GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

Office of the Chief Contracting Officer

TASK ORDER DIRECTIVE

FROM: Jerry Carter, Chief Contracting Officer

TO: Kittelson & Associates, Inc.

RE: Research and Technology
Contract # DCKA-2010-T-0050
Task Order No. 3
Innovative Bicycle Facility Research and Analysis

DATE: February 16, 2011

In accordance with Contract Number DCKA-2010-T-0050, this Task Order Number 3 is issued to confirm that your firm is directed to proceed with the services as listed herein.

PURPOSE

The District of Columbia is undergoing a transition into one of the most bicycle-friendly cities in the United States. This transition emphasizes attracting new riders, particularly those interested in cycling but hesitant to do so because of the real and perceived threats posed by traffic. To attract these riders, cycling must be made easy: bike-sharing to provide bikes where and when they are most needed; convenient and secure parking; and above all, safe and low-stress facilities on which to ride. To that end, DDOT has recently implemented several innovative bicycle facilities intended to improve cyclist comfort and safety by reducing cyclist-motorist conflicts, and has plans for many more.

This evaluation provides a unique opportunity to assess these innovative facilities from the perspective of all roadway users to understand both their benefits and drawbacks. The objective of this evaluation will be to:

- Improve the safety and operations of existing facilities through design refinements (e.g., signal timing modifications, geometric adjustments, supplemental signs, etc.);
- Provide guidance on best practice to achieve desired results for future bicycle facility designs within the District;
- Complete the required reporting for the FHWA bicycle signal and bicycle box experiment at 16th Street and U Street, NW;
• Thoroughly document the potential benefits of innovative bicycle facilities to guide and support future DDOT capital programming; and

• Summarize the results of the study in a concise and well-written report (including an Executive Summary) intended for the public and decision-makers, and serve as a resource for a national audience.

This evaluation will focus on data collection and analysis of effectiveness on the following four facilities:

• **16th Street/U Street/New Hampshire Avenue**: A 6-way intersection with bicycle boxes, bicycle signals, contra flow bicycle lanes, and possible future colored bicycle lanes

• **Pennsylvania Avenue Bicycle Lanes**: Bicycle lanes running down the center median of the roadway with no grade separation

• **15th Street Cycle Track**: Separated bicycle lane, currently one-way southbound to be converted into two-way in Fall 2010

• **L Street and M Street Cycle Tracks**: A one-way couplet of separated bicycle lanes, to be installed in Spring 2011.

Each task focuses on one facility, with an additional task for the study of future facilities.

**KEY ASSUMPTIONS**

*Project Schedule*

All project analysis will be completed within 18 months of receiving the Notice to Proceed. Tasks will be performed in the order listed, although data collection tasks may be overlapped for efficiency.

*Data*

For facilities that are already installed, DDOT will provide “before” data for analysis. In addition, DDOT will provide “after” data for 16th Street/U Street. In both cases, this data will include video data for behavior analysis, and turning movement counts of pedestrians, bicycles, and automobiles.

Prior to collecting the “after” observations, the Consultant will review the “before” data collected for each facility to determine (1) where “after” observations need to be conducted to match the existing “before” observations and (2) any “before” data collection issues that should be addressed for the “after” data collection (e.g., camera field-of-view blocked by vehicles or the camera angle not capturing all information of interest). The data-collection methodology will be reviewed with DDOT staff prior to collecting any new data.
DDOT will provide crash data for each intersection from 12 years prior to installation through the most recent data available. To the extent available, DDOT will also provide the original police reports for each bicycle-motor vehicle crash, as these can often provide valuable information.

DDOT will provide current traffic signal timing data and copies of any existing Synchro models developed by DDOT for the facilities under evaluation.

**Operations Analysis**

Intersection operations will be evaluated using several different software tools.

- Automobile operations will be estimated using 2000 Highway Capacity Manual methodologies, implemented through the use of Synchro.

- Pedestrian and bicycle LOS will be estimated using the *NCHRP Report 616: Multimodal Level of Service for Urban Streets* methodologies, implemented through the use of a spreadsheet tool.

- An alternative pedestrian and bicycle LOS analysis will also be performed using a LOS model recently developed for the Danish Road Directorate, implemented through the use of a spreadsheet tool.

**Consultant Deliverables**

All consultant deliverables will be provided in electronic format (Microsoft Office and/or PDF) only. All printing, copying and distribution will be the responsibility of DDOT.

**TASK 1: 16TH STREET/U STREET/NEW HAMPSHIRE AVENUE – T ST TO V ST (.2 MILES)**

**Task 1.1. Data Collection**

The Consultant will obtain the following data from DDOT:

- Bicycle and pedestrian count data during peak hours of use on Tuesday, Wednesday, or Thursday (6am-10am and 3pm-7pm) and Saturday (10am-2pm). Count data will be provided for both “before” and “after” conditions.

- Video data of the intersection on Tuesday, Wednesday, or Thursday (7am-9am and 4pm-6pm) and Saturday (10am-2pm). Video data will be provided for both “before” and “after” conditions.

- Pedestrian and bicycle crash data for the study area for the past 12 years, including police report sheets where available
• Peak hour motor vehicle turning movement counts for the purposes of estimating automobile LOS (analysis will assume that motor vehicle volumes remain unchanged in “before” and “after” conditions

The Consultant will also visit the site in-person as part of Task 1.1 to observe conditions in the field.

Note that this task does not include additional data collection following the installation of green color bicycle facilities and/or signal timing changes.

Task 1.2 Crash Analysis

The Consultant will analyze crash data, as provided by DDOT. The analysis will include examination of crash trends, types, and causes. This analysis of historical crash data will also be used to identify the types of conflicts to be studied through determination of the most common crash types and an understanding of the design intention of the facility.

Task 1.3 Multimodal LOS Operations Analysis

The Consultant will analyze intersection operations from the perspectives of automobile, bicycle, and pedestrians under both “before” and “after” conditions. The following performance metrics will be calculated for the 16th/U Street/New Hampshire Avenue intersection:

• Automobile intersection level of service (LOS) and average vehicle delay;

• Intersection Volume-to-Capacity ratio;

• Pedestrian and bicycle LOS (using both the NCHRP 616 and Danish Road Directorate methodologies); and,

• Supplementary bicycle performance measures such as bicycle progression, speed, and/or delay, subject to the availability of necessary data.

Task 1.4 Intercept and Neighborhood Survey

Task 1.4A Neighborhood Survey

The neighborhood survey will capture neighborhood perceptions of the facility as local motorists, pedestrians, and bicyclists using the intersection(s), and will include questions relating to perceived safety, intersection operation, parking impacts, business impacts, and impact on the respondents’ (or respondents’ customers and employees) bicycle trip-making patterns.

The Consultant will prepare separate survey forms for residents and businesses, with questions tailored to their issues. The resident survey will include some demographic questions to help determine whether the responses are representative of the neighborhood. Both the resident and business surveys will solicit feedback about changes to the facilities that respondents would like to see happen to make them work better.
The Consultant will conduct the neighborhood survey as a mail-out, mail-back survey targeted to all households and businesses within 2,000 feet of the facility. The survey will include the following features:

- Portland State University’s Center for Transportation Studies will serve as the survey originator.
- The survey will offer an incentive for returning the survey, most likely having respondents enter a random drawing for several larger denomination gift cards.
- The Consultant will purchase a mailing list with resident names and use those on the mailing label.
- Surveys will be sent via first class mail, likely in a larger envelope, to attract attention and not be mistaken for junk mail.
- Each survey packet will include a postage-paid envelope for returning the survey.
- Responses will be tracked using a number, and non-respondents would receive a second mailing. All households will also receive a reminder postcard shortly after the first survey packet is received.

Task 1.4B Intercept Survey

The Consultant will perform an intercept survey of motorist and bicyclist users of the facility. The bicyclist user survey will capture perceptions of the facility and will include questions relating to perceived safety, speed/delay impacts, trip length, and route and mode used for this trip prior to the construction of the facility. The motorist survey will also focus on understanding of the facility, perceptions of safety and operations (e.g. delay), and interactions with other users.

All of the user surveys will include demographic questions about the respondents (e.g., age, sex) and will solicit feedback about changes to the facilities that respondents would like to see happen to make them work better for them. Each survey may also contain questions that are specific to issues at the facility in question.

As part of both the bicyclist and motorist survey, surveyors will assure respondents that answers will be kept confidential and not shared with other parties or used for other purposes.

The intercept surveys will target responses from a minimum of 150 bicyclists and 150 motorists.

To intercept cyclists for the survey, the Consultant will stand in a visible location along the facility with a sign stating “Bicycle Survey Ahead.” Stopped cyclists will be handed a postcard with an invitation to complete a survey on-line. Each postcard will have a unique number to eliminate non-users from responding or users from responding more than once and to track responses by facility location.
As with the mail surveys, the intercept surveys would also incorporate an incentive to encourage a high response rate, likely entry into a random drawing for gift cards or free snack bars and water.

For the motorist survey, the Consultant will intercept people at parking meters near the facility and ask if they have driven on the street in question. If they have, they will be asked to take a short survey.

**Task 1.5 User Behavior Analysis**

The user behavior evaluation will capture whether the facility is operating as intended and whether any unanticipated issues have developed as a result of the installation of the facility. The analysis will include an assessment of:

- Weather conditions
- Directional and total bicycle and pedestrian volumes
- Effect of the leading westbound left turn phase and other signal timing aspects on the overall operations of the intersection
- Lagging left turn on red for U Street motorists turning northbound onto 16th Street and New Hampshire Avenue across the path of bicyclists
- Assess the operational and safety benefits of two-stage versus one-stage bicycle crossings
- The location and design of the bicycle signal heads and detection devices
- Effectiveness of channelizing devices to capture riders within detection zone
- Effectiveness of detection devices/systems
- Use of contra-flow bicycle lane and wrong way bicycle riding
- Frequency and distance of motor vehicle encroachment into the bicycle box
- Motorist behavior (signaling, yielding, compliance with devices)
- Motorist disregard of "no turn on red"
- Conflicts between cyclists and motorists requiring evasive action
- Cyclist behavior (signaling, head checks, compliance with devices.)
- Cyclist’s position in the bicycle box
- Cyclist’s use of crosswalks for crossing and accompanying issue of sidewalk crowding

To assess conflicts, the Consultant will define each conflict type drawing on previous work in earlier research and from published work. Conflicts may be defined as series of events that could lead to a collision between motor vehicles and bicycles. To ensure repeatability of the conflict measurement, all possible conflicts will be extracted from the video and reviewed by a panel.
As part of the data collection, the required data to control for exposure for each conflict will be collected (e.g., the number of right-turning vehicles and through cyclists).

Results will be reported in terms of raw counts and descriptive summaries. Potential safety issues will also be evaluated based on the field visit and survey results.

**Task 1.6: Assess Project Impacts and Suggest Improvements**

This Consultant will synthesize the prior analysis to 1) evaluate the effectiveness of the treatment, and 2) suggest refinements to the facility design and operations. This synthesis will include an assessment of the overall safety, comfort, and operational impacts of the treatments. In addition, the analysis will determine the necessity of colored bicycle boxes and approach lanes and investigate alternative signal phasing options through the use of Synchro.

The results of Task 1.6 will be summarized in Technical Memorandum #1.

**Task 1.7: Submit Interim Report**

The Consultant will prepare an interim report describing the preceding tasks assessing the facility’s impact six months after installation. This report will be submitted to FHWA per the terms of the approved experiment.

**Task 1.8: Submit Final Report**

The Consultant will prepare a final report one year after installation. We assume that the field data collection, analysis, and evaluation steps will be repeated six months after the work activities leading up to the interim report, with the exception of the surveys which will only be conducted once.

**TASK 2: PENNSYLVANIA AVENUE, NW BICYCLE LANES – 3RD ST TO 15TH ST (1.3 MILES)**

**Task 2.1. Data Collection**

The Consultant will obtain the following data from DDOT:

- Bicycle and pedestrian count data during peak hours of use on Tuesday, Wednesday, or Thursday (6am-10am and 3pm-7pm) and Saturday (10am-2pm). Count data will be provided for the “before” condition.

- Video data of the facility on Tuesday, Wednesday, or Thursday (7am-9am and 4pm-6pm) and Saturday (10am-2pm). Video data will be provided for the “before” condition.

- Pedestrian and bicycle crash data for the study area for the past 12 years, including police report sheets where available.
• Peak hour motor vehicle turning movement counts for the purposes of estimating automobile LOS (analysis will assume that motor vehicle volumes remain unchanged in “before” and “after” conditions

The Consultant will perform the following field data collection:

• Bicycle and pedestrian count data during peak hours of use on Tuesday, Wednesday, or Thursday (6am-10am and 3pm-7pm) and Saturday (10am-2pm). Count data will be collected for the “after” condition.

• Video data of the intersection on Tuesday, Wednesday, or Thursday (7am-9am and 4pm-6pm) and Saturday (10am-2pm). Video data will be collected for the “after” condition.

• Conduct an in-person site visit to observe conditions in the field.

Before and after data will cover the following nine Pennsylvania Avenue intersections: 6th Street, 7th Street, 9th Street, 10th Street, 11th Street, 12th Street, 13th Street, 14th Street and 15th Street, and will include the following data (in addition to basic turning counts):

• Average platoon size of pedestrians crossing Pennsylvania Avenue at each intersection

• Number of pedestrians/percentage that perform a two-stage crossing of Pennsylvania Avenue at each intersection

• Number of pedestrians queued in the median during each traffic signal cycle at each intersection

**Task 2.2 Crash Analysis**

The Consultant will analyze crash data, as provided by DDOT. The analysis will include examination of crash trends, types, and causes. This analysis of historical crash data will also be used to identify the types of conflicts to be studied through determination of the most common crash types and an understanding of the design intention of the facility.

**Task 2.3 Multimodal LOS Operations Analysis**

The Consultant will analyze intersection operations from the perspectives of automobile, bicycle, and pedestrians under both “before” and “after” conditions. The following performance metrics will be calculated for up to four (4) intersections along the Pennsylvania Avenue corridor:

• Automobile intersection level of service (LOS) and average vehicle delay;

• Intersection Volume-to-Capacity ratio;

In addition, the following corridor-level measures will be estimated for Pennsylvania Avenue:

• Pedestrian and bicycle LOS (using both the NCHRP 616 and Danish Road Directorate methodologies); and,
Supplementary bicycle performance measures such as bicycle progression, speed, and/or delay, subject to the availability of necessary data.

Task 2.4 Intercept and Neighborhood Survey

Task 2.4A Neighborhood Survey

The neighborhood survey is intended to capture neighborhood perceptions of each facility as local motorists, pedestrians, and bicyclists using the intersection(s), and will include questions relating to perceived safety, intersection operation, parking impacts, business impacts, and impact on the respondents’ (or respondents’ customers and employees) bicycle trip-making patterns.

The Consultant will prepare separate survey forms for residents and businesses, with questions tailored to their issues. The resident survey will include some demographic questions to help determine whether the responses are representative of the neighborhood. Both the resident and business surveys will solicit feedback about changes to the facilities that respondents would like to see happen to make them work better.

The Consultant will conduct the neighborhood survey as a mail-out, mail-back survey targeted to all households and businesses within 2,000 feet of the facility. The survey will include the following features:

- Portland State University’s Center for Transportation Studies will serve as the survey originator.

- The survey will offer an incentive for returning the survey, most likely having respondents enter a random drawing for several larger denomination gift cards.

- The Consultant will purchase a mailing list with resident names and use those on the mailing label.

- Surveys will be sent via first class mail, likely in a larger envelope, to attract attention and not be mistaken for junk mail.

- Each survey packet will include a postage-paid envelope for returning the survey.

- Responses will be tracked using a number, and non-respondents would receive a second mailing. All households will also receive a reminder postcard shortly after the first survey packet is received.

- The Consultant will coordinate with the Downtown BID to distribute the business survey.

Task 2.4B Intercept Survey
The Consultant will perform an intercept survey of motorist, pedestrian, and bicyclist users of the facility. The bicyclist user survey will capture perceptions of the facility and will include questions relating to perceived safety, speed/delay impacts, trip length, and route and mode used for this trip prior to the construction of the facility. The motorist survey will also focus on understanding of the facility, perceptions of safety and operations (e.g. delay), and interactions with other users. The pedestrian user survey would focus on pedestrians' understanding of the facility and interactions with bicyclists.

All of the user surveys will include demographic questions about the respondents (e.g., age, sex) and will solicit feedback about changes to the facilities that respondents would like to see happen to make them work better for them. Each survey may also contain questions that are specific to issues at the facility in question.

As part of both the bicyclist and motorist survey, surveyors will assure respondents that answers will be kept confidential and not shared with other parties or used for other purposes.

The intercept surveys will target responses from a minimum of 150 bicyclists, 150 pedestrians and 150 motorists.

To intercept cyclists for the survey, the Consultant will stand in a visible location along the facility with a sign stating “Bicycle Survey Ahead.” Stopped cyclists will be handed a postcard with an invitation to complete a survey on-line. Each postcard will have a unique number to eliminate non-users from responding or users from responding more than once and to track responses by facility location.

The pedestrian intercept survey will be conducted by approaching pedestrians on the sidewalk along the facility, particularly those observed crossing Pennsylvania Avenue, and administering a short, on-site, paper survey.

As with the mail surveys, the intercept surveys would also incorporate an incentive to encourage a high response rate, likely entry into a random drawing for gift cards or free snack bars and water.

For the motorist survey, the Consultant will intercept people at parking meters near the facility and ask if they have driven on the street in question. If they have, they will be asked to take a short survey.

**Task 2.5 User Behavior Analysis**

The user behavior evaluation will capture whether the facility is operating as intended and whether any unanticipated issues have developed as a result of the installation of the facility. The analysis will include an assessment of:

- Weather conditions
• Directional and total bicycle volumes, including percentage using the bicycle lanes versus the sidewalk or travel lane
• Directional and total pedestrian volumes
• Pedestrian and bicycle conflicts, with attention to the issue of crowding at the crosswalks
• Directional and total motor vehicle volumes and turning movements
• Effectiveness of signal timing relative to safety and operational efficiency
• User compliance with traffic controls in place;
• Safety of efficiency of transitions into and out of the center bike lanes;
• Safety of bicyclists and pedestrians interacting in the medians;
• Assessment of the existing signal and sign locations on safety and operations; and

To assess conflicts, the Consultant will define each conflict type drawing on previous work in earlier research and from published work. Conflicts may be defined as series of events that could lead to a collision between motor vehicles and bicycles. To ensure repeatability of the conflict measurement, all possible conflicts will be extracted from the video and reviewed by a panel.

As part of the data collection, the required data to control for exposure for each conflict will be collected (e.g., the number of right-turning vehicles and through cyclists).

Results will be reported in terms of raw counts and descriptive summaries. Potential safety issues will also be evaluated based on the field visit and survey results.

**Task 2.6: Assess Project Impacts and Suggest Improvements**

This Consultant will synthesize the prior analysis to 1) evaluate the effectiveness of the treatment, and 2) suggest refinements to the facility design and operations. This synthesis will include an assessment of the overall safety, comfort, and operational impacts of the treatments. In addition, the analysis will investigate alternative signal phasing options through the use of Synchro.

The results of Task 2.6 will be summarized in Technical Memorandum #2.

**Task 2.7: Submit Interim Report**

The Consultant will prepare an interim report describing the preceding tasks assessing the facility’s impact six months after installation.

**Task 2.8: Submit Final Report**

The Consultant will prepare a final report one year after installation. We assume that the field data collection, analysis, and evaluation steps will be repeated six months after the work
activities leading up to the interim report, with the exception of the surveys which will only be conducted once. The final report will describe the facility’s impact one year after installation, and will include an evaluation of the impact of any changes made to the facility following the interim report.

**TASK 3: 15TH STREET CYCLE TRACK – E ST TO W ST/NEW HAMPSHIRE AVE (1.7 MILES)**

**Task 3.1. Data Collection**

The Consultant will obtain the following data from DDOT:

- Bicycle and pedestrian count data during peak hours of use on Tuesday, Wednesday, or Thursday (6am-10am and 3pm-7pm) and Saturday (10am-2pm). Count data will be provided for the “before” condition.

- Video data of the facility on Tuesday, Wednesday, or Thursday (7am-9am and 4pm-6pm) and Saturday (10am-2pm). Video data will be provided for the “before” condition.

- Pedestrian and bicycle crash data for the study area for the past 12 years, including police report sheets where available

- Peak hour motor vehicle turning movement counts for the purposes of estimating automobile LOS (analysis will assume that motor vehicle volumes remain unchanged in “before” and “after” conditions

The Consultant will perform the following field data collection at up to 4 intersections selected in consultation with DDOT:

- Bicycle and pedestrian count data during peak hours of use on Tuesday, Wednesday, or Thursday (6am-10am and 3pm-7pm) and Saturday (10am-2pm). Count data will be collected for the “after” condition.

- Video data of the intersection on Tuesday, Wednesday, or Thursday (7am-9am and 4pm-6pm) and Saturday (10am-2pm). Video data will be collected for the “after” condition.

- Corridor motor vehicle travel time analysis on Tuesday, Wednesday, or Thursday during the AM peak (7:30am-9:30am), mid-day peak (11am-1pm), and PM peak (4:30pm-6:30pm) for “after” condition.

- Conduct an in-person site visit to observe conditions in the field.

**Task 3.2 Crash Analysis**

The Consultant will analyze crash data, as provided by DDOT. The analysis will include examination of crash trends, types, and causes. This analysis of historical crash data will also be
used to identify the types of conflicts to be studied through determination of the most common crash types and an understanding of the design intention of the facility.

**Task 3.3 Multimodal LOS Operations Analysis**

The Consultant will analyze intersection operations from the perspectives of automobile, bicycle, and pedestrians under both “before” and “after” conditions. The following performance metrics will be calculated for up to four (4) intersections along the 15th Avenue corridor:

- Automobile intersection level of service (LOS) and average vehicle delay;
- Intersection Volume-to-Capacity ratio;

In addition, the following corridor-level measures will be estimated for 15th Avenue:

- Pedestrian and bicycle LOS (using both the NCHRP 616 and Danish Road Directorate methodologies); and,
- Supplementary bicycle performance measures such as bicycle progression, speed, and/or delay, subject to the availability of necessary data.

**Task 3.4 Intercept and Neighborhood Survey**

**Task 3.4A Neighborhood Survey**

The neighborhood survey is intended to capture neighborhood perceptions of each facility as local motorists, pedestrians, and bicyclists using the intersection(s), and will include questions relating to perceived safety, intersection operation, parking impacts, business impacts, and impact on the respondents’ (or respondents’ customers and employees) bicycle trip-making patterns.

The Consultant will prepare separate survey forms for residents and businesses, with questions tailored to their issues. The resident survey will include some demographic questions to help determine whether the responses are representative of the neighborhood. Both the resident and business surveys will solicit feedback about changes to the facilities that respondents would like to see happen to make them work better.

The Consultant will conduct the neighborhood survey as a mail-out, mail-back survey targeted to all households and businesses within 2,000 feet of the facility. The survey will include the following features:

- Portland State University’s Center for Transportation Studies will serve as the survey originator.
- The survey will offer an incentive for returning the survey, most likely having respondents enter a random drawing for several larger denomination gift cards.
• The Consultant will purchase a mailing list with resident names and use those on the mailing label.

• Surveys will be sent via first class mail, likely in a larger envelope, to attract attention and not be mistaken for junk mail.

• Each survey packet will include a postage-paid envelope for returning the survey.

• Responses will be tracked using a number, and non-respondents would receive a second mailing. All households will also receive a reminder postcard shortly after the first survey packet is received.

*Task 3.4B Intercept Survey*

The Consultant will perform an intercept survey of motorist, pedestrian, and bicyclist users of the facility. The bicyclist user survey will capture perceptions of the facility and will include questions relating to perceived safety, speed/delay impacts, trip length, and route and mode used for this trip prior to the construction of the facility. The motorist survey will also focus on understanding of the facility, perceptions of safety and operations (e.g. delay), and interactions with other users. The pedestrian user survey would focus on pedestrians’ understanding of the facility and interactions with bicyclists.

All of the user surveys will include demographic questions about the respondents (e.g., age, sex) and will solicit feedback about changes to the facilities that respondents would like to see happen to make them work better for them. Each survey may also contain questions that are specific to issues at the facility in question.

As part of both the bicyclist and motorist survey, surveyors will assure respondents that answers will be kept confidential and not shared with other parties or used for other purposes.

The intercept surveys will target responses from a minimum of 150 bicyclists, 150 pedestrians, and 150 motorists.

To intercept cyclists for the survey, the Consultant will stand in a visible location along the facility with a sign stating “Bicycle Survey Ahead.” Stopped cyclists will be handed a postcard with an invitation to complete a survey on-line. Each postcard will have a unique number to eliminate non-users from responding or users from responding more than once and to track responses by facility location.

The pedestrian intercept survey will be conducted by approaching pedestrians on the sidewalk along the facility, particularly those observed crossing 15th Avenue, and administering a short, on-site, paper survey.
As with the mail surveys, the intercept surveys would also incorporate an incentive to encourage a high response rate, likely entry into a random drawing for gift cards or free snack bars and water.

For the motorist survey, the Consultant will intercept people at parking meters near the facility and ask if they have driven on the street in question. If they have, they will be asked to take a short survey.

**Task 3.5 User Behavior Analysis**

The user behavior evaluation will capture whether the facility is operating as intended and whether any unanticipated issues have developed as a result of the installation of the facility. The analysis will include an assessment of:

- Weather conditions
- Directional and total bicycle volumes, including percentage using the cycle track versus the sidewalk or travel lane
- Directional and total volumes of all users on cycle track
- Directional and total pedestrian volumes
- Directional and total motor vehicle volumes and turning movements
- Number of motor vehicle, bicycle, and pedestrian collisions, including a 12-year period prior to installation
- Effectiveness of signal timing relative to safety and operational efficiency, including left turn phases, leading pedestrian intervals, and bicycle signals
- Safety of users at signalized intersections and compliance with traffic control
- Safety of users at uncontrolled intersections and compliance and understanding of traffic control signs and markings (symbols, color)
- Comparison of safety, operational, and geometric features for residential neighborhood areas with full time parking (north of Massachusetts Avenue) versus downtown commercial areas with peak hour restricted parking (south of Massachusetts Avenue)
- Assessment of attitudes (cyclists and motorists) for use of cycle track versus traveling with traffic on 15th Street where the sharrows have been removed

To assess conflicts, the Consultant will define each conflict type drawing on previous work in earlier research and from published work. Conflicts may be defined as series of events that could lead to a collision between motor vehicles and bicycles. To ensure repeatability of the conflict measurement, all possible conflicts will be extracted from the video and reviewed by a panel.

As part of the data collection, the required data to control for exposure for each conflict will be collected (e.g., the number of right-turning vehicles and through cyclists).
Results will be reported in terms of raw counts and descriptive summaries. Potential safety issues will also be evaluated based on the field visit and survey results.

**Task 3.6: Assess Project Impacts and Suggest Improvements**

This Consultant will synthesize the prior analysis to 1) evaluate the effectiveness of the treatment, and 2) suggest refinements to the facility design and operations. This synthesis will include an assessment of the overall safety, comfort, and operational impacts of the treatments. In addition, the analysis will investigate alternative signal phasing options through the use of Synchro.

The results of Task 3.6 will be summarized in Technical Memorandum #3.

**Task 3.7: Submit Interim Report**

The Consultant will prepare an interim report describing the preceding tasks assessing the facility’s impact six months after installation.

**Task 3.8: Submit Final Report**

The Consultant will prepare a final report one year after installation. We assume that the field data collection, analysis, and evaluation steps will be repeated six months after the work activities leading up to the interim report, with the exception of the surveys which will only be conducted once. The final report will describe the facility’s impact one year after installation, and will include an evaluation of the impact of any changes made to the facility following the interim report.

**Task 3.9 Standardized Evaluation Methodology and Summary Report**

Task 3.9 will draw on the lessons learned from Tasks 1-3 to provide two key deliverables to DDOT:

- Summarize the results of the Task 1-3 evaluations in a concise and well-written report (including an Executive Summary) intended for the public and decision-makers, and serve as a resource for a national audience.

- Standardized data collection and evaluation methodology for analysis of subsequent bicycle facilities within the District. This document will draw on the lessons learned from Tasks 1-3 to ensure that the results of future evaluations are comparable to the Task 1-3 evaluations, and that the future evaluations are conducted as efficiently as possible.

**TASK 4: L STREET AND M STREET CYCLE TRACKS**

*L Street, NW between Massachusetts Ave and 25th St (1.4 miles)*

*M Street, NW between 15th St and 28th St (1.2 miles)*
Task 4.1. Data Collection

The Consultant will perform the following field data collection at up to 6 intersections selected in consultation with DDOT:

- Bicycle and pedestrian count data during peak hours of use on Tuesday, Wednesday, or Thursday (6am-10am and 3pm-7pm) and Saturday (10am-2pm). Count data will be collected for the “before” and “after” conditions.

- Video data of the intersection on Tuesday, Wednesday, or Thursday (7am-9am and 4pm-6pm) and Saturday (10am-2pm). Video data will be collected for the “before” and “after” conditions.

- Corridor motor vehicle travel time analysis on Tuesday, Wednesday, or Thursday during the AM peak (7:30am-9:30am), mid-day peak (11am-1pm), and PM peak (4:30pm-6:30pm) for “before” and “after” conditions.

- Conduct an in-person site visit to observe conditions in the field.

Schedule

The work under this task order number 3 shall be completed within eighteen months, five hundred forty eight (548) days, from the date this task order directive is executed by the contracting officer.

Payment

For all services rendered by the Consultant under this Task Order No. 2 and as full and complete compensation including all expenditures made and all expenditures incurred by the Consultant in connection with this Task Order, subject to and in confirmation with all applicable provisions of this Agreement and the provisions forth herein, the District shall pay the Consultant $88,032 in hourly fees, and up to $104,459 in direct costs. Total payment under this task order shall not exceed $192,491.
ACCEPTED  
Consultant  

RECOMMENDED  
Michael Goodno  
Project Manager  
Bicycle Program Specialist

APPROVED  
Karma Ricks  
Associate Director of Transportation  
DDOT, TPPA

APPROVED  
Jerry Carter  
Agency Chief Contracting Officer