

## Transit Strategies – Transit Modes

# Rapid Bus

**Rapid Bus provides faster, more reliable, more convenient, and more attractive service than regular buses – at a significantly lower cost than Bus Rapid Transit and Light Rail.**

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

REGULAR BUS	RAPID BUS	BUS RAPID TRANSIT (BRT)
<p><b>TYPICAL FEATURES</b></p> <ul style="list-style-type: none"> <li>• No special branding</li> <li>• Frequent stops</li> <li>• Wide range of stop facilities – from very basic to elaborate</li> <li>• Wide range of service frequencies – from very infrequent to very frequent</li> <li>• Wide range of service spans – from early morning to late night to only a few trips</li> </ul>  <p>Trinity Metro local bus service</p>	<p><b>TYPICAL FEATURES</b></p> <ul style="list-style-type: none"> <li>• Special branding</li> <li>• Simple service design</li> <li>• Limited stops</li> <li>• Enhanced stops/stations</li> <li>• Frequent service (at least every 15 minutes)</li> <li>• Service from early morning to late night</li> <li>• Real-time passenger information</li> </ul> <p><b>OTHER COMMON FEATURES</b></p> <ul style="list-style-type: none"> <li>• Unique vehicles, including high-capacity buses</li> <li>• Queue jump lanes</li> <li>• Transit signal priority</li> <li>• Off-board fare collection</li> </ul>  <p>Los Angeles Metro Rapid service</p>	<p><b>TYPICAL FEATURES</b></p> <ul style="list-style-type: none"> <li>• Special branding</li> <li>• Simple service design</li> <li>• Limited stops</li> <li>• High quality stations</li> <li>• High-capacity buses</li> <li>• Exclusive bus lanes</li> <li>• Transit signal priority</li> <li>• Very frequent service (at least every 10 minutes)</li> <li>• Service from early morning to late night</li> <li>• Real-time passenger information</li> </ul> <p><b>OTHER COMMON FEATURES</b></p> <ul style="list-style-type: none"> <li>• Unique vehicles</li> <li>• Level platform boarding</li> <li>• Off-board fare collection</li> </ul>  <p>Cleveland Healthline BRT service</p>

## Benefits of Rapid Bus Service

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 significant compared to regular bus service:

<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.

- **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%.
- **Affordability:** 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.

### Rapid Bus in Fort Worth: The Spur\*

Trinity Metro developed the Spur\* as its first enhanced service. The Spur\* has many features of Rapid Bus service, including a unique identify, articulated buses, enhanced stations, and signal priority to expedite the transit vehicle's travel time through traffic lights. In many respects, it can be considered Rapid Bus service. However, many Rapid Bus services also include a variety of other features such as off-board fare collection, queue jump lanes, and short sections of bus lanes.



- **Image:** Well-branded Rapid Bus services, like BRT, attract favorable attention to themselves and also to other available transit services.

## 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 because it 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 farther 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. Rhode Island'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. 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. 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.
- **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.

*Branding: Kansas City MAX, AC Transit Rapid, and Fort Worth Spur*



### 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.

*Seattle RapidRide Station*



*Kansas City MAX Station*



## 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).

## 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 Lane in New York City*



## 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.

## Ticket Vending Machines

Fare payment is a significant cause of bus delays. The shifting of fare payment from on-board the vehicle to before passengers board speeds service by eliminating on-board fare payment delays.

## 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 maintain regular 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. Currently in Fort Worth, customers can access real-time arrival information using Trinity Metro's Nextbus app.

*Ticket Vending Machines (NYC)*



*Real-Time Schedule Information (Seattle)*



## Effective Connections for First/Last Mile

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> Frequent and fast Direct 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>

## Rapid Bus Examples

### LA Metro Rapid, Los Angeles, CA

*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.*

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.

#### LA Metro Rapid Service



- **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 Transit A Line, Minneapolis-St. Paul, MN

*In the first full year of operation, weekday ridership on the A Line corridor increased by 31% and travel speeds increased by around 20%*

Minneapolis’ A Line is the first line of a long range plan to transform 11 high ridership bus routes into Rapid Bus lines. Metro Transit pursued Rapid Bus, rather than BRT, after identifying that traffic delays were just 3% of total bus travel time on the corridor – compared to 55% of total travel time spent boarding passengers or waiting at red lights.

### *Metro Transit A Line*



The A Line includes almost all Rapid Bus best practice elements: 10-minute all day service, enhanced stations spaced every half mile, transit priority, and real-time information. Stations feature off-board fare collection and curb extensions.

Metro Transit maintained a local underlay service with closer stops, and as a result provides more service on the corridor than it did before the A Line began operation.

## King County Metro RapidRide, Seattle, WA

*RapidRide reduced travel times by up to 19%, increased overall service reliability to 85%, and increased ridership by 43% in four years.*

King County Metro operates a six route, 62-mile long Rapid Bus network, with plans for seven additional routes by 2027. All routes run at least every 10 minutes during rush hours, and most run at least every 15 minutes off- peak and on weekends.

*King County Metro RapidRide Service*



RapidRide service is provided with 60-foot articulated buses with three doors, low floors, real-time information screens, and highly visible branding. RapidRide corridors have transit signal priority, queue jumps, and stops with enhanced amenities.

On some corridors, local service was maintained and RapidRide stops were spaced farther apart (around 2 stops per mile). On other corridors, RapidRide service completely replaced local service, with stops spaced closer together (3 stops per mile).

**KC Ride MAX, Kansas City, MO**

*Main Street MAX and Troost MAX operate 20% faster than previous local bus services.*

KC Ride upgraded two of its highest ridership bus routes to Rapid Bus – implementing Main Street MAX in 2005 and Troost MAX in 2011. It is currently upgrading a third line, which will be Prospect MAX.

*KC Ride MAX Service*



*Over 80% of Troost Avenue businesses reported increased store traffic after the MAX line began operations.*

MAX lines stop every four to six blocks, instead of every one to two blocks, and have transit signal priority to speed up service. MAX Street MAX also has some areas with dedicated bus lanes. MAX stations have upgraded shelters, real-time service information, community art installations, and green infrastructure such as solar-powered lighting and rainwater filtration systems.

## New York City Transit Select Bus Service (SBS)

*SBS routes have mostly outperformed other bus routes in terms of ridership and speed in an extremely challenging operating environment. Overall, SBS routes operate 20% faster than local bus routes. SBS routes also have better ridership performance than the network overall, and have seen ridership growth between 15% and 30% in the Bronx and Staten Island*

Since, 2008, New York City has converted 18 bus routes to Rapid Bus, branded as Select Bus Service (SBS), since 2008.

### NYC Select Bus Service



These routes employ a wide, but inconsistent, range of Rapid Bus improvements – including a simple service design, wider stop spacing, off-board fare collection, and transit signal priority. Some SBS routes also have extensive curbside bus lanes, but the City has had difficulty with enforcement.

## Rapid Bus in Fort Worth

Rapid Bus is most effective in high ridership corridors, especially on streets where demand for transit is high, but not high enough to support Bus Rapid Transit or light rail. In some cases, Rapid Bus improvements can be a precursor to future BRT investments, especially curbside bus lanes. Many communities also choose to implement Rapid Bus on streets where there is not enough room for dedicated bus lanes, or where delays mostly come from red lights and passenger loading, rather than congestion.

Putting in place Rapid Bus could significantly improve transit service in the Fort Worth area in a way that can be implemented quickly and at a relatively low cost. Some existing transportation corridors can be improved through switching local bus service to Rapid Bus service, while in other areas of the city, new corridors can be created with new Rapid Bus lines.

The 89-SPUR East Lancaster bus route is one potential starting point for Rapid Bus service, as it already has many Rapid Bus elements. The route also has the highest ridership in the system and operates at a high frequency on weekdays and moderate frequencies on weekends. The span is also relatively long, operating from before 6 AM to after 10 PM every day.

Other potential locations for Rapid Bus include “High Frequency Transit Corridors” identified by various stakeholders, shown in the map above. Some of the corridors featuring higher density and ridership call for light rail or BRT to meet the potential demand. Most other corridors can be adequately serviced by Rapid Bus at first. Since Rapid Bus is a highly flexible strategy, it allows for staged implementation and even eventual conversion to BRT based on available resources and roadway constraints.

*Potential High Frequency Transit Corridors*

