Technical Memorandum

To:	Mr. Upal Barua, P.E., PTOE	From:	Bobak J. Tehrany, P.E.
	Austin Transportation Department		BOE Consulting Services, LLC
File:	100111	Date:	June 9, 2019

Reference: HEB Tarrytown Traffic Summary

The summary provided herein is based on traffic data collected on April 11, 2019 at the following intersections identified by Austin Transportation Department (ATD):

- Lake Austin Blvd & Atlanta St/Mopac SBFR
- Lake Austin Blvd & Veterans Drive
- Lake Austin Blvd & Newman Drive
- Lake Austin Blvd & W 7th St
- Lake Austin Blvd & Exposition Blvd
- Lake Austin Blvd & Red Bud Trail
- Exposition Blvd & Enfield Road
- W 7th St/Newman Drive

Trip Generation

The trip generation for the proposed HEB located at the intersection of Lake Austin Boulevard and Exposition Boulevard is calculated using ITE Trip Generation Handbook (10th Edition). Currently, there exists a Randall's at the site location that is to be vacated and converted into the proposed HEB. The net trip generation calculated for the proposed HEB store is shown in the **Table 1** below:

Table 1 Trip Generation Summary

ITE Code	ITE Land Use	Size		24-Hour Daily Volume	AM Peak Hour			PM Peak Hour		
					Enter	Exit	Total	Enter	Exit	Total
Existing Randalls Store										
850	Supermarket	34,000	s.f.	3,631	78	52	130	160	154	314
	Total Existing Trips			**3,631**	**78**	**52**	**130**	**160**	**154**	**314**
Proposed HEB Store										
813	Free Standing Discount Superstore	42,052	s.f.	2,132	44	34	78	89	93	182
850	Supermarket	63,077	s.f.	6,735	145	96	241	297	286	583
932	High-Turnover (Sit-Down) Restaurant	3,703	s.f.	415	20	17	37	22	13	36
	Total Proposed Trips			**9,283**	**208**	**147**	**356**	**409**	**391**	**801**
	Net Increase of Trips			**5,652**	**130**	**95**	**226**	**249**	**238**	**487**

Overall Traffic Distribution

Based on the data captured, it was observed that there is an 80-20-20 split between Exposition Boulevard and Eastbound and Westbound Lake Austin Boulevard. The trip distribution for the proposed HEB store was determined utilizing the existing traffic distribution as the starting point and by considering the prevalent land uses around the vicinity of the proposed HEB store as well as applying suitable engineering judgment. **Table 2** below provides a summary of distribution of the proposed HEB store site trips along adjacent roadways.

Table 2 Overall Directional Distribution

Direction	% of Site Traffic
N Exposition Blvd	50%
W Lake Austin Blvd	15%
E Lake Austin Blvd	20%
Red Bud Trail	5%
Mopac SBFR/Atlanta St	7%
Newman Drive	3%
Total	**100%**

Exhibit 01 at the end of this technical memorandum provides a graphical representation of the proposed site trip distribution.

Proposed HEB Site and Future Roadway Network

Per scope and guidance received from ATD, a growth factor of 1% per year was used to calculate the 2021 Base Forecasted Conditions. The section of W 7th St between Newman Drive and Lake Austin Boulevard is proposed to be eliminated with W 7th St terminating at the intersection of Newman Drive to form a T- intersection with stop control along W 7th St. This roadway modification is not part of the HEB development; however, it was requested by ATD to evaluate in the case that this vacation does occur as City support will be required to achieve this modification. The base traffic for the 2021 Forecasted Conditions has been adjusted and redistributed at the Newman Drive/W 7th St and Newman Drive/Lake Austin Blvd to match the elimination of W 7th St section between Newman Drive and Lake Austin Boulevard.

The proposed HEB store is expected to have two driveway access points servicing the site. One driveway access (Driveway A) is located along Exposition Blvd and the second driveway access (Driveway B) is located along Newman Drive. A truck/delivery access will also be located along Exposition Blvd just north of Driveway A. Per ATD's request; we have evaluated the potential future realignment of Exposition Boulevard. It should be noted that this realignment is not required nor needed for the HEB. It was evaluated as requested by ATD for future developments south of Lake Austin Boulevard to understand what potential impact the realignment would have

on the roadway network. The section of Exposition Boulevard along HEB Site frontage and the intersection of Exposition Boulevard/Lake Austin Boulevard could be realigned by others in the future to align with a theoretical southern leg at this intersection. **Exhibit 02** at the end of this technical memorandum provides a preliminary site plan of the proposed HEB Store and a draft schematic of the proposed reconfigurations at the intersections of W 7th St/Newman Drive, Newman Drive/Lake Austin Blvd and Exposition Blvd/Lake Austin Blvd.

For the purposes of this technical memorandum, the 2021 Site + Forecasted Conditions analyzes the intersection of W7th St/Lake Austin Blvd as a T-intersection with stop control along W 7th St. The intersection of Exposition Blvd/Lake Austin Blvd is still analyzed similar to current lane configurations under the 2021 Site + Forecasted Conditions since no definite information pertaining to the land use and the site traffic related to the fourth leg at this intersection is available at this time.

Synchro Model Calibration

Per directives from ATD, the base Synchro network for existing conditions was required to be calibrated to match existing operational parameters of demand/queue lengths. For purposes of calibration, AM peak hour queues were captured on Friday morning (June 7) and PM peak hour queues were captured on Thursday evening (June 6) to understand the actual queues in the field. **Exhibit 03** at the end of this technical memorandum provided summary of the queues captured in the field. Per guidelines available within Synchro, the saturation flow rate and the headway factor were adjusted as needed (Refer image below) to obtain queue lengths in Sim Traffic that would reasonably match the captured queue data. An exact calibration could not be achieved due to the difference in time periods between data collection of the turning movement counts and captured queue lengths. The calibration of the base Synchro network was iterated suitably to achieve minimal delta between the results of the Simtraffic and actual data collected and captured.

Table 26-6 Saturation Flow and Headways for Given Speeds

Speed (mph)	Headway (s)	Saturated Flow Rate (vph)
0	0.50	NA
9	0.86	1545
10	0.90	1619
15	1.03	1883
25	1.35	1916
30	1.40	1955
40	1.50	1966
50	1.60	1931
60	1.60	1977
80	1.6	2039

Findings and Recommendations

The purpose of the technical memorandum is to identify the impacts of the proposed HEB Site Trips on the study area intersection and provide recommendations to mitigate the potential impacts. A brief summary of capacity analysis results for each study area intersections are provided in **Table 3** below. **Exhibit 04** at the end of this technical memorandum provides turning movements counts for all the study area intersections under all the scenarios analyzed. The detailed performance results for each study area intersection are available at the end of this technical memorandum as **Exhibit 05**. The capacity analysis reports obtained from Synchro are also available at the end of this technical memorandum as **Exhibit 06.**

Table 3 Performance Summary

Node #	Intersection	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		2019 Existing		2019 Existing		2021 Forecasted		2021 Forecasted		2021 S+F		2021 S+F	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	Lake Austin Blvd & Atlanta Street	C	29.9	C	27.7	C	31.6	C	28.0	C	32.0	C	29.3
2	Lake Austin Blvd & Veterans Drive	B	14.4	C	21.0	B	14.8	C	21.5	B	15.2	C	22.1
3	Lake Austin Blvd & Exposition Blvd	B	14.1	B	18.5	B	14.3	B	18.6	B	16.0	C	22.6
4	Lake Austin Blvd & Redbud Trail	B	18.3	C	22.3	B	19.1	C	23.7	B	19.6	C	26.6
5	Exposition Blvd & Enfield Road	C	30.1	C	33.5	C	30.6	D	39.7	C	32.6	E	72.2
10[(1)]	Lake Austin Blvd & Newman Drive	F	50.3	E	39.3	F	82.0	F	51.1	F	121.5	F	148.0
20[(1)(2)]	Lake Austin Blvd & W 7th Street	B	11.3	B	13.2	-	-	-	-	-	-	-	-
30[(1)(2)]	Newman Drive & W 7th Street	B	13.9	B	12.1	B	13.6	B	12.5	B	14.2	B	13.8
(1): Stop Control Intersections													
(2): Section of W 7th St between Lake Austin Blvd and Exposition is considered eliminated per proposed site plan													
(3): Newman Drive and W 7th Street is considered to operate as T-intersection with W 7th St terminating at Newman Drive per proposed HEB site plan													

Lake Austin Blvd & Mopac SBFR/Atlanta St: This intersection is operating at LOS C or better under 2021 Site + Forecasted Conditions in both AM and PM Peak. Under 2021 Site + Forecasted Conditions; the 95th percentile queue does exceed capacity along EBT (PM Peak), WBL (AM Peak). The EBT queue is due to high volume of traffic travelling EB during the PM peak. There is limited room to extend the storage due to adjacent intersection located at Lake Austin/Veterans Drive. The WBL queue is due to high volume of traffic turning into SB Mopac during AM peak. There is limited room to extend the WBL at this location due to right-of-way constraints. No improvements are recommended at this intersection as this intersection is already built out.

Lake Austin Blvd & Veterans Dr: This intersection is operating at LOS C or better under 2021 Site + Forecasted Conditions in both AM and PM Peak. No improvements are recommended at this intersection.

Lake Austin Blvd & Exposition Blvd: This intersection is operating at LOS C or better under 2021 Site + Forecasted Conditions in both AM and PM Peak. Under 2021 Site + Forecasted Conditions; the 95th percentile queue does exceed capacity along SBL (PM Peak). It is recommended to extend the SBL storage length at this intersection to match the 95th percentile queue observed.

Lake Austin Blvd & Red Bud Trail: This intersection is operating at LOS C or better under 2021 Site + Forecasted Conditions in both AM and PM Peak. Under 2021 Site + Forecasted Conditions; the 95th percentile queue does exceed capacity along EBR (PM Peak), WBL (PM Peak) and NBR (AM Peak). It is recommended to extend the storage length at this intersection to match the 95th percentile queues observed. No other improvements are needed at this intersection.

Exposition Blvd & Enfield Road: This intersection is operating at LOS C or better under 2021 Site + Forecasted Conditions in the AM Peak. This intersection is operating at LOS D under 2021 Forecasted Conditions in PM Peak. The LOS at this intersection degraded to LOS E Under 2021 Site + Forecasted Conditions in PM Peak due to addition of site trips. The 95th percentile queue does exceed capacity along NBL (PM Peak), NBT/R (AM Peak, PM Peak), EBL (PM Peak), EBT/R (PM Peak) WBL/T/R (PM Peak), SBT/R (PM Peak). It is recommended to extend the storage length at this intersection to match the 95th percentile queues observed and provide dedicated storage bays along shared approaches at this intersection. No other improvements are needed at this intersection.

Lake Austin Blvd & Newman Drive: This intersection is operating at LOS F 2019 Existing, 2021 Forecasted and continues to operate at LOS F Under 2021 Site + Forecasted Conditions in both AM and PM Peak. This is due to insufficient gaps available at this intersection for traffic to merge into Lake Austin Blvd due to heavy eastbound and westbound traffic. It is recommended that the City of Austin restrict traffic movements at this intersection to a right-in/right-out movement only.

W 7th St & Newman Drive: This intersection is operating at LOS B or better under 2021 Site + Forecasted Conditions. This intersection will be modified to a T-intersection with stop control along W 7th Street under 2021 Site + Forecasted as part of proposed HEB site development. No additional improvements are recommended at this intersection.

Lake Austin Blvd & W 7th St: There is no capacity analysis result at this intersection as this intersection was evaluated to be eliminated in the future.

We appreciate your review of this information and should you have any questions, please contact us.

Sincerely,

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APPENDIX

A1: TRIP DISTRIBUTION

A2: PRELIMINARY SITE PLAN & RODWAY SCHEMATICS

A3: AM & PM FIELD CAPTURED QUEUES

A4: TURNING MOVEMENTS

A5: PERFORMANCE TABLES

A6: SYNCHRO OUTPUTS