Chapter 4:

Bus Lane Treatments

Introduction to Bus Lanes

Bus lanes are one of the most cost-effective transit priority treatments to improve bus speed and reliability. Bus lanes are typically repurposed general purpose traffic lanes or on-street parking, dedicated for bus-only use designated by signage, red paint, and decals.

The separation of buses from traffic increases bus speeds, reduces travel time variability, and improves schedule adherence resulting in faster, more reliable transit service. Dedicated bus lanes allow buses to bypass traffic and avoid conflicts with other road users. Additionally, bus lanes improve roadway safety by reducing conflicts between buses and other vehicles/modes.

When and Where to Consider Bus Lanes

Bus lanes are most effective on **corridors with:**

- Streets with lanes of traffic or parking that can be repurposed with limited impacts to driveways, bike lanes, and turning traffic where there is curb and sidewalk access
- **Frequent transit delays** where dedicated lanes save riders time and improve reliability, making bus travel more competitive with driving
- **Frequent bus service** and high ridership to maximize speed and reliability benefits
- **Streets with multiple bus routes or planned bus priority projects**

Policy and Planning Considerations

- **Bus lanes help transit agencies get the most out of every operating dollar,** making them an important tool for network redesigns and service changes. Bus lanes support service enhancements by providing dedicated, congestion-free paths along some of the most vital and high ridership routes in the transit network.
- **Bus lanes also support in-fill and new development** by encouraging more people to ride transit and mitigating future congestion. Municipalities should consider promoting bus lanes as part of their development guidelines to ease the financial burden on the city and transit agency to streamline implementation.
- **Taking a network approach to bus and bike lane implementation supports Massachusetts's vision** for safer, more complete streets that promote walking, biking, and riding transit. Bus lanes should complement not preclude bike lanes and vice versa. When possible, municipalities should provide dedicated bus and bike lanes with the understanding that shared lanes are not for all ages and abilities.

Implementation Considerations

Municipalities should consider the following design approaches and strategies to manage bus lane interactions with turning vehicles and other modes.

Frequent and clear signage is required to deter private motorists from entering the bus lane.

Emergency vehicles are always permitted in the bus lane. Other vehicles may be permitted on a case-by-case basis, such as turning vehicles or school buses, these exceptions are typically negotiated between municipalities and the MBTA. The benefits of bus lanes are lessened when the lane is shared with a high-volume of other vehicles.

Provide safe spaces for people biking when implementing bus lanes. Depending on the street context, bike lanes may be separated in the street by paint or posts, raised, or on an adjacent street.

- People biking should be able to use the bus lane when the options above are not available.

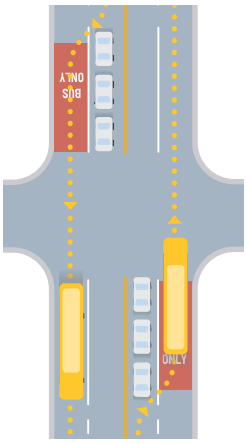
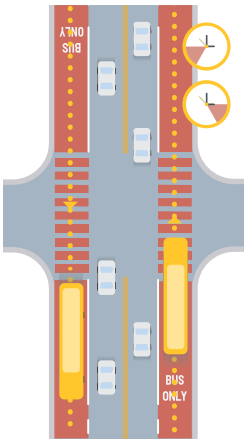
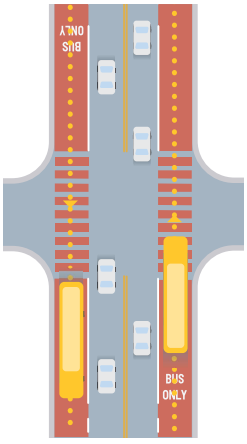
Bus lanes only work well if cars stay out of them. It is important to clearly demarcate bus lanes and craft a strategy for enforcing them. The best enforcement mechanism is road design.

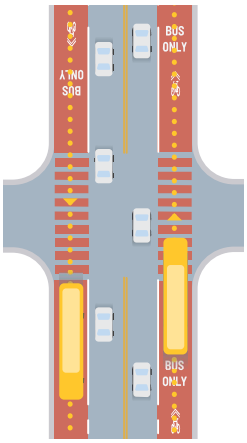
- Center-running and contraflow bus lanes are self-enforcing by design, making it difficult for traffic to use transit-only lanes and reducing the burden of other bus lane enforcement mechanisms.
- For other bus lane and busway designs, physical barriers like posts can provide separation and prevent vehicles from entering. Municipalities should implement self-enforcing design approaches when possible.

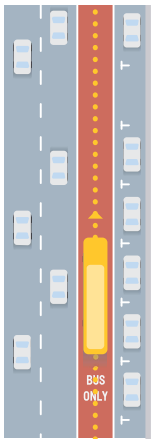
Red paint is widely used to denote bus-only lanes across the United States, typically for 24/7 or all-day bus lanes, but several cities also use red for peak-period bus lanes.

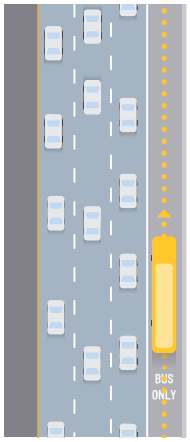
Types of Bus Lanes

Table 7. Bus Lane Types

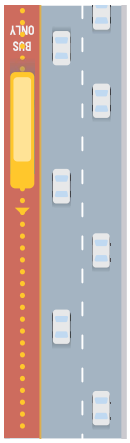
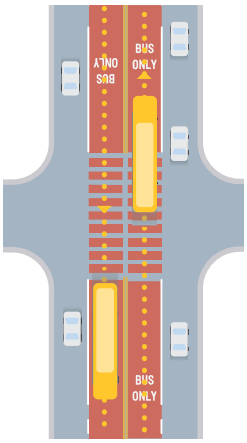
	Type of Bus Lane and Description	Level of Investment Needed	Right of Way Needed	Level of Transit Priority
	**Short Bus Lane** Short, dedicated transit lanes that exist only on the approach to an intersection	Low: Requires clearly marked lane decals and signage to communicate dedicated transit use	Low: Can be lengthened or reconfigured in any lane to meet needs of a given corridor	Low: Used for spot improvements to allow buses to bypass traffic at specific intersections, with less impact than a full bus lane
	**Part-time Bus Lane** Repurposes general purpose traffic or parking lanes for dedicated bus operations part-time	Low: Requires extra signage and may require new lane markings if existing parking lane is too narrow	Low: Converts general-purpose traffic or parking lanes, typically during peak periods	Low: Allows buses to stop in-lane and bypass congestion during the most congested periods of the day, but illegal parking and loading can cause delays.
	**Curbside Bus Lane** Repurposes general-purpose traffic or parking lanes along the curb for dedicated bus operations	Low: Requires minimal signage, may require new lane markings if existing lane is too narrow	Low: Converts existing curbside lane, either parking or travel lane	Medium: In-lane stops provide additional speed and reliability benefits. Parking lane conversion makes illegal parking and loading possible.

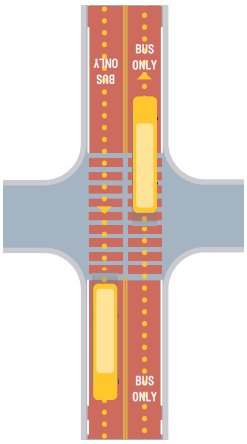
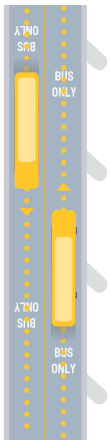






Type of Bus Lane and Description	Level of Investment Needed	Right of Way Needed	Level of Transit Priority
Bus-bike Lane A shared lane for both buses and people cycling	Low: Requires minimal additional lane markings, like sharrows, or a dashed bike lane	Low: Can be implemented with most types of bus lane configurations	Medium: Improves speed and reliability, but not suitable for corridors with high transit or bike volumes, or fast traffic/ buses
Parking Offset Bus Lane Repurposes a lane of traffic for dedicated bus operations, while preserving on-street parking and loading at the curb	Medium: Requires new lane markings and in-lane stops would require bus bulbs	Medium: Requires ROW for general-purpose traffic, parking, and dedicated bus lane	Medium: In-lane stops provide additional speed and reliability benefits, but illegal use of the lane can cause delays
Bus-on-shoulder Authorizes buses to use the shoulder of an interstate highway or other routes when there is heavy congestion	Low: Requires extra signage and may require relocating or enhancing existing highway elements for safe bus operations; narrow shoulders would require widening	Low: Converts existing shoulder with minor changes to lane markings	Medium: Improves bus speeds and reliability through congested highway segments and state routes

Type of Bus Lane and Description	Level of Investment Needed	Right of Way Needed	Level of Transit Priority
 **Contraflow Lane** Repurposes a parking or traffic lane for dedicated bus operations that oppose the flow of traffic	●●○ Medium: Requires extra signage and road design to clearly prohibit wrong-way entry and private vehicle use; requires dedicated signals and transit priority	●○○ Low: Converts one lane of traffic or parking for contraflow operations	●●● High: Increases bus speeds with few vehicle conflicts, allows bus travel in both directions along one-way streets reducing the number of turning movements
 **Center-running Bus Lane** Repurposes inner travel lanes for dedicated bus operations	●●● High: Requires median bus platforms, in addition to new dedicated transit signals; likely to impact utilities.	●●● High: Requires a wide cross section for accessible, median bus platforms	●●● High: Provides transit priority consistent with BRT service by eliminating most conflicts between buses and other vehicles
 **Separated Busway** Roadways dedicated exclusively to transit operations with continuous separation from traffic	●●● High: Requires constructing a physical buffer between transit and traffic, may require median bus platforms if a two-way busway	●●● High: Requires a wide cross section to physically separate transitway from general traffic	●●● High: Provides transit priority consistent with center-running lanes

Type of Bus Lane and Description	Level of Investment Needed	Right of Way Needed	Level of Transit Priority
 **Transit-only Street** Streets dedicated solely to bus operations where all other traffic is prohibited	●●○ Medium: Requires extra signage and road design to clearly prohibit entry, and dedicated signals and transit priority	●●● High: Repurposes entire street for transit and emergency vehicles only	●●● High: Eliminates most conflicts with general-purpose by completely prohibiting traffic
 **Fixed Guideway** Grade separated bridges, tunnels, guideways, or repurposed rail corridors dedicated solely to bus operations	●●● High: Requires construction of new stations and elevators and infrastructure to access the station; may require constructing a separated guideway if not repurposing existing infrastructure	●●● High: Requires right-of-way for elevators and new walkways and bike lanes to access the station	●●● High: Grade separation and greater distances between stop spacing maximize efficiency and eliminate all other modal conflicts.

Short Bus Lane

Short bus lanes—also called transit approach lanes, queue bypass lanes, or queue jump lanes—are segments of traffic lanes dedicated to buses approaching an intersection. Often paired with TSP (see TSP in a Queue Jump Lane), short bus lanes reduce transit delay at intersections by allowing buses to bypass queues and travel through the intersection more quickly.

Benefits

- Improves speed and reliability by allowing buses to bypass general traffic queues. Can use existing stops (if not creating bus stop curb extensions).
- Can implement in areas without space for a longer dedicated lane
- Can lengthen or reconfigure in any lane to meet the needs of a given corridor

Challenges

- Must be long enough to allow buses to bypass queues of through lane and turn lane general purpose traffic
- Enforcement is difficult, as the lane is not typically physically separated, and vehicles are only in the lane for a short time
- Intersections where right turns on red are prohibited may result in longer queues and reduce the benefit of the short bus lane

Complementary Treatments

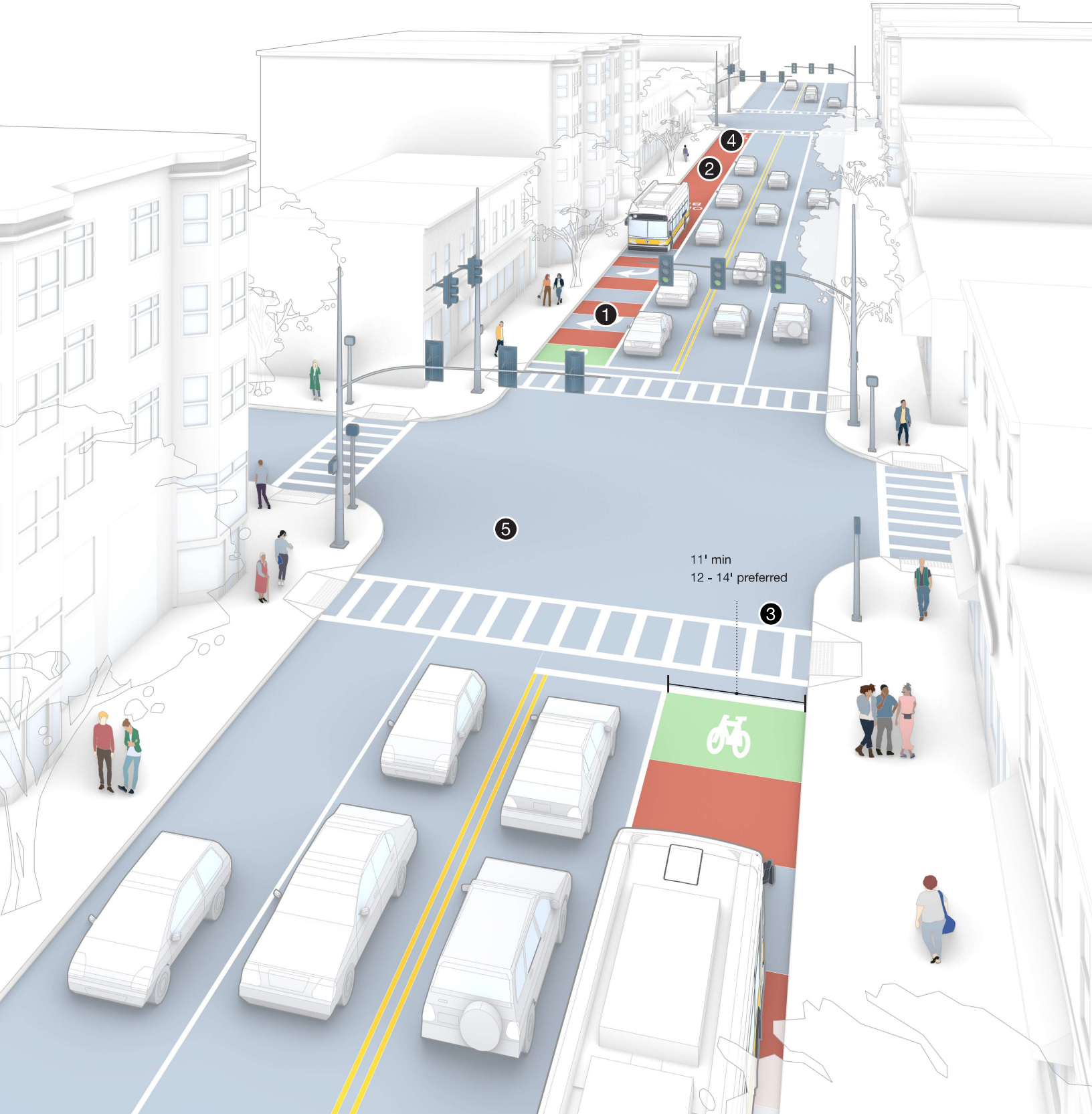
- Bus Bulbs (p. 90)
- TSP in Queue Jump Plan (p. 40)

1. **Painting Treatment** Short bus lanes should be painted red with “BUS ONLY” or “BUS BIKE ONLY” markings.
2. **Queuing** Ensure short bus lane is long enough for buses to bypass general purpose traffic queues and reach the short bus lane. If queues span multiple intersections along a corridor, consider implementing a dedicated bus lane instead.
3. **Bus-bike Interactions** If the street cannot accommodate a separated bike lane, allow bicycles in the short bus lane with a bike box at the head of the bus lane, if possible.
4. **Enforcement** Ensure there is a strategy in place to prevent illegal driving in short bus lane.
5. **Roadway Type** Short bus lanes are most impactful at approaches to TSP-enabled intersections, intersections where transit vehicles operate in a curbside lane, or at crossings where a right-turn queue jump lane is not viable.

Short Bus Lane on Summer Street, Boston.

See It in Action:

An exclusive Short Bus/ Bike Lane was implemented in 2019 on Summer St at South Station for South Boston bus routes bound for Downtown.


4
2
1
5
11' min
12 - 14' preferred
3

Part-time Bus Lane

Part-time bus lanes are restricted to bus travel only during part of the day, using space otherwise allocated for curbside parking lanes. These lanes typically operate during morning and/or afternoon peak times, when ridership demand is highest, bus service is most frequent, and streets are at their most congested.

Benefits

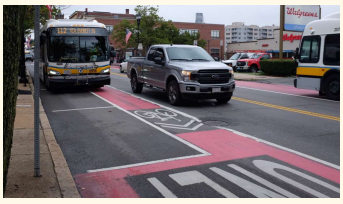
- Maintains general roadway capacity and does not require converting general purpose traffic lanes to transit priority
- Parking lanes are generally curbside, so buses serve existing stops
- Compatible use of ROW—can operate in the morning before businesses open, when on-street parking demand is low
- Can convert from part-time lane to full-time lane as needed

Challenges

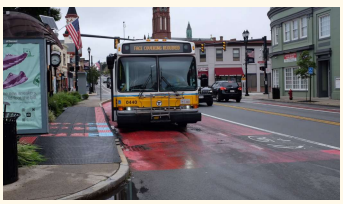
- Requires extra signage and education
- Illegal parking and loading cause operational challenges
- Traffic must turn right in the bus lanes
- Only provides bus transit priority for part of the day—with all-day congestion, on-time performance for buses will be better in the peak than in the off-peak

Complementary Treatments

- Transit Signal Priority (p. 31)



Mid-block

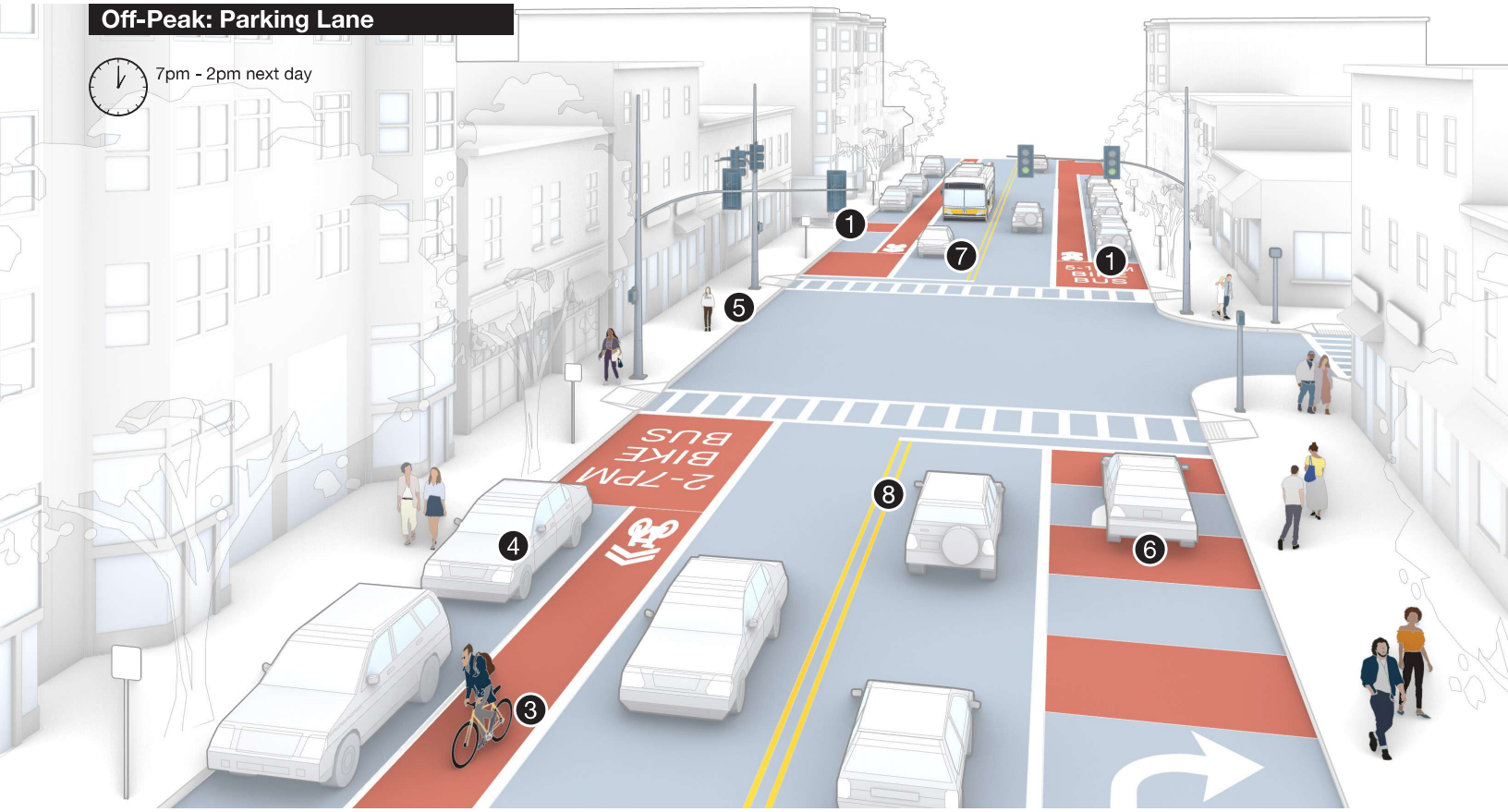


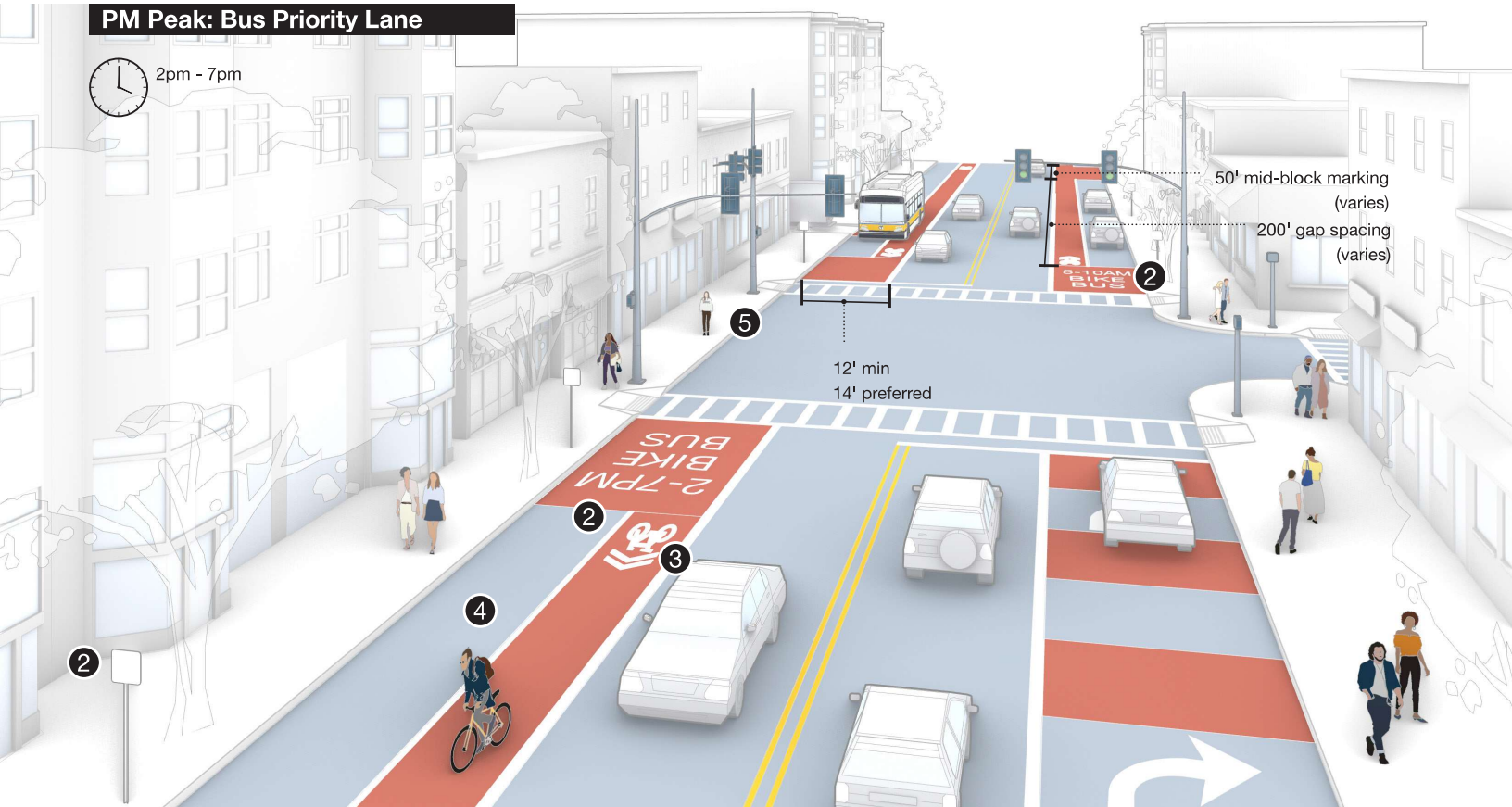
Bus stop

See It in Action

In 2016, the City of Everett piloted a morning peak bus-bike lane on a one mile stretch of Broadway's inbound parking lane. Transit travel times were reduced by 20–30%. With public support, the lane was made permanent and an outbound afternoon peak lane was added.

1. **Curb Access** Consider all the uses (including parking, loading, bike lane) the lane will host and if/how they can be designated to different times of day.
2. **Signage + Painting Treatment** Provide clear and consistent signage regarding when the bus lane is in effect and other shared regulations, such as parking. Apply "BUS ONLY" markings on receiving side of each intersection, more often on longer blocks.
3. **Bus-bike Interactions** Where possible, accommodate bicyclists separate from THE bus lane, potentially through an off-peak curbside bike lane adjacent to parking; otherwise, consider shared bus-bike LANE (P. 66) and additional bike accommodations (such as bike boxes).
4. **Enforcement** Craft a strategy to clear the lane of parked cars before bus only hours and to prevent activities such as illegal parking, standing, or traveling in the bus lane. If the part-time bus lane has electronic parking meters, reprogram them to prohibit parking during the bus lane hours of operation to avoid people being able to pay for parking. Update instructions on traditional parking meters to indicate parking is prohibited while the bus lane is in operation.
5. **Bus Stops** Buses will naturally stop curbside without having to pull in and out of traffic. Curb extensions do not work with this type of bus lane.
6. **Right Turn Volumes** Account for right turn volumes, as right-turning vehicles will need to enter the right lane to turn.
7. **Traffic Volumes + Queueing** Use where there are high vehicle volumes and where the bus is often delayed due to vehicle queuing, especially in peak hours.
8. **Roadway Type** Best used where there is only one travel lane and a parking lane. With more travel lanes, consider other types of full-time bus lanes.


Off-Peak: Parking Lane
7pm - 2pm next day
2-7PM BIKE BUS
6-10AM BIKE BUS
1
1
7
5
8
4
6
3


PM Peak: Bus Priority Lane
2pm - 7pm
50' mid-block marking
(varies)
200' gap spacing
(varies)
2
5
12' min
14' preferred
2-7PM BIKE BUS
2
3
4
2

Curbside Bus Lane

Curbside Bus Lanes are bus lanes that run adjacent to the curb and are typically used on routes that experience significant traffic delays. They can be implemented by repurposing a curbside general purpose travel lane or parking lane. This treatment allows buses to stop in-lane to pick up and drop off passengers on the sidewalk, saving time and further improving transit speed and reliability.

Benefits

- Higher visibility and reliability of transit service with full-time dedicated lane
- Maintains existing level of roadway capacity
- Possible to implement on roadways with more limited ROW as compared to other types of bus lanes
- Buses can serve existing stops since the lane abuts the curb
- Cyclists can use the bus lane for a safer option compared to general purpose traffic lanes

Challenges

- Displaces existing curbside parking and loading, which requires modifications to driver behavior and bus lane enforcement to prevent illegal parking or loading
- Requires removal of existing bus bulbs and curb extensions
- Requires wider lane width (11 ft.) than typical parking lane (7 ft.), unless there is a bike lane next to the parking lane
- Right turns must be made within the bus lane or require a dedicated turn-pocket or signal phase
- Municipalities must plow snow that it doesn't block the bus lane or boarding area or have an MOU with MBTA
- Municipalities must keep gutters and drainage clear to avoid rain pooling and splashing onto the sidewalk

Complementary Treatments

- Part-time Bus Lane (p. 62)
- Bus-bike Lane (p. 66)
- Transit Signal Priority (p. 31)

1. **Curb Access** Plan to relocate any loading or delivery zones or taxi stands to nearby side streets, or restrict delivery hours. Look for opportunities on nearby side streets to add or reconfigure parking, especially handicap spots.
2. **Signage and Painting Treatment** Apply red paint for entire lane, and bus lane markings on the receiving side of each intersection, as well as intermittently, approximately every 200', on longer blocks. Apply skip stripe markings at intersections or crossings of the bus lane.
3. **Bus-bike Interactions** Where possible, accommodate bicyclists separate from bus lane. Consider shared bus-bike facility and additional bike accommodations (such as bike boxes) at intersections.
4. **Enforcement** Ensure there is a strategy in place to limit opportunities of encroaching on the bus lane, such as with turning restrictions or bus specific signals, and clear the bus lane of parked cars to prevent activities such as illegal parking, standing, or traveling in the bus lane.
5. **Bus Stops** Bus stop curb extensions do not work with this type of bus lane; buses will naturally stop curbside without having to pull in and out of a general purpose travel lane. Ensure there is sufficient sidewalk space for both bus stop passengers waiting to board and pedestrians passing through the stop, as well as any bus stop amenities.
6. **Right Turn Volumes** Curbside Bus Lanes will need to serve as bus/right turn lanes at intersections, as right-turning vehicles will need to enter the bus lane to turn.
7. **Traffic Volumes and Queueing** Use where there is a high degree of delay and travel time variability (unreliability) in bus operations, as well as low to moderate curb, street, or driveway conflicts.

8 **Roadway Type** Best used on roadways with more than two travel lanes; one travel lane with underutilized, limited, or no on-street parking and off-street parking alternatives; or one travel lane with well-utilized parking and a local commitment to prioritize moving people along a corridor.

See It in Action

A Curbside Bus Lane was installed in the City of Revere on Broadway, running southbound between Revere Street and Revere Beach Parkway during AM peak hours. This project has helped improve bus service by reducing congestion delays in a high-traffic area of Revere.

Bus-bike Lane

Bus-bike lanes provide a shared lane for both buses and bicyclists. They can be implemented by re-purposing a curbside general purpose travel lane, parking lane, or a narrow parking lane and adjacent bike lane. This treatment allows both buses and bicyclists to avoid congestion and conflicts from general purpose traffic.

Benefits

- Improves reliability of transit service, which may lead to reduced scheduled run times
- Improves experience for bicyclists as compared to riding in a general purpose travel lane
- Cost effective treatment on streets with constrained right of way unable to accommodate separate bus and bike facilities
- Can be peak period only and revert to parking, or parking and conventional bike lane, in off peak periods

Challenges

- Bicyclists must still share lane with large vehicles
- Biking around buses serving an in-lane stop can be problematic and may lead bicyclists encroaching on general purpose travel lanes; articulated buses are particularly difficult to navigate around
- Not suitable for corridors with very frequent bus service (under 4 minutes), high bicyclist volumes, or high-speed bus service

Complementary Treatments

- Curbside Lane (p. 64)
- Part-time Bus Lane (p. 62)

1. **Headways** Consider current or desired route frequency. Not recommended on roadways with frequent bus service (headways of 4 min. or less).
2. **Bus-bike Interactions** As buses and bikes share a lane, these are not low stress bike facilities.
3. **Intersections** Consider installing bike boxes to improve bicyclist visibility and bike signals to provide separation through intersections. Buses would use the general purpose traffic signal(s).
4. **Right Turn Volume** Account for right turn volumes, as right-turning vehicles will need to enter the bus-bike lane to turn. Bus-bike lanes will need to serve as bus-bike-right turn lanes at intersections.
5. **Roadway Type** Bus-bike lanes are best suited for slower roadways with travel speeds of less than 20 mph and where there is only one travel lane and a wide parking lane or parking lane with conventional bike lane, or two travel lanes where one lane is underutilized. Bus-bike lanes are typically implemented because there is not sufficient roadway space for separate facilities. Where space is available, consider installing a bike lane in the direction of uphill travel, where cycling speeds are slower.

See It in Action

In 2020, MBTA and the City of Chelsea implemented an all-day bus-bike lane on Broadway in Downtown Chelsea. At the southern end of the bus-bike lane, a separated bike lane continues south.


ONLY
BIKE
BUS
11' min
12' - 14'
preferred
1
2
3
4
5

Parking Offset Bus Lane

Parking offset bus lanes restrict the use of the outer travel lane(s) to buses only, while preserving on-street parking along the curb. They require at least two travel lanes in each direction of the bus lane.These lanes improve transit speed and reliability and reduce transit travel times by allowing buses to bypass congestion along the corridor.

Benefits

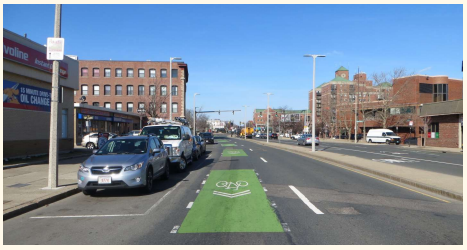
- Maintains parking supply at or near existing levels
- Maintains loading
- Can use existing curbside stops (if not creating bus bulbs)
- Does not require traffic signal changes

Challenges

- Double parking and loading cause operational challenges—enforcement can be difficult
- Buses must pull into the curb, slowing down service, and cannot stop in lane without bus bulbs
- Right turning vehicles must enter or cross the bus lane
- Requires a wider cross-section to preserve the parking lane

Complementary Treatments

- Bus Bulbs (p. 90)
- Transit Signal Priority (p. 31)



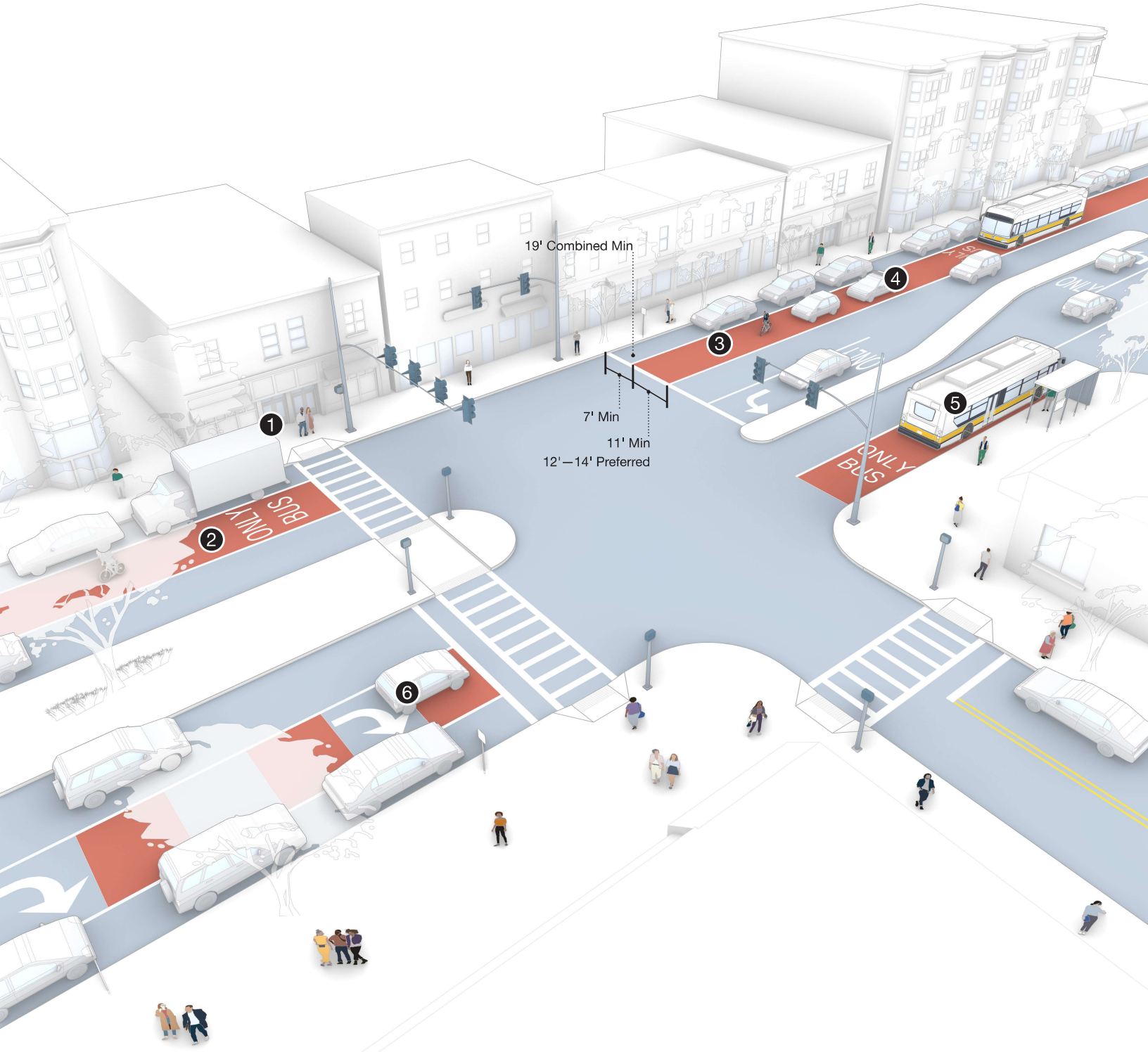
Before

After

See It in Action

In 2019, MBTA and the City of Boston implemented a 0.6-mile parking offset bus and bike lane in both directions on Brighton Ave between Cambridge St and Commonwealth Ave where the MBTA Routes 57 and 66 operate.

1. **Curb Access** Consider how loading activities (such as large vehicles in a narrow parking lane) may encroach on the bus lane, and provide adequate curb access along the corridor.
2. **Painting Treatment** Apply red paint for entire lane with BUS ONLY markings on receiving side of each intersection as well as approximately every 200’ on longer blocks.
3. **Bus-bike Interactions** Consider current and future bicycle volumes along the corridor. Where possible, separate bus and bike lanes; otherwise, consider a shared bus-bike lane and additional bike accommodations (such as bike boxes).
4. **Enforcement** Enforce proper use of bus and parking lanes to prevent activities such as double parking and illegal parking or standing. May require more agency-municipal coordination than other bus lanes.
5. **Bus Stops** Bus stop lengths vary based on the stop location and configuration, but must be at least 40’. Bus bulbs require the least amount of curb space while curbside pullout stops require the most. Consider installing bus bulbs, as shown in the image, to reduce curb space and allow buses to stop in lane.
6. **Right Turn Volumes** Account for right turn volumes, as right-turning vehicles will need to enter or cross the bus lane to turn.


19' Combined Min
7' Min
11' Min
12'—14' Preferred
1
2
3
4
5
6
BUS ONLY
ONLY BUS

Bus-on-shoulder

Bus-on-shoulder operations are when buses are authorized to use the shoulder of an interstate highway or other route when traffic is congested, bypassing slower general purpose travel lanes. This treatment is a relatively low-cost means of improving transit speed and reliability on highways.

Benefits

- Improves bus speeds and reliability through congested segments or periods
- Relatively low capital costs, depending on existing conditions
- High visibility to potential transit users—may encourage mode shift

Challenges

- May require relocating or upgrading rumble strips, stormwater grates and guardrails
- Buses may encroach on general purpose traffic lanes if shoulder is too narrow
- Pinch points, such as bridge abutments, guardrails, etc.
- Emergency use of the shoulder by other vehicles requires buses to merge into general purpose traffic lane
- Left exits and resulting lane shifts
- Monitoring of debris/other obstacles and quick removal
- Snow clearing and surface treatment of the shoulder

I-93 in vicinity of Medford

See It in Action

In Massachusetts, the state's first bus-on-shoulder operations began as a pilot in 2021 on I-93 between the I-95/Rt-128 interchange and Sullivan Square. Bus-on-shoulder are more commonly used in other US metropolitan areas, such as Minneapolis, MN, St. Petersburg, FL, and the Research Triangle area of North Carolina.

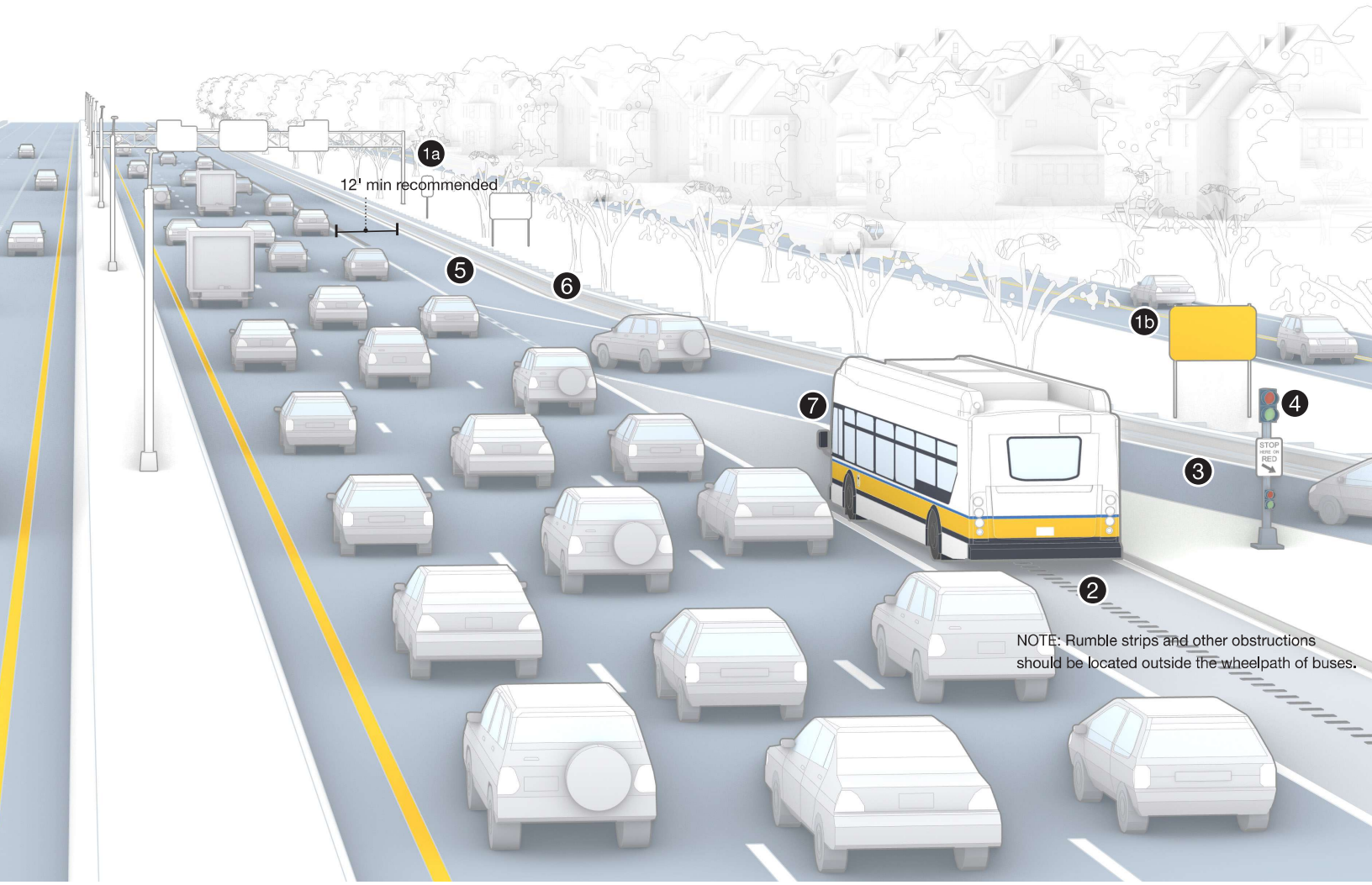
1. **Signs & Striping** Provide signage to prohibit non-transit vehicles from using the shoulder. Signage is also required to alert motorists to the possibility of buses traveling in the shoulder across on and off-ramps. Red paint is not required, but could be used as a spot treatment on a case by case basis to enhance visibility.

2. **Roadway / Guardrail Conditions** Evaluate (1) shoulder width for consistency and identify pinch points, such as at bridges or protruding natural features; (2) roadway shoulder/edge conditions for ability of buses to drive over the surface, including gravel shoulders, edge treatment, or damaged pavement; (3) start of guardrail or impact attenuator to confirm sufficient offset from shoulder.

3. **On/Off-Ramps** Consider bus travel in shoulders through on and off-ramps and the sight lines for vehicles using those ramps. Vehicles merging onto a highway via on-ramps will need additional signage and indication to expect buses traveling in the shoulder. Vehicles exiting the highway will need to be alerted to buses passing on the right at off-ramps.

4. **Signals** Consider use of supportive signal treatments, such as Bus on Shoulder Signals, which are controlling signals installed on on-ramps to notify drivers of approaching buses on the shoulder. If used, a "Ramp Signal Ahead" sign should be installed ahead of the signal to warn drivers.

1a



5 **Education & Enforcement** Only authorized buses can use the shoulder. Extensive outreach, combined with police monitoring when a lane first opens, can build an understanding of proper use of the lane. On highways where peak period travel in the breakdown lane was or is still permitted on other segments, outreach should address that access is no longer permitted in bus-on-shoulder lanes (e.g., via signs). MassDOT permits buses to travel in the shoulder at up to 35 mph. However, MBTA only permits bus operators to travel a maximum 15 mph above the general purpose lane speed, while not exceeding 25 mph. MassDOT has the same 15 mph speed differential restriction.

6 **Maintenance** Repair guardrail if there is any damage that would create a pinch point along the shoulder between the guardrail and bus. Clear catch basins regularly and keep far shoulder edge in sufficient condition to prevent crumbling.

7 **Agency Coordination** When multiple transit operators use the bus-on-shoulder, there should be good communication between the roadway owner and the transit operators to disseminate alerts about lane disruptions and other important messages.

Contraflow Lane

Contraflow lanes are dedicated bus or shared bus-bike lanes that flow against general traffic. A contraflow bus lane operates on one- and two-way streets where one lane is restricted to buses or buses and bikes only; general purpose traffic is prohibited in that lane.

Benefits

- Used strategically to make the bus network more efficient, especially in areas with one-way streets that would require extra turns and route deviations if the bus was going the same direction as traffic
- Buses can run in both directions on one-way streets
- Improves bus speeds by avoiding congestion and parking conflicts, making in-lane, curbside stops
- Also supports contraflow bike lanes

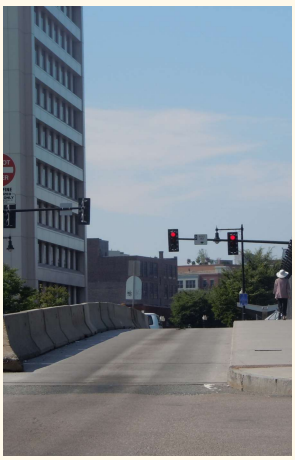
Challenges

- Requires extra signage and road design to clearly prohibit wrong-way entry and private vehicle use, and to aid in pedestrian safety
- May require removing bus or pedestrian bulbs
- Requires traffic signal changes at signalized intersections

Complementary Treatments

- Transit Signal Priority with or without Queue Jump (p. 40)
- Floating Bus Stops (p. 92)

1. **Curb Access** Relocate parking and loading activities to mixed-traffic side of the street or to adjacent roadways.
2. **Signage and Painting Treatment** Provide clear and consistent signage indicating one-way travel, turn prohibitions, and no entry except for buses (and bikes if applicable). Contraflow lanes should be painted red with “BUS ONLY” or “BUS BIKE ONLY” markings. If there is not a physical separation, a double-yellow center line should be applied to separate the contraflow bus lane from opposing flow of traffic.
3. **Bus-bike Interactions** When possible separate bus and bike lanes. Otherwise, bicyclists should be permitted in the contraflow lane.
4. **Enforcement** Ensure there is a strategy in place to prevent illegal parking, standing, and traveling in the bus lane.
5. **Roadway Type** Municipalities can implement contraflow lanes on a variety of roadway typesNarrow roads may only accommodate one contraflow bus lane and one mixed traffic lane, while wider roads may accommodate bus lanes in both directions.



Washington St, Boston

See It in Action

MBTA Silver Lines 4 and 5 run along a short contraflow lane on the Washington Street bridge over the Massachusetts Turnpike/I-90. There is one southbound bus-only lane, separated by a concrete jersey barrier from northbound traffic, which has two general purpose lanes and one bus-only lane.


ONLY
BIKE
BUS
11' min
12' max
1
2
3
4
5

Center-running Bus Lane

Center-running bus lanes are dedicated bus lanes that operate in the middle of the roadway, in the same direction as adjacent general purpose traffic lane(s). They are typically implemented on streets that have at least two lanes in each direction. Usually, the leftmost travel lane in each direction is converted to a bus lane. By placing the bus lane away from parking and/or side street traffic, center-running bus lanes reduce conflicts with vehicles and bicycles and significantly improve transit speed and reliability. Center-running bus lanes are often most effective on corridors with a wide cross-section, frequent curb cuts, and/or there is support for a high-quality transit facility.

Benefits

- Reduces bus conflicts with parking, loading, bicycles, vehicle right-turn movements, driveway, and side street egress
- Requires less enforcement, as the bus lane is not curbside, where lane encroachment for stopping, loading and parking, or double parking is typically more prevalent
- When used in conjunction with median bus platforms, provides high level of transit priority—reflective of BRT service, that enhances the public perception of bus service as a high-quality service and passenger experience
- Suports broader multimodal improvements, such as new or enhanced crosswalks, streetscaping, and lighting that also provide traffic calming benefits

Challenges

- Conflict points between through buses and left and u-turning vehicles, and between through vehicles and right-turning buses, requiring transit signals to separate bus and general purpose movements
- Truck and delivery drivers may still attempt to park/load in a center-running bus lane if curb regulations are not updated
- Requires significant construction to relocate bus stops from curbside to median bus platforms; moving stops requires deconstruction of existing eliminated bus platforms and reconstruction of new platforms
- Wider cross-section needed in order to maintain a parking lane
- Higher service frequencies and/or articulated buses may require longer platforms
- Construction may involve extensive utility relocations and drainage improvements as a result of regrading
- Difficult to implement along corridors that are not straight

1. **Intersections** Implement appropriate turning provisions to remove conflicts between buses and turning vehicles, including:
   a. Restrict unsignalized left and u-turns for general traffic.
   b. Provide dedicated turn signals and transit signals to separate bus movements from general purpose traffic; avoid configurations requiring general purpose traffic to cross over the bus lane.
   c. Only use shared center bus lane and left turn lane at start of bus lane, otherwise shared lanes should be avoided.
2. **Platform Length Requirements** Consider current or desired route frequency. More frequent bus service may require longer platforms.
3. **Bus-bike Interactions** Bus-bike conflicts on the right side of the roadway are removed. Center-running lanes are generally not suitable for shared bus-bike lanes due to likely lower comfort level for bicyclists. Bicyclists would have to cross at least one lane of traffic to reach the bus lane/egress and access side streets. Service frequencies and potential conflicts with buses going the opposite direction if trying to pass buses at stops.
4. **Signage + Painting Treatment** Apply red paint for entire lane, and bus lane markings on the receiving side of each intersection, as well as intermittently, approximately every 200', on longer blocks. Solid white lane lines should be used to offset bus lanes from general traffic where physical separation is not present. Apply skip stripe markings at intersections or crossings of the bus lane.
5. **Enforcement** Enforce proper use of bus lane to prevent activities such as illegal use of the lane. Due to their separation from parking and loading areas, center-running bus lanes likely need less intensive enforcement than curbside lanes. Consider the land use of the corridor; commercial uses lacking easy access (short-term) loading zones, may result in loading in the bus lane.

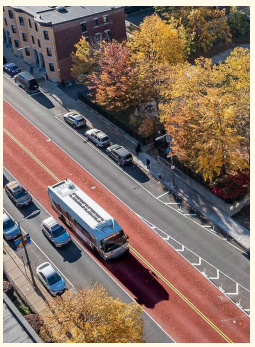
6 Physical Separation At lane approaches/egress areas of platforms may warrant vertical deflections to further discourage general vehicle/parking/loading use of gore area. Place the deflections on the outer edge adjacent to travel lane approaching the platform, and on the inner edge adjacent to bus lane approaching and egressing platform, where allowing for service vehicle access. To allow access during a temporary bus lane obstruction and to maintain emergency access, physical separation is discouraged on the right side of the bus lane (except where recurring/problematic turn conflicts may need more visible deterrence).

Complementary Treatments

- Median Bus Boarding Platform (p. 74)
- Transit Signal Priority (p. 31)

See It in Action

Completed in 2021, center-running bus lanes servicing both directions of travel on Boston's Columbus Ave serve MBTA Routes 22, 29, and 44 between Jackson Sq and Walnut St.



Separated Busway

Separated busways are a type of transitway, with street space dedicated exclusively to transit operations, physically separated from general-purpose traffic. They improve bus travel times by allowing buses to bypass traffic and by giving buses priority at the intersection. They are best suited for corridors with high transit volumes to maximize reliability benefits. When implemented along streets with mixed traffic, either on a one or two-way street, separated busways typically run along one side of the street either as bi-directional transit lanes or a single transit lane. Unlike center-running bus lanes, separated busways typically feature vertical separation and buffers along the entire corridor.

Benefits

- Improves bus speed and reliability by eliminating conflicts with parked cars, turning traffic, delivery trucks, bicycles, and general-purpose traffic
- MBTA buses, third party transit operators, and emergency vehicles can use the transitway to bypass traffic
- Physical barriers and enhanced stations create a premium look and feel to bus service that's comparable to rail
- Improves the pedestrian and rider experience by providing separation from vehicle traffic, in addition to refuge islands and other features that shorten crossings

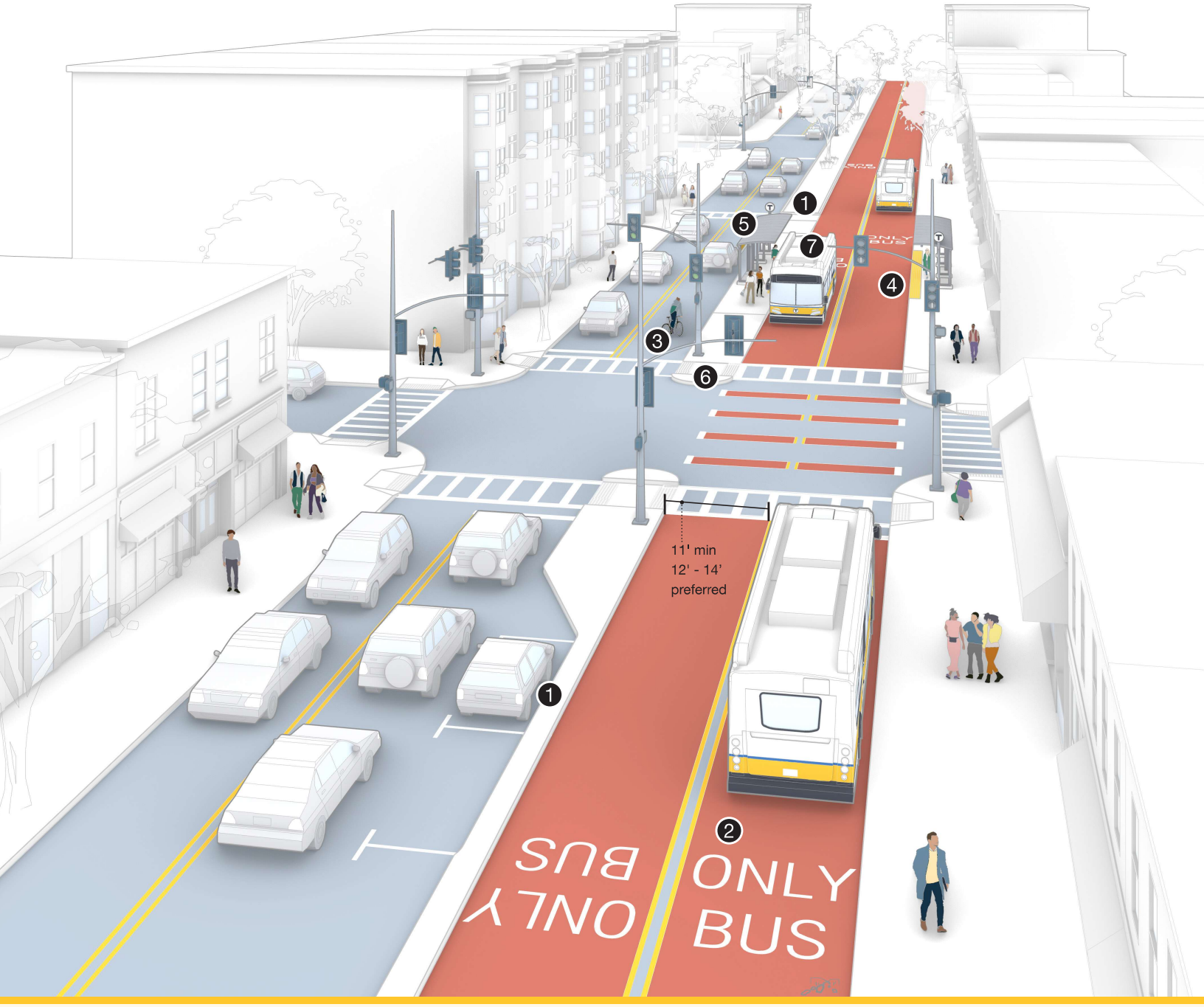
Challenges

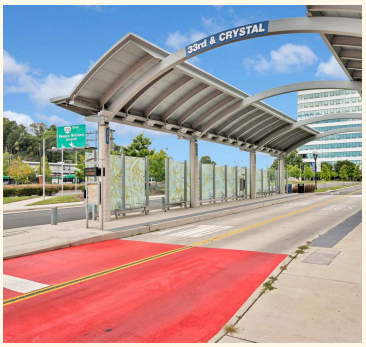
- Requires a higher level of capital investment with a longer construction duration compared to bus lanes
- Requires repurposing parking and travel lanes, that could reroute traffic and limit curb access
- Requires a wide cross section to physically separate the transitway and accommodate space for other modes along the corridor
- Requires managing or prohibiting turns across the transitway

Complementary Treatments

- Median Bus Platforms (p. 94)
- Transit Signal Priority in a dedicated lane (p. 38)

1. **Curb Access** Relocate parking and loading activities to the non-busway side of the street, along the median between the transitway and the general-purpose lanes, or to adjacent roadways.
2. **Signage and Painting Treatment** Place signage preventing cars from entering the transitway at every intersection and consider applying red paint for entire transitway with BUS ONLY markings on the receiving side of each intersection.
3. **Bus-bike Interactions** Bus and bike facilities should be physically separated or on parallel streets since there is limited space for passing in the busway and high transit volumes.
4. **Signals and Intersections** Separated busways require their own signals with transit signal heads to give the bus priority at the intersection and maintain efficient and reliable bus operations. TSP can extend green lights and truncate red lights as buses approach intersections.
5. **Bus Stops** Where possible, provide premium bus stops with level boarding and off-board fare payment to reduce dwell time at high ridership stops. For two-way busways, bus stops should be along the median between the transitway and the general-purpose lanes.
6. **Pedestrian Crossings** Include refuge islands at intersections between the transitway and general-purpose lanes and allow ample time for pedestrians to cross the full length of the street.
7. **Entering and Exiting** Buses should have a dedicated signal and priority that allow them ample time and space to enter the busway and transition back into the curb lane when the transitway ends.





See It in Action

In Arlington, VA, WMATA's Metroway BRT service runs along the Crystal City Potomac Yard Transitway, which features a separated busway between the 27th St and South Glebe stations. The transitway includes two lanes for buses in both directions along the whole corridor, while the general-purpose lane is either one-way or two-way depending on the segment.

Transit-only Street

Transit-only streets, sometimes referred to as transit malls, are a type of transitway that converts a corridor, curb-to-curb, for exclusive or nearly exclusive use by buses or light rail, prohibiting or restricting general purpose traffic. Transit-only streets typically run through downtown and neighborhood commercial and retail corridors. When paired with other multimodal improvements, transit-only streets can improve access and spur economic growth. Unlike other transitways, transit-only streets provide dedicated transit facilities without physical separation by limiting vehicle access to buses all-day or at certain times of day.

Benefits

- Does not require wide ROW and can support pedestrian and bike improvements to create a vibrant street that promotes economic activity
- Significantly improves bus travel times and reliability in some of the most dense and congested areas
- Reduces conflicts between transit and vehicles, and people and vehicles improving corridor safety

Challenges

- Repurposing general-purpose traffic and parking requires rerouting traffic to other adjacent streets and identifying nearby areas for parking opportunities
- Loading and curb access may be difficult and must be managed for businesses along the corridor with time-of-day restrictions or other access points, like alleys or side streets

Fulton Street, Brooklyn, NY

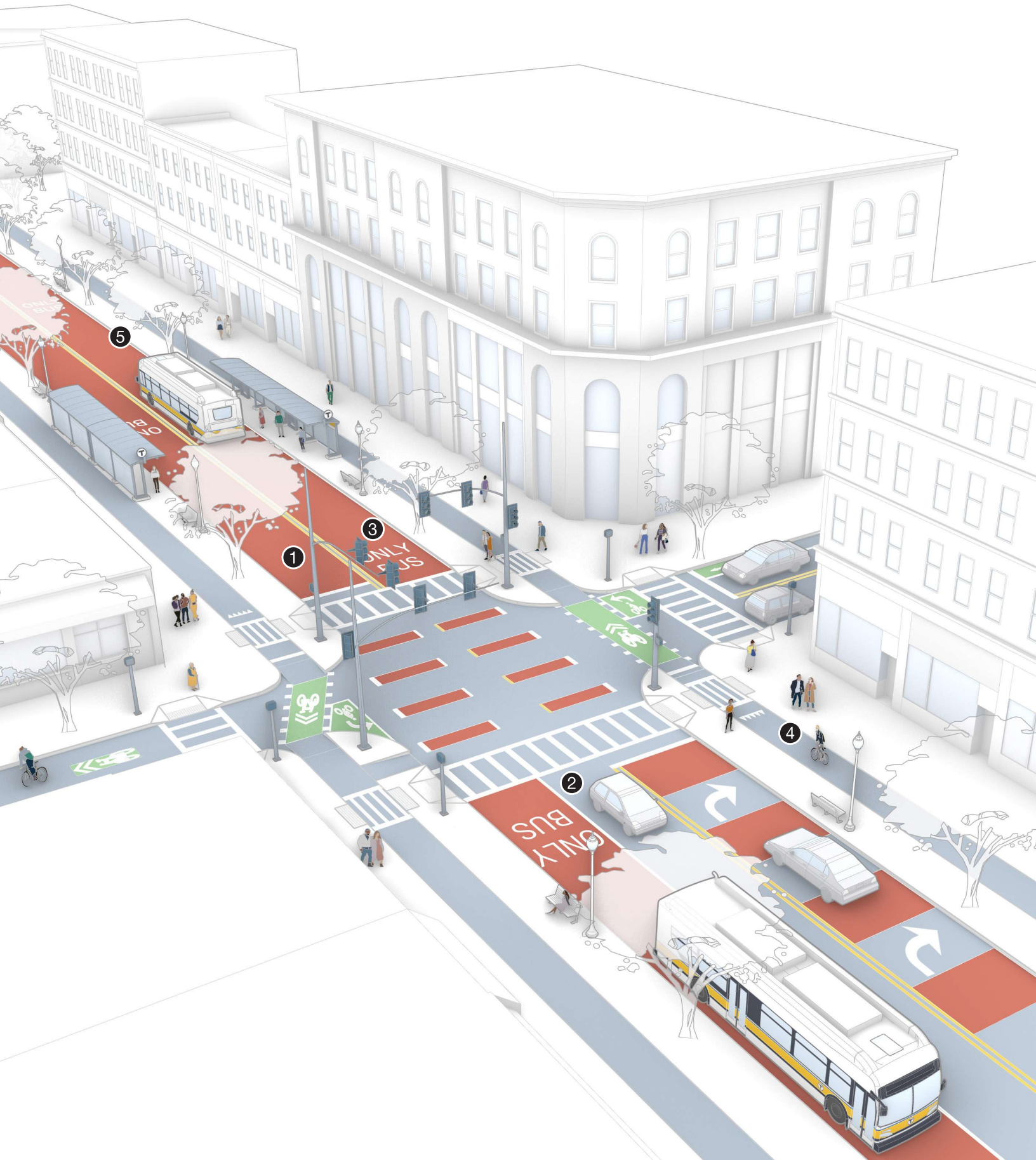
See It in Action

The Fulton Street Busway is a two-lane transit-only street in Downtown Brooklyn, along a dense commercial corridor with high pedestrian and bus volumes. The transit-only street is served by four bus routes carrying approximate 40,000 riders per weekday.

1. **Signage and Painting Treatment** Clear indications that cars should not enter the street are essential, with red painted lanes and visible signage at every intersection.
2. **Street Access** Based on the surrounding street network and loading needs, determine if general-purpose traffic should be prohibited or restricted, such as allowing delivery trucks to load and unload during certain hours.
3. **Enforcement** Enforce proper use of transit-only streets, especially when cars are prohibited from entering, to prevent activities such as blocking or driving in the bus lane.
4. **Pedestrian and Bike Environment** Transit-only streets are likely to have high pedestrian and bike traffic. Sidewalks should be wide enough to accommodate high volumes of pedestrians, and separated bikeways at the sidewalk or street level should be provided to reduce conflicts between pedestrians, bicyclists, and transit riders.
5. **Curb Height & Drainage** Curbless streets encourage activity and maximize the amount of space for transit and people walking and biking. Curbless streets require special landscaping and pavement to support drainage and storm water collection, as well as tactile edges for those with vision impairments. Curbless streets should reserve space outside of the transitway for snow removal.

Complementary Treatments

- Transit Signal Priority (p. 31)


1
2
3
4
5
BUS ONLY

Fixed Guideway

Fixed guideways maximize the efficiency of bus operations by fully separating the busway from the street network. Fixed guideways can be at-grade, elevated, below grade, or tunnels and work for high transit volumes that have limited stops over longer distances. Many fixed guideways are implemented along rail ROW.

Benefits

- Maximizes bus speed and reliability due to limited intersections and conflict points with other modes
- Support new walkways and bikeways can be added along the corridor to increase connectivity and improve safety and comfort for pedestrians and bicyclists
- Expands the transit network to provide faster and often more direct connections to downtown and other neighborhoods centers along the alignment

Challenges

- May require significant capital investment and space to build dedicated guideway and stations
- Requires investments in pedestrian and bike connections to the stations
- Bridges and tunnels may be subject to additional rules and regulations requiring more intense coordination across stakeholder groups, including other jurisdictions, MassDOT, and the Federal Railroad Administration
- Not suited for downtown areas and local stops

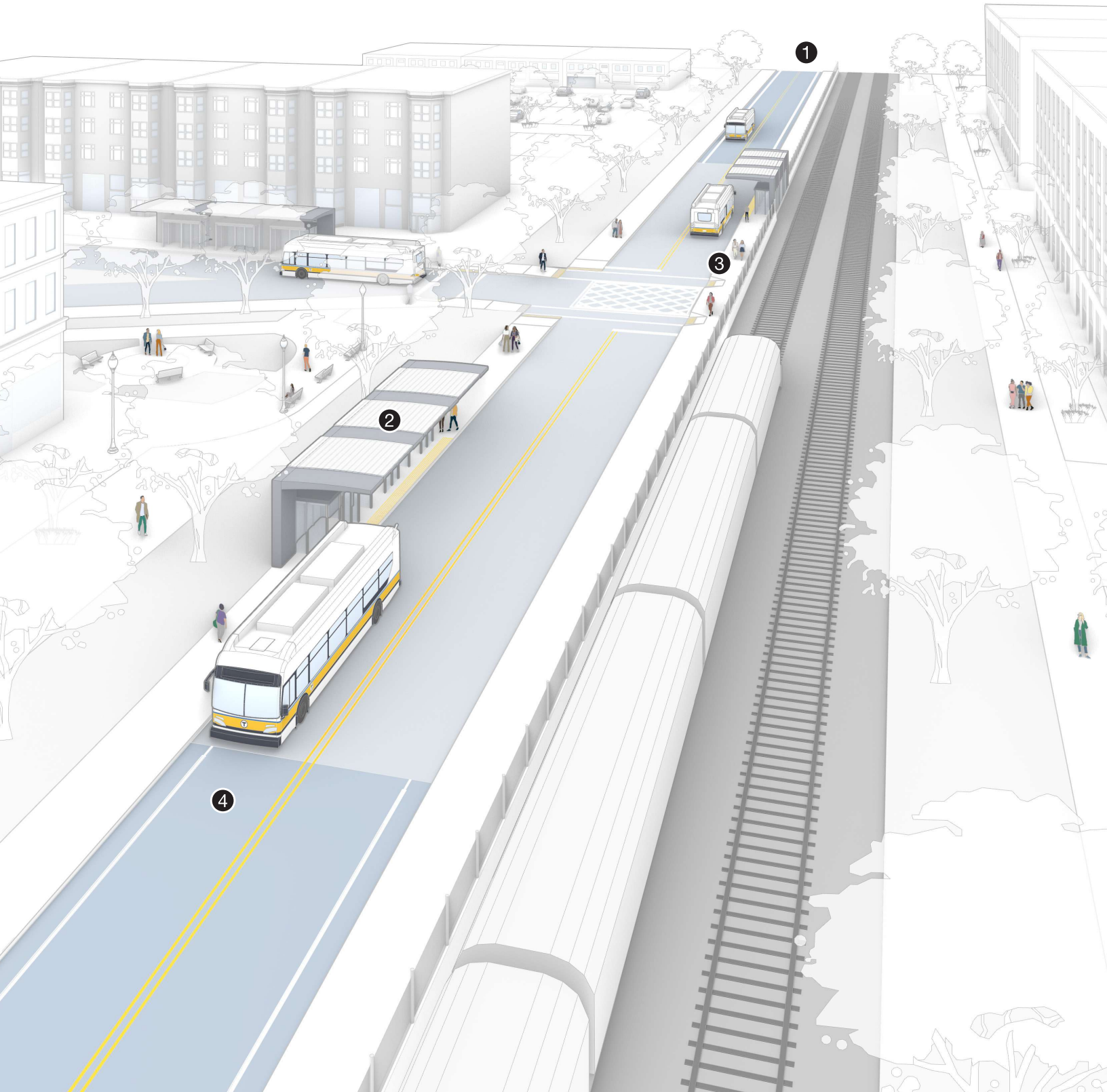
Complementary Treatments

- Transit Signal Priority (p. 31)

See It in Action

In Boston, through Chelsea, Silver Line 3 operates in a fixed guideway adjacent to a rail corridor.

1. **Signage** Post signage at entrances and exits of the fixed guideway to prevent cars from entering.
2. **Station Locations** Consider building premium bus stations at key destinations with a limited stop service to optimize bus speeds. If there is local service consider bypass lanes to allow rapid/express buses to pass local stops.
3. **Station Access** Since a fixed guideway is separate from the street network, provide convenient ADA, pedestrian and bike access to stations, including pedestrian and bike bridges, or elevators if the guideway is not at street-level.
4. **Long-Term Operations** MBTA or MassDOT offices with experience in fixed-guideway and highway operations may be better suited to manage fixed guideways than MBTA bus or other municipalities.


1
2
3
4


22
WARNING
Do not cross
in front of bus.
Massachusetts
1781