TRANSIT STRATEGIES

TRANSIT PRIORITY

Transit service is most attractive when it is faster than driving, or when the time differences are reasonable. To make transit faster, it can be given priority over regular traffic. This can be done through the use of various measures:

- Grade separated busways—dedicated rights-of-way and reserved lanes on existing roads—which allow buses to avoid the delays experienced in mixed-traffic operations.
- Exclusive bus lanes, which can be developed in a number ways, including in medians and in curb lanes.
- Peak period-only bus lanes, which are usually in lieu of parking, but are sometimes implemented through the use of a regular traffic lane.
- Queue jump lanes, which typically substitute a short stretch of parking for a curbside bus lane that allows buses to jump to the front of the queue at bus stops or traffic signals.
- Transit signal priority that extends green signals for approaching buses, which allows them pass through the intersection before the light turns red and provides them with an early green signal.
- The use of freeway shoulders by express buses to bypass congestion.

These measures all contribute to transit service that is faster, more reliable, and more attractive to riders. Although these strategies are critical components of premium services such as Rapid Bus or Bus Rapid Transit (BRT), they can also be implemented to enhance regular bus service by improving speed and reliability along specific corridors.

GRADE SEPARATED BUSWAYS

Grade separated busways allow buses to operate in a completely exclusive right-of-way, often in a former rail right-of-way. Examples include the East, West, and South Busways in Pittsburgh, the Orange Line in Los Angeles, and CTfastrak in Hartford, CT.

PITTSBURGH EAST BUSWAY

CTFASTRAK EXCLUSIVE BUSWAY (HARTFORD, CT)

EXCLUSIVE BUS LANES

Unlike separated busways, bus lanes are located on arterials or other streets that serve general vehicle traffic. Exclusive bus lanes are dedicated for use by bus vehicles only, either part-time (such as during peak commute hours) or at all times. In addition to signage that advertises lanes as bus-only, exclusive bus lanes can be separated from general traffic by physical barriers, such as curbs or bollards, or by other visual elements, such as striping lanes or applying color to the pavement. Striping treatments have been shown to be effective at modifying driver behavior,

leading to increased compliance and lower levels of required enforcement. The effectiveness of striping is due, in part, to the additional visibility that is provided beyond regular street signage.

CURBSIDE LANES

Exclusive lanes can be located either in the center of streets or in curb lanes. Curbside lanes are the most common approach to exclusive bus lanes, due to the fact bus stops are already located along the curb. Curbside lanes let buses continue moving without the need to weave in and out of traffic, and without getting stuck in general vehicle traffic.

CURBSIDE BUS LANES

NEW YORK CITY

LOS ANGELES

Bus lanes can be exclusive to buses full-time, or they can be in effect only during certain hours or days. Most commonly, part-time bus lanes are shared with parking, with curb lanes used for bus service during peak periods and for parking at other times. In many cases, bus lanes are also shared with other uses, such as taxis or bicycles. In addition, emergency vehicles may also be permitted to use exclusive lanes during periods of heavy traffic congestion, preserving emergency response times.

BUS AND BIKE ONLY LANE (WASHINGTON, DC)

Curbside lanes can also function in contraflow lanes, in which buses travel in the opposite direction as regular traffic. In effect, a one-way street is converted to two-way, with regular traffic traveling in one direction, and buses in the other.

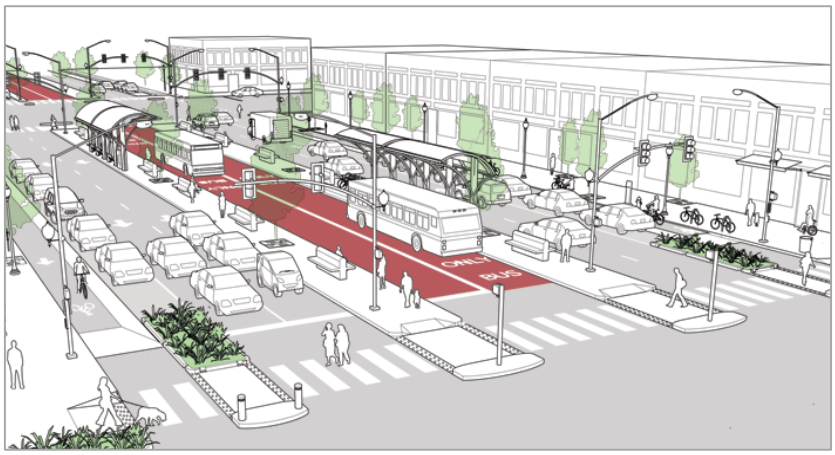
Best Practice: Marq2 Transit Corridor
Minneapolis, MN

In 2009, Minneapolis converted two major downtown arterials—Marquette Avenue and 2nd Avenue South—to transit emphasis corridors for express bus service and named it the "Marq2 Corridor." On both streets, the bus lanes operate as contraflow lanes. On Marquette Avenue, there are two northbound general traffic lanes and two southbound bus lanes, and on 2nd Avenue, the pattern is reversed. The bus lanes are part-time, with only buses permitted on weekdays from 6:00 to 9:00 a.m. and from 3:00 to 7:00 p.m.

MEDIAN LANES

With median lanes, buses operate in the center of a roadway. Whereas buses traveling in curb lanes can face several conflicts from other vehicle traffic, including passenger drop-offs, commercial deliveries, and illegal parking, median lanes eliminate most of these conflicts and thus enhance service speed and reliability. Traffic controls can protect or prohibit left turns by other vehicles. Dedicated transit signal heads can help to minimize confusion over which traffic signals apply to left-turning vehicles versus transit vehicles.

MEDIAN BUS LANE AND STOPS



With median lanes, stations are also located along the median, and designated crosswalks with clear signage and signals can let users reach stops. Stops may be located on the right side of the vehicle (which allows regular transit vehicles to serve the stop) or on the left side in the middle of the roadway (which necessitates the use of vehicles with doors on the left side). In Cleveland, HealthLine BRT vehicles are equipped with passenger doors on both sides to serve stops on both the left and right sides of the vehicle.

Best Practice: HealthLine
Cleveland, OH

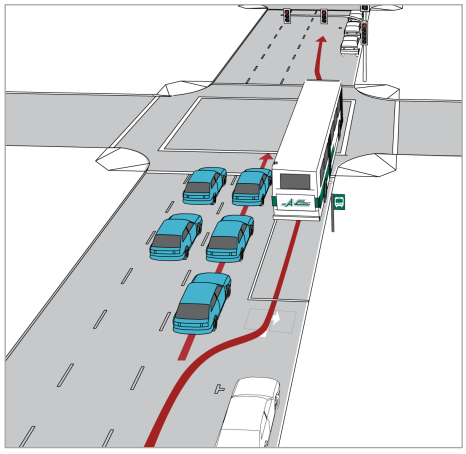
Cleveland's HealthLine is a full-featured BRT route, including exclusive bus lanes that are separated from general traffic by both striping and physical barriers. Median bus lanes were implemented along the route to avoid delays that are associated with the curb lane, providing faster and more reliable service. The use of median lanes also allowed more on-street parking to be retained along the corridor.

Dedicated transit signal heads and signage help to direct traffic at intersections. Since HealthLine has stations on both the left and right sides of the bus, the system has low-floor buses with both right and left-side doors to allow for boarding and alighting from both sides of the bus.

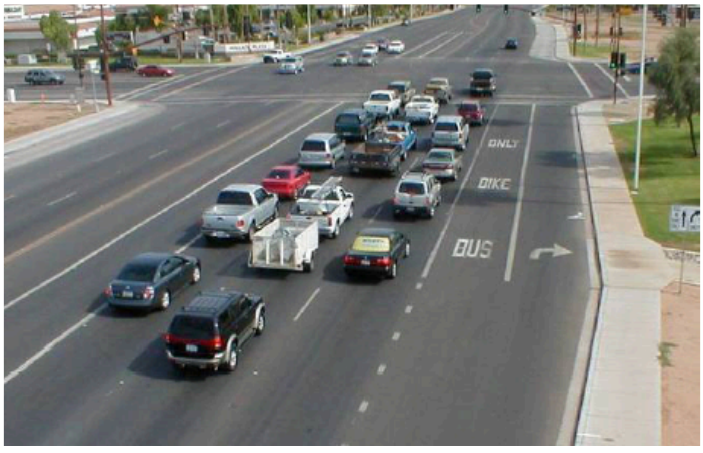
QUEUE JUMP LANES

Queue jump lanes provide transit vehicles priority by creating a special lane at intersections that allows buses to move to the front of stopped traffic. The lanes are restricted to transit vehicles only (and often also right turning vehicles); this allows a bus to skip to the front of the line at a stop light. 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 OPERATION



QUEUE JUMP LANE (CHANDLER, AZ)

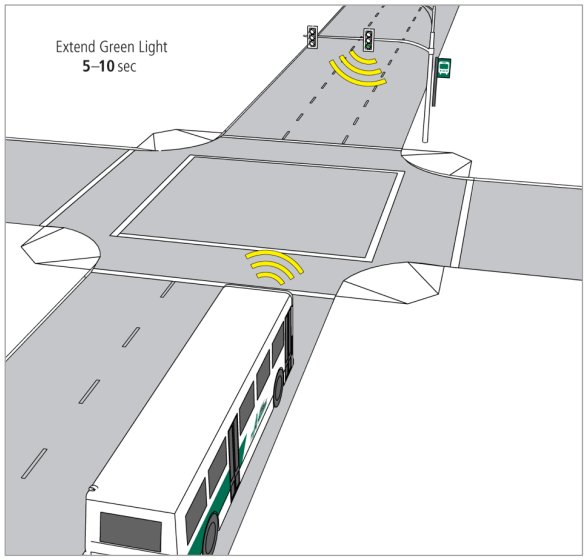


Queue jumps improve transit's speed and reliability by helping buses move through intersections and stay on schedule. The use of queue jumps alone can result in travel time improvements of 5 to 25%. When paired with other bus treatments, additional travel time savings have been recorded.

TRANSIT SIGNAL PRIORITY

Transit Signal Priority gives preferential treatment to buses at traffic signals. Signal priority modifies normal traffic signal operation to facilitate the movement of transit vehicles by changing the signal to green early or by extending the green signal until the bus passes through. This technology significantly reduces signal delays, and can reduce bus travel times by 5% to more than 20%, depending upon the level of system investment.

TRANSIT SIGNAL PRIORITY OPERATION



Signal priority is typically implemented in conjunction with exclusive bus lanes. Signal priority systems vary in complexity. Some systems rely on transit operator intervention or activation, while others have automated systems that use transponders to connect with signal equipment.

SHOULDER-RUNNING BUS SERVICE

Twelve states have implemented policies that permit buses to operate on selected freeway shoulders in order to speed service, and more are now considering it. These policies allow buses on selected freeway and arterial shoulders in order to bypass congestion and maintain transit schedules. Bus on shoulder operation is a low-cost way to make freeway transit service faster and more reliable.

BUS-ON-SHOULDER OPERATIONS

MINNEAPOLIS

RALEIGH, NC

Bus on shoulder operations were first implemented in Minnesota more than 20 years ago. The state now has 300 miles of shoulders in use by buses today and cites a number of benefits to bus on shoulder operation, including:

- Shorter and more predictable and reliable transit travel times
- Fewer missed transfer connections
- Increased transit ridership
- Reduced driver overtime
- Decreased operating costs

OPPORTUNITIES FOR NASHVILLE AND MIDDLE TENNESSEE

Transit priority has been identified as a key strategy to strengthen transit service along major corridors in Nashville and in Middle Tennessee. Nashville MTA is in the process of implementing transit signal priority along Murfreesboro Pike, which will improve travel times on Routes 15 Murfreesboro Pike and 55 Murfreesboro BRT lite. As part of the Northeast Corridor Mobility Study, transit priority measures such as signal priority and queue jumps were identified as potential strategies for congestion relief and travel time savings at several congested intersections. In addition, a network of High Capacity Transit Corridors were identified in NashvilleNext; as ridership and land use changes generate a market for more frequent transit, these corridors may be strong candidates to examine for transit priority treatments.

Looking forward, the implementation of transit priority measures will be crucial to the success of high-capacity transit options in the region. Measures may be implemented along new Bus Rapid Transit (BRT) and Rapid Bus lines, along Transit Emphasis Corridors, and in areas served by a Frequent Transit Network, would make transit faster and more attractive. These strategies may also be appropriate along heavily-traveled corridors served by local bus routes. In addition, the Nashville MTA and the RTA of Middle Tennessee currently operate a relatively large number of express bus routes along most of the Nashville's radial freeways, but in particular I-24 and I-65 from the south and I-24/I-65 from the north. Bus on shoulder operations could make these services faster and more reliable, and more competitive with automobile travel, without the expense of additional travel lanes or dedicated infrastructure.