

EN 301 549 v12 (Feb 2025) Reach ranges

ITI analysis & proposal
February 2025

Side reach

Current vs. Proposed EN 301 549 side reach

EN 301 549 HEIGHT AND DEPTH REQUIREMENTS (currently released version & all previous drafts)

- This Public Procurement Standard (voluntary for private procurement) states that all modules should be at a height between 380-1220mm. Assuming unobstructed side approach, the maximum depth is 255mm. The reach depth can be increased to 610mm as long as the maximum height does not exceed 1170mm and the height of the obstruction does not exceed 865mm.

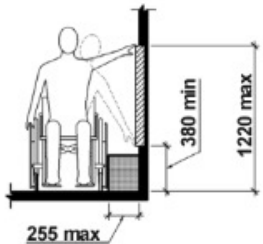


Figure 3: Unobstructed side reach

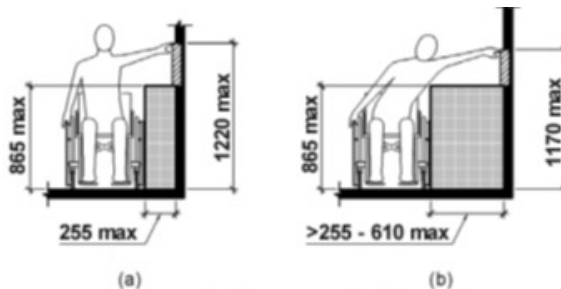


Figure 4: Obstructed side reach

EN 301 549 HEIGHT AND DEPTH REQUIREMENTS – DRAFT V4.1.1c (2025-02) – V.O.0.12

- Where ICT is, or includes, stationary hardware, and the side reach is unobstructed or obstructed by an element that is an integral part of the ICT, at least one of each type of operable part shall be placed within a low reach of 800 mm to a high reach of 1100 mm above the floor of the access space, at a horizontal distance of a maximum of 400 mm from the lateral-most point of the mobility device.

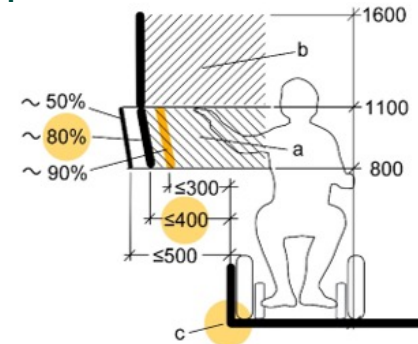


Figure 1: High and low side reach

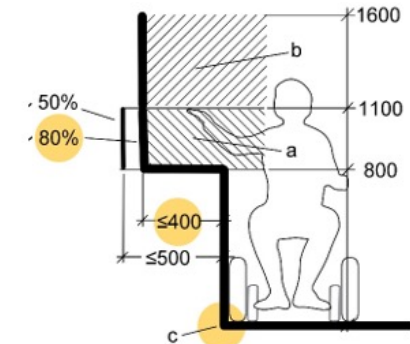


Figure 2: Obstructed side reach

Background – reference sources for new reach ranges in EN 301 549 V4.1.1c (2025-02) – V.0.0.12

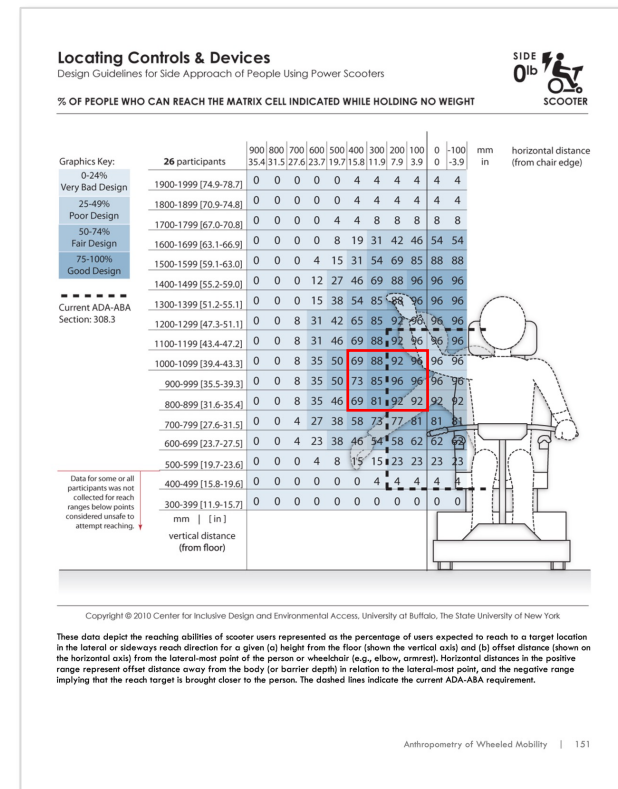
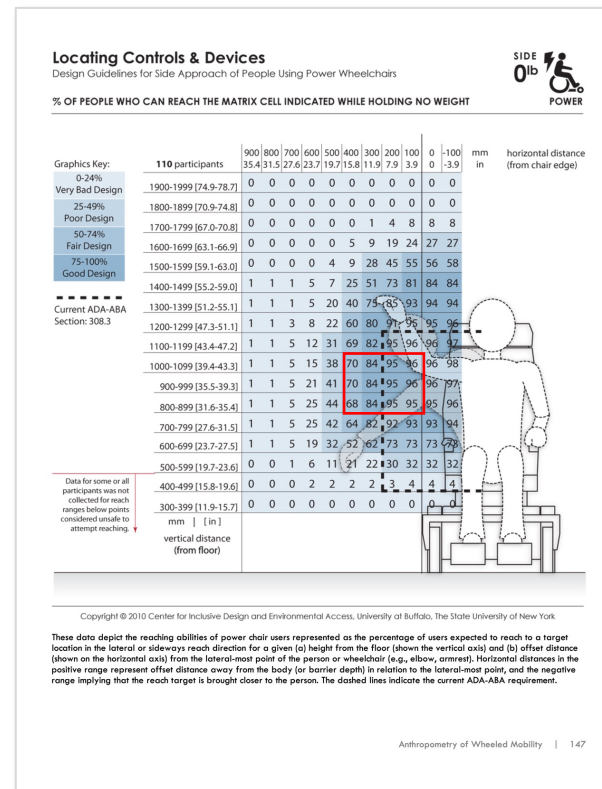
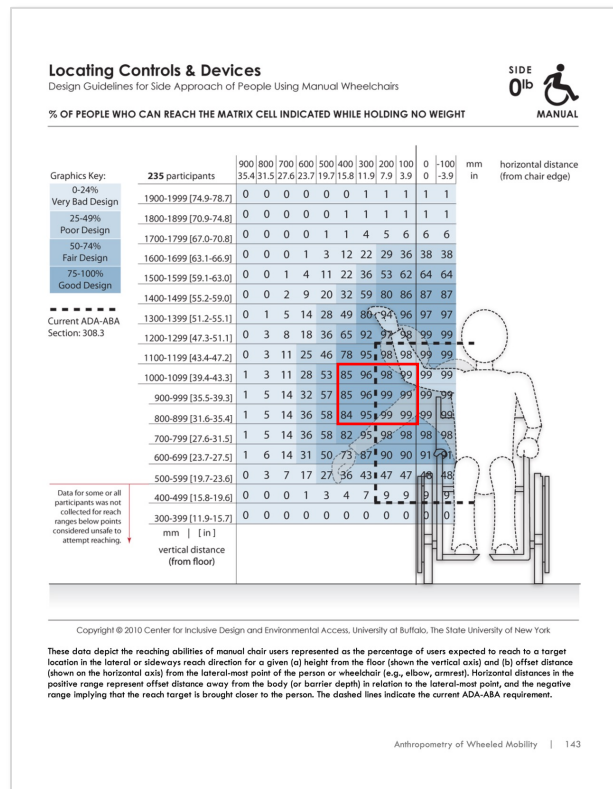
- Original study *Anthropometry of Wheeled Mobility Project* conducted in USA by University of Buffalo (funded by US Access Board & others), report issued in 2010
- ISO 21542:2021 has
 - heights for information displays & signage (1200-1600) and recommendations for card and keyboard to be 800-1100 for card & vending machines.
- Latest draft of EN 301 549 (v12) aims for approximately 80% of participants from data in Buffalo 2010, which gives 800-1100 for operable parts, 400mm depth. 800-1600 for non-touch displays (non-operable parts)

800–1100, 400 depth: <80% accommodation for some wheelchair types

- Latest EN draft states: *“Note 1: According to the Anthropometry of Wheeled Mobility Project [i.65], approximately 80 % of participants can reach operable elements using a side reach when the operable elements are placed minimum 800 mm and maximum 1 100 mm above floor, and maximum 400 mm horizontally from the reference point.”*
- However, inspecting the accommodation tables reveals that for some wheeled mobility categories this number is less
- 800–1100 at 400mm depth only gives >68% of power wheelchairs, and >69% of mobility scooters

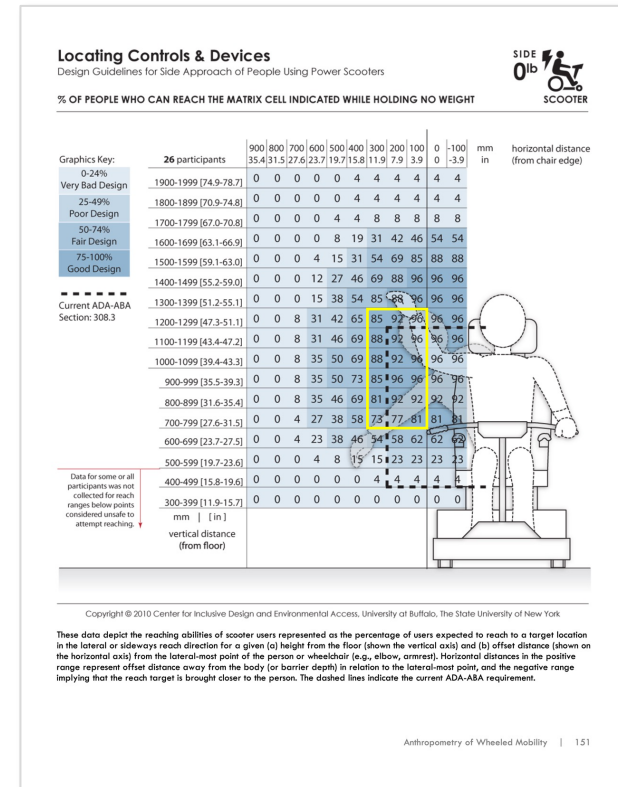
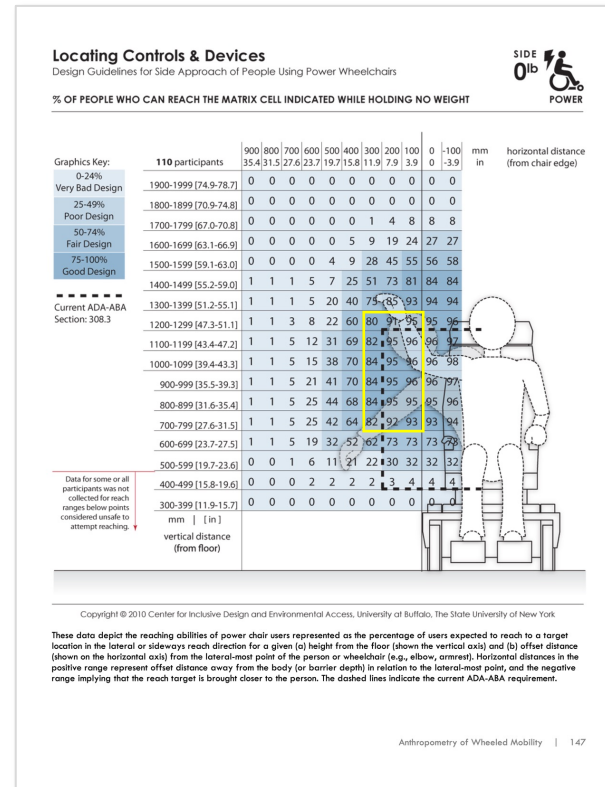
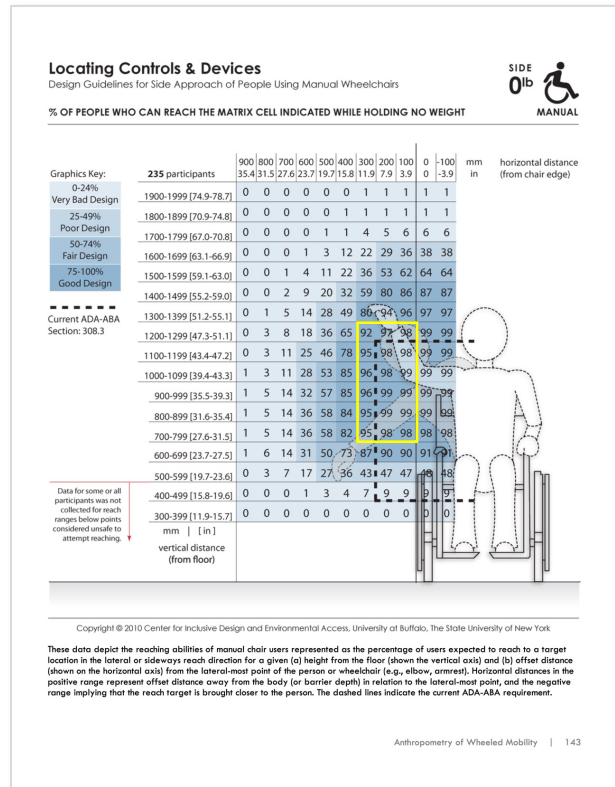
800-1100, 400 depth: <80% accommodation for some wheelchair types

- Inspecting the accommodation tables reveals that the current proposal in EN 301 549 gives <80% accommodation for some wheeled mobility categories
- 800-1100 at 400mm depth only gives >68% of power wheelchairs, and >69% of mobility scooters



800-1300, 300 depth: >80% accommodation for all wheelchair types

- We therefore propose an alternative reach range to complement the current proposal, using the same accommodation models as the EN, but limiting maximum depth to 300mm, we get 700-1300, with max 300 depth
- This gives ~80% accommodation (> 80% for manual & power, >73% for scooter)



Proposed change to EN 301 549 side reach

2 reach ranges should be offered

1. Where ICT is, or includes, stationary hardware, and the side reach is unobstructed or obstructed by an element that is an integral part of the ICT, at least one of each type of operable part shall be placed within a low reach of 800 mm to a high reach of 1100 mm above the floor of the access space, at a horizontal distance of a maximum of 400 mm from the lateral-most point of the mobility device.
2. Where ICT is, or includes, stationary hardware, and the side reach is unobstructed or obstructed by an element that is an integral part of the ICT, at least one of each type of operable part shall be placed within a low reach of 700 mm to a high reach of 1300 mm above the floor of the access space, at a horizontal distance of a maximum of 300 mm from the lateral-most point of the mobility device.

(1 is the current proposal from ETSI, 2 is our new addition)

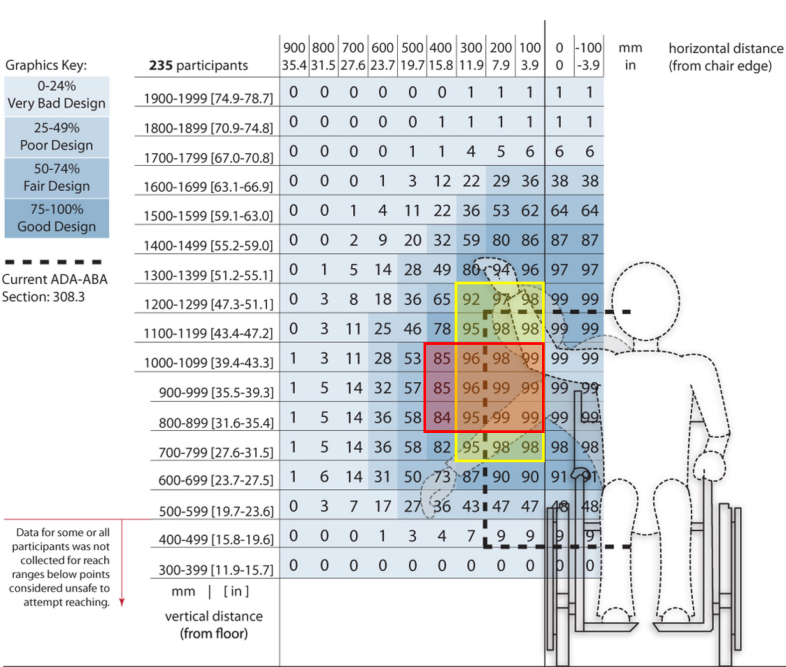
Buffalo 2010 Accommodation Models (Side Reach)

Locating Controls & Devices

Design Guidelines for Side Approach of People Using Manual Wheelchairs



% OF PEOPLE WHO CAN REACH THE MATRIX CELL INDICATED WHILE HOLDING NO WEIGHT



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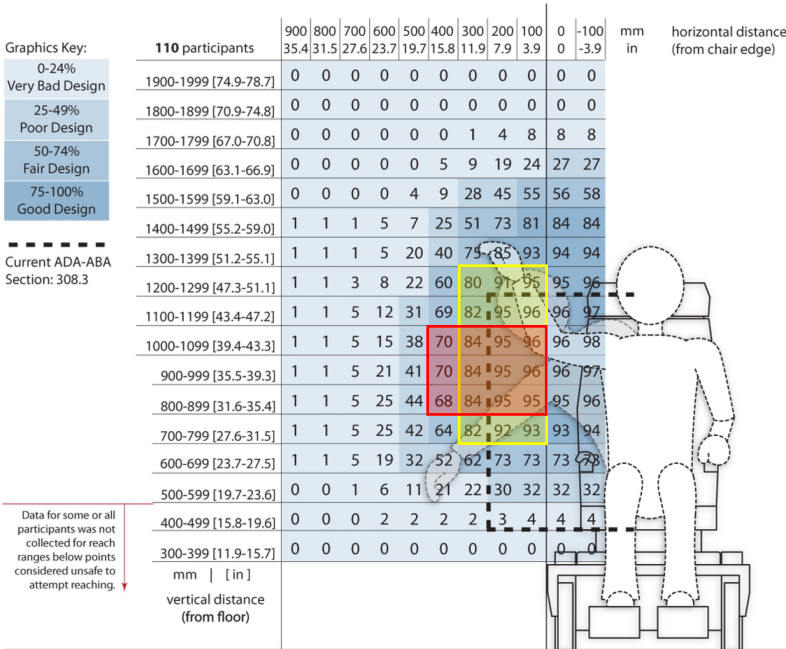
These data depict the reaching abilities of manual chair users represented as the percentage of users expected to reach to a target location in the lateral or sideways reach direction for a given (a) height from the floor (shown the vertical axis) and (b) offset distance (shown on the horizontal axis) from the lateral-most point of the person or wheelchair (e.g., elbow, armrest). Horizontal distances in the positive range represent offset distance away from the body (or barrier depth) in relation to the lateral-most point, and the negative range implying that the reach target is brought closer to the person. The dashed lines indicate the current ADA-ABA requirement.

Locating Controls & Devices

Design Guidelines for Side Approach of People Using Power Wheelchairs



% OF PEOPLE WHO CAN REACH THE MATRIX CELL INDICATED WHILE HOLDING NO WEIGHT



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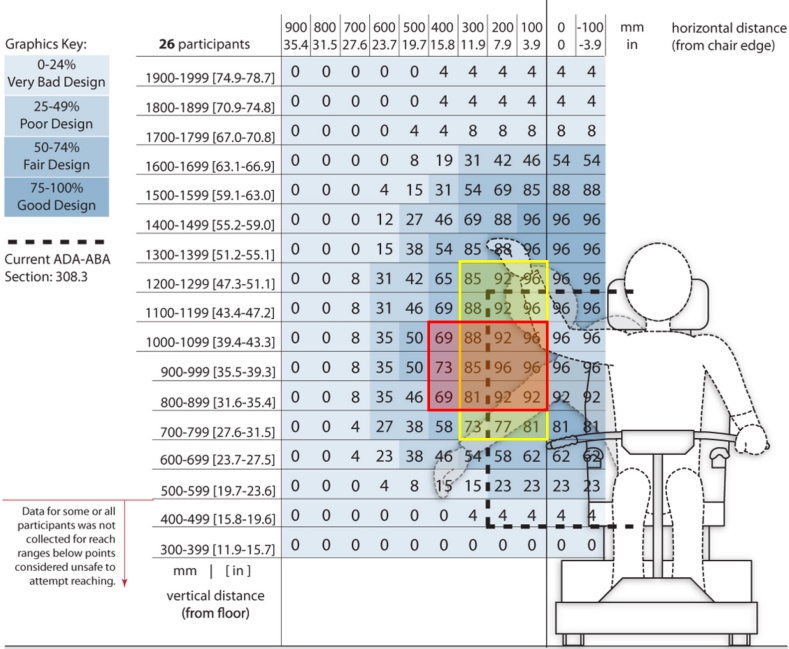
These data depict the reaching abilities of power chair users represented as the percentage of users expected to reach to a target location in the lateral or sideways reach direction for a given (a) height from the floor (shown the vertical axis) and (b) offset distance (shown on the horizontal axis) from the lateral-most point of the person or wheelchair (e.g., elbow, armrest). Horizontal distances in the positive range represent offset distance away from the body (or barrier depth) in relation to the lateral-most point, and the negative range implying that the reach target is brought closer to the person. The dashed lines indicate the current ADA-ABA requirement.

Locating Controls & Devices

Design Guidelines for Side Approach of People Using Power Scooters



% OF PEOPLE WHO CAN REACH THE MATRIX CELL INDICATED WHILE HOLDING NO WEIGHT



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These data depict the reaching abilities of scooter users represented as the percentage of users expected to reach to a target location in the lateral or sideways reach direction for a given (a) height from the floor (shown the vertical axis) and (b) offset distance (shown on the horizontal axis) from the lateral-most point of the person or wheelchair (e.g., elbow, armrest). Horizontal distances in the positive range represent offset distance away from the body (or barrier depth) in relation to the lateral-most point, and the negative range implying that the reach target is brought closer to the person. The dashed lines indicate the current ADA-ABA requirement.