METRO

September 20, 2005

Ms. Regina S. McElroy
Office Director, Transportation Operations, HOTO
Federal Highway Administration, Room 3408
400 Seventh Street SW
Washington, DC 20590

Subject: Request for Permission to Experiment – In-Pavement Lighted Stop Bar System

Ms. McElroy:

Metropolitan Transit Authority of Harris County (METRO) operates a 7.5 mile at grade light rail system, a portion of which runs on Main Street through downtown Houston. METRO is working with the City of Houston to improve visibility and awareness of traffic signals at intersections with light rail crossings to reduce the potential for collisions.

By way of the attached request, METRO is seeking permission to install an experimental application of in-pavement lighting adjacent to an intersection stop bar and a lighted traffic signal backplate in downtown Houston, Texas. Our request is very time sensitive as we have had several very serious incidents, one of which resulted in collision involving a motorist fatality. We desire to begin this experiment as quickly as possible to address the safety concerns of our system.

If you have any questions regarding this Request, please contact me via any of the avenues listed below.

Sincerely,

Ina Heffner

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cc: Paul Carlson, TTI
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METRO Staff

Request to the Federal Highway Administration

For Permission to Experiment with Innovative TCD applications

to Reduce Red-Light Running

Submitted by:
Metropolitan Transit Authority of Harris County, Texas
Office of Technology and Police & Traffic Management Divisions

Assisted by:

Texas Transportation Institute

Revised: September 12, 2005

method will use LEDs along the perimeter of the signal backplates to be lit in coordination with the traffic signal.

METRO proposes installing in-pavement illuminated road markers immediately before the painted stop bar for traffic on the minor approaches to one intersection. These in-pavement illuminated road markers will be synchronized with the traffic signal so that the in-pavement markers will emit a red light toward approaching road users when the traffic signal is red. Once the light changes to green, the in-pavement markers will be off and inconspicuous.

The in-pavement markers will be tested using two different configurations. In one configuration, the markers will stutter flash when the traffic signal is red. In the second configuration, the markers will not flash at all but instead be set to steady burn. Signing, as needed, will be used to help convey the meaning of the in-pavement road markers.

METRO also proposed installing signal backplates at an adjacent intersection. The signal backplates will be outlined in a ring of LEDs which will be synchronized with the traffic signal. The LEDs will be yellow and red. It is not planned to have green LEDs included in the backplate. When the traffic signal indication shows green, the LEDs will not be lit. The LED backplate can be tested in various configurations. For instance, a flash rate, other than once per second, can be used to draw attention to the signal. The flash can continue for a short time or through the entire phase. These options will be considered in the study plan. Suggestions are welcome.

Description of Application:

Various vendors of lighted road markers have been evaluated by METRO and Texas Transportation Institute for visibility, durability and functionality. The recommended vendor(s) products will be used for a pilot installation at one intersection, Jefferson and Main Streets, in downtown Houston. A sample layout of the intersection with the in-pavement lighted marking installed is shown in Figure A.

The markers will be installed at least 6 inches before the painted stop bar from the perspective of the flow of traffic and will be configured to give the appearance of a continuous line of conspicuous depth.

Supplemental signs can also be developed with assistance from Texas Transportation Institute (TTI). The signs can be installed on the post at the curb location of the stop bar to indicate that drivers should "Stop here when flashing" or "Stop here when red."

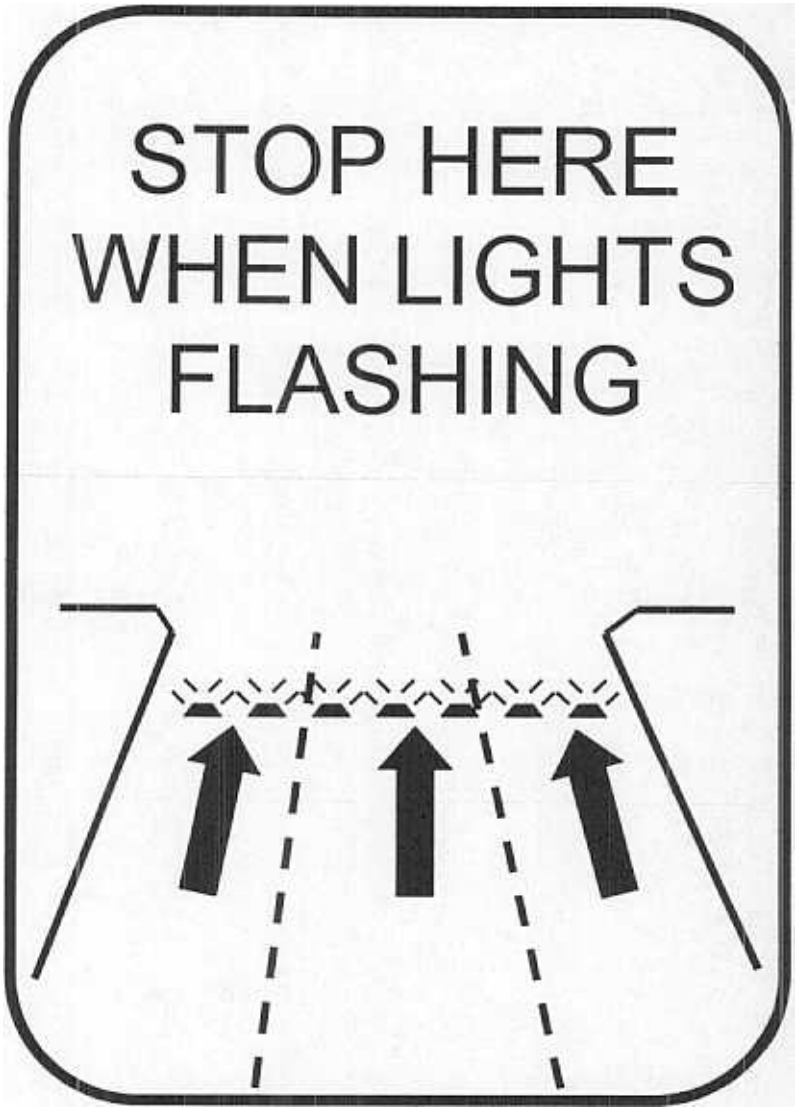

Figure B. Prototype Sign for Flash Condition

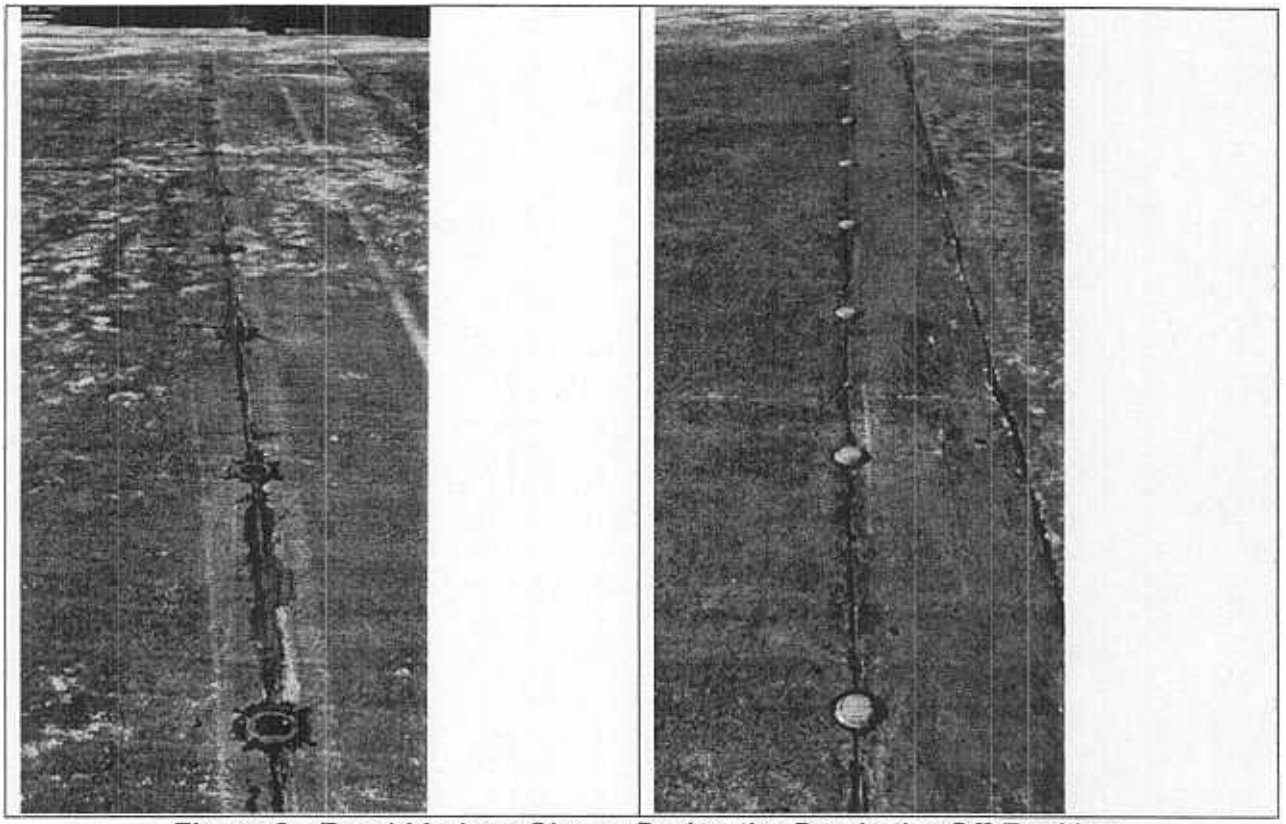

Figure 3. Road Markers Shown During the Day in the Off Position

Test Period and Evaluation;

If Permission to Experiment is granted in during the fall of 2005, it is anticipated that the construction will be completed by the end of calendar year 2005. It is our intent to experiment with these devices for a period of 2 years. Should these devices prove to be an improvement over previously existing conditions, we understand that they may remain in place until FHWA considers this type of warning device for inclusion in the MUTCD.

We are also aware that semi-annual reports are required by FHWA as to the progress of testing. METRO agrees that if at any time a determination is made that a significant safety hazard exists because of this experiment, the test will terminate.
A research plan, as described hereafter, will be initiated beforehand to obtain the necessary "before and after" data.

Research Plan:

METRO will initiate a research study to evaluate the effectiveness of the application described herein. The plan will include several efforts including a "before and after" study of driver behavior and signal effectiveness at the test sites. The study will emphasize the collection and analysis of early "after" data to ensure safety. The research tasks are described below.

1. Design and conduct a driver comprehension survey. This survey will be used to evaluate how well drivers understand the potential application, including proposed sign designs. A separate survey will be generated to solicit feedback from rail operators.
2. Collect before data – Using video technology, the researchers will record driver response to traffic signals at the test sites before the road markers are installed. A minimum of 3 normal week days of data will be obtained, including both daytime and nighttime data that spans times of frequent and infrequent train service. Measures of effectiveness such as the following will be used to assess the effectiveness of the road markers:
    - Number / percent of vehicles running red lights
    - Number / percent of vehicles that seem to notice red lights at the last minute and must stop suddenly
    - Other interesting events will be recorded as well, such as near misses or conflicts.
3. Collect early after data – Using video technology, the researchers will record driver behavior at the test site within the first month after the devices are installed. At least three days of data will be obtained. The video will be reduced and the data will be compared to the before data. The objective of this task is to ensure that drivers are reacting as expected. If not, then immediate remedial actions will be taken such as additional signing or simply turning off the road