



# CAPS Connection



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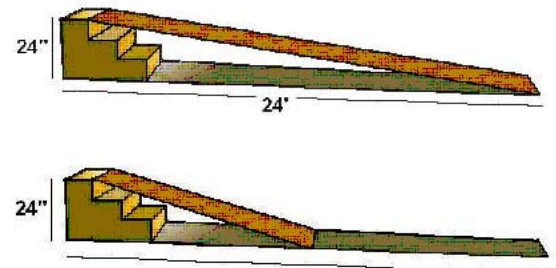
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## ■ The Ups and Downs of Ramps

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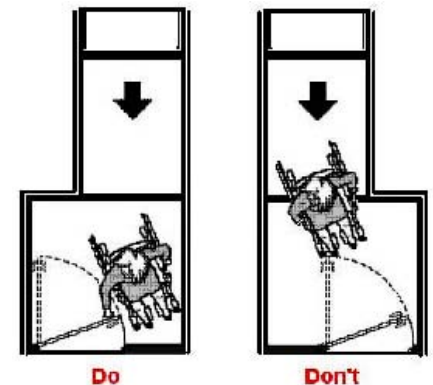
One of the first concerns that we are asked to address for many of our clients is the need for access in and out of their homes. For individuals who use a wheelchair or scooter, a ramp may be necessary. For other clients who use a cane or walker, steps with a lower rise and deeper tread may be more useful. And for some clients who do not have the space for a ramp or extended stairs, other options such as a platform lift may need to be considered.

A ramp is an inclined path between two surfaces of varying heights. The maximum slope of a ramp in residential settings in most municipalities is no greater than 1:12 (no more than 1 inch of rise for every 12 inches of run). This is the same maximum slope permitted in public areas as specified in the [Americans with Disabilities Act Accessibility Guidelines](#). Although this slope may be allowable by zoning regulations, it does not ensure that a specific client will be able to propel themselves safely up or down a ramp with this degree of incline. A simple rule of thumb is; a shorter ramp will cost less money, but it will be harder to use because the angle is steeper. For example, if the stairs are 24" in height, then a proper ramp should be no less than 24' long. This allows a person with "average upper body strength" to be able to get up the slope by themselves. Ultimately we all want the client to be successful with using the ramp.



Some clients may need a more shallow slope (1:16) on a ramp to be able to push their own wheelchair due to upper body strength or cardiovascular limitations, while other individuals do not have the strength to push or manage a wheelchair for another person (such as their spouse or adult child) at that angle, and may require an even more shallow incline. A sloping walkway with a 1:20 incline is not considered to be a ramp, and does not require the guard rails and hand rails that a ramp needs for code-compliance.

Another important consideration in a successful ramp design is the placement of a platform at the doorway. It can be difficult to get a storm door open, or to get the house door unlocked, while keeping yourself from rolling back down the ramp. A good design should include a platform or landing at the door entrance. The proper platform placement allows the user to get next to the door, and allow it to swing open with maximum ease. It is most valuable to observe the client to determine the amount of space needed, but at least 6 feet of space for approach and maneuverability is desirable.



Also, long ramps should include a strategic place to take a rest. Most guidelines suggest that a ramp should have a level rest area for every 30 feet of incline run.

Some clients who are able to walk with the support of a handrail, a cane or a walker may prefer a ramp to steps. Many individuals find the slope of a ramp to be a challenge to maintain their balance, or to be more difficult to ascend/descend when using prosthetic limbs. A rehabilitation therapist (occupational therapist or physical therapist) can assist in determining the best options for the client to be able to safely enter and exit their home.

## **Features of Ramps**

Each ramp is unique once the following features are taken into account: the vertical distance that the ramp ascends/descends, the slope and length of the ramp, the duration that the ramp is expected to be needed, the materials used to construct the ramp (as well as the surface texture of the ramp), the placement and design of the handrails, and the aesthetic considerations.

As discussed above, the slope of the ramp is determined by the vertical distance that needs to be traversed, as well as the distance or length of the ramp. Often, measuring the step risers leading to the door is not enough information to determine the ramp length. In locations where the ground is not flat, it is most important to recognize that the “difference in height”, from where the ramp will start at the ground surface, to the door threshold, is what determines the ramp length. Often, the ground slopes away from the home. For larger ramps, use of a level or measurement device is necessary to determine the elevations of the terrain. A series of scenarios may be necessary to determine the most efficient ramp designs. Seeing the ideal design is not always obvious at first.

If there is not sufficient room to accommodate a ramp with a 1:12 slope, or if the ramp is so long that the user can not use it due to fatigue or limited strength/endurance, other options such as a platform lift, exterior stair lift, exterior elevator or other devices may be needed.

Some individuals will need a ramp for the rest of their lifetime, due to conditions that are not expected to improve over time (such as a spinal cord injury) or may become progressively more debilitating (such as multiple sclerosis or rheumatoid arthritis). Other individuals may need a ramp temporarily, as they recover from orthopedic surgery or regain mobility after a stroke. Consultation with rehabilitation professionals may be useful in helping the client determine if they need a permanent or temporary ramp.

Once the decision has been made regarding the permanency of a ramp, the many options of materials need to be considered. Wood, concrete, aluminum, steel and other options are available.

## **Cost Considerations**

Steel is always the lowest in cost. Wood can be the lowest if the labor is donated or provided by a family member or friend, or the highest in cost, if constructed by a contractor or carpenter.

From lowest to highest cost:

1. Wood
2. Steel
3. Concrete
4. Aluminum

## **Installation Considerations / Potential for Shifting Over Time**

Concrete frost footings are required for most wood ramps. As frost heaves or settling occurs, some wooden or concrete structures may become misaligned. Steel and aluminum ramps are easily realigned as they are designed with adjustable support structures.

## **Maintenance Considerations**

Metal may rust depending on the finish, and some touch up is occasionally required.  
Wood needs to be regularly treated with a wood sealer to prevent splintering and warping.

From lowest to highest maintenance:

1. Concrete
2. Aluminum
3. Steel
4. Wood

## **Safety Considerations**

Wood may rot or warp. Wood, concrete and aluminum are all solid surfaces and allow moisture to accumulate and freeze in colder climates. Wood and concrete may become slick when wet, if not treated with a non-skid finish. Steel has a gripping texture, making it non-skid. Steel can also have an open, pattern ramp surface allowing moisture to pass through, eliminating the danger of ice film.

## **Durability / Permanency Issues**

Wood can rot, while steel and concrete can last for ages. The nonskid grooving on an aluminum ramp surface can erode over time, becoming smooth and slippery in wet weather.

Least to most durable:

1. Wood
2. Aluminum
3. Steel
4. Concrete

## **Aesthetics**

Depending on the property, wood can match an existing deck, steel can look like wrought iron; concrete can match a walkway.

## **Building Permits Issues**

Wood and concrete are permanent modifications to the home, requiring permits. Steel and aluminum modular ramps are classified as reusable, durable, medical equipment (DME) not requiring permits. Check with local building codes before choosing ramp materials.

(Information adapted from American Ramp Systems)

The placement of handrails may be dictated by codes, but the options for materials, shapes and finishes may greatly affect the usability of the finished product. An easy-to-grip handrail is oval-shaped, 1" – 1 ½" in diameter (depending on the hand size of the user), and smoothly finished, but not slippery when wet. Some users may grip the handrail from below and pull on it to propel their wheelchair up the ramp, others may use an overhand grasp to slow the descent down the ramp. Each user will approach the handrail differently, based on their needs. Observing the client using a ramp may provide valuable cues as to how they use the handrails.

Clients may choose that their ramp not include handrails. However, at a minimum, turning platforms should have handrails for safety. Curbing on the sides of ramps may be required by code, but should be encouraged if not required. Curbs can keep a mobility device (and the user of the device) from going over the ramp edge. Injury and liability can result from omission of these safety features.

Aesthetic considerations include the placement of the ramp, the style of the ramp and the integration of the design of the ramp with the residence and the surrounding neighborhood. The decision to have a ramp at the front door may raise personal issues. In some areas, a ramp may be interpreted by others as a sign of potential weakness/frailty, and may put the occupant at risk for crimes of opportunity. In other settings, condominium or neighborhood association regulations may prevent the owner from altering the approach to the front door. Other possibilities for ramp placement include a side or back entrance, or through a garage. Often (especially on older homes), the back door is much narrower than the front. This can be an issue for the person maneuvering a wheelchair through a tight space.

If there is a storm door, piston dampers are often mounted on the door jamb, to assist in closing the storm door. When present, I often suggest moving them to the top of the door, or suggest removal of the storm door.

Many individuals consider installing a ramp going into the laundry room. Often this can be problematic, as the washing machine and dryer may be obstructing the path the individual needs to use. Careful attention needs to be paid to these details. These laundry room entries often lead to a hallway that is too narrow for a standard wheelchair to turn. This can result in damage to the walls and trim of the home. Wider doorways and hallways often become necessary; especially for clients who have not yet mastered the skills needed for precision wheelchair or scooter mobility.

Simple low cost solutions can include replacing the existing door hinges with “offset” hinges. These cleverly designed hinges can add up to 1½” additional clearance by getting the door outside of the jamb when opened.

The vertical distance that a ramp needs to traverse may be reduced through changing the topography of the site. Building up the height of the driveway or yard may reduce the length or slope of the ramp. Working in conjunction with a landscape architect may offer innovative solutions to increase access to/from the home, while maintaining or improving the attractiveness of the site.

### **Installation Considerations**

Other factors in determining the most appropriate location and materials of a ramp include terrain, climate (need for overhang or snow and ice consideration), maintenance, cost (initial and lifecycle considerations), and the cost of other options (such as a platform lift). Ramps require less upkeep than platform lifts, stair glides, or elevators. Lifts can take up less space, but initial costs can be expensive. Platform lifts have specific requirements for the concrete base pad and electric. If a concrete pad is not installed correctly, ongoing service problems will be likely. Ongoing maintenance contracts are a good idea for these electric devices. Replacement parts for an older lift can become difficult to locate. Exterior stair glides, similar to their indoor cousins, can be an affordable access solution, especially for city row home situations. It is recommended that clients consult with a care provider (occupational therapist or physical therapist) to determine if a stair glide is an appropriate solution for the client’s needs.

### **Collaboration Results in Better Client Outcomes**

For clients who need home modifications that include getting in and out of the home, especially for those clients that use wheelchairs, scooters, cane, walkers or other mobility devices, a collaboration between remodeler and an occupational therapist can determine the best solution in partnership with the client. Assisting the client in selecting between a ramp, alternative stairs, or lifts/stair glides/elevators requires knowledge of the client’s current and projected abilities as well as an understanding of the benefits and features and potential challenges of the various options. A team approach provides the best options for the client to promote their safety and independence, and ensure their satisfaction with the modification services that are provided.