

1. How does a ropeway work?

In the case of a ropeway, passengers or freight are transported from station to station in or on carriers (cabins, chairs or T-bars) suspended from a rope that is guided over towers. Passengers can board and disembark in the stations. The drive is electric and located in one of the stations. The main components of a ropeway are the carriers, rope, drive station and towers.

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Carrier: Used to carry passengers.

Rope: Used to support and move the carriers.

Drive: Used to move the ropes and consequently the carriers.

Tower: Used to carry the rope.

Station: This is where passengers can load and unload. In addition, all the equipment for the drive and/or the return of the rope is located in the stations.

Mid stations: Can be added and enable a change of direction in a ropeline.

1.1. How does the ropeway drive work?

The ropeway drive is an electric motor, which is centrally located in the station. It acts directly onto the bullwheel, which propels the rope and the carriers. Brakes, gear units and motors are not required in the individual carriers as these are hauled, accelerated and braked solely by the rope. This technology is very energy-efficient, environmentally friendly and economical.

Various drive concepts exist – with or without gear unit. The drive concept is always adapted to suit the given situation.

2. What types of ropeway are there?

There are many ropeway systems. Those best suited to the urban environment are continuous-movement monocable ropeways (detachable gondola lifts) with cabins for max. 10 passengers, reversible aerial tramways with cabin sizes up to 230 passengers, tricable gondola lifts with cabins for up to 34 passengers, funicular railways or Cable Liners.

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Ropeway systems for the applications winter, summer, urban and material: detachable gondola and chairlifts, fixed-grip chairlifts, reversible aerial tramways, tricable gondola lifts, funicular railways, Funifors, Funitels, combination lifts, pulsed-movement aerial ropeways, surface lifts, RopeCons, Monoracks, Cable Liners, avalanche blasting ropeways and material ropeways.

Link to systems on website.

3. What does a ropeway cost?

The costs of implementing/building a ropeway are a fraction of the cost of other modes of transport: 1/3 that of a tramway, 1/10 that of a subway.

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Every ropeway is custom-tailored to the specific project. For that reason, the costs of a ropeway installation depend very much on the individual project and the numerous design parameters such as purpose, transport capacity, vertical rise, number of stations, length, alignment, etc.

4. How many people can a ropeway carry?

The maximum transport capacity of a ropeway is 6,000 passengers per hour and direction.

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By way of comparison: To transport 10,000 passengers an hour (5,000 in each direction), you need 2,000 automobiles (fully occupied, with 5 passengers each) or 200 buses (bus capacity for 50 passengers). This, in turn, requires more space (e.g. in order to build a wider and bigger road) and produces noise and emissions.

5. How environmentally friendly are ropeways?

Ropeways are environmentally friendly. They are electrically operated – with no exhaust emissions and no noise – and they have a comparatively small ecological footprint. Only cycling or walking is more environmentally friendly.

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Example: 0.1 kW is consumed per km ropeway trip/passenger. This is the equivalent of blow-drying your hair for 5 minutes.

6. When do you use which ropeway system?

Doppelmayr/Garaventa can build virtually any ropeway system in urban spaces. The choice of system will depend on the “traffic problem” to be resolved and the requirements. Parameters such as purpose, alignment, safety, vertical meters to be climbed, availability, transport capacity, passenger groups to be carried (bikes, wheelchairs, strollers), carrier comfort, etc. are the deciding factors.

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Ropeways generally optimize material and passenger flows – irrespective of whether it's in cities, at ski resorts or in summer tourism. In addition, ropeways boost the development of tourism. *A questionnaire on this topic should be developed and inserted.*

7. How fast do ropeways travel?

The trip time on a ropeway is short. The great advantage of a ropeway is that it can travel without being affected by other means of transport (buses, automobiles, etc.) – because it moves in an entirely different transport plane and glides above road traffic and congestion. Furthermore, the ropeway takes virtually no detours (as it moves through the air). Another factor in its favor is that a ropeway operates continuously (with no timetable and no stops).

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A continuous-movement monocable ropeway runs at up to 7 m/s (25.2 km/h); a tricable gondola lift at up to 8.5 m/s (30.6 km/h). Examples from road transport: In Vienna, the average speed of road traffic is 21 km/h; in Berlin it is 18 km/h and in Stuttgart 17 km/h. This traveling time also reflects the need to respect laws and standards.

8. How tall are ropeway towers?

The height and architectural design of ropeway towers can be adapted to suit the relevant situation.

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Tower height depends on the ropeway system, the required height above ground, tower spacing, topography and other factors. The towers in La Paz, Bolivia, for instance, are on average around 22 meters tall.

9. How big are ropeway cabins?

Ropeway cabins come in many sizes and variations. Depending on the ropeway system, these can hold from 6 (continuous-movement monocable ropeway) to 34 (tricable gondola lift) and as many as 230 (reversible aerial tramway) passengers. Ropeway cabins are also designed for barrier-free access and can therefore be used by everyone.

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The cabins are designed to suit the respective purpose (e.g. for carrying freight as well as passengers) and to address other crucial parameters such as transport requirements (bikes, wheelchairs, strollers), desired comfort and transport capacity.

10. What sets ropeways apart from other urban transport solutions?

The ropeway opens up an entirely new transport plane: It travels above existing infrastructure, which can still be used for city life. Obstacles such as rivers or hills can be crossed without any difficulty. The ropeway moves independently of traffic volumes and is not held up by congestion. In addition, ropeways run continuously and therefore do not need a timetable.

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Ropeways also have a host of advantages that harmonize very well with other modes of transport. This means that ropeways can broaden a city's transport infrastructure as well as connecting up major hubs or hotspots with the transport network. As a result, they provide an ideal complement to and relief for the existing mobility system.

11. How long does it take to build an urban ropeway?

It takes roughly 2 years to complete a ropeway installation. In comparison with other means of transport, a ropeway project can be implemented relatively quickly.

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Stations can be integrated into existing buildings, for instance, or infrastructure incorporated or built above roads. Towers require little space and can readily blend in with their surroundings. The time required to build the world's biggest urban ropeway network in La Paz with 10 lines was roughly 6 years.

12. Do ropeway carriers allow the barrier-free transport of bicycles, baby strollers, etc.?

Ropeways are barrier-free. They are designed to carry all types of people – seniors, families with children, people with physical impairments, etc. – and also for transporting cargo. Cabins have no problem providing room for bicycles, wheelchairs, baby strollers, luggage and pallets. Level walk-in in the stations ensures easy access.

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The bigger the cabin, the greater the convenience for carrying bikes, etc.

13. Is a ropeway network (e.g. La Paz) transferable to any other city?

Each ropeway project is unique and has to be considered individually. The ropeway has the advantage that it readily lends itself to meeting a wide range of requirements – it is custom-tailored to mobility needs.

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For example, a ropeway line can connect major transport hubs to the network and/or extend the existing local transit infrastructure and therefore substantially relieve traffic congestion.

14. What are the maximum parameters of a ropeway?

The first requirement that a ropeway has to meet is that of mobility. The various ropeway systems (with their different parameters) and their respective characteristics meet the needs of a mobility solution to differing degrees (barrier-free access, comfort, transport capacity, etc.). For that reason, the system has to be chosen to meet the requirements of the specific project.

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The requirements to be met often point to which ropeway system would be best suited. Barrier-free access, transport capacity, structural footprint and comfort needs can already be the factors that decide which ropeway system would be the most appropriate.

15. How is a ropeway integrated into an urban environment?

Ropeways are a highly flexible mode of transport. Their structures (stations, towers) can be integrated into the existing infrastructure (houses, transport hubs, etc.) and their architecture individually designed to harmonize with the cityscape.

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Ropeways can also be linked with and integrated into a local transit network (combined stations, ticketing, etc.). The towers take up little space and additional amenities like shops, info points or restrooms can be provided in the stations.

If you have any question that have not been answered in this section, please feel free to contact us via email at mobility@doppelmayr.com – we are pleased to help!