Congressional Briefing Summary
June 2003

Bus Rapid Transit Systems

Expanding Transit Investment Alternatives at the Federal Level

<u>Bus Rapid Transit: Expanding Our Transportation Options</u>

Monday, June 23, 2003, 2318 Rayburn House Office Building

PANELISTS

Rex Gephart,
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Barbara Sisson
Associate Administrator, Federal Transit Administration
Patrick Mullane,
Legislative Assistant, Rep. Thomas Petri (R-WI-6th)
Bill Vincent,
General Counsel, Breakthrough Technologies Institute
Sam Zimmerman
Principal for Transportation Planning, DMJM+Harris

A New Transit Policy

Policymakers are looking at Bus Rapid Transit as a complement to current mass transit investment options, including light- and heavy-rail. The **Transportation Equity Act for the 21st Century** (TEA-21), which provides six-year funding for highway and transit programs, including Major Capital Investment "New Starts" Projects, expired on September 30th. An extension was approved through February 29th. New Starts Projects are defined under current legislation as fixed-guideway systems (like rail systems) that significantly restructure land use and congestion patterns in an urban area. As policymakers look for ways to invest in BRT, the Department of Transportation is encouraging BRT eligibility under the New Starts Program. The proposal included in the **Safe, Accountable, Flexible and Efficient Transportation Equity Act of 2003** (SAFETEA), the policy recommendation for TEA-21 reauthorization put forth by the Bush Administration, provides funding under the New Starts Program to "non-fixed guideway" systems. The Congress will consider this as it debates SAFETEA through 2003 and 2004.

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Not Just Another Bus

BRT combines vehicle design, land use planning, and technology to increase the speed, efficiency and overall attractiveness of roadway-based transit service. Panelists discussed the aesthetic and environmental characteristics that differentiate BRT from traditional bus service.

BRT decreases travel time and increases passenger volume at low cost. Relatively simple ideas have generated these improvements. For example, new vehicle designs that are low to the ground or level with boarding platforms permit quick boarding. Extra-wide doors on larger vehicles allow high-volume egress from the vehicle. Operational changes also differentiate BRT systems. These buses operate at higher frequency and make fewer stops, decreasing time spent at a stop (i.e., dwell time). Some systems also use advanced ticketing before boarding the bus. Availability of surface-level corridors is another critical element. By removing transit vehicles from regular traffic, these corridors ensure smooth flow and fast speeds. These elements decrease dwell time and increase passenger capacity to distinguish bus rapid transit systems from traditional bus systems.

BRT COMPONENTS

Intelligent Transportation Systems

1.Automatic Vehicle Location
2.Passenger Information
3.Safety
4.Security
5.Signal Priority
6.Communications
7.Advanced Fare Collection
8.Vehicle Guidance and Control

Priority Lanes

1.Tunnel Busways
2.Elevated Busways
3.Independent, At-Grade Busways
4.Freeway Busways, Bus Lanes
5.Arterial Median Busways
6.Arterial Curb, Offset

BRT system developers have worked hard to change the image of buses as slow moving vehicles by designing new models with greater passenger capacity, decreasing delay time, and making changes to street design and signalization. The operating examples presented at the briefing illustrated some of these improvements.

Overview of BRT Worldwide

Sam Zimmerman, Principal for Transportation Planning at DMJM+Harris, presented the results of research he has undertaken with the support of the Transportation Research Board to comprehensively study and compare BRT systems worldwide. Selected for the study were BRT systems in Europe, South America, North America and Australia operating in medium to large-sized cities with populations over 750,000. Mr. Zimmerman found that 15 of the world's 26 major BRT systems operate as part of multi-modal transportation networks that include fixed rail. Of these, 80 percent incorporated dedicated guideways and 70 percent distinguished BRT service from regular bus service using distinctive stations. Only 14 percent had installed advanced fare collection systems to permit fare purchases before boarding. Mr. Zimmerman found that most BRT systems combine a mixture of priority lanes, from dedicated guideways to freeway busways, arterial lanes and mixed traffic lanes. Additionally, the bus vehicles in these systems trend towards specialization to accommodate quick-loading at high volume, though there are some examples where traditional buses are also being used. Most BRT stations are designed to provide identity and image to separate them from traditional bus service, though most are mixed on amenities, passenger information and urban integration. Bus stops range from "super" bus stops to metro-like stations. Intelligent Transportation Systems (ITS) are adding to the convenience and service BRT provides over traditional bus transit, though there are few BRT systems that integrate all ITS applications. In sum, transit planners and decision makers worldwide are improving the speed, capacity and image of traditional bus service with BRT systems that fit the needs and the budget of local communities with combinations of BRT components.

Bus Rapid Transit in Los Angeles

Rex Gephart, Director of Regional Transit Planning for the Los Angeles County Metropolitan Transportation Authority (LACMTA), is coordinating the implementation of a comprehensive BRT network in the region. Up until a few years ago, excessively slow buses were creating severe dissatisfaction with public transit customers. This necessitated an increase in the number of buses to improve service. But the payback from this investment was negligible, given that these buses were stopped in traffic for more than 50 percent of their service time.

To address this problem, LACMTA decided to invest in a BRT system. It installed its first two BRT lines along the Wilshire-Whittier and Ventura Boulevard corridors. With BRT along these corridors, ridership increased between 26 and 33 percent, with one-third of this increase attributable to new riders. The incredible success of these initial two lines prompted the expansion of the deployment plan to over 300 miles of new BRT service by 2008. In making decisions on the style and characteristics of its new BRT system, Los Angeles chose a number of operational strategies and design components to increase the efficiency and appeal of its rapid transit buses. First, it was decided that these buses should operate at greater frequency and make fewer stops compared to conventional buses. To implement this strategy, the transit agency chose to install signal prioritization technology on its rapid transit buses, allowing them to delay or speed-up the changing of traffic signals when approaching an intersection, thereby minimizing stops. This service improvement has gone a long way to distinguish BRT service from traditional bus service. But to further separate rapid transit buses from conventional buses, LACMTA has established styling and design characteristics for its rapid transit buses to give BRT a distinctive image. For example, LACMTA is painting its BRT vehicles with one solid color to distinguish them from conventional buses and to signal the routes they serve. All rapid transit buses are also powered by natural gas, a cleaner-burning fuel that produces less visual and olfactory pollution. Los Angeles attributes the success of its BRT system to the integration of these details, and plans to make additional upgrades as expansions to its BRT system continue.

Los Angeles MTA
Metro Rapid Attributes*

1. Frequent Service
2. Bus Signal Priority
3. Headway-based Schedules
4. Simple Route Layout
5. Less Frequent Stops
6. Integrated with Local Bus Service
7. Level Boarding and Alighting
8. Color-coded Buses and Stations
9. **High Capacity Buses**
10. **Exclusive Lanes**
11. **Off-Vehicle Fare Payment**
12. **Bus Feeder Network**

* Bold items are in the planning and deployment stage

BRT in Europe

Patrick Mullane, legislative assistant for Congressman Thomas Petri (R-6th-WI), traveled to Europe earlier this year to see BRT systems there and understand how they could become a part of transit in the United States. The response of the European public to BRT has been very positive, and BRT programs have become a reliable backbone of transportation systems in a number of major metropolitan areas in the region.

In Belgium, the Netherlands and France, BRT systems are among the most advanced in the world. Vehicle engineers have integrated technologies and design features into their buses to give them the operational look and feel of a subway car. In the Netherlands, for example, a 60-foot articulated and 80-foot bi-articulated bus model use magnetic guidance systems to operate without a human driver. They integrate Intelligent Transportation System technologies with large passenger capacity to improve service, reliability and efficiency. They are also powered by hybrid-electric drive systems capable of accepting more than one clean-burning fuel. Europeans have developed advanced BRT vehicles and are deploying these in a growing number of metropolitan areas.

Unfortunately, Americans are experiencing more difficulty investing in bus rapid transit compared to their European counterparts. Due to the fact that a market for BRT vehicles and technologies has not existed in the United States until recently, supplies of domestically-produced advanced BRT vehicles are low. The European market, however, has been growing for some time. This low supply is keeping the price of BRT vehicles high. As a whole, Europeans have invested heavily in transit systems compared to Americans, which has served to support their rapid growth of BRT.

Mr. Mullane recognized that land use changes forced by bombing during World War II have played a decisive factor in permitting the establishment of surface transit corridors. Due to the destruction of major European cities after the war, city planners were free to install transit corridors for both fixed guideway and non-fixed guideway use. American transit planners are decidedly more restricted from doing this. The lack of valuable surface-level transit corridors in America forces transit planners to construct plans for underground corridors that require intensive heavy-rail fixed-guideway systems. Political leaders in some American cities have successfully seen these plans through.

Finally, a member of the audience identified "Buy America" provisions in federal legislation as an inhibitor of BRT investment. These provisions restrict the purchase of European BRT vehicles and technologies that are unavailable in the United States. These are much more advanced and mature than comparable American products. Some interested parties are choosing to lobby Congress and the Federal Transit Administration to confer waivers to "Buy America" provisions or to restructure the legislation altogether.

The Growing Popularity of BRT

Bus Rapid Transit has become increasingly popular in the United States as an inexpensive option for deploying high volume transit systems. According to Bill Vincent, General Counsel of the Breakthrough Technologies Institute, there is an estimated $42 billion demand for federal funds to construct transit systems, but the current annual budget only meets $1.2 billion of this. This large gap has led transit authorities, such as Los Angeles, to explore alternatives that require fewer resources.

Importantly, BRT systems can be a stepping stone for investments in more sophisticated transit systems. Transit corridors concentrate development, which improve travel patterns, decrease congestion, reduce energy consumption and improve air quality. BRT systems create corridors at relatively low cost. Establishing a corridor helps to build a rider base and facilitates the possible creation of a more sophisticated transit system, like a fixed-guideway light- or heavy-rail system in the future.

BRT systems can be implemented incrementally, which allows transit corridors to grow and expand when funds become available.

Barbara Sisson, Associate Administrator for Research, Development and Innovation for the Federal Transit Administration, explained the advantage of BRT over other transit options. Fundamentally, it is a viable, low-cost solution to pressing transit needs. Incremental implementation allows transit authorities to 'test the waters' as Los Angeles has done, without taking significant investment risks. Prior to developing its BRT system, Los Angeles attempted the construction of an underground heavy-rail transit system. Project overruns, construction failures and other problems generated substantial losses to LACMTA. With BRT, LACMTA is able to test-run transit corridors, gauge public interest and ridership, and deploy the system at a different pace for different areas. This gives BRT an advantage over more demanding transit investment options.

BRT Challenges

BRT systems face a few challenges before being widely implemented in the United States. The first is overcoming the public perception that bus rapid transit is 'just another bus' by giving BRT a new image that distinguishes it from stereotypical old, slow, dirty buses. Transit authorities need to be creative when considering this challenge and must compare the costs of public relations efforts with the inherent benefits of other transit investments.

Air quality is also a challenge. It is critical that BRT systems employ the cleanest and most advanced technology to ensure that such vehicles do not deplete local air quality – as a significant number of U.S. regions are either out of attainment or are working to maintain compliance with federal air quality standards. Cleaner vehicles are also important to improve the image of buses and to make BRT comparable to transit systems that produce zero ground-level emissions. Conventional diesel buses are a significant source of air pollution linked to respiratory diseases such as asthma, lung cancer, chronic bronchitis, heart disease and premature death.

Rail systems powered by electricity, though they emit no ground-level pollutants, also contribute to poor air quality. One-half of the nation's electricity is generated from coal-fired power plants, which are significant sources of particulate matter and other pollutants. The Breakthrough Technologies Institute recently conducted a study to examine the emissions of a rail system compared to the emissions of a BRT system. The study concluded that given the large amount of electricity generated by coal, electric rail may emit more pollutants (on a per passenger mile basis) than BRT, if the BRT system uses alternative fuels. For the sake of public health, energy consumption and the environment, it is critical that all transit systems, including BRT take advantage of fuels and efficiency technologies to reduce harmful emissions to acceptable levels.

Conclusions

BRT systems are gaining popularity in the United States. State governments and municipalities strapped by tight budgets and a need for immediate transit solutions see BRT as a viable, logical option. BRT can wield speed, efficiency and passenger volumes comparable to other mass transit options including light- and heavy rail. It is appealing due to its low cost, ease of deployment, adaptability, flexibility, and air quality benefits. As the public learns more about BRT, transit planners will work to include this as a conventional option in the range of transit investment choices.

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