Regional Mobility Initiatives

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High Occupancy Vehicle (HOV) Lanes *are being constructed on numerous freeways in the Dallas-Fort Worth Metropolitan Area. These facilities encourage ridesharing and transit use by permitting vehicles carrying two or more people to use these exclusive lanes, allowing HOVs to bypass congested highway lanes and reduce travel times.*

HOV lanes in this region are for the exclusive use of carpools with two or more persons, vanpools, buses and motorcycles. Presently, three highway segments in the Dallas-Fort Worth area feature HOV lanes: Interstate Highway 635 from Interstate Highway 35E to U.S.75; Interstate Highway 35E from south of Round Grove Road to Interstate Highway 635; and Interstate Highway 30, from Central Expressway to Jim Miller Road. Construction is presently underway on segments of Interstate Highway 35E/U.S.67 south of downtown Dallas to add HOV lanes. In addition to these immediate-action facilities, *Mobility 2020: The Metropolitan Transportation Plan* calls for 250 miles of HOV facilities to be built in congested freeway corridors.

Photo courtesy of DART

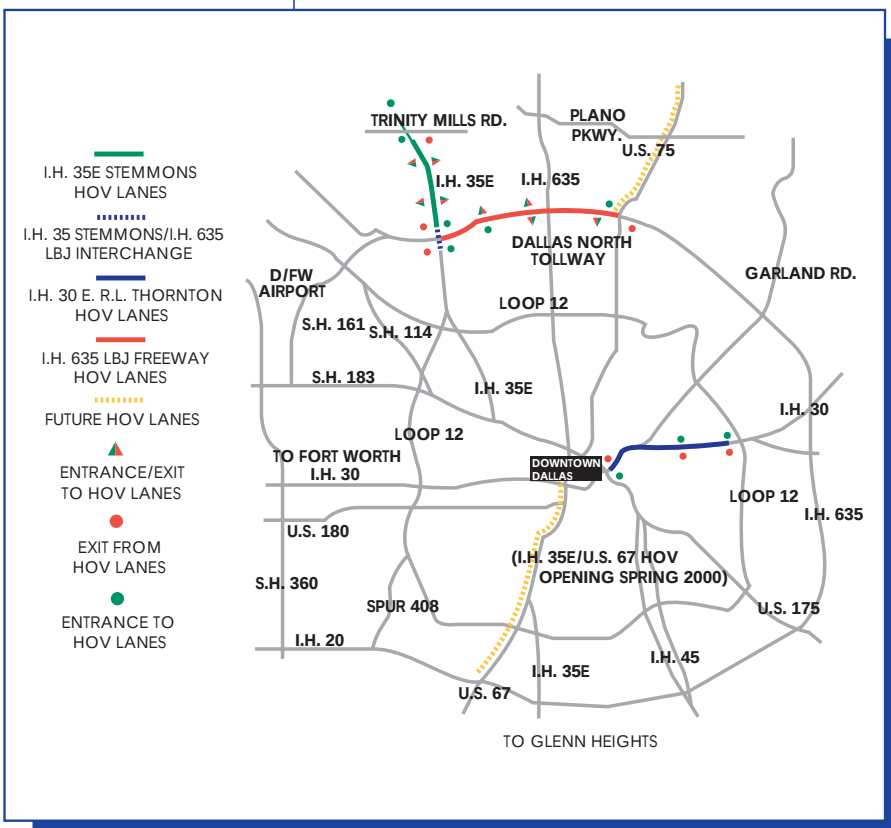
Immediate-action HOV facility on Interstate Highway 635 in Dallas

Recognizing the importance of HOV facilities in aiding mobility and reducing vehicle emissions, the Regional Transportation Council (RTC) has programmed federal funds for HOV facilities. Congestion Mitigation and Air Quality Improvement Program (CMAQ) and Surface Transportation Program—Metropolitan Mobility (STP-MM) funding have provided two-thirds of the funding for the construction of the immediate-action HOV lanes; the remaining third has been provided by local funds supplied by Dallas Area Rapid Transit (DART) and State funds furnished by the Texas Department of Transportation (TxDOT). The three-way partnership between DART, TxDOT, and the RTC has proved to be a successful collaboration in the quest to address the region's traffic congestion and air quality issues.

Regional Mobility Initiatives is a report on the transportation planning activities and air quality programs of the North Central Texas Council of Governments and the Regional Transportation Council – together serving as the Metropolitan Planning Organization for the Dallas-Fort Worth Metropolitan Area since 1974.

HOV Lanes: A Cost-Effective Solution to Traffic Congestion

Current HOV Lanes



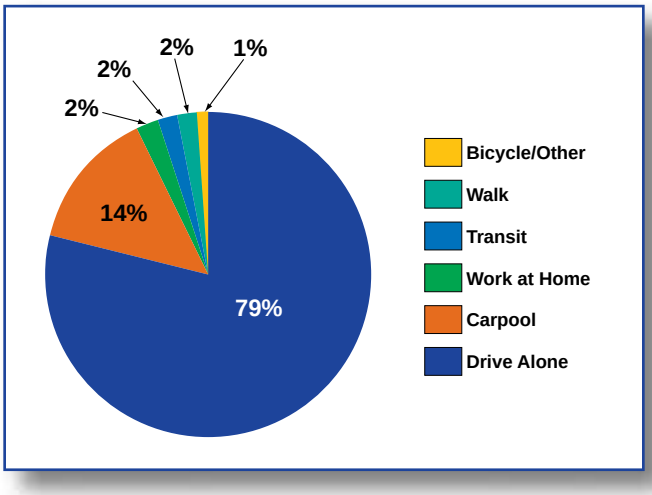
Traffic congestion continues to affect more and more of the freeways and thoroughfares in the Dallas-Fort Worth region. Freeways in large portions of Dallas-Fort Worth, the Mid-Cities, Northeast Tarrant County, Southwest Collin County, and Southeast Denton County are all experiencing heavy traffic congestion during peak travel periods. Today, 30 percent of the region's roadway system is congested during the peak hour. Forecasts for the year 2020 indicate that without improvement to the current transportation system, 66 percent of the roadways will be congested during the peak hour. The Major Investment Study for the immediate-action U.S. 75 HOV project will begin shortly. It will encompass the design of HOV service from U.S. 75 to McKinney.

Current HOV Lane Operations

	I.H. 30 (East R.L. Thornton Freeway)	I.H. 35E (Stemmons Freeway)	I.H. 635 (LBJ Freeway)
Type of HOV Facility	Barrier-separated, contraflow HOV lane	Buffer-separated, concurrent flow HOV lanes	Buffer-separated, concurrent flow HOV lanes
Length of HOV Facility	Westbound: 5.2 miles Eastbound: 5.2 miles	Southbound: 7.3 miles Northbound: 6.0 miles	Westbound: 6.1 miles Eastbound: 6.8 miles
Hours of Operation	Weekdays: Westbound: 6-9 a.m. Eastbound: 4-7 p.m.	24 hours a day, 7 days a week	24 hours a day, 7 days a week
Eligible Users	Buses, vehicles with two or more persons, and motorcycles	Buses, vehicles with two or more persons, and motorcycles	Buses, vehicles with two or more persons, and motorcycles

Source: Dallas Area Rapid Transit

One of the primary reasons for the growth in traffic congestion in our region has been the increase in drive-alone travel. Aside from the growth in population, the expansion of the economy and employment opportunities, and increases in vehicle ownership, more people commute to work and school, shop, and run errands alone. In fact, the average vehicle occupancy for the Dallas-Fort Worth area is 1.09 persons per vehicle during peak travel times. Therefore, much of the existing highway capacity is being occupied by vehicles with a single occupant: the driver. Drive-alone travel hinders the efficiency of the transportation system in providing adequate mobility—fewer *people* are moved along a highway corridor. In other words, the capability of a highway to carry more people and goods is reduced, resulting in increased traffic congestion and air pollution, especially during peak travel periods.



How Dallas-Fort Worth Area Residents Travel to Work

Average Vehicle Occupancy

Area	Persons Per Vehicle
Atlanta, GA	1.18
Washington, DC	1.16
Houston, TX	1.10
Dallas-Fort Worth	**1.09**
Phoenix, AZ	1.09
Albuquerque, NM	1.08
Chicago, IL	1.08
Denver, CO	1.08

Source of chart and table: 1990 Census,. Bureau of the Census, U.S. Department of Commerce

Interstate Highway 635 (LBJ Freeway) is the highest volume freeway in the State carrying nearly 250,000 vehicles per day. It is also the highest use HOV facility in Texas, carrying almost 55,000 riders daily.

Photo courtesy of DART

Future HOV Systems for the Dallas-Fort Worth Region

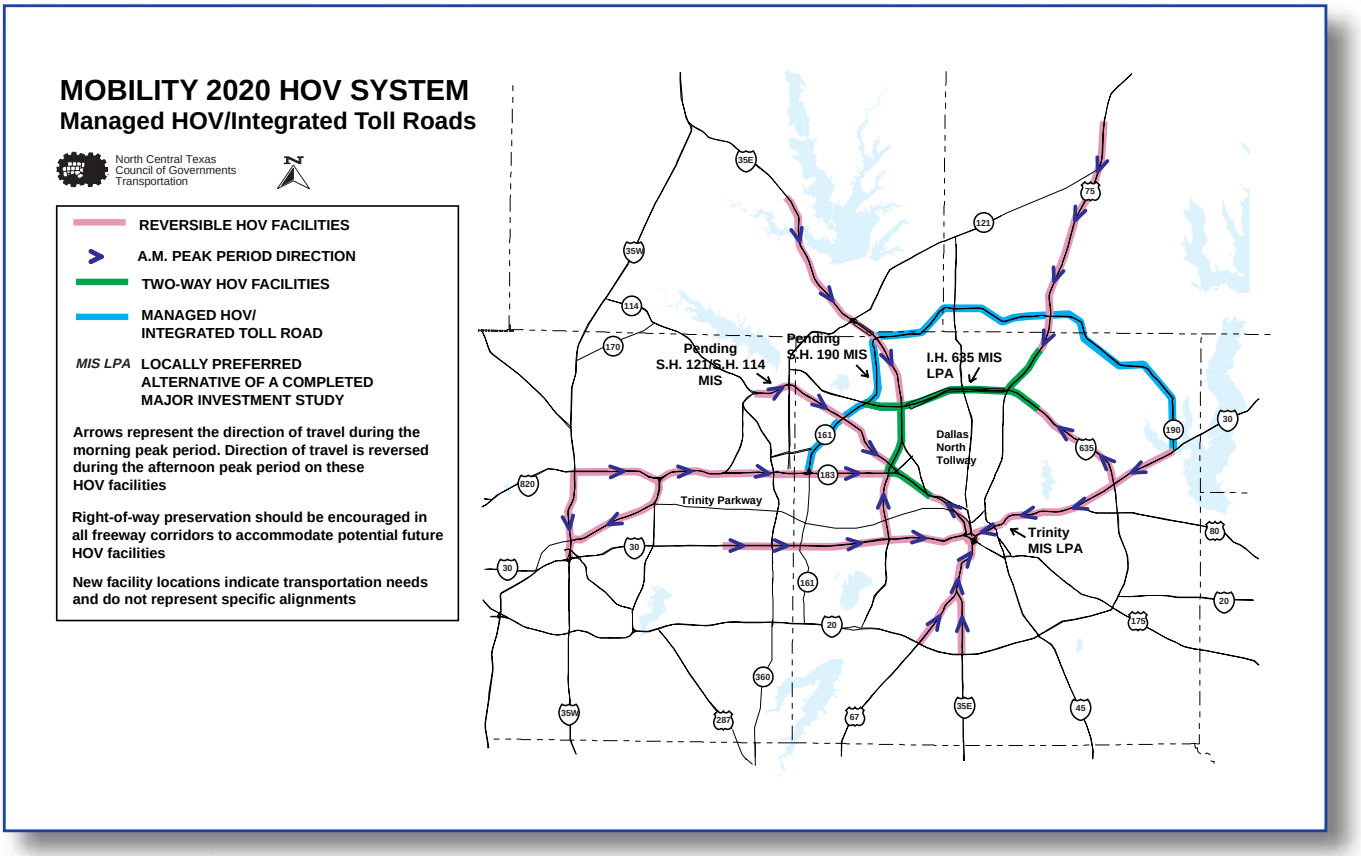
HOV systems offer a cost-effective solution to traffic congestion by increasing the number of persons using a roadway. They improve the ability of the transportation system to move people and goods.

HOV Lane System

Development of *Mobility 2020: The Metropolitan Transportation Plan* included an extensive analysis of HOV lanes. The analysis identified corridors currently experiencing traffic congestion and those projected to be congested by the year 2020. The final recommendations for the construction of permanent HOV facilities include 13 highways totaling 249 miles. The total cost of the construction of these facilities is estimated to be $1.2 billion, and they are projected to accommodate approximately 4.3 million HOV passenger-miles of travel daily.

HOV/Off-Peak Express Lane System

Some roadways recommended in the Plan are expected to experience a demand so high that they warrant more than one HOV lane. In these segments, multi-lane HOV facilities must be provided to accommodate HOV demand during the peak periods in the needed direction. Due to their multi-lane design, these facilities can potentially be used as express lanes for all traffic during off-peak periods. These lanes are called express lanes since they still have limited entrance and exit points. The feasibility of charging a toll for off-peak express lane use will be studied.



Managed HOV/Toll Road System

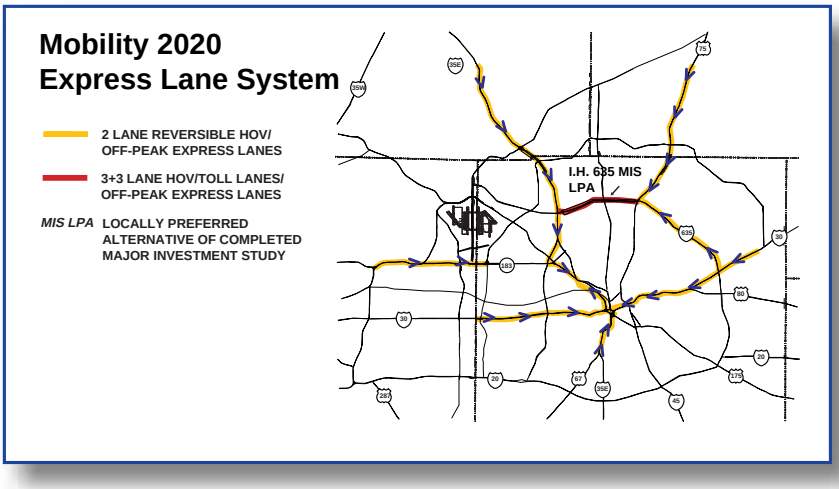
In order to speed the construction and enhance the operation of transportation facilities, *Mobility 2020* recommends the integration of HOV facilities and toll roads in certain corridors. Several future toll roads are projected to have a heavy volume of traffic. As a means of moving more commuters through these corridors, tolls can be structured to provide an incentive for commuters who rideshare or use transit in order to limit the drive-alone traffic. This would ensure a higher level of service operation on the toll roads.

This concept is referred to as a Managed HOV/Integrated Toll Road. Traditional HOV systems provide HOV-only lanes. However, under the Managed HOV/ Integrated Toll Road concept, the HOVs are provided with a bypass area to avoid traffic delays at toll plazas. While HOVs will not have an exclusive lane along the facility, they will save travel time when bypassing the toll plaza and have the additional incentive of a reduced toll.

The combination of variable pricing, bypass toll barriers for HOVs, and automated vehicle identification technology enables the tollway authority to manage the freeway capacity to maximize the movement of people and goods in the corridors. This approach also supports the goals of increasing vehicle occupancies and encouraging carpools and vanpools, while generating revenue for the construction of additional transportation facilities. Recently, the Regional Transportation Council and the North Texas Tollway Authority endorsed the Managed HOV/Integrated Toll Road concept as an important tool to help solve transportation problems in our region.

Photo courtesy of DART

Operation of the Interstate Highway 35E (Stemmons Freeway) immediate-action HOV facility involves the opening and closing of access ramps.



Types of HOV Facilities

The concept behind HOV lanes is a simple one. By providing an incentive, such as travel time savings and reduced vehicle operation and maintenance costs, many commuters will opt to share their daily commute with others. By requiring a minimum of two persons per vehicle, HOV lanes help decrease the number of single-occupant vehicles on the roadway. The fewer the cars, the less congestion and vehicle emissions. The fewer vehicle emissions, the better the quality of our air. By encouraging people to abandon their old mode of travel and adopt a rideshare philosophy, the HOV system will reap huge benefits for the North Central Texas region.

Barrier-separated HOV lanes with flyover ramps along Houston's Interstate Highway 45 (Gulf Freeway). Flyover ramps are an alternative form of egress/ingress access to HOV facilities.

Due to construction challenges and space limitations on highways, several different approaches are taken to accommodate the addition of HOV lanes to a highway. Based on Charles A. Fuhs' *High Occupancy Vehicles Facilities: A Planning, Design, and Operational Manual (1990)*, there are six physical types of HOV facilities:

Barrier-separated HOV facility, freeway right-of-way: This is a roadway or lane(s) built within the freeway right-of-way that is physically separated by barriers or pylons from other freeway lanes. These facilities can operate on a reversible-flow basis (inbound in the morning and outbound in the evening) or a two-way basis (one or more lanes operating in each direction). Although designed for ridesharing and transit use, the flexibility in operation of the HOV facility allows the option of permitting some drive-alone vehicle use of the facility during portions of the day.

Concurrent flow, buffer-separated HOV facility, freeway right-of-way: This facility, built within the freeway right-of-way, is separated from the main lanes by a striped buffer (usually one foot or more in width). Such a facility is designed to operate in the same direction as the adjacent freeway lanes and is commonly located on the inside lane(s) of the freeway, adjacent to the median barrier. The HOV lanes on Interstate Highway 635 and Interstate Highway 35E in the Dallas area are this type of facility. *(see picture on page 9)*

Non-separated HOV facility, freeway right-of-way: This is a lane located either as an inside lane adjacent to the median or an outside lane adjacent to (or on the) outside shoulder. It contains no separation from the adjacent freeway lanes, but is marked with the HOV diamond. The HOV facility is oriented to operate in the same direction as the adjacent freeway lanes. During non-peak periods of the day the facility can be reverted back to a regular lane or shoulder.

Contraflow, barrier-separated HOV facility, freeway right-of- way: This facility is commonly located on the inside lane of the off-peak direction of main travel lanes. It is separated from the opposing direction of traffic flow by insertable plastic posts or moveable barriers. The reversible HOV lane on Interstate Highway 30 in Dallas is an example of this type of facility.

HOV facility, separate right-of-way: This is a roadway or lane(s) built in a separate right-of-way that is commonly designated for the exclusive use of buses.

Queue bypass HOV facility: Such a facility is a short, often non-separated lane, designed to allow HOVs to bypass an isolated traffic bottleneck, such as a toll plaza or a signalized location. The facility operates in the same direction as the adjacent traffic lanes, and is for the exclusive use of HOVs to bypass queued traffic.

The different designs permit flexibility in the operation of the HOV facilities along a corridor. In many cases, HOV lanes can be added to a highway in an interim fashion, as exemplified by the three facilities currently being operated by DART in the Dallas area. Furthermore, the enforcement of HOV use on the facility can be done either during specific times of the day, normally the peak travel periods, or on a 24-hour basis.

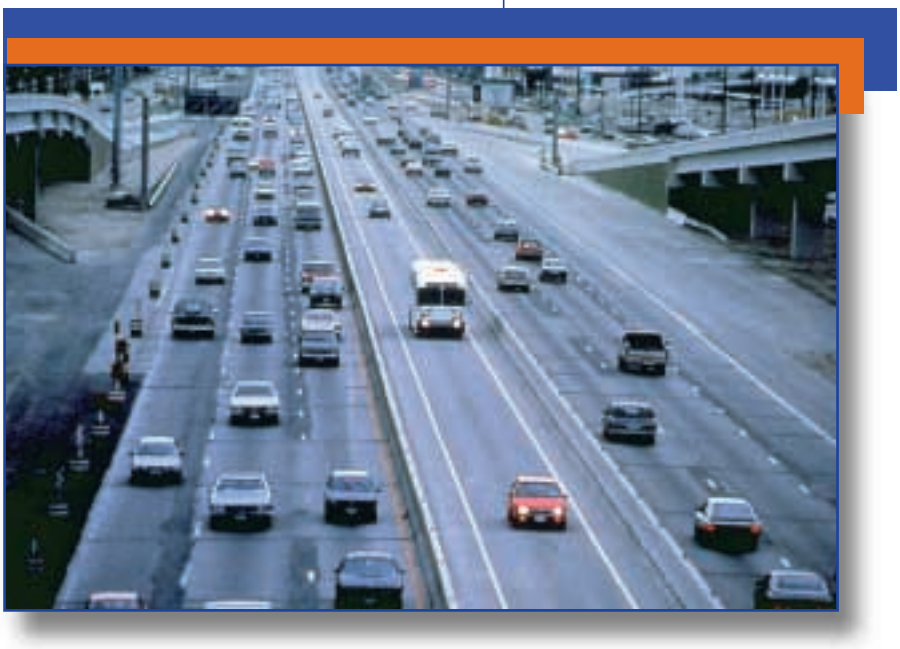


Photo courtesy of DART

This barrier-separated HOV lane on Interstate Highway 10 (Katy Freeway) in Houston is operated as a reversible-flow facility.

DART's zipper vehicle removes and places barriers along Interstate Highway 30 (East R. L.Thornton Freeway) to create a contraflow, barrier-separated HOV lane.

Benefits of HOV Lanes

To the user of an HOV lane, the benefits are readily apparent. Lower traffic volume on the HOV lane, as compared to the main lanes, allows HOV commuters to travel at higher speeds. Overall travel time for work, shopping, and recreational trips is reduced. Second, sharing a ride or using transit reduces the costs related to operating and maintaining a personal vehicle. In the future, HOVs on toll road facilities may be allowed to pay reduced fees or no fees. These benefits, however, are only the most apparent ones of using an HOV system.

Photo courtesy of DART

Eliminate the stress from your daily commute by joining a vanpool program.

Use of HOV facilities produces significant benefits for the region as a whole. One such benefit is a reduction in traffic congestion. By eliminating vehicles from the main lanes, HOVs help reduce traffic density and increase traveling speeds. A win-win situation is produced for the HOV lanes and the main freeway lanes, by increasing traffic speeds on both. Also, $640,000 is saved annually on bus operations due to the HOV lanes, according to DART. The reduction of vehicles from roadways also helps reduce accidents and vehicle emissions, and improves air quality. The Texas Transportation Institute compiles information on the performance of the HOV lanes in the Dallas area for Dallas Area Rapid Transit and the Texas Department of Transportation. As the table on the next page depicts, the three HOV lanes in operation are providing travel time savings for those commuters using the facilities during the peak periods, while allowing the HOVs using the facilities to travel at higher speeds than the vehicles on the main freeway lanes.

HOVs traveling westbound on Interstate Highway 30 (East R. L. Thornton Freeway) in the peak morning periods save on average over six minutes on their trips, as they can travel about 25 miles per hour faster than vehicles on the main lanes. Travel time savings of over three minutes are experienced by HOVs traveling in the eastbound HOV lane during the afternoon peak travel periods. HOVs that make use of the Interstate Highway 35 (Stemmons Freeway) HOV lane are able to save close to 11 minutes on the southbound segment while traveling over 55 mph, on average; the northbound direction of the HOV lane provides users a travel time savings over four minutes, with average travel speeds in excess of 50 mph. HOVs using the Interstate Highway 635 (LBJ Freeway) HOV lanes also save travel time, varying on average from three minutes to over nine minutes, depending on the time of day and direction of travel. Speeds along this section of freeway are 20 mph higher on the HOV lane as compared to the main lanes during the peak periods.

Performance of HOV Lanes in the Dallas-Fort Worth Area *(for June 1998)*

Freeway Corridor	Number of Daily Users[1,2]	Travel Speed in miles per hour[3]		HOV Lanes Travel Time Savings in minutes[3]		HOV Lanes Emissions Reduced in lbs.[4]	
		A.M.	P.M.	A.M.	P.M.	VOC	NOx
I.H. 30 (East R.L. Thornton Freeway)		Westbound	Eastbound	Westbound	Eastbound		
Main lanes	196,312	29	34				
HOV lane	15,657	57	53	6.1	3.7	45.8	54.9
I.H. 35E (Stemmons Freeway)		Southbound	Northbound	Southbound	Northbound		
Main lanes	182,903	24	31				
HOV lane	22,226	57	52	10.7	4.8	45.9	36.6
I.H. 635 Westbound (LBJ Freeway)							
Main lanes	120,744	28	27				
HOV lanes	27,335	55	53	6.7	7.3	45.8	51.0
I.H. 635 Eastbound (LBJ Freeway)							
Main lanes	133,812	37	23				
HOV lane	27,577	57	49	3.9	9.2	53.0	37.7

1. *Main lanes: number of daily users based on 1996 traffic counts and June 1998 observed vehicle occupancy.*
2. *HOV lanes: daily (24 hours) total person volume, June 1998. Source: Texas Transportation Institute (TTI)*
3. *Average peak-hour travel times and speeds, Sept. 1996-Oct. 1998 (I.H. 30, I.H. 35E), April 1997-Oct. 1998 (I.H. 635). Source: DART, TTI*
4. *Corridor emission reductions (volatile organic compounds and nitrogen oxides) during the peak hours, based on June 1998 performance figures. Source: North Central Texas Council of Governments*

Photo courtesy of DART

Traffic congestion on Insterstate Highway 635 (LBJ Freeway) warrants immediate-action HOV lanes in both directions.

Travel Demand Management Activities Supporting HOV Systems

HOV lanes require supporting facilities and activities in order to maximize the benefits they can deliver. Commuters have several options regarding their mode choice and travel behavior if they would like to utilize the HOV lanes. Several travel demand management and multimodal activities are outlined below.

Transit buses are high occupancy vehicles and can use the HOV lanes. Increased speeds and reliability on HOV lanes permit transit vehicles to operate in an efficient manner. HOV lanes can be used as express lanes for transit vehicles, allowing transit service between areas to be improved. Also, bus transfer facilities and transit stations support transit usage by providing a convenient boarding point for commuters using public transit.

Carpooling is another way to form a high occupancy vehicle. By sharing a ride with a coworker or another person with similar origin and destination points, carpoolers are able to take advantage of HOV facilities while maintaining some opportunity to accommodate personal commitments. To assist persons looking for carpool partners, the transit agencies in Dallas and Fort Worth (DART and The T) maintain rideshare databases, a list of individuals willing to share a ride with another person, based on the criteria the person has selected, including the origin and destination of the trip and the time of day to travel.

Vanpools are supported by many employers as an alternative to drive-alone commuting. Similar to a carpool, vanpools transport a group of coworkers, usually to and from the same trip origin and destination. DART and The T offer assistance to employers interested in beginning a vanpool program for their companies. For more information on forming a vanpool or other employer trip reduction programs, contact DART at (214) 747-RIDE or The T at (817) 336-RIDE.

Park-and-ride lots (also called park-and-pool in some areas of the country) are used as a meeting place for vanpoolers and carpoolers in an area to meet their vanpool party. Commuters may leave their vehicles at the park-and-ride lot and ride together to work in buses, vanpools, and carpools. A park-and-ride lot can be a newly-built parking lot or a lot from another establishment, such as a church or community center, that can be utilized during the weekday as a park-and-ride lot.

Many commuters and travelers in the Dallas area have realized they can easily avoid congested highway segments by using the HOV lanes where available. Commuters that share a ride with at least one other person are able to use an HOV facility and improve their travel experience. Use of public transit buses, carpooling, and vanpooling are becoming popular options that save travel time and money.

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What Is NCTCOG?

The North Central Texas Council of Governments (NCTCOG) is a voluntary association of local governments within the 16-county North Central Texas region. The agency was established in 1966 to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development. North Central Texas is a 16-county region with a population of 4.6 million and an area of approximately 12,800 square miles. NCTCOG has 227 member governments, including all 16 counties, 161 cities, 26 independent school districts, and 24 special districts.

Since 1974, NCTCOG has served as the Metropolitan Planning Organization (MPO) for transportation in the Dallas-Fort Worth Metropolitan Area. The Regional Transportation Council is the policy body for the Metropolitan Planning Organization. The Regional Transportation Council consists of 37 members, predominantly local elected officials, overseeing the regional transportation planning process. NCTCOG's Department of Transportation is responsible for support and staff assistance to the Regional Transportation Council and its technical committees, which comprise the MPO policy-making structure.

We would like your comments. . .

If you have questions or comments regarding the transportation and air quality programs of the North Central Texas Council of Governments and the Regional Transportation Council or need additional information, please contact the NCTCOG Transportation Department at **(817) 695-9240**, by **fax** at **(817) 640-3028,** via e-mail: **transinfo@dfwinfo.com,** or visit our website at **www.dfwinfo.com/trans.**

Regional Mobility Initiatives Issues

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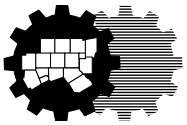

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