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## NSAA Aerial Ropeway and Surface Lift Fact Sheet

### Introduction

Aerial ropeways (including chairlifts, trams, and gondolas) remain one of the safest methods of transportation. Ski areas across the United States are committed to lift safety and, overall, have an excellent record for uphill transportation safety as a result of this commitment.

### Methodology & Terms

NSAA compiles lift incident information and updates this fact sheet annually to provide ski areas and the public with the most current information on the ski industry's commitment to overall lift safety, financial investment in lift infrastructure, lift maintenance, industry education and training, and frequently asked questions about chairlifts.

The fatality and incident statistics included in this fact sheet focus on incidents involving ski area guests as opposed to ski area employees. Most employee-involved incidents are not situations in which the public would find themselves (such as ascending a lift tower to perform maintenance). Additionally, fatal falls from chairlifts that are the result of a medical event (e.g. heart attack, stroke, seizure) are not included in fatality data, as the cause of death is often inconclusive and unrelated to mechanical or operational issues.

Aerial ropeway: a chairlift, gondola, or tram that moves via vehicles attached to a cable suspended in the air allowing for mechanized uphill transportation. Mechanized uphill transportation is the key element to being classified as a “ski area” at NSAA.

Chairlift: equipment installed to facilitate uphill transportation at a ski area. The term “ski lift” can also include surface lifts such as conveyor lifts and rope tows.

Surface lift: refers to people movers that are situated on the snow surface or allow the skier/rider to maintain contact with the snow surface, including conveyor lifts, rope tows, T-bars and platter lifts.

## Lift Safety for Skiers and Riders

Having the ability to safely load, ride, and unload a ski lift is an important tenet of [Your Responsibility Code](#). While lift types can vary from ski area to ski area, and even within a ski area, the basics of safe lift usage stay the same:

- Pay attention – don't be distracted by your phone, music, friends or loose items
- Remove pole straps from wrists
- Obey all posted signs, paying special attention to the wait line and the load line
- Ask attendants for assistance prior to entering the loading area if needed
- Avoid impairment from alcohol or drugs

There are many educational resources to assist new skiers and snowboarders in the safe usage of ski lifts. One of these programs is NSAA's [Kids on Lifts](#), a program geared toward educating both kids and parents on lift safety.

### Lift Safety Resources

Riding a chairlift, gondola, or tram while skiing, snowboarding, mountain biking or sightseeing, is a safe and secure mode of transportation. NSAA and the greater ski industry are committed to guest safety and education, and have made many resources available to help you understand your role as a passenger. Ski areas and industry associations have produced videos and other helpful resources that can tell you what to expect when riding a chairlift, and provide best practices for a safe lift ride experience.

- [How to Ride a Ski Lift](#) (Colorado Ski Country USA)
- [Load and Unload with Care](#) (Pacific Northwest Ski Areas Association)
- [Mountain Safety Guide](#) (Ski California)
- [Chairlift Safety](#) (Squaw Valley | Alpine Meadows)

### Inspections and State/Federal Regulation

Ski areas adhere to rigorous and exacting inspection procedures for the lifts at their resorts. Ski area technicians and employees conduct their own individual inspection of chairlifts on daily, weekly, monthly, and annual bases. An independent, third-party inspection by a ropeway expert is mandatory annually. This year-round maintenance regimen is conducted pursuant to regulations by state agencies, lift manufacturer requirements, federal requirements, national safety standards, and insurance company compliance policies.

The [American National Standards Institute](#) (ANSI) is a national, non-profit umbrella accrediting organization which oversees standard-setting committees for nearly every industry in the U.S. Safety standards for ski lifts have been established by the ANSI [Accredited Standards Committee \(ASC\) B77](#), which was started back in 1956 to recommend safeguards, principles, specifications, and performance objectives that would reflect the current state of passenger ropeway design, operations, and maintenance. The B77 Committee is comprised of government regulators, engineers, lift manufacturers, ski area owners and operators, academics, and other

members of the public interested in ski lift design, operation, and maintenance.<sup>1</sup> NSAA is the Secretariat of this committee.

The development of these standards is reactive to historical incidents. Meaning, many of the mechanical incidents from the 1970s-1990s are not the reality of today's lift operation.

Approximately 60% of total skier visits occur at ski areas situated on National Forest System lands. The 122 ski areas operating on USDA Forest Service land must adhere to lift-related requirements in their special use permits. The USDA requires certification and inspection of lifts in accordance with the ANSI B77 Committee standards.

Lastly, ski areas routinely practice chairlift evacuation drills with their ski patrol and other staff in case of a situation where a lift transporting passengers is stopped and cannot be restarted in order to offload the riders. Industry experts, including NSAA and National Ski Patrol, developed the Aerial Lift Evacuation Resource Guide as a training tool for ski area personnel to safely and effectively evacuate guests in the event of a stoppage.

### **Technical Training and Education**

Technical training and education is continuous, and is critical to our commitment to overall safe lift operations. NSAA, partner organizations, and lift manufacturers have developed opportunities for ski area personnel across the country to elevate their skills and education.

The [Rocky Mountain Lift Association](#) (RMLA) is a trade association for aerial ropeway maintenance and operational personnel. RMLA has hosted an annual educational conference in the western United States since 1971, with more than 400 ski area attendees participating in more than 70 different educational seminars relating to lift safety, maintenance, and operations. Ski areas located in the eastern U.S. attend the annual [Lift Maintenance Seminar](#) (LMS), which has been holding similar educational workshops annually since 1976.

NSAA also offers lift maintenance education to ski industry personnel across the country. NSAA partnered with Colorado Mountain College in 2020 to develop a [Lift Maintenance Online Education Program](#), and presented a full summer of free training sessions via its Lift Maintenance Webinar Series.

There are numerous other regional workshops hosted by both NSAA and state ski associations on lift maintenance, lift safety, and lift operations. Lift manufacturers also conduct their own training and educational seminars for ski areas that have installed their lifts.

### **Lift Incidents in Context**

While the greater ski industry goes to great lengths to ensure the safety of ski area guests and employees, there are still risks associated with heavy machinery like an aerial ropeway. We aim to mitigate those risks by examining and learning from incidents. The industry uses these

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<sup>1</sup> Canada has a parallel standards committee, known as the Z98 standards, which are similar to ANSI B77 standards in the United States.

findings to help mitigate risk through both engineering and education, including using this knowledge to better inform new riders on how to safely load, ride and unload a lift.

NSAA began collecting lift fatality data in 1973. Since that time through 2020, there have been a total of 30 fatalities related to ski lifts. However, eight of those fatalities were due to a medical condition (such as heart attack, stroke or seizure; 5), or involved a ski area employee (3). Those conditions are not indicative of what the average lift rider would experience. The remaining 22 fatalities were due to mechanical malfunctions, human error, or an indeterminate cause.

The industry's fatality rate relevant to lift rides is extremely low. Between 1973 and 2020, the industry provided more than 18.3 billion rides to guests, totaling 9.2 billion miles in lift rides. As of the 2019/20 ski season, the annual fatality rate per 100 million miles traveled on ski lifts was 0.142 -- far more safe, in comparison, than the annual fatality rate of riding in an automobile. The [annual fatality rate](#) per 100 million miles traveled in a car is 1.13.

### **Mechanical Malfunctions**

Fatalities from chairlift and aerial ropeway mechanical malfunctions are rare. There have been 14 fatalities stemming from seven mechanical malfunction incidents from 1973 to 2020. The majority of these fatalities occurred in the 1970s and 1980s.

The most recent death of a guest due a mechanical malfunction at a U.S. ski resort was in 2016. Prior to the 2016 incident, the industry went 23 years without a fatality related to a chairlift mechanical malfunction in the U.S.

### **Falls from Lifts**

In 2012, NSAA analyzed 11 seasons of data from the Colorado's Passenger Tramway Safety Board to understand the primary causes of falls from chairlifts. In that period, Colorado ski areas reported 227 falls from chairlifts that resulted in injury to the passenger. Causes for the reported falls included passenger error, a medical condition, operator/mechanical error, or unknown cause.

The results of this analysis showed that 86% of all falls are attributed to passenger behavior and error and 4% of falls were due to medical issue experienced by the passenger. Only 2% of all falls from chairlifts were the result of mechanical or operator error, reinforcing the overall safety of chairlift operations. Additionally, 71% of all falls from lifts in Colorado occurred on chairlifts that had a restraint bar (a device which is now required by law on all new and relocated lifts).

An individual may fall from a chairlift as a result of a pre-existing or emergent medical condition, such as a heart attack, stroke, seizure. When a fall of this nature results in a fatality, the actual cause of the death is often undetermined (whether it be the medical condition itself, the fall, or some combination of the two). Fatalities and falls due to medical conditions do not reflect the overall safety of riding chairlifts for the public.

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***The National Ski Areas Association (NSAA) is a trade association representing the interests of ski area operators and industry suppliers. Formed in 1962, NSAA designs and supports ski industry initiatives and programs, including growth, safety and sustainability, from its Lakewood, Colo., headquarters. Learn more about NSAA's mission and programs at [NSAA.org](http://NSAA.org).***