

TECHNICAL MEMORANDUM – DRAFT



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Cc
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Subject
Blue Hill District TIA –
Aura South Elliott Redevelopment –
Transportation Adequacy Summary

Date
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Per Town of Chapel Hill staff request related to the *Blue Hill District – Transportation Impact Analysis* (formerly known as the Ephesus-Fordham (E-F) District TIA), the following information represents a summary of transportation impacts and recommendations specific to the proposed Aura South Elliott redevelopment project. This project was not one of the developments within the Blue Hill District specifically studied in the 2030 “Build” Scenario of the Blue Hill TIA, but does lie within the District boundaries, and is being assessed for transportation network impacts in a similar fashion to the other redevelopment sites. This technical memorandum represents an assessment of current design plans to evaluate adequate intersection traffic operations adjacent to the proposed Aura South Elliott site and overall access/traffic circulation details using results and recommendations from the Blue Hill TIA documentation for the 2030 “Build” and 2030 “Build+Mitigation” Scenarios.

1. Site Trip Generation

Based on information provided by the Applicant and a review of existing conditions on the proposed redevelopment site, a trip generation analysis was conducted using *Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition* data. This information was entered into the TransModeler microsimulation software tool utilized in the Blue Hill TIA study to generate trips for the proposed Aura South Elliott site redevelopment and to distribute and assign traffic to/from the site based on future traffic volume projections for the overall Blue Hill TIA study area. **Table 1** summarizes the trip generation details.

A nominal 10 percent reduction in vehicular trips was assumed for transit/pedestrian/bicycle trips, based on comparisons of 2030 future study area transit trip growth between the Blue Hill TIA Build and No-Build Scenarios and to assume conservative levels of vehicular trip-making in analyses of roadway operations. The proposed development is slated to contain approximately 334 units of multi-family residential in buildings up to five stories and 11,375 square feet of general small-scale retail space. Existing and proposed land uses were compiled for determination of “net” trip generation impact. The ITE Land Use Code 822 – Strip Retail Plaza was used as a surrogate for future trip generation to allow an equitable comparison of smaller-scale proposed retail facilities. ITE Land Use Code 710 – General Office Building was used for the existing Extraordinary Ventures commercial building on the proposed redevelopment site.

Table 1. Aura South Elliott Redevelopment ITE Trip Generation Summary

Proposed Aura South Elliott			Daily			AM Peak			Noon Peak			PM Peak		
LUC	Land Use	Density	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
221	Multi-Family (Mid-Rise)	334 units	774	774	1,548	31	104	135	28	39	67	80	51	131
822	Commercial Retail	11.4K SF	310	310	620	19	12	31	29	25	54	38	37	75
Raw Totals			1,084	1,084	2,168	50	116	166	57	64	121	118	88	206
Transit/Ped/Bike Trips (-10%)			-108	-108	-217	-5	-12	-17	-6	-6	-12	-12	-9	-21
Existing Development			Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
710	General Office	14.4K SF	-108	-108	-216	-28	-4	-32	-13	-12	-25	-6	-27	-33
Net Trips Added to Network			868	868	1,735	17	100	117	38	46	84	100	52	152

In addition to vehicular trip generation for the proposed site, additional trip generation estimates were made for the Signature Health Care development that is adjacent to the proposed Aura site, due to the fact that both developments may share access to E. Franklin Street and S. Elliott Road and that no traffic counts at these existing connections currently exist for use in the traffic modeling process. The Signature Health Care development, according to latest information available on-line, provides both “medical clinic” and “nursing home” care, which are categories that ITE Trip Generation information exists. **Table 2** provides estimates of trip generation from the Signature Health Care development. It was assumed that 50 percent of the existing building space falls into the “medical clinic” designation and 75 percent of the current 108 beds at the facility are occupied as “nursing home” trip generating variables. 2030 traffic volume projections that were formulated in the original Blue Hill District TIA account for existing traffic volumes to/from the Signature Health site, so no external increases for this site were added to 2030 traffic projections beyond the current Site Driveway intersection with E. Franklin Street.

Table 2. Signature Health Care Existing ITE Trip Generation Estimates

Existing Development			Daily			AM Peak			Noon Peak			PM Peak		
LUC	Land Use	Density	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
620	Nursing Home	108 beds	124	124	248	10	6	16	5	5	10	11	14	25
630	Medical Clinic	23.4K SF	437	437	874	49	11	60	28	27	55	26	60	86
Raw Totals			561	561	1,122	59	17	76	33	32	65	37	74	111

Finally, a trip generation estimate was conducted for the existing Berkshire Chapel Hill development located across S. Elliott Road from the proposed site. This exercise was necessary to develop traffic volumes to/from Alexan Court which forms the fourth leg of the intersection of S. Elliott Drive and the existing Site Driveway. Berkshire Chapel Hill is a mixed-use development and its estimated trip generation information (based on data from Town records of site plan documents) is found in **Table 3**. 2030 traffic volume projections that were formulated in the original Blue Hill District TIA account for the Berkshire Chapel Hill development traffic volumes, so no external increases for this site were added to 2030 traffic projections beyond the Alexan Court intersection.

Table 3. Berkshire Chapel Hill Existing ITE Trip Generation Estimates

Existing Development			Daily			AM Peak			Noon Peak			PM Peak		
LUC	Land Use	Density	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
221	Multi-Family (Mid-Rise)	265 units	609	609	1,218	24	81	105	22	31	53	63	41	104
822	Commercial Retail	15K SF	409	409	818	21	14	35	35	32	67	49	50	99
Raw Totals			1,018	1,018	2,036	45	95	140	57	63	120	112	91	203
Transit/Ped/Bike Trips (-10%)			-102	-102	-204	-5	-10	-14	-6	-6	-12	-11	-9	-20
"Net" Vehicle Total Trips			916	916	1,832	40	85	126	51	57	108	101	82	183

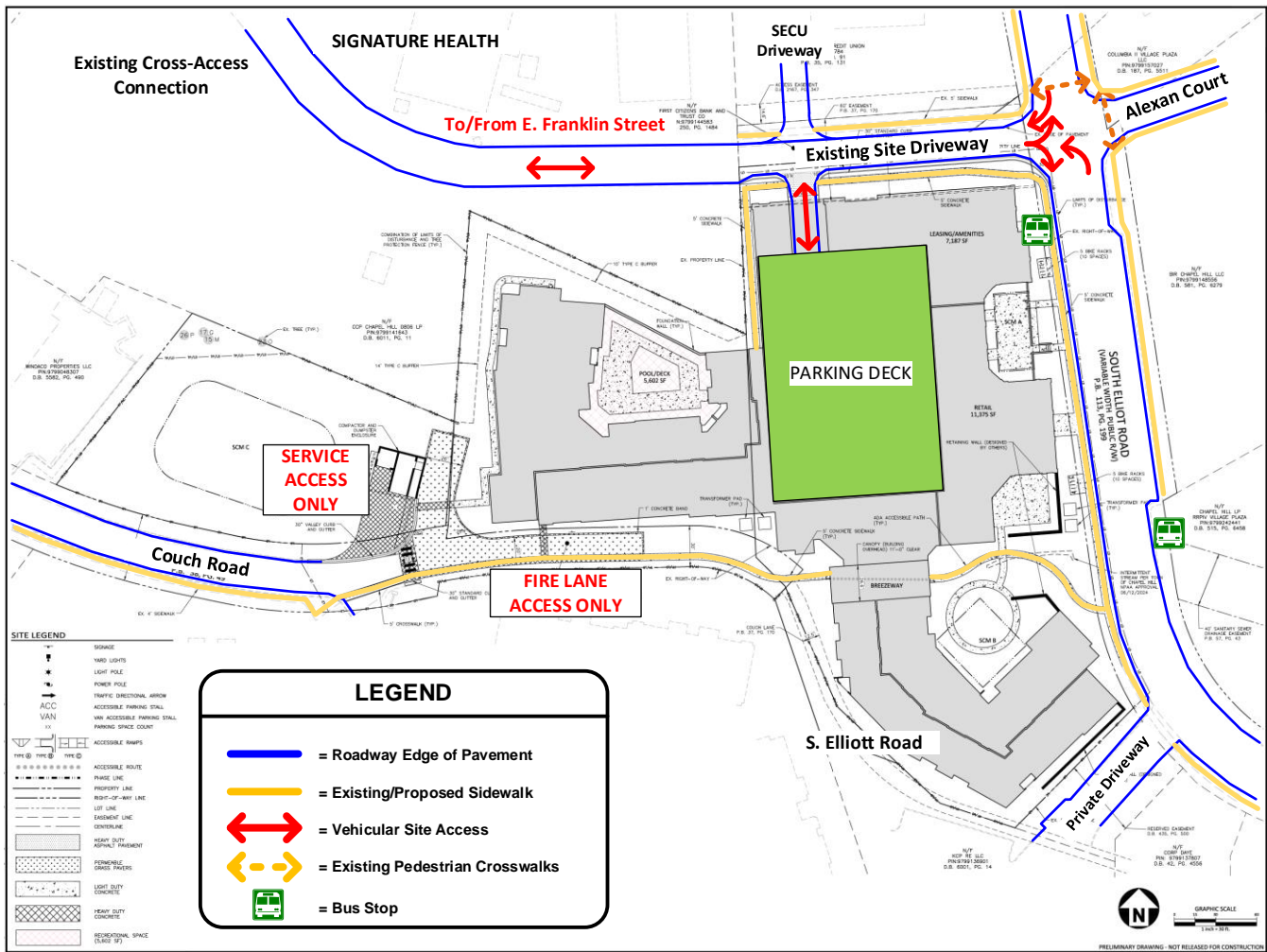
2. Access Analysis

Site generated trip data was entered into the Blue Hill TIA 2030 future year microsimulation models and trip distribution and assignment were based on details found in **Exhibit 1** provided by the Applicant and engineering judgement. Site generated trips were distributed by the model based on general existing external roadway traffic patterns and the most convenient external access points. The proposed site structured parking garage was assumed to have two potential access scenarios - full access to the existing driveway connection to S. Elliott Road and to the internal cross-access connection to Signature Health Care that connects to E. Franklin Street and a scenario where cross-access to the Signature Health parking lot would be restricted. Site traffic to/from the proposed on-site parking garage was loaded onto the existing driveway and then to/from these two locations in the traffic modeling process, depending on the access scenario.

Driveway separation and corner clearance distances for the proposed access driveway parking deck connection from existing or future major roadway intersections are acceptable, with over 150 feet of separation minimum from the proposed internal access point to an existing or future major intersection.

Per conceptual design details, adequate access for pedestrians/bicycles is provided, with connected sidewalks along the S. Elliott Road site frontage, the existing site driveway access to S. Elliott Road and a connection to Couch Street. Bicycle sharrow lanes are present on the adjacent Alexan Court facility. Additional pedestrian and bicycle elements are found in the *Town of Chapel Hill Mobility Plan*. The Mobility Plan has additional recommendations for a buffered bicycle lane along S. Elliott Road along with additional sidewalk connections to the south and east. Bicycle lanes and a greenway/multi-use path are recommended for E. Franklin Street in the vicinity of the proposed site. Additional bicycle lanes are recommended for N. Elliott Road. These Mobility Plan details are not shown on **Exhibit 1** and are not included as specific recommendations for the Aura S. Elliott redevelopment but would provide benefit to multi-modal transportation to/from the site. There is currently a transit stop along the site’s S. Elliott Road frontage that serves the Chapel Hill Transit D Route.

Exhibit 1. Site Conceptual Design Transportation Access



3. Intersection Operations Analysis

The *Draft E-F District TIA Technical Memorandum #2 – 2030 Future Year Analysis* provides a complete 2030 peak hour operational analysis of the broad Blue Hill District study area. **Table 4** shows “Build” and “Build + Mitigation” simulation Level-of-Service (LOS_s) and average vehicular delay results for intersections in the vicinity of the Aura South Elliott Redevelopment project. “Build” Scenario results include the full development or redevelopment of five sites within the Blue Hill District, the redevelopment of the Aura South Elliott site, and no transportation improvements to the overall Blue Hill District TIA study area. “Build+Mitigation” results consider recommended roadway improvements both in the vicinity of the Aura redevelopment project, and for the broader study area, and were developed to account for regional background traffic growth and specific needs for transportation mobility within the Blue Hill District.

In addition, two access scenarios were included in both “Build” and “Build+Mitigation” analyses, as shown in **Table 4**. The first scenario assumes a percentage of site-related traffic using the private cross-access driveway connection with Signature Health to directly connect to E. Franklin Street. The second scenario assumes that no site traffic is able to utilize this access and all site traffic must use S. Elliott Road to connect to E. Franklin Street.

As previously noted, the Aura South Elliott Site was not specifically considered in the original Blue Hill District TIA. Only “net” additional Aura South Elliott site trips were added to both the “Build” and “Build+Mitigation” analyses.

Table 4. 2030 Peak Hour Intersection Capacity Analysis Results

Scenario 1 – E. Franklin Street Direct Access Allowed Via Signature Health Driveway						
Intersection Name	LOS _s & Average Control Delay (sec/veh)					
	2030 Build + Mitigation Scenario			2030 Build Scenario		
	AM	Noon	PM	AM	Noon	PM
US 15-501 (Fordham Blvd) & S. Elliott Rd / Elliott Rd Extn	C (20.7)	D (48.7)	D (43.4)	C (31.2)	<i>E (57.4)</i>	<i>E (57.5)</i>
E. Franklin Street & S. Elliott Road	B (16.7)	C (22.7)	C (24.6)	B (18.9)	C (27.8)	C (33.5)
S. Elliott Road and Existing Site Driveway / Alexan Court*	B (10.9)	C (18.0)	C (21.0)	B (10.6)	C (23.9)	E (37.9)
E. Franklin Street and Signature Health Driveway*	C (19.5)	<i>F (246)</i>	<i>F (321)</i>	C (18.1)	<i>F (248)</i>	<i>F (284)</i>
Scenario 2 – E. Franklin Street Direct Access NOT Allowed Via Signature Health Driveway						
Intersection Name	LOS _s & Average Control Delay (sec/veh)					
	2030 Build + Mitigation Scenario			2030 Build Scenario		
	AM	Noon	PM	AM	Noon	PM
US 15-501 (Fordham Blvd) & S. Elliott Rd / Elliott Rd Extn	B (19.9)	D (49.1)	D (41.1)	C (29.9)	<i>E (61.0)</i>	D (54.8)
E. Franklin Street & S. Elliott Road	B (18.7)	C (24.2)	C (26.2)	C (20.7)	C (28.1)	C (34.5)
S. Elliott Road and Existing Site Driveway / Alexan Court*	C (15.1)	D (25.0)	E (43.2)	C (17.3)	D (25.2)	E (37.6)
E. Franklin Street and Signature Health Driveway*	C (19.4)	<i>F (209)</i>	<i>F (273)</i>	C (17.0)	<i>F (223)</i>	<i>F (230)</i>

BOLD/ITALICS – Intersection Over Capacity Per Town of Chapel Hill Thresholds

* - Unsignalized Intersection – LOSs/Delay are for Stop-Controlled Critical Movement Only

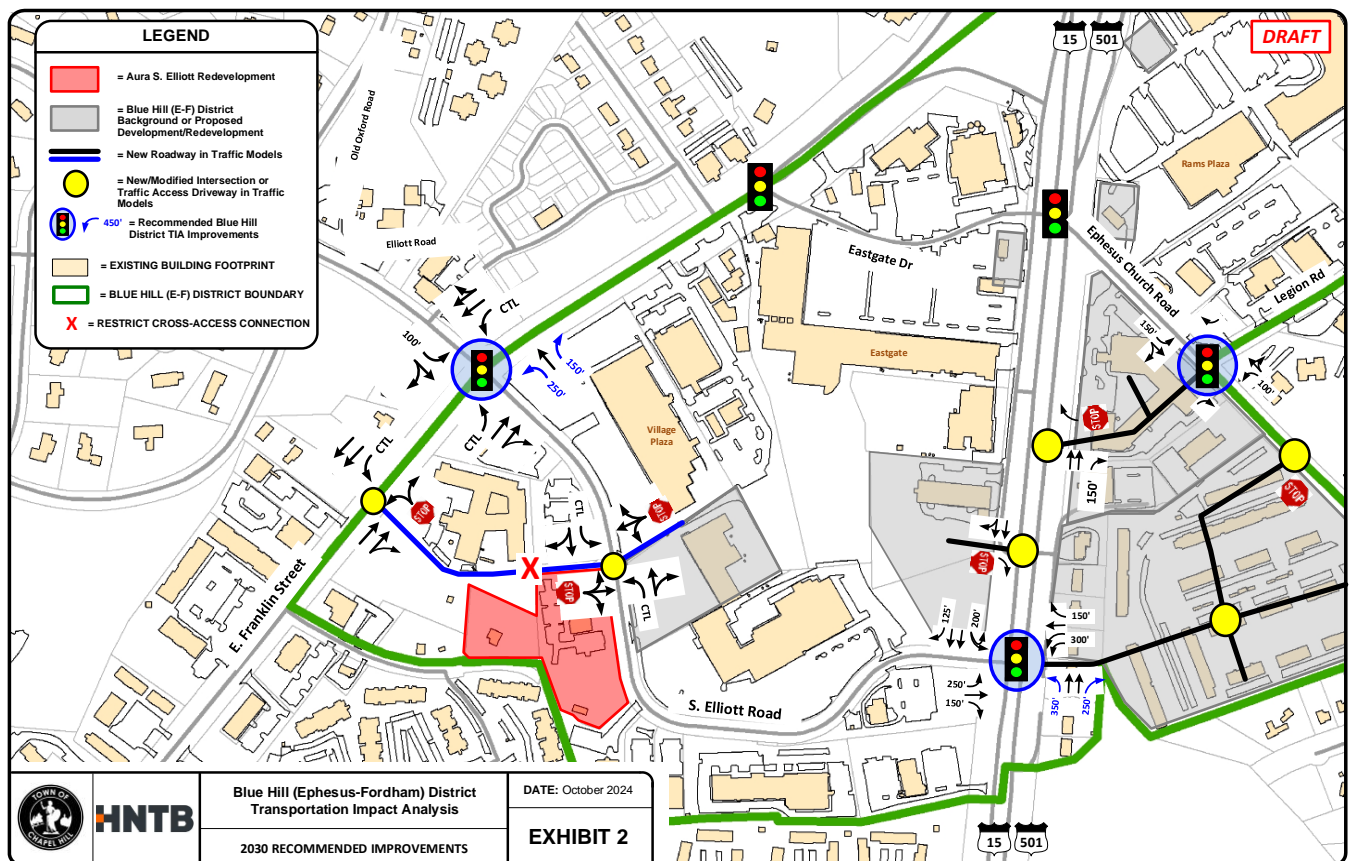
As shown in the table, there are operational trade-offs between the two access scenarios, due to traffic shifts at each intersection that reflect route changes depending on the ability for a portion of the site traffic to utilize the Signature Health Driveway. LOSs and vehicular delay data at the Signature Health Driveway and E. Franklin Street intersection indicates that 2030 conditions during the noon and PM peak hours produce few acceptable gaps in E. Franklin Street traffic to make a left-turn out of this driveway. Any additional site traffic exiting at this driveway, as projected for Scenario 1, would add to delays and expected queues. The 2030 Build+Mitigation scenario originally developed in the Blue Hill District TIA does recommend geometric turn lane improvements at the two signalized intersections – which are reflected in overall intersection delay reductions for all three peak hours, regardless of the access scenario for site traffic. Operations are slightly better for all three peak hours at the E. Franklin Street/S. Elliott Road signalized intersection in Scenario 1, where less site traffic is forced to use S. Elliott Road as the only access point. Similarly Scenario 1 lessens traffic demand at the S. Elliott Road/Existing Site Driveway – Alexan Court intersection, resulting in generally lower vehicular delays for stop-controlled movements in both the 2030 Build and Build+Mitigation conditions.

4. Conclusions and Recommendations

Per recommendations from the *Draft Blue Hill District TIA Technical Memorandum #2 – 2030 Future Year Analysis*, the roadway laneage recommendations for the major intersections in the vicinity of the Aura South Elliott redevelopment as shown in **Exhibit 2** below (taken from Figure 16C of the Technical Memorandum and modified per conceptual design in **Exhibit 1**) are anticipated to provide adequate peak hour traffic operations in the 2030 analysis year. It is also recommended that the proposed roadway conceptual design details included in **Exhibit 1**, as shown previously, be completed as part of the redevelopment project.

Additional mitigation improvements shown in **Exhibit 2** (in blue) are necessary to mitigate potential peak hour operations and queuing issues to account for the overall impacts of background traffic growth and Blue Hill District development-related growth in the broader Blue Hill TIA study area. The primary improvement in those recommendations affecting the proposed site would be the capacity improvement to the E. Franklin Street/S. Elliott Road intersection that extends the current left-turn lane and adds a dedicated northbound right-turn lane to S. Elliott Road.

Exhibit 2.
Recommended Laneage and Traffic Control in Vicinity of the Aura South Elliott Redevelopment



While cross-access may be beneficial in many situations, the capacity analysis results for this study indicate that additional site-related traffic using the Signature Health Care driveway connection to E. Franklin Street may exacerbate stop-controlled delay and increase safety issues at the current full access driveway intersection with E. Franklin Street, in addition to introducing additional vehicle and pedestrian conflicts in the Signature Health Care

parking lot. The scenario tested for this study that limits site traffic to access at the existing site driveway along S. Elliott Road did not show substantial negative traffic operations impact in the 2030 weekday peak hours compared to the allowance of cross-access. Based on these findings, it is recommended that the cross-access be closed, or at least restricted to emergency vehicles only.

Some additional multi-modal improvement recommendations in the immediate site vicinity include:

- Install additional cross-walks in the two quadrants where they do not exist at the S. Elliott Road/Existing Site Driveway – Alexan Court intersection.
- Consider a median crossing/crosswalk to the proposed site from northbound bus stop along S. Elliott Drive. This location is just past a horizontal curve along S. Elliott Drive, so additional sight distance study may be required to verify the visibility of pedestrians crossing at this location.
- Provide bus stop amenities at both existing stop locations along S. Elliott Road near the proposed site redevelopment.