IH-30 DALLAS HOV LANE

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A “DEMONSTRATION PROJECT” TO TEST FEASIBILITY IS NOW IN ITS THIRD DECADE

In 1990, construction began to create a new managed lanes system on IH-30 in Dallas, TX. A High Occupancy Vehicle lane (HOV) would run for five miles into downtown in the morning and three miles out of the city center for evening commuters. Three scenarios were originally considered: 1) an exclusive HOV facility in the median, 2) a concurrent flow HOV facility on the inside shoulder, and 3) a contraflow HOV facility using a lane in the off-peak direction. Because of bridge structures at different elevations and an inside shoulder that was not continuous, the contraflow lane was the only viable option. The contraflow was possible because of a 70/30 tidal flow traffic split between peak and off-peak traffic, which allowed a lane to be taken from the off-peak traffic side without negatively affecting traffic flow in that direction.

The managed lanes facility was opened to the public in May, 1991 using a moveable concrete barrier. The barrier is stored next to the median on both sides of the freeway (see graphic below). During the morning commute into the city, the barrier on the off-peak side is moved out one lane plus the shoulder area by a Barrier Transfer Machine (BTM), and eligible vehicles are allowed to cross over to the other side of the freeway and run contraflow to traffic. When the peak period ends, the barrier is shifted back to the median and the lane is returned to concurrent flow traffic. This process is repeated on the other side of the freeway for the evening peak commute. By using a moveable barrier, IH-30 can be reconfigured on a daily basis for a fraction of the cost of building the same capacity (two additional lanes) using traditional construction methods, while opposing traffic lanes still benefit greatly from positive barrier protection.

When this moveable barrier “demonstration project” was implemented, it was believed that the B/C might be between 1.2 and 1.9. In 2005, a review by FHWA found that the B/C was 28:1, as compared to building two general purpose lanes which would have had a B/C of 10:1. Today there are over 200,000 vehicles per day using IH-30 in and out of the city center, with almost 10% of those vehicles moving through the HOV facility. The moveable barrier contraflow lane, now in its 26th year of operation, was upgraded several years ago with two new BTMs. The value of the HOV lane continues to make it the best option for this corridor, and while it is still considered to be an “interim project” there are no current plans to replace it.

WHO CAN USE THE HOV LANES?
• Buses
• Vanpools
• 2+ occupant carpools
• Motorcycles
• Law enforcement vehicles

TRANSFER TIMES:
• 4:00 am - 5:30 am, west to east
• 10:00 am - 11:45 am, east to west
• 1:00 pm - 2:45 pm, east to west
• 7:00 pm - 8:30 pm, west to east

“TEXAS IS PROUD TO BE A LEADER IN FORWARD-THINKING MANAGED LANES CONCEPTS. THE IH-30 MOVEABLE BARRIER HOV SYSTEM HAS PROVEN TO BE A SAFE, RELIABLE WAY TO MOVE MORE TRAFFIC WITHOUT A MAJOR INVESTMENT IN NEW CONSTRUCTION. THE SYSTEM HAS HELPED DALLAS MEET OUR AIR QUALITY GOALS, REDUCE URBAN CONGESTION, AND REDUCE MASS TRANSIT COSTS BY PROVIDING MORE EFFICIENT USE OF OUR HIGHWAY SYSTEM.”

BILL HALE
CHIEF ENGINEER
TxDOT
IT’S ALL ABOUT SAFETY

Highway safety cannot be compromised by the implementation of a managed lanes facility. Agencies must consider how the new lane configurations will affect the overall safety of the motoring public through the facility. In September, 2003, the FHWA conducted a study of HOV corridors in Dallas to determine if there was a difference in crash statistics between barrier-separated HOV lanes and buffer-separated HOV lanes (buffer separated lanes have a paint buffer and/or plastic delineation to separate the managed lanes from the general purpose lanes, and access to the managed lanes is allowed only through specific ingress and egress locations.) To collect data for the barrier-separated lanes, the FHWA chose to examine the moveable barrier facility on IH-30. The study found that while the moveable barrier HOV facility did not show a statistical increase in accidents, two buffer-separated HOV facilities reported accident increases of 41% and 56%. This major increase in accidents was attributed largely to the differential in speed between the HOV lane and the adjacent general purpose lane. While speeds in the HOV facilities averaged between 52 and 66 mph, the adjacent GP lanes traveled at only 18 to 38 mph.

CRASH INCREASE AFTER HOV

Moveable barrier lanes: 0%
Buffer-separated lanes: 41% to 56%

QUICK FACTS

RIDESHARING

HOV LANE DURING THE 6-HOUR PEAK PERIOD (AM & PM)

- 6,106 vans and carpools
- 2.6 passengers per vehicle
- 16% of vehicles and 35% of road users are in the HOV lane
- 179% increase in 2+ carpools
- Round trip commuters save up to 14 minutes per day
- Overall corridor speeds increased by up to 127%
- 19,166 persons per day using HOV lane
- General purpose lane speed is 27.5 mph, HOV lane speed is 51.5 mph
- HOV lane carries 200% more users than each GP lane

OPERATIONS

- Full length of system is 11.1 miles from downtown to Northwest Drive
- Initial capital costs of $12.2 million
- Lindsay Transportation Solutions now provides full turn-key operation including maintenance & traffic control

RAPID TRANSIT

- 200 buses per day
- 19.7 riders per bus average
- 18 bus routes through the HOV corridor
- Bus transit costs reduced by $402,000 per year due to more efficient trips through the HOV corridor

PUBLIC BENEFITS AND CITIZEN SUPPORT

- Dallas HOV lanes have 65% favorability among those who do not use the HOV lanes
- Air-quality: volatile organic compounds (VOC) reduced by nearly 7 tons per year
- For every dollar spent on the moveable barrier HOV lane, $18 in benefits are realized
- Buffer-separated concurrent flow HOV systems in Dallas have 3 times as many violations as the moveable barrier contraflow lane

FOR A LIST OF REFERENCED STUDIES AND REPORTS, PLEASE VISIT:
www.BarrierSystemsInc.com/Dallas-Tour-Documents

INTELLIGENT AUTOMATION

Traffic control is an important part of opening, closing and reversing lanes in an HOV facility. Unfortunately, it can also be a dangerous job. To remove the HOV Operations Crew from harm’s way, the Dallas IH-30 facility uses an automated lane closure system called the SwiftGate from Versilis. This system consists of a number of tapered gates that pivot from a stored to a deployed position to channel motorists into the correct traffic configuration. The SwiftGate system can be remotely operated and monitored from traffic headquarters.

Before SwiftGate

Fully automated
IH-30 DALLAS HOV LANE

1. One-meter sections of highly reinforced concrete barriers are pinned together at each end to form a continuous barrier wall. The barriers have a “T” top, which acts as a lifting surface for The Road Zipper Machine.

2. The machine lifts (not drags) the barrier and passes it through a conveyor system. Unique, patented variable length barriers allow for lane curvature and expansion joints.

3. In one pass, the barrier can be transferred up to 24 ft (7.3 m) and gently set down without damaging the road, at speeds up to 10 mph (15 km/h).