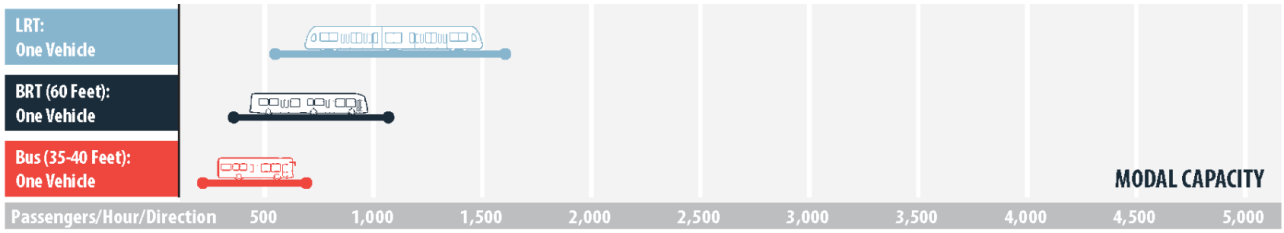
Glossary

Transit Mode

- ***Bus Rapid Transit (BRT)***
  - A rapid mode of transportation that can provide the quality of rail transit and the flexibility of buses
  - A flexible, permanently integrated high-performance system with a quality image and a strong identity
  - BRT is a high-quality bus-based transit system that delivers fast and efficient service that may include dedicated lanes, busways, traffic signal priority, off-board fare collection, elevated platforms and enhanced stations.[1]
- ***Regular Bus***
  - A conventional bus system that operates with frequent stops, mixed-flow operations with general traffic, on-board fare collection, and variable stop types/amenities.

Transit Vehicle

- ***Rigid-bodied Bus:***
  - Average 40 ft long
- ***Articulated Bus:***
  - Average 60 ft long, comprises two or more rigid sections linked by a pivoting joint (articulation) enclosed by protective bellows inside and outside and a cover plate on the floor.
  - allows a longer legal length than rigid-bodied buses, and hence a higher passenger capacity (94–120), while still allowing the bus to maneuver adequately.
- ***Conventional Bus Fuel System***
  - Propelled using an internal combustion engine with fuels, such as diesel or compressed natural gas (CNG)
  - Releases greenhouse gas emissions and smog-producing pollutants
- ***Battery Electric Bus***
  - Propelled using electric motors as opposed to an internal combustion engine
  - Can store the needed electricity on-board, or be fed continuously from an external source
  - Offers zero-emission and quiet operations
- ***Modal Capacity***
  - Number of passengers moved along a corridor segment per hour by a transit vehicle (e.g., light rail transit, articulated bus, rigid-bodied bus); also known as person throughput when compared with non-transit mode



[1] https://www.transit.dot.gov/research-innovation/bus-rapid-transit

- ***Right- and/or Left-side Boarding/Alighting***
    - Conventional buses only have doors on the right-side of a transit vehicle, which limits the bus stop platform to the curbside of a street for right-side boarding/alighting only.
    - BRT, like rail, has doors on both sides of a transit vehicle, allowing passengers to board and alight on either side depending on where the bus stop platform is located (curbside or median).

Bus Service

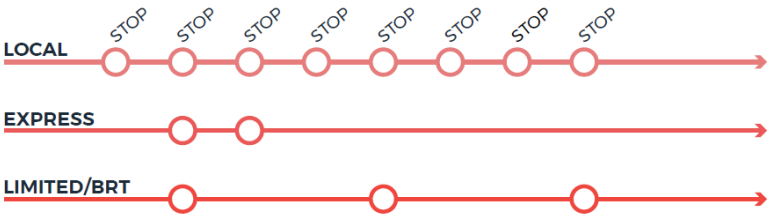
- ***Local Service***
    - Local bus service is primarily characterized by frequent stops (shorter stop spacing compared to BRT), mixed-flow on-street operations, and varying stop types and amenities.
- ***BRT Service***
    - BRT service is characterized by longer stop spacing, dedicated or semi-dedicated bus lanes, strong identity, and enhanced and consistent station infrastructure and amenities among other features.

Local

- On-street
- Frequent stops
- Variable stop types
- On-board fare collection

BRT

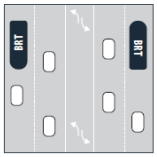
- Arterial or freeway treatments
- Dedicated or semi-dedicated lanes
- Longer stop spacing
- Enhanced stations
- Off-board fare collection



BRT Running Way

- ***Busways***
    - Road or guideway dedicated to Buses
- ***Arterial Street Running way***
    - ***Mixed Traffic Lane***
        - Right
        - Left
    - ***Business Access Transit (BAT) Lane:***
        - Curbside
        - Median
    - ***BRT Exclusive***
        - Median Lane
        - Offset Side Running Lane
        - Bidirectional/Reversible Flow Lane

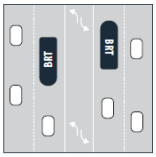
Glossary



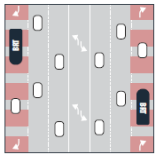
Mixed Traffic Right Lane

BRT in mixed traffic at curb or in left lane

- Preserves on-street parking (if left lane)
- Cost effective and useful for existing and forecasted moderate volume traffic
- Provides smoother ride for transit vehicle and avoids "side friction"
- Required testing for BRT vehicle docking and merge at stations
- Requires travel time comparison to median running exclusive lanes
- **WSP developed the cutting-edge Left Lane Mixed Traffic concept**



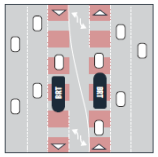
Mixed Traffic Left Lane



Curbside Business Access Transit (BAT) Lane

Semi-exclusive lane for the BRT vehicle

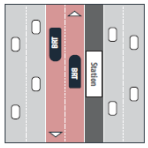
- Allows general traffic right turns at business driveways and intersections
- Allows curbside stations to integrate with sidewalk, reducing right-of-way (ROW) needs
- Can be left-side running on one-way corridors



Median Business Access Transit (BAT) Lane

Semi-exclusive lane for the BRT vehicle

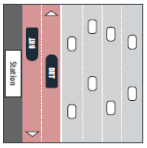
- Allows general traffic left turns at intersections
- Restricts left turns across BRT lane at locations where left-turn lanes aren't provided
- Provides smoother ride in left lane for the transit vehicle and avoids "side friction" with curb lane
- **WSP is using this new cutting-edge concept and is currently applying it in the IndyGo Purple Line design**



BRT Exclusive Median Lane

Most exclusive and ideal typical section for transit travel time savings and performance

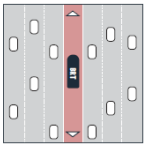
- Typically converts existing left travel lanes to BRT exclusive lanes
- Creates showcase image and branding for high-capacity transit
- Restricts left turns across the BRT lane



BRT Exclusive Offset Side Running Lane

Exclusive lane for the BRT vehicle that is ideal for transit travel time savings and performance

- Requires turn restrictions across the BRT lane
- Creates showcase image and branding for high-capacity transit
- Median provides separation and avoids "side friction" with general traffic
- Can preserve parking on one side of the street



BRT Exclusive Bidirectional/Reversible Flow Lane

Flexible lane that allows only one direction of BRT travel at a time

- Reduces amount of street widening and can preserve more street parking and/or general purpose travel lanes
- Requires additional detailed traffic simulation testing to verify transit operation is functional
- Requires left-turn restrictions across the BRT lane
- **WSP pioneered the first bidirectional BRT lane design 15 years ago in Eugene, OR**

Station

- ***Accessibility***
  - Transit accessibility is a key determinant in the overall quality of the transit service and the user experience. It defines how conveniently and safely transit can be accessed by people regardless of their age, gender, disabilities, and physical conditions.
  - Accessibility standards issued under the Americans with Disabilities Act (ADA) apply to places of public accommodation, commercial facilities, and state and local government facilities in new construction, alterations, and additions. Regarding a bus stop/station, this includes but is not limited to ADA ramps, platform edge (on-street) warning surface, traveler information system for users with vision disabilities, bus boarding assistance including level or near-level boarding.
- ***Station Amenities***
  - Infrastructure, devices, and services offered at a bus stop/station for the benefit and convenience of the passengers, including but not limited to shelter, bench, passenger information system, fare collection, wifi, elevated platform, and public arts.

- ***Safety and Security***
    - Lighting, security, and surveillance system that are intended to make passengers safe while waiting for the service
    - A key consideration of safety and security is to increase the visibility of passengers at the station/stop through physical design and lighting
- ***Passenger Information System***
    - Supplies users of public transport with information about the nature and the state of a public transport service through visual, voice or other media, including static or schedule information and real-time arrival information, derived from automatic vehicle location (AVL) systems and changes continuously based on real-world events
- ***Wayfinding***
    - Combines signage and map design, symbols, color, and typography to effectively navigate people through stations, destinations, and nearby landmarks
- ***Level Boarding and Alighting***
    - The platform height matches the floor height of transit vehicles (for on-street low-floor vehicles, typically 12–14 inches), easy to board
    - Transit vehicles pull in very close to the curb to eliminate the gap
    - Near level boarding: usually 9 inches platform and bus would kneel down and a ramp will be extended out of the bus for ADA access
- ***Off-board Fare Collection***
    - Passengers pay their fare before boarding the bus using ticketing machine at the bus station/stop, which can cut per-passenger dwell time by half or more
- ***Precision Docking***
    - The ability for a bus to approach and depart a station platform through optical, mechanical or other guided means, in order to get as close to the platform as possible and to provide as small as gap as practical between the platform and the bus chassis/doors. This also involves the ability for the bus to dock in the same location reliably every time the bus vehicle services the station[2]

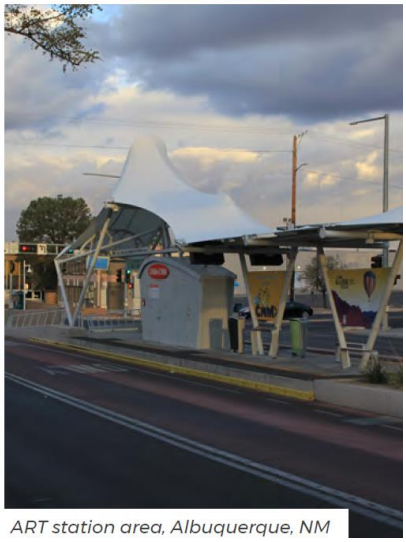
[2] https://www.apta.com/wp-content/uploads/Standards_Documents/APTA-BTS-BRT-RP-005-10.pdf

Example of level boarding/alighting

EmX BRT station area, Eugene, OR

EmX BRT, Eugene, OR

Off-board fare collection, Eugene, OR

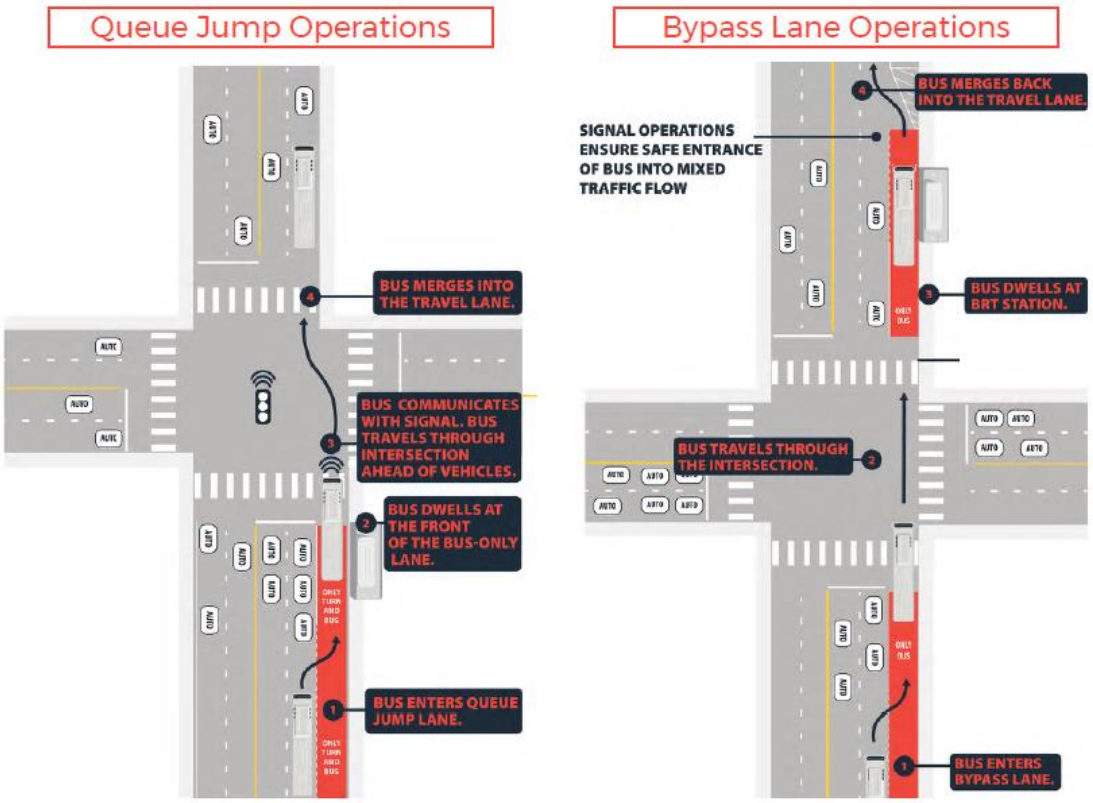


ART station area, Albuquerque, NM

Bus Priority Treatment

- ***Transit Signal Priority (TSP)***
  - Allows a traffic signal controller to react to the detection of an approaching transit vehicle and provide a best effort to grant priority treatment of the transit vehicle at the intersection
  - Extends green time of a main street or truncate green time of a side street green to grant priority to transit vehicles operating on the main street
  - Provides on-time performance application for schedule adherence
- ***Dedicated Transit Phase***
  - At the start / end of a dedicated bus lane to give buses priority to access and exit the transitway on the far side of the intersection
- ***Signal Operations***
  - Focuses on optimizing corridor signal timing for transit and traffic operations on the main street
  - Considers pedestrians' and bicyclists' needs and safety
- ***Queue Jump***
  - Transit priority intersection treatment that provides preference to transit by allowing buses to skip the queue using an exclusive turn-lane or a dedicated transit lane
  - A leading transit interval or active signal priority allows bus to travel ahead of other traffic

- ***Bypass Lane***
    - Transit intersection enhancement that allocates a dedicated transit lane before and after intersection
    - Option allows BRT to circumvent queues



Bus Technology

- ***Intelligent Transportation System (ITS)*** in public transit aims to control public transportation networks, to maintain their performance, and to provide users (passengers and decision makers) with up-to-date information about trips and network operating conditions.
    - Guidance system (precision docking, lane keeping, collision warning systems)
    - On-board data computers
    - Radio systems
    - Enhanced messaging systems
    - Fare collection system
    - Automatic passenger counters
    - Voice announcement system
    - Automated vehicle technology
- ***Automatic Passenger Counters (APC)***
    - Electronic device designed to count the number of passengers boarding and disembarking at each stop, working together with modern passenger information system solutions
- ***Automatic Vehicle Location (AVL)***
    - A means for automatically determining and transmitting the geographic location of a vehicle

  - A tracking system may collect this aggregate data from one or more vehicles to manage an overview of vehicle travel
  - Used in dispatching and tracking transit vehicles and public transport
- ***Automated Vehicle***
  - At least some aspect of a safety-critical control function (e.g., steering, throttle, or braking) occurs without direct driver input.
  - Automated guidance features for precision operations and docking
- ***Platooning***
  - A method for driving a group of buses together, with smaller inter-vehicle distance safely, improving energy efficiency as well as capacity, with safer, more frequent, and reliable services

Supporting Tools/Concepts

- ***Multimodal Connectivity***
  - Connect to other transit services such as rail or local/regional bus
  - Provide access to stations for those walking, biking, rolling via connected sidewalks and bicycle facilities
- ***Park & Ride***
  - Parking lots with public transport connections that allows commuters and other people heading to city centers to leave their vehicles and transfer to a bus, rail system (rapid transit, light rail, or commuter rail)
- ***Shared Mobility***
  - Forms of mobility that are shared by users. Shared mobility, such as bikeshare, electric scooters, are often used by transit passengers for first- and last-mile connections
- ***Transit Dependent and High Need Communities***
  - Transit dependent communities include households that rely on transit as their primary mobility choice (e.g., zero-car households)
  - High need communities may include low-income population, minority population, and zero-car households who use transit frequently as the means for jobs, services, and other home-based trips.
- ***Transit Oriented Development (TOD)***
  - Urban development that maximizes the amount of residential, business and leisure space within walking distance of public transport. It promotes a symbiotic relationship between dense, compact urban form and public transport use.
- ***Transit Corridor***
  - Promotes economic development around high-quality transit service while fostering a pedestrian scale in which walking and biking actively complement public transit
  - Transit Corridor retrofits should be coordinated with land use changes to maximize a corridor's potential for economic growth and physical transformation.