

November 8, 2017

Michelle Gonzalez
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hwlochner.com

Re: **Proposal for Professional Engineering Services:
I-75 Bridge Openings Traffic Study at NW 154th Street and NW 170th Street**

Dear Ms. Gonzalez:

We are pleased to submit this proposal for the subject project as requested by the Town. Enclosed are the Study Scope of Services and Fee Estimate to be completed under our Professional Services Agreement, Miscellaneous Civil Engineering Services, for the services described below.

1. PURPOSE AND NEED

The purpose of this study is to isolate the impacts of the 154th Street and 170th Street bridge openings, the new 170th Street/Turnpike Interchange and the SR 826/Palmetto underpasses to alleviate traffic due to population growth and construction of new developments. In addition to major roadway improvements, there are also more than 20 major planned developments within the study area, including the American Dream Mall.

Signal Warrant analysis will be performed, under separate contract (by FDOT), at the following intersections:

1. NW 159th Street at NW 77 Court
2. NW 159th Street at NW 77 Avenue
3. NW 146th Street at NW 77 Court
4. NW 146th Street at NW 77 Avenue
5. NW 154th Street/Miami Lakes Drive at NW 77 Avenue

This study will demonstrate the roadway network needed, considering all programmed roadway improvements and planned developments.

2. SCOPE OF WORK

A. Study Area

For the purposes of this study, the study is generally limited to Florida's Turnpike to the west, NW 77 Avenue to the east, NW 138th Street to the south and Miami Gardens/NW 186th Street to the north, as shown on Figure 1.

B. Traffic Volume Development

The future hourly traffic volumes at the intersection will be calculated based on projected morning and afternoon peak turning volume ratios, the 2040 AADT SERPM Model Volumes and existing hourly ADT volumes.

B1. 72-Hour approach volumes (TO BE COLLECTED UNDER SEPARATE CONTRACT)

72-Hour Bi-Directional Machine Counts will be collected during a typical weekday at the following locations:

1. North of proposed signal location on NW 159th Street at NW 77 Court (COLLECTED BY FDOT)
2. South of proposed signal location on NW 159th Street at NW 77 Court (COLLECTED BY FDOT)
3. North of proposed signal location on NW 159th Street at NW 77 Avenue (COLLECTED BY FDOT)
4. South of proposed signal location on NW 159th Street at NW 77 Avenue (COLLECTED BY FDOT)
5. North of proposed signal location on NW 146th Street at NW 77 Court (COLLECTED BY FDOT)
6. South of proposed signal location on NW 146th Street at NW 77 Court (COLLECTED BY FDOT)
7. North of proposed signal location on NW 146th Street at NW 77 Avenue (COLLECTED BY FDOT)
8. South of proposed signal location on NW 146th Street at NW 77 Avenue (COLLECTED BY FDOT)
9. NW 77 Avenue, south of NW 154th Street/Miami Lakes Drive (COLLECTED BY FDOT)
10. NW 154th Street/Miami Lakes Drive, east of NW 77 Avenue (COLLECTED BY FDOT)
11. NW 154th Street/Miami Lakes Drive, west of NW 77 Avenue (COLLECTED BY FDOT)

B2. AM, MIDDAY and PM peak hourly turning movement counts (TO BE COLLECTED UNDER SEPARATE CONTRACT)

Turning Movement Counts (TMCs) will be collected during the AM (6 - 9 AM), midday (11 AM – 1 PM) and PM (4 – 7 PM) peak hours during a typical weekday at the following locations:

1. NW 154th Street/Miami Lakes Drive at NW 77 Avenue (north leg) (COLLECTED BY FDOT)
2. NW 154th Street/Miami Lakes Drive at NW 77 Avenue (south leg) (COLLECTED BY FDOT)
3. NW 154th Street/Miami Lakes Drive at NW 77 Court
4. NW 138th Street at NW 107th Avenue
5. NW 138th Street at NW 97th Avenue
6. NW 138th Street at NW 87th Avenue
7. NW 154th Street at NW 87th Avenue
8. NW 154th Street at NW 82nd Avenue
9. NW 170th Street at NW 87th Avenue
10. NW 170th Street at NW 82nd Avenue
11. NW 186th Street at NW 87th Avenue
12. NW 186th Street at NW 82nd Avenue

Note: Utilizing the collected ADT, an hourly percent of daily traffic distribution will be determined for each location.

B3. 2040 SERPM MODEL

The SERPM model will be ran for the following scenarios:

- ❖ 2010 Base year AADT
- ❖ 2010 Base year AM peak
- ❖ 2010 Base year MD peak
- ❖ 2010 Base year PM peak
- ❖ Future (2040) no build AADT
- ❖ Future (2040) no build AM peak
- ❖ Future (2040) no build MD peak
- ❖ Future (2040) no build PM peak
- ❖ Future (2040) build AADT
- ❖ Future (2040) build AM peak

- ❖ Future (2040) build MD peak
- ❖ Future (2040) build PM peak

The model will be validated using the data collection study results from the *TOWN OF MIAMI LAKES ORIGIN-DESTINATION, July 2017* that calculated the NW 154th Street corridor trips east and west of SR 826/Palmetto Expressway.

B4. Segment Traffic Volumes

Segment traffic volumes for the existing AM, midday and PM peak periods will be calculated from the intersection turning movement counts (TMCs).

B5. Additional Data Collection

B5.1 Signal Timing Analysis – Existing signal timing and phasing will be obtained from Miami-Dade County Traffic Engineering. The signals can be obtained using the ATMS website and phasing and timing verified in the field.

B5.2 Peak Season Adjustment Factors – These factors will be used to adjust raw counts to reflect average annual for typical weekday and weekday conditions. These factors will be obtained from the FDOT Florida Traffic Online (2017) or latest available.

B5.3 Peak Hour Factors – The existing peak hour factor by approach will be used for hourly variation of the traffic flow in the future peak periods, as accepted by the Florida Department of Transportation (FDOT) within the Quality/Level of Service Handbook.

B5.4 Other Data - In addition to the traffic data counts, existing characteristics of the roadway network including intersection geometry, lane geometry and posted speeds in the traffic study area will be collected.

C. Existing Traffic Analysis

C.1 Field Review

Site will be visited during the morning and evening peak traffic periods or other periods, to make qualitative assessments of the intersection operation. Such factors as queue lengths, delays, vehicular conflicts or any other operational characteristics critical to evaluate the need for intersection improvements, signal control, and left turn phase, etc. shall be noted. During the field review safety conditions must also be observed and recorded.

Photographs shall be taken of all intersection approaches with emphasis on obtaining visual information that would be of value to the Department during any subsequent project plan preparation activities.

C2. Existing Level of Service Analysis

Synchro/SimTraffic micro-simulation software will be used to analyze the current operational conditions of the study area during the AM, midday and PM peak period. Synchro will be used to code the network and SimTraffic will be used for the simulation portion of the analysis. The delay and level of service for each movement, approach and overall intersection will be determined according to Highway Capacity Manual methodology, along with the 95th percentile queue length for each movement. The Synchro model will be developed based upon the guidelines recommended by FHWA in Traffic Analysis Toolbox Volume III—Guidelines for Applying Traffic Microsimulation Modeling Software.

D. Committed Development

The future 2040 build SERPM model will be ran taking the following into consideration, but not limited to:

Developments

1. Future Bob Graham Senior Development
2. American Dream Mall Development
3. Bob Graham Project (along NW 170th Street)
4. Lenar development
5. New home development, east of NW 87th Avenue
6. Lucita Property
7. All other/DTPW may provide up to 20

Committed development shall be approved Town of Miami Lakes and DTPW, prior to commencement of study analysis.

E. Programmed Transportation Improvements

Roadway Improvements

1. NW 159th Street underpass (FDOT)
2. NW 146th Street underpass (FDOT)
3. NW 77th Avenue realignment at NW 154th Street/Miami Lakes Drive (FDOT)
4. NW 82nd Avenue at Oak Drive Intersection improvements
5. NW 170th Street extension, 97th to SR 91/Florida's Turnpike (6 LANE)
6. NW 97th Avenue, NW 170th Street to NW 154th Street (5 LANE)
7. NW 97th Street, north of NW 170th Street (6 LANE)
8. NW 102nd Avenue, south of NW 170th Street (5 LANES)
9. NW 102nd Avenue, north of NW 170th Street (6 LANES)
10. NW 154th Street extension to NW 107th Avenue
11. NW 87th Avenue on-ramp to SR 826
12. NW 107th Avenue connection to NW 170th Street
13. Proposed NW 67th Avenue interchange with Gratigny
14. Park-n-ride at NW 77th Avenue at NW 154th Street/Miami Lakes (MDT)
15. Texas U-Turn on SR 826/Palmetto (FDOT)
16. NW 87th Avenue extension to Okeechobee Road
17. Miami Gardens widening from 4-lanes to 6-lanes
18. Interchange connection to I-75 at NW 154th Street (FDOT)
19. Interchange connection to I-75 at NW 170th Street bridges (Turnpike/American Dream Mall)

F. Future Traffic

F.1 Projected Underpass Volumes

Projected morning and afternoon peak turning volumes from the 2040 SERPM model will be developed. Based on these projected morning and afternoon peak turning volumes from the 2040 SERPM model, average (movement-to-approach) turning movement ratios will be calculated for each of the turning movements at the following intersections:

1. NW 159th Street at NW 77 Court
2. NW 159th Street at NW 77 Avenue
3. NW 146th Street at NW 77 Court
4. NW 146th Street at NW 77 Avenue

Based on the calculated average turning movement ratios and the projected 2040 AADT link volumes (SERPM model), the hourly approach volumes and turning movement volumes will be developed.

F.2 Growth Rate

Future intersection and link volumes for existing roadways will be calculated by applying a calculated yearly growth rate developed from FDOT and/or Miami Dade County historical count data at nearby count stations to the existing counts collected as part of this project.

G. Future Traffic Analysis

The project will analyze the existing conditions and the future build-out in one phase of development. The following sections describe the methodology to be followed in performing analysis of future conditions.

G.1 Total Traffic

The total peak period traffic volumes will include trips generated by the sites identified as committed development and background traffic generated by yearly growth.

G1.1 Analysis Years/Alternative Analysis

Future traffic projections for the study area will be developed using a calculated growth rate. As previously described, this project will analyze the future build-out in one phase of development in year 2040.

G1.2 Roadway Network

The programmed (funded and/or committed) transportation improvements within the traffic study area will be identified from, but not limited to the following documents:

- Florida Department of Transportation (FDOT) five year work program
- Most recent Miami-Dade County Transportation Planning Organization (TPO) Transportation Improvement Program (TIP)
- Miami-Dade County 2040 Long Range Transportation Plan
- Miami-Dade County Transit Agency current and near-term operational plans

In addition, the Programmed Transportation Improvements identified in Section F will also be included.

G2. Future Level of Service Analysis

Analysis of future 2040 traffic within the study area will be performed for two scenarios: a) no-build and b) build which includes background traffic, committed development traffic, plus project traffic. A summary of alternatives are described, as follows:

- A. No build
 - 1. without Mall
 - 2. with Mall
- B. Build with Mall
 - 1. NW 170th bridge and NW 154th bridge open
 - 2. NW 170th bridge and NW 154th bridge closed
 - 3. NW 170th bridge open and NW 154th bridge closed
 - 4. NW 170th bridge closed and NW 154th bridge open
 - 5. I-75 connection at NW 170th Street, with NW 170th bridge and NW 154th bridge open
 - 6. I-75 connection at NW 154th Street, with NW 170th bridge and NW 154th bridge open
 - 7. I-75 connection at NW 170th Street, with NW 170th bridge and NW 154th bridge closed
 - 8. I-75 connection at NW 154th Street, with NW 170th bridge and NW 154th bridge closed
- C. Build without Mall

1. NW 170th bridge and NW 154th bridge open
2. NW 170th bridge and NW 154th bridge closed
3. NW 170th bridge open and NW 154th bridge closed
4. NW 170th bridge closed and NW 154th bridge open
5. I-75 connection at NW 170th Street, with NW 170th bridge and NW 154th bridge open
6. I-75 connection at NW 154th Street, with NW 170th bridge and NW 154th bridge open
7. I-75 connection at NW 170th Street, with NW 170th bridge and NW 154th bridge closed
8. I-75 connection at NW 154th Street, with NW 170th bridge and NW 154th bridge closed

The purpose of the analysis is to isolate the impacts of both the 154th Street and 170th Street bridge openings, the new 170th Street/Turnpike Interchange and the SR 826/Palmetto underpasses to alleviate traffic due to population growth and construction of new developments.

Analysis of future conditions will be performed for weekday AM, midday and PM peak hour conditions on the roadway segments within the study area based on the Florida Department of Transportation Generalized Level of Service (LOS) Tables.

Intersection levels of service will be determined for the AM, midday and PM peak period conditions using Synchro based on the procedures of the 2010 Highway Capacity Manual and Intersection Capacity Utilization.

The Levels of Service thresholds used for the analysis are based on the "Generalized" tables for Urbanized Areas within the FDOT Level of Service Handbook adopted for Miami Dade County, which is LOS E.

G2.1 Microsimulation

The 2040 Synchro models (AM, Midday, PM) for the NW 154 Street arterial from NW 77 Avenue to NW 77 Court will also be utilized to optimize the arterial's signal timing and input into the modified 2040 Build CORSIM models (AM+PM).

G2.2 Signal Warrant Analysis (TO BE PERFORMED UNDER SEPARATE CONTRACT BY FDOT)

All signal warrants, projected intersection level of service (LOS) and delay will form the basis of determination as to whether to justify a traffic signal. Not applicable (N/A) will be documented for all other warrants. Signal warrant analysis will be performed at the following locations:

1. NW 159th Street at NW 77 Court
2. NW 159th Street at NW 77 Avenue
3. NW 146th Street at NW 77 Court
4. NW 146th Street at NW 77 Avenue
5. NW 154th Street/Miami Lakes Drive at NW 77 Avenue

The analysis results will determine whether signals are warranted at the subject locations specified.

H. Report

The results of previous subtasks within this study shall be analyzed collectively. The consultant shall then form a comprehensive report. The report shall recommend, in consideration of accepted traffic engineering practice and optimal project/user benefits, intersection improvements to include but not be limited to geometry and/or capacity enhancements, improved channelization and positive guidance, improved signal operations, which may include display adjustments or phasing and timing adjustments, and reduced fixed object and sight distance hazards. Attached to this report, in the form of appendices or figures (as appropriate), shall be the products of subtasks described above.

I. COORDINATION & MEETINGS

I1. Methodology Meeting

A methodology meeting shall occur between FDOT, DTWP and the Town of Miami Lakes to come to consensus on the study methodology.

I2. Study submission and approval

An electric (PDF) and hard copy of the final report shall be submitted to FDOT, DTWP and the Town of Miami Lakes for approval.

3. CLIENT RESPONSIBILITIES

- Provide access to and make all provisions for the Engineer to enter upon public and private lands as required for the Engineer to perform his work under this proposal.
- Place at the disposal of the Engineer all available information pertinent to the project upon which the Engineer can rely, including previous reports and any other data related to the design and construction of the project.
- Designate a person to act as the Client's representative with respect to the work to be performed, such person to have complete authority to transmit instructions, receive information, interpret and define the Client's policies and decisions with respect to the work covered by this proposal.

4. SCHEDULE AND DELIVERIES

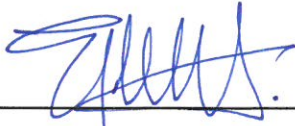
- Notice to Proceed (NTP)
- Traffic Counts (Contingent on FDOT counts)
- Draft Report four (4) months after NTP
- Final Report four (4) weeks after comments received

5. FEE PROPOSAL

The total fee for the professional services is a Lump Sum not to exceed the amount of **\$80,939.91**. This fee will be invoiced on a monthly basis. Additional services not included in the aforementioned scope of services will require a separate proposal.

If you have any questions, please call me at (305) 503 - 9873.

Sincerely,



Edwin F. Mojena, PE
Vice President
LOCHNER

Reviewed and approved by:

Michelle Gonzalez
Senior Transportation Manager
Office of the Town Manager

Thomas Fossler
Procurement Manager

Alex Rey
Town Manager

ESTIMATE OF WORK EFFORT
Consultant: HW Lochner

Tasks	Chief Engineer \$256.82	Project Manager \$220.70	Sr. Engineer \$190.86	Project Engineer \$141.51	Engineer Intern \$73.20	Senior Designer \$92.72	Secretary/Clerical \$73.55	TOTAL HOURS	TOTAL FEE
Study Methodology	1.00	1.00						2.00	\$477.52
Traffic Data Processing					2.00			2.00	\$146.40
Field Review (AM/MD/PM)				38.00	38.00			76.00	\$8,158.98
Field Inventory					1.50			1.50	\$109.80
Existing Condition Analysis (Including Coding and Running Synchro Network)		2.00		24.00	8.00			34.00	\$4,423.24
Trip Generation (20 planned developments)		2.00	2.00	6.00	18.00			28.00	\$2,989.78
Trip Distribution and Assignment		2.00	4.00	8.00	24.00			38.00	\$4,093.72
Future Traffic Analysis (Includes Build and No-Build Synchro and Build and No Build SERPM Model - Signal Warrant to Be Performed as part of FDOT Study)		6.00	172.00	30.00	12.00			220.00	\$39,275.82
Draft Report		6.00	45.00	6.00	12.00	6.00	3.00	78.00	\$12,417.33
Final Report		1.00	8.00	1.00	3.00	1.00	1.00	15.00	\$2,274.96
Commission Meetings/Presentations	4.00	4.00		8.00		4.00	4.00	24.00	\$3,707.24
Meetings with Staff (3 meetings @ 2 hrs per meeting)	6.00	6.00						12.00	\$2,865.12
								0.00	\$0.00
Total Hours	11.00	30.00	231.00	121.00	118.50	11.00	8.00	530.50	
Salary Cost by Staff Category	\$2,825.02	\$6,621.00	\$44,088.66	\$17,122.71	\$8,674.20	\$1,019.92	\$588.40		\$80,939.91

TOTAL CONTRACT FEE COMPUTATIONS

SALARY COSTS (LOADED) \$80,939.91

Subtotal \$80,939.91

Direct Expenses:

Count Type	\$ per Unit	# of Units	Total
8 Hr. Turning Movement Counts	\$1,883.67	0	\$0.00

TOTAL FEE \$80,939.91