The Coming Convergence of Tollways and Public Transit Systems

By Thomas J. Bamonte

Public transit systems and tollways have different histories, fundamentally different operating models, and very different positions in the marketplace. Highways, especially tollways, are ascendent; public transit remains in a state of relative decline. Yet, tollways and transit systems will benefit from greater operational integration in many metropolitan areas in the coming decade, as municipalities seek to alleviate congestion and improve their citizens' quality of life. As a consequence, it may make good business sense for tollways to adopt a business model that will enable them to operate more like transit systems.

Two Models, Two Fates

Public transit systems. One hundred and fifty years ago, rapidly growing cities were clogged by private vehicles; namely, horse-and-buggies. In just a few decades, sophisticated subway, elevated-train, and streetcar systems came into being, creatively employing emerging electricity-based technologies. Indeed, the success of the great metropolises that arose before the automobile's invention would be unthinkable without this burst of innovation.

These transit systems required communal travel and adherence to schedules. When the private auto, with its promise of freedom and convenience, emerged, it quickly began to gobble market share from transit systems. Financial collapse followed, and local governments stepped in to assume responsibility for their transit systems. Public ownership didn't stem the decline in transit market share, however. Travelers still preferred the convenience and privacy of the auto. Today, public transit enjoys a significant

market share in only a few metropolitan areas in the United States, although in recent years transit has better protected and, in some cases, even increased its market share.

Nonetheless, public transit is unlikely to grow beyond its niche role. The 2030 Regional Transportation Plan for the Chicago area, for example, anticipates that almost 60 percent of transportation capital investment in the Chicago area will be spent on public transit projects over the next 25 years. Yet, the plan also projects that even after that many years of "overinvestment" in public transit, the latter's market share in the Chicago area by 2030 will be only 10 percent.

Despite its limited market share, public transit has some advantages over its highway competition. Transit systems can carry a large volume of people in a relatively small right of way. Three Chicago Transit Authority trains, for example, can carry roughly the same number of people in an hour as a freeway lane. A single bus can replace 40 cars on the street.

Transit systems have a smaller environmental footprint than highway systems. They use less fuel per passenger mile, chew up less land for their rights of way, and promote more-efficient, high-density development. Additionally, travel on public transit systems is much safer than passenger-car travel on highways.

Highway systems. Highway systems are triumphant in the transportation market. Auto ownership rates continue to rise, as do vehicle miles traveled per person. The increasing reliance on the auto in countries with high gas prices indicates that the market superiority of the highway network will continue even if energy prices increase significantly.

Tollways are especially well positioned in today's market. Toll rates well below the optimum price point to maximize revenue usually are sufficient to maintain the tollways. This explains why tollways are attractive assets to investors.

Highway systems do face significant challenges, however. The centrifugal forces pulling commercial and residential development out from central cities, for example, are transforming tollways into commuter-oriented routes. Commuter service imposes peak-period demand problems long faced by public transit systems. The development surrounding major highways makes it more difficult and expensive to expand those highways, and such development has adverse environmental and public health effects, as well. The fact that it is so difficult to raise taxes to fund highway needs signals growing consumer dissatisfaction with the highway travel experience.

Even though it has triumphed in the marketplace, the highway operating

model hasn't advanced significantly in decades. Highway systems still delegate operational responsibility to individual drivers, which means the system is no better than the least competent driver. Errors of judgment and poor reactions by drivers are endemic, which means that the highway accident rate is unacceptably high and the carrying capacity of roads hasn't increased much over time.

Two potential ways to improve today's transportation picture are to encourage much greater integration of public transit and highway systems, and to foster the evolution of tollways into comprehensive transitways.

Two potential ways to improve today's transportation picture are to encourage much greater integration of public transit and highway systems, and to foster the evolution of tollways into comprehensive transitways.

System Integration

Extending highway tolling. Forward-thinking metropolitan regions will begin to realize that the weaknesses of their public transit systems and the problem of traffic congestion are closely related. The fact that consumers must pay a fare to one branch of government for transit service that is slower and less convenient than highway travel while another branch of government gives away valuable highway space has predictable results—highway congestion and anemic public transit market share.

Raising tolls, extending tolling to more roads, and being more aggressive in terms of peak-period pricing are, thanks to places like London and Stockholm, now recognized as effective ways to bolster transit systems and improve overall transportation system performance. Tolls reduce the perceived price advantage of the private auto and can help fund both highway and public transit improvements.

Extending tolling to more roads could create a significant business opportunity for tollways to expand their electronic tolling infrastructure, call centers, and the like. In the Chicago area, roughly 2 million vehicles have electronic tolling capability. It would be a relatively simple matter to include all vehicles in the region in the existing tolling system if tolling were extended to roads throughout the region.

Public officials must show that increased highway tolling will result in tangible benefits for consumers. The Illinois Tollway put this lesson to use when it coupled a toll increase with a capital plan that added significant new roadway capacity, extending its North-South Tollway (I-355) to a rapidly developing area and implementing open road tolling throughout the system, all in the space of three years. Corridor integration projects offer one set of such tangible benefits.

Corridor integration projects. As development matures around tollways, bus rapid transit and rail lines become more viable in those corridors. Bus rapid transit and rail lines can carry high volumes of people during peak travel times, thus reducing congestion on the tollway and allowing the tollway to delay or even forgo expensive capacity expansion projects.

In areas where tollways carry a high volume of commuter traffic, it makes sense for them to open up their rights of way for these options. The Illinois Tollway, for example, is working with the local commuter rail agency on a new rail line that will run in the Northwest Tollway (I-90) right of way from a suburban satellite community to O'Hare Airport. Rather than viewing the commuter rail line as a distraction or as an unwelcome competitor, the Tollway is working with the rail agency to coordinate highway and railway construction.

In some areas, it may make sense for tollways to assume responsibility for establishing and operating public transit service that complements the tollway.

Does this kind of corridor coordination harm a tollway's long-term prospects? Public transit lines stimulate denser development. Given the market realities, it is likely that most of the trips generated by this transit-oriented development will still be by car and that a nearby tollway will capture a substantial part of this traffic. If the public transit line succeeds in carrying a substantial load of peak-period commuters while generating net additional trips for the adjacent tollway, the tollway and its customers benefit from having public transit in the corridor.

Tollways as transit operators. In some areas, it may make sense for tollways to assume responsibility for establishing and operating public transit service that complements the tollway. This approach allows regions to leverage the financial strength, engineering expertise, and customer-service orientation of tollways to build and operate public transit assets.

The recent transfer of the Dulles Toll Road to the Metropolitan Washington Airports Authority so that the Authority can use toll revenue to construct a long-stalled $4-billion rail line to Dulles Airport is one example of this approach. The Golden Gate Bridge, Highway and Transportation District goes even further: It operates the Golden Gate toll bridge as well as an extensive network of buses and ferries.

Tollways may make sense as builders, and sometimes even operators, of public transit when there is gridlock among transit operators and government. For example, the Eisenhower Expressway (I-290), which connects downtown Chicago to a job-rich suburban county, has a notorious chokepoint where the highway narrows from four to three lanes. A rapid transit line sits along part of the corridor, but it doesn't reach the suburban area.

Local opposition and a lack of funds have stymied the expressway's expansion. The transit agency running the existing rail line lacks the legal authority to extend service to another county, and the commuter rail agency has no interest in running a rapid transit line. The third transit agency in the region provides only bus service. In these circumstances, it is easy to understand, but hard to justify,

how thousands of people waste many hours each day using this corridor.

This bottleneck restricts the flow of Illinois Tollway customers to and from the Reagan Memorial Tollway (I-88). It thus might make sense for the Illinois Tollway to extend its electronic tolling system via high-occupancy toll (HOT) lanes on the freeway. Revenue from these lanes could help fund the extension of the rapid transit line to high-employment areas and shopping centers that surround the Tollway in the suburban area. The combination of price incentives from the expanded tolling and a public transit line that finally goes where people want to go would help address the endemic congestion problem in the corridor.

Transportation accounts. Perhaps the most exciting integration scenario is not etched in concrete and rail but rather realized in electronic tolling back offices. Transit agencies and tollways are increasingly relying on electronic revenue collection. It is now possible through intergovernmental agreements and shared databases to offer customers in a metropolitan area a single transportation account to manage the financial side of their travel, whatever the mode. Even public parking could be integrated into this system.

Such transportation accounts would allow for targeted incentives to help ensure the most efficient use of the transportation system. For example, major bus and rail lines often operate in the same corridors as the most congested highways do. Those who

took public transit for travel in these congested corridors at peak times would get a credit in their transportation account. This credit might be redeemed for lower tolls if those customers later drove on a toll highway during nonpeak periods or lower public transit fares on future rides—a sort of frequent flier program for transit users. Likewise, people who took most of their trips by public transit might get incentives designed to encourage them to switch their travel entirely to public transit.

If transportation credits were made freely transferable, heavy users of public transit could accumulate valuable transportation credits and use them to help family members and friends pay for tolls if their trips necessitated car travel. The use of transportation credits to reward public transit riders, who are willing to put up with the extra time and inconvenience of transit travel during peak travel periods and in doing so free up valuable road space, would help address the social equity concerns that are always raised when expanded highway tolling is discussed. Also on the positive side, this approach doesn't involve the bulk transfer of money from toll-road agencies to public transit agencies. Such transfers can run afoul of bond indentures and enabling acts and thus be politically unpalatable.

Tollways as Transitways

As an alternative to the systems-integration scenario described above, another option, with tollways operating as transitways, would result in a more complete convergence between public transit and tollways and, hence, yield more substantial improvements to our transportation system. This scenario challenges the undisputed leader in surface transportation—the highway system—to develop a new operating model, one that moves from a motorist-controlled operating environment to a central control network.

The use of transportation credits to reward public transit riders would help address the social equity concerns that are always raised when expanded highway tolling is discussed.

As traffic volumes grow on major highways and development envelopes them, highways face a challenge to their operating model akin to the crowded conditions that threatened the horse-and-buggy operating model in rapidly urbanizing areas 150 years ago. Congestion slows travel and commerce and diminishes quality of life. Moreover, the accident rate on highways continues

The risk of continued complacency is that other players—such as automobile companies—will take the lead in developing an improved highway operating model and reap the accolades and the revenue from doing so.

to be appallingly high and causes major economic drag as well as great human tragedy—more than 6 million crashes annually in the United States alone, with 2.5 million injuries and 43,443 deaths at a cost exceeding $230 billion. (Source: National Highway Traffic Safety Administration, U.S. Department of Transportation, Traffic Safety Facts 2005.)

Clearly, the public deserves a safer and more efficient operating model. This model would meld onboard electronic vehicle controls, which are being rolled out with increasing frequency—onboard radar, vehicle-to-vehicle communication devices, collision-avoidance systems—with the fiber-optic infrastructure that parallels many of our toll roads and can support high-speed wireless communication. Joined together, these technologies could support a centralized vehicle-control network run by the tollway operator.

The goal would be a tollway to which vehicles would log on at the entrance ramp and on which the vehicle occupants would do no driving. This "driverless" control network would be able to move vehicles more quickly, more safely, and with less spacing between vehicles than is now possible with human drivers, markedly increasing the carrying capacity of the roadway. Tollways thus would realize significantly more value from their highway and electronic assets.

With the sophistical electronics for this control network available to tollways in the same way that emerging electric technologies were available to the developers of the urban transit networks, the primary obstacle to the realization of a tollway as a transitway isn't technological; rather, it's the complacency that often affects market leaders. The tollway industry seems content to continue to run off of our grandparents' highway operating model even if technological developments have now rendered that model unsafe and inefficient.

The risk of continued complacency is that other players—such as automobile companies—will take the lead in developing an improved highway operating model and reap the accolades and the revenue from doing so. If this occurs, tollway agencies will become more like parking-lot vendors, charging

for highway space but doing little to influence the direction of transportation.

Certainly one could argue that the shift to a tollway as transitway would be too radical a change in our individualistic culture to be achievable. Yet, the horse-and-buggy model of transportation must have been at least as deeply entrenched as the current highway operating model. Nonetheless, in a matter of a few decades, the radically different operating model of the urban transit system was successfully implemented because it leveraged newly available technologies to offer a premium product. Likewise, tollways can exercise their market power and leverage their technology assets to change their operating model, and ultimately the operating model of all high-volume highways. Just as they led the way to the interstate system, tollways should again be market leaders and drive us to a safer and more efficient highway system.

The realization of this vision is also stymied by the erroneous notion that a tollway-as-transitway model requires a sudden shift from the current operating model to a radically new model akin to that found in a science fiction movie. The tollway-as-transitway model, however, can be rolled out gradually, using the existing electronic tolling system and toll-rate differentials to stimulate incremental adoption of the new technology necessary to build a tollway system where travel is directed by a central control network.

Just as they led the way to the interstate system, tollways should again be market leaders and drive us to a safer and more efficient highway system.

Tollways, for example, could create dedicated "safe lanes" reserved for vehicles that have a certain set of onboard electronic controls that improve safety. Likewise, they could reduce tolls for early adopters of this technology. Initially, the qualifying set of onboard technologies might be limited to a few basic controls,

such as collision-avoidance warning systems and DUI-prevention tools. Tollways would gradually increase the required feature set until the goal of a fully automated tollway system was achieved.

The tollway-as-transitway model will succeed where the public transit model has not because it permits consumers to ride in their own vehicles without having to share the space with strangers. They retain the full right to choose when and where to travel, in the vehicle of their choice. The financial burden on public agencies, in turn, is less, because private companies share much of the cost of the technology development while consumers ultimately bear the capital cost of the vehicles on the network. This model thus builds on the best features of the public transit model to speed and improve travel in private vehicles, the preferred mode of travel.

A bolder solution is for tollways to develop a new operating model that bears some resemblance to the public transit operating model. Complacency, not technology, is the biggest obstacle to making this new operating model a reality.

At first, tollways could speed the adoption of this technology by offering toll discounts and other incentives, much as the Illinois Tollway doubled the penetration rate of its I-PASS tags in a matter of months by doubling tolls for cash customers only. The value equation would flip when the combination of roadside electronics plus the second or third generation of onboard vehicle controls allowed the central control network to take over the driving responsibilities. Drivers would gladly pay a premium to have someone else do the driving, freeing up their travel time for other things, with the assurance that they would arrive at their destination more quickly and more safely than if they did the driving themselves. In this way, the tollway-as-transitway model boosts the long-term revenue potential of the tollway.

Bold Solutions

The current tollway operating model is aging and showing strains as tollways are asked to carry more commuter traffic while nearby development makes capacity expansion more difficult. One interim solution is for tollways in large metropolitan areas to collaborate with public transit systems, important niche

players in many transportation markets. A bolder solution is for tollways to once again be innovators and develop a new operating model that bears some resemblance to the public transit operating model. Again, complacency, not technology, is the biggest obstacle to making this new operating model a reality. The public's resistance to funding highways and recent improvements in public transit's market performance should be a wake-up call to our industry.

Thomas J. Bamonte is general counsel of the Illinois State Toll Highway Authority, which operates in the Chicago metropolitan region. Before joining the Illinois Tollway, he served as first deputy general counsel of the Chicago Transit Authority. The views expressed in this article do not necessarily reflect those of the Illinois Tollway or the Illinois attorney general. Tom may be reached at tbamonte@getipass.com.