Robert L. Ehrlich, Jr., *Governor*
Michael S. Steele, *Lt. Governor*

SHA State Highway Administration — Driven to Excel

Robert L. Flanagan, *Secretary*
Neil J. Pedersen, *Administrator*

Maryland Department of Transportation

August 31, 2005

Regina McElroy, Director
Office of Transportation Operations
U.S. Department of Transportation
Federal Highway Administration
400 Seventh Street, S.W. HOTO
Washington, DC 20590

Dear Ms. McElroy:

In accordance with the MUTCD Section 1A.10- Interpretations, Experimentations, Changes, and Interim Approvals, the Maryland State Highway Administration, Office of Traffic & Safety is requesting an interim approval to experiment with part-time traffic control signal in Baltimore County, Maryland.

At some unsignalized intersections, there are often intense arriving and departure traffic in a short period due to school hours or after-school activities, which not only creates congested areas but also brings about increased concerns from the public and officials on traffic and pedestrian safety. Engineering studies indicate that the traffic signal warrants as set forth in the MUTCD are not met at those locations. Efforts have been made to create safer traffic operations for the students, teachers, school buses, and visitors through other means. However, the problems remain. We believe the problem could be eliminated by a Part-Time traffic signal. Therefore, we would like an opportunity to conduct an evaluation on the Part-Time traffic signal operated on demand basis to determine its effectiveness on traffic and safety under these types of situations. The experiment is designed to be a before/after study that includes:

1. Observation on traffic including volume, queuing, delay, and gap distribution on the major road, and the arrival pattern of vehicles on minor roads under the given situation above,
2. Observation on driver's behavior including gaps selection,
3. Observation on school buses including volume, percentage of school buses, arrival patterns, and gap selection
4. Observation on pedestrians including volume, arrival pattern, and crossing behavior.

Through the above observations and safety and capacity analysis, the study is to establish warranting conditions and criteria that guide the operation of the Part-Time traffic signal. If it is proved to be successful, the signal will remain in use thereafter as a traffic signal and be guided by the study.

410-787-5815

My telephone number/toll-free number is _____
Fax: _ 410.787.4082, _ 410.553.6399, _ 410.582.9469, _ 410.787.5823, _ 410.787.2863, _ 410.787.3798
Maryland Relay Service for Impaired Hearing or Speech: 1.800.735.2258 Statewide Toll Free
Street Address: 7491 Connelley Drive • Hanover, Maryland 21076 • *Phone* 410.787.5800 • www.marylandroads.com

The location where we wish to conduct the experiment is MD 45 at Hereford High School, Baltimore County, Maryland.

Enclosed you will find the research plan that we proposed. If you have any questions or require additional information, please do not hesitate to contact me or Dr. Ruihua Tao. She may be reached at 410-787-5863 or rtao@sha.state.md.us.

Sincerely,

Thomas Hicks, P.E., Director
Office of Traffic & Safety

TH/rth

Enclosures

cc: Mr. Nelson Castellanos
Mr. Dave Malkowski
Mr. Randall Scott
Mr. Eric Tabacek
Dr. Ruihua Tao

Research and Evaluation Plan for

Part-time Traffic Signal at MD 45 and Hereford High School, Baltimore, Maryland

(Request for Interim Approval)

Prepared for

U.S. Department of Transportation
Federal Highway Administration
Office of Transportation Operations

Prepared by

Maryland State Highway Administration
Office of Traffic and Safety
7491 Connelley Drive
Hanover, MD 21076

August 24, 20

1. Project Background

The Maryland State Highway Administration (SHA), Office of Traffic and Safety(OOTS), has received numbers of requests from local jurisdictions for installing traffic control signals at school intersections where there are often intense arriving and departure traffic in a short period due to school hours or after school-activities, which not only creates congested areas but also brings about increased concerns from the public and officials on traffic and pedestrian safety. Engineering studies indicate that the traffic signal warrants as set forth in the MUTCD are not met at those locations. Efforts have been made to create safer traffic operations for the students, teachers, school buses, and visitors through other means. However, there still exist problems that, it is thought, could be alleviated by a Part-Time traffic control signal. Therefore, we would like an opportunity to conduct a study on the Part-Time traffic control signal operated on demand basis to determine its effectiveness on traffic and safety under these types of situations.

2. Objectives and Tasks

The objectives of the study include:

1. to evaluate the effectiveness of the Part-Time traffic control signal on alleviating traffic tension during school hour or after-school activities,
2. to develop warranting conditions and criteria that guide the operation of the Part-Time traffic control signals at school intersections.

These objectives will be accomplished through the following tasks:

Task 1- Develop the evaluation plan and research methodology
Task 2- Signal design
Task 3- Data collection before the installation of the part-time signal
Task 4- Signal installation
Task 5- Data collection after the installation of the part-time signal
Task 6- Data analysis and simulation
Task 7- Research report

The study will be conducted at the intersection of MD 45 and Hereford High School, Baltimore, Maryland. The location, geometric features and laneages of the intersection are shown in attached Figures. The project will authorize the installation of Part-Time traffic signals, as replacement for the current operation at the intersection.

3. Study Methodology and Data Collection

"Before" and "After" studies will be conducted. The following observations will be made in the periods of before and after installation:

- Observation on traffic including volume, delay, queue, gap distribution on MD 45, and arrival pattern of vehicles on the minor road
- Observation on gap selecting behavior before installation,
- Observation on school buses including number of school buses in use, percentage of school buses, arrival patterns, and gap selection
- Observation on pedestrians including number of students crossing, arrival pattern, and crossing behavior

Data will be collected at the studied site during school peak-hours and/or after-school activities. Date collections will be in the same time period on the same day of the week during "before" and "after" periods.

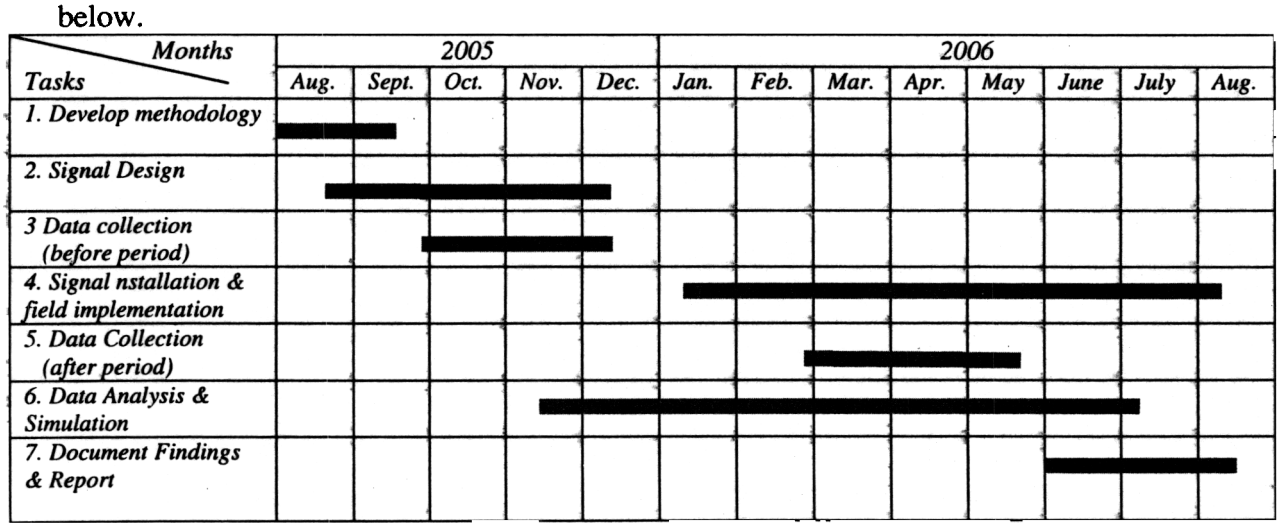
It is anticipated that traffic data will be recorded at the school main entrance and the exit. The videotaped data will be deduced with the assistance of a Video-based method for measuring traffic at intersection that was developed in one of our previous studies to obtain traffic related data. The observation on pedestrian crossing behavior will be performed at the school crossings. MOE, serving as indications of the performance of the intersection during the before and after periods, will also be established.

4. Data Analysis and Documentation

Field data collected during "before" and "after" periods will be statistically analyzed on the basis of the MOEs to exam the effectiveness of the Part-Time traffic control signal on improving the intersection operation and safety. Simulation will be performed by using field data to determine the optimal conditions for the use of the Part-Time signal and to establish the warranting conditions that guide the operation of the Part-Time traffic control signal under the described situations. The results of the study will be documented in a research report. The final report will be distributed to the FHWA and the AASHTO subcommittee on Traffic Engineering within three months after completion.

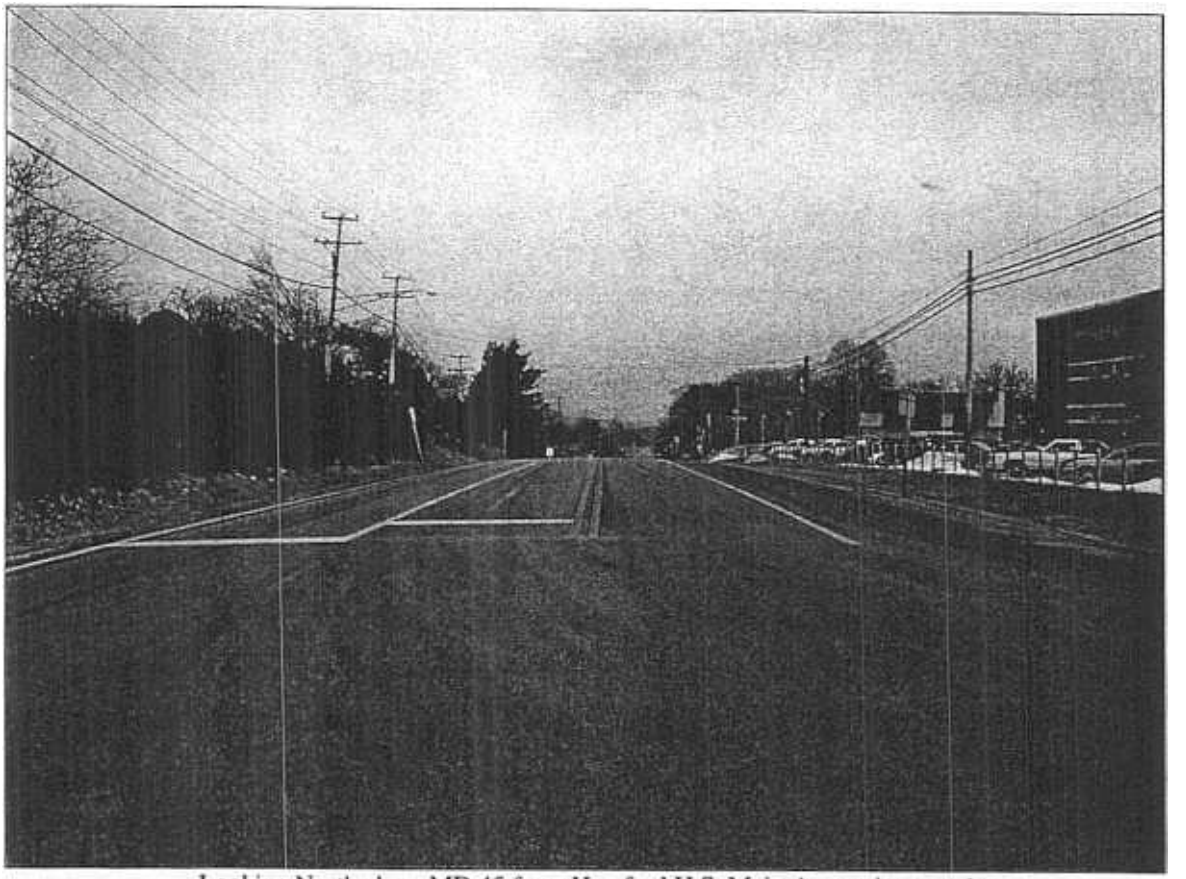
5. Schedule

The length of the study will be 12 months. The timeframe of the study is shown in the table below.

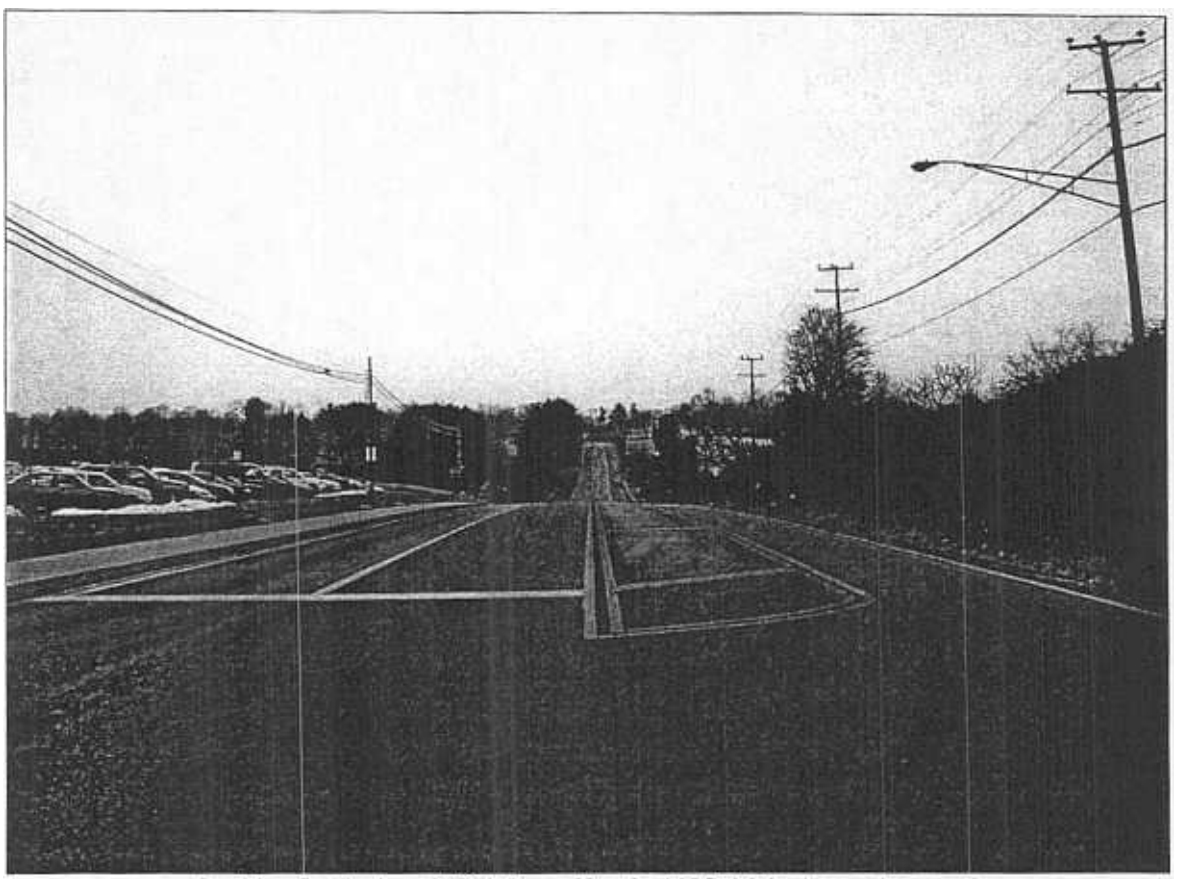


6. Administration

The OOTS of the SHA requests to the Federal Highway Administration for the interim approval for the installation of the part-time traffic control signal at the intersection of MD 45 and Hereford High School, Baltimore County, Maryland. The project will be led and supervised by Mr. Tom Hicks, Director of the Office of Traffic and Safety. Dr. Ruihua Tao will be leading researcher responsible for the study. If you have any questions in regards to this study, please feel free to contact her at 410-787-5863 or rtao@sha.state.md.us.

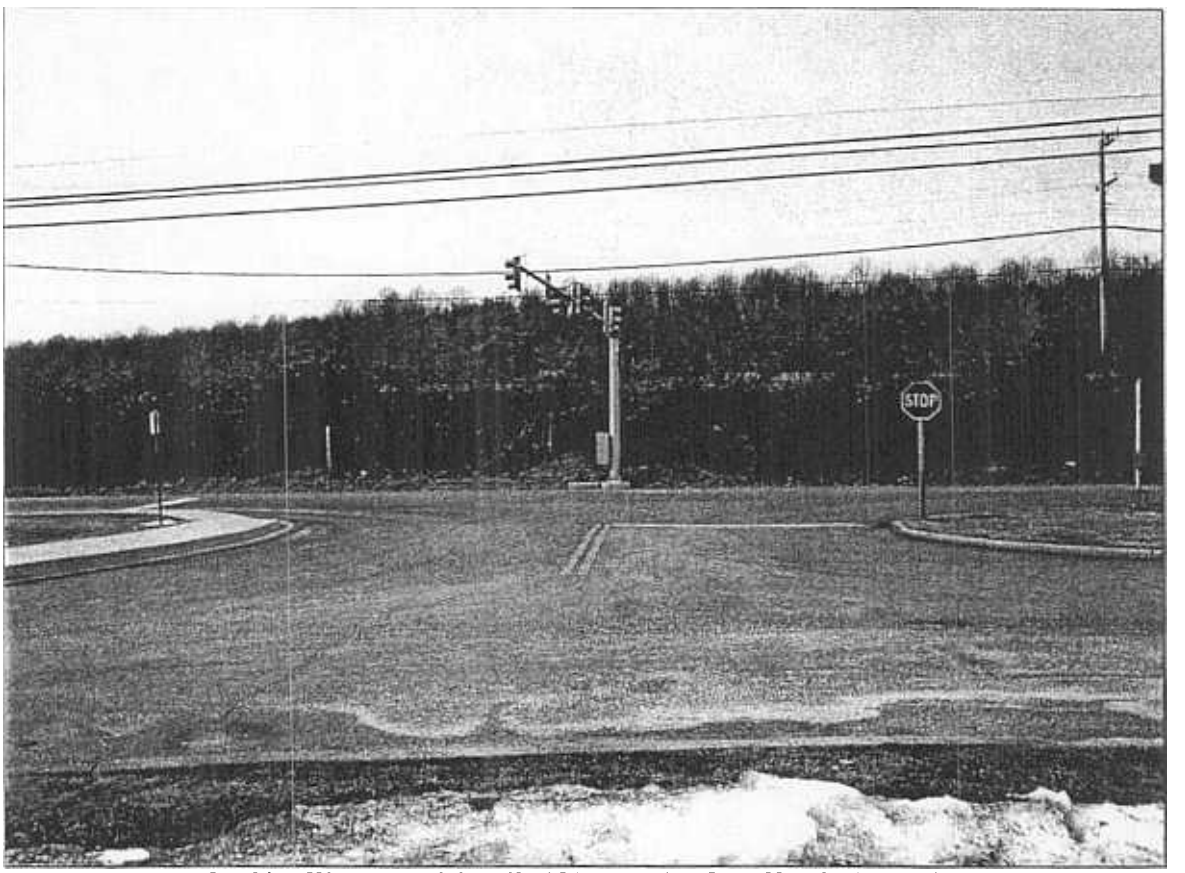


Looking North along MD 45 from Hereford H.S. Main Access intersection

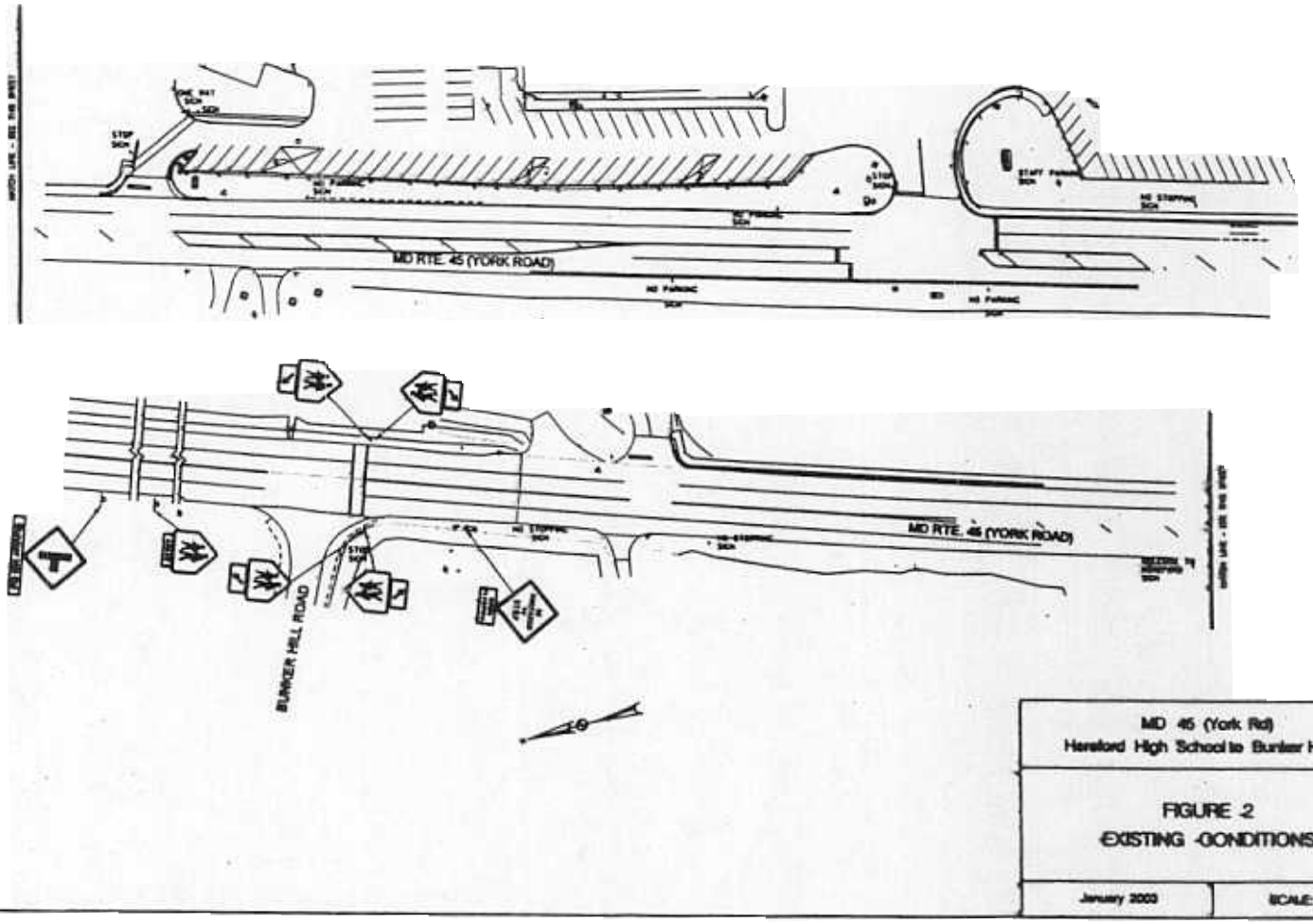


Looking South along MD 45 from Hereford H.S. Main Access intersection

Looking East toward Hereford High School from MD 45 intersection



Looking West toward the MD 45 intersection from Hereford High School



MD 45 (York Rd)
Hereford High School to Bunker Hill Rd

FIGURE 2
EXISTING CONDITIONS

January 2003 | SCALE: NTS