

## TRANSIT STRATEGIES

# RAPID BUS

Over the past decade, much attention has been placed on the development of Bus Rapid Transit (BRT) systems. These systems provide rail-like service, but with buses, and are typically less expensive to construct than rail service. However, while costs are lower than rail, BRT systems can still be expensive. Implementation times can also be long.

In order to provide many of the benefits of BRT service, many transit systems—including Los Angeles Metro, the San Francisco Bay Area’s AC Transit, and Kansas City’s KCATA—have begun operating “Rapid Bus” services.<sup>1</sup> This type of service includes the elements of BRT that can be implemented on existing roadways at a lower cost and in a much shorter timeframe. Rapid Bus can also be a first step toward full-featured BRT.

## RAPID BUS BENEFITS

While BRT represents a middle ground between light rail service and regular bus service, Rapid Bus represents a middle ground between BRT and regular bus. The service benefits are not as significant as with BRT but are still very meaningful compared to regular bus service:

- **Service Quality:** Rapid Bus is faster, more convenient, more comfortable, and more attractive than regular bus service.
- **Higher Ridership:** Because it is more attractive, Rapid Bus can significantly increase ridership over regular bus service. LA Metro’s first two Metro Rapid lines increased ridership by 49%, AC Transit’s Rapid service on San Pablo Avenue increased ridership by 66%, and Kansas City’s first MAX line increased ridership by over 50%.
- **Very Affordable:** The cost to implement Rapid Bus service is relatively low and consists of moderately higher costs for vehicles and premium stations/stops. Operating cost increases can be limited to the additional service required to serve the new riders.
- **Image:** Well-branded Rapid Bus services, like BRT, attract favorable attention to themselves and also to other available transit services.

### RAPID BUS VERSUS BUS RAPID TRANSIT

	Rapid Bus	BRT
Unique Identity for Service	✓✓	✓
Premium Stations	✓✓	✓✓
Frequent Service	✓✓	✓✓
Headway-Based Schedules	✓✓	✓✓
Simple Route Layout	✓✓	✓✓
Less Frequent Stops	✓✓	✓✓
Integration with Local Bus Service	✓✓	✓✓
Transit Signal Priority	Sometimes	✓✓
Queue Jump Lanes	Sometimes	✓
Exclusive Bus Lanes		✓✓
Level Boarding and Alighting		✓✓
High Capacity Buses		✓✓
Off-Vehicle Fare Payment		✓✓

<sup>1</sup> Especially in the United States, many premium bus services, including most of those described in this document, are marketed as “BRT” even though they lack important BRT elements such as dedicated bus lanes. This document uses the term “Rapid Bus” for premium bus services that provide meaningfully better service than regular bus services but fall short of full-featured BRT.

## RAPID BUS SERVICE

Like BRT, Rapid Bus is popular with passengers for a number of reasons, the most important of which is that service is significantly faster than regular bus service and is frequent, direct, and often operates from early morning to late night. These attributes make service convenient—much better than regular bus service—and more competitive with travel by automobile.

- ➔ **Frequent service, typically every 10 minutes or less**
- ➔ **Long span of service**
- ➔ **Faster service, not as fast as BRT but faster than regular bus**
- ➔ **Direct, operating along major arterials and without deviations**

Also, like BRT, a key reason that service is faster is that stations are spaced further apart than with local bus service—typically two to five stops per mile. This avoids the delays (and discomfort) due to frequent stops and starts and, similar to light rail, experience has shown that more passengers would rather walk farther to fast service than a shorter distance to slow service.

When the Rapid Bus concept was first developed, Rapid Bus was implemented in addition to regular local service. Now, however, many transit systems are using Rapid Bus as a replacement for regular local bus service. Kansas City's KCATA originally developed its Main Street MAX service with underlying local service that it recently discontinued in favor of more MAX service. Providence's RIPTA, which originally planned to develop its new R-Line service with widely-spaced stops and underlying local service, shifted to slightly more closely-spaced stops and all R-Line service. This type of approach improves the cost-effectiveness of Rapid Bus service by limiting operating cost increases to the amount of new service required to serve new passengers.

## RAPID BUS ELEMENTS

Rapid Bus is a combination of a number of elements, albeit a more limited number than BRT, all of which work together to produce more attractive service:

- **Unique Identity** to increase the service's visibility and differentiate it from "regular" bus service.
- **Premium Stations** that provide similar features, amenities, and levels of passenger comfort as BRT stations.
- **Real-Time Passenger Information** to inform passengers when buses will arrive or depart from stations, which reduces much of the uncertainty that is associated with bus service.
- **Intelligent Transportation System Technologies**, such as automatic vehicle location, which can be used to maintain consistent spacing between buses and to keep them on schedule.

### Best Practice: Metro Rapid LA Metro, Los Angeles

LA Metro's service, which is called "Metro Rapid," was the first Rapid Bus service in the United States and now consists of nine lines. As described by LA Metro, the most important attributes of this service are:

- Simple route layout: Makes it easy to find, use, and remember.
- Frequent service: Buses arrive as often as every 3-10 minutes during peak commuting times.
- Fewer stops: Stops spaced about three-quarters of a mile apart, like rail lines, at most major transfer points.
- Level boarding: Low-floor buses speed up dwell times.
- Bus priority at traffic signals: Technology reduces traffic delay by extending the green light or shortening the red light to help Metro Rapid get through intersections.
- Color-coded buses and stops: Metro Rapid's distinctive red paint makes it easy to identify Metro Rapid stops and buses.
- Enhanced stations: Metro Rapid stations provide information, lighting, canopies, and "Next Trip" displays.



Metro Rapid service has reduced travel times by as much as 29%, which has increased ridership by up to 40%. One-third of the increase represents new riders who had never before ridden transit and previously used automobiles.

### Best Practice: Rapid AC Transit, Oakland, CA

AC Transit's definition of Rapid Bus service is similar to LA's:

- Headway-based schedules with maximum 12-minute headways.
- Stops one-half to two-thirds of a mile apart on average.
- As many stops far side as possible.
- Traffic signal coordination, transit signal priority, and queue jump lanes.
- Recognizable shelters, with Rapid branding and bus arrival information signs.
- Recognizable vehicles, with Rapid branding and features, which reduced dwell times.



AC Transit's first Rapid Bus route (72R San Pablo) went into service in June 2003. Travel times were reduced by 17%, and ridership on the Rapid Bus route is 66% higher than on the local route that it replaced. Total corridor ridership has increased by 20%.

- **Effective Connections** with other transit and surrounding areas.
- **Transit Priority**, such as signal priority and queue jump lanes to speed buses through intersections.

These measures work together to make service fast and reliable, to make it convenient and comfortable service, and to establish a strong image and identity for service.

## UNIQUE IDENTITY

In the same manner as BRT, unique branding provides Rapid Bus service with a distinct identity that produces clear and positive public recognition. With Rapid Bus, the most common strategy is to brand buses, which are usually standard transit vehicles, and stations.

Examples include Kansas City's MAX, Oakland's Rapid, Seattle's RapidRide, Albuquerque's Rapid Ride, Fort Worth's Spur, and LA's Metro Rapid. Santa Monica's Big Blue Bus Rapid service, which operates in some of the same areas as LA's Metro Rapid service, uses the Rapid name and logo for its Rapid Bus service.

## PREMIUM STATIONS

Rapid Bus services typically have stations that are the same as BRT services (see examples on next page), with specific design features that vary depending upon passenger volumes, location, type of facility, and available space.

### BRANDING: KANSAS CITY MAX, AC TRANSIT RAPID, AND LA METRO RAPID



## TRANSIT SIGNAL PRIORITY

Signal priority modifies normal traffic signal operation to facilitate the movement of transit vehicles by changing the signal to green early or extending the green signal until the bus passes through. This significantly reduces signal delays, and can reduce bus travel times by 5% to more than 20%. Signal priority is often implemented in conjunction with queue jump lanes (see below).

SEATTLE RAPIDRIDE STATION



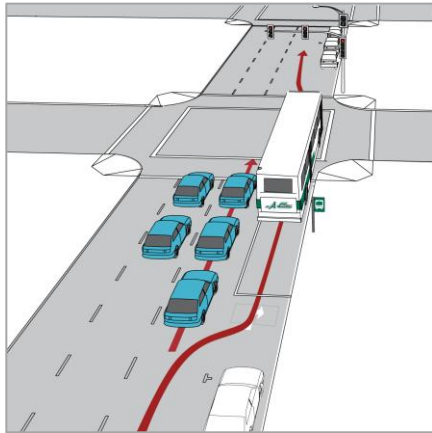
KANSAS CITY MAX STATION



## QUEUE JUMP LANES

Whereas full BRT service operates largely in exclusive bus lanes, Rapid Bus service typically operates in mixed traffic. However, in congested areas, Rapid Buses often use queue jump lanes, which are short stretches of bus lane that enable buses to bypass queued vehicles at traffic signals. Queue jump lanes are often combined with signal priority, where the queue jump lane is provided a green signal before the general traffic lanes.

QUEUE JUMP OPERATION



QUEUE JUMP LANE (CHANDLER, AZ)



## REAL-TIME PASSENGER INFORMATION

Real-time passenger information at stations and stops can inform passengers when buses will actually arrive or depart from that location, which reduces some of the uncertainty often associated with bus service.

## INTELLIGENT TRANSPORTATION SYSTEMS

Reductions in waiting time and more reliable service can make transit service much more attractive. Automatic vehicle location (AVL) systems can be used to manage bus service to regularize the intervals between buses, thereby minimizing passenger waiting time. AVL can also be used to provide real-time bus status information, which can reduce customer anxiety while waiting.



TICKET VENDING MACHINES (NEW YORK CITY SELECT BUS)



REAL-TIME SCHEDULE INFORMATION (SEATTLE RAPIDRIDE)



## EFFECTIVE CONNECTIONS

Effective Rapid Bus services should also be well connected to other transit services and the surrounding environment. Major Rapid Bus lines, like BRT and rail lines, can become a fundamental transit system backbone. Like all transit services, most passengers will access Rapid Bus lines by walking; therefore, effective pedestrian connections between BRT lines and the areas they serve are critical. Comfortable pedestrian access becomes even more important when Rapid Bus service operates along fast and wide arterials, which is often the case.

Bicycles can extend the reach of Rapid Bus services, and external bicycle racks are now commonly included on buses. Bike share stations at Rapid Bus stations can provide additional opportunities for multimodal connections.

## KEYS TO SUCCESSFUL RAPID BUS

The development of successful Rapid Bus service consists of packaging the elements described above to provide service that is **Convenient**, **Comfortable**, **Memorable**, and **Connected**.

What?	How?
<b>CONVENIENT</b> Fast Direct Frequent Long hours Real-time passenger information	<ul style="list-style-type: none"> <li>• Attractive service plan</li> <li>• Limited stops</li> <li>• Queue jump lanes</li> <li>• Transit signal priority</li> <li>• Web and station-based real-time information</li> </ul>
<b>COMFORTABLE</b> Attractive and secure waiting environment	<ul style="list-style-type: none"> <li>• Stations and stops with high-quality amenities</li> <li>• Stations as mobility hubs</li> </ul>
<b>MEMORABLE</b> Highly visible Easy to recognize Easy to understand	<ul style="list-style-type: none"> <li>• Branded buses</li> <li>• Branded stations/stops</li> <li>• Simple service structure</li> <li>• Clockface schedules</li> </ul>
<b>CONNECTED</b> To other transit With other modes With surrounding environment	<ul style="list-style-type: none"> <li>• Bus/rail connections</li> <li>• Pedestrian access/street crossings</li> <li>• Bicycle connections/bikeshare</li> </ul>

## POTENTIAL NASHVILLE RAPID BUS SERVICES

Nashville MTA has already developed three Rapid Bus services, called “BRT Lite,” in the Gallatin, Murfreesboro, and Charlotte corridors. These services feature premium shelters, real-time information at stations, and transit signal priority. These three services, plus Rapid Bus services from other cities, can provide a model for how other arterial service could be upgraded in areas where ridership levels may not warrant an investment in full-featured BRT. Additional upgrades to the Gallatin, Murfreesboro, and Charlotte corridors could further improve MTA’s BRT Lite services. For example, a more distinctive brand could be developed, and slightly closer station spacing could provide the ability to convert more or all local service to Rapid Bus service.