

**Appendix F**

**Whistler Sliding Centre  
Passenger Bobsleigh  
Experience:  
International Comparison  
Research**

## Introduction

Research was conducted with the intention of understanding the safety frameworks of sliding centres worldwide. The output from our analysis is captured in the key findings.

## Key Findings

1. Nearly all sliding centres appear to offer public “pay-to-ride” sliding experiences to sustain their operation.
2. The public experience at Whistler Sliding Center (WSC) falls within the average for reported speeds and g-forces experienced. Some experiences advertise higher speeds and g-forces than the WSC, and some offer lower speeds and g-forces.
3. The pre-ride warnings used by the Whistler Sliding Centre appear to be comparable to other sliding centers that offer “pay-to-ride” experiences worldwide. Although, some sliding centres offer more nuanced language to help participants self-assess risk.
4. There does not appear to be a uniform set of safety standards that need to be followed when administering “pay-to-ride” sliding experiences to the public. Full responsibility and liability for public experiences lie with the track management who will set standards according to their country, province, or municipality jurisdictions.
5. Some countries in Europe have “mid-tier” bobsleigh rides available with varied levels of modification. These rides provide the public an alternative sliding experience between a “professional” bobsleigh, and not taking the ride at all.

## Background and Context

Bobsleigh and luge sliding facilities such as the one at Whistler Sliding Centre offer pay-to-ride “sliding experiences” to the public. Some of these facilities have reported incidents of patrons being injured on such experiences, including Whistler Sliding Centre.

Sliding experiences fall under Technical Safety BC’s jurisdiction via Elevating Devices regulation under the Safety Standards Act. Our Incident Investigation team investigated the injury and the Marketing Insights & Engagement team conducted desk research and client discovery to support context setting topics.

## Desired Outcome of Research

1. How does the safety framework put in place by the Whistler Sliding Centre compare to other sliding facilities?
2. Are other public experiences at sliding centres regulated or not?
  - a. If they are regulated, to what extent?
  - b. Who is involved in the regulation?
  - c. Do they have protocols or controls in place?
  - d. What can we learn from them that we can apply in BC?

## Research Approach

The MI&E team took a 2-phase approach to data collection that includes primary and secondary research.

Phase 1	Desk Research (Secondary Research)
	<ul style="list-style-type: none"> <li>• Context gathering with existing information               <ul style="list-style-type: none"> <li>○ Data collection from previous incident information or existing data</li> </ul> </li> <li>• Desk research               <ul style="list-style-type: none"> <li>○ Collected and analyzed publicly available information on sliding centre websites</li> </ul> </li> </ul>
Phase 2	Client Discovery (Primary Research)
	<ul style="list-style-type: none"> <li>• Interest holder research and analysis               <ul style="list-style-type: none"> <li>○ Interviewed sliding centre operators and regulators to gather information</li> </ul> </li> </ul>

## Data Collection and Activities

	Activity	Quantity
<b>Phase 1</b>	Previous incident information and existing data analyzed	-
	Sliding centre websites analyzed	11
<b>Phase 2</b>	Total outreach (sliding centre operator and regulators)	11
	Total interest holders responded	6
	Total interest holders interviewed	4*
	Sliding centre operator	1
	Regulators	3

	Bobsleigh pilots	2
	Countries	Canada, Norway, Switzerland

\*Track operators responded but were unable to provide information due to operational constraints.

## Key Questions: Safety Frameworks and Controls

### 1. How does the ride at Whistler Sliding Centre compare to similar experiences at other sliding facilities?

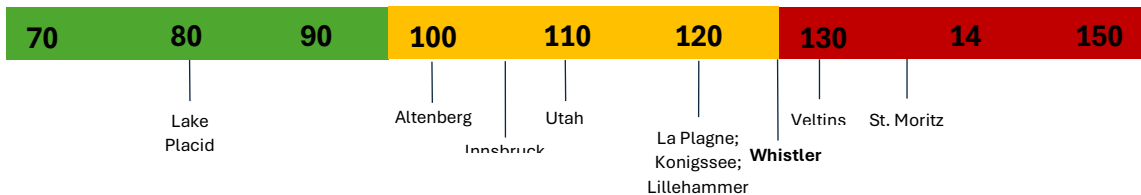
The majority of sliding centres worldwide offer an unmodified bobsleigh sliding experience for tourists. However, ride experiences differ based on a variety of factors, including top speeds, starting position on the track, number of curves or turns, and impact of G-force during the ride.

Whistler Sliding Centre was among the fastest sliding experiences observed in top speed and G-force and has similar pre-ride safety precautions and guidelines to comparable rides. Some sliding centres offer more nuanced safety language that more clearly articulates risks than others. For exact health and safety guidelines, see **Appendix A**.

### Ride Comparisons

#### Estimated Top Speed (KM/hour)

The graph plots the top speeds in KM/hour posted on each sliding centres' website.



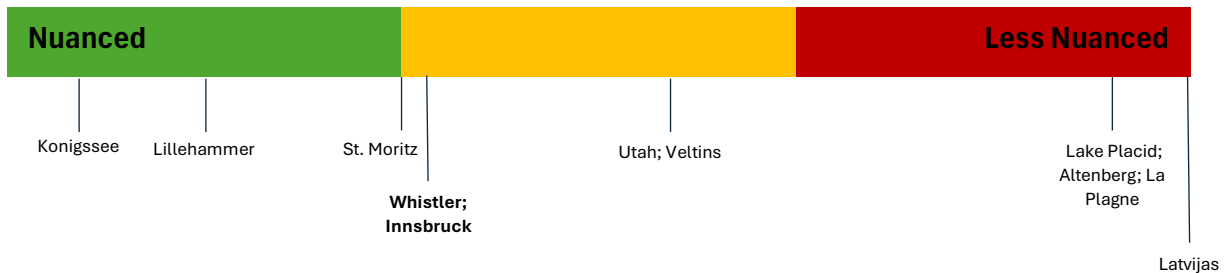
#### Estimated G-force

The graph plots the estimated G-force reported on each sliding centre's website.



## Warning and Safety Language

Relative ratings of warning and safety language were determined through a variety of factors including availability and presence of guidelines, length, detail, and clarity of language, as well as additional safety documentation available on each website.



\*Sliding centres with higher estimated g-forces appear to offer more nuanced safety language.

## Modified sliding experiences

Some sliding centres in Europe offer alternative sliding experiences for tourists that utilize modified bobsleighs and other vehicles with slower top speeds and G-force. For a list of modified sliding experiences, see **Appendix B**.

## 2. Are other public experiences at sliding centres regulated?

Although there are likely to be technical requirements and standards dictating the design and manufacturing of bobsleighs and sliding tracks for athletic competition, the track's transition to the public does not appear to be regulated by one uniform safety standard. Full responsibility and liability for public experiences lie with the track management who will set standards.

In Europe, each country, province, or municipality can determine their own safety standards, which are overseen by different bodies based on the EU's non-harmonized standards regulation. For more client discovery insights, see **Appendix C**.

# Appendix

## Appendix A

### Unmodified Bobsleigh Health and Safety Guidelines and Participant Requirements

	Speed	G-force	Turns or track length	Age	Height	Weight	Health and Safety Guidelines and Participant Requirements
<b>Whistler Sliding Centre</b>	125 km/hr	Up to 4	10 turns	Min age: 14 (14 and 15 year-olds will need to ride positioned in front of a parent or guardian in the sled)	4'6" (137 cm) and 6'8" (203 cm)	90 lbs (41 kg) and 285 lbs (129 kg)	<p>1. Are you between 14 and 75 years old? (14 and 15 year-olds will need to ride positioned in front of a parent or guardian in the sled. The ratio is 1:1, one adult for every youth. Guests over 75 years of age may participate providing they can meet the physical strength and dexterity guidelines below and are also aware that with increasing age there is an increasing risk of injury, specifically back injuries.)</p> <p>2. Will you have a parent or guardian present to sign your waiver when arriving at the Whistler Sliding Centre (participants under 19 years only)?</p> <p>3. Do you weigh between 90 lbs (41 kg) and 285 lbs (129 kg) in full winter clothing?</p> <p>4. Are you between 4'6" (137 cm) and 6'8" (203 cm) in height?</p> <p>5. Do you have the physical strength to walk a steep grade, and lift yourself over the 3' (91 cm) high track wall?</p> <p>6. Do you have the physical dexterity to be able to strongly grip the sides of the sled?</p> <p>7. Are you in good general and physical health?</p> <p>If you have answered "no" to any of the above, unfortunately, you will be unable to participate in our Passenger Bobsleigh activity due to health and safety guidelines.</p> <p>8. Do you suffer from any heart conditions?</p> <p>9. Do you have any previous head, neck or back injuries?</p> <p>10. Are you or could you be pregnant?</p> <p>11. Do you have osteoporosis, metabolic bone disease, or ankylosing spondylitis?</p> <p>12. Are you taking an oral steroid on a regular basis?</p> <p>If you have answered "yes" to any of the above, unfortunately, you will be unable to participate in our Passenger Bobsleigh activity due to health and safety guidelines.</p> <p>We do not recommend taking part in our passenger bobsleigh activity if you are pregnant or suffer from a heart condition or any chronic, recent, or severe head, neck or back injuries or have osteoporosis, metabolic bone disease, ankylosing spondylitis or take an oral steroid on a regular basis. This is due to the pressure (g-forces) put on the body during the ride which may aggravate these conditions, or in the case of the items in Q11 and 12 cause compression fractures. The potential risks include but are not limited to motion sickness, bumps, bruises, ice</p>

							rashes, head, neck and back injuries, sprains or broken bones.
<b>Utah Winter Bobsled Experience</b>	110+ km/hr	4-5		At least 16 years of age		100 lbs	<p>The Winter Bobsled Experience is a highly physical and extreme experience, generating up to 4-5 times the force of gravity.</p> <ul style="list-style-type: none"> <li>Riders must be at least 16 years of age or older and at least 100 lbs to ride.</li> <li>Proof of age may be requested and a parent or guardian must be present to sign waiver for riders younger than 18 years of age.</li> <li>We strongly discourage anyone with chronic neck problems, back or kidney problems, heart problems, recent surgery, and/or high blood pressure from riding the bobsled.</li> <li>Anyone questioning their health status or experiencing hesitations should not ride the bobsled.</li> <li>Please note that there is a possibility of injury whether the above listed conditions and symptoms apply to you or not. The bobsled ride is an aggressive, intense, bumpy ride.</li> <li>If you are pregnant you may not ride the bobsled.</li> <li>Rides may close due to extreme weather conditions or other special circumstances.</li> <li>There is no guarantee that you and your party will be assigned to the same sled. Sled assignments are based on the order in which reservations are made and will be determined prior to the session.</li> </ul>
<b>Lake Placid Bobsled Experience</b>	50 mph (80km/hr)		~ a mile long	<p>1<sup>st</sup>/2<sup>nd</sup> rider (middle) at least 9 years old</p> <p>3<sup>rd</sup> rider (rear) at least 13 years old</p>	52" or taller		<ul style="list-style-type: none"> <li>Middle Passenger(s), Must Be Age 9 &amp; Up, And Minimum 52" Tall.</li> <li>Rear Passenger, Must Be Age 13 &amp; Up, And Minimum 52" Tall.</li> <li>Weight Limit, The Maximum Weight Per Each Passenger Is 300 Lbs.</li> </ul> <p>The bobsled experience is a high-speed ride that features many sudden twists and turns, which may cause participants to be jolted throughout the ride. For your protection, this ride is not recommended for guests with head, neck, or bone injuries, recent surgery, heart trouble, high blood pressure, heart conditions, or guest who are pregnant.</p>
<b>Lillehammer Olympia parken</b>	120 km/hr	5G	16 turns/ 1710 meters	Min 16 years			<p><b>Bob is not permitted for:</b></p> <ul style="list-style-type: none"> <li>Persons under the influence of alcohol or other intoxicants.</li> <li>Persons under 16 years</li> <li>Pregnant.</li> <li>People who have/have had problems with their back, neck, heart or lungs.</li> <li>People who are generally in poor physical shape.</li> </ul> <p><b>For people with disabilities</b> We do our best to ensure that everyone can complete the activity in a good way. Persons with reduced functional abilities (physical, e.g. paralyzed from the chest/waist) must contact us themselves (or a companion) in advance for planning and adapting the trip.</p>

							<p><b>NB!</b> The bob's speed approaches 120 km/h, which gives a centrifugal force equivalent to 5G. The body becomes 3 times as heavy as usual, and the pressure is mainly felt on the back and neck. This can cause unusual strain on the back and neck muscles, which can lead to a stiff and sore neck afterwards.</p> <p><b>BEFORE THE TRIP:</b></p> <ul style="list-style-type: none"> <li>• Make sure you have got a helmet in the right size, and that the chinstrap is tightened sufficiently. Do not touch the strap after you have taken your place in the bob!</li> <li>• The provided kidney belt must be attached under outer clothing and tightened well.</li> <li>• Follow the instructions you receive from the pilot before starting regarding seating position etc.</li> </ul> <p><b>ON THE WAY DOWN THE TRACK:</b></p> <ul style="list-style-type: none"> <li>• Breathe normally! Full lungs help to stabilize the spine.</li> <li>• Don't lean forward and hold on tight! In the event of a crash: remain completely calm until the bob has stopped.</li> </ul> <p><b>Special Notes: 2 passengers only in each Taxibob with authorized pilot</b></p>
<b>Sachsen Energie Altenberg</b>	100+ km/hr  Guest bobsleigh starts at the junior start (near curve 15)	2-3G	11 turns / 1000 meters	Min 16 years (accompanied by a parent or guardian)	150 cm	None	<ul style="list-style-type: none"> <li>• Minimum age 16 (accompanied by a parent or guardian)</li> <li>• Maximum weight: 130 kg</li> <li>• Normal physical and mental condition: physical fitness, no previous damage (cardiovascular problems, spine, intervertebral discs, bones, neck muscles, organic diseases), no pregnancy</li> <li>• Guests take the bobsleigh ride at their own risk!</li> <li>• Private accident insurance is recommended.</li> </ul> <p><a href="#">Guest Event Terms and Conditions (detailed)</a></p>
<b>Innsbruck Olympia world</b>	115 km/hr  From men's start		14 curves / 1,270 meters	Min 14 years	150 cm	N/A	<ol style="list-style-type: none"> <li>1. It is prohibited to participate in guest bobsleigh rides before reaching 12 years of age AND 130 cm in height.</li> <li>2. It is prohibited to participate in race bobsleigh rides before reaching 14 years of age AND 150 cm in height.</li> <li>3. Race or guest bobsleigh ride participation is at your own risk.</li> <li>4. All participants in race or guest bobsleigh rides are obliged to wear crash helmets. All participants of guest bobsleigh rides are obliged to additionally wear seatbelts.</li> <li>5. The provided handholds must be used during the bobsleigh ride.</li> <li>6. Participation in race or guest bobsleigh rides is only permitted for people who are physically and mentally fit, who have a stable cardiovascular system, who have no damages to their musculoskeletal system and who are not suffering from osteoporosis.</li> </ol> <p>Pregnant women are not permitted to participate in race or guest bobsleigh rides. Participants have to judge on their own if</p>



						<p>they meet the health requirements mentioned above. In case of doubt, our operating staff has to be consulted.</p> <p>7. No liability is assumed for injuries to life, body and health during transportation of participants by truck.</p> <p>8. No liability is assumed for lost or damaged valuable objects such as clothes, watches, jewelry, glasses and the like.</p> <p>9. It is prohibited to take photographs or videos during bobsleigh rides and to carry along any objects on the ride.</p> <p>10. Instructions given by the pilots and operating staff must be followed.</p> <p>ride.</p> <p>1011. The operating staff is authorised to ban people with conspicuous behaviour (e.g. intoxicated people) from participating in bobsleigh rides.</p>
<b>Lotto Bayern Königssee</b>	<p>120 km/hr</p> <p>Bobstart (full competition length)</p>	5G	12 curves / 1,244 meters	Min 16 years		<p>The fascination of unimaginable centrifugal forces, which reach up to six times the gravitational acceleration, can now be experienced by anyone who is physically fit.</p> <p><b>Requirements</b></p> <p><b>Even if you are willing to take risk, there is no one-hundred-percent guarantee that our pilots will rate you fit to slide.</b> If, in anticipation of your adventure, you have drunk a glass too much, or the safety is not ensured based on your physical constitution, there is a possibility of denial.</p> <ul style="list-style-type: none"> <li>• Physical fitness</li> <li>• No previous injuries (especially to intervertebral discs, spine, bone, cardiovascular)</li> <li>• No organic diseases</li> <li>• Minimum age for winter dates: 16 years (less than 18 years with signature of parent or guardian)</li> <li>• If you are pregnant</li> <li>• If you are not physically fit or have previous damage of the musculoskeletal system, especially the spine</li> <li>• If you are prone to osteoporosis</li> <li>• If you have cardiovascular disorders</li> <li>• If you are unsure, to meet the physical requirements, take a medical check-up before</li> <li>• If you do not want to be filmed, the Königssee bobsleigh track is video-monitored for security reasons</li> </ul> <p><b>Disclaimer</b></p> <p>The kick through the ice track you can only experience if you give us in writing that you know about your risks and you are ready to take this on your own responsibility (disclaimer) and otherwise accept our terms and conditions.</p> <p>1. Bobsledding is a sporty challenge, even for passengers. Even with the utmost care of experienced drivers an incident cannot be ruled out. High speed and centrifugal forces require full health and an outstanding physical condition! Especially your spine and intervertebral discs will be heavily strained. If you have any concerns about your physical requirements you better renounce the ride. In this risky sport, you act at your own risk. <b>In rare cases (1 out of 1000 rides) it can lead</b></p>

						<p><b>to serious injuries without any accident, vertebral body fracture for example.</b></p> <ol style="list-style-type: none"> <li>For passengers safety equipment is obligatory, especially wearing a helmet. Check your helmet to fit perfectly. Tell your driver if anything would cause difficulties before departure.</li> <li>The safety of the crew and your own safety depends on complying with certain behavioral rules, therefore be sure to follow the instructions of the driver.</li> <li>The liability of the Bobsleigh and Sled Federation of Germany (BSD) as well as of organizers and drivers is excluded with the exception of intentional or grossly negligent cause of damage. The Bobsleigh and Sled Federation of Germany (BSD) stands for gross, negligent or intentional induction of physical damage according with statutory regulations.</li> <li>A participation as a passenger in a race bob taxi is only possible from the age of 16 years, in summer from the age of 14 years, together with a valid personally signed ticket and a reserved time. For minors under the age of 18 a legal representative must sign. Cancellations or shifts of dates are possible. The exclusion of passengers is at the discretion of the organizer and responsible driver.</li> </ol>
<b>La Plagne – Piste Olympique Bobsleigh</b>	120 km/hr	3G		Min 16 years		<p><b>Description</b></p> <p>In a real competition bobsleigh (remodelled and completely safe), piloted by a professional, hurtle down the Olympic Bobsleigh track.</p> <ul style="list-style-type: none"> <li>Up to 3G in some bends, around 120 km / h, thrills guaranteed!</li> <li>The G-force in the bends, the ever-increasing speed, the sound of the friction on the ice</li> <li>Not for the faint hearted!</li> <li>Bob Racing leaves you with an unforgettable memory.</li> <li>3 people per bobsleigh, piloted by a professional pilot.</li> <li>Speeds of up to 120km/hr.</li> <li>A taste of a real competition descent. Not for the faint hearted!</li> <li>Speed and adrenaline rushes guaranteed !</li> </ul> <p><b>Requirements</b></p> <ul style="list-style-type: none"> <li>Terms of use : 16 years and over.</li> <li>Written parental authorisation or accompanied by a parent, guardian or responsible adult for all 16-18 year olds.</li> <li>Not advised for people with heart, vascular and back problems and for pregnant women.</li> <li>A disclaimer certificate for the activity must be signed by the participant on the day of the descent</li> </ul> <p><b>Terms and conditions</b></p>
<b>St. Moritz-Celerina</b>	<b>Up to 135 km/hr</b>	4G	1,722 meters	Min 16 years		<p>In the corners, you are exposed to centrifugal forces of up to 5G (pressure equivalent to five times your body weight). If your health is impaired, you should</p>

Olympia Bobrun						<p>refrain from taking part. This applies in particular if you suffer from the following restrictions:</p> <ul style="list-style-type: none"> <li>• Back and/or neck problems</li> <li>• Heart and/or lung problems</li> <li>• Circulatory problems</li> <li>• Osteoporosis (reduced bone density)</li> <li>• Operations on the spine or herniated discs</li> <li>• Polyarthritis</li> </ul> <p>Participation should also be avoided during pregnancy. If in doubt, we recommend that you seek medical advice.</p> <p>Guests aged 70 and older are requested to present a written medical certificate stating that there are no health reasons against taking a bobsleigh ride.</p>
Veltins Winterberg	130 km/hr		1600 meters	Min 16 years	1.5 m	<p>Who can drive Taxibob?</p> <p>If you can answer all of the following points in the affirmative, we would be happy to take you with us at any time:</p> <ul style="list-style-type: none"> <li>• At least 16 years old</li> <li>• Taller than 1.50 meters.</li> <li>• Physically fit.</li> <li>• No influence of intoxicating substances.</li> <li>• No cardiovascular problems/diseases.</li> <li>• No spinal disease.</li> <li>• Not pregnant.</li> </ul> <p>Bobsleighbing is a sporting challenge. Despite all the care taken, a fall cannot be ruled out. The speeds and centrifugal forces require complete health and a good physical constitution. The spine and intervertebral discs are particularly stressed. If you have any complaints in this area or heart or circulatory problems, you should refrain from taking part.</p> <p>In this risky sport, each participant acts at their own risk. The thrill of the descent through the ice channel can only be experienced if there is written confirmation that the risks have been recognized and the participant is prepared to bear these risks on their own responsibility (liability waiver) and otherwise accepts the implementation regulations.</p>
Latvijas Nacionales Sports Centre	100 km/hr		1200 meters	Min 16 years		<p>Take the opportunity and capture the adrenaline rush with speeds that can reach up to 100 km/h and the thrill of a real Olympic bobsledder. At the same time, we will take care of your health and safety, we invite you to go on the track and indulge in an adventure with a winter bobsleigh with a healthy back and neck vertebrae.</p> <ul style="list-style-type: none"> <li>• Number of participants: up to 3 persons + pilot. The minimum number of riders is 2 people.</li> <li>• Age of participants: from 16 years.</li> <li>• Achievable speed: up to 100 km/h.</li> </ul>

### Bobsleigh sliding experience offering and rider experience

- At least 10 sliding centres around the world offer an unmodified bobsleigh as public experiences for tourists to ride. We define unmodified bobsleigh as a

vehicle that would be similar to a professional bobsleigh vehicle.

- Sochi, Russia and PyeongChang, Korea did not have information posted on their website and were not included in the analysis.
  - Top 3 ride speeds
    - St. Moritz-Celerina (Switzerland) 135 km/hr
    - Veltins Winterberg (Germany) 130 km/hr
    - Whistler Sliding Centre (Canada) 125 km/hr
- Whistler Sliding Centre begins at a tourist start which is lower on the track than the men's start (typically the length of the entire competition track) or the junior's start (slightly shorter than the men's start), which were offered by a few sliding centres in Europe.

### **Bobsleigh Health and Safety Guidelines**

- Rider safety rules across all sliding centres contain similar language and limitations. Around 3 sliding centres appeared to offer slightly more nuanced safety language in their health and safety guidelines, either utilizing plain language to explain the impact of G-force, attempting to quantify the safety risk (1 in 1000), or including additional safety documentation.
  - Whistler Sliding Center includes a thorough safety checklist on the website before riders can ride, captured in the "[Know Before You Go](#)" section.
- The impact or sensation of G-force is not clearly articulated at most sliding centres. Only 3 sliding track centres were observed to include a layman's term articulation of G-force:
  - **St Moritz** – In the curves, centrifugal forces of up to 5G can be achieved (pressure of five times the body weight)
  - **Lillehammer** – The bob's speed approaches 120km/hour, which gives a centrifugal force equivalent to 5G. The body becomes 3 times as heavy as usual, and the pressure is mainly felt on the back and neck
  - **Altenberg** – Since the physical strain of guest bobsleigh rides (centrifugal forces up to 3 G, quick curve changes) should not be underestimated

## Appendix B

### Modified Bobsleigh Health and Safety Guidelines and Participant Requirements

	Speed	G-force	Turns or track length	Age	Height	Weight	Health and Safety Guidelines and Participant Requirements	Special Notes
<b>Bobraft</b>								
Lillehammer Olympiaparken	100 km/hr	3Gs		Min 10 years (w/guardian)  Min 12 years (without)			<p>Bob is not permitted for:</p> <ul style="list-style-type: none"> <li>• Persons under the influence of alcohol or other intoxicants.</li> <li>• Persons under 10 years of age (12 years without an adult)</li> <li>• Pregnant.</li> <li>• People who have/have had problems with their back, neck, heart or lungs.</li> <li>• People who are generally in poor physical shape.</li> </ul> <p>For people with disabilities We do our best to ensure that everyone can complete the activity in a good way. Persons with reduced functional abilities (physical, e.g. paralyzed from the chest/waist) must contact us themselves (or a companion) in advance for planning and adapting the trip.</p> <p>NB! The bob's speed approaches 100 km/h, which gives a centrifugal force equivalent to 3G. The body becomes 3 times as heavy as usual, and the pressure is mainly felt on the back and neck. This can cause unusual strain on the back and neck muscles, which can lead to a stiff and sore neck afterwards.</p> <p><b>BEFORE THE TRIP:</b> Make sure you have got a helmet in the right size, and that the chinstrap is tightened sufficiently. Do not touch the strap after you have taken your place in the bob! The provided kidney belt must be attached under outer clothing and tightened well. Follow the instructions you receive from the pilot before starting regarding seating position etc.</p> <p><b>ON THE WAY DOWN THE TRACK:</b> Breathe normally! Full lungs help to stabilize the spine. Don't lean forward and hold on tight! In the event of a crash: remain completely calm until the bob has stopped.</p>	Bobraft is suitable for both young and old! It is piloted by one of our authorized pilots and has room for 4 passengers.

<b>Innsbruck Olympiaworld</b>	95 km/h  From men's start		14 curves /1,270meters	Min 10 years	130 cm		Same health and safety requirements as the unmodified racing bobsleigh ride.	<b>Thanks to its innovative design, it offers the greatest possible safety</b> - which is why it does not require a pilot and offers space for up to 4 people per trip. Ideal for families, companies and group events
<b>La Plagne – Piste Olympique Bobsleigh</b>	80 km/hr		1.3M	Min 10 years	Min 130 cm		Same health and safety requirements as the unmodified racing bobsleigh ride.  Not recommended under 10 years old, children must be accompanied by a responsible adult.	Accessible to all from 1,30 m, this is the perfect choice for families. Self-guided and self-braking; the Bob raft can hold up to 4 people for an incredible experience on the Olympic bobsleigh Track. Can reach speeds of up to 80 km/ h This is the ideal run for your first time in a Bobsleigh. First time or not there is only one Bobsleigh Track so you will be on the same run as the professionals!
<b>Bludenz Eiskanal</b>	<b>No information available</b>							
<b>Iceraft</b>								
<b>Oberhof Thuringer Wald</b>	75 km/hr	1-2G	15 curves / 1354.5 m	Min 7 years			Riders take part at their own risk. Wearing a helmet is mandatory. Children under 7 years of age are not allowed to take part in ice rafting. The activity is prohibited under the influence of alcohol or drugs. Customers must familiarize themselves with the published rules of use and track regulations of the LOTTO	There is room for 10 brave people, 6 passengers in the front boat and 4 in the back boat.

								<p>Thüringen EISARENA before the activity. Customers must accept these rules when taking part.</p> <p>Participants' duty to cooperate</p> <p>Participation in all activities is at your own risk. The organizer assumes that customers are in good health.</p> <p>Participants undertake to inform the organizer of any health problems before using the service. Participants must not be under the influence of drugs or alcohol under any circumstances.</p> <p>Pregnancy, high blood pressure, heart problems, increased risk in the cardiovascular system, damage and hypersensitivity to the musculoskeletal system preclude participation in the activity. Participants are aware that, except in cases of intent or gross negligence on the part of the organizer or third parties commissioned by the organizer, they cannot assert any claims for damages or injuries resulting from participation in the event. The customer undertakes to meet the conditions of participation and to strictly follow all instructions from the organizer and all persons working for the organizer.</p>
<b>Skeletonbob</b>								
<b>Latvijas Nacionales Sports Center</b>	Up to 80 km/hr		13 curves	Min 6 years (with 1 adult)				Safety guidelines unclear
<b>Winter Woof</b>								
<b>Latvijas Nacionales Sports Center</b>	Up to 80 km/hr			Min 6 years (with 1 adult)				Safety guidelines unclear Up to 5 persons
<b>Pointy Bob (Zipflbob)</b>								
<b>Veltins Winterberg</b>	Up to 30 km/hr			Min 14 years	160 cm			<ul style="list-style-type: none"> <li>• Minimum age: 14 years</li> <li>• Height at least 160 cm</li> <li>• You are physically fit</li> <li>• You have no cardiovascular problems/diseases</li> <li>• You do not have a spinal disease</li> <li>• You are not pregnant</li> <li>• Please wear weatherproof clothing and bring gloves</li> <li>• The maximum weight of the participant including the Zipflbob must not exceed 113 kilograms</li> </ul>

Guest Tobogganing								
<b>Veltins Winterberg</b>	Up to 60 km/hr			Min 10 years (with an adult)			Who is allowed to go tobogganing? <ul style="list-style-type: none"> <li>If you can answer all of the following points in the affirmative, we would be happy to take you with us at any time:</li> <li>Minimum age: 10 years accompanied by a parent or guardian.</li> <li>You are physically fit.</li> <li>You have no cardiovascular problems/diseases.</li> <li>You do not have any spinal disease.</li> <li>You are not pregnant.</li> <li>Please wear weatherproof clothing and bring gloves.</li> </ul>	
Icetubing								
<b>Veltins Winterberg</b>				Min 10 years old	130M		<ul style="list-style-type: none"> <li>At least 10 years old</li> <li>Taller than 1.30 meters.</li> <li>Physically fit.</li> <li>No influence of intoxicating substances.</li> <li>No cardiovascular problems/diseases.</li> <li>No spinal disease.</li> <li>Not pregnant.</li> </ul>	
<b>SachsenEnergie Altenberg</b>	Up to 55 km/hr		Start at the weighing house (braking slope); 400 meters in the ice channel	Min 10 years (with legal guardian)	130 cm		Requirements: <ul style="list-style-type: none"> <li>no pregnancy</li> <li>no previous injuries, disabilities or other limitations (e.g. spine)</li> <li>no organic diseases (e.g. heart, kidney problems)</li> <li>For the ride we recommend wearing sports clothing appropriate to the weather and season as well as gloves</li> <li>We recommend private accident insurance</li> </ul>	Ice tubing in the ice channel
<b>SachsenEnergie Altenberg</b>			1,000 meters	Min 16 years			Same as above	Callis Tour – ice tubing from the junior Start
<b>Latvijas Nacionales Sports Center</b>	Up to 50 km/hr		13 turns	Min 16 years			Safety guidelines unclear	

\*Empty cells indicate that information was not publicly available on sliding centre websites. Most sliding centres with alternative rides used the same set of health and safety guidelines as the unmodified bobsleigh sliding experiences.



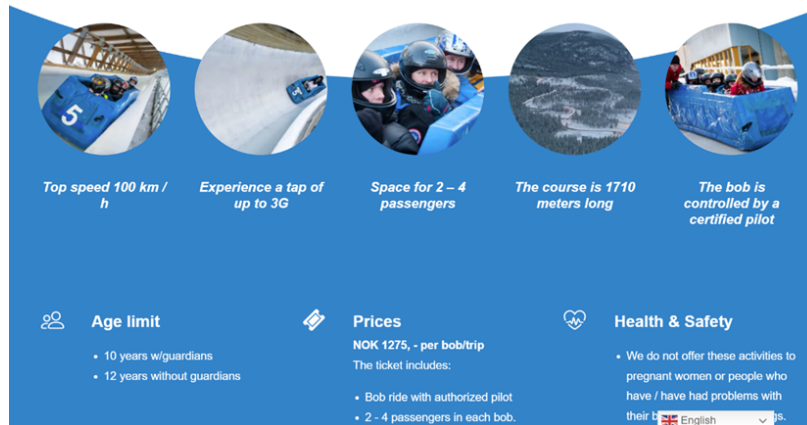
## Modified rides offered

- At least 8 other sliding centres in Europe offer a modified bobsleigh experience.
- Sochi, Russia and PyeongChang, Korea did not have information posted on their website and were not included in the analysis.

Modified Ride Name	Description
<b>Bobraft</b>	A modified bobsleigh, rubber bob, lower top speeds (starts at 80 km/hr), lower G-forces
<b>Icraft</b>	Inflatable boats consisting of 2 dingy specially designed for travelling through the ice canal. A complete set consists of a front and rear boat. The connection between the two boats is our pilot, who will take you safely through the 14 curves of the track. Modified to fit 10 people. Offers lower speed & g-force (70 kilometers per hour with centrifugal forces of 1 - 2 G)
<b>Skeletonbob</b>	A fully enclosed, modified bobsleigh for 2 people
<b>Winter Woof</b>	Looks similar to a bobraft but goes slower and fits 5 people
<b>Pointybob</b>	A “mini bobsleigh” a cross between a toboggan and an ice tube that takes the rider down the bobsleigh track. The handle is placed between the legs and the Zipflbob can be controlled easily and precisely with the help of the feet.
<b>Guest Tobogganing</b>	Tobogganing through the ice. Drive through one of the key parts of the Winterberg bobsleigh track, the Sauerland S curve into the target curve. During the tobogganing, you will be instructed and accompanied by experienced trainers and supervisors from the base.
<b>Icetubing</b>	Experience the ice channel on a tube instead of a bobsleigh. Fire down the track as a team in the ice tube.

## Examples

### Bobraft



*Top speed 100 km / h*

*Experience a tap of up to 3G*

*Space for 2 – 4 passengers*

*The course is 1710 meters long*

*The bob is controlled by a certified pilot*

**Age limit**

- 10 years w/guardians
- 12 years without guardians

**Prices**

NOK 1275, - per bob/trip

The ticket includes:

- Bob ride with authorized pilot
- 2 - 4 passengers in each bob.

**Health & Safety**

- We do not offer these activities to pregnant women or people who have / have had problems with their health.

English

## Bobrafting



FAQ

Instructions and Conditions

Directions map

Overview map

## BOBRAFTING

- from 10 years on
- 3-4 guests
- from the men's start (95 km/h)
- 14 curves including roundabouts
- Price is per person and trip

Fun & excitement for the family

## NEW – BOB RAFTING!

Put on your helmet and let's go! When borafting, you race to the finish line at up to 95 km/h. 1,270 meters of track length, 14 curves and the spectacular roundabout await all brave souls aged 10 and over. Thanks to its innovative design, it offers the greatest possible safety - which is why it does not require a pilot and offers space for up to 4 people per trip. Ideal for families, companies and group events. The ice channel adventure awaits!

## Bob Raft, for fun

Accessible from 1.30m, it is the perfect machine for families. Self-guided and self-braking, it accommodates four people for an incredible, shared experience. The car reaches 80 km/h at the height of the descent. Ideal as an "approach experience", the Bob Raft is perfect for first times. But let's be clear, the La Plagne bobsleigh track allows no half-measures, so you will take the same route as the professionals! Price: €55 per person

[I RESERVE MY DESCENT](#)



## Icerafting

### ICE RAFTING

Experience the entire course from the men's start on ice rafting in an inflatable boat version, consisting of two boats. 1,100 meters of track and 14 curves lie ahead of you.

There is space for 10 brave people, 6 passengers in the front boat and 4 in the back boat.

You race through the ice channel at around 70 kilometers per hour with centrifugal forces of 1 - 2 G.



[BUY VOUCHER](#)

## Skeletonbob

## Skeletonbob

Our famous "green frog" has turned into a red skeleton bob, but the fun and excitement of adventure does not decrease from it. Get inspired and experience the thrilling joy of a fun descent with a skeleton bob on our bobsled and sledge track "Sigulda". An attraction that, along with a pleasant thrill and a speed of up to 80 km/h, goes through 13 bends of the track, providing unforgettable emotions and memories.



- Number of participants: 2 persons.
- Age of participants: from 6 years, together with one adult.
- Achievable speed: up to 80 km/h.
- Descent duration: ~ 1 minute.
- Service available: from November to mid-March (depending on the weather).

## Winter Woof

### Winter woof

During the winter season, we invite you to experience an attractive and fun fun ride on the bobsleigh and toboggan track "Sigulda" with the winter sled vuchko, which got its name from the name of the train, the mascot of the 1984 Winter Olympic Games held in Sarajevo. During the trip, it is possible to enjoy the speed, and every corner you pass is like a new adventure that remains unforgettable.



- Number of participants: up to 5 persons.
- Age of participants: from 6 years, together with one adult.
- Achievable speed: up to 80 km/h.
- Descent duration: ~ 1 minute.
- Service available: from November to mid-March (depending on the weather).

**ONE TRIP WITH WINTER VUCKO AND TRACK INSPECTION FOR 1 PERSON (01.10.2023-17.03.2024)**



- For an adult: 25 EUR
- For a child up to 6 years\*: 20 EUR
- For a pupil, student, pensioner, person with a disability, with a 3+ Family card\*: 22.50 EUR

## Pointy bob (Zipflbob)



## Tobogganing or icetubing in the bobsleigh track

Callis Tour - junior start



- ✓ Exclusive use of the bobsleigh track
- ✓ Start of the guest bobsleigh start - 1,000 meters in the ice channel
- ✓ As a race with a training and rating run
- ✓ With certificate and award ceremony
- ✓ Minimum age: from 16 years (accompanied by a legal guardian)

### Ice rafting

Get ready for an epic, unique and perhaps the most amazing winter adventure – ice rafting on the bobsleigh and sledge track “Sigulda”!

Ice rafting is a large inflatable chamber that invites you to conquer the 13 twists and turns of the bobsleigh and toboggan track “Sigulda”, experiencing an adrenaline rush and enjoying speeds of up to 50 km/h. Fun and unforgettable emotions are guaranteed!

After an adventure-filled ride, go see the constructions of the track and visit the observation deck, where you can capture beautiful views of Sigulda and Gauja.

- Number of participants: 1 person.
- Age of participants: from 16 years.
- Achievable speed: up to 50 km/h.
- Descent duration: ~ 1 minute.
- Service available: from November to mid-March (depending on the weather).
- Working hours: Saturdays and Sundays, at 12:00 – 17:00; on weekdays pre-order for groups of 15 people.



## Appendix C

### Client Discovery Insights

It appears that many bobsleigh and luge tracks are designed by a German company (<https://ibg-partner.com/projects/>), which likely point to technical standards that dictate the design and manufacturing of sliding tracks for athletic requirements. However, the public experience is not the main consideration for requirements in the design of sliding tracks. There does not appear to be a set standard for the transition from competition to public experience.

#### One of the track regulators in Europe stated:

- Each country, province, or municipality in Europe can choose their own set of standards to follow.
- In some Nordic countries such as Denmark, Finland, and Sweden, the police oversee the amusement device industry.
- Other European countries such as Germany are divided into provinces & municipalities like Canada, and each municipality can choose their own regulation or specific standard to follow. There is a public certification, but interest holders were not aware of any other regulators.

- In the Netherlands, they are under a consumer safety department in the government.
- In Switzerland, there is no entity. They have regulations from the state but nothing specific or an entity that looks in-depth at these activities.
- In Norway, the sliding track facility works with a regulator called Statens Jernbanetilsyn (authority of trains, subways, railways, recreational facilities & amusement parks), that regulates safety in Norway.
  - There are rules they must follow. Statens Jernbanetilsyn checks the track every 2<sup>nd</sup> or 3<sup>rd</sup> year, but after every season, they need to have a 3<sup>rd</sup> party check the Taxibob, Bobraft and Wheelbob
  - Norway's regulations were like the ASTM standards, but has since changed to functional standards. Functional requirement requires that the amusement device is safe but it is up to the operation to document why it's safe. They can choose:
    - Third party inspection
    - Own knowledge
    - Or can use standards
  - Norway is moving away from inspections due to high volume of amusement devices, that also include ropeways and ski lifts in the winter.

#### **Another regulator in Canada stated that:**

- The winter bobsleigh sliding experience was not regulated when it was in operation. The decision was that it had a professional driver and regulation deemed that to be sufficient. However, it was a different time and the track has not operated the winter bobsleigh in over 20 years.
- Summer bobsleigh is regulated under specific standards.
- All amusement rides in Alberta have to meet clear standards with respect to design, maintenance, operation & inspection. They follow the ASTM standards and reference standards. All standards are adopted within 12 months after publication.

#### **Safety precautions and track starts**

##### **Taxibob**

- There's a form riders must sign before going down the track in the Taxibob, which tells them what to expect.
- They warn people twice before the ride starts:

- They welcome people, ask questions about neck, back, lung issues, pregnancy, etc. if they're deemed unsuitable, they won't allow them to go
- Whether someone is listening or not, they must read and sign the form. They're not allowed to have been drinking alcohol.
- The Taxibob is operated from the junior start. They use to operate the Taxibob from the men's start but found it too difficult for the pilot and tourists, so they decided to change it to the junior start.
  - Tourists
    - Around the end of the 90s, there were more crashes and they saw that tourists got tired.
    - The speed became too high and tourists are not trained for the activity. They don't know what to expect or how to behave in the vehicle. It was a danger to hurt themselves.
  - Pilots
    - With pilots working and driving everyday, the body and mind starts to get tired. For bob athletes, 2-3 runs is normal, then you take a break and do a few runs at night, but as a pilot, you could be doing up to 10 rides in a row.
    - Changing the start for the pilot was also not so hard for their bodies and minds.

### **Bobraft**

- They don't have the same form for the Bobraft but tell them twice – at the start and then when they're getting helmets & belts and getting placed into the Bobraft.
- Bobstart is where the Bobraft starts (at the top near the men's start).

### **Information about the Bobraft**

- Made it with company in Norway (they made it new for them and also take control of the Bobraft at the end of each season, making improvements to it).
  - Had to do something for tourists and did it just for fun
  - Had some guys working on the track for 30 years who've seen a lot. They came up with the idea for the ride and worked with a company to produce it.
    - They have Taxibob and regular bob as well so it wasn't for safety reasons.
  - Taxibob is a regular 4-man bob
    - 16 year age limit
  - Bobraft can reach more people
  - Age limit is lower

- 10 year age limit together with a parent
- 12 year age limit if going alone
- Totally different ride and different how it feels in your body
  - Can go up to 100KM per hour but it's softer, you don't feel it as much on your body. You don't hurt as much after a Bobraft
  - You are in rubber, you are sitting on rubber mat, everything is soft
  - You can see more of the track when you're in a Bobraft
  - In a Taxibob, everything is hard and you can hit yourself
- Lillehammer was quite early with creating the Bobraft and many other tracks would like one, though unsure whether they are the first to have one.
- Sigula has one, Lake Placid has been in discussions

### **Bobsleigh Athlete Guidelines**

- IBSF looks over all tracks worldwide for international events, qualifying pathways for championships and the Olympics. All tracks worldwide are used for public Taxibob and so forth, but the full responsibility and liability lie with the track management.
- Sometimes tracks will sub-license the track or rent out the track to different companies who do the track rides on behalf of them, which will limit the liability of the track management.
- Generally, all tracks are being homologated regularly by their technical experts and all track-related matters are regulated in their track rules ([https://www.ibsf.org/fileadmin/user\\_upload/Resources/Sports/Rules\\_Quotas/Declaration\\_of\\_National\\_federation\\_e\\_license\\_and\\_registration\\_system.pdf](https://www.ibsf.org/fileadmin/user_upload/Resources/Sports/Rules_Quotas/Declaration_of_National_federation_e_license_and_registration_system.pdf)).
- What riders of Taxibob will see:
  - Get an introduction from company who does the rides and the pilot, and sign a waiver.
  - The waiver will state that they are fully aware of the safety conditions, confirm they are healthy, aware of the limitations and risks.
    - The waiver will confirm that rider doesn't have any problems and they're doing this at their own risk.
    - Back and heart are most important; they must confirm no back or heart disease or illness – this is usually where the problems are with the pressure.
  - With the equipment, it's fully the responsibility of the company that does the rides

- Sleighs are well maintained but not similar to elite level; they wouldn't go as fast as elite level sports equipment.
- Have to provide evidence that the track is in good condition – no obstructions on the track, track is clear etc.
- They also go over procedures for clearance of the track.
- Use safe and maintained equipment. It will not be the fastest equipment they can find.

### **Rider and group dynamics**

- Interesting group dynamics and ride behaviours observed by a regulator in Europe:
  - There is a group dynamic where people may not want to backout.
  - They suggest pilots speak to their passengers and find out if the Taxibob passenger is fit for riding, and encourage passengers to speak up if they are uncomfortable.