



Traffic Impact Analysis

The Backyard TIA Update

Bee Cave, Texas

First Submission: July 10, 2020

Second Submission: April 9, 2021

Third Submission: May 19, 2021

Fourth Submission: June 24, 2021

This page is intentionally left blank.

Traffic Impact Analysis

The Backyard TIA Update

Bee Cave, Texas

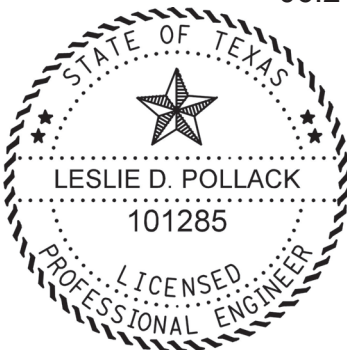
First Submission: July 10, 2020

Second Submission: April 9, 2021

Third Submission: May 19, 2021

Fourth Submission: June 24, 2021

06.24.21



Leslie D Pollack

Prepared for

JPD Backyard Finance

Prepared by

HDR Engineering, Inc.

Texas P.E. Firm Registration No. F-754

504 Lavaca Street, Suite 900

Austin, Texas 78701 USA

Telephone 512 904-3700

Website: hdrinc.com

This page is intentionally left blank.

Contents

Introduction.....	1
Site and Access Characteristics	1
Existing Thoroughfare System.....	4
Traffic Analysis.....	6
2019 Existing Conditions.....	8
2023 Forecasted Conditions with Site Generated Traffic	13
Site Generated Traffic	13
Analysis Assumptions	18
Directional Distribution	24
Intersection Analysis	24
Summary and Recommendations	37
Event Traffic Analysis.....	40
Shared Parking Study	47
References	62

Tables

Table 1. Signalized Intersection: Level of Service Measurement and Qualitative Descriptions.....	7
Table 2. Unsignalized Intersection: Level of Service Measurement.....	8
Table 3. Summary of Unadjusted Daily and Peak Hour Trip Generation	15
Table 4. Pass-By Reductions PM Peak Period.....	19
Table 5. Pass-By Reductions at Backyard Driveways.....	19
Table 6. Summary of Adjusted Daily and Peak Hour Trip Generation	23
Table 7. Forecasted Overall Directional Distribution of Site-Oriented Traffic	24
Table 8. Signalized Intersection Level of Service and Delay (sec/veh).....	37
Table 9. Unsignalized Intersection Level of Service and Delay (sec/veh).....	38
Table 10. Summary of Recommended Improvements and Pro-Rata Share	39
Table 11. Summary of PM Peak and Event Peak Trip Generation	41
Table 12. Volume Reductions for Background Traffic	42
Table 13. Event Intersection Level of Service.....	42
Table 14. City of Bee Cave Parking Requirements – Office and Glenn Peak.....	47
Table 15. City of Bee Cave Parking Requirements – Live Oak Amphitheater Event Peak	48
Table 16. Total Parking Requirement for Peak Month and Peak Period – Glenn Peak (No Hotel or Office).....	50
Table 17. Total Parking Requirement for Peak Month and Peak Period – Event Peak (No Hotel or Office).....	53
Table 18. Total Parking Requirement for Peak Month and Peak Period – Office and Glenn Peak	56
Table 19. Total Parking Requirement for Peak Month and Peak Period – Event Peak	59

Figures

Figure 1. Area Location Map.....	2
Figure 2. Conceptual Site Plan	3
Figure 3. 2019 Existing Traffic Volumes	16
Figure 4. Glenn Area Building Map with ITE Land Use Code.....	17
Figure 5. 2023 Background Growth Traffic Volumes	20
Figure 6. Other Projects Location Map	21
Figure 7. 2023 Other Projects Traffic Volumes.....	22
Figure 8. 2023 Forecasted without Willie Way or Site Traffic Volumes	30
Figure 9. 2023 Forecasted without Site Traffic Volumes	31
Figure 10. Site Traffic Distribution Map.....	32
Figure 11. Site Traffic Volumes Without Pass-By	33
Figure 12. PM Peak Pass-By Adjustments	34
Figure 13. Total Site Traffic Volumes.....	35
Figure 14. 2023 Site Plus Forecasted Traffic Volumes	36
Figure 15. Event Traffic Circulation.....	44
Figure 16. Event Traffic Site Circulation Before Event	45
Figure 17. Event Traffic Site Circulation After Event	46
Figure 18. Weekday Peak Month Daily Parking Demand by Hour and Land Uses – Glenn Peak (No Hotel or Office)	51
Figure 19. Weekend Peak Month Daily Parking Demand by Hour and Land Uses – Glenn Peak (No Hotel or Office)	52
Figure 20. Weekday Peak Month Daily Parking Demand by Hour and Land Uses – Event Peak (No Hotel or Office)	54
Figure 21. Weekend Peak Month Daily Parking Demand by Hour and Land Uses – Event Peak (No Hotel or Office)	55
Figure 22. Weekday Peak Month Daily Parking Demand by Hour and Land Uses – Office and Glenn Peak	57
Figure 23. Weekend Peak Month Daily Parking Demand by Hour and Land Uses – Office and Glenn Peak	58
Figure 24. Weekday Peak Month Daily Parking Demand by Hour and Land Uses – Event Peak	60
Figure 25. Weekend Peak Month Daily Parking Demand by Hour and Land Uses – Event Peak.....	61

Introduction

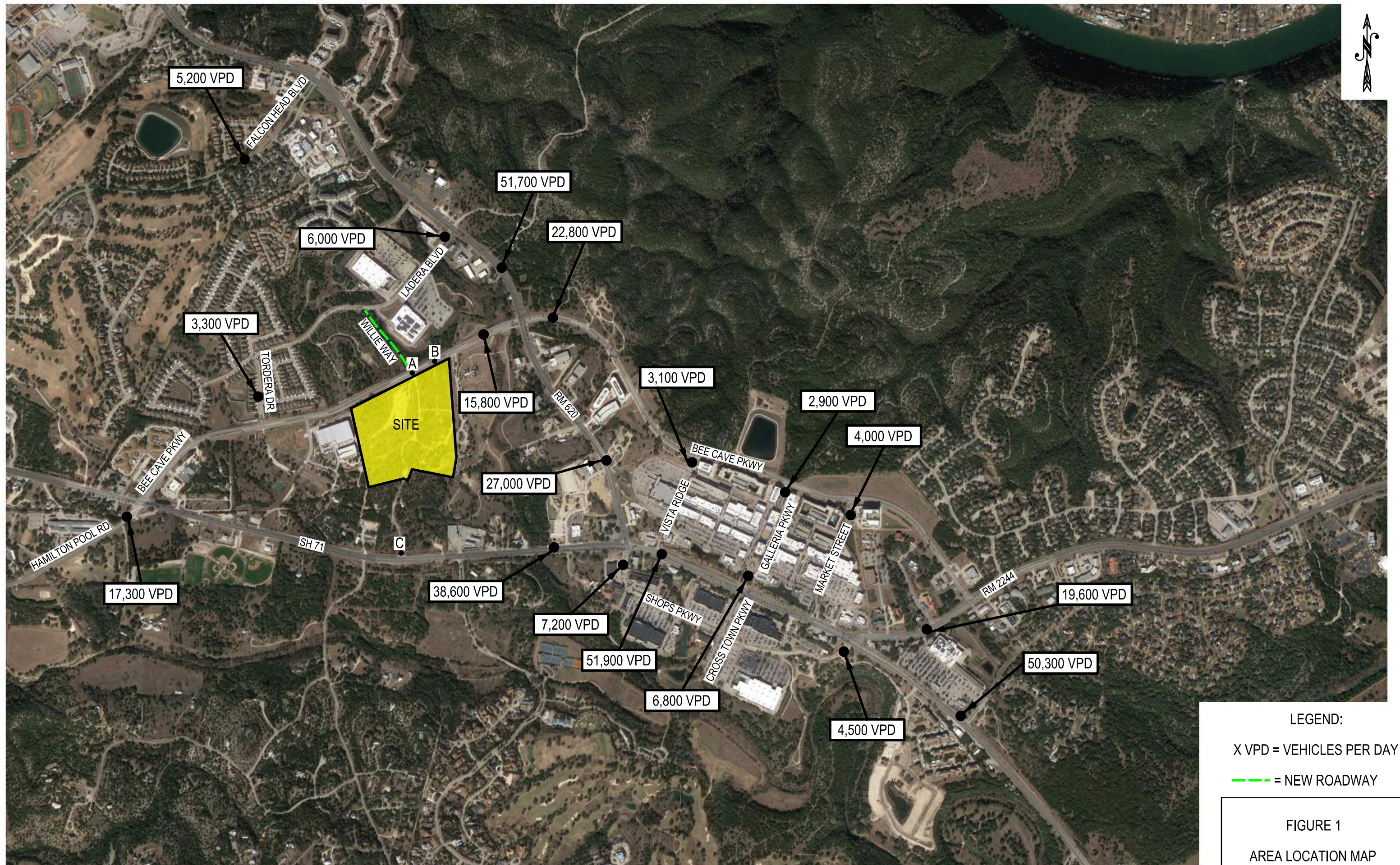
HDR Engineering, Inc. has been retained by JPD Backyard Finance to perform a Traffic Impact Analysis (TIA) for the proposed Backyard development located southwest of the intersection of RM 620 and Bee Cave Parkway in Bee Cave, Texas, as shown in Figure 1. The development is anticipated to consist of the following proposed land uses:

- 125-room Hotel
- 350-person Dance Hall
- 181,476 square feet of Office
- 3,096 square feet of Shopping Center
- 4,923 square feet of Drinking Place
- 5,394 square feet of Fast Casual Restaurant
- 897 seats of High-Turnover (Sit-Down) Restaurant
- 816 square feet of High-Turnover (Sit-Down) Restaurant
- 61-seat Fast Food Restaurant without Drive Through Window
- 1,649 square feet of Fast Food Restaurant without Drive Through Window
- 2,743 square feet of Coffee Shop without Drive Through Window
- 208-person Private Event Space

The Backyard development will also operate the Live Oak Amphitheater Venue with a maximum occupancy of 3,700 attendees. All concerts will operate outside of peak hours and no other programmed events within the development will occur simultaneously as an event at the Live Oak Amphitheater. The project site is currently vacant and development is expected to be complete by 2023.

Site and Access Characteristics

As shown in Figure 2, access to the site will be provided via one primary driveway on Bee Cave Parkway and one driveway on SH 71. A second driveway on Bee Cave Parkway will provide emergency vehicle access only.



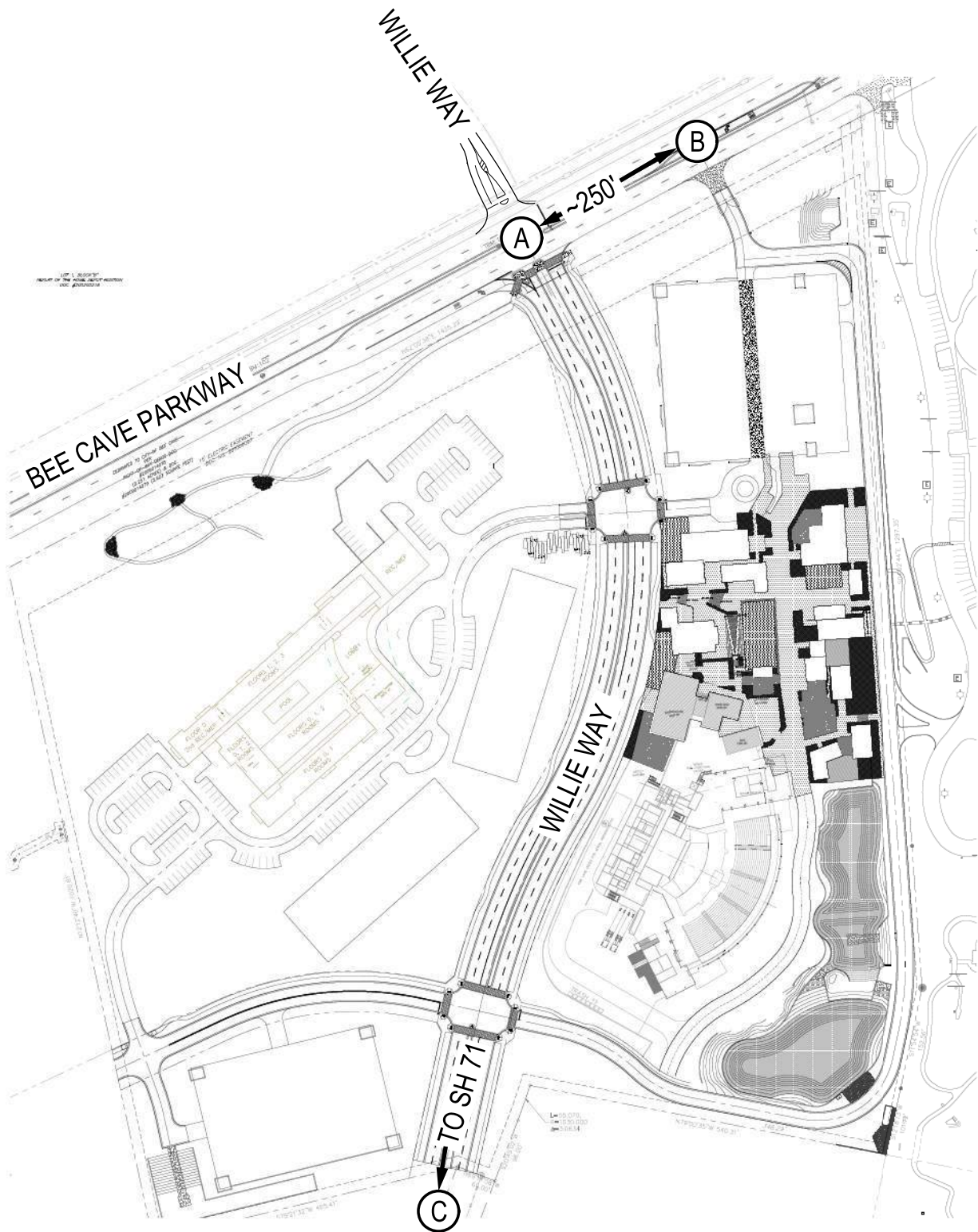


FIGURE 2

CONCEPTUAL SITE PLAN

(X) = SITE DRIVEWAY

Existing Thoroughfare System

As indicated on the area location map and the conceptual site plan (Figures 1 and 2), the project is southwest of the intersection of RM 620 and Bee Cave Parkway, in Bee Cave, Texas. The interrelationship of these roadways and others in the area is shown on Figure 1. The City of Bee Cave Comprehensive Plan (CBCCP) (Ref. 1) catalogs the classifications of these major roadways and documents proposed improvements. The Capital Area Metropolitan Planning Organization (CAMPO) also documents proposed improvements in the network in its 2045 Regional Transportation Plan (RTP) (Ref. 2). Average daily traffic estimates for these roadways were obtained from Texas Department of Transportation (TxDOT) Traffic Counts Database System (TCDS) (Ref. 3) and counts conducted by HDR. To adequately describe these roadways, a further characterization is provided for each.

SH 71

The CBCCP classifies SH 71 as a Type AA major regional arterial. According to the TxDOT TCDS, the 2018 daily traffic volume on SH 71 is 38,600 vehicles per day (vpd) and 51,900 vpd, west and east of RM 620, respectively. According to the TxDOT TCDS, the 2018 daily traffic volume on SH 71, east of RM 2244 is 50,300 vpd.

RM 620

The CBCCP classifies RM 620 as a major arterial. According to the TxDOT TCDS, the 2018 daily traffic volume on RM 620, north of SH 71, is 27,000 vpd. 24-Hour traffic volume information is not available for RM 620, north of Bee Cave Parkway; however, 2019 tube counts recorded a traffic volume of 51,700 vpd on RM 620, north of Bee Cave Parkway.

TxDOT is proposing improvements to RM 620 South between SH 71 and Hudson Bend Road to address safety and mobility concerns. These improvements include widening the existing 4-lane divided rural roadway to a 6-lane divided urban roadway, adding raised medians, and intersection improvements. The final project construction timeline is unknown and was not assumed to be completed within the timeframe of this TIA. The proposed improvements were taken into consideration for the Backyard's recommended improvements.

RM 2244

The CBCCP classifies RM 2244 as a Type A major arterial. According to the TxDOT TCDS, the 2018 daily traffic volume on RM 2244, north of SH 71, is 19,600 vpd.

Bee Cave Parkway

The CBCCP classifies Bee Cave Parkway as a Type B minor arterial. 2019 tube counts recorded a traffic volume of 15,800 vpd and 22,800 vpd on Bee Cave Parkway, west and east of RM 620, respectively.

Hamilton Pool Road

The CBCCP classifies Hamilton Pool Road as a Type A major arterial. According to the TxDOT TCDS, the 2018 daily traffic volume on Hamilton Pool Road, south of SH 71, is

17,300 vpd. According to CAMPO's 2045 RTP, TxDOT is proposing improvements to RM 3238 (Hamilton Pool Road) between RM 12 and SH 71 to rehabilitate the existing roadway. These improvements include construction of shoulders and a center turn lane. The project is planned to let in 2021.

Ladera Boulevard

The CBCCP classifies Ladera Boulevard as a Type C major collector. 24-Hour traffic volume information is not available; however, based on a review of 2019 peak period counts 6,000 vpd are estimated on Ladera Boulevard, west of RM 620.

Falcon Head Boulevard

The CBCCP classifies Falcon Head Boulevard as a Type C major collector. 24-Hour traffic volume information is not available; however, based on a review of 2019 peak period counts 5,200 vpd are estimated on Falcon Head Boulevard, west of RM 620.

Tordera Drive

The CBCCP classifies Tordera Drive as a Type C major collector. 24-Hour traffic volume information for Tordera Drive is not available; however, based on a review of 2019 peak hour traffic counts conducted by HDR, 3,300 vpd are estimated on Tordera Drive, north of Bee Cave Parkway.

Galleria Parkway/Cross Town Parkway

The CBCCP classifies Galleria Parkway/Cross Town Parkway as a Type C major collector. 24-Hour traffic volume information is not available; however, based on a review of 2019 peak hour traffic counts conducted by HDR, 6,800 vpd are estimated on Galleria Parkway, north of SH 71 and 2,900 vpd, south of Bee Cave Parkway.

Shops Parkway

The CBCCP classifies Shops Parkway as a Type C major collector. 24-Hour traffic volume information is not available; however, based on a review of 2019 peak period counts 7,200 vpd and 4,500 vpd are estimated on Shops Parkway at its western and eastern termini with SH 71, respectively.

Market Street

The CBCCP classifies Market Street as a Type C major collector. 24-Hour traffic volume information is not available; however, based on a review of 2019 peak hour traffic counts conducted by HDR, 4,000 vpd are estimated on Market Street, south of Bee Cave Parkway.

Vista Ridge

The CBCCP classifies Vista Ridge as a Type C major collector. 24-Hour traffic volume information is not available; however, based on a review of 2019 peak hour traffic counts conducted by HDR, 3,100 vpd are estimated on Vista Ridge, south of Bee Cave Parkway.

Willie Way

The CBCCP classifies Willie Way, between Ladera Ranch Boulevard and Bee Cave Parkway, as a proposed Type C main collector. The proposed Willie Way segment is constructed, but not currently open to traffic. 24-Hour traffic volume information is not currently available, but the roadway is included in 2023 analysis.

Traffic Analysis

In order to assess the traffic impacts of the proposed development, two (2) time periods and four (4) travel conditions were evaluated:

- 2019 Existing Conditions
- 2023 Forecasted (without site traffic) Conditions
- 2023 Site Plus Forecasted Traffic Conditions (without improvements)
- 2023 Site Plus Forecasted Traffic Conditions (with improvements)

Intersections in the vicinity of the site are considered the locations of principal concern because they are the locations of highest traffic conflict and delay. The standard used to evaluate traffic conditions at intersections is level of service (LOS), which is a qualitative measure of the effect of a number of factors such as speed, volume of traffic, geometric features, traffic interruptions, freedom to maneuver, safety, driving comfort, convenience, and operating cost.

Two types of intersections to be evaluated are signalized and unsignalized, which use different criteria for assessment of operating levels. The analysis procedures are described in the following sections.

Signalized Intersection Level of Service

Signalized intersection LOS is defined in terms of delay, which is a direct and/or indirect measure of driver discomfort, frustration, fuel consumption, and lost travel time. The levels of service have been established based on driver acceptability of various delays. The delay for each approach lane group is calculated based on a number of factors including lane geometrics, percentage of trucks, peak hour factor, number of lanes, signal progression, volume, signal green time to total cycle time ratio, roadway grades, parking conditions, and pedestrian flows.

Because delay is a complex measure, its relationship to capacity is also complex. The City of Bee Cave considers overall intersection levels of service A to C to be acceptable, while overall LOS of D to F is unacceptable.

Table 1 summarizes the levels of service that are appropriate for different levels of average control delay, and provides a qualitative description for each. The Highway Capacity Manual, 6th Edition, uses the criteria of average control delay. Average control delay includes initial deceleration, delay, queue move-up time, stopped delay, and final acceleration delay (Ref. 4).

Table 1. Signalized Intersection: Level of Service Measurement and Qualitative Descriptions

Level of Service	Control Delay Per Vehicle (sec)	Qualitative Description
A	< 10	Good progression and short cycle lengths
B	> 10 and < 20	Good progression or short cycle lengths, more vehicle stops
C	> 20 and < 35	Fair progression and/or longer cycle lengths, some cycle failures
D	> 35 and < 55	Congestion becomes noticeable, high volume to capacity ratio
E	> 55 and < 80	Limit of acceptable delay, poor progression, long cycles, and/or high volume
F	> 80	Unacceptable to drivers, volume greater than capacity

Unsignalized Intersection Level of Service

Unsignalized intersection LOS is defined in terms of average control delay and, in some cases, volume to capacity (v/c) ratio. Control delay is that portion of total delay attributed to traffic control measures, either traffic signals or stop signs. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

For two-way stop-controlled intersections, the analysis method assumes that major street through traffic is not affected by minor street flows. Major street left-turning traffic and the traffic on the minor approaches will be affected by opposing movements. Stop or yield signs are used to assign the right-of-way to the major street. This designation forces drivers on the controlled street to judgmentally select gaps in the major street flow through which to execute crossing or turning maneuvers. Thus, the capacity of the controlled legs is based upon two factors:

- The distribution of gaps in the major street traffic stream.
- Driver judgment in selecting gaps through which to execute their desired maneuvers.

The LOS procedure computes a capacity for each movement based upon the critical time gap required to complete the maneuver and the volume of traffic that is opposing the movement. The average control delay for any particular movement is calculated as a function of the capacity of the approach and the degree of saturation (v/c ratio). The degree of saturation is defined as the volume for a movement, expressed as an hourly flow rate, divided by the capacity of the movement, expressed as an hourly flow rate. With the HCM 6 methodology, overall intersection LOS is best quantified based on minor street movement average control delay. The HCM 6 methodology adjusts individual movement delay to account for a degree of saturation (v/c ratio) that is greater than 1.0. Those movements are assigned an LOS of F, regardless of the average control delay.

Engineering judgment must be used to determine which minor street movement controls for overall intersection LOS, and whether unacceptable LOS on minor street movements appropriately reflects unacceptable LOS for the overall intersection.

Table 2 shows the relationship between the average control delay and the LOS. The LOS range for unsignalized intersections is different than that for signalized intersections. This difference is due to the fact that drivers expect different levels of performance from different kinds of transportation facilities. Unsignalized intersections carry less traffic volume than signalized intersections and delays at unsignalized intersections are variable. For these reasons, control delay would be less for an unsignalized intersection than for a signalized intersection. The overall approach LOS is computed as a weighted average of the vehicle delay for each movement; therefore, an approach may have an overall LOS C or D and have individual movements, which are LOS E or F.

Analysis was performed using the microcomputer program "Synchro 10.3" by Trafficware (Ref. 5), which is based on the procedures contained in the Highway Capacity Manual.

**Table 2. Unsignalized
Intersection: Level of Service
Measurement**

Level of Service	Control Delay Per Vehicle (sec)
A	< 10
B	> 10 and < 15
C	> 15 and < 25
D	> 25 and < 35
E	> 35 and < 50
F	> 50

2019 Existing Conditions

The analysis of existing traffic required the collection of data on the major roadways and intersections. Traffic counts for the following study area intersections were collected on Tuesday, May 21, 2019 and Thursday, May 23, 2019 as part of this study. All traffic data was collected while schools were in session. Existing intersection controls for the study area are also noted below.

- SH 71 and RM 2244/Shops Parkway
- SH 71 and Galleria Parkway/Cross Town Parkway
- SH 71 and RM 620/Shops Parkway
- SH 71 and Hamilton Pool Road/Bee Cave Parkway
- RM 2244 and Bee Cave Parkway
- Bee Cave Parkway and Market Street
- Bee Cave Parkway and Galleria Parkway
- Bee Cave Parkway and Vista Ridge

- RM 620 and Bee Cave Parkway
- RM 620 and Ladera Ranch Boulevard
- RM 620 and Falcon Head Boulevard
- Bee Cave Parkway and Tordera Drive

Signalized Intersections

The following intersections within the study area are signalized:

- SH 71 and RM 2244/Shops Parkway
- SH 71 and Galleria Parkway/Cross Town Parkway
- SH 71 and RM 620/Shops Parkway
- SH 71 and Hamilton Pool Road/Bee Cave Parkway
- RM 2244 and Bee Cave Parkway
- RM 620 and Bee Cave Parkway
- RM 620 and Ladera Ranch Boulevard
- RM 620 and Falcon Head Boulevard
- Bee Cave Parkway and Galleria Parkway

2019 existing turning movement counts are shown in Figure 3. Brief descriptions of the intersections follow:

SH 71 and RM 2244/Shops Parkway

The northbound approach of Shops Parkway provides one left-turn/through shared lane, one through lane, and one channelized right-turn lane. The southbound approach of RM 2244 provides one left-turn lane, one left-turn/through shared lane, and two right-turn lanes. The eastbound approach of SH 71 provides two left-turn lanes, two through lanes, and one through/right-turn shared lane with a channelized right turn, while the westbound approach provides one left-turn lane, two through lanes, and one through/right-turn shared lane with a channelized right turn. The intersection currently operates at LOS D and E under 2019 existing traffic conditions during the AM and PM peak periods, respectively. Assuming the same intersection geometry, the intersection will operate at LOS F under 2023 forecasted (without site) traffic conditions during both the AM and PM peak periods.

SH 71 and Galleria Parkway/Cross Town Parkway

The northbound approach of Cross Town Parkway provides one left-turn lane, one through lane, and one right-turn lane. The southbound approach of Galleria Parkway provides one left-turn lane, one left-turn/through shared lane, and one right-turn lane. The eastbound approach of SH 71 provides one left-turn lane, two through lanes, and one through/right-turn shared lane, while the westbound approach provides one left-turn lane, three through lanes, and one right-turn lane. The intersection currently operates at LOS A and C under 2019 existing traffic conditions during the AM and PM peak periods, respectively. Assuming the same intersection geometry, the intersection will operate at

LOS B and F under 2023 forecasted (without site) traffic conditions during the AM and PM peak periods, respectively.

SH 71 and RM 620/Shops Parkway

The northbound approach of Shops Parkway provides one left turn, one left-turn/through shared lane, and one through/right-turn shared lane. The southbound approach of RM 620 provides two left-turn lanes, one through lane, and one channelized right-turn lane. The eastbound approach of SH 71 provides two left-turn lanes, two through lanes, and one through/right-turn shared lane with a channelized right-turn, while the westbound approach provides one left-turn lane, three through lanes, and one channelized right-turn lane. The intersection currently operates at LOS C under 2019 existing traffic conditions during both the AM and PM peak periods. Assuming the same intersection geometry, the intersection will operate at LOS E and F under 2023 forecasted (without site) traffic conditions during the AM and PM peak periods, respectively.

SH 71 and Hamilton Pool Road/Bee Cave Parkway

The northbound approach of Hamilton Pool Road provides one left-turn lane, two through lanes, and one channelized right-turn lane. The southbound approach of Bee Cave Parkway provides one left-turn lane, one through lane, and one channelized right-turn lane. The eastbound approach of SH 71 provides one left-turn lane, two through lanes, and one channelized right-turn lane, while the westbound approach provides one left-turn lane, one through lane, and one through/right-turn shared lane with a channelized right-turn lane. The current overall level of service is C and F during the AM and PM peak periods, respectively. Assuming the same intersection geometry, the intersection will operate at LOS F under 2023 forecasted (without site) traffic conditions during both the AM and PM peak periods.

RM 2244 and Bee Cave Parkway

The northbound approach of RM 2244 provides one left-turn lane, one through lane, and one through/right-turn shared lane, while the southbound approach provides one left-turn lane, two through lanes, and one right-turn lane. The eastbound approach of Bee Cave Parkway provides one left-turn lane, one left-turn/through shared lane, and one right-turn lane. The westbound driveway approach provides one left-turn/through/right-turn shared lane. The intersection currently operates at LOS C and D under 2019 existing traffic conditions during the AM and PM peak periods, respectively. Assuming the same intersection geometry, the intersection will operate at LOS E and D under 2023 forecasted (without site) traffic conditions during the AM and PM peak periods, respectively.

RM 620 and Bee Cave Parkway

The northbound approach of RM 620 provides one left-turn lane, two through lanes, one right-turn lane, while the southbound approach provides two left-turn lanes, two through lanes, and one channelized right-turn lane. The eastbound approach of Bee Cave Parkway provides one left-turn lane, one left-turn/through shared lane, and one through/right-turn shared lane, while the westbound approach provides one left-turn lane, one through/right-turn shared lane, and one right-turn lane. The intersection currently

operates at LOS D and E under 2019 existing traffic conditions during the AM and PM peak periods, respectively.

Assuming the same intersection geometry, the intersection will operate at LOS E and F under 2023 forecasted (without site) traffic conditions during the AM and PM peak periods, respectively.

RM 620 and Ladera Ranch Boulevard

The northbound approach of RM 620 provides one left-turn lane, one through lane, and one through/right-turn shared lane, while the southbound approach provides one left-turn lane, one through lane, and one through/right-turn shared lane. The eastbound approach of Ladera Ranch Boulevard provides one left-turn lane, one left-turn/through shared lane, and one right-turn lane, while the westbound approach provides one left-turn/through shared lane and one right-turn lane. The intersection currently operates at LOS C and B under 2019 existing traffic conditions during the AM and PM peak periods, respectively.

Assuming the same intersection geometry, the intersection will operate at LOS E and D under 2023 forecasted (without site) traffic conditions during the AM and PM peak periods, respectively.

RM 620 and Falcon Head Boulevard

The northbound approach of RM 620 provides one left-turn lane, one through lane, and one through/right-turn shared lane, while the southbound approach provides one left-turn lane, one through lane, and one through/right-turn shared lane. The eastbound approach of Falcon Head Boulevard provides one left-turn lane, one left-turn/through shared lane, and one right-turn lane, while the westbound approach provides one left-turn lane, one left-turn/through shared lane, and one right-turn lane. The intersection currently operates at LOS C under 2019 existing traffic conditions during both the AM and PM peak periods. Assuming the same intersection geometry, the intersection will operate at LOS E under 2023 forecasted (without site) traffic conditions during both the AM and PM peak periods.

Bee Cave Parkway and Galleria Parkway

The northbound approach of Galleria Parkway provides one left-turn lane and one right-turn lane. The eastbound approach of Bee Cave Parkway provides one through lane and one through/right-turn shared lane, while the westbound approach provides one left-turn lane and two through lanes. The intersection currently operates at LOS A under 2019 existing traffic conditions during both the AM and PM peak periods.

For 2023 forecasted traffic conditions, it was assumed that forty (40) percent of minor street left-turning traffic at Market Street and seventy (70) percent of minor street left-turning traffic at Vista Ridge would divert to the Bee Cave Parkway and Galleria Parkway signal to avoid extended queues at the stop-controlled approaches of Market Street and Vista Ridge and unsafe turning conditions. Assuming the same intersection geometry and the additional diverted traffic, the intersection will operate at LOS A and B under 2023 forecasted (without site) traffic conditions during the AM and PM peak periods, respectively.

Unsignalized Intersections

The following intersections within the study area are unsignalized:

- Bee Cave Parkway and Market Street
- Bee Cave Parkway and Vista Ridge
- Bee Cave Parkway and Tordera Drive
- Bee Cave Parkway and Willie Way

Bee Cave Parkway and Market Street

The northbound approach of Market Street provides one left-turn lane and one right-turn lane. The eastbound approach of Bee Cave Parkway provides one through lane and one through/right-turn shared lane, while the westbound approach provides one left-turn lane and two through lanes. The intersection currently operates at LOS A under 2019 existing traffic conditions during both the AM and PM peak periods. The highest delay minor street approach (NB) currently operates at LOS C under 2019 existing traffic conditions during both the AM and PM peak periods.

For 2023 forecasted traffic conditions, it was assumed that forty (40) percent of minor street left-turning traffic at Market Street would divert to the Bee Cave Parkway and Galleria Parkway signal to avoid extended queues at the stop-controlled Market Street approach and unsafe turning conditions. Assuming the same intersection geometry and the left-turn reduction from Market Street to Galleria Parkway, the intersection will continue to operate at LOS A under 2023 forecasted (without site) traffic conditions during both the AM and PM peak periods, while the highest delay minor street approach (NB) will operate at LOS C and D during the AM and PM peak periods, respectively.

Bee Cave Parkway and Vista Ridge

The northbound approach of Vista Ridge provides one left-turn lane and one right-turn lane. The eastbound approach of Bee Cave Parkway provides one through lane and one through/right-turn shared lane, while the westbound approach provides one left-turn lane and two through lanes. The intersection currently operates at LOS A under 2019 existing traffic conditions during both the AM and PM peak periods. The highest delay minor street approach (NB) currently operates at LOS D and F under 2019 existing traffic conditions during the AM and PM peak periods, respectively.

For 2023 forecasted traffic conditions, it was assumed that seventy (70) percent of minor street left-turning traffic at Vista Ridge would divert to the Bee Cave Parkway and Galleria Parkway signal to avoid extended queues at the stop-controlled approach of Vista Ridge and unsafe turning conditions. Assuming the same intersection geometry, the intersection will operate at LOS A and B under 2023 forecasted (without site) traffic conditions during the AM and PM peak periods, respectively, while the highest delay minor street approach (NB) will operate at LOS D and F during the AM and PM peak periods, respectively.

Bee Cave Parkway and Tordera Drive

The southbound approach of Tordera Drive provides one left-turn lane and one right-turn lane. The eastbound approach of Bee Cave Parkway provides one left-turn lane and two

through lanes, while the westbound approach of Bee Cave Parkway provides one left-turn/u-turn lane, one through lane, and one through/right-turn shared lane. The intersection currently operates at LOS A under 2019 existing traffic conditions during both the AM and PM peak periods. The highest delay minor street approach (SB) currently operates at LOS C under 2019 existing traffic conditions during both the AM and PM peak periods. Assuming the same intersection geometry, the intersection will continue to operate at LOS A under 2023 forecasted (without site) traffic conditions during both the AM and PM peak periods, while the highest delay minor street approach (SB) will operate at LOS D and E during the AM and PM peak periods, respectively.

Bee Cave Parkway and Willie Way

For 2023 forecasted traffic conditions, it was assumed that Willie Way between Ladera Ranch Boulevard and Bee Cave Parkway would be completed and open. The southbound approach of Willie Way provides one left-turn lane and one right-turn lane. The eastbound approach of Bee Cave Parkway provides one left-turn lane and two through lanes, while the westbound approach of Bee Cave Parkway provides one left-turn/u-turn lane, one through lane, and one through/right-turn shared lane. Traffic volumes at this intersection were projected by assuming diversions from nearby roadways that could utilize the newly constructed Willie Way. The intersection will operate at LOS A under 2023 forecasted (without site) traffic conditions during both the AM and PM peak periods, while the highest delay minor street approach (SB) will operate at LOS C during both the AM and PM peak periods.

2023 Forecasted Conditions with Site Generated Traffic

The proposed Backyard development is anticipated to be completed in 2023. This time frame was used to assess the major roadway effects and to facilitate the evaluation of potential improvements. The forecasted traffic was projected using available information. This process was facilitated by using trends established by prior data for the major roadways and intersections in the immediate vicinity of the project site.

Site Generated Traffic

Determining the site generated traffic, or the traffic that will be generated due to the development of the proposed project, was a major element of this analysis. Unadjusted total trips per day, as well as the peak hour traffic associated with the project, were estimated using recommendations and data contained in the Institute of Transportation Engineers Trip Generation, 10th Edition (Ref. 6).

The proposed project will generate approximately 15,732 unadjusted daily trips upon build-out. Table 3 provides a detailed summary of traffic production, which is directly related to the assumed land use plan. A map of the Glenn area buildings with ITE land use codes is shown in Figure 4. A comprehensive breakdown of the buildings within the Glenn area of the Backyard development is included in the Technical Addendum. It should be noted that traffic generated by the Live Oak Amphitheater Venue was excluded from this analysis as entertainment venues do not have typical peaking characteristics. The analysis of a full-occupancy event at the Live Oak Amphitheater Venue is presented in the Event Peak analysis.

Trip generation for the Dance Hall is based on the occupancy of the space (350 person), assuming a 2.1 person per vehicle occupancy rate from the National Household Travel Survey (Ref. 7) and recommended time-of-day factors (for nightclubs) provided in Urban Land Institute (ULI) Shared Parking Report (Ref. 8). Trip generation for the private event spaces (208 person) was assumed to follow the characteristics of the Quality Restaurant land use, as they would operate similarly. Events at the Dance Hall and the Private Event Spaces would occur outside of the peak periods and would not coincide with an event at the Live Oak Amphitheater venue.

Table 3. Summary of Unadjusted Daily and Peak Hour Trip Generation

Land Use	Land Use Code	Size	Glenn Building Number	Trip Generation Method ¹	24-Hour Two-Way Volume	AM Peak Hour		PM Peak Hour	
						Enter	Exit	Enter	Exit
Hotel	310	125 Rooms	+	Rate	1,045	35	24	38	37
Dance Hall ²	-	350 Person	G1:1	-	334	-	-	42	-
Private Event Space ³	931	208 Person	G6:32 G7:36 G10:51	Rate	541	-	-	39	-
Office	710	181,476 SF	G6:35 G10:51	Rate	1,768	181	30	33	176
Shopping Center	820	3,096 SF	G2:6 G6:22 G10:50 +	Rate (AM) Fitted Curve (PM)	566	2	1	20	22
Drinking Place	925	4,923 SF	G10:46-49	Rate	560	-	-	37	19
Fast Casual Restaurant	930	5,394 SF	G5:19-21	Rate	1,699	-	-	42	34
High Turnover (Sit-Down) Restaurant ⁴	932	897 Seats	G3:9-10 G6:25 G9:39 G9:42 G11:54	Rate	3,920	35	32	215	162
High Turnover (Sit-Down) Restaurant ⁵	932	816 SF	G4:14	Rate	92	-	-	5	3
Fast-Food Restaurant without Drive Through Window	933	61 Seats	G1:3	Rate	2,569	-	-	83	47
Fast-Food Restaurant without Drive Through Window	933	1,649 SF	G6:28	Rate	571	-	-	23	24
Coffee Shop (no Drive-thru)	936	2,743 SF	G2:7-8 G5:17-18	Rate	2,067	141	136	49	50
Total					15,732	394	223	626	574

¹ Trip Generation is based on the higher of the ITE's average rate and fitted curve method for all land uses except Shopping Center. Shopping Center uses a hybrid approach of average rate in the AM peak and fitted curve in the PM peak.

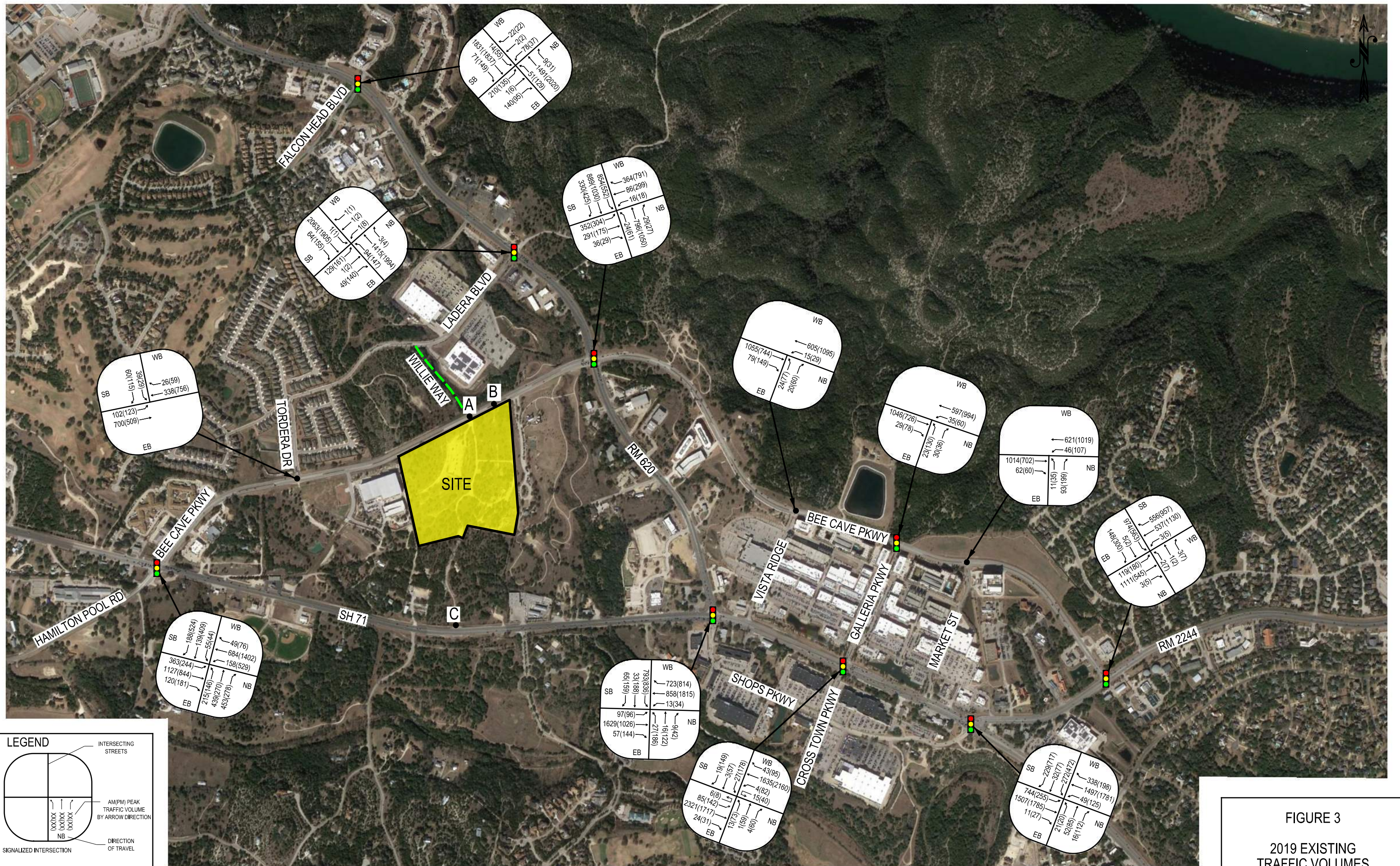
² Dance Hall land use trip generation is based on occupancy of the space, NTHS vehicle occupancy rate, and ULI's nightclub TOD factors.

³ Quality Restaurant land use is assumed for the private event spaces.

⁴ Only one restaurant open in the AM Peak (G11-54: 139 seats). The 24-hr two-way volume is based on the total 897 seats.

⁵ Ice Cream Shop (G4:14) uses square footage to produce the higher number of trips.

+ Backyard building outside the Glenn area



Background Map Copyrighted by Google, 2018

FIGURE 3
2019 EXISTING
TRAFFIC VOLUMES



Land Use Code Legend

Dance Hall - No ITE Land Use Code Available

710 Office

820 Shopping Center

925 Drinking Place

930 Fast Casual Restaurant

931 Private Event Space

932 High Turnover Restaurant

933 Fast Food Restaurant without Drive-Through

936 Coffee Shop (No Drive-Thru Window)

Not Included in Trip Generation

XX Glenn Building ID #

FIGURE 4

GLENN AREA
BUILDING MAP WITH
ITE LAND USE CODE

Analysis Assumptions

The traffic impact analysis process involves both the use of primary data and engineering judgment on transferable parameters. Specifically, engineering judgment is required for estimation of background traffic growth, pass-by capture, internal capture, and transit trip reductions, all of which are further described in the following paragraphs.

Background Traffic

In order to estimate 2023 forecasted (without site) traffic volumes, it is necessary to perform two steps. The first is to apply a growth rate to the 2019 existing counts. Based on discussion with the City, a five (5) percent annual growth rate was assumed for the study. The resulting turning movement volumes are shown in Figure 5. The second step is to add traffic resulting from other projects in the area that are anticipated to be completed prior to buildout of this site. The following “other” projects were included, as shown in Figure 6.

- The Park at Bee Cave
- The Village at Spanish Oaks

Figure 7 depicts the total turning movement volumes for all “other” developments included in the analysis, and spreadsheets included in the Technical Addendum provide detail for each background project separately. The resulting 2023 forecasted (without Willie Way open and site) traffic volumes, which are obtained by adding Figure 5 and Figure 7 volumes, are shown in Figure 8. Willie Way between Ladera Ranch Boulevard and Bee Cave Parkway will be open by 2023. Traffic volumes diverted to this Willie Way segment are included in the 2023 forecasted (without site) traffic volumes and shown in Figure 9.

Pass-By Capture

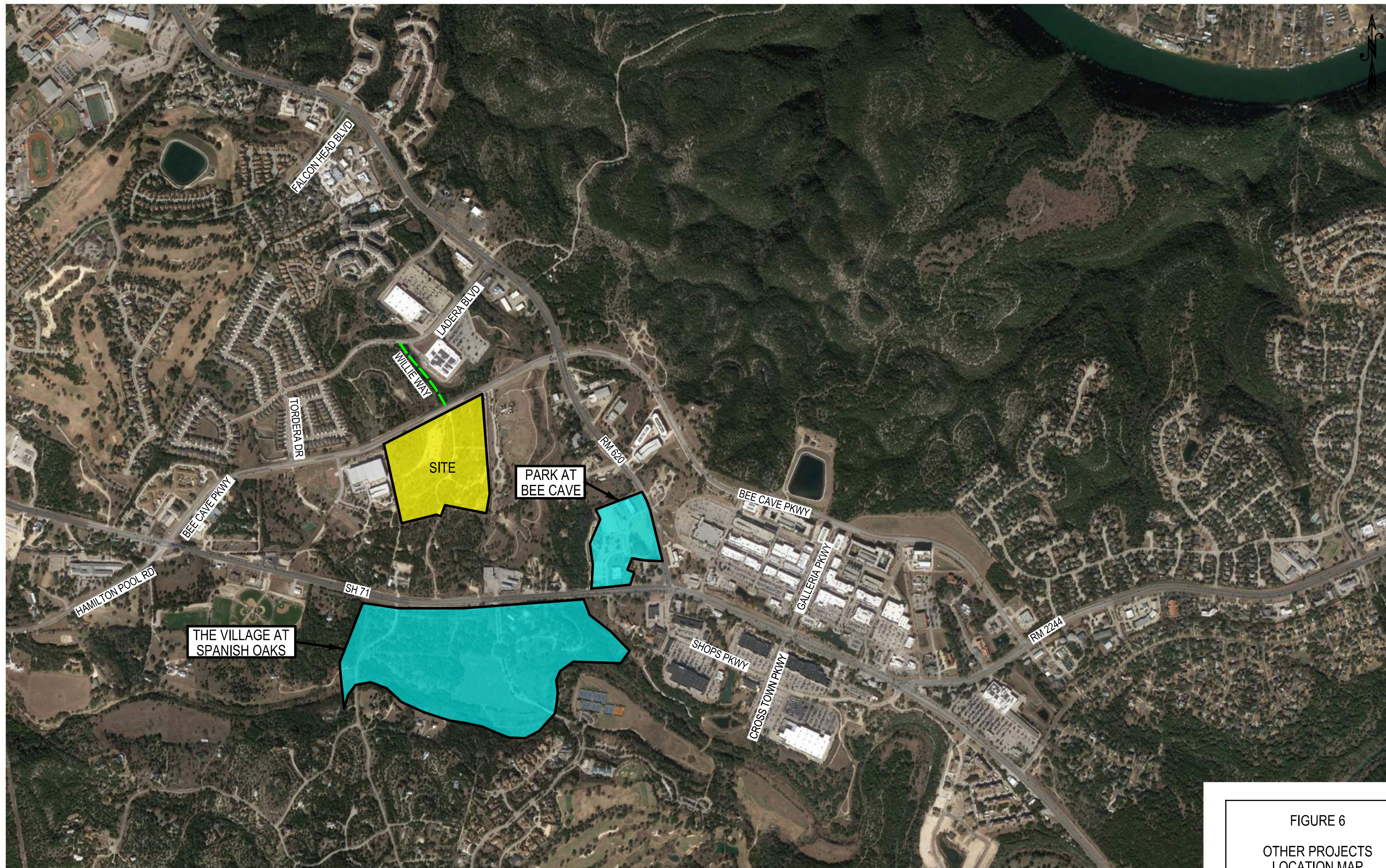
Studies have shown that retail land uses will capture between twenty and sixty percent of their traffic as pass-by trips, depending upon their size. It is well documented that many other land uses also experience significant pass-by trip capture, such as drive-in banks and restaurants. The amount of trip reduction that each tract may attribute to the pass-by phenomenon will depend directly on the type of land use that is developed. The following pass-by reductions, shown in Table 4, were assumed based on the average rates provided in the ITE Trip Generation Handbook (Ref. 9). Table 5 summarizes the directional distribution factors assumed at the Backyard driveways based on the 2019 PM traffic counts.

Table 4. Pass-By Reductions PM Peak Period

Land Use	Land Use Code	Size	Pass-By Reduction	Unadjusted Trip Generation		Adjusted Trip Generation with Internal Capture		Pass-By Reduction		Adjusted Trip Generation with Internal Capture and Pass-By	
				Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Shopping Center	820	3,096 SF	34%	20	22	17	19	6	7	11	12
High-Turnover (Sit-Down Restaurant)	932	897 Seats	43%	215	162	183	138	79	60	104	78
High-Turnover (Sit-Down Restaurant) – Ice Cream Shop	932	816 SF	43%	5	3	4	3	2	1	2	2
			Total	240	187	204	160	87	68	117	92

Table 5. Pass-By Reductions at Backyard Driveways

Backyard Entrance	Pass-By Roadway	Direction	D-Factor	Pass-By Vehicles	
				Enter	Exit
Driveway A	Bee Cave Parkway	Eastbound	41%	24	18
		Westbound	59%	34	26
Driveway C	SH 71	Eastbound	37%	11	9
		Westbound	63%	18	15
		Total		87	68



Background Map Copyrighted by Google, 2018

FIGURE 6
OTHER PROJECTS
LOCATION MAP

Internal Capture

Once the total build-out of proposed land uses occurs, there will be some interaction between the uses within this development. Internal capture is accounted for in two ways. First, to account for internal capture among similar retail land uses in adjacent areas, the sizes may be combined during the trip generation process. Because the equations used in trip generation estimations are logarithmic, the number of trips generated by a site does not increase in direct proportion to an increase in the square footage of a development. By combining retail projects in close proximity to each other, a lower number of trips will be estimated, thereby taking into account the internal capture factor. The second way to account for internal capture is to reduce the expected number of trips directly by some percentage, which reflects expected multipurpose trip-making among different types of land uses, which are in close proximity. As with pass-by trip reductions, internal capture depends on the type and quantity of land uses. The following internal capture reductions were applied based on the approved scope:

- Fifteen (15) percent for the PM peak trips, except for the Dance Hall and Private Event Space land use

Transit Reduction

No transit reduction was assumed for this project.

Pedestrian and Bicycle Reduction

No pedestrian or bicycle reductions were assumed for this analysis.

Table 6 provides a detailed summary of the adjusted traffic production for the site. The proposed project will generate approximately 13,381 adjusted daily trips upon build-out.

Table 6. Summary of Adjusted Daily and Peak Hour Trip Generation

Land Use	Land Use Code	Size	24-Hour Two-Way Volume	AM Peak Hour		PM Peak Hour	
				Enter	Exit	Enter	Exit
Hotel	310	125 Rooms	967	35	24	32	32
Dance Hall	-	350 Person	334	-	-	42	-
Private Event Space	931	208 Person	541	-	-	39	-
Office	710	181,476 SF	1,635	181	30	28	150
Shopping Center	820	3,096 SF	442	2	1	11	12
Drinking Place	925	4,923 SF	476	-	-	31	16
Fast Casual Restaurant	930	5,394 SF	1,444	-	-	36	29
High Turnover (Sit-Down) Restaurant	932	897 Seats	2,910	35	32	104	78
High Turnover (Sit-Down) Restaurant	932	816 SF	51			2	2
Fast-Food Restaurant without Drive-Through Window (G1)	933	61 Seats	2,184	-	-	71	40

Table 6. Summary of Adjusted Daily and Peak Hour Trip Generation

Land Use	Land Use Code	Size	24-Hour Two-Way Volume	AM Peak Hour		PM Peak Hour	
				Enter	Exit	Enter	Exit
Fast-Food Restaurant without Drive-Through Window (G6)	933	1,649 SF	485	-	-	20	20
Coffee Shop (no Drive-thru)	936	2,743 SF	1,912	141	136	42	43
Total			13,381	394	223	458	422

Directional Distribution

The next step involved distribution of the site generated trips to appropriate geographic directions and logical connecting roadways. The major thoroughfares that have a direct bearing on the accessibility of the project have been previously identified. Traffic counts conducted during previous studies in the area provided the basis for the overall directional distribution of traffic approaching and departing the project site, as summarized in Table 7.

Table 7. Forecasted Overall Directional Distribution of Site-Oriented Traffic

Direction/Roadway	% Overall Distribution	
	AM Peak	PM Peak
East SH 71	20	20
West SH 71	15	15
North RM 620	20	20
North RM 2244	20	20
Hamilton Pool Rd	10	10
Willie Way (from W Ladera Ranch Blvd)	5	2.5
West Falcon Head Blvd	5	2.5
Hill Country Galleria	2.5	5
Shops at the Galleria	2.5	5
Total	100	100

Given the total site generated traffic and the directional distribution by approach, the next step in the process is to assign the traffic destined to and from the project to the most likely travel paths. This step was performed by investigating a number of alternative travel patterns, as well as ingress/egress points along the project boundaries. Primary consideration was given to the traffic flow and safety of the major roadways.

Intersection Analysis

The total 2023 traffic demand will be the sum of traffic generated by the proposed project and changes in existing traffic. 2023 site traffic and 2023 site plus forecasted traffic routing and volumes are shown in Figures 10 through 14. Brief descriptions of the intersections follow.

SH 71 and RM 2244/Shops Parkway

This intersection will operate at LOS F under 2023 site plus forecasted traffic conditions during the AM and PM peak periods, respectively, with **signal timing optimization**. No additional improvements are recommended as part of this report. Site traffic comprises approximately 2.0 and 2.5 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

SH 71 and Galleria Parkway/Cross Town Parkway

This intersection will operate at LOS B and F under 2023 site plus forecasted traffic conditions during the AM and PM peak periods, respectively, with **signal timing optimization**. No additional improvements are recommended as part of this report. Site traffic comprises approximately 2.5 and 3.4 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

SH 71 and RM 620/Shops Parkway

This intersection will operate at LOS E and F under 2023 site plus forecasted traffic conditions during the AM and PM peak periods, respectively, with **signal timing optimization**. TxDOT's RM 620 project proposes construction of the following additional improvements:

- Widen RM 620 to a six-lane divided roadway
- Construct displaced left-turn lanes for eastbound to northbound traffic movement.
- Construct an additional southbound left-turn lane to provide three left-turn lanes
- Eliminate the westbound left-turn movement

These improvements are not assumed to be completed prior to buildout of the Backyard development.

Site traffic comprises approximately 2.5 and 3.2 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

SH 71 and Hamilton Pool Road/Bee Cave Parkway

The intersection will operate at LOS E and F under 2023 site plus forecasted traffic conditions during the AM and PM peak periods, respectively, assuming the following improvements:

- **Construct an additional eastbound left-turn lane to provide dual left-turn lanes.**
- **Construct an additional westbound left-turn lane to provide dual left-turn lanes.**
- **Widen Hamilton Pool Road to provide two southbound receiving lanes.**
- **Optimize signal timing.**

Site traffic comprises approximately 2.6 and 3.0 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

RM 2244 and Bee Cave Parkway

This intersection will operate at LOS D and E under 2023 site plus forecasted traffic conditions during the AM and PM peak periods, respectively, assuming the following improvements:

- **Install a southbound right-turn overlap phase.**
- **Optimize signal timing.**

Site traffic comprises approximately 2.7 and 3.6 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

RM 620 and Bee Cave Parkway

This intersection will continue to operate at LOS E and F under 2023 site plus forecasted traffic conditions during the AM and PM peak periods, respectively, assuming the following improvements:

- **Construct an additional eastbound left-turn lane to provide dual left-turn lanes, one through lane, and one through/right-turn lane. (Proposed in the RM 620 project.)**
- **Construct an additional westbound right-turn lane to provide dual right-turn lanes (Proposed in the RM 620 project.) and extend the turn lane to 850' to accommodate the 95th percentile queue and the required deceleration.**
- **Optimize signal timing.**

TxDOT's RM 620 project proposes construction of the following additional improvements:

- Widen RM 620 to a six-lane divided roadway.
- Widen westbound Bee Cave Parkway, west of RM 620, to accommodate a channelized, free right-turn acceleration lane.
- Construct a dedicated eastbound right-turn lane.

These improvements are not assumed to be completed prior to buildout of the Backyard development.

Site traffic comprises approximately 5.1 and 6.0 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

RM 620 and Ladera Ranch Boulevard

The intersection will operate at LOS E and D under 2023 site plus forecasted traffic conditions during the AM and PM peak periods, respectively, assuming the following improvements:

- **Construct a southbound right-turn lane.**
- **Optimize signal timing.**

TxDOT's RM 620 project proposes construction of the following additional improvements:

- Widen RM 620 to a six-lane divided roadway.

These improvements are not assumed to be completed prior to buildout of the Backyard development.

Site traffic comprises approximately 3.1 and 3.4 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

RM 620 and Falcon Head Boulevard

The intersection will operate at LOS D and E under 2023 site plus forecasted traffic conditions during the AM and PM peak periods, respectively, assuming the following improvements:

- **Construct a southbound right-turn lane.**
- **Construct an additional eastbound left-turn lane to provide dual left-turn lanes. (Proposed in the RM 620 project.)**
- **Optimize signal timing.**

TxDOT's RM 620 project proposes construction of the following additional improvements:

- Widen RM 620 to a six-lane divided roadway.
- Construct an additional westbound left-turn lane to provide dual left-turn lanes.

These improvements are not assumed to be completed prior to buildout of the Backyard development.

Site traffic comprises approximately 3.0 and 3.4 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

Bee Cave Parkway and Galleria Parkway

The intersection will operate at LOS A and B under 2023 site plus forecasted traffic conditions during the AM and PM peak periods, respectively. There are no improvements recommended at this intersection as part of this TIA. Site traffic comprises approximately 5.0 and 6.6 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

Bee Cave Parkway and Tordera Drive

The intersection will operate at LOS A under 2023 site plus forecasted traffic conditions during both the AM and PM peak periods, **assuming the installation of a traffic signal. The traffic signal will be installed when warrants are met in the field.**

Site traffic comprises approximately 6.6 and 7.2 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

Bee Cave Parkway and Market Street

The intersection will operate at LOS A under 2023 site plus forecasted traffic conditions during the AM and PM peak periods. The highest delay minor street approach (NB) will operate at LOS C and D under 2023 site plus forecasted traffic conditions during the AM and PM Peak periods, respectively. There are no improvements recommended at this intersection as part of this TIA. Site traffic comprises approximately 4.6 and 5.7 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

Bee Cave Parkway and Vista Ridge

The intersection will operate at LOS A under 2023 site plus forecasted traffic conditions during the AM and PM peak periods. The highest delay minor street approach (NB) will operate at LOS D and F under 2023 site plus forecasted traffic conditions during the AM and PM Peak periods, respectively. There are no improvements recommended at this intersection as part of this TIA. Site traffic comprises approximately 4.9 and 6.1 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

Bee Cave Parkway and Willie Way (Driveway A)

Driveway A will be constructed as a full-purpose driveway, with two inbound and two outbound lanes. This driveway will create the northbound approach for the proposed intersection and will align with the proposed southbound Willie Way approach. The following improvements are recommended as part of this TIA:

- **Install a traffic signal at Driveway A when warrants are met in the field. This traffic signal should provide communication with the existing traffic signal at RM 620 and Bee Cave Parkway to allow for coordination. A planning-level signal warrant including the minor street right turns was completed and can be found in the Technical Addendum.**
- **Extend the westbound left-turn lane bay on Bee Cave Parkway to maximize the storage without impeding access to the park driveway to the east.**
- **Modify the eastbound right-turn lane to provide a channelized, free-flowing right-turn movement from Bee Cave Parkway onto Willie Way.**

The intersection will operate at LOS C during both the AM and PM peak periods under 2023 site plus forecasted conditions. Site traffic comprises approximately 22.5 and 25.6 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

Bee Cave Parkway and Driveway B

Driveway B will be constructed as a gated right-in, right-out driveway, for emergency vehicle use only. There are no improvements recommended at this intersection as part of this TIA. Site traffic comprises approximately 16.6 and 19.8 percent of total traffic at the intersection during the AM and PM peak periods, respectively.

SH 71 and Willie Way (Driveway C)

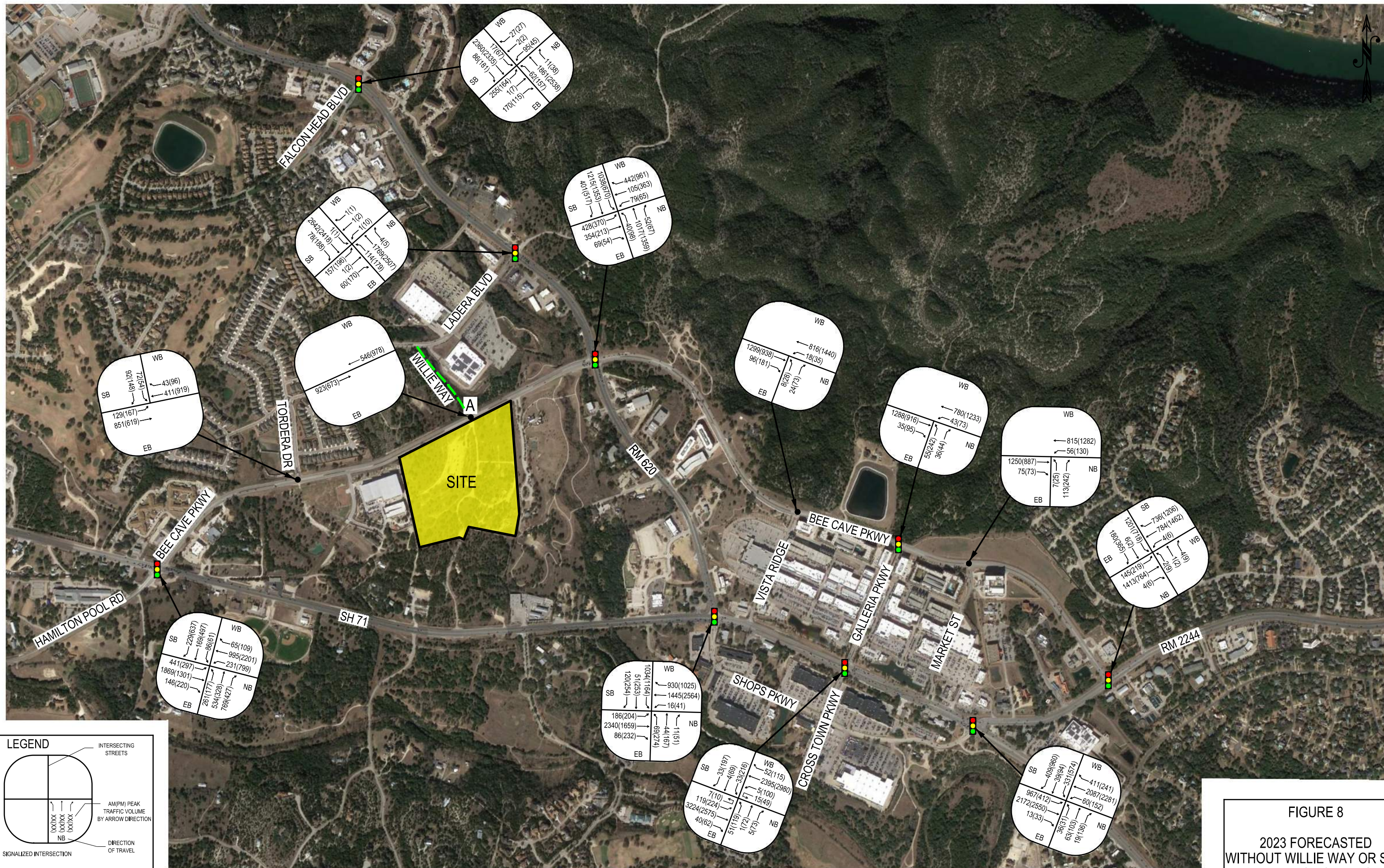
Driveway C will be constructed as a full-purpose driveway with two left-turn lanes and 1 shared through/right-turn lane and two inbound lanes. This driveway will create the southbound approach for the proposed intersection and will align with the proposed northbound Village Oaks Drive approach. The following improvements are recommended as part of this TIA:

- **A traffic signal at Driveway C, which is also recommended as part of the Spanish Oaks development, will be installed when warrants are met in the**

field. This traffic signal should provide communication with the existing traffic signal at RM 620 and SH 71 to allow for coordination.

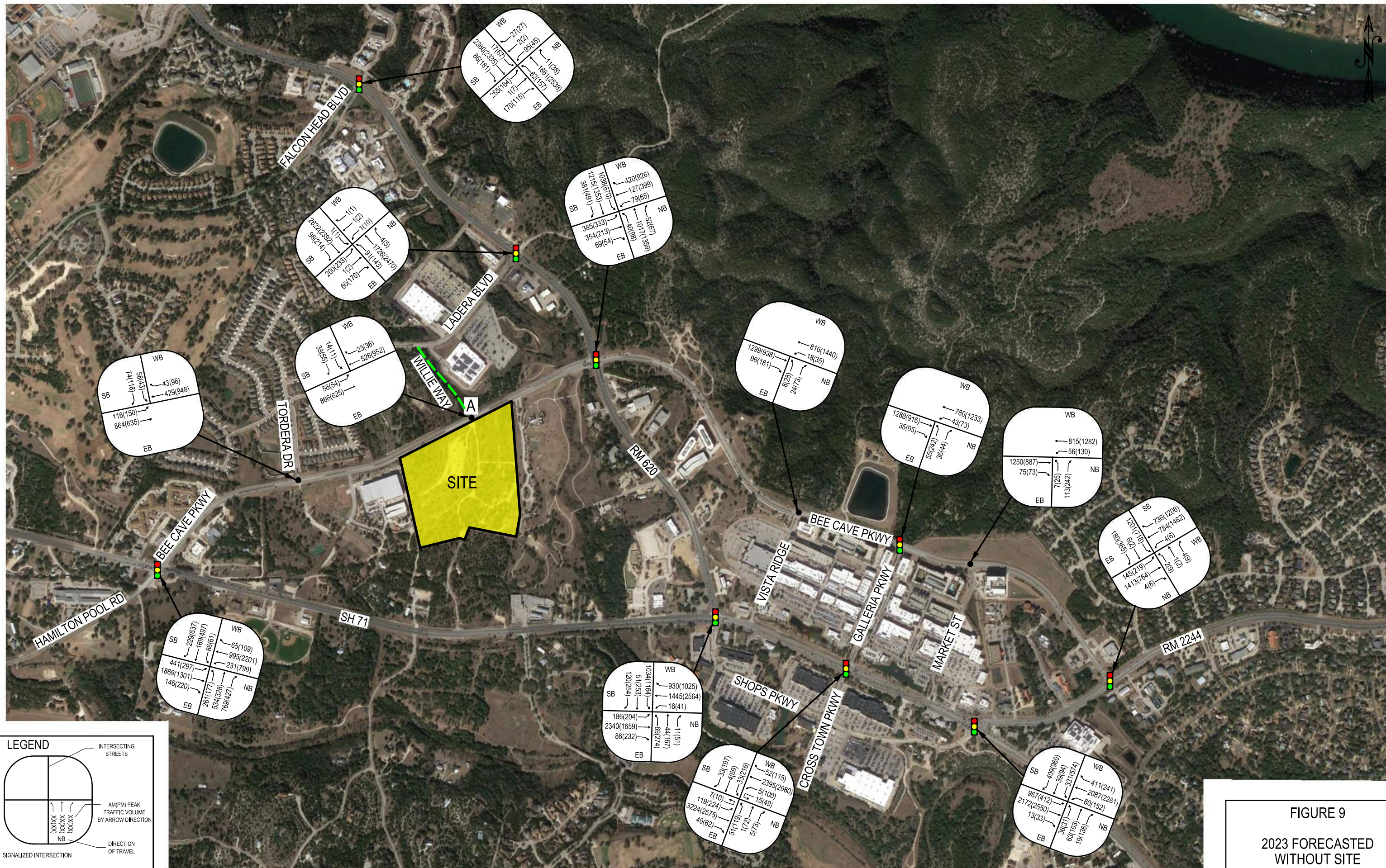
- **Modify the westbound right-turn lane to provide a channelized, free-flowing right-turn movement from SH 71 onto Willie Way.**

The intersection will operate at LOS F during the AM and PM peak periods under 2023 site plus forecasted conditions. Site traffic comprises approximately 4.1 and 5.3 percent of total traffic at the intersection during the AM and PM peak periods, respectively.



Background Map Copyrighted by Google, 2018

FIGURE 8
2023 FORECASTED
WITHOUT WILLIE WAY OR SITE
TRAFFIC VOLUMES



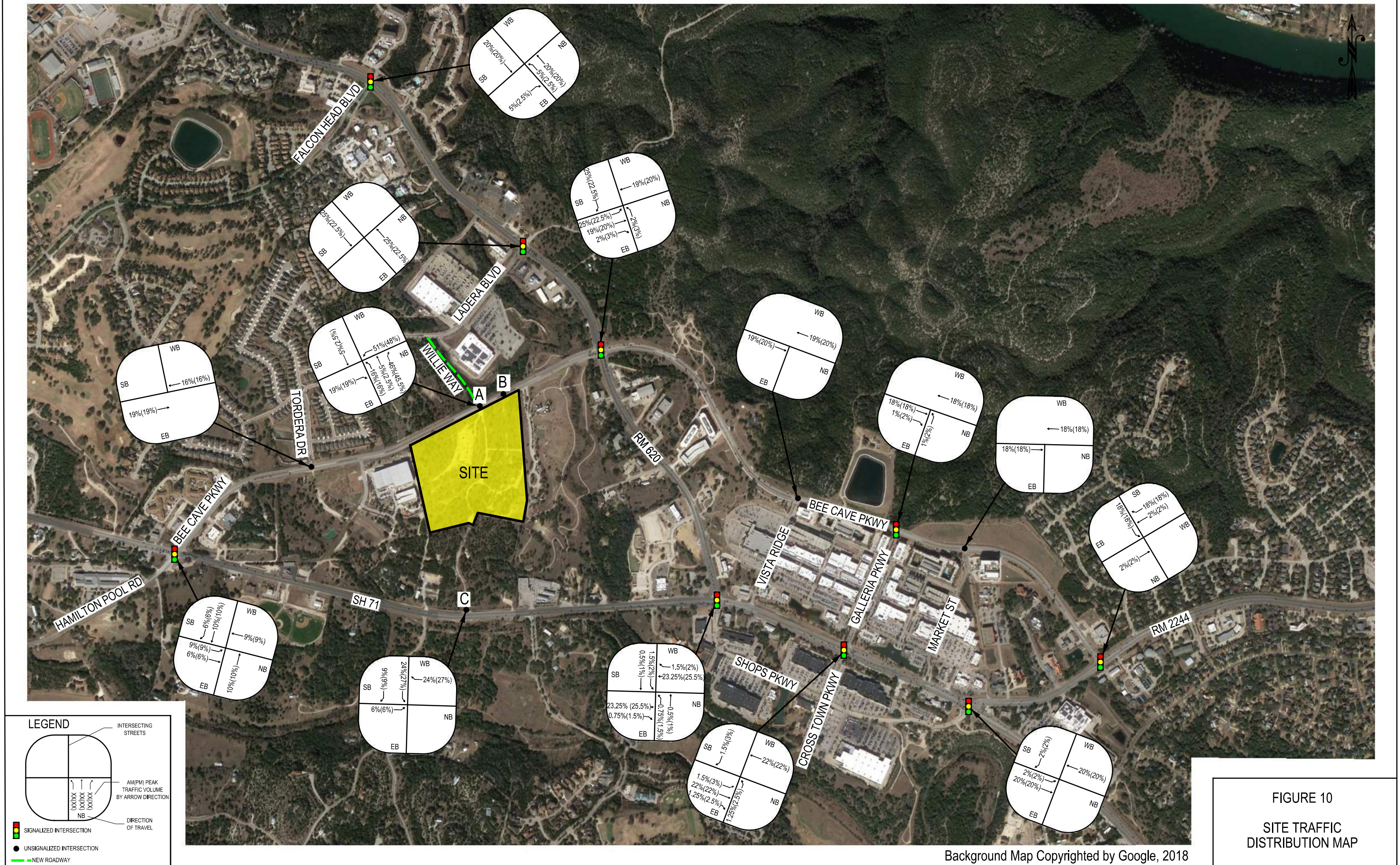
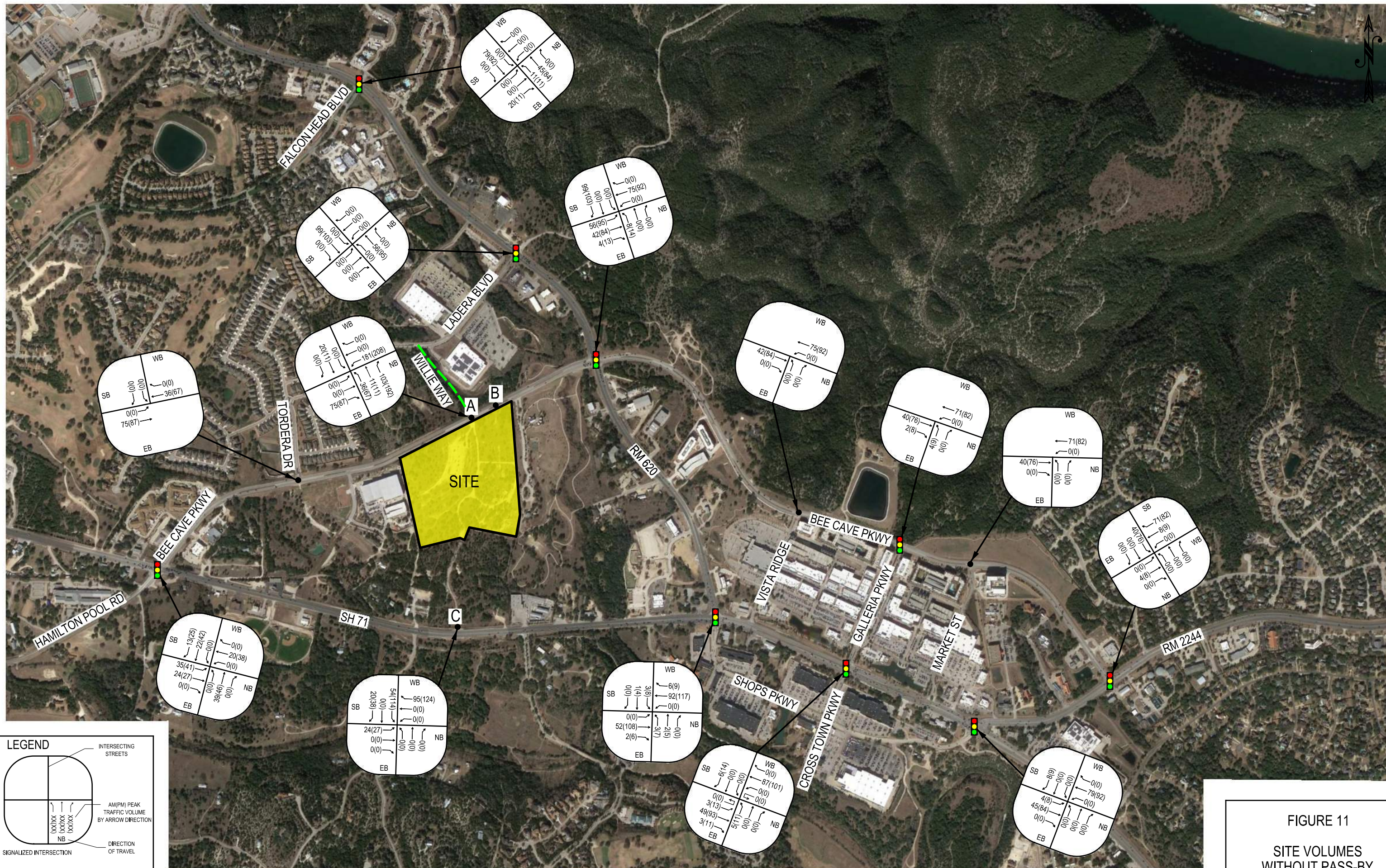


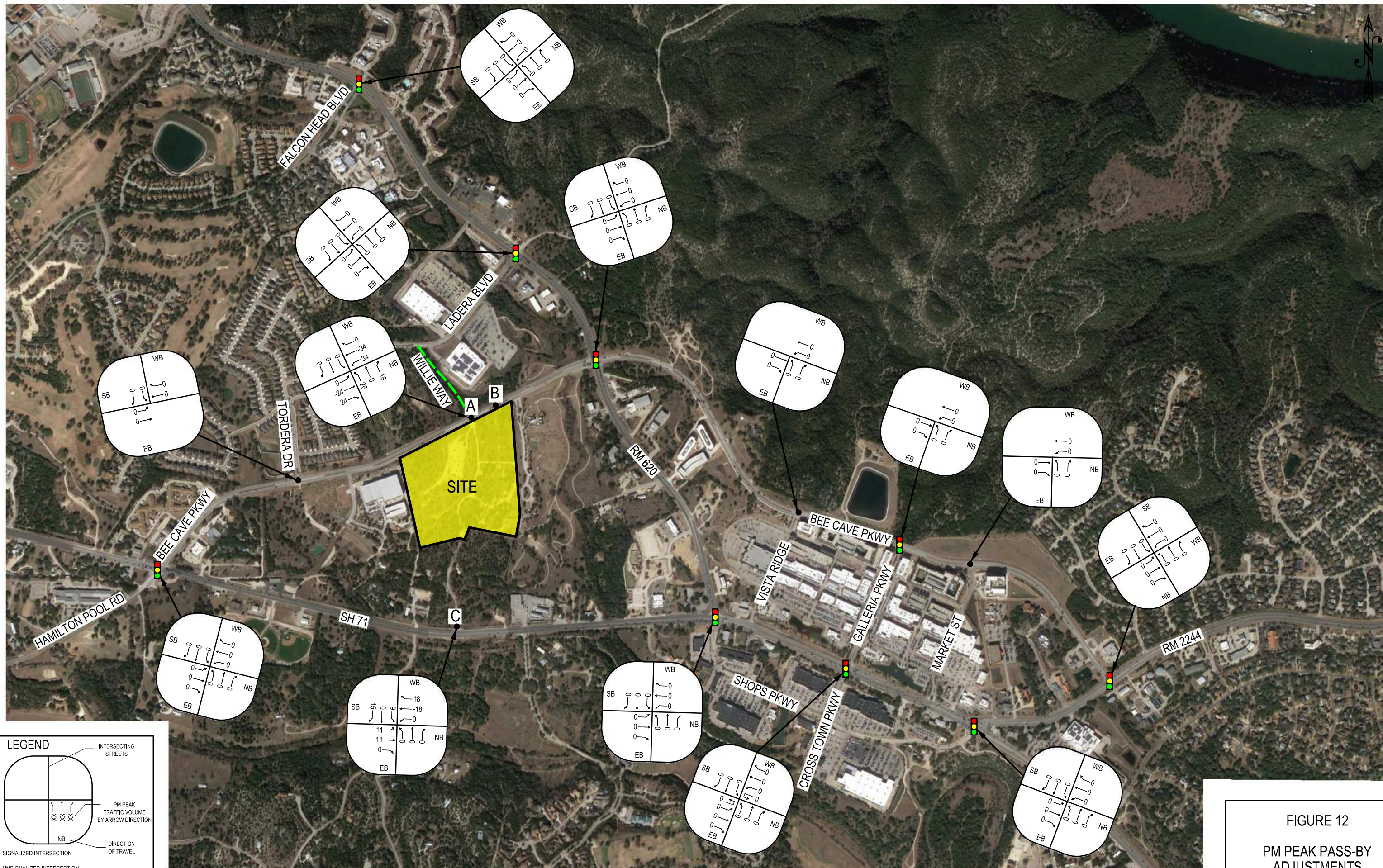
FIGURE 10
SITE TRAFFIC
DISTRIBUTION MAP

Background Map Copyrighted by Google, 2018



Background Map Copyrighted by Google, 2018

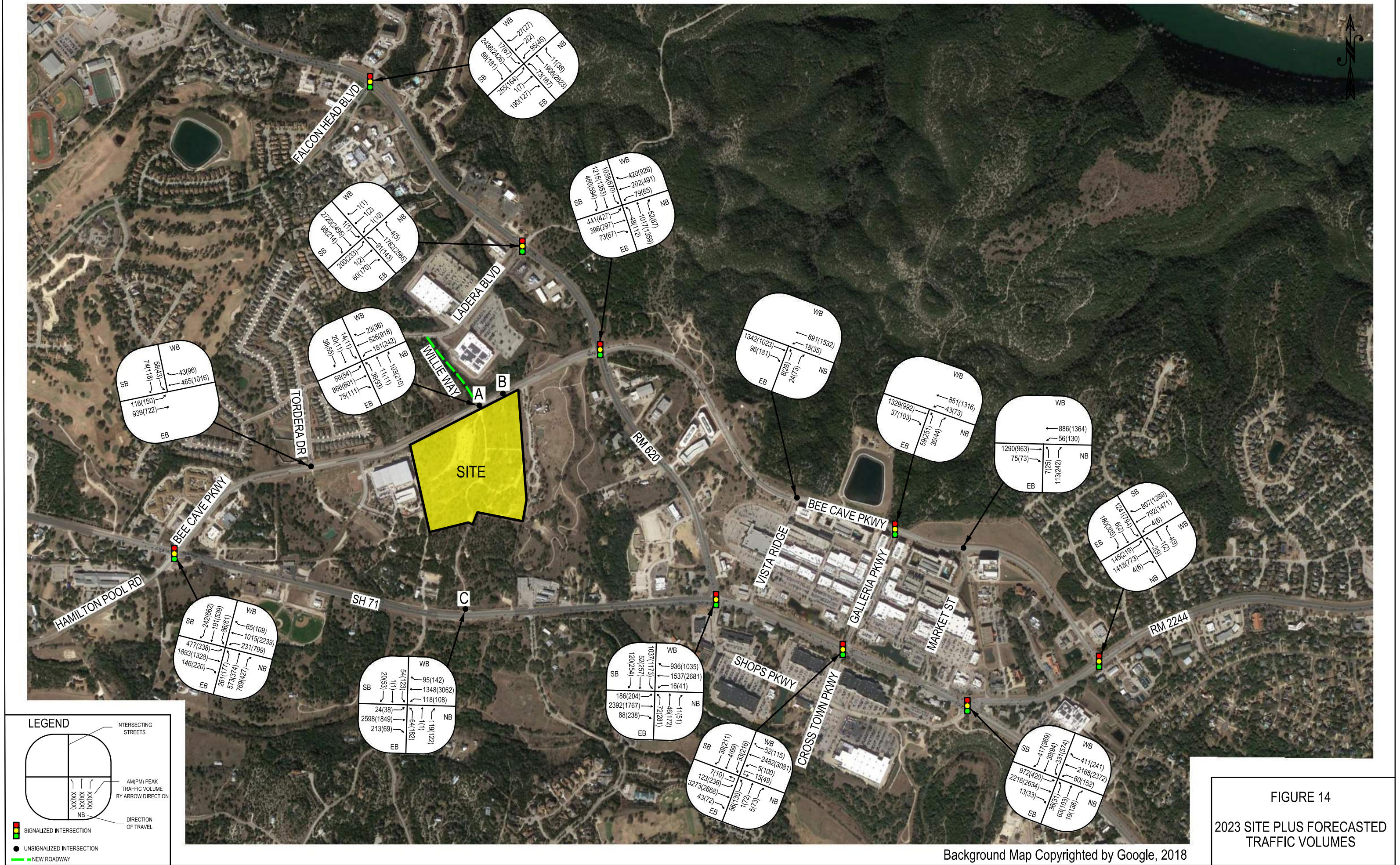
FIGURE 11
SITE VOLUMES
WITHOUT PASS-BY





Background Map Copyrighted by Google, 2018

FIGURE 13
TOTAL SITE
TRAFFIC VOLUMES



Summary and Recommendations

Intersection LOS and delay results for 2019 existing, 2023 forecasted, and 2023 site plus forecasted volume conditions are presented in Tables 8 and 9. 2023 site plus forecasted with improvements level of service assume all improvements recommended and identified as part of this TIA have been implemented. Table 10 provides a summary of all recommended improvements discussed in this report along with the developer's estimated pro-rata share. The pro-rata share for each recommended improvement is calculated based on the percent of site traffic for the applicable movement, approach, or overall intersection.

Table 8. Signalized Intersection Level of Service and Delay (sec/veh)

Intersection	2019 Existing		2023 Forecasted (Without Site)		2023 Site + Forecasted w/o Improvements		2023 Site + Forecasted w/ Improvements	
	AM	PM	AM	PM	AM	PM	AM	PM
SH 71 and RM 2244/Shops Parkway	D (54.6)	E (70.1)	F (134.8)	F (119.8)	F (136.2)	F (130.0)	F (134.0)	F (128.8)
SH 71 and Galleria Parkway/Cross Town Parkway	A (5.8)	C (30.8)	B (12.2)	F (129.7)	B (12.8)	F (152.4)	B (13.0)	F (143.5)
SH 71 and RM 620/Shops Parkway	C (23.7)	C (29.4)	E (69.2)	F (99.2)	E (76.9)	F (111.2)	E (67.7)	F (104.1)
SH 71 and Hamilton Pool Road/Bee Cave Parkway	C (33.4)	F (87.6)	F (108.1)	F (257.3)	F (117.0)	F (271.4)	E (71.0)	F (185.3)
RM 2244 and Bee Cave Parkway	C (33.2)	D (38.0)	E (65.8)	D (53.7)	E (71.7)	F (120.8)	D (51.2)	E (60.9)
RM 620 and Bee Cave Parkway	D (45.1)	E (75.0)	E (68.7)	F (131.6)	F (87.2)	F (166.7)	E (61.4)	F (98.2)
RM 620 and Ladera Ranch Boulevard	C (20.6)	B (12.1)	E (65.8)	D (46.5)	E (75.9)	E (60.1)	E (63.3)	D (45.7)
RM 620 and Falcon Head Boulevard	C (23.0)	C (24.8)	E (49.2)	E (69.6)	E (57.8)	F (85.3)	D (48.6)	E (57.6)
Bee Cave Parkway and Galleria Parkway	A (7.4)	A (8.7)	A (8.2)	B (11.8)	A (8.1)	B (12.5)	A (8.1)	B (12.5)
Bee Cave Parkway and Tordera Drive	*	*	*	*	*	*	A (9.2)	A (9.1)
Bee Cave Parkway and Willie Way	*	*	*	*	C (25.3)	C (22.6)	C (25.2)	C (22.6)
SH 71 and Driveway C	-	-	-	-	F (99.0)	F (137.1)	F (85.7)	F (122.2)

+ Value is excessive or exceeds Synchro limits

* See Table 9 for unsignalized intersection LOS and delay information.

Table 9. Unsignalized Intersection Level of Service and Delay (sec/veh)

Intersection	2019 Existing		2023 Forecasted (Without Site)		2023 Site + Forecasted w/o Improvements		2023 Site + Forecasted w/ Improvements	
	AM	PM	AM	PM	AM	PM	AM	PM
Bee Cave Parkway and Market Street	A (1.3)	A (2.7)	A (1.5)	A (3.3)	A (1.5)	A (3.7)	A (1.5)	A (3.7)
Eastbound Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
Westbound Approach	A (0.8)	A (0.9)	A (0.9)	A (1.0)	A (0.8)	A (1.0)	A (0.8)	A (1.0)
Northbound Approach	C (18.3)	C (20.3)	C (22.7)	D (27.3)	C (24.2)	D (32.9)	C (24.2)	D (32.9)
Bee Cave Parkway and Vista Ridge	A (0.9)	A (6.9)	A (0.5)	A (2.8)	A (0.5)	A (3.6)	A (0.5)	A (3.6)
Eastbound Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)
Westbound Approach	A (0.3)	A (0.3)	A (0.3)	A (0.3)	A (0.3)	A (0.3)	A (0.3)	A (0.3)
Northbound Approach	D (31.0)	F (106.2)	D (29.6)	F (69.4)	D (32.3)	F (98.5)	D (32.3)	F (98.5)
Bee Cave Parkway and Tordera Drive	A (2.0)	A (2.5)	A (3.0)	A (4.4)	A (3.2)	A (5.3)	*	*
Eastbound Approach	A (1.1)	A (2.0)	A (1.1)	A (2.3)	A (1.0)	A (2.2)	*	*
Westbound Approach	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	A (0.0)	*	*
Southbound Approach	C (16.5)	C (18.6)	D (27.7)	E (43.5)	D (32.7)	F (59.0)	*	*
Bee Cave Parkway and Willie Way	-	-	A (0.8)	A (1.1)	*	*	*	*
Eastbound Approach	-	-	A (0.5)	A (0.9)	*	*	*	*
Westbound Approach	-	-	A (0.0)	A (0.0)	*	*	*	*
Southbound Approach	-	-	C (15.2)	C (18.7)	*	*	*	*

+ Value is excessive or exceeds Synchro limits

* See Table 8 for signalized intersection LOS and delay information.

Table 10. Summary of Recommended Improvements and Pro-Rata Share

Intersection	Recommended Improvements	Pro-Rata Applicable Movement	Backyard Site Volume		Forecasted (No Site) Volume		Pro-Rata Share	Approximate Improvement Cost	Backyard Fiscal Share
			AM	PM	AM	PM			
SH 71 and RM 2244/Shops Parkway	Optimize signal timing.	Total Intersection	136	194	6,607	7,565	100%	\$5,000	\$5,000
SH 71 and Galleria Parkway/Cross Town Parkway	Optimize signal timing.	Total Intersection	153	242	5,963	6,802	100%	\$5,000	\$5,000
SH 71 and RM 620/Shops Parkway	Optimize signal timing.	Total Intersection	160	264	6,332	7,889	100%	\$5,000	\$5,000
SH 71 and Hamilton Pool Road	Construct an additional eastbound left-turn lane to provide dual left turns.	Eastbound Left Movement	35	41	441	297	12.1%	\$2,059,120	\$249,775
	Construct an additional westbound left-turn lane to provide dual left turns.	Westbound Approach	20	38	1,291	3,110	1.5%	\$2,059,120	\$31,413
	Widen Hamilton Pool Road to provide two southbound receiving lanes.	Exiting Southbound	22	42	546	1,516	3.9%	\$336,946	\$13,051
	Optimize signal timing.	Total Intersection	154	220	5,794	7,055	100.0%	\$5,000	\$5,000
RM 2244 and Bee Cave Parkway	Install a southbound right-turn overlap phase.	Southbound Right Movement	71	82	736	1,206	8.8%	\$78,748	\$6,928
	Optimize signal timing.	Total Intersection	123	176	4,479	4,768	100.0%	\$5,000	\$5,000
RM 620 and Bee Cave Parkway	Construct an additional eastbound left-turn lane to provide dual left-turn lanes, one through lane, and one through/right-turn shared lane.	Eastbound Left Movement	56	95	385	333	22.2%	\$150,303	\$33,362
	Construct an additional westbound right-turn lane to provide dual right-turn lanes and extend the turn lanes to 850 feet.	Westbound Approach	75	92	626	1,390	10.7%	\$783,463	\$83,823
	Optimize signal timing.	Total Intersection	276	387	5,177	6,028	100.0%	\$5,000	\$5,000
RM 620 and Ladera Ranch Boulevard	Construct a southbound right-turn lane.	Southbound Approach	99	103	2,719	2,606	3.8%	\$249,455	\$9,485
	Optimize signal timing.	Total Intersection	154	198	4,802	5,642	100.0%	\$5,000	\$5,000
RM 620 and Falcon Head Boulevard	Construct a southbound right-turn lane.	Southbound Approach	79	92	2,463	2,583	3.4%	\$333,905	\$11,484
	Construct an additional eastbound left-turn lane to provide dual left-turn lanes.	Eastbound Approach	20	11	427	287	4.5%	\$100,331	\$4,489
	Optimize signal timing.	Total Intersection	154	198	4,948	5,677	100.0%	\$5,000	\$5,000
Bee Cave Parkway and Tordera Drive	Install a traffic signal.	Total Intersection	111	155	1,583	1,991	7.2%	\$350,000	\$25,280
Bee Cave Parkway and Willie Way (Driveway A)	Construct Driveway A as a full-purpose driveway, with two inbound and two outbound lanes.	-	-	-	-	-	100%*	-	-
	Install a traffic signal.	-	-	-	-	-	100%*	\$350,000	\$350,000
	Extend the westbound left-turn lane bay.	-	-	-	-	-	100%*	-	-
	Construct an eastbound right-turn lane to provide a channelized, free-flowing right-turn movement	-	-	-	-	-	100%*	-	-
Bee Cave Parkway and Driveway B	Construct Driveway B as a right-in, right-out only emergency access driveway.	-	-	-	-	-	100%*	-	-
SH 71 and Willie Way (Driveway C)***	Construct Driveway C as a full-purpose driveway, with dual left-turns and one shared through/right-turn lane and two inbound lanes.	-	-	-	-	-	100%*	-	-
	Modify the westbound right-turn lane to provide a channelized, free-flowing right-turn movement.	-	-	-	-	-	100%*	-	-
	Install a traffic signal**	Total Intersection	192	303	4,460	5,420	5.3%	\$350,000	\$18,530
							Backyard Fiscal Share		\$877,619

*To be constructed by the developer as part of the site development.
** Recommended in the Spanish Oaks TIA.
*** The pro-rata share to construct the portion of Willie Way between the Backyard site and SH 71 Driveway C will be discussed with contiguous land owners.

Event Traffic Analysis

The Live Oak Amphitheater Venue will have a maximum occupancy of 3,700 attendees with concerts operating outside of the Backyard development's peak hours. The typical timeline for a weekday event is gates opening at 6:00 PM, the show starting at 7:00 PM, and the venue closing at 10:30 PM. The venue closing time is extended to 11:00 PM on the weekend. It is expected that a portion of attendees will arrive before gates open, falling within the PM peak hour. Therefore, an analysis of the Backyard's access points was completed for the PM Peak hour (4:45-5:45 PM) and the Event Peak hour, the hour prior to the show (6:00-7:00 PM), to document the impacts of the entering event traffic. The dance hall and private event spaces will not operate concurrently with a show at the Live Oak Amphitheater Venue.

Average vehicle occupancy for shows was assumed at 2.7 persons/vehicle for a total of 1,371 entering trips. Event traffic was assumed to be parked in the garages on-site for the purposes of the traffic operations analysis. The Developer and venue operator are in negotiations with neighboring property owners to provide off-site parking for the venue in addition to the on-site parking garages. Off-site parking availability will reduce the number of vehicles entering and exiting the site before and after events.

The City of Bee Cave Central Park, located east of the Backyard development, could be utilized as the drop off/loading area for rideshare operations. No rideshare to and from the Backyard venue for events was assumed for this TIA to provide the most conservative analysis. A further study to determine the appropriate reductions needs to be completed.

Based on documented parking data from the St. Augustine's Amphitheater Venue, a similar venue to the proposed Live Oak Amphitheater Venue, it is assumed that thirty (30) percent of event traffic (411 trips) will arrive during the PM Peak hour and fifty (50) percent will arrive during the Event Peak hour (686 trips). ULI Time-of-Day Factors (Ref. 8) were utilized to determine the Event Peak hour trip generation for all other land uses. Table 11 provides a detailed summary of the adjusted traffic generation for the site during weekdays when an event occurs.

Table 11. Summary of PM Peak and Event Peak Trip Generation

Land Use	Land Use Code	Size	24-Hour Two-Way Volume	PM Peak (4:45-5:45 PM)		Event Peak Adjustment Factor ³		Event Peak (6:00-7:00 PM)	
				Enter	Exit	Enter	Exit	Enter	Exit
Concert Venue ¹	-	3,700 Person	2,742	411	-	-	-	686	-
Hotel	310	125 Rooms	967	32	32	5%	5%	2	2
Dance Hall ²	-	350 Person	-	-	-	-	-	-	-
Private Event Space ²	931	208 Person	-	-	-	-	-	-	-
Office	710	181,476 SF	1,635	28	150	0%	25%	0	37
Shopping Center	820	3,096 SF	442	11	12	0%	10%	0	1
Drinking Place	925	4,923 SF	179	31	16	5%	5%	2	1
Fast Casual Restaurant	930	5,394 SF	919	36	29	5%	5%	2	1
High Turnover (Sit-Down) Restaurant	932	897 Seats	2,962	104	78	5%	5%	5	4
High Turnover (Sit-Down) Restaurant (G4:14)	932	816 SF	45	2	2	5%	5%	0	0
Fast-Food Restaurant without Drive-Through Window (G1:3)	933	61 Seats	2,184	71	40	5%	5%	4	2
Fast-Food Restaurant without Drive-Through Window (G6:28)	933	1,649 SF	485	20	20	5%	5%	1	1
Coffee Shop (no Drive-thru)	936	2,743 SF	1,159	42	43	5%	5%	2	2
Total			13,719	788	422	-	-	704	51

¹The Live Oak Amphitheater venue assumed 30% of event traffic would enter during the PM Peak and 50% of event traffic would enter during the event peak.

²No programmed event at the Dance Hall or Private Event Spaces will occur simultaneously as an event at the Live Oak Amphitheater

³The event peak adjustment factor was applied to both entering and exiting trips for all restaurant land uses and the hotel land use.

To evaluate intersection operations for the Event Peak, the through volumes on Bee Cave Parkway, through volumes on SH 71, turning volumes for Willie Way (north of Bee Cave Parkway), and turning volumes for the Spanish Oak project were adjusted based on the 2019 24-hour tube count data collected. Table 12 provides a summary of the volume reductions assumed, the analysis of which is provided in the Technical Addendum.

Table 12. Volume Reductions for Background Traffic

Location	Direction	2023 PM Peak (4:45-5:45 PM) Volumes	Volume Reduction (Percent)	2023 Event Peak (6:00-7:00 PM) Volumes
Bee Cave Parkway	Eastbound	625	10%	563
	Westbound	952	40%	571
SH 71	Eastbound	1,860	20%	1,488
	Westbound	3,079	15%	2,617
Bee Cave Parkway and Willie Way	Eastbound Left	54	20%	43
	Westbound Right	36		29
	Southbound Left	11		9
	Southbound Right	55		44
SH 71 and Willie Way/Village Oaks Drive	Eastbound Right	69	20%	55
	Westbound Left	108		86
	Northbound Left	182		146
	Northbound Right	122		98

Intersection LOS and delay results for the 2023 PM Peak and 2023 Event Peak are presented in Table 13. Driveway A will continue to operate at an acceptable level of service during both the PM peak period and event peak period on event days. Driveway C will continue to operate at a LOS F during the PM Peak on event days. During the 2023 Event Peak, Driveway C will operate at a LOS E.

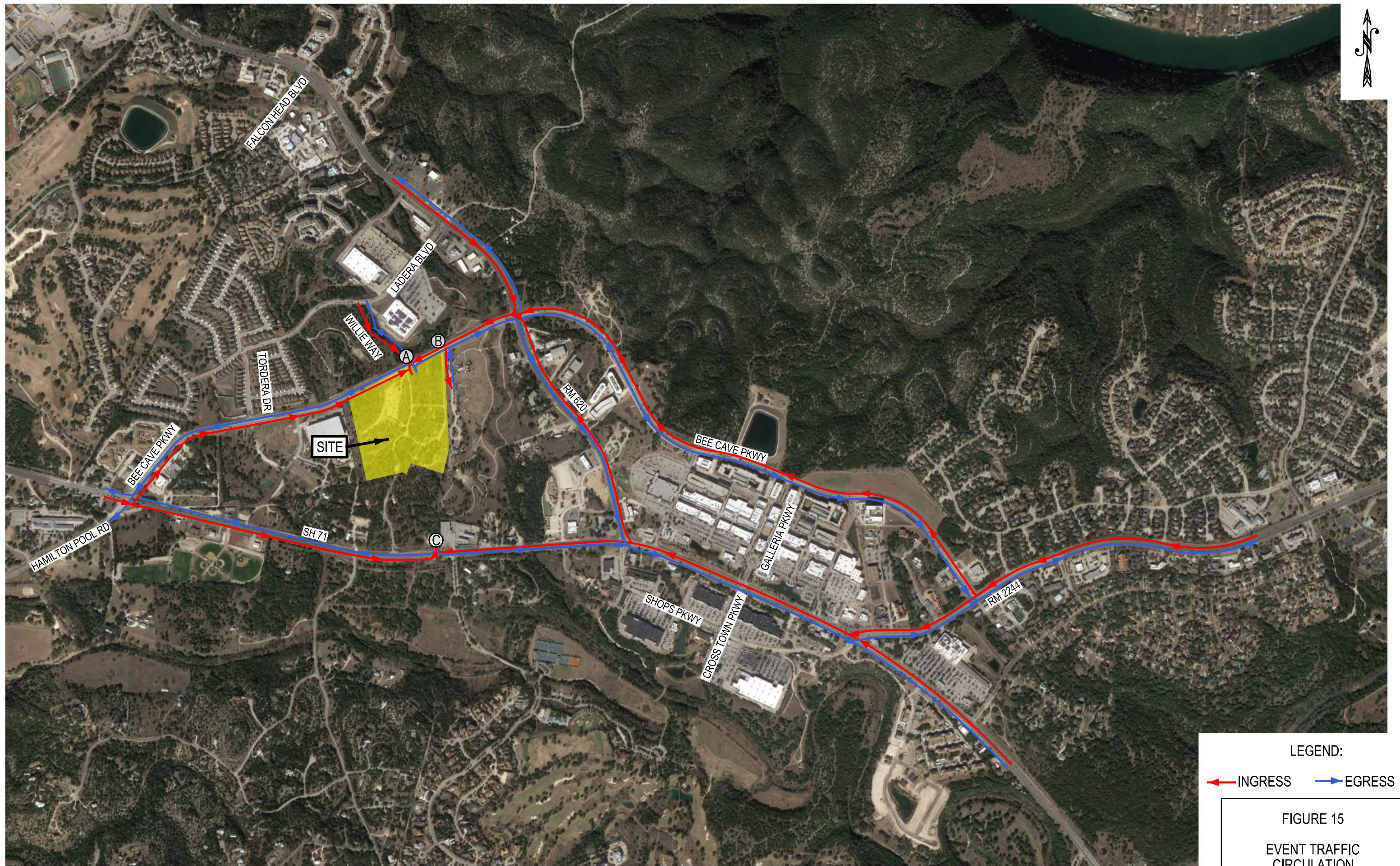
Table 13. Event Intersection Level of Service

Intersection	2023 PM Peak (4:45-5:45 PM)		2023 Event Peak (6:00-7:00 PM)	
	LOS	Delay (sec)	LOS	Delay (sec)
Bee Cave Parkway and Willie Way (Driveway A)	C	22.8	B	10.8
SH 71 and Willie Way (Driveway C)	F	123.0	E	70.1

Figures 15 through 17 depict the traffic circulation throughout the network and within the site before and after events. A potential rideshare path through the Central Park Driveway is also shown within the “Before” and “After” Traffic Figures. The following changes are recommended on event days within the site:

- A temporary management blockade be placed at internal Roadway A to prohibit left turns into and out of the garage.
- Convert internal Roadway B, east of Willie Way, to an eastbound one-way, two-lane roadway before events and a westbound one-way, two-lane roadway after events.
- Station police officers and event staff onsite and at Willie Way and Central Park Driveway to facilitate entry and exit of vehicles.
- Prohibit left turns out of Central Park Driveway onto Bee Cave Parkway

It is also recommended that “Before Event” and “After Event” signal timing plans be considered at the intersections of Bee Cave Parkway and Willie Way and SH 71 and Willie Way to further improve operations.

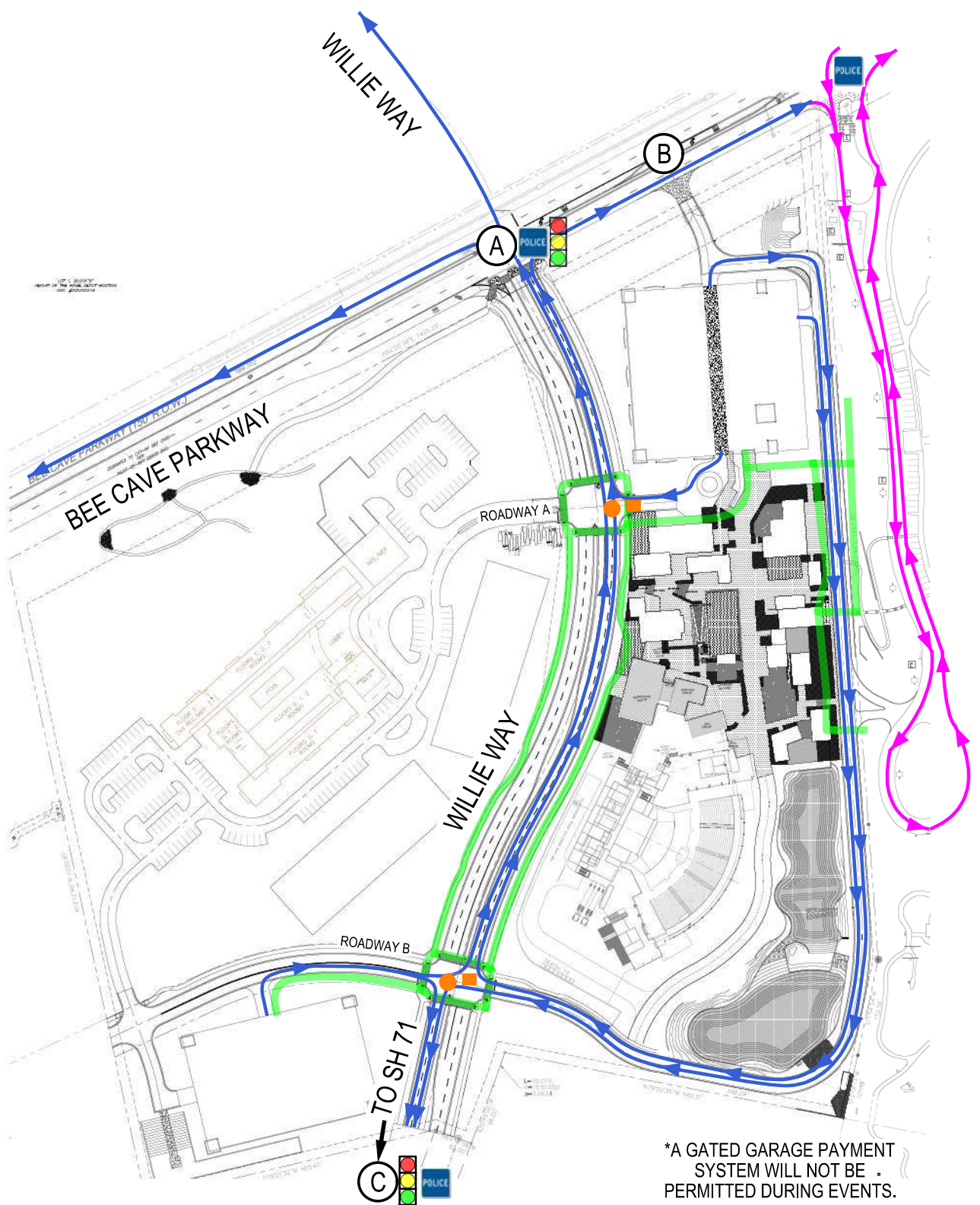


LEGEND:

← INGRESS → EGRESS

FIGURE 15

EVENT TRAFFIC
CIRCULATION



LEGEND

- | | | |
|-----------------|----------------------|--|
| = INGRESS | = POLICE OFFICER | = TRAFFIC SIGNAL WITH "BEFORE" AND "AFTER" EVENT SIGNAL TIMING PLANS |
| = EGRESS | = VENUE FLAGGER | |
| = RIDESHARE | = PEDESTRIAN PATHWAY | |
| = SITE DRIVEWAY | | |

FIGURE 17

EVENT TRAFFIC
SITE CIRCULATION
"AFTER" EVENT

Shared Parking Study

In mixed-use developments with specific land uses identified in the Urban Land Institute (ULI) Shared Parking report (Ref. 8), there exists a potential for utilization of adjacent parking spaces by more than one land use during the day. This potential increases as the time between periods of maximum parking demand of each use varies.

Parking requirement for the Backyard site were calculated based on the City of Bee Cave's parking code. Tables 14 and 15 present the City of Bee Cave parking requirements for the office and Glenn peak and the Live Oak Amphitheater Event peak, respectively. The office and Glenn peak and the Live Oak Amphitheater Event land use peak periods will not directly coincide, as events at the Dance Hall / Private event spaces will not occur at the same time as events at the Live Oak Amphitheater. For a typical weekday assuming the Dance Hall and private event spaces are operational at the Glenn, Table 14 indicates a parking demand of 1,601 spaces. However, an Event Peak parking analysis, shown in Table 15, indicates the site will require a maximum parking demand of 2,757.

Table 14. City of Bee Cave Parking Requirements – Office and Glenn Peak

Use Classification ¹	Size	Minimum Off-Street Parking Requirements	Number of Spaces
Hotel	125 Rooms	1 space per room	125
Hotel	70 Employees	1 space per 2 employees	35
Hotel Restaurant	150 Seats	1 space per 5 seats	30
Office (100 to 500 Th. SF)	181,476 SF	1 space per 300 SF	605
Restaurant ²	67,010 SF	1 space per 100 SF	670
Retail	3,746 SF	1 space per 200 SF	19
Dance Hall ³	350 Person	1 space per 3 tickets	117
		Total	1,601

¹Detailed parking use classification breakdown included in the Technical Addendum.

²Private event spaces (9,514 SF) are included in the Restaurant category.

³Requirements for nightclub are used for Dance Hall.

Table 15. City of Bee Cave Parking Requirements – Live Oak Amphitheater Event Peak

Use Classification	Size	Minimum Off-Street Parking Requirements	Number of Spaces
Hotel	125 Rooms	1 space per room	125
Hotel	70 Employees	1 space per 2 employees	35
Hotel Restaurant	150 Seats	1 space per 5 seats	30
Office (100 to 500 Th. SF)	181,476 SF	1 space per 300 SF	605
Restaurant ¹	57,496 SF	1 space per 100 SF	575
Retail	3,746 SF	1 space per 200 SF	19
Concert Venue ¹	3,700 Person	1 space per 2.7 seats	1,371
		Total	2,757

¹Private event spaces (9,514 SF) removed from Restaurant land uses and Dance Hall parking removed, because no other programmed event will occur simultaneously as an event at the Live Oak Amphitheater venue.

The Shared Parking Model (Ref. 10) developed by ULI incorporating the parameters suggested by the ULI Shared Parking report was used to estimate parking demand for the land uses within the planned development. Although this spreadsheet provides recommended parking ratios for each land use, those base data values were revised to match parking ratios required by the City of Bee Cave Code of Ordinances Section 32.05.001(f) (Ref. 11). To understand the impacts of the hourly parking demand, the anticipated parking demand for each land use for each hour interval was computed and summed with the other uses. The hour with the maximum parking demand determined the minimum required number of parking spaces.

Interim Scenario (No Hotel or Office)

The Glenn area buildings of the Backyard development will be built before the Hotel and Office buildings. Figure 18 through 21 depict the variation in parking space utilization by time of day for both the maximum weekday and weekend cases. The shared parking analysis, presented in Table 16, suggests that the predicted peak weekday demand of 634 spaces occurs in December at 7:00 PM during the Glenn (no hotel or office) peak scenario. The peak weekend demand of 685 spaces occurs at 8:00 PM during the Glenn (no hotel or office) peak scenario.

The shared parking analysis, presented in Table 17, suggests that the predicted peak weekday demand of 1,819 spaces occurs in December at 8:00 PM when there is an event at the Live Oak Amphitheater venue prior to the construction of the hotel and offices. The peak weekend demand of 1,868 spaces occurs at 8:00 PM when there is an event at the Live Oak Amphitheater venue prior to the construction of the hotel and offices. Based on the shared parking analysis, the maximum parking generation peak period for the site will occur during the weekday peak period due to an event at the Live Oak Amphitheater. A minimum of 1,868 parking spaces will be required to accommodate the expected shared parking demand for the proposed land uses during the event peak prior to the construction of the hotel and offices.

Ultimate Buildout Scenario (With Hotel and Office)

Table 18 illustrates predicted shared parking needs during the Office and Glenn peak, while Table 19 illustrate predicted shared parking needs during an event peak. Figure 21 through 25 depict the variation in parking space utilization by time of day for both the maximum weekday and weekend cases. The shared parking analysis, presented in Table 18, suggests that the predicted peak weekday demand of 1,157 spaces occurs in March at 2:00 PM during the Office and Glenn peak scenario. The peak weekend demand of 818 spaces occurs at 8:00 PM during the Office and Glenn peak scenario.

The shared parking analysis, presented in Table 19, suggests that the predicted peak weekday demand of 1,987 spaces occurs at 8:00 PM when there is an event at the Live Oak Amphitheater venue. The peak weekend demand of 2,003 spaces occurs at 8:00 PM when there is an event at the Live Oak Amphitheater venue. Based on the shared parking analysis, the maximum parking generation peak period for the site will occurs in March during the weekday peak period due to an event at the Live Oak Amphitheater. A minimum of 2,003 parking spaces will be required to accommodate the expected shared parking demand for the proposed land uses during the event peak at full buildout of the development.

The shared parking minimum parking spaces for the Glenn (no hotel or office) peak scenario of 685 will be provided completely per the parking garage site plans that are provided in the Technical Addendum. The shared parking minimum parking spaces for the Office and Glenn peak scenario of 1,157 spaces will be provided per the parking garage site plans and an additional 200 spaces that the City staff has agreed to consider on-site. The on-site parking garages (P1: 508 spaces, P2: 628 Spaces) will provide 1,136 parking spaces, excluding any future surface spaces adjacent to the hotel and offices. In addition to the onsite parking garages provided, a minimum of 867 parking spaces on-site or 1,040 spaces off-site must be provided upon Council's approval before the opening of the Live Oak venue.

Table 16. Total Parking Requirement for Peak Month and Peak Period – Glenn Peak (No Hotel or Office)

Land Use	Project Data		COBC Parking Rate	Unit		Peak Month Adj December	Weekday			Weekend		
	Quantity	Unit					Weekday Base Rate	Peak Hr Adj 7 PM	Estimated Parking Demand	Weekend Base Rate	Peak Hr Adj 8 PM	Estimated Parking Demand
Retail	3,746	sf	5.0	/ksf GLA	Customer	1.00	3.63	0.90	13	4.00	0.55	8
					Employee	1.00	0.88	1.00	3	1.00	0.75	3
Restaurants (Fine/Casual) ¹	47,093	sf	10.0	/ksf GFA	Customer	1.00	7.46	1.00	352	8.59	1.00	405
					Employee	1.00	1.27	1.00	60	1.41	1.00	66
Restaurants (Fast Food)	14,994	sf	10.0	/ksf GFA	Customer	0.96	8.44	0.80	97	8.64	0.50	62
					Employee	1.00	1.36	0.90	18	1.36	0.60	12
Restaurants (Nightclub)	4,923	sf	10.0	/ksf GFA	Customer	0.96	8.03	0.50	19	9.21	0.75	32
					Employee	1.00	0.66	1.00	3	0.79	1.00	4
Dance Hall	350	seats	0.33	/seat	Customer	1.00	0.28	0.50	49	0.28	0.75	73
					Employee	1.00	0.06	1.00	20	0.06	1.00	20
							Customer		530	Customer		580
							Employee		104	Employee		105
							Total		634	Total		685

¹Includes the private event spaces (9,514 sf).

*ULI base data have been modified from default values to match City of Bee Cave Code of Ordinances parking ratios, where applicable.

**Shared Parking Demand Summary does not include accessible or reserved parking spaces.

Figure 18. Weekday Peak Month Daily Parking Demand by Hour and Land Uses – Glenn Peak (No Hotel or Office)

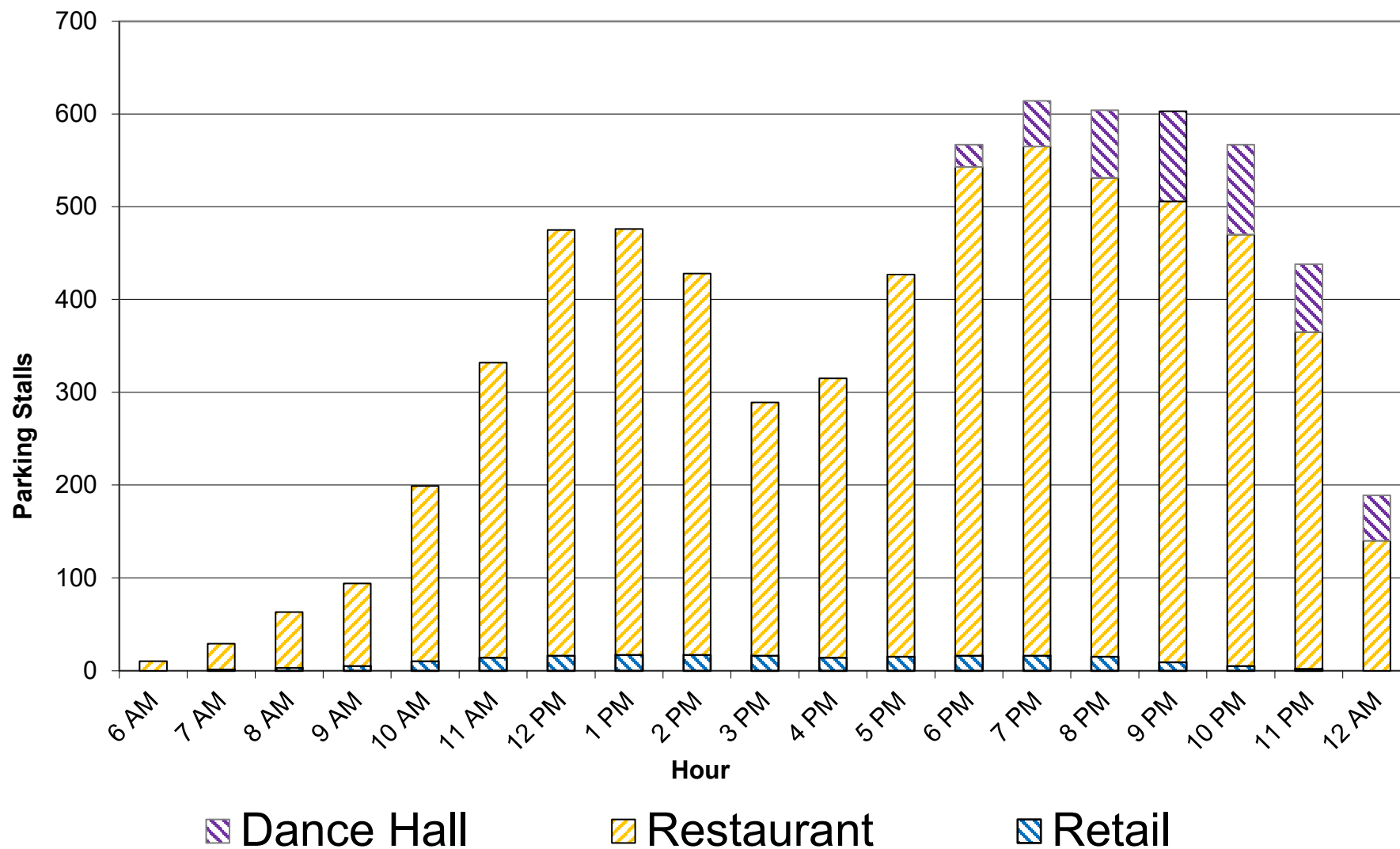


Figure 19. Weekend Peak Month Daily Parking Demand by Hour and Land Uses – Glenn Peak (No Hotel or Office)

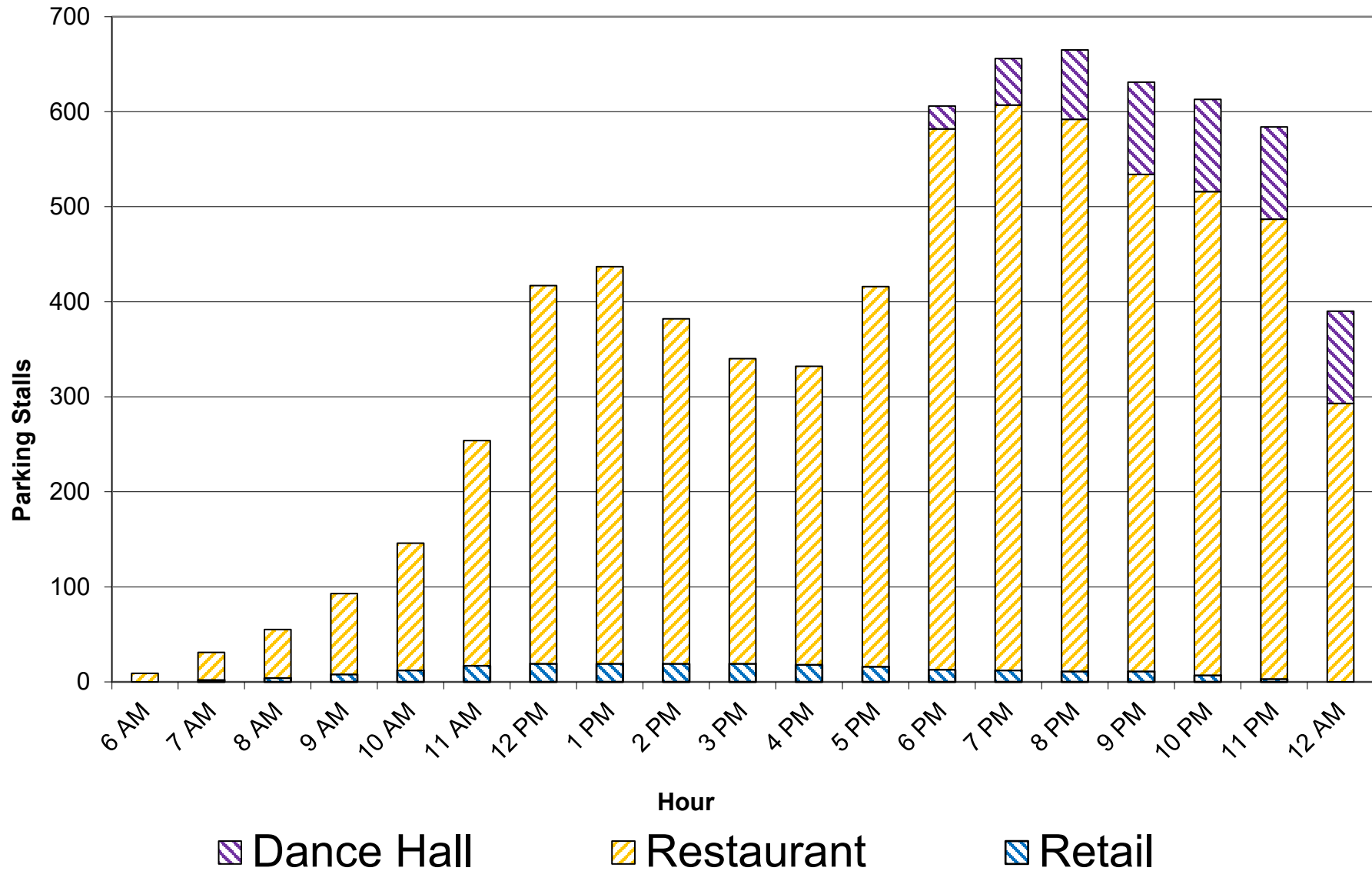


Table 17. Total Parking Requirement for Peak Month and Peak Period – Event Peak (No Hotel or Office)

Land Use	Project Data		COBC Parking Rate	Unit		Peak Month Adj December	Weekday			Weekend		
	Quantity	Unit					Weekday Base Rate	Peak Hr Adj 8 PM	Estimated Parking Demand	Weekend Base Rate	Peak Hr Adj 8 PM	Estimated Parking Demand
Concert Venue	3,700	seats	0.37	/seat	Customer	1.00	0.37	1.00	1,371	0.37	1.00	1,371
Retail	3,746	sf	5.0	/ksf GLA	Customer	0.85	3.63	0.85	12	4.00	0.55	8
					Employee	0.90	0.88	0.90	3	1.00	0.75	3
Restaurants (Fine/Casual) ¹	37,579	sf	10.0	/ksf GFA	Customer	1.00	7.46	1.00	281	8.59	1.00	323
					Employee	1.00	1.27	1.00	48	1.41	1.00	53
Restaurants (Fast Food)	14,994	sf	10.0	/ksf GFA	Customer	0.96	8.44	0.50	60	8.64	0.50	62
					Employee	1.00	1.36	0.60	12	1.36	0.60	12
Restaurants (Nightclub)	4,923	sf	10.0	/ksf GFA	Customer	1.00	8.03	0.75	29	9.21	0.75	32
					Employee	1.00	0.66	1.00	3	0.79	1.00	4
							Customer		1,753	Customer		1,796
							Employee		66	Employee		72
							Total		1,819	Total		1,868

¹Private event spaces are not included in the restaurant (9,514 sf).

*ULI base data have been modified from default values to match City of Bee Cave Code of Ordinances parking ratios, where applicable.

**Shared Parking Demand Summary does not include accessible or reserved parking spaces.

Figure 20. Weekday Peak Month Daily Parking Demand by Hour and Land Uses – Event Peak (No Hotel or Office)

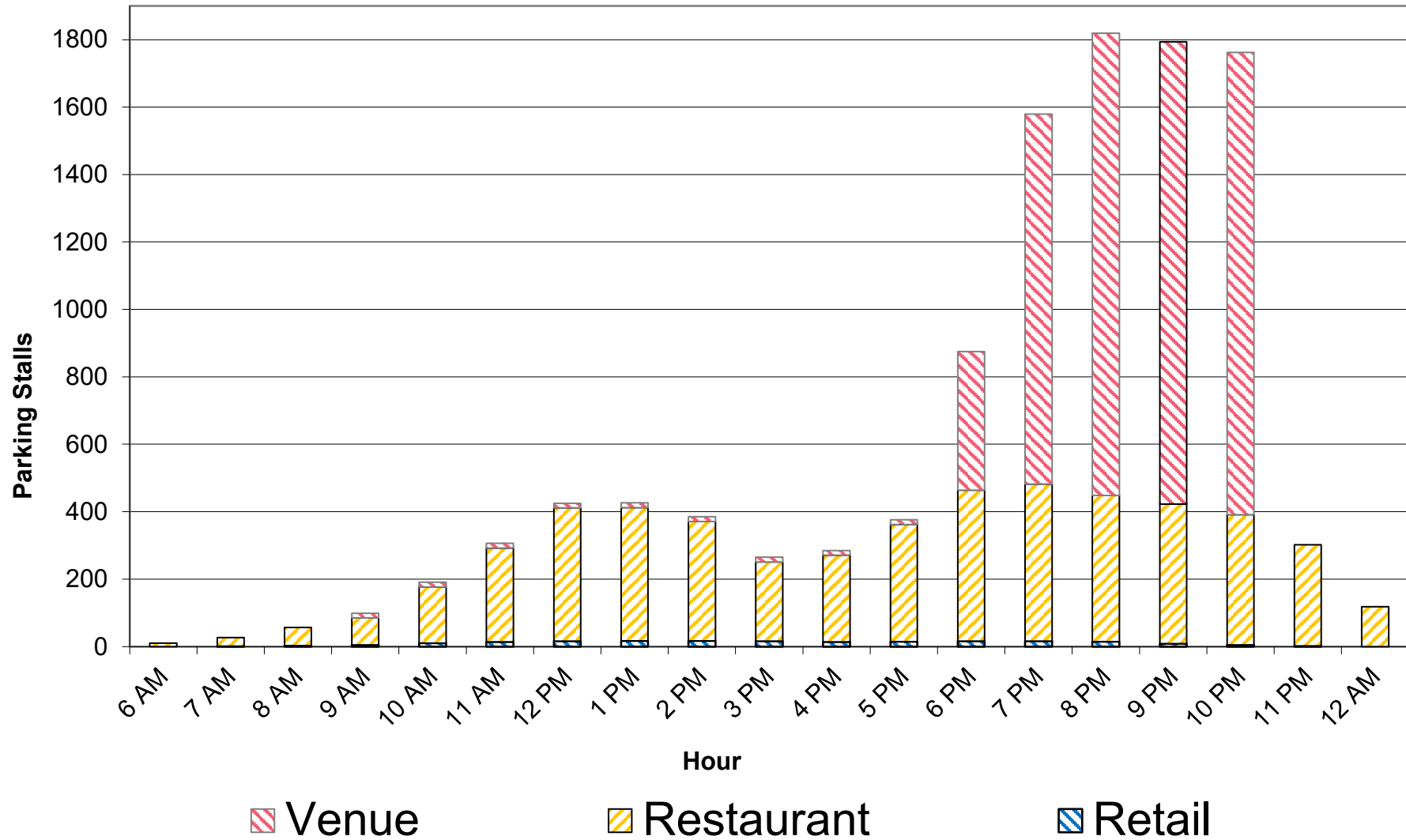


Figure 21. Weekend Peak Month Daily Parking Demand by Hour and Land Uses – Event Peak (No Hotel or Office)

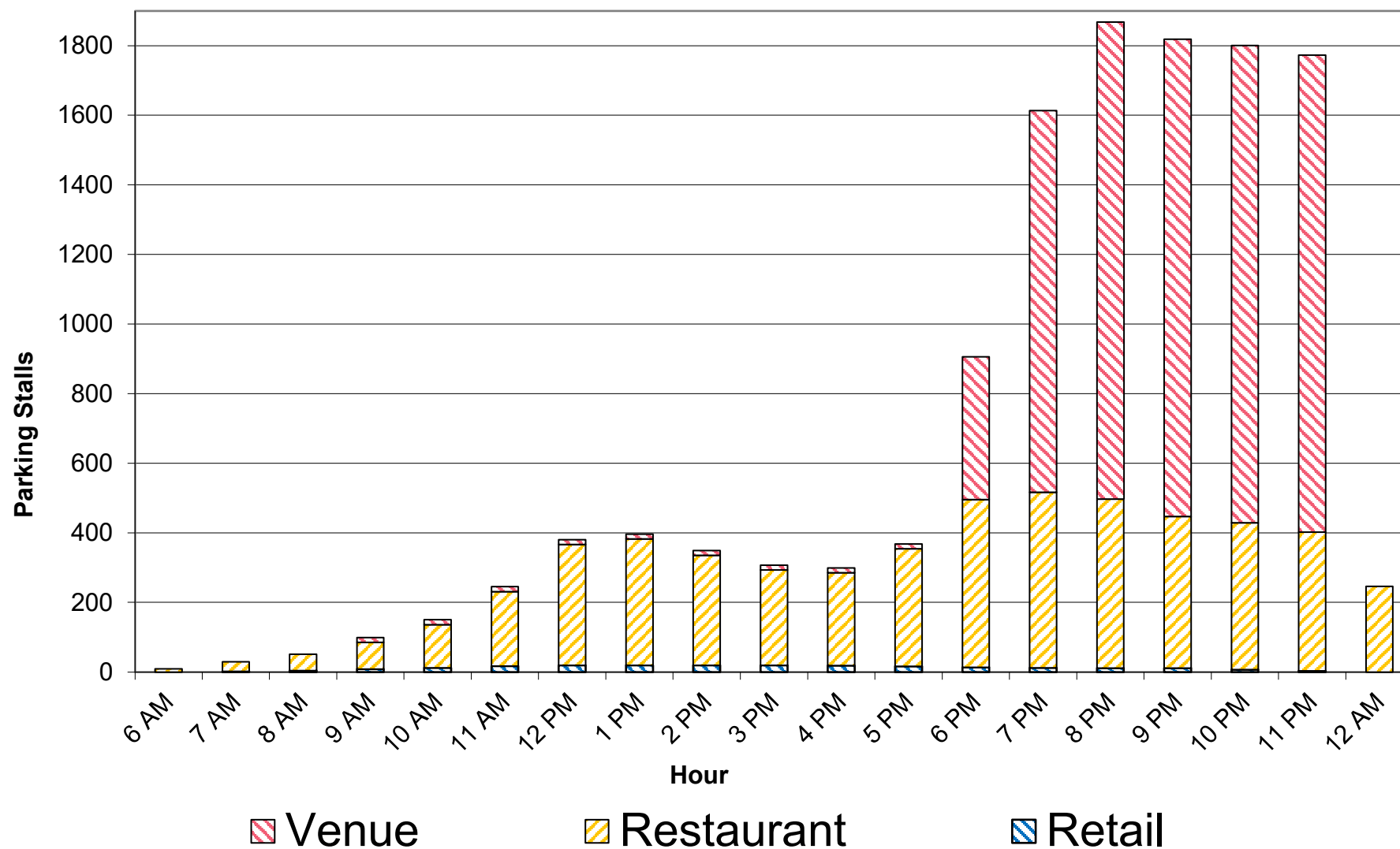


Table 18. Total Parking Requirement for Peak Month and Peak Period – Office and Glenn Peak

Land Use	Project Data		COBC Parking Rate	Unit		Peak Month Adj March	Weekday			Weekend		
	Quantity	Unit					Weekday Base Rate	Peak Hr Adj 2 PM	Estimated Parking Demand	Weekend Base Rate	Peak Hr Adj 8 PM	Estimated Parking Demand
Retail	3,746	sf	5.0	/ksf GLA	Customer	0.70	3.63	0.95	9	4.00	0.65	7
					Employee	0.79	0.88	1.00	2	1.00	0.75	2
Restaurants (Fine/Casual) ¹	47,093	sf	10.0	/ksf GFA	Customer	0.98	7.46	0.65	224	8.59	1.00	397
					Employee	1.00	1.27	0.90	54	1.41	1.00	66
Restaurants (Fast Food)	14,994	sf	10.0	/ksf GFA	Customer	0.97	8.44	0.90	110	8.64	0.50	63
					Employee	1.00	1.36	0.95	19	1.36	0.60	12
Restaurants (Nightclub)	4,923	sf	10.0	/ksf GFA	Customer	1.00	8.03	0.00	0	9.21	0.75	34
					Employee	1.00	0.66	0.10	0	0.79	1.00	4
Dance Hall	350	seats	0.33	/seat	Customer	1.00	0.275	0.00	0	0.275	0.75	73
					Employee	1.00	0.058	0.10	2	0.058	1.00	20
Hotel - Leisure	125	rooms	1.00	/room	Customer	1.00	1.00	0.70	88	1.00	0.90	113
Hotel - Restaurant/Lounge	150	seats	0.20	/seat	Customer	0.95	0.20	1.00	9	0.20	0.70	20
Hotel - Employee	70	employees	0.50	/room	Employee	1.00	0.50	0.20	35	0.50	0.20	7
Office 100 to 500 ksf	181,476	sf	3.33	/ksf GFA	Visitor	1.00	0.24	1.00	43	0.03	0.00	0
					Employee	1.00	3.09	1.00	562	0.31	0.00	0
							Customer		484	Customer		707
							Employee		673	Employee		111
							Total		1,157	Total		818

¹Includes the private event spaces (9,514 sf).

*ULI base data have been modified from default values to match City of Bee Cave Code of Ordinances parking ratios, where applicable.

**Shared Parking Demand Summary does not include accessible or reserved parking spaces.

Figure 22. Weekday Peak Month Daily Parking Demand by Hour and Land Uses – Office and Glenn Peak

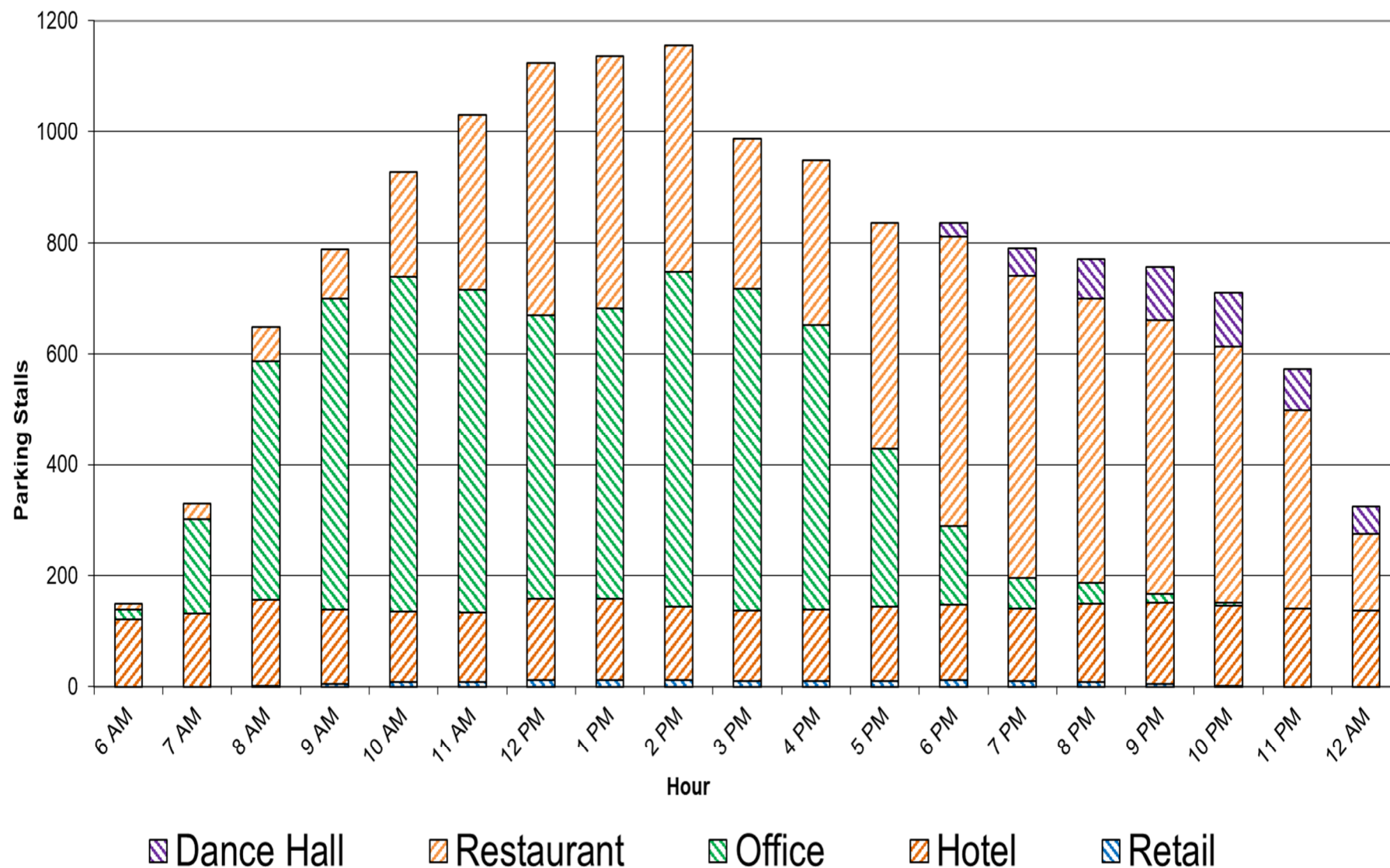


Figure 23. Weekend Peak Month Daily Parking Demand by Hour and Land Uses – Office and Glenn Peak

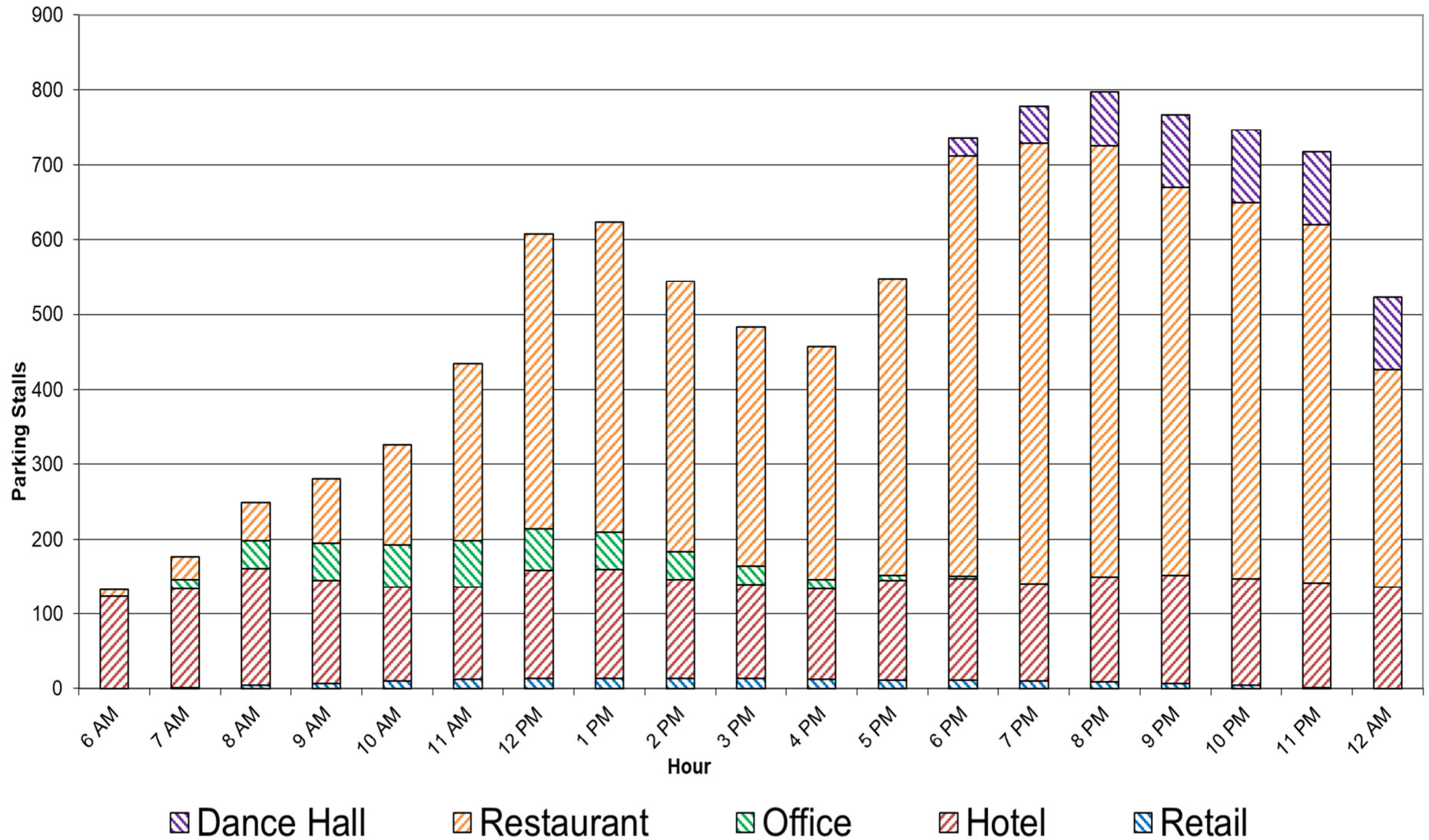


Table 19. Total Parking Requirement for Peak Month and Peak Period – Event Peak

Land Use	Project Data		COBC Parking Rate	Unit		Peak Month Adj March	Weekday			Weekend		
	Quantity	Unit					Weekday Base Rate	Peak Hr Adj 8 PM	Estimated Parking Demand	Weekend Base Rate	Peak Hr Adj 8 PM	Estimated Parking Demand
Concert Venue	3,700	seats	0.37	/seat	Customer	1.00	0.37	1.00	1,371	0.37	1.00	1,371
Retail	3,746	sf	5.0	/ksf GLA	Customer	0.70	3.63	0.65	6	4.00	0.65	7
					Employee	0.79	0.88	0.90	2	1.00	0.75	2
Restaurants (Fine/Casual) ¹	37,579	sf	10.0	/ksf GFA	Customer	0.98	7.46	1.00	275	8.59	1.00	317
					Employee	1.00	1.27	1.00	48	1.41	1.00	53
Restaurants (Fast Food)	14,994	sf	10.0	/ksf GFA	Customer	0.97	8.44	0.50	61	8.64	0.50	63
					Employee	1.00	1.36	0.60	12	1.36	0.60	12
Restaurants (Nightclub)	4,923	sf	10.0	/ksf GFA	Customer	1.00	8.03	0.75	30	9.21	0.75	34
					Employee	1.00	0.66	1.00	3	0.79	1.00	4
Hotel - Leisure	125	rooms	1.00	/room	Customer	1.00	1.00	0.90	113	1.00	0.90	113
Hotel - Restaurant/Lounge	150	seats	0.20	/ksf GFA	Customer	0.95	0.20	0.70	20	0.20	0.70	20
Hotel - Employee	70	employees	0.50	/room	Employee	1.00	0.50	0.20	7	0.50	0.20	7
Office 100 to 500 ksf	181,476	sf	3.33	/ksf GFA	Visitor	1.00	0.24	0.01	0	0.03	0.00	0
					Employee	1.00	3.09	0.07	39	0.31	0.00	0
							Customer		1,876	Customer		1,925
							Employee		111	Employee		78
							Total		1,987	Total		2,003

¹Private event spaces are not included in the restaurant (9,514 sf). *ULI base data have been modified from default values to match City of Bee Cave Code of Ordinances parking ratios, where applicable.

**Shared Parking Demand Summary does not include accessible or reserved parking spaces.

Figure 24. Weekday Peak Month Daily Parking Demand by Hour and Land Uses – Event Peak

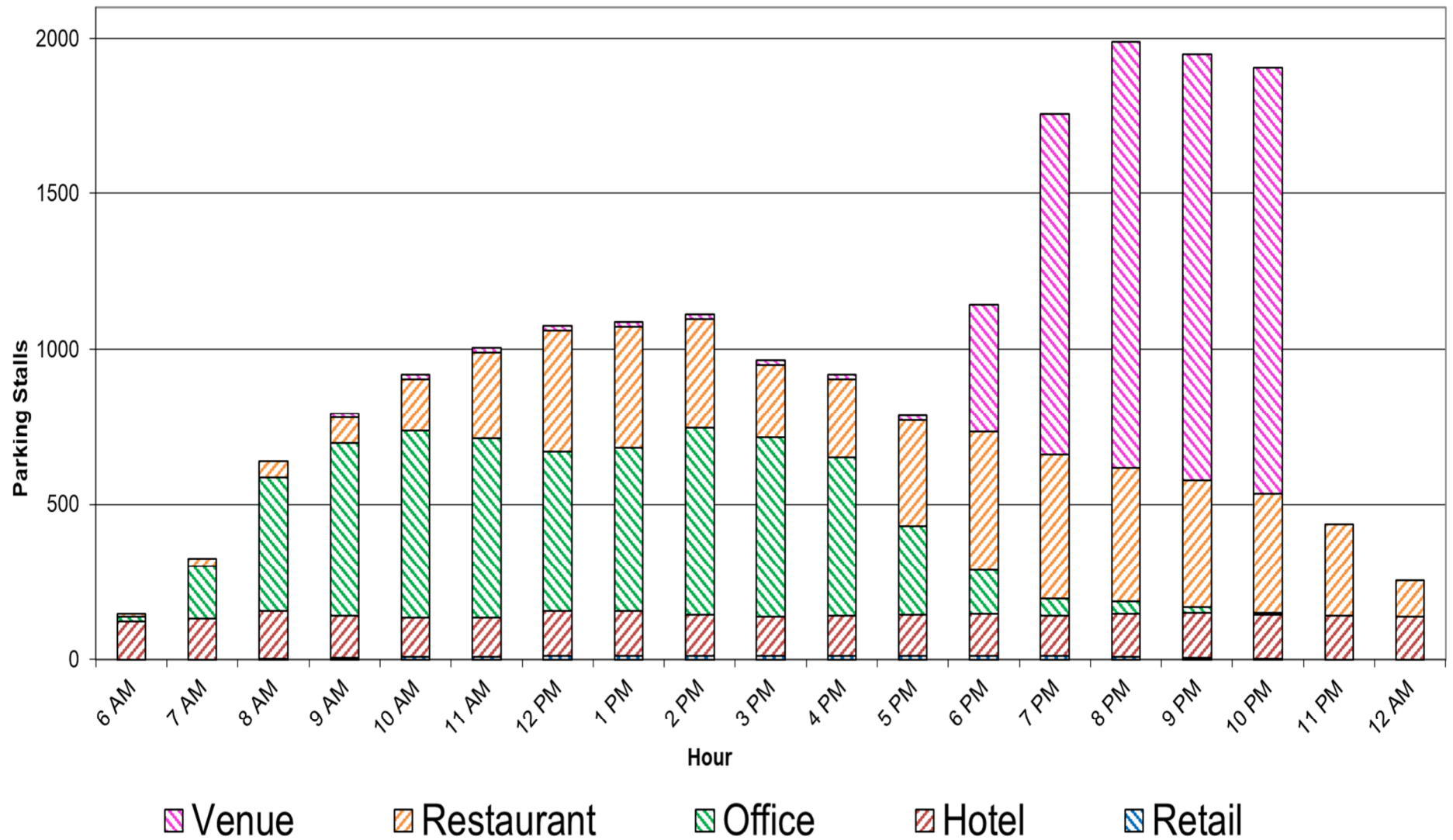


Figure 25. Weekend Peak Month Daily Parking Demand by Hour and Land Uses – Event Peak



References

1. City of Bee Cave
2016 City of Bee Cave Comprehensive Plan, Bee Cave, Texas
2. 2045 Regional Transportation Plan
2020 2045 Regional Transportation Plan (Draft), Austin, Texas.
3. Texas Department of Transportation
2019 Traffic Count Database System, Austin, Texas
4. Transportation Research Board
2016 Highway Capacity Manual, Washington, D.C.
5. Trafficware Ltd
2019 Synchro 10.3, Sugar Land, Texas
6. Institute of Transportation Engineers
2017 Trip Generation Manual, An Informational Report, 10th Edition, Washington D.C.
7. National Household Travel Survey
2017 Average Vehicle Occupancy for Selected Trip Purposes.
8. Shared Parking: Third Edition
2020 The Urban Land Institute, International Council of Shopping Centers, and National Parking Association, Washington D.C.
9. Institute of Transportation Engineers
2017 Trip Generation Handbook, An ITE Proposed Recommended Practice, Washington D.C.
10. Shared Parking Model
2020 The Urban Land Institute, International Council of Shopping Centers, and National Parking Association, 3rd Edition, Washington D.C.
11. City of Bee Cave Code of Ordinances
2013 Section 32.05.001(f), City of Bee Cave, Texas.