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the full depth of the curb ramp or 24 inches (610 mm) deep minimum measured from the back of the curb on the ramp surface.

MODIFICATION TO 810.2.2 OF APPENDIX D

810.2.2 Dimensions. Bus boarding and alighting areas shall provide a clear length of 96 inches (2440 mm), measured perpendicular to the curb or vehicle roadway edge, and a clear width of 60 inches (1525 mm), measured parallel to the vehicle roadway. Public entities shall ensure that the construction of bus boarding and alighting areas comply with 810.2.2, to the extent the construction specifications are within their control.

MODIFICATION TO 810.5.3 OF APPENDIX D

810.5.3 Platform and Vehicle Floor Coordination. Station platforms shall be positioned to coordinate with vehicles in accordance with the applicable requirements of 36 CFR part 1192. Low-level platforms shall be 8 inches (205 mm) minimum above top of rail. In light rail, commuter rail, and intercity rail systems where it is not operationally or structurally feasible to meet the horizontal gap or vertical difference requirements of part 1192 or 49 CFR part 38, mini-high platforms, carborne or platform-mounted lifts, ramps or bridge plates or similarly manually deployed devices, meeting the requirements of 49 CFR part 38, shall suffice.

EXCEPTION: Where vehicles are boarded from sidewalks or street-level, low-level platforms shall be permitted to be less than 8 inches (205 mm).

[72 FR 13707, Mar. 23, 2007]

PART 1192—AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES FOR TRANSPORTATION VEHICLES

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FIGURES TO PART 1192
APPENDIX A TO PART 1192—ACCESSIBILITY GUIDELINES FOR BUSES, OVER-THE-ROAD BUSES, AND VANS

AUTHORITY: 29 U.S.C. 792 (b) (3); 42 U.S.C. 12204.

SOURCE: 56 FR 45558, Sept. 6, 1991, unless otherwise noted.

Subpart A—General

§ 1192.1 Purpose.

This part provides minimum guidelines and requirements for accessibility standards to be issued by the Department of Transportation in 49 CFR part 37 for transportation vehicles required to be accessible by the Americans with Disabilities Act (ADA) of 1990 (42 U.S.C. 12101 *et seq*).

§ 1192.2 Equivalent facilitation.

Departures from particular technical and scoping requirements of these guidelines by use of other designs and technologies are permitted where the alternative designs and technologies used will provide substantially equivalent or greater access to and usability of the vehicle. Departures are to be considered on a case-by-case basis by the Department of Transportation under the procedure set forth in 49 CFR 37.7.

§ 1192.3 Definitions.

Accessible means, with respect to vehicles covered by this part, compliance with the provisions of this part.

Automated guideway transit (AGT) system means a fixed-guideway transportation system which operates with automated (driverless) individual vehicles or multi-car trains. Service may be on a fixed schedule or in response to a passenger-activated call button. Such systems using small, slow moving vehicles, often operated in airports and amusement parks, are sometimes called *people movers*.

Bus means any of several types of self-propelled vehicles, generally rubber tired, intended for use on city streets, highways, and busways, including but not limited to minibuses, forty- and thirty-foot transit buses, articulated buses, double-deck buses, and electric powered trolley buses, used to provide designated or specified public transportation services. Self-propelled, rubber tire vehicles designed to look like antique or vintage trolleys or streetcars are considered buses.

Commuter rail car means a rail passenger car obtained by a commuter authority (as defined by 49 CFR 37.3) for use in commuter rail transportation.

Commuter rail transportation means short-haul rail passenger service operating in metropolitan and suburban areas, operated by a commuter authority, whether within or across the geographical boundaries of a state, usually characterized by reduced fare, multiple ride, and commutation tickets and by morning and evening peak period operations. This term does not include light or rapid rail transportation.

High speed rail means an intercity-type rail service which operates primarily on a dedicated guideway or track not used, for the most part, by freight, including, but not limited to, trains on welded rail, magnetically levitated (maglev) vehicles on a special guideway, or other advanced technology vehicles, designed to travel at speeds in excess of those possible on other types of railroads.

Intercity rail passenger car means a rail car intended for use by revenue passengers obtained by the National Railroad Passenger Corporation (Amtrak) for use in intercity rail transportation.

Intercity rail transportation means transportation provided by Amtrak.

Light rail means a streetcar-type vehicle railway operated on city streets, semi-private rights-of-way, or exclusive private rights-of-way. Service may be provided by step-entry vehicles or by level-boarding.

Over-the-road bus means a vehicle characterized by an elevated passenger deck located over a baggage compartment.

Rapid rail means a subway-type transit vehicle railway operated on exclusive private rights-of-way with high-level platform stations. Rapid rail may also operate on elevated or at-grade level track separated from other traffic.

Tram means any of several types of motor vehicles consisting of a tractor unit, with or without passenger accommodations, and one or more passenger trailer units, including but not limited to vehicles providing shuttle service to remote parking areas, between hotels and other public accommodations, and between and within amusement parks and other recreation areas.

[56 FR 45558, Sept. 6, 1991, as amended at 81 FR 90624, Dec. 14, 2016]

§ 1192.4 Miscellaneous instructions.

(a) *Dimensional conventions.* Dimensions that are not noted as minimum or maximum are absolute.

(b) *Dimensional tolerances.* All dimensions are subject to conventional engineering tolerances for manufacturing processes, material properties, and field conditions, including normal anticipated wear not exceeding accepted industry-wide standards and practices.

(c) *General terminology.* The terms used in this part shall have the following meanings:

(1) *Comply with* means meet one or more specification of these guidelines.

(2) *If* or *if* * * * *then* denotes a specification that applies only when the conditions described are present.

(3) *May* denotes an option or alternative.

(4) *Shall* denotes a mandatory specification or requirement.

(5) *Should* denotes an advisory specification or recommendation and is used only in the appendix to this part.

[56 FR 45558, Sept. 6, 1991, as amended at 81 FR 90624, Dec. 14, 2016]

Subpart B—Buses, Over-the-Road Buses, and Vans

§ 1192.21 General.

The accessibility guidelines for buses, over-the-road buses, and vans are set forth in Appendix A to this part.

[81 FR 90624, Dec. 14, 2016]

Subpart C—Rapid Rail Vehicles and Systems

§ 1192.51 General.

(a) New, used and remanufactured rapid rail vehicles, to be considered accessible by regulations issued by the Department of Transportation in 49 CFR part 37, shall comply with this subpart.

(b) If portions of the vehicle are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible vehicles be retrofitted with lifts, ramps or other boarding devices.

(c) Existing vehicles which are retrofitted to comply with the ''one-car-per-train rule'' of 49 CFR 37.93 shall comply with §§ 1192.55, 1192.57(b), 1192.59 and shall have, in new and key stations, at least one door complying with § 1192.53(a)(1), (b) and (d). Removal of seats is not required. Vehicles previously designed and manufactured in accordance with the accessibility requirements of 49 CFR part 609 or Department of Transportation regulations implementing section 504 of the Rehabilitation Act of 1973 that were in effect before October 7, 1991, and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of 49 CFR 37.93.

§ 1192.53 Doorways.

(a) *Clear width.* (1) Passenger doorways on vehicle sides shall have clear openings at least 32 inches wide when open.

(2) If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30 inches to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway shall have a minimum clear opening of 30 inches to permit wheelchair and mobility aid users to be evacuated to an adjoining vehicle in an emergency.

(b) *Signage.* The International Symbol of Accessibility shall be displayed on the exterior of accessible vehicles operating on an accessible and rapid rail system unless all vehicles area accessible and are not marked by the access symbol. (See Fig. 6)

(c) *Signals.* Auditory and visual warning signals shall be provided to alert passengers of closing doors.

(d) *Coordination with boarding platform*—(1) *Requirements.* Where new vehicles will operate in new stations, the design of vehicles shall be coordinated with the boarding platform design such that the horizontal gap between each vehicle door at rest and the platform shall be no greater than 3 inches and the height of the vehicle floor shall be within plus or minus 5⁄8 inch of the

platform height under all normal passenger load conditions. Vertical alignment may be accomplished by vehicle air suspension or other suitable means of meeting the requirement.

(2) *Exception*. New vehicles operating in existing stations may have a floor height within plus or minus 1½ inches of the platform height. At key stations, the horizontal gap between at least one door of each such vehicle and the platform shall be no greater than 3 inches.

(3) *Exception*. Retrofitted vehicles shall be coordinated with the platform in new and key stations such that the horizontal gap shall be no greater than 4 inches and the height of the vehicle floor, under 50% passenger load, shall be within plus or minus 2 inches of the platform height.

§ 1192.55 Priority seating signs.

(a) Each vehicle shall contain sign(s) which indicate that certain seats are priority seats for persons with disabilities, and that other passengers should make such seats available to those who wish to use them.

(b) Characters on signs required by paragraph (a) of this section shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case ''X'') of ⅝ inch, with ''Wide'' spacing (generally, the space between letters shall be 1/16 the height of upper case letters), and shall contrast with the background, either light-on-dark or dark-on-light.

§ 1192.57 Interior circulation, handrails and stanchions.

(a) Handrails and stanchions shall be provided to assist safe boarding, onboard circulation, seating and standing assistance, and alighting by persons with disabilities.

(b) Handrails, stanchions, and seats shall allow a route at least 32 inches wide so that at least two wheelchair or mobility aid users can enter the vehicle and position the wheelchairs or mobility aids in areas, each having a minimum clear space of 48 inches by 30 inches, which do not unduly restrict movement of other passengers. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required. Particular attention shall be given to ensuring maximum maneuverability immediately inside doors. Ample vertical stanchions from ceiling to seat-back rails shall be provided. Vertical stanchions from ceiling to floor shall not interfere with wheelchair or mobility aid user circulation and shall be kept to a minimum in the vicinity of doors.

(c) The diameter or width of the gripping surface of handrails and stanchions shall be 1¼ inches to 1½ inches or provide an equivalent gripping surface and shall provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface.

§ 1192.59 Floor surfaces.

Floor surfaces on aisles, places for standees, and areas where wheelchair and mobility aid users are to be accommodated shall be slip-resistant.

§ 1192.61 Public information system.

(a)(1) *Requirements*. Each vehicle shall be equipped with a public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted. Each vehicle operating in stations having more than one line or route shall have an external public address system to permit transportation system personnel, or recorded or digitized human speech messages, to announce train, route, or line identification information.

(2) *Exception*. Where station announcement systems provide information on arriving trains, an external train speaker is not required.

(b) [Reserved]

§ 1192.63 Between-car barriers.

(a) *Requirement*. Suitable devices or systems shall be provided to prevent, deter or warn individuals from inadvertently stepping off the platform between cars. Acceptable solutions include, but are not limited to, pantograph gates, chains, motion detectors or similar devices.

(b) *Exception*. Between-car barriers are not required where platform screens are provided which close off the platform edge and open only when trains are correctly aligned with the doors.

Subpart D—Light Rail Vehicles and Systems

§ 1192.71 General.

(a) New, used and remanufactured light rail vehicles, to be considered accessible by regulations issued by the Department of Transportation in 49 CFR part 37, shall comply with this subpart.

(b)(1) Vehicles intended to be operated solely in light rail systems confined entirely to a dedicated right-of-way, and for which all stations or stops are designed and constructed for revenue service after the effective date of standards for design and construction issued pursuant to subpart C of 49 CFR part 37, shall provide level boarding and shall comply with §§ 1192.73(d)(1) and 1192.85.

(2) Vehicles designed for, and operated on, pedestrian malls, city streets, or other areas where level boarding is not practicable shall provide wayside or car-borne lifts, mini-high platforms, or other means of access in compliance with § 1192.83 (b) or (c).

(c) If portions of the vehicle are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible vehicles be retrofitted with lifts, ramps or other boarding devices.

(d) Existing vehicles retrofitted to comply with the ''one-car-per-train rule'' at 49 CFR 37.93 shall comply with §§ 1192.75, 1192.77(c), 1192.79(a) and 1192.83(a) and shall have, in new and key stations, at least one door which complies with § 1192.73 (a)(1), (b) and (d). Vehicles previously designed and manufactured in accordance with the accessibility requirements of 49 CFR part 609 or Department of Transportation regulations implementing section 504 of the Rehabilitation Act of 1973 that were in effect before October 7, 1991, and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of 49 CFR 37.93.

§ 1192.73 Doorways.

(a) *Clear width*. (1) All passenger doorways on vehicle sides shall have minimum clear openings of 32 inches when open.

(2) If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30 inches to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway shall have a minimum clear opening of 30 inches to permit wheelchair and mobility aid users to be evacuated to an adjoining vehicle in an emergency.

(b) *Signage*. The International Symbol of Accessibility shall be displayed on the exterior of each vehicle operating on an accessible light rail system unless all vehicles are accessible and are not marked by the access symbol (See Fig. 6).

(c) *Signals*. Auditory and visual warning signals shall be provided to alert passengers of closing doors.

(d) *Coordination with boarding platform*—(1) *Requirements*. The design of level-entry vehicles shall be coordinated with the boarding platform or mini-high platform design so that the horizontal gap between a vehicle at rest and the platform shall be no greater than 3 inches and the height of the vehicle floor shall be within plus or minus ⅝ inch of the platform height. Vertical alignment may be accomplished by vehicle air suspension, automatic ramps or lifts, or any combination.

(2) *Exception*. New vehicles operating in existing stations may have a floor height within plus or minus 1½ inches of the platform height. At key stations, the horizontal gap between at least one door of each such vehicle and the platform shall be no greater than 3 inches.

(3) *Exception*. Retrofitted vehicles shall be coordinated with the platform in new and key stations such that the horizontal gap shall be no greater than 4 inches and the height of the vehicle floor, under 50% passenger load, shall

be within plus or minus 2 inches of the platform height.

(4) *Exception*. Where it is not operationally or structurally practicable to meet the horizontal or vertical requirements of paragraphs (d) (1), (2) or (3) of this section, platform or vehicle devices complying with §1192.83(b) or platform or vehicle mounted ramps or bridge plates complying with §1192.83(c) shall be provided.

§1192.75 Priority seating signs.

(a) Each vehicle shall contain sign(s) which indicate that certain seats are priority seats for persons with disabilities, and that other passengers should make such seats available to those who wish to use them.

(b) Where designated wheelchair or mobility aid seating locations are provided, signs shall indicate the location and advise other passengers of the need to permit wheelchair and mobility aid users to occupy them.

(c) Characters on signs required by paragraph (a) or (b) of this section shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case ''X'') of 5/8 inch, with ''wide'' spacing (generally, the space between letters shall be 1/16 the height of upper case letters), and shall contrast with the background, either light-on-dark or dark-on-light.

§1192.77 Interior circulation, handrails and stanchions.

(a) Handrails and stanchions shall be sufficient to permit safe boarding, onboard circulation, seating and standing assistance, and alighting by persons with disabilities.

(b) At entrances equipped with steps, handrails and stanchions shall be provided in the entrance to the vehicle in a configuration which allows passengers to grasp such assists from outside the vehicle while starting to board, and to continue using such handrails or stanchions throughout the boarding process. Handrails shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than 1/8 inch. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface. Where on-board fare collection devices are used, a horizontal passenger assist shall be located between boarding passengers and the fare collection device and shall prevent passengers from sustaining injuries on the fare collection device or windshield in the event of a sudden deceleration. Without restricting the vestibule space, the assist shall provide support for a boarding passenger from the door through the boarding procedure. Passengers shall be able to lean against the assist for security while paying fares.

(c) At all doors on level-entry vehicles, and at each entrance accessible by lift, ramp, bridge plate or other suitable means, handrails, stanchions, passenger seats, vehicle driver seat platforms, and fare boxes, if applicable, shall be located so as to allow a route at least 32 inches wide so that at least two wheelchair or mobility aid users can enter the vehicle and position the wheelchairs or mobility aids in areas, each having a minimum clear space of 48 inches by 30 inches, which do not unduly restrict movement of other passengers. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required. Particular attention shall be given to ensuring maximum maneuverability immediately inside doors. Ample vertical stanchions from ceiling to seat-back rails shall be provided. Vertical stanchions from ceiling to floor shall not interfere with wheelchair or mobility aid circulation and shall be kept to a minimum in the vicinity of accessible doors.

§1192.79 Floors, steps and thresholds.

(a) Floor surfaces on aisles, step treads, places for standees, and areas where wheelchair and mobility aid users are to be accommodated shall be slip-resistant.

(b) All thresholds and step edges shall have a band of color(s) running the full width of the step or threshold which contrasts from the step tread and riser or adjacent floor, either light-on-dark or dark-on-light.

§ 1192.81 Lighting.

(a) Any stepwell or doorway with a lift, ramp or bridge plate immediately adjacent to the driver shall have, when the door is open, at least 2 footcandles of illumination measured on the step tread or lift platform.

(b) Other stepwells, and doorways with lifts, ramps or bridge plates, shall have, at all times, at least 2 footcandles of illumination measured on the step tread or lift or ramp, when deployed at the vehicle floor level.

(c) The doorways of vehicles not operating at lighted station platforms shall have outside lights which provide at least 1 footcandle of illumination on the station platform or street surface for a distance of 3 feet perpendicular to all points on the bottom step tread. Such lights shall be located below window level and shielded to protect the eyes of entering and exiting passengers.

§ 1192.83 Mobility aid accessibility.

(a)(1) *General.* All new light rail vehicles, other than level entry vehicles, covered by this subpart shall provide a level-change mechanism or boarding device (e.g., lift, ramp or bridge plate) complying with either paragraph (b) or (c) of this section and sufficient clearances to permit at least two wheelchair or mobility aid users to reach areas, each with a minimum clear floor space of 48 inches by 30 inches, which do not unduly restrict passenger flow. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required.

(2) *Exception.* If lifts, ramps or bridge plates meeting the requirements of this section are provided on station platforms or other stops, or mini-high platforms complying with §1192.73(d) are provided, at stations or stops required to be accessible by 49 CFR part 37, the vehicle is not required to be equipped with a car-borne device. Where each new vehicle is compatible with a single platform-mounted access system or device, additional systems or devices are not required for each vehicle provided that the single device could be used to provide access to each new vehicle if passengers using wheelchairs or mobility aids could not be accommodated on a single vehicle.

(b) *Vehicle lift*—(1) *Design load.* The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

(2) *Controls*—(i) *Requirements.* The controls shall be interlocked with the vehicle brakes, propulsion system, or door, or shall provide other appropriate mechanisms or systems, to ensure that the vehicle cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all levels (i.e., ground, curb, and intermediate positions) normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a momentary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position.

(ii) *Exception.* Where physical or safety constraints prevent the deployment at some stops of a lift having its long dimension perpendicular to the vehicle axis, the transportation entity may specify a lift which is designed to deploy with its long dimension parallel to the vehicle axis and which pivots into or out of the vehicle while occupied (i.e., ''rotary lift''). The requirements of paragraph (b)(2)(i) of this section prohibiting the lift from being stowed while occupied shall not apply to a lift design of this type if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

(iii) *Exception.* The brake or propulsion system interlocks requirement does not apply to a station platform mounted lift provided that a mechanical, electrical or other system operates to ensure that vehicles do not move when the lift is in use.

(3) *Emergency operation.* The lift shall incorporate an emergency method of deploying, lowering to ground level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer's instructions, and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift intended to be stowed while occupied.

(4) *Power or equipment failure.* Lift platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, falling, or folding any faster than 12 inches/second or their dropping of an occupant in the event of a single failure of any load carrying component.

(5) *Platform barriers.* The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the lift during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the vehicle until the lift is in its fully raised position. Each side of the lift platform which extends beyond the vehicle in its raised position shall have a barrier a minimum 1½ inches high. Such barriers shall not interfere with maneuvering into or out of the aisle. The loading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically rise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the lift is more than 3 inches above the station platform or roadway and the lift is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged or disengaged by the lift operator provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged.

(6) *Platform surface.* The lift platform surface shall be free of any protrusions over ¼ inch high and shall be slip resistant. The lift platform shall have a minimum clear width of 28½ inches at the platform, a minimum clear width of 30 inches measured from 2 inches above the lift platform surface to 30 inches above the surface, and a minimum clear length of 48 inches measured from 2 inches above the surface of the platform to 30 inches above the surface. (See Fig. 1)

(7) *Platform gaps.* Any openings between the lift platform surface and the raised barriers shall not exceed ⅝ inch wide. When the lift is at vehicle floor height with the inner barrier (if applicable) down or retracted, gaps between the forward lift platform edge and vehicle floor shall not exceed ½ inch horizontally and ⅝ inch vertically. Platforms on semiautomatic lifts may have a hand hold not exceeding 1½ inches by 4½ inches located between the edge barriers.

(8) *Platform entrance ramp.* The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8 measured on level ground, for a maximum rise of 3 inches, and the transition from the station platform or roadway to ramp may be vertical without edge treatment up to ¼ inch. Thresholds between ¼ inch and ½ inch high shall be beveled with a slope no greater than 1:2.

(9) *Platform deflection.* The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of vehicle roll) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26 inch by 26 inch test pallet at the centroid of the lift platform.

(10) *Platform movement.* No part of the platform shall move at a rate exceeding 6 inches/second during lowering and

lifting an occupant, and shall not exceed 12 inches/second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3g.

(11) *Boarding direction*. The lift shall permit both inboard and outboard facing of wheelchairs and mobility aids.

(12) *Use by standees*. Lifts shall accommodate persons using walkers, crutches, canes or braces or who otherwise have difficulty using steps. The lift may be marked to indicate a preferred standing position.

(13) *Handrails*. Platforms on lifts shall be equipped with handrails, on two sides, which move in tandem with the lift which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. Handrails shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ⅛ inch. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

(c) *Vehicle ramp or bridge plate*—(1) *Design load*. Ramps or bridge plates 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp or bridge plate distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps or bridge plates shorter than 30 inches shall support a load of 300 pounds.

(2) *Ramp surface*. The ramp or bridge plate surface shall be continuous and slip resistant, shall not have protrusions from the surface greater than ¼ inch, shall have a clear width of 30 inches, and shall accommodate both four-wheel and three-wheel mobility aids.

(3) *Ramp threshold*. The transition from roadway or station platform and the transition from vehicle floor to the ramp or bridge plate may be vertical without edge treatment up to ¼ inch. Changes in level between ¼ inch and ½ inch shall be beveled with a slope no greater than 1:2.

(4) *Ramp barriers*. Each side of the ramp or bridge plate shall have barriers at least 2 inches high to prevent mobility aid wheels from slipping off.

(5) *Slope*. Ramps or bridge plates shall have the least slope practicable. If the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 3 inches or less above the station platform a maximum slope of 1:4 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 6 inches or less, but more than 3 inches, above the station platform a maximum slope of 1:6 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 9 inches or less, but more than 6 inches, above the station platform a maximum slope of 1:8 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is greater than 9 inches above the station platform a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.

(6) *Attachment*—(i) *Requirement*. When in use for boarding or alighting, the ramp or bridge plate shall be attached to the vehicle, or otherwise prevented from moving such that it is not subject to displacement when loading or unloading a heavy power mobility aid and that any gaps between vehicle and ramp or bridge plate, and station platform and ramp or bridge plate, shall not exceed ⅝ inch.

(ii) *Exception*. Ramps or bridge plates which are attached to, and deployed from, station platforms are permitted in lieu of vehicle devices provided they meet the displacement requirements of paragraph (c)(6)(i) of this section.

(7) *Stowage.* A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps or bridge plates, including portable ramps or bridge plates stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop.

(8) *Handrails.* If provided, handrails shall allow persons with disabilities to grasp them from outside the vehicle while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ⅛ inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the vehicle.

§ 1192.85 Between-car barriers.

Where vehicles operate in a high-platform, level-boarding mode, devices or systems shall be provided to prevent, deter or warn individuals from inadvertently stepping off the platform between cars. Appropriate devices include, but are not limited to, pantograph gates, chains, motion detectors or other suitable devices.

§ 1192.87 Public information system.

(a) Each vehicle shall be equipped with an interior public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted.

(b) [Reserved]

Subpart E—Commuter Rail Cars and Systems

§ 1192.91 General.

(a) New, used and remanufactured commuter rail cars, to be considered accessible by regulations issued by the Department of Transportation in 49 CFR part 37, shall comply with this subpart.

(b) If portions of the car are modified in such a way that it affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible cars be retrofitted with lifts, ramps or other boarding devices.

(c)(1) Commuter rail cars shall comply with §§ 1192.93(d) and 1192.109 for level boarding wherever structurally and operationally practicable.

(2) Where level boarding is not structurally or operationally practicable, commuter rail cars shall comply with § 1192.95.

(d) Existing vehicles retrofitted to comply with the ''one-car-per-train rule'' at 49 CFR 37.93 shall comply with §§ 1192.93(e), 1192.95(a) and 1192.107 and shall have, in new and key stations, at least one door on each side from which passengers board which complies with § 1192.93(d). Vehicles previously designed and manufactured in accordance with the program accessibility requirements of section 504 of the Rehabilitation Act of 1973, or implementing regulations issued by the Department of Transportation that were in effect before October 7, 1991, and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of 49 CFR 37.93.

§ 1192.93 Doorways.

(a) *Clear width.* (1) At least one door on each side of the car from which passengers board opening onto station platforms and at least one adjacent doorway into the passenger coach compartment, if provided, shall have a minimum clear opening of 32 inches.

(2) If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30

inches to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway shall have, to the maximum extent practicable in accordance with the regulations issued under the Federal Railroad Safety Act of 1970 (49 CFR parts 229 and 231), a clear opening of 30 inches.

(b) *Passageways.* A route at least 32 inches wide shall be provided from doors required to be accessible by paragraph (a)(1) of this section to seating locations complying with §1192.95(d). In cars where such doorways require passage through a vestibule, such vestibule shall have a minimum width of 42 inches. (See Fig. 3)

(c) *Signals.* If doors to the platform close automatically or from a remote location, auditory and visual warning signals shall be provided to alert passengers of closing doors.

(d) *Coordination with boarding platform*—(1) *Requirements.* Cars operating in stations with high platforms, or mini-high platforms, shall be coordinated with the boarding platform design such that the horizontal gap between a car at rest and the platform shall be no greater than 3 inches and the height of the car floor shall be within plus or minus ⅝ inch of the platform height. Vertical alignment may be accomplished by car air suspension, platform lifts or other devices, or any combination.

(2) *Exception.* New vehicles operating in existing stations may have a floor height within plus or minus 1½ inches of the platform height. At key stations, the horizontal gap between at least one accessible door of each such vehicle and the platform shall be no greater than 3 inches.

(3) *Exception.* Where platform setbacks do not allow the horizontal gap or vertical alignment specified in paragraph (d) (1) or (2) of this section, car, platform or portable lifts complying with §1192.95(b), or car or platform ramps or bridge plates, complying with §1192.95(c), shall be provided.

(4) *Exception.* Retrofitted vehicles shall be coordinated with the platform in new and key stations such that the horizontal gap shall be no greater than 4 inches and the height of the vehicle floor, under 50% passenger load, shall be within plus or minus 2 inches of the platform height.

(e) *Signage.* The International Symbol of Accessibility shall be displayed on the exterior of all doors complying with this section unless all cars are accessible and are not marked by the access symbol (See Fig. 6). Appropriate signage shall also indicate which accessible doors are adjacent to an accessible restroom, if applicable.

§1192.95 Mobility aid accessibility.

(a)(1) *General.* All new commuter rail cars, other than level entry cars, covered by this subpart shall provide a level-change mechanism or boarding device (e.g., lift, ramp or bridge plate) complying with either paragraph (b) or (c) of this section; sufficient clearances to permit a wheelchair or mobility aid user to reach a seating location; and at least two wheelchair or mobility aid seating locations complying with paragraph (d) of this section.

(2) *Exception.* If portable or platform lifts, ramps or bridge plates meeting the applicable requirements of this section are provided on station platforms or other stops, or mini-high platforms complying with §1192.93(d) are provided, at stations or stops required to be accessible by 49 CFR part 37, the car is not required to be equipped with a car-borne device. Where each new car is compatible with a single platform-mounted access system or device, additional systems or devices are not required for each car provided that the single device could be used to provide access to each new car if passengers using wheelchairs or mobility aids could not be accommodated on a single car.

(b) *Car Lift*—(1) *Design load.* The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

(2) *Controls*—(i) *Requirements.* The controls shall be interlocked with the car brakes, propulsion system, or door, or shall provide other appropriate mechanisms or systems, to ensure that the car cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all platform levels normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a momentary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position.

(ii) *Exception.* Where physical or safety constraints prevent the deployment at some stops of a lift having its long dimension perpendicular to the car axis, the transportation entity may specify a lift which is designed to deploy with its long dimension parallel to the car axis and which pivots into or out of the car while occupied (i.e., ''rotary lift''). The requirements of paragraph (b)(2)(i) of this section prohibiting the lift from being stowed while occupied shall not apply to a lift design of this type if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

(iii) *Exception.* The brake or propulsion system interlock requirement does not apply to a platform mounted or portable lift provided that a mechanical, electrical or other system operates to ensure that cars do not move when the lift is in use.

(3) *Emergency operation.* The lift shall incorporate an emergency method of deploying, lowering to ground or platform level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer's instructions, and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift intended to be stowed while occupied.

(4) *Power or equipment failure.* Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, falling, or folding any faster than 12 inches/second or their dropping of an occupant in the event of a single failure of any load carrying component.

(5) *Platform barriers.* The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the lift during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the car until the lift is in its fully raised position. Each side of the lift platform which, in its raised position, extends beyond the car shall have a barrier a minimum 1½ inches high. Such barriers shall not interfere with maneuvering into or out of the car. The loading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground or station platform level, shall be sufficient when raised or closed, or a supplementary system shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically rise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the lift platform is more than 3 inches above the station platform and the lift is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged or disengaged by the lift operator provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged.

(6) *Platform surface.* The lift platform surface shall be free of any protrusions over ¼ inch high and shall be slip resistant. The lift platform shall have a minimum clear width of 28½ inches at the platform, a minimum clear width of 30 inches measured from 2 inches above the lift platform surface to 30

inches above the surface, and a minimum clear length of 48 inches measured from 2 inches above the surface of the platform to 30 inches above the surface. (See Fig. 1)

(7) *Platform gaps.* Any openings between the lift platform surface and the raised barriers shall not exceed ⅝ inch wide. When the lift is at car floor height with the inner barrier down (if applicable) or retracted, gaps between the forward lift platform edge and car floor shall not exceed ½ inch horizontally and ⅝ inch vertically. Platforms on semi-automatic lifts may have a hand hold not exceeding 1½ inches by 4½ inches located between the edge barriers.

(8) *Platform entrance ramp.* The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8, when measured on level ground, for a maximum rise of 3 inches, and the transition from station platform to ramp may be vertical without edge treatment up to ¼ inch. Thresholds between ¼ inch and ½ inch high shall be beveled with a slope no greater than 1:2.

(9) *Platform deflection.* The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of vehicle roll) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26 inch by 26 inch test pallet at the centroid of the lift platform.

(10) *Platform movement.* No part of the platform shall move at a rate exceeding 6 inches/second during lowering and lifting an occupant, and shall not exceed 12 inches/second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3g.

(11) *Boarding direction.* The lift shall permit both inboard and outboard facing of wheelchairs and mobility aids.

(12) *Use by standees.* Lifts shall accommodate persons using walkers, crutches, canes or braces or who otherwise have difficulty using steps. The lift may be marked to indicate a preferred standing position.

(13) *Handrails.* Platforms on lifts shall be equipped with handrails, on two sides, which move in tandem with the lift which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ⅛ inch. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the car.

(c) *Car ramp or bridge plate*—(1) *Design load.* Ramps or bridge plates 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp or bridge plate distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps or bridge plates shorter than 30 inches shall support a load of 300 pounds.

(2) *Ramp surface.* The ramp or bridge plate surface shall be continuous and slip resistant, shall not have protrusions from the surface greater than ¼ inch high, shall have a clear width of 30 inches and shall accommodate both four-wheel and three-wheel mobility aids.

(3) *Ramp threshold.* The transition from station platform to the ramp or bridge plate and the transition from car floor to the ramp or bridge plate may be vertical without edge treatment up to ¼ inch. Changes in level between ¼ inch and ½ inch shall be beveled with a slope no greater than 1:2.

(4) *Ramp barriers.* Each side of the ramp or bridge plate shall have barriers at least 2 inches high to prevent mobility aid wheels from slipping off.

(5) *Slope*. Ramps or bridge plates shall have the least slope practicable. If the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 3 inches or less above the station platform a maximum slope of 1:4 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 6 inches or less, but more than 3 inches, above the station platform a maximum slope of 1:6 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 9 inches or less, but more than 6 inches, above the station platform a maximum slope of 1:8 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is greater than 9 inches above the station platform a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.

(6) *Attachment*—(i) *Requirement*. When in use for boarding or alighting, the ramp or bridge plate shall be attached to the vehicle, or otherwise prevented from moving such that it is not subject to displacement when loading or unloading a heavy power mobility aid and that any gaps between vehicle and ramp or bridge plates, and station platform and ramp or bridge plate, shall not exceed ⅝ inch.

(ii) *Exception*. Ramps or bridge plates which are attached to, and deployed from, station platforms are permitted in lieu of car devices provided they meet the displacement requirements of paragraph (c)(6)(i) of this section.

(7) *Stowage*. A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps or bridge plates, including portable ramps or bridge plates stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop.

(8) *Handrails*. If provided, handrails shall allow persons with disabilities to grasp them from outside the car while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ⅛ inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the car.

(d) *Mobility aid seating location*. Spaces for persons who wish to remain in their wheelchairs or mobility aids shall have a minimum clear floor space 48 inches by 30 inches. Such spaces shall adjoin, and may overlap, an accessible path. Not more than 6 inches of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of 9 inches from the floor to the lowest part of the seat overhanging the space. Seating spaces may have fold-down or removable seats to accommodate other passengers when a wheelchair or mobility aid user is not occupying the area, provided the seats, when folded up, do not obstruct the clear floor space required. (See Fig. 2)

§ 1192.97 Interior circulation, handrails and stanchions.

(a) Where provided, handrails or stanchions within the passenger compartment shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location, complying with § 1192.95(d), from an accessible entrance. The diameter or width of the gripping surface of interior handrails and stanchions shall be 1¼ inches to 1½ inches or shall provide an equivalent gripping surface. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface.

(b) Where provided, handrails or stanchions shall be sufficient to permit safe boarding, on-board circulation, seating and standing assistance, and alighting by persons with disabilities.

(c) At entrances equipped with steps, handrails or stanchions shall be provided in the entrance to the car in a configuration which allows passengers

to grasp such assists from outside the car while starting to board, and to continue using such assists throughout the boarding process, to the extent permitted by 49 CFR part 231.

§ 1192.99 Floors, steps and thresholds.

(a) Floor surfaces on aisles, step treads, places for standees, and areas where wheelchair and mobility aid users are to be accommodated shall be slip-resistant.

(b) All thresholds and step edges shall have a band of color(s) running the full width of the step or threshold which contrasts from the step tread and riser or adjacent floor, either light-on-dark or dark-on-light.

§ 1192.101 Lighting.

(a) Any stepwell or doorway with a lift, ramp or bridge plate shall have, when the door is open, at least 2 footcandles of illumination measured on the step tread, ramp, bridge plate, or lift platform.

(b) The doorways of cars not operating at lighted station platforms shall have outside lights which, when the door is open, provide at least 1 footcandle of illumination on the station platform surface for a distance of 3 feet perpendicular to all points on the bottom step tread edge. Such lights shall be shielded to protect the eyes of entering and exiting passengers.

§ 1192.103 Public information system.

(a) Each car shall be equipped with an interior public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted.

(b) [Reserved]

§ 1192.105 Priority seating signs.

(a) Each car shall contain sign(s) which indicate that certain seats are priority seats for persons with disabilities and that other passengers should make such seats available to those who wish to use them.

(b) Characters on signs required by paragraph (a) shall have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10, with a minimum character height (using an upper case ''X'') of 5/8 inch, with ''wide'' spacing (generally, the space between letters shall be 1/16 the height of upper case letters), and shall contrast with the background either light-on-dark or dark-on-light.

§ 1192.107 Restrooms.

(a) If a restroom is provided for the general public, it shall be designed so as to allow a person using a wheelchair or mobility aid to enter and use such restroom as specified in paragraphs (a)(1) through (5) of this section.

(1) The minimum clear floor area shall be 35 inches by 60 inches. Permanently installed fixtures may overlap this area a maximum of 6 inches, if the lowest portion of the fixture is a minimum of 9 inches above the floor, and may overlap a maximum of 19 inches, if the lowest portion of the fixture is a minimum of 29 inches above the floor, provided such fixtures do not interfere with access to the water closet. Fold-down or retractable seats or shelves may overlap the clear floor space at a lower height provided they can be easily folded up or moved out of the way.

(2) The height of the water closet shall be 17 inches to 19 inches measured to the top of the toilet seat. Seats shall not be sprung to return to a lifted position.

(3) A grab bar at least 24 inches long shall be mounted behind the water closet, and a horizontal grab bar at least 40 inches long shall be mounted on at least one side wall, with one end not more than 12 inches from the back wall, at a height between 33 inches and 36 inches above the floor.

(4) Faucets and flush controls shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N). Controls for flush valves shall be mounted no more than 44 inches above the floor.

(5) Doorways on the end of the enclosure, opposite the water closet, shall have a minimum clear opening width of 32 inches. Doorways on the side wall shall have a minimum clear opening width of 39 inches. Door latches and hardware shall be operable with one

hand and shall not require tight grasping, pinching, or twisting of the wrist.

(b) Restrooms required to be accessible shall be in close proximity to at least one seating location for persons using mobility aids and shall be connected to such a space by an unobstructed path having a minimum width of 32 inches.

§ 1192.109 Between-car barriers.

Where vehicles operate in a high-platform, level-boarding mode, and where between-car bellows are not provided, devices or systems shall be provided to prevent, deter or warn individuals from inadvertently stepping off the platform between cars. Appropriate devices include, but are not limited to, pantograph gates, chains, motion detectors or other suitable devices.

Subpart F—Intercity Rail Cars and Systems

§ 1192.111 General.

(a) New, used and remanufactured intercity rail cars, to be considered accessible by regulations issued by the Department of Transportation in 49 CFR part 37, shall comply with this subpart to the extent required for each type of car as specified below.

(1) Single-level rail passenger coaches and food service cars (other than single-level dining cars) shall comply with §§ 1192.113 through 1192.123. Compliance with § 1192.125 shall be required only to the extent necessary to meet the requirements of paragraph (d) of this section.

(2) Single-level dining and lounge cars shall have at least one connecting doorway complying with § 1192.113(a)(2), connected to a car accessible to persons using wheelchairs or mobility aids, and at least one space complying with § 1192.125(d) (2) and (3), to provide table service to a person who wishes to remain in his or her wheelchair, and space to fold and store a wheelchair for a person who wishes to transfer to an existing seat.

(3) Bi-level dining cars shall comply with §§ 1192.113(a)(2), 1192.115(b), 1192.117(a), and 1192.121.

(4) Bi-level lounge cars shall have doors on the lower level, on each side of the car from which passengers board, complying with § 1192.113, a restroom complying with § 1192.123, and at least one space complying with § 1192.125(d) (2) and (3) to provide table service to a person who wishes to remain in his or her wheelchair and space to fold and store a wheelchair for a person who wishes to transfer to an existing seat.

(5) Restrooms complying with § 1192.123 shall be provided in single-level rail passenger coaches and food service cars adjacent to the accessible seating locations required by paragraph (d) of this section. Accessible restrooms are required in dining and lounge cars only if restrooms are provided for other passengers.

(6) Sleeper cars shall comply with §§ 1192.113 (b) through (d), 1192.115 through 1192.121, and 1192.125, and have at least one compartment which can be entered and used by a person using a wheelchair or mobility aid and complying with § 1192.127.

(b)(1) If physically and operationally practicable, intercity rail cars shall comply with § 1192.113(d) for level boarding.

(2) Where level boarding is not structurally or operationally practicable, intercity rail cars shall comply with § 1192.125.

(c) If portions of the car are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible cars be retrofitted with lifts, ramps or other boarding devices.

(d) Passenger coaches or food service cars shall have the number of spaces complying with § 1192.125(d)(2) and the number of spaces complying with § 1192.125(d)(3), as required by 49 CFR 37.91.

(e) Existing cars retrofitted to meet the seating requirements of 49 CFR 37.91 shall comply with §§ 1192.113(e), 1192.123, 1192.125(d) and shall have at least one door on each side from which passengers board complying with § 1192.113(d). Existing cars designed and manufactured to be accessible in accordance with Department of Transportation regulations implementing section 504 of the Rehabilitation Act of

1973 that were in effect before October 7, 1991, shall comply with § 1192.125(a).

§ 1192.113 Doorways.

(a) *Clear width.* (1) At least one doorway, on each side of the car from which passengers board, of each car required to be accessible by § 1192.111(a) and where the spaces required by § 1192.111(d) are located, and at least one adjacent doorway into coach passenger compartments shall have a minimum clear opening width of 32 inches.

(2) Doorways at ends of cars connecting two adjacent cars, to the maximum extent practicable in accordance with regulations issued under the Federal Railroad Safety Act of 1970 (49 CFR parts 229 and 231), shall have a clear opening width of 32 inches to permit wheelchair and mobility aid users to enter into a single-level dining car, if available.

(b) *Passaway.* Doorways required to be accessible by paragraph (a) of this section shall permit access by persons using mobility aids and shall have an unobstructed passageway at least 32 inches wide leading to an accessible sleeping compartment complying with § 1192.127 or seating locations complying with § 1192.125(d). In cars where such doorways require passage through a vestibule, such vestibule shall have a minimum width of 42 inches. (see Fig. 4)

(c) *Signals.* If doors to the platform close automatically or from a remote location, auditory and visual warning signals shall be provided to alert passengers of closing doors.

(d) *Coordination with boarding platforms*—(1) *Requirements.* Cars which provide level-boarding in stations with high platforms shall be coordinated with the boarding platform or mini-high platform design such that the horizontal gap between a car at rest and the platform shall be no greater than 3 inches and the height of the car floor shall be within plus or minus 5/8 inch of the platform height. Vertical alignment may be accomplished by car air suspension, platform lifts or other devices, or any combination.

(2) *Exception.* New cars operating in existing stations may have a floor height within plus or minus 1½ inches of the platform height.

(3) *Exception.* Where platform setbacks do not allow the horizontal gap or vertical alignment specified in paragraph (d) (1) or (2) of this section, platform or portable lifts complying with § 1192.125(b), or car or platform bridge plates, complying with § 1192.125(c), may be provided.

(4) *Exception.* Retrofitted vehicles shall be coordinated with the platform in existing stations such that the horizontal gap shall be no greater than 4 inches and the height of the vehicle floor, under 50% passenger load, shall be within plus or minus 2 inches of the platform height.

(e) *Signage.* The International Symbol of Accessibility shall be displayed on the exterior of all doors complying with this section unless all cars and doors are accessible and are not marked by the access symbol (see Fig. 6). Appropriate signage shall also indicate which accessible doors are adjacent to an accessible restroom, if applicable.

§ 1192.115 Interior circulation, handrails and stanchions.

(a) Where provided, handrails or stanchions within the passenger compartment shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location, complying with § 1192.125(d), from an accessible entrance. The diameter or width of the gripping surface of interior handrails and stanchions shall be 1¼ inches to 1½ inches or shall provide an equivalent gripping surface. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface.

(b) Where provided, handrails and stanchions shall be sufficient to permit safe boarding, on-board circulation, seating and standing assistance, and alighting by persons with disabilities.

(c) At entrances equipped with steps, handrails or stanchions shall be provided in the entrance to the car in a configuration which allows passengers to grasp such assists from outside the car while starting to board, and to continue using such assists throughout the boarding process, to the extent permitted by 49 CFR part 231.

§ 1192.117 Floors, steps and thresholds.

(a) Floor surfaces on aisles, step treads and areas where wheelchair and mobility aid users are to be accommodated shall be slip-resistant.

(b) All step edges and thresholds shall have a band of color(s) running the full width of the step or threshold which contrasts from the step tread and riser or adjacent floor, either light-on-dark or dark-on-light.

§ 1192.119 Lighting.

(a) Any stepwell, or doorway with a lift, ramp or bridge plate, shall have, when the door is open, at least 2 footcandles of illumination measured on the step tread, ramp, bridge plate or lift platform.

(b) The doorways of cars not operating at lighted station platforms shall have outside lights which, when the door is open, provide at least 1 footcandle of illumination on the station platform surface for a distance of 3 feet perpendicular to all points on the bottom step tread edge. Such lights shall be shielded to protect the eyes of entering and exiting passengers.

§ 1192.121 Public information system.

(a) Each car shall be equipped with a public address system permitting transportation system personnel, or recorded or digitized human speech messages, to announce stations and provide other passenger information. Alternative systems or devices which provide equivalent access are also permitted.

(b) [Reserved]

§ 1192.123 Restrooms.

(a) If a restroom is provided for the general public, and an accessible restroom is required by §1192.111 (a) and (e), it shall be designed so as to allow a person using a wheelchair or mobility aid to enter and use such restroom as specified in paragraphs (a) (1) through (5) of this section.

(1) The minimum clear floor area shall be 35 inches by 60 inches. Permanently installed fixtures may overlap this area a maximum of 6 inches, if the lowest portion of the fixture is a minimum of 9 inches above the floor, and may overlap a maximum of 19 inches, if the lowest portion of the fixture is a minimum of 29 inches above the floor. Fixtures shall not interfere with access to and use of the water closet. Fold-down or retractable seats or shelves may overlap the clear floor space at a lower height provided they can be easily folded up or moved out of the way.

(2) The height of the water closet shall be 17 inches to 19 inches measured to the top of the toilet seat. Seats shall not be sprung to return to a lifted position.

(3) A grab bar at least 24 inches long shall be mounted behind the water closet, and a horizontal grab bar at least 40 inches long shall be mounted on at least one side wall, with one end not more than 12 inches from the back wall, at a height between 33 inches and 36 inches above the floor.

(4) Faucets and flush controls shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf (22.2 N). Controls for flush valves shall be mounted no more than 44 inches above the floor.

(5) Doorways on the end of the enclosure, opposite the water closet, shall have a minimum clear opening width of 32 inches. Doorways on the side wall shall have a minimum clear opening width of 39 inches. Door latches and hardware shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

(b) Restrooms required to be accessible shall be in close proximity to at least one seating location for persons using mobility aids complying with §1192.125(d) and shall be connected to such a space by an unobstructed path having a minimum width of 32 inches.

§ 1192.125 Mobility aid accessibility.

(a)(1) *General.* All intercity rail cars, other than level entry cars, required to be accessible by §1192.111 (a) and (e) of this subpart shall provide a level-change mechanism or boarding device (e.g., lift, ramp or bridge plate) complying with either paragraph (b) or (c) of this section and sufficient clearances to permit a wheelchair or other mobility aid user to reach a seating location complying with paragraph (d) of this section.

(2) *Exception.* If portable or platform lifts, ramps or bridge plates meeting the applicable requirements of this section are provided on station platforms or other stops, or mini-high platforms complying with §1192.113(d) are provided, at stations or stops required to be accessible by 49 CFR part 37, the car is not required to be equipped with a car-borne device.

(b) *Car Lift*—(1) *Design load.* The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.

(2) *Controls*—(i) *Requirements.* The controls shall be interlocked with the car brakes, propulsion system, or door, or shall provide other appropriate mechanisms or systems, to ensure that the car cannot be moved when the lift is not stowed and so the lift cannot be deployed unless the interlocks or systems are engaged. The lift shall deploy to all platform levels normally encountered in the operating environment. Where provided, each control for deploying, lowering, raising, and stowing the lift and lowering the roll-off barrier shall be of a momentary contact type requiring continuous manual pressure by the operator and shall not allow improper lift sequencing when the lift platform is occupied. The controls shall allow reversal of the lift operation sequence, such as raising or lowering a platform that is part way down, without allowing an occupied platform to fold or retract into the stowed position.

(ii) *Exception.* Where physical or safety constraints prevent the deployment at some stops of a lift having its long dimension perpendicular to the car axis, the transportation entity may specify a lift which is designed to deploy with its long dimension parallel to the car axis and which pivots into or out of the car while occupied (i.e., ''rotary lift''). The requirements of paragraph (b)(2)(i) of this section prohibiting the lift from being stowed while occupied shall not apply to a lift design of this type if the stowed position is within the passenger compartment and the lift is intended to be stowed while occupied.

(iii) *Exception.* The brake or propulsion system interlocks requirement does not apply to platform mounted or portable lifts provided that a mechanical, electrical or other system operates to ensure that cars do not move when the lift is in use.

(3) *Emergency operation.* The lift shall incorporate an emergency method of deploying, lowering to ground or station platform level with a lift occupant, and raising and stowing the empty lift if the power to the lift fails. No emergency method, manual or otherwise, shall be capable of being operated in a manner that could be hazardous to the lift occupant or to the operator when operated according to manufacturer's instructions, and shall not permit the platform to be stowed or folded when occupied, unless the lift is a rotary lift and is intended to be stowed while occupied.

(4) *Power or equipment failure.* Platforms stowed in a vertical position, and deployed platforms when occupied, shall have provisions to prevent their deploying, failing, or folding any faster than 12 inches/second or their dropping of an occupant in the event of a single failure of any load carrying component.

(5) *Platform barriers.* The lift platform shall be equipped with barriers to prevent any of the wheels of a wheelchair or mobility aid from rolling off the lift during its operation. A movable barrier or inherent design feature shall prevent a wheelchair or mobility aid from rolling off the edge closest to the car until the lift is in its fully raised position. Each side of the lift platform which, in its raised position, extends beyond the car shall have a barrier a minimum 1½ inches high. Such barriers shall not interfere with maneuvering into or out of the car. The loading-edge barrier (outer barrier) which functions as a loading ramp when the lift is at ground or station platform level, shall be sufficient when raised or closed, or a supplementary system

shall be provided, to prevent a power wheelchair or mobility aid from riding over or defeating it. The outer barrier of the lift shall automatically rise or close, or a supplementary system shall automatically engage, and remain raised, closed, or engaged at all times that the lift platform is more than 3 inches above the station platform and the lift is occupied. Alternatively, a barrier or system may be raised, lowered, opened, closed, engaged or disengaged by the lift operator provided an interlock or inherent design feature prevents the lift from rising unless the barrier is raised or closed or the supplementary system is engaged.

(6) *Platform surface.* The lift platform surface shall be free of any protrusions over ¼ inch high and shall be slip resistant. The lift platform shall have a minimum clear width of 28½ inches at the platform, a minimum clear width of 30 inches measured from 2 inches above the lift platform surface to 30 inches above the surface, and a minimum clear length of 48 inches measured from 2 inches above the surface of the platform to 30 inches above the surface. (See Fig. 1.)

(7) *Platform gaps.* Any openings between the lift platform surface and the raised barriers shall not exceed ⅝ inch wide. When the lift is at car floor height with the inner barrier (if applicable) down or retracted, gaps between the forward lift platform edge and car floor shall not exceed ½ inch horizontally and ⅝ inch vertically. Platforms on semi-automatic lifts may have a hand hold not exceeding 1½ inches by 4½ inches located between the edge barriers.

(8) *Platform entrance ramp.* The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8, when measured on level ground, for a maximum rise of 3 inches, and the transition from station platform to ramp may be vertical without edge treatment up to ¼ inch. Thresholds between ¼ inch and ½ inch high shall be beveled with a slope no greater than 1:2.

(9) *Platform deflection.* The lift platform (not including the entrance ramp) shall not deflect more than 3 degrees (exclusive of car roll) in any direction between its unloaded position and its position when loaded with 600 pounds applied through a 26 inch by 26 inch test pallet at the centroid of the lift platform.

(10) *Platform movement.* No part of the platform shall move at a rate exceeding 6 inches/second during lowering and lifting an occupant, and shall not exceed 12 inches/second during deploying or stowing. This requirement does not apply to the deployment or stowage cycles of lifts that are manually deployed or stowed. The maximum platform horizontal and vertical acceleration when occupied shall be 0.3g.

(11) *Boarding direction.* The lift shall permit both inboard and outboard facing of wheelchairs and mobility aids.

(12) *Use by standees.* Lifts shall accommodate persons using walkers, crutches, canes or braces or who otherwise have difficulty using steps. The lift may be marked to indicate a preferred standing position.

(13) *Handrails.* Platforms on lifts shall be equipped with handrails, on two sides, which move in tandem with the lift, and which shall be graspable and provide support to standees throughout the entire lift operation. Handrails shall have a usable component at least 8 inches long with the lowest portion a minimum 30 inches above the platform and the highest portion a maximum 38 inches above the platform. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ⅛ inch. Handrails shall be placed to provide a minimum 1½ inches knuckle clearance from the nearest adjacent surface. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the car.

(c) *Car ramp or bridge plate*—(1) *Design load.* Ramps or bridge plates 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp or bridge plate distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on

the ultimate strength of the material. Ramps or bridge plates shorter than 30 inches shall support a load of 300 pounds.

(2) *Ramp surface.* The ramp or bridge plate surface shall be continuous and slip resistant, shall not have protrusions from the surface greater than ¼ inch high, shall have a clear width of 30 inches and shall accommodate both four-wheel and three-wheel mobility aids.

(3) *Ramp threshold.* The transition from station platform to the ramp or bridge plate and the transition from car floor to the ramp or bridge plate may be vertical without edge treatment up to ¼ inch. Changes in level between ¼ inch and ½ inch shall be beveled with a slope no greater than 1:2.

(4) *Ramp barriers.* Each side of the ramp or bridge plate shall have barriers at least 2 inches high to prevent mobility aid wheels from slipping off.

(5) *Slope.* Ramps or bridge plates shall have the least slope practicable. If the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 3 inches or less above the station platform a maximum slope of 1:4 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 6 inches or less, but more than 3 inches, above the station platform a maximum slope of 1:6 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 9 inches or less, but more than 6 inches, above the station platform a maximum slope of 1:8 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is greater than 9 inches above the station platform a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.

(6) *Attachment*—(i) *Requirement.* When in use for boarding or alighting, the ramp or bridge plate shall be attached to the vehicle, or otherwise prevented from moving such that it is not subject to displacement when loading or unloading a heavy power mobility aid and that any gaps between vehicle and ramp or bridge plate, and station platform and ramp or bridge plate, shall not exceed ⅝ inch.

(ii) *Exception.* Ramps or bridge plates which are attached to, and deployed from, station platforms are permitted in lieu of car devices provided they meet the displacement requirements of paragraph (c)(6)(i) of this section.

(7) *Stowage.* A compartment, securement system, or other appropriate method shall be provided to ensure that stowed ramps or bridge plates, including portable ramps or bridge plates stowed in the passenger area, do not impinge on a passenger's wheelchair or mobility aid or pose any hazard to passengers in the event of a sudden stop.

(8) *Handrails.* If provided, handrails shall allow persons with disabilities to grasp them from outside the car while starting to board, and to continue to use them throughout the boarding process, and shall have the top between 30 inches and 38 inches above the ramp surface. The handrails shall be capable of withstanding a force of 100 pounds concentrated at any point on the handrail without permanent deformation of the rail or its supporting structure. The handrail shall have a cross-sectional diameter between 1¼ inches and 1½ inches or shall provide an equivalent grasping surface, and have eased edges with corner radii of not less than ⅛ inch. Handrails shall not interfere with wheelchair or mobility aid maneuverability when entering or leaving the car.

(d) *Seating*—(1) *Requirements.* All intercity rail cars required to be accessible by § 1192.111 (a) and (e) of this subpart shall provide at least one, but not more than two, mobility aid seating location(s) complying with paragraph (d)(2) of this section; and at least one, but not more than two, seating location(s) complying with paragraph (d)(3) of this section which adjoin or overlap an accessible route with a minimum clear width of 32 inches.

(2) *Wheelchair or mobility aid spaces.* Spaces for persons who wish to remain in their wheelchairs or mobility aids shall have a minimum clear floor area 48 inches by 30 inches. Such space may have fold-down or removable seats for use when not occupied by a wheelchair or mobility aid user. (See Fig. 2)

(3) *Other spaces.* Spaces for individuals who wish to transfer shall include a regular coach seat or dining car booth or table seat and space to fold and store the passenger's wheelchair.

§ 1192.127 Sleeping compartments.

(a) Sleeping compartments required to be accessible shall be designed so as to allow a person using a wheelchair or mobility aid to enter, maneuver within and approach and use each element within such compartment. (See Fig. 5.)

(b) Each accessible compartment shall contain a restroom complying with §1192.123(a) which can be entered directly from such compartment.

(c) Controls and operating mechanisms (e.g., heating and air conditioning controls, lighting controls, call buttons, electrical outlets, etc.) shall be mounted no more than 48 inches, and no less than 15 inches, above the floor and shall have a clear floor area directly in front a minimum of 30 inches by 48 inches. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist.

Subpart G [Reserved]

Subpart H—Other Vehicles and Systems

§ 1192.171 General.

(a) New, used and remanufactured vehicles and conveyances for systems not covered by other subparts of this part, to be considered accessible by regulations issued by the Department of Transportation in 49 CFR part 37, shall comply with this subpart.

(b) If portions of the vehicle or conveyance are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible vehicles be retrofitted with lifts, ramps or other boarding devices.

(c) Requirements for vehicles and systems not covered by this part shall be determined on a case-by-case basis by the Department of Transportation in consultation with the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).

§ 1192.173 Automated guideway transit vehicles and systems.

(a) Automated Guideway Transit (AGT) vehicles and systems, sometimes called ''people movers'', operated in airports and other areas where AGT vehicles travel at slow speed, shall comply with the provisions of §§1192.53 (a) through (c), and 1192.55 through 1192.61 for rapid rail vehicles and systems.

(b) Where the vehicle covered by paragraph (a) of this section will operate in an accessible station, the design of vehicles shall be coordinated with the boarding platform design such that the horizontal gap between a vehicle door at rest and the platform shall be no greater than 1 inch and the height of the vehicle floor shall be within plus or minus ½ inch of the platform height under all normal passenger load conditions. Vertical alignment may be accomplished by vehicle air suspension or other suitable means of meeting the requirement.

(c) In stations where open platforms are not protected by platform screens, a suitable device or system shall be provided to prevent, deter or warn individuals from stepping off the platform between cars. Acceptable devices include, but are not limited to, pantograph gates, chains, motion detectors or other appropriate devices.

(d) Light rail and rapid rail AGT vehicles and systems shall comply with subparts D and C of this part, respectively.

§ 1192.175 High-speed rail cars, monorails and systems.

(a) All cars for high-speed rail systems, including but not limited to those using ''maglev'' or high speed steel-wheel-on-steel-rail technology, and monorail systems operating primarily on dedicated rail (i.e., not used by freight trains) or guideway, in which stations are constructed in accordance with subpart C of 49 CFR part 37, shall be designed for high-platform, level boarding and shall comply with §1192.111(a) for each type of car which is similar to intercity rail, §§1192.111(d), 1192.113 (a) through (c) and (e), 1192.115 (a) and (b), 1192.117 (a)

and (b), 1192.121 through 1192.123, 1192.125(d), and 1192.127 (if applicable). The design of cars shall be coordinated with the boarding platform design such that the horizontal gap between a car door at rest and the platform shall be no greater than 3 inches and the height of the car floor shall be within plus or minus ⅝ inch of the platform height under all normal passenger load conditions. Vertical alignment may be accomplished by car air suspension or other suitable means of meeting the requirement. All doorways shall have, when the door is open, at least 2 footcandles of illumination measured on the door threshold.

(b) All other high-speed rail cars shall comply with the similar provisions of subpart F of this part.

§ 1192.177 Ferries, excursion boats and other vessels. [Reserved]

§ 1192.179 Trams, similar vehicles and systems.

(a) New and used trams consisting of a tractor unit, with or without passenger accommodations, and one or more passenger trailer units, including but not limited to vehicles providing shuttle service to remote parking areas, between hotels and other public accommodations, and between and within amusement parks and other recreation areas, shall comply with this section. For purposes of determining applicability of 49 CFR 37.101, 37.103, or 37.105, the capacity of such a vehicle or ''train'' shall consist of the total combined seating capacity of all units, plus the driver, prior to any modification for accessibility.

(b) Each tractor unit which accommodates passengers and each trailer unit shall comply with §§ 1192.25 and 1192.29. In addition, each such unit shall comply with § 1192.23 (b) or (c) and shall provide at least one space for wheelchair or mobility aid users complying with § 1192.23(d) unless the complete operating unit consisting of tractor and one or more trailers can already accommodate at least two wheelchair or mobility aid users.

FIGURES TO PART 1192

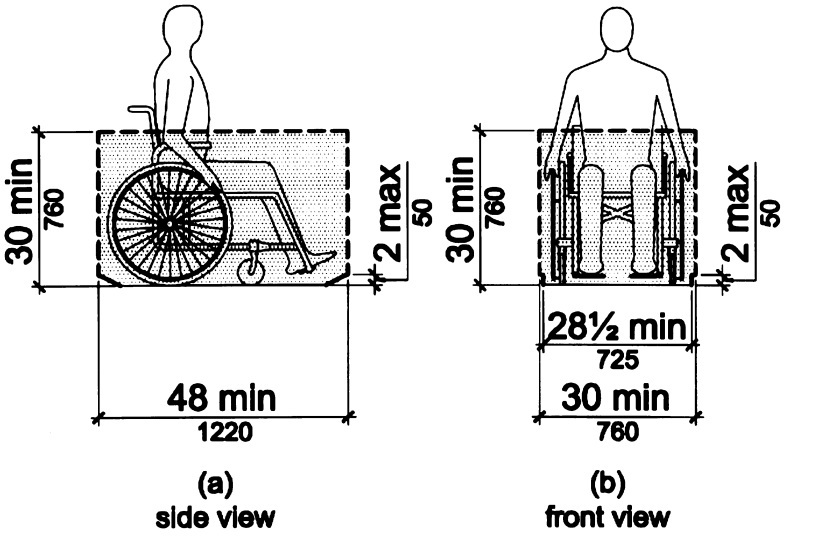


Figure 1
Wheelchair or Mobility Aid Envelope

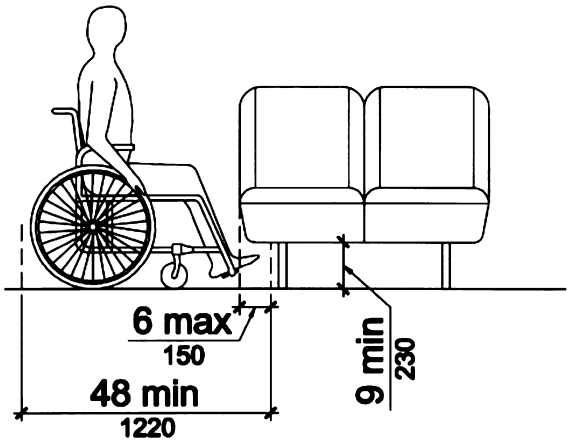


Figure 2
Toe Clearance Under a Fixed Element

[63 FR 51701, 51702, Sept. 28, 1998]

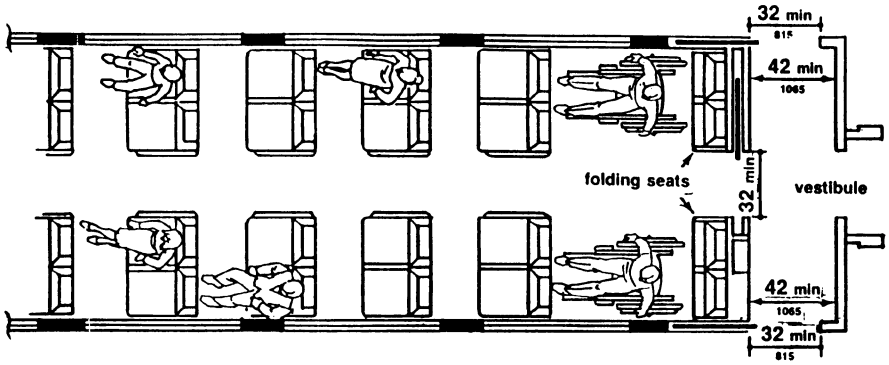


Fig. 3
Commuter Rail Car (without restrooms)

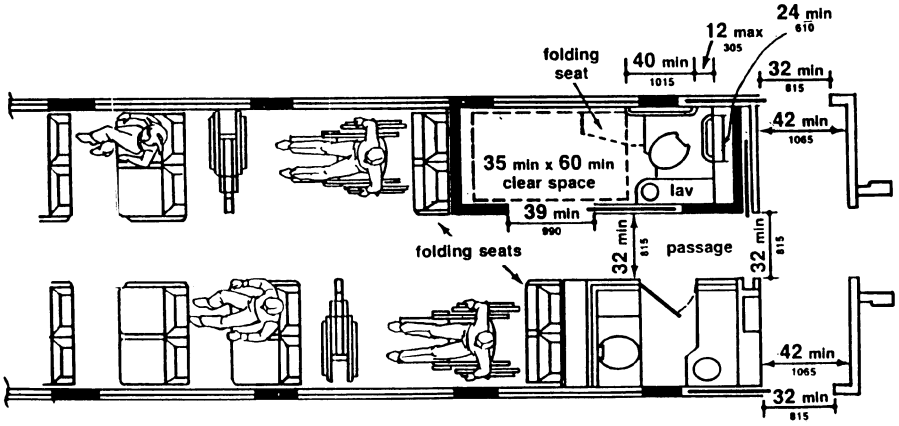


Fig. 4
Intercity Rail Car (with accessible restroom)

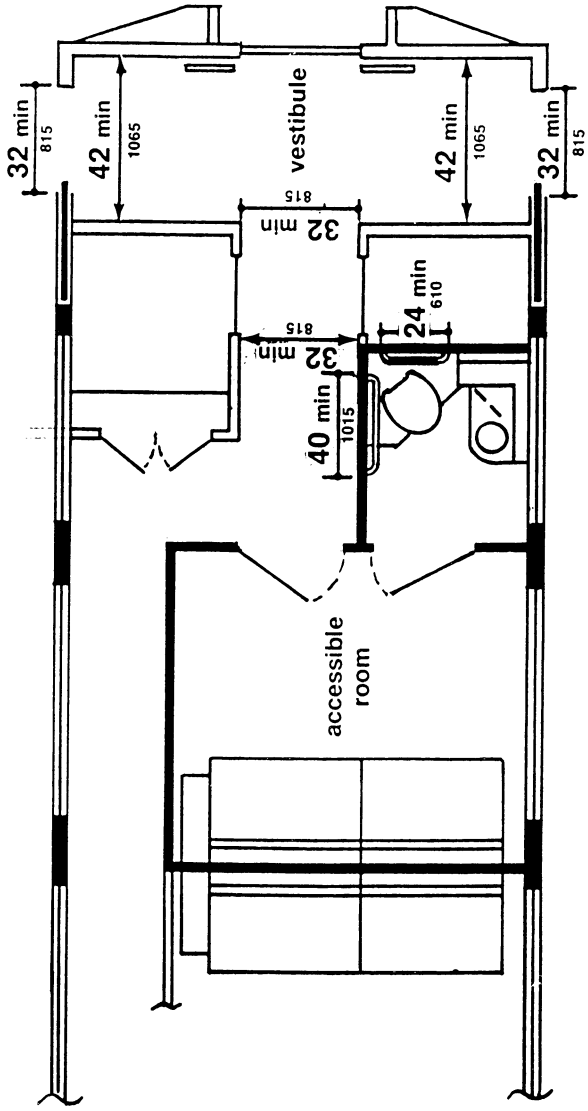
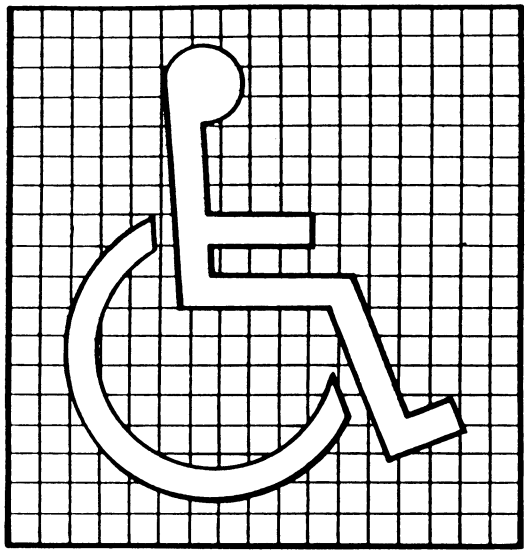


Fig. 5
Intercity Rail Car (with accessible sleeping compartment)



(a)
Proportions

(b)
Display Conditions

Fig. 6
International Symbol of Accessibility

APPENDIX A TO PART 1192—ACCESSIBILITY GUIDELINES FOR BUSES, OVER-THE-ROAD BUSES, AND VANS

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CHAPTER 1: APPLICATION AND ADMINISTRATION

T101 Purpose

T101.1 Purpose. These Non-Rail Vehicle Guidelines, which consist of Chapters 1 through 7, contain scoping and technical requirements for new, used or remanufactured non-rail vehicles to ensure their accessibility to, and usability by, individuals with disabilities. The Non-Rail Vehicle Guidelines apply to the extent required by regulations issued by the Department of Transportation under the Americans with Disabilities Act, as amended (42 U.S.C. 12101 *et seq.*).

T102 Conventions

T102.1 Calculation of Percentages. Where the determination of the required size or dimension of an element involves ratios or percentages, rounding down for values less than one half shall be permitted.

T102.2 Units of Measurement. Measurements are stated in U.S. and metric customary units. The values stated in each system (U.S. and metric customary units) may not be exact equivalents, and each system shall be used independently of the other.

T102.3 Vehicle Length. The length of non-rail vehicles shall be measured from standard bumper to standard bumper.

T103 Definitions

T103.1 Terms Defined in Referenced Standards. Terms defined in referenced standards and not defined in T103.4 shall have the meaning as defined in the referenced standards.

T103.2 Undefined Terms. Terms not specifically defined in T103.4 or in regulations issued by the Department of Transportation (49 CFR part 37) shall be given their ordinarily accepted meaning in the sense that the context implies.

T103.3 Interchangeability. Words, terms, and phrases used in the singular include the plural; and words, terms, and phrases used in the plural include the singular.

T103.4 Defined Terms. For the purpose of the Non-Rail Vehicle Guidelines, the following terms have the indicated meaning.

Boarding platform. A platform in a level boarding bus system raised above standard curb height in order to align vertically with the transit vehicle entry for level boarding and alighting.

Fixed route service (or fixed route). Operation of a non-rail vehicle along a prescribed route according to a fixed schedule.

Large transit entity. A provider of public transportation that is required to report to the National Transportation Database (49 U.S.C. 5335), and that, for an any given calendar year, reports to such database the operation of 100 or more buses in annual maximum service for all fixed-route service bus modes collectively, through either direct operation or purchased transportation.

Large non-rail vehicle. Non-rail vehicles that are more than 25 feet (7.6 m) in length.

Level boarding bus system. A system in which buses operate where some or all of the designated stops have boarding platforms and the design of boarding platforms and non-rail vehicles are coordinated to provide boarding having little or no change in level between the vehicle floor and the boarding platform.

Non-rail vehicle. A self-propelled, rubber-tired vehicle used to provide transportation services and intended for use on city streets, highways, or busways that constitutes either a bus, over-the-road bus, or van.

Operable part. A component of a device or system used to insert or withdraw objects, or to activate, deactivate, adjust, or connect to the device or system. Operable parts include, but are not limited to, buttons, levers, knobs, smart card targets, coin and card slots, pull-cords, jacks, data ports, electrical outlets, and touchscreens.

Small non-rail vehicle. Non-rail vehicles that are equal to or less than 25 feet (7.6 m) in length.

Surface discontinuities. Differences in level between two adjacent surfaces. Elevation changes due to ramps or stairs do not, themselves, constitute surface discontinuities. However, abrupt changes in level on the walking surface of ramps or stairs are surface discontinuities.

CHAPTER 2: SCOPING REQUIREMENTS

T201 Scope

T201.1 General. Non-rail vehicles purchased, leased or remanufactured by entities covered by the Americans with Disabilities Act (ADA) shall comply with the requirements in the Non-Rail Vehicle Guidelines to the extent required by regulations issued by the Department of Transportation in 49 CFR Part 37.

T201.2 Reduction in Access Prohibited. No modifications to a non-rail vehicle shall be taken that decrease, or have the effect of decreasing, the net accessibility or usability of the vehicle below the requirements of the Non-Rail Vehicle Guidelines.

T202 Accessible Means of Boarding and Alighting

T202.1 General. Non-rail vehicles shall provide at least one means of accessible boarding and alighting that serves each designated stop on the fixed route to which the vehicle is assigned. Non-rail vehicles shall also provide at least one means of accessible boarding and alighting that can be deployed to the roadway. Provision of accessible boarding and alighting shall be made through one or more of the following methods: ramps or bridgeplates complying with T402, lifts complying with T403, or a means of level boarding and alighting complying with T404.

T203 Steps

T203.1 General. Steps on non-rail vehicles shall comply with T405.

T204 Doorways

T204.1 General. Doorways on non-rail vehicles shall comply with T204.

T204.2 Doorways with Lifts, Ramps or Bridgeplates. Doorways with lifts or ramps shall comply with T502.2.

T204.3 Doorways with Level Boarding and Alighting. Doorways with level boarding and alighting shall comply with T502.3.

T204.4 Doorways with Steps on Over-the-Road Buses. On over-the-road-buses, doorways with steps shall comply with T502.4.

T205 Illumination

T205.1 General. Non-rail vehicles shall provide illumination complying with T503 at ramps, bridgeplates, doorways, and boarding and alighting areas.

T206 Circulation Paths

T206.1 General. Circulation paths in non-rail vehicles shall comply with T302.

T207 Handrails, Stanchions, and Handholds

T207.1 General. Non-rail vehicles shall provide handrails, stanchions, and handholds in accordance with T207. Handrails, stanchions, and handholds shall comply with T303.

T207.2 Passenger Doorways. Handrails or stanchions shall be provided at passenger doorways in a configuration that permits grasping and use from outside the non-rail vehicle and throughout the boarding and alighting process.

T207.3 Fare Collection Devices. Handrails shall be provided at fare collection devices and shall be configured so that they can be used for support when at the fare collection device.

T207.4 Circulation Paths. Handrails, stanchions, and handholds shall be provided along circulation paths in accordance with T207.4.

T207.4.1. Small vehicles. Handrails, stanchions, or handholds shall be provided within small non-rail vehicles in a configuration that permits onboard circulation and assistance with seating and standing.

T207.4.2. Large vehicles. Handholds or stanchions shall be provided within large non-rail vehicles on all forward- and rear-facing seat backs located directly adjacent to the aisle.

Exception: Where high-back seats are provided, handrails located overhead or on overhead luggage racks shall be permitted instead of stanchions or handholds.

T208 Passenger Access Routes

T208.1 General. Non-rail vehicles shall provide passenger access routes that permit boarding and alighting, onboard circulation, and seating by passengers with disabilities. A passenger access route shall consist of a route complying with T208.2 between wheelchair spaces and doorways, walking surfaces complying with T302, and clearances complying with T504.

T208.2 Connection to Doorways. A passenger access route shall connect each wheelchair space to doorways that provide a means of accessible boarding and alighting in accordance with T208.2.

T208.2.1 Doorways on One Side of vehicle. Where non-rail vehicles have doorways on one side, a passenger access route shall connect each wheelchair space to a doorway that provides a means of accessible boarding and alighting in accordance with T202.

T208.2.2 Doorways on Two Sides of vehicle. Where non-rail vehicles have doorways on two sides, a passenger access route shall connect each wheelchair space to doorways on both sides of the vehicle that provide a means of accessible boarding and alighting in accordance with T202.

T208.2.3 Deployment to Roadway. A passenger access route shall connect each wheelchair space to a doorway providing a means of accessible boarding and alighting that can be deployed to the roadway in accordance with T202.

T209 Fare Collection Devices

T209.1 General. Where non-rail vehicles provide onboard fare collection devices, at least one fare collection device shall serve a passenger access route and comply with T505.

T210 Wheelchair Spaces

T210.1 General. Non-rail vehicles shall provide wheelchair spaces in accordance with T210.

T210.2 Large non-rail vehicles. Large non-rail vehicles shall provide at least two wheelchair spaces complying with T602.

T210.3 Small non-rail vehicles. Small non-rail vehicles shall provide at least one wheelchair space complying with T602.

T210.4 Location. Wheelchair spaces shall be located as near as practicable to doorways that provide a means of accessible boarding and alighting.

T211 Wheelchair Securement Systems

T211.1 General. Non-rail vehicles shall provide wheelchair securement systems complying with T603 at each wheelchair space.

T212 Seat Belts and Shoulder Belts

T212.1 General. Non-rail vehicles shall provide seat belts and shoulder belts complying with T605 at each wheelchair space.

T213 Seats

T213.1 General. Seats on non-rail vehicles shall comply with T213.

T213.2 Priority Seats. Non-rail vehicles operated in fixed-route service shall designate at least two seats as priority seats for passengers with disabilities. Priority seats shall be located as near as practicable to a doorway used for boarding and alighting. Where non-rail vehicles provide both aisle-facing and forward-facing seats, at least one of the priority seats shall be a forward-facing seat.

T213.3 Armrests at Aisle Seats on Over-the-Road Buses. Where armrests are provided on the aisle side of seats on over-the-road buses, folding or removable armrests shall be provided on the aisle side of at least 50 percent of aisle seats. Priority seats and moveable or removable seats permitted by T602.4.1 at wheelchair spaces shall be included among the fifty percent of seats with folding or removable armrests.

T214 Operable Parts

T214.1 General. Where provided for passenger use, operable parts at wheelchair spaces and priority seats, stop request systems, and fare collection devices serving passenger access routes shall comply with T304.

T215 Communication Features

T215.1 General. Communication features on non-rail vehicles shall comply with T215.

T215.2 Signs. Signs shall comply with 215.2.

T215.2.1 Priority Seats. Priority seats shall be identified by signs informing other passengers to make the seats available for persons with disabilities. Signs at priority seats shall comply with T702.

T215.2.2 Wheelchair Spaces. Wheelchair spaces shall be identified by the International Symbol of Accessibility complying with T703.

T215.2.3 Doorways. Doorways that provide a means of accessible boarding and alighting shall be identified on the exterior of the non-rail vehicle by the International Symbol of Accessibility complying with T703.

T215.2.4 Destination and Route Signs. Where destination or route signs are provided on the exterior of non-rail vehicles, such signs shall be located at a minimum on the front and boarding sides of the vehicle. The signs shall be illuminated and comply with T702.

T215.3. Public Address and Stop Request Systems. Large non-rail vehicles that operate in fixed route service with multiple designated stops shall provide public address and stop request systems in accordance with T215.3.

T215.3.1 Public Address Systems. Public address systems shall be provided within non-rail vehicles to announce stops and other passenger information.

T215.3.2 Stop Request Systems. Where non-rail vehicles stop on passenger request, stop request systems complying with T704.3 shall be provided.

T215.4 Automated Announcement Systems. Large non-rail vehicles operated in fixed route service with multiple designated stops by large transit entities shall provide automated stop announcement systems and automated route identification systems in accordance with T215.4.

T215.4.1 Automated Stop Announcement Systems. Automated stop announcement systems shall comply with T704.3.1.

T215.4.2 Automated Route Identification Systems. Automated route identification systems shall comply with T704.3.2.

CHAPTER 3: BUILDING BLOCKS

T301 General

T301.1 Scope. The requirements in Chapter 3 shall apply where required by Chapter 2 or where otherwise referenced in any other chapter of the Non-Rail Vehicle Guidelines.

T302 Walking Surfaces

T302.1 General. Walking surfaces in non-rail vehicles shall comply with T302.

Exception: Walking surfaces on lifts shall not be required to comply with T302.

T302.2 Slip Resistant. Walking surfaces shall be slip resistant.

T302.3 Openings. Openings in walking surfaces shall not allow the passage of a sphere more than ⅝ inch (16 mm) in diameter. Elongated openings shall be placed so that the long dimension is perpendicular to the dominant direction of travel.

Exceptions: 1. Wheelchair securement system components affixed to walking surfaces shall be permitted to have openings ⅞ inch (22 mm) maximum in width provided that, where such openings are more than ⅝ inch (16 mm) in width, they contrast visually with the rest of the walking surface either light-on-dark or dark-on-light.

2. Ramp and bridgeplate surfaces shall be permitted to have one opening 1½ inches (38 mm) maximum in width and 4½ inches (115 mm) maximum in length to allow the operator to grasp the ramp or bridgeplate for manual operation.

T302.4 Surface Discontinuities. Surface discontinuities shall be ½ inch (13 mm) high maximum and shall be beveled with a slope not steeper than 1:2.

Exceptions: 1. Surface discontinuities ¼ inch (6.4 mm) high maximum shall not be required to be beveled.

2. Steps complying with T405 shall be permitted on walking surfaces that are not part of a passenger access route.

T303 Handrails, Stanchions, and Handholds

T303.1 General. Handrails, stanchions, and handholds in non-rail vehicles shall comply with T303.

T303.2 Edges. Edges shall be rounded or eased.

T303.3 Cross Section. Gripping surfaces shall have a cross section complying with T303.3.

T303.3.1 Seat-Back Handhold Cross Section. The cross section of seat-back handholds shall have an outside diameter of ⅞ inches (22 mm) minimum and 2 inches (50 mm) maximum.

T303.3.2 Handrail and Stanchion Circular Cross Section. Handrails and stanchions with a circular cross section shall have an outside diameter of 1¼ inches (32 mm) minimum and 2 inches (50 mm) maximum.

T303.3.3 Handrail and Stanchion Non-Circular Cross Section. Handrails and stanchions with a non-circular cross section shall have a perimeter dimension of 4 inches (100 mm) minimum and 6¼ inches (160 mm) maximum, and a cross section dimension of 2¼ inches (57 mm) maximum.

T303.4 Clearance. Clearance between gripping surfaces and adjacent surfaces shall be 1½ inches (38 mm) minimum.

T304 Operable Parts

T304.1 General. Operable parts in non-rail vehicles shall comply with T304.

T304.2 Height. Operable parts shall be located 24 inches (610 mm) minimum and 48 inches (1220 mm) maximum above the floor of non-rail vehicles.

T304.3 Location. Operable parts provided at a wheelchair space shall be located adjacent to the wheelchair space 24 inches (610 mm) minimum and 36 inches (915 mm) maximum from the rear of the wheelchair space measured horizontally.

T304.4 Operation. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate operable parts shall be 5 lbf (22.2 N) maximum.

CHAPTER 4: BOARDING AND ALIGHTING

T401 General

T401.1 Scope. The requirements in Chapter 4 shall apply where required by Chapter 2 or where otherwise referenced in any other chapter of the Non-Rail Vehicle Guidelines.

T402 Ramps and Bridgeplates

T402.1 General. Ramps and bridgeplates shall comply with T402. Ramps and bridgeplates shall be permitted to fold or telescope.

T402.2 Design Load. Ramps and bridgeplates 30 inches (760 mm) or more in length shall be designed to support a load of 600 pounds (273 kg) minimum, placed at the centroid of the ramp distributed over an area of 26 inches by 26 inches. The design load of ramps and bridgeplates less than 30 inches (760 mm) in length shall be 300 pounds (136 kg) minimum. The factor of safety for ramps and bridgeplates shall be 3 or more, based on the ultimate strength of the material.

T402.3 Installation and Operation. When used for boarding and alighting, ramps and bridgeplates shall be firmly attached to the non-rail vehicle to prevent displacement. Ramps and bridgeplates provided on large non-rail vehicles shall be permanently installed and power operated.

Exception: Ramps and bridgeplates on large non-rail vehicles that serve only designated stops with boarding platforms providing level boarding and alighting shall not be required to be permanently attached and power operated provided that portable ramps or bridgeplates capable of deployment to the roadway are carried onboard.

T402.4 Emergency Operation. Power-operated ramps and bridgeplates shall be capable of manual operation in the event of a power failure.

T402.5 Surfaces. Ramp and bridgeplate surface material shall comply with T302 and extend across the full width and length of the ramp or bridgeplate.

T402.6 Clear Width. The clear width of ramps and bridgeplates shall be 30 inches (760 mm) minimum.

T402.7 Edge Guards. Ramps and bridgeplates shall provide edge guards continuously along each side of the ramp or bridgeplate to within 3 inches (75 mm) of the end of the ramp or bridgeplate that is deployed furthest from the non-rail vehicle. Edge guards shall be 2 inches (51 mm) high minimum above the ramp or bridgeplate surface.

T402.8 Running Slope. The maximum running slope of ramps and bridgeplates shall comply with T402.8.1 or T402.8.2.

T402.8.1 Deployment to Roadways or to Curb Height Boarding and Alighting Areas. The running slope of ramps and bridgeplates used for deployment to the roadway or to curb-height boarding and alighting areas shall be 1:6 maximum, as measured to ground level with the non-rail vehicle resting on a flat surface.

T402.8.2 Deployment to Boarding Platforms. The running slope of ramps and bridgeplates used for deployment to platforms shall be 1:8 maximum, as measured to the boarding platform with the non-rail vehicle resting on a flat surface.

T402.9 Transitions. Vertical surface discontinuities at transitions from boarding and alighting areas to ramps and bridgeplates shall comply with T302.4.

T402.10 Visual Contrast. The perimeter of the walking surface on ramps and bridgeplates shall be marked by a stripe. The stripe shall be 1 inch (25 mm) wide minimum and shall contrast visually with the rest of the walking surface either light-on-dark or dark-on-light.

T402.11 Gaps. When ramps or bridgeplates are deployed for boarding and alighting, gaps between the ramp or bridgeplate surface and floor of non-rail vehicles shall not permit passage of a sphere more than ⅝ inch (16 mm) in diameter.

T402.12 Stowage. Where portable ramps and bridgeplates are permitted, a compartment, securement system, or other storage method shall be provided within the non-rail vehicle to stow such ramps and bridgeplates when not in use.

T403 Lifts

T403.1 General. Lifts shall comply with T403 and the National Highway Traffic Safety Administration's Federal Motor Vehicle Safety Standards (FMVSS) for public use lifts at 49 CFR 571.403 and 571.404.

T403.2 Boarding Direction. Lift platforms shall be designed to permit passengers who use wheelchairs the option to board the platforms facing either toward or away from the non-rail vehicle.

T404 Level Boarding and Alighting

T404.1 General. Boarding and alighting at boarding platforms in level boarding bus systems shall comply with T404.

T404.2 Vehicle Floor and Boarding Platform Coordination. The design of non-rail vehicles shall be coordinated with the boarding platforms to minimize the gap between the vehicle floor and the boarding platforms.

T404.3 Ramps and Bridgeplates. Where the space between the floor of non-rail vehicles and a boarding platform is greater than 2 inches (51 mm) horizontally or 5/8 inch (16 mm) vertically when measured at 50 percent passenger load with the vehicle at rest, non-rail vehicles shall provide ramps or bridgeplates complying with T402.

T405 Steps

T405.1 General. Steps shall comply with T405.

T405.2 Surfaces. Step tread surfaces shall comply with T302.

T405.3 Visual Contrast. The outer edge of step treads shall be marked by a stripe. The stripe shall be 1 inch (25 mm) wide minimum and shall contrast visually with the rest of the step tread or circulation path surface either light-on-dark or dark-on-light.

CHAPTER 5: DOORWAYS, CIRCULATION PATHS AND FARE COLLECTION DEVICES

T501 General

T501.1 Scope. The requirements in Chapter 5 shall apply where required by Chapter 2 or where otherwise referenced in any other chapter of the Non-Rail Vehicle Guidelines.

T502 Doorways

T502.1 General. Doorways in non-rail vehicles shall comply with T502.

T502.2 Doorways with Lifts, Ramps or Bridgeplates. The vertical clearance at doorways with lifts, ramps or bridgeplates shall comply with T502.2. Vertical clearance shall be measured from the inside finished edge of the door opening to the highest point of the deployed lift, ramp or bridgeplate below.

T502.2.1 Over-the-Road Buses. For over-the-road buses, the vertical clearance at doorways shall be 65 inches (1650 mm) minimum.

T502.2.2 Other Vehicles. For other non-rail vehicles, the vertical clearance at doorways shall be 56 inches (1420 mm) minimum on small non-rail vehicles and 68 inches (1725 mm) on large non-rail vehicles.

T502.3 Doorways with Level Boarding. Doorways on non-rail vehicles designed for level boarding bus systems shall comply with T502.3.

T502.3.1 Clear Width. Doorways shall provide a clear opening of 32 inches (810 mm) minimum.

T502.3.2 Thresholds. Thresholds at doorways shall be marked by a stripe. The stripe shall be 1 inch (25 mm) wide minimum and contrast with the rest of the walking surface either light-on-dark or dark-on-light.

T502.4 Doorways with Steps on Over-the-Road Buses. On over-the-road buses, doorways with steps shall provide an opening with a clear width of 30 inches (760 mm) minimum.

Exceptions: 1. The door opening clear width above a height of 48 inches (1220 mm) measured from the lowest step tread shall be permitted to taper so as to reduce in width to 18 inches (457 mm) minimum.

2. Where compliance with T502.4 is not structurally feasible, the door opening clear width shall be permitted to be 27 in (685 mm) minimum.

3. Hinges and other door mechanisms shall be permitted to protrude 4 inches (100 mm) maximum into the door opening clear width at or below 48 inches (1220 mm) in height measured from the lowest step tread.

T503 Illumination

T503.1 General. Illumination shall be provided at ramps, bridgeplates, doorways, and boarding and alighting areas in accordance with T503. Lights shall be shielded so as not to project directly into the eyes of entering and exiting passengers.

T503.2 Ramps and Bridgeplates. When ramps or bridgeplates are deployed, the walking surface shall be lighted with 2 foot-candles (22 lux) minimum of illumination.

T503.3 Steps at Front Doorways. The walking surface on steps serving the front doorway of non-rail vehicles shall be lighted with 2 foot-candles (22 lux) minimum of illumination when the vehicle doors are open.

T503.4 Steps at Other Doorways. The walking surface on steps serving all other non-rail vehicle doorways shall be lighted at all times with 2 foot-candles (22 lux) minimum of illumination.

T503.5 Exterior Illumination for Boarding and Alighting Areas. Exterior lighting shall be provided to illuminate walking surfaces of boarding and alighting areas when the doors of non-rail vehicles are open. Where doorways have steps, the illumination shall be 1 foot-candle (11 lux) minimum for a distance of 3 feet (915 mm) measured beyond the outside edge of the doorway or bottom step tread. Where doorways have ramps, bridgeplates or lifts, the illumination shall be 1 foot-candle (11 lux) minimum for a distance of 3 feet (915 mm) measured beyond the edge of the ramp, bridgeplate or lift farthest from the non-rail vehicle.

T504 Passenger Access Routes

T504.1 General. Passenger access routes shall provide clearances that are sufficient to permit passengers using wheelchairs to move between wheelchair spaces and doorways that provide accessible boarding and alighting, and to enter and exit wheelchair spaces.

T505 Fare Collection Devices

T505.1 General. Fare collection devices in non-rail vehicles shall comply with T505.

T505.2 Location. Fare collection devices shall be located so as not to interfere with wheelchair movement along passenger access routes.

T505.3 Location of Operable Parts. Operable parts shall be located so that they are reachable by passengers using wheelchair when parked in a clear space 30 inches (760 mm) wide minimum and 48 inches (1220 mm) long minimum. Operable parts shall be located adjacent to the toe end of the clear space or shall be located no more than 10 inches (255 mm) measured from the centerline of the long dimension of the clear space.

CHAPTER 6: WHEELCHAIR SPACES AND SECUREMENT SYSTEMS

T601 General

T601.1 Scope. The requirements in Chapter 6 shall apply where required by Chapter 2 or where otherwise referenced in any other chapter of the Non-Rail Vehicle Guidelines.

T602 Wheelchair Spaces

T602.1 General. Wheelchair spaces in non-rail vehicles shall comply with T602.

T602.2 Surfaces. Wheelchair space surfaces shall comply with T302.

T602.3 Approach. One full unobstructed side of each wheelchair space shall adjoin or overlap a passenger access route.

T602.4 Size. Wheelchair spaces shall be 30 inches (760 mm) minimum in width and 48 inches (1220 mm) minimum in length.

Exception: The portion of the wheelchair space occupied by wheelchair footrests shall be permitted to be located beneath another seat provided that space beneath the seat is 30 inches (760 mm) wide minimum, 9 inches (230 mm) high minimum, and 6 inches (150 mm) deep minimum.

T602. 5 Fold-Down or Removable Seats. Fold-down or removable seats shall be permitted in wheelchair spaces, provided that, when folded up or stowed, they do not obstruct the minimum size of the wheelchair space specified in T602.4.

T603 Wheelchair Securement Systems

T603.1 General. Wheelchair securement systems in non-rail vehicles, including attachments, shall comply with T603.

T603.2 Orientation. Wheelchair securement systems shall secure the wheelchair so that the occupant faces the front of the non-rail vehicle.

*Exception: O*n large non-rail vehicles designed for use by both seated and standing passengers, rear-facing wheelchair securement systems shall be permitted provided that at least one wheelchair securement system is front facing.

T603.3 Design Load. Wheelchair securement systems shall comply with the design loads specified in T603.3.1 or T603.3.2, as applicable.

T603.3.1 Non-Rail Vehicles with Gross Vehicle Weight Rating Equal to or Greater than 30,000 lbs. On non-rail vehicles with a gross vehicle weight rating equal to or greater than 30,000 pounds (13,608 kg), wheelchair securement systems shall restrain a force in the forward longitudinal direction of 2,000 lbf (8,800 N) minimum for each wheelchair.

T603.3.2 Non-Rail Vehicles with Gross Vehicle Weight Rating Less than 30,000 lbs. On non-rail vehicles with a gross vehicle weight rating less than 30,000 pounds (13,608 kg), wheelchair securement systems shall restrain a force in the forward longitudinal direction of 5,000 lbf (22,000 N) minimum for each wheelchair.

T603.4 Movement. Wheelchair securement systems shall limit the movement of an occupied wheelchair to 2 inches (51 mm) maximum in any direction when secured in accordance with the manufacturer's instructions and when the non-rail vehicle is operating in normal conditions.

T603.5 Securement Systems for Rear-Facing Wheelchair Positions. Rear-facing wheelchair securement systems shall provide forward excursion barriers and padded head rests that comply with ISO 10865–1:2012(E), Wheelchair containment and occupant retention systems for accessible transport vehicles designed for use by both sitting and standing passengers—Part 1: Systems for rearward facing wheelchair-seated passengers, First Edition, June 5, 2012 [ISO Standard 10865–1:2012(E)]. ISO Standard 10865–1:2012(E) is incorporated by reference into this section with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, a notice of change must be published in the FEDERAL REGISTER and the material must be made available to the public. All approved material is available for inspection at the U.S. Access Board, 1331 F Street NW., Suite 1000, Washington, DC 20004–1111, (202) 272–0080 (voice), (202) 272–0082 (TTY) and is available from the International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH–1211, Geneva 20, Switzerland (*http://www.iso.org/iso/home/store.htm*). It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741–6030, or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*.

T604 Stowage

T604.1 General. When wheelchair securement systems are not in use, the systems shall not protrude into the wheelchair space except as provided in T603.5, and shall not interfere with passenger movement or pose a hazard. Wheelchair securement systems shall be reasonably protected from vandalism, and shall be readily accessed then needed for use.

T605 Seat Belts and Shoulder Belts

T605.1 General. Seat belts and shoulder belts provided for passengers who use wheelchairs shall comply with 49 CFR 571.209. Seat belts and shoulder belts shall not be used in place of wheelchair securement systems complying with T603.

CHAPTER 7: COMMUNICATION FEATURES

T701 General

T701.1 Scope. The requirements in Chapter 7 shall apply where required by Chapter 2 or where otherwise referenced in any other chapter of the Non-Rail Vehicle Guidelines.

T702 Signs

T702.1 General. Signs on non-rail vehicles shall comply with T702.

T702.2 Character Style. Characters shall be displayed in sans serif fonts and shall not use italic, oblique, script, highly decorative, or other unusual forms.

T702.3 Character Proportions. Characters shall use fonts where the width of the uppercase letter ''O'' is 55 percent minimum and 110 percent maximum of the height of the uppercase letter ''I''.

T702.4 Character Height. Character height shall comply with Table T702.4. Character height shall be based on the uppercase letter ''I''.

TABLE T702.4—CHARACTER HEIGHT

Sign location	Minimum character height
Exterior route or destination signs on boarding side of non-rail vehicle	2 inches (51 mm).
Exterior route or destination signs on front of non-rail vehicle	4 inches (100 mm).
Interior signs designating wheelchair spaces or priority seats, where baseline of character is equal to or less than 70 inches (1780 mm) above the non-rail vehicle floor.	5/8 inch (16 mm).

TABLE T702.4—CHARACTER HEIGHT—Continued

Sign location	Minimum character height
Interior signs designating wheelchair spaces, priority seats, stop announcements, or stop requests where baseline of character is more than 70 inches (1780 mm) above the non-rail vehicle floor.	2 inches (51 mm).

T702.5 Stroke Thickness. Stroke thickness of the uppercase letter ''I'' shall be 10 percent minimum and 30 percent maximum of the height of the character.

T702.6 Character Spacing. Character spacing shall be measured between the two closest points of adjacent characters, excluding word spaces. Spacing between individual characters shall be 10 percent minimum and 35 percent maximum of character height.

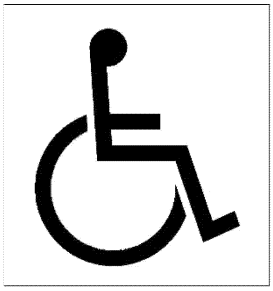
T702.7 Line Spacing. Spacing between the baselines of separate lines of characters within a message shall be 135 percent minimum and 170 percent maximum of the character height.

T702.8 Contrast. Characters shall contrast with their background with either light characters on a dark background or dark characters on a light background. Where provided, protective surfaces over signs shall have a non-glare finish.

T703 International Symbol of Accessibility

T703.1 General. The International Symbol of Accessibility shall comply with Figure T703.1. The symbol shall have a background field height of 4 inches (100 mm) minimum. The symbol and its background shall have a non-glare finish. The symbol shall contrast with its background with either a light symbol on a dark background or a dark symbol on a light background.

Figure T703.1 International Symbol of Accessibility



T704 Announcement Systems

T704.1 General. Non-rail vehicles shall provide announcement systems in accordance with T704.

T704.2 Stop Request Systems. Stop request systems shall comply with T704.3.

T704.2.1 Audible and visible notification. Audible and visible notification shall be provided onboard indicating when passengers have requested to disembark at the next stop on the fixed route. Audible notifications shall be verbal or non-verbal signals and sound only once for each stop. Visible components of stop request systems shall include signs complying with T702, lights, or other visually perceptible indicators. Visible components shall illuminate or activate with a stop request, be viewable onboard from all wheelchair spaces and priority seats for passengers with disabilities, and extinguish when the doors open at a stop on non-rail vehicles.

T704.2.2 Operation. A mechanism for requesting stops shall be located at each wheelchair space and priority seat for passengers with disabilities. Operable parts on stop request systems shall comply with T304.

T704.3 Automated Announcement Systems. Automated systems for stop announcements and route identification announcements shall comply with T704.3.

T704.3.1 Automated Stop Announcements. Automated stop announcement systems shall provide audible and visible notification of upcoming stops on fixed routes. Stop announcements shall use synthesized, recorded or digitized speech and be audible within non-rail vehicles. Visible components of stop

announcements shall consist of signs complying with T702. Signs shall be viewable onboard from all wheelchair spaces and priority seats for passengers with disabilities.

T704.3.2 Automated Route Identification Announcements. Automated route identification systems shall audibly and visibly identify the fixed route on which the non-rail vehicle is operating. Audible route identification announcements shall be broadcast externally at boarding and alighting areas using synthesized, recorded or digitized speech. Signs displaying route identification information shall be provided on the front and boarding sides of non-rail vehicles. Signs shall comply with T702.

PART 1194—INFORMATION AND COMMUNICATION TECHNOLOGY STANDARDS AND GUIDELINES

Sec.

1194.1 Standards for Section 508 of the Rehabilitation Act.
1194.2 Guidelines for Section 255 of the Communications Act.
APPENDIX A TO PART 1194—SECTION 508 OF THE REHABILITATION ACT: APPLICATION AND SCOPING REQUIREMENTS
APPENDIX B TO PART 1194—SECTION 255 OF THE COMMUNICATIONS ACT: APPLICATION AND SCOPING REQUIREMENTS
APPENDIX C TO PART 1194—FUNCTIONAL PERFORMANCE CRITERIA AND TECHNICAL REQUIREMENTS
APPENDIX D TO PART 1194—ELECTRONIC AND INFORMATION TECHNOLOGY ACCESSIBILITY STANDARDS AS ORIGINALLY PUBLISHED ON DECEMBER 21, 2000

AUTHORITY: 29 U.S.C. 794d, 47 U.S.C. 255.

SOURCE: 65 FR 80523, Dec. 21, 2000, unless otherwise noted.

§ 1194.1 Standards for Section 508 of the Rehabilitation Act.

The standards for information and communication technology developed, procured, maintained, or used by Federal agencies covered by Section 508 of the Rehabilitation Act are set forth in Appendices A, C and D to this part.

[82 FR 5832, Jan. 18, 2017]

§ 1194.2 Guidelines for Section 255 of the Communications Act.

The guidelines for telecommunications equipment and customer premises equipment covered by Section 255 of the Communications Act are set forth in Appendices B and C to this part.

[82 FR 5832, Jan. 18, 2017]

APPENDIX A TO PART 1194—SECTION 508 OF THE REHABILITATION ACT: APPLICATION AND SCOPING REQUIREMENTS

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508 CHAPTER 1: APPLICATION AND ADMINISTRATION

E101 GENERAL

E101.1 *Purpose.*These Revised 508 Standards, which consist of 508 Chapters 1 and 2 (Appendix A), along with Chapters 3 through 7 (Appendix C), contain scoping and technical requirements for information and communication technology (ICT) to ensure accessibility and usability by individuals with disabilities. Compliance with these standards is mandatory for Federal agencies subject to Section 508 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794d).

E101.2 *Equivalent Facilitation.* The use of an alternative design or technology that results in substantially equivalent or greater accessibility and usability by individuals with disabilities than would be provided by conformance to one or more of the requirements in Chapters 4 and 5 of the Revised 508 Standards is permitted. The functional performance criteria in Chapter 3 shall be used to determine whether substantially equivalent or greater accessibility and usability is provided to individuals with disabilities.

E101.3 *Conventional Industry Tolerances.* Dimensions are subject to conventional industry tolerances except where dimensions are stated as a range with specific minimum or maximum end points.

E101.4 *Units of Measurement.* Measurements are stated in metric and U.S. customary units. The values stated in each system (metric and U.S. customary units) may not be exact equivalents, and each system shall be used independently of the other.