

Summary Bulletin Home Lifts

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Abstract

Lifts in the home enable people with limited mobility to travel up and/or down a range of distances. The technology that enables lift installation and ease of operation is changing rapidly in response to increased consumer demand. Thus, it is important to reflect carefully about trends and issues prior to purchase or recommendation for any residential lift.

This Summary Bulletin reviews the main types of lifts that can be used in homes and provides useful information on their characteristics, cost and space requirements, to enable informed choice of home lift.

Keywords

Home lift; elevator; lift selection; lift operation; lift characteristics

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Contribution of Authors

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Residential Lifts

Lifts in the home enable people with limited mobility to travel up and/or down a range of distances. Residential lifts for instance, are designed to carry an occupant from across a one metre change of level to many floors within a multi-residential building.

The technology that enables lift installation and ease of operation is changing rapidly in response to increased consumer demand. Thus it is important to reflect carefully about trends and issues prior to purchase or recommendation for any residential lift.

Obviously a crucial component, in choosing the most appropriate residential lift, involves considering the potential user's abilities, caregiver situation and environment. Lifts have become the "device of choice" for short-range elevation changes in the built environment within existing buildings because of their convenience, relatively small overall footprint and enhanced safety features. However, for effective installation, the actual spatial and material of the home in question remain equally important. This is because many homes and existing staircases and/or stairwells have features that affect lift selection, positioning options and installation feasibility. Thus careful inspection of the staircase and surrounding areas must be made prior to any suggestions or recommendations being made.

In general, a contractor or supplier with experience installing lifts should inspect the property and provide input during the selection process. Critical factors to consider include the shape, angle, length and width of the current vertical transfer options (typically stairs or staircase), the walls and the floors. The size and shape of landings and adjacent space or hallways is also important.

Residential lifts are used for indoor and outdoor usage and should comply with the Australian Standards on Lifts Escalators and Moving Walks. The relevant Australian Standards is of the AS 1735 suite of standards.

Table 1 presents the main systems that can be used to change level in the home environment, including:

- Stairway lifts;
- Low rise platform lifts;
- Inclined lifts and
- Automatically controlled small-sized, low-speed passenger lifts.

Table 2 provides a comprehensive comparison between the various technologies of automatically controlled small-sized, low-speed passenger lifts.

Table 1. Comparison of residential lift types

Type of Lift	a. Max. travel; b. Max. speed; c. Rated load	Max Floor area (m ²)	Advantages and disadvantages
<p>Stairway lifts: Devices used for transiting 2 or more levels by a guided carriage moving in the direction of the flight of stairs.</p>	<p>a) no limit b) 0.16 m/s. c) min. 115 kg for standing platforms and one-chair carriages and 200 kg for wheelchair and two-chair carriage – max. 300 kg</p>	<p>Standing platform: 0.35, (with minimum dimensions: 370 x 290 mm); Wheelchair platform: 1.00, (with minimum dimensions: 1000 x 685 mm)</p>	<ul style="list-style-type: none"> ✓ Where it may be impractical to provide a passenger lift, a wheelchair stairs lift may constitute a reasonable alternative. ✓ No need for a separate machine room ✗ May obstruct access and emergency egress ✗ Not fully enclosed
<p>Low rise platform lift: A raising platform that can be used in interior and exterior applications. Particularly good for wheelchair users.</p>	<p>a. 1 m; b. 0.15 m/s; c. not less than 220 kg/m² subject to a minimum of 115 kg</p>	<p>1.60</p>	<ul style="list-style-type: none"> ✓ The minimum dimensions of a platform lift are 850mm by 1200mm. ✓ Not required to have fully enclosed platform. ✓ Range of controls available. ✗ Possibility of child, small animal entrapment when lift is operating. ✗ Require protection from weather for all operating machinery

Type of Lift	a. Max. travel; b. Max. speed; c. Rated load	Max Floor area (m ²)	Advantages and disadvantages
Inclined lifts: a platform lift moving on a track along an inclined flight of stairs or hill.	a. Not provided; b. The mean of the speeds in the upward and downward directions while the lift is carrying rated load, measured along the steepest part of the incline. Max. 0.5 m/s. c. The max. passenger capacity is equal to the min. rated load (kg) divided by 68 and rounded to the nearest whole number.	For cars travelling on monorails only: 1.00 (platform area measured inside the platform walls) And Max. ratio of platform width to monorail width is 6:1.	The angle of inclination of the guide rail shall not be more than 45 degrees from the horizontal. Car platforms shall not have an angle of inclination more than 10 degrees for private installations.
Automatically controlled small-sized, low-speed passenger lifts: various types of automatic residential lifts.	a. 12m; b. 0.3 m/s; c. Min. 200 kg/m ² and Min. 115 kg.	1.60	The floor should have minimum dimensions 600 mm x 600 mm. * A fully enclosed liftwell is required.

Note: Table key for advantages and disadvantages column

Source: AS 1735.7:1998, AS 1735.14:1998, AS 1735.8:1986, AS 1735.18:2002

Table 2. Comparison of residential passenger lift types (Automatically controlled small-sized, low-speed passenger lifts from Table 1)

Type of Lift	Travel	Load	Floor Area	Pit	Machine Room	Hoistway (shaft)	Descend with Battery Backup	Cost of lift
Screw-driven lift	Medium (max of 12 m or 4 floors)	Average (max 400kg)	Large (up to 4 people or 1 wheelchair and a carer)	Yes (small: 50-100mm)	No	Yes	Yes	Medium
Hydraulic lifts, including: conventional, roped and hole-less hydraulic lifts	Low-Medium	High	Medium (depending on whether machine room is required)	Yes (large)	Can be avoided	Yes	Usually yes	Medium - High
Winding drum lifts (electric lifts with a motor above the cab)	Medium (4-5 floors)	Average	Large	No	No	No (in private residences)	Yes	Medium
Traction/Chain/Cable lifts	High	High	Medium (depending on whether machine room is required)	Yes	Can be avoided	Yes	Usually yes	Low - Medium
Pneumatic/Vacuum lifts	Low	Small	Small	No	No	No	Usually yes	Low - Medium

Choosing a home lift

In terms of ensuring usability and desired outcome, some critical factors to consider when choosing a home lift, are:

- The rated load of the lift in relation to assumptions about maximum passenger load. For example, is the client bariatric or obese? In general, the minimum rated load for one passenger is 68 kg.
- The number of passengers that need to be accommodated.
- The number of landings at which the lift must stop.
- The location of the lift at ground and subsequent floors needs to be considered, as well as access to motor rooms/power for servicing. The Council may determine that an assessment is required regarding egress from the dwelling in the event of a fire, and/or to restrict the spread of fire from the dwelling to other dwellings nearby, especially if common property is impacted or if the installation impacts neighbours or the streetscape.
- The structural capacity of the building should be signed off by a structural engineer for the lift installation, especially for timber framed floors.
- Changes to the electrical services may be required and could include an upgrade to the consumers mains, potentially alteration or replacement of the main switchboard to include protection equipment for new lift and lighting circuit.
- In case of a power failure or break down, any persons using the lift might be trapped in the lift and will require the lift service company to attend and release them. Choosing a lift service company that can come to the house quickly is really important, especially in Country Regional areas.

Other factors that may need to be considered in terms of design include but are not limited to:

- Rated speed at which the lift should safely and conveniently travel.
- Lifts that open directly into private premises shall be accessible 24/7 and have direct access to fire stairs or exit.
- The lift door's clear opening width should be appropriate for the users, especially if they use wide wheelchairs or other assistive technology.
- The users should be able to open the doors without much effort. If users cannot reach the lift door, or are not strong enough to open it, then the doors should open automatically.
- If the users of the lift have impaired vision, there should be minimum luminance contrast between elements such as the push buttons, the face plate, the lift identification and the symbols on the buttons and each element's surrounding/background (see AS 1735.12.2020 for details).
- If the users of the lift have impaired hearing and depending on how noisy the environment is, audible signals or voice announcements should be adjustable

between 35 dB and 80 db.

- The lift car floor should be slip resistant, especially if the primary user has poor balance.
- The space should be appropriate for the size of the lift car and the size and weight of the counterweight mass.
- The maintenance access inspections and replacement of parts (usually required at a minimum of one yearly intervals by an authorised person).
- The emergency egress options, which can be dependent on the type of the lift.
- The fire rating of the lift.
- Fixed seating and/or handrails.
- Ownership (i.e. if funding is provided who is the owner and/or has maintenance liability).
- Note that the various Australian States might have different regulations applicable to lifts.

Parameters affecting the lift cost

The cost of a home lift can vary significantly, depending on:

- Whether the lift is going to be installed in a new building or it is a retrofit. The cost of the retrofits is usually much higher and can reach \$60-100K.
- The number of floors that the lift needs to travel.
- The type of doors (swinging or sliding).
- The interior and exterior design of the lift.
- The size of the lift car.
- The machine-room-less options of hydraulic and traction lifts are more expensive than the versions with a machine room.
- The operational cost of a lift includes daily running costs, servicing of finishes and moving parts and drive system, regular maintenance (check warranties) and cleaning of not just the lift car, but the door tracks.

Funding options for lifts, include:

- Home usage: NDIS, Veteran Affairs, Aged Care
- Public usage: Developer, Building operator and the Local chamber of Commerce.

Questions for Suppliers

In discussing lift options with suppliers some of the questions for suppliers would be:

- What models of lifts do you provide?
- How long have you been in business?
- How much do lifts cost? Does this price include installation?
- Are you aware of the local regulations applying to lifts?
- What is the approximate lifespan of a lift?
- Do you service lifts? How much does a service call cost? Do you offer service contracts? How much does one cost and what do you cover?
- How long is the warranty? What does it cover?
- Is there a residential lift that you have installed in the area that I can see?

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