Fill-in all of the information highlighted in yellow. Once the scope is finalized select all text and remove highlighting.

Items in pink are comments that can be removed once scope has been finalized

*Is a base year build or opening year build model required?*

For locations that potentially include adding new signals to the network it is often beneficial to know how the intersection will operate with and without the signal in the base year or the opening year for the project. If the project proposes to add new signals it is recommended that an analysis be completed that analyzes each location as both unsignalized and signalized.

Base Year Build analysis may also be required to provide information for air quality modeling, so coordination with the Project Development and Environmental Analysis Branch should be undertaken to determine if this scenario is needed. Utilize highlighted text in scope if a base year build is required, if not, remove the highlighted text from the scope.

It is likely that all of the details required to complete the scope won’t be available at the time the scope is being developed, especially if all of the alternatives have not been developed yet. However, if the scope is uncertain please make a good faith estimate of the number of analysis segments or intersections and note that it is an assumption. If the number is substantially different then it can be rectified in a future task order.

**Guidance on Level of Complexity**

Simple: This category includes basic traffic operations that are common in most analyses, including stop-controlled intersections, basic signals with standard phasing and basic single lane roundabout intersections. This category should be used for projects with under saturated operations that do not have intersections whose operations are substantially affected by adjacent intersections.

Low: This category includes the same basic types included in the Simple category as well as conventional signals with more complex phasing and operations near or at capacity with very few intersections having operations that are substantially affected by adjacent intersections.

Moderate: This category includes the same types included in the Simple and Low categories as well as unconventional intersections such as superstreets, Michigan u-turns and quadrant roadways. This category should be used for projects with the operations being near or above the capacity of the roadway with some intersections having operations that are substantially affected by adjacent intersections.

High: This category includes the same types included in the previous categories as well as more advanced unconventional intersections and interchanges such as CFI’s and DDI’s. This category should be used for projects with the operations being near or above the capacity of the roadway with more than a few intersections having operations that are substantially affected by adjacent intersections. This category should also be used for more complex multi-hour analysis and for projects that have more complex volume development requiring manual re-routing of trips. **Use of this category requires approval from NCDOT.**

Very Complex: This category includes the same types included in the previous categories as well as a combination of multiple advanced modeling or analysis requirements that are not commonly utilized or require the development of project specific analysis methods. It should only be utilized for very complex and large systems/network level analyses. **Use of this category requires approval from NCDOT.**

**Note on Volume Balancing**

The use of balancing between intersections on STIP projects is not typically needed. Synchro does not require balanced volumes and SimTraffic is able to use sinks and sources to adequately accommodate volume differences. For locations where there is If there a substantial imbalance (typically greater than a 10% difference) and the intersection spacing is less than 1/8 of a mile consideration should be given to adding a dummy node/links to accommodate the change in volume. If the PEF believes volume balancing is needed, it must be approved by NCDOT.

**SCOPE TEMPLATE LAST UPDATED: 02/16/2019**

**S****cope of Work**

**Task Order 1**

**Insert Project Description**

Insert County Name **County**

**STIP Project No.:** Insert STIP No.

**WBS No.: Insert WBS No.**

**Contract No.: Insert Contract No.**

**Prepared for:**

**North Carolina Department of Transportation**

**Prepared by:**

**Insert Private Engineering Firm Name**

**Task Order Period: Month 201X-Month 201X**

Date: Insert Initial Development Date.

Finalized: Insert Finalized Date

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# General Information

*{Insert a BRIEF statement about the contract mechanism, such as TM&S On-Call, Division On-Call, stand-alone contract, etc}.*

Under insert Contract Type/Mechanism. with the North Carolina Department of Transportation (NCDOT), insert PEF Name (CONSULTANT) has been requested to assist NCDOT in the development of traffic operations analysis utilizing HCS/Synchro and/or Sidra software for the subject project. Assignments under this contract will be assigned and defined on a Task Order basis.

The following Scope of Work (Scope) for Task Order insert Task Order # has been prepared to define the services that the CONSULTANT will provide NCDOT for developing the analysis in HCS, Synchro and/or Sidra. The analysis will conform with the NCDOT Congestion Management Capacity Analysis Guidelines ([https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/Congestion%20Management/Capacity%20Analysis%20Guidelines.pdf](https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/Congestion%20Management/Standards%20-%20Capacity%20Analysis%20Guidelines.pdf) ).

The study period for this assignment is expected to extend over a insert # month period. Unless specified otherwise under a particular task, it is assumed that NCDOT or its representatives will provide all data, technical analyses, and other pertinent information in a form sufficient for the CONSULTANT to complete this scope of work. The CONSULTANT will assume information including, but not limited to, technical reports, technical data, technical references and citations, and project correspondence received from NCDOT or a third party is accurate and up to date. If errant data or technical analyses are discovered by the CONSULTANT during the performance of the scope, the CONSULTANT will immediately notify NCDOT. Current documents and standards are those in effect at the signing of this task order. Reference to current versions of software will be the current version of the software at the time of the Finalized date included on the cover of this scope.

# Project Information

*{Please fill this section in with as much information as is known. This is the basis for many of the items and should be provided in enough detail that the values included in the scope can be verified/justified.}*

The study includes the Insert Project/Study Overview and includes the following Insert # intersections:

* List of intersections

The analysis includes the following Build Alternatives:

* List and description of alternatives

# Project Management, Coordination and Administration

## Project Management and Administration

*{Insert any other units or entities that you will need to coordinate with for the traffic analysis only. The units should be for general project coordination, the technical aspects are included in Section 1.2. This is to cover the administration of the contract, the invoicing and progress reporting. If this scope is part of a larger contract (or task order) that also includes this administrative time, then it should be noted and the time will be reduced or removed for the traffic portion.}*

The CONSULTANT will manage and administer this contract with NCDOT throughout the duration of this assignment, including coordination with the Congestion Management Section, Insert other units/agencies, as needed.

The study is anticipated to have a insert # month duration. The CONSULTANT will prepare a monthly progress report and submit an invoice to the NCDOT Project Manager each month throughout the duration of the study. For projects where the contract is not through the Transportation Mobility and Safety Branch or the Congestion Management Section, the CONSULTANT will provide a duplicate copy of the monthly progress report to the Congestion Management Section.

## Project Coordination

*{This covers any coordination required between the CONSULTANT and NCDOT for technical aspects of the study. Insert the duration of the analysis and the number of meetings and staff members. If the meeting requires travel beyond the consultants’ local area it should be noted here and will be included in the estimate.}*

The CONSULTANT will coordinate with NCDOT relating to the technical aspects of the assignment throughout the duration of this study, including coordination with the Congestion Management Section.

The study is anticipated to have a insert # month duration. The CONSULTANT will attend up to insert # coordination meetings with NCDOT, including up to insert # staff members for each meeting.

## Consultant Coordination

*{If a subconsultant is being utilized to develop portions of the analysis and coordination is required between the firms, then add the information included below. Also designate the individual tasks to be completed by subconsultant in each scope item.}*

The CONSULTANT and SUBCONSULTANT will coordinate with one another during the completion of this scope of work. The coordination will include both technical aspects of the evaluation and coordination relating to schedule and tracking of progress.

*{If the Consultant is preparing the traffic analysis for a prime consultant from a different firm and coordination is required between the firms then add the information below.*

The CONSULTANT and PRIME CONSULTANT will coordinate with one another during the completion of this scope of work. The coordination will include both technical aspects of the evaluation and coordination relating to schedule and tracking of progress.

*{If no subconsultants are being utilized or if the work is being completed by a single firm then strike through the above tasks.}*

# Data Collection and Field Visit

## Data Collection

The CONSULTANT will acquire the following items for developing the analysis:

* Latest aerial photography
* Existing Signal Plans
* Traffic Forecast
* [List any other data needed including design plans, etc.]

*{If existing models are already developed they need to be noted as this reduces the level of effort required to develop them. Any details about the level of detail in the models that may need to be modified should also be included so that it can be determined what the additional effort will be to develop them for this scope of work.}*

*{If existing HCS/Synchro/Sidra files are available from previous work efforts, then a description of the files and pertinent data on the level of detail, etc. should be included here. If no existing files are available, it should be stated here.}*

*{Data collection is typically only included once for each project. Additional task orders for the same project should not include data collection unless it can be justified with specific data collection needs beyond what was originally scoped.}*

## Field Visit (OPTIONAL)

*{Please coordinate with NCDOT Congestion Management to determine if a field visit is needed. If one is needed, then the Consultant will visit the site during the more critical of the peak periods to observe traffic and spend some time reviewing the area and verifying the geometry and operations. If a field visit it not required, then ~~strike through~~ this text instead of deleting it.}*

The CONSULTANT will visit the project site during the critical peak period to observe traffic patterns, note any congestion and develop a basis for visually validating the base year model. The CONSULTANT will also verify the provided data is consistent with the actual operations. Two (2) staff members will participate in the field visit with the approximate travel time to the project being insert # hours.

# Traffic Volume Development

The CONSULTANT will utilize the traffic forecast for the project to develop peak hour volumes for each of the scenarios being evaluated. The traffic volumes will be developed for the following scenarios:

* Scenario 1: 201X Base Year No-Build
* Scenario 2: 201X Base Year Build
* Scenario 3: 204X No-Build
* Scenario 4: 204X Build

*For the 201X Base Year Build, If there are multiple Build Alternatives only the preferred alternative should be included as this mostly to make decisions during the final design stage.* *If there are multiple 2040X Build Alternatives they should be listed here individually.}*

*{if the forecast volumes are the same for any of the scenarios (ie. BY No-Build and Build are the same) then it should be noted and the totals below should only be for each unique set of volumes.* *The Consultant will be paid for each unique scenario that needs to be developed. If there is substantial overlap between alternatives that have the same volumes it should be noted.}*

## Convert Forecast to Peak Hour Volumes

The CONSULTANT will convert the Average Annual Daily Traffic (AADT) data included in the traffic forecast to peak hour volumes for insert # intersections for insert # scenarios utilizing the Intersection Analysis Utility (IAU). The volume development process includes breakout of insert # interchanges and/or non-standard intersection configurations for insert # scenarios. The traffic forecast, IAU output, traffic breakouts for interchanges/unconventional intersections and any calculations utilized to balance the network will be included as an appendix to the Technical Memorandum.

*{If the Consultant feels that balanced volumes for the network are needed they should discuss it with the Congestion Management Engineer before adding the item to the scope.}*

*{If there is a need to develop balanced network the following should be added: The peak hour volumes will then be balanced for the entire network by starting at the center of the network and working outward, or by another means approved by NCDOT.}*

*{Note that the # of scenarios is based on this listing above in Item 3 with 201X Base Year Build being one scenario and includes both AM and PM peak hour. If there are a different number of intersections for certain scenarios then each scenario can be described separately. If any of the scenarios have identical traffic volumes then they should only be listed one time.}*

# 201X Base Year Model

The CONSULTANT will develop a 201X base year model for the subject project that will not be calibrated to existing conditions. The analysis will be prepared for both the AM and PM peak hours.

## Highway Capacity Software (HCS) Analysis

The CONSULTANT will prepare the analysis of the following items utilizing the latest version of HCS:

* ## segments for Freeway Facilities Analysis/FREEVAL
* ## Basic Freeway Segments (isolated analysis – non-Freeway Facility Analysis)
* ## Ramp Merge and Diverge Segments (isolated analysis – non-Freeway Facility Analysis)
* ## Freeway Weaving Segments (isolated analysis – non-Freeway Facility Analysis)
* ## Multi-lane Highway Segments
* ## Two-Lane Highway Segments

*{For standard freeway analysis the Freeway Facilities/FREEVAL analysis should be utilized with the isolated segment analysis only being utilized for non-standard configurations. If the use of isolated analysis is required, it should be justified and explained in the scope.}*

*{Multi-lane and two-lane shall not be used for corridors that have signals within 2 miles. Any locations that include signalized intersections should be analyzed in Synchro/Sidra.}*

To facilitate review, the analysis shall include assigning each segment an analysis ID that will be used throughout the entire analysis and shall be included on all figures, tables and output sheets. The results of the analysis should be summarized in tabular format and with a figure depicting the analysis network with the results shown visually. The output reports for all analyses shall be included in the appendices and labeled with the proper analysis ID.

## Synchro Analysis

The CONSULTANT will utilize the latest available version and build of Synchro signal software developed by Trafficware to complete an analysis of the operations for unsignalized and signalized intersections.

The base year analysis network includes the following attributes:

* ## unsignalized intersections
* ## signalized intersections
  + ## standard intersections
  + ## unconventional intersections (quadrant left, superstreet, continuous flow, etc.)

*{The level of effort for a standard intersection is less than for an unconventional intersection. The number of unconventional intersections includes all elements of the intersection (for example, 1 superstreet intersection includes the main intersection and the 2 u-turn intersections)}*

The analysis will include developing the networks in Synchro and reviewing the operations in SimTraffic (10 runs). To facilitate review, the analysis shall include assigning each intersection an analysis ID that will be used throughout the entire analysis and shall be included on all figures, tables and output sheets. The results shall include the following: Delay and LOS for each lane group and for the overall intersection, the SimTraffic maximum queue length, and the Synchro 95% percentile queue length. The results of the analysis should be summarized in tabular format and with a figure that includes the existing lane configurations. The output reports for all analyses (Synchro – Lanes, Volume and Timing Report, SimTraffic – Queueing and Blocking Report) shall be included in the appendices and labeled with the proper analysis ID.

## Sidra Analysis

The CONSULTANT will utilize the latest version of Sidra to analyze the operations of roundabouts. The base year model network includes the following attributes:

* ## roundabout intersections

To facilitate review, the analysis shall include assigning each segment an analysis ID that will be used throughout the entire analysis and shall be included on all figures, tables and output sheets. The results of the analysis should be summarized in tabular format and with a figure depicting the analysis network with the results shown visually. The output reports for all analyses shall be included in the appendices and labeled with the proper analysis ID.

# 204X No-Build Analysis

{*The analysis for the future year no-build should include any fiscally constrained project with the exception of the proposed project. Only include projects that are located within the limits of the traffic analysis. If there are no additional project, please note it. Based on the location of the project, please remove either the MPO or non-MPO portions that are not applicable.}*

The CONSULTANT will develop an analysis of the No-Build scenario that will include all fiscally constrained projects within the model study area being constructed with the exception of the proposed project. The current [Insert MPO Name and title of Long Range Transportation Plan or Metropolitan Transportation Plan] will be utilized to determine if any fiscally constrained project besides the subject project are present. For scoping purposes, the following projects are located within the analysis limits and are considered to be constructed by the design year:

* Add list of project(s) that are within the analysis study area and must be analyzed in the 204X No-Build Analysis

For non-MPO areas, any project located within the model study area that has construction funding in the current State Transportation Improvement Program (STIP) or Municipal Transportation Improvement Program (MTIP) will be included in the analysis. For scoping purposes, the following projects are located within the analysis limits and are to be included in the future year networks:

* Add list of project(s) that are within the analysis study area and must be analyzed in the 204X No-Build Analysis

*{Select either the MPO or Non-MPO text above and remove the other text}*

## Highway Capacity Software (HCS) Analysis

The CONSULTANT will prepare the analysis of the following items utilizing the latest version of HCS:

Segments Analyzed in Base Year

* ## segments for Freeway Facilities Analysis/FREEVAL
* ## Basic Freeway Segments (isolated analysis – non Freeway Facility Analysis)
* ## Ramp Merge and Diverge Segments (isolated analysis – non Freeway Facility Analysis)
* ## Freeway Weaving Segments (isolated analysis – non Freeway Facility Analysis)
* ## Multi-lane Highway Segments
* ## Two-Lane Highway Segments

*{The segments included in this section are those that are identical to those included in the base year scenario. The only change will be to the volumes and requires less effort than a new analysis.}*

New Segments for 204X No-Build

* ## segments for Freeway Facilities Analysis/FREEVAL
* ## Basic Freeway Segments (isolated analysis – non Freeway Facility Analysis)
* ## Ramp Merge and Diverge Segments (isolated analysis – non Freeway Facility Analysis)
* ## Freeway Weaving Segments (isolated analysis – non Freeway Facility Analysis)
* ## Multi-lane Highway Segments
* ## Two-Lane Highway Segments

*{The segments included in this section are those that have been changed from the base year scenario and should correspond to the improvement listed in Section 5.}*

The analysis will be completed in the same manner as described in Section 4.1.

## Synchro Analysis

The CONSULTANT will utilize the latest available version and build of Synchro signal software developed by Trafficware to complete an analysis of the operations for unsignalized and signalized intersections.

The analysis network includes the following attributes:

Intersections Analyzed in Base Year

* ## unsignalized intersections –already coded in base year scenario
* ## signalized intersections – already coded in base year scenario
  + ## standard intersections
  + ## unconventional intersections (quadrant left, superstreet, continuous flow, etc.)

*{The intersections included here are those that are identical to those included in the base year scenario. The only change is to volumes, review of the phasing and re-optimization of the timings. Please note that No-Build does not mean that nothing can be changed from the base year – the phasing and timings should be reviewed and modified as needed for the future year volumes.}*

New Intersections for 204X No-Build

* ## unsignalized intersections – not coded or modified from base year scenario
* ## signalized intersections – not coded or modified from base year scenario
  + ## standard intersections
  + ## unconventional intersections (quadrant left, superstreet, continuous flow, etc.)

*{The intersections included here are for new or modified intersections not included in the base year scenario and should correspond to the improvements listed in Section 5.}*

The analysis will be completed in the same manner as described in Section 4.1.

## Sidra Analysis

The CONSULTANT will utilize Sidra to analyze the operations of roundabouts. The analysis network includes the following attributes:

* ## roundabout intersections – not coded or modified from base year scenario
* ## roundabout intersections – already coded in base year scenario

The analysis will be completed in the same manner as described in Section 4.1.

# 204X Build Analysis

*{Enough details on the Build Alternatives should be provided such that the model coding attributes can be determined. If it is not well known what the build design will be then it should be noted and any assumptions should be provided to justify the details included in the following sections.}*

The CONSULTANT will develop an analysis of the Build scenario that will include all listed projects within the analysis study area (as were added in Section 5) including the proposed project.

The analysis includes the following Build Alternatives:

* List and description of alternatives

*{Note: A separate listing of attributes should be included for each alternative that includes the differences from the other alternatives, with any overlapping aspects removed. The following list should include a summary of the overall attributes for all build models.}*

## Highway Capacity Software (HCS) Analysis

The CONSULTANT will prepare the analysis of the following items utilizing the latest version of HCS:

Segments Analyzed in Base Year or 204X No-Build

* ## segments for Freeway Facilities Analysis/FREEVAL
* ## Basic Freeway Segments (isolated analysis – non Freeway Facility Analysis)
* ## Ramp Merge and Diverge Segments (isolated analysis – non Freeway Facility Analysis)
* ## Freeway Weaving Segments (isolated analysis – non Freeway Facility Analysis)
* ## Multi-lane Highway Segments
* ## Two-Lane Highway Segments

*{Similar to the 204X No-Build – anything that has been developed previously will only include updating the volumes. This should include the total for all alternatives that have different traffic volumes. If segments have the same traffic volumes under multiple scenarios they should only be included one time.}*

New Segments for 204X Build

* ## segments for Freeway Facilities Analysis/FREEVAL
* ## Basic Freeway Segments (isolated analysis – non Freeway Facility Analysis)
* ## Ramp Merge and Diverge Segments (isolated analysis – non Freeway Facility Analysis)
* ## Freeway Weaving Segments (isolated analysis – non Freeway Facility Analysis)
* ## Multi-lane Highway Segments
* ## Two-Lane Highway Segments

*{This is the total number of segments for all of the build alternatives combined.}*

The analysis will be completed in the same manner as described in Section 4.1. The results of the analysis should be summarized in tabular format and with a figure that includes the proposed lane configurations.

## Synchro Analysis

The CONSULTANT will utilize the latest available version and build of Synchro signal software developed by Trafficware to complete an analysis of the operations for unsignalized and signalized intersections.

The analysis network includes the following attributes:

Intersections Analyzed in Base Year or 204X No-Build

* ## unsignalized intersections – already coded in previous scenario
* ## signalized intersections – already coded in previous scenario
  + ## standard intersections
  + ## unconventional intersections (quadrant left, superstreet, continuous flow, etc.)

New Intersections for 204X Build

* ## unsignalized intersections – not coded or modified from previous scenario
* ## signalized intersections – not coded or modified from previous scenario
  + ## standard intersections
  + ## unconventional intersections (quadrant left, superstreet, continuous flow, etc.)

*{Similar to Section 6.1, any previously developed will only include updating volumes, phasing and timings, while new intersections will be developed fully.}*

The analysis will be completed in the same manner as described in Section 4.1. The results of the analysis should be summarized in tabular format and with a figure that includes the proposed lane configurations.

## Sidra Analysis

The CONSULTANT will utilize Sidra to analyze the operations of roundabouts. The analysis network includes the following attributes:

* ## roundabout intersections – already coded in previous scenario
* ## roundabout intersections – not coded or modified from previous scenario

The analysis will be completed in the same manner as described in Section 4.1. The results of the analysis should be summarized in tabular format and with a figure that includes the proposed lane configurations.

## Design Iterations

*{This section is to capture the effort of the back and forth in the analysis between the design team and the traffic team. The level of complexity and potential for highly iterative designs will be the primary measure used to determine the level of effort here. Details that justify why additional time will be needed for the project should be provided such that the individual developing the in-house estimate can provide an adequate estimate.}*

The CONSULTANT will review the MOEs for the AM and PM peak periods and determine if design modifications are required to achieve desirable operations. The CONSULTANT will then make changes to the analysis to improve operations or attain a prescribed MOE for the project and will re-run the steps described in Section 6.1 through Section 6.3 The CONSULTANT will notify NCDOT if modifications are being made to determine if *coordination with the NCDOT design team is required before modifications are developed.*

*{Insert a description of the number of designs and level of design expected. (conceptual/functional/preliminary/final) and what the expected level of design iterations is expected to be. If the design is not well defined, it may take more iterations compared with the analysis of a project that is in the final design phases. The description should be adequate to develop an estimate of the level of effort that will be required.}*

# 201X Base Year Build

*{This analysis will only include detailed analysis of the preferred alternative and will focus on the signalized intersections only.}*

The CONSULTANT will develop an analysis of the preferred alternative for the Build scenario using 201X base year build volumes. Because the analysis is primarily utilized to determine the need for signals during the initial construction of the project only the signalized intersections will be analyzed.

## Synchro Analysis

The CONSULTANT will utilize the latest available version and build of Synchro signal software developed by Trafficware to complete an analysis of the operations for signalized intersections.

The analysis network includes the following attributes:

* ## signalized intersections – already coded in previous scenario
  + ## standard intersections
  + ## unconventional intersections (quadrant left, superstreet, continuous flow, etc.)

The analysis will be completed in the same manner as described in Section 4.1.

# Documentation

## Traffic Capacity Analysis Technical Memorandum

*{It should be determined how many hard copies are actually needed. Many units are fine with just receiving pdf’s of the report.}*

The CONSULTANT will prepare a traffic capacity analysis technical memorandum including the results of analyses. The memorandum will include all pertinent information relating to the analysis, the volume development/breakout, the results of the analysis and figures depicting the information included in each previous section of this scope. The HCS/Synchro/Sidra output reports will be included as appendices to the report. A digital copy of the Draft Technical Memorandum will be prepared for NCDOT review and revised based on comments received. The comments provided by NCDOT on the Draft Technical Memorandum will be addressed and the Final Technical Memorandum will be prepared with ## hard copies being provided to NCDOT. A digital copy of the Final Technical Memorandum in Adobe Acrobat format will also be developed.

At the conclusion of the study, the CONSULTANT will also provide NCDOT with all digital files utilized in the development of the analysis.

# Schedule and Deliverables

At the conclusion of the study, the CONSULTANT will provide the following deliverables to NCDOT:

* HCS/Synchro/Sidra files for 201X Base Year Model
* HCS/Synchro/Sidra files for 204X No-Build Model
* HCS/Synchro/Sidra files for 204X Build Model for each design alternative
* HCS/Synchro/Sidra files for 201X Base Year Build Model
* Traffic Capacity Analysis Technical Memorandum
* Pertinent information used in developing the analysis (included in the memorandum) including but not limited to, signal plans, design concepts, etc.

The anticipated schedule is shown below. It assumes that Notice to Proceed is received by insert date. Total duration for traffic operations analysis is insert # weeks from receipt of NTP.

|  |  |  |
| --- | --- | --- |
| **Task** | **Duration** | **Date of Completion** |
| Notice to Proceed | n/a | 00/00/0000 (assumed) |
| Submit Interim Review Information | # weeks | 00/00/0000 |
| NCDOT Review | # weeks | 00/00/0000 |
| Submit Draft Traffic Operations Analysis | # weeks | 00/00/0000 |
| NCDOT Review | # weeks | 00/00/0000 |
| Submit Final Traffic Operations Analysis | # weeks | 00/00/0000 |

*{Note that the schedule should be established such that it provides an estimate of when submittals and deliverables will be completed. The use of interim submittals should be determined on a project by project basis.}*

The CONSULTANT may submit analysis for any interim review by NCDOT if deemed appropriate. Any interim submittals must include FULL DOCUMENTATION of the volume and analysis development process. Analysis submitted without proper documentation will be returned to the CONSULTANT without review.

The duration of NCDOT reviews will be 3 weeks for projects with an “Estimation Index” of 6 or less (see estimate spreadsheet for Estimation Index). For projects with an index of 7 or more please allow 4 weeks for review by NCDOT.

The CONSULTANT should also coordinate with NCDOT at least one week prior to making any submittal to alert them that it will be submitted and to allow them to coordinate the review. Any submittals made without prior coordination with NCDOT will have the review time increased by two weeks.

# Crash Analysis

*{The inclusion of the crash analysis should only be included if requested by NCDOT. This scope should only be used for individual projects when it is ancillary to the traffic operations analysis.}*

## Develop/Request TEAAS Data

*{The development of the crash data in TEAAS requires prequalification for Code 458 – Crash Analysis and approval from the Traffic Safety System Section. If the firm completing the analysis is approved to develop TEAAS Data the following should be included, if not, then ~~strike through~~ the below tasks.}*

The CONSULTANT will prepare a section/strip crash analysis of the project corridor within the analysis study limits. The time frame will be the most current five (5) year study range.

The CONSULTANT 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

*{If the firm completing the analysis is not prequalified or approved to develop the TEAAS Data the following should be included, if not, then ~~strike through~~ the below tasks.}*

The CONSULTANT will prepare a request for crash data to the NCDOT Traffic Safety Unit for the TEAAS strip crash analysis.

## Prepare Traffic Safety Analysis

The CONSULTANT will prepare a Traffic Safety Analysis that includes the following information:

* Identify critical crash rates and develop a comparison of the rates.
* Identify crash patterns.
* Identify potential safety issues (based on crash analysis).
* Provide write up in the Draft and Final Traffic Operations Analysis Technical Memorandum Reports.

# Additional Scope Items

## Multi-hour Analysis Adjustment – HCS Analysis

*{If the project includes analysis of a peak period that extends beyond the normal one-hour AM and PM peak then the task included below should be included in the scope. The use of multi-hour simulation should only be utilized after consultation with NCDOT and when the additional effort is warranted.}*

The development of multi-hour simulation analysis requires additional effort beyond what is required for a standard single peak hour analysis. The development of the analysis and the associated outputs for multi-hour simulation models requires additional effort. Instead of detailing all of the items that require additional effort and attempting to capture the difference for multi-hour models it is assumed that the development and analysis increases the level of effort included in Section 4.1, 5.1 and 6.1 by ten percent (10%) to thirty percent (30%) depending on the number of additional hours being analyzed. The additional effort will be captured in this task on the estimate form.

The CONSULTANT will develop the analysis and outputs for a total of insert # analysis hours.

## Multi-hour Analysis Adjustment – Synchro Analysis

*{If the project includes analysis of a peak period that extends beyond the normal one-hour AM and PM peak then the task included below should be included in the scope. The use of multi-hour simulation should only be utilized after consultation with NCDOT and when the additional effort is warranted.}*

The development of multi-hour simulation analysis requires additional effort beyond what is required for a standard single peak hour analysis. The development of the analysis and the associated outputs for multi-hour simulation models requires additional effort. Instead of detailing all of the items that require additional effort and attempting to capture the difference for multi-hour models it is assumed that the development and analysis increases the level of effort included in Section 4.2, 5.2, 6.2 and 7.1 by ten percent (10%) to thirty percent (30%) depending on the number of additional hours being analyzed. The additional effort will be captured in this task on the estimate form.

The CONSULTANT will develop the analysis and outputs for a total of insert # analysis hours.

## Multi-hour Analysis Adjustment – Sidra Analysis

*{If the project includes analysis of a peak period that extends beyond the normal one-hour AM and PM peak then the task included below should be included in the scope. The use of multi-hour simulation should only be utilized after consultation with NCDOT and when the additional effort is warranted.}*

The development of multi-hour simulation analysis requires additional effort beyond what is required for a standard single peak hour analysis. The development of the analysis and the associated outputs for multi-hour simulation models requires additional effort. Instead of detailing all of the items that require additional effort and attempting to capture the difference for multi-hour models it is assumed that the development and analysis increases the level of effort included in Section 4.3, 5.3, and 6.3 by ten percent (10%) to thirty percent (30%) depending on the number of additional hours being analyzed. The additional effort will be captured in this task on the estimate form.

The CONSULTANT will develop the analysis and outputs for a total of insert # analysis hours.

*{Insert any additional scope items beyond those included in Sections 1-9. This section is for any additional items or considerations that are beyond what is included in the basic scope items in Sections 1-9. The individual tasks should be numbered with the same formatting as the above items and listed in the Cost Estimate. They will be estimated and negotiated individually. If there are no additional scope items insert the following statement: There are no additional scope items identified for this Task Order.}*