



**NJDOT LOCAL TRANSPORTATION PLANNING ASSISTANCE
AGREEMENT NO. 2009LA704B
CONTRACT ID NO. 09 70131**



**TASK ORDER NO. 6
SCOPE OF WORK**

**East Hanover Avenue Corridor Traffic Study
Hanover Township, Morris Township & Morris Plains Borough, Morris County**

INTRODUCTION

The New Jersey Department of Transportation (NJDOT) accepted a request from the Morris County Department of Public Works, Division of Engineering to provide Local Transportation Planning Assistance for a traffic study and design of East Hanover Avenue (CR 650) from Speedwell Avenue (US 202) to Whippany Road (CR 511). This 2.4 mile corridor traverses Morris Plains Borough, Morris Township and Hanover Township. For the purposes of this Scope of Work, future references to the "Corridor" refer to the section East Hanover Avenue (CR 650) within the study area. Stantec Consulting Services, Inc. (Stantec) will provide the technical services to the County.

According to Morris County's problem statement, current congestion issues and anticipated redevelopment in the area make it critical that land use and transportation be evaluated simultaneously, collaboratively, and in close coordination between and amongst the county and the three municipalities. Recently, the corridor has been the focus of increased and substantial redevelopment projects and proposals that will have a major impact on future traffic in the area. Two corner properties in Hanover Township are currently proposed for redevelopment to retail/supermarket and mixed use big box retail. Hanover Township has also approved the development of a 160-unit assisted living housing complex. Unless a comprehensive approach to planning for the circulation and traffic changes that would be generated from the increasing development in this area, associated traffic and mobility issues will continue to be addressed on a town-by-town basis, which will impact current and future economic development in the area. This calls for a joint transportation and land use undertaking.

The goal of this study and design effort is to analyze the existing and future traffic operations along this already congested corridor, and develop the necessary infrastructure improvements to reduce congestion and increase safety, while considering the needs of all users. The planning and concept design work effort will provide a comprehensive plan for the corridor across the three municipalities and will allow the County to negotiate pro rata contributions for transportation improvements with developers within the corridor.

The scope of work will be broken into two separate phases: 1) Planning and 2) Design. The Planning phase will include the traffic analysis, corridor study, preliminary engineering, and community involvement necessary to develop clear direction for the proposed infrastructure improvements. The Design phase will include the efforts required for the development of 95% complete contract documents for the implementation of the proposed infrastructure improvements outside the limits of work for the current proposed and anticipated developments.

The following tasks will be performed:



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PART 1: PLANNING PHASE

TASK 1 – PROJECT MANAGEMENT

The purpose of this task is to manage the study effort. The project manager and task leaders will effectively communicate with all involved parties and ensure that work flow is maintained on schedule and the necessary resources are committed to the project.

It is anticipated that Morris County will appoint a project manager or a contact person to coordinate the study with Stantec project manager throughout the process.

Task 1.1 – Meeting and Presentations

This scope of work assumes up to seven (7) progress meetings or stakeholder meetings / presentations with Morris County, Morris Plains Borough, Morris Township, and Hanover Township and other stakeholders during the planning phase. A joint kick-off meeting will be held with all local agencies involved to go over the scope and to obtain feedback. One “interview meeting” will be held with each municipality’s contact/representative during the data collection in Task 2 to obtain information regarding their plans for corridor and adjacent land uses. A meeting will be held with the municipalities and Morris County upon completion of the alternatives analysis in Task 4. Finally, two stakeholder/public information meetings will be held to present the recommended alternative before it is finalized, if required. It is anticipated that Morris County will assume the responsibility of coordinating with the three municipalities and other key stakeholders for meetings, including scheduling, meeting places and notices.

Minutes will be drafted for each meeting and circulated to the attendees for review and comment. Comments received will be incorporated, and the final approved minutes will be distributed as appropriate.

The County will obtain a “resolution of support” at the conclusion of the Planning phase when a recommended alternative has been identified.

Deliverables: Meeting minutes and presentation materials will be provided for each meeting. A resolution of support will be obtained from each municipality.

TASK 2 – DATA COLLECTION

Task 2.1: Roadway / Signal Information and Mapping

Stantec will collect and review all available, data, reports, plans and mapping including:



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- As-built plans of E. Hanover Avenue (CR 650) within the project limits
- As-built plans of all traffic signals (signal plans and electrical plans) within the project limits
- Aerial mapping
- Available traffic data; reports and studies
- Development plans and studies (if available)
- Tax, Right-of-Way and File Maps
- Zoning and Flood Maps
- Jurisdictional Agreements and Maps
- County and Local Master Plans and Land Use Studies
- Utility Maps
- Accident Records
- Levels of Bicycle and Pedestrian Activity
- Environmental Landscape Data, Reports and Studies.

Task 2.2: Traffic Data Collection

In order to facilitate a comprehensive analysis of the study area, the following data collection program will be implemented:

2.2.1 Manual Turning Movement Counts

Techniquist, a DBE sub consultant, will conduct manual turning movement counts at the following seven (7) intersections during the AM (6:30 AM – 9:00 AM) and PM (4:00 PM – 6:30 PM) peak periods:

- East Hanover Avenue and Speedwell Avenue (signalized)
- East Hanover Avenue and The American Road (signalized)
- East Hanover Avenue and Martin Luther King Avenue/Horse Hill Road (signalized)
- East Hanover Avenue and Monroe Street (unsignalized)
- East Hanover Avenue and Ridgedale Avenue (signalized)
- East Hanover Avenue and Morris County Library Driveway (signalized)
- East Hanover Avenue and Whippany Road (signalized)

Manual turning movement counts will be classified into vehicles and heavy vehicles, and will be verified utilizing data provided by the County.



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2.2.2 Pedestrian and Bicycle Counts

Pedestrian and bicycle counts will be performed at all seven manual turning movement count locations during all three peak periods. Pedestrian volume by crosswalk will be recorded.

2.2.3 Automatic Traffic Recorders

Techniquest will also place automatic traffic recorders (ATRs) at the following four locations for a period of at least seven days:

- East Hanover Avenue between Speedwell Avenue and the American Road
- East Hanover Avenue between The American Road and Martin Luther King Avenue/Horse Hill Road
- East Hanover Avenue between Highview Avenue and Monroe Street
- East Hanover Avenue between the Library Driveway and Whippany Road

2.2.4 Travel Time Runs

Speed and delay travel time runs will be conducted along the corridor during the same peak periods as the manual turning movement counts. The speed and delay runs will be used to evaluate corridor performance as well as to calibrate the traffic analysis models.

2.2.5 Crash Data

Crash data will be acquired for the entire corridor for the most recent three year period available.

Deliverables: All data collected in this task will be provided in raw, electronic format.

TASK 3 – EXISTING AND NO BUILD CONDITIONS ANALYSES

Task 3.1: Existing Condition Capacity Analysis

Traffic data collected in Task 2 will be reduced to develop 2011 Existing Condition AM, midday, and PM peak hour traffic volumes. Synchro 7/Sim Traffic analysis and simulation models will be developed for the AM, midday, and PM peak hours using the peak hour data. The models will be calibrated utilizing the travel time runs. A capacity analysis will be performed for each peak hour to establish baseline calibrated model in which to analyze future conditions, and to identify existing deficiencies along the corridor.



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Task 3.2: Complete Streets Review

Aerial mapping, site visits, and pedestrian and bicycle data will be used to evaluate the existing corridor from a Complete Streets perspective. Existing sidewalks, crosswalks, shoulders, transit stops, and streetscaping will be identified and mapped, and a visual condition assessment will be conducted. The mapping and condition assessment will be used to identify needs and opportunities to enhance Complete Streets principles along the corridor.

Task 3.3: Crash Analysis

Corridor crash data for the most recent three year period available will be obtained and analyzed. The data will be evaluated to determine if there are any locations that warrant additional safety improvements.

Task 3.4: No Build Condition Capacity Analysis

Stantec will develop background growth rates based on available population and employment projections, and will obtain information regarding all proposed developments within, or near, the corridor. The background growth rate and future development traffic volumes will be applied to the 2011 Existing Condition traffic volumes to develop 2015 and 2035 No Build Condition traffic volumes. Synchro 7/Sim Traffic models will be developed for all peak hours in the 2015 and 2035 No Build Conditions. A capacity analysis will be performed and deficiencies will be identified.

Deliverables: Volume diagrams and a Technical Memorandum summarizing the results of the Existing and No Build capacity and crash analyses results will be prepared.

TASK 4 – DEVELOPMENT AND EVALUATION OF IMPROVEMENT CONCEPTS

Task 4.1: Development and Evaluation of Alternatives

Utilizing Synchro/Sim Traffic models, Stantec will propose and evaluate up to three corridor improvement alternatives to mitigate the deficiencies identified in Task 3. Potential improvements included in the alternatives may consist of traffic-related mitigation measures, such as new or upgraded traffic signals, turn bays, improved signage, and Complete Streets improvements such as new or improved sidewalks and crosswalks, pedestrian signal heads at signalized intersections, bus pull-offs, bus shelters, streetscaping, and bicycle lanes, among others. Summary delay, level of service, and queue analysis will be prepared for each alternative.

An impact assessment will be made for each alternative in order to state the advantages and disadvantages of each. Where practical, impacts will be approximately quantified (e.g. wetland, right of way needs, costs etc.). The impact assessment will be presented in an Impact Matrix with the list of alternatives on one axis and the critical issues/items represented on the other. An



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example of typical issues considered in the impact matrix may include meeting the purpose & need, safety, traffic operations, substandard design features, structural integrity, cost, LOS, utilities, community needs, wetlands, Section 4f, ecology, regulatory requirements etc.

Deliverables: Impact matrix and Synchro / SimTraffic outputs.

Task 4.2: Environmental Screening

An environmental screening will be performed to identify and indicate the approximate locations of resources such as the approximate location of wetlands and wetland transition areas, regulated waters (streams, lakes), riparian zones, special water resource protection areas, floodway and flood hazard area boundaries, parklands and wildlife refuges, potential habitat for endangered and threatened species, forest areas, known or suspected historic and/or archaeological resources, suspected hazardous waste contaminated sites and noise sensitive receptors. Information will be obtained from NJDEP iMap, County, and other available resources.

Environmentally sensitive areas will be identified within the project area and overlain on the project base mapping. Areas of sensitivity may include wetlands, riparian buffers, hazardous waste sites, Green Acres Program encumbered properties, historic properties, high probability archeological sites, etc.

Deliverables: Environmentally sensitive areas will be identified within the project area and overlain on the project base mapping. The results of the research will be included in the Concept Development Report.

Task 4.3: Cost Estimates

Order-of-magnitude cost estimates will be prepared for each alternative for comparison and budgeting purposes. Unit prices will consider recent bid pricing for similar projects made available by County, Municipality or NJDOT sources. Contingencies and escalation will be included in the estimate.

Deliverables: Order-of-magnitude cost estimates in a tabular format.

Task 4.4: Alternatives Analysis

Stantec will seek input from the various project stakeholders to obtain feedback on issues and concerns regarding each alternative. Stantec will summarize the findings of the investigation including a detailed description and conceptual plan of each alternative, as well as an impact matrix, alternative analysis synopsis and identification of a recommended alternative. The alternatives will be reviewed by NJDOT, Morris County, Morris Plains Borough, Morris Township, Hanover Township, and other key stakeholders. A preferred alternative will be selected as a result of the review.



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Deliverables: Stantec will prepare an Alternatives Analysis document that will summarize the findings of the investigation including a detailed description and conceptual plan of each alternative, as well as an impact matrix, capacity analysis results, alternative analysis synopsis, and identification of a recommended alternative.

TASK 5 – CONCEPT DEVELOPMENT AND VISUALIZATION

Task 5.1: Concept Plans

Stantec will develop concept plans at an appropriate scale for the preferred alternative selected in Task 4. The concept plans will clearly present the nature and purpose of the proposed work, as well as provide enough detail to establish reasonable cost of the improvements. Stantec will prepare draft concept plans detailing the recommendations for review and comment by NJDOT, Morris County, Morris Plains Borough, Morris Township, Hanover Township, and other key stakeholders. The plans will be revised based on review comments and a final version, the preferred alternative, will be released.

Deliverables: Concept plans at an appropriate scale for the preferred alternative selected in Task 4 will be prepared.

Task 5.2: Visualization

In addition, Stantec will develop 2021 (10-year projection) AM and PM peak hour 3-D VISSIM simulations for the corridor to be used as a visualization tool for public and stakeholder meetings. Stantec will also prepare up to five (5) digital renderings of key features of the preferred alternative.

Deliverables: 2021 AM and PM peak hour 3-D VISSIM simulations recorded on DVD, and print and electronic copies of the five digital renderings.

Task 5.3: Preliminary Cost Estimate

A preliminary construction cost estimate for the recommended alternative will be prepared. The cost estimate will consider major construction activities including mobilization, paving, excavation, drainage and storm water management (SWM) facilities, lighting, landscaping, environmental mitigations and other major construction activities. Unit prices will consider recent bid pricing for similar projects made available by County, Municipality or NJDOT sources. Contingencies and escalation will be included in the estimate. In addition to construction cost, costs for Right of Way acquisitions, preliminary and final design, and other major expenditures will be included. Cost developed for this task will be utilized for future funding needs.

Deliverables: A preliminary construction cost estimate for the recommended alternative will be prepared.



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Task 5.4: Concept Development Report

Stantec will prepare a Concept Development Report detailing the analyses that were performed for Phase 1 for review and comment by NJDOT, Morris County, Morris Plains Borough, Morris Township, and Hanover Township. We will revise the draft report based on review comments and release a final version of the report.

Deliverables: Stantec will prepare and distribute three (3) hard copies of the Draft Report for review and comment to each governing body, and two (2) hard copies to NJDOT. The draft will be revised to incorporate/address the comments. Three (3) hard copies and three (3) CD-ROMs (Adobe format) of the Final Report will be submitted to each governing body and NJDOT.



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PART 2: IMPLEMENTATION DESIGN

The Planning Phase will culminate with the development of “standards” for improvements at intersections and along the mainline where developments are currently proposed and anticipated. The proposed improvements within the limits of work associated with the current proposed and anticipated developments will be designed and constructed by the developer.

The Design phase will include the efforts required for the development of 95% complete contract documents for the implementation of the proposed infrastructure improvements outside the limits of work for the current proposed and anticipated developments only. This work is anticipated to include elements such as intersection improvements, sidewalk/multi-use trail connections and extensions, and traffic striping modifications.

Task 6 – Survey and Base Mapping

It is anticipated that the design elements will require minimal survey involvement. The base mapping will be developed using existing as-built plans provided by Morris County. Field edits will be performed to validate the as-built plans. Ground survey will be performed, if required, to supplement the information provided on the as-built plans. The base mapping will include right of way and property lines within the project limits based on tax map information. The project mapping will be submitted to the County for their review and records.

Deliverables: Project base mapping with right of way and property lines based on tax map information.

Task 7 – Environmental & Stormwater Management

Task 7.1: Wetlands

NJDEP iMap indicates that there are wetlands located along the corridor. It is anticipated that the proposed work will not directly impact the wetlands or the wetlands transition areas. Therefore, this scope of work assumes that no wetlands permit would be required or prepared.

Task 7.2: Highlands

The project area is located within the Highlands Planning Area. However, it is assumed that the project is exempt from the Highlands Water Protection and Planning Act Rules. Transportation safety projects and bicycle/pedestrian facilities are exempt provided no new through lane capacity travel lanes are provided.



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Task 7.3: Soil Erosion & Sediment Control

If any design phase improvement exceeds a total soil/surface disturbance area of 5,000 s.f., Stantec will prepare Soil Erosion and Sediment Control Plans and accompanying design report. This package will be submitted to the Morris County Soil Conservation District for approval. The Soil Erosion and Sediment Control Report will be prepared to ensure continuity between permanent landscape treatments and the requirements for stabilization of the site during construction. Temporary Soil Erosion and Sediment control devices will be shown on Soil Erosion and Sediment Control Plans. Effort is included to prepare one (1) application to MCSCD.

Task 7.4: Stormwater Management

It is anticipated that the project may result in a net-increase of more than 1/4 acre of impervious surface due to sidewalk/multi-use path connections and extensions outside the limits of development, and will therefore be considered a 'major development' as defined in N.J.A.C. 7:8 – Stormwater Management Rules (Rules). The project must therefore conform to the design and performance standards set forth in the Rules. The Rules require the incorporation of specific nonstructural stormwater management strategies into the project design to the maximum extent practicable, and sets forth groundwater recharge, water quality, and water quantity standards for major development projects. It is assumed that NJDOT will self-certify the stormwater management design.

Since the proposed sidewalk/multi-use trail will extend along an existing roadway corridor, the incorporation of nonstructural stormwater management strategies into the project design is not practicable. Also, since the new impervious surface is sidewalk area, limited to pedestrian traffic, stormwater management measures for water quality control are not required. However, it is assumed that stormwater management measures for groundwater recharge and water quantity control will be required for the additional impervious surface, or an equivalent impervious area thereof.

The incorporation of a recharge best management practice (BMP) will require soil testing, including field percolation tests and measurements of the depth to the seasonal high groundwater table. Given the adjacent land use along the project corridor, there appear to be limited opportunities to incorporate structural stormwater management measures to meet the groundwater recharge and water quantity control standards of the Rules.

Locations for structural BMP's, such as a detention basin to recharge and detain runoff, will be investigated. To ensure sufficient runoff is treated, modifications to the existing drainage system may be required to direct runoff to the proposed basin. It is assumed that the impervious area requiring treatment will be accomplished with one (1) basin.

A geotechnical investigation will be completed to determine the soil type, soil permeability rates and seasonal high ground water elevation at one (1) recharge basin approximately 5 feet deep. A



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minimum of 3 price quotes from qualified boring contractors will be obtained. A total of 2 borings to a depth of approximately 20' is anticipated.

The following work will be completed at the proposed basin location:

- Two falling head permeability tests at the depth and location of the proposed basin.
- Two soil borings to a depth of approximately 20'.
- Estimation of the depth to the seasonal high water table based on groundwater levels, soil types and soil observations made at the time of testing.

Prior to drilling, all utilities will be marked out on site using the NJ Utility Markout One-Call System. A Project Geologist and/or Soils Engineer will direct the driller and be on site during all drilling operations. The engineer will visually examine and classify all soils samples and prepare boring logs for all borings taken. Soil classification will be based on the Burmister Classification System. Project deliverables will consist of a letter containing boring logs, permeability test results, estimated seasonal high groundwater levels and a description of the soils encountered.

The scope of work for the stormwater management task includes the following:

1. Obtain existing drainage system information from available As-Built drawings and field survey;
2. Locate and design a stormwater management basin within the project area to recharge and detain runoff from the additional area of impervious surface;
3. Prepare the water quantity analysis for the 2, 10, and 100-year storm events using Hydraflow Hydrographs program.
4. Prepare groundwater recharge calculations;
5. Design drainage system modifications, as required, to convey runoff to the basin;
6. Design soil erosion and sediment control measures, as required, for the drainage system; and
7. Prepare a Stormwater Management Report.

Pipe calculations and soil erosion and sediment control measures, such as conduit outlet protection, will be prepared in accordance with NJDOT design criteria. *The New Jersey Stormwater Best Management Practices Manual* will be used in the selection and design of stormwater management measures.

Deliverables: Soil Erosion and Sediment Control Plans and accompanying design report. Stormwater management design and report to be reviewed and self-certified by NJDOT.

Task 8 – Contract Documents

Stantec will prepare 95% complete contract plans, specifications, cost estimate and construction schedule for the implementation of the proposed infrastructure improvements outside the limits of work for the current proposed and anticipated developments only. This work is anticipated to include elements such as intersection improvements, sidewalk/multi-use trail connections and extensions, and traffic striping modifications.



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Task 8.1: Utilities

Stantec anticipates that coordination with the local telephone, cable television, electric, gas, and water utility companies and NJDOT (Traffic Signals) is required for this project. Stantec will establish the necessary utility contacts and obtain existing utility verification plans. The existing utilities will be depicted on the construction plans. Required temporary and/or permanent utility relocations will be identified and coordinated with the County and utility companies. The relocation schemes will be identified on the plans.

Deliverables: None. Effort incorporated into Task 9.3 Contract Plans.

Task 8.2: Right-of-Way

For the purposes of this proposal, it is assumed that all roadway and sidewalk improvements will be limited to the existing public right-of-way. Right-of-way verifications, development of any required right-of-way plans, or any negotiations with property owners are not included in this scope of work. It is anticipated that these tasks, if required, will be performed by Morris County.

Deliverables: None.

Task 8.3: Contract Plans

Stantec will prepare 95% complete roadway plans in accordance with the NJDOT Procedures Manual, NJDOT Design Manual, and Sample Plans as modified by the County standards. The contract plans shall conform to AASHTO, MUTCD, NJDOT, and Morris County standards.

The following plan sheets may be required depending on the complexity of the design:

- Key Map
- Summary/Distribution of Quantities
- Typical Sections
- Construction Plans
- Environmental/SESC Plans
- Traffic Control Plans
- Traffic Signal Plans
- Electrical Plans
- Highway Lighting Plans
- Traffic Striping & Signing Plans
- Landscape Plans
- Construction Details



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Task 8.4: Specifications

Using the current edition of the NJDOT Standard Input for Special Provisions, Stantec will prepare supplemental specifications for the project based upon the *NJDOT Standard Specifications for Roadway and Bridge Construction, 2007 edition*.

Task 8.5: Engineer's Estimate

Stantec will develop the project cost based upon the final quantities for all pay items and the latest unit price for each pay item, adjusted for location and quantity.

Task 8.6: Construction Schedule

Stantec will prepare the Construction Schedule for the project using Primavera P3 software in accordance with the NJDOT Capital Program Management Construction Scheduling Standard Coding and Procedures for Designers and Contractors Manual as a guide.

Deliverables: Stantec will prepare and distribute a 60% complete submission and a 95% complete submission to NJDOT, Morris County and each municipality. Each submission will consist of a total of eight (8) hard copies each of full size (24" x 36") plans, supplemental specifications, engineer's estimate and construction schedule. A formal comment resolution summary will be provided in response to a compiled comment list provided by the County for each submission.

FEE PROPOSAL

To be negotiated between NJDOT and Stantec once a final scope of work is agreed upon by the parties involved.