Go BRT!

High Quality Rapid Transit For the 21st Century --

Breakthrough Technologies Institute – Washington, DC
Updated March 2007

Communities need rapid transit to reduce congestion, improve air quality, and provide mobility options, particularly for underserved populations. But deciding what type of service to provide can be difficult.

Heavy and light rail are popular options, but they are expensive. Traditional bus service is flexible and inexpensive, but it is often slow and saddled with a negative public image.

BRT Station in Brisbane, Australia

There is a third option. Bus Rapid Transit (BRT) combines the best features of rail with the flexibility and cost advantages of roadway transit. BRT has been successfully implemented in Australia, South America and Europe and is now gaining popularity in North America. For example, new BRT lines have opened in Los Angeles, Boston, and Oregon, and new systems are being planned or built in Cleveland, San Francisco, New York, Houston, Seattle, and many other cities.

----- What is BRT? -----

BRT is a high quality, high capacity rapid transit system that, in many ways, improves upon tradition rail transit systems. Vehicles travel in exclusive lanes, thus avoiding traffic. Passengers walk to comfortable stations, pay their fare in the station, and board through multiple doors like a train. Service is very frequent and often passengers can choose between express and local routes, an option not available on most train systems. Vehicles can be hybrid electric or CNG and in the future may be powered by zero-emission fuel cells.

"Megabus" BRT station

The following are major components of BRT, and the best systems have most or all of these features

Exclusive Lanes. These greatly increase speed and reduce travel time, thus making BRT more competitive with car travel. Unlike rail, transit vehicles can leave the exclusive lane to take

passengers directly to their destination. Exclusive lanes also can provide emergency vehicles with congestion-free routes. Exclusive lanes have been built next to highways, in the medians of arterial streets, in abandoned rail corridors, and in tunnels.

Exclusive BRT lane helps passengers bypass traffic

Exclusive lanes help ensure that BRT can meet demand in almost any US corridor. There are several BRT systems that carry more than 10,000 passengers per hour in the peak direction. Most US light rail systems carry between 1,500 and 3,000 passengers per hour in the peak direction.

Stations. Stations come in many shapes and sizes, both on the surface and underground. The best have a number of common features. First, they provide a seamless, sheltered connection to transit vehicles (see the "Megabus" photo on the previous page). Vehicle doors line up precisely with the station, enabling fast unloading and boarding. This reduces the time that the vehicle must wait in the station (known as "dwell" time). and makes the overall trip faster and more pleasant.

Second, the best stations ensure that passengers pay their fare before entering the station, rather than on the vehicle. In many recent systems, fare collection is accomplished with a smart-card reader and a turnstile at the station entrance. In other systems, particularly in the US, a "proof of payment" system is used. Rather than a turnstile, passengers must carry a fare receipt and can be fined if they are caught without the receipt.

Third, the best stations provide passengers with options to access the station without using a car.

Bogota terminal station with fare collection turnstiles and bicycle storage facility

These options include feeder bus systems and pedestrian and bicycle access.

Finally, the best stations serve as focal points for economic development. In Brisbane Australia, the air rights above a BRT station were sold so that a new building could be constructed above the station. Also in Brisbane, the BRT was put in a tunnel beneath the downtown, promoting

economic development and supporting a mixed-use, pedestrian-only mall.

In Boston, a new underground BRT system is supporting the complete redevelopment of the South Boston waterfront. Billions of dollars of new commercial and residential development has been attracted to the area, in part because of the access enabled by the new BRT system.

Planned transit-oriented development around Boston's Silver Line BRT, an underground BRT connecting the city with Logan Airport

Vehicles: The best BRT vehicles have multiple doors for entry and exit and are designed to "dock" with the station, similar to a rail system. Clean propulsion systems are available, such as hybrid-electric and CNG.

"Docked" BRT vehicle in a terminal station (Guayaquil, Ecuador)

Some vehicles even have optical or magnetic guidance, enabling them to maneuver without a driver, as well as on-board electronic information displays.

Vehicle capacities vary greatly depending on the size and design. The largest vehicles are made by Volvo and have a maximum capacity of 300 passengers. Manufacturers such as North American Bus Industries and New Flyer make BRT vehicles for US systems, such as Los Angeles, Cleveland, and Eugene, Oregon.

Service: BRT provides frequent, all day service. This service is depicted with simple, intuitive maps, not complicated bus schedules.

Sample BRT route map – Cleveland, Ohio

BRT also makes it possible to eliminate many transfers that otherwise would be required with rail technology. This is because passengers can board BRT vehicles near their homes, and these vehicles can then access exclusive lanes to provide a direct trip to the final destination. With rail, a transfer is always required at a station.

BRT also can provide passengers with the choice of express or local services. Most rail systems have only one track in each direction, making it impossible for trains to pass each other.

Intelligent Transportation Systems (ITS): BRT uses ITS systems to track vehicle locations, control traffic signals, and provide vehicle arrival information,. This information can also be provided directly to passenger cell phones.

BRT passenger information system

----- Why BRT? -----

BRT can exceed the performance of even the best rail systems at a fraction of the cost. Increasingly, the question is not "why BRT," but rather "why not BRT?" In many places, BRT is now the preferred transit mode, because it costs less and accomplishes more.

Better Quality, Better Service. A properly designed BRT system can serve more neighborhoods and provide better service than a comparably-priced rail system. Customers can choose between express and local routes and many transfers can be avoided or eliminated. Better service means more transit riders and a more sustainable city.

Providing Value for the Investment. The demand for transit construction is over $42 billion per year, according to the American Public Transportation Association. Yet, just a tiny fraction of this amount is set aside for transit in the federal budget.

BRT in Curitiba Brazil

To effectively compete for federal dollars, cities must develop cutting-edge, cost-effective transit systems. They must show the greatest value for the federal investment. Increasingly, this means finding alternatives to rail.

In the US, a typical heavy rail system can cost $200 million or more per mile to construct, and a typical light rail system can cost $70 million per mile or more. By contrast, the most expensive BRT's cost around $25 million per mile. Some very competitive systems have been built for significantly less.

In fiscal year 2007, there were only two BRT projects in the Federal Transit Administration's annual report to Congress. In fiscal year 2008, there were ten. Many cities understand that if they want to be competitive, BRT is an excellent option.

Fighting Global Warming. BRT is the best transit strategy for most US cities to reduce transportation-related CO2 emissions, according to a recent analysis published in the Journal of Public Transportation. BRT can be deployed more quickly, and in greater quantities, than rail systems. This increases opportunities to attract people out of their cars.

Moreover, most rail systems receive their electricity from power plants that burn fossil fuels, the leading source of CO2 emissions in the United States. More than 50 percent of the electricity generated in the United States comes from coal-fired power plants, and coal consumption is increasing substantially.

An electric transit system powered by coal and other fossil fuels has greater CO2 emissions than a modern BRT system, and BRT has much greater potential to reduce CO2 emissions over the long-term. That's why BRT was the first, and so far the only, mass transit technology certified under the Kyoto Protocol.

----- Conclusion -----

BRT is "Better Rapid Transit." It is the best option available to restore high quality transit service, attract people out of their cars, and fight global warming. BRT can be built in phases, providing almost immediate relief and offering cost-effective future expansion options. It also attracts transit-oriented development.

For more information, visit www.gobrt.org, where you can search a database of BRT systems around the world, view a film about BRT, subscribe to a free newsletter, download reports and presentations, and learn more about our program. We are an independent, non-profit, environmental organization. We are promoting BRT because it is the best transit option available to improve the environment, enhance mobility, and promote more livable cities.