# *Traffic Impact Analysis*

# Austin Oaks

# Austin, Texas

Prepared for:
**Spire Realty Group, LP**

Prepared by:

**Kimley-Horn**
801 Cherry Street, Suite 950
Fort Worth, TX 76102
(817) 339-2254

KH Project No. 061277705

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# Austin Oaks TIA

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Prepared By:


Kimley»Horn

Contact: Jeff Whitacre, P.E., AICP, PTP

Phone: 817-335-6511

Kimley»Horn

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## 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 anticipated phase of development.

**Table II– Change in Land Use (By Anticipated 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. RECOMMENDED IMPROVEMENTS*

The Austin Oaks Traffic Impact Study identifies twenty-three (23) improvements. The improvements' costs have been broken up by pro-rated shares. For the identified improvements, the developer's pro rata share based on improvements identified is anticipated to be approximately $628,000. 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.

## CAPACITY ANALYSIS

### *A. 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 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.

Potential improvements at intersections along Loop 1 are identified and recommended as part of this study. These improvements will reduce delay but capacity issues along Loop 1 remain. Although regional improvements are required to achieve an acceptable LOS at the intersections along Loop 1, such improvements within TxDOT right-of-way require TxDOT approval. Coordination between the City of Austin and TxDOT is recommended to aid in determining these regional improvements.

### *B. 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 Trips (at Site Driveways) | | | | **19,648** | **1,356** | **514** | **1,870** | **646** | **1,229** | **1,875** |
| 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 analyses indicate twenty-three (23) improvements are recommended concurrently with the construction of the proposed development to provide adequate traffic operations in the study area.

**2018 Improvements (14):**

- *Spicewood Springs Road & Hart Lane (1).* Consider installing a fully actuated traffic signal at the intersection of Spicewood Springs Road and Hart Lane. Install an advance warning flasher west of the intersection synchronized with the traffic signal to address the potential safety issue related to the horizontal curvature of Spicewood Springs Road. Widen the northbound approach of Hart Lane to include dual left-turns.

- *Hart Lane between Executive Center Drive and Spicewood Springs Road (2)*. Widen Hart Lane between Executive Center Drive and Spicewood Springs Road to accommodate a three-lane northbound approach at the intersection of Hart Lane at Spicewood Springs Road. Restripe the northbound approach of Hart Lane to include dual-left-turn lanes and an exclusive right-turn lane (three 10' approach lanes); a single northbound receiving lane (14') and southbound bike lane (5') will remain.

- *Spicewood Springs Road & Wood Hollow Drive (3)*. 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. 15% of the inbound trips generated by the Austin Oaks development were assigned to the westbound left-turn movement of Spicewood Springs Road to Wood Hollow Drive. The proposed left-turn bay extension will mitigate the impact of site traffic at this movement.

- *Spicewood Springs Road & Wood Hollow Drive (4).* 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. 15% of the outbound trips generated by the Austin Oaks development were assigned to the right-turn movement of Wood Hollow Drive to Spicewood Springs Road. The proposed right-turn overlap operation will mitigate the impact of site traffic at this movement.

- *Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road (5)*. Concurrently with the right-turn overlap improvement at the northbound right-turn movement of Wood Hollow Drive to Spicewood Springs Road, 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.

- *Spicewood Springs Road & Loop 1 SBFR* (6). Provide a FREE, channelized operation at the southbound right-turn movement from Loop 1 SBFR to Spicewood Springs Road (westbound). On Spicewood Springs the existing pavement can accommodate a FREE operation, however, there are design constraints due to the existing bike lane. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Spicewood Springs Road & Loop 1 SBFR* (7). 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. 12' receiving lanes should be maintained along Mopac Southbound Frontage Road. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Executive Center Drive & Wood Hollow Drive (8)*. Implement stop-control at the northbound and southbound approaches of Wood Hollow Drive. Restripe the northbound approach of Wood Hollow Drive at Executive Center Drive to include a shared thru-left and a shared thru-right. The shared thru-right lanes will also be marked as shared bike lanes. This will require the north-leg of the intersection to be restriped to provide two receiving lanes. Restripe the southbound approach of Wood Hollow Drive at Executive Center Drive to include an exclusive right-turn lane and a shared thru-left. The proposed cross-sections can be accomplished using existing pavement.

- *Executive Center Drive & Loop 1 SBFR (9)*. 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. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Executive Center Drive at Loop 1 SBFR (10)*. 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. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Greystone Drive & Loop 1 SBFR (11)*. Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Greystone Drive). 15% of the outbound trips generated by the Austin Oaks development were assigned to the eastbound right-turn movement of Greystone Drive at Loop 1 SBFR. The proposed southbound right-turn deceleration lane will mitigate the impact of site traffic at eastbound approach by removing vehicles turning right from the southbound thru lane. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Far West Boulevard & Hart Lane (12).* 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. Concurrently with the approach widening, a 5' sidewalk should be reconstructed adjacent to the northbound approach of Hart Lane. Restripe the southbound approach of Hart Lane to include an exclusive left-turn lane, exclusive thru lane, and shared thru-right lane (three 10' approach lanes); a single northbound receiving lane (14') will remain.

- *Far West Boulevard & Wood Hollow Drive (13)*. 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 (14)*. 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'). The proposed southbound channelized right-turn movement is intended to accommodate the planned bike lane. However, it remains unclear what further improvements will be necessary to accommodate the bike lane west of the intersection. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

**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 (2):**

- *Executive Center Drive & Wood Hollow Drive (1)*. Restripe the eastbound approach of Executive Center Drive at Wood Hollow Drive to include a shared thru-left and a shared thru-right. The shared thru-right lanes will also be marked as shared bike lanes. This will require the east-leg of the intersection to be restriped to provide two receiving lanes. Restripe the westbound approach of Executive Center Drive at Wood Hollow Drive to include an exclusive right-turn lane and a shared thru-left. The proposed cross-sections can be accomplished using existing pavement.

- *Far West Boulevard & Wood Hollow Drive (*2). 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 (6):**

- *Executive Center Drive & Hart Lane (1).* 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 (2).* 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 dual-left-turn lanes at the northbound approach from Hart Lane to Spicewood Springs Road.

- *Executive Center Drive & Wood Hollow Drive (3)*. Consider installing a fully actuated traffic signal at the intersection of Executive Center Drive and Wood Hollow Drive. The City should consider operating northbound and southbound approaches as split phased. Although a signal will ultimately be required, the recommended all-way stop could remain and be monitored until the signal is necessary. An intersection analysis is recommended prior to the installation of the signal.

- *Greystone Drive & Hart Lane (4)*. 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.

- *Greystone Drive & Wood Hollow Drive (5)*. 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.

- *Far West Boulevard & Wood Hollow Drive. (6)* Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.

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

## 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.***

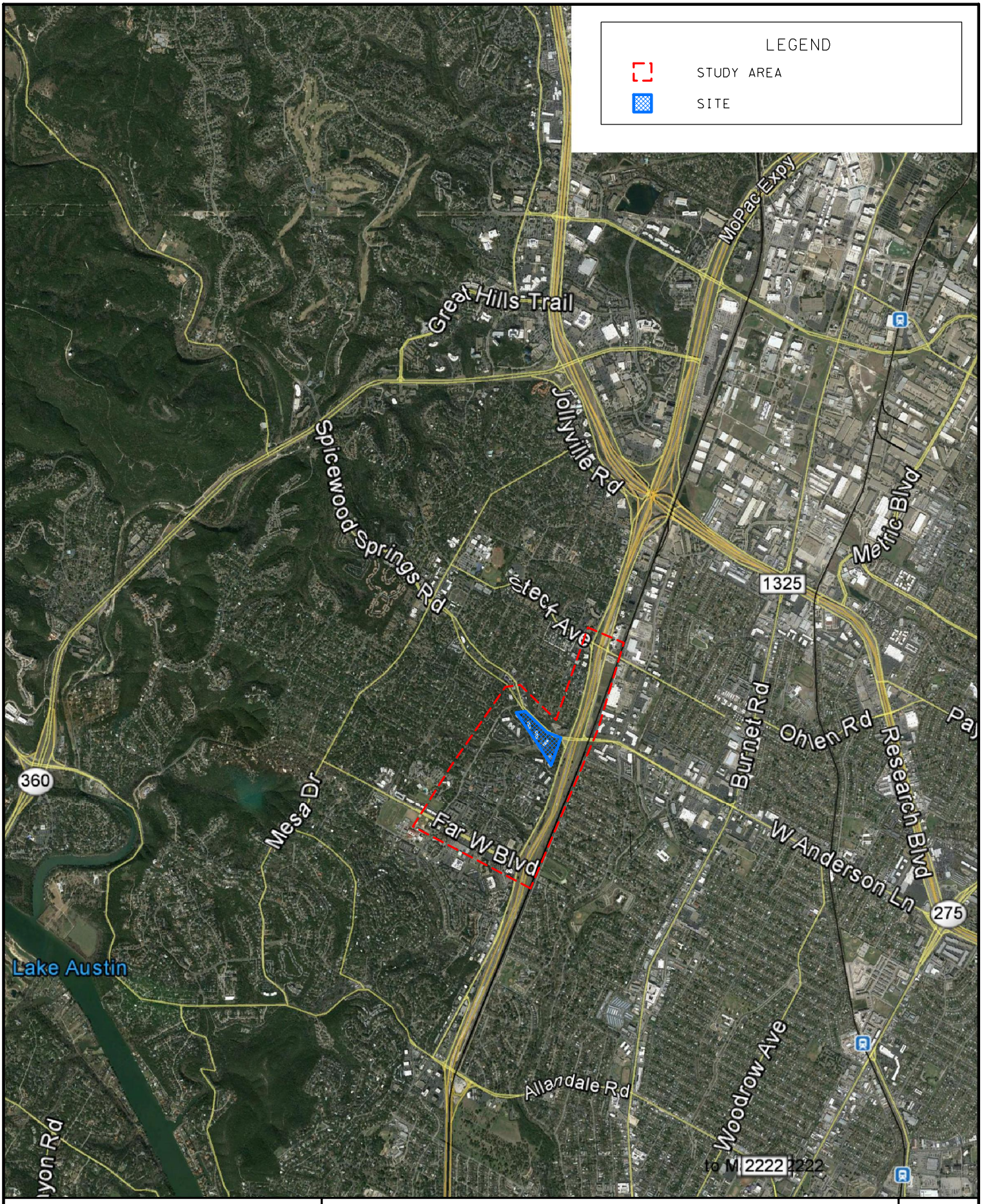
**Table 1 – Existing and Proposed Land Use**

| 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** |
| **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)** | 2016 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 |

## 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 existing office development will be removed in phases concurrently with the construction of the proposed development. 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 lane assignments 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 85$^{th}$ 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.

**STECK 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 (while schools were in session) to verify that the March 2014 counts grown at 2% were accurate. The 2014 counts were compared to the 2016 24-hour counts and the percent difference (actual-expected)/expected) was calculated. The results of the comparison show the TMCs used in the analysis were greater than the actual 2016 counts and were within an acceptable margin of error when compared to the 24-hour counts. ***Table 4*** below shows the results of this comparison.

**Table 4 – Existing and Projected Count Comparison**

| Roadway | 24-Hour | TMC | % Difference |
|---|---|---|---|
| Executive Center Dr | 176 | 190 | 8% |
| Far West Blvd | 4,418 | 5,142 | 16% |
| Hart Lane | 939 | 1,020 | 9% |
| Spicewood Springs Rd | 4,174 | 4,791 | 15% |
| Wood Hollow Dr | 1,013 | 1,148 | 13% |

Note: The 24-hour volume shown is the sum of the 2016 AM and PM peak hour bi-directional volume along the designated roadway. The TMC volume shown is the corresponding approach volumes used for the Existing conditions analysis (2014 TMCs grown at 2% and adjusted for volume balancing).

The TMCs were volumes balanced at the following locations to keep a consistent volume along the corridor. The volume balancing was balanced on the through volumes and compared to the 24-hour tube volume to confirm accuracy.

- Along Spicewood Springs Road between Mopac Northbound and Southbound Frontage Roads
- Along Spicewood Springs Road between Mopac Southbound Frontage Road and Wood Hollow Drive
- Along Spicewood Springs Road between Wood Hollow Drive and Hart Lane
- Along Loop 1 between Executive Center Drive and Greystone Drive

Traffic volumes at Loop 1 On-ramps and Off-ramps were calculated based upon volumes collected at intersections adjacent to each ramp. The following is a brief description of these calculations:

- SB Off-Ramp – the volume difference between SB receiving lanes of Mopac & Spicewood Springs and SB approach lanes of Mopac & Executive Center
- SB On-Ramp – the volume difference between SB receiving lanes of Mopac & Executive Center Drive and SB approach lanes of Mopac & Far West
- NB On-Ramp – the NB receiving lanes of Mopac & Far West
- NB Off-Ramp – the NB approach lanes of Mopac & Spicewood Springs

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. A Peak Hour Factor (PHF) was calculated for each intersection and applied to all movements at that intersection. The HCM 2010 recommends one peak hour for the entire intersection: "The use of a single peak hour factor for the entire intersection is intended to avoid the likelihood of creating demand scenarios with conflicting volumes that are disproportionate to the actual volumes during the 15-min analysis period."

The raw traffic counts are provided in ***Appendix E.*** The peak hour counts included in Appendix E are year 2014. The volumes shown in ***Exhibit 4*** are year 2016 (2014 volumes grown by 2% annually). Additionally, due to volume balancing the peak hour counts and count exhibits will differ at the aforementioned intersections.

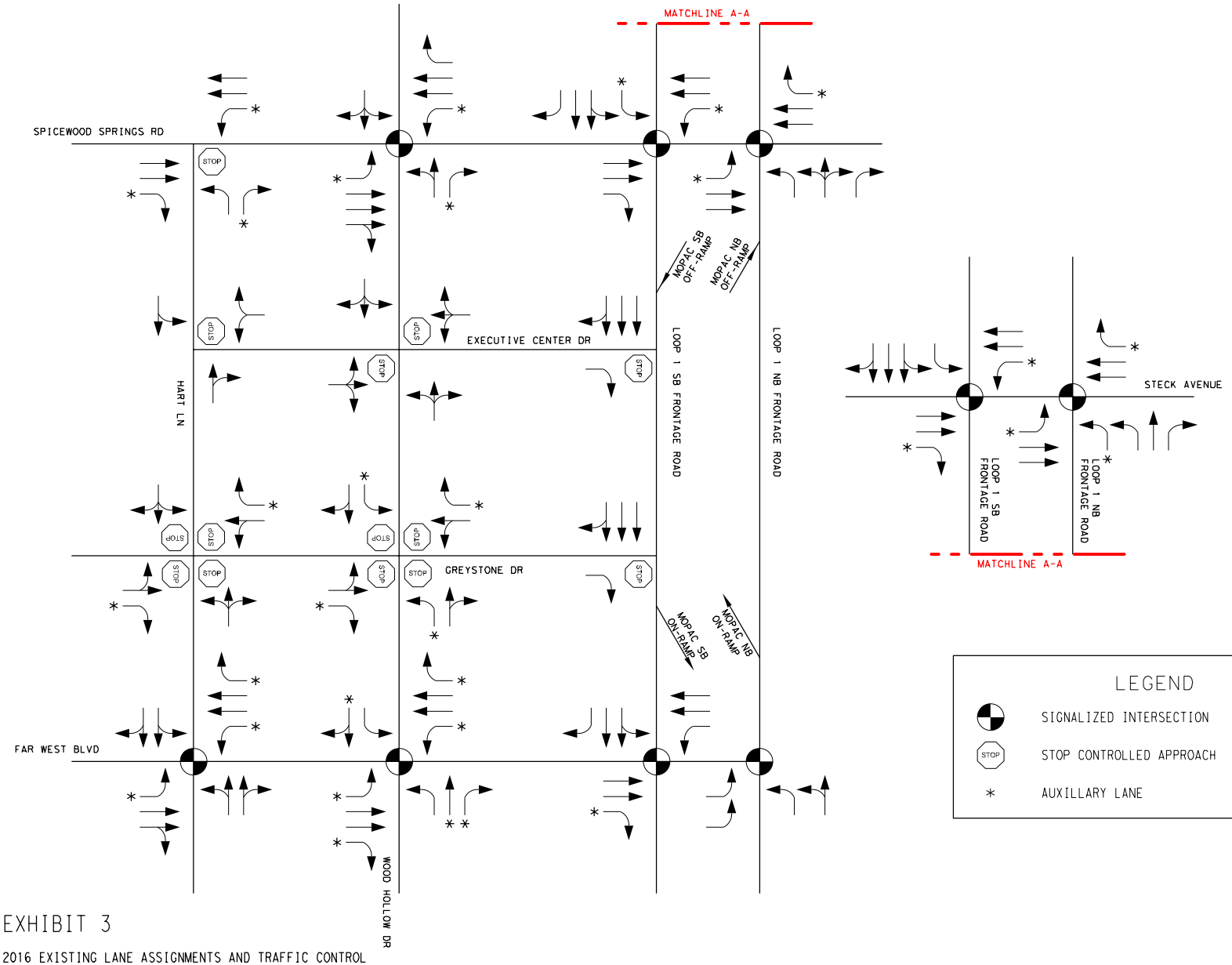
## D. BACKGROUND TRAFFIC GROWTH

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.

***Table 5*** below shows historic AADT on roadways in the vicinity of the proposed development provided by the TxDOT Statewide Planning Map. The average annual growth rate for the total AADT between 2007 and 2013 is approximately 2.1%.

**Table 5 – Calculations for Background Growth Rate**

| Year | Volume | | | | Annual Growth Rate | Average Annual Growth Rate |
|---|---|---|---|---|---|---|
| | SH 360 | US 183 | Loop 1 | Total | | |
| 2013 | 47,881 | 188,725 | 172,032 | 408,638 | 1.40% | 2.1% |
| 2012 | 46,000 | 186,000 | 171,000 | 403,000 | 4.40% | |
| 2011 | 44,000 | 178,000 | 164,000 | 386,000 | -4.93% | |
| 2010 | 45,000 | 187,000 | 174,000 | 406,000 | 5.73% | |
| 2009 | 49,000 | 167,000 | 168,000 | 384,000 | -1.29% | |
| 2008 | 52,000 | 165,000 | 172,000 | 389,000 | 7.46% | |
| 2007 | 55,000 | 141,000 | 166,000 | 362,000 | | |

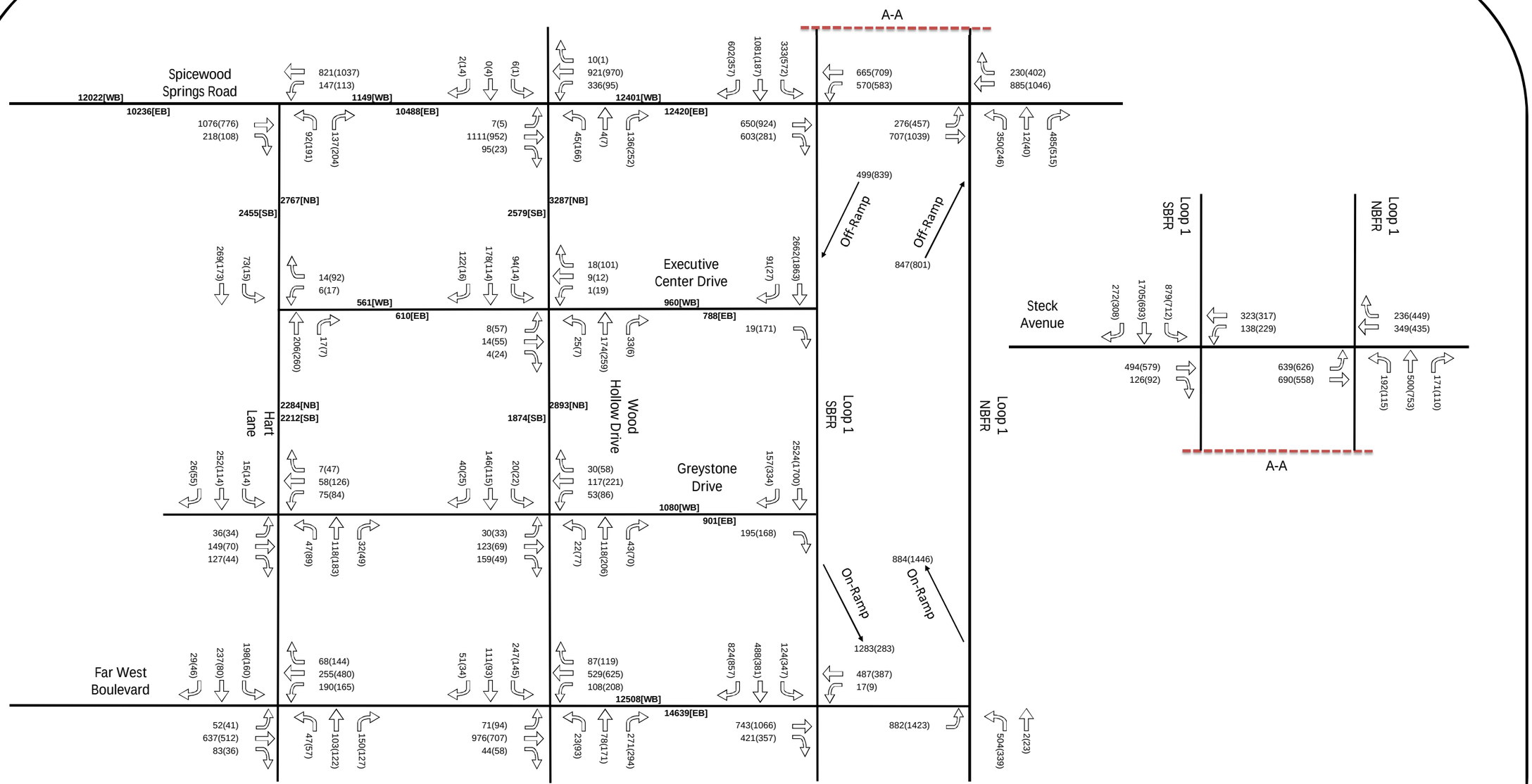



# EXHIBIT 3

2016 EXISTING LANE ASSIGNMENTS AND TRAFFIC CONTROL

AUSTIN OAKS TIA

Kimley»Horn




# EXHIBIT 4

2016 EXISTING TRAFFIC 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

7/21/2016

## 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 6*** 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 6 – 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 95$^{th}$ 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, the City typically programs the signals 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

An analysis of the 2016 Existing scenario 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[1] reports, including signal timing plans, for the 2016 analyses are provided as ***Appendix M.***

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 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 of Spicewood Springs Road to Wood Hollow Drive exceeds the existing bay length.

- *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 due to the high volume at this approach.

- *Spicewood Springs Road & Loop 1 SBFR.* The southbound approach of Loop 1 SBFR at Spicewood Springs Road experiences an unacceptable LOS 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 AM and PM 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 exceeds the threshold at which a deceleration lane should be considered (50 vehicles per hour (vph)) per TxDOT Access Management Requirements.

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[1] 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.

- *Greystone Drive Executive Center Drive & Loop 1 SBFR.* The southbound right-turn volume from Loop 1 SBFR to Greystone Drive 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.

## 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 85$^{th}$ 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.***

## C. *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 existing traffic and regional background growth on traffic operations at intersections along Loop 1 will 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.

As illustrated in ***Table 7*** and ***Table 8,*** 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. Regional improvements are required to achieve an acceptable LOS at the intersections along Loop 1. Applicant requests that the City also seek any regional improvement plans for Mopac from TxDOT. Determining these regional improvements is within the control of TxDOT and the City; beyond the scope of mitigation for a local development. The following are issues that will be observed in each future scenario -- all of which require TxDOT approval:

- *Spicewood Springs Road & Loop 1 SBFR.* 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 high as are the external eastbound and westbound approach volumes. Geometric improvements within TxDOT's right-of-way are required to achieve an acceptable LOS at the intersection which may include an innovative intersection configuration.

- *Spicewood Springs Road & Loop 1 NBFR.* The northbound approach of Loop 1 NBFR at Spicewood Springs Road experiences an unacceptable LOS due to the high volume at this approach. Additional capacity is needed to achieve an acceptable LOS at the intersection. However, due to railroad constraints, the northbound approach cannot be widened.

- *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.

- *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 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. Delays are reported at the external approaches of the diamond. Additional capacity is needed at the intersection to provide adequate traffic operations.

# TABLE 7

## 2016 AM PEAK HOUR ANALYSIS RESULTS

## AUSTIN OAKS TIA

| Required Study Area | | | 2016 No Build Condition | | | |
|---|---|---|---|---|---|---|
| **Intersection** | **Traffic Control** | **Approach** | **95% Queue** | **V/C** | **Delay** | **LOS** |
| Spicewood Springs Road & Hart Lane | TWSC/ Signalized | EB | 0 | 0.33 | 0 | A |
| | | WB | 24 | 0.25 | 1.9 | A |
| | | NB | 79 | 0.54 | 28.7 | C |
| Spicewood Springs Road & Wood Hollow Drive | Signalized | EB | 279 | 0.46 | 19 | B |
| | | WB | m382 | 0.84 | 18.8 | B |
| | | NB | 76 | 0.2 | 45.1 | D |
| | | SB | 0 | 0.01 | 43.3 | D |
| | | INT | | | 20.8 | C |
| Spicewood Springs Road & Loop 1 SBFR | Signalized | EB | ***#824*** | ***1.45*** | ***198.6*** | ***F*** |
| | | WB | m527 | 0.85 | 15.3 | B |
| | | SB | ***m384*** | ***1.19*** | ***72.1*** | ***E*** |
| | | INT | | | ***91.7*** | ***F*** |
| Spicewood Springs Road & Loop 1 NBFR | Signalized | EB | m40 | 0.4 | 2.1 | A |
| | | WB | 440 | 0.76 | 38.7 | D |
| | | NB | ***#549*** | ***1.31*** | ***99.9*** | ***F*** |
| | | INT | | | 44.1 | D |
| Executive Center Drive & Hart Lane | TWSC | WB | 3 | 0.04 | 11.5 | B |
| | | NB | 0 | 0.16 | 0 | A |
| | | SB | 5 | 0.07 | 2.2 | A |
| Executive Center Drive & Wood Hollow Drive | TWSC/ AWSC | EB | 8 | 0.09 | 17.4 | B |
| | | WB | 5 | 0.07 | 13 | B |
| | | NB | 2 | 0.02 | 1.1 | A |
| | | SB | 7 | 0.08 | 2.5 | A |
| Executive Center Dr. & Loop 1 SBFR | TWSC | EB | 2 | 0.02 | 9.4 | A |
| | | SB | 0 | 0.66 | 0 | A |
| Greystone Drive & Hart Lane | AWSC | NB | 2.2 | 0.435 | 14.3 | B |
| | | EB | 2.2 | 0.442 | 13.6 | B |
| | | WB | 1.5 | 0.343 | 14 | B |
| | | SB | 4.2 | 0.618 | 18.8 | B |
| | | INT | | | 15.4 | B |
| Greystone Drive & Wood Hollow Drive | AWSC | NB | 1.3 | 0.319 | 11.9 | B |
| | | EB | 1.3 | 0.302 | 11.1 | B |
| | | WB | 1.5 | 0.347 | 12.2 | B |
| | | SB | 1.7 | 0.367 | 12.5 | B |
| | | INT | | | 11.8 | B |
| Greystone Drive & Loop 1 SBFR | TWSC | EB | ***149*** | ***0.79*** | ***56.4*** | ***E*** |
| | | SB | 0 | 0.62 | 0 | A |
| Faw West Boulevard & Hart Lane | Signalized | EB | 357 | 0.65 | 34.7 | C |
| | | WB | 206 | 0.58 | 37.5 | D |
| | | NB | ***190*** | ***0.8*** | ***62.9*** | ***E*** |
| | | SB | ***282*** | ***0.89*** | ***65.6*** | ***E*** |
| | | INT | | | 46.5 | D |
| Faw West Boulevard & Wood Hollow Drive | Signalized | EB | 478 | 0.57 | 30.2 | C |
| | | WB | m180 | 0.49 | 29.4 | C |
| | | NB | ***#208*** | ***0.72*** | ***68.8*** | ***E*** |
| | | SB | 303 | 0.67 | 45.6 | D |
| | | INT | | | 37.9 | D |
| Faw West Boulevard & Loop 1 SBFR | Signalized | EB | 373 | 0.57 | 20.2 | C |
| | | WB | m12 | 0.41 | 2.8 | A |
| | | SB | m158 | 0.89 | 26.8 | C |
| | | INT | | | 20.4 | C |
| Faw West Blvd. & Loop 1 NBFR | Signalized | EB | 13 | 0.42 | 3.3 | A |
| | | NB | 306 | 0.57 | 41 | D |
| | | INT | | | 17 | B |
| Steck Avenue & Loop 1 SBFR | Signalized | EB | ***#325*** | ***0.88*** | ***62*** | ***E*** |
| | | WB | m42 | 0.4 | 5.2 | A |
| | | SB | ***#1445*** | ***1.3*** | ***143.8*** | ***F*** |
| | | INT | | | ***114.7*** | ***F*** |
| Steck Avenue & Loop 1 NBFR | Signalized | EB | m122 | 0.61 | 4.1 | A |
| | | WB | 208 | 0.73 | 54.8 | D |
| | | NB | ***m#1195*** | ***2.58*** | ***610*** | ***F*** |
| | | INT | | | ***203*** | ***F*** |

# TABLE 8

## 2016 PM PEAK HOUR ANALYSIS RESULTS

## AUSTIN OAKS TIA

| Required Study Area | | | 2016 No Build Condition | | | |
|---|---|---|---|---|---|---|
| **Intersection** | **Traffic Control** | **Approach** | **95% Queue** | **V/C** | **Delay** | **LOS** |
| Spicewood Springs Road & Hart Lane | TWSC/ Signalized | EB | 0 | 0.25 | 0 | A |
| | | WB | 14 | 0.34 | 1 | A |
| | | NB | ***329*** | ***1.01*** | ***77.4*** | ***E*** |
| Spicewood Springs Road & Wood Hollow Drive | Signalized | EB | 201 | 0.33 | 11.7 | B |
| | | WB | 253 | 0.46 | 10 | A |
| | | NB | ***#291*** | ***0.76*** | ***64.2*** | ***E*** |
| | | SB | 30 | 0.03 | 49.1 | D |
| | | INT | | | 20.3 | C |
| Spicewood Springs Road & Loop 1 SBFR | Signalized | EB | ***#714*** | ***1.1*** | ***108*** | ***F*** |
| | | WB | m482 | 0.74 | 10.5 | B |
| | | SB | ***#582*** | ***1.09*** | ***86.1*** | ***F*** |
| | | INT | | | ***66.4*** | ***E*** |
| Spicewood Springs Road & Loop 1 NBFR | Signalized | EB | m180 | 0.77 | 7.3 | A |
| | | WB | 545 | 0.72 | 34.3 | C |
| | | NB | ***#534*** | ***1.35*** | ***161.1*** | ***F*** |
| | | INT | | | 50.6 | D |
| Executive Center Drive & Hart Lane | TWSC | WB | 22 | 0.23 | 12.3 | B |
| | | NB | 0 | 0.21 | 0 | A |
| | | SB | 1 | 0.02 | 0.8 | A |
| Executive Center Drive & Wood Hollow Drive | TWSC/ AWSC | EB | 63 | 0.48 | 23.3 | C |
| | | WB | 32 | 0.3 | 14.1 | B |
| | | NB | 0 | 0.01 | 0.3 | A |
| | | SB | 1 | 0.02 | 0.9 | A |
| Executive Center Dr. & Loop 1 SBFR | TWSC | EB | 65 | 0.49 | 23.1 | C |
| | | SB | 0 | 0.48 | 0 | A |
| Greystone Drive & Hart Lane | AWSC | NB | 3.1 | 0.525 | 14.6 | B |
| | | EB | 0.8 | 0.209 | 10.6 | B |
| | | WB | 2 | 0.405 | 12.8 | B |
| | | SB | 1.3 | 0.309 | 11.3 | B |
| | | INT | | | 12.8 | B |
| Greystone Drive & Wood Hollow Drive | AWSC | NB | 2.6 | 0.486 | 13.9 | B |
| | | EB | 0.7 | 0.2 | 10.8 | B |
| | | WB | 3.5 | 0.562 | 16.1 | B |
| | | SB | 1 | 0.263 | 11.6 | B |
| | | INT | | | 13.9 | B |
| Greystone Drive & Loop 1 SBFR | TWSC | EB | 99 | 0.63 | 34.7 | C |
| | | SB | 0 | 0.46 | 0 | A |
| Faw West Boulevard & Hart Lane | Signalized | EB | 207 | 0.32 | 18.8 | B |
| | | WB | 63 | 0.32 | 6.3 | A |
| | | NB | ***182*** | ***0.75*** | ***60.7*** | ***E*** |
| | | SB | ***171*** | ***0.73*** | ***60.5*** | ***E*** |
| | | INT | | | 26.3 | C |
| Faw West Boulevard & Wood Hollow Drive | Signalized | EB | 199 | 0.45 | 15.7 | B |
| | | WB | m184 | 0.76 | 30.3 | C |
| | | NB | ***#297*** | ***0.82*** | ***65.2*** | ***E*** |
| | | SB | ***202*** | ***0.75*** | ***65.9*** | ***E*** |
| | | INT | | | 36.6 | D |
| Faw West Boulevard & Loop 1 SBFR | Signalized | EB | 538 | 0.68 | 18.6 | B |
| | | WB | 16 | 0.25 | 3.7 | A |
| | | SB | ***#889*** | ***1.38*** | ***151.5*** | ***F*** |
| | | INT | | | ***78.7*** | ***E*** |
| Faw West Blvd. & Loop 1 NBFR | Signalized | EB | 736 | 0.93 | 32.2 | C |
| | | NB | 181 | 0.29 | 25.4 | C |
| | | INT | | | 30.8 | C |
| Steck Avenue & Loop 1 SBFR | Signalized | EB | ***#351*** | ***0.87*** | ***59.4*** | ***E*** |
| | | WB | 7 | 0.31 | 0.7 | A |
| | | SB | ***#952*** | ***1.34*** | ***202.5*** | ***F*** |
| | | INT | | | ***132.2*** | ***F*** |
| Steck Avenue & Loop 1 NBFR | Signalized | EB | m376 | 0.97 | 15.9 | B |
| | | WB | ***#503*** | ***0.91*** | ***56.9*** | ***E*** |
| | | NB | ***#1460*** | ***2.02*** | ***458.2*** | ***F*** |
| | | INT | | | ***169.8*** | ***F*** |

## 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 9*** displays the addition (or removal) of land use for each anticipated phase of development.

**Table 9 – 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”.

Per City requirements, a 5% reduction was used to calculate trips captured internally for each analysis year. Although the internal capture reduction can be determined at the discretion of the City, 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. The methodology of estimating the existing office development traffic using ITE methodology, as opposed to actual count data, was submitted in the scoping meeting notes

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 10***.

**Table 10 – 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)<br>X= 1,000 Sq. Ft. GFA<br>Y= Dwelling Units<br>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. Multiple paths of travel exist for each origin-destination pair. For instance, a vehicle originating at the site and destined to W. Anderson Lane could travel north to Spicewood Springs Road then continue east or travel south via Loop 1 SBFR and make a U-turn at Far West Boulevard. These paths were considered when assigning a percent of trips associated with the proposed development to each movement.

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 11*** displays the global directional distribution percentages assumed for the Austin Oaks development.

**Table 11 – 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. Because the intersection of Executive Center Drive & Wood Hollow Drive is in such close proximity with the site, the trip distribution at this intersection will vary with each anticipated phase of development.

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. For the local trip distribution, trips were assigned to driveways based on the quantity of trips generated by the land uses the driveway provides access to. Based on the 2024 Build Trip Generation, the percent of trips (average of AM and PM peak hour) generated by each land use and the breakdown of each land use by phase is shown in ***Table 12***. For example, the apartment generates 7% of the 2024 trips and 100% of the apartment is anticipated to be constructed in year 2020.

**Table 12 – Land Use Trip Generation and Construction**

| Phase | Year | Apartment | Hotel | Gen. Off | Med. Off | Restaurant |
|---|---|---|---|---|---|---|
| % of 2024 Trips | | 7% | 3% | 43% | 22% | 24% |
| Phase I | 2018 | 0% | 0% | 32% | 33% | 0% |
| Phase II | 2020 | 100% | 0% | 0% | 0% | 32% |
| Phase III | 2022 | 0% | 100% | 31% | 33% | 68% |
| Phase IV | 2024 | 0% | 0% | 37% | 35% | 0% |

The product of the land use trip generation and the amount of the corresponding land use constructed in each anticipated phase is used to determine the percent of trips allocated to each land use for each analysis year. Ultimately, this information can then be used to calculate the percent of trips generated by each phase for each analysis year. The breakdown (by phase) of total site traffic for each analysis year are shown in ***Table 13***. For example, anticipated Phase II generates approximately 40% of total site traffic in year 2020 and 20% in year 2022. Driveways which provide access to each phase were assigned trips accordingly

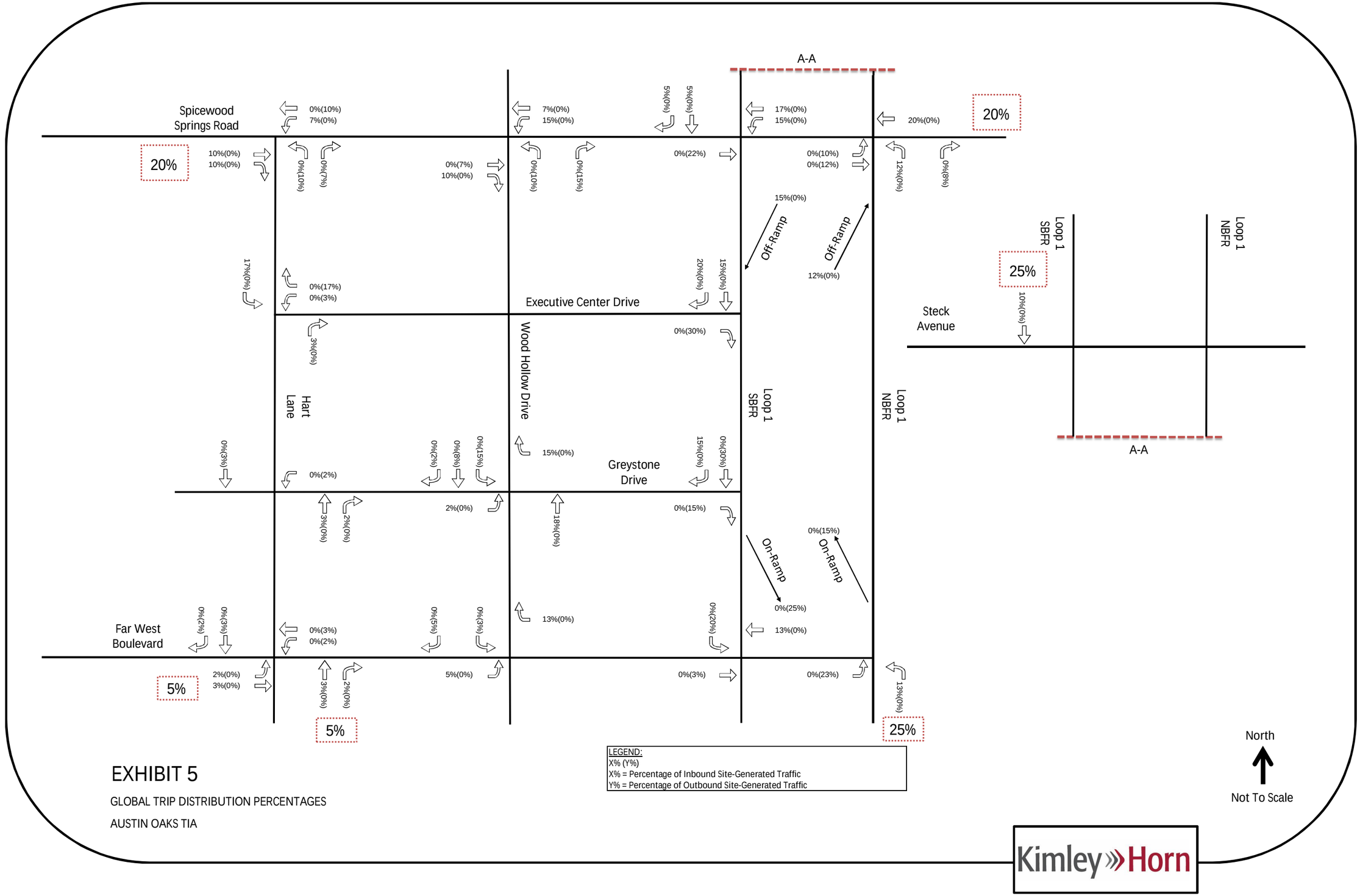
**Table 13 – Local Trip Distribution Information**

| % Of Total Development Site Trips | | Analysis Year | | | |
|---|---|---|---|---|---|
| | | 2024 | 2022 | 2020 | 2018 |
| **Phase** | Phase I | 20% | 30% | 60% | 100% |
| | Phase II | 15% | 20% | 40% | |
| | Phase III | 40% | 50% | | |
| | Phase IV | 25% | | | |

Trip distribution percentages (global and local) are multiplied by the corresponding phase 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 variation in the proposed trip generation. For all existing intersections, trip distribution percentages are multiplied by the Net New External Trips to calculate the trip assignment volumes to avoid "double counting" the existing office trips. For all site driveways, trip distribution percentages are multiplied by the Trips (at Site Driveways) to calculate the trip assignment volumes as these driveways were assumed to have no existing office trips.

## *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 6, 13, 20, and 27***. 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 5

GLOBAL TRIP DISTRIBUTION PERCENTAGES

AUSTIN OAKS TIA

Kimley»Horn

7/21/2016

## A. TRAFFIC VOLUME CONDITIONS

### TRIP GENERATION

The 2018 Build Scenario assumes the completion of Phase I of the Austin Oaks development. ***Table 14*** 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 anticipated completion of Phase I.

**Table 14 – 2018 Build Trip Generation**

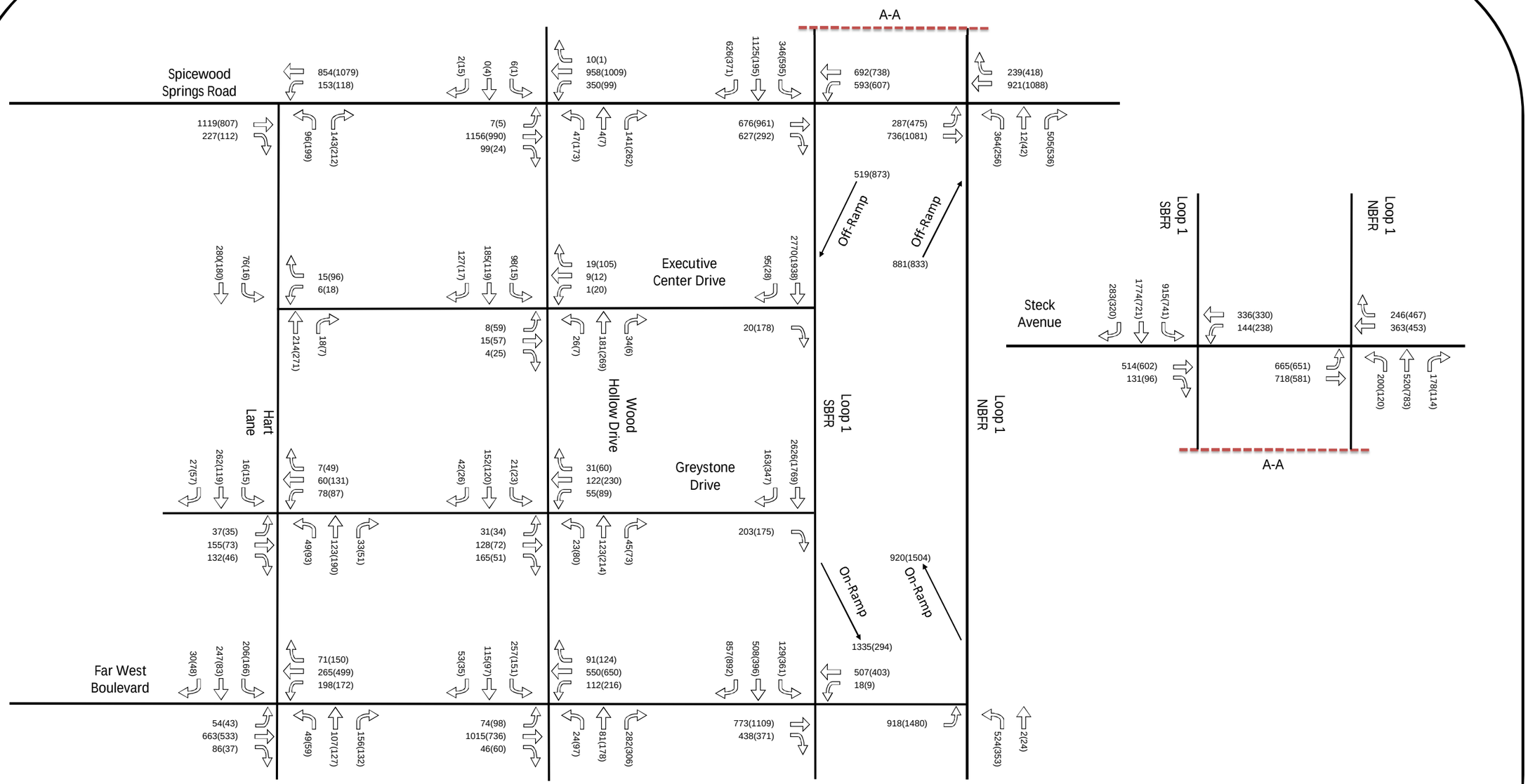
| Land Use | Amount | Units | ITE Code | Daily Trips | AM Peak Hour Trips | | | PM Peak Hour Trips | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | In | Out | Total | In | Out | Total |
| Existing General Office Building | 445.322 | 1,000 Sq Ft | 710 | 4,086 | 556 | 76 | 632 | 98 | 479 | 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 Trips (at Site Driveways) | | | | **4,383** | **414** | **70** | **484** | **102** | **387** | **489** |
| 2018 Net New External Trips | | | | **3,755** | **325** | **57** | **382** | **85** | **306** | **391** |

### TRIP DISTRIBUTION AND ASSIGNMENT

The 2018 Trip Assignment Volumes, shown as ***Exhibit 7,*** are the product of the Global Trip Distribution Percentages and 2018 Net New External Trips, as shown in ***Table 14***. The 2018 Local Trip Distribution Percentages, as shown as ***Exhibit 8***, were developed based on the size and location of the Austin Oaks development expected to be completed by year 2018.

### TOTAL TRAFFIC VOLUMES

For all existing intersections, the assignment volumes were added to 2018 No Build Volumes (***Exhibit 6***) to determine the 2018 Build Traffic Volumes. Existing office trips were not assumed at site driveways. Therefore, the in/out movements to/from site driveways are the product of the Local Trip Distribution Percentages and the Trips (at Site Driveways) shown in ***Table 14.*** The weekday AM and PM peak hour traffic volumes used for the analysis of the 2018 Build and Mitigated Scenarios are shown in ***Exhibit 9*** and ***Exhibit 10*** for network intersections and site driveways, respectively.




# EXHIBIT 6

2018 NO BUILD TRAFFIC VOLUMES

AUSTIN OAKS TIA

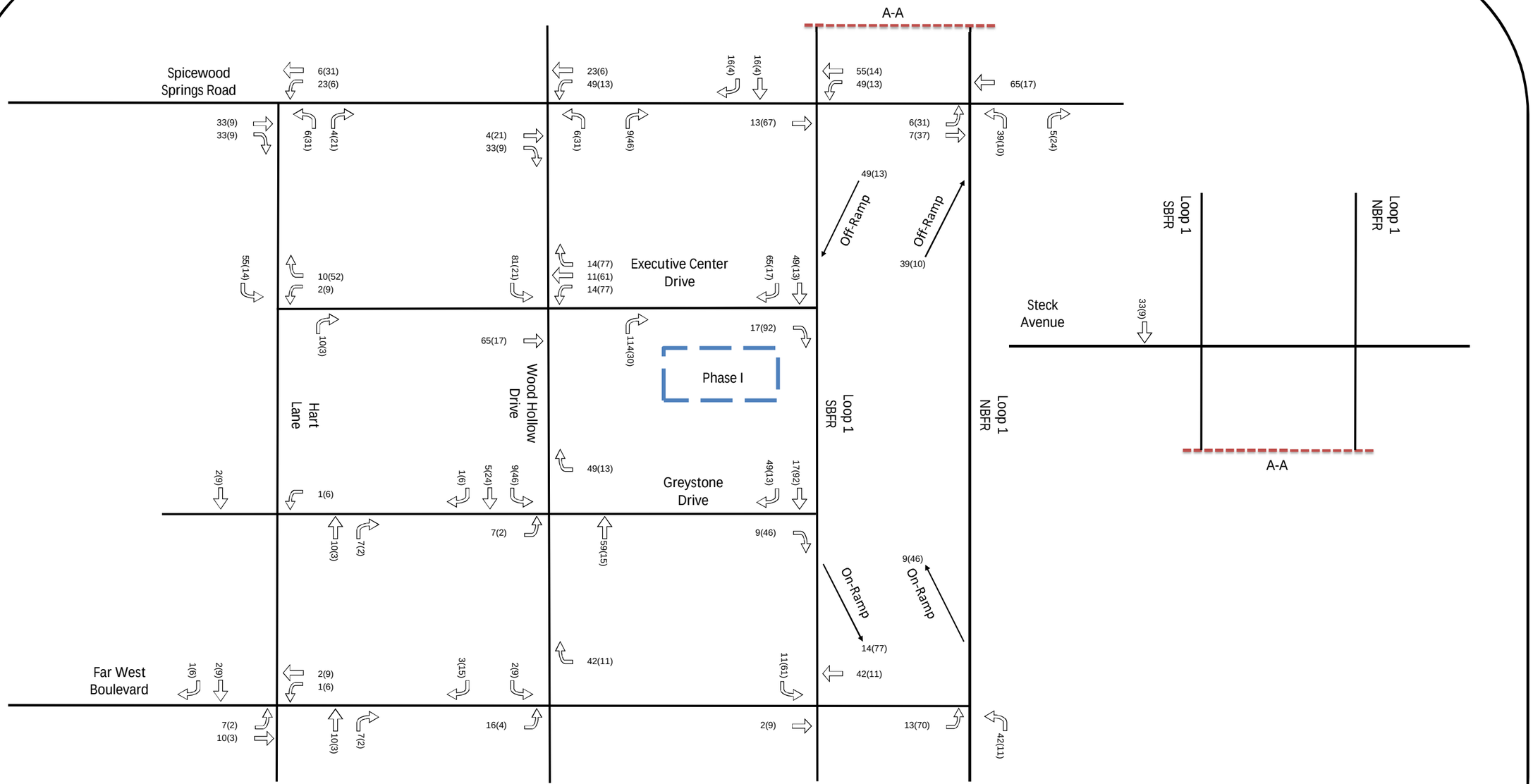
LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

Kimley»Horn

7/21/2016




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

North

Not To Scale

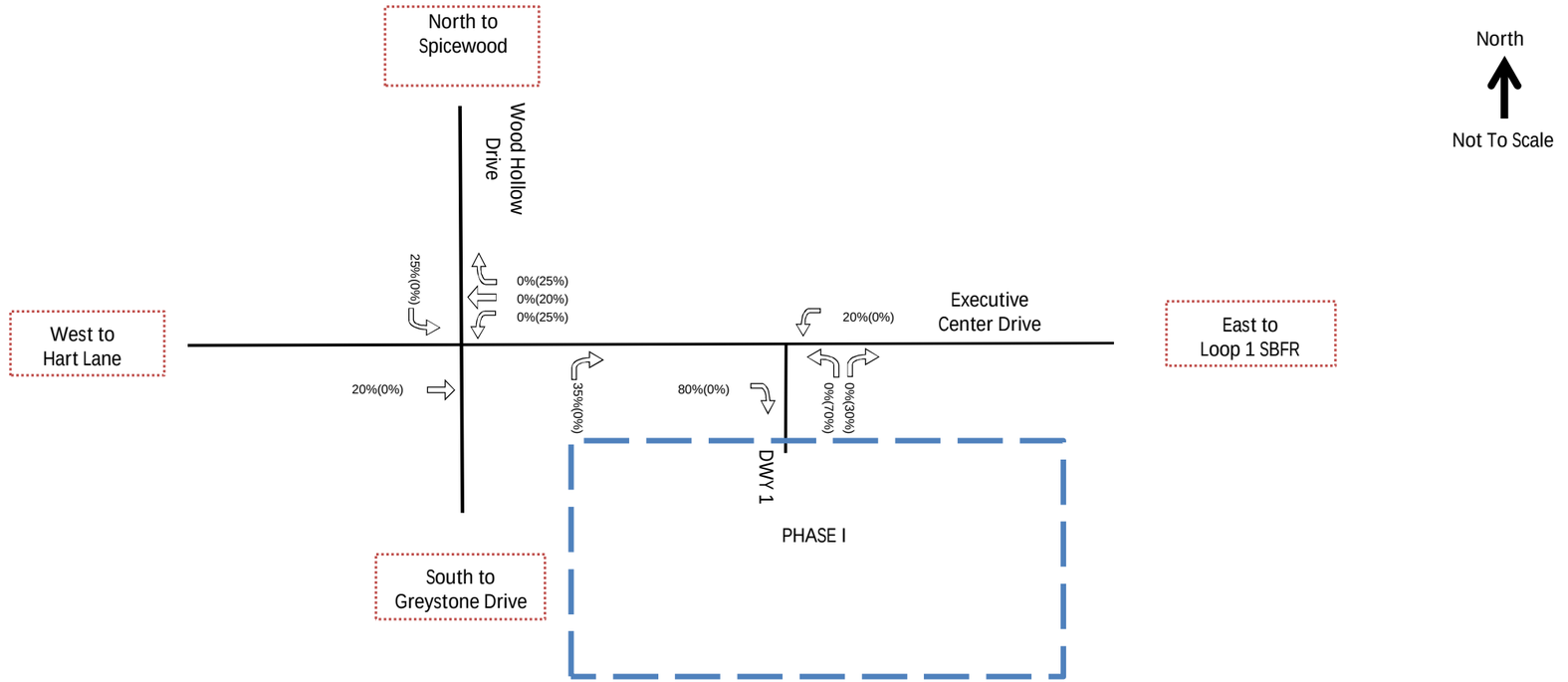
# EXHIBIT 7

2018 TRIP ASSIGNMENT VOLUMES (NET NEW TRIPS)

AUSTIN OAKS TIA - SEE TABLE 14

Kimley»Horn

7/21/2016




North

Not To Scale

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

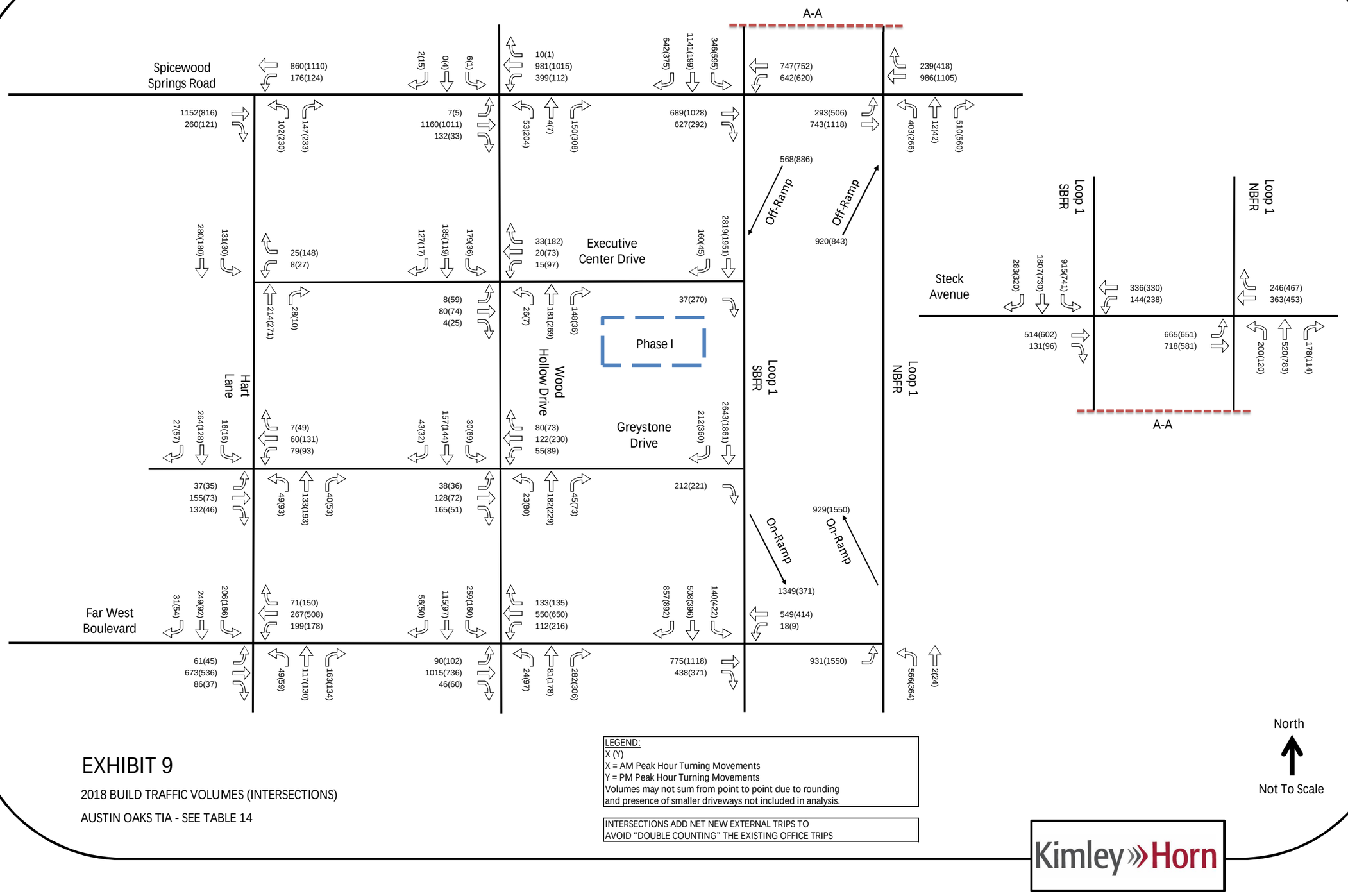
# EXHIBIT 8

2018 LOCAL TRIP DISTRIBUTION PERCENTAGES

AUSTIN OAKS TIA

Kimley»Horn

7/21/2016




# EXHIBIT 9

2018 BUILD TRAFFIC VOLUMES (INTERSECTIONS)

AUSTIN OAKS TIA - SEE TABLE 14

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.

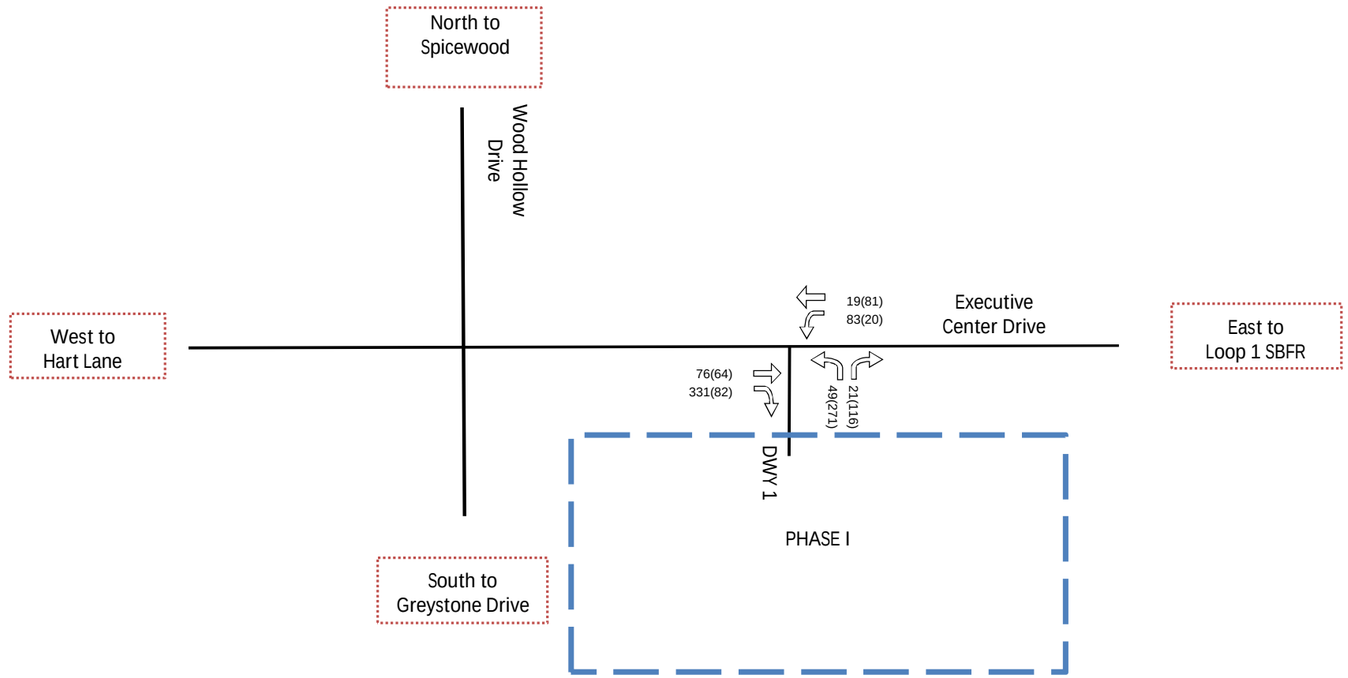
INTERSECTIONS ADD NET NEW EXTERNAL TRIPS TO AVOID "DOUBLE COUNTING" THE EXISTING OFFICE TRIPS

North

Not To Scale

Kimley»Horn

7/21/2016




North

Not To Scale

# EXHIBIT 10

2018 BUILD TRAFFIC VOLUMES (DRIVEWAYS)

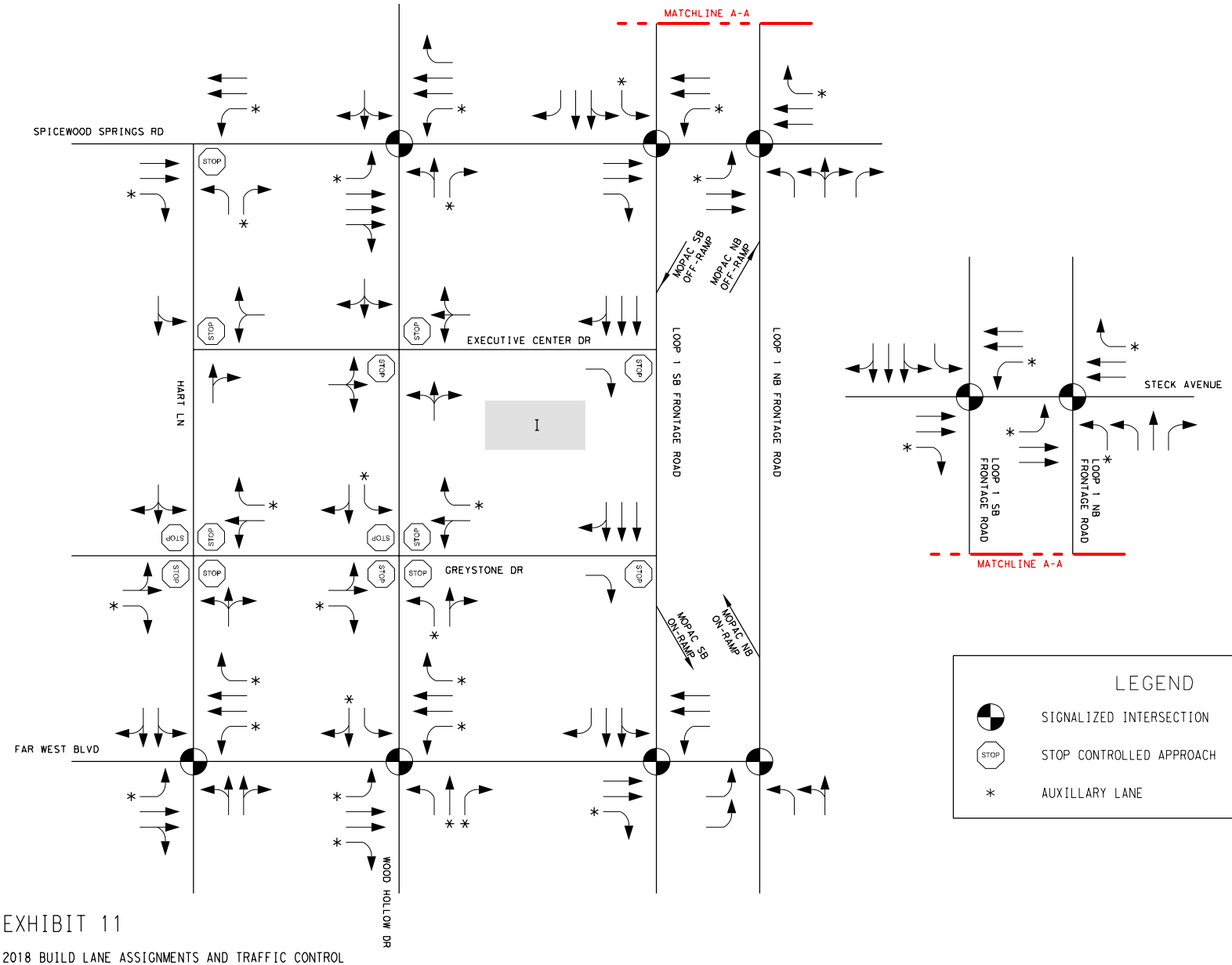
AUSTIN OAKS TIA - SEE TABLE 14

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.

DRIVEWAY INGRESS/EGRESS VOLUMES REFLECT TRIPS (AT SITE DRIVEWAYS)
AS THESE MOVEMENTS WERE ASSUMED TO HAVE NO EXISTING OFFICE TRIPS

Kimley»Horn

7/21/2016




# EXHIBIT 11

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 11***. ***Table 15*** and ***Table 16*** summarize the intersection operations for the 2018 Build Scenario AM and PM peak hours, respectively. Synchro reports, including signal timing plans, for all 2018 analyses are provided as ***Appendix N.*** Noteworthy traffic operations at intersections are as follows:

Aforementioned 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 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 of Spicewood Springs Road to Wood Hollow Drive exceeds the existing bay length.

- *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 due to the high volume at this approach.

- *Spicewood Springs Road & Loop 1 SBFR.* The southbound approach of Loop 1 SBFR at Spicewood Springs Road experiences an unacceptable LOS 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 AM and PM 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 exceeds the threshold at which a deceleration lane should be considered (50 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 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 exceed the impacts of local development.

Build (2018) Observations:

- *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.

## C. 2018 IMPROVEMENTS

Based on the results of the 2018 Build analysis, the following improvements (shown in ***Exhibit 12***) are recommended:

- *Spicewood Springs Road & Hart Lane (1).* Consider installing a fully actuated traffic signal at the intersection of Spicewood Springs Road and Hart Lane. Install an advance warning flasher west of the intersection synchronized with the traffic signal to address the potential safety issue related to the horizontal curvature of Spicewood Springs Road. Widen the northbound approach of Hart Lane to include dual left-turns.

- *Hart Lane between Executive Center Drive and Spicewood Springs Road (2)*. Widen Hart Lane between Executive Center Drive and Spicewood Springs Road to accommodate a three-lane northbound approach at the intersection of Hart Lane at Spicewood Springs Road. Restripe the northbound approach of Hart Lane to include dual-left-turn lanes and an exclusive right-turn lane (three 10' approach lanes); a single northbound receiving lane (14') and southbound bike lane (5') will remain.

- *Spicewood Springs Road & Wood Hollow Drive (3)*. 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. 15% of the inbound trips generated by the Austin Oaks development were assigned to the westbound left-turn movement of Spicewood Springs Road to Wood Hollow Drive. The proposed left-turn bay extension will mitigate the impact of site traffic at this movement.

- *Spicewood Springs Road & Wood Hollow Drive (4).* 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. 15% of the outbound trips generated by the Austin Oaks development were assigned to the right-turn movement of Wood Hollow Drive to Spicewood Springs Road. The proposed right-turn overlap operation will mitigate the impact of site traffic at this movement.

- *Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road (5)*. Concurrently with the right-turn overlap improvement at the northbound right-turn movement of Wood Hollow Drive to Spicewood Springs Road, 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.

- *Spicewood Springs Road & Loop 1 SBFR* (6). Provide a FREE, channelized operation at the southbound right-turn movement from Loop 1 SBFR to Spicewood Springs Road (westbound). On Spicewood Springs the existing pavement can accommodate a FREE operation, however, there are design constraints due to the existing bike lane. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Spicewood Springs Road & Loop 1 SBFR* (7). 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. 12' receiving lanes should be maintained along Mopac Southbound Frontage Road. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Executive Center Drive & Wood Hollow Drive (8)*. Implement stop-control at the northbound and southbound approaches of Wood Hollow Drive. Restripe the northbound approach of Wood Hollow Drive at Executive Center Drive to include a shared thru-left and a shared thru-right. The shared thru-right lanes will also be marked as shared bike lanes. This will require the north-leg of the intersection to be restriped to provide two receiving lanes. Restripe the southbound approach of Wood Hollow Drive at Executive Center Drive to include an exclusive right-turn lane and a shared thru-left. The proposed cross-sections can be accomplished using existing pavement.

- *Executive Center Drive & Loop 1 SBFR (9)*. 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. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Executive Center Drive at Loop 1 SBFR (10)*. 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. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Greystone Drive & Loop 1 SBFR (11)*. Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Greystone Drive). 15% of the outbound trips generated by the Austin Oaks development were assigned to the eastbound right-turn movement of Greystone Drive at Loop 1 SBFR. The proposed southbound right-turn deceleration lane will mitigate the impact of site traffic at eastbound approach by removing vehicles turning right from the southbound thru lane. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Far West Boulevard & Hart Lane (12).* 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. Concurrently with the approach widening, a 5' sidewalk should be reconstructed adjacent to the northbound approach of Hart Lane. Restripe the southbound approach of Hart Lane to include an exclusive left-turn lane, exclusive thru lane, and shared thru-right lane (three 10' approach lanes); a single northbound receiving lane (14') will remain.

- *Far West Boulevard & Wood Hollow Drive (13)*. 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 (14)*. 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'). The proposed southbound channelized right-turn movement is intended to accommodate the planned bike lane. However, it remains unclear what further improvements will be necessary to accommodate the bike lane west of the intersection. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

The 2018 improvements recommended along Mopac Southbound Frontage Road between Spicewood Springs Road and Far West Boulevard are incorporated into a single exhibit provided as ***Appendix H.*** 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 15*** and ***Table 16*** 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 either an acceptable LOS or report delay less than the No Build scenario.

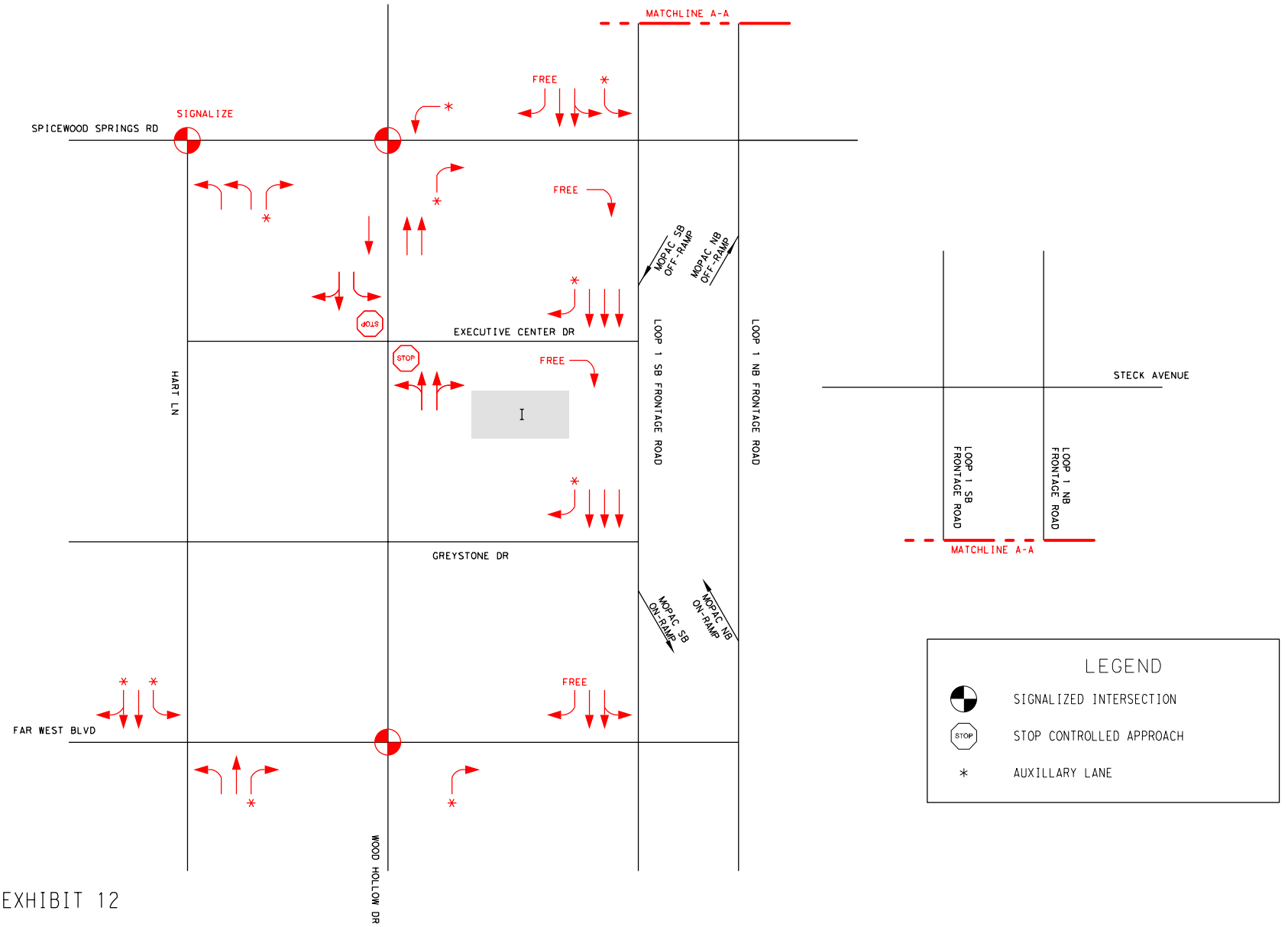



EXHIBIT 12

2018 IMPROVEMENTS

AUSTIN OAKS TIA

Kimley»Horn

# TABLE 15

## 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 | A | 0 | 0.35 | 0 | A | 440 | 0.64 | 22.8 | C |
| | | WB | 26 | 0.26 | 2 | A | 33 | 0.31 | 2.4 | A | 231 | 0.36 | 8.4 | A |
| | | NB | 97 | 0.61 | 32.4 | C | 130 | 0.71 | 40 | D | 69 | 0.4 | 23.6 | C |
| | | INT | | | | | | | | | | | 20.2 | C |
| Spicewood Springs Road & Wood Hollow Drive | Signalized | EB | 294 | 0.49 | 20.5 | C | 305 | 0.52 | 21.5 | C | 485 | 0.6 | 25.9 | C |
| | | WB | m387 | 0.85 | 20.1 | C | m#412 | 0.96 | 26 | C | 397 | 0.94 | 26.3 | C |
| | | NB | 78 | 0.2 | 45.1 | D | 85 | 0.23 | 45.4 | D | 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 | | | 22.1 | C | | | 25.4 | C | | | 19.3 | B |
| Spicewood Springs Road & Loop 1 SBFR | Signalized | EB | ***#868*** | ***1.52*** | ***215.5*** | ***F*** | ***#870*** | ***1.52*** | ***215*** | ***F*** | #455 | 0.97 | 51 | D |
| | | WB | m534 | 0.88 | 15.9 | B | m#597 | 0.95 | 18.4 | B | m#597 | 0.95 | 18.4 | B |
| | | SB | ***m390*** | ***1.24*** | ***85.6*** | ***F*** | ***m388*** | ***1.26*** | ***93.2*** | ***F*** | ***m388*** | ***1.26*** | ***80.3*** | ***F*** |
| | | INT | | | ***102.6*** | ***F*** | | | ***104.9*** | ***F*** | | | ***71.8*** | ***E*** |
| Spicewood Springs Road & Loop 1 NBFR | Signalized | EB | m42 | 0.41 | 2.2 | A | m42 | 0.42 | 2.1 | A | m42 | 0.42 | 2.1 | A |
| | | WB | 462 | 0.79 | 39.8 | D | 506 | 0.85 | 42.5 | D | 506 | 0.85 | 42.5 | D |
| | | NB | ***#573*** | ***1.36*** | ***111.3*** | ***F*** | ***#608*** | ***1.43*** | ***140.3*** | ***F*** | ***#609*** | ***1.43*** | ***139.6*** | ***F*** |
| | | INT | | | 47.8 | D | | | ***57.7*** | E | | | ***58.2*** | ***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 | A | 0 | 0.17 | 0 | A | 0 | 0.17 | 0 | A |
| | | SB | 6 | 0.07 | 2.3 | A | 10 | 0.12 | 3.5 | A | 10 | 0.12 | 3.5 | A |
| Executive Center Drive & Wood Hollow Drive | TWSC | EB | 8 | 0.1 | 18.3 | B | ***91*** | ***0.65*** | ***60.9*** | ***E*** | 0.7 | 0.182 | 10.6 | B |
| | | WB | 6 | 0.07 | 13.2 | B | 42 | 0.39 | 33.8 | C | 0.4 | 0.13 | 10 | A |
| | | NB | 2 | 0.02 | 1.1 | A | 2 | 0.02 | 0.8 | A | 1.9 | 0.403 | 11.2 | B |
| | | SB | 7 | 0.08 | 2.6 | A | 15 | 0.17 | 4.4 | A | 3 | 0.521 | 13.1 | B |
| | | INT | | | | | | | | | | | 20 | B |
| Executive Center Dr. & Loop 1 SBFR | TWSC | EB | 2 | 0.03 | 9.7 | A | 4 | 0.05 | 10.3 | B | FREE | FREE | FREE | FREE |
| | | SB | 0 | 0.69 | 0 | A | 0 | 0.7 | 0 | A | FREE | FREE | FREE | FREE |
| Greystone Drive & Hart Lane | AWSC | NB | 2.4 | 0.463 | 15.2 | B | 2.8 | 0.505 | 16.3 | B | 2.8 | 0.505 | 16.3 | B |
| | | EB | 2.5 | 0.469 | 14.3 | B | 2.5 | 0.476 | 14.5 | B | 2.5 | 0.476 | 14.5 | B |
| | | WB | 1.7 | 0.364 | 14.6 | B | 1.7 | 0.376 | 14.9 | B | 1.7 | 0.376 | 14.9 | B |
| | | SB | 4.8 | 0.659 | 20.8 | C | 5.1 | 0.671 | 21.7 | C | 5.1 | 0.671 | 21.7 | C |
| | | INT | | | 16.6 | B | | | 17.2 | B | | | 13.8 | B |
| Greystone Drive & Wood Hollow Drive | AWSC | NB | 1.5 | 0.338 | 12.2 | B | 2.6 | 0.485 | 15.5 | B | 2.6 | 0.485 | 15.5 | B |
| | | EB | 1.4 | 0.32 | 11.4 | B | 1.6 | 0.36 | 12.8 | B | 1.6 | 0.36 | 12.8 | B |
| | | WB | 1.7 | 0.368 | 12.6 | B | 1.9 | 0.394 | 13.2 | B | 1.9 | 0.394 | 13.2 | B |
| | | SB | 1.8 | 0.39 | 13 | B | 2.1 | 0.429 | 14.4 | B | 2.1 | 0.429 | 14.4 | B |
| | | INT | | | 12.2 | B | | | 13.9 | B | | | 16 | B |
| Greystone Drive & Loop 1 SBFR | TWSC | EB | ***179*** | ***0.87*** | ***72.4*** | ***E*** | ***212*** | ***0.95*** | ***92.8*** | ***F*** | ***159*** | ***0.81*** | ***56.2*** | ***E*** |
| | | SB | 0 | 0.64 | 0 | A | 0 | 0.65 | 0 | A | 0 | 0.54 | 0 | A |
| Faw West Boulevard & Hart Lane | Signalized | EB | 375 | 0.69 | 36.4 | D | 382 | 0.7 | 37 | D | 369 | 0.57 | 26.1 | C |
| | | WB | 215 | 0.63 | 40.9 | D | 215 | 0.64 | 41.6 | D | 215 | 0.54 | 25.5 | C |
| | | NB | ***197*** | ***0.81*** | ***64.1*** | ***E*** | ***207*** | ***0.83*** | ***65.4*** | ***E*** | 180 | 0.69 | 51.3 | D |
| | | SB | ***294*** | ***0.9*** | ***67*** | ***E*** | ***295*** | ***0.91*** | ***68*** | ***E*** | ***248*** | ***0.82*** | ***55.2*** | ***E*** |
| | | INT | | | 48.5 | D | | | 49.4 | D | | | 31.8 | C |
| Faw West Boulevard & Wood Hollow Drive | Signalized | EB | 497 | 0.61 | 31.5 | C | 498 | 0.61 | 31.2 | C | 562 | 0.58 | 29.7 | C |
| | | WB | m181 | 0.54 | 30 | C | m183 | 0.56 | 35.5 | D | 225 | 0.4 | 33.6 | C |
| | | NB | ***#242*** | ***0.81*** | ***75.9*** | ***E*** | ***#244*** | ***0.81*** | ***76.9*** | ***E*** | ***156*** | ***0.81*** | ***66.6*** | ***E*** |
| | | SB | #325 | 0.68 | 44.9 | D | #334 | 0.68 | 45 | D | 304 | 0.81 | 54.9 | D |
| | | INT | | | 39.5 | D | | | 41 | D | | | 41.6 | D |
| Faw West Boulevard & Loop 1 SBFR | Signalized | EB | m390 | 0.6 | 20 | B | m392 | 0.6 | 20.1 | C | 383 | 0.58 | 20.3 | C |
| | | WB | m12 | 0.43 | 1.7 | A | m12 | 0.46 | 1.8 | A | m12 | 0.45 | 8.5 | A |
| | | SB | m161 | 0.96 | 31.6 | C | m165 | 0.97 | 34.8 | C | m171 | 0.56 | 11.5 | B |
| | | INT | | | 22.4 | C | | | 23.6 | C | | | 26.2 | C |
| Faw West Blvd. & Loop 1 NBFR | Signalized | EB | 13 | 0.42 | 3 | A | 14 | 0.43 | 3 | A | 21 | 0.5 | 6.4 | A |
| | | NB | 320 | 0.62 | 44.3 | D | 346 | 0.68 | 46.2 | D | 333 | 0.5 | 33.2 | C |
| | | INT | | | 18.1 | B | | | 19.4 | B | | | 42.8 | D |
| 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*** | | | ***148.8*** | ***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#1252*** | ***2.7*** | ***648.7*** | ***F*** | ***m#1250*** | ***2.7*** | ***648.3*** | ***F*** | ***m#1249*** | ***2.7*** | ***648.3*** | ***F*** |
| | | INT | | | ***215.5*** | ***F*** | | | ***215.4*** | ***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 | | | | | 11 | 0.13 | 12.1 | B | 11 | 0.13 | 12.3 | B |

# TABLE 16

## 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 | A | 0 | 0.27 | 0 | A | 374 | 0.52 | 26.2 | C |
| | | WB | 16 | 0.35 | 1.1 | A | 17 | 0.36 | 1.1 | A | 273 | 0.42 | 9.9 | A |
| | | NB | ***452*** | ***1.18*** | ***135.1*** | ***F*** | ***728*** | ***1.54*** | ***285.9*** | ***F*** | 171 | 0.72 | 35.3 | D |
| | | INT | | | | | | | | | | | 20.2 | C |
| Spicewood Springs Road & Wood Hollow Drive | Signalized | EB | 212 | 0.35 | 11.9 | B | 223 | 0.36 | 12.2 | B | 353 | 0.45 | 10.6 | B |
| | | WB | 274 | 0.48 | 10.3 | B | 283 | 0.48 | 10.5 | B | 334 | 0.58 | 17.4 | B |
| | | NB | ***#310*** | ***0.79*** | ***66.1*** | ***E*** | ***#390*** | ***0.93*** | ***77.7*** | ***E*** | 288 | 0.56 | 40.3 | D |
| | | SB | 31 | 0.03 | 49.1 | D | 31 | 0.03 | 49.1 | D | 26 | 0.02 | 34.9 | C |
| | | INT | | | 20.8 | C | | | 24.3 | C | | | 19.3 | B |
| Spicewood Springs Road & Loop 1 SBFR | Signalized | EB | ***#759*** | ***1.14*** | ***119.2*** | ***F*** | ***#838*** | ***1.22*** | ***144.1*** | ***F*** | ***#838*** | ***1.22*** | ***132*** | ***F*** |
| | | WB | m498 | 0.77 | 10.9 | B | m504 | 0.79 | 11.2 | B | M504 | 0.79 | 11.2 | B |
| | | SB | ***#609*** | ***1.13*** | ***92.6*** | ***F*** | ***#609*** | ***1.13*** | ***93.5*** | ***F*** | ***#609*** | ***1.13*** | ***74.8*** | ***E*** |
| | | INT | | | ***72.2*** | ***E*** | | | ***81.5*** | ***F*** | | | ***71.8*** | ***E*** |
| Spicewood Springs Road & Loop 1 NBFR | Signalized | EB | m180 | 0.8 | 7.5 | A | m183 | 0.85 | 7.8 | A | m183 | 0.85 | 7.8 | 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 | | | 54.7 | D | | | ***58.2*** | ***E*** | | | ***58.2*** | ***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 | A | 0 | 0.22 | 0 | A | 0 | 0.22 | 0 | A |
| | | SB | 1 | 0.02 | 0.8 | A | 3 | 0.03 | 1.4 | A | 3 | 0.03 | 1.4 | A |
| Executive Center Drive & Wood Hollow Drive | TWSC | EB | 72 | 0.52 | 25.6 | C | ***209*** | ***0.97*** | ***99.5*** | ***F*** | 2 | 0.409 | 14.9 | B |
| | | WB | 35 | 0.33 | 14.6 | B | ***436*** | ***1.15*** | ***122.8*** | ***F*** | 7.7 | 0.793 | 29.4 | C |
| | | NB | 0 | 0.01 | 0.3 | A | 0 | 0.01 | 0.2 | A | 2.3 | 0.445 | 15.1 | B |
| | | SB | 1 | 0.02 | 0.9 | A | 3 | 0.04 | 2 | A | 1.7 | 0.378 | 14.2 | B |
| | | INT | | | | | | | | | | | 20 | B |
| Executive Center Dr. & Loop 1 SBFR | TWSC | EB | 75 | 0.53 | 25.4 | C | 183 | 0.83 | 48.2 | D | FREE | FREE | FREE | FREE |
| | | SB | 0 | 0.5 | 0 | A | 0 | 0.5 | 0 | A | FREE | FREE | FREE | FREE |
| Greystone Drive & Hart Lane | AWSC | NB | 3.4 | 0.555 | 15.6 | B | 3.6 | 0.572 | 16 | B | 3.6 | 0.572 | 16 | B |
| | | EB | 0.8 | 0.22 | 11.5 | B | 0.8 | 0.223 | 11 | B | 0.8 | 0.223 | 11 | B |
| | | WB | 2.1 | 0.43 | 14.3 | B | 2.3 | 0.446 | 13.8 | B | 2.3 | 0.446 | 13.8 | B |
| | | SB | 1.4 | 0.328 | 11.7 | B | 1.5 | 0.349 | 12 | B | 1.5 | 0.349 | 12 | B |
| | | INT | | | 13.4 | B | | | 13.8 | B | | | 13.2 | B |
| Greystone Drive & Wood Hollow Drive | AWSC | NB | 2.9 | 0.513 | 15.7 | B | 3.6 | 0.568 | 16.7 | B | 3.6 | 0.568 | 16.7 | B |
| | | EB | 0.8 | 0.212 | 11.8 | B | 0.9 | 0.231 | 11.8 | B | 0.9 | 0.231 | 11.8 | B |
| | | WB | 3.8 | 0.595 | 18.7 | B | 4.3 | 0.629 | 19 | B | 4.3 | 0.629 | 19 | B |
| | | SB | 1.1 | 0.278 | 12.2 | B | 1.5 | 0.349 | 13 | B | 1.5 | 0.349 | 13 | B |
| | | INT | | | 14.6 | B | | | 16 | B | | | 16 | B |
| Greystone Drive & Loop 1 SBFR | TWSC | EB | 118 | 0.69 | 40.9 | D | ***216*** | ***0.93*** | ***78.4*** | ***E*** | 120 | 0.68 | 32.7 | C |
| | | SB | 0 | 0.48 | 0 | A | 0 | 0.5 | 0 | A | 0 | 0.42 | 0 | A |
| Faw West Boulevard & Hart Lane | Signalized | EB | 219 | 0.33 | 19.5 | B | 222 | 0.34 | 20 | B | 198 | 0.3 | 15.5 | B |
| | | WB | 67 | 0.34 | 6.7 | A | 73 | 0.36 | 7.1 | A | 253 | 0.33 | 26.1 | C |
| | | NB | ***187*** | ***0.75*** | ***60.6*** | ***E*** | ***190*** | ***0.75*** | ***60.5*** | ***E*** | 173 | 0.68 | 54.6 | D |
| | | SB | ***176*** | ***0.74*** | ***60.6*** | ***E*** | ***185*** | ***0.75*** | ***60.7*** | ***E*** | ***204*** | ***0.72*** | ***55.4*** | ***E*** |
| | | INT | | | 26.7 | C | | | 27.2 | C | | | 31.8 | C |
| Faw West Boulevard & Wood Hollow Drive | Signalized | EB | 190 | 0.47 | 16.2 | B | 182 | 0.47 | 15.9 | B | 430 | 0.52 | 33.7 | C |
| | | WB | m185 | 0.82 | 31.6 | C | m184 | 0.83 | 32.5 | C | 328 | 0.71 | 35.6 | D |
| | | NB | ***#313*** | ***0.83*** | ***68.2*** | ***E*** | ***#313*** | ***0.85*** | ***70.1*** | ***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 | | | 38.9 | D | | | 41.6 | D |
| Faw West Boulevard & Loop 1 SBFR | Signalized | EB | 568 | 0.72 | 19.4 | B | 574 | 0.73 | 19.8 | B | 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*** | ***#987*** | ***1.51*** | ***186.2*** | ***F*** | #540 | 0.99 | 36.6 | D |
| | | INT | | | ***92.4*** | ***F*** | | | ***96.5*** | ***F*** | | | 26.2 | C |
| Faw West Blvd. & Loop 1 NBFR | Signalized | EB | #835 | 0.97 | 36.5 | D | m#879 | 1.01 | 47 | 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 | | | 42.7 | 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)** | | | | | | | | | | | | | | |
| **Intersection** | **Approach** | | | | | | | | | | | | | |
| Driveway 1 (Phase I) | NB | 81 | 0.54 | 14.8 | B | 81 | 0.54 | 14.8 | B | | | | | |

## A. TRAFFIC VOLUME CONDITIONS

### TRIP GENERATION

The 2020 Build Scenario assumes the completion of Phases I and II of the Austin Oaks development. ***Table 17*** 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 anticipated completion of Phase I and II.

**Table 17 – 2020 Build Trip Generation**

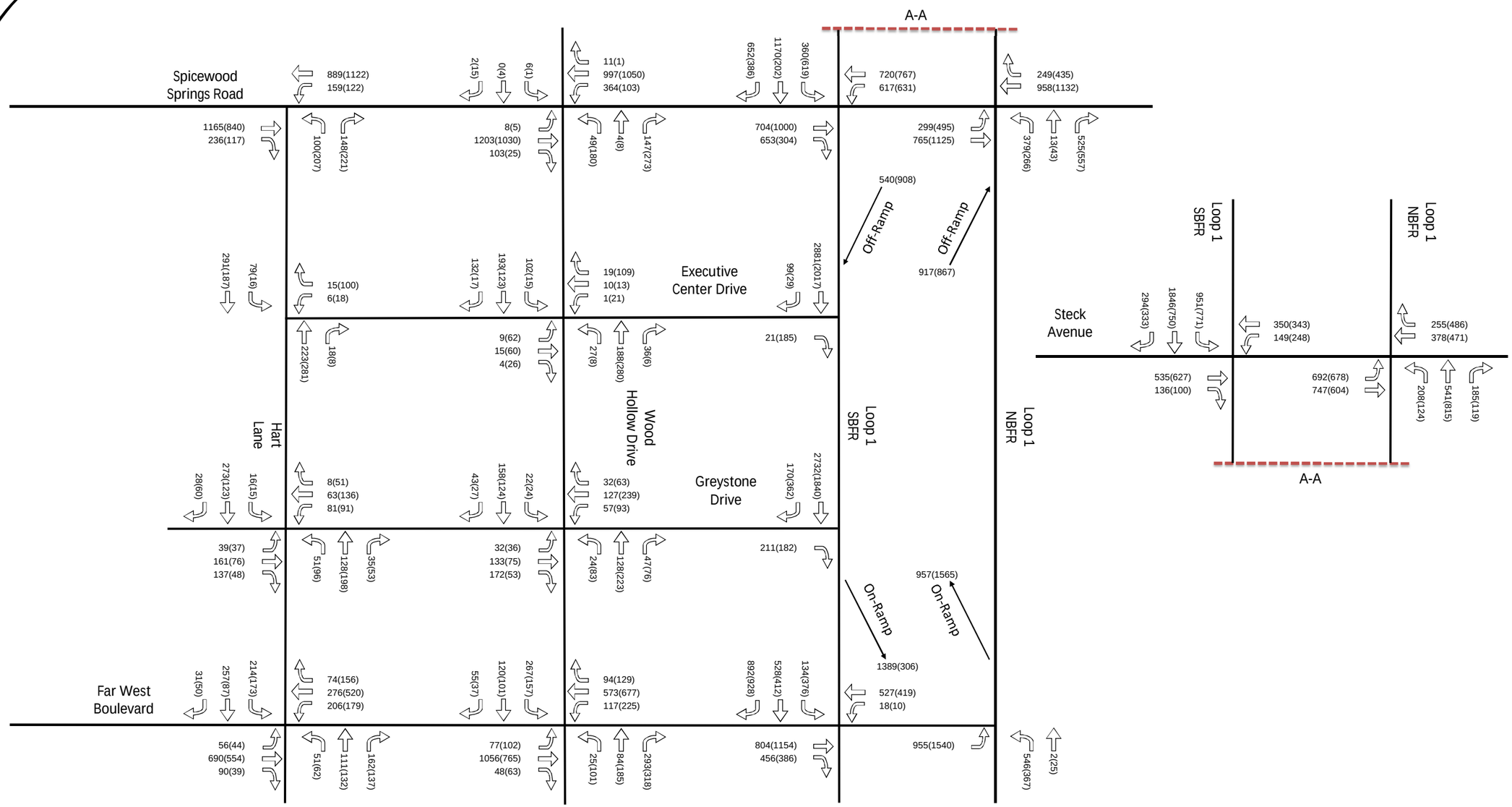
| Land Use | Amount | Units | ITE Code | Daily Trips | AM Peak Hour Trips | | | PM Peak Hour Trips | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | In | Out | Total | In | Out | Total |
| Existing General Office Building | 445.322 | 1,000 Sq Ft | 710 | 4,086 | 556 | 76 | 632 | 98 | 479 | 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 Trips (at Site Driveways) | | | | **7,464** | **491** | **230** | **722** | **276** | **466** | **742** |
| 2020 Net New External Trips | | | | **6,026** | **287** | **202** | **490** | **239** | **286** | **525** |

### TRIP DISTRIBUTION AND ASSIGNMENT

The 2020 Trip Assignment Volumes, shown as ***Exhibit 14,*** are the product of the Global Trip Distribution Percentages and 2020 Net New External Trips, as shown in ***Table 17***. The 2020 Local Trip Distribution Percentages, as shown as ***Exhibit 15***, were developed based on the size and location of the Austin Oaks development expected to be completed by year 2020.

### TOTAL TRAFFIC VOLUMES

For all existing intersections, the assignment volumes were added to 2020 No Build Volumes (***Exhibit 13***) to determine the 2020 Build Traffic Volumes. Existing office trips were not assumed at site driveways. Therefore, the in/out movements to/from site driveways are the product of the Local Trip Distribution Percentages and the Trips (at Site Driveways) shown in ***Table 17.*** The weekday AM and PM peak hour traffic volumes used for the analysis of the 2020 Build and Mitigated Scenarios are shown in ***Exhibit 16*** and ***Exhibit 17*** for network intersections and site driveways, 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

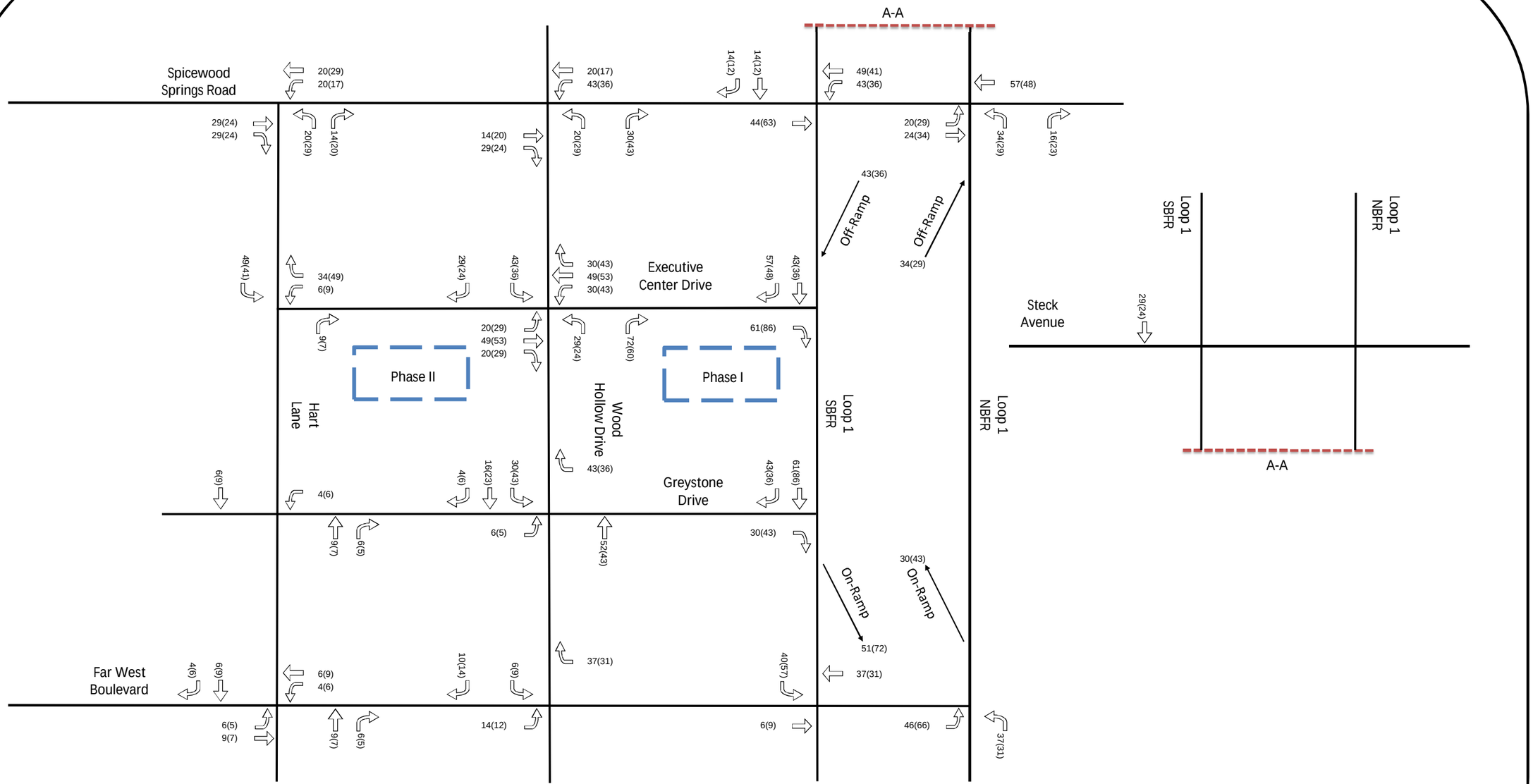
# EXHIBIT 13

2020 NO BUILD TRAFFIC VOLUMES

AUSTIN OAKS TIA

Kimley»Horn

7/21/2016




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

# EXHIBIT 14

2020 TRIP ASSIGNMENT VOLUMES (NET NEW TRIPS)

AUSTIN OAKS TIA - SEE TABLE 17

North

Not To Scale

Kimley»Horn

7/21/2016

North

Not To Scale

Wood Hollow Drive

Executive Center Drive

10%(0%)
15%(0%)

0%(15%)
10%(10%)
0%(15%)

10%(0%)
10%(0%)

0%(10%)
10%(10%)
0%(10%)

10%(0%)

25%(0%)

0%(10%)
50%(0%)

0%(40%)

0%(20%)

DWY 1

PHASE I

0%(14%)
5%(0%)

5%(12%)
5%(0%)

10%(10%)
20%(0%)

14%(0%)
6%(0%)

0%(6%)

0%(5%)

12%(5%)
2%(0%)

0%(2%)

0%(5%)

10%(10%)
2%(0%)

0%(2%)

0%(20%)

DWY 4

DWY 3

DWY 2

PHASE II

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

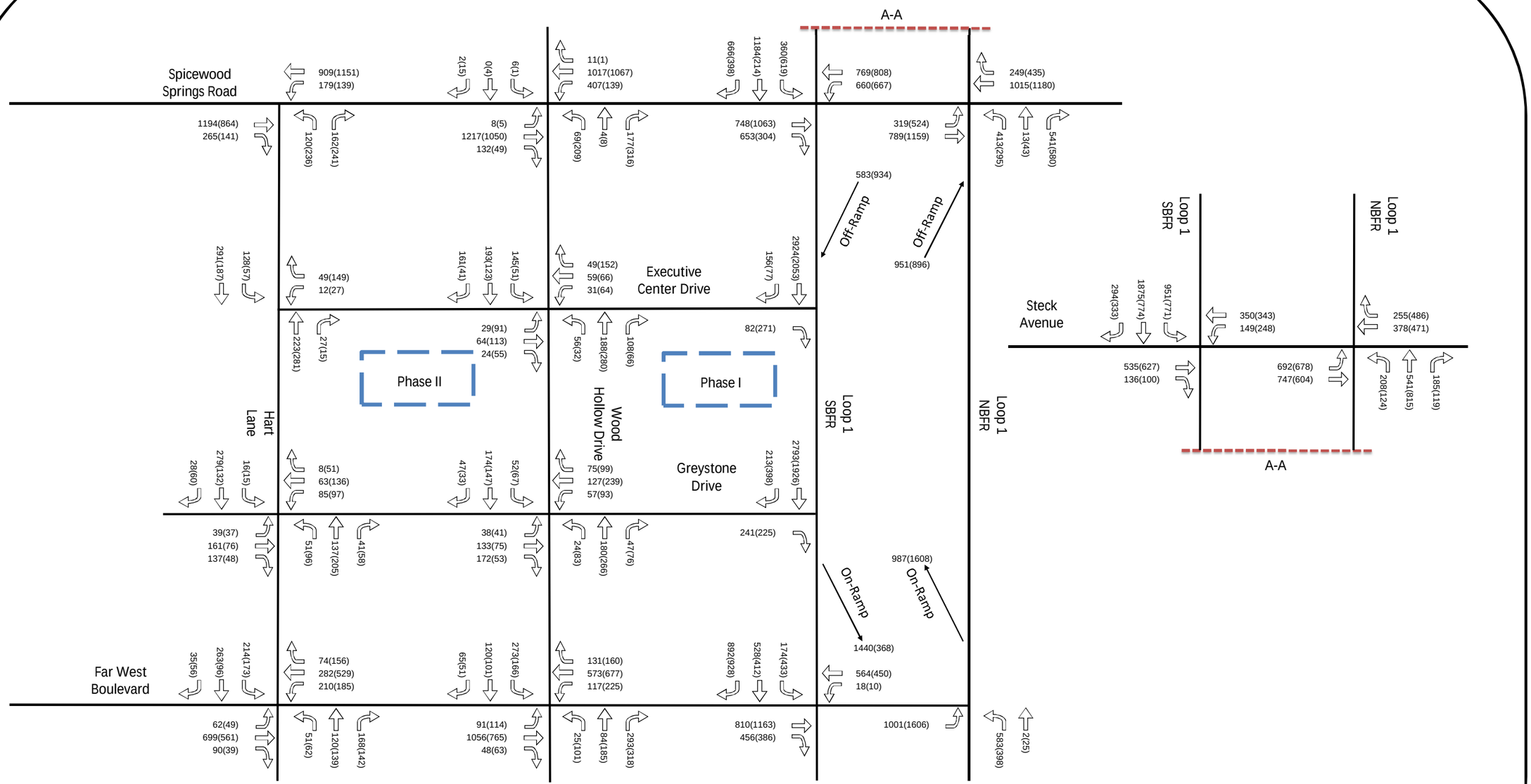
# EXHIBIT 15

2020 LOCAL TRIP DISTRIBUTION PERCENTAGES

AUSTIN OAKS TIA

Kimley»Horn

7/21/2016




# EXHIBIT 16

2020 BUILD TRAFFIC VOLUMES (INTERSECTIONS)

AUSTIN OAKS TIA - SEE TABLE 17

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.

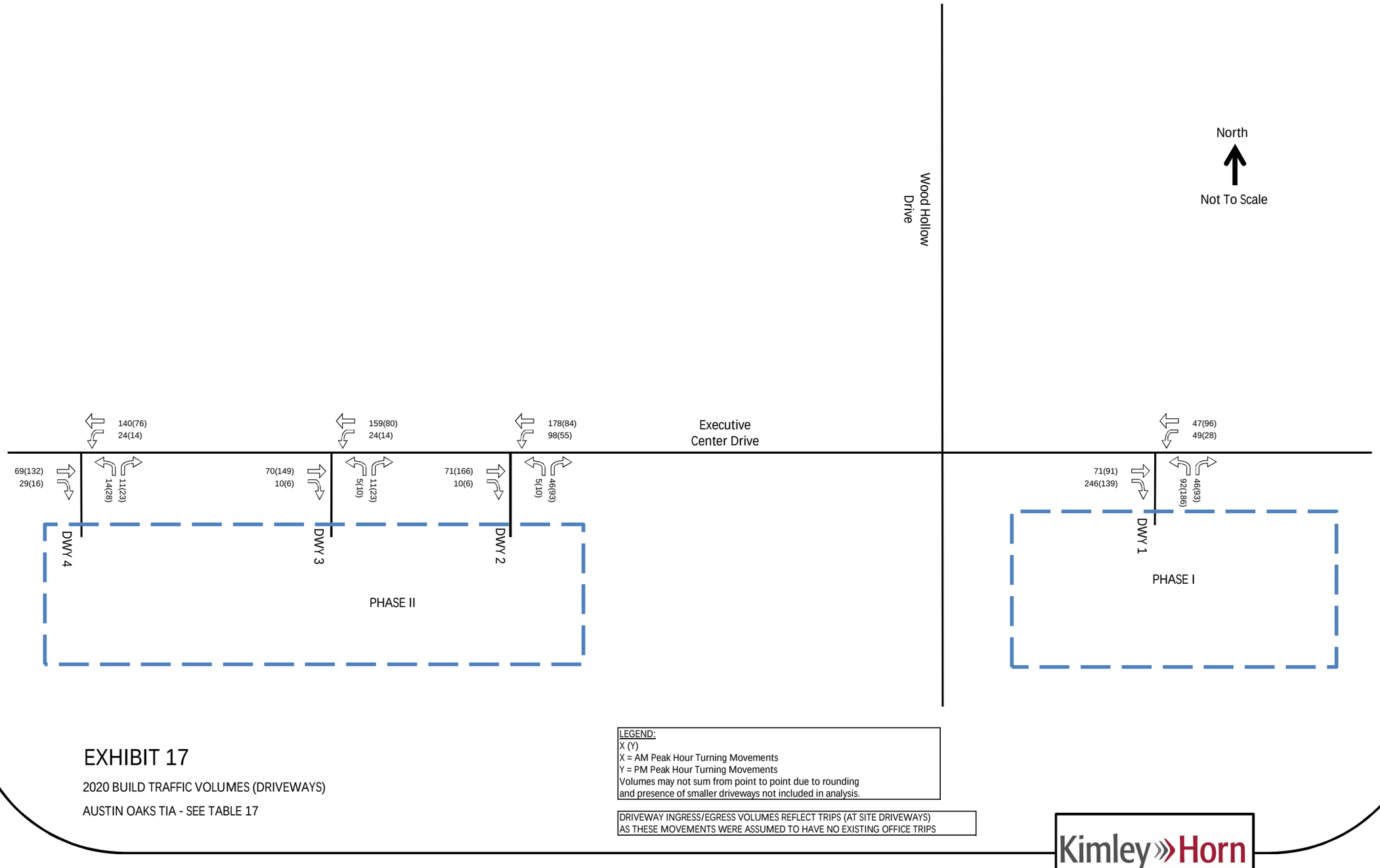
INTERSECTIONS ADD NET NEW EXTERNAL TRIPS TO AVOID "DOUBLE COUNTING" THE EXISTING OFFICE TRIPS

North

Not To Scale

Kimley»Horn

7/21/2016




# EXHIBIT 17

2020 BUILD TRAFFIC VOLUMES (DRIVEWAYS)

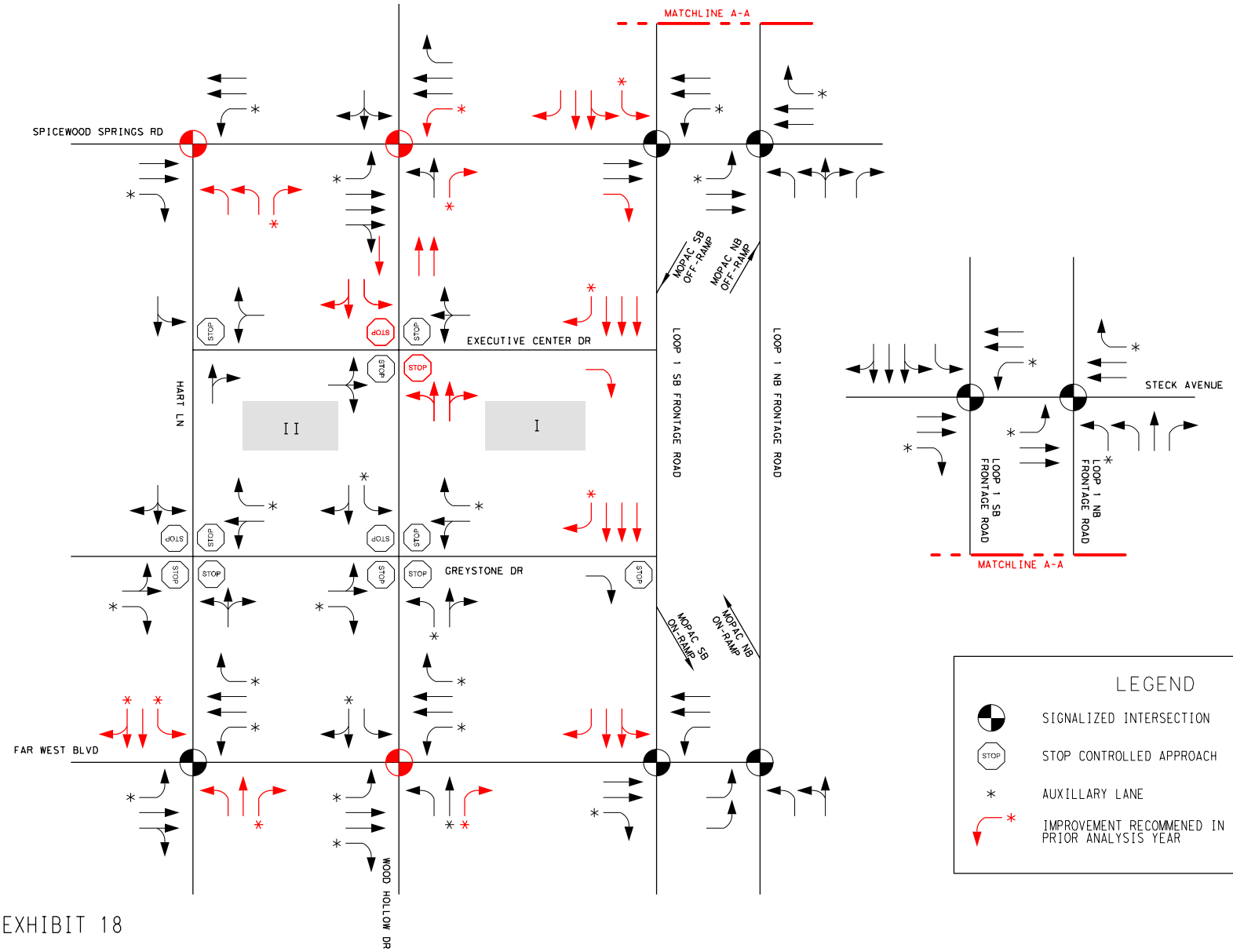
AUSTIN OAKS TIA - SEE TABLE 17

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.

DRIVEWAY INGRESS/EGRESS VOLUMES REFLECT TRIPS (AT SITE DRIVEWAYS)
AS THESE MOVEMENTS WERE ASSUMED TO HAVE NO EXISTING OFFICE TRIPS

Kimley»Horn

7/21/2016




# EXHIBIT 18

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 18***, which incorporates improvements recommended in analysis years prior to 2020. ***Table 18*** and ***Table 19*** summarize the intersection operations for the 2020 Build Scenario AM and PM peak hours, respectively. Synchro reports, including signal timing plans, 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 and Future Regional Impacts)

- *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 and Future Regional Impacts)

- *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 and Future Regional Impacts)

- *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 and Future Regional Impacts)

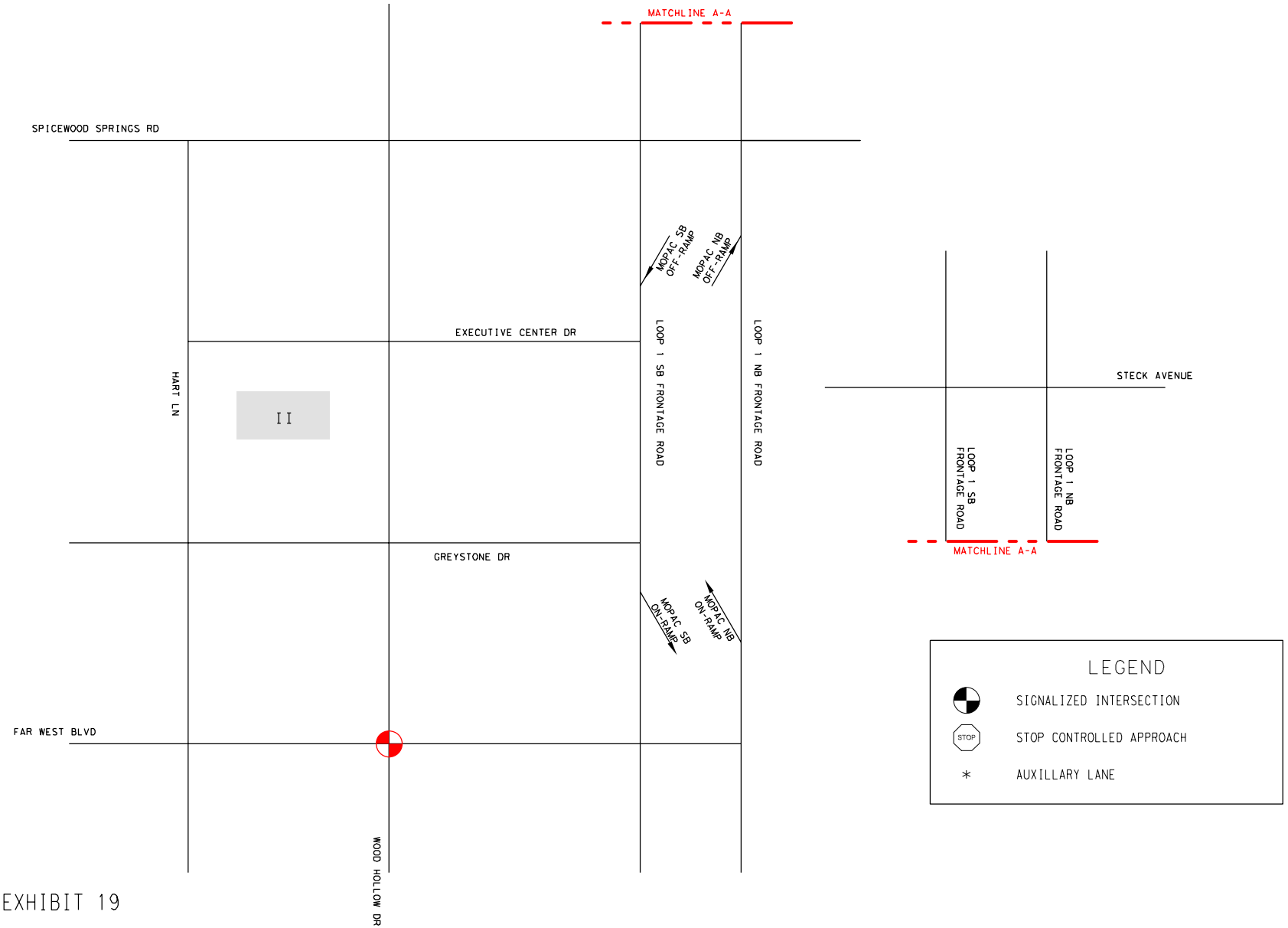
## C. 2020 IMPROVEMENTS

Based on the results of the 2020 Build analysis, the following improvement (shown in ***Exhibit 19)*** 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 18*** and ***Table 19*** 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 either an acceptable LOS or report delay less than the No Build scenario.




# EXHIBIT 19

2020 IMPROVEMENTS

AUSTIN OAKS TIA

Kimley»Horn

# TABLE 18

## 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 | A | 440 | 0.64 | 22.8 | C | 464 | 0.67 | 23.3 | C |
| | | WB | 29 | 0.28 | 2.1 | A | 231 | 0.36 | 8.4 | A | 234 | 0.37 | 8.6 | A |
| | | NB | 119 | 0.68 | 37.5 | D | 69 | 0.4 | 23.6 | C | 78 | 0.45 | 24.5 | C |
| | | INT | | | | | | | 17.8 | B | | | 17.8 | B |
| Spicewood Springs Road & Wood Hollow Drive | Signalized | EB | 310 | 0.52 | 21.5 | C | 485 | 0.6 | 25.9 | C | 506 | 0.63 | 26.9 | C |
| | | WB | m393 | 0.89 | 21.3 | C | 397 | 0.94 | 26.3 | C | 411 | 0.96 | 28.5 | C |
| | | NB | 80 | 0.21 | 45.2 | D | 80 | 0.18 | 27.5 | 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 | | | 23.1 | C | | | 27.8 | C | | | 27.8 | C |
| Spicewood Springs Road & Loop 1 SBFR | Signalized | EB | ***#922*** | ***1.6*** | ***236.7*** | ***F*** | #455 | 0.97 | 51 | D | ***#514*** | ***1.05*** | ***63*** | ***E*** |
| | | WB | m534 | 0.92 | 16.8 | B | m#597 | 0.95 | 18.4 | B | m568 | 0.98 | 17.9 | B |
| | | SB | ***m394*** | ***1.29*** | ***102.2*** | ***F*** | ***m388*** | ***1.26*** | ***80.3*** | ***F*** | ***m394*** | ***1.31*** | ***92.1*** | ***F*** |
| | | INT | | | ***116.2*** | ***F*** | | | ***63*** | ***E*** | | | ***63*** | ***E*** |
| Spicewood Springs Road & Loop 1 NBFR | Signalized | EB | m45 | 0.43 | 2.2 | A | m42 | 0.42 | 2.1 | A | m44 | 0.46 | 2.2 | A |
| | | WB | 487 | 0.83 | 41.2 | D | #609 | 0.85 | 42.5 | D | 526 | 0.87 | 44.1 | D |
| | | NB | ***#601*** | ***1.41*** | ***125.8*** | ***F*** | ***10*** | ***1.43*** | ***139.6*** | ***F*** | ***#636*** | ***1.49*** | ***156.6*** | ***F*** |
| | | INT | | | 52.5 | D | | | ***62.8*** | E | | | ***62.8*** | ***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 | A | 0 | 0.18 | 0 | A | 0 | 0.18 | 0 | A |
| | | SB | 6 | 0.07 | 2.3 | A | 10 | 0.12 | 11.7 | B | 10 | 0.12 | 3.4 | A |
| Executive Center Drive & Wood Hollow Drive | TWSC/ AWSC | EB | 9 | 0.11 | 19.3 | B | 0.9 | 0.244 | 11.7 | B | 0.9 | 0.244 | 11.7 | B |
| | | WB | 6 | 0.08 | 13.9 | B | 1.1 | 0.283 | 12 | B | 1.1 | 0.283 | 12 | B |
| | | NB | 2 | 0.03 | 1.1 | A | 1.8 | 0.38 | 12.2 | B | 1.8 | 0.38 | 12.2 | B |
| | | SB | 7 | 0.09 | 2.6 | A | 4.6 | 0.644 | 16.5 | B | 4.6 | 0.644 | 16.5 | B |
| | | INT | | | | | | | 14.1 | B | | | 14.1 | B |
| 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 | A | FREE | FREE | FREE | FREE | FREE | FREE | FREE | FREE |
| Greystone Drive & Hart Lane | AWSC | NB | 2.7 | 0.497 | 16.4 | B | 3.2 | 0.541 | 17.7 | B | 3.2 | 0.541 | 17.7 | B |
| | | EB | 2.8 | 0.503 | 15.1 | B | 2.9 | 0.514 | 15.6 | B | 2.9 | 0.514 | 15.6 | B |
| | | WB | 1.8 | 0.393 | 15.4 | B | 2 | 0.41 | 16 | B | 2 | 0.41 | 16 | B |
| | | SB | 5.6 | 0.703 | 23.5 | C | 6.1 | 0.731 | 25.5 | C | 6.1 | 0.731 | 25.5 | C |
| | | INT | | | 18 | B | | | 19.2 | B | | | 19.2 | B |
| Greystone Drive & Wood Hollow Drive | AWSC | NB | 1.6 | 0.357 | 12.7 | B | 2.8 | 0.5 | 16.3 | B | 2.8 | 0.5 | 16.3 | B |
| | | EB | 1.5 | 0.336 | 11.8 | B | 1.8 | 0.383 | 13.5 | B | 1.8 | 0.383 | 13.5 | B |
| | | WB | 1.8 | 0.389 | 13.1 | B | 2.1 | 0.423 | 14.1 | B | 2.1 | 0.423 | 14.1 | B |
| | | SB | 2 | 0.409 | 13.5 | B | 2.6 | 0.484 | 15.5 | B | 2.6 | 0.484 | 15.5 | B |
| | | INT | | | 12.7 | B | | | 14.7 | B | | | 14.7 | B |
| Greystone Drive & Loop 1 SBFR | TWSC | EB | ***214*** | ***0.96*** | ***95.7*** | ***F*** | ***240*** | ***0.99*** | ***97.3*** | ***F*** | ***240*** | ***0.99*** | ***97.3*** | ***F*** |
| | | SB | 0 | 0.67 | 0 | A | 0 | 0.57 | 0 | A | 0 | 0.57 | 0 | A |
| 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 | 27.5 | C | 225 | 0.59 | 34.6 | 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 | | | 37.2 | D | | | 39 | 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 | 236 | 0.43 | 34.5 | C | 251 | 0.59 | 43.7 | 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 | | | 41.1 | D | | | 45.4 | 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 | m11 | 0.44 | 1.8 | A | m15 | 0.46 | 7.3 | A | m15 | 0.46 | 7.3 | A |
| | | SB | m164 | 1.02 | 40.5 | D | m190 | 0.58 | 12.1 | B | m190 | 0.58 | 12.1 | B |
| | | INT | | | 26.5 | C | | | 14.3 | B | | | 14 | B |
| Faw West Blvd. & Loop 1 NBFR | Signalized | EB | 14 | 0.44 | 3 | A | 21 | 0.52 | 6.3 | A | 21 | 0.52 | 6.3 | A |
| | | NB | 334 | 0.65 | 45.3 | D | 357 | 0.54 | 35.6 | D | 357 | 0.54 | 35.6 | D |
| | | INT | | | 18.4 | B | | | 17.1 | B | | | 17.1 | 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#1301*** | ***2.8*** | ***685.8*** | ***F*** | ***m#1295*** | ***2.8*** | ***684.8*** | ***F*** | ***m#1295*** | ***2.8*** | ***684.8*** | ***F*** |
| | | INT | | | ***227.4*** | ***F*** | | | ***227*** | ***F*** | | | ***227*** | ***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 | | | | | 22 | 0.23 | 12 | B | 22 | 0.23 | 12 | B |
| Driveway 2 (Phase II) | NB | | | | | 5 | 0.06 | 9.3 | A | 5 | 0.06 | 9.3 | A |
| Driveway 3 (Phase II) | NB | | | | | 2 | 0.02 | 9.3 | A | 2 | 0.02 | 9.3 | A |
| Driveway 4 (Phase II) | NB | | | | | 3 | 0.03 | 9.8 | A | 3 | 0.03 | 9.8 | A |

# TABLE 19

## 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 | A | 402 | 0.55 | 26.8 | C | 402 | 0.55 | 26.8 | C |
| | | WB | 17 | 0.37 | 1.1 | A | 270 | 0.44 | 10 | A | 270 | 0.44 | 10 | A |
| | | NB | ***584*** | ***1.36*** | ***209.7*** | ***F*** | 174 | 0.73 | 35.2 | D | 174 | 0.73 | 35.2 | D |
| | | INT | | | | | | | 20.4 | C | | | 20.4 | C |
| Spicewood Springs Road & Wood Hollow Drive | Signalized | EB | 223 | 0.36 | 12.1 | B | 398 | 0.49 | 12.3 | B | 398 | 0.49 | 12.3 | B |
| | | WB | 305 | 0.5 | 10.7 | B | 372 | 0.61 | 19.4 | B | 372 | 0.61 | 19.4 | B |
| | | NB | ***#330*** | ***0.83*** | ***68.5*** | ***E*** | 291 | 0.58 | 39.8 | D | 291 | 0.58 | 39.8 | D |
| | | SB | 31 | 0.03 | 49.1 | D | 26 | 0.02 | 34.9 | C | 26 | 0.02 | 34.9 | C |
| | | INT | | | 21.4 | C | | | 20.6 | C | | | 20.6 | C |
| Spicewood Springs Road & Loop 1 SBFR | Signalized | EB | ***#805*** | ***1.19*** | ***132.1*** | ***F*** | ***#878*** | ***1.26*** | ***144.3*** | ***F*** | ***#878*** | ***1.26*** | ***144.3*** | ***F*** |
| | | WB | m499 | 0.8 | 11.1 | B | m543 | 0.85 | 12.2 | B | m543 | 0.85 | 12.2 | B |
| | | SB | ***#642*** | ***1.18*** | ***101.3*** | ***F*** | ***#642*** | ***1.18*** | ***83.5*** | ***F*** | ***#642*** | ***1.18*** | ***83.5*** | ***F*** |
| | | INT | | | ***79.3*** | ***E*** | | | ***78.1*** | ***E*** | | | ***78.1*** | ***E*** |
| Spicewood Springs Road & Loop 1 NBFR | Signalized | EB | m182 | 0.83 | 7.9 | A | m182 | 0.88 | 8.3 | A | m182 | 0.88 | 8.3 | A |
| | | WB | 610 | 0.78 | 36.3 | D | 647 | 0.81 | 37.6 | D | 647 | 0.81 | 37.6 | D |
| | | NB | ***#527*** | ***1.49*** | ***194*** | ***F*** | ***#628*** | ***1.57*** | ***225.4*** | ***F*** | ***#628*** | ***1.57*** | ***225.4*** | ***F*** |
| | | INT | | | ***58.6*** | ***E*** | | | ***66.8*** | ***E*** | | | ***66.8*** | ***E*** |
| Executive Center Drive & Hart Lane | TWSC | WB | 26 | 0.26 | 12.9 | B | 49 | 0.41 | 15.4 | B | 49 | 0.41 | 15.4 | B |
| | | NB | 0 | 0.23 | 0 | A | 0 | 0.23 | 0 | A | 0 | 0.23 | 0 | A |
| | | SB | 1 | 0.02 | 0.8 | A | 5 | 0.07 | 2.4 | A | 5 | 0.07 | 2.4 | A |
| Executive Center Drive & Wood Hollow Drive | TWSC/ AWSC | EB | 85 | 0.57 | 29 | C | 5.7 | 0.719 | 27.9 | C | 5.7 | 0.719 | 27.9 | C |
| | | WB | 39 | 0.35 | 15.3 | B | 6.4 | 0.751 | 29.5 | C | 6.4 | 0.751 | 29.5 | C |
| | | NB | 1 | 0.01 | 0.3 | A | 3.7 | 0.584 | 20.2 | C | 3.7 | 0.584 | 20.2 | C |
| | | SB | 1 | 0.02 | 0.9 | A | 2.7 | 0.495 | 17.6 | B | 2.7 | 0.495 | 17.6 | B |
| | | INT | | | | | | | 22.5 | C | | | 23.8 | C |
| Executive Center Dr. & Loop 1 SBFR | TWSC | EB | 87 | 0.58 | 28.4 | C | FREE | FREE | FREE | FREE | FREE | FREE | FREE | FREE |
| | | SB | 0 | 0.52 | 0 | A | FREE | FREE | FREE | FREE | FREE | FREE | FREE | FREE |
| Greystone Drive & Hart Lane | AWSC | NB | 3.8 | 0.588 | 16.7 | B | 4.2 | 0.617 | 17.7 | B | 4.2 | 0.617 | 17.7 | B |
| | | EB | 0.9 | 0.234 | 11.2 | B | 0.9 | 0.239 | 11.4 | B | 0.9 | 0.239 | 11.4 | B |
| | | WB | 2.3 | 0.454 | 14 | B | 2.5 | 0.476 | 14.6 | B | 2.5 | 0.476 | 14.6 | B |
| | | SB | 1.5 | 0.349 | 12.1 | B | 1.7 | 0.37 | 12.7 | B | 1.7 | 0.37 | 12.7 | B |
| | | INT | | | 14.1 | B | | | 14.3 | B | | | 14.8 | B |
| Greystone Drive & Wood Hollow Drive | AWSC | NB | 3.2 | 0.546 | 15.6 | B | 4.9 | 0.666 | 20.6 | C | 4.9 | 0.666 | 20.6 | C |
| | | EB | 0.9 | 0.227 | 11.4 | B | 1 | 0.259 | 12.5 | B | 1 | 0.259 | 12.5 | B |
| | | WB | 4.3 | 0.629 | 18.6 | B | 5 | 0.675 | 21.1 | C | 5 | 0.675 | 21.1 | C |
| | | SB | 1.2 | 0.297 | 12.4 | B | 1.7 | 0.372 | 13.8 | B | 1.7 | 0.372 | 13.8 | B |
| | | INT | | | 15.5 | B | | | 16 | B | | | 18.4 | B |
| Greystone Drive & Loop 1 SBFR | TWSC | EB | 140 | 0.76 | 49.7 | D | 134 | 0.72 | 36.7 | D | 134 | 0.72 | 36.7 | D |
| | | SB | 0 | 0.5 | 0 | A | 0 | 0.43 | 0 | A | 0 | 0.43 | 0 | A |
| 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 | ***#328*** | ***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)** | | | | | | | | | | | | | | |
| **Intersection** | **Approach** | | | | | | | | | | | | | |
| Driveway 1 (Phase I) | NB | | | | | | 55 | 0.43 | 14 | B | 55 | 0.43 | 14 | B |
| Driveway 2 (Phase II) | NB | | | | | | 12 | 0.14 | 10.1 | B | 12 | 0.14 | 10.1 | B |
| Driveway 3 (Phase II) | NB | | | | | | 3 | 0.04 | 9.6 | A | 3 | 0.04 | 9.6 | A |
| Driveway 4 (Phase II) | NB | | | | | | 6 | 0.07 | 9.9 | A | 6 | 0.07 | 9.9 | A |

## 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 20*** 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 anticipated completion of Phases I, II, and III.

**Table 20 – 2022 Build Trip Generation**

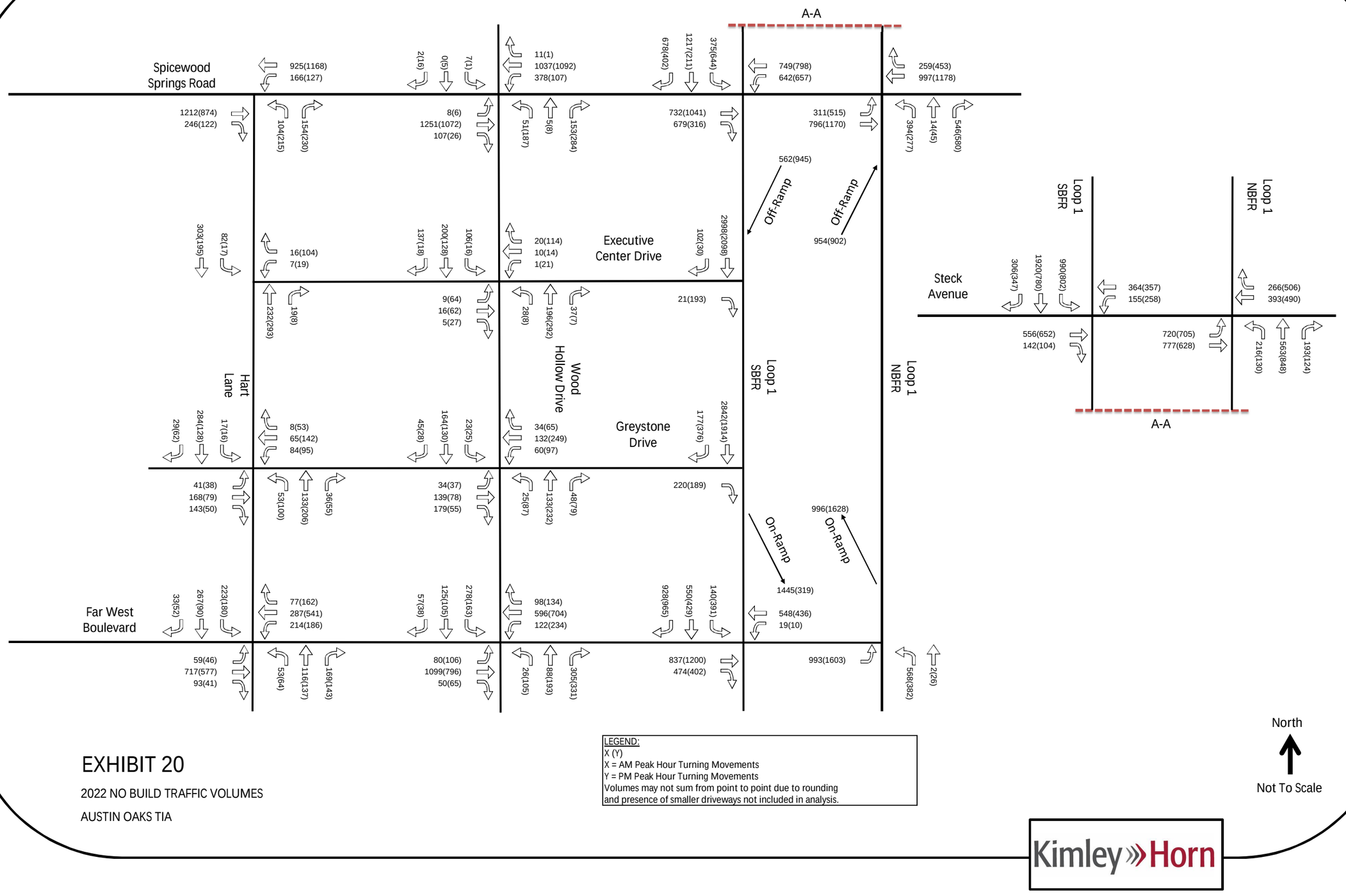
| Land Use | Amount | Units | ITE Code | Daily Trips | AM Peak Hour Trips | | | PM Peak Hour Trips | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | In | Out | Total | In | Out | Total |
| Existing General Office Building | 445.322 | 1,000 Sq Ft | 710 | 4,086 | 556 | 76 | 632 | 98 | 479 | 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 Trips (at Site Driveways) | | | | **15,770** | **1,021** | **453** | **1,474** | **561** | **904** | **1,466** |
| 2022 Net New External Trips | | | | **13,016** | **636** | **400** | **1,036** | **496** | **584** | **1,081** |

### TRIP DISTRIBUTION AND ASSIGNMENT

The 2022 Trip Assignment Volumes, shown as ***Exhibit 21,*** are the product of the Global Trip Distribution Percentages and 2022 Net New External Trips, as shown in ***Table 20***. The 2022 Local Trip Distribution Percentages, as shown as ***Exhibit 22***, were developed based on the size and location of the Austin Oaks development expected to be completed by year 2022.

### TOTAL TRAFFIC VOLUMES

For all existing intersections, the assignment volumes were added to 2022 No Build Volumes (***Exhibit 20***) to determine the 2022 Build Traffic Volumes. Existing office trips were not assumed at site driveways. Therefore, the in/out movements to/from site driveways are the product of the Local Trip Distribution Percentages and the Trips (at Site Driveways) shown in ***Table 20.*** The weekday AM and PM peak hour traffic volumes used for the analysis of the 2022 Build and Mitigated Scenarios are shown in ***Exhibit 23*** and ***Exhibit 24*** for network intersections and site driveways, respectively.




# EXHIBIT 20

2022 NO BUILD TRAFFIC VOLUMES

AUSTIN OAKS TIA

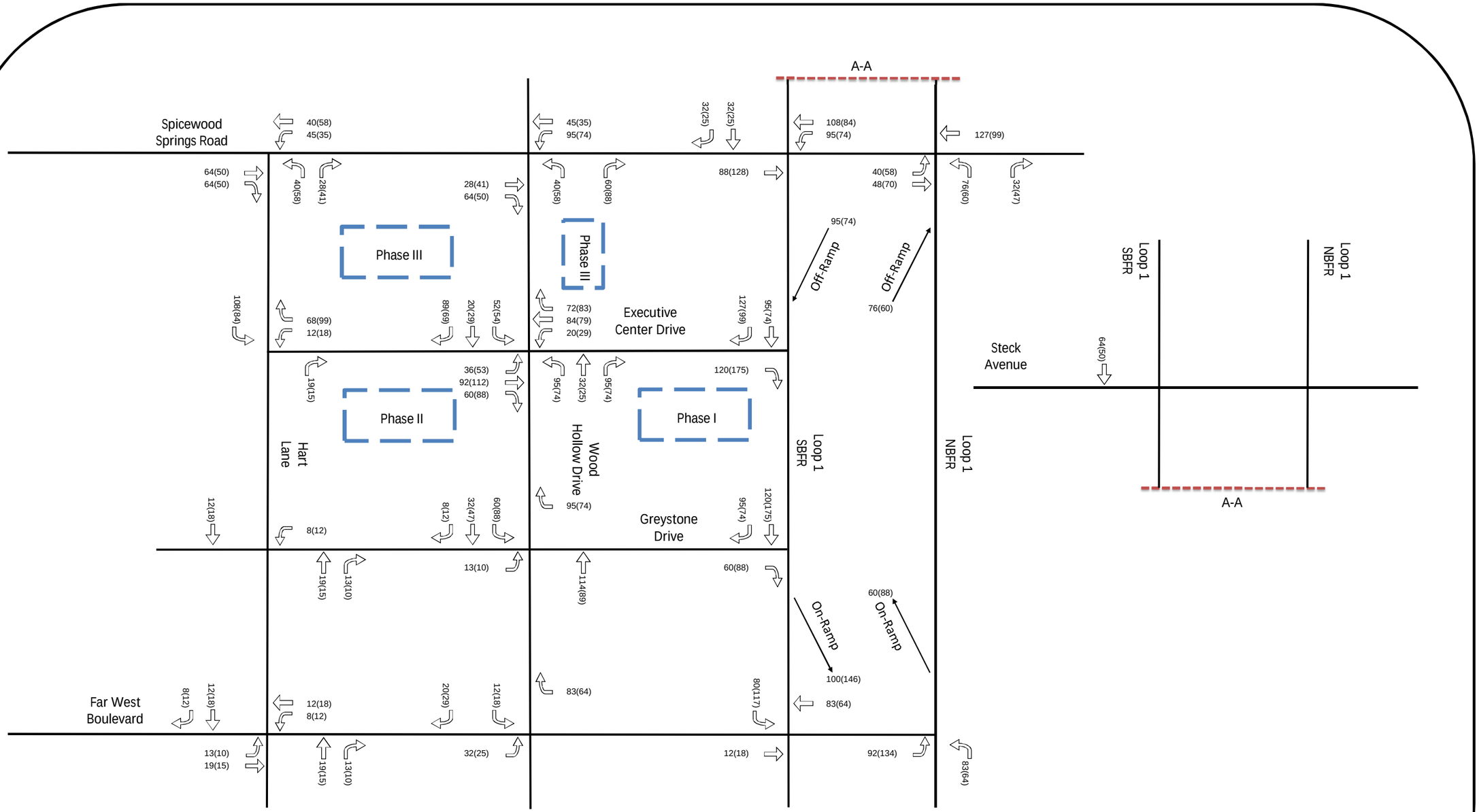
LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

Kimley»Horn

7/21/2016




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

# EXHIBIT 21

2022 TRIP ASSIGNMENT VOLUMES (NET NEW TRIPS)

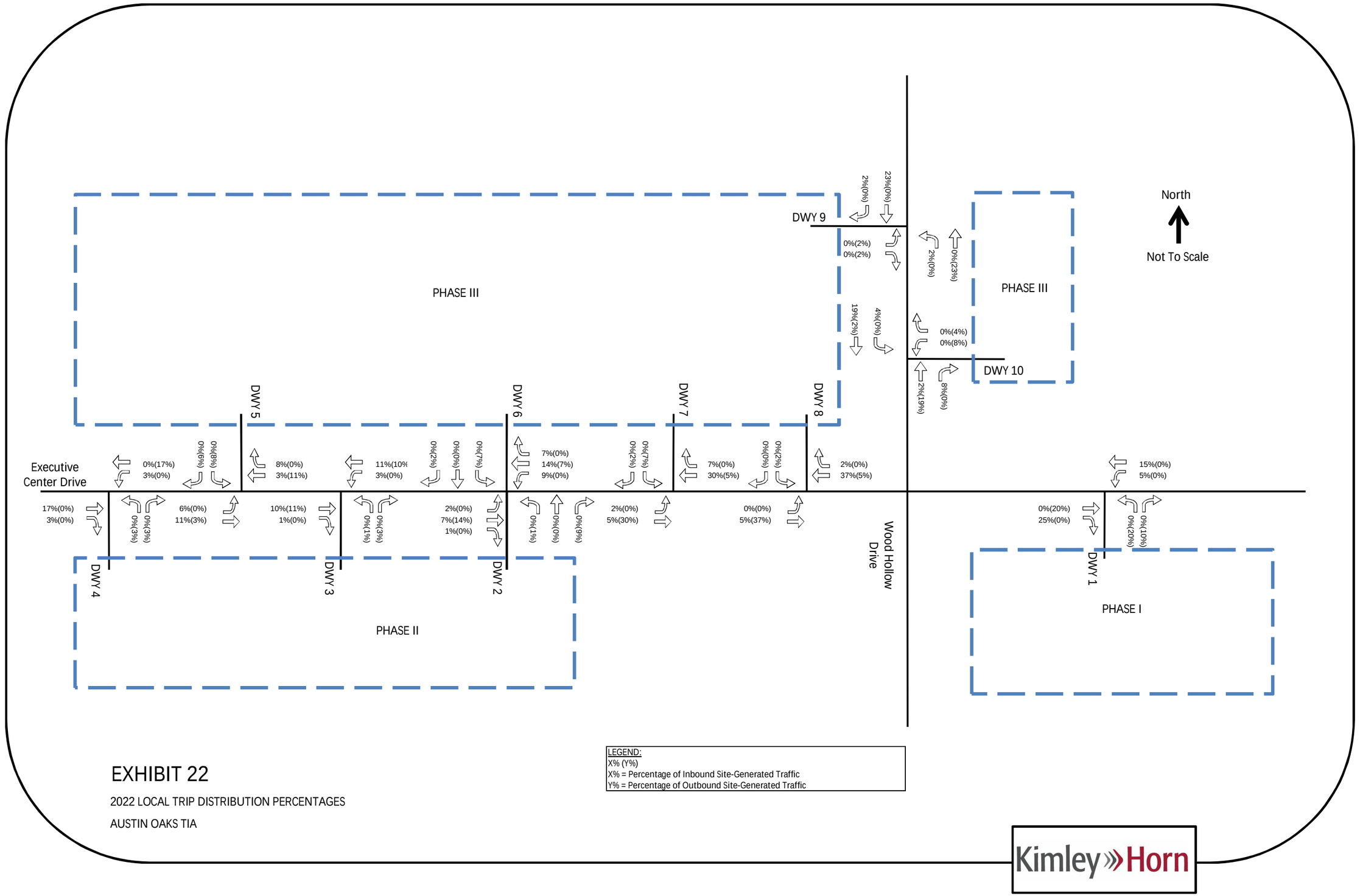
AUSTIN OAKS TIA - SEE TABLE 20

North

Not To Scale

Kimley»Horn

7/21/2016




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

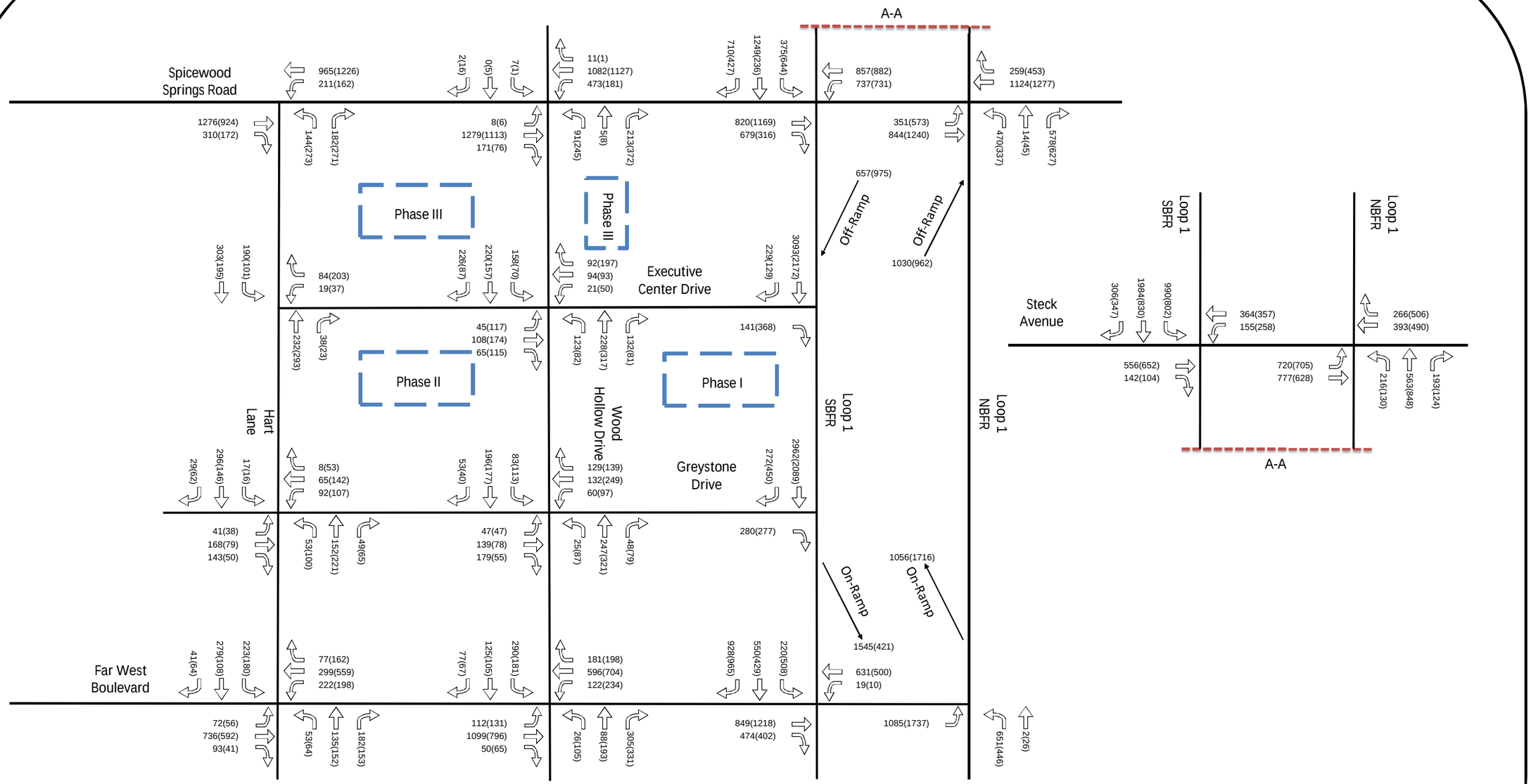
# EXHIBIT 22

2022 LOCAL TRIP DISTRIBUTION PERCENTAGES

AUSTIN OAKS TIA

Kimley»Horn

7/21/2016




# EXHIBIT 23

2022 BUILD TRAFFIC VOLUMES (INTERSECTIONS)

AUSTIN OAKS TIA - SEE TABLE 20

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.

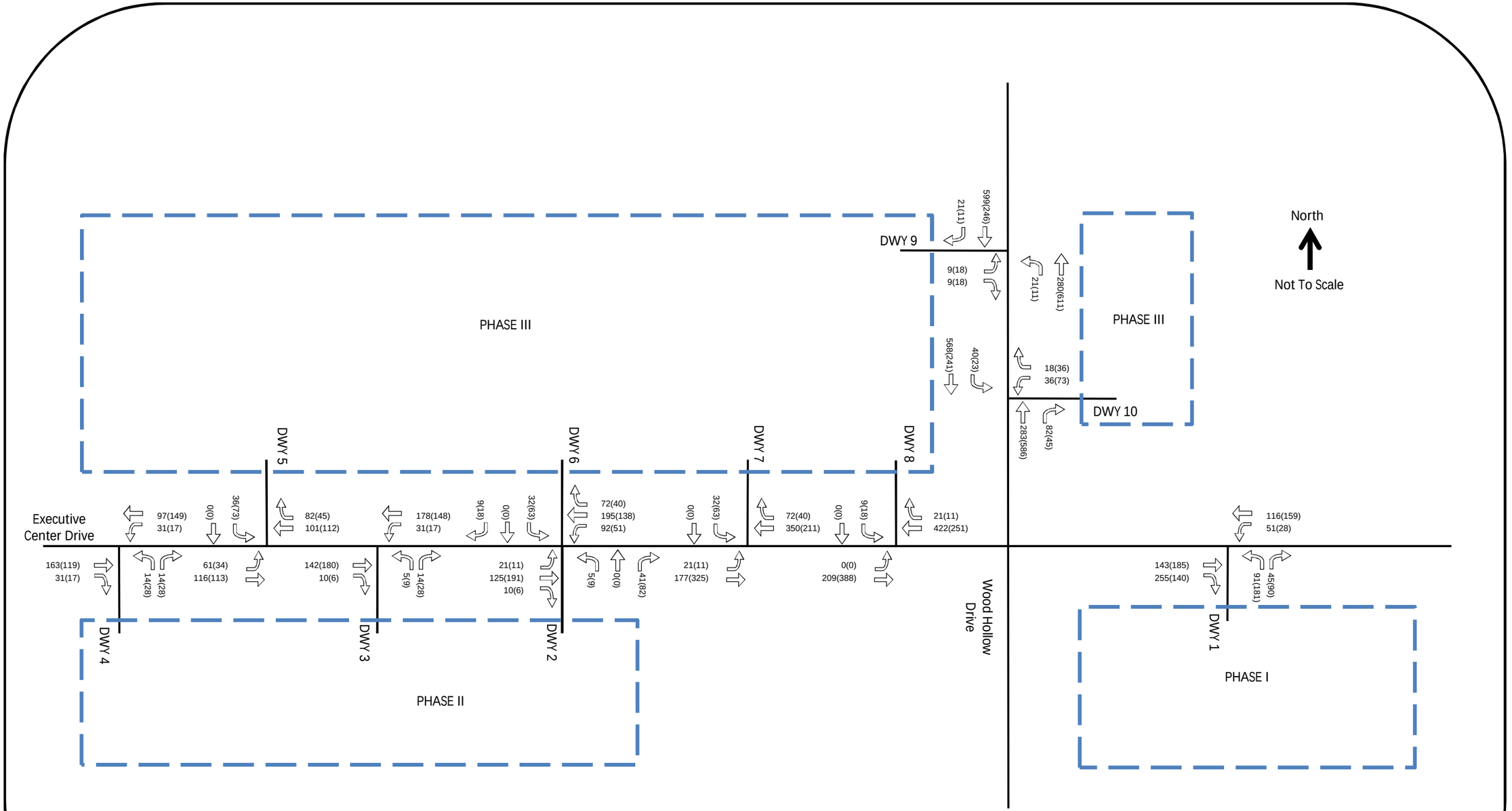
INTERSECTIONS ADD NET NEW EXTERNAL TRIPS TO AVOID "DOUBLE COUNTING" THE EXISTING OFFICE TRIPS

North

Not To Scale

Kimley»Horn

7/21/2016




# EXHIBIT 24

2022 BUILD TRAFFIC VOLUMES (DRIVEWAYS)

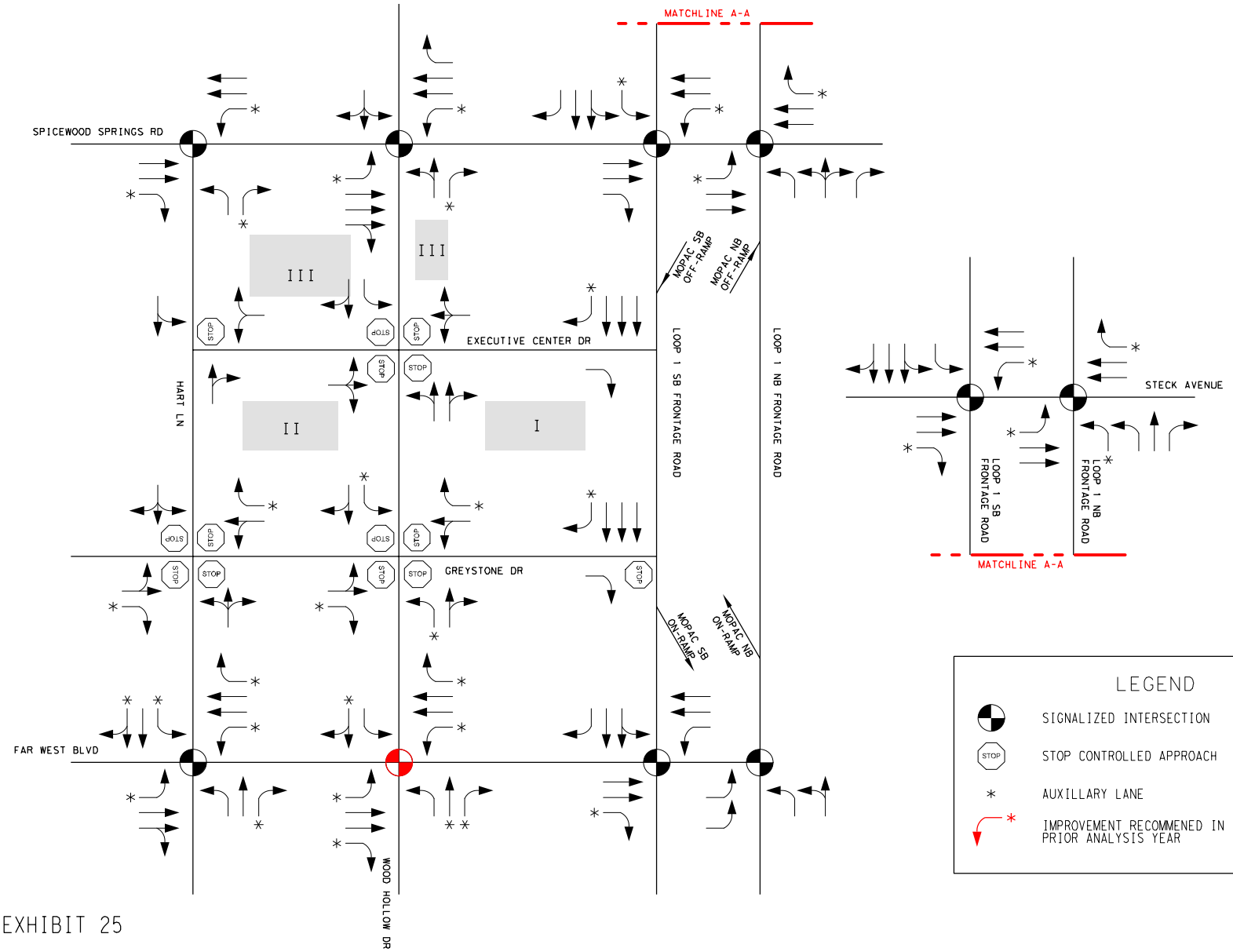
AUSTIN OAKS TIA - SEE TABLE 20

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.

DRIVEWAY INGRESS/EGRESS VOLUMES REFLECT TRIPS (AT SITE DRIVEWAYS) AS THESE MOVEMENTS WERE ASSUMED TO HAVE NO EXISTING OFFICE TRIPS

Kimley»Horn

7/21/2016




# EXHIBIT 25

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 25***, which incorporates improvements recommended in analysis years prior to 2022. ***Table 21*** and ***Table 22*** summarize the intersection operations for the 2022 Build Scenario AM and PM peak hours, respectively. Synchro reports, including signal timing plans, for all 2022 analyses are provided as ***Appendix P.*** Noteworthy traffic operations at intersections are as follows:

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

- *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 and Future Regional Impacts)

- *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 and Future Regional Impacts)

- *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 and Future Regional Impacts)

- *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 and Future Regional Impacts)

## C. 2022 IMPROVEMENTS

Based on the results of the 2022 Build analysis, the following improvement (shown in ***Exhibit 26)*** is recommended:

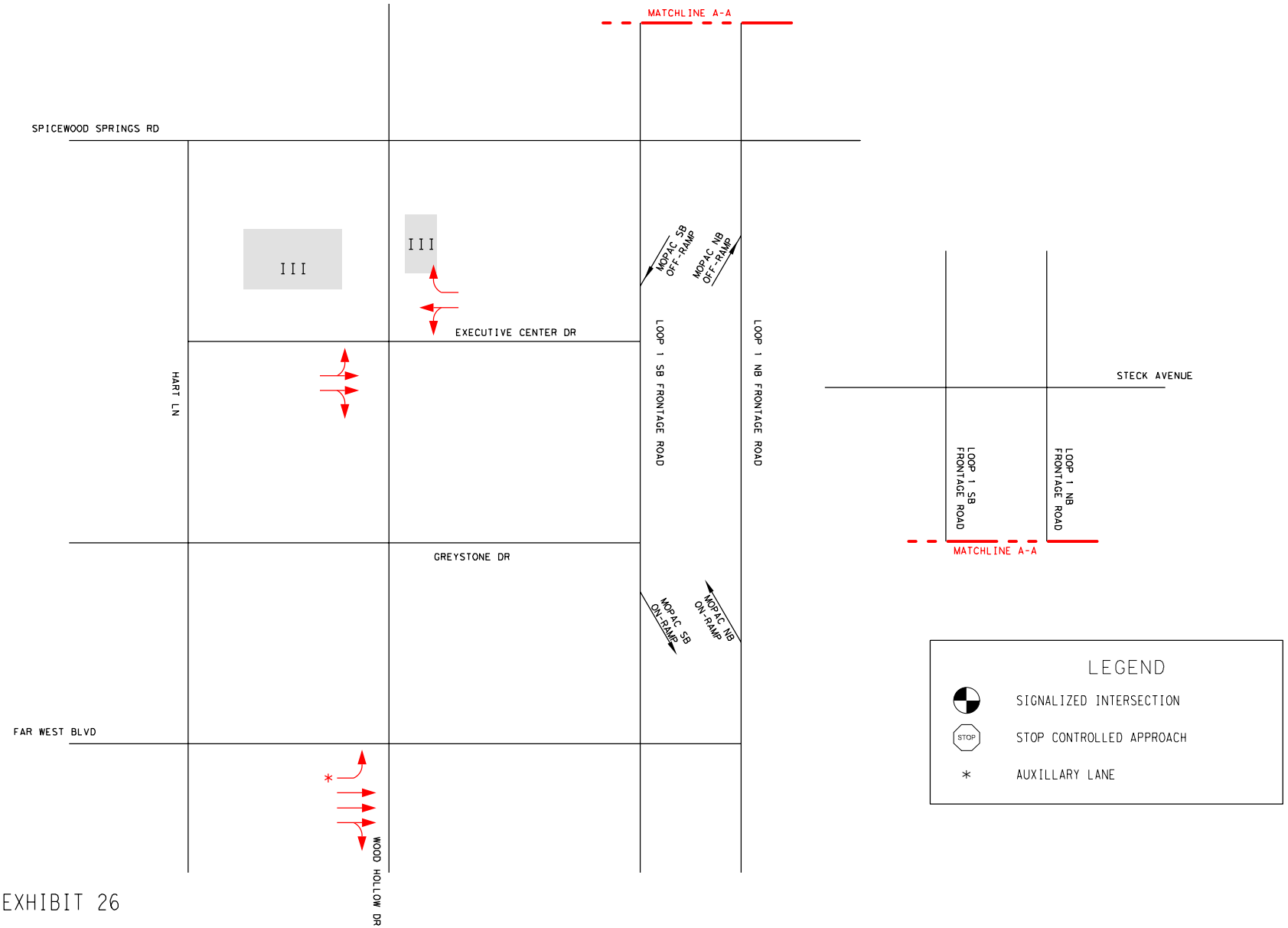
- *Executive Center Drive & Wood Hollow Drive (1)*. Restripe the eastbound approach of Executive Center Drive at Wood Hollow Drive to include a shared thru-left and a shared thru-right. The shared thru-right lanes will also be marked as shared bike lanes. This will require the east-leg of the intersection to be restriped to provide two receiving lanes. Restripe the westbound approach of Executive Center Drive at Wood Hollow Drive to include an exclusive right-turn lane and a shared thru-left. The proposed cross-sections can be accomplished using existing pavement.

- *Far West Boulevard & Wood Hollow Drive (*2). 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 21*** and ***Table 22*** 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 either an acceptable LOS or report delay less than the No Build scenario.




# EXHIBIT 26

2022 IMPROVEMENTS

AUSTIN OAKS TIA

Kimley»Horn

# TABLE 21

## 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 | A | 512 | 0.71 | 24.4 | C | 512 | 0.71 | 24.4 | C |
| | | WB | 33 | 0.31 | 2.2 | A | 272 | 0.45 | 9.9 | A | 272 | 0.45 | 9.9 | A |
| | | NB | 149 | 0.75 | 44.4 | D | 91 | 0.5 | 25.3 | C | 91 | 0.5 | 25.3 | C |
| | | INT | | | | | | | 19 | B | | | 19 | B |
| Spicewood Springs Road & Wood Hollow Drive | Signalized | EB | 326 | 0.54 | 22 | C | 541 | 0.74 | 32.8 | C | 541 | 0.74 | 32.8 | C |
| | | WB | m398 | 0.94 | 23.8 | C | #528 | 1 | 31.4 | C | #528 | 1 | 31.4 | 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 | | | 24.5 | C | | | 31.7 | C | | | 31.7 | C |
| Spicewood Springs Road & Loop 1 SBFR | Signalized | EB | ***#974*** | ***1.69*** | ***259*** | F | ***#585*** | ***1.15*** | ***81*** | F | ***#585*** | ***1.15*** | ***81*** | F |
| | | WB | m538 | 0.95 | 16.2 | B | m#614 | 1.1 | 36.9 | D | m#614 | 1.1 | 36.9 | D |
| | | SB | ***m400*** | ***1.34*** | ***124*** | F | ***m400*** | ***1.38*** | ***109.7*** | F | ***m400*** | ***1.38*** | ***109.7*** | F |
| | | INT | | | ***132*** | ***F*** | | | ***80.4*** | ***F*** | | | ***80.4*** | ***F*** |
| Spicewood Springs Road & Loop 1 NBFR | Signalized | EB | m45 | 0.45 | 2.3 | A | m44 | 0.5 | 2.4 | A | m44 | 0.5 | 2.4 | A |
| | | WB | 514 | 0.86 | 42.9 | D | #654 | 0.97 | 55.1 | E | #654 | 0.97 | 55.1 | E |
| | | NB | ***#627*** | ***1.47*** | ***141*** | F | ***#705*** | ***1.63*** | ***205.5*** | F | ***#704*** | ***1.63*** | ***205.5*** | F |
| | | INT | | | ***57.6*** | ***E*** | | | ***81.7*** | ***F*** | | | ***81.7*** | ***F*** |
| 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 | A | 0 | 0.19 | 0 | A | 0 | 0.19 | 0 | A |
| | | SB | 6 | 0.08 | 2.3 | A | 17 | 0.18 | 4.5 | A | 17 | 0.18 | 4.5 | A |
| Executive Center Drive & Wood Hollow Drive | TWSC/ AWSC | EB | 11 | 0.12 | 20 | B | 3.2 | 0.541 | 20.2 | C | 1.3 | 0.305 | 14.6 | B |
| | | WB | 7 | 0.08 | 14.2 | B | 2.9 | 0.51 | 19.1 | B | 1.3 | 0.315 | 14.3 | B |
| | | NB | 2 | 0.03 | 1.1 | A | 4 | 0.598 | 21.3 | C | 3.8 | 0.587 | 20.5 | C |
| | | SB | 8 | 0.09 | 2.7 | A | 13.5 | 1.02 | 54.3 | D | 13.7 | 1 | 53.5 | D |
| | | INT | | | | | | | 34 | C | | | 32 | C |
| 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 | A | FREE | FREE | FREE | FREE | FREE | FREE | FREE | FREE |
| Greystone Drive & Hart Lane | AWSC | NB | 3.1 | 0.532 | 17.7 | B | 4.3 | 0.634 | 22.1 | C | 4.3 | 0.634 | 22.1 | C |
| | | EB | 3.1 | 0.537 | 16.3 | B | 3.4 | 0.565 | 17.8 | B | 3.4 | 0.565 | 17.8 | B |
| | | WB | 2 | 0.417 | 16.3 | B | 2.4 | 0.461 | 18.1 | B | 2.4 | 0.461 | 18.1 | B |
| | | SB | 6.5 | 0.751 | 27.1 | C | 8 | 0.813 | 34.6 | C | 8 | 0.813 | 34.6 | C |
| | | INT | | | 20 | B | | | 24 | C | | | 24 | C |
| Greystone Drive & Wood Hollow Drive | AWSC | NB | 1.8 | 0.379 | 13.3 | B | 5.6 | 0.715 | 26.7 | C | 5.6 | 0.715 | 26.7 | C |
| | | EB | 1.6 | 0.361 | 12.3 | B | 2.4 | 0.47 | 16.5 | B | 2.4 | 0.47 | 16.5 | B |
| | | WB | 2 | 0.414 | 13.8 | B | 2.6 | 0.492 | 16.5 | B | 2.6 | 0.492 | 16.5 | B |
| | | SB | 2.1 | 0.436 | 14.2 | B | 3.9 | 0.603 | 19.8 | B | 3.9 | 0.603 | 19.8 | B |
| | | INT | | | 13.3 | B | | | 19.8 | B | | | 19.8 | B |
| Greystone Drive & Loop 1 SBFR | TWSC | EB | ***257*** | ***1.07*** | ***129.5*** | F | ***373*** | ***1.26*** | ***190.4*** | F | ***373*** | ***1.26*** | ***190.4*** | F |
| | | SB | 0 | 0.7 | 0 | A | 0 | 0.6 | 0 | A | 0 | 0.6 | 0 | A |
| 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 | 38.9 | D | 233 | 0.67 | 38.9 | 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 | | | 40.3 | D | | | 40.3 | 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 | 266 | 0.65 | 52.2 | D | 266 | 0.57 | 52 | D |
| | | NB | ***#313*** | ***0.94*** | ***95.3*** | F | ***#225*** | ***0.94*** | ***83.8*** | F | ***#225*** | ***0.94*** | ***83.8*** | F |
| | | SB | 213 | 0.7 | 43.8 | D | #410 | 0.72 | 44.8 | D | #410 | 0.72 | 44.8 | D |
| | | INT | | | ***56.1*** | ***E*** | | | ***60.7*** | ***E*** | | | 47.1 | 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 | m13 | 0.46 | 1.9 | A | m14 | 0.53 | 6.1 | A | m14 | 0.53 | 6.1 | A |
| | | SB | m220 | 1.09 | 53.1 | D | m213 | 0.6 | 13.1 | B | m213 | 0.6 | 13.1 | B |
| | | INT | | | 32.2 | C | | | 14.4 | B | | | 15.2 | B |
| Faw West Blvd. & Loop 1 NBFR | Signalized | EB | 14 | 0.46 | 3 | A | 24 | 0.54 | 5.7 | A | 24 | 0.54 | 5.7 | A |
| | | NB | 347 | 0.68 | 46.3 | D | #425 | 0.64 | 40.3 | D | #425 | 0.64 | 40.3 | D |
| | | INT | | | 18.8 | B | | | 18.7 | B | | | 18.7 | 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 | m46 | 0.45 | 5.7 | A | m46 | 0.45 | 5.7 | A | m46 | 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#1355*** | ***2.92*** | ***726.1*** | F | ***m#1335*** | ***2.92*** | ***724.3*** | F | ***m#1335*** | ***2.92*** | ***724.3*** | F |
| | | INT | | | ***240.3*** | ***F*** | | | ***239.7*** | ***F*** | | | ***239.7*** | ***F*** |
| **Site Driveways (Stop-Controlled Approach Only)** | | | | | | | | | | | | | | |
| **Intersection** | **Approach** | | | | | | | | | | | | | |
| Driveway 1 (Phase I) | NB | | | | | | 27 | 0.27 | 14 | B | 27 | 0.27 | 14 | B |
| Driveway 2 (Phase II) | NB | | | | | | 5 | 0.06 | 10 | A | 5 | 0.06 | 10 | A |
| Driveway 6 (Phase III) | SB | | | | | | 10 | 0.12 | 16 | C | 10 | 0.12 | 16 | C |
| Driveway 3 (Phase II) | NB | | | | | | 2 | 0.03 | 9.8 | A | 2 | 0.03 | 9.8 | A |
| Driveway 4 (Phase II) | NB | | | | | | 3 | 0.04 | 10.3 | B | 3 | 0.04 | 10.3 | B |
| Driveway 5 (Phase III) | SB | | | | | | 8 | 0.1 | 11 | B | 8 | 0.1 | 11 | B |
| Driveway 7 (Phase III) | SB | | | | | | 8 | 0.1 | 13.8 | B | 8 | 0.1 | 13.8 | B |
| Driveway 8 (Phase III) | SB | | | | | | 2 | 0.02 | 14.1 | B | 2 | 0.02 | 14.1 | B |
| Driveway 9 (Phase III) | EB | | | | | | 5 | 0.06 | 16.1 | C | 5 | 0.06 | 16.1 | C |
| Driveway 10 (Phase III) | WB | | | | | | 20 | 0.22 | 21.9 | C | 20 | 0.22 | 21.9 | C |

# TABLE 22

## 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 | A | 440 | 0.59 | 27.5 | C | 440 | 0.59 | 27.5 | C |
| | | WB | 19 | 0.38 | 1.1 | A | 278 | 0.47 | 11.1 | B | 278 | 0.47 | 11.1 | B |
| | | NB | ***706*** | ***1.54*** | ***288.1*** | ***F*** | 196 | 0.75 | 35.8 | D | 196 | 0.75 | 35.8 | D |
| | | INT | | | | | | | 21.5 | C | | | 21.5 | C |
| Spicewood Springs Road & Wood Hollow Drive | Signalized | EB | 236 | 0.38 | 12.3 | B | 468 | 0.56 | 16.5 | B | 468 | 0.56 | 16.5 | B |
| | | WB | 342 | 0.52 | 11 | B | 410 | 0.74 | 23.1 | C | 410 | 0.74 | 23.1 | C |
| | | NB | ***#347*** | ***0.86*** | ***70.6*** | ***E*** | 345 | 0.68 | 40.7 | D | 345 | 0.68 | 40.7 | D |
| | | SB | 32 | 0.03 | 49.1 | D | 27 | 0.02 | 35 | C | 27 | 0.02 | 35 | C |
| | | INT | | | 22 | C | | | 24.2 | C | | | 24.2 | C |
| Spicewood Springs Road & Loop 1 SBFR | Signalized | EB | ***#853*** | ***1.24*** | ***146.4*** | ***F*** | ***#1002*** | ***1.39*** | ***186.4*** | ***F*** | ***#1002*** | ***1.39*** | ***186.4*** | ***F*** |
| | | WB | m520 | 0.84 | 11.6 | B | m599 | 0.93 | 13 | B | m599 | 0.93 | 13 | B |
| | | SB | ***#674*** | ***1.23*** | ***112*** | ***F*** | ***#674*** | ***1.23*** | ***94.4*** | ***F*** | ***#674*** | ***1.23*** | ***94.4*** | ***F*** |
| | | INT | | | ***87.6*** | ***F*** | | | ***95.6*** | ***F*** | | | ***95.6*** | ***F*** |
| Spicewood Springs Road & Loop 1 NBFR | Signalized | EB | m181 | 0.87 | 8.2 | A | m178 | 0.96 | 10 | A | m178 | 0.96 | 10 | 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 | | | ***63.5*** | ***E*** | | | ***81.8*** | ***F*** | | | ***81.8*** | ***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 | A | 0 | 0.25 | 0 | A | 0 | 0.25 | 0 | A |
| | | SB | 1 | 0.02 | 0.8 | A | 10 | 0.12 | 3.7 | A | 10 | 0.12 | 3.7 | A |
| Executive Center Drive & Wood Hollow Drive | TWSC/ AWSC | EB | 100 | 0.63 | 33.5 | C | ***12.2*** | ***1.332*** | ***76.2*** | ***E*** | 5.6 | 0.728 | 32 | C |
| | | WB | 43 | 0.38 | 16 | B | ***12.3*** | ***1.085*** | ***75.3*** | ***E*** | 4.4 | 0.644 | 25.3 | C |
| | | NB | 1 | 0.01 | 0.3 | A | 7.9 | 0.838 | 44.2 | D | 7.7 | 0.832 | 42.7 | D |
| | | SB | 1 | 0.02 | 1 | A | 7.8 | 0.827 | 39.1 | D | 7.8 | 0.84 | 39.9 | D |
| | | INT | | | | | | | ***58.5*** | ***E*** | | | 35.5 | D |
| Executive Center Dr. & Loop 1 SBFR | TWSC | EB | 102 | 0.63 | 32.5 | C | FREE | FREE | FREE | FREE | FREE | FREE | FREE | FREE |
| | | SB | 0 | 0.54 | 0 | A | FREE | FREE | FREE | FREE | FREE | FREE | FREE | FREE |
| Greystone Drive & Hart Lane | AWSC | NB | 4.3 | 0.628 | 18.2 | B | 5.4 | 0.691 | 21.6 | C | 5.4 | 0.691 | 21.6 | C |
| | | EB | 1 | 0.248 | 11.5 | B | 1 | 0.258 | 12 | B | 1 | 0.258 | 12 | B |
| | | WB | 2.6 | 0.486 | 14.8 | B | 3 | 0.529 | 16.3 | B | 3 | 0.529 | 16.3 | B |
| | | SB | 1.7 | 0.371 | 12.8 | B | 2.1 | 0.42 | 13.9 | B | 2.1 | 0.42 | 13.9 | B |
| | | INT | | | 15.1 | B | | | 17 | B | | | 17 | B |
| Greystone Drive & Wood Hollow Drive | AWSC | NB | 3.7 | 0.581 | 16.9 | B | 8.5 | 0.847 | 34.9 | C | 8.5 | 0.847 | 34.9 | C |
| | | EB | 0.9 | 0.242 | 11.8 | B | 1.3 | 0.308 | 14.3 | B | 1.3 | 0.308 | 14.3 | B |
| | | WB | 5 | 0.67 | 20.8 | C | 6.6 | 0.769 | 27 | C | 6.6 | 0.769 | 27 | C |
| | | SB | 1.4 | 0.319 | 12.9 | B | 2.6 | 0.482 | 16.7 | B | 2.6 | 0.482 | 16.7 | B |
| | | INT | | | 16.9 | B | | | 25.8 | C | | | 25.8 | C |
| Greystone Drive & Loop 1 SBFR | TWSC | EB | ***167*** | ***0.83*** | ***62.2*** | ***E*** | ***259*** | ***0.97*** | ***79.2*** | ***E*** | ***259*** | ***0.97*** | ***79.2*** | ***E*** |
| | | SB | 0 | 0.52 | 0 | A | 0 | 0.47 | 0 | A | 0 | 0.47 | 0 | A |
| 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 | | | 33.4 | 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 | ***#346*** | ***0.87*** | ***74.8*** | ***E*** | 265 | 0.81 | 51.9 | D | 256 | 0.81 | 50.6 | D |
| | | SB | ***225*** | ***0.79*** | ***67.9*** | ***E*** | ***246*** | ***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 | 25.9 | 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*** | ***1.20dl*** | ***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#1000*** | ***1.13*** | ***88.9*** | ***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)** | | | | | | | | | | | | | | |
| **Intersection** | **Approach** | | | | | | | | | | | | | |
| Driveway 1 (Phase I) | NB | | | | | | 73 | 0.51 | 17.8 | C | 73 | 0.51 | 17.8 | C |
| Driveway 2 (Phase II) | NB | | | | | | 11 | 0.13 | 10.5 | B | 11 | 0.13 | 10.5 | B |
| Driveway 6 (Phase III) | SB | | | | | | 20 | 0.22 | 16.3 | C | 20 | 0.22 | 16.3 | C |
| Driveway 3 (Phase II) | NB | | | | | | 4 | 0.05 | 10 | A | 4 | 0.05 | 10 | A |
| Driveway 4 (Phase II) | NB | | | | | | 7 | 0.08 | 10.2 | B | 7 | 0.08 | 10.2 | B |
| Driveway 5 (Phase III) | SB | | | | | | 17 | 0.19 | 11.1 | B | 17 | 0.19 | 11.1 | B |
| Driveway 7 (Phase III) | SB | | | | | | 16 | 0.18 | 13.9 | B | 16 | 0.18 | 13.9 | B |
| Driveway 8 (Phase III) | SB | | | | | | 4 | 0.05 | 14.3 | B | 4 | 0.05 | 14.3 | B |
| Driveway 9 (Phase III) | EB | | | | | | 6 | 0.07 | 12.2 | B | 6 | 0.07 | 12.2 | B |
| Driveway 10 (Phase III) | WB | | | | | | 45 | 0.39 | 24.3 | C | 45 | 0.39 | 24.3 | C |

## 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 23*** 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 23 – 2024 Build Trip Generation**

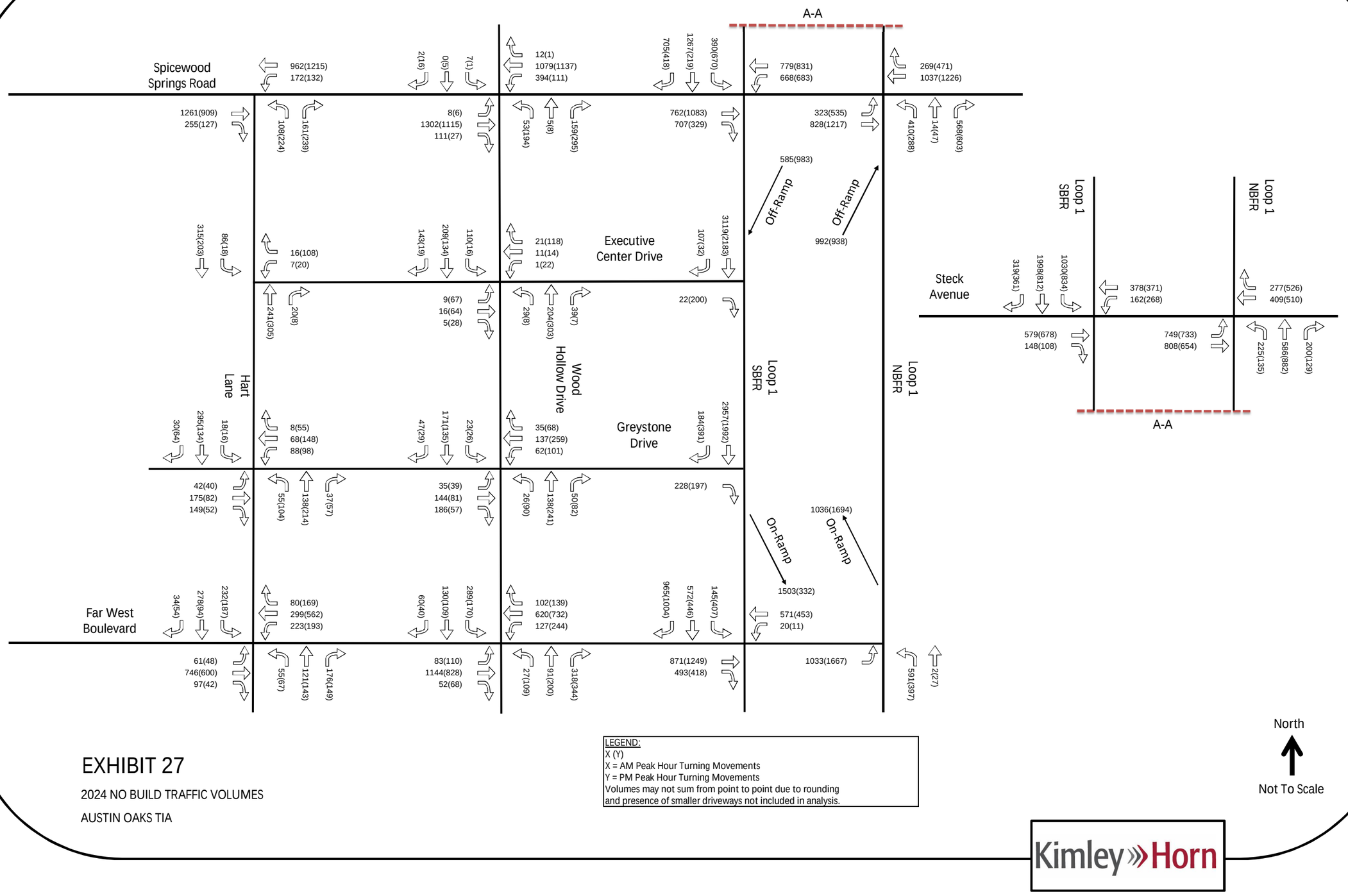
| Land Use | Amount | Units | ITE Code | Daily Trips | AM Peak Hour Trips | | | PM Peak Hour Trips | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | In | Out | Total | In | Out | Total |
| Existing General Office Building | 445.322 | 1,000 Sq Ft | 710 | 4,086 | 556 | 76 | 632 | 98 | 479 | 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 Trips (at Site Driveways) | | | | **19,648** | **1,356** | **514** | **1,870** | **646** | **1,229** | **1,875** |
| 2024 Net New External Trips | | | | **15,562** | **800** | **438** | **1,238** | **548** | **750** | **1,298** |

### TRIP DISTRIBUTION AND ASSIGNMENT

The 2024 Trip Assignment Volumes, shown as ***Exhibit 28,*** are the product of the Global Trip Distribution Percentages and 2024 Net New External Trips, as shown in ***Table 23***. The 2024 Local Trip Distribution Percentages, as shown as ***Exhibit 29***, were developed based on the size and location of the Austin Oaks development expected to be completed by year 2024.

### TOTAL TRAFFIC VOLUMES

For all existing intersections, the assignment volumes were added to 2024 No Build Volumes (***Exhibit 27***) to determine the 2024 Build Traffic Volumes. Existing office trips were not assumed at site driveways. Therefore, the in/out movements to/from site driveways are the product of the Local Trip Distribution Percentages and the Trips (at Site Driveways) shown in ***Table 23.*** The weekday AM and PM peak hour traffic volumes used for the analysis of the 2024 Build and Mitigated Scenarios are shown in ***Exhibit 30*** and ***Exhibit 31*** for network intersections and site driveways, respectively.




# EXHIBIT 27

2024 NO BUILD TRAFFIC VOLUMES

AUSTIN OAKS TIA

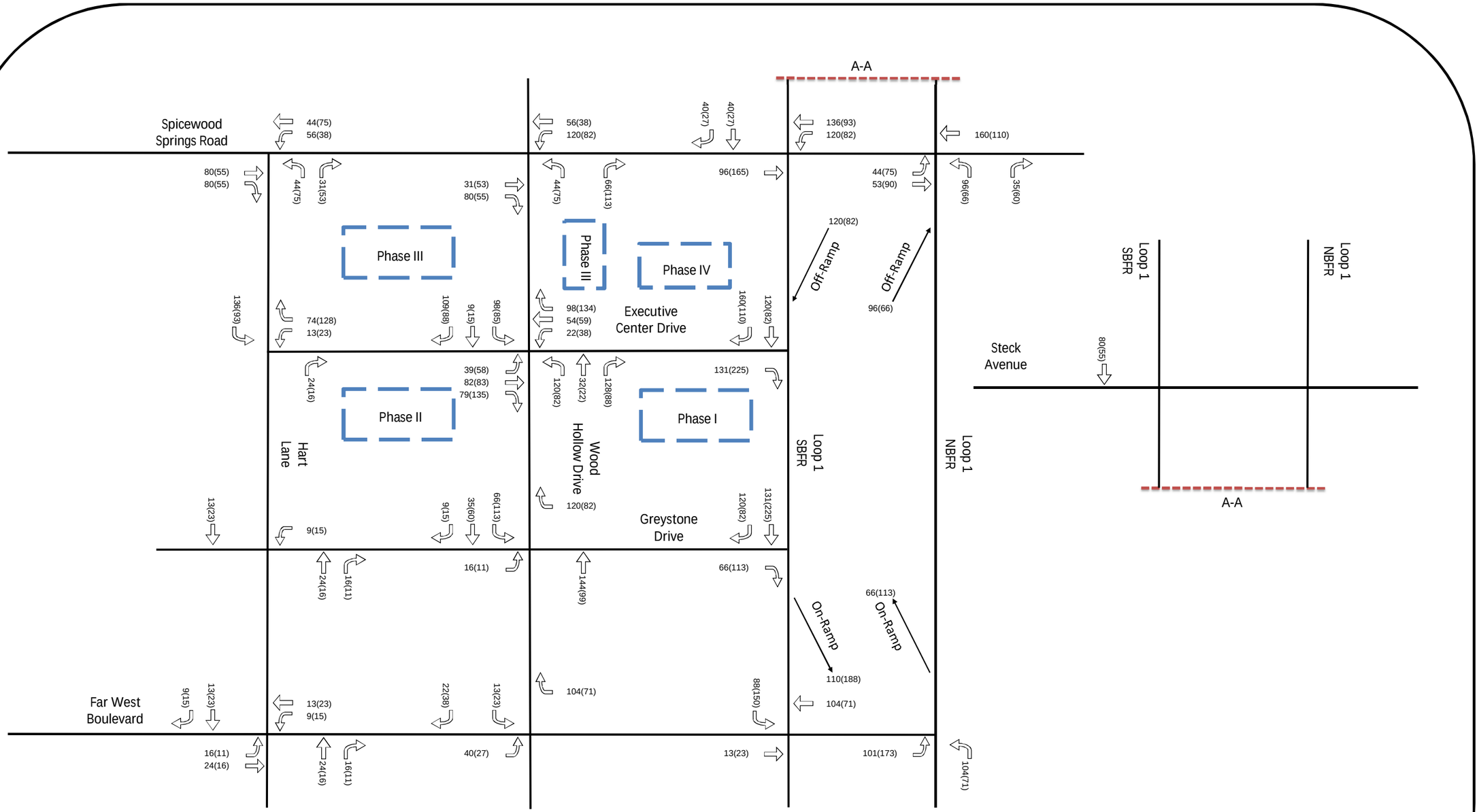
LEGEND:
X (Y)
X = AM Peak Hour Turning Movements
Y = PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

Kimley»Horn

7/21/2016




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

North

Not To Scale

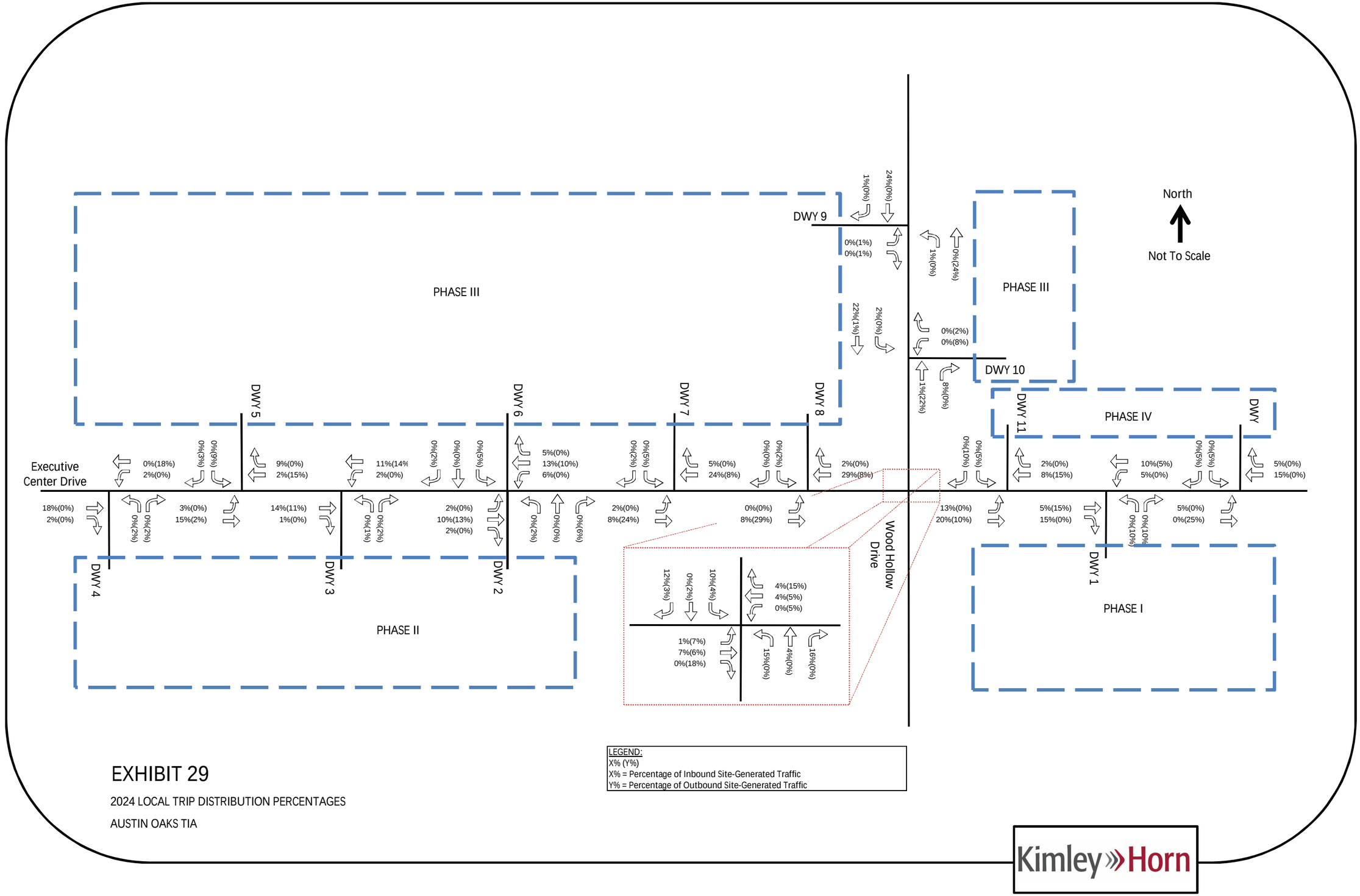
# EXHIBIT 28

2024 TRIP ASSIGNMENT VOLUMES (NET NEW TRIPS)

AUSTIN OAKS TIA - SEE TABLE 23

Kimley»Horn

7/21/2016




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

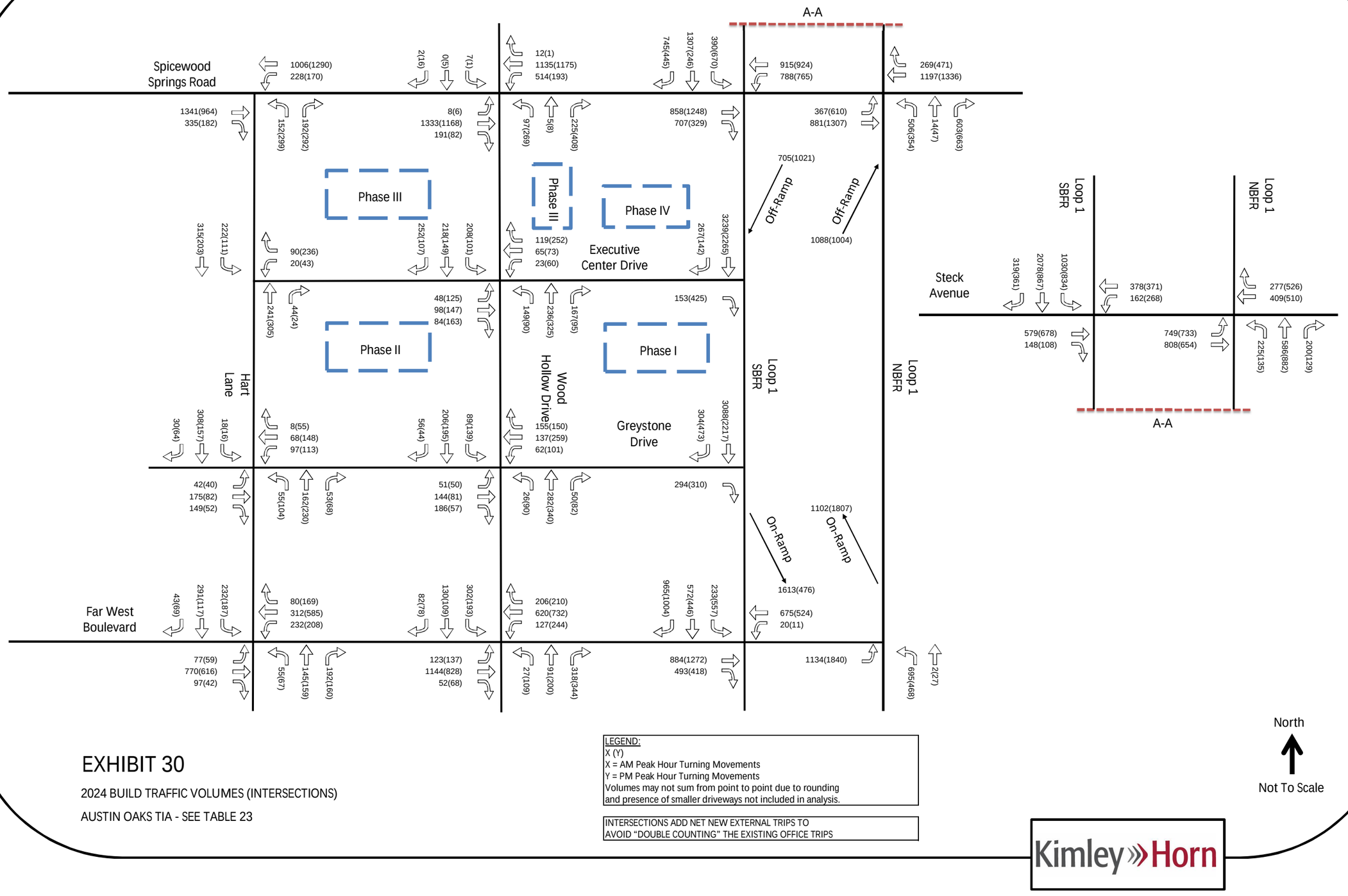
# EXHIBIT 29

2024 LOCAL TRIP DISTRIBUTION PERCENTAGES

AUSTIN OAKS TIA

Kimley»Horn

7/21/2016




# EXHIBIT 30

2024 BUILD TRAFFIC VOLUMES (INTERSECTIONS)

AUSTIN OAKS TIA - SEE TABLE 23

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.

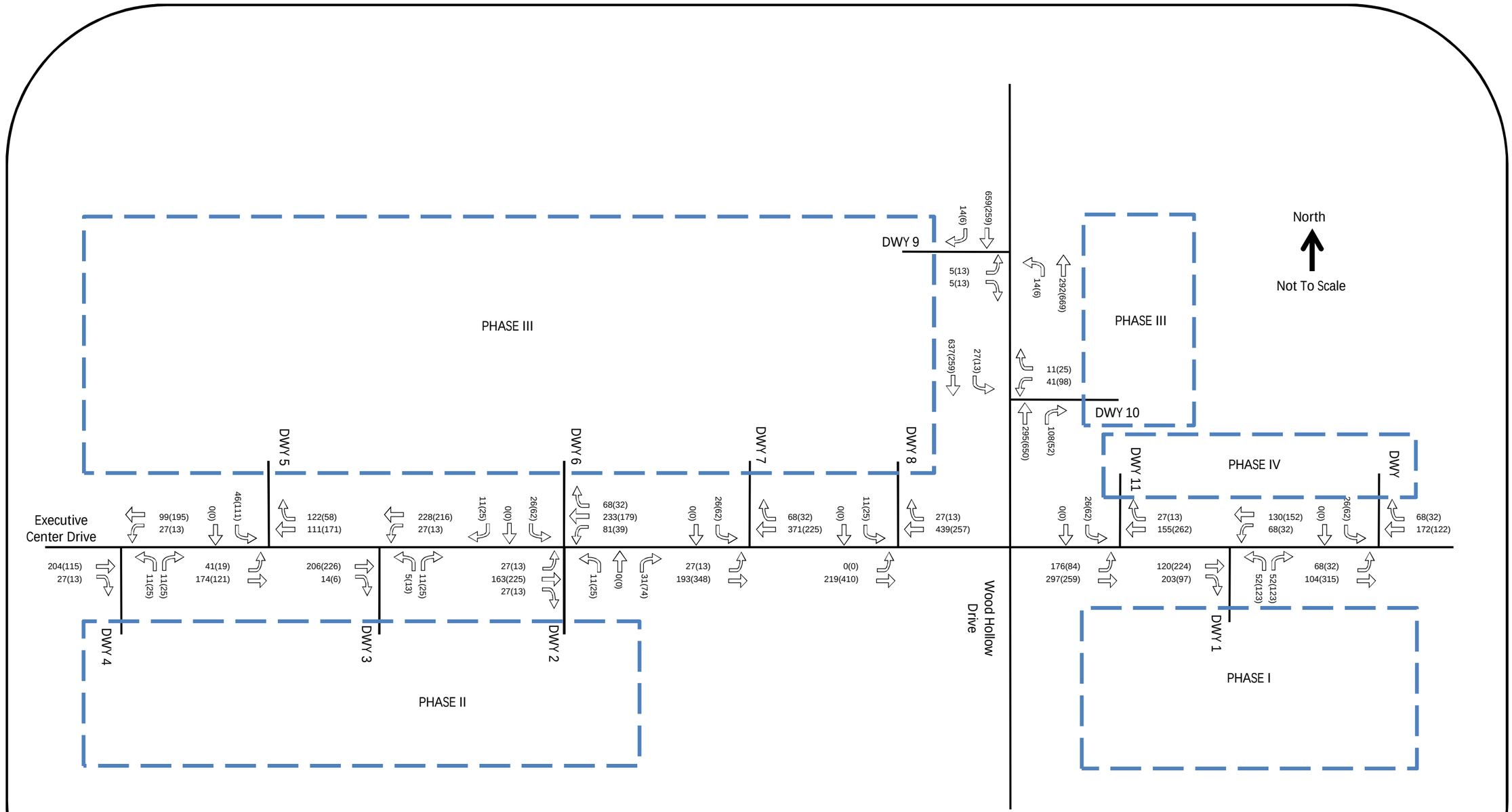
INTERSECTIONS ADD NET NEW EXTERNAL TRIPS TO AVOID "DOUBLE COUNTING" THE EXISTING OFFICE TRIPS

North

Not To Scale

Kimley»Horn

7/21/2016




# EXHIBIT 31

2024 BUILD TRAFFIC VOLUMES (DRIVEWAYS)

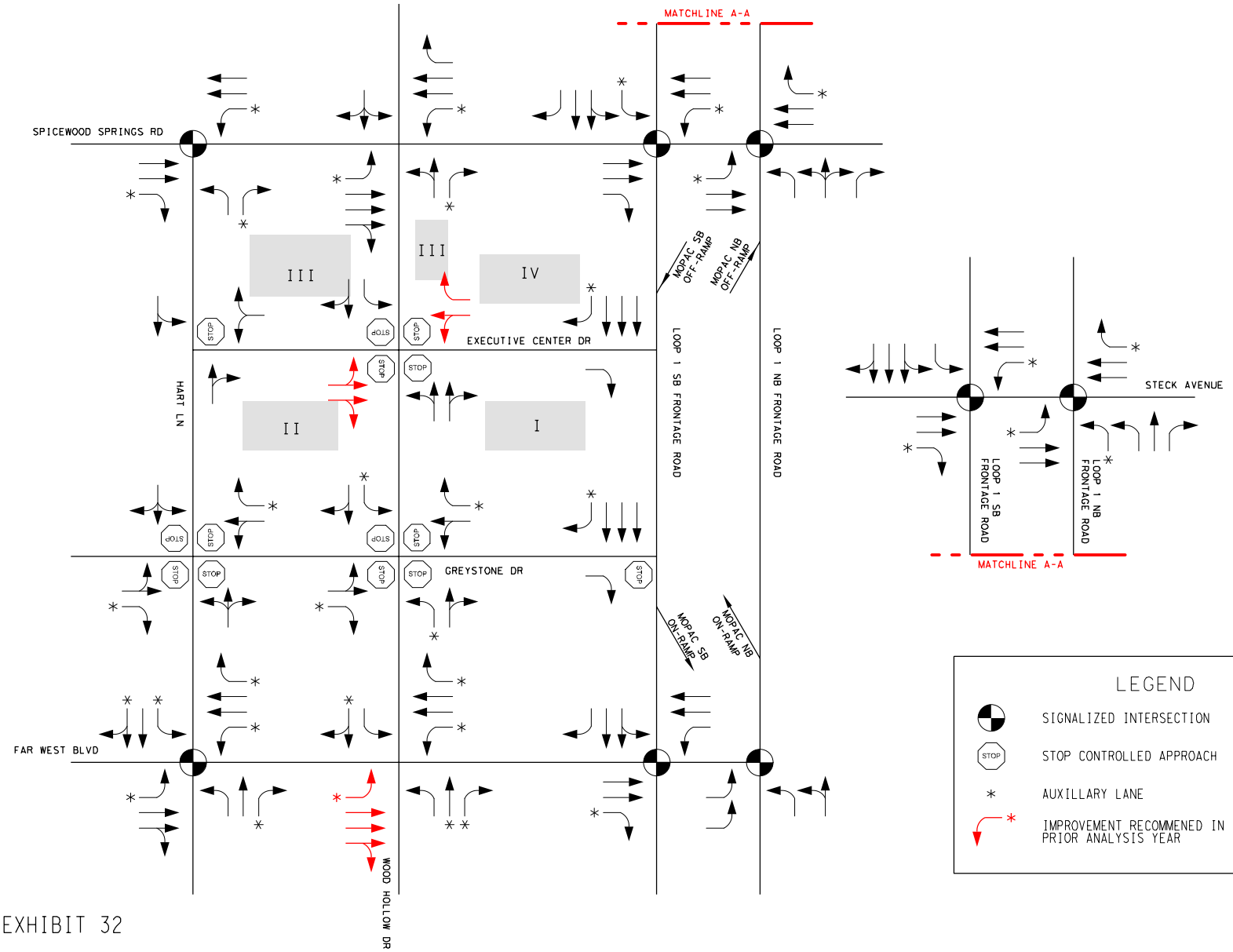
AUSTIN OAKS TIA - SEE TABLE 23

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.

DRIVEWAY INGRESS/EGRESS VOLUMES REFLECT TRIPS (AT SITE DRIVEWAYS) AS THESE MOVEMENTS WERE ASSUMED TO HAVE NO EXISTING OFFICE TRIPS

Kimley»Horn

7/21/2016




# EXHIBIT 32

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 32***, which incorporates improvements recommended in analysis years prior to 2024. ***Table 24*** and ***Table 25*** summarize the intersection operations for the 2024 Build Scenario AM and PM peak hours, respectively. Synchro reports, including signal timing plans, for all 2024 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.

- *Executive Center Drive & Wood Hollow Drive*. The northbound approach of Wood Hollow Drive at Executive Center Drive experience an unacceptable LOS due to the high volume expected at this approach.

- *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 and Future Regional Impacts)

- *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 and Future Regional Impacts)

- *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 and Future Regional Impacts)

- *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 and Future Regional Impacts)

## C. TRAFFIC SIGNAL WARRANT ANALYSIS

As part of the analysis of 2024 Build conditions, a traffic signal warrant analysis (TSWA) was performed at the intersection of Executive Center Drive and Wood Hollow Drive. The TSWA followed procedures outlined in the 2011 TxMUTCD.

24-Hour recording machine counts collected along Executive Center Drive and Wood Hollow Drive in the vicinity of the intersection. The raw traffic counts (provided in ***Appendix E***) were used to determine the hourly variation of traffic volumes along Executive Center Drive and Wood Hollow Drive. The hourly variation was then used to project 2024 volumes at each approach for all hours of the day.

The number of vehicles at the eastbound approach of Executive Center Drive throughout the day is consistently above the minor street volume threshold for warranting a signal. A traffic signal is warranted based on the 2024 projected traffic volumes at the intersection. Results of the TSWA are summarized in the worksheets included in ***Appendix T.***

## D. 2024 IMPROVEMENTS

Based on the results of the 2024 Build analysis, the following improvements (shown in ***Exhibit 33***) are recommended:

- *Executive Center Drive & Hart Lane (1).* 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 (2).* 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 dual-left-turn lanes at the northbound approach from Hart Lane to Spicewood Springs Road.

- *Executive Center Drive & Wood Hollow Drive (3)*. Consider installing a fully actuated traffic signal at the intersection of Executive Center Drive and Wood Hollow Drive. The City should consider operating northbound and southbound approaches as split phased. Although a signal will ultimately be required, the recommended all-way stop could remain and be monitored until the signal is necessary. An intersection analysis is recommended prior to the installation of the signal.

- *Greystone Drive & Hart Lane (4)*. 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.

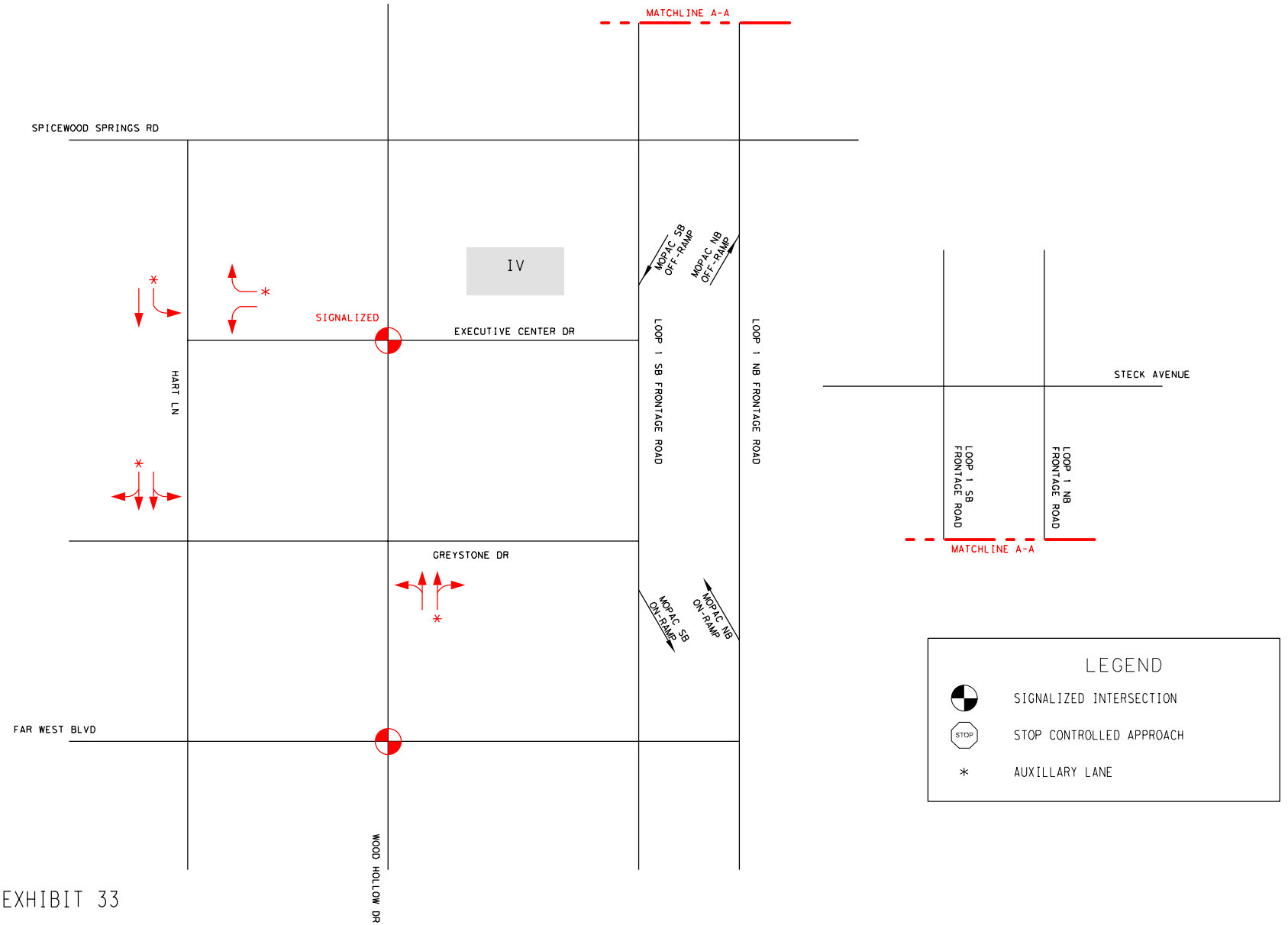
  *Greystone Drive & Wood Hollow Drive (5)*. Restripe the northbound approach of Wood Hollow Drive at Greystone Drive to include two thru lanes. This will require the north-leg of the intersection to be restriped to provide two receiving lanes. A cross-section which will accommodate three travel lanes 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.

- *Far West Boulevard & Wood Hollow Drive. (6)* 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***.

## E. 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 34***. ***Table 24*** and ***Table 25*** 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 either an acceptable LOS or report delay less than the No Build scenario.

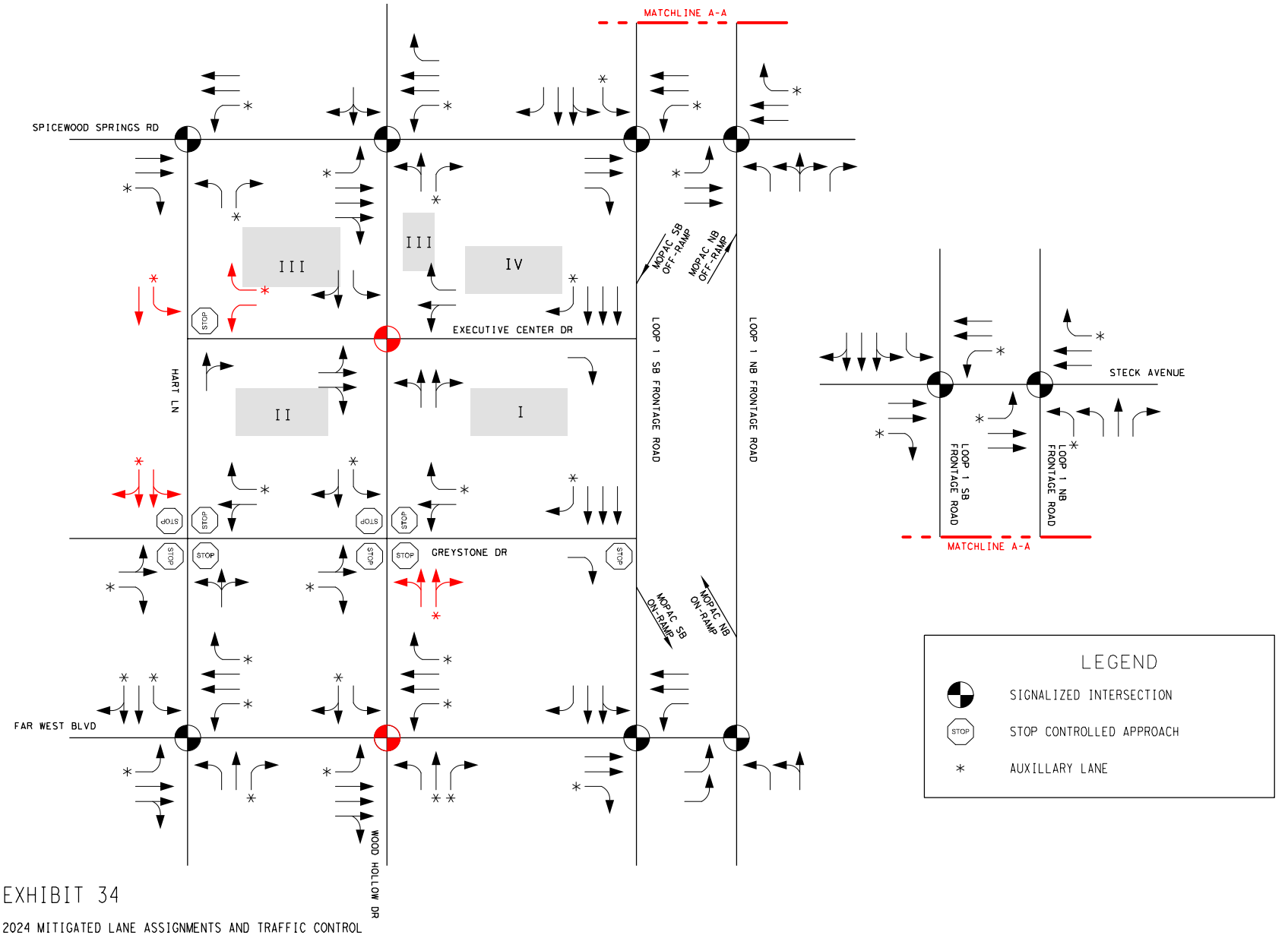



# EXHIBIT 33

2024 IMPROVEMENTS

AUSTIN OAKS TIA

Kimley»Horn




# EXHIBIT 34

2024 MITIGATED LANE ASSIGNMENTS AND TRAFFIC CONTROL

AUSTIN OAKS TIA

Kimley»Horn

# TABLE 24

## 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 | A | 554 | 0.75 | 25.4 | C | 554 | 0.75 | 25.4 | C |
| | | WB | 37 | 0.34 | 2.3 | A | 295 | 0.49 | 10.6 | B | 295 | 0.49 | 10.6 | B |
| | | NB | 187 | 0.84 | 53.7 | D | 96 | 0.52 | 25.5 | C | 96 | 0.52 | 25.5 | C |
| | | INT | | | | | | | 19.8 | B | | | 19.8 | B |
| Spicewood Springs Road & Wood Hollow Drive | Signalized | EB | 344 | 0.57 | 22.4 | C | #580 | 0.83 | 37.4 | D | #580 | 0.83 | 37.4 | D |
| | | WB | m405 | 1 | 28 | C | #604 | 1 | 31.4 | C | #604 | 1 | 31.4 | 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 | | | 26.7 | C | | | 33.6 | C | | | 33.6 | C |
| Spicewood Springs Road & Loop 1 SBFR | Signalized | EB | ***#1030*** | ***1.78*** | ***284.1*** | ***F*** | ***#626*** | ***1.2*** | ***91.2*** | ***F*** | ***#626*** | ***1.2*** | ***91.2*** | ***F*** |
| | | WB | m538 | 0.99 | 19 | B | m#618 | 1.17 | 52.4 | D | m#618 | 1.17 | 52.4 | D |
| | | SB | ***m#409*** | ***1.4*** | ***147.4*** | ***F*** | ***m#407*** | ***1.44*** | ***125.1*** | ***F*** | ***m#407*** | ***1.44*** | ***125.1*** | ***F*** |
| | | INT | | | ***150.2*** | ***F*** | | | ***94.1*** | ***F*** | | | ***94.1*** | ***F*** |
| Spicewood Springs Road & Loop 1 NBFR | Signalized | EB | m45 | 0.46 | 2.4 | A | m44 | 0.52 | 2.5 | A | m44 | 0.52 | 2.5 | 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*** | ***236.4*** | ***F*** | ***#752*** | ***1.73*** | ***236.4*** | ***F*** |
| | | INT | | | ***63.3*** | ***E*** | | | ***96.3*** | ***F*** | | | ***96.3*** | ***F*** |
| Executive Center Drive & Hart Lane | TWSC | WB | 4 | 0.05 | 12.5 | B | 31 | 0.3 | 16.7 | B | 13 | 0.15 | 14.7 | B |
| | | NB | 0 | 0.18 | 0 | A | 0 | 0.2 | 0 | A | 0 | 0.2 | 0 | A |
| | | SB | 7 | 0.08 | 2.4 | A | 21 | 0.22 | 5.1 | A | 21 | 0.22 | 3.6 | A |
| Executive Center Drive & Wood Hollow Drive | TWSC/ Signalized | EB | 11 | 0.13 | 21.2 | C | 1.5 | 0.348 | 15.3 | B | 60 | 0.24 | 21.7 | C |
| | | WB | 8 | 0.09 | 14.9 | B | 1.3 | 0.305 | 14.5 | B | 74 | 0.22 | 21.2 | C |
| | | NB | 2 | 0.03 | 1.1 | A | 5 | 0.675 | 24.9 | C | 170 | 0.77 | 31.9 | C |
| | | SB | 8 | 0.1 | 2.7 | A | 13.5 | 1.074 | 53.3 | D | #392 | 0.92 | 38.2 | D |
| | | INT | | | | | | | 33.8 | C | | | 31.7 | C |
| 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 | A | FREE | FREE | FREE | FREE | FREE | FREE | FREE | FREE |
| Greystone Drive & Hart Lane | AWSC | NB | 3.6 | 0.571 | 19.8 | B | 5.4 | 0.698 | 26.6 | C | 5.7 | 0.719 | 28.6 | C |
| | | EB | 3.6 | 0.575 | 17.8 | B | 4 | 0.61 | 19.7 | B | 3.7 | 0.592 | 18.5 | B |
| | | WB | 2.3 | 0.451 | 17.5 | B | 2.7 | 0.504 | 20 | B | 2.6 | 0.488 | 18.9 | B |
| | | SB | 7.6 | 0.806 | 32.3 | C | 9.8 | 0.885 | 44.9 | D | 2.6 | 0.483 | 17.3 | B |
| | | INT | | | 22.7 | C | | | 29 | C | | | 20.5 | C |
| Greystone Drive & Wood Hollow Drive | AWSC | NB | 1.9 | 0.403 | 13.9 | B | 8.4 | 0.848 | 41.1 | D | 2.5 | 0.475 | 17.6 | B |
| | | EB | 1.8 | 0.382 | 12.9 | B | 3 | 0.527 | 18.9 | B | 2.7 | 0.503 | 17.6 | B |
| | | WB | 2.2 | 0.438 | 14.5 | B | 3.1 | 0.54 | 18.9 | B | 2.9 | 0.518 | 17.6 | B |
| | | SB | 2.4 | 0.464 | 15.1 | B | 4.9 | 0.675 | 23.9 | C | 4.5 | 0.65 | 22 | C |
| | | INT | | | 14 | B | | | 25.6 | C | | | 18.7 | B |
| Greystone Drive & Loop 1 SBFR | TWSC | EB | ***302*** | ***1.19*** | ***172.1*** | ***F*** | ***444*** | ***1.42*** | ***254.9*** | ***F*** | ***444*** | ***1.42*** | ***254.9*** | ***F*** |
| | | SB | 0 | 0.72 | 0 | A | 0 | 0.63 | 0 | A | 0 | 0.63 | 0 | A |
| 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 | #268 | 0.82 | 53.5 | D | #253 | 0.74 | 43.1 | D | #262 | 0.74 | 32.4 | 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*** | | | 39.3 | 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 | ***281*** | ***0.61*** | ***56.7*** | ***E*** | 290 | 0.47 | 42.9 | 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 | | | 49.4 | D | | | 42.3 | 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 | m13 | 0.48 | 1.9 | A | m13 | 0.57 | 5.7 | A | m13 | 0.57 | 5.7 | A |
| | | SB | ***m284*** | ***1.16*** | ***69*** | ***E*** | m222 | 0.63 | 13.6 | B | m222 | 0.63 | 13.6 | B |
| | | INT | | | 39.5 | D | | | 15.3 | B | | | 15.3 | B |
| Faw West Blvd. & Loop 1 NBFR | Signalized | EB | 15 | 0.47 | 3.1 | A | 25 | 0.56 | 5.5 | A | 25 | 0.56 | 5.5 | A |
| | | NB | 363 | 0.7 | 47.6 | D | #470 | 0.71 | 43.7 | D | #468 | 0.71 | 43.7 | D |
| | | INT | | | 19.3 | B | | | 20.1 | C | | | 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 | 5.9 | 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#1406*** | ***3.04*** | ***766.6*** | ***F*** | ***m#1391*** | ***3.04*** | ***765*** | ***F*** | ***m#1391*** | ***3.04*** | ***765*** | ***F*** |
| | | INT | | | ***253.9*** | ***F*** | | | ***253.4*** | ***F*** | | | ***253.4*** | ***F*** |
| **Site Driveways (Stop-Controlled Approach Only)** | | | | | | | | | | | | | | |
| **Intersection** | **Approach** | | | | | | | | | | | | | |
| Driveway 1 (Phase I) | NB | | | | | | 17 | 0.19 | 12.4 | B | 17 | 0.19 | 12.4 | B |
| Driveway 2 (Phase II) | NB | | | | | | 6 | 0.08 | 11.7 | B | 6 | 0.08 | 11.7 | B |
| Driveway 6 (Phase III) | SB | | | | | | 9 | 0.11 | 16.3 | C | 9 | 0.11 | 16.3 | C |
| Driveway 3 (Phase II) | NB | | | | | | 2 | 0.03 | 10.5 | B | 2 | 0.03 | 10.5 | B |
| Driveway 4 (Phase II) | NB | | | | | | 3 | 0.04 | 10.5 | B | 3 | 0.04 | 10.5 | B |
| Driveway 5 (Phase III) | SB | | | | | | 9 | 0.11 | 11.9 | B | 9 | 0.11 | 11.9 | B |
| Driveway 7 (Phase III) | SB | | | | | | 8 | 0.09 | 14.1 | B | 8 | 0.09 | 14.1 | B |
| Driveway 8 (Phase III) | SB | | | | | | 2 | 0.03 | 14.5 | B | 2 | 0.03 | 14.5 | B |
| Driveway 9 (Phase III) | EB | | | | | | 3 | 0.03 | 16.8 | C | 3 | 0.03 | 16.8 | C |
| Driveway 10 (Phase III) | WB | | | | | | 26 | 0.26 | 27.7 | D | 26 | 0.26 | 27.7 | D |
| Driveway 11 (Phase IV) | SB | | | | | | 15 | 0.17 | 13.7 | B | 15 | 0.17 | 13.7 | B |
| Driveway 12 (Phase IV) | SB | | | | | | 7 | 0.09 | 11.3 | B | 7 | 0.09 | 11.3 | B |

# TABLE 25

## 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 | A | 465 | 0.61 | 28.1 | C | 465 | 0.61 | 28.1 | C |
| | | WB | 20 | 0.4 | 1.1 | A | 304 | 0.5 | 11.9 | B | 304 | 0.5 | 11.9 | B |
| | | NB | ***834*** | ***1.75*** | ***381.1*** | ***F*** | 211 | 0.77 | 35.9 | D | 211 | 0.77 | 35.9 | D |
| | | INT | | | | | | | 22.1 | C | | | 22.1 | C |
| Spicewood Springs Road & Wood Hollow Drive | Signalized | EB | 250 | 0.39 | 12.6 | B | 500 | 0.6 | 17.7 | B | 517 | 0.64 | 18.8 | B |
| | | WB | 382 | 0.54 | 11.2 | B | 429 | 0.8 | 25.8 | C | 476 | 0.86 | 31.5 | C |
| | | NB | ***#365*** | ***0.89*** | ***73.6*** | ***E*** | 386 | 0.74 | 42.9 | D | 351 | 0.67 | 34.4 | C |
| | | SB | 32 | 0.03 | 49.1 | D | 27 | 0.02 | 35 | C | 25 | 0.02 | 31.6 | C |
| | | INT | | | 22.7 | C | | | 26.3 | C | | | 27.3 | C |
| Spicewood Springs Road & Loop 1 SBFR | Signalized | EB | ***#902*** | ***1.29*** | ***162.4*** | ***F*** | ***#1095*** | ***1.48*** | ***219.5*** | ***F*** | ***#1095*** | ***1.48*** | ***220.5*** | ***F*** |
| | | WB | m527 | 0.87 | 12.1 | B | m600 | 0.97 | 14.7 | B | m600 | 0.97 | 14.7 | B |
| | | SB | ***#707*** | ***1.28*** | ***125.3*** | ***F*** | ***#707*** | ***1.28*** | ***105.2*** | ***F*** | ***#707*** | ***1.28*** | ***105.2*** | ***F*** |
| | | INT | | | ***97.2*** | ***F*** | | | ***111.2*** | ***F*** | | | ***111.5*** | ***F*** |
| Spicewood Springs Road & Loop 1 NBFR | Signalized | EB | m180 | 0.9 | 8.7 | A | m179 | 1.03 | 14.9 | B | m178 | 1.03 | 14.8 | 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 | | | ***68.5*** | ***E*** | | | ***91.4*** | ***F*** | | | ***91.4*** | ***F*** |
| Executive Center Drive & Hart Lane | TWSC | WB | 31 | 0.3 | 13.8 | B | 155 | 0.74 | 29.9 | C | 70 | 0.5 | 17.6 | B |
| | | NB | 0 | 0.25 | 0 | A | 0 | 0.26 | 0 | A | 0 | 0.26 | 0 | A |
| | | SB | 2 | 0.02 | 0.9 | A | 11 | 0.13 | 4 | A | 11 | 0.16 | 3.1 | A |
| Executive Center Drive & Wood Hollow Drive | TWSC/ Signalized | EB | 118 | 0.69 | 39.2 | D | 7.5 | 0.825 | 42.9 | D | 102 | 0.49 | 20.7 | C |
| | | WB | 48 | 0.4 | 16.8 | B | 8.6 | 0.878 | 42.6 | D | m88 | 0.44 | 20 | B |
| | | NB | 1 | 0.01 | 0.3 | A | ***9.8*** | ***0.925*** | ***62.2*** | ***E*** | 162 | 0.81 | 33.4 | C |
| | | SB | 1 | 0.02 | 0.9 | A | 9.9 | 0.926 | 52.5 | D | 252 | 0.81 | 49.1 | D |
| | | INT | | | | | | | | | | | 30.4 | C |
| Executive Center Dr. & Loop 1 SBFR | TWSC | EB | 120 | 0.69 | 37.8 | D | FREE | FREE | FREE | FREE | FREE | FREE | FREE | FREE |
| | | SB | 0 | 0.56 | 0 | A | FREE | FREE | FREE | FREE | FREE | FREE | FREE | FREE |
| Greystone Drive & Hart Lane | AWSC | NB | 5 | 0.667 | 20.5 | C | 6.3 | 0.735 | 25 | C | 7.9 | 0.808 | 33.5 | C |
| | | EB | 1.1 | 0.267 | 12 | B | 1.1 | 0.279 | 12.5 | B | 1.2 | 0.284 | 12.8 | B |
| | | WB | 2.9 | 0.516 | 15.8 | B | 3.5 | 0.569 | 17.7 | B | 3.6 | 0.579 | 18.4 | B |
| | | SB | 1.9 | 0.399 | 13.5 | B | 2.4 | 0.458 | 15 | B | 1.2 | 0.297 | 12.5 | B |
| | | INT | | | 16.4 | B | | | 18.9 | B | | | 21.7 | C |
| Greystone Drive & Wood Hollow Drive | AWSC | NB | 4.2 | 0.616 | 18.3 | B | 10.8 | 0.934 | 47.7 | D | 3.7 | 0.596 | 20.9 | C |
| | | EB | 1 | 0.258 | 12.1 | B | 1.5 | 0.339 | 15.5 | B | 1.4 | 0.329 | 14.9 | B |
| | | WB | 5.7 | 0.71 | 23.1 | C | 8 | 0.835 | 33.2 | C | 7.6 | 0.814 | 30.7 | C |
| | | SB | 1.5 | 0.339 | 13.4 | B | 3.3 | 0.554 | 19.3 | B | 3.5 | 0.574 | 19.2 | B |
| | | INT | | | 18.3 | B | | | 32.5 | C | | | 22.9 | C |
| Greystone Drive & Loop 1 SBFR | TWSC | EB | ***202*** | ***0.92*** | ***81.6*** | ***F*** | ***382*** | ***1.17*** | ***143.4*** | ***F*** | ***382*** | ***1.17*** | ***143.4*** | ***F*** |
| | | SB | 0 | 0.54 | 0 | A | 0 | 0.5 | 0 | A | 0 | 0.5 | 0 | A |
| 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*** | ***0.71*** | ***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*** | ***#667*** | ***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)** | | | | | | | | | | | | | | |
| **Intersection** | **Approach** | | | | | | | | | | | | | |
| Driveway 1 (Phase I) | NB | | | | | | 58 | 0.45 | 15.9 | C | 58 | 0.45 | 15.9 | C |
| Driveway 2 (Phase II) | NB | | | | | | 16 | 0.17 | 12 | B | 16 | 0.17 | 12 | B |
| Driveway 6 (Phase III) | SB | | | | | | 23 | 0.24 | 16.9 | C | 23 | 0.24 | 16.9 | C |
| Driveway 3 (Phase II) | NB | | | | | | 5 | 0.06 | 10.7 | B | 5 | 0.06 | 10.7 | B |
| Driveway 4 (Phase II) | NB | | | | | | 6 | 0.07 | 10.2 | B | 6 | 0.07 | 10.2 | B |
| Driveway 5 (Phase III) | SB | | | | | | 24 | 0.25 | 12.4 | B | 24 | 0.25 | 12.4 | B |
| Driveway 7 (Phase III) | SB | | | | | | 18 | 0.2 | 14.3 | B | 18 | 0.2 | 14.3 | B |
| Driveway 8 (Phase III) | SB | | | | | | 6 | 0.07 | 15 | B | 6 | 0.07 | 15 | B |
| Driveway 9 (Phase III) | EB | | | | | | 4 | 0.05 | 12.3 | B | 4 | 0.05 | 12.3 | B |
| Driveway 10 (Phase III) | WB | | | | | | 72 | 0.53 | 34.8 | D | 72 | 0.53 | 34.8 | D |
| Driveway 11 (Phase IV) | SB | | | | | | 43 | 0.37 | 15.6 | C | 43 | 0.37 | 15.6 | C |
| Driveway 12 (Phase IV) | SB | | | | | | 20 | 0.22 | 12.4 | B | 20 | 0.22 | 12.4 | B |

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 operations at the 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.

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 twenty-three specific existing 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 $628,000. 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 26 and 27*** 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 26

## OPINION OF PROBABLE COST SUMMARY – PHASE I IMPROVEMENTS

## AUSTIN OAKS TIA

| Improvement Name | Improvement Description | Opinion of Probable Cost ($) | Site Traffic (%) | Pro-Rata Cost Share ($) |
|---|---|---|---|---|
| 1. Spicewood Springs Road & Hart Lane (2018) | 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 & Hart Lane (2018) | Widen Hart Lane between Executive Center Drive and Spicewood Springs Road. | $ 150,000 | 11.0% | $ 16,500 |
| 3. Spicewood Springs Road & Wood Hollow Drive (2018) | Extend the westbound left-turn bay of Spicewood Springs Road to Wood Hollow Drive. | $ 50,000 | 42.5% | $ 21,250 |
| 4. Spicewood Springs Road & Wood Hollow Drive (2018) | 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 |
| 5. 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 |
| 6. Spicewood Springs Road & Loop 1 SBFR (2018) | Provide a FREE, channelized operation at the southbound right-turn movement from Loop 1 SBFR to FSpicewood Springs Road (westbound) | $ 175,000 | 7.3% | $ 12,780 |
| 7. Spicewood Springs Road & Loop 1 SBFR (2018) | Provide a FREE eastbound right-turn movement from Spicewood Springs Road to Loop 1 SBFR | $ 35,000 | 7.3% | $ 2,560 |
| 8. Executive Center Drive & Wood Hollow Drive (2018) | Provide stop-control at the northbound and southbound approaches of Wood Hollow Drive. | $ 10,000 | 52.6% | $ 5,260 |
| 9. Executive Center Drive & Loop 1 SBFR (2018) | Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Executive Center Drive). | $ 160,000 | 77.5% | $ 124,000 |
| 10. Executive Center Drive & Loop 1 SBFR (2018) | Construct a southbound accceleration lane on Loop 1 SBFR (downstream of Executive Center Drive). | $ 130,000 | 85.6% | $ 111,280 |
| 11. Greystone Drive & Loop 1 SBFR (2018) | Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Greystone Drive). | $ 160,000 | 39.5% | $ 63,200 |
| 12. Far West Boulevard & Hart Lane (2018) | Widen the northbound approach and restripe the southbound approach of Hart Lane at the intersection of Far West Boulevard. | $ 110,000 | 8.6% | $ 9,460 |
| 13. Far West Boulevard & Wood Hollow Drive (2018) | Provide a right-turn overlap operation at the northbound right-turn movement from Wood Hollow Drive to Far West Boulevard. | $ 20,000 | 5.8% | $ 1,160 |
| 14. Far West Boulevard & Loop 1 SBFR (2018) | Provide a FREE, channelized operation at the southbound right-turn movement from Loop 1 SBFR to Far West Boulevard (westbound) | $ 175,000 | 7.5% | $ 13,130 |
| **Phase I Improvements Subtotal** | | **$ 1,625,000** | **-** | **$ 437,730** |

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 27

## OPINION OF PROBABLE COST SUMMARY – PHASE II, III, & IV IMPROVEMENTS

## AUSTIN OAKS TIA

| Improvement Name | Improvement Description | Opinion of Probable Cost ($) | Site Traffic (%) | Pro-Rata Cost Share ($) |
|---|---|---|---|---|
| **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. Executive Center Drive & Wood Hollow Drive (2022) | Widen Executive Center Drive to include a four-lane cross-section at eastbound and westbound approaches | $ 20,000 | 52.6% | $ 10,520 |
| 2. 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. Executive Center Drive & Hart Lane (2024) | Restripe Restripe Hart Lane between Executive Center Drive and Spicewood Springs Road | $ 20,000 | 79.1% | $ 15,820 |
| 3a. Executive Center Drive & Wood Hollow Drive (2024) | Preform Traffic Signal Warrant Analysis at the intersection of Executive Center Drive and Wood Hollow Drive. | $ 10,000 | 52.6% | $ 5,260 |
| 3b. Executive Center Drive & Wood Hollow Drive (2024) | Install a fully actuated traffic signal at the intersection of Executive Center Drive and Wood Hollow Drive. | $ 250,000 | 52.6% | $ 131,500 |
| 4. Greystone Drive & Hart Lane (2024) | Restripe the southbound approach of Hart Lane at Greystone Drive. | $ 20,000 | 9.7% | $ 1,940 |
| 5. Greystone Drive & Wood Hollow Drive (2024) | Restripe the northbound approach of Wood Hollow Drive at Greystone Drive. | $ 20,000 | 40.2% | $ 8,040 |
| 6. 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 |
| **Phase II, III, & IV Improvements Subtotal** | | **$ 390,000** | **-** | **$ 190,320** |
| **Recommened Improvements Total (Rounded)** | | **$ 2,015,000** | **-** | **$ 628,000** |

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.

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

**2018 Improvements (14):**

- *Spicewood Springs Road & Hart Lane (1).* Consider installing a fully actuated traffic signal at the intersection of Spicewood Springs Road and Hart Lane. Install an advance warning flasher west of the intersection synchronized with the traffic signal to address the potential safety issue related to the horizontal curvature of Spicewood Springs Road. Widen the northbound approach of Hart Lane to include dual left-turns.

- *Hart Lane between Executive Center Drive and Spicewood Springs Road (2)*. Widen Hart Lane between Executive Center Drive and Spicewood Springs Road to accommodate a three-lane northbound approach at the intersection of Hart Lane at Spicewood Springs Road. Restripe the northbound approach of Hart Lane to include dual-left-turn lanes and an exclusive right-turn lane (three 10' approach lanes); a single northbound receiving lane (14') and southbound bike lane (5') will remain.

- *Spicewood Springs Road & Wood Hollow Drive (3)*. 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. 15% of the inbound trips generated by the Austin Oaks development were assigned to the westbound left-turn movement of Spicewood Springs Road to Wood Hollow Drive. The proposed left-turn bay extension will mitigate the impact of site traffic at this movement.

- *Spicewood Springs Road & Wood Hollow Drive (4).* 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. 15% of the outbound trips generated by the Austin Oaks development were assigned to the right-turn movement of Wood Hollow Drive to Spicewood Springs Road. The proposed right-turn overlap operation will mitigate the impact of site traffic at this movement.

- *Wood Hollow Drive between Executive Center Drive and Spicewood Springs Road (5)*. Concurrently with the right-turn overlap improvement at the northbound right-turn movement of Wood Hollow Drive to Spicewood Springs Road, 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.

- *Spicewood Springs Road & Loop 1 SBFR* (6). Provide a FREE, channelized operation at the southbound right-turn movement from Loop 1 SBFR to Spicewood Springs Road (westbound). On Spicewood Springs the existing pavement can accommodate a FREE operation, however, there are design constraints due to the existing bike lane. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Spicewood Springs Road & Loop 1 SBFR* (7). 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. 12' receiving lanes should be maintained along Mopac Southbound Frontage Road. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Executive Center Drive & Wood Hollow Drive (8)*. Implement stop-control at the northbound and southbound approaches of Wood Hollow Drive. Restripe the northbound approach of Wood Hollow Drive at Executive Center Drive to include a shared thru-left and a shared thru-right. The shared thru-right lanes will also be marked as shared bike lanes. This will require the north-leg of the intersection to be restriped to provide two receiving lanes. Restripe the southbound approach of Wood Hollow Drive at Executive Center Drive to include an exclusive right-turn lane and a shared thru-left. The proposed cross-sections can be accomplished using existing pavement.

- *Executive Center Drive & Loop 1 SBFR (9)*. 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. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Executive Center Drive at Loop 1 SBFR (10)*. 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. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Greystone Drive & Loop 1 SBFR (11)*. Construct a southbound right-turn deceleration lane on Loop 1 SBFR (upstream of Greystone Drive). 15% of the outbound trips generated by the Austin Oaks development were assigned to the eastbound right-turn movement of Greystone Drive at Loop 1 SBFR. The proposed southbound right-turn deceleration lane will mitigate the impact of site traffic at eastbound approach by removing vehicles turning right from the southbound thru lane. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

- *Far West Boulevard & Hart Lane (12).* 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. Concurrently with the approach widening, a 5' sidewalk should be reconstructed adjacent to the northbound approach of Hart Lane. Restripe the southbound approach of Hart Lane to include an exclusive left-turn lane, exclusive thru lane, and shared thru-right lane (three 10' approach lanes); a single northbound receiving lane (14') will remain.

- *Far West Boulevard & Wood Hollow Drive (13)*. 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 (14)*. 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'). The proposed southbound channelized right-turn movement is intended to accommodate the planned bike lane. However, it remains unclear what further improvements will be necessary to accommodate the bike lane west of the intersection. To the extent possible, an 8' sidewalk will be provided along Mopac Southbound Frontage Road. Any improvements at Mopac Frontage Road are subject to TxDOT approval.

**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 (2):**

- *Executive Center Drive & Wood Hollow Drive (1)*. Restripe the eastbound approach of Executive Center Drive at Wood Hollow Drive to include a shared thru-left and a shared thru-right. The shared thru-right lanes will also be marked as shared bike lanes. This will require the east-leg of the intersection to be restriped to provide two receiving lanes. Restripe the westbound approach of Executive Center Drive at Wood Hollow Drive to include an exclusive right-turn lane and a shared thru-left. The proposed cross-sections can be accomplished using existing pavement.

- *Far West Boulevard & Wood Hollow Drive (*2). 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 (6):**

- *Executive Center Drive & Hart Lane (1).* 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 (2).* 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 dual-left-turn lanes at the northbound approach from Hart Lane to Spicewood Springs Road.

- *Executive Center Drive & Wood Hollow Drive (3)*. Consider installing a fully actuated traffic signal at the intersection of Executive Center Drive and Wood Hollow Drive. The City should consider operating northbound and southbound approaches as split phased. Although a signal will ultimately be required, the recommended all-way stop could remain and be monitored until the signal is necessary. An intersection analysis is recommended prior to the installation of the signal.

- *Greystone Drive & Hart Lane (4)*. 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.

- *Greystone Drive & Wood Hollow Drive (5)*. 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.

- *Far West Boulevard & Wood Hollow Drive. (6)* Adjust signal timing at the intersection of Far West Boulevard and Wood Hollow Drive.

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