Bus

Alternative Description/Overview

Bus systems typically operate in mixed traffic and have minimal station infrastructure. Bus service typically operates every 10-60 minutes. Bus stop spacing is typically 1/4 to 1/2 mile apart.

Bus systems are in operation in multiple locations around North America. Multiple vendors provide this technology. Future expansion or modification of a bus system would be simple and would not require substantial investment in guideways, propulsions or stations.

Vehicle Description

Bus routes can operate using either standard or articulated buses. Vehicles are typically diesel propelled, but can also be powered using compressed natural gas, hybrid-electric, diesel or biodiesel. Bus vehicles typically have low floors, and if they are articulated have three doors.

Vehicle Example

Facts at a Glance

Propulsion: Diesel/Compressed Natural Gas/Bio-diesel/Hybrid Electric

Capacity: 50 passengers (standard vehicle), 80 passengers (articulated vehicle)

Vehicle Length: 40 feet long (standard vehicle), 62 feet long (articulated vehicle)

Maximum Speed: 60 MPH

Infrastructure Required to Support this Alternative

Space to maintain and store the vehicles would be required for service. Locating this facility near the operating routes is not required, but it is desirable in order to minimize operating costs. If compressed natural gas vehicle are used, a specialized fueling facility would be required.

Station Infrastructure

Bus stations are typically minimal in their design. Most stations include signs identifying the stop and listing the routes served.

Bus Rapid Transit (BRT)

Alternative Description/Overview

BRT uses a variety of infrastructure and technological improvements to improve the travel time and reliability of bus service. These infrastructure improvements could include exclusive running ways, queue jumps and/or transit signal priority at intersections.

BRT stop spacing is typically less than normal bus service (1/2 to 1 mile apart).

BRT is in operation in multiple locations around North America. Multiple vendors provide this technology. Future expansion or modification of BRT would be simple and would not require substantial investment in guideways, propulsions or stations.

Vehicle Description

BRT routes can operate using either standard or articulated buses. Vehicles are typically diesel propelled, but can also be powered using compressed natural gas, hybrid-electric, diesel or biodiesel. In order to differentiate BRT service from standard bus service, vehicles typically have a different look, including special wraps, interiors and design. In order to speed boarding and improve accessibility, BRT vehicles typically have low-floors, and have three doors if they are articulated.

Vehicle Example

Facts at a Glance

Propulsion: Diesel/Compressed Natural Gas/Bio-diesel/Hybrid-Electric

Capacity: 50 passengers (standard vehicle), 80 passengers (articulated vehicle)

Vehicle Length: 40 feet long (standard vehicle), 62 feet long (articulated vehicle)

Maximum Speed: 60 MPH

Infrastructure Required to Support this Alternative

A Bus Rapid Transit system would require space to maintain and store the vehicles required for service. Locating this space near the BRT alignment is not required, but it is desirable in order to minimize operating costs. If compressed natural gas vehicles are used, a specialized fueling facility would be required.

BRT improvements can also include transit signal priority (TSP), which allows transit vehicles to receive preferential treatment at intersections. Depending on the complexity chosen, this technology could require TSP-enabled equipment at intersections, on vehicles, and at traffic management centers.

Station Infrastructure

BRT stations include elements to improve the overall travel experience for passengers and to provide a sense of permanence to the customer (and adjacent properties). Typically, they include sheltered waiting areas, “next-bus” enunciators, fare payment machinery and benches. Stations can also be constructed with curb extensions, bus pull-outs, and higher curbs (meeting the height of the bus floor), all of which can improve the overall customer experience.

Light Rail Transit (LRT)

Alternative Description/Overview

A Light Rail Transit (LRT) system would be best accommodated within an exclusive running way, but mixed traffic systems exist. LRT systems are typically comprised of 1 to 2 tracks for most of the alignment.

LRT stop spacing is typically 1/2 to 1-mile apart.

LRT is found in multiple locations around North America. Multiple vendors provide this technology. Future expansion/modification of LRT would have some cost but would not be entirely prohibitive.

Vehicle Description

LRT vehicles can either be diesel or electrically propelled. Other methods of propulsion such as battery and ground level powered vehicles are being installed/tested in various locations outside of the United States.

LRT vehicles with high-floor and low-floors are available, although high-floor vehicles are becoming less common due to accessibility issues.

Vehicle Example

Facts at a Glance

Propulsion: Diesel/Electric

Capacity: 200 passengers (per car). Typical train-set configurations range from 2-3 cars.

Vehicle Length: Approximately 70 feet (per car)

Maximum Speed: 65 MPH

Infrastructure Required to Support this Alternative

An LRT system would require space to store and maintain the vehicles. This facility would need to be connected to the tracks, and would ideally be located at the end of the line. If a diesel-propelled vehicle is chosen, fueling facilities would be required. Electrically propelled light rail vehicles require catenary poles and wire, and power substations. In some instances, LRT vehicles use train-control signals to keep trains safely spaced apart.

LRT systems can also include transit signal priority (TSP), which allows the vehicle to receive preferential treatment at intersections when operating at grade. Depending on the complexity chosen, this technology could require TSP-enabled equipment at intersections, on vehicles, and at traffic management centers.

Station Infrastructure

LRT stations typically include sheltered waiting areas, “next-train” enunciators, fare payment machinery and benches. Depending on the type of vehicle, stations can either be high or low-platform (depending on the vehicle type).

Streetcar

Alternative Description/Overview

Streetcar systems are most often accommodated in mixed traffic, although in some locations streetcars are operated in partial exclusive guideways. Streetcars are typically comprised of 1 to 2 tracks for most of the alignment.

Streetcar stop spacing is typically every 1 to 2 blocks. It is assumed that a streetcar alternative would stop at or close to the existing bus stops along the corridor.

Vehicle Description

Streetcar vehicles are typically smaller than LRT vehicles, and have fewer doors. Streetcars can either be diesel or electrically propelled.

Depending on the type of vehicle used, vehicles can either be a heritage or more modern fleet. Heritage fleets are typically high-floor vehicles and require either lifts or high level platforms for accessibility. Modern, low-floor fleets do not require this additional infrastructure.

Vehicle Example

Facts at a Glance

Propulsion: Diesel/Electric

Capacity: 80 to 100 passengers per car. Typical train-set configuration consists of one car only.

Vehicle Length: Approximately 50 feet

Maximum Speed: 25 MPH

Infrastructure Required to Support this Alternative

A Streetcar system would require space to store and maintain the vehicles. This location would need to be connected to the tracks, and would ideally be located at the end of the line. If a diesel-propelled vehicle is chosen, fueling facilities would be required. Electrically propelled streetcar vehicles require catenary poles and wire, and power substations.

Streetcars typically do not operate using train-control signals (the driver maintains a safe distance between vehicles by using “line of sight”).

Streetcar systems can also include transit signal priority (TSP), which allows transit vehicles to receive preferential treatment at intersections when operating at grade. Depending on the complexity chosen, this technology could require TSP enabled equipment at intersections, on vehicles, and at traffic management centers.

Station Infrastructure

Streetcar stations typically include minimal amenities, and at a minimum could consist of no more than a simple sign indicating where the vehicle stops.

Commuter Rail

Alternative Description/Overview

Commuter Rail would require an exclusive, fixed guideway – typically single track with sections of double track – for the entire length of its route. Commuter rail alignments are typically at-grade, though tunneled or elevated alignments do exist.

Commuter Rail stop spacing is typically 2 to 10-miles apart.

Commuter Rail is in operation in multiple locations around North America. Multiple vendors provide this technology. Future expansion/modification of Commuter Rail would require a substantial investment in guideways, propulsion and stations.

Vehicle Description

Commuter Rail systems can either be diesel or electrically propelled (overhead catenary wire or third rail). Commuter Rail vehicles typically operate in exclusive guideways and vehicles can have level boarding or low platforms.

Vehicle Example

Facts at a Glance

Propulsion: Diesel/Electric

Capacity: 100-200 passengers (per car). Typical train-set configurations range from 2-12 cars.

Vehicle Length: ~85 feet (per vehicle)

Maximum Speed: 65-79 MPH

Infrastructure Required to Support this Alternative

A Commuter Rail system would require space to store and maintain the vehicles. This facility would need to be connected to the tracks, and would ideally be located at the end of the line. If a diesel-propelled vehicle is chosen, fueling facilities would be required. Electrically propelled vehicles would require catenary poles and wire, and power substations. Commuter Rail vehicles use train-control signals to keep trains safely spaced apart.

Station Infrastructure

Commuter Rail stations include elements to improve the overall travel experience for customers and to provide a sense of permanence to the customer (and adjacent properties). Typically, they include sheltered waiting areas, with space for fare payment machinery and waiting areas with benches.

Heavy Rail

Alternative Description/Overview

Heavy Rail would have to be accommodated within an exclusive, fixed guideway. Heavy Rail systems are typically two tracks in each direction and are typically elevated or in tunnel sections.

Heavy Rail stop spacing is typically every 1 to 2 miles.

Heavy Rail is in operation in a handful of highly urban locations around North America. Multiple vendors provide this technology. Future modification/expansion of Heavy Rail would require a substantial investment in guideways, propulsion and stations.

Vehicle Description

Heavy Rail vehicles are electrically propelled and powered by either third rail or overhead catenary wire. Heavy Rail vehicles are high-floor vehicles with multiple doors. Heavy Rail vehicles typically operate in a fixed guideway due to their speeds.

Vehicle Example

Facts at a Glance

Propulsion: Electric

Capacity: Approximately 150 passengers per car. Typical train-set configurations range from 4-10 cars.

Vehicle Length: 60-75 feet (per car)

Maximum Speed: 65 MPH

Infrastructure Required to Support this Alternative

A Heavy Rail system would require space to store and maintain the vehicles. This facility would need to be connected to the tracks, and would ideally be located at the end of the line. Either catenary poles and wires or a third rail system, as well as electrical substations, would be required along the line to power the vehicles. A train-control signal system to keep trains spaced safely apart would also be required.

Station Infrastructure

Heavy Rail stations typically include sheltered waiting areas, “next-train” enunciators, fare payment machinery and benches. Heavy Rail stations would need to be elevated (due to the elevated guideway) and would require vertical circulation elements including elevators and overpasses.

Monorail

Alternative Description/Overview

Monorail systems are accommodated within an exclusive running way. Single beam monorails exist, but are mainly used for uni-directional operation. Two beams would be required for bi-directional operation.

Monorail stop spacing is typically every 1/2 to 2 miles.

Monorail is in use in the study area (at Walt Disney World) and is found at a handful of locations in North America. The number of vendors for Monorail technology is limited to a few proprietary companies. Future expansion/modification of a monorail would require a substantial investment in guideways, propulsion and stations.

Vehicle Description

Monorail vehicles are electrically propelled and slightly narrower than LRT/Heavy Rail Vehicles due to the width of their guideways. Vehicles have level boarding with station platforms. Monorail vehicles straddle a single guide-beam which provides vertical and horizontal support as well as traction power. Monorails must operate in an exclusive guideway due to their unique guide-beam. This beam is usually elevated on piers.

Vehicle Example

Facts at a Glance

Propulsion: Electric

Capacity: 40-60 passengers (per car). Typical train-set configurations range from 2-6 cars.

Vehicle Length: 34 feet long (per car)

Maximum Speed: 55 MPH

Infrastructure Required to Support this Alternative

A Monorail system would require space to maintain and store the vehicles required for service. This facility would need to be connected to the tracks and would ideally be located at the end of the line. Train signal infrastructure to control the movement of trains and substations for electrical power would also be required.

Station Infrastructure

Monorail stations must be elevated to access the guideway. They require elevators and other vertical passenger circulation elements to access the station platforms. Similar to other modal technologies, station platforms include sheltered waiting areas, next-train enunciators, and fare payment machinery.

High Speed Rail

Alternative Description/Overview

High Speed Rail (HSR) is a type of passenger transport that operates significantly faster than traditional rail traffic. The U.S. Department of Transportation is currently working with various States to plan and develop high-speed and intercity passenger rail corridors that range from upgrading existing track and services to entirely new rail lines exclusively devoted to 150 to 220 mph trains. HSR alignments typically consist of two tracks and must be grade separated, which requires substantial infrastructure.

HSR stations are typically spaced 10 miles apart or greater.

High Speed Rail is operated in North America on Amtrak's Northeast Corridor. The number of vendors for High Speed Rail technology is limited. Future expansion/modification of a High Speed Rail would require a substantial investment in guideways, propulsion and stations.

Vehicle Description

High Speed Rail vehicles are electrically propelled. Vehicles must have level boarding. High Speed Rail vehicles typically operate in an exclusive guideway due to their speed.

Vehicle Example

Facts at a Glance

Propulsion: Electric

Capacity: 70-80 passengers

Vehicle Length: Varies

Maximum Speed: 220+ mph

Infrastructure Required to Support this Alternative

A HSR system would require an exclusive running way for the entire length of its route. The alignment would be examined as part of the study and be based on the availability of right-of-way for the required tracks and other alignment features.

HSR would require dedicated and significant stations and a train storage and maintenance facility. This facility would need to be connected to the tracks and would ideally be located at the end of the line. A HSR system would also require an electric traction power system and signal system.

Station Infrastructure

HSR stations include elements to improve the overall travel experience for customers and to provide a sense of permanence to the customer (and adjacent properties). Typically, they include sheltered waiting areas, with space for fare payment machinery and waiting areas with benches.

Maglev

Alternative Description/Overview

Maglev (or magnetic levitation) transport, is a form of transportation that suspends, guides and propels vehicles via electromagnetic force. A Maglev alternative would require a two track exclusive running way for the entire length of its route. Maglev alignments are typically elevated or tunneled, though at-grade alignments do exist.

Maglev stations are typically spaced every 2 to 10 miles apart.

There is no Maglev currently in operation in North America. There are a limited number of vendors which provide this proprietary technology. Future expansion/modification of Maglev would require a substantial investment in guideways, propulsion and stations.

Vehicle Description

Maglev vehicles are propelled using electromagnetic force. The levitation of the vehicle using magnetic forces helps to create a quiet and smooth ride, even at high speeds. Vehicles have level boarding with high level station platforms. Maglev vehicles straddle a single guide beam and operate in an exclusive guideway due to their high speeds.

Vehicle Example

Facts at a Glance

Propulsion: Electromagnetic force

Capacity: 220+ passengers

Vehicle Length: Varies

Maximum Speed: 300 mph

Infrastructure Required to Support this Alternative

A Maglev system would require an exclusive running way for the entire length of its route. The alignment would be examined as part of the study and be based on the availability of right-of-way for the required tracks and other alignment features.

A Maglev system would require space to maintain and store the vehicles required for service. This facility would need to be connected to the Maglev alignment, ideally at the end of the line.

Station Infrastructure

Maglev stations include elements to improve the overall travel experience for customers and to provide a sense of permanence to the customer (and adjacent properties). Typically, they include sheltered waiting areas, with space for fare payment machinery and waiting areas with benches.

Stations may be enclosed with sliding doors at the platform edges for passenger safety – to prevent any person from entering the pathway of an oncoming vehicle.