

The image features a dark blue background with several vibrant, overlapping lines in red, green, and orange. A prominent diagonal line in light blue runs from the top-left to the bottom-right. The text "When you see RED" is written in white, with "RED" in red, and "STOP!" is written in red below it. A green arrow points upwards and to the right, and a red arrow points downwards and to the right. The overall composition is dynamic and abstract.

When you see **RED**
at the ramp
STOP!

In cities and suburban communities throughout the country, traffic engineers are wrestling with the same problem - - too many vehicles and too little space to build new highways to handle them. In Southeastern Pennsylvania, the State Department of Transportation (PennDOT) has been looking at a number of ways to solve the problem, including:

- widening existing roadways to provide more lanes;
- reducing demand by getting more people onto public transportation and into carpools/vanpools, and
- managing the existing highway system to operate more efficiently.

While PennDOT is involved in developing all three options, the focus of this brochure is on the plan we are beginning to implement to manage accidents and other incidents that happen on our existing expressways in order to maximize capacity. Following is an overview of the Traffic and Incident Management System -- TIMS for short -- that will be put in place over the next 10 years on the 115 miles of interstate highway serving the five-county Philadelphia area. TIMS initially will cover Interstates 95 and 476 (Blue Route), then be expanded to include Interstates 676 (Vine Expressway), 76 (Schuylkill Expressway) and 276 (Pennsylvania Turnpike). Eventually it will include major state highways such as Routes 202 and 309.

WHAT IS A TRAFFIC AND INCIDENT MANAGEMENT SYSTEM?

TIMS is a program that combines the newest technology available with specially trained personnel to:

- monitor on a real time basis how traffic is moving on the expressways;
- manage traffic congestion by regulating the rate traffic enters the expressways;
- detect incidents soon after they happen and dispatch the appropriate help;
- improve the incident response time of police, fire, ambulance and municipal authorities by

providing them with accurate, up-to-the-minute information;

- provide highway users with timely information **BEFORE** they get caught in the traffic jam.

There are more than a dozen basic components that can go into a TIMS. This brochure describes some of those that will be phased in gradually on the region's expressways. It also provides information on the specific components to be used on I-95 and I-476, the two interstate highways on which the system is being introduced.

TIMS COMPONENTS

RAMP METERS

Like the title of this brochure states: **when you see RED at the ramp, STOP.** Ramp meters, which are nothing more than traffic signals minus the amber caution light, are used at on-ramps to expressways to regulate the flow of vehicles merging into mainline traffic. On a single-lane ramp, when the signal turns green it allows one driver at a time to enter the expressway before reverting to red. On a two-lane ramp, a signal is provided for each lane and operates the same as a single-lane signalized ramp. Even when they have a green light, drivers still must use the same precautions when merging onto the expressway as they would at a yield or stop sign. Disregarding the signal carries the same penalties as running a red light at an intersection. The signals are operated only during periods of heavy travel or congestion.

DETECTORS

Detectors, installed either in the pavement of or over the expressway at approximately one-half-mile intervals, pick up vehicular movement in each lane. When vehicles pass over or through the detectors, the detectors relay to a control center the volume and speed that traffic is moving. High speeds indicate that traffic is flowing well. If the speed begins to drop, it indicates either traffic volume is building and causing congestion, or some incident has occurred.

CLOSED CIRCUIT TELEVISION (CCTV)

Closed Circuit TV cameras are strategically located along the interstate highways and on ramps and can be operated independently or preferably in conjunction with the detectors to provide a redundant system. Under the latter scenario, when the detectors send signals to the Control Center indicating that congestion is occurring, the operating personnel focus the camera on the problem area to determine what the problem is and what type response is required. These cameras also can be used by the operating personnel to monitor the highway for disabled vehicles.

CHANGEABLE MESSAGE SIGNS (CMS)

Changeable Message Signs -- also called Variable Message Signs (VMS) -- use either light emitting diodes (LED) or fiber optics to display a two or three line message that informs drivers of traffic conditions ahead whenever a situation occurs that requires a motorist alert. The signs are placed at carefully selected locations on the expressway and on local streets used to access the expressway. The message displayed gives drivers timely information, allowing them to choose an alternate route and reduce their chances of getting caught in a traffic tie-up.

ACCIDENT INVESTIGATION SITES

These sites, located along the shoulder of an expressway or at major interchanges, provide a safe place to relocate disabled vehicles, exchange accident information, and conduct accident investigations. Stranded motorists also can use them to contact and wait for help.

EMERGENCY CROSSOVERS AND FIRE SERVICE STANDPIPES

Crossovers, installed in the median of the expressway, are used by emergency vehicles to access the opposite side and by police to run two-way traffic on one side of the expressway should the other side have to be closed. Fire hose standpipes are installed at overpasses

and underpasses near hydrants to help firefighters and hazardous material specialists respond more quickly to incidents.

SERVICE VEHICLES

Specially equipped vehicles, operated by trained personnel, patrol the interstate highways to provide assistance to disabled vehicles to get them moving again. If necessary, they will also help get vehicles to an accident investigation site.

HIGHWAY ADVISORY RADIO (HAR)

HAR broadcasts real time information over a designated AM radio station on what is happening on the expressway. HAR is operated from a Control Center, usually in conjunction with signs equipped with flashing beacons to alert motorists to tune into the HAR station whenever an incident occurs that will affect traffic.

CONTROL CENTER

The core of TIMS is the Control Center that houses the computers, the operators at their work stations, the remote TV camera controls, the TV monitors, and anything else that is required to bring together all the components needed to ensure a smooth and efficient highway operation.

CELLULAR PHONE AND SUPPLEMENTAL SIGNS

Drivers with in-car cellular phones already are playing the "Good Samaritan" by reporting vehicular breakdowns and other incidents. They will be aided in the future by a toll-free number to be installed and advertised through highway signing. Callers are helped in determining the exact location of the incident through the use of other supplemental signs such as route markers, one-tenth-mile mileposts, and the names of the counties, townships, roads and waterways over, under or through which the expressway passes.

SATELLITE COMMUNICATIONS SYSTEMS

As part of its Traffic Incident and Management System, PennDOT will be testing satellites as a viable communication's tool under a two-year, \$2 million demonstration project. Still in its infancy, the satellite technology will be used to connect various components of TIMS to relay local traffic information to regional, state and federal transportation agencies along the Northeast Corridor. The technology is expected to come into general use gradually, but eventually it will mean that drivers will have access to current traffic conditions as they travel the interstate highway system between Maine and Virginia.

GETTING INTO HIGH GEAR

The first two highways on which some of the TIMS components are being installed and tested for their effectiveness are I-476 and I-95. A temporary Control Center will be located at PennDOT's St. Davids office and will start operating by summer of 1993. The permanent site eventually will be located near the Philadelphia International Airport.

On I-476...

the entire 21.5 miles are included in the initial TIMS effort. In this first stage, the system components will incorporate:

- 16** Ramp Meters
- 357** Detectors
- 8** CCTV Cameras
- 5** Accident Investigation Sites
- 6** Emergency Crossovers
- 35** Fire Hose Standpipes
- 481** Supplemental Signs

The detectors, accident investigation sites, emergency crossovers, standpipes and supplemental signs are already in place on I-476. The ramp meters and CCTV cameras will be installed and tested between late 1993 and early 1994.

On I-95...

the 17-mile section between approximately State Route 420 in Tinicum Township, Delaware County, and the Betsy Ross Bridge in Philadelphia is initially covered under TIMS. The components to be operated and tested for effectiveness are:

- 4** Changeable Message Signs -- two at each end
- 12** CCTV Cameras -- between Island and Girard Avenues
- A Satellite Communications System (installed as a demonstration project)

The changeable message signs and cameras are expected to be in operation by the fall of 1993 and the satellite system by mid-1994.

THE BENEFITS

The cost to fully install TIMS on the 115 miles of interstate highway in Southeastern Pennsylvania is an estimated \$100 million over 10 years. That is about equal to the current cost to build just one mile of new four-lane interstate highway in an urban area.

In addition to the cost effectiveness, the system is expected eventually to:

- reduce delays now experienced from everyday normal congestion by 28 percent;
- reduce delays resulting from unexpected incidents occurring on the system by 37 percent;
- reduce fuel consumption by a significant 22 percent;
- reduce the number of accidents 10 to 20 percent.

Making TIMS work will require not only the latest technology, specially trained personnel and funding to operate it, but the cooperation of highway users -- YOU -- who have the most to gain from an expressway system that functions at maximum efficiency.

- ◆ CCTV Cameras
- Ramp Meters
- ↔ Changeable Message Signs



New Jersey

PHILADELPHIA

Valley Forge

Fort Washington

Willow Grove

Radnor

Lancaster Ave - US 30

West Chester Pk - PA 3

Media Bypass - US 1
Media

Baltimore Pk

MacDade Blvd

Commodore Barry Bridge

Delaware River

PA 291

Ben Franklin Bridge

Walt Whitman Bridge

Betsy Ross Bridge

Tacony-Palmyra Bridge

NJ 90

NJ 73

Roosevelt Blvd - US 1

PA 63

PA 73

Broad St - PA 611

PA Turnpike

Ridge Pk

Germantown Pk

PA 309

Northeast Extension
PA 9

US 422

US 202

76

476

95

676

76

276

Valley Forge

Northeast Extension
PA 9

Fort Washington

PA 309

Germantown Pk

Ridge Pk

PA Turnpike

Willow Grove

276

Broad St - PA 611

PHILADELPHIA

PA 73

Langhorne

Roosevelt Blvd - US 1

PA 63

676

95

Ben Franklin Bridge

Betsy Ross Bridge

Tacony-Palmyra Bridge

Whitman Bridge

