

**Scope of Services  
For  
Shelby County Congestion Management Program  
TDOT PIN 123030**

**Scope of Services**

The following is a description of the scope of services to be provided by the Kimley-Horn and Associates, Inc., team for the Program Management, NEPA Environmental and Signal Timing phases of the 2016 to 2019 Shelby County Congestion Management Program (SCCMP). The SCCMP consists of environmental, design, and construction administration services for 15 projects identified by the Memphis Area Metropolitan Planning Organization (MPO) Engineering and Technical Committee and approved by the Tennessee Department of Transportation (TDOT). Program Management services are anticipated to occur over a three year period beginning in the Federal FY 2016 and continuing as funding is provided by TDOT. The NEPA Environment services are anticipated to occur over a 6 – 9 month period during the first year of the program. The Signal Timing services are anticipated to occur over the final 6 – 9 months of the three year program.

***Task 1 – General Program Management***

Kimley-Horn will assist Shelby County with general program management tasks associated with the Shelby County Congestion Management Program. The SCCMP is a large program with many stakeholders. Kimley-Horn will assist the county by coordinating with these stakeholders to keep each party informed as to the progress of the program. These parties consist of the TDOT Local Programs staff, MPO staff, Shelby County staff, and the engineering staff of each jurisdiction involved in the program. Kimley-Horn will also assist with program grant management tasks. These tasks will consist of budget and schedule oversight and program spending tracking. This coordination is estimated to occur throughout the entire life of the project.

Kimley-Horn will conduct monthly coordination meetings with the program team throughout the three year program. The program team will consist of Shelby County, local jurisdictions, the design consultant, the contractors, the CEI consultant, utility companies, City of Memphis Signal Maintenance, and TDOT. The purpose of these meetings will be to allow for efficient communication between all parties, to let all parties know about changes that have occurred in processes and procedures, and to keep all parties informed on the progress of the overall program as well as individual projects. Kimley-Horn will lead the meetings, prepare minutes summarizing the meetings, and distribute the minutes to the appropriate parties for review.

***Deliverables:***

- Budget and Schedule updates at each monthly progress meeting to all attendees
- Meeting minutes for each monthly progress meeting in electronic PDF format to all attendees

***Task 2 – Design Phase Program Management***

Kimley-Horn will coordinate with the design consultant throughout the design phase of the program. This coordination will occur on a weekly basis throughout an estimated 12 month time frame. The coordination will consist of setting and enforcing mutually agreed upon design schedules and providing

technical assistance to allow for compatibility with existing infrastructure, existing hardware configuration, and existing software installations. Kimley-Horn will also provide a preliminary design plans review for the county.

Kimley-Horn will be TDOT's one point of contact for the program throughout the design phase. Kimley-Horn will perform the required utility coordination with all necessary utility stakeholders for all three anticipated project bid sets, provide railroad coordination as needed on the program, coordinate with the design consultant to assemble all required local program certification packages for all three anticipated project bid sets, and submit and track the progress of the certification packages.

Railroad permit and insurance fees will need to be paid to the appropriate railroad companies to obtain fully executed railroad permits. If necessary, Kimley-Horn will pay the railroad permit application and insurance fees on behalf of Shelby County and has budgeted \$15,000 to be used only for these fees.

*Deliverables:*

- Preliminary Plans Review comments for three sets of plans in electronic PDF format to the design consultant
- TDOT Local Programs Certification Packages in electronic PDF format to TDOT Local Programs

***Task 3 – Bid Phase Program Management***

Upon receipt of the authorization from TDOT to proceed with obtaining bids, Kimley-Horn will assist the county with managing the bid phase for the program. Kimley-Horn has assumed there will be a total of three project bid packages for the program consisting of two detection upgrade bid packages and one signal system bid package. Kimley-Horn will assemble a bid book template to be used for all three bid packages. Kimley-Horn will coordinate with both Shelby County staff and TDOT staff to develop a final bid book that is acceptable to all parties involved. We assume as a part of this coordination that we would need to make up to two trips to Nashville to coordinate with the TDOT concerning the contents of the proposed bid book.

Kimley-Horn will coordinate with the design consultant to obtain the proper bid forms and cost estimates, necessary special provisions, and to set DBE goals for each project. Kimley-Horn will prepare for and work with the Shelby County Purchasing Department to conduct the pre-bid meetings. Upon receipt of Requests for Information from contractors, KHA will prepare a response to contractor's requests for information in a format that can be issued as an addendum(s) to the bid documents. Kimley-Horn will attend the bid opening meeting and subsequently review the bids for conformity with Shelby County, TDOT, and FHWA requirements. Assuming that reasonable bids are received and the contractor provides the required documentation, a recommendation for award of the project will be made to TDOT. Upon concurrence from TDOT to award the contract, Shelby County and Kimley-Horn will work with the contractor to execute the contract and issue a notice to proceed with construction.

*Deliverables:*

- Bid documents in electronic PDF format to the Client
- Respond to contractors' Requests for Information in PDF format to the Client
- Bid concurrence request submitted to TDOT in electronic PDF format

***Task 4 – NEPA Documentation***

Since the project will involve the use of federal funds, the requirements of the National Environmental Policy Act (NEPA) will be in effect. In most cases, the proposed improvements will take place within existing right-of-way, will not impact access to adjacent properties, and will not impact wetlands, streams, or waters of the State. For those projects that may impact one of these items, the impacts will generally be

very minor. Therefore, it is anticipated that all projects will be eligible for obtaining a Categorical Exclusion (CE), and in many instances a Programmatic Categorical Exclusion (PCE).

The application for the CE or PCE will be prepared and submitted to TDOT. This will include requesting clearance from the U.S. Fish and Wildlife Administration, Tennessee Department of Environmental Conservation, U. S. Army Corps of Engineers, Air and Noise and Hazardous Materials clearance through the TDOT Environmental Division, Tennessee Wildlife Resources Agency, and the State Historic Preservation Officer (SHPO), with the SHPO approval being obtained through the Environmental Division at TDOT. Kimley-Horn will also assemble the Section 106 letter that is required to be submitted with the SHPO coordination letter.

As a part of the preparation of the NEPA documentation, Kimley-Horn will collect turning movement traffic counts at representative intersections and calculate the projected emissions reductions for each project to include in the NEPA documents. To reduce the number and duration of reviews, we will group similar projects together for submittal of the NEPA documents. For this program, there will be three separate NEPA documents for the signal timing projects, isolated signal upgrades, and coordinated signal projects. For the signal timing only projects, we will meet with each of the four jurisdictions and review the previous list of intersections identified for retiming and make adjustments as necessary. Once the NEPA document has been approved, this list of intersections for retiming cannot be changed.

Kimley-Horn will provide a limited preliminary design for each of the projects. This limited design will be what is required to determine whether there are impacts on adjacent properties, wetlands, streams, waters of the state, endangered species, and historic properties. The limited design is also required to conduct the preliminary air quality analysis for the projects. If the projects are determined to have any of these impacts, Kimley-Horn will coordinate with the design consultant and Shelby County to take the appropriate steps to minimize those impacts. The preliminary design will consist of field inventories to identify the necessary signal improvements and ADA accessibility deficiencies at each signalized intersection. These aspects of design will be coordinated with the design consultant to be included in the final design plans.

*Deliverables:*

- Environmental documentation for each of the three NEPA documents as submitted to TDOT and other review agencies in electronic format to the Client
- Intersection inventory forms in electronic PDF format to the Client

***Task 5 – Signal Timing Plans and Field Fine Tuning – Signal Retiming Projects***

Kimley-Horn will conduct AM, Mid-Day, and PM turning movement traffic counts at the 40 intersections included in the signal retiming only projects. Kimley-Horn will develop the traffic signal timings to be implemented for the intersections identified in the four jurisdictions, consisting of a total of 40 intersections as shown in **Attachment A**. The signal timing plans will include timing plans for both AM and PM peak periods, an off-peak plan, and school plan or mid-day plan, if necessary. These timing plans will be based on the turning movement traffic volume counts and will be developed to provide progressive flow of traffic on the arterial roadways while minimizing delays on the side streets.

Kimley-Horn will develop the traffic signal timings to be implemented for the subject intersections using the following steps:

- Obtain and review traffic counts.
- Conduct field verification of signal phasing, display, and detector status information as necessary.

- Calculate yellow, all-red, and pedestrian clearance intervals.
- Construct microsimulation models for the following four time-of-day periods: AM peak, Midday or school peak, PM peak, and off-peak.
- For isolated intersections, perform an operational analysis consistent with the methodology in the *Highway Capacity Manual 2010* and develop splits and cycle lengths for each intersection.
- For signal system projects:
  - Perform an operational analysis consistent with the methodology in the *Highway Capacity Manual 2010*.
  - Develop coordination system group boundaries and evaluate cycle lengths for each system.
  - Develop splits and offsets for each individual intersection within the corridor.
  - Develop time-of-day plans for each coordination system group.

Kimley-Horn will prepare and submit the following documents to the City Traffic Engineer of the appropriate jurisdiction and City of Memphis Traffic Signal Maintenance Department for review:

- Overview of time-of-day plans by system
- Map of cycle length by system group
- Signal timing coding sheets for each individual traffic signal in the format used by that jurisdiction

After receiving comments, Kimley-Horn will send the coding sheets in Microsoft Excel file format to the City of Memphis Traffic Signal Maintenance Department for implementation.

After the proposed timings have been implemented, Kimley-Horn will conduct field fine-tuning of the proposed signal timings to provide efficient traffic signal operations. Kimley-Horn will perform the field fine-tuning by traveling the corridors to determine if the signals are “in step” (i.e., in coordination) within each coordination system group using printed platoon progression diagrams as a visual aid. Kimley-Horn will monitor mainline left-turn and side-street queues to judge the split allocations at each individual intersection. Kimley-Horn will develop recommendations for changes to cycle length, splits, and offsets based on the observed traffic conditions. These recommendations will be provided to the City of Memphis Traffic Signal Maintenance Department for implementation. As soon as the revised timings are implemented, Kimley-Horn will observe the traffic again to determine if further adjustments are needed. This process will repeat until no further adjustments are required.

The field fine tuning work will be conducted for both AM and PM peak periods and the noon peak hour during a typical work day. Finalized signal timings will be documented in the revised coding sheets. Finalized coding sheets and Synchro models will be submitted to the appropriate jurisdiction and the City of Memphis Traffic Signal Maintenance Department for records.

For the projects listed in **Attachment A**, the traffic signal timing and field fine-tuning work will be completed within 12 months of the Notice to Proceed with construction from TDOT for the signal retiming projects.

Deliverables:

- Proposed signal timing coding sheets in electronic PDF format to the appropriate jurisdiction and the City of Memphis Traffic Signal Maintenance Department.

- Finalized signal timing coding sheets after the field fine tuning in electronic PDF format to the appropriate jurisdiction and the City of Memphis Traffic Signal Maintenance Department.
- Microsimulation models in electronic format for each time of day period to the appropriate jurisdiction and the City of Memphis Traffic Signal Maintenance Department.

***Task 6 – Signal Timing Plans and Field Fine Tuning – Construction Projects***

Kimley-Horn will conduct AM, Mid-Day, and PM turning movement traffic counts at the 76 intersections included in the construction projects. Kimley-Horn will develop the traffic signal timings to be implemented for the 11 projects consisting of a total of 76 intersections as shown in **Attachment B**. The signal timing plans will be provided for both AM and PM peak periods, an off-peak plan, and a mid-day or school plan, if necessary. These timing plans will be based on the turning movement traffic volume counts and will be developed to provide progressive flow of traffic on the arterial roadways while minimizing delays on the side streets.

Kimley-Horn will develop the traffic signal timings to be implemented for the subject intersections using the following steps:

- Obtain and review turning movement traffic counts.
- Conduct field verification of signal phasing, display, and detector status information as necessary.
- Calculate yellow, all-red, and pedestrian clearance intervals.
- Construct microsimulation models for the following four time-of-day periods: AM peak, Midday or school peak, PM peak, and off-peak.
- For isolated intersections, perform an operational analysis consistent with the methodology in the *Highway Capacity Manual 2010* and develop splits and cycle lengths for each intersection.
- For signal system projects:
  - Perform an operational analysis consistent with the methodology in the *Highway Capacity Manual 2010*.
  - Develop coordination system group boundaries and evaluate cycle lengths for each system.
  - Develop splits and offsets for each individual intersection within the corridor.
  - Develop time-of-day plans for each coordination system group.

Kimley-Horn will prepare and submit the following documents to the City Traffic Engineer of the appropriate jurisdiction and City of Memphis Traffic Signal Maintenance Department for review:

- Overview of time-of-day plans by system
- Map of cycle length by system group
- Signal timing coding sheets for each individual traffic signal in the format used by the jurisdiction

After receiving comments, Kimley-Horn will send the coding sheets in Microsoft Excel file format to the City of Memphis Traffic Signal Maintenance Department for implementation.

After the proposed timings have been implemented, Kimley-Horn will conduct field fine-tuning of the proposed signal timings to provide efficient traffic signal operations. Kimley-Horn will perform the field fine-tuning by traveling the corridors to determine if the signals are “in step” (i.e., in coordination) within

each coordination system group using printed platoon progression diagrams as a visual aid. Kimley-Horn will monitor mainline left-turn and side-street queues to judge the split allocations at each individual intersection. Kimley-Horn will develop recommendations for changes to cycle length, splits, and offsets based on the observed traffic conditions. These recommendations will be provided to the City of Memphis Traffic Signal Maintenance Department for implementation. As soon as the revised timings are implemented, Kimley-Horn will observe the traffic again to determine if further adjustments are needed. This process will repeat until no further adjustments are required.

The field fine tuning work will be conducted for both AM and PM peak periods and the noon or school peak hour during a typical work day. Finalized signal timings will be documented in the revised coding sheets. Finalized coding sheets and microsimulation models will be submitted to the appropriate jurisdiction and the City of Memphis Traffic Signal Maintenance Department for records.

For the projects listed in **Attachment B**, the traffic signal timing and field fine-tuning work will be completed within three months following the final acceptance of the construction project by the County for each individual project.

Deliverables:

- Proposed signal timing coding sheets in electronic PDF format to the appropriate jurisdiction and the City of Memphis Traffic Signal Maintenance Department.
- Finalized signal timing coding sheets after the field fine tuning in electronic PDF format to the appropriate jurisdiction and the City of Memphis Traffic Signal Maintenance Department.
- Microsimulation models in electronic format for each time of day period to the appropriate jurisdiction and the City of Memphis Traffic Signal Maintenance Department.

**Fee**

KHA will perform the services in **Tasks 1 – 6** for the total lump sum fee of \$998,200.00. Individual task amounts are informational only. Fees and expenses will be invoiced monthly based, as applicable, upon the percentage of services performed or actual services performed and expenses incurred as of the invoice date.

All permitting, application, and similar project fees will be paid directly by the Client, except as noted above. Payment will be due within 25 days of your receipt of the invoice and should include the invoice number and Kimley-Horn project number.

Task 1 – General Program Management	\$ 92,500.00
Task 2 – Design Phase Program Management	\$ 84,500.00
Task 3 – Bid Phase Program Management	\$ 21,400.00
Task 4 – NEPA Documentation	\$ 199,800.00
Task 5 – Signal Timing and Field Fine Tuning – Signal Retiming Projects	\$ 207,000.00
<u>Task 6 – Signal Timing and Field Fine Tuning – Construction Projects</u>	<u>\$ 393,000.00</u>
Total Lump Sum	\$ 998,200.00

Attachment A: Signal Retiming Bucket Project Intersections

Jurisdiction	Project ID	Project	Project Description	Number of Intersections	Intersections
Collierville	1	Signal Retiming - Collierville	Retiming at Various Locations	10	Poplar Ave at Bailey Station Poplar Ave at Shea Rd Poplar Ave at Bray Station Poplar Ave at Schilling Blvd Poplar Ave at Market Poplar Ave at Byhalia Rd Poplar at Highway 72 Poplar at Maynard Way Poplar at Peterson Lake Poplar at Main
Germantown	2	Signal Retiming - Germantown	Retiming at Various Locations	10	Poplar Ave at Riverdale Poplar Ave at Arthurwood Poplar Ave at Farmington/West Poplar Ave at Germantown Rd Poplar Ave at Exeter Germantown Rd at Farmington Farmington Blvd at Briarbrook Farmington Blvd at Kimbrough Poplar Ave at Poplar Estates Parkway Wolf River Blvd at Germantown Rd
Bartlett	3	Signal Timing - Bartlett	Retiming at Various Locations	10	Stage Rd at Shelby Stage Rd at Sycamore View/Bartlett Rd Stage Rd at Bartlett Blvd Bartlett Blvd at Kroger Driveway Stage Rd at Towne Center Stage Rd at Elmore Park Stage Rd at Altruria Stage Rd at Kirby Whitten Kirby Whitten at Hwy 70 Stage Rd at Hwy 70
Shelby County	12	Signal Retiming - Shelby County	Retiming at Various Locations	10	Houston Levee Rd at Houston Hill Houston Levee Rd at Walnut Grove Houston Levee Rd at Macon Hacks Cross Rd at SR 385 Hacks Cross Rd at Lowrance Hacks Cross Rd at Shelby Houston Hill at Raleigh Lagrange Old Brownsville at SR 14 Fite at US 51 Fite at Raleigh Millington

Attachment B: Signal Timing Construction Project Intersections

Jurisdiction	Project ID	Project	Project Description	Number of Intersections	Intersections
Collierville	4	Hwy 72 - Shelby to SR 385	Install fiber optic interconnect cable between intersections, install fiber distribution boxes and ethernet switches at each intersection, and retune all signals.	2	Highway 72 at Shelby Highway 72 at SR 385
Collierville	5	Poplar - Main to Collierville Arlington	Install fiber optic interconnect cable between intersections, install fiber distribution boxes at Collierville Arlington, and retune all signals.	2	Poplar Ave at Main Poplar Ave at Collierville-Arlington
Memphis	6	Detection Upgrades Set 1	Installation of video detection and emergency vehicle detection at each intersection and retune all signals.	21	Germantown Pkwy at Stage Rd Germantown Pkwy at Wolf Creek Pkwy Germantown Pkwy at Giacosa Pl Germantown Pkwy at I-40 WB Ramp Germantown Pkwy at Rockcreek Pkwy Germantown Pkwy at Varnavas Dr/Market Plaza Germantown Pkwy at Bellevue Pkwy Germantown Pkwy at Chimney Rock Blvd Germantown Pkwy at Woodchase Dr Germantown Pkwy at Dexter Rd Germantown Pkwy at Bonnie Ln Germantown Pkwy at Club Pkwy Germantown Pkwy at Cordova Rd Germantown Pkwy at Macon Rd Germantown Pkwy at Walnut Run Rd Germantown Pkwy at Trinity Rd Germantown Pkwy at Friars Point Lv Germantown Pkwy at Walnut Grove Rd Germantown Pkwy at Timber Creek Dr Germantown Pkwy at Walnut Bend Rd Germantown Pkwy at Lowes
Bartlett	7	TMC Upgrades	Upgrade equipment in the Bartlett TMC for new software and Ethernet communications. Upgrade each intersection to include Ethernet switches and video interface cards.	10	Stage Rd at Shelby Stage Rd at Sycamore View/Bartlett Rd Stage Rd at Bartlett Blvd Bartlett Blvd at Kroger Driveway Stage Rd at Towne Center Stage Rd at Elmora Park Stage Rd at Altruria Stage Rd at Kirby Whitten Kirby Whitten at Hwy 70 Stage Rd at Hwy 70
Memphis	8	Detection Upgrades Set 2	Installation of video detection and emergency vehicle detection at each intersection and retune all signals.	29	Poplar Ave at Hollywood St Poplar Ave at Collins St Poplar Ave at Scott St Poplar Ave at Humes St Poplar Ave at Tillman St Poplar Ave at Lafayette St Poplar Ave at Holmes St Poplar Ave at Prescott St Poplar Ave at Highland St Poplar Ave at Goodlett St Poplar Ave at Cherry Rd Poplar Ave at Oak Court Dr Poplar Ave at Grove Park Rd Poplar Ave at Perkins Ext Poplar Ave at Perkins Rd Poplar Ave at Mendenhall Rd Poplar Ave at Truse Pkwy Poplar Ave at White Station Rd Poplar Ave at Estate Dr Poplar Ave at Valleybrook Dr Poplar Ave at Massey Rd Poplar Ave at Aaron Brenner Dr Park Ave at White Station Rd Park Ave at Estate Dr Park Ave at Lynnfield Rd Park Ave at St. Francis Pkwy Park Ave at Primacy Pkwy Park Ave at Ridgeway Rd Park Ave at Massey Rd
Germantown	9	Germantown Rd - Crestridge to Poplar Pike	Install fiber optic interconnect cable between intersections, install video detection and Emergency Vehicle preemption, install fiber distribution boxes and ethernet switches at each intersection, and retune all signals.	3	Germantown Road at Crestridge Germantown Road at Stout Germantown Road at Poplar Pike/McVay
Millington	10	US 51 - Wilkinsville to Veterans Parkway	Install fiber optic interconnect cable between intersections, install video detection and Emergency Vehicle preemption, install fiber distribution boxes and ethernet switches at each intersection, and retune all signals.	2	US 51 at Wilkinsville US 51 at Veteran Pkwy
Collierville	11	Wolf River Blvd - Germantown limits to Houston Levee Rd	Connect fiber optic interconnect cable from Germantown City Limits to Houston Levee Road and retune traffic signal.	1	Wolf River at Houston Levee
Germantown	13	Wolf River Blvd - Dogwood Grove to Collierville limits	Extend fiber optic interconnect cable from Dogwood Grove to Collierville City Limits.	1	Wolf River at Dogwood Grove
Memphis	14	White Station -Walnut Grove to Summer	Install fiber optic interconnect cable between intersections, install video detection and Emergency Vehicle preemption, install fiber distribution boxes and ethernet switches at each intersection, and retune all signals.	2	White Station at Walnut Grove Connection to TDOT TMC on Boswell White Station at Summer
Memphis	15	Airways - Winchester to Democrat	Install fiber optic interconnect cable between intersections, install video detection and Emergency Vehicle preemption, install fiber distribution boxes and ethernet switches at each intersection, and retune all signals.	3	Airways Blvd at Winchester Airways Blvd at Brooks Airways Blvd at Democrat

**BILLING RATE SCHEDULE**

<u>Classification</u>	<u>Hourly Rate</u>
Principal	220.00 – 275.00
Senior Professional	170.00 – 220.00
Professional	120.00 – 175.00
Junior Professional/ Analyst	95.00 – 120.00
Senior Technical/ CADD Operator	90.00 – 150.00
Technical/ Drafter	85.00 – 100.00
Admin/ Clerical	70.00 – 95.00

These hourly rates will remain in effect until June 30, 2017