8	A
		WB	39	0.35	15.3	C	80	0.576	15.7	C	80	0.576	15.7	C
		NB	1	0.01	0.3	FREE	60	0.521	10.9	B	60	0.521	10.9	B
		SB	1	0.02	0.9	FREE	20	0.242	6.1	A	20	0.242	6.1	A
Executive Center Dr. & Loop 1 SBFR	TWSC	EB	87	0.58	28.4	D	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
		SB	0	0.52	0	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
Greystone Drive & Hart Lane	AWSC	EB	18	0.234	11.2	B	18	0.239	11.4	B	18	0.239	11.4	B
		WB	46	0.454	14	B	50	0.476	14.6	B	50	0.476	14.6	B
		NB	76	0.588	16.7	C	84	0.617	17.7	C	84	0.617	17.7	C
		SB	30	0.349	12.1	B	34	0.37	12.7	B	34	0.37	12.7	B
		INT			14.1	B			14.8	B			14.8	B
Greystone Drive & Wood Hollow Drive	AWSC	EB	18	0.227	11.4	B	20	0.259	12.5	B	20	0.259	12.5	B
		WB	86	0.629	18.6	C	100	0.675	21.1	C	100	0.675	21.1	C
		NB	64	0.546	15.6	C	98	0.666	20.6	C	98	0.666	20.6	C
		SB	24	0.297	12.4	B	34	0.372	13.8	B	34	0.372	13.8	B
		INT			15.5	B			18.4	B			18.4	B
Greystone Drive & Loop 1 SBFR	TWSC	EB	***122***	***0.7***	***40.9***	***E***	114	0.66	30.2	D	114	0.66	30.2	D
		SB	0	0.48	0	FREE	0	0.4	0	FREE	0	0.4	0	FREE
Faw West Boulevard & Hart Lane	Signalized	EB	231	0.35	20.2	C	211	0.32	16.1	B	211	0.32	16.1	B
		WB	68	0.36	7	A	263	0.35	27.8	C	263	0.35	27.8	C
		NB	***193***	***0.76***	***60.4***	***E***	182	0.69	54.5	D	182	0.69	54.5	D
		SB	***185***	***0.75***	***61.3***	***E***	210	0.73	55	D	210	0.73	55	D
		INT			27.1	C			32.5	C			32.5	C
Faw West Boulevard & Wood Hollow Drive	Signalized	EB	199	0.5	16.9	B	446	0.56	35.1	D	446	0.56	35.1	D
		WB	m184	0.9	32.4	C	344	0.76	38.3	D	344	0.76	38.3	D
		NB	***#313***	***0.83***	***70.6***	***E***	246	0.8	51.5	D	246	0.8	51.5	D
		SB	***216***	***0.78***	***67.4***	***E***	***227***	***0.79***	***67.5***	***E***	***227***	***0.79***	***67.5***	***E***
		INT			39	D			43.2	D			43.2	D
Faw West Boulevard & Loop 1 SBFR	Signalized	EB	597	0.75	20.4	C	654	0.77	22.2	C	654	0.77	22.2	C
		WB	17	0.27	3.7	A	17	0.29	3.5	A	17	0.29	3.5	A
		SB	***#1067***	***1.61***	***211.1***	***F***	570	1.02	40.6	D	570	1.02	40.6	D
		INT			***107.3***	***F***			28.6	C			28.6	C
Faw West Blvd. & Loop 1 NBFR	Signalized	EB	m#891	1	44.3	D	***m#924***	***1.05***	***56.9***	***E***	***m#924***	***1.05***	***56.9***	***E***
		NB	195	0.32	25.7	C	209	0.34	26	C	209	0.34	26	C
		INT			40.5	D			50.5	D			50.5	D
Steck Avenue & Loop 1 SBFR	Signalized	EB	***#398***	***0.94***	***68.7***	***E***	***#398***	***0.94***	***68.7***	***E***	***#398***	***0.94***	***68.7***	***E***
		WB	8	0.34	0.7	A	8	0.34	0.7	A	8	0.34	0.7	A
		SB	***#1049***	***1.45***	***250.5***	***F***	***#1064***	***1.47***	***258.7***	***F***	***#1064***	***1.47***	***258.7***	***F***
		INT			***162.3***	***F***			***167.8***	***F***			***167.8***	***F***
Steck Avenue & Loop 1 NBFR	Signalized	EB	m376	1.05	27.5	C	m368	1.05	27.5	C	m368	1.05	27.5	C
		WB	***#577***	***1.01***	***69.8***	***E***	***#577***	***1.01***	***69.8***	***E***	***#577***	***1.01***	***69.8***	***E***
		NB	***#1595***	***2.18***	***523.1***	***F***	***#1595***	***2.18***	***523.1***	***F***	***#1595***	***2.18***	***523.1***	***F***
		INT			***198.8***	***F***			***198.8***	***F***			***198.8***	***F***

Site Driveways (Stop-Controlled Approach Only)		2020 No Build Condition				2020 Build Condition				2020 Mitigated Condition			
Intersection	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Driveway 1 (Phase I)	NB	N/A	N/A	N/A	N/A	55	0.43	14	B	55	0.43	14	B
Driveway 2 (Phase II)	NB	N/A	N/A	N/A	N/A	12	0.14	10.1	B	12	0.14	10.1	B
Driveway 3 (Phase II)	NB	N/A	N/A	N/A	N/A	3	0.04	9.6	A	3	0.04	9.6	A
Driveway 4 (Phase II)	NB	N/A	N/A	N/A	N/A	6	0.07	9.9	A	6	0.07	9.9	A

2022 ANALYSIS

A. TRAFFIC VOLUME CONDITIONS

TRIP GENERATION

The 2022 Build Scenario assumes the completion of Phases I, II, and III of the Austin Oaks development. ***Table 16*** summarizes the Daily, and Weekday AM and PM peak hour trip generation the 2022 Build Scenario based on ITE methodology. 2022 Net New External Trips represent the comprehensive site traffic added to the adjacent roadway network after the completion of Phases I, II, and III.

Table 16 – 2022 Build Trip Generation

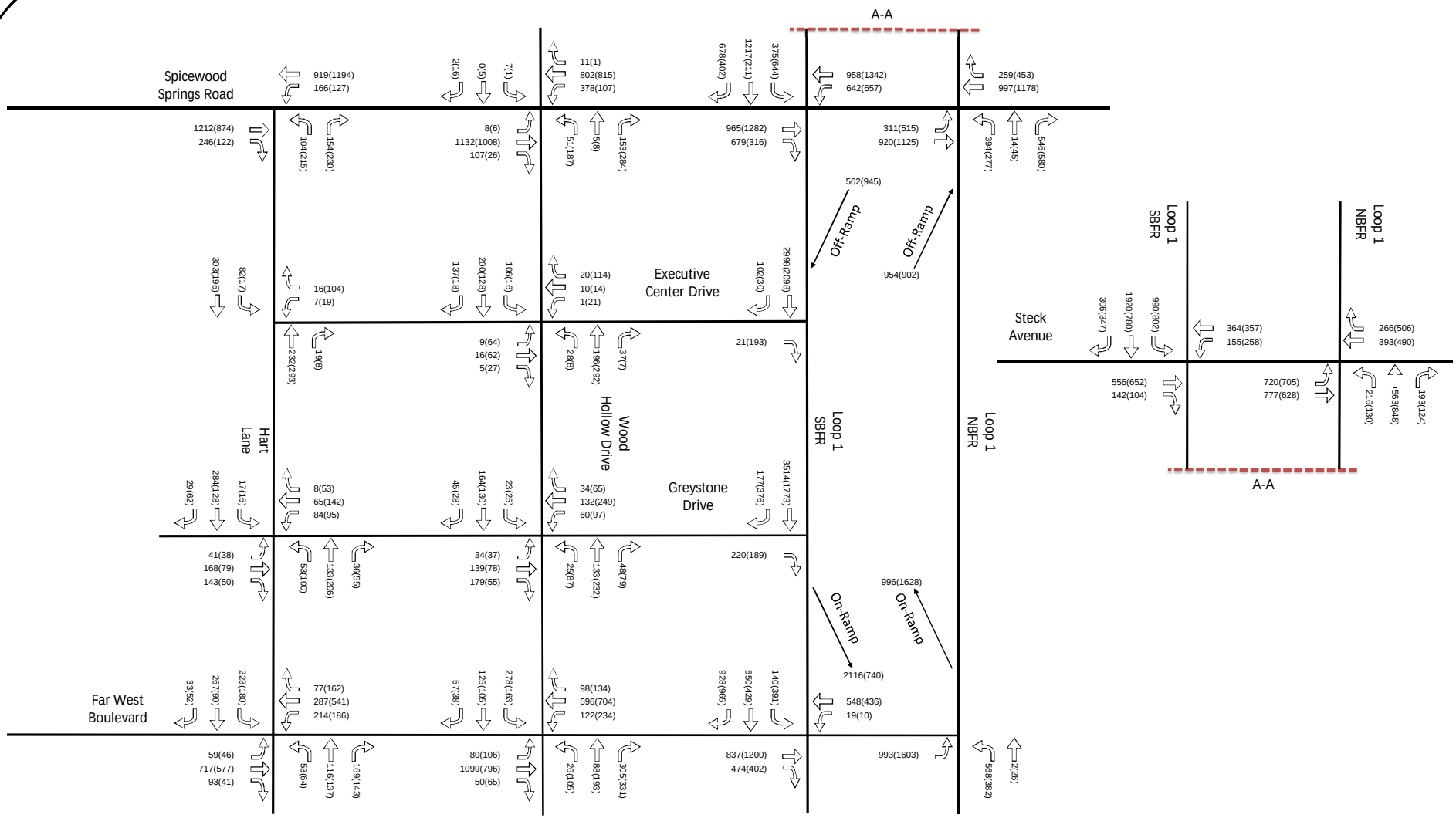
Land Use	Amount	Units	ITE Code	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
					In	Out	Total	In	Out	Total
Existing General Office Building	445.322	1,000 Sq Ft	710	4,086	556	76	632	98	479	577
Existing General Office Building (To Remain)	101.77	1,000 Sq Ft	710	1,332	171	23	194	33	159	192
Reduction in Existing Office Trips				2,754	385	53	438	65	320	385
Apartment	250	Dwelling Unit(s)	220	1,640	25	101	126	101	54	155
Hotel	100	Room(s)	310	818	31	22	53	31	29	60
General Office Building	422.000	1,000 Sq Ft	710	3,921	533	72	605	94	457	551
Medical-Dental Office Building	110.000	1,000 Sq Ft	720	4,283	208	55	263	89	228	317
Retail/High-Turnover (Sit-Down) Restaurant	46.700	1,000 Sq Ft	932	5,938	278	227	505	276	184	460
2022 Net New Trips				13,846	690	424	1,114	526	632	1,158
Internal Capture Trip Reduction (5%):				830	54	24	78	30	48	77
2022 Net New External Trips				**13,016**	**636**	**400**	**1,036**	**496**	**584**	**1,081**

TRIP DISTRIBUTION AND ASSIGNMENT

The 2022 Global Trip Assignment Volumes, shown as ***Exhibit 24,*** are the product of the Global Trip Distribution Percentages (***Exhibit 6)*** and 2022 Net New External Trips. The 2022 Local Trip Distribution Percentages, shown as ***Exhibit 25***, were developed based on the size and location of the Austin Oaks development expected to be completed by year 2022. Similar to the global assignment volumes, local percentages were applied to the net external trips to calculate the 2022 Local Trip Assignment Volumes (shown as ***Exhibit 26***).

TOTAL TRAFFIC VOLUMES

The assignment volumes were added to 2022 No Build Volumes (***Exhibit 23***) to determine the 2022 Build Traffic Volumes. Existing office trips were not assumed at site driveways, therefor the in and out movements to/from these driveways do not include the Reduction in Existing Office Trips. The weekday AM and PM peak hour traffic volumes used for the analysis of the 2022 Build and Mitigated scenarios shown in ***Exhibit 27*** and ***Exhibit 28*** for global and local volumes, respectively.



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

EXHIBIT 23

2022 BACKGROUND VOLUMES

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

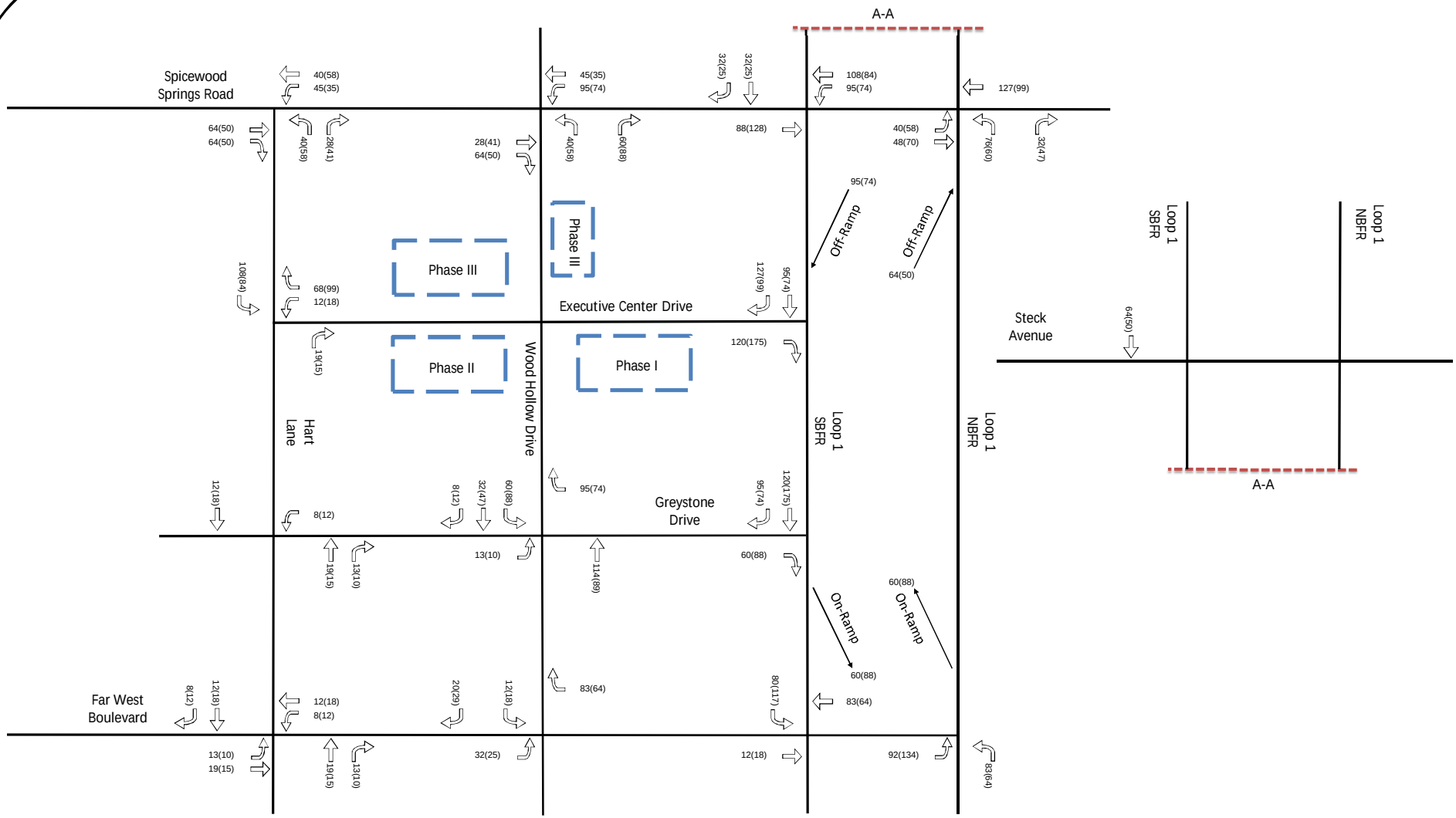


EXHIBIT 24

2022 GLOBAL TRIP ASSIGNMENT

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

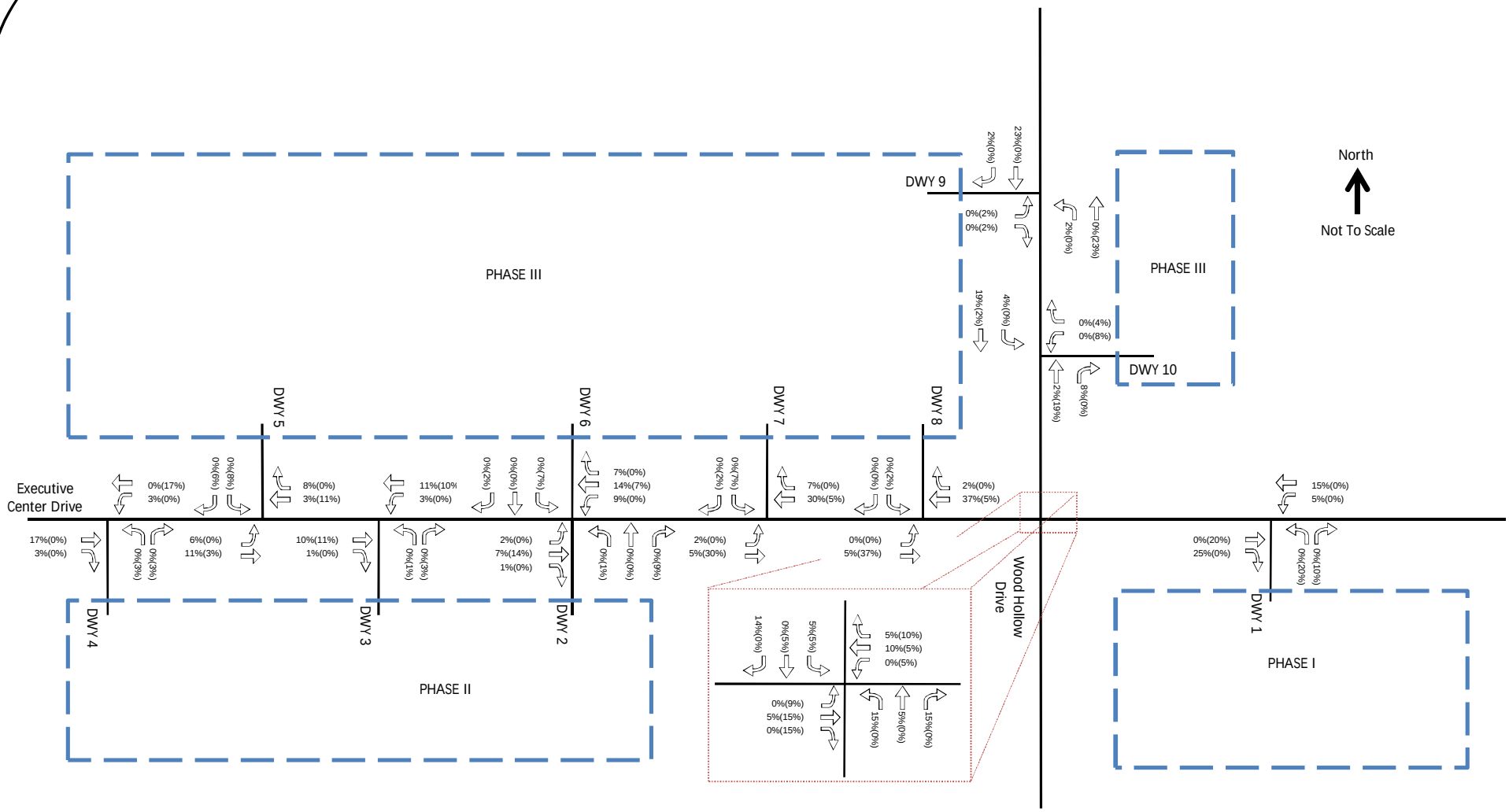


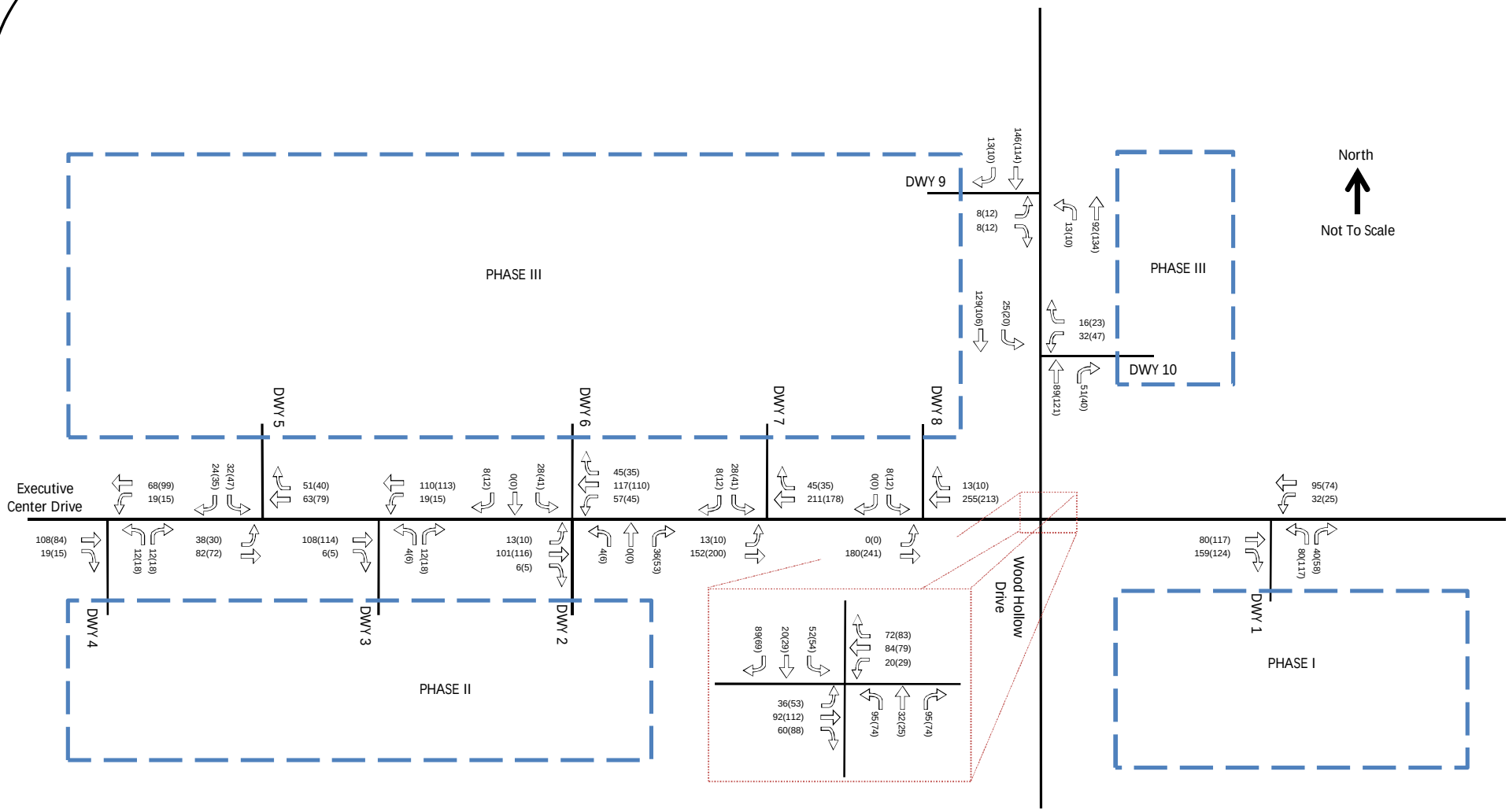
EXHIBIT 25

2022 LOCAL TRIP DISTRIBUTION

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements

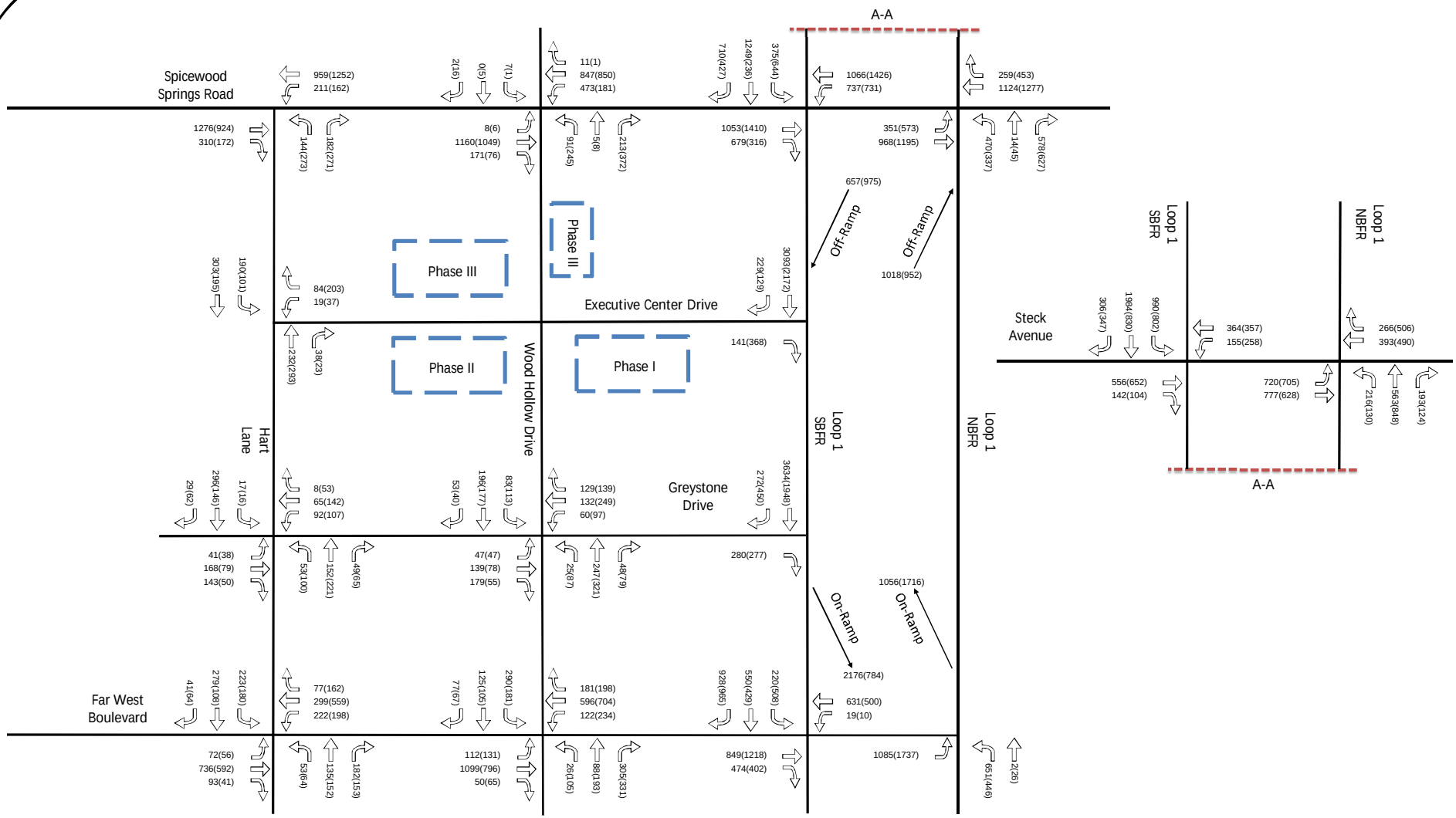
EXHIBIT 26

2022 LOCAL TRIP ASSIGNMENT

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

EXHIBIT 27

2022 BUILD VOLUMES (GLOBAL)

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

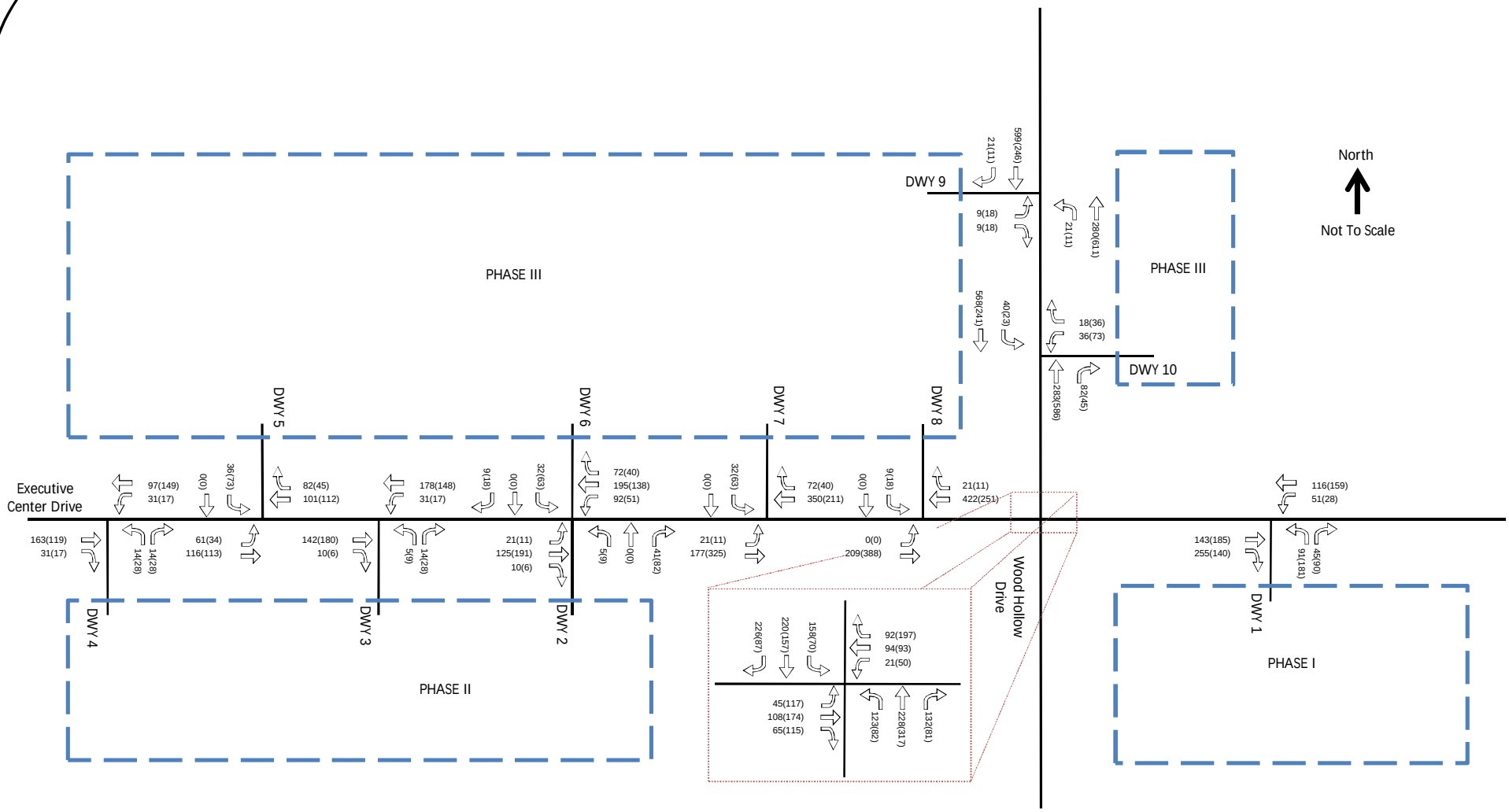


EXHIBIT 28

2022 BUILD VOLUMES (LOCAL)

AUSTIN OAKS TIA

LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

Kimley»Horn

4/18/2016

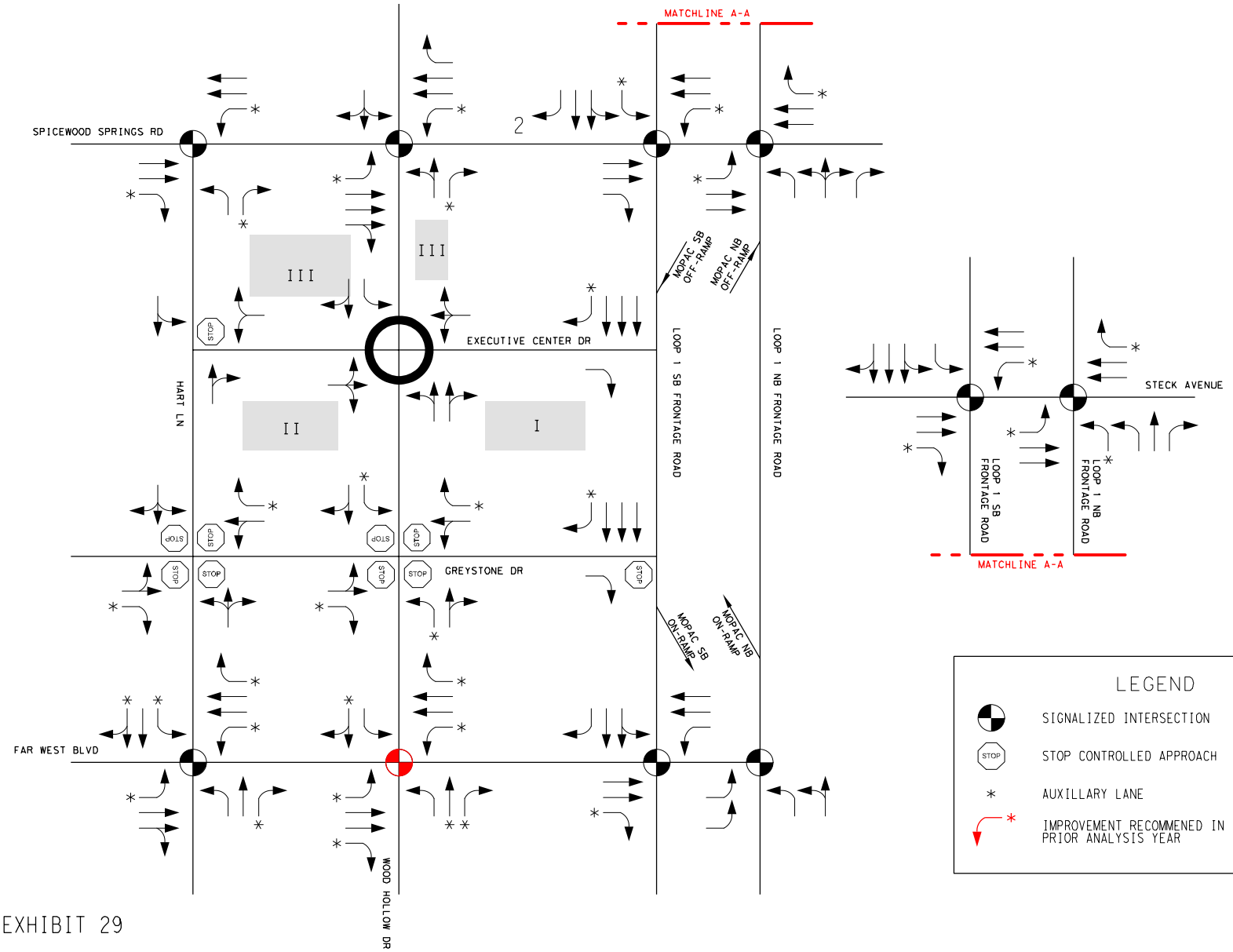


EXHIBIT 29

2022 BUILD LANE ASSIGNMENTS AND TRAFFIC CONTROL

AUSTIN OAKS TIA

Kimley»Horn

B. 2022 BUILD ANALYSIS RESULTS

The analysis was performed using the 2022 Build Lane Assignments and Traffic Control, shown as ***Exhibit 29***, which incorporates improvements recommended in analysis years prior to 2022. ***Table 17*** and ***Table 18*** summarize the intersection operations for the 2022 Build Scenario AM and PM peak hours, respectively. Synchro reports for all 2018 analyses are provided as ***Appendix P.*** Noteworthy traffic operations at intersections are as follows:

- *Spicewood Springs Road & Wood Hollow Drive*. The northbound approach of Wood Hollow Drive at Spicewood Springs Road experiences an unacceptable LOS in the PM peak hour. The volume of the northbound approach, the signal timing splits, and a 150 second cycle length are all factors which contribute to the delay at this approach.

- *Far West Boulevard & Wood Hollow Drive*. The intersection of Wood Hollow Drive and Far West Boulevard is nearing capacity and an unacceptable LOS is reported at multiple approaches.

- *Spicewood Springs Road & Loop 1*. Similar to existing conditions the intersection of Spicewood Springs Road and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Greystone Drive & Loop 1.* Similar to existing conditions the eastbound approach of Greystone Drive at Loop 1 SBFR continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Far West Boulevard & Loop 1*. Similar to existing conditions the intersection of Far West Boulevard and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Steck Avenue & Loop 1*. Similar to existing conditions the intersection of Steck Avenue and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

C. 2022 IMPROVEMENTS

Based on the results of the 2022 Build analysis, the following improvement (shown in ***Exhibit 30)*** is recommended:

- *Far West Boulevard & Wood Hollow Drive (*1). Restripe the eastbound approach of Far West Boulevard at Wood Hollow Drive. The outside lane of the eastbound approach is currently striped as an exclusive right-turn lane and there are three eastbound receiving lanes. To prevent weaving downstream of Wood Hollow Drive the City should consider restriping the outside lane of Far West Boulevard as a shared thru-right until Loop 1 SBFR.

An exhibit showing the 2022 Improvement at a conceptual level is provided as ***Appendix K***.

D. 2022 MITIGATED ANALYSIS RESULTS

The 2022 Mitigated analysis was performed using the 2022 Build Traffic Volumes and incorporates the 2022 Improvements enumerated above. ***Table 17*** and ***Table 18*** summarize the intersection operations for the 2022 Mitigated Scenario AM and PM peak hours, respectively. The 2022 improvements reduce delay such that all approaches in the study area, with the exception of intersections along Loop 1, operate at an acceptable LOS or report delay less than the No Build scenario.

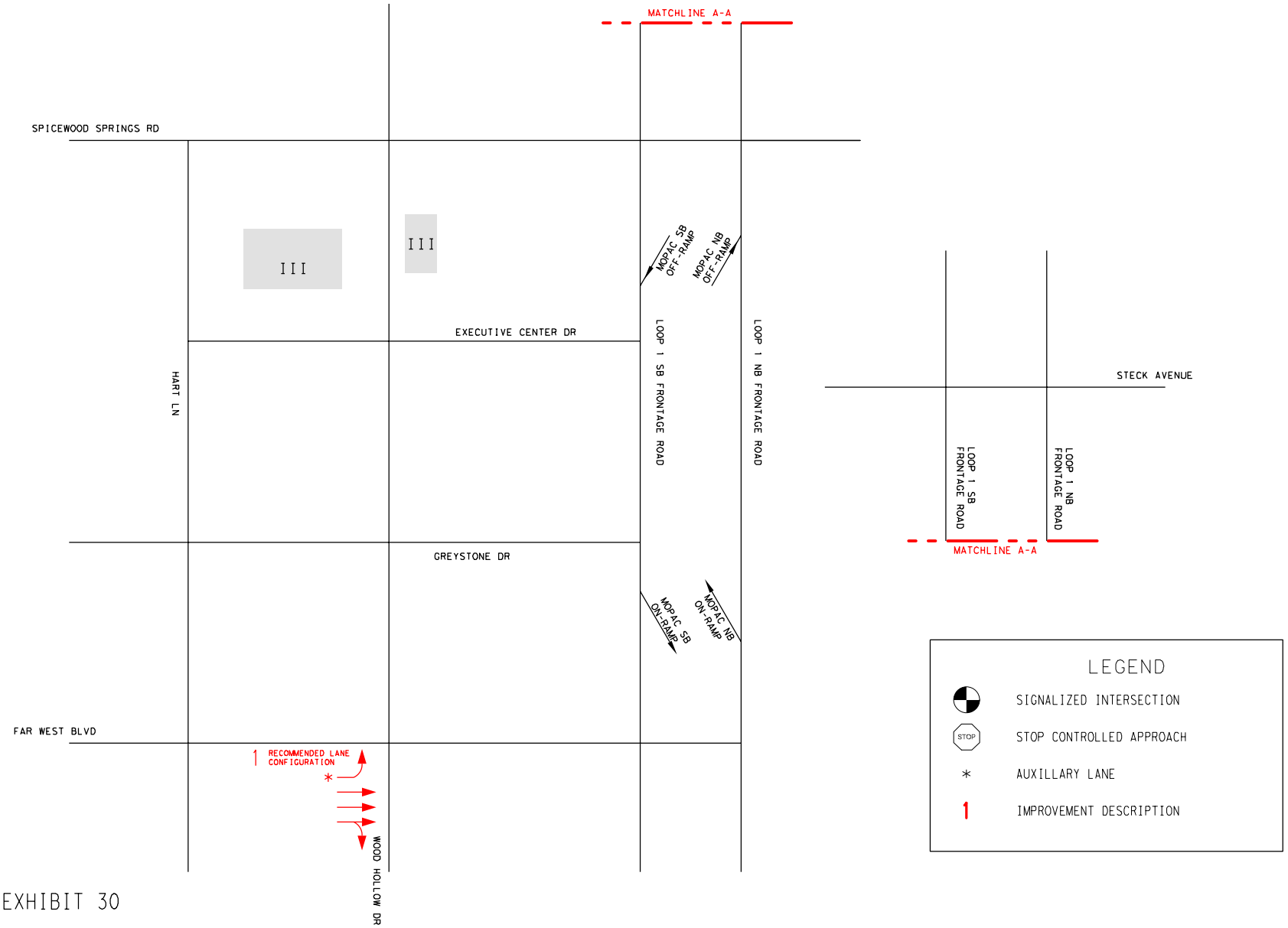


EXHIBIT 30

2022 IMPROVEMENTS

AUSTIN OAKS TIA

Kimley»Horn

TABLE 17

2022 INTERSECTION AM PEAK HOUR ANALYSIS RESULTS

AUSTIN OAKS TIA

Required Study Area			2022 No Build Condition				2022 Build Condition				2022 Mitigated Condition			
Intersection	**Traffic Control**	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Spicewood Springs Road & Hart Lane	TWSC/ Signalized	EB	0	0.37	0	FREE	521	0.72	25.3	C	521	0.72	25.3	C
		WB	33	0.31	2.2	STOP*	276	0.49	8.1	A	263	0.49	7.8	A
		NB	***160***	***0.78***	***47.5***	***E***	187	0.72	28.7	C	187	0.72	28.7	C
		INT							19.1	B			19	B
Spicewood Springs Road & Wood Hollow Drive	Signalized	EB	289	0.5	21.1	C	497	0.68	33.5	C	497	0.68	33.5	C
		WB	m233	0.89	21	C	m193	1	32.5	C	m193	1	32.4	C
		NB	85	0.22	45.3	D	125	0.32	27.5	C	125	0.32	27.5	C
		SB	0	0.01	43.3	D	0	0.01	38.5	D	0	0.01	38.5	D
		INT			23	C			32.4	C			32.4	C
Spicewood Springs Road & Loop 1 SBFR	Signalized	EB	***#730***	***1.69***	***306.9***	***F***	***#818***	***1.48***	***177.8***	***F***	***#818***	***1.48***	***175***	***F***
		WB	m#618	0.95	20.8	C	m#655	1.1	35.4	D	m#655	1.1	35.4	D
		SB	***m181***	***1.34***	***157.1***	***F***	***m178***	***1.38***	***178.5***	***F***	***m178***	***1.38***	***178.5***	***F***
		INT			***162.2***	***F***			***134.3***	***F***			***133.5***	***F***
Spicewood Springs Road & Loop 1 NBFR	Signalized	EB	m31	0.48	1.9	A	m31	0.51	2.3	A	m31	0.51	2.3	A
		WB	514	0.86	42.9	D	***#654***	***0.97***	***55.1***	***E***	***#654***	***0.97***	***55.1***	***E***
		NB	***#480***	***1.47***	***141.1***	***F***	***#704***	***1.63***	***205.7***	***F***	***#704***	***1.63***	***205.7***	***F***
		INT			***55.5***	***E***			***79.1***	***E***			***79.1***	***E***
Executive Center Drive & Hart Lane	TWSC	WB	4	0.05	12.3	B	25	0.25	15	B	25	0.25	15	B
		NB	0	0.18	0	FREE	0	0.19	0	FREE	0	0.19	0	FREE
		SB	6	0.08	2.3	FREE	17	0.18	4.5	FREE	17	0.18	4.5	FREE
Executive Center Drive & Wood Hollow Drive	TWSC/ Roundabout	EB	11	0.12	20	C	40	0.354	9.7	A	40	0.354	9.7	A
		WB	7	0.08	14.2	B	20	0.336	9.4	A	20	0.336	9.4	A
		NB	2	0.03	1.1	FREE	60	0.517	10.7	FREE	60	0.517	10.7	B
		SB	8	0.09	2.7	FREE	80	0.603	11.7	FREE	80	0.603	11.7	B
Executive Center Dr. & Loop 1 SBFR	TWSC	EB	3	0.03	10.5	B	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
		SB	0	0.74	0	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
Greystone Drive & Hart Lane	AWSC	EB	62	0.537	16.3	C	68	0.565	17.8	C	68	0.565	17.8	C
		WB	40	0.417	16.3	C	48	0.461	18.1	C	48	0.461	18.1	C
		NB	62	0.532	17.7	C	86	0.634	22.1	C	86	0.634	22.1	C
		SB	130	0.751	27.1	D	160	0.813	34.6	D	160	0.813	34.6	D
		INT			20	B			24	C			24	C
Greystone Drive & Wood Hollow Drive	AWSC	EB	32	0.361	12.3	B	48	0.47	16.5	C	48	0.47	16.5	C
		WB	40	0.414	13.8	B	52	0.492	16.5	C	52	0.492	16.5	C
		NB	36	0.379	13.3	B	112	0.715	26.7	D	112	0.715	26.7	D
		SB	42	0.436	14.2	B	78	0.603	19.8	C	78	0.603	19.8	C
		INT			13.3	B			19.8	B			19.8	B
Greystone Drive & Loop 1 SBFR	TWSC	EB	***389***	***1.54***	***327.5***	***F***	***536***	***1.81***	***436.3***	***F***	***536***	***1.81***	***436.3***	***F***
		SB	0	0.86	0	FREE	0	0.74	0	FREE	0	0.74	0	FREE
Faw West Boulevard & Hart Lane	Signalized	EB	414	0.77	40.4	D	426	0.63	28.1	C	426	0.63	28.1	C
		WB	#235	0.75	48.2	D	233	0.67	39	D	233	0.67	39.1	D
		NB	***214***	***0.85***	***66.3***	***E***	196	0.73	51.7	D	196	0.73	51.7	D
		SB	***#344***	***0.94***	***71.8***	***E***	262	0.84	54.5	D	262	0.84	54.5	D
		INT			53.3	D			40.4	D			40.4	D
Faw West Boulevard & Wood Hollow Drive	Signalized	EB	***m531***	***0.69***	***61.5***	***E***	***592***	***0.7***	***65.3***	***E***	384	0.51	32.2	C
		WB	m184	0.7	34.9	C	265	0.65	50.5	D	265	0.57	51	D
		NB	***#313***	***0.94***	***95.3***	***F***	***#225***	***0.94***	***83.8***	***F***	***#225***	***0.94***	***83.8***	***F***
		SB	#385	0.7	43.8	D	#410	0.72	44.8	D	#410	0.72	44.8	D
		INT			***56.1***	***E***			***60.2***	***E***			46.8	D
Faw West Boulevard & Loop 1 SBFR	Signalized	EB	m416	0.65	19.6	B	m444	0.66	20.2	C	m444	0.66	22.3	C
		WB	0	0.46	1.9	A	m14	0.53	6.1	A	m14	0.53	6.1	A
		SB	***m442***	***1.09***	***58.3***	***E***	m214	0.6	12.6	B	m214	0.6	13.3	B
		INT			34.6	C			14.2	B			15.3	B
Faw West Blvd. & Loop 1 NBFR	Signalized	EB	14	0.46	3	A	23	0.54	5.5	A	23	0.54	5.5	A
		NB	347	0.68	46.3	D	#425	0.64	40.3	D	#425	0.64	40.3	D
		INT			18.8	B			18.6	B			18.5	B
Steck Avenue & Loop 1 SBFR	Signalized	EB	***#388***	***0.99***	***78.8***	***E***	***#388***	***0.99***	***78.8***	***E***	***#388***	***0.99***	***78.8***	***E***
		WB	m64	0.45	5.7	A	m64	0.45	5.7	A	m64	0.45	5.7	A
		SB	***#1710***	***1.46***	***209.3***	***F***	***#1774***	***1.5***	***222.9***	***F***	***#1774***	***1.5***	***222.9***	***F***
		INT			***164.9***	***F***			***175.5***	***F***			***175.5***	***F***
Steck Avenue & Loop 1 NBFR	Signalized	EB	m126	0.69	4.7	A	m123	0.69	4.7	A	m123	0.69	4.7	A
		WB	***#250***	***0.82***	***59.5***	***E***	***#250***	***0.82***	***59.5***	***E***	***#250***	***0.82***	***59.5***	***E***
		NB	***m#1349***	***2.92***	***724.5***	***F***	***m#1336***	***2.92***	***723.1***	***F***	***m#1336***	***2.92***	***723.1***	***F***
		INT			***239.8***	***F***			***239.3***	***F***			***239.3***	***F***
Site Driveways (Stop-Controlled Approach Only)			**2022 No Build Condition**				**2022 Build Condition**				**2022 Mitigated Condition**			
Intersection		**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Driveway 1 (Phase I)		NB	N/A	N/A	N/A	N/A	27	0.27	14	B	27	0.27	14	B
Driveway 2 (Phase II)		NB	N/A	N/A	N/A	N/A	5	0.06	10	A	5	0.06	10	A
Driveway 6 (Phase III)		SB	N/A	N/A	N/A	N/A	10	0.12	16	C	10	0.12	16	C
Driveway 3 (Phase II)		NB	N/A	N/A	N/A	N/A	2	0.03	9.8	A	2	0.03	9.8	A
Driveway 4 (Phase II)		NB	N/A	N/A	N/A	N/A	3	0.04	10.3	B	3	0.04	10.3	B
Driveway 5 (Phase III)		SB	N/A	N/A	N/A	N/A	8	0.1	11	B	8	0.1	11	B
Driveway 7 (Phase III)		SB	N/A	N/A	N/A	N/A	8	0.1	13.8	B	8	0.1	13.8	B
Driveway 8 (Phase III)		SB	N/A	N/A	N/A	N/A	2	0.02	14.1	B	2	0.02	14.1	B
Driveway 9 (Phase III)		EB	N/A	N/A	N/A	N/A	5	0.06	16.1	C	5	0.06	16.1	C
Driveway 10 (Phase III)		WB	N/A	N/A	N/A	N/A	20	0.22	21.9	C	20	0.22	21.9	C

TABLE 18

2022 INTERSECTION PM PEAK HOUR ANALYSIS RESULTS

AUSTIN OAKS TIA

Required Study Area			2022 No Build Condition				2022 Build Condition				2022 Mitigated Condition			
Intersection	**Traffic Control**	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Spicewood Springs Road & Hart Lane	TWSC/ Signalized	EB	0	0.29	0	FREE	#381	0.99	47.1	D	#381	0.99	47.1	D
		WB	19	0.39	1.1	STOP*	126	0.39	2.5	A	126	0.39	2.5	A
		NB	***776***	***1.68***	***351.7***	***F***	#212	0.8	19.4	B	#212	0.8	19.4	B
		INT							21.5	C			21.5	C
Spicewood Springs Road & Wood Hollow Drive	Signalized	EB	219	0.35	12.1	B	m272	0.57	18.8	B	m272	0.57	18.8	B
		WB	m210	0.39	10	A	m304	0.76	21	C	m304	0.76	21	C
		NB	***#347***	***0.86***	***70.6***	***E***	328	0.61	35.9	D	328	0.61	35.9	D
		SB	32	0.03	49.1	D	25	0.02	31.6	C	25	0.02	31.6	C
		INT			23	C			23.5	C			23.5	C
Spicewood Springs Road & Loop 1 SBFR	Signalized	EB	***#1132***	***1.52***	***250***	***F***	***#1282***	***1.67***	***293.3***	***F***	***#1282***	***1.67***	***293.3***	***F***
		WB	m666	0.84	14.5	B	m794	0.93	18	B	m794	0.93	18	B
		SB	***#674***	***1.23***	***135***	***F***	***#674***	***1.23***	***150.4***	***F***	***#674***	***1.23***	***150.4***	***F***
		INT			***123.2***	***F***			***142.9***	***F***			***142.9***	***F***
Spicewood Springs Road & Loop 1 NBFR	Signalized	EB	m106	0.87	7.7	A	m101	0.96	9.5	A	m101	0.96	9.5	A
		WB	647	0.81	37.6	D	730	0.88	41.1	D	730	0.88	41.1	D
		NB	***#628***	***1.57***	***213.6***	***F***	***#701***	***1.75***	***280.8***	***F***	***#701***	***1.75***	***280.8***	***F***
		INT			***63.9***	***E***			***82.4***	***F***			***82.4***	***F***
Executive Center Drive & Hart Lane	TWSC	WB	28	0.28	13.4	B	101	0.61	22	C	101	0.61	22	C
		NB	0	0.24	0	FREE	0	0.25	0	FREE	0	0.25	0	FREE
		SB	1	0.02	0.8	FREE	10	0.12	3.7	FREE	10	0.12	3.7	FREE
Executive Center Drive & Wood Hollow Drive	TWSC/ Roundabout	EB	100	0.63	33.5	D	120	0.7	18.4	C	120	0.7	18.4	C
		WB	43	0.38	16	C	160	0.804	32	D	160	0.804	32	D
		NB	1	0.01	0.3	FREE	140	0.769	21.5	FREE	140	0.769	21.5	C
		SB	1	0.02	1	FREE	40	0.391	8.3	FREE	40	0.391	8.3	A
Executive Center Dr. & Loop 1 SBFR	TWSC	EB	102	0.63	32.5	D	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
		SB	0	0.54	0	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
Greystone Drive & Hart Lane	AWSC	EB	20	0.248	11.5	B	20	0.258	12	B	20	0.258	12	B
		WB	52	0.486	14.8	B	60	0.529	16.3	C	60	0.529	16.3	C
		NB	86	0.628	18.2	C	108	0.691	21.6	C	108	0.691	21.6	C
		SB	34	0.371	12.8	B	42	0.42	13.9	B	42	0.42	13.9	B
		INT			15.1	B			17	B			17	B
Greystone Drive & Wood Hollow Drive	AWSC	EB	18	0.242	11.8	B	26	0.308	14.3	B	26	0.308	14.3	B
		WB	100	0.67	20.8	C	132	0.769	27	D	132	0.769	27	D
		NB	74	0.581	16.9	C	170	0.847	34.9	D	170	0.847	34.9	D
		SB	28	0.319	12.9	B	52	0.482	16.7	C	52	0.482	16.7	C
		INT			16.9	B			25.8	C			25.8	C
Greystone Drive & Loop 1 SBFR	TWSC	EB	***145***	***0.77***	***49.6***	***E***	***210***	***0.87***	***54.6***	***F***	***210***	***0.87***	***54.6***	***F***
		SB	0	0.49	0	FREE	0	0.43	0	FREE	0	0.43	0	FREE
Faw West Boulevard & Hart Lane	Signalized	EB	241	0.37	20.9	C	229	0.34	17	B	229	0.34	17	B
		WB	71	0.39	7.2	A	276	0.39	29.2	C	271	0.39	30.6	C
		NB	***200***	***0.77***	***60.7***	***E***	196	0.72	54.5	D	196	0.72	54.5	D
		SB	***193***	***0.77***	***61.9***	***E***	216	0.74	54.3	D	216	0.74	54.3	D
		INT			27.5	C			34.8	C			34	C
Faw West Boulevard & Wood Hollow Drive	Signalized	EB	224	0.53	17.3	B	465	0.6	37.2	D	311	0.44	33.9	C
		WB	m185	1	36.9	D	362	0.82	43.8	D	353	0.75	43.6	D
		NB	***#343***	***0.87***	***74.8***	***E***	200	0.81	51.9	D	256	0.81	50.6	D
		SB	***225***	***0.79***	***67.9***	***E***	***169***	***0.82***	***69.3***	***E***	***238***	***0.83***	***69.7***	***E***
		INT			41.7	D			46.2	D			44.9	D
Faw West Boulevard & Loop 1 SBFR	Signalized	EB	m640	0.79	21.6	C	#764	0.85	26.1	C	#753	0.85	26.2	C
		WB	17	0.28	3.7	A	17	0.32	3.3	A	17	0.32	3.3	A
		SB	***#1156***	***1.73***	***243***	***F***	***#666***	***1.2dl***	***61.3***	***E***	***#666***	***1.2dl***	***61.3***	***E***
		INT			***122.6***	***F***			39.8	D			39.9	D
Faw West Blvd. & Loop 1 NBFR	Signalized	EB	***m#940***	***1.05***	***56.1***	***E***	***m#1001***	***1.13***	***88.8***	***F***	***m#1001***	***1.13***	***88.9***	***F***
		NB	203	0.33	25.9	C	235	0.39	26.6	C	235	0.39	26.6	C
		INT			49.9	D			***75.5***	***E***			***75.6***	***E***
Steck Avenue & Loop 1 SBFR	Signalized	EB	***#422***	***0.98***	***75.6***	***E***	***#422***	***0.98***	***75.6***	***E***	***#422***	***0.98***	***75.6***	***E***
		WB	8	0.35	0.8	A	8	0.35	0.8	A	8	0.35	0.8	A
		SB	***#1098***	***1.51***	***276.1***	***F***	***#1134***	***1.55***	***292.6***	***F***	***#1134***	***1.55***	***292.6***	***F***
		INT			***178.9***	***F***			***190.1***	***F***			***190.1***	***F***
Steck Avenue & Loop 1 NBFR	Signalized	EB	m376	1.09	36.5	D	m351	1.09	36.5	D	m351	1.09	36.5	D
		WB	***#618***	***1.06***	***77.6***	***E***	***#618***	***1.06***	***77.6***	***E***	***#618***	***1.06***	***77.6***	***E***
		NB	***#1669***	***2.27***	***558.9***	***F***	***#1669***	***2.27***	***558.9***	***F***	***#1669***	***2.27***	***558.9***	***F***
		INT			***216.3***	***F***			***216.3***	***F***			***216.3***	***F***

Site Driveways (Stop-Controlled Approach Only)		2022 No Build Condition				2022 Build Condition				2022 Mitigated Condition			
Intersection	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Driveway 1 (Phase I)	NB	N/A	N/A	N/A	N/A	73	0.51	17.8	C	73	0.51	17.8	C
Driveway 2 (Phase II)	NB	N/A	N/A	N/A	N/A	11	0.13	10.5	B	11	0.13	10.5	B
Driveway 6 (Phase III)	SB	N/A	N/A	N/A	N/A	20	0.22	16.3	C	20	0.22	16.3	C
Driveway 3 (Phase II)	NB	N/A	N/A	N/A	N/A	4	0.05	10	A	4	0.05	10	A
Driveway 4 (Phase II)	NB	N/A	N/A	N/A	N/A	7	0.08	10.2	B	7	0.08	10.2	B
Driveway 5 (Phase III)	SB	N/A	N/A	N/A	N/A	17	0.19	11.1	B	17	0.19	11.1	B
Driveway 7 (Phase III)	SB	N/A	N/A	N/A	N/A	16	0.18	13.9	B	16	0.18	13.9	B
Driveway 8 (Phase III)	SB	N/A	N/A	N/A	N/A	4	0.05	14.3	B	4	0.05	14.3	B
Driveway 9 (Phase III)	EB	N/A	N/A	N/A	N/A	6	0.07	12.3	B	6	0.07	12.3	B
Driveway 10 (Phase III)	WB	N/A	N/A	N/A	N/A	44	0.39	24.2	C	44	0.39	24.2	C

2024 ANALYSIS

A. TRAFFIC VOLUME CONDITIONS

TRIP GENERATION

The 2024 Build Scenario assumes the completion of Phases I, II, III, and IV of the Austin Oaks development. ***Table 19*** summarizes the Daily, and Weekday AM and PM peak hour trip generation the 2024 Build Scenario based on ITE methodology. 2024 Net New External Trips represent the comprehensive site traffic added to the adjacent roadway network after the completion of Phase I, II, III, and IV.

Table 19 – 2024 Build Trip Generation

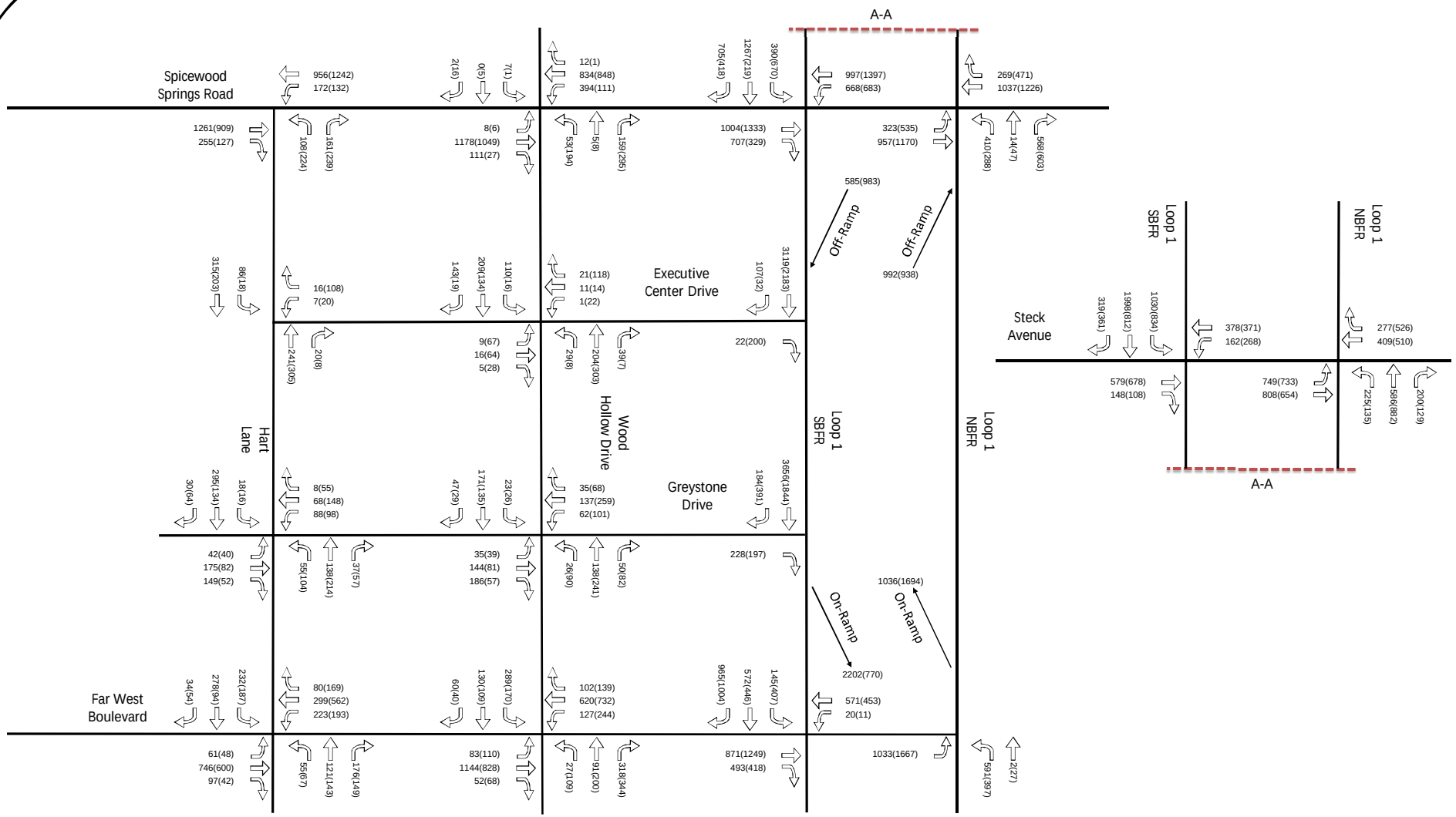
Land Use	Amount	Units	ITE Code	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
					In	Out	Total	In	Out	Total
Existing General Office Building	445.322	1,000 Sq Ft	710	4,086	556	76	632	98	479	577
Existing General Office Building (To Remain)	0	1,000 Sq Ft	710	0	0	0	0	0	0	0
Reduction in Existing Office Trips				4,086	556	76	632	98	479	577
Apartment	250	Dwelling Unit(s)	220	1,640	25	101	126	101	54	155
Hotel	100	Room(s)	310	818	31	22	53	31	29	60
General Office Building	672.995	1,000 Sq Ft	710	5,591	774	106	880	141	691	832
Medical-Dental Office Building	169.000	1,000 Sq Ft	720	6,695	319	85	404	131	336	467
Retail/High-Turnover (Sit-Down) Restaurant	46.700	1,000 Sq Ft	932	5,938	278	227	505	276	184	460
2024 Net New Trips				16,596	871	465	1,336	582	815	1,397
Internal Capture Trip Reduction (5%):				1,034	71	27	98	34	65	99
2024 Net New External Trips				**15,562**	**800**	**438**	**1,238**	**548**	**750**	**1,298**

TRIP DISTRIBUTION AND ASSIGNMENT

The 2024 Global Trip Assignment Volumes, shown as ***Exhibit 32,*** are the product of the Global Trip Distribution Percentages and 2024 Net New External Trips. The 2024 Local Trip Distribution Percentages, shown as ***Exhibit 33***, were developed based on the size and location of the Austin Oaks development expected to be completed by year 2024. Similar to the global assignment volumes, local percentages were applied to the net external trips to calculate the 2024 Local Trip Assignment Volumes (shown as ***Exhibit 34***).

TOTAL TRAFFIC VOLUMES

The assignment volumes were added to 2024 No Build Volumes (***Exhibit 31***) to determine the 2024 Build Traffic Volumes. Existing office trips were not assumed at site driveways, therefor the in and out movements to/from these driveways do not include the Reduction in Existing Office Trips. The weekday AM and PM peak hour traffic volumes used for the analysis of the 2024 Mitigated scenarios shown in ***Exhibit 35*** and ***Exhibit 36*** for global and local volumes, respectively.



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

EXHIBIT 31

2024 BACKGROUND VOLUMES

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

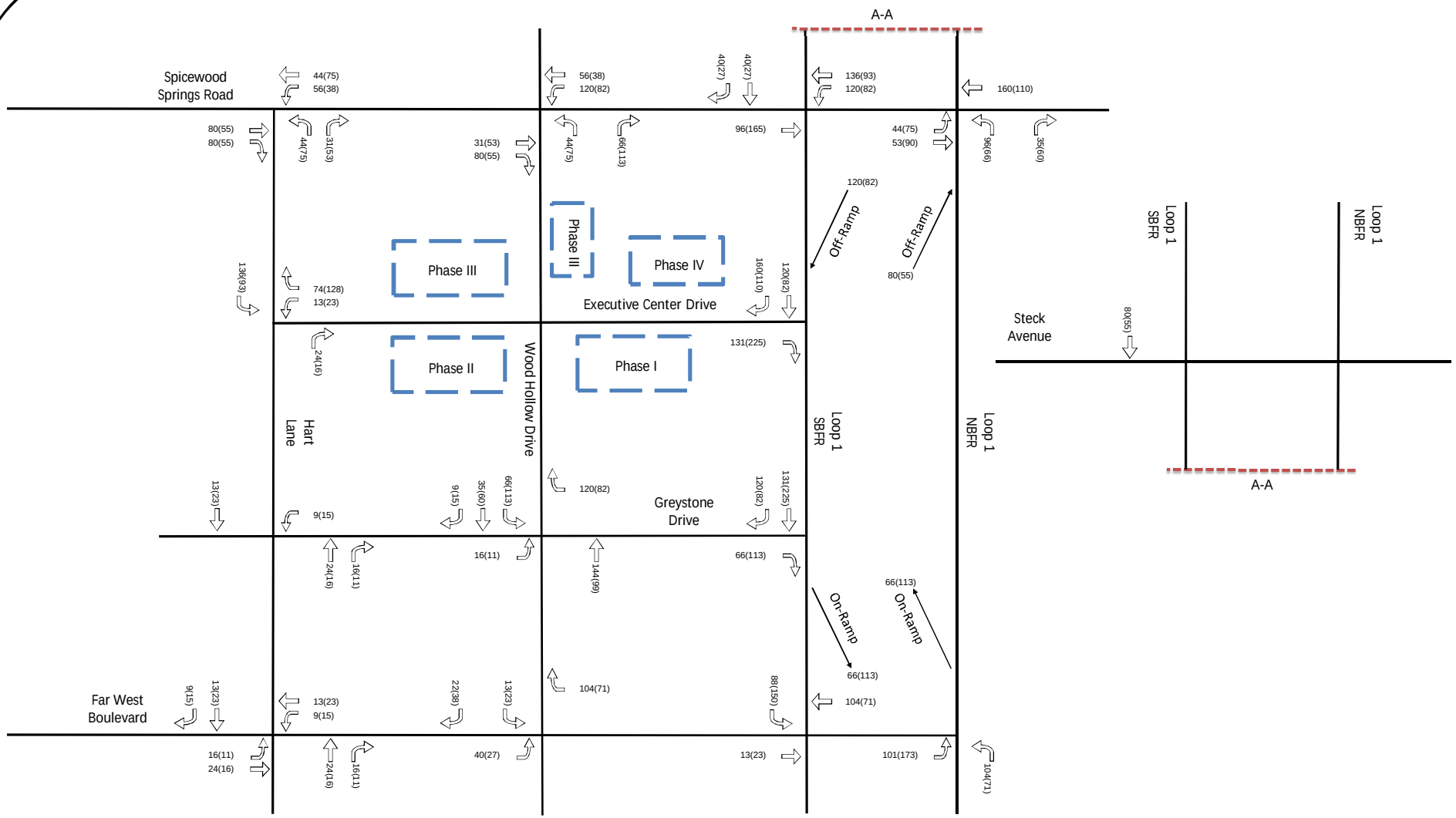


EXHIBIT 32

2024 GLOBAL TRIP ASSIGNMENT

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

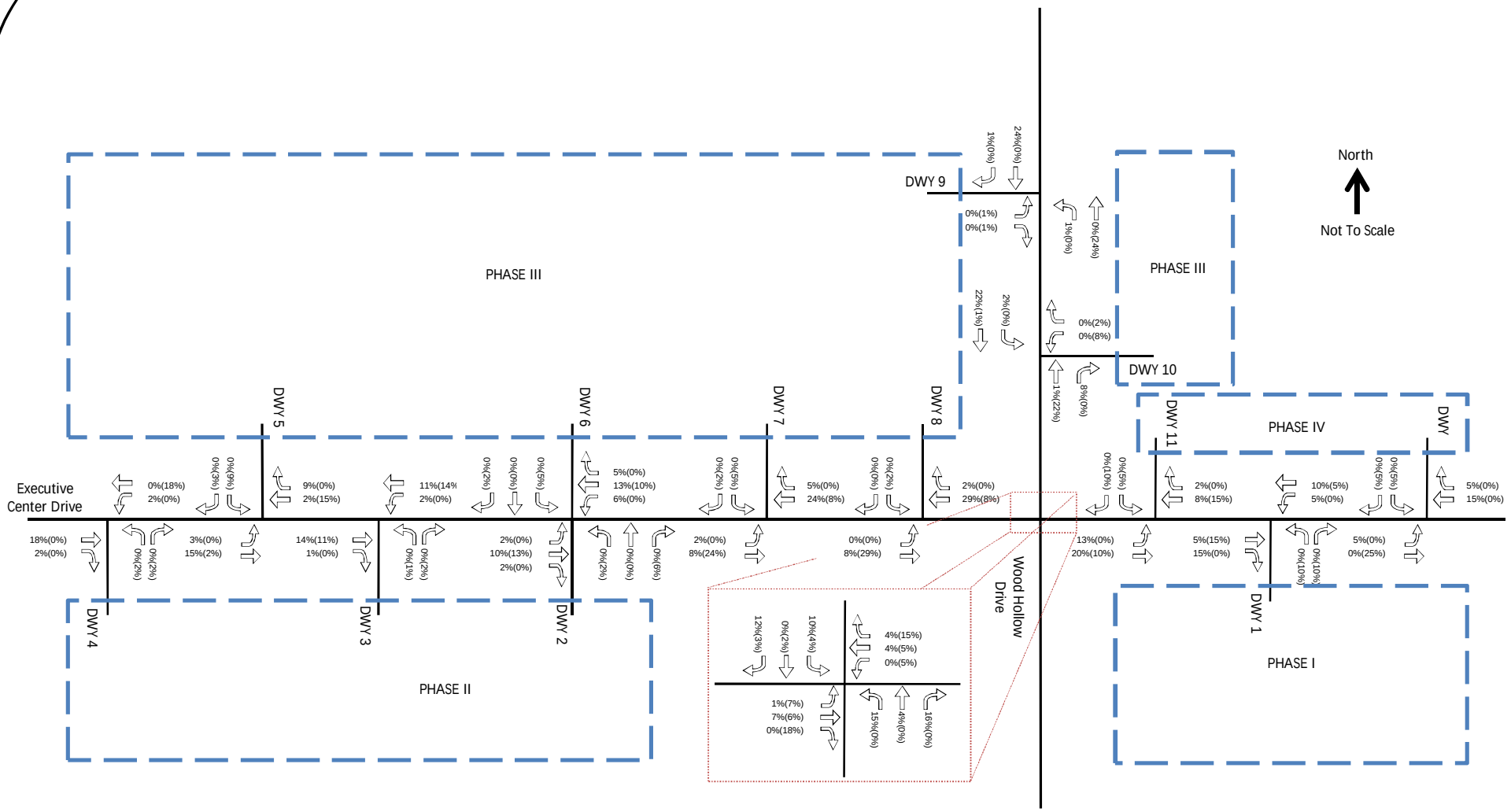


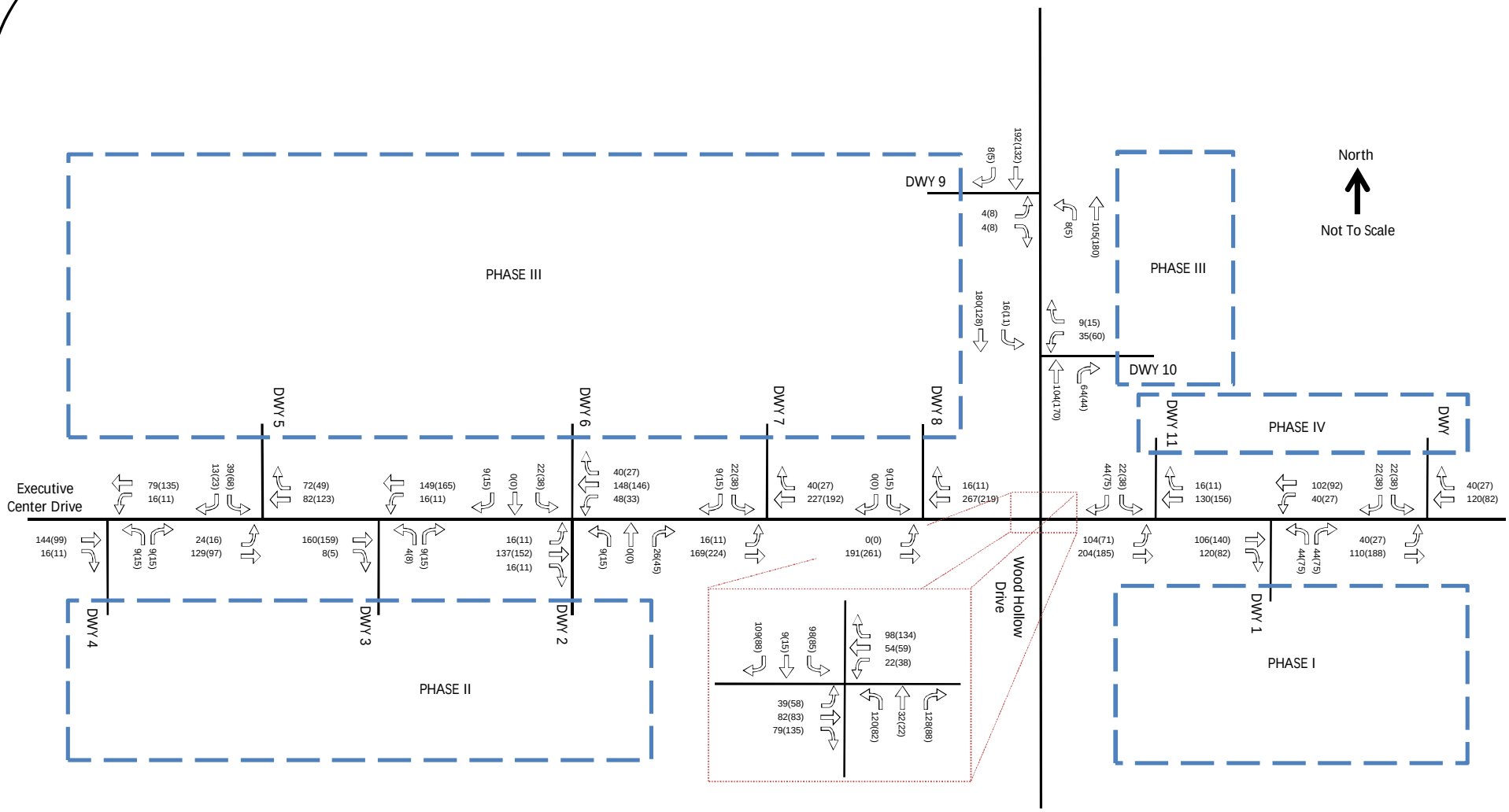
EXHIBIT 33

2024 LOCAL TRIP DISTRIBUTION

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements

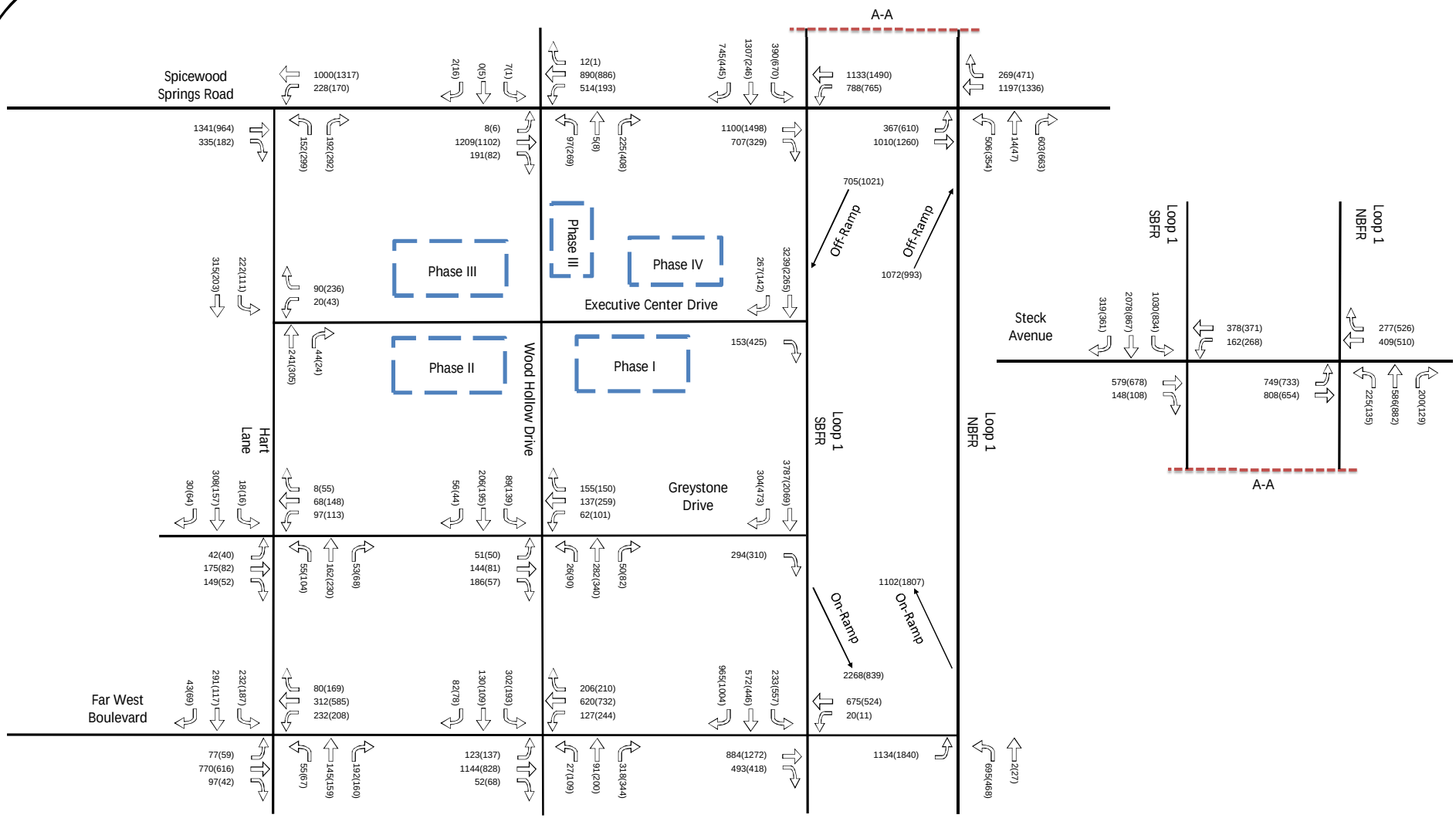
EXHIBIT 34

2024 LOCAL TRIP ASSIGNMENT

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016



LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

EXHIBIT 35

2024 BUILD VOLUMES (GLOBAL)

AUSTIN OAKS TIA

Kimley»Horn

4/18/2016

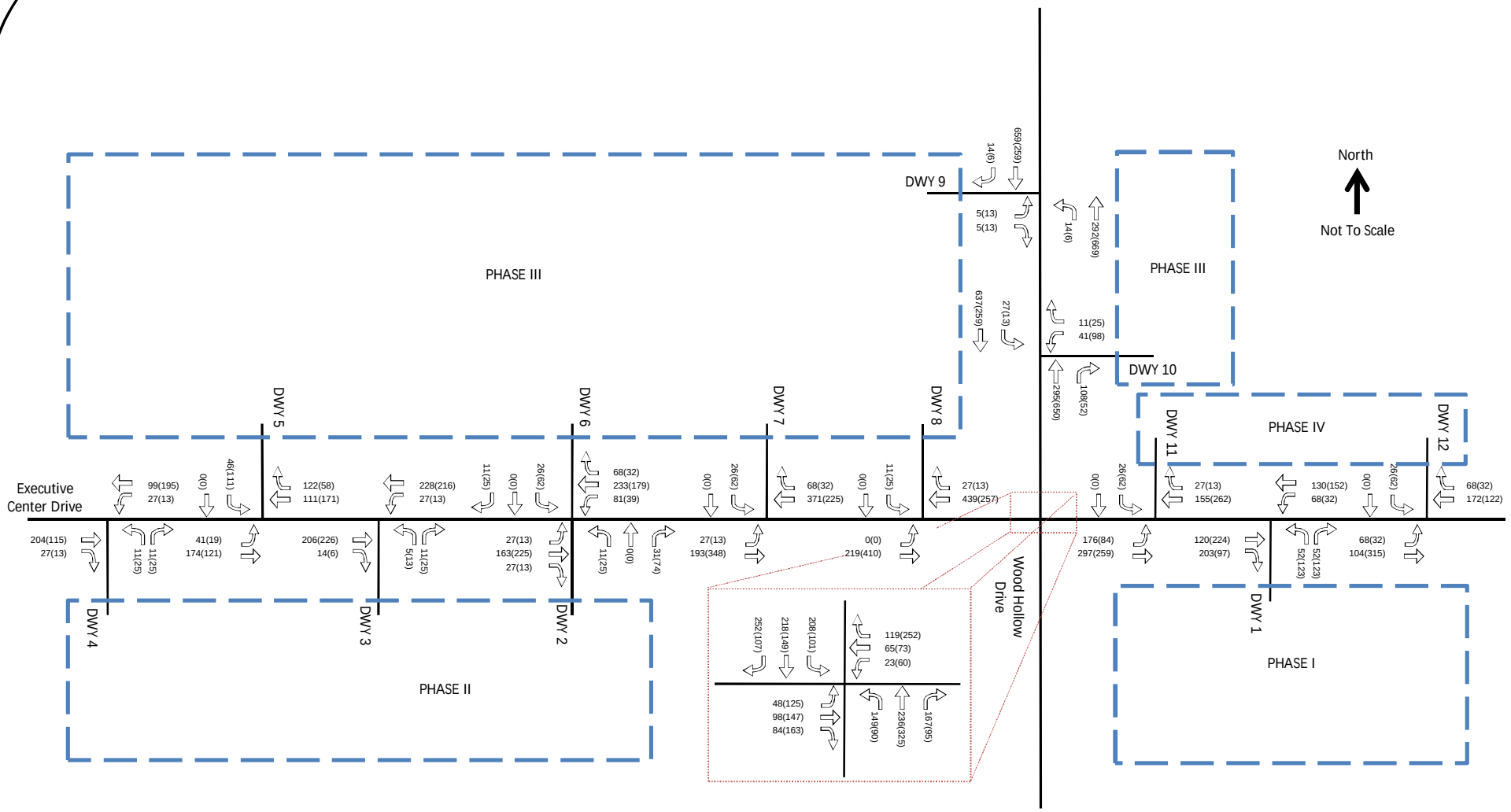


EXHIBIT 36

2024 BUILD VOLUMES (LOCAL)

AUSTIN OAKS TIA

LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

Kimley»Horn

4/18/2016

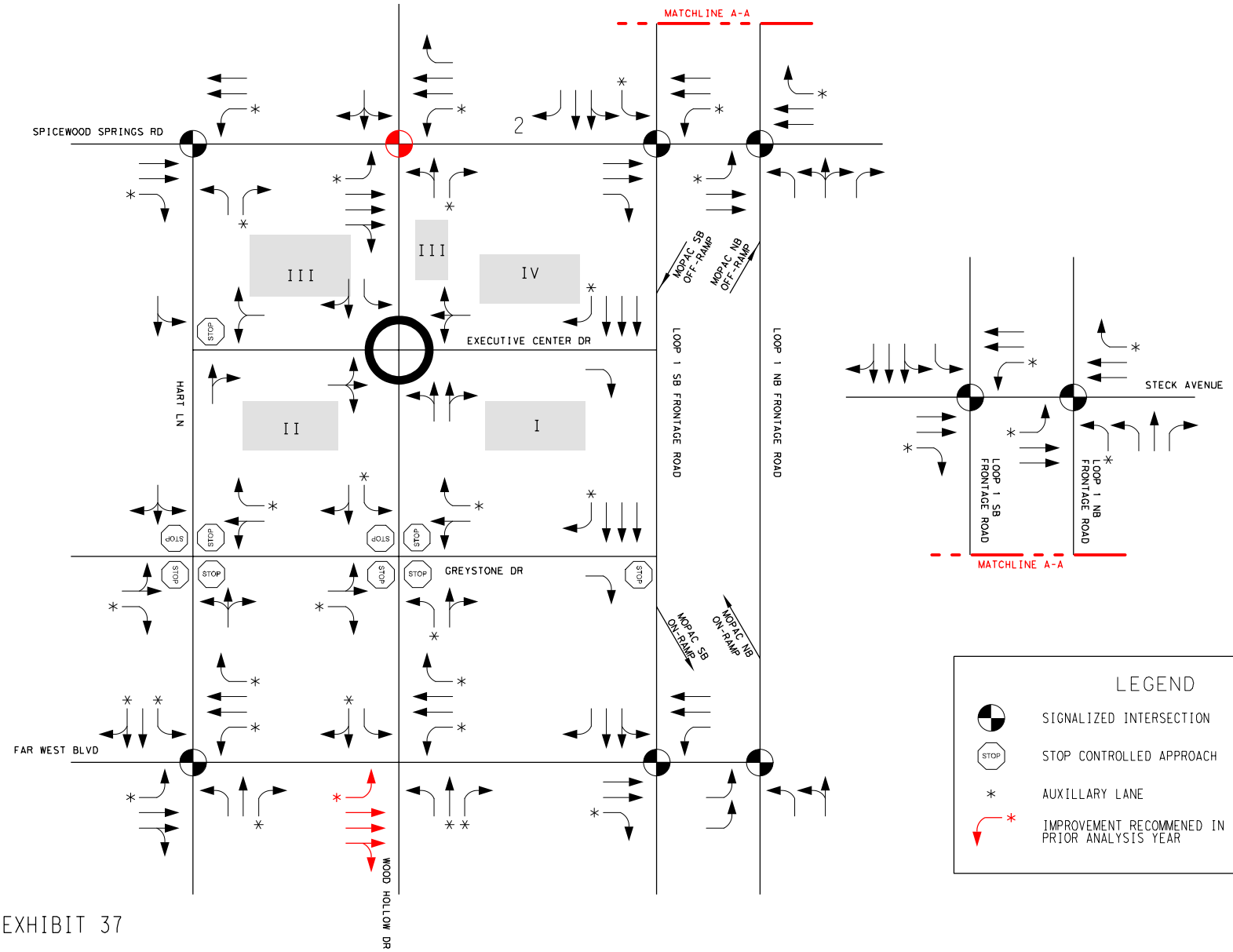


EXHIBIT 37

2024 BUILD LANE ASSIGNMENTS AND TRAFFIC CONTROL

AUSTIN OAKS TIA

Kimley»Horn

B. 2024 BUILD ANALYSIS RESULTS

The analysis was performed using the 2024 Build Lane Assignments and Traffic Control, shown as ***Exhibit 37***, which incorporates improvements recommended in analysis years prior to 2024. ***Table 20*** and ***Table 21*** summarize the intersection operations for the 2024 Build Scenario AM and PM peak hours, respectively. Synchro reports for all 2018 analyses are provided as ***Appendix Q.*** Noteworthy traffic operations at intersections are as follows:

- *Executive Center Drive & Hart Lane*. Vehicles making the 'westbound' left-turn movement from Executive Center Drive have difficulty finding gaps onto Hart Lane. Because the westbound approach is a single lane, the delay at the westbound left-turn movement is also experienced by vehicles waiting to turn right onto Hart Lane.

- *Greystone Drive & Hart Lane*. The southbound approach of Hart Lane at Greystone Drive experiences an unacceptable LOS due to the high volume at this approach and the capacity limitations of an all-way stop-controlled (AWSC) intersection.

- *Greystone Drive & Wood Hollow Drive*. The northbound approach of Wood Hollow Drive at Greystone Drive experiences an unacceptable LOS due to the high volume at this approach and the capacity limitations of an AWSC intersection.

- *Spicewood Springs Road & Loop 1*. Similar to existing conditions the intersection of Spicewood Springs Road and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Greystone Drive & Loop 1.* Similar to existing conditions the eastbound approach of Greystone Drive at Loop 1 SBFR continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Far West Boulevard & Loop 1*. Similar to existing conditions the intersection of Far West Boulevard and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

- *Steck Avenue & Loop 1*. Similar to existing conditions the intersection of Steck Avenue and Loop 1 continues to operate at an unacceptable LOS. (see Existing (2016) Analysis Mitigation Results)

C. 2024 IMPROVEMENTS

Based on the results of the 2024 Build analysis, the following improvements (shown in ***Exhibit 38***) are recommended:

- *Executive Center Drive & Hart Lane (1a).* Restripe the westbound approach of Executive Center Drive at Hart Lane to include two lanes: exclusive left-turn lane and exclusive right-turn lane. This improvement will allow the left-turn and right-turn movements to operate independently and improve the LOS of this approach.

- *Hart Lane between Executive Center Drive and Spicewood Springs Road (1b).* Restripe Hart Lane between Executive Center Drive and Spicewood Springs Road to provide a southbound left-turn bay from Hart Lane to Executive Center Drive. The storage provided in this bay will be minimum as space must be preserved to accommodate the northbound left-turn bay from Hart Lane to Spicewood Springs Road.

- *Greystone Drive & Hart Lane (2)*. Restripe the southbound approach of Hart Lane at Greystone Drive to include two thru lanes. This will require the south-leg of the intersection to be restriped to provide two receiving lanes. A cross-section which will accommodate three travel lanes and two bike lanes can be accomplished using existing pavement. We recommend that this improvement not be implement until necessary based on actual (not projected) traffic demands require it. It should be noted that, based on turning movement volumes, a single-lane roundabout would perform better and was evaluated at this location. However, due to right-of-way ROW) constraints a roundabout is not feasible nor recommended.

- *Greystone Drive & Wood Hollow Drive (3)*. Restripe the northbound approach of Wood Hollow Drive at Greystone Drive to include two thru lanes. This will require the north-leg of the intersection to be restriped to provide two receiving lanes. A cross-section which will accommodate three travel lanes and two bike lanes can be accomplished using existing pavement. We recommend that this improvement not be implement until necessary based on actual (not projected) traffic demands require it. It should be noted that, based on turning movement volumes, a single-lane roundabout would perform better and was evaluated at this location. However, due to ROW constraints a roundabout is not feasible nor recommended.

- *Far West Boulevard & Wood Hollow Drive. (4)* Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.

Exhibits showing 2024 Improvements at a conceptual level are provided as ***Appendix L***.

D. 2024 MITIGATED ANALYSIS RESULTS

The 2024 Mitigated analysis was performed using the 2024 Build Traffic Volumes and incorporates the 2024 Improvements enumerated above; 2024 Mitigated Lane Assignments and Traffic Control is shown as ***Exhibit 39***. ***Table 20*** and ***Table 21*** summarize the intersection operations for the 2024 Mitigated Scenario AM and PM peak hours, respectively. The 2024 improvements reduce delay such that all approaches in the study area, with the exception of intersections along Loop 1, operate at an acceptable LOS or report delay less than the No Build scenario.

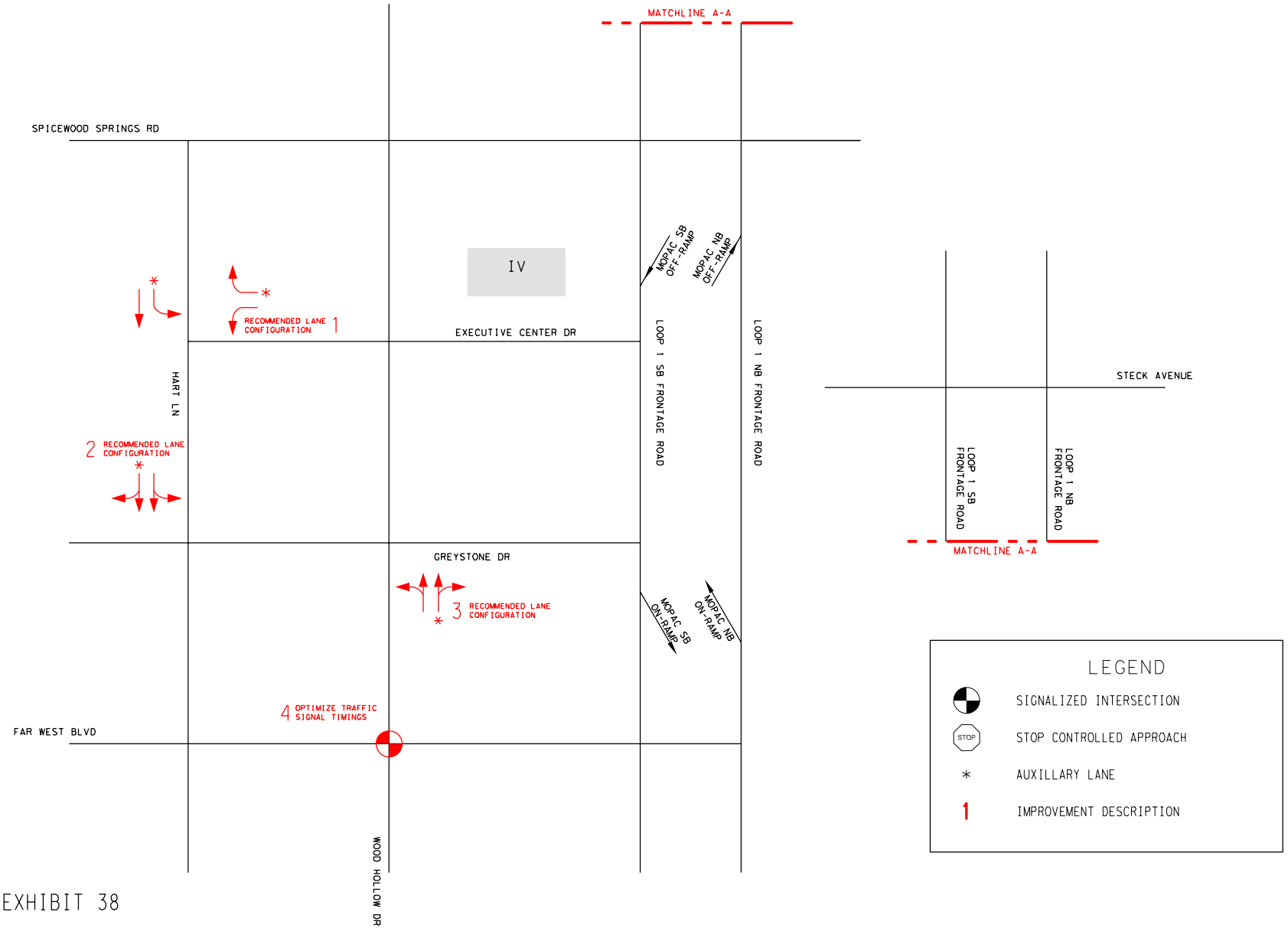


EXHIBIT 38

2024 IMPROVEMENTS

AUSTIN OAKS TIA

Kimley»Horn

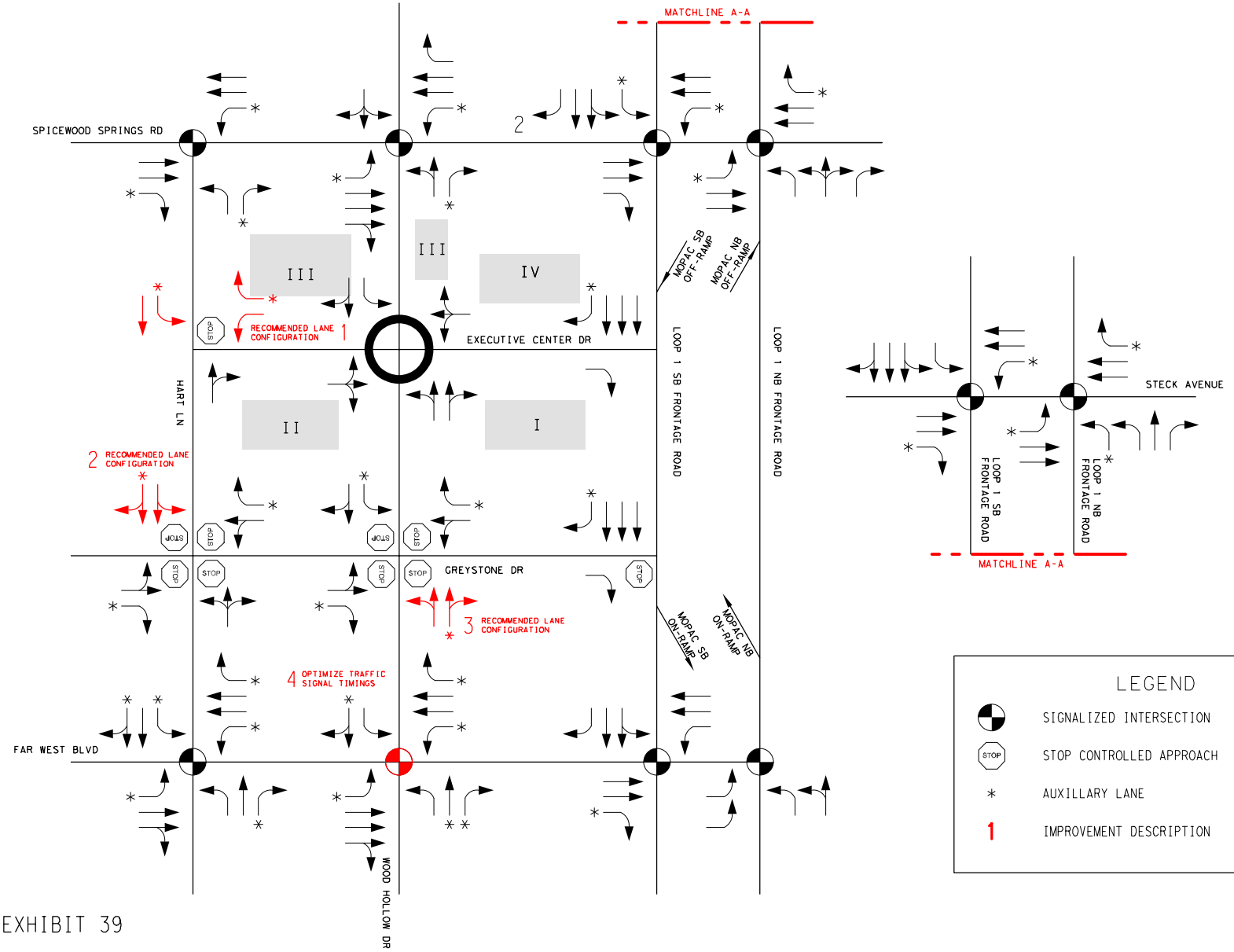


EXHIBIT 39

2024 MITIGATED LANE ASSIGNMENTS AND TRAFFIC CONTROL

AUSTIN OAKS TIA

Kimley»Horn

TABLE 20

2024 INTERSECTION AM PEAK HOUR ANALYSIS RESULTS

AUSTIN OAKS TIA

Required Study Area			2024 No Build Condition				2024 Build Condition				2024 Mitigated Condition			
Intersection	Traffic Control	Approach	95% Queue	V/C	Delay	LOS	95% Queue	V/C	Delay	LOS	95% Queue	V/C	Delay	LOS
Spicewood Springs Road & Hart Lane	TWSC/ Signalized	EB	0	0.38	0	FREE	564	0.76	26.4	C	564	0.76	26.4	C
		WB	37	0.34	2.3	STOP*	286	0.54	8.3	A	286	0.54	8.3	A
		NB	***202***	***0.88***	***57.9***	***F***	196	0.73	28.8	C	196	0.73	28.8	C
		INT							19.8	B			19.8	B
Spicewood Springs Road & Wood Hollow Drive	Signalized	EB	304	0.52	21.5	C	522	0.76	37.5	D	522	0.76	37.5	D
		WB	m241	0.95	23.9	C	m200	1	31.7	C	m200	1	31.7	C
		NB	86	0.23	45.4	D	132	0.34	26.5	C	132	0.34	26.5	C
		SB	0	0.01	43.3	D	0	0.01	38.5	D	0	0.01	38.5	D
		INT			24.5	C			33.8	C			33.8	C
Spicewood Springs Road & Loop 1 SBFR	Signalized	EB	***#770***	***1.78***	***336.7***	***F***	***#864***	***1.54***	***191***	***F***	***#864***	***1.54***	***191***	***F***
		WB	m#628	0.99	23.8	C	m#666	1.17	49.3	D	m#666	1.17	49.3	D
		SB	***m181***	***1.4***	***180.2***	***F***	***m176***	***1.44***	***206.4***	***F***	***m176***	***1.44***	***206.4***	***F***
		INT			***181.5***	***F***			***153***	***F***			***153***	***F***
Spicewood Springs Road & Loop 1 NBFR	Signalized	EB	m31	0.5	2.1	A	m31	0.53	2.6	A	m31	0.53	2.6	A
		WB	#555	0.89	45.4	D	***#723***	***1.03***	***68.7***	***E***	***#723***	***1.03***	***68.7***	***E***
		NB	***#655***	***1.53***	***157.6***	***F***	***#755***	***1.73***	***236.6***	***F***	***#669***	***1.73***	***236.6***	***F***
		INT			***61***	***E***			***93.3***	***F***			***93.3***	***F***
Executive Center Drive & Hart Lane	TWSC	WB	4	0.05	12.5	B	31	0.3	16.7	C	13	0.15	14.7	B
		NB	0	0.18	0	FREE	0	0.2	0	FREE	0	0.2	0	FREE
		SB	7	0.08	2.4	FREE	21	0.22	5.1	FREE	21	0.22	3.6	FREE
Executive Center Drive & Wood Hollow Drive	TWSC/ Roundabout	EB	11	0.13	21.2	C	40	0.396	11	B	40	0.396	11	B
		WB	8	0.09	14.9	B	40	0.351	10	A	40	0.351	10	A
		NB	2	0.03	1.1	FREE	80	0.593	12.7	FREE	80	0.593	12.7	B
		SB	8	0.1	2.7	FREE	100	0.634	12.3	FREE	100	0.634	12.3	B
Executive Center Dr. & Loop 1 SBFR	TWSC	EB	3	0.04	11	B	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
		SB	0	0.77	0	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
Greystone Drive & Hart Lane	AWSC	EB	72	0.575	17.8	C	80	0.61	19.7	C	32	0.592	18.5	C
		WB	46	0.451	17.5	C	54	0.504	20	C	52	0.488	18.9	C
		NB	72	0.571	19.8	C	108	0.698	26.6	D	114	0.719	28.6	D
		SB	152	0.806	32.3	D	***196***	***0.885***	***44.9***	***E***	52	0.483	17.3	C
		INT			22.7	C			29	C			20.5	C
Greystone Drive & Wood Hollow Drive	AWSC	EB	36	0.382	12.9	B	60	0.527	18.9	C	54	0.432	17.6	C
		WB	44	0.438	14.5	B	62	0.54	18.9	C	58	0.518	17.6	C
		NB	38	0.403	13.9	B	***168***	***0.848***	***41.1***	***E***	50	0.475	17.6	C
		SB	48	0.464	15.1	C	98	0.675	23.9	C	92	0.241	22	C
		INT			14	B			25.6	C			18.7	B
Greystone Drive & Loop 1 SBFR	TWSC	EB	***440***	***1.73***	***413.9***	***F***	***611***	***2.06***	***551.4***	***F***	***611***	***2.06***	***551.4***	***F***
		SB	0	0.9	0	FREE	0	0.77	0	FREE	0	0.77	0	FREE
Faw West Boulevard & Hart Lane	Signalized	EB	436	0.82	43.3	D	452	0.67	29.6	C	452	0.67	29.6	C
		WB	#267	0.82	53.5	D	#253	0.74	43.2	D	#262	0.74	32.3	C
		NB	***222***	***0.86***	***67.8***	***E***	205	0.74	51.4	D	205	0.74	51.4	D
		SB	***#367***	***0.96***	***75.1***	***E***	273	0.85	54.9	D	273	0.85	54.9	D
		INT			***56.7***	***E***			42	D			42	D
Faw West Boulevard & Wood Hollow Drive	Signalized	EB	m549	0.73	41.4	D	401	0.54	33.1	C	454	0.52	29.6	C
		WB	m186	0.72	35.6	D	***280***	***0.61***	***55.8***	***E***	290	0.47	41.9	D
		NB	***#349***	***1.04***	***115***	***F***	***#252***	***0.96***	***88.2***	***F***	***162***	***0.83***	***64.8***	***E***
		SB	#407	0.71	43.9	D	#433	0.72	44.5	D	341	0.85	54.7	D
		INT			50.7	D			49.1	D			42	D
Faw West Boulevard & Loop 1 SBFR	Signalized	EB	m430	0.67	19.6	B	m458	0.68	22.4	C	462	0.68	22.2	C
		WB	0	0.48	1.9	A	m13	0.57	5.7	A	m13	0.57	5.7	A
		SB	***m#546***	***1.16***	***73.8***	***E***	m240	0.63	13.8	B	m240	0.63	13.8	B
		INT			41.8	D			15.4	B			15.3	B
Faw West Blvd. & Loop 1 NBFR	Signalized	EB	15	0.47	3.1	A	25	0.56	5.3	A	25	0.56	5.3	A
		NB	363	0.7	47.6	D	#470	0.71	43.7	D	#470	0.71	43.7	D
		INT			19.3	B			20	B			20	B
Steck Avenue & Loop 1 SBFR	Signalized	EB	***#413***	***1.03***	***88***	***F***	***#413***	***1.03***	***88***	***F***	***#413***	***1.03***	***88***	***F***
		WB	m48	0.47	6	A	m48	0.47	6	A	m48	0.47	6	A
		SB	***#1806***	***1.52***	***233.9***	***F***	***#1886***	***1.57***	***250.7***	***F***	***#1886***	***1.57***	***250.7***	***F***
		INT			***184.3***	***F***			***197.4***	***F***			***197.4***	***F***
Steck Avenue & Loop 1 NBFR	Signalized	EB	m123	0.72	4.9	A	m123	0.72	4.9	A	m123	0.72	4.9	A
		WB	***#267***	***0.85***	***62.8***	***E***	***#267***	***0.85***	***62.8***	***E***	***#267***	***0.85***	***62.8***	***E***
		NB	***m#1397***	***3.04***	***765***	***F***	***m#1392***	***3.04***	***763.9***	***F***	***m#1392***	***3.04***	***763.9***	***F***
		INT			***253.4***	***F***			***253.1***	***F***			***253.1***	***F***

Site Driveways (Stop-Controlled Approach Only)		2024 No Build Condition				2024 Build Condition				2024 Mitigated Condition			
Intersection	Approach	95% Queue	V/C	Delay	LOS	95% Queue	V/C	Delay	LOS	95% Queue	V/C	Delay	LOS
Driveway 1 (Phase I)	NB	N/A	N/A	N/A	N/A	17	0.19	12.4	B	17	0.19	12.4	B
Driveway 2 (Phase II)	NB	N/A	N/A	N/A	N/A	6	0.08	11.7	B	6	0.08	11.7	B
Driveway 6 (Phase III)	SB	N/A	N/A	N/A	N/A	9	0.11	16.3	C	9	0.11	16.3	C
Driveway 3 (Phase II)	NB	N/A	N/A	N/A	N/A	2	0.03	10.5	B	2	0.03	10.5	B
Driveway 4 (Phase II)	NB	N/A	N/A	N/A	N/A	3	0.04	10.5	B	3	0.04	10.5	B
Driveway 5 (Phase III)	SB	N/A	N/A	N/A	N/A	9	0.11	11.9	B	9	0.11	11.9	B
Driveway 7 (Phase III)	SB	N/A	N/A	N/A	N/A	8	0.09	14.1	B	8	0.09	14.1	B
Driveway 8 (Phase III)	SB	N/A	N/A	N/A	N/A	2	0.03	14.5	B	2	0.03	14.5	B
Driveway 9 (Phase III)	EB	N/A	N/A	N/A	N/A	3	0.03	16.8	C	3	0.03	16.8	C
Driveway 10 (Phase III)	WB	N/A	N/A	N/A	N/A	26	0.26	27.7	D	26	0.26	27.7	D
Driveway 11 (Phase IV)	SB	N/A	N/A	N/A	N/A	15	0.17	13.7	B	15	0.17	13.7	B
Driveway 12 (Phase IV)	SB	N/A	N/A	N/A	N/A	7	0.09	11.3	B	7	0.09	11.3	B

TABLE 21

2024 INTERSECTION PM PEAK HOUR ANALYSIS RESULTS

AUSTIN OAKS TIA

Required Study Area			2024 No Build Condition				2024 Build Condition				2024 Mitigated Condition			
Intersection	**Traffic Control**	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Spicewood Springs Road & Hart Lane	TWSC/ Signalized	EB	0	0.3	0	FREE	***#405***	***1.03***	***56.3***	***E***	***#405***	***1.03***	***56.3***	***E***
		WB	20	0.41	1.1	STOP*	133	0.41	2.6	A	133	0.41	2.6	A
		NB	***895***	***1.9***	***448.7***	***F***	#258	0.83	20.9	C	#258	0.83	20.9	C
		INT							25.1	C			25.1	C
Spicewood Springs Road & Wood Hollow Drive	Signalized	EB	231	0.37	12.3	B	m280	0.61	19.7	B	m280	0.61	19.7	B
		WB	m228	0.42	10.1	B	m317	0.82	23.8	C	m317	0.82	23.8	C
		NB	***#365***	***0.89***	***73.6***	***E***	365	0.67	37.4	D	365	0.67	37.4	D
		SB	32	0.03	49.1	D	25	0.02	31.6	C	25	0.02	31.6	C
		INT			23.7	C			25.3	C			25.3	C
Spicewood Springs Road & Loop 1 SBFR	Signalized	EB	***#1190***	***1.58***	***271.3***	***F***	***#1380***	***1.78***	***322.2***	***F***	***#1380***	***1.78***	***322.2***	***F***
		WB	m695	0.87	15.4	B	m798	0.97	20.7	C	m798	0.97	20.7	C
		SB	***#707***	***1.28***	***151.5***	***F***	***#707***	***1.28***	***169.9***	***F***	***#707***	***1.28***	***169.9***	***F***
		INT			***134.9***	***F***			***162.6***	***F***			***162.6***	***F***
Spicewood Springs Road & Loop 1 NBFR	Signalized	EB	m106	0.9	8.2	A	m102	1.03	14.6	B	m102	1.03	14.6	B
		WB	687	0.84	39.2	D	#787	0.92	44.5	D	#787	0.92	44.5	D
		NB	***#662***	***1.66***	***233***	***F***	***#747***	***1.86***	***309.2***	***F***	***#747***	***1.86***	***309.2***	***F***
		INT			***68.9***	***E***			***92.1***	***F***			***92.1***	***F***
Executive Center Drive & Hart Lane	TWSC	WB	31	0.3	13.8	B	155	0.74	29.9	D	70	0.5	17.6	C
		NB	0	0.25	0	FREE	0	0.26	0	FREE	0	0.26	0	FREE
		SB	2	0.02	0.9	FREE	11	0.13	4	FREE	11	0.13	3.1	FREE
Executive Center Drive & Wood Hollow Drive	TWSC/ Roundabout	EB	***118***	***0.69***	***39.2***	***E***	160	0.782	24.1	C	160	0.782	24.1	C
		WB	48	0.4	16.8	C	***240***	***0.946***	***54***	***F***	***240***	***0.946***	***54***	***F***
		NB	1	0.01	0.3	FREE	160	0.813	24.5	FREE	160	0.813	24.5	C
		SB	1	0.02	0.9	FREE	40	0.411	8.5	FREE	40	0.411	8.5	A
Executive Center Dr. & Loop 1 SBFR	TWSC	EB	***120***	***0.69***	***37.8***	***E***	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
		SB	0	0.56	0	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE	FREE
Greystone Drive & Hart Lane	AWSC	EB	22	0.267	12	B	22	0.279	12.5	B	24	0.284	12.8	B
		WB	58	0.516	15.8	C	70	0.569	17.7	C	72	0.579	18.4	C
		NB	100	0.667	20.5	C	126	0.735	25	C	158	0.808	33.5	D
		SB	38	0.399	13.5	B	48	0.458	15	B	24	0.297	12.5	B
		INT			16.4	B			18.9	B			21.7	C
Greystone Drive & Wood Hollow Drive	AWSC	EB	20	0.258	12.1	B	30	0.339	15.5	C	28	0.329	14.9	B
		WB	114	0.71	23.1	C	160	0.835	33.2	D	152	0.814	30.7	D
		NB	84	0.616	18.3	C	***216***	***0.934***	***47.7***	***E***	74	0.596	20.9	C
		SB	30	0.339	13.4	B	66	0.554	19.3	C	70	0.574	19.2	C
		INT			18.3	B			32.5	C			22.9	C
Greystone Drive & Loop 1 SBFR	TWSC	EB	***174***	***0.84***	***62.8***	***F***	***315***	***1.05***	***97.7***	***F***	***315***	***1.05***	***97.7***	***F***
		SB	0	0.51	0	FREE	0	0.46	0	FREE	0	0.46	0	FREE
Faw West Boulevard & Hart Lane	Signalized	EB	252	0.39	21.7	C	243	0.36	17.5	B	243	0.36	17.5	B
		WB	73	0.42	7.6	A	282	0.42	31.5	C	282	0.42	31.5	C
		NB	***208***	***0.78***	***61.4***	***E***	203	0.73	54.5	D	203	0.73	54.5	D
		SB	***200***	***0.78***	***62.3***	***E***	222	0.74	54	D	222	0.74	54	D
		INT			28.1	C			34.5	C			34.5	C
Faw West Boulevard & Wood Hollow Drive	Signalized	EB	252	0.55	17.4	B	326	0.47	35.6	D	326	0.47	35.6	D
		WB	m185	1.12	47.7	D	368	0.79	45.7	D	368	0.79	45.7	D
		NB	***#370***	***0.92***	***80.9***	***F***	265	0.82	51.2	D	265	0.82	51.2	D
		SB	***233***	***0.81***	***69.2***	***E***	***248***	***0.83***	***69.2***	***E***	***248***	***0.83***	***69.2***	***E***
		INT			47.1	D			46.3	D			46.3	D
Faw West Boulevard & Loop 1 SBFR	Signalized	EB	m#721	0.83	23.2	C	#834	0.9	29.5	C	#834	0.9	29.5	C
		WB	18	0.29	3.8	A	17	0.33	3.3	A	17	0.33	3.3	A
		SB	***#1251***	***1.86***	***277.7***	***F***	***#735***	***1.32dl***	***78.6***	***E***	***#735***	***1.32dl***	***78.6***	***E***
		INT			***139.4***	***F***			49.5	D			49.5	D
Faw West Blvd. & Loop 1 NBFR	Signalized	EB	***m#987***	***1.09***	***70.8***	***E***	***m#1063***	***1.2***	***117***	***F***	***m#1063***	***1.2***	***117***	***F***
		NB	212	0.35	26	C	247	0.4	26.8	C	247	0.4	26.8	C
		INT			***61.7***	***E***			***97.9***	***F***			***97.9***	***F***
Steck Avenue & Loop 1 SBFR	Signalized	EB	***#449***	***1.02***	***84.9***	***F***	***#449***	***1.02***	***84.9***	***F***	***#449***	***1.02***	***84.9***	***F***
		WB	8	0.36	0.7	A	8	0.36	0.7	A	8	0.36	0.7	A
		SB	***#1152***	***1.57***	***303.2***	***F***	***#1187***	***1.61***	***321.6***	***F***	***#1187***	***1.61***	***321.6***	***F***
		INT			***196.9***	***F***			***209.4***	***F***			***209.4***	***F***
Steck Avenue & Loop 1 NBFR	Signalized	EB	m376	1.14	46.5	D	m349	1.14	46.5	D	m349	1.14	46.5	D
		WB	***#657***	***1.12***	***86.7***	***F***	***#657***	***1.12***	***86.7***	***F***	***#657***	***1.12***	***86.7***	***F***
		NB	***#1741***	***2.36***	***594.3***	***F***	***#1741***	***2.36***	***594.3***	***F***	***#1741***	***2.36***	***594.3***	***F***
		INT			***234***	***F***			***234***	***F***			***234***	***F***

Site Driveways (Stop-Controlled Approach Only)		2024 No Build Condition				2024 Build Condition				2024 Mitigated Condition			
Intersection	**Approach**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**	**95% Queue**	**V/C**	**Delay**	**LOS**
Driveway 1 (Phase I)	NB	N/A	N/A	N/A	N/A	58	0.45	15.9	C	58	0.45	15.9	C
Driveway 2 (Phase II)	NB	N/A	N/A	N/A	N/A	16	0.17	12	B	16	0.17	12	B
Driveway 6 (Phase III)	SB	N/A	N/A	N/A	N/A	23	0.24	16.9	C	23	0.24	16.9	C
Driveway 3 (Phase II)	NB	N/A	N/A	N/A	N/A	5	0.06	10.7	B	5	0.06	10.7	B
Driveway 4 (Phase II)	NB	N/A	N/A	N/A	N/A	6	0.07	10.2	B	6	0.07	10.2	B
Driveway 5 (Phase III)	SB	N/A	N/A	N/A	N/A	24	0.25	12.4	B	24	0.25	12.4	B
Driveway 7 (Phase III)	SB	N/A	N/A	N/A	N/A	18	0.2	14.3	B	18	0.2	14.3	B
Driveway 8 (Phase III)	SB	N/A	N/A	N/A	N/A	6	0.07	15	B	6	0.07	15	B
Driveway 9 (Phase III)	EB	N/A	N/A	N/A	N/A	4	0.05	12.3	B	4	0.05	12.3	B
Driveway 10 (Phase III)	WB	N/A	N/A	N/A	N/A	72	0.54	34.9	D	72	0.54	34.9	D
Driveway 11 (Phase IV)	SB	N/A	N/A	N/A	N/A	43	0.37	15.6	C	43	0.37	15.6	C
Driveway 12 (Phase IV)	SB	N/A	N/A	N/A	N/A	20	0.22	12.4	B	20	0.22	12.4	B

OTHER TRAFFIC/PLANNING CONSIDERATIONS

A separate conceptual analysis was performed to examine the existing and future traffic operations at intersections outside the required study area. These intersections were discussed at the Austin Oaks charrette and are as follows:

Neighborhood Study Area

- Spicewood Springs Road & Mesa Drive
- Greystone Drive & Mesa Drive
- Greystone Drive & Chimney Corners
- Far W Boulevard & Mesa Drive
- Anderson Lane & Shoal Creek Boulevard

Existing roadway conditions and 2016 traffic volumes were used to determine the LOS at intersections in the neighborhood study area and identify operational deficiencies that may exist. Similar to the methodology used to evaluate intersections within the required study area, background traffic growth and proposed development traffic volumes (distributed throughout the neighborhood study area) were added to 2016 traffic volumes to evaluate future traffic operations. These intersections will not be part of the development's consideration for future improvements and are provided for information purposes.

In the 2016 Existing conditions all intersections with the neighborhood study area operate at an acceptable LOS. Based on a preliminary analyses of future years, the following improvements would improve traffic operations at intersections within the neighborhood study area:

- *Anderson Lane & Shoal Creek Boulevard (2018).* Extend the eastbound left-turn bay of Anderson Lane to provide adequate storage for vehicles making a left-turn movement onto Shoal Creek Boulevard and prevent spill-back into the adjacent lane. Also, adjust splits to optimize traffic signal operations at the intersection while maintaining coordination along Anderson Lane.

- *Spicewood Springs Road & Mesa Drive (2022).* Construct an exclusive left-turn lane at the northbound approach of Mesa Drive at Spicewood Springs Road; the updated lane configuration at this approach will be two exclusive left-turn lanes, a shared thru-right lane, and an exclusive right-turn lane. Furthermore, restripe the westbound approach of Spicewood Springs Road to include an exclusive left-turn lane, two exclusive thru lanes, and a shared thru-right lane. Concurrently with this restriping, the raised channelizing device at the southbound right-turn movement of Mesa Drive must be removed and the westbound receiving lanes of Spicewood Springs Road (downstream of intersection) must be widened

  Greystone Drive & Mesa Drive (2024). Monitor the traffic operations at the intersection of Greystone Drive and Mesa Drive and implement improvements as needed.

- *Anderson Lane & Shoal Creek Boulevard (2018).* Widen the southbound approach of Shoal Creek Boulevard to a six-lane cross-section at the intersection of Anderson lane. The southbound approach should include an exclusive left-turn lane, two-exclusive thru lanes, and an exclusive right-turn lane; two northbound receiving lanes with remain.

  Far West Boulevard & Mesa Drive (2024+). Monitor the traffic volumes at this intersection of Far West Boulevard and Mesa Drive and implement improvements as needed.

Office traffic, which accounts for the majority of trips generated by the proposed development, is expected to originate from locations at a considerable distance from the site. For this reason, the office traffic will primarily use the major arterials to access the proposed development. The changes in traffic volumes along minor roadways in the neighborhood study area are the result of background traffic growth.

RECOMMENDED IMPROVEMENTS COST SHARING

With a traffic impact mitigation plan, a developer is required to pay their pro rata (or "fair share") for needed improvements to arterial streets. The pro-rata share of cost is estimated by multiplying the cost of implementing the required roadway/intersection improvements by the percentage of site trips in overall traffic using the roadway/intersection.

This study identifies nine (9) specific existing improvements and eleven (11) future improvements. The improvements' costs have been broken up by pro-rated shares. For the identified improvements, the developer's pro rata share is anticipated to be approximately $1,460,000. These funds will be allocated to construct a traffic signal at Spicewood Springs Road and Hart Lane, as well as other improvements to be determined through a discussion with City of Austin staff.

Tables 22 and 23 provide a summary of the recommendations associated with the study area, the estimated cost, and the developer's pro-rata for 2016 and future improvements, respectively. The costs shown in the table are planning level estimates and are not based on any actual survey and/or design exercise.

TABLE 22

OPINION OF PROBABLE COST SUMMARY – 2016 IMPROVEMENTS

AUSTIN OAKS TIA

Improvement Name	Improvement Description	Opinion of Probable Cost ($)	Site Traffic (%)	Pro-Rata Cost Share ($)
1. Spicewood Springs Road & Hart Lane (2016)	Install a fully actuated traffic signal at the intersection of Spicewood Springs Road and Hart Lane.	$ 420,000	11.0%	$ 46,200
2. Spicewood Springs Road & Wood Hollow Drive (2016)	Extend the westbound left-turn bay of Spicewood Springs Road to Wood Hollow Drive.	$ 50,000	42.5%	$ 21,250
3. Spicewood Springs Road & Wood Hollow Drive (2016)	Provide a right-turn overlap operation at the northbound right-turn movement of Wood Hollow Drive to Spicewood Springs Road.	$ 10,000	29.3%	$ 2,930
4. Spicewood Springs Road & Loop 1 SBFR (2016)	Provide a FREE eastbound right-turn movement from Spicewood Springs Road to Loop 1 SBFR	$ 25,000	0.0%	$ -
5. Executive Center Drive & Loop 1 SBFR (2016)	Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Executive Center Drive).	$ 150,000	77.5%	$ 116,250
6. Greystone Drive & Loop 1 SBFR (2016)	Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Greystone Drive).	$ 150,000	39.5%	$ 59,250
7. Far West Boulevard & Hart Lane (2016)	Widen the northbound approach and restripe the southbound approach of Hart Lane at the intersection of Far West Boulevard.	$ 95,000	8.6%	$ 8,170
8. Far West Boulevard & Wood Hollow Drive (2016)	Provide a right-turn overlap operation at the northbound right-turn movement from Wood Hollow Drive to Far West Boulevard.	$ 20,000	0.0%	$ -
9. Far West Boulevard & Loop 1 SBFR (2016)	Provide a FREE, channelized operation at the southbound right-turn movement from Loop 1 SBFR to Far West Boulevard (westbound)	$ 150,000	7.5%	$ 11,250
2016 Improvements Subtotal		**$ 1,070,000**	**-**	**$ 265,300**

THE ENGINEER HAS NO CONTROL OVER THE COST OF LABOR, MATERIALS, EQUIPMENT, OR OVER THE CONTRACTOR'S METHODS OF DETERMINING PRICES OR OVER COMPETITIVE BIDDING OR MARKET CONDITIONS. OPINIONS OF PROBABLE COSTS PROVIDED HEREIN ARE BASED ON THE INFORMATION KNOWN TO ENGINEER AT THIS TIME AND REPRESENT ONLY THE ENGINEER'S JUDGMENT AS A DESIGN PROFESSIONAL FAMILIAR WITH THE CONSTRUCTION INDUSTRY. THE ENGINEER CANNOT AND DOES NOT GUARANTEE THAT PROPOSALS, BIDS, OR ACTUAL CONSTRUCTION COSTS WILL NOT VARY FROM ITS OPINIONS OF PROBABLE COSTS.

TABLE 23

OPINION OF PROBABLE COST SUMMARY – FUTURE IMPROVEMENTS

AUSTIN OAKS TIA

Improvement Name	Improvement Description	Opinion of Probable Cost ($)	Site Traffic (%)	Pro-Rata Cost Share ($)
2018 improvements				
1. Spicewood Springs Road & Wood Hollow Drive (2018)	Adjust signal timing at the intersection of Spicewood Springs Road and Wood Hollow Drive.	$ 10,000	14.2%	$ 1,420
2. Executive Center Drive & Wood Hollow Drive (2018)	Construct a multi-lane roundabout at intersection of Executive Center Drive and Wood Hollow Drive.	$ 2,000,000	52.6%	$ 1,052,000
3. Executive Center Drive & Wood Hollow Drive (2018)	Restripe Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road.	$ 20,000	40.1%	$ 8,020
4. Executive Center Drive & Loop 1 SBFR (2018)	Construct a southbound accceleration lane on Loop 1 SBFR (downstream of Executive Center Drive).	$ 120,000	85.6%	$ 102,720
5. Far West Boulevard & Wood Hollow Drive (2018)	Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.	$ 10,000	5.6%	$ 560
2020 improvements				
1. Far West Boulevard & Wood Hollow Drive (2020)	Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.	$ 10,000	5.6%	$ 560
2022 improvements				
1. Far West Boulevard & Wood Hollow Drive (2022)	Restripe the eastbound approach of Far West Boulevard at Wood Hollow Drive.	$ 10,000	3.0%	$ 300
2024 improvements				
1. Executive Center Drive & Hart Lane (2024)	Restripe the westbound approach of Executive Center Drive at Hart Lane (1a) and restripe Hart Lane between Executive Center Drive and Spicewood Springs Road (1b).	$ 20,000	79.1%	$ 15,820
2. Greystone Drive & Hart Lane (2024)	Restripe the southbound approach of Hart Lane at Greystone Drive.	$ 20,000	9.7%	$ 1,940
3. Greystone Drive & Wood Hollow Drive (2024)	Restripe the northbound approach of Wood Hollow Drive at Greystone Drive.	$ 20,000	40.2%	$ 8,040
4. Far West Boulevard & Wood Hollow Drive (2024)	Adjust signal timing at the intersection of Spicewood Springs Road and Wood Hollow Drive.	$ 10,000	5.6%	$ 560
	Future Improvements Subtotal	**$ 2,250,000**	**-**	**$ 1,191,940**

THE ENGINEER HAS NO CONTROL OVER THE COST OF LABOR, MATERIALS, EQUIPMENT, OR OVER THE CONTRACTOR'S METHODS OF DETERMINING PRICES OR OVER COMPETITIVE BIDDING OR MARKET CONDITIONS. OPINIONS OF PROBABLE COSTS PROVIDED HEREIN ARE BASED ON THE INFORMATION KNOWN TO ENGINEER AT THIS TIME AND REPRESENT ONLY THE ENGINEER'S JUDGMENT AS A DESIGN PROFESSIONAL FAMILIAR WITH THE CONSTRUCTION INDUSTRY. THE ENGINEER CANNOT AND DOES NOT GUARANTEE THAT PROPOSALS, BIDS, OR ACTUAL CONSTRUCTION COSTS WILL NOT VARY FROM ITS OPINIONS OF PROBABLE COSTS.

CONCLUSION AND RECOMMENDATION

The improvements recommended as a result of this TIA are as follows:

2016 Improvements (9):

- *Spicewood Springs Road & Hart Lane (1).* Install a fully actuated traffic signal at the intersection of Spicewood Springs Road and Hart Lane.

- *Spicewood Springs Road & Wood Hollow Drive (2)*. Extend the westbound left-turn bay of Spicewood Springs Road to Wood Hollow Drive to provide adequate storage for vehicles making a left-turn movement and prevent spill-back into the adjacent lane.

- *Spicewood Springs Road & Wood Hollow Drive (3).* Provide a right-turn overlap operation at the northbound right-turn movement of Wood Hollow Drive to Spicewood Springs Road. This will allow the northbound right-turn phase and the westbound left-turn phase to operate simultaneously and decrease delay at the northbound approach of Wood Hollow Drive.

- *Spicewood Springs Road & Loop 1 SBFR* (4). Provide striping and vertical panels (or other physical barrier) at the southbound receiving lanes of Loop 1 SBFR to facilitate a FREE eastbound right-turn movement from Spicewood Springs Road to Loop 1 SBFR. This movement is currently channelized and a merge with Loop 1 SBFR can be accomplished with existing pavement.

- *Executive Center Drive & Loop 1 SBFR (5)*. Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Executive Center Drive). Additionally, install vertical panels (or other physical barrier) along Loop 1 Southbound Off-Ramp to prevent access to Executive Center Drive from southbound Loop 1 Southbound Off-Ramp and reduce weaving in this section of the frontage road.

- *Greystone Drive & Loop 1 SBFR (6)*. Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Greystone Drive).

- *Far West Boulevard & Hart Lane (7).* Widen the northbound approach of Hart Lane to a five-lane cross-section at the intersection of Far West Boulevard. The northbound approach should include an exclusive left-turn lane, exclusive thru lane, and exclusive right-turn lane; two southbound receiving lanes with remain. Restripe the southbound approach of Hart Lane to include an exclusive left-turn lane, exclusive thru lane, and shared thru-right lane; a single northbound receiving lane will remain.

- *Far West Boulevard & Wood Hollow Drive (8)*. Provide a right-turn overlap operation at the northbound right-turn movement from Wood Hollow Drive to Far West Boulevard. To maximize the benefits of this improvement, restripe the northbound approach to extend the existing right-turn lane.

- *Far West Boulevard & Loop 1 SBFR (9)*. Provide a FREE, channelized operation at the southbound right-turn movement from Loop 1 SBFR to Far West Boulevard (westbound). The existing lane configurations can accommodate a FREE operation because there are three westbound receiving lanes. The right-turn-only lane along Far West Boulevard is recommended to be restriped as a shared thru-right lane between Loop 1 and the first driveway (approximately 400').

2018 Improvements (5):

- *Spicewood Springs Road & Wood Hollow Drive (1).* Adjust signal timing at the intersection of Spicewood Springs Road and Wood Hollow Drive. A half-cycle length was not implemented but should be considered by the City to accommodate future traffic volumes.

- *Executive Center Drive & Wood Hollow Drive (2)*. Construct a multi-lane roundabout at intersection of Executive Center Drive and Wood Hollow Drive. The northbound and southbound approaches will be flared (expanding from one to two lanes) and the roundabout design should accommodate pedestrian and bicycle facilities. The roundabout improvement requires right-of-way and could be a substantial cost. A roundabout is optimal ultimate solution by year 2024; however, an interim all way stop could be implemented and monitored until the ultimate rounded is necessary. An all-way stop and restriping would improve the operations as compared to existing conditions, but does not result in the LOS as a roundabout. For analysis purposes a roundabout was assumed at the intersection of Executive Center Drive and Wood Hollow Drive in year 2018 since it is ultimately necessary
- *Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road (3)*. Concurrently with the roundabout construction, restripe Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road to allow two northbound lanes, one southbound lane, and bike lanes on both sides of the roadway. Restricting parking and extending the northbound right-turn lane will maximize the operations at the northbound approach of Wood Hollow Drive at Spicewood Springs Road.

- *Executive Center Drive at Loop 1 SBFR (4)*. Construct a southbound acceleration lane on Loop 1 SBFR, downstream of Executive Center Drive to provide a FREE operation at the eastbound right-turn movement of Executive Center Drive.

- *Far West Boulevard & Wood Hollow Drive (5)*. Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.

2020 Improvement (1):

- *Far West Boulevard & Wood Hollow Drive* (1) Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.

2022 1 Improvement (1):

- *Far West Boulevard & Wood Hollow Drive (*1). Restripe the eastbound approach of Far West Boulevard at Wood Hollow Drive. The outside lane of the eastbound approach is currently striped as an exclusive right-turn lane and there are three eastbound receiving lanes. To prevent weaving downstream of Wood Hollow Drive the City should consider restriping the outside lane of Far West Boulevard as a shared thru-right until Loop 1 SBFR.
-

2024 Improvements (4):

- *Executive Center Drive & Hart Lane (1a).* Restripe the westbound approach of Executive Center Drive at Hart Lane to include two lanes: exclusive left-turn lane and exclusive right-turn lane. This improvement will allow the left-turn and right-turn movements to operate independently and improve the LOS of this approach.

- *Hart Lane between Executive Center Drive and Spicewood Springs Road (1b).* Restripe Hart Lane between Executive Center Drive and Spicewood Springs Road to provide a southbound left-turn bay from Hart Lane to Executive Center Drive. The storage provided in this bay will be minimum as space must be preserved to accommodate the northbound left-turn bay from Hart Lane to Spicewood Springs Road.

- *Greystone Drive & Hart Lane (2)*. Restripe the southbound approach of Hart Lane at Greystone Drive to include two thru lanes. This will require the south-leg of the intersection to be restriped to provide two receiving lanes. A cross-section which will accommodate three travel lanes and two bike lanes can be accomplished using existing pavement. We recommend that this improvement not be implement until necessary based on actual (not projected) traffic demands require it. It should be noted that, based on turning movement volumes, a single-lane roundabout would perform better and was evaluated at this location. However, due to right-of-way ROW) constraints a roundabout is not feasible nor recommended.

- *Greystone Drive & Wood Hollow Drive (3)*. Restripe the northbound approach of Wood Hollow Drive at Greystone Drive to include two thru lanes. This will require the north-leg of the intersection to be restriped to provide two receiving lanes. A cross-section which will accommodate three travel lanes and two bike lanes can be accomplished using existing pavement. We recommend that this improvement not be implement until necessary based on actual (not projected) traffic demands require it. It should be noted that, based on turning movement volumes, a single-lane roundabout would perform better and was evaluated at this location. However, due to ROW constraints a roundabout is not feasible nor recommended.

- *Far West Boulevard & Wood Hollow Drive. (4)* Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.

Kimley»Horn

CERTIFICATION STATEMENT

I hereby certify that this report complies with the City Code and with applicable technical requirements of the City of Austin and is complete to the best of my knowledge.

KIMLEY-HORN AND ASSOCIATES

Jeff Whitacre, P.E., AICP, PTP

Transportation Engineer