

Chapter 12

Intermodal Facilities and Rest Areas



Intermodal Facilities and Rest Areas

12.1 Introduction

This chapter describes design considerations for Park & Ride/Transit Centers and Rest Areas/Tourist Information Centers. **Park and Ride** lots provide a collection point for travelers to transfer between the automobile mode and transit, or between the single occupant vehicle (SOV) and high occupancy vehicle modes. Other modes potentially supported by a Park and Ride facility include pedestrian, bicycle, paratransit, intercity bus transit, airport service, and intercity and commuter rail. In addition to the services offered at park-and-ride lots, **Transit Centers** tend to offer a higher degree of travel services, route choices, and mode choices.

Rest Areas are as areas that provide a location for travelers to relax and take a break from highway travel. Rest areas often serve multiple purposes, providing comfort stations, and in some cases, food and beverage services. **Tourist Information Centers**, also provide a location for travelers to rest and provide information on nearby services and attractions. These centers could be included within Rest Areas or constructed separately.

12.2 Park & Ride Facilities

Park & ride facilities are constructed to provide a convenient area for commuters to park and carpool or take public transportation. In tourist-oriented areas, they can also serve as Tourist Information Centers (described in section 12.4 below) and meeting places for travelers. The following section describes characteristics of successful park & ride lots and key design considerations.

12.2.1 Success Factors

Key design considerations for developing successful park & ride lots include:

- A location on a major highway serving commuters that is convenient to residential areas, bus routes, and/or feeder highways to the major commuting route;
- A location upstream of points of congestion along the commuting highway;
- A location in proximity to good quality transit services (high frequency and speed);
- A location near or within commercial developments such as movie theaters, shopping malls, restaurants, stadiums, and hotels (as well as other public or private developments). These land uses often have a surplus of parking during the workday (the establishment's "off-peak" time). This parking could be sufficient to serve the needs of commuters or travelers during the day and patrons of the establishment at night and on weekends.
- The presence of retail services near the park & ride facility and ambient lighting and security;
- Quality design elements such as effective lot circulation, easy access and egress, ample parking, bicycle accommodation, attractive landscaping, lighting, bus shelters, phones, and security; and
- Proper maintenance of these quality design elements, including snow removal, also contributes to success.

12.2.2 Design Considerations

The design of a park and ride facility should consider expected parking demand, parking facility design standards, circulation patterns, and drainage facilities. Key design considerations for park & ride lots are discussed in the following sections.

- **Site Selection:** In addition to the factors that make a park & ride lot attractive for users, the designer needs to consider site terrain, drainage, subgrade soils, and the available space compared to the required lot size. The designer should also consider impacts to any surrounding streams, wetlands, or environmentally sensitive areas, as well as impacts to abutters and compatibility with surrounding

land uses. All measures should be taken to avoid historically, culturally, or environmentally sensitive areas or minimize impacts to them if a facility must be located near them.

- **Multi-modal Access:** The designer should attempt to incorporate park and ride facilities into existing transit, bicycle, and pedestrian systems and should consider expected uses of the facility, including transit access, pedestrian access, bicycle accommodation, vehicular access, and parking layout. Bus loading, passenger drop-off and pick-up, and parking should be separated from each other and clearly marked. For facilities with transit service, dedicated busways should be provided and short term parking and drop-off/pickup space should be located near the bus loading area.
- **Safe Pedestrian and Bicycle Circulation:** Pedestrian connections, crosswalks, and paths must be provided throughout the lot to the transit area and nearby buildings. Within the parking areas, spaces should be aligned 90 degrees to the direction of pedestrian travel ensuring clear routes that maximize visibility. Consideration should be given to providing a separate walking route between parking bays that aligns with a transit center entrance or bus loading area. If bicyclists are expected to commute to the lot, a bicycle area with covered racks or lockers should be provided. Bicycle parking should be provided at a rate of 1 space for every 10 to 20 vehicle spaces, depending on location.
- **Site Access/Egress:** Separate driveway exits and entrances should be provided, preferably on different streets if possible. The entrance driveways should be on the upstream side of the traffic flow nearest the lot, and the exit driveway on the downstream side. It is desirable to provide at least one exit and one entrance for every 500 parking spaces provided. Individual driveways serving a greater number of parking spaces should be reviewed for possible signalization. All exits and entrances should be designed according to the criteria in Chapter 6 (At Grade Intersections). These criteria include capacity, turning radii, and auxiliary lanes on the intersecting highway or street.
- **Parking:** The number of parking spaces to be provided in a new or expanded park-and-ride facility should be determined using information generated by the Office of Planning. The size of the drop-off/pickup area and the number of associated short-term spaces should be determined according to projected demand. Best practice calls for right-angle parking with sufficient aisle width for

two-way travel. However, where space is limited, angle parking with one-way travel is acceptable. There are specific requirements for accessible parking spaces for cars and vans, including the number, size, and location of these spaces as well as vertical clearance for van spaces. Refer to 521 CMR and ADAAG for specific parking standards. Where accessible parking is more than 200 feet from a building entrance, an accessible drop-off area must be provided. In addition, refer to the *AASHTO Guide for the Design of Park-and-Ride Facilities* for guidance in parking layout and recommendations for parking stall dimensions based upon the angle of parking. Consideration should also be given to the need for any parking regulatory signs such as “No Overnight Parking”.

- **Bus Bays and Circulation:** Where possible, linear bus bays are preferred, with a separation between bus layover and passenger loading areas. All required turns within the parking lot (e.g., to and from bus loading area and around islands) should be designed to accommodate the applicable vehicle. Refer to Chapters 3 and 6 of this manual and the *AASHTO Guide for the Design of Park-and-Ride Facilities* to determine appropriate bay dimensions and turning radii. Adequate level areas adjacent to where buses stop to discharge or pick-up passengers are needed to accommodate a wheelchair getting on or off a bus.
- **Sidewalks and Walkways:** It is recommended that any sidewalks be at least 7 feet wide. Loading areas should be at least 12 feet wide. Wheelchair ramps are required for access onto sidewalks and loading areas.
- **Grading and Drainage:** Where buses will use the park-and-ride lot, the grade should not exceed 7 percent. A maximum grade of 5 percent is preferred. Grades may be steeper in facilities where only cars will use the lot. Chapter 8 should be used for the detailed drainage design of the parking lot. This includes design storm frequency pavement discharge, and capacity of drainage inlets. The drainage design should not allow ponding on pedestrian routes, bicycle routes, or any access roadways or parking areas. To provide proper drainage, the minimum gradient should be 1 percent. Water quality and peak discharge rate attenuation should also be addressed.
- **Signage:** Directional signs, bicycle route markings and signing, and traffic control should be designed in accordance with the Manual on

Uniform Traffic Control Devices (MUTCD). Local policies for informational signs should be considered.

- **Lighting & Security:** The entire parking lot should be lighted, however care should be taken to prevent spillover into adjacent neighborhoods. The uniformity ratio should not exceed 6:1. The area should be well lit and free of landscaping that can obstruct a user's view of his/her surroundings. The designer should provide adequate security measures which may include:

- Video Surveillance;
- Random Police Patrols;
- Provision of Emergency Call Boxes; and
- Provision of Safety Information Brochures to patrons.

Additionally, co-location of park & ride facilities with active commercial sites, or other compatible uses can increase the "eyes on the street" and improve lot security.

- **Landscaping:** The designer should include landscaping in the plans for the park-and-ride lot. If islands are incorporated in the design, these can be convenient locations for trees and other landscaping elements. Safety, lighting, plowing, and landscape maintenance should also be considered in the placement and choice of trees and shrubs.
- **Amenities:** Where a loading area for buses or trains will be provided, a shelter should be included in the design. The size of the shelter should be approximately three to five square feet per person waiting to board. It is desirable to include lighting, benches, trash receptacles, and route information in loading areas. Bus shelters must be accessible to people with disabilities. Both 521 CMR and ADAAG have specific requirements for approaching, entering, and using shelters.
- **Solid Waste Management:** The designer should provide information on plans for collection of trash and recycling at the proposed facility.

Some of these design considerations can also be applied to the development "joint use" facilities such as at shopping centers although their application will be limited for existing facilities and by the needs of the joint user.

12.3 Transit Centers

Transit Centers serve as major multi-modal nodes connecting various regional, express, circulator and local bus services with each other and providing vehicular, bicycle and pedestrian access to these services. Transit centers are designed specifically to facilitate transferring between bus routes and between bus and other travel modes. They are often located within major activity centers. Transit centers will operate most successfully if good directional and informational signs are in place. Way finding systems should incorporate multi-media information so that people with hearing, sight, or mobility limitations can navigate between transportation modes. Accessible routes should coincide with the routes of the general public.

Typically, the design and operation of a Transit Center is the responsibility of a Transit Agency. The design guidelines of the transit agency should be followed with respect to layout and design. Design considerations specified earlier for park & ride facilities should also be considered for Transit Centers. Particular consideration should be given to:

- Allowances for minimum clearances and turning radii of transit vehicles;
- Acceleration/deceleration, grade, sight distance issues;
- Appropriate roadway and driveway widths; and
- Allowances for underside road clearance at driveways, speed humps, raised pedestrian paths, and railroad crossings

The designer must especially consider the need for multimodal safety and accommodation as discussed below.

12.3.1 Multi-Modal Safety & Accommodation

The design of a transfer facility should include safety measures that prevent conflicts between modes while not restricting the ability to easily transfer between modes. This can be achieved by providing separate access driveways for transit, non-transit modes, and pick-up/drop-off, and providing separate areas for bus loading and unloading and layover.

A continuous sidewalk network and pedestrian circulation pathway should be provided throughout the facility, including connections to park and ride lots, as applicable. Pedestrian desire lines (the natural

pedestrian path) should not be blocked by landscaping or other impediments.

Maximum visibility of pedestrian crossings of vehicular routes should be provided through pavement markings, medians, or varying crossing heights. The Transportation Research Board's *Transit Capacity and Quality of Service Manual* and ADAAG and 521 CMR regulations should be consulted for procedures in designing pedestrian walkways and waiting areas.

Finally, planning for proper storage and access of bicycles is important to support the needs of the surrounding community. Protected bike racks or lockers should be provided in a secure, visible location that does not interfere with pedestrian and auto traffic.

12.4 Rest Areas

Rest Areas are developed primarily to provide safety and convenience to the traveling public along freeways and major arterials in Massachusetts. While the need for rest areas is determined on a case by case basis, planning for rest areas should consider:

- Attractiveness of location;
- Topography;
- Distance from other rest areas;
- Distance between interchanges; and
- Availability of water and utilities.

All rest areas should comply with the "Recreational Facility" section of 521 CMR.

12.4.1 Site Selection

A typical rest area requires approximately 25 acres of land within the highway right-of-way to accommodate the site functions. Where possible, rest areas should be located on both sides of the highway to avoid motorists stopping to use a rest area on the opposite side of the highway. To reduce this likelihood, measures such as advanced signage and median fencing should be considered. Additionally, Rest Areas on opposite sides of the highway should be spaced approximately 0.25 miles apart, with the motorist reaching the rest area in their travel direction prior to seeing one on the opposite side of the highway. Rest areas in the middle of the highway are not

recommended because they disrupt mainline flow by requiring left-hand exiting from the highway and left-hand entering to the highway.

In addition to new locations, the designer should investigate the use of existing facilities or co-locating rest areas with other roadside facilities such as weigh stations. Once the need for a rest area is determined and the location selected, MassHighway should be consulted as to scenic quality of the area, roadway access to the area, and whether the area can sustain the proposed development (based on topography and utility connections). Generally, attempts should be made to locate the rest area away from adjacent residential and industrial land uses but near connections to municipal water and sewer systems. If no municipal water and sewer systems are available, the designer should provide MassHighway with alternate water and sewer plans. Alternatives for locations where utilities are not available include composting toilets, solar or wind power generation, or on-site sewerage treatment/storage/ disposal, designed in conformance with local and state regulations.

12.4.2 Design Considerations

Once a site has been selected, the rest area must be designed in detail. Several features need to be considered, including exits and entrances, parking, facilities, utilities, landscaping, safety and handicap access. All rest areas must be designed to properly accommodate people who require mobility aids with curb cuts, ramps, handicap and van accessible parking, and rest room features. All buildings must be accessible.

These considerations are described in the following sections.

- **Exits and Entrances:** The rest area junctions should be designed to the standards appropriate for the adjacent highway. These are described in Chapter 7. At a minimum, entrance and exit ramps should be located approximately 3,000 feet from adjacent highway interchanges. The ramps should be designed to slow traffic from highway speeds to those suitable for the pedestrian environment of the rest area (less than 30 miles per hour).
- **Parking:** The number of parking spaces should be commensurate with the expected usage of the rest area. The usage, in turn, will be a function of the size and type of facility provided (e.g., a large information facility will generate a greater percent stopping than a

smaller one). Parking should be provided for at least 50 passenger cars and 40 trucks. However, where space is restricted the number of parking spaces should be calculated as shown in Exhibit 12-1.

Exhibit 12-1 Minimum Parking Requirements

Minimum Required Truck Stalls	Passenger Cars
Percent trucks * DHV = _____	Percent Passenger Cars* DHV = _____
* 0.15 entering vehicles = _____	* 0.09 entering vehicles = _____
* 0.5 Dwell Time/Turnover = <input type="text"/>	* 0.34 Dwell Time/Turnover = <input type="text"/>

DHV = Design Hour Volume

Note: Passenger Stall requirements should be increased by 25 percent for Welcome Centers.

Source: Adapted from the Illinois Department of Transportation

Separate parking areas should be provided for passenger vehicles and for trucks and buses. There are specific requirements for accessible parking spaces for cars and vans, including the number, size, and location of these spaces as well as vertical clearance for van spaces. Refer to 521 CMR and the ADAAG for specific parking standards. Where accessible parking is more than 200 feet from a building entrance, an accessible drop-off area must be provided. Because of the one-way operation of rest areas, angle parking is generally recommended. Parking should be prohibited on entrance and exit ramps to the facility to ensure that adequate visibility and horizontal clearance is maintained along these ramps. Consideration should also be given to the need for any parking regulatory signs such as parking time limits.

- **Facilities:** Rest areas may provide a building with rest rooms, tourist and public information services, picnic tables and shelters, benches, sidewalks, pet accommodations, drinking fountains, vending machines, and trash collectors. If facilities are provided, they shall comply with 521 CMR and ADAAG requirements.
- **Restroom Facilities:** Entranceways to restrooms should provide an unobstructed walkway. Elevated planters, walls, shrubs, and bushes should not obscure the approaching patron's view of his/her surroundings. The area should be well lit. In general, restrooms buildings require approximately 3,000 square feet to accommodate traveler needs. Rest rooms should provide approximately 700

square feet for every eight fixtures provided. The number of fixtures needed can be calculated as shown in Exhibit 12-2. Restrooms should comply with 521 CMR and ADAAG.

**Exhibit 12-2
Minimum Rest Room Requirements**

		Notes
Two-way ADT =	_____	
* 0.6 percent =	_____	60/40 directional distribution
* 0.11 =	_____	11 percent of ADT occurs during peak hour (DHV)
*2 =	_____	2 person average vehicle occupancy
* 0.85 =	_____	
P/RU =	<input type="text"/>	total person/rest room use

P/RU	Rest Room Amenities						
	Men				Women		
	Urinals	Toilets	Wash Basins	Hand Dryers	Toilets	Wash Basins	Hand Dryers
<250	4	2	2	2	6	2	2
>250	4	4	4	4	8	4	4
>500	6	4	4	6	10	4	6

Source: Adapted from the Illinois Department of Transportation

- **Other Amenities:** When considering other amenities, the following should be considered:
 - ❑ The number of picnic tables provided should equal approximately 0.008 times the projected roadway design hour volume and 5 percent of the tables, or a minimum of one table, should be accessible for a wheel chair user and on an accessible route (see 521 CMR "Recreational Facilities" and 521 CMR "Accessible Route" for clarification).
 - ❑ The number of trash receptacles provided should equal approximately 0.0008 times the projected roadway design hour volume or a minimum of two.

Picnic tables and other recreation areas at rest areas should be located so that entering and exiting traffic does not pose an undue hazard to users of the facility.

- **Utilities:** Where permanent sanitary facilities are provided, an adequate water supply, sewage disposal system, and power supply will be required. These considerations may dictate the size of the rest area. Other utilities that may be needed include lighting and telephones.
- **Landscaping:** The rest area should be landscaped to take advantage of existing natural features and vegetation. Paths, sidewalks, and architectural style should fit naturally into the existing surroundings. If extensive regrading is required, architectural mounds or undulations should be considered both for aesthetics and other functions (safety, noise, and visual barrier). Designated dog walking areas should be provided away from areas designated for human use such as picnic areas to avoid safety and sanitary issues.

12.5 Tourist Information Centers

Tourist Information Centers are operated primarily for the purpose of providing information, directions, maps, and brochures to the general public. These centers may be combined within rest areas or constructed separately. If constructed separately, they may or may not include restrooms and food and beverage services. In addition to the design guidance given in section 12.4.2, the following should also be considered:

- At a minimum, the center must be staffed at least eight hours per day, seven days per week. Seasonal operation is permitted. Proper maintenance of facilities is critical to ensuring a good visitor experience.
- The Center should have parking spaces for at least 10 mid-sized passenger vehicles at least one of which is van accessible.
- At a minimum, 28 square feet of floor space shall be designated solely for tourist information.
- Each Center should provide an accessible public pay phone, a public text telephone, and an illuminated, weather protected MassHighway map,
- Each Center may provide wireless or wireline internet access.
- Other operational details as described in MassHighway's *Supplemental Private Sign Policy*.

12.6 For Further Information

- *Guide for Park and Ride Facilities*, AASHTO, 2003.
- *Supplemental Private Sign Policy*, MassHighway, 2003.
- *Manual on Uniform Traffic Control Devices (MUTCD)*, Federal Highway Administration, 2003.
- *Commonwealth of Massachusetts 521 CMR – Rules and Regulations of the Massachusetts Architectural Access Board*, Boston, 2002.
- U.S. Department of Justice, *ADA Accessibility Standards for Buildings and Facilities*, 1992, Washington, D.C.
- *Transit Capacity and Quality of Service Manual*. Transit Cooperative Research Program. Web Document No. 6. TRB, National Research Council, Washington D.C., 1999.
- *Guidebook. Bureau of Design and Environment Manual*, Illinois Department of Transportation, 2002.
- *Accessing Transit: Design Handbook for Florida Bus Passenger Facilities*, Florida Department of Transportation, 2004.