## Transportation Pooled Fund Program

| **Project Title:** | | |
|---|---|---|
| Updating "A Guide to Standardized Highway Lighting Pole Hardware" | | |
| **Project Manager and Phone Number:** | **Project No:** | Project is: |
| **Michael J. Patritch**<br>**307-777-4182** | **TPF-5(002)** | PLANNING<br>X R&D |
| **Reporting Period:** | **Multi Year Project** | |
| October 1, 2008 to March 30, 2009 | Yes | |
| | | |
| | | |
| **STATUS AND COMPLETION DATE** | | |
| Percentage of work completed to date for total project | | |
| Project is approximately 40 % complete<br>X on schedule behind schedule, explain:<br>Expected Completion Date: April 30, 2010 | | |
| No invoices have been received therefore no payments have made to the P.I., Malcolm H. Ray. | | |

Malcolm H. Ray, P.E., Ph.D.
186 Staples Hill Road
Canton Maine 04221

Dear Mr. Fredrick:

This letter is the fifth and sixth quarterly progress report for the project Update to A Guide to Standardized Highway Lighting Pole Hardware sponsored by the Wyoming Department of Transportation and covering the period between October 1, 2008 and March 30, 2009. The following paragraphs summarize the progress to-date in the project.

***Task 1: Determination of Standardized Lighting Poles and Hardware***

The research team has previously indentified all the major manufacturers of lighting poles and lighting pole hardware and a list was provided in Attachment D. Most of these manufacturers are involved in the AASHTO-ARTBA-AGC Task Force 13 and the research team has been using the twice-yearly Task Force 13 meetings to disseminate and collect information from the manufacturers. The PI attended the fall Task Force 13 meeting in Savanna, Georgia on September 29 and 30. At that meeting the PI up-dated the Sign and Luminaire Subcommittee on progress on the luminaire guide. The group discussed the objectives and progress to that point and several interesting issues where raised which the research team believes need some input from the pooled-fund sponsors, namely:

Scope – The group asked if the guide would be limited to luminaire supports or would also include traffic signal supports, aid call boxes and the like.

Crash tested hardware – traditionally, the TF13 guides have been limited to crash tested and FHWA accepted hardware. While the TF13 group certainly wants to indicate the acceptance status of any luminaire hardware in the guide, there was some question about if non-accepted hardware should also be included.

AASHTO Specification – the research team carefully investigated the AASHTO specifications for signs and luminaire supports and discussed several specific pole designs with manufacturers. It seems unlikely that the research team can obtain adequate information to assess if each configuration meets the AASHTO specification primarily because only the manufacturer has complete information about the geometry, welding, materials specifications, etc. An alternative is to ask manufacturers for copies of certification letters that they already provide to the States. This way, the manufacturer is still responsible for the actual certification but users of the on-line guide will be able to see that a particular configuration has been certified.

The research team would like some clarification on these points as we proceed. We are certainly willing and able to proceed in any direction the sponsors desire, however, we propose the following responses to the three issues above: 2
Scope – We believe adding traffic signal supports and aid call boxes would be of use to the community and doing so should not complicate the rest of the project. We would suggest, however, that we prioritize these items lower than luminaires and address them if there is adequate funding as the project progresses.

Crash tested hardware – We believe that it is preferable to continue with the usual TF13 policy of only including crash tested items or items with and FHWA acceptance letter. Probably the largest category of un-crash tested items would be ornamental poles. While including these would be of use to municipalities and DOTs it would expand the scope of the project since there are many ornamental variations in the marketplace. Perhaps prioritizing the crash tested luminaires higher would be an adequate approach.

AASHTO Specification – We believe that ultimately the manufacturer must stand behind the certification of the product and only the manufacturer has the necessary information to assess a particular product design with respect to the AASHTO specification. We believe it is important to include the information in the Guide but we suggest that it will be up to the manufacturer to do the analysis and present a certification to the project team. If there are particular manufacturers that need assistance in assessing their AASHTO certification level we would be willing to provide that assistance.

The research team has been working closely with personnel at HAPCO in order to organize the on-line website. The team feels that if we can develop a data structure and software that can accommodate the extensive HAPCO catalog, then we should be able to incorporate all the other manufacturers in the same way. The team obtained complete catalog information as well as drawings and acceptance letters from HAPCO and has been developing a very large database of all the possible alternatives for HAPCO poles. There are basically eight FHWA acceptance letters to HAPCO. Generally, an acceptance letter is considered to grant acceptance to a broad range of luminaires covered by the testing presented by the manufacturer. For example, a manufacturer may perform a series of four tests on two specific luminaire configurations but the FHWA acceptance generally covers all the ranges in between. So if a test was performed on a 15-ft pole and a 30-ft pole, the letter would accept all poles of that type between 15 and 30 feet. FHWA acceptance letter LS65, for example, covers 384 different configurations of the components since there are a variety of pole heights, mast arm types, numbers of mast arms. HAPCO addresses this issue using its on-line design center at http://www.hapco.com/Config.aspx. A highway designer or engineer should be able to go to the TF13 on-line luminaire guide website, specify the basic conditions they are interested in (i.e., wind load, pole height, number and type of mast arms and fixture weight) and have the guide return a listing of the components (i.e., pole, mast arms, base, etc.) that satisfy their criteria. This is the approach being used in Task 2 to develop the on-line guide. In this task, the research team has been organizing the HAPCO data into a searchable database that allows the designer to search by his or her design requirements. ***Task 2: Prototype Guide Development***

As mentioned in the last task, the PI attended the fall Task Force 13 meeting in Savanna, Georgia on September 29 and 30. At that meeting the PI up-dated the Sign and Luminaire Subcommittee on progress on the luminaire guide as well as the sign guide which is also being revised, updated and put on-line in a separate contract. The research team presented a mock-up of the on-line luminaire guide to the Sign and Luminaire Subcommittee. The website for the luminaire guide is http://civil-ws2.wpi.edu/Documents/Roadsafe/Guides/luminaireGuide/index.php but it is also connected to the overall Task Force 13 on-line guides website at http://civil-ws2.wpi.edu/Documents/Roadsafe/Guides. The proposed luminaire guide follows the same basic structure as the other TF13 on-line guides. There are webpages for the following: 3
The HOME page provides basic information about luminaire supports, the Report 350 testing appropriate for luminaire supports and basic information about the AASHTO specification.

The BROWSE page presents an ordered list of all the luminaire hardware in the guide. The page has the functionality to include photographs of the system, a short descriptive title and some basic information about the system. The user can select any system on this page to get the detailed information

The SEARCH page allows the user to enter information about their own design requirements. For example, the user can ask to see all Report 350 tested, 30-ft tall aluminum poles with a single davit mast arm acceptable for use in an 85 mi/hr

wind zone. The system responds with a list of systems that meet those requirements. The user can then select any of the systems and obtain more complete information.

The SYSTEM page contains complete information about each particular luminaire design. The page will have a schematic drawing, contact information, information about FHWA crash test acceptance, AASHTO specification certification and a list of components of that system. The component list is automatically linked to a Component Guide that contains drawings and specifications for each of the components of a system (i.e., the pole, the base, the mast arm, etc.)

The CONTACTS page lists contact information for all manufacturers. The CONTACT page is also interlinked with the system page so users can look for a system by manufacturer or find the manufacturer of a particular pole configuration.

The LINKS page includes links to other TF13 guides as well as the webpages with the templates and standards for submitting new materials to the guide.

The ABOUT page includes information about Task Force 13, the history of the guides and contact information.

The research team expects to have a functioning on-line system up and running by the spring Task Force 13 meeting in San Antonio, Texas on June 4, 2009. While the software system will be essentially complete, there will not be any real content in the system yet. We plan on shifting the focus of this task from software development to content addition in the next quarter. By the fall Task Force meeting, we plan to have a large amount of data entered into the system so that the Sign and Luminaire Subcommittee members can critique how the on-line guide functions and determine if it satisfies their needs. As the focus of the project shifts from software development to content addition, we will need to get the manufacturers heavily involved in providing content (i.e., drawings, specifications, test reports, videos, etc) that we can upload onto the site. We will use the up-coming Task Force meeting to organize this effort with the manufacturers. ***Task 3: Final Guide Development*** This task has not been initiated as yet. ***Task 4: Final Report*** This task has not been initiated as yet.

Sincerely, Malcolm H. Ray, P.E., Ph.D.

**Project Manager  Michael Patritch, WYDOT Research Center**