



# Virtual Exclusive Busways Improving Urban Transit while Relieving Congestion

By Robert W. Poole, Jr. and Ted Balaker

**B**us rapid transit (BRT) can deliver high-quality service if operated on exclusive busways, where there is no congestion. But building such guideways has two major drawbacks. First, they are expensive, comparable to costly new freeway lanes. Second, they are very wasteful of this expensive capacity, since even high-capacity BRT service (e.g., one every minute—60 vehicles per hour) leaves the vast majority of the capacity (1,500-2,000 vehicles per hour) unused. Hence, very few such busways have been built in the United States.

This study argues for developing the virtual equivalent of exclusive busways, by selling the unused space to drivers willing to pay a market price to bypass congestion. This would generate toll revenue to pay for much of the cost of the guideway, without burdening transit agency budgets. The study argues that this policy would be far more cost-beneficial than the current policy of relying on carpool lanes as the guideways for

long-haul BRT service. Carpool lanes are not sustainable as uncongested guideways, but value-priced managed lanes can be kept free-flowing on a long-term, sustainable basis.

## HOW TRANSITWAYS BECAME CARPOOL LANES

In the 1960s and 70s, exclusive busways were the big new idea in mass transit. Bus transit's relatively low cost meant officials could quickly expand service to keep up with expanding populations. Local officials looked to the bus's high carrying capacity to help resist gridlock, and often designed busways to function as rubber-tire commuter rail systems. Compared to the automobile, the bus took up less roadway space per person, and this added to the appeal of rubber-tire transit. However, the political climate that favored exclusive busways did not last long. Only a handful of busways were built then, and most

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of them have since become carpool lanes. In only two cases (in New Jersey and Pittsburgh) are these original busways still used as exclusive busways.

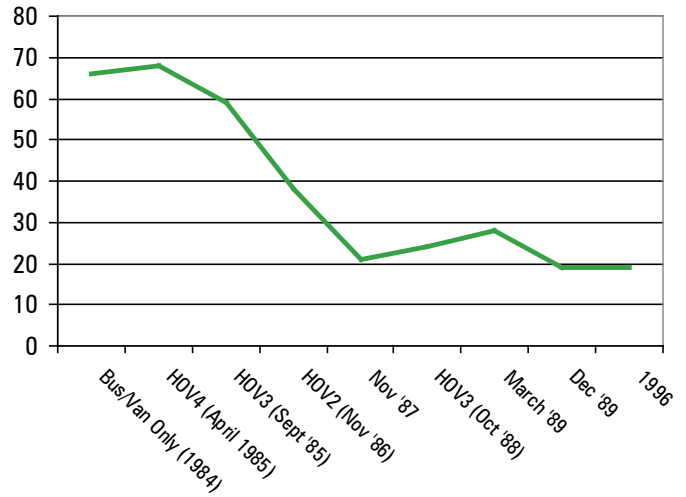
How busways evolved into carpool lanes is worth recalling, and Houston provides a good case study. The city's planned system of transitways began with a reversible lane on the Katy Freeway, which opened in October 1984 for buses and vanpools. However, because of the relatively low bus and vanpool use, the vehicle occupancy requirement was lowered to HOV-4 in 1985. In the wake of oil shortages and changes to federal policy that reversed an earlier preference for BRT, carpooling grew in popularity. In Houston, the vehicle occupancy requirement continued to drop, from HOV-3 later in 1985 to HOV-2 in 1986. Carpools quickly overtook bus and vanpools, and within three years morning rush vanpool volumes had dropped by nearly 70 percent (Figure 1). The move to HOV-2 brought more traffic, and more congestion, and bus riders were particularly vocal in their frustration, leading to a requirement for HOV-3 during some peak hours.

Houston's transitway system grew rapidly, and by 2003 there were 100 miles of HOV lanes operating on six freeway corridors, with four of the six operating as HOV-2. Houston's system was designed to promote bus transit. It was developed by and funded by transit agencies. The local agency sought funding from the Federal Transit Administration, which was not especially enthusiastic about funding HOV lanes. For these reasons, "transitway" was an accurate term in the early years. But as occupancy requirements fell and HOV lanes became a fixture in Houston, the term "HOV lane" supplanted "transitway." The same pattern was repeated in large metro areas around the country.

## THE RISE AND FALL OF CARPOOL LANES

For a variety of reasons, promotion of carpooling via the creation of HOV lanes became a dominant feature of federal transportation policy by the 1990s. The Clean Air Act of 1990 listed HOV lanes as a transportation measure states could use to attain federal air quality standards, and the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) encouraged the construction of HOV lanes by making such facilities eligible for Congestion Mitigation and Air Quality (CMAQ) funds. ISTEA also changed the federal government's involvement in highway funding. Previously, states could receive a 90 percent federal matching share

Figure 1: Vanpooling's Decline on the Katy Freeway



Source: Richard H. Pratt, et al, "Traveler Response to Transportation System Changes, Interim Handbook," Transit Cooperative Research Program, Washington, D.C. 2000.

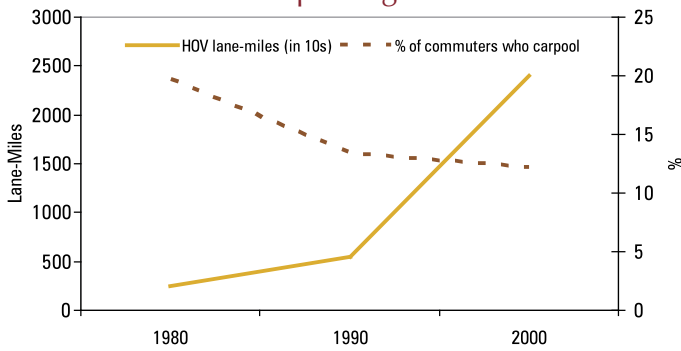
if they added general-purpose lanes. After ISTEA, that arrangement was only offered to HOV projects. ISTEA also allowed states to define a "high occupancy" vehicle as one that has as few as two occupants.

In the past decade, HOV facilities did not evolve from busways to carpool lanes or even from HOV-3 to HOV-2. Rather, they were built as HOV-2 facilities from the beginning. Yet the outcome remained the same: a policy designed to combat gridlock and increase vehicle occupancy often failed to accomplish either goal.

Carpooling peaked in 1980 when nearly 20 percent of Americans commuted to work with at least one other person in the car. But as wealth increased, more Americans chose to buy their own cars, and fewer chose to carpool. Today 92 percent of households own at least one car, and approximately 65 percent own two or more. Even approximately 80 percent of households earning less than \$25,000 per year own at least one car. Amazingly, even those who live in households with no car are more likely to rely on auto transportation (36 percent of trips) than on transit (20 percent).

Carpool lane-miles have increased dramatically since the 1980s. Today, our nation is home to 2,400 carpool lane-miles, roughly the distance across the continental United States. Current expansion plans will add over 1000 more lane-miles. Even so, as America has added more carpool lanes, the rate of carpooling has actually declined. Since 1980 when 19.7 percent of commuters carpooled, carpooling has fallen to 13.4 percent in 1990 and to 12.2 percent in 2000. The most recent national figure, from the American Community Survey, shows that carpooling accounted for only 10.4 percent of work trips in 2003.

Figure 2: Carpool Lanes Expand, While Carpooling Declines



Source: U.S. Census Bureau and Fuhs and Obenberger p.26: [http://www.hovworld.com/PDFs/Fuhs\\_Obenberger-final%20paper.pdf](http://www.hovworld.com/PDFs/Fuhs_Obenberger-final%20paper.pdf)

Strong public policy favoring carpools has led to unintended consequences. It has encouraged these expensive new lanes to fill up with “fampools”—two or more family members who would be riding together anyway. Fampools constitute between one-third and two-thirds of HOV lane users, depending on the facility. Also, by allowing even two-person carpools into specialized lanes, public policy has devastated the vanpool sector, which is the most cost-effective and energy-efficient form of transit. A vanpool uses only 1,273 BTUs per passenger mile, compared with 3,172 for rail transit and 4,124 for bus transit, according to Oak Ridge National Laboratory’s Transportation Energy Data Book.

Carpooling is also least likely to happen during commute hours, when congestion relief is needed most. Average vehicle occupancy is lowest for work trips and work-related trips (as opposed to family, social, and recreational trips). And weekday vehicle occupancy is significantly higher in the evenings, outside of peak periods.

Finally, filling up the most important HOV lanes with two-person carpools destroys their effectiveness as transit guideways, which is especially crucial for BRT.

## THE POTENTIAL OF RUBBER-TIRE TRANSIT

Canada and South America have long-standing examples of rubber tire transit’s ability to offer flexible, cost-effective service that appeals to large numbers of patrons. The surge in interest in U.S. bus rapid transit (BRT) systems is a recognition of the success other nations have enjoyed.

Bus transit can operate with headways as short as five seconds. At 40 to 120 passenger spaces per bus (including

standees), theoretical busway capacity is between 28,800 and 86,400 people/lane/hour—exceeding the capacity of light rail and even some heavy rail systems. At its busiest hour the nation’s busiest busway, the Lincoln Tunnel Express Bus Lane (XBL), carries over 30,000 passengers/lane. Ottawa’s busway system is used by 40 percent of those within its service area, a much greater proportion than San Francisco’s BART heavy rail system or the light rail system of Portland, Oregon.

Rail transit has certain operational advantages over rubber-tired transit, perhaps the most significant being that rail cars’ greater capacity and ability to be coupled into trains allows for more passengers per consist. Of course, there is a significant difference between available passenger space and space actually used by passengers. And, unlike bus transit, rail typically requires a separate repair facility and specialized staff. In addition, the much longer stopping distance required by trains requires much greater headways, which permits busways to make up in frequency what they lose in lower capacity per consist.

The Government Accountability Office (GAO) examined six cities that operate both BRT and light rail, and then measured operating costs in three categories: operating cost per vehicle hour, per revenue mile, and per passenger mile. For each category, the large majority of cities experienced lower operating costs with BRT.

Another advantage of buses operating on HOV lanes or exclusive rights of way is greater flexibility than rail transit. As the booklet “High Quality Transportation” (on BRT and managed lanes) points out:

*The flexibility of BRT allows combinations of different running ways and operating conditions. For instance, a BRT service could begin with a local circulation route in mixed traffic on local streets, proceed on an exclusive guideway, and then circulate once again on a transit priority system in the downtown.*

Because bus headways can be much shorter, frequency of service can be much greater with a busway system. It is easier for buses to overtake one another than for rail cars, and because of their smaller unit size, it is easier to fill a bus with passengers going from a common origin to a common destination. Hence, it is easier to organize express bus service than express train service. Buses can deviate from routes to avoid accidents or traffic jams. And rail trains are always run by a single monopoly operator, whereas a busway can be open to competing bus and van operators.

Another rubber-tire transit mode is the vanpool. Van-

pools typically carry between 8 and 15 passengers, and do so very efficiently. Recovery ratios measure the degree to which a mode of travel is reliant on subsidies. If a transit agency has a recovery ratio of 40 percent, that means revenue generated from fares, advertisements, and so on covers 40 percent of the cost of operating the service (with the other 60 percent covered by subsidies from taxpayers). Light rail's average recovery ratio is 28 percent. But vanpool recovery ratios often exceed 70 percent and sometimes they actually make a profit.

Reasons for vanpooling's cost-effectiveness include lower capital costs, higher load factors, and less energy use. Because vans are mass-produced, in contrast with buses and rail cars, vans' cost per seat is less than that of the average transit bus and much less than that of the average light rail car. Like bus transit, vanpooling typically makes use of existing infrastructure (the road), so the costs associated with building and maintaining transit-only infrastructure are absent.

## THE VIRTUAL EXCLUSIVE BUSWAY

The demonstrated ability of value pricing to manage traffic flow, offering reliable high-speed travel during peak periods, suggests that lanes managed with value pricing could become the second-best alternative to the exclusive busways that transit planners would like to have. If priority is given to bus transit usage, a managed lane can become the virtual equivalent of an exclusive busway, from the transit agency's standpoint. Thus, transportation planners studying the possibility of a whole network of HOT or managed lanes should look upon them not merely as an alternative for drivers and carpoolers. Such a network of managed lanes is also the infrastructure for an area-wide bus rapid transit system—a virtual exclusive busway (VEB).

To elaborate a bit further, although the highway capacity manual may report that a lane can handle 2,300 vehicles per hour, to ensure uncongested flow and prevent traffic-flow breakdown into unstable stop-and-go conditions, a managed lane is generally limited to no more than 2,000 vehicles/hour. Depending on how much demand for BRT service exists, some pre-defined amount of this capacity can be reserved on a long-term basis for bus service for each corridor of the managed lane network. With peak-period bus service at one-minute headways, for example, that would be 60 buses/hour, the equivalent of 90 cars/hour. The balance of the capacity would be available for other vehicles, some operating at no charge (e.g., vanpools, and possibly some other HOVs) and the rest as paying vehicles. As long as over-

all traffic is kept within these limits, the buses can operate at the speed limit, as unconstrained as if they were on an exclusive busway. Yet because a significant fraction of the other vehicles will be paying for access, a large fraction of the cost of this busway infrastructure will be paid for willingly, by those purchasing a premium-service auto trip.

The VEB concept was first suggested in Reason's HOT Networks policy study in 2003, and subsequently elaborated upon by Wilbur Smith Associates in their booklet on "High Quality Transportation."

## HOUSTON'S REBUILT KATY FREEWAY: THE WORLD'S FIRST VEB

The metro area with the most extensive system of express bus operations on HOV lanes has a project under way that amounts to the country's first Virtual Exclusive Busway. Houston is adding four value-priced managed lanes to the median of the Katy Freeway (I-10), as part of a major modernization of that freeway.

The managed lanes approach emerged as the preferred option in a major investment study in the 1990s. During the environmental review process, the local toll agency, Harris County Toll Road Authority (HCTRA), proposed that the managed lanes be tolled. Toll revenues could pay for their capital cost, and value-priced tolls would manage traffic flow. The environmental impact statement (EIS) was revised to include this option, and after further public involvement activities, this approach was adopted.

Two multi-agency agreements were crucial factors in creating the "public-public partnership" that made this project possible. The Tri-Party Agreement between FHWA, TxDOT, and Harris County deals with roles and responsibilities in design, funding, and construction of the managed lanes project. HCTRA agreed to pay for the construction cost (up to \$250 million), design the toll-related elements, and carry out any additional public-involvement activities needed. Toll revenues are specified to be used for debt service, a reasonable return on investment, and operation and maintenance of the managed lanes. TxDOT will secure needed federal funds, obtain right of way for the overall freeway expansion, and handle construction. And FHWA authorizes tolling of these lanes on the Interstate system under the federal Value Pricing Pilot Program.

The other agreement is a Memorandum of Understanding (MOU) between TxDOT, METRO, and Harris County. This MOU sets forth the respective roles of these three

parties as to how the managed lanes will be operated. In general, HCTRA is responsible for operation and maintenance of the lanes. METRO is responsible for operating bus services on the lanes, with various key protections built in. And TxDOT makes sure the managed lanes are properly integrated with the rest of the freeway and other facilities.

To sum up, the transit agency is guaranteed up to 25 percent of the managed lanes' capacity for transit and HOV uses. And the toll agency guarantees to use its value pricing authority to limit paying traffic to an amount consistent with uncongested traffic flow. The transit agency gives first priority to buses, since their passenger capacity is far greater than those of vanpools or carpools.

## IMPLICATIONS OF HOUSTON'S VEB

A number of the features of the MOU that made Houston's first VEB possible are worth discussing in more detail.

### Transit Funding

As HOT lanes have begun to catch on among transportation planners, the transit community has begun to appreciate their importance as a way of providing infrastructure for express bus or bus rapid transit service. In particular, transit organizations have begun to advocate for using net toll revenues from managed lanes for both transit-related facilities as part of the project (e.g., bus stations, park-and-ride lots) and transit operating subsidies anywhere in the region. Such uses are only possible in situations where there are net toll revenues. That is generally the case for projects that convert an existing HOV lane to a HOT lane (as is being done currently in Denver and Minneapolis). But in cases like the Katy project, where significant new lane capacity is being added, the likelihood of any "net" revenues being left over after debt service, return on investment, and operating and maintenance costs are covered is very small. That is why no such commitments are included in the Katy MOU.

But even though METRO is not receiving any net toll revenues, it is still getting a very good deal from this project. On the Katy today it must make do with a single, reversible HOV lane, which it must share with carpools and vanpools. A single-lane facility is far more vulnerable to incident-related congestion (e.g., when a vehicle breaks down) than a multi-lane facility like the managed lanes that will replace it. And a bi-directional facility makes possible reverse-commute bus service, which will be increasingly important as Houston grows and the central business district accounts for

a smaller percentage of all jobs. And especially important, thanks to value pricing, the managed lanes will be sustainable long-term as a reliable, high-speed facility.

### Busway Capacity

Houston has one of the nation's most extensive systems for express bus service on HOV lanes. So the question arises whether the Katy MOU provides a reasonable level of capacity for METRO, at 25 percent of total vehicles and a guarantee of 65 buses per hour. As of 2003, the Katy HOV lane served 40 buses during its busiest AM peak hour. (The other freeway HOV peak bus levels ranged from 4 to 43.) Thus, the Katy's allocation of 65 buses per hour represents a 62.5 percent increase over its maximum rush-hour bus service today. There is nothing magic about 65 per hour, nor about 25 percent of total capacity. But given the actual level of demand for such bus service today, those numbers appear reasonable.

### FTA Approval

HOV lanes in U.S. metro areas have been developed using federal, state, and local funding sources. Federal sources in some cases are exclusively highway (FHWA) funds and in other cases exclusively transit (FTA) funds. The Katy HOV lane received some of each; hence, the FTA had to concur in the decision to change the nature of this facility. In the past, the FTA has had a mixed record on HOV to HOT conversions. It approved San Diego's pioneering project on I-15, but initially raised objections to Denver's plans for a similar conversion on I-25 North. But the FTA seems to have come to terms with HOT lanes, as long as transit service is maintained and suffers no degradation in service quality. Managed lanes using value pricing to maintain traffic flow meet this test.

### HOV Occupancy Changes

The vast majority of U.S. HOV lanes are operated as HOV-2 facilities. The most successful become congested over time. But transportation officials are often reluctant to increase the occupancy requirements, for fear of backlash from existing (mostly two-person) carpools. Yet Houston had already been willing to bite the bullet on both the Katy and Northwest Freeways, increasing peak-period occupancy to HOV-3. This very likely made it easier to make the across-the-board change from HOV-2 to HOV-3 for the Katy managed lanes project.

It should also be noted that although federal approval is required for "significant" changes to HOV lanes that have received federal funds, that term appears reserved for major changes in operating hours and converting from HOV to

HOT or to general-purpose lanes. Minor changes in operating hours and changing the occupancy requirements do not require federal approval.

### Pricing Sustainability

The other key to a VEB’s long-term sustainability is pricing flexibility. Paying customers are the key factor in providing the funds for building, operating, and maintaining these managed lanes. But allowing too many to crowd onto the lanes during rush hour would completely defeat their dual purpose of facilitating high-quality transit and providing a reliable, higher-speed trip for those opting to pay for premium lanes. Therefore, the ability to increase value-priced toll rates as high as is needed to maintain uncongested conditions is essential. But since future toll levels might grow to quite high levels, if rush-hour demand in the corridor continues to grow, there is always concern about whether future price increases might be politically constrained. Orange County, California has adopted a managed lanes pricing policy for the 91 Express Lanes that is essentially on automatic pilot; whenever incipient congestion appears during a 12-week period, a toll increase goes into effect for that hour of the day.

The Houston MOU commits the three parties—HCTRA, METRO, and TxDOT—to use pricing in a comparable way to maintain uncongested conditions on the Katy managed lanes. This represents important institutional support for long-term use of value pricing to manage traffic flow. All three agencies have a lot at stake in the performance of the managed lanes. In particular, from METRO’s standpoint, they will only function as a Virtual Exclusive Busway if HCTRA increases toll levels when necessary to maintain the free-flow conditions it needs for reliable, high-speed express bus service.

### Network Benefits

An interconnected network of uncongested lanes offers obvious benefits, opening up a much larger radius of job opportunities within any individually determined maximum commute period. And a region-wide express bus system is far more feasible if it can operate on a region-wide infrastructure that is the functional equivalent of a network of exclusive busways.

Yet such a network would be highly unlikely to come about if it had to be developed with existing federal, state, and local

transit system resources. Conceptual designs of HOT Networks for Atlanta, Dallas/Ft. Worth, Houston, Seattle, and Washington, D.C. consist of about 500 lane-miles apiece. At today’s urban freeway construction costs, such systems would cost \$4-5 billion each. (This would cover the roadway infrastructure but not bus-related elements such as park-and-ride lots or bus stations.) By contrast, rail transit system encompassing 500 miles (two tracks, 250 miles each) would cost over \$30 billion, based on recent experience (see Table).

Even though the VEB network would cost considerably less, neither a 250-mile rail system nor a 500-mile VEB network would be affordable out of transit system funding sources. But the VEB network’s capital costs would be largely paid for by drivers paying to bypass congested freeway lanes, so this kind of network would be far more affordable, in practice.

## CURRENT STEPS TOWARD MANAGED LANE NETWORKS

There has been a flurry of activity around the country on the subject of networks of HOT or managed lanes. This is a brief recap, as of mid-2005.

- In Atlanta, the State Road and Tollway Authority has released a HOT lanes feasibility study, prepared by Parsons

Current FTA-Supported Light and Heavy Rail Projects						
Metro Area	Project	Type	Route miles	Capital Cost (\$M)	Cost/Mile (\$M)	250-mi.system cost(\$B)
--- Light Rail ---						
Los Angeles	Gold Line	Light	5.9	\$899	\$152.4	\$38.1
San Diego	Mission Valley	Light	5.9	\$431	\$73.0	\$18.3
Denver	T-REX	Light	19.1	\$879	\$46.0	\$11.5
New Jersey	Hudson-Bergen	Light	5.1	\$1210	\$237.2	\$59.3
Portland	MAX	Light	5.8	\$350	\$60.3	\$15.1
Seattle	Sound Transit	Light	13.9	\$2440	\$175.5	\$43.9
Phoenix	East Valley	Light	19.6	\$1400	\$71.4	\$17.9
Charlotte	South Corridor	Light	9.6	\$427	\$44.5	\$11.1
Pittsburgh	North Shore	Light	1.5	\$381	\$254.0	\$63.5
<b>Average</b>		<b>Light</b>			<b>\$123.8</b>	<b>\$30.95</b>
--- Heavy Rail ---						
San Francisco	BART-SFO	Heavy	8.7	\$1550	\$178.2	\$44.5
Chicago	Douglas Branch	Heavy	6.6	\$483	\$73.2	\$18.3
San Juan	Tren Urbano	Heavy	10.7	\$2250	\$210.3	\$52.6
<b>Average</b>		<b>Heavy</b>			<b>\$153.9</b>	<b>\$38.5</b>

Source: Federal Transit Administration ([www.fta.dot.gov/news/press\\_release/16282\\_16385\\_ENG\\_HTML.htm](http://www.fta.dot.gov/news/press_release/16282_16385_ENG_HTML.htm))

Brinckerhoff. It identified feasible corridors to begin implementing what would evolve into a network of HOT lanes.

- All the principal transit, highway, and toll road agencies in the Dallas/Ft. Worth metro area are cooperating on a HOT lanes region-wide study, with the assistance of consultant URS Corporation.
- The relatively new Colorado Tolling Enterprise has completed a major study, with consultant Wilbur Smith Associates, on Denver corridors where tolled express lanes would be most feasible.
- Texas DOT (in conjunction with Houston METRO and HCTRA) has received a federal Value Pricing grant to study the possible conversion of all six current HOV facilities in Houston to HOT lanes and their development into a HOT Network.
- Three agencies—Florida DOT, Miami-Dade Expressway Authority, and Florida Turnpike Enterprise—are working together on managed lane feasibility studies for major freeways and toll roads in Miami-Dade County.
- Minnesota DOT and the Metropolitan Council have released a study on the potential of managed lanes and bus rapid transit for Minneapolis/St. Paul. The MnPASS Toll Lane System Study was conducted by Cambridge Systematics.
- The San Diego Association of Governments (SANDAG) has included in its 2030 long-range transportation plan a set of managed lanes on four of its major freeways.
- The Metropolitan Transportation Commission of the nine-county San Francisco Bay region’s new year 2030 long-range transportation plan includes a proposal to consider a \$3 billion HOT Network.
- In 2004, the Transportation Planning Board for the greater Washington, DC metro area completed a Regional Mobility and Accessibility Study that proposed an extensive HOT Network for the metro area. The Maryland State Highway Authority is actively studying express toll lanes for a number of freeways, and the Virginia DOT is evaluating HOT lane proposals for several major freeways.

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These studies have several features in common. All are examining the trade-offs between HOV occupancy requirements (for free passage) and toll revenue, since all would involve extensive construction of new managed lane capacity. All are examining going beyond individual managed lane facilities to consider the possibility of a complete network. And all are including a significant role for bus transit operations. Hence, all have the potential to lead to VEB networks.

## NEEDED FEDERAL POLICY CHANGES

Current FTA policy toward HOT lanes and managed lanes is supportive of converting HOV lanes to HOT lanes, so long as transit remains an important use of the facility and transit service quality is not degraded. Since this condition is easy to satisfy by using value pricing, such conversions are increasingly being approved.

HOV lanes qualify as “guideway” for FTA funding, and recent FTA policy on HOV to HOT conversions allows the resulting HOT lanes to qualify, as well. But there is no statutory or policy statement on the status of new HOT lanes that get added to a region’s system. While a clarifying policy statement from FTA would help, transit agencies should have the certainty of a statutory change to the term “fixed guideway” in Title 49, so as to include value-priced lanes operated in partnership with transit agencies.

A second issue arises in connection with the alternatives analysis that a transit agency must carry out in applying for capital funding under FTA’s New Starts program. Given the great benefits of a Virtual Exclusive Busway for transit, a VEB or a VEB Network should be one of the alternatives studied in such analyses.

The third issue concerns New Starts funding itself. A VEB is a very cost-effective fixed guideway for high-volume, high-speed, highly reliable express bus service. As such, it ought to be eligible for New Starts funding. Since as we have seen, toll revenues can support a significant fraction of the capital costs of VEBs and VEB Networks, and local, state, and federal highway funds can be justified for the remainder of the basic highway infrastructure portions of such facilities, FTA New Starts funds should be available for the bus-related infrastructure portions, namely:

- Park and ride lots;
- Direct-access ramps (from stations and other high-traffic entry and exit points);
- On-line and/or off-line stations; and
- Buses.

Eligibility for a project to be considered a VEB for New Starts purposes should be conditioned on a multi-agency agreement such as the MOU in Houston which spells out the amount of capacity dedicated to transit-type uses and the commitment of all parties to use value pricing and occupancy-level adjustments to maintain acceptable level of service conditions on a long-term basis.

## CONCLUSION

It's time to rethink America's over-emphasis on carpooling and revisit the advantages of busways. Instead of filling up the empty space on a busway with fampools, we could fill it up with paying customers. And because those customers would pay value-priced tolls, their numbers could be limited to amounts consistent with maintaining uncongested conditions even at the busiest rush hours, as proven on the HOT lanes in San Diego and Orange County, California.

Rubber-tire transit (including express bus and vanpools) can be highly cost-effective, especially when operating on exclusive rights of way. Our experience over the past decade with value pricing shows that such pricing can be used to create the virtual equivalent of an exclusive busway, paid for largely by drivers. This is too good an opportunity for transportation planners to pass up.

## ABOUT THE AUTHORS

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## RELATED STUDIES AND ARTICLES

Robert W. Poole, Jr., Peter Samuel, and Brian F. Chase, *Building for the Future: Easing California's Transportation Crisis with Tolls and Public-Private Partnerships*, Policy Study No. 324, January 2005.

Robert W. Poole, Jr. and C. Kenneth Orski, *HOT Networks: A New Plan for Congestion Relief and Better Transit*, Policy Study No. 305, February 2003.



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