





Bus Toll Lanes: A New Transit–Toll Partnership to Improve Mobility

By Martin Stone, Ph.D., AICP, with contributions from Joe Waggoner

A promising new idea to solve urban traffic congestion would combine the funding resources and operational capabilities of public transit and toll agencies. That idea is the bus toll lane (BTL), a transit-based solution for creating sustainable new transportation capacity by making transit a partner in the toll road business.

A 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. With BTLs, capacity would be dedicated first to public transit. The remaining highway capacity would be sold to all other vehicles, using dynamically priced tolls, to ensure that 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 any debt service related to the construction of the lanes and the cost of the infrastructure's operations and maintenance. Revenues in excess of these costs would be shared between the transit and toll agencies involved based on the percentage of their respective capital contributions to the lanes' construction.

A Push for New Ideas

During the past 50 years, the United States 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

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officials to increase the tax or support any other meaningful transportation funding to keep up with a half century of inflation and traffic growth.

The combination of increasing VMT, more efficient vehicles that result in substantial reductions in gallons of fuel purchased per miles driven, inflation that has increased the cost of operating and maintaining our national infrastructure and building new facil-

ities, 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 facilities to understand these circumstances. Today, virtually every state government spends all of its 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. And with the extremely poor economic conditions now confronting everyone, we seem to be in the midst of a "perfect storm" of transportation finance that will make the construction of new capacity even more difficult; hence, the need for new financing and operating ideas.

One set of solutions has focused on techniques to make our existing infrastructure more efficient. The conversion of existing nontolled freeway lanes and high-occupancy vehicle (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

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guarantee service quality (traffic speed and volume), thereby 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 forgo large amounts of revenue that could support financial sustainability.

Bus rapid transit (BRT) and express buses are other techniques that offer great promise for improving trans-

portation efficiencies. By combining carrying capacities that can approach those of rail with the route flexibility of rubber-tired vehicles, BRT and express buses theoretically produce the type of passenger throughput that could make meaningful dents in traffic congestion in communities of all sizes and land-use densities. To provide effective, reliable, and competitive service, however, these bus systems must have access to free-flowing travel lanes, which often come at a very high cost, if they're available at all.

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TABLE 1: Buss Toll Lanes Move People

Level of Service	Vehicles per Hour	Vehicle Speed (MPH)	Vehicle Occupancy ³	Passenger Trips per Hour	Equivalent Lanes
LOSC	1,600	50 – 60	1.2 (assumed)	1,920	1.0
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 three occupants

Source: Joe Waggoner, executive director, Tampa-Hillsborough Expressway Authority

The Power of Multimodal BTL

As shown in Table 1, a single limited-access bus toll lane using articulated buses can carry a tremendous amount of people, depending on the number of buses running in the lane. But even with 100 buses per lane per hour (with less than one minute between buses), a huge amount of lane capacity—93.6 percent—remains for sale to nontransit vehicles. Therefore, using all-electronic ORT with dynamic pricing to ensure Level of Service C or better, a BTL could generate a significant amount of toll revenue.

While achieving these extremely high carrying capacities, the BTL could be constructed and operated at a fraction of the cost of fixed rail. Moreover, the flexibility of the bus requires no complementary infra-

structure to feed passengers into the system. The BTL approach would also allow communities to better utilize existing transportation resources. Medians and shoulder areas on currently 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 buses as ridership grows.

Strength in Partnership

The BTL model would 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, and so on—what the transit agency

already knows how to do very well. In the same manner, the partnering toll agency would be responsible for the toll collection and operations related to the nontransit users, maintenance and renewal activities related to the highway, and payment of the debt service for the toll agency's contribution to the capital cost of the facilities—the type of things toll agencies already know how to do very well.

The transit industry's financial strength lies at the front end, in capital investment, whereas its financial weakness lies in long-term system operations. At the federal level, the desire to create true multimodal systems that provide a range of transportation choices results in significant capital

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 service.

The financial strengths and weaknesses of the toll industry, meanwhile, are very much the opposite of transit's. The toll industry's strength lies in long-term operations and revenue generation, whereas its financial challenge generally comes in the front-end financing of new facilities. Toll agencies often struggle to meet tests of financial feasibility to sell the revenue bonds used for the construction of new facilities. Once built, however, a well-planned and -operated toll road usually produces

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being made available to construct transit facilities. Unfortunately, this funding doesn't 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 to make up the operating deficit. And the inability of

increasing revenue as customers are attracted to the premium service the facility provides.

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. According to Joe Waggoner, executive director of

the Tampa-Hillsborough Expressway Authority in Tampa, Fla., “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 nontransit toll-paying customers.” (See Table 2.)

The high level of service produced by managed-lane pricing should make the bus a very competitive transportation choice, thus increasing ridership. The sharing of toll revenue combined with added revenue from higher bus ridership should also contribute to a reliable income stream



that transit agencies could then use to support operations or system expansion. And while one multimodal BTL project has the potential to deliver numerous benefits to users and agencies, these benefits would be

multiplied considerably if communities could develop a network of BTL facilities that complemented the existing transportation system.

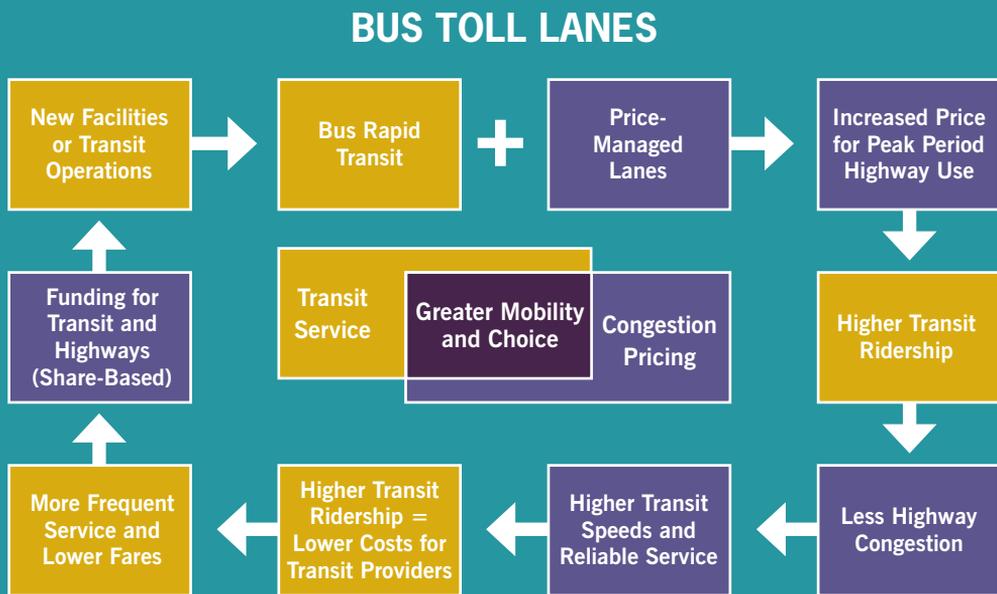
Benefiting the Entire Community

BTLs benefit the whole community, from transit riders and agencies to drivers and the entire highway network.

Benefits to transit riders and transit agencies. The BTL's benefits to the transit side of the partnership are numerous. Transit riders achieve time savings equivalent to those of toll-paying auto drivers, with the same schedule reliability but without the expense of tolls, fuel, and parking. Because buses can travel most anywhere an auto can, the number of transfers would be minimized, thus saving riders even more time over traditional combination transit services. All of this produces higher bus ridership and more revenue at the farebox, which should translate into more frequent transit service (improved headways) and expansion of bus routes. For transit agencies, these improvements should mean more efficient, cost-effective system operations and the development of a sustainable, inflation-sensitive method of funding transit operations.

Benefits to automobile drivers and the community. Dynamically priced tolls, set to ensure a free-flowing level of lane service, would make the safety, convenience, trip reliability, and

TABLE 2: The Synergy of Transit and Tolls



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 competing roadways, as well. Because a BTL represents the construction of new capacity, real reductions in traffic congestion on the entire highway network would result. The improved travel speeds should also yield improvements in local air quality. In addition, the BTL should benefit the local economy because the lanes can also be used by private transit providers (shuttle buses, taxis, jitneys, and such) 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.

Changing Funding Policy

For the BTL partnership to work, a change in policy must occur at the federal level, specifically at the U.S. Department of Transportation 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

The Virtual Fixed Guideway

In response to severe and worsening gridlock, a growing number of metropolitan areas want to broaden New Starts funding eligibility to support the cost-effective deployment of high-end bus service in combination with road pricing strategies that manage congestion. The bus toll lane network to which Martin Stone refers is a notable example of this new direction in transportation policy.

In a notice of proposed rulemaking (NPRM) published in 2007, the FTA contemplated supporting BTL networks through New Starts. In particular, the NPRM proposed New Starts funding for the transit elements of HOT lanes that would qualify under the rule as “virtual fixed guideways.” First conceived by Robert Poole and Ted Balaker, a virtual fixed guideway, according to the NPRM, would be a roadway facility eligible for New Starts funding if the facility achieved free-flow conditions for transit by means of variable pricing. Under the proposed rule, New Starts assistance would be available only for transit’s “allocable share” of project costs or as otherwise agreed upon by the FTA and the project’s sponsor.

With the rulemaking suspended by an act of Congress in 2008, and subsequently withdrawn by FTA in February 2009, the challenge now for advocates of innovative transit systems is finding the federal capital needed to build them. Federal law famously restricts most transit funding to “fixed guideways,” which it defines as “separate right(s)-of-way reserved for the exclusive use of public transportation and other high-occupancy vehicles.” Thus, the statute appears to bar federal transit assistance for facilities, such as BTL networks, used by both HOVs and SOVs (single-occupant vehicles).

But does it really?

Under current law, the FTA has allowed significant exceptions to the “exclusivity requirement.” Through New Starts, for example, the agency has funded bus rapid transit facilities involving nonexclusive segments accessible by SOVs on a case-by-case basis. Similarly, the FTA counts certain HOV lanes converted to HOT lanes—that is, toll roads used by toll-paying SOVs—as “fixed guideway miles” for the purpose of distributing formula funds. The agency also recognizes HOV lanes as fixed guideway miles in cases where low-emission SOVs are permitted to use HOV lanes under the federal highway title. In a recent letter ruling, the FTA allowed the use of approximately \$70 million of 5309 Fixed Guideway Modernization funds to convert 83 miles of HOV lanes to HOT lanes on I-45, US-59, and US-290 in metropolitan Houston.

So are BTLs currently eligible for New Starts funding? Precedent exists for exceptions to the rule of exclusivity. Whether they are extended to BTLs as exceptions (or become the norm) will depend on policymakers and Congress.—David B. Horner is senior counsel in the projects group of Allen & Overy LLP. Prior to joining Allen & Overy, David served at the U.S. Department of Transportation as deputy assistant secretary for transportation policy and chief counsel of the Federal Transit Administration. He may be reached at David.Horner@allenoverly.com

capacity and a proportionate share of excess toll revenues, the FTA must change the policies related to funding new transit projects and partnering with nontransit agencies.

Today, capital funds for bus systems are targeted for the acquisition of rolling equipment, not the construction of highway lanes. To make BTLs a reality, transit funding must be made available for the construction of new highway lanes, to be dedicated first to transit, with the remaining capacity sold to produce

revenue that can be reinvested in the transportation system.

The transportation techniques and strategies of BTLs are not new—but the financial approach is. To more effectively use our precious transportation resources, the FTA must recognize partnering between transit and toll agencies, and the new capacity and financial concepts found in BTLs, as desirable funding and operating strategies. (For more on FTA funding policy and BTLs, see the sidebar “The Virtual Fixed Guideway,” below.)

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Endnote

- 1 The National Bus Rapid Transit Institute (NBRTI), part of the Center for Urban Transportation Research at the University of South Florida, is preparing a white paper on BTLs to address federal constraints and other policy issues. Approved for funding in October 2008, the study is expected to be completed in time to allow an opportunity for adjustments in the upcoming federal transportation authorization process.
- 2 “Major Capital Investment Projects.” *Federal Register*, Volume 72, Number 149, pp. 43328–43329, August 3, 2007.
- 3 Balaker, Ted, and Robert W. Poole, Jr., *Virtual Exclusive Busways: Improving Urban Transit While Relieving Congestion*, Policy Study 337, Reason Foundation, September 2005 (available at <http://www.reason.org/ps337.pdf>).
- 4 49 USC 5302(a)(4).
- 5 See, for example, the Euclid Corridor Transportation Project in Cleveland, Ohio. Still greater allowance for nonexclusivity is contemplated by the recently enacted Small Starts program. (See 49 USC 5309(e).)
- 6 “Policy Statement on When High-Occupancy Vehicle (HOV) Lanes Converted to High-Occupancy/Toll (HOT) Lanes Shall Be Classified as Fixed Guideway Miles for FTA’s Funding Formulas” *Federal Register*, Volume 71, Number 173, p. 54849, September 7, 2006.
- 7 See, for example, the HOV lanes on I-10 and I-110 in Los Angeles County, Calif., as reported to the National Transit Database.
- 8 Letter to Frank J. Wilson, president and chief executive officer, Houston METRO, from Sherry R. Little, acting administrator, Federal Transit Administration, January 2009 (available at www.fightgridlocknow.gov).