

Bus Toll Lanes: A New Transit-Toll Financial and Operating Partnership to Improve Mobility and Choice

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A bus toll lane (BTL) is a transit-based highway solution for creating financially sustainable new transportation capacity by combining the funding resources and operational capabilities of public transit and toll agencies. The proposed concept would expand public transportation by making transit an “equity” partner in the toll road business.

The BTL would maximize passenger throughput by employing proven bus technologies, electronic open road tolling (ORT) and dynamic congestion-based pricing techniques on new multi-modal high-speed express lanes. Capacity would be dedicated first to public transit. All of the remaining highway capacity above that used by the public transit system would be sold to other vehicles using dynamically-priced tolls to ensure the facility’s level-of-service would always be high enough to maintain the competitive quality of the transit service. Revenues generated from tolls would be used first to cover the cost of operations and maintenance of the infrastructure. Revenues in excess of these costs would then be shared between the transit and toll agencies based on the percentage of the respective capital contribution to the construction of the lanes from each agency. In essence, the transit agency would be an equity owner in the toll lanes.

Historical Decline in Transportation Resources Leads Push for New Financing and Operating Ideas

During the past 50 years, the USA has experienced a steady increase in annual vehicle-miles-traveled (VMT). A corresponding decline in the financial resources available for building new transportation facilities to keep pace with these growing traffic volumes is directly linked to the severe traffic congestion now found on almost all highways within the country’s major urban areas. For the most part, this financial deficit is a result of the primary reliance on the per-gallon fuel tax to fund transportation and the unwillingness of elected officials to increase the tax or support any other meaningful transportation funding to keep up with a half a century of inflation and traffic growth.

The combination of increasing VMT, more efficient vehicles that result in substantial reductions in gallons purchased per miles driven, inflation that has increased the cost of operating and maintaining our national infrastructure and building new facilities, and the lack of political will to increase funding all have contributed to a financial crisis in transportation now facing the entire country. No charts and graphs are needed by those who plan, build and operate transportation to understand these circumstances. Today, virtually every state government spends all of their gas tax revenues to simply maintain, rebuild, renew and occasionally expand existing transportation facilities. Throughout the country, almost all new major highways are being constructed using some form of user-financing based on tolls.

With the addition of extremely poor economic conditions, the country is now facing a “perfect storm” of transportation finance that will make the construction of new capacity even more difficult - therefore, the need for new financing and operating ideas.

HOT Lanes, Managed Lanes and Variable Pricing

One set of solutions has focused on techniques to make our existing infrastructure more efficient. The conversion of existing non-tolled freeway lanes and high-occupancy-vehicles (HOV) lanes into high-

occupancy-toll (HOT) lanes using variable pricing regimes (often referred to as managed-lanes) has proven to be an effective strategy. The managed-lane approach increases or decreases the toll rate based on variables such as time-of-day or levels of existing congestion. The purpose of the variable toll rate is to use pricing to guarantee service quality (traffic speed and volume) therefore maximizing throughput and making the lanes attractive to toll payers. Unfortunately, most of these projects do not involve building the additional capacity needed to substantially reduce the traffic congestion choking America’s urban streets and highways. And, by providing free capacity to those who meet occupancy thresholds (usually two or three occupants per vehicle), these projects forego large amounts of revenue that could help support the financial sustainability of the transportation system.

Toll Violation Enforcement on HOT Lanes Raises Operational, Cost and Privacy Issues

This discussion must also recognize that HOT lanes also require vehicle occupancy enforcement as part of the toll violation activities that are very costly and difficult to implement in a uniform manner. Verifying the number of occupants in moving vehicles as part of the toll violation enforcement process is currently a manual undertaking and, as such, is labor intensive and open to considerable human error. Automated approaches using fairly expensive forms of video technology to define vehicle occupancy have been developed but not yet thoroughly tested. Early evaluations of these technologies indicate that enough errors occur to still require human intervention. Therefore, in addition to the high initial capital expense of the video equipment, there will likely be additional operating and maintenance costs to verify and enforce vehicle occupancy. These automated approaches to determining vehicle occupancy also present significant public concerns about the protection of personal privacy in the toll violation process – concerns that will have to be addressed and resolved before automated enforcement can become a reality.

Bus Rapid Transit – Flexible, High Volume Public Transportation

Bus Rapid Transit (BRT) and express-bus are techniques that also present great promise for improving transportation efficiencies. By combining the carrying capacities that can approach rail with the route flexibility of rubber-tired buses, BRT and express-bus theoretically produce the type of passenger throughput that could make meaningful dents in traffic congestion in communities of all sizes and land-use densities. However, to provide effective, reliable and competitive service, these bus systems must have access to free flowing travel lanes which often come at a very high cost if available at all.

Multi-Modal Bus Toll Lanes Can Be Effective for Moving People by Combining the Efficiencies of Public Transit and Managed Toll Lanes

A BTL project would combine the best transportation efficiencies of both managed toll lanes and high-capacity high-speed bus systems. As shown in the enclosed table created by Joe Waggoner, Executive Director of the Tampa Hillsborough Expressway Authority, a single limited-access Bus Toll Lane, using articulated buses, can carry a tremendous amount of people dependant on the number of buses running in the lane. But, even at the highest levels (100

Bus Toll Lanes - MOVE PEOPLE

| Level of Service | Vehicles Per Hour | Vehicle Speed (MPH) | Vehicle Occupancy ³ | Passenger Trips per Hour | Equivalent Lanes |
|---|--------------------|---------------------|--------------------------------|--------------------------|------------------|
| LOS C | 1,600 | 50-60 | 1.2 (assumed) | 1,920 | 1 |
| Bus Toll Lane with 25 Buses ¹ (1.6%) ² | 1,587 ³ | 50-60 | 2.7 | 4,296 | 2.2 |
| Bus Toll Lane with 50 Buses ¹ (3.2%) ² | 1,575 ³ | 50-60 | 4.0 | 6,242 | 3.3 |
| Bus Toll Lane with 100 Buses ¹ (6.4%) ² | 1,551 ³ | 50-60 | 6.5 | 10,134 | 5.3 |

¹ Assumes an 80-passenger bus
² Percentage of lane capacity used by transit
³ Assumes 15% of autos have 3 occupants

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buses per lane per hour with less than one minute between buses), a huge amount of lane capacity still remains for sale to non-transit vehicles. Therefore, using all-electronic ORT with dynamic pricing to ensure LOS C or better, a BTL will also provide the opportunity to generate a significant amount of toll revenue.

And, while achieving these extremely high carrying capacities, the BTL can be constructed and operated at a fraction of the cost of fixed rail and the flexibility of the bus requires no complementary infrastructure to feed passengers into the system. The BTL approach would allow communities to better utilize existing transportation resources. Medians and shoulder areas on current limited-access and major arterial highways could be used to locate the lanes and existing rolling stock could be used by transit systems to begin the BTL network, upgrading to BRT or articulated express-bus as ridership grows.

Bus Toll Lanes Would Take Advantage of the Unique Operating and Financial Strengths of Transit and Tolls

The BTL model would also take advantage of the operating and financial strengths of public transit and toll agencies.

In the BTL partnership, the transit agency would be responsible for all bus operations, schedules, bus maintenance, etc. – what the transit agency already knows how to do very well. In the same manner, the partnering toll agency would be responsible for the electronic toll collection, toll violation enforcement and operations related to the non-transit users; maintenance and renewal activities related to the highway infrastructure; and payment of the debt service for the toll agency contribution to the capital cost of the facilities – the types of things that toll agencies already perform on a daily basis.

The financial strength of the transit industry is on the front end while the transit financial weakness is in long-term system operations. At the Federal level, the desire to create true multi-modal systems that provide a range of transportation choices results in significant capital being made available to construct transit facilities. Unfortunately, this funding does not carry over into the operating side of public transit agencies. Because transit fares never fully cover the cost of operations, the lack of federal operating subsidies places a tremendous financial burden on state and local governments. And, the inability of local communities to meet the financial requirements needed to sustain their local transit programs often translates into reductions in the number of bus routes and lower frequencies of public transportation service.

The financial strengths and weaknesses of the toll industry are very much the opposite of transit. The strength of the toll industry is in long-term operations and revenue generation while the financial challenge is generally located in the front-end financing of new facilities. Toll agencies often struggle to meet tests of financial feasibility in order to sell the revenue bonds used for the construction of new facilities. However, once built, a well planned and operated toll road usually produces increasing revenue as customers are attracted to the premium service provided by the facilities.

The BTL equity-based revenue-sharing model thus matches the strength of the transit agency's ability to acquire capital funding with the strength of the toll agency's long-term growing revenue stream. As pointed out by Waggoner, "the resulting synergy of combining transit and tolls should produce a financially and operationally sustainable transportation system by providing dedicated capacity for public transit and enough excess capacity to deliver meaningful congestion relief for non-transit toll-paying customers."

Benefits to Automobile Drivers and the Community

The dynamically priced tolls, set to ensure a free-flowing level of service on the lanes, would make the safety, convenience, trip reliability and time savings of the BTL available to all drivers whenever they need it and are willing to pay the toll. In addition, every toll-paying trip and bus rider on the BTL removes that trip from other routes, thus providing congestion relief for other competing roadways as well. Because a BTL represents the construction of new capacity, this means real reductions in traffic congestion on the entire highway network. The improved travel speeds should also mean improvements in local air quality. And, the BTL should have a positive impact on the local economy because the lanes can also be used by private transit providers (shuttle buses, taxis, jitneys, etc. who are willing to pay the toll) and for the movement of goods and services. On the financial side, the combination of transit and toll resources should reduce the reliance on local taxes for construction, operations and maintenance. And, the opportunity to plow excess revenues back into local transportation operations and improvements will benefit all who live and work in the community.

Change in Funding Policy Required for BTL to be Successful

For the BTL equity partnership to work, a change in policy must occur at the federal level, specifically at the US Department of Transportation (USDOT) Federal Transit Administration (FTA). To leverage the investment of transit funds to build all or a portion of a BTL in exchange for guaranteed lane capacity and a proportionate share of excess toll revenues, FTA would have to change the policies related to funding new transit projects and partnering with non-transit agencies.

Today, capital funds for bus systems are targeted for the acquisition of rolling equipment, not the construction of highway lanes in the manner described here. To make BTL a reality, transit funding must be made available for the construction of new highway lanes to be wholly or partially owned by the transit agency and dedicated first to public transit with the remaining capacity being sold to produce revenue that can be reinvested in the local public transportation system. The transportation techniques and strategies of BTL are not new – but the financial approach is. To more effectively use our precious transportation resources, equity partnering between transit and toll agencies to produce projects like BTL should be recognized by FTA as a desirable funding and operating strategy.