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September 23, 2019

Mr. Adam Moser, P.E.
Office of the City Engineer
109 3rd Avenue South
Suite 133
Franklin, Tennessee 37064

Client's Authorized Representative(s): Adam Moser, P.E.

Subject: Proposed Scope of Work & Fee Estimate – The City of Franklin’s Cool Springs Area Transportation Network Study

KCI Technologies, Inc. (KCI) is pleased to submit this proposed scope and fee estimate (the "Proposal") to City of Franklin ("Client") for the work (the "Work") described in detail in the Scope of Services section of this Proposal. The Work will be performed for the following:

Location: Franklin, Tennessee

Project: Cool Springs Area Transportation Network Study

SCOPE OF SERVICES:

KCI’s understanding is that the purpose of the work to be performed is to examine existing and future transportation needs in the Cool Springs area. The study will identify and prioritize needs to improve safety and mobility for all users on major transportation corridors within this area. The study is to include all existing and potential corridors in the area, generally from Moores Lane to Murfreesboro Road.

This Proposal is limited exclusively to the Work as described in this Scope of Services section and anything not expressly described shall be considered excluded from the Work. KCI proposes to perform the Work which is described as follows:

Task 1 – Information Gathering and Existing Conditions

The purpose of this task is to establish a firm foundation, rooted in data, from which the modeling and analysis process will take place. All data points and analyses of existing conditions for the corridors within the Cool Springs area will consider and incorporate travel within, to, and from the area. Our approach to this task includes:

- **1A. Review Available Data**

Relevant previous models, plans, programs, and other data provided by the City of Franklin and TDOT will be reviewed including, but not limited to, turning movement counts, traffic impact studies, ADT data, crash records, GIS data, land use plans, transportation plans, design plans and other planning studies, subdivision regulations and zoning ordinances, and all planned roadway improvement programs. The purpose of these evaluations will be to identify the status of previously-recommended projects, coordinate previously completed efforts, and build upon the recommendations presented in existing plans. The information reviewed will be used to identify and evaluate existing conditions and develop the recommended improvements program.

- **1B. Roadway & Traffic Data Collection**

Roadway and traffic conditions will be inventoried in order to understand the current transportation system and its related system performance. Points of data include, but are not limited to, existing rights-of-way, roadway cross-sections and laneage, transit routes and stops, speed limits, traffic volumes, presence of on-street parking, presence of sidewalk and bikeway facilities, and traffic signal timings. KCI will observe existing queueing and note existing operational and safety issues at the inventoried intersections.

During the field inventory process KCI field staff will visit new or recently opened developments in order to gather data regarding the percent occupancy in these developments. This process will allow future trips to be added for existing developments that are not yet fully occupied.

The study area will include the following intersections:

1. Bakers Bridge Avenue and Market Exchange Ct
2. Carothers Parkway and Bakers Bridge Avenue
3. Carothers Parkway and Corporate Centre Drive
4. Carothers Parkway and Crescent Centre Drive N (unsignalized)
5. Carothers Parkway and Crescent Centre Drive S
6. Carothers Parkway and Gillespie Drive/Meridian Boulevard
7. Carothers Parkway and Liberty Pike
8. Carothers Parkway and Mayfield Way
9. Carothers Parkway and Nissan Way (Primary)
10. Carothers Parkway and Nissan Way N (unsignalized)
11. Carothers Parkway and Nissan Way S (unsignalized)
12. Carothers Parkway and Ovation Parkway
13. Carothers Parkway and Physicians Way
14. Carothers Parkway and Private Road north of Mayfield Drive (unsignalized)
15. Carothers Parkway and Private Road south of Mayfield Drive (unsignalized)
16. Carothers Parkway and Resource Parkway (unsignalized)
17. Carothers Parkway and Southstar Drive
18. Carothers Parkway and Tower Circle
19. Cool Springs Boulevard and Aspen Grove Drive
20. Cool Springs Boulevard and Carothers Parkway
21. Cool Springs Boulevard and E McEwen Drive
22. Cool Springs Boulevard and Frazier Drive
23. Cool Springs Boulevard and Highwoods
24. Cool Springs Boulevard and I-65 Northbound Ramps

25. Cool Springs Boulevard and I-65 Southbound Ramps
26. Cool Springs Boulevard and W McEwen Drive
27. Cool Springs Boulevard and Windcross Court
28. Galleria Boulevard and Bakers Bridge Avenue
29. Galleria Boulevard and Cool Springs Crossings
30. Galleria Boulevard and I-65 Southbound
31. Liberty Pike and Mallory Lane/N Royal Oaks Boulevard
32. Mallory Lane and Bakers Bridge Avenue
33. Mallory Lane and Cool Springs Boulevard
34. Mallory Lane and Crossroads Boulevard
35. Mallory Lane and Frazier Drive
36. Mallory Lane and Jordan Road
37. Mallory Lane and Kroger Center
38. Mallory Lane and Mallory Station Road /South Springs
39. Mallory Lane and Nichol Mill Lane
40. Mallory Lane and Seaboard Lane
41. Mallory Lane and Spring Creek Drive
42. Mallory Station Road and Duke Drive (shared controlled w Gen George Patton Drive)
43. Mallory Station Road and Gen George Patton Drive
44. Mallory Station Road and Seaboard Lane
45. McEwen Drive and Carothers Parkway
46. McEwen Drive and I-65 Interchange
47. McEwen Drive and Mallory Lane
48. McEwen Drive and Ovation Parkway
49. McEwen Drive and Spring Creek Drive
50. McEwen Drive and Tower Circle
51. McEwen Drive and Turning Wheel Lane (unsignalized)
52. *Moores Lane and Carothers Parkway (City of Brentwood)*
53. *Moores Lane and Galleria Boulevard (City of Brentwood)*
54. *Moores Lane and I-65 Northbound (City of Brentwood)*
55. *Moores Lane and I-65 Southbound (City of Brentwood)*
56. *Moores Lane and Mallory Lane (City of Brentwood)*
57. *Moores Lane and Westgate Circle (City of Brentwood)*
58. Murfreesboro Road (SR 96) and Carothers Parkway
59. Murfreesboro Road (SR 96) and Edward Curd Lane
60. Murfreesboro Road (SR 96) and I-65 Northbound Ramp
61. Murfreesboro Road (SR 96) and I-65 Southbound Ramp
62. Murfreesboro Road (SR 96) and Royal Oaks Boulevard
63. Royal Oaks Boulevard and Lakeview Drive

KCI will collect turning movement counts at up to 50 study intersections as determined by the City and identified above. Turning movement counts will be collected for AM (7:00-9:00AM), Midday (11:00AM-1:00PM), and PM (4:00-6:00PM) peak periods. Pedestrians and bicycles will be included in the traffic counts. The results of these counts will be used to conduct traffic analyses of each intersection as well as to provide data to better understand travel patterns through the study area.

- **1C. Drone Footage**

KCI will collect drone footage of the study area in order to observe high level traffic flows, extended queues, and lane utilization. This effort will provide input into the Vistro model calibration and may also be useful for presentations to project stakeholders. Drone footage will be collected on two days and will include one hour of footage for three peaks (AM, Midday, and PM) during each day. The drone footage will attempt to capture each study area, focusing first on the more central, and higher volume study intersections. A total of six hours of drone footage will be captured and provided.

- **1D. Existing Conditions Analysis and Modeling**

KCI will evaluate the existing conditions at the 63 study intersections, 57 within the City of Franklin and 6 within the City of Brentwood and will conduct capacity analyses using Vistro based on the roadway inventory data and traffic count data. Vistro produces the capacity analysis outputs required for this project (level of service, delay, queues, v/c ratio, etc.), but has added functionality in the areas of traffic impact analysis. Specifically, Vistro allows for the creation of multiple development scenarios within a single file, each of which can contain multiple site-specific developments and their respective access points on the network, trip generations, distributions, and assignments.

Existing scenario Vistro models will be created for the AM, Midday, and PM peak hours and will be initially based on conversion of the City's existing Synchro traffic model into Vistro. Once converted and modified to add the additional intersections within the study area, KCI will check all inputs to the model to verify its accuracy (laneage, signal timings, etc.). Models will then be calibrated and validated to duplicate the bottlenecks and queues within the study area. Calibration may include updating specific aspects of the Vistro model, including the following design parameters:

- Saturation flow rate
- Lane utilization
- Lane widths
- Signal operations

- **1E. Existing Policy Review**

To understand the existing development climate as well as the potential for future growth within the Cool Springs study area, KCI will review the City's land use plans, growth policies, and transportation plans. This will include, but is not limited to:

- Envision Franklin
- Franklin Zoning Ordinance
- Franklin Traffic Impact Study Guidelines
- Transportation and Street Standards
- Connect Franklin
- Integrated Growth Plan
- Greenways and Open Space Master Plan
- Cool Springs Multimodal Transportation Study

Review of Envision Franklin and the newly drafted zoning ordinance will first allow KCI to determine allowable densities within the study area, which will help calculate the growth potential for both vacant land as well as those parcels poised for redevelopment. Ultimately, this

review will feed the creation of a full-build out scenario, laying the foundation for an analysis of future traffic conditions. Once future conditions are established, a review of the Connect Franklin document, the Integrated Growth Plan, the Greenways and Open Space Master Plan, and the Cool Springs Multimodal Transportation Study will be used to produce a comprehensive list of previously-identified multimodal improvements in the study area. This list will be supplemented and modified based on results of the future conditions analysis as well as input from the City.

An important component of this task will be the review of Franklin's Traffic Impact Study Guidelines and Transportation Street Standards. While not directly impacting the technical analyses included in this project, this review will seek to objectively evaluate whether the existing processes are adequate in enabling the City to accomplish infrastructure investments that are necessitated by growth. Within this review and discussion will be ideas related to performance metrics for measuring congestion (v/c ratios, level-of-service, travel time, Vehicle Miles Traveled (VMT), etc.), what constitutes acceptable traffic operations, and the types of improvements required with development including non-motorized modes, transit, and other transportation technology solutions. The research and discussion surrounding this element will be focused in areas with similar character to and built environments as Franklin.

- **1F. Existing Conditions Summary**

KCI will summarize the data collected and analyzed for Task 1 in an Existing Conditions Memorandum. The memo will summarize sub-tasks 1A through 1D and will identify any recommendations for immediate needs regarding safety or operations.

Task 1 Deliverables:

- **Existing Conditions Summary**
 - Roadway and Traffic Data
 - Capacity Analysis
 - Operational Issues and Improvements
 - Noted Safety Issues
 - Policy Review

Task 2 – Project Growth and Future Conditions

- **2A. Background Growth**

Utilizing historic TMC and AADT data, KCI will establish a background growth rate for each study corridor. Major corridors may be broken into multiple segments based on roadway context and connectivity. KCI will populate a figure or table with proposed annual growth rates by corridor for City of Franklin approval.

- **2B. Future Scenarios: Approved Developments**

Using information provided by the City of Franklin, KCI will assemble information for all planned and approved developments in the study area. For developments with traffic impact studies, distributions will be extended through the study area by the creation of paths in the Vistro model. It is anticipated that this task will involve not more than 25 developments.

Further, KCI will work with the City to identify committed roadway improvements as included in the City's Capital Improvement Plan (CIP).

Committed roadway improvements will be incorporated into future Vistro model scenarios. Two approved development future model scenarios are proposed:

1. Future 50%: 10 Year Growth, including approved roadway improvements and 50% of all approved developments,
2. Future 100%: 10 Year Growth, including approved roadway improvements and 100% of all approved developments.

Both scenarios will assess AM, Midday, and PM peak operations. Both scenarios will be analyzed first with the current, committed roadway improvements and second, with additional improvements needed to achieve an acceptable level of service, delay, and queuing. Outputs presented will include level-of-service, delay, v/c ratio, and 95th percentile queues. In addition, a component of this task will be exploring additional performance metrics that may be useful in conveying the difference in existing and future congestion levels to the public and stakeholders. Results from this task will be presented in tabular format and/or via intersection diagrams and will be also included in the future conditions summary.

The results of this effort will be a preliminary list of project recommendations and their associated impact on performance.

- **2C. Future Scenarios: Maximized Development Potential**

KCI will work with the City to determine development potential for undeveloped or underdeveloped parcels of land within the study area. Development potential will be determined using the City's Draft Zoning Ordinance. Once identified, these will be included in the future condition models at the City's discretion.

Building on future scenarios 1 and 2, KCI will incorporate maximized development potential into the future Vistro model scenarios. Two maximized development future model scenarios are proposed:

3. Future 50%: 10 Year Growth, including approved roadway improvements and 50% of all approved and potential developments,
4. Future 100%: 10 Year Growth, including approved roadway improvements and 100% of all approved and potential developments.

Both scenarios will assess AM, Midday, and PM peak operations. Both scenarios will be analyzed first with the current, committed roadway improvements and second, with additional improvements needed to achieve an acceptable level of service, delay, and queuing. Outputs presented will include level-of-service, delay, v/c ratio, and 95th percentile queues. Results from this task will be presented in tabular format and/or via intersection diagrams and will be also included in the future conditions summary.

The results of this effort will be a preliminary list of project recommendations and their associated impact on performance.

Task 2 Deliverables:

- **Future Conditions Summary**
 - **Capacity analysis results for each scenario**
 - **Preliminary list of project recommendations**

Task 3 –Project Recommendations and Preliminary Opinion of Probable Cost

Utilizing the analysis completed in Tasks 1 and 2 and the preliminary list of recommendations determined via Vistro modeling, KCI will develop a list of phased and actionable recommendations. Recommendations will include a prioritized list of projects for the study area. The recommendations will further comprise innovative solutions identified during the project development process, including changes to policy and planning strategies that support the vision for the study area, as called for in Envision Franklin. Such recommendations may include sidewalk, bikeway, transit, traffic demand management strategies, access management strategies, transportation technology solutions, etc. Each transportation improvement will be coupled with an associated planning-level opinion of probable cost and will be phased and identified as either short- or long-term, based on the expected timeframe for implementation, relationship to expected development timelines, model outputs, and overall feasibility.

A draft report will be prepared and submitted to the client for review. The report will address in detail the inventory and data collected, project assumptions, analyses conducted, the output of said analysis, and recommendations and conclusions. The report will include the graphics, maps, and data to support and adequately illustrate the recommendations of this study. KCI anticipates the project documentation process to be coupled with an engaging review process, with input from the City and identified stakeholders. Up to two rounds of review and revision are included for the final report.

Task 3 Deliverables:

- **Prioritized List of Recommended Projects, Policies, and Strategies**
 - **Opinion of Probable Cost**
 - **Implementation Timeline**
- **Draft and Final Report**

Task 4 – Functional Plans

Each infrastructure project identified in the prioritized list of recommended projects will be translated into functional plans. It is anticipated that functional plans will be designed on top of aerial imagery. Imagery is to be provided by the city. Necessary field visits will be made to explore existing roadway conditions, existing utilities and a general review of existing grades and cross slopes. This information will be used in the functional design. The functional plans will include distinguishable color coding to identify existing vs. proposed infrastructure. Anticipated proposed infrastructure will include turn lanes with appropriate bay length and taper length, lane widening, bike lanes, concept level roundabouts and mini roundabouts. It is not anticipated that functional plans will include storm sewer work, cross-sections, or proposed roadway grades. Up to one round of review and revision are included for the functional plans.

Task 5 – Vistro Model Software Support and Materials

KCI will develop and administer support to City of Franklin staff for PTV America's Vistro software. This will focus on the required data inputs and features of the Vistro software. City staff will learn how to complete a simple analysis from start to finish, including understanding the results provided by the Vistro software.

Support activities will consist of a one-day (or two half-day) session with up to six attendees from the City of Franklin. KCI will provide all required materials. The session will showcase examples of how the City may utilize the existing model scenarios in the future; including the addition of intersections,

the addition of developments, and, editing paths. Participants are anticipated to leave with a wide-ranging understanding of the Vistro software and will have a binder of pertinent resource materials to reference after completion.

Task 6 – Project Management and Coordination

At the beginning of the project KCI will prepare for and attend a kick-off meeting with representatives responsible for the oversight of this project. The purpose of this initial meeting will be to discuss and review the proposed scope of services and study schedule, define study area intersections, and acquire existing data relevant to the study.

Beyond the kick-off meeting, project management meetings will be held monthly between the City of Franklin and KCI. The project timeframe is 12 months; therefore 12 project management meetings are anticipated.

KCI further anticipates the need to present project findings to the Board of Mayor and Alderman (BOMA) during multiple stages of the project. A total of four BOMA presentations are included at the anticipated project stages:

- During Task 1: KCI will present the first stage of the project to BOMA, discuss the use and capabilities of Vistro software, and gather input on project assumptions
- During Task 2: KCI will present the outcome of the Phase 1 analysis and will provide an update on progress for Task 2. This may include preliminary findings.
- During Task 3: KCI will present the prioritized list of project recommendations, including policy changes.
- At project completion: KCI will present final project findings and next steps.

Project management and coordination will be provided for the duration of the project. This includes phone calls and e-mails necessary to accomplish the project objectives, as well as general administration and accounting activities.

Task 7 – Adjustment to TAZs

Knowing that the City has previously invested in a refined component of the Nashville Area MPO's travel demand model, KCI will be able to build on the development analysis conducted as part of this effort to support the continued use of this model if so desired by the City. This process would involve taking all planned and future growth in the study area and converting the development densities into forecasted population and employment growth, which serve as the primary inputs for the model. Future development would initially be calculated at a parcel level and then aggregated to the Traffic Analysis Zones (TAZ) structure currently used in the model. If desired, KCI would also identify modifications to the TAZ geographies and the transportation network needed to account for anticipated changes in connectivity between zones and within the network due to future development.

PROJECT SCHEDULE

Given notice to proceed and contract execution, KCI is prepared to provide these services based upon a twelve-month project schedule.

FEES AND PAYMENTS

The following fees are for the performance of the Work listed in the Scope of Services above, at the location described above. The fees listed in this FEES AND PAYMENTS section do not cover any Additional Work, or any other services which are not specifically described as part of the Work listed in the Scope of Services above.

KCI will invoice for the Work completed monthly on the basis of percentage of work performed. A progress report with an itemized account of project activity will be submitted with each invoice.

Task	Description of Work	Fee
1	Information Gathering and Existing Conditions	\$85,800
2	Project Growth and Future Conditions	\$67,200
3	Project Recommendations and Preliminary Opinion of Probable Cost	\$50,600
4	Functional Plans	\$33,500
5	Vistro Model Software Support and Materials	\$9,200
6	Project Management and Coordination	\$26,600
7	Adjustment to TAZs	\$6,200
	Estimated Expenses	\$11,000
Project Total (Labor Fee and Expenses)		\$290,100

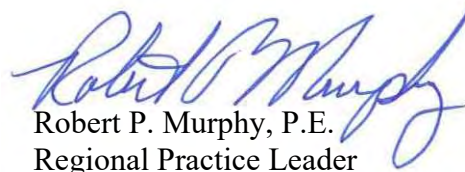
Thank you for this opportunity. We look forward to working with you on this project.

Please contact us if you have any questions regarding this scope of work.

Sincerely,



Beth Ostrowski, P.E.
Senior Project Manager



Robert P. Murphy, P.E.
Regional Practice Leader