

1. WHAT IS BUS RAPID TRANSIT?

Bus Rapid Transit, or BRT, is a high-quality and high-capacity bus-based transit system that delivers reliable, comfortable, convenient and branded transit service. Because BRT contains features similar to light rail or the Metrorail system, it is more reliable, comfortable and convenient than local bus services and can avoid the causes of delay that slow Metrobus and RideOn and the reliability issues that make these bus services often less desirable than Metrorail.

Internationally, BRT is a proven high-quality transit service that offers the benefits of light rail at far less cost. In the United States the record of BRT is mixed. This is because BRT is often compromised to reduce impacts to traffic and private property and to reduce costs. To achieve the full promise of BRT service, each of the four performance characteristics described below must be met:

1. **Reliability.** High-quality BRT service makes travel predictable. This is the main advantage of BRT service over travel by private vehicle and is critical to encouraging motorists to switch to transit. The main feature that achieves reliability is the dedicated transitway. Dedicated transitways are bus-only lanes that ensure that bus travel times are predictable from day to day by reducing the impacts of non-recurring congestion (congestion that cannot be anticipated because it is caused by irregular incidents such as road work, collisions and vehicle breakdowns).
2. **Comfort.** High-quality BRT service includes amenities that reduce the stresses of travel and enables people to use their time more productively. Features that create a high-quality level of comfort include:
 - Premium transit vehicles
 - Enhanced stations
 - Real time information
 - Off-board fare collection
 - WiFi
3. **Convenience:** High-quality BRT service transports passengers to places quickly and provides Metrorail-like service frequency so that passengers do not have to consult a schedule; upon arrival at the station they can expect the BRT vehicle to arrive within a few minutes. Features that create a BRT level of convenience include:
 - Dedicated transitways
 - Transit signal priority
 - Queue jumps
 - Frequent / all-day transit service
 - Off-board fare collection
 - Level boarding
4. **Branded:** High-quality BRT creates a distinctive transit service – much like Metrorail – that is recognized and distinguished as reliable, comfortable and convenient. Distinctive features include:
 - Dedicated transitways
 - Premium transit vehicles
 - Enhanced stations
 - Frequent / all-day transit service

2. GLOSSARY OF BRT COMPONENTS

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

2.1. 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.

2.1.1. 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

2.1.2. 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.

Attachment B: Overview of Bus Rapid Transit

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

2.1.3. 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

2.1.4. Mixed Traffic

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

2.2. Operational Improvements

2.2.1. 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.

2.2.2. 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.

2.3. Transit Vehicles

2.3.1. Premium Transit Vehicles

BRT vehicles offer a higher quality of service than typical transit vehicles. They are similar to light rail vehicles in that they provide multiple doors for efficient boardings and alightings, wifi and power outlets, and bicycle storage on board.



US 29 FLASH Vehicle (Photo Credit: MCDOT)

2.3.2. Level Boarding

Like Metrorail, BRT services provides 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)

2.4. Station Enhancements

2.4.1. 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 29 FLASH (Photo Credit: Montgomery Planning)

2.4.2. 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)

3. MONTGOMERY COUNTY'S PLANNED PREMIUM AND ENHANCED TRANSIT NETWORK

Montgomery County's existing and planned transit network includes enhanced and premium transit services.

3.1. Planned Premium Transit Network

The county's premium transit network includes commuter rail, metro, light rail, bus rapid transit and enhanced bus services:

- Existing services: MARC Brunswick Line, WMATA Red Line and US 29 FLASH.
- Under Construction: Purple Line
- Under Design: Upgrades to US 29 FLASH, MD 355 BRT, University Blvd BRT and Veirs Mill Road BRT
- Under Study: New Hampshire Ave BRT, North Bethesda Transitway BRT
- Planned: Georgia Ave BRT, Randolph Rd BRT, Red Line Extension

The extents, transit mode and status of each service is described below.

Line	From	To	Transit Mode	Status
Brunswick Line	Martinsburg	Union Station	Commuter Rail	Existing
Georgia Ave	Montgomery General Hospital	District of Columbia Line	Bus Rapid Transit	Planned
MD 355	Clarksburg Outlets	Bethesda Purple Line Station	Bus Rapid Transit	Under Design
New Hampshire Ave	Colesville Park and Ride	Fort Totten Metrorail Station	Bus Rapid Transit	Under Study
North Bethesda Transitway	North Bethesda Metrorail Station	Montgomery Mall Transit Center	Bus Rapid Transit	Under Study
Purple Line	Bethesda Station	New Carrollton Metrorail Station	Light Rail	Under Construction
Randolph Road	White Flint Metrorail Station	US 29	Bus Rapid Transit	Planned
Red Line	Shady Grove Metrorail Station	Glenmont Metro Station	Metro	Existing
Red Line Extension	Germantown Transit Station	Shady Grove Metrorail Station	Metro	Planned
University Blvd	Wheaton Metrorail Station	Takoma / Langley Transit Center	Bus Rapid Transit	Partially Under Design
US 29 FLASH	Burtonsville Park & Ride	Silver Spring Transit Center	Bus Rapid Transit	Existing, Upgrades Under Study
Veirs Mill Road	Rockville Metrorail Station	Wheaton Metrorail Station	Bus Rapid Transit	Under Design

3.2. Planned Enhanced Transit Network

The county’s enhanced transit network includes the Corridor Connectors, which maximize the potential of the MD 355 BRT and Veirs Mill Road BRT projects by providing branches of additional dedicated bus lanes that feed into these services to serve communities and employment centers along the I-270 corridor.

Line	From	To	Transit Mode	Status
Life Sciences Connector	Fallsgrove Blvd	Key West Ave	Bus	Planned
Crown Connector	Gaithersburg City Limits	Medical Center Dr	Bus	Planned
Great Seneca Connector	Medical Center Dr	Great Seneca Hwy	Bus	Planned
Lakeforest / Montgomery Village Connector	Gaithersburg City Limits	Club House Rd	Bus	Planned
Germantown Connector	Bowman Mill Dr	Frederick Rd	Bus	Planned
Manekin West Connector	Germantown Rd	Observation Dr	Bus	Planned
Milestone / COMSAT East Clarksburg Connector	Germantown Rd	Stringtown Rd	Bus	Planned

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