

SCOPE OF SERVICES

The purpose of this project is to develop new and/or more coordinated timing plans for the Hamburg area to strategically move vehicular and pedestrian traffic. The routes included in this project are:

- Sir Barton Way Corridor (9 intersections)
- Man o' War Boulevard Corridor (8 intersections)
- Winchester Road Corridor (6 intersections)

A full intersection list is provided in **Table 1**.

In the last several years, many state departments of transportation and local public works agencies have discovered that their traffic signal systems have enormous improvement potential during the weekends. Historically, the traffic engineering community has focused so intently on weekday peak periods, there has not been adequate resources directed towards developing customized weekend timing plans. This project will greatly expand the number of plans for the weekend time frames for the Hamburg area. A total of eight (8) new timing plans, four (4) on Saturday, and four (4) on Sunday, will be developed as a part of this project.

DATA COLLECTION PLAN

The consultant will perform turning movement counts at nine (9) of the study area intersections. **Table 1** provides a list of the intersections for which the consultant will perform turning movement counts. LFUCG will provide counts for all study area intersections using the detection that is set up at each intersection, and will provide that to the consultant. The consultant will use the turning movement counts that we have collected to validate the counts provided by LFUCG.

The counts collected by the consultant using Miovision data collection units for 12 hours on Saturday and 12 hours on Sunday. All intersections will be collected on the same day, when there are no University of Kentucky football or basketball games, and Keeneland is not in session. Miovision data will be provided in 15-minute bins with identified peak and off-peak periods and peak hour factors calculated for each analyzed period. Truck percentages and pedestrian volumes will be provided at all counted intersections.

The consultant will collect travel time before and after implementation of new timing for each time period. LFUCG has a contract with Inrix, and will provide the consultant with a login username and password so that the consultant can access the data for the purposes of this project. LFUCG has purchased historical data dating back to January 2016. The consultant will utilize this data to collect before and after average travel times through the corridor. Average travel times comparisons will be performed for each of the new timing plans.

The consultant will perform intersection measurements and update all red and pedestrian clearance (flashing don't walk) intervals, as necessary, to meet current policies.

Table 1. Turning Movement Traffic Data Counts for Arterial Routes

Corridor	Intersection	Data Collection
Sir Barton Way	Sir Barton Way at Winchester Road	X
Sir Barton Way	Sir Barton Way at War Admiral Way	
Sir Barton Way	Sir Barton Way at Meeting Street	
Sir Barton Way	Sir Barton Way at Grey Lag Way	
Sir Barton Way	Sir Barton Way at Old Rosebud Road	
Sir Barton Way	Sir Barton Way at Star Shoot Parkway	X
Sir Barton Way	Sir Barton Way at Vendor Way	X
Sir Barton Way	Sir Barton Way at Alysheba Way	X
Sir Barton Way	Sir Barton Way at Man o' War Boulevard	X
Man o' War Boulevard	Man o' War Boulevard at Polo Club	
Man o' War Boulevard	Man o' War Boulevard at I-75	
Man o' War Boulevard	Man o' War Boulevard at Pink Pigeon Parkway	X
Man o' War Boulevard	Man o' War Boulevard at Helmsdale	
Man o' War Boulevard	Man o' War Boulevard at Todds Road	X
Man o' War Boulevard	Polo Club Boulevard at Ftizgerald Court	
Man o' War Boulevard	Pink Pigeon Parkway at Alysheba Way	
Man o' War Boulevard	Liberty Road at Old Todds Road	
Winchester Road	Winchester Road at I-75 (Outer)	X
Winchester Road	Winchester Road at I-75 (Inner)	X
Winchester Road	Winchester Road at Elkhorn	
Winchester Road	Winchester Road at Frederick Douglass	
Winchester Road	Winchester Road at Patchen Drive	
Winchester Road	Winchester Road at Fortune Drive	

TIMING DEVELOPMENT AND IMPLEMENTATION PLAN

The consultant will utilize the most recent version of the Synchro Suite for all of the project modeling. Additionally, supplemental Origin-Destination data will be collected to develop VISSIM models for Hardware-In-Loop testing for the Winchester Road and I-75 area, as well as the Man o' War Boulevard and I-75 / Sir Barton Way area. Up to six (6) intersections in each of these areas will be modeled to test complex signal programming prior to implementation. The CATSlab at the University of Kentucky will be used to perform the testing. Upon optimizing the traffic signal timing, we will review the proposed plans with LFUCG Traffic Engineering. Upon endorsement of the proposed timing plans, our project team will schedule a time to work on-site utilizing MaxView with the support of LFUCG's recently upgraded Video Management System for the programming and implementation process.

The consultant project manager will be on site for all timing implementation.

The consultant will use a hybridized methodology for field adjusting the timing plans, utilizing Tru-Traffic software, which incorporates the use of GPS data to be layered on top of the time-space diagram model. Combining Synchro timings plans and GPS data will provide the consultant the ability to analyze real vehicle paths in relation to the simulation vehicle paths, and make changes to splits, sequencing, and offsets. All changes will be verified and final runs along each corridor will be performed to ensure that the new timings are performing optimally.

SIGNAL TIMING STRATEGIES

Balanced bi-directional flow has been difficult to achieve in the Hamburg Area. An array of left turn and split phasing options will be evaluated to minimize delay, manage queues and open time-space constraints to enhance vehicle progression. All corridors in this area currently share a common cycle length, however, due to the intense turning movements and sheer number of possible destinations within Hamburg Pavilion, along Man o' War Boulevard and even Winchester Road, progression of large platoons may not be practical. Therefore, smaller subsystems may yield better overall results for the group. Additionally, traffic responsive parameters will be implemented into the timing plans to adapt to weekend fluctuations due to events, as well as incidents that may occur during the weekend when staff is not available to make adjustments.

PROJECT DELIVERABLES

The Consultant will deliver electronic project files including:

- Synchro models containing final adjusted timing plans
- Controller Programming Tables
- Before and after travel time data
- Electronic copies of project executive summary

The executive summary will be based upon the following outline:

- Project Area
 - Description / Map of study area
- Existing Conditions Summary
- Optimization Goals
- Recommended Timing Plans
- Evaluation of New Timing Plans
 - Comparison of model performance measures
 - Comparison of before and after travel time
 - Observations from field

As part of our corporate Green Strategies, Synchro output will be provided in PDF format only to conserve paper.

PROJECT SCHEDULE

The consultant has considered a number of factors in developing a project schedule. First and foremost is the data collection. This project will begin in the winter season. Noting that winter weather is unpredictable, the consultant will work as often as possible in the field to collect any residual traffic counts or existing travel time data. The modeling efforts will be performed throughout December and January, with implementation schedules for the end of February and March. Should winter weather delay implementation, there is ample time built in at the end of the schedule to move implementation to later weekends, and collect the after travel time data at the end of the project.

As spring approaches, our team will not perform signal adjustments or collect travel time data during University of Kentucky public school spring break or Easter.

Meeting Schedule

Three meetings will be scheduled throughout the project. The first will be a kick-off meeting, occurring at the beginning of the project, a mid-point meeting, occurring once timing plans have been developed, and a final meeting, to occur after implementation. These are noted in the project schedule.

Fee for Services

The proposed **lump sum** fee for services described herein is **\$116,456.31** which includes professional services and project direct costs.

Invoicing

This project will be invoiced on a monthly basis upon percentage of work complete. A monthly progress report highlighting partially and fully completed milestones, expended and total man-hours expended during the billing month, meeting summaries, project decisions and any project issues will accompany the invoice.