HEB DALLAS 01

Transportation Impact Analysis

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H-E-B LP

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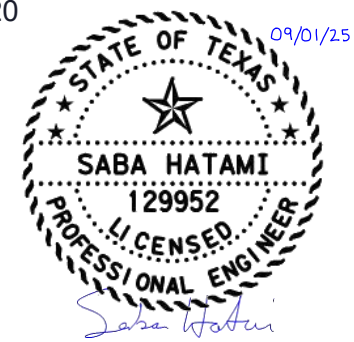

Zoning Case #: Z-25-000085

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1. EXECUTIVE SUMMARY

BOE Consulting Services, LLC (BOE) was retained by H-E-B, LP (HEB) to complete a Traffic Impact Analysis (TIA) for the proposed development of a new HEB Grocery Store to be located at the southeast corner of Hillcrest Road and Interstate Highway 635 Frontage Road (IH 635 FR) in Dallas, Dallas County, Texas. This project is a redevelopment of an existing office complex. The proposed concept plan includes commercial land uses to be constructed in one (1) major build-out, anticipated to be completed in 2027. The analysis includes an evaluation of the existing conditions, as well as the 2027 future "no-build" and "build" conditions. **Figure 1** below provides an aerial image of the site location.

Figure 1: Proposed Site Location

1.1. METHODOLOGY

The study intersections and the parameters of the TIA were identified through the TIA Scoping process with the City of Dallas. The turning movement counts for the identified study intersections utilized in the analyses are collected by Gram Traffic NTX, Inc. on December 12, 2024. It should be noted that area schools were still in session on Thursday December 12, 2024. Additionally, due to the characteristic of the proposed development, weekend counts were also collected on December 15, 2024 in order to evaluate weekend traffic conditions.

The Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, was utilized to estimate the site trips for the proposed HEB Dallas development. Once the trip generation was established, the site trips were distributed throughout the study network based on the overall trip distribution percentages determined based on the existing trip patterns and by applying the best engineering judgment. Once the analyses of the overall distribution were completed and established, the site-specific trip assignment was then evaluated to understand the most likely path for people entering and existing the site itself.

The traffic analyses for existing and future conditions include appropriate traffic volumes and the current geometric conditions. **Synchro™ Version 11** was used to perform capacity analysis at each study intersection, implementing methods from the Highway Capacity Manual (HCM) 2000, and HCM 6 by the Transportation Research Board. Upon completing the analysis for the roadway network, it became evident that with the anticipated future growth of the area, and with the proposed development, the intersections within the study area begin to operate at deficient levels of service. Based on the results of the analysis, transportation related mitigation measures are identified in order to support this development in the future condition.

1.2. RECOMMENDED MITIGATION MEASURES

The following mitigation measures are recommended to mitigate the impact of the site traffic and **Figure 1** below reflects the Concept Plan with the associated driveways labeled for reference.

Figure 2: Proposed Concept Plan

Node 2: Hillcrest Road and IH 635 EBFR

- Widen the northbound Hillcrest Road approach to provide a channelized smart right-turn lane. This improvement will require additional right-of-way be dedicated by the Developer as well. The Project Team will coordinate with the Texas Department of Transportation (TxDOT) and the City of Dallas during the site plan stage to determine final design parameters. This improvement is identified to be funded and constructed entirely by the Developer.

Node 3: Hillcrest Road and Hillcrest Plaza Drive

- Modify the westbound Hillcrest Plaza Drive approach by removing the existing median and restriping the approach to provide an additional left-turn lane. This will also require modifications to the existing traffic signal infrastructure to accommodate the additional turn-lane. Hillcrest Plaza Drive east of Hillcrest Road is a Private Drive with an Ingress/Egress Easement over the drive with the adjacent landowners. The Project Team will coordinate with the adjacent landowners and the City of Dallas during the site plan stage to determine final design parameters. This improvement is identified to be funded and constructed entirely by the Developer.

Node 7: IH 635 EBFR and Driveway A

- Widen the eastbound IH 635 EBFR approach to provide a right-turn deceleration lane. This improvement will require additional right-of-way to be dedicated in order to accommodate this improvement. Further, a Dallas Area Rapid Transit (DART) Bus Stop will also need be relocated as well as other I-635 communication infrastructure that currently lies within the frontage of this property. The Project Team will coordinate with TxDOT during the site plan stage to determine final design parameters. This improvement is identified to be funded and constructed entirely by the Developer.

Node 8: IH 635 EBFR and Driveway B

- Provide an eastbound right-turn deceleration lane into the site. This improvement will require additional right-of-way to be dedicated in order to accommodate this improvement. Further, I-635 communication infrastructure that currently lies within the frontage of this property will be required to be relocated to accommodate this improvement. The Project Team will coordinate with TxDOT during the site plan stage to determine final design parameters. This improvement is identified to be funded and constructed entirely by the Developer.

Hilcrest Plaza Drive

- This roadway is a private drive with an Ingress and Egress Access Easement between the Developer and the three (3) commercial landowners immediately to the south along Hilcrest Plaza Drive. Through this analysis, modifications to this roadway segment have been recommended to increase capacity along the roadway and to provide a direct connection back to the I-635 Eastbound Frontage Road. The Developer will continue to coordinate with the adjacent commercial landowners to finalize the improvements along this roadway segment.

IH 635 EBFR / Flood Warning System

- As part of this study, BOE has coordinated with TxDOT and the City of Dallas related to the existing warning signs and gates that along the IH 635 EBFR. In discussions with these agencies, the Project Team is working with them to bolster the warning system and process at which the system is active. Further, this Project will work with the agencies to install a gate at the site driveway preventing the general public from utilizing Driveway A when the flood warning system is activated.

Pedestrian/Bicycle Facilities

- Sidewalks are not currently provided around the perimeter of the site along Hillcrest Road, I-635 EBFR, nor Hillcrest Plaza Drive. As part of the site development, the Project will be installing sidewalks along the frontage of each roadway. Further, an existing DART Stop along the frontage of the Project to I-635 EBFR will be relocated to ensure transit access is maintained. These mobility improvements will allow adjacent office users and others to access the HEB Store without the need to drive their car for lunch as an example.

2. PROJECT DESCRIPTION

BOE was retained by H-E-B, LP (HEB) to complete a Traffic Impact Analysis (TIA) for the proposed development of a new HEB Grocery Store to be located at the southeast corner of the Hillcrest Road and Interstate Highway 635 Frontage Road (IH 635 FR) in Dallas, Dallas County, Texas.

The proposed concept plan includes commercial land uses to be constructed in one (1) major build-out, anticipated to be completed in 2027.

The TIA Scoping Memo defining the parameters of this report is contained within the Appendix of this report as ***Exhibit 1***. A site location map identifying the property and study intersections is included in the Appendix as ***Exhibit 2***. The location of the proposed development is shown in **Figure 1** below.

Figure 3: Proposed Site Location

The concept plan has been included within the Appendix of this report as ***Exhibit 3***. The proposed development is to include commercial land uses. A summary of the proposed land uses, and the associated trips generated from the land uses can be seen under **Section 5.2** within **Table 3** of this report.

3. STUDY AREA

According to the TIA scope, which was coordinated with the City of Dallas, six (6) intersections have been selected to be analyzed as part of the TIA. An evaluation of the existing roadway network in the vicinity of the site was conducted. Based on this evaluation, the traffic flow in the study area was determined to predominantly occur along IH 635 Frontage Roads and Hillcrest Road. These roadways provide east-west and north-south connectivity for the surrounding area. Additional roadway characteristics are provided below for the primary thoroughfares in the study area network.

3.1. ROADWAY NETWORK

IH 635 Westbound Frontage Road (WBFR) is generally a two-lane cross-section in the vicinity of the study area and is located to the north of the proposed development. The posted speed limit on IH 635 WBFR is 40 mph. Based on the Texas Department of Transportation (TxDOT) Statewide Planning Map, IH 635 WBFR is classified as a minor arterial west of Hillcrest Road and as a major collector east of Hillcrest Road. Based on record data obtained from the Statewide Traffic Analysis and Reporting System (STARS II), the Annual Average Daily Traffic (AADT) along the WBFR was 16,115 in 2024. Bike lanes are not present along IH 635 WBFR. Sidewalks are provided along the north side of IH 635 WBFR. Dallas Area Rapid Transit (DART) routes operate along IH 635 WBFR between Park Central Drive and Preston Road.

IH 635 Eastbound Frontage Road (EBFR) is generally a three-lane cross-section and bounds the proposed site to the north. Beginning east of Hillcrest Road, the IH 635 FR splits into three distinct paths: one (1) lane serving as the IH 635 on-ramp, two (2) lanes serving as a bypass road, and one (1) lane running along the frontage of the site that provides access to Park Central Drive. The posted speed limit on IH 635 EBFR is 40 miles per hour (mph). Based on the TxDOT Statewide Planning Map, IH 635 EBFR is classified as a minor arterial west of Hillcrest Road and as a major collector east of Hillcrest Road, abutting the site. Based on record data obtained from the Statewide Traffic Analysis and Reporting System (STARS II), the Annual Average Daily Traffic (AADT) along the EBFR was 16,907 in 2024. Bike lanes and sidewalk infrastructure are not provided along IH 635 EBFR along the frontage of the property. An existing DART bus stop is located on IH 635 EBFR, approximately 225 feet east of Hillcrest Road. DART routes operate along IH 635 EBFR between Park Central Drive and Preston Road.

Hillcrest Road is a six-lane divided roadway that provides north-south directional movements and bounds the proposed site to the west. Based on the City of Dallas Thoroughfare Plan, Hillcrest Road is classified as a principal arterial. The posted speed limit on Hillcrest Road is 35 mph. Based on the peak hour traffic counts collected as part of this project, the estimated ADT on Hillcrest Road at the intersection of Hillcrest Plaza Drive is 30,290 vpd. Bike lanes are not present along Hillcrest Road. Sidewalks exist along both sides of Hillcrest Road. DART routes are also not present along Hillcrest Road in the vicinity of the proposed site.

Churchill Way is a four-lane divided roadway west of Hillcrest Road and is a four-lane undivided roadway east of Hillcrest Road. Churchill Way provides east-west directional movements and the posted speed limit is 30 mph. According to traffic counts collected by Gram NTX in December 2024, the daily volume on Churchill Way is calculated to be 2,770 vpd at the intersection of Hillcrest Road. This is calculated by applying a k-factor of 0.1 to the total eastbound and westbound Churchill Way approach volumes at the intersection during PM peak period. Bike lanes are not present along Churchill Way. Sidewalks exist along both sides of Churchill Way east of Hillcrest Road, while west of Hillcrest Road, sidewalks are present only on the south side.

Park Central Drive is a four-lane divided roadway that provides north-south directional movements. Based on the City of Dallas Thoroughfare Plan, Park Central Drive is classified as a community collector. The posted speed limit on Park Central Drive is 30 mph. According to traffic counts collected by Gram NTX in December 2024, the daily volume on Park Central Drive is calculated to be 6,710 vpd at the intersection of IH 635 EBFR. This is calculated by applying a k-factor of 0.1 to the total northbound and southbound Park Central Drive approach volumes at the intersection during PM peak period. Bike lanes are not present along Park Central Drive. Sidewalks are generally present along Park Central Drive; however, there are several missing sections of sidewalk between IH 635 EBFR and Forest Lane. DART routes operate along both the northbound and southbound directions of Park Central Drive.

Hillcrest Plaza Drive is a two-lane divided private drive east of Hillcrest Road and is a two-lane undivided public roadway west of Hillcrest Road. Hillcrest Plaza Drive provides east-west directional movements and bounds the proposed site to the south. There are two (2) approach lanes in each direction at the Hillcrest Road intersection, where the eastbound lanes are striped while the westbound lanes are unstriped; however, a lane-use sign on the mast arm confirms that it is a two-lane approach. There is no posted speed along Hillcrest Plaza Drive and therefore, a speed limit of 30 mph is assumed for this study. According to traffic counts collected by Gram NTX in December 2024, the daily volume on Hillcrest Plaza Drive is calculated to be 5,030 vpd at the intersection of Hillcrest Road. Bike lanes and sidewalks are both not present along Hillcrest Plaza Drive.

A site location map identifying the property, study intersections, traffic controls, and lane configurations at the study intersections is provided in the Appendix as ***Exhibit 2***.

3.2. DATA COLLECTION

Gram Traffic NTX was contracted to collect traffic counts at the study intersections. Traffic counts were collected for both weekdays and weekends. Weekday turning movement counts (TMCs) were collected on Thursday, December 12, 2024, during the AM (7:00–9:00) and PM (4:00–6:00) peak periods, while weekend counts were collected on Sunday, December 15, 2024, during the off-peak period (12:30 AM–2:45 PM). Please note that area schools were in session when the traffic counts were collected during the weekday.

Based on the TIA Scoping, TMCs at the following intersections were collected in December:

Turning Movement Counts

- IH 635 WBFR and Hillcrest Road (Signalized)
- IH 635 EBFR and Hillcrest Road (Signalized)
- Hillcrest Road and Hillcrest Plaza Drive (Signalized)
- Hillcrest Road and Churchill Way (Signalized)
- IH 635 WBFR and Park Central Drive (Unsignalized)
- IH 635 EBFR and Park Central Drive (Unsignalized)

24-Hour Counts

- Driveway on IH 635 EBFR
- North Driveway and Hillcrest Road
- South Driveway and Hillcrest Road
- Driveway on Hillcrest Plaza Drive

The AM and PM peak hours observed at the study intersections did not all occur at the same time. Due to these variations, instead of applying one common peak hour, the highest peak hour at each study intersection was used for analysis, as this represents a conservative approach. However, for the four (4) intersections along IH 635 Frontage Road at Hillcrest Road and Park Central Drive, the highest common peak hours between the north and south intersections were used.

Moreover, the traffic signal timings for the signalized intersections that were analyzed as part of this study were obtained from City of Dallas.

All traffic counts utilized in the analysis collected by Gram Traffic NTX are included as ***Exhibit 4*** and the signal timings obtained from City of Dallas have been included as ***Exhibit 5*** within the Appendix of this report. The existing traffic volumes and the volumes for all the future conditions are provided as volume figures in the Appendix of this report as ***Exhibit 6***.

4. PROJECT BACKGROUND GROWTH

For the purposes of this analysis, the proposed development is assumed to be completed in one (1) major build-out phase by the year 2027. As this development is currently going through a zoning application, assumptions on when the development will ultimately be constructed are an estimate based on the information available to us at this time.

4.1. GROWTH RATE

Typically, the growth rate related to traffic is calculated utilizing historic traffic data and future traffic projections obtained from the TxDOT Statewide Planning Map. The calculation yields an average annual growth rate of one percent (1%), which was utilized in the TIA to project future traffic. The historic traffic data from TxDOT Statewide Planning Map and growth rate calculation are included as ***Exhibit 7*** within the Appendix of this report.

4.2. BACKGROUND PROJECTS

Background traffic is the traffic generated by other proposed developments which are planned to be constructed prior to the proposed HEB development. As part of the coordination with the City of Dallas for the TIA Scope, two (2) nearby developments were identified as background projects to be included in this TIA:

- Swan Lake
- Church Redevelopment with K-8 School

The Swan Lake background project is proposed to be located on the northeast quadrant of the Hillcrest Road and Forest Lane intersection. The site trips identified in the Swan Lake background TIA were utilized as background trips in this TIA. The background project traffic volume utilized in the analysis of this TIA is shown on Figure 3, within ***Exhibit 6*** of the Appendix. The Swan Lake TIA is included in the Background Project Summary within the Appendix of this report as ***Exhibit 8***.

The Church Redevelopment with K-8 School project was identified by the City as a development in the vicinity of the proposed site. However, minimal project details were provided by the City as it is currently inactive. Therefore, this development was not included as a background project as part of this analysis.

4.3. FORECASTED (NO-BUILD) CONDITIONS

Between the existing condition and the final 2027 build-out year, traffic around the proposed site is expected to increase by the natural growth of the area. For this study, an average annual growth rate of one percent (1%) was applied to each of the existing turning movement counts detailed within **Section 3.2** of this report.

The projected Forecasted (No-Build) traffic volumes are the growth rate applied to the existing volume plus the site volumes from the background projects, but without the site volume generated by the proposed HEB project. The 2027 Forecasted (No-Build) traffic volumes are shown on Figure 3, within ***Exhibit 6*** *of* the Appendix***.***

5. PROJECTED SITE AND FUTURE BUILD TRAFFIC

The proposed site traffic was estimated through trip generation and trip distribution analyses. This section describes the proposed driveways, while also detailing the methodology used to determine the trip generation and distribution of site traffic throughout the roadway network. This also discusses the resulting turning movement volumes at each study intersection generated by the proposed site.

5.1. PROPOSED DRIVEWAYS

The proposed development will provide six (6) driveways to access the site. The driveways proposed for the developments are designated as:

- Driveway A (easternmost along IH 635 EBFR) – Right-in/Right-out (currently existing)
- Driveway B (westernmost along IH 635 EBFR) – Right-in only
- Driveway C (along Hillcrest Road, just north of Hillcrest Plaza Drive) – Right-in Truck Access Only (currently existing to all traffic)
- Driveway D (westernmost along Hillcrest Plaza Drive) – Full-purpose (currently existing)
- Driveway E (middle driveway along Hillcrest Plaza Drive) – Full-purpose, and
- Driveway F (easternmost along Hillcrest Plaza Drive) – Full-purpose

The driveways and driveway spacings have been identified and labeled in the site plan for the proposed HEB project within the Appendix of the report as ***Exhibit 3***.

5.2. TRIP GENERATION

The proposed HEB project is planned to provide commercial land uses such as Free Standing Discount Superstore and Supermarket. For the trip generation purposes, the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, was used to calculate the anticipated trip generation for the development. As it is related to trip generation, it should be noted that the actual HEB Store is divided between the Supermarket and Free-Standing Discount Superstore as a 60/40 split, respectively. This land use division for the store has been determined based on the evaluation and analysis of how HEB stores over 100,000 square feet in size are stocked and utilized by customers. Decades of research have been performed by HEB through sales analysis that has concluded this determination of land use split. This methodology has been utilized and accepted throughout Texas in all the other markets in which HEB is currently present.

Table 1 summarizes the applicable rates and variables used to estimate trip generation for the proposed HEB on both weekdays and weekends. It should be noted that ITE Trip Generation Manual data indicates that peak weekend traffic occurs on Saturday; therefore, the Saturday trip estimates were applied to the weekend peak hour operations in the vicinity of the site, which occur on Sunday afternoon.

Table 1: ITE Trip Generation 11th Edition Rates-Applicable Rates/Equations

Weekday Trip Generation Rates/Equation									
ITE Code	Land Use	Variable	24-Hour Daily Volume Rate or Equation	AM Peak Hour			PM Peak Hour		
				% Enter	% Exit	Rate or Equation	% Enter	% Exit	Rate or Equation
813	Free-Standing Discount Superstore	SF	T=50.52(X)	56%	44%	T=1.86(X)	49%	51%	T=4.33(X)
850	Supermarket	SF	T=83.39(X)+539.33	59%	41%	T=2.86(X)	50%	50%	Ln(T)=0.81 Ln(X)+2.92

Weekend Trip Generation Rates/Equation					
ITE Code	Land Use	Variable	Saturday Peak Hour of Generator[1]		
			% Enter	% Exit	Rate or Equation
813	Free-Standing Discount Superstore	SF	50%	50%	T=5.58(X)
850	Supermarket	SF	50%	50%	Ln(T)=0.74 Ln(X)+3.41

[1]Used Trip Generation for Saturday Peak Hour as it is the Highest Peak

5.2.1. Unadjusted Trip Generation

From the rates/equation provided in **Table 1** above, the anticipated unadjusted trip generation was calculated for each land use proposed for the Project. A summary of the proposed land uses, and the anticipated unadjusted trip generation can be seen within **Table 2** below:

Table 2: Summary of Unadjusted Trip Generation

ITE Code	Land Use	Size		24-Hour Two-Way Volume	AM Peak Hour			PM Peak Hour			Saturday Peak Hour of Generator[1]		
					Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
813	Free-Standing Discount Superstore	50,800	s.f.	2,566	53	41	94	108	112	220	142	141	283
850	Supermarket	76,200	s.f.	6,894	129	89	218	310	310	620	374	373	747
Proposed - Sub-Total				**9,460**	**182**	**130**	**312**	**418**	**422**	**840**	**516**	**514**	**1,030**

[1]Used Trip Generation for Saturday Peak Hour as it is the Highest Peak

5.2.2. Adjusted Trip Generation

Pass-by trips can account for a significant portion of site generated traffic. Pass-by trips are attracted to the site passing on an adjacent street and are based on information contained in the Pass-by Tables by ITE 11th Edition. Pass-by reductions, therefore, allow for a reduction in site traffic at the existing intersections, but not at site driveways. According to the ITE Trip Generation Handbook, pass-by trips are available during both the AM and PM peak periods, as well as during weekend periods for certain land uses. For others, including the Free-Standing Discount Superstore and Supermarket, pass-by trips are only available during the PM peak period. **Table 3** summarizes the average pass-by trip percentages applied to the land uses in the HEB Dallas development for both weekdays and weekends.

Table 3: Pass-by Trip Percentages Based on ITE

ITE Code	Land Use	AM Peak	PM Peak
813	Free-Standing Discount Superstore	-	29%
850	Supermarket	-	24%
ITE Code	**Land Use**	**Weekend (Saturday)**	
813	Free-Standing Discount Superstore	21%	
850	Supermarket	19%	

Internal capture occurs when customers travel between uses of a mixed use development. This typically occurs when a development has a mix of residential, retail, and office uses and its users do not need to travel on the public roadway network in order to go from one use to the other. Internal capture thus reduces the number of new trips generated on the adjacent roadway network. Although there is potential for internal capture to occur between the proposed land uses and the existing office buildings along Hillcrest Plaza Drive, internal trip reduction was not considered for this study to be conservative.

Table 4 below provides a summary of the trips after adjustments and a detailed calculation on trip reductions have been provided in the Appendix of this report as ***Exhibit 9.*** The adjusted trips below represent the trip generation values that were utilized within the analysis to evaluate the performance of the various intersections analyzed as required by the TIA Scope of Work.

Table 4: Summary of Adjusted Trip Generation

ITE Code	Land Use	Size		24-Hour Two-Way Volume	AM Peak Hour			PM Peak Hour			Saturday Peak Hour of Generator		
					Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
813	Free-Standing Discount Superstore	50,800	s.f.	2,199	53	41	94	77	80	157	112	111	223
850	Supermarket	76,200	s.f.	6,071	129	89	218	236	236	472	303	302	605
Proposed - Sub-Total				**8,270**	**182**	**130**	**312**	**313**	**316**	**629**	**415**	**413**	**828**

5.3. TRIP DISTRIBUTION

Now that the trip generation has been set as discussed above, the anticipated site generated trips are then distributed through the analysis network. The trip distribution calculation is based on the volume of traffic traveling to/from the cardinal directions near the site. As a starting point for the trip distribution, the existing data captured in December was evaluated to understand how vehicles are currently traveling though the roadway system. Please find the existing traffic volumes that are used to calculate the distribution percentages on Figure 1 within ***Exhibit 6***, which is included in the Appendix of this report. The counts are used to calculate the percentage of vehicles entering or exiting the system along a specific roadway over the total volume of vehicles in the entire system.

After calculating the existing trip distributions, the site trips were evaluated for how it would move throughout the network. The trip distribution for the site was evaluated utilizing the existing traffic counts as well as applying engineering judgment for projected traffic patterns with regards to where the origin and destinations of the traffic accessing the site. The overall bi-directional trip distribution percentages are shown in **Table 5**.

Table 5: Overall Directional Distribution

Direction	Percent Distribution
North Hillcrest Road	25%
South Hillcrest Road	30%
West IH 635 FR	15%
East IH 635 FR	15%
South Park Central Drive	5%
West Churchill Way	5%
East Churchill Way	5%

The Traffic Distribution Map is attached as ***Exhibit 10*** showing these overall bi-directional trip distributions to and from the site. The distributions at individual intersections are provided in ***Exhibit 6.***

5.4. SITE TRAFFIC

Once the analyses of the overall distribution were completed and established, the site-specific trip assignment was then evaluated to understand the most likely path for people entering and existing the proposed site driveways. As noted in **Section 5.1** of this report, six (6) driveways are proposed for the development; however, only five (5) were included in the analysis, as Driveway C along Hillcrest Road is anticipated for truck access only and therefore, no site traffic was distributed to it.

The various site driveway assignments were assumptions about the most likely travel path for vehicles based on engineering judgment. Details of these assumptions are shown in **Table 6** and can be found in the electronic copy of the Distribution Spreadsheet.

The site volumes were calculated based on the overall distribution percentages provided in **Table 5** and distributed among the driveways based on the percentages provided in **Table 6**. The 2027 Site (Total) traffic volumes are shown on **Figure 4** within ***Exhibit 6*** of the Appendix.

Table 6: Driveway Distribution of Site Traffic

Direction	Driveway A		Driveway B		Driveway C*		Driveway D		Driveway E		Driveway F	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
North Hillcrest Road	10%	30%	30%	-	-	-	40%	50%	10%	10%	10%	10%
South Hillcrest Road	-	-	-	-	-	-	50%	50%	25%	25%	25%	25%
West IH 635 FR	50%	50%	50%	-	-	-	-	40%	-	5%	-	5%
East IH 635 FR	10%	60%	30%	-	-	-	40%	25%	10%	10%	10%	5%
South Park Central Drive	40%	100%	60%	-	-	-	-	-	-	-	-	-
West Churchill Way	-	-	-	-	-	-	50%	50%	25%	25%	25%	25%
East Churchill Way	-	-	-	-	-	-	50%	50%	25%	25%	25%	25%

*Driveway C is a Truck Access Only driveway that will be controlled; therefore, no general traffic was assigned to this driveway.

5.5. SITE+FORECASTED (BUILD) CONDITIONS

The projected Site+Forecasted (Build) traffic condition is the combined volume of the Forecasted (No-Build) condition detailed in **Section 4.3** and the site traffic described in **Section 5.4** of this report. The 2027 Site+Forecasted (Build) traffic volumes are shown on **Figure 5** of **Exhibit 6** in the Appendix.

6. ACCESS MANAGEMENT ANALYSES

Access Management Analysis was performed for this development to evaluate the spacing of driveways to nearby intersections, intersection sight distance from the proposed driveway and the need, if any, for a right-turn deceleration lane along eastbound IH 635 EBFR at the proposed driveways.

6.1. ACCESS SPACING

The access spacing for driveways along the frontage road is based on *Table 2-1*, Frontage Road Connection Spacing Criteria in the TxDOT Access Management Manual (AMM). Table *2-1* of the AMM indicates that for a one-way frontage road with a posted speed limit of 40 mph (posted speed limit on IH 635 EBFR), the required spacing between access points is 305 feet.

Driveway A – The distance between Driveway A and the nearest adjacent driveway/intersection (Driveway B to the west) is approximately 790 feet. Therefore, Driveway A meets the required minimum spacing.

Driveway B – The distance between Driveway B and the nearest adjacent driveway/intersection (Hillcrest Road to the west) is approximately 160 feet. Therefore, Driveway B does not meet the required minimum spacing and will require a variance to be obtained from TxDOT as part of its future driveway permit.

The access spacing for driveways along the City streets within the study area is based on the requirements provided in the City of Dallas Off-Street Parking and Driveways Handbook. According to the Handbook, the driveway spacing criteria are as follows:

- For a driveway on an arterial (Hillcrest Road), the minimum spacing between the driveway and an intersecting arterial (IH 635 EBFR) is 55 feet, and the desirable spacing is 250 feet.

- For a driveway on an arterial (Hillcrest Road), the minimum spacing between the driveway and the intersecting local street is 40 feet, and the desirable spacing is 50 feet.

Driveway C – The distance between Driveway C and IH 635 EBFR is approximately 380 feet, which meets the City's desirable threshold of 250 feet. The distance between Driveway C and Hillcrest Plaza Drive is approximately 40 feet, which meets the City's minimum threshold of 40 feet.

Driveway D along Hillcrest Plaza Drive will be located approximately 500 feet east of Hillcrest Road (intersecting arterial). The spacing between Driveway D and Driveway E is approximately 270 feet, and between Driveway E and Driveway F is approximately 330 feet. Hillcrest Plaza Drive is a Private Drive.

The proposed spacing meets the City's minimum threshold separation.

6.2. INTERSECTION SIGHT DISTANCE

An Intersection Sight Distance (ISD) analysis was performed for all proposed access points of the development on public roadways. The American Association of State Highway and Transportation Officials (AASHTO) Green Book was the basis of the ISD analysis. **Table 7** below provides the criteria from *Table 9-9* from AASHTO, which presents the ISD calculated for Case B2, right-turns for various speed obtained from AASHTO.

Table 7: Minimum ISD for Case B2-Right Turn from Stop (AASHTO)

Design Speed (mph)	Stopping Sight Distance (feet)	Intersection Sight Distance for Passenger Cars	
		Calculated (feet)	Design (feet)
15	80	143.3	145
20	115	191.1	195
25	155	238.9	240
30	200	286.7	290
35	250	334.4	335
40	305	382.2	385
45	360	430	430
50	425	477.8	480
55	495	525.5	530
60	570	573.3	575
65	645	621.1	625
70	730	668.9	670
75	820	716.6	720
80	910	764.4	765

Driveway A – This driveway is located on IH 635 EBFR, which has a posted speed limit of 40 mph, and is proposed to operate as right-in/right-out. The design ISD for right turns out of Driveway A is 385 feet. **The sight distance is met for Driveway A.**

Driveway B – This driveway is located on IH 635 EBFR and is proposed to operate as right-in only. Therefore, ISD analysis is not applicable at Driveway B.

Driveway C – This driveway is located on Hillcrest Road, which has a posted speed limit of 35 mph, and is proposed to operate as right-in only for loading/delivery trucks. Since this driveway is proposed as ingress only, ISD calculations have not been performed.

Table 8 below summarizes the ISD analysis and results for Driveways A.

Table 8: Summary of Intersection Sight Distance

Major Roadway	IH 635 EBFR
Speed Limit	40 mph
Design Vehicle	Passenger Car
Minor Roadway	Driveway A
Required Sight Distance	385 Feet
Sight Distance Met?	Yes

**Calculated utilizing a combination truck as the design vehicle*

The ISD schematic for Driveway A along IH 635 EBFR, is provided within the Appendix of this report as ***Exhibit 11***. Based on the exhibit, it has been visually determined that adequate ISD can be accommodated for vehicles exiting Driveway A onto IH 635 EBFR. The ISD calculations are based on given variables and do not account for field conditions. It is recommended that prior to the construction of the driveway, in-situ conditions should be evaluated to determine if an adequate clear line of sight is achievable. BOE does not guarantee, nor does it certify that the in-situ conditions match the calculations above.

6.3. RIGHT-TURN DECELERATION LANE

A turn lane analysis was performed for all proposed driveways along public roadways. For driveways along the frontage road, the TxDOT Access Management Manual was utilized, which states that a right-turn deceleration lane should be considered at a driveway if the right-turn volume exceeds 60 vehicles per hour (vph) on a roadway with a posted speed limit less than or equal to 45 mph. For driveways along City streets, guidelines from the City of Dallas Off-Street Parking and Driveways Handbook were utilized, which states that a deceleration lane should be considered on arterials operating at speeds greater than 35 mph or if the entering right-turn volume exceeds 120 vph during peak periods.

6.3.1. Driveway A at IH 635 EBFR

The speed limit along IH 635 EBFR is 40 mph. The projected peak hour volume for the eastbound right-turn movement at this intersection under 2027 Site+Forecasted traffic conditions was 25, 42, and 56 vph during the weekday AM, weekday PM, and Weekend peak hours, respectively. The TxDOT volume threshold of 60 vph for considering a right-turn deceleration lane is not met at Driveway A; however, given the characteristic of the development and the intention to limit this driveway to an ingress only driveway, **a right-turn deceleration lane is recommended** and will be provided as part of the site development.

6.3.2. Driveway B at IH 635 EBFR

The speed limit along IH 635 EBFR is 40 mph. The projected peak hour volume for the eastbound right-turn movement along IH 635 EBFR at Driveway B under 2027 Site+Forecasted traffic conditions were 41, 70, and 93 vph during the weekday AM, weekday PM, and Sunday peak hours, respectively. The TxDOT volume threshold of 60 vph for considering a right-turn deceleration lane is met at Driveway B. Therefore, **a right-turn deceleration lane is recommended** and will be provided as part of the site development.

6.3.3. Driveway C at Hillcrest Road

Hillcrest Road is classified as a principal arterial per the City of Dallas Thoroughfare Plan; however, the proposed Driveway C along Hillcrest Road will be an access controlled Truck Access Only driveway. Therefore, a northbound deceleration lane along Hillcrest Road is not recommended at Driveway C. **Table 9** provides a summary of the turn lane analysis for the driveways.

Table 9: Summary of Right-Turn Lane Analysis Results

Intersection	Right-turn Lane Threshold (vph)	2027 Site+Forecasted Right Turn Volume (vph)				Turn Lane Warranted?	Turn Lane Recommended?
		AM	PM	Weekend	Max		
IH 635 FR & Driveway A	60	25	42	56	56	No	Yes
IH 635 FR & Driveway B	60	41	70	93	93	Yes	Yes
Hillcrest Road & Driveway C	>35 mph or 120 vph	0	0	0	0	No	No

7. CRASH ANALYSIS

As part of this TIA, crash data were obtained from the Statewide database, Crash Records Information System (CRIS) by TxDOT, starting in 2020 through 2025. The data were summarized to identify the most frequent crash types at each study intersection. **Table 10** provides a summary of the crash types that occur most frequently at each intersection.

Table 10: Summary of Crashes at the Study Intersections

Intersection	Type of Accident	# of Occurrences
Hillcrest Road & IH 635 WBFR	Angle-Both Going Straight	12
	Opposite Direction-One Straight-One Left-turn	8
	Sub-Total	**20**
Hillcrest Road & IH 635 EBFR	Same Direction-One Straight-One Stopped	13
	Angle-Both Going Straight	4
	Opposite Direction-One Straight-One Left-turn	3
	Sub-Total	**20**
Hillcrest Road & Hillcrest Plaza Drive	Same Direction-Both Going Straight-Sideswipe	1
	Sub-Total	**1**
Hillcrest Road & Churchill Way	Opposite Direction-One Straight-One Left-turn	3
	Angle--One Straight-One Left-turn	2
	Sub-Total	**5**
Park Central Drive & IH 635 WBFR	One Motor Vehicle-Turning Left	1
	One Motor Vehicle-Going Straight	1
	Sub-Total	**2**
	Total	**48**

Based on **Table 10**, the majority of crashes were rear-end and angle collisions. These are typically associated with congestion and queuing, sudden stopping at traffic signals due to inadequate signal timing, and left-turn movements under permissive phasing. The raw crash data obtained from the CRIS database is provided within the Appendix of this report as ***Exhibit 12***.

8. TRAFFIC ANALYSIS

The traffic analysis performed for this study includes a level of service and delay analysis for each of the study intersections. This section describes the methodology used in the traffic analysis and details the results of the various conditions analyzed as part of the TIA.

8.1. TRAFFIC MODELING METHODOLOGY

Synchro™ Version 11 was used to perform capacity analysis at each intersection. Synchro implements capacity analysis functions based on methods from the Highway Capacity Manual (HCM) 2000, and HCM 6 by the Transportation Research Board (TRB). The HCM is a nationally recognized standard for performing capacity analyses.

Capacity analyses are evaluated based on a level of service (LOS) that ranges from A to F. LOS A and B typically represent roadways that experience zero delay with vehicles traveling at or just above the 85th percentile speed. This typically occurs during the middle of the day or in the middle of the night. LOS C and D typically represent roadways that experience minor levels of delay with vehicles traveling at or just below the 85th percentile speed. This typically occurs just before or just after the peak hour conditions (rush hour). LOS E and F represent roadways that experience higher levels of delay with vehicles traveling below the 85th percentile speed. This typically occurs during peak hour conditions. Facilities that perform at a LOS A through C at all times of the day are considered to be overdesigned and unnecessary. In contrast, some have suggested that LOS E and F, while representing congestion, may also reflect a robust economy.

The LOS criteria for signalized and unsignalized intersections are different and is mainly because of how the driver's function at a signalized versus unsignalized intersections. The level of service thresholds from the Highway Capacity Manual are shown in **Table 11** below.

Table 11: Intersection Level of Service Thresholds

LOS	Control Delay Per Vehicle (seconds)	
	Signalized Intersection	Stop-Controlled Intersection
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

For unsignalized intersections with side-street stop-controlled (SSSC) approaches, the LOS are reported for the stop-controlled approaches rather than the overall intersection LOS, since the major approaches are free to proceed through the intersection. However, for unsignalized four-way stop-controlled intersections, the LOS is reported for the overall intersections. In cases where intersections and/or approaches did not meet an acceptable level of service, recommendations were made for improving the intersection.

8.2. PERFORMANCE METRICS

The traffic analysis for the existing and future conditions includes appropriate traffic volumes and the current geometric conditions. The analysis results provided are broken down by four (4) key performance metrics, Level of Service (LOS), Delay, volume-to-capacity (V/C) ratio, and 95th percentile queue for each intersection. These were determined for three (3) distinct scenarios:

- 2025 Existing
- 2027 No Build (Forecasted)
- 2027 Build (Site+Forecasted)

Further, this analysis was performed for the Weekday AM and PM Peak conditions as well as the Weekend Peak condition. The Synchro outputs with existing geometry (No Improvements) have been provided in the Appendix of this report as ***Exhibit 13***. The existing traffic analysis includes the current geometric conditions. Due to the large size, a detailed performance metrics table with existing geometry (No Improvements) is included as ***Exhibit 14*** in the Appendix of this report***.*** The analysis results provided in ***Exhibit 14*** are broken down by LOS, Delay, V/C ratios, and 95th percentile queue for each intersection.

9. FINDINGS AND RECOMMENDATIONS

Mitigation measures have been identified for intersection and approaches where feasible. The Synchro outputs for the intersections with improvements have been included within the Appendix of this report as ***Exhibit 15***. The analyses results with improvements in tabular format have been included within the Appendix of this report as ***Exhibit 14.***

Based on the results of the capacity analysis for the study intersections, improvements need to be evaluated to mitigate the impact of the site traffic at the study intersections. The following section summarizes the operations of the study intersections and proposed driveways, as well as the recommended improvements at these locations.

9.1.1. Node 1: Hillcrest Road and IH 635 WBFR

This is a 4-legged signalized interchange. Hillcrest Road provides north-south directional movements, and IH 635 WBFR provides westbound directional movements carrying westbound traffic only. This intersection is a clustered intersection with Hillcrest Road and IH 635 EBFR intersection (Node #2).

- The overall intersection operates at LOS E during both AM and PM peak hours and at LOS D during weekend peak hour under the existing condition.
- The intersection continues to operate at LOS E during both AM and PM peak hours and LOS D during weekend peak hour under the 2027 Forecasted condition.
- The intersection continues to operate at LOS E during both AM and PM peak hours and at LOS D during weekend peak hour under the 2027 Site+Forecasted condition, with the completion of the HEB development.

All the reported movements will continue to operate with same LOS and increase in delay compared to the Forecasted condition during AM, PM, and Weekend peak hours as the traffic volumes at this intersection incrementally increase due to the applied growth factor along with the addition of the background project trips and the proposed site trips.

Signal timing optimization alone could mitigate the impact of the site traffic at this intersection; however, for meaningful improvements, a geometric modification to the interchange is required. Unfortunately, geometric improvements are not feasible due to ROW constraints and the interchange width being limited by the overpass structure (i.e. would require the reconstruction of the entire bridge structure). Additionally, the signal timing for this interchange is part of the Hillcrest Road coordinated corridor; therefore, isolated signal timing optimization is not recommended.

9.1.2. Node 2: Hillcrest Road and IH 635 EBFR

This is a four-legged signalized interchange. Hillcrest Road provides north-south directional movements, and IH 635 EBFR provides eastbound directional movements carrying eastbound traffic only. This intersection is a clustered intersection with Hillcrest Road and IH 635 WBFR intersection (Node #1) detailed above.

- The overall intersection operates at LOS D during both AM and PM peak hours and at LOS C during weekend peak hour under the existing condition.
- The intersection continues to operate at LOS D during both AM and PM peak hours and at LOS C during weekend peak hour under the 2027 Forecasted condition.
- The intersection continues to operate at LOS D during both AM and PM peak hours and also at LOS D during weekend peak hour under the 2027 Site+Forecasted condition, with the completion of the HEB development.

All the reported movements will continue to operate at an acceptable LOS condition during the weekend peak period under the 2027 Site+Forecasted condition. In order to mitigate the impact of site traffic, the following improvement is recommended:

- Widen northbound Hillcrest Road to provide an exclusive smart right-turn lane.

With these improvements, the intersection continues to operate at LOS D, but with a reduced overall delay.

9.1.3. Node 3: Hillcrest Road and Hillcrest Plaza Drive

This is a four-legged signalized intersection. Hillcrest Road provides north-south directional movements, and Hillcrest Plaza Drive provides east-west directional movements. Hill Crest Plaza Drive, west of Hillcrest Road is a public roadway while Hill Crest Plaza Drive, east of Hillcrest Road is a private drive with a mutual ingress/egress easement between various landowners.

- The overall intersection operates at LOS B during AM peak, LOS C during PM peak hour, and LOS B during weekend peak hour under the existing condition.
- The overall intersection continues to operate the same at LOS B during AM peak, LOS C during PM peak hour, and at LOS B during weekend peak hour under the 2027 Forecasted condition.
- The overall intersection operates at LOS B during AM peak, LOS D during PM peak hour, and LOS D during weekend peak hour under the 2027 Site+Forecasted condition.

In order to mitigate the impact of site traffic, the following improvement is recommended:

- Modify the westbound Hillcrest Plaza Drive approach by removing the existing median and restriping the approach to provide an additional left-turn lane.

With these improvements, the delay of the westbound left-turn movements were significantly reduced. No additional improvements are recommended at this time.

9.1.4. Node 4: Hillcrest Road and Churchill Way

This is a four-legged signalized intersection. Hillcrest Road provides north-south directional movements, and Churchill Way provides east-west directional movements.

- The overall intersection operates at LOS C during AM peak, LOS B during PM peak hour, and LOS A during weekend peak hour under the existing condition.
- The overall intersection continues to operate the same at LOS C during AM peak, LOS B during PM peak hour, and LOS A during weekend peak hour under the 2027 Forecasted condition.
- The overall intersection continues to operate the same at LOS C during AM peak, LOS B during PM peak hour, and LOS A during weekend peak hour under 2027 Site+Forecasted condition.

As the reported movements that have been impacted are experiencing only a minor delay increase, no improvements are proposed for this intersection at this time.

9.1.5. Node 5: IH 635 WBFR and Park Central Drive

This is a 4-legged unsignalized interchange intersection. Park Central Drive provides north-south directional movements, and IH 635 WBFR provides westbound directional movements only.

- The overall intersection operates at LOS B during AM and PM peak hour, and at LOS C during weekend peak hour under the existing condition.
- The overall intersection continues to operate the same at LOS B during AM and PM peak hour, and at LOS C during weekend peak hour under the 2027 Forecasted condition.
- The overall intersection operates at LOS C during AM and PM peak hour, and at LOS E during weekend peak hour under 2027 Site+Forecasted condition.

In coordination with TxDOT, future signalization of this intersection is not currently planned. No additional improvements are feasible at this time.

9.1.6. Node 5: IH 635 EBFR and Park Central Drive

This is a 4-legged unsignalized interchange intersection. Park Central Drive provides north-south directional movements, and IH 635 EBFR provides eastbound directional movements only.

- The overall intersection operates at LOS C during AM, PM, and weekend peak hour under the existing condition.
- The overall intersection continues to operate at LOS C or better during AM, PM, and weekend peak hour under the 2027 Forecasted condition.
- The overall intersection operates at LOS C during AM and PM peak hour, and at LOS E during weekend peak hour under 2027 Site+Forecasted condition.

In coordination with TxDOT, future signalization of this intersection is not currently planned. No additional improvements are feasible at this time.

9.1.7. Node 7: IH 635 EBFR and Driveway A

This proposed intersection is a three-legged, unsignalized intersection where IH 635 EBFR is the eastbound leg and Driveway A is the south leg. The IH 635 EBFR is a free eastbound movement, and Driveway A is proposed as a right-in/right-out driveway.

As part of the turn-lane analysis provided in Section 6.3.2, a deceleration lane is required at this site driveway. Therefore, a right-turn deceleration lane is recommended and proposed as part of the site development to improve traffic operations along the frontage road.

9.1.8. Node 20: IH 635 EBFR and Driveway B

This proposed intersection is a three-legged, unsignalized intersection where IH 635 EBFR is the eastbound leg and Driveway B is the south leg. The IH 635 EBFR is a free eastbound movement, and Driveway B shall be an ingress only driveway and modeled as such within this analysis.

As part of the turn-lane analysis provided in Section 6.3.1, a deceleration lane is not required at this site driveway; however, a right-turn deceleration lane shall be provided by the development to further enforce the ingress only operations.

9.1.9. Hilcrest Plaza Drive

This roadway is a private drive with an Ingress and Egress Access Easement between the Developer and the three (3) landowners immediately to the south along Hilcrest Plaza Drive. Through this analysis, modifications to this roadway segment have been recommended to increase capacity along the roadway and to provide a direct connection back to the I-635 Eastbound Frontage Road. The Developer will continue to coordinate with the adjacent Stakeholders to finalize the improvements along this roadway segment.

9.1.10. IH 635 EBFR / Flood Warning System

As part of this study, BOE has coordinated with TxDOT and the City of Dallas related to the existing warning signs and gates that along the IH 635 EBFR. In discussions with these agencies, the Project Team is working with them to bolster the warning system and process at which the system is active. Further, this Project will work with the agencies to install a gate at the site driveway preventing the general public from utilizing Driveway A when the flood warning system is activated.

9.1.11. Pedestrian/Bicycle Facilities

Sidewalks are not currently provided around the perimeter of the site along Hillcrest Road, I-635 EBFR, nor Hillcrest Plaza Drive. As part of the site development, the Project will be installing sidewalks along the frontage of each roadway. Further, an existing DART Stop along the frontage of the Project to I-635 EBFR will be relocated to ensure transit access is maintained. These mobility improvements will allow adjacent office users and others to access the HEB Store without the need to drive their car for lunch as an example.

The Improvements Summary Table, which outlines the recommended mitigation measures, and the schematics of the geometric improvements proposed for the study intersections are provided in the Appendix of this report as *Exhibit 16*.

10. REFERENCES

1. “Dallas” 32°55’25” N and 96°47’15” W. Near Map, May 23, 2025.
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APPENDIX