TECHNICAL
MEMORANDUM - DRAFT

To
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From
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Cc
HNTB Project File: 38435

Subject
Walgreens at E. Franklin TIS – Addendum Crash/Driveway Volume Study

Date
2/11/10

Per Town of Chapel Hill request, and related to the *Walgreens at E. Franklin Street Traffic Impact Study*, prepared by HNTB North Carolina, PC in March 2007, the following information represents a detailed data compilation and analysis of vehicular crashes and peak hour traffic volumes at the intersection of E. Franklin Street and Estes Drive and driveway access locations immediately adjacent to the intersection.

Crash Analysis

Town of Chapel Hill staff provided HNTB with standard DMV crash reports for the three year period 1/1/07 to 12/31/09. The crash locations were at and in the vicinity of the E. Franklin Street intersection with Estes Drive. A collision diagram, summarizing relative crash locations, crash type, and severity is shown in **Figure 1**. The diagram also highlights crashes that occurred due to vehicle interactions at the driveways for the four adjacent development parcels at the intersection. The current BP Service Station, located in the northeast quadrant of the intersection, is the proposed site for the Walgreens development.

In summary, a total of 51 reported crashes occurred over the three year period in the vicinity of the intersection. Of these crashes, 27 occurred during peak AM (7:00-9:00), noon (11:30-1:30), and PM (4:00-6:00) peak travel periods. Approximately one half of all crashes were rear-end type crashes (25 crashes). There were nine side-swipe crashes and nine left-turn type crashes. The remaining crashes included vehicles running off the roadway and hitting fixed objects, right-turn crashes, angle crashes and backing-up crashes. One crash involved a bicyclist. There were no pedestrian-related crashes.

Crash severity was primarily property damage-only (PDO), with six injury crashes and no fatalities. Most crashes were low-speed incidents. 11 crashes occurred at the driveways adjacent to the intersection, with no driveway experiencing more than two crashes over the three year period. Five other driveway-related crashes were included in the crash data, with the driveways represented being beyond the four adjacent developments at the intersection. Crash details are summarized in **Table 1** on the following pages.

Table 1. Crash Data Details

2007 Crash Data

Collision Diagram ID#	Accident ID #	Date	Time	Peak Period?	Crash Type	Injury ?	Driveway-Related?
1	0701869	1/20/07	12:59	**Y**	Rear-end	N	N
2	0700438	1/5/07	15:39	N	Rear-end	N	N
3	0708849	3/28/07	18:02	N	Rear-end	N	**Y**
4	0713516	5/9/07	17:32	**Y**	Side-swipe	N	N
5	0726755	9/19/07	16:02	**Y**	Fixed Object - deer	N	N
6	0711822	4/24/07	17:18	**Y**	Rear-end	N	N
7	0705035	2/20/07	20:03	N	Rear-end	N	N
8	0712630	5/1/07	14:33	N	Side-swipe	N	N
9	0718402	6/28/07	17:41	**Y**	Side-swipe	N	N
10	0720479	7/19/07	16:07	**Y**	Backing-up	N	**Y**
11	0720767	7/22/07	17:43	**Y**	Rear-end	N	N
12	0722908	8/13/07	14:59	N	Rear-end	N	N
13	0728955	10/10/07	14:38	N	Rear-end	N	N
14	0732366	11/11/07	12:49	**Y**	Rear-end	**Y**	**Y**
15	0732908	11/16/07	18:12	N	Left-Turn	N	**Y**
16	0734984	12/7/07	13:23	**Y**	Left-Turn	N	**Y**
17	0735500	12/12/07	10:01	N	Rear-end	N	N

2008 Crash Data

Collision Diagram ID#	Accident ID #	Date	Time	Peak Period?	Crash Type	Injury ?	Driveway-Related?
1	0805756	2/28/08	16:54	**Y**	Left-Turn	N	**Y**
2	0810133	4/10/08	16:57	**Y**	Left-Turn	N	**Y***
3	0811950	4/29/08	14:55	N	Backing-up	N	N
4	0819549	7/18/08	7:38	**Y**	Rear-end	**Y**	N
5	0820121	7/24/08	11:23	N	Rear-end	N	N
6	0820602	7/29/08	13:30	**Y**	Rear-end	N	N
7	0827459	10/7/08	17:35	**Y**	Left-Turn	N	**Y***
8	0831535	11/18/08	12:32	**Y**	Rear-end	N	N
9	0831883	11/21/08	15:05	N	Side-swipe	N	N
10	0834377	12/19/09	11:12	N	Side-swipe	N	N
11	0808985	3/31/08	11:35	**Y**	Rear-end	N	**Y**
12	0809010	3/31/08	16:28	**Y**	Left-Turn	N	**Y**
13	0809017	3/31/08	17:39	**Y**	Rear-end	N	N
14	0814750	5/28/08	12:04	**Y**	Left-Turn	N	**Y***
15	0816476	6/14/08	19:31	N	Ran-off-Road - Fixed Object	**Y**	N
16	0822678	8/20/08	7:49	**Y**	Left-Turn	N	**Y***
17	0827688	10/10/08	14:36	N	Rear-end	N	N
18	0827880	10/11/08	21:32	N	Side-swipe	N	N
19	0834209	12/17/08	15:37	N	Ran-off-Road - Fixed Object	**Y**	N

*-Crash occurred at driveway not adjacent to the intersection

2009 Crash Data

Collision Diagram ID#	Accident ID #	Date	Time	Peak Period?	Crash Type	Injury ?	Driveway-Related?
1	0900719	1/9/09	11:10	N	Side-swipe	N	N
2	0904207	2/17/09	16:26	**Y**	Rear-end	N	N
3	0904699	2/23/09	8:33	**Y**	Right-turn	N	**Y***
4	0905677	3/6/09	17:13	**Y**	Rear-end	**Y**	**Y**
5	0907688	3/27/09	14:15	N	Rear-end	N	N
6	0909312	4/13/09	14:45	N	Side-swipe	N	N
7	0915123	6/12/09	14:42	N	Left-Turn - Bicycle	**Y**	**Y**
8	0915809	6/19/09	18:08	**Y**	Side-swipe	N	N
9	0917809	7/10/09	9:45	N	Rear-end	N	N
10	0920580	8/8/09	13:01	**Y**	Rear-end	N	N
11	0920961	8/12/09	18:35	N	Rear-end	N	N
12	0925151	9/28/09	14:36	N	Rear-end	N	N
13	0930702	11/30/09	16:31	**Y**	Rear-end	N	N
14	0931636	12/12/09	11:46	**Y**	Ran-off-Road/Fixed Object	N	N
15	0932012	12/17/09	11:06	N	Angle	N	**Y**

*-Crash occurred at driveway not adjacent to the intersection

Overall, the types of crashes, and the fact that a high percentage of them occurred during peak travel periods, suggest that the causes stem from high traffic volumes and congestion in the intersection area during the peak travel periods, particularly the PM peak. No significant crash pattern, direction, or location suggests a particular problem with vehicular speeds, limited sight distances, or other roadway geometric issues. The presence of multiple full access driveways in close proximity to the intersection does produce the potential for crashes, due to the multiple vehicular conflict points for left-turning vehicles into and out of the driveways, but no significant incidence of crashes from a particular driveway was found in the data.

Limitations on the number of driveways, and of full driveway access, may reduce the number of driveway crashes, and would reduce the number of vehicular conflict points. However, since all roadway approaches feature a central two-way left-turn lane, additional improvements to allow for u-turning movements would be necessary to allow safe vehicular circulation at the intersection and upstream/downstream of the intersection along all roadway approaches.

Driveway Volumes Analysis

Per Town of Chapel Hill staff request, peak hour driveway turning movement counts were collected at the four adjacent development parcels at the E. Franklin Street/Estes Drive intersection. All four parcels have multiple driveway access points, with at least one full access driveway connection at each parcel. Data was collected for the AM, noon, and PM peak periods by HNTB on February 10, 2010. Driveway volumes are shown in **Figure 2**. Data was only collected for turning movements into and out of each driveway. **Figure 2** also shows peak hour turning movement counts at the intersection approaches. This data was taken from counts conducted in the Fall of 2009 for the *Carolina North Transportation Impact Analysis*, completed by VHB. Through traffic volumes at the driveway connections upstream and downstream of the intersection were calculated from the intersection volume data.

In general, most driveways do not experience exceptionally heavy peak hour traffic volumes. The driveways connecting to the commercial office building on the southwest quadrant were virtually unused, since the building is vacant. Traffic volumes at the Kangaroo Gas Station and Caribou Coffee

developments were the highest recorded and fairly constant throughout the peak hours. Left-turn volumes out of the driveways were consistently lower than right-turn volumes, as patrons of the businesses likely avoid attempting a left-turn exit maneuver during peak travel periods because of lengthy delays and the lack of safe turning gaps in traffic that would queue at the signalized intersection.