EXHIBIT A: SCOPE OF SERVICES
Ephesus Church Road – Fordham Boulevard Transportation Impact Analysis

This Scope of Services document identifies the general scope of work to be completed by the Engineer (**HNTB North Carolina, PC**) for the Town (**Town of Chapel Hill**) for the following Project:

Ephesus Church Road – Fordham Boulevard Transportation Impact Analysis
Chapel Hill, North Carolina

This Scope of Services will be amended, as required, by information discussed and agreed upon by the Engineer and Town following a public information session on the project to be held on October 12, 2016.

Section A. - Scope of Services

A.1. Engineer shall perform the following Services:

TASK 1 – PROJECT MANAGEMENT

1.1 Project Meetings

1.1.1 Project Scoping/Negotiation and Kickoff Meetings

Engineer will meet with Town for one scoping/fee negotiation meeting to define study details as initially presented in this Scope of Services (1 meeting/2 HNTB staff). When final scope and fee is determined and Town issues Notice-to-Proceed (NTP) to Engineer, Engineer will participate in a project kick-off meeting to review all appropriate study details and schedule (1 meeting/2 HNTB staff). Engineer will provide any necessary materials/deliverables related to project contract/scope/fee estimate/schedule for these meetings.

1.1.2 Monthly Progress Meetings

Engineer will meet with Town on a recurring basis throughout the project, as necessary, to discuss project progress, milestones, and any issues related to the project work plan, scope and schedule. Meetings will be via teleconference. (Six (6) meetings anticipated/1 HNTB staff) Engineer will provide any necessary materials/deliverables summarizing applicable meeting agendas, notes, and record of any decisions made.

1.2 Project Coordination

Engineer will coordinate general study activities with Town staff via phone call, email, or other communication to obtain necessary information, provide any necessary updates, and insure that project progress and activities are meeting Town expectations. (Anticipated over nine (9) month study duration)

1.3 Project Administration

Engineer will provide general administration for the project including monthly invoicing and project progress details for the Town's review and approval. (Anticipated over nine (9) month study duration)

TASK 2 – DATA COLLECTION

2.1 Traffic Count Data Compilation

Engineer will coordinate with Town and traffic count data sub-consultant (Quality Counts, LLC) to schedule traffic data collection activities and provide review and quality control check of field data collected for the study (see **Section 3.2.1** for traffic count locations and details). Engineer will also obtain and review any available recent (less than one year old) traffic count data from NCDOT and other sources for use in the study.

2.2 Field Data Collection/Observation

Engineer will conduct a field review of existing conditions in the project study area, including review of existing traffic signal operations, verification of study area transportation network and facilities, and field observation of existing transportation system operations and areas of traffic congestion/safety concerns. (1 day observation X 2 HNTB staff)

2.3 Obtain Latest Version of Triangle Regional Model (TRM)

Engineer will coordinate with Town to obtain the most current version of the Triangle Region Travel Demand Model (TRM) from the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) for

use in sub-area modeling efforts.

2.4 Obtain Latest Data on Town Studies
Engineer will coordinate with Town to obtain and review the latest versions of all appropriate and applicable Town-related planning documentation in the project study area, along with any private development plans and plans/studies previously completed or on-going by NCDOT, the Durham-Chapel Hill-Carrboro MPO or any other public agency.

2.5 Obtain Latest Model-Related Data
Engineer will coordinate with Town to obtain necessary traffic model-related data including, but not limited to, traffic signal plans, coordinated signal timing information, Synchro files, Chapel Hill Transit (CHT) ridership data and any other traffic models in the project study area.

TASK 3 – 2016 EXISTING CONDITIONS ANALYSIS

3.1 2016 Existing Year Sub-Area Model Development
Engineer will develop a sub-area model using the TransCAD software and latest version of the TRM obtained from the DCHC MPO for use in this study. Engineer will also obtain any other recent sub-area model information from on-going NCDOT US 15-501 corridor studies in the project study area, as appropriate. The following sub-sections provide details related to the sub-area model development for existing conditions.

3.1.1 Sub-Area Model Network Creation/Modification
Engineer will extract a defined sub-area model for the E-F TIA traffic study area from the 2010 Base Year TRM. Engineer will refine base year TRM traffic analysis zones (TAZs) in locations of the sub-area model where future refinement may be necessary to capture effects of potential future growth at a more refined level.

3.1.2 Sub-Area Model Calibration/Validation
Engineer will review existing calibration/validation documentation from the TRM and perform a quality control check on the existing base year sub-area model network links and centroids, as well as the TRM transit network in the proposed sub-area. Engineer will review sub-area model daily traffic assignments and transit demand data in comparison to 2010 base year conditions to note where areas of the model may need additional refinement in the 2030 design year.

3.2 2016 Existing Year Traffic Operations Analysis
3.2.1 2016 Existing Year TransModeler Model Development
Engineer will create a study area transportation network using the latest version of the TransModeler software tool at the time of study initiation. Sources for the creation of the model may include, but not necessarily be limited to, conversion of existing Synchro networks, adaptation of previously completed TransModeler networks by NCDOT or others for NCDOT-related projects/studies in the project study area, or creation of new network areas based on any gaps in previous models. Engineer will review previous networks and network conversions for appropriate use in this study.

Study Area Definition
The Study Area will consist of the following existing intersections for the Ephesus Church Road – Fordham Boulevard Transportation Impact Analysis (see **Figure 1**):

1) US 15-501 (Durham-Chapel Hill Boulevard) & Eastowne Drive/Lakeview Drive
2) US 15-501 (Durham-Chapel Hill Boulevard) & Eastowne Drive
3) US 15-501 (Durham-Chapel Hill Boulevard) & Sage Road/Old Durham Road
4) US 15-501 (Fordham Boulevard) & Erwin Road/Europa Drive (4 intersection superstreet)
5) US 15-501 (Fordham Boulevard) & Ephesus Church Road
6) US 15-501 (Fordham Boulevard) & Elliott Road
7) US 15-501 (Fordham Boulevard) & Willow Drive
8) US 15-501 (Fordham Boulevard) & Estes Drive
9) US 15-501 (Fordham Boulevard) & Cleland Road
10) US 15-501 (Fordham Boulevard) & Brandon Road
11) US 15-501 (Fordham Boulevard) & NC 54 Westbound Ramps
12) US 15-501 (Fordham Boulevard) & NC 54 Eastbound Ramps
13) US 15-501/NC 54 (Fordham Boulevard) & Old Mason Farm Road

14) US 15-501/NC 54 (Fordham Boulevard) & Manning Drive
15) Raleigh Road and US 15-501 (Fordham Boulevard) Southbound Ramps
16) NC 54 (Raleigh Road) & US 15-501 (Fordham Boulevard) Northbound Ramps
17) NC 54 (Raleigh Road) & Hamilton Road
18) NC 54 (Raleigh Road) & Environ Way
19) NC 54 (Raleigh Road) & Burning Tree Drive/Finley Golf Course Road
20) Estes Drive & Caswell Road
21) Estes Drive & Library Drive
22) Estes Drive & E. Franklin Street
23) Estes Drive & Willow Drive/Shepherd Lane
24) Elliott Road & Old Oxford Road/Velma Road
25) Elliott Road & E. Franklin Street
26) Eastgate Crossing & E. Franklin Street
27) Ephesus Church Road & Rams Plaza Access (RIRO) / University Inn Driveway
28) Ephesus Church Road & Legion Road
29) Ephesus Church Road & Pinehurst Drive
30) Legion Road & Clover Drive / Rams Plaza Access
31) Legion Road & Quality Inn Driveway
32) Legion Road & Europa Drive
33) US 15-501 Service Road & Quality Inn Driveway
34) Europa Drive & US 15-501 Service Road
35) Legion Road & Scarlett Drive
36) Weaver Dairy Road & Erwin Road
37) Sage Road & Erwin Road

Other private driveways/access connections may be included in the study area traffic model, as needed, but will not be part of the study area intersections evaluated in the operation analysis.

Traffic Counts

Weekday turning movement traffic counts (AM, Noon, and PM peak periods) will be conducted by the Engineer's traffic count sub-consultant for the following intersections (13 hour volume-speed-classification counts indicated by a "**", all other intersections for 2 hour AM/Noon/PM peak periods):

1) US 15-501 (Fordham Boulevard) & Ephesus Church Road**
2) US 15-501 (Fordham Boulevard) & Elliott Road**
3) US 15-501 (Fordham Boulevard) & Willow Drive
4) US 15-501 (Fordham Boulevard) & Estes Drive**
5) US 15-501/NC 54 (Fordham Boulevard) & Manning Drive**
6) Estes Drive & Caswell Road
7) Estes Drive & Library Drive
8) Estes Drive & E. Franklin Street**
9) Estes Drive & Willow Drive/Shepherd Lane
10) Elliott Road & Old Oxford Road/Velma Road
11) Elliott Road & E. Franklin Street**
12) Eastgate Crossing & E. Franklin Street**
13) Ephesus Church Road & Rams Plaza Access (RIRO) / University Inn Driveway
14) Ephesus Church Road & Pinehurst Drive
15) Legion Road & Clover Drive / Rams Plaza Access
16) Legion Road & Quality Inn Driveway
17) US 15-501 Service Road & Quality Inn Driveway
18) Europa Drive & US 15-501 Service Road
19) Weaver Dairy Road & Erwin Road

Weekday peak hour traffic counts (AM, Noon, and PM peak periods) will be taken from the recent count data (less than one year old) as compiled on the NCDOT Traffic Safety Unit website (https://connect.ncdot.gov/resources/safety/Pages/Volume-Class.aspx?d=07&c=Orange&p=TM) for the following intersections:

1) US 15-501 (Fordham Boulevard) & Cleland Road
2) US 15-501 (Fordham Boulevard) & Brandon Road

3) US 15-501 (Fordham Boulevard) & NC 54 Westbound Ramps
4) US 15-501 (Fordham Boulevard) & NC 54 Eastbound Ramps
5) US 15-501/NC 54 (Fordham Boulevard) & Old Mason Farm Road
6) Raleigh Road and US 15-501 (Fordham Boulevard) Southbound Ramps
7) NC 54 (Raleigh Road) & US 15-501 (Fordham Boulevard) Northbound Ramps
8) NC 54 (Raleigh Road) & Hamilton Road
9) NC 54 (Raleigh Road) & Environ Way
10) NC 54 (Raleigh Road) & Burning Tree Drive/Finley Golf Course Road

Weekday peak hour traffic counts (AM, Noon, and PM peak periods) will be taken from the recent count data as compiled by the Engineer from recent ongoing studies for the following intersections:

1) US 15-501 (Durham-Chapel Hill Boulevard) & Eastowne Drive/Lakeview Drive
2) US 15-501 (Durham-Chapel Hill Boulevard) & Eastowne Drive
3) US 15-501 (Durham-Chapel Hill Boulevard) & Sage Road/Old Durham Road
4) US 15-501 (Fordham Boulevard) & Erwin Road/Europa Drive (4 intersection superstreet)
5) Ephesus Church Road & Legion Road (will require Noon Peak Period Count)
6) Legion Road & Europa Drive (will require Noon Peak Period Count)
7) Legion Road & Scarlett Drive (will require Noon Peak Period Count)
8) Sage Road & Erwin Road

All turning movement counts will include pedestrian and bicycle volumes.

Weekday 48 Hour Vehicle Volume/Classification/Speed (VSC) counts will be conducted at the following locations using tube counts or other appropriate data collection technologies:

1) US 15-501 (Fordham Boulevard) north of Estes Drive
2) Estes Drive west of E. Franklin Street
3) E. Franklin Street north of Estes Drive
4) Elliott Road east of E. Franklin Street
5) Ephesus Church Road east of Frances Street
6) US 15-501 (Durham-Chapel Hill Boulevard) west of Sage Road/Old Durham Road

48 Hour VSC count information will be used to evaluate current traffic conditions with similar NCDOT AADT traffic count stations and to develop/assess current vehicular speed profiles, heavy vehicle percentages, and as a comparison to historical AADT values.

Traffic count information will be imported into the TransModeler software package, as appropriate, in the development of the 2016 Existing Conditions analysis.

The Engineer will also collect the following additional information, as necessary, for the 2016 Base Model development:

- Aerial Imagery from NC OneMap or other sources for verification of previous model geometrics
- CHT Transit Routes/Stops
- Pedestrian Volume crossing at Intersections

Bicycle Counts
In addition to bicycle count data collected in the intersection turning movement count scope defined above, Engineer will collect additional 12 hour bicycle counts in locations defined in **Figure 2** for any locations that do not coincide with bicycle data collected in the intersection turning movement counts process (22 locations initially anticipated).

3.2.2 2016 Existing Year TransModeler Model Measures-of-Effectiveness (MOE) Runs/Extraction
Engineer will run the TransModeler AM, noon, and PM peak hour models to produce MOE statistics for intersections in the project study area. 10 runs of each model scenario will be conducted and results averaged for the following MOEs:

Project Study Area System MOEs
Project study area system-wide MOEs will be collected from the Trip Statistics output in Transmodeler.

MOEs will be collected for each peak hour to include the following for the entire model network:

- Vehicle Miles Traveled (VMT)
- Vehicle Hours Traveled (VHT)
- Mean System Speed
- Total System Delay/Delay Per Vehicle

Corridor-Level MOEs

Corridor-Level MOEs will be compiled through the use of sensors placed in the study area TransModeler networks that record vehicular travel times and speeds between pairs of sensors over specified durations. MOE data will be collected from TransModeler output matrices for each peak hour to include the following:

- Average Travel Time/Speed between selected points on US 15-501 (Fordham Boulevard)

Localized Element MOEs

Localized element MOEs will be collected through the use of delay and queue reports produced by the TransModeler software. The Delay-by-lane and Spillback Queue reports will be utilized to produce the following MOE data.

- Average Queue Length for each intersection movement/approach
- Maximum Queue Length for each intersection movement/approach
- Average vehicular delay and Level-of-Service (LOS) for each intersection

3.3 2016 Existing Transit Analysis

The Engineer will provide an existing transit analysis of all current CHT routes in the project study area (directly serving the E-F SAP boundaries) based on existing ridership demand data (boardings and alightings) and service capacity based on existing headways (latest fall 2016 data to be provided by CHT). Data will be shown in graphical format and existing capacity issues for each peak hour (AM, noon, PM) will be highlighted.

Engineer will also provide graphical representations of all study area bus stops, amenities, and current conditions.

In the sub-area model development process, Engineer will assess existing TRM transit networks and include all relevant information in development of sub-area model. Comparisons from model inputs and results will be made with existing CHT data.

3.4 2016 Existing Pedestrian Analysis

The Engineer will provide an existing pedestrian analysis that includes qualitative review and assessment of existing pedestrian facilities and crossings in the project study area. Engineer will also develop a corridor-level pedestrian LOS assessment of four (4) existing corridors within the specific E-F SAP area using the Highway Capacity Software (HCS) ARTPLAN multi-model analysis tool.

The four corridors are anticipated to be:

- US 15-501 (Fordham Boulevard) from Estes Drive to Erwin Road/Europa Drive
- Ephesus Church Road/Eastgate Crossing from E. Franklin Street to Frances Street
- Elliott Road from Old Oxford Road/Velma Street to US 15-501 (Fordham Boulevard)
- E. Franklin Street from Estes Drive to US 15-501 (Fordham Boulevard) interchange

3.5 2016 Existing Bicycle Analysis

The Engineer will provide an existing bicycle analysis that includes qualitative review and assessment of existing bicycle facilities and crossings in the project study area. Engineer will also develop a corridor-level bicycle LOS assessment of four (4) existing corridors (same corridors as **Section 3.4**) within the specific E-F SAP area using the Highway Capacity Software (HCS) ARTPLAN multi-model analysis tool.

3.6 2016 Existing Crash Analysis

The Engineer will prepare a strip crash analysis of four corridors within the E-F SAP area using the NCDOT TEAAS software.

- Time frame will be the most current five (5) year study range.
- A 0 foot y-line will be used.

The Engineer will also provide intersection-specific crash analyses of 10 locations in and adjacent to the E-F SAP area. A 150 foot boundary condition will be used for these analyses. The Engineer will provide the following in the development of the crash analysis:

- Coordination with NCDOT Traffic Safety Unit.
- Preparation and QC of the strip crash analysis using TEAAS.
- Review of crashes/crash history.
- Perform safety review and prepare summary tables and write up in Existing Conditions Technical Memorandum.
- Identify critical crash rates.
- Identify crash patterns.
- Identify potential safety issues (based on crash analysis).

3.7 2016 Existing Conditions Technical Memorandum

The Engineer will produce a technical memorandum to describe existing year 2016 study area conditions from field-collected information and the results of the 2016 peak hour capacity analyses. This report will be submitted to the Town for comments and incorporation in the complete Transportation Impact Analysis document. The information will also be disseminated to the public and presented at a public information meeting.

TASK 4 – 2030 DESIGN YEAR NO-BUILD (DYNB) SCENARIO ANALYSIS

4.1 2030 DYNB Sub-Area Model Development

4.1.1 Sub-Area Model TAZ/Network Modifications

Engineer will update existing 2030 TRM network to extract a sub-area model for use in traffic volume development and evaluation in TransModeler. Engineer will review and refine 2030 future socio-economic data projects and TAZs to reflect current potential development/redevelopment plans for major projects in the project study area. Engineer will also review and adjust, if necessary, specific levels of assumed redevelopment and transportation network changes within the E-F SAP area. Any other assumed network improvements will be reflected in changes to sub-area link data/characteristics.

4.1.2 Sub-Area Model Traffic Volume Development/Extraction to TransModeler

Sub-area model will be run in TransCAD and traffic assignments throughout the project study area will be converted to peak hour origin-destination flows that will be exported to TransModeler.

Transit assignment data from the sub-area model will also be reviewed and incorporated into TransModeler or transit demand/capacity spreadsheet tool, as appropriate, depending on the accuracy of the data extracted.

4.2 2030 DYNB Traffic Operations Analysis

4.2.1 TransModeler Model Development

Engineer will update the 2016 existing conditions AM, noon, and PM peak hour TransModeler models to include updated O-D matrices extracted from the 2030 DYNB sub-area TransCAD model. Engineer will also update study area model network for any planned/committed roadway improvement projects, transit route/stop modifications, or any other relevant changes to the study area transportation network to be analyzed in this scenario. All appropriate coordinated traffic signals in the project study area will be reoptimized in TransModeler to reflect 2030 peak hour future traffic demand levels.

4.2.2 TransModeler MOE Runs/Extraction

Engineer will run the 2030 DYNB TransModeler AM, noon, and PM peak hour models to produce MOE statistics for intersections in the project study area. 10 runs of each model scenario will be conducted and results averaged for the same MOEs as described in **Section 3.2.2**.

4.3 2030 DYNB Transit Analysis

The Engineer will provide a 2030 DYNB transit analysis of all current (and any potential future) CHT routes in the project study area (directly serving the E-F SAP boundaries) based on existing ridership demand data (boardings and alightings) that would be modified by growth rates produced by the sub-area TransCAD model transit assignment and/or other CHT historical data sources and service capacity based on existing and or

future projected headways. Data will be shown in graphical format and potential future capacity issues for each peak hour (AM, noon, PM) will be highlighted.

In the sub-area model development process, Engineer will assess 2030 TRM transit networks and include all relevant information in development of sub-area model. Comparisons from model inputs and results will be made with existing CHT data projections.

4.4 2030 DYNB Pedestrian Analysis

The Engineer will provide a 2030 DYNB pedestrian analysis that includes qualitative review and assessment of proposed planned and committed improvements to pedestrian facilities and crossings in the project study area. Engineer will also refine the 2016 existing conditions corridor-level pedestrian LOS assessment of four (4) existing corridors within the specific E-F SAP area using the Highway Capacity Software (HCS) ARTPLAN multi-model analysis tool.

4.5 2030 DYNB Bicycle Analysis

The Engineer will provide a 2030 DYNB bicycle analysis that includes qualitative review and assessment of proposed planned and committed improvements to bicycle facilities and intersection crossings in the project study area. Engineer will also refine the 2016 corridor-level bicycle LOS assessment of four (4) existing corridors within the specific E-F SAP area using the Highway Capacity Software (HCS) ARTPLAN multi-model analysis tool.

TASK 5 – 2030 DESIGN YEAR BUILD (DYB) SCENARIO ANALYSIS

5.1 2030 DYB Sub-Area Model Development

5.1.1 Sub-Area Model TAZ/Network Modifications

Engineer will update 2030 DYNB sub-area network to reflect anticipated land use and transportation network changes that will be provided by the Town for evaluation in the 2030 DYB scenario. Engineer will update the 2030 future socio-economic data for TAZs in the E-F SAP area to reflect changes in trip generation.

5.1.2 Sub-Area Model Traffic Volume Development/Extraction to TransModeler

Sub-area model will be run in TransCAD and traffic assignments and new distributions throughout the project study area caused by the E-F Build scenario will be converted to peak hour origin-destination flows that will be exported to TransModeler.

Transit assignment data from the sub-area model will also be reviewed and incorporated into TransModeler or transit demand/capacity spreadsheet tool, as appropriate, depending on the accuracy of the data extracted.

5.1.3 ITE Trip Generation Development/Comparison

As a check for sub-area trip generation data produced from model TAZ centroids, the Engineer will conduct a separate ITE trip generation analysis of 2030 future E-F SAP area redevelopment trip generation. Trip generation rates for all future redevelopment site traffic from the E-F SAP area will be calculated from the following sources:

- *Institute of Transportation Engineers Trip Generation Manual*, Version 9

Any estimates for internally captured trips, transit and pedestrian-bicycle trips will be calculated in accordance with ITE Trip Generation standards, NCDOT Congestion Management Unit policy, relevant research studies of higher density mixed-use development projects, relevant and applicable software tools for generating trips for such projects, and information to be provided by the Town. Depending on the comparisons between the sub-area TAZ trip productions/attractions and the ITE trip generation exercise, additional adjustments may be made by the Engineer to the sub-area model S-E data, based on coordination with and approval from Town staff.

5.2 2030 DYB Traffic Operations Analysis

5.2.1 TransModeler Model Development
Engineer will update the 2030 DYNB conditions AM, noon, and PM peak hour TransModeler models to include updated O-D matrices extracted from the 2030 DYB sub-area TransCAD model. Engineer will also update study area model network for any planned roadway improvement projects in the E-F SAP study area that were not considered to be built in the 2030 DYNB models, and any transit route/stop modifications, or any other relevant changes to the study area transportation network that are assumed in the Build Scenario to be analyzed in these models. Coordinated traffic signal timings in the project study area will held constant in TransModeler to allow comparisons with 2030 DYNB conditions, unless Build Scenario network changes require individual signal timing modifications.

5.2.2 TransModeler MOE Runs/Extraction
Engineer will run the 2030 DYB TransModeler AM, noon, and PM peak hour models to produce MOE statistics for intersections in the project study area. 10 runs of each model scenario will be conducted and results averaged for the same MOEs as described in **Section 3.2.2**.

5.3 2030 DYB Transit Analysis
The Engineer will provide a 2030 DYB transit analysis of all current (and any potential future) CHT routes in the project study area (directly serving the E-F SAP boundaries) based on existing ridership demand data (boardings and alightings) that would be modified by growth rates produced by the sub-area DYB TransCAD model transit assignment and/or other CHT historical data sources and service capacity based on existing and or future projected headways. Data will be shown in graphical format and potential future capacity issues for each peak hour (AM, noon, PM) will be highlighted – with emphasis on projected ridership demands between the Build and No-Build Scenarios.

In the sub-area model development process, Engineer will assess 2030 TRM transit networks and include all relevant information in development of sub-area model and refinement for Build Scenario conditions. Comparisons from model inputs and results will be made with existing CHT data projections and the 2030 DYNB transit analysis results.

5.4 2030 DYB Pedestrian Analysis
The Engineer will provide a 2030 DYB pedestrian analysis that includes qualitative review and assessment of proposed planned and committed improvements to pedestrian facilities and crossings in the project study area. Engineer will also refine the 2030 DYNB corridor-level pedestrian LOS assessment of four (4) existing corridors within the specific E-F SAP area using the Highway Capacity Software (HCS) ARTPLAN multi-model analysis tool for any anticipated Build Scenario pedestrian improvements.

5.5 2030 DYB Bicycle Analysis
The Engineer will provide a 2030 DYB bicycle analysis that includes qualitative review and assessment of proposed planned and committed improvements to bicycle facilities and intersection crossings in the project study area. Engineer will also refine the 2030 DYNB corridor-level bicycle LOS assessment of four (4) existing corridors within the specific E-F SAP area using the Highway Capacity Software (HCS) ARTPLAN multi-model analysis tool for any anticipated Build Scenario bicycle improvements.

5.6 Identification of Mitigation Recommendations – All Modes
The Engineer will review operational and planning-level analyses of the 2030 DYNB and 2030 DYB scenarios for all peak hours to identify, for each mode, where capacity, connectivity, or accessibility is lacking in the assumed Build Scenario. The Engineer will coordinate with the Town to develop specific improvement mitigation strategies to provide a peak hour LOS D for each mode (or adequate capacity to meet transit ridership for that mode).

TASK 6 – 2030 DESIGN YEAR BUILD (DYB) + MITIGATION SCENARIO ANALYSIS

6.1 2030 DYB+Mitigation Sub-Area Model Development

6.1.1 Sub-Area Model TAZ/Network Modifications
Strategies developed in Section 5.6 that are applicable to inclusion in the 2030 DYB sub-area model will be made with respect to land use S-E data or transportation network changes/adjustments. The

sub-area model will be rerun, as necessary, to provide new traffic assignments or transit trip demand values that can be incorporated into analyses listed below.

6.1.2 Sub-Area Model Traffic Volume Development/Extraction to TransModeler
The DYB+Mitigation sub-area model traffic assignments will be extracted and converted into peak hour flows in TransModeler for testing and verification of mitigation strategies.

6.2 2030 DYB+Mitigation Traffic Operations Analysis

6.2.1 TransModeler Model Development
Engineer will update the 2030 DYB conditions AM, noon, and PM peak hour TransModeler models to include updated O-D matrices extracted from the 2030 DYB+mitigation sub-area TransCAD model. Engineer will also adjust model networks to reflect proposed transportation network mitigation improvements for intersections falling below LOS D in the 2030 DYB models.

6.2.2 TransModeler MOE Runs/Extraction
Engineer will run the 2030 DYB+mitigation TransModeler AM, noon, and PM peak hour models to produce MOE statistics for intersections in the project study area. 10 runs of each model scenario will be conducted and results averaged for the same MOEs as described in **Section 3.2.2**.

6.3 2030 DYB+Mitigation Transit Analysis
The Engineer will provide a 2030 DYB+Mitigation transit analysis of all current (and any potential future) CHT routes in the project study area (directly serving the E-F SAP boundaries) based on the same methodology used in previous scenarios and focusing on routes where future demand exceeds future capacity. Data will be shown in graphical format and potential future capacity issues for each peak hour (AM, noon, PM) will be highlighted – with emphasis on projected capacity requirements to serve the Build Scenario peak hour demands.

6.4 2030 DYB+Mitigation Pedestrian Analysis
The Engineer will provide a 2030 DYB+Mitigation pedestrian analysis that includes qualitative review and assessment of any locations where pedestrian facilities and crossings in the project study area fail to provide a multimodal LOS D in the 2030 DYB analysis. Engineer will also refine the 2030 DYNB corridor-level pedestrian LOS assessment of four (4) existing corridors within the specific E-F SAP area using the Highway Capacity Software (HCS) ARTPLAN multi-model analysis tool for any necessary Mitigation Scenario pedestrian improvements.

6.5 2030 DYB+Mitigation Bicycle Analysis
The Engineer will provide a 2030 DYB+Mitigation bicycle analysis that includes qualitative review and assessment of any locations where bicycle facilities and intersection crossings in the project study area fail to provide a multi-modal LOS D in the 2030 DYB analysis. Engineer will also refine the 2030 DYNB corridor-level bicycle LOS assessment of four (4) existing corridors within the specific E-F SAP area using the Highway Capacity Software (HCS) ARTPLAN multi-model analysis tool for any necessary Mitigation Scenario bicycle improvements.

TASK 7 – PRODUCE REPORTS

7.1 Draft TIA Report
Engineer will provide a free standing draft report and technical report summarizing the 2016 Existing Conditions Technical Memorandum and the findings and conclusions from the 2030 Design Year No-Build, Build, and Build+Mitigation Scenario analyses for all transportation modes. This report will contain grammatical, graphical, and tabular information. The report will include any specific information as required in the *Town of Chapel Hill Guidelines for Traffic Impact Analysis* that directly pertains to analysis conducted for this study. The information will also be disseminated to the public and presented at a public information meeting.

7.2 Final TIA Report
Engineer will submit Draft TIA Report to Town, the public, and other project stakeholders for review and comments. After receiving comments, Engineer will revise Draft TIA report, as necessary, and provide a sealed Final TIA report to Town.

TASK 8 – PUBLIC INVOLVEMENT

8.1 Development of a Public Involvement Plan (PIP)
The Town will be responsible for the development and facilitation of a project PIP. The Engineer will coordinate with the Town, as needed, to provide all relevant information as described in **Sections 8.2 and 8.3** below.

8.2 Meeting Preparation
Engineer will prepare any necessary meeting materials, including PowerPoint presentations, hand-out material, video visualizations and any other resources that are discussed and agreed upon with Town staff that may be necessary for public, stakeholder and Town Council meetings.

8.3 Meeting Attendance
The Engineer will provide appropriate staff to attend public meetings, as necessary and in coordination with information from Town staff. It is envisioned that up to eight (8) public meetings may occur through the duration of the project and two (2) staff from HNTB would attend each meeting, depending on the scope/nature of the meeting and presentation requirements set forth by the Town. The Engineer will assist the Town by providing summary notes from each meeting that will be provided to the Town for distribution.

A.2. The following Services are not included in this Scope of Services document, but shall be provided as Additional Services if authorized or confirmed in writing by the Town:

- Any additional analyses
- Any additional meetings or detailed PIP development and significant public involvement activities not identified in **Section 8.0** of this Scope of Services

A.3. In conjunction with the performance of the foregoing Services, Engineer shall provide the following submittals/deliverables (Documents) to Town:

- 1 electronic and 1 hardcopy of Existing Conditions technical memorandum and overall TIA draft report
- 8 hard copies of final TIS report and executive summary
- 1 electronic copy of final TIS report and executive summary and all supporting files/models/analysis
- 1 electronic copy of all meeting summaries and presentation materials

Section B. - Schedule
Engineer shall perform the Services and deliver the related Documents according to the following anticipated schedule:

- Traffic Counts to be Completed by November 18, 2016
- Task 3 Draft 2016 Existing Conditions Technical Memorandum and Public Information Meeting – January 2017
- Draft TIA report and Public Information Meeting – May 2017
- Final TIA report – June 2017

Additional schedule details for additional public meetings/presentations and overall work plan to be submitted by Engineer after consultation with Town.

Section C. - Compensation
C.1. In return for the performance of the foregoing obligations, Town shall pay to Engineer the amount of **$195,840** (see Exhibit "B" for detailed fee estimate) payable according to the following terms:

- Monthly Invoice, to be accompanied by a monthly progress report summarizing the hours spent and work completed.
- Town to be billed only for hours spent on a task and for meetings attended.

C.2. Compensation for Additional Services (if any) shall be paid by Town to Engineer according to the following terms following Town acceptance of study:

- Lump Sum upon completion

Section D. - Town's Responsibilities

Town shall perform and/or provide the following in a timely manner so as not to delay the Services of Engineer. Unless otherwise provided in this Scope of Services, Town shall bear all costs incident to compliance with the following:

- Information on any proposed roadway improvements in the study area
- Information on any approved proposed developments in the study area
- Information on traffic projections for future roadways in the study area
- Information on all relevant Town studies, plans and construction projects
- If available, planned redevelopment building uses and sizes