

## What is Bus Rapid Transit?

This section of the staff report provides a description of several BRT components, including transitway types, operational improvements and station enhancements.

### Transitway Types

Transit service can be provided via a variety of transitway types: a dedicated two-lane median transitway, a dedicated one-lane median transitway (to accommodate transit service in one direction or in both directions), dedicated curb lanes transitway, or running in mixed traffic. The transitways can be mixed and matched along the corridor to provide the best solution within the existing constraints and needs of the area. These transitway types are described in more detail below.

#### Dedicated Two-Lane Median Transitway

Two lanes located in the center of the roadway that are dedicated for use by the BRT vehicle and may be physically separated from traffic by a raised curb or median. Median BRT lanes minimize conflicts with general purpose traffic lanes and allow the BRT vehicle to travel with faster speeds and greater travel time reliability. To avoid conflicts with BRT vehicles, general traffic is only permitted to make left turns at signalized intersections. Two-lane median transitways require the most space and are therefore the most costly and impactful to implement. An example of a two-lane median transitway is the Metroway on US 1 in Alexandria.



The Metroway BRT Service Operates in a Two-Lane Median Transitway

## Dedicated One-Lane Median Transitway

Multiple types of BRT operations are being considered utilizing a single BRT lane, including: bi-directional, fixed direction, and reversible transit operations.

In bi-directional operations, BRT vehicles traveling in both directions share a single dedicated lane in the center of the roadway. Since the BRT vehicles travel within this one lane in both directions, passing zones are created, generally at station locations, so BRT vehicles moving in opposite directions do not conflict with each other.

In fixed-direction operations, a single median BRT lane is used solely by the BRT vehicles in one direction. The BRT vehicles travel in general purpose traffic lanes in the other direction.

In reversible-direction operations, the direction of the BRT vehicle in the one-lane median varies depending on the time of day. BRT vehicles traveling in the peak direction use the median BRT lane and BRT vehicles traveling in the non-peak direction use the general traffic lanes. An example of a one-lane median transitway is the Emerald Express in Eugene, Oregon.

One-lane median transitways are most appropriate on roadways where the directional split of travel varies by the time of day. In the peak direction it provides fast speeds and reliability but is less costly and impactful than two-lane median transitways. On roads where the directional split of travel is balanced, one-lane median transitway result in slower speeds and less travel time reliability for the direction of travel that uses general traffic lanes.



A One-Lane Median Transitway in Eugene, Oregon (Credit: Google Maps)

## Dedicated Curb Lanes Transitway

The lanes adjacent to the curb are used exclusively by the BRT vehicle, local buses, and right-turning vehicles. The roadway surface may be painted or otherwise marked to reinforce the lane designation. Similar to the median guideways, multiple types of dedicated curb lane operations are being considered including two lanes (one on each side of the roadway), and one curb BRT lane in locations where existing constraints make additional widening impactful and where off-peak BRT vehicles can efficiently operate in mixed traffic. This transitway is less costly and impactful than the two-lane and one-lane median transitways, but speed and travel time reliability will suffer due to right turning vehicles and non-recurring congestion. An example of a curb lane transitway is in Washington, DC.



Curb Lane Transitway in Washington, DC

## Mixed Traffic

The BRT vehicle travels in the same lanes as traffic. It would not have lanes dedicated for its use.

## Operational Improvements

### Transit Signal Priority

Transit Signal Priority (TSP) gives priority to BRT vehicles when certain conditions are met by either extending a green light or shortening a red light by a few seconds to allow an approaching BRT vehicle to pass through the intersection. TSP was implemented on the MD 355 corridor between Medical

Center and the Lakeforest Transit Center as part of Ride On extRa service and on US 29 as part of the US 29 Flash service implementation in 2020.

## Queue Jumps

Queue jumps are a short section of widened roadway or an existing right turn lane to allow BRT vehicles to bypass congestion or delays at intersections. In most applications, queue jumps are used in conjunction with TSP to provide a lane and dedicated BRT signal that allows BRT vehicles to enter an intersection and “jump” ahead of the other vehicles stopped at the light. In some locations where constraints allow, the roadway is widened to provide a receiving lane that allows the BRT vehicle to merge into traffic beyond the signal. This is beneficial if there is no “BRT Only” signal phase.

## Transit Vehicles

### Premium Transit Vehicles

BRT vehicles offer a higher quality of service than typical transit vehicles.



US 29 Flash Vehicle (Photo Credit: MCDOT)

## Level Boarding

Like Metrorail, BRT services often provide level boardings, which allows persons with mobility challenges to board the BRT vehicle more easily.



Level Boardings on the US 29 Flash (Photo Credit: MCDOT)

## Station Enhancements

### Enhanced Stations

BRT services include enhanced stations with weather protection, seating, lighting, off-board fare collection, real time information displays, landscaping/hardscaping and bicycle accommodations.



An Enhanced Station on the US 2 Flash (Photo Credit: Montgomery Planning)

## Off-Board Fare Collection

Like Metrorail, BRT services collect fares from passengers before they board the vehicle, to reduce travel time delay.



Off-Board Fare Collection on the US 29 Flash (Photo Credit: MCDOT)