



January 26, 2016

Mr. David Tickell
Traffic Operations Supervisor
City of League City
1505 Dickinson Avenue
League City, Texas 77573

RE: ***City of League City – Signal Timing Optimization – Multiple Corridors
Professional Services Proposal***

Dear Mr. Tickell,

We are pleased to submit this revised scope of services and fee schedule to the City of League City for Signal Timing Optimization along multiple corridors totaling 40 signals. We have prepared this scope of services based on our knowledge of the City's traffic signal infrastructure and the current traffic needs conveyed to us.

We look forward to working with you on this project. If you have any further questions regarding this scope or fee, please don't hesitate to contact me.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Manu Isaac".

Manu Isaac, P.E.
Associate/ Project Manager

City of League City Signal Timing Optimization – 40 Signals along Multiple Corridors

Kimley-Horn and Associates, Inc. (“Kimley-Horn”) is pleased to submit this scope and fee proposal to the City of League City (“the Client”) for professional engineering services which include signal timing services along multiple corridors within the City. Our project understanding, scope of services and fees are presented below.

INFORMATION PROVIDED BY CLIENT

The City of League City will provide the following:

1. Any previous traffic data for the intersections.
2. Existing timings.
3. Any information about current citizen complaints, problem areas, etc.

Kimley-Horn shall be entitled to rely on the completeness and accuracy of materials supplied by others in the completion of their services under this agreement.

SCOPE OF SERVICES

The scope of services for the signal timing optimization is as follows:

TASK 1: – FIELD INVESTIGATION/ SIGNAL OPERATIONS REVIEW

Kimley-Horn will conduct field investigation of the signalized intersections and document traffic signal control, intersection geometry, traffic operations, and existing traffic patterns. Any observed deficiencies or improvements that can be implemented by the City will be noted. The information gathered during the field investigation will form the basis for preparing exhibits and recommendations for traffic signal modifications or geometric improvements at these locations, if any.

TASK 2: – TRAFFIC DATA COLLECTION

Kimley-Horn will use the services of a traffic data collection sub-consultant to complete the following data collection tasks:

24-hour ATR counts

24-hour bi-directional traffic counts in 15 minute intervals will be collected for one typical weekday and a Saturday for each direction on the major roadway, at the following locations:

1. FM 518 between Palomino and Magnolia Estates
2. FM 518 between Interurban and SH 3
3. FM 518 between Meadow Pkwy and S. Shore Blvd
4. FM 646 between Brookport and Cross Colony
5. FM 2094 between Davis and Stadium

Turning Movement Counts (TMC)

TMC's will be conducted during a typical weekday (Tuesday, Wednesday or Thursday) for the following signalized intersections. TMC will include 13-hour counts that comprise the AM, PM and Off peak periods for all major intersections, whereas 2 hour peak period counts may be substituted for some minor intersections. No TMC's will be collected on the weekend. These TMC data will be accomplished either using video cameras or manual data collection and the data file will be provided to the City upon completion of this project. TMC's will be collected at the following intersections:

FM 518 Corridor:

- | | |
|---|---|
| 1. FM 518 at Maple Leaf Drive | 15. FM 518/E Main St at Iowa Avenue |
| 2. FM 518 at Country Lane | 16. FM 518/E Main St at Texas Avenue |
| 3. FM 518 at Bay Area Blvd | 17. FM 518/E Main St at FM 270 |
| 4. FM 518 at Palomino Lane | 18. Proposed FM 518 Extension at FM 270 |
| 5. FM 518 at Magnolia Estates | 19. FM 518/E Main St at FM 2094 |
| 6. FM 518 at Landing Blvd | 20. FM 518 E. at Clear Creek ISD |
| 7. FM 518 at Williamsport/Newport Blvd | 21. FM 518 E. at Louisiana Avenue |
| 8. FM 518 at Hobbs/Lafayette Lane | 22. FM 518 E. at Pinehurst Drive |
| 9. FM 518 at IH 45 SB and NB Frontage Road (Diamond Intersection) | 23. FM 518 E. at Meadow Bend Drive |
| 10. FM 518 at N. Wesley Drive | 24. FM 518 E. at Meadow Pkwy |
| 11. FM 518 at Calder Drive | 25. FM 518 E. at S. Shore Boulevard |
| 12. FM 518 at Interurban Street | 26. FM 518 E. at S. Laguna Pointe Drive |
| 13. FM 518 at SH 3 | 27. FM 518 E. at Columbia Memorial Pkwy |
| 14. FM 518/E Main St at Park Avenue | 28. FM 518 E. at Lawrence Road |

FM 646 Corridor:

- | | |
|--------------------------------------|---|
| 29. FM 646 at SH 3 | 34. FM 646 at Cross Colony Drive |
| 30. FM 646 at W Walker Street | 35. FM 646 at Bay Colony Elementary Drive |
| 31. FM 646 at IH 45 SB Frontage Road | 36. FM 646 at Bay Creek Drive |
| 32. FM 646 at IH 45 NB Frontage Road | |
| 33. FM 646 at Brookport Drive | |

FM 2094 Corridor:

37. FM 2094 at Davis Road
38. FM 2094 at Stadium Drive

SH 96 / League City Parkway:

39. SH 96 at Isla Vista
40. League City Parkway at Kroger/YMCA Driveway

TASK 3: – TRAVEL TIME RUNS

Kimley-Horn will conduct travel time runs along these corridors. Upon completion of both before and after travel time runs, a comparison of the data will be used to evaluate the result of signal timing optimization.

Before Travel Times

Kimley-Horn will conduct three (3) "before" travel time runs in each direction during the AM, Off and PM peak periods. Such runs will be made during the same two-hour time interval selected as the peak period for AM, Off, and PM. The initial travel time runs will be made prior to the implementation of the new signal timing plans. The data will be analyzed and presented to the City in the form of tables and graphs.

After Travel Times

Following the implementation and fine-tuning of the new timing plans, Kimley-Horn will conduct three (3) "after" travel time runs in each direction during the AM, Off, and PM peak periods. The times and geographical limits will be the same as for the "before" travel time runs. The data will be analyzed and presented to the City in the form of tables and graphs.

Kimley-Horn will do a comparative evaluation of the existing and future operations at the five corners intersection (FM 518/ FM 270/ FM 2094) using field data. Data collected for evaluation will include queue lengths and stopped delay at the two/three intersections in the five corners area of League City. A comparison of the traffic operations using queue and delay measures will be used to evaluate the before and after conditions.

TASK 4: – OPERATIONAL ANALYSIS AND TIMING GENERATION

Kimley-Horn will field-verify the number of lanes and lane use at each intersection. We will also observe actual peak-hour traffic operations to identify specific problems that should be addressed during the development of the new timing plans. Kimley-Horn will review existing vehicular clearance intervals (yellow and all-red intervals) and existing pedestrian clearance intervals for appropriateness based on the intersection geometry as depicted in available scaled drawings or aerial images. Kimley-Horn will verify these calculations by measuring intersection widths or crosswalk lengths in the field, if needed.

Using the TMC data collected, we will determine the AM, Off, and PM peak periods for the corridor. Kimley-Horn will perform capacity analyses at each intersection to determine the existing saturation flow rates and Level of Service (LOS). Kimley-Horn will then perform Synchro optimization analysis to determine the optimum cycle lengths for the AM, Off, and PM peak periods. The cycle length analysis evaluates and compares various measures of effectiveness (MOE's) like total and average delay, number of stops, total travel time, emissions, etc. for various cycle lengths. We will select the recommended cycle lengths for each peak period, and evaluated the overall level of service (LOS), delay and volume to capacity (v/c) ratio for each intersection to ensure the proposed timing plans provided efficient intersection conditions. We will then further optimize intersection offsets and lead-lag sequences using TSPPD (Tru-Traffic) in an effort to further improve green bands and progression patterns along the corridor. During this task the Kimley-Horn may also determine what, if any, intersections would operate more efficiently running free instead of coordinated timings.

TASK 5: – SIGNAL TIMING IMPLEMENTATION

Upon approval of the proposed cycle lengths and timing plans developed under Task 4 by City staff, Kimley-Horn will input the new timing plans into the signal controllers. As part of the signal timing implementation, we will reprogram the existing Signal Controllers (primarily Econolite) with the new proposed signal timings. Using a laptop and the Centrac® system, we will reprogram the Basic Phase Data, Unit Data, Coordination Data, Time Base Data, and review various controller settings for optimum timing performance in the field. In the initial phases of traffic signal implementation, the City's traffic signal technician should be present when new timings are input or modified at these controllers. After the new timing plans have been installed, Kimley-Horn will observe the actual operation of the new timing plans and recommend field adjustments to improve traffic operations. A critical aspect of signal coordination is the ability of the controller clocks to be in sync. Kimley-Horn assumes that there would be communication between controllers to accomplish this or Time-Based Coordination employing the controller's internal clock will be used. The final timings will be uploaded onto the City's laptop in the field when the timing implementation is complete. A hard copy of the final timings will also be placed in each cabinet for reference. Listed below are the intersections for which Signal Timing Optimization/ Implementation will be performed.

FM 518 Corridor:

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|---|---|
| 1. FM 518 at Maple Leaf Drive | 15. FM 518/E Main St at Iowa Avenue |
| 2. FM 518 at Country Lane | 16. FM 518/E Main St at Texas Avenue |
| 3. FM 518 at Bay Area Blvd | 17. FM 518/E Main St at FM 270 |
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| 32. FM 646 at IH 45 NB Frontage Road | |
| 33. FM 646 at Brookport Drive | |

FM 2094 Corridor:

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|------------------------------|
| 37. FM 2094 at Davis Road |
| 38. FM 2094 at Stadium Drive |

SH 96 / League City Parkway:

39. SH 96 at Isla Vista

40. League City Parkway at Kroger/YMCA Driveway

TASK 6: – DOCUMENTATION

Kimley-Horn will prepare the proposed preliminary timing plans and time-space diagrams developed under Task 4 and submit to the City for review and approval as a Preliminary Report. Kimley-Horn will address reasonable comments received from the City prior to Signal Timing Optimization/Implementation.

Kimley-Horn will summarize the data collection, cycle length analyses, timing plan generation, time-space diagrams, and final implemented timings in a final report. This report will include the final timing plan data (cycle lengths, splits, offsets, and phase sequences) in tabular form. In addition, the report will include the results of the before and after travel time comparisons. Recommendations for the signalized intersections or the corridor will also be a part of this report. One bound copy of the final report and an electronic copy in pdf format will be submitted to the City.

TASK 7: – OTHER SIGNAL TIMING SUPPORT

Kimley-Horn when requested can provide “on-call” traffic signal timing services within the City for signals not listed in the above tasks. When traffic signal timing services are requested, the Consultant would provide an initial assessment of the effort required for each assignment. Traffic signal timing services would be performed only upon authorization of said effort by City. These signal timing services will be provided on an “as-needed” basis as directed by the City of League City as a complement to the efforts of City staff. These assignments could include signal operations review, signal phasing evaluation, and traffic signal timing implementation.

The allocated initial fee for on-call signal timing support services would be \$15,000.00 and the associated total effort under this task will be limited to 90 person-hours of consultant services. The services rendered under each work assignment will be billed based on the attached Standard Rate Schedule which would be effective for two years from date of this agreement.

FEE AND BILLING

Kimley-Horn will perform the scope of services for Tasks 1 through 6 as described above for a total lump sum fee of **\$184,000.00** (see detail below).

Task 1	Field Investigation / Signal Operations Review	\$ 15,000.00
Task 2	Traffic Data Collection	\$ 25,000.00
Task 3	Travel Time Runs and Delay Study	\$ 14,000.00
Task 4	Operational Analyzes and Timing Generation	\$ 40,000.00
Task 5	Signal Timing Implementation	\$ 80,000.00
Task 6	Documentation	<u>\$ 10,000.00</u>
Total Lump Sum Labor Fee		\$184,000.00

Kimley-Horn will perform the scope of services under Task 7 on an hourly basis and will be billed based on the Standard Rate Schedule attached for a not-to-exceed amount of **\$15,000.00**.

All project-related direct expenses are included in these fees. For lump sum tasks, fees will be invoiced monthly based upon the percentage of services performed as of the invoice date. Payment will be due within 25 days of your receipt of the invoice.

SCHEDULE

The work identified under Tasks 1 through 6 shown above is anticipated to be complete within 8 months from receiving notice to proceed. However, the schedule could be impacted due to City reviews.

Times for performance shall be extended as necessary for delays due to circumstances that Kimley-Horn does not control. Kimley-Horn shall not be liable for or be deemed in breach because of delays caused by any factor outside of its reasonable control.

ADDITIONAL SERVICES

Any services beyond the Scope of Services described in the tasks above shall be considered additional services. The Consultant can provide these services, if needed, upon the City's issuance of a written Task Order. Any additional amounts paid to the Consultant as a result of the material change to the Scope of the Project shall be agreed upon in writing by both parties before the services are performed.

Kimley-Horn and Associates, Inc.

Standard Rate Schedule

Senior Professional I	\$220 - \$240
Senior Professional II	\$180 - \$230
Professional	\$145 - \$195
Analyst	\$140 - \$155
Designer	\$105 - \$170
Technical Support	\$75 - \$155
Clerical/Administrative Support	\$65 - \$120

Effective July 2015