Traffic officials responsible for some of the East Coast corridor's most congested bottlenecks are employing innovative technologies to alleviate the frustrating rush-hour delays at these locations. And the rest of the nation is starting to take notice.

In a region where land is dear and every thoroughfare eventually chokes down to pass over a bridge, building new lanes to accommodate vehicular flow is expensive, and in some instances virtually impossible. To further impede new construction, officials in New York City and elsewhere will not even consider a project that closes down existing traffic; and environmental concerns now put a whole new set of regulations on the backs of planners and highway engineers.

As a result, traffic officials in the Northeast have become especially adept at increasing capacity on an existing roadway. The techniques they use include reversing lanes on thruways without fixed medians, and creating contra-flow lanes on divided highways. This methodology has succeeded in restoring an acceptable flow of traffic, and garnered the approval of morning and evening commuters.

**HOV LANE DOUBLES BUS RIDERSHIP**

In New York City, officials have found a way to ease the morning crunch on the Gowanus Expressway (I-278) with the creation of a five-mile high-occupancy-vehicle (HOV) lane that carries 4,000 vehicles per peak period, including 300 busses per hour. The HOV lane, gradually constructed over the last few years, creates additional space on I-278 from the Verrazano Narrows Bridge to the Brooklyn Battery Tunnel for the 17,000 passengers each morning.

Ridership of express busses using the lane has more than doubled while total peak hour traffic in the HOV lane continues to rise.

Imaginative planning and some relatively low-tech hardware (when compared to today's "intelligent highway" initiatives) have made it all possible. The New York State Department of Transportation carefully designed the extra space in the narrow Gowanus Expressway by applying a contra-flow lane along most of the HOV lane, while there are still some areas where the HOV lane is a concurrent flow lane and a median lane. The 2+ HOV lane han-

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dles the traffic entering lower Manhattan from Brooklyn, Queens, Staten Island, and New Jersey. It operates during the morning peak traffic hours between 6 a.m. and 10 a.m.

New York transportation agencies collaborated on the project and selected a QuickChange Moveable Barrier from Barrier Systems Inc. (Rio Vista, California) to create the contraflow HOV lane. The system utilizes a linked chain of concrete barrier that is picked up and moved laterally across lanes, using a specially designed barrier transfer machine. The system, which costs the state little more than $4 million, allows for switching over lanes quickly and efficiently, and also provides positive separation between contraflowing lanes to prevent head-on collisions.

Based on the success of this “evolving” system, NYS DOT has opted to extend and upgrade the existing system to a permanent network that includes enclosed and self-guided barrier transfer machines. Working with the joint venture of URS/Bechtel, the new project starts at the Verrazano Narrows Bridge and continues almost five miles to the Battery Tunnel.

To coordinate the region’s traffic feeding this corridor, a “Bus Only” lane was recently completed on Staten Island and several small scale “Park and Ride” locations are being built. There is also bus prioritization on certain ramps, a commuter link network, and electronic tolling at the Midtown Tunnel. These measures are expected to help increase bus ridership, further reducing congestion and travel time on I-278.

The synergy of these different tactics to reduce commute time and bus fares has had a dramatic effect on ridership. Commuters using the HOV/BRT lane reduce travel time by 45 percent with far fewer disruptions than experienced in the general-traffic lanes. On average, there are 11 disruptions per month in the general-purpose lane, compared to just one in the HOV lane.

**PHILADELPHIA INCREASES CAPACITY AT THREE BRIDGES**

The Delaware River Port Authority (DRPA) has succeeded in opening the arteries at the heart of the Philadelphia area’s transportation system. Movable barrier has been installed on the Walt Whitman, Ben Franklin, and Commodore Barry bridges, which link New Jersey and Pennsylvania. According to DRPA officials, the project was undertaken to reduce congestion and increase safety.

The new system enables the agency to reconfigure lanes and directional capacity on their bridges in about 30 minutes (bridge lengths range from two to three miles). The barrier transfer machines safely move the barrier over one or more traffic lanes at up to seven miles per hour. Sensors on the machines read a magnetic tape that is grooved into the pavement to precisely reposition the barrier.

Both the Walt Whitman and Ben Franklin bridges previously had been restricted to a maximum of six lanes with a seventh lane used as a buffer. According to Paul Drayton, DRPA’s executive director, “Effectively, we’re adding a seventh lane... It gives us tremendous flexibility and significantly improves traffic flow in one of the most congested traffic areas in the region.”

**SAFE REVERSIBLE LANES**

Overhead lights, cones, flexible posts, and other “delineation” devices have been used to tell the driver which lane is open or closed. However, these devices do nothing to prevent a vehicle from crossing over into an oncoming lane, as happened last year in Manhattan when a bus went out of control, crossed over into the oncoming lane, and completely shut down rush-hour traffic.

According to a Barrier System spokesperson, the action taken by the DRPA and other local transportation agencies in the Northeast corridor improves both performance and safety of structures and roads with reversible lanes and contraflow operations.

“These agencies have effectively raised the ‘standard of care’ by reducing the potential of head-on collisions and improving traffic flow.”

To date, there are eight locations in the Northeast region using movable barrier technology to relieve stress at chokepoints. In addition to the Gowanus Expressway and the Delaware River installations, movable barrier is in use to reconfigure lanes on New York’s Tappan Zee Bridge and the Mid-Town Tunnel, Boston’s Southeast Expressway (I-93), and the Theodore Roosevelt Bridge in Washington D.C.

When compared to new construction, the creation of HOV, contraflow, or reversible lanes using movable-barrier technology is significantly less expensive. Also, a project such as that on New York’s Gowanus Expressway can be put in place in less than a year with minimum disruption to traffic. The system also improves safety since it prevents crossover accidents.”

Photo: NYS DOT