

“We bike together – Training and trail mapping in Europe”

TRAIL DIFFICULTY RATING SYSTEM

The **IMBA** Trail Difficulty Rating System is a basic method used to categorize the relative technical difficulty of recreation trails. The IMBA Trail Difficulty Rating System can:

- Help trail users make informed decisions
- Encourage visitors to use trails that match their skill level
- Manage risk and minimize injuries
- Improve the outdoor experience for a wide variety of visitors
- Aid in the planning of trails and trail systems

This system was adapted from the International Trail Marking System used at ski areas throughout the world. Many trail networks use this type of system, most notably resort-based mountain biking trail networks. The system best applies to mountain bikers, but is also applicable to other visitors such as hikers and equestrians. These criteria should be combined with personal judgment and trail-user input to reach the final rating.

Trail Rating Guidelines

1. Rate Technical Challenge Only

The system focuses on rating the technical challenge of trails, not the physical exertion. It is not practical to rate both types of difficulty with one system. Consider, for example, a smooth, wide trail that is 20 miles long. The technical challenge of this trail is easy, yet the distance would make the physical exertion difficult. The solution is to independently rate technical challenge, and indicate physical exertion by posting trail length, and possibly even elevation change.

2. Collect Trail Measurements

Use the accompanying table and collect trail measurements for each criteria. There is no prescribed method for tallying a "score" for each trail. Evaluate the trail against the table and combine with judgment to reach the final rating. It is unlikely that any particular trail will measure at the same difficulty level for every criteria. For example, a certain trail may rate as a green circle in three criteria, but a blue square in two different criteria.

3. Include Difficulty and Trail Length on Signs and Maps

Trail length is not a criterion of the system. Instead, trail length should be posted on signs in addition to the difficulty symbol. A sign displaying both length and difficulty provides lots of information, yet it is simple to create and easy to understand.

Likewise, elevation change is not a criterion. The amount of climbing (**cumulative elevation gain**) on a trail is more an indicator of physical exertion than technical difficulty. Mountainous regions may consider including the amount of climbing on trail signs.

[In running, cycling and mountaineering **cumulative elevation gain** refers to the sum of every gain in elevation throughout an entire trip. It is sometimes also known as **cumulative gain** or **elevation gain**. Elevation losses are not counted in this measure. Cumulative elevation gain, along with round-trip distance, is arguably the most important value used in quantifying the strenuousness of a trip]

4. Evaluate Difficulty Relative to Local Trails

Trails should be rated relative to other trails in the region. Don't evaluate each trail in isolation. Consider all the trails in a region and how they compare to one another. This will help you rank the relative difficulty of each trail and will help trail users select an appropriate route. Trails will rate differently from region to region. A black diamond trail in one region may rate as a blue square in another region, but the ratings should be consistent locally.

5. Use Good Judgment

Rating a trail is not 100 percent objective. Its best to combine tangible data with subjective judgment to reach the final rating. For example, a trail may have a wide range of tread surfaces - most of the trail is easy, but some sections are more difficult. How would you rate it? Use your personal experience to consider all elements and select a rating that best matches the style of trail.

6. Consider Other Trail Qualities

Don't forget to consider trail qualities beyond the objective criteria. A wide variety of features could contribute to a trail's difficulty. For example, exposure - the feeling of empty space next to and below the trail tread - provides an added psychological challenge beyond the steepness or roughness of the trail. A 3-inch rock seems like a boulder when a 50-foot drop looms on your side! Other qualities to think about are corridor clearance and turn radius.

7. Use Common Sense and Seek Input

No rating system can be totally objective or valid for every situation. This system is a tool to be combined with common sense. Look at trails with a discerning eye, and seek input from trail users before selecting the rating. Remember, a diverse trail network with a variety of trail styles is a great way to ensure happy

visitors. Provide both easy and difficult trails to spread visitors and meet a range of needs. By indicating the length and difficulty of trails with a clear signage system, visitors will be able to locate their preferred type of trail easily.

Criteria to Consider

Tread Width

The average width of the active tread or beaten path of the trail.

Tread Surface

The material and stability of the tread surface is a determining factor in the difficulty of travel on the trail. Some descriptive terms include: hardened (paved or surfaced), firm, stable, variable, widely variable, loose and unpredictable.

Trail Grade (maximum and average)

Maximum grade is defined as the steepest section of trail that is more than approximately 3 m in length and is measured in percent with a clinometer. Average grade is the steepness of the trail over its entire length. Average grade can be calculated by taking the total elevation gain of the trail, divided by the total distance, multiplied by 100 to equal a percent grade.







Natural Obstacles and Technical Trail Features

Objects that add challenge by impeding travel. Examples include: rocks, roots, logs, holes, ledges, drop-offs, etc. The height of each obstacle is measured from the tread surface to the top of the obstacle. If the obstacle is uneven in height, measure to the point over which it is most easily ridden.




Technical Trail Features are objects that have been introduced to the trail to add technical challenge. Examples include: rocks, logs, elevated bridges, teeter-totters, jumps, drop-offs, etc. Both the height and the width of the technical trail feature are measured.

Trail Difficulty rating

The suggestions offered do not constitute a standard, specification, or regulation. Trail builders and landowners are responsible for the safety of their own trails and facilities. Freeriding and dirt jumping are high-risk activities that can result in serious injuries. IMBA's goal is to help land managers and volunteers manage these risks by sharing information.

Trail rating						
Symbol	White Circle	Green Circle	Blue Square	Red triangle	Black Diamond	DbL Black Diamond
Level	1	2	3	4	5	5
Trail Width (cm)	180 or more	90 or more	60 or more	30 or more	15 or more	15 or more
Tread Surface	Hardened or Surfaced	Firm and Stable	Mostly Stable with some variability	Widely variable	Widely variable and unpredictable	Widely variable and unpredictable
Average Trail Grade (%)	< 5	5 or less	10 or less	15 or less	20 or more	20 or more
Maximum Trail Grade (%)	Max 10	Max 15	Max 15 or greater	Max 15 or greater	Max 15 or greater	Max 15 or greater
Natural Obstacles and Technical Trail Features (TTF)	None	Unavoidable obstacle 5 cm or less Avoidable obstacles may be present	Unavoidable obstacle 20 cm or less Avoidable obstacles may be present	Unavoidable obstacle 40 cm or less Avoidable obstacles may be present Short section may exceed criteria	Unavoidable obstacle 40 cm or less Avoidable obstacles may be present Many section may exceed criteria	Unavoidable obstacle 40 cm or less Avoidable obstacles may be present Many section may exceed criteria TTF may be present

Tandems and handbikes adapted for off-road use can safely cover natural-terrain roads, mule tracks and paths included in the first, second and where it is clearly indicated in the third level of technical difficulty. Particular attention must be paid to the exposure of the path, which indirectly increases difficulty and danger of single sections!

		
Loop	Round Trip	Point to Point

Physical Exertion	Distance (km)	Elevation Gain (m)
Easiest	<10	< 200
Easy	10/25	<400
Average	10/50	400/800
More Difficult	20/40	600/1400
Very Difficult	>40	>900

COLLECTING AND SHARING GPS DATA

Members of your organization or third parties may already have collected much of the essential trail data for a map with GPS devices. In order to make use of that information, you will need to select a common data format that allows for easy sharing. The GPX data format is a good choice -- it will allow you to create a shared route library, and keep it current with regular updating. This information can be shared through online services or you might decide to reserve its pooled data for the creation of a unique map, strongly branded to the organization needs and designed to suit its goals. Either way, the fun part will be getting out in the field with GPS units and exploring the trails.

Plan Ahead

- Make a list of data you want to collect with your GPS unit.
- Set properly your GPS unit (especially the track recording method!).
- Carry extra batteries.
- Allow for extra time to collect points and take notes.
- Mount the unit on the bike. Placing it near the stem keeps it centered over the trail.

After the Ride

- Download and backup data (Track and Points of interest) as soon as possible.
- Document necessary information while it's fresh in your mind.
- Edit the Track (with Google Earth, SAS Planet or other software) using satellite images or good detailed maps on the background to solve any problems.

PROMOTING TRAIL SYSTEMS WITH PRINT AND ONLINE MAPS

Good maps do much more than point out where the trail goes. Through the use of text, logos and other and visual symbols, they can offer guidance about trail etiquette and user relations, showcase your club's commitment to sustainable design or even strengthening advocacy efforts.

For example, a map might be designed to highlight threatened trails. Or, you could build a map that helps land managers identify valuable mountain bike trails that have not been adequately documented on official travel plans. Another great option is to employ a map in fundraising appeals and membership drives. There is no better way to display the scope of your club's efforts than a visually appealing and informative map.

Planning and Design

While advances in technology have made mapmaking easier, producing a quality map still requires substantial planning and a hefty amount of effort. Professional assistance with graphic design and the sophisticated use of Geographic Information Systems (GIS) software will greatly enhance a project. The hard work will pay off when you proudly display an interactive map with information about signature trail projects on the club website, or distribute beautiful printed maps to local shops and place them at trailhead kiosks.

By blending the traditional concepts of cartography with the specifics of trail riding, you can create a simple, useful and beautiful resource. Important design principles to keep in mind include:

- Arrange graphic elements so that the important information stands out from non-essential details.
- Elements like route descriptions, elevation profiles and climate information will enrich the project.
- Don't obstruct important elements by labeling every feature on the map.
- Use colors that focus the map user's attention and are easy to understand. Also, consider colors that will be easy to print and reproduce.
- Essential data (route, trailhead, obstacles, etc.) should command the map user's attention while the supporting data (topography, rivers/streams, etc.) should add subtle enhancements.
- Ensure that the final version of your map matches the trails and markers in place. Any difference between map and trail signs can be very confusing for users.