



## Residential Hoists and Ceiling Lifts

### Universal design

People who inhabit and visit the houses we live in come in all shapes and sizes, ranging from infants to seniors, with various ever-changing abilities and skills. As we grow up, grow old and welcome new people into our homes, our housing needs change. A house that is designed and constructed to reflect the principles of universal design will be safer and more accommodating to the diverse range of ages and abilities of people who live in and visit these homes.

A residential hoist or ceiling lift can help people who have difficulty safely moving themselves or others in and out of bed, and in and out of a bathtub. Consistent with the philosophy of universal design, it takes little physical effort to use a residential hoist or ceiling lift to move people from one position to another and from one place to another.

Residential hoists and ceiling lifts help many people—for instance, seniors who want to remain in their home despite changes in their mobility, strength or agility and parents who can no longer lift their child with a disability. A residential hoist or ceiling lift can allow a spouse, partner, parent or caregiver to help with transfers, which can help maintain independence and allow people to stay in their homes.

Effective universal design and construction can only occur when we truly appreciate how persons with disabilities engage the built environment. Universal design is only a subtle shift from what is typically done; designing for greater accessibility then is not a new way of designing, simply a more focused one. By providing flexibility in the selection of design features and incorporating adaptability into home design, the life and usability of a home is extended, which promotes the concept of **aging in place**.

This concept is increasingly popular with families and individuals who choose to stay in their homes and neighbourhoods as they grow and age. Planning for individuals' changing needs and abilities allows for periodic home customization based on changing requirements and reduces the need for future costly renovations.

Planning for future needs is good practice. Principles of universal design encourage flexibility, adaptability, safety and efficiency.

This document provides information on the types of residential hoists and ceiling lifts that are commonly available in Canada. It identifies some of the issues you should consider when choosing and installing a hoist or ceiling lift in your house, condominium or apartment.

Universal design is the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size and ability. “The Principles of Universal Design” are found on page 8.

**Bolded** terms throughout this fact sheet are defined in the Glossary on page 6.



## A word about terms

Often, the words used in discussing lifts, elevators and hoists can be confusing because these terms are used interchangeably. This document uses **hoist** and **ceiling lift**.

## Hoists and ceiling lifts

A **hoist** is a mechanical lifting device that can lift someone from a seated position and transfer him/her to another location, such as a bed, a seat or a bathtub. Some hoists can move horizontally between areas within a room and between rooms.

There are three types of residential hoisting devices:

- Wheeled hoists (see figure 1)
- Stationary hoists (see figure 3)
- Ceiling lifts (see figure 4)

### Wheeled hoists

A **wheeled hoist** is a piece of freestanding equipment that supports the person being moved in a sling or harness suspended from a cantilevered arm. The sling is placed around the person while he or she is seated or lying down. The person is then hoisted up, the hoist is wheeled to the new location and the person is lowered (see figure 1).

One of the first things to consider is the amount of manoeuvring space a wheeled hoist needs. The wheeled base of the hoist must be wide enough to remain stable with the person in the hoist.

Consequently, wheeled hoists require a wide unobstructed path of travel—usually at least 1,100 mm (43 in.) and possibly more, if turns are required (see figure 2).

Another design consideration is clear space under furniture and fixtures, to accommodate the frame of the hoist. If a wheeled hoist is to be used for transfers in and out of a bathtub, the bathtub should have legs or be raised from the floor to allow the hoist frame to fit under the bathtub.

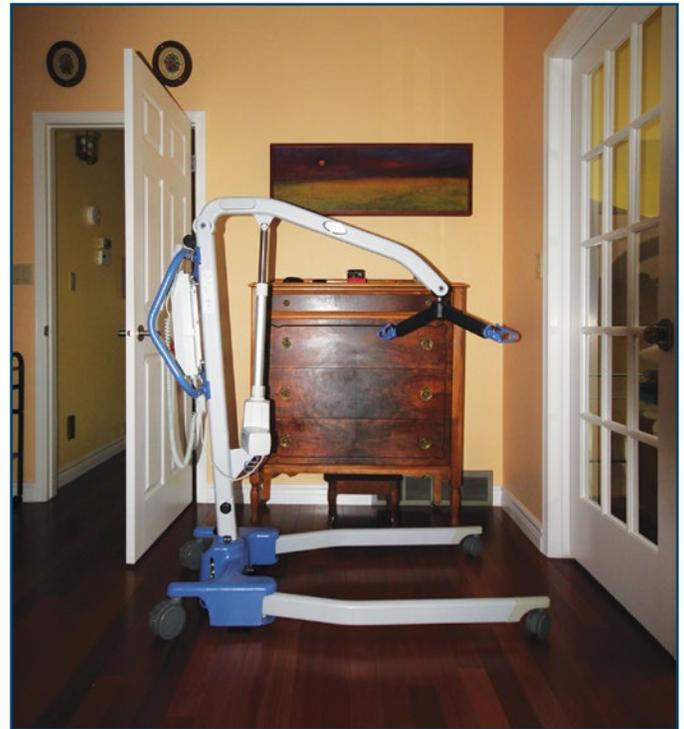


Figure 1: Wheeled hoist  
Photo by Ron Wickman

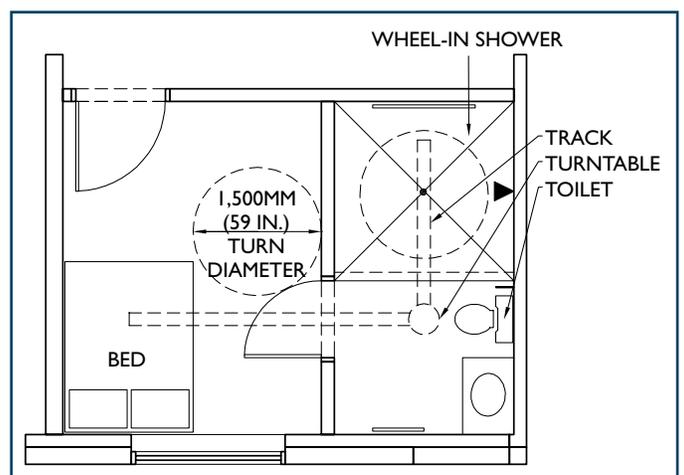


Figure 2: Plan view of ceiling lift installation  
Diagram by Ron Wickman, Architect



### Stationary hoists

**Stationary hoists** are fixed to the floor or a wall (see figure 3). Although the base of the hoist is fixed, a support arm pivots to transfer the person sideways. Stationary hoists use slings and harnesses like wheeled hoists.

The primary design consideration for a stationary hoist is the structural strength of the floor or wall it is attached to. When installing a stationary hoist, a structural engineer must be consulted.

Other considerations include the arc of the hoist swing—to ensure it reaches the necessary elements—and clear space for the wheelchair during the transfer to and from the hoist.

A stationary hoist should have a dedicated electrical outlet at ceiling height, however, in many cases, the cord is run down the wall to the nearest available outlet.

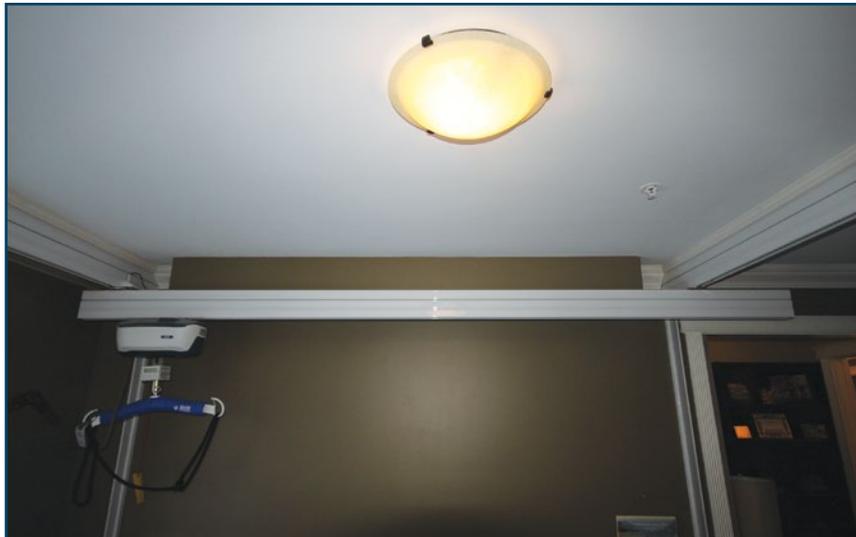


Figure 3: Stationary hoist  
Photo by Ron Wickman

### Ceiling lift

A **ceiling lift** is the commonest term for a type of hoist that consists of a hoisting unit mounted to a track in the ceiling (see figure 4). This type of hoist allows a person to be lifted and moved across a room and between rooms. A ceiling lift is usually electrically powered, but there are manual units.

The primary consideration in choosing and installing a track-mounted ceiling lift is the structural strength of the supports in the ceiling. When installing a ceiling lift, a structural engineer must be consulted. You must also provide a clear path of travel along the route of the track, particularly at door frames, for a system that connects two or more rooms.

Ceiling tracks can be provided in a variety of locations—most electric hoists can be manually moved from one location to another. Some track systems incorporate a turntable that allows the hoist to move from one track system to another (see figure 2). Turntables can be manual or electric.



Figure 4: Ceiling lift  
Photo by Ron Wickman



Portable track lifts can also be used by persons who travel. The track system can be dismantled to be carried in a smaller bag, the size of a small suitcase. The track system is then easily set up over a bed in a hotel suite (see figure 5).

## Frequently asked questions

### When should you consider a hoist or ceiling lift?

Consider a hoist or ceiling lift when the person being moved cannot be moved safely manually (someone who is quadriplegic for example). One person can easily and safely assist with transfers if a mechanical hoist is used.

### *Can the track take someone from a bed into a bathroom?*

A single track can take someone from the bedroom into the bathroom. However, a notch must be created at the top of the door to allow for the track and sling to get from one room to the next (see figure 6). A sliding door will not allow for this, because of the track rail.

### *Do I need a building permit?*

Call your municipal office to find out if you need a building permit. You probably do not need one for devices such as wheeled and stationary hoists.

But you may need one if you will be making structural changes to your residence for a ceiling lift.

Whether you need a building permit or not, you should always get advice from a structural engineer for stationary hoist and ceiling lift installations.

### *Are there standards, licences and inspections?*

Hoists and ceiling lifts do not have to meet specific standards or be licensed or inspected. But hoists and ceiling lifts should comply with the Canadian Standards Association (CSA) standard CAN/CSAZ10535 (R2014): *Hoists for the transfer of disabled persons—Requirements and test methods*. They should also be regularly inspected and serviced.



Figure 5: Portable track lift  
Photo by Ron Wickman



Figure 6: Ceiling track passing through a doorway  
Photo by Ron Wickman



*What about maintenance?*

Hoists and ceiling lifts are mechanical devices that can break down. They need regular servicing. Maintenance is generally complex and should be done by an expert. Purchasing a maintenance contract from a reputable supplier is a good idea.

Powered lifts often have a standby, rechargeable battery. You will eventually have to replace the battery.

*How much does it cost?*

As with all construction, costs can vary significantly depending on the equipment, materials and finishes that you choose, as well as the design of your residence. A wheeled hoist will cost much less than a track-mounted ceiling lift.

The figures in table 1 are for general budgeting purposes only. They may vary significantly, depending on site and market conditions, inflation and many other factors.

To make your dollars go further, consider buying a hoist or ceiling lift from a company that sells refurbished equipment. Residential hoists and lifts are frequently recycled, providing a reliable, cost-effective and environment-friendly solution. When purchasing used equipment, the buyer should verify with the seller or manufacturer if there is any remaining warranty on the product.

**Table 1** Approximate costs for purchase and installation of various types of hoists

Type	Cost
Wheeled hoist	\$2,500–7,500
Stationary hoist	\$2,500–3,000
Ceiling lift	\$3,000–12,000
Hoist service contract (per year)	\$200–500

*Can I take it with me if I move?*

Yes—hoists and ceiling lifts are quite portable.

*Where do I start and who can help me?*

Designing a fixed hoist installation is typically a complex process involving architectural, structural and electrical elements. It is not a project to be tackled by a handyman.

The best starting point is to call medical equipment suppliers. A home visit will likely follow, at which time the supplier will make recommendations on the feasibility of installing different types of hoists. It is always a good idea to have a health professional, such as an occupational therapist, present for the site visit, to ensure that the type of hoist being recommended will meet your current and future functional needs. Before choosing a supplier, it is also a good idea to request quotes and references from at least three suppliers.



## Glossary

**Aging in place:** The ability to remain in one's home safely, independently and comfortably, regardless of age, income or ability level throughout one's changing lifetime.

**Ceiling lift:** A hoist that is mounted on a ceiling track that lifts a person in a sling and allows movement along a track.

**Hoist:** A mechanical lifting device that can lift someone from a seated position and transfer him/her to another location, such as a bed, a seat or a bathtub.

**Stationary hoist:** A device that is fixed to the floor or a wall and equipped with a pivoting support arm that can transfer a person sideways using a sling or a harness.

**Wheeled hoist:** A freestanding piece of equipment that supports a person being moved in a sling or a harness that is suspended from a mobile cantilevered arm.



## Additional resources

### Books

- Barrier Free Environments Inc. *The Accessible Housing Design File*. New York: John Wiley & Sons, 1991.
- Behar, S., and C. Leibrock. *Beautiful Barrier-Free: A Visual Guide to Accessibility*. New York: Van Nostrand Reinhold, 1993.
- CMHC. *Housing Choices for Canadians with Disabilities*. Ottawa, ON, Canada: CMHC, 1995.
- Dobkin, I. L., and M. J. Peterson. *Gracious Spaces: Universal Interiors by Design*. New York: McGraw-Hill, 1999.
- Frechette, L. A. *Accessible Housing*. New York: McGraw-Hill, 1996.
- Goldsmith, S. *Universal Design: A Manual of Practical Guidance for Architects*. Oxford, England: Architectural Press, 2000.
- Jordan, Wendy A. *Universal Design for the Home*. Beverly, Massachusetts: Quarry Books, 2008.
- Leibrock, C., and J. E. Terry. *Beautiful Universal Design: A Visual Guide*. New York: John Wiley & Sons, 1999.
- Mace, R. *Residential Remodeling and Universal Design: Making Homes more Comfortable and Accessible*. Darby, PA: Diane Publishing Co, 1996.
- Pierce, Deborah. *The Accessible Home: Designing for All Ages and Abilities*. Newtown, CT: The Taunton Press, 2012.
- Wylde, Margaret, Adrian Baron-Robins, and Sam Clark. *Building for a Lifetime: The Design and Construction of Fully Accessible Homes*. Newtown, CT: The Taunton Press, 1994.

### Websites

**NC State University: College of Design** (May 2016)

<http://www.design.ncsu.edu>

**Home for Life** (May 2016)

<http://www.homeforlife.ca/>

**Institute for Human Centered Design** (May 2016)

<http://humancentereddesign.org/>

**Livable Housing Australia** (May 2016)

<http://livablehousingaustralia.org.au/>



## The Principles of Universal Design

### Principle 1: Equitable use

This principle focuses on providing equitable access for everyone in an integrated and dignified manner. It implies that the design is appealing to everyone and provides an equal level of safety for all users.

### Principle 2: Flexibility in use

This principle implies that the design of the house or product has been developed considering a wide range of individual preferences and abilities throughout the life cycle of the occupants.

### Principle 3: Simple and intuitive

The layout and design of the home and devices should be easy to understand, regardless of the user's experience or cognitive ability. This principle requires that design elements be simple and work intuitively.

### Principle 4: Perceptible information

The provision of information using a combination of different modes, whether using visual, audible or tactile methods, will ensure that everyone is able to use the elements of the home safely and effectively. Principle 4 encourages the provision of information through some of our senses—sight, hearing and touch—when interacting with our home environment.

### Principle 5: Tolerance for error

This principle incorporates a tolerance for error, minimizing the potential for unintended results. This implies design considerations that include fail-safe features and gives thought to how all users may use the space or product safely.

### Principle 6: Low physical effort

This principle deals with limiting the strength, stamina and dexterity required to access spaces or use controls and products.

### Principle 7: Size and space for approach and use

This principle focuses on the amount of room needed to access space, equipment and controls. This includes designing for the appropriate size and space so that all family members and visitors can safely reach, see and operate all elements of the home.

