URBAN ROPEWAYS - SOLUTION for CONGESTED CITIES
In just a few years’ time, two-thirds of the world’s population will live in cities.

Many cities are already fighting major traffic problems and congested streets.

Simply switching to electric vehicles will not be enough.
There is a need for innovative, environmentally friendly solutions. One such could be **opening up a new level** with ropeways.

Urban ropeway running right above the streets in Medellin / CO
Overview of urban ropeway systems

**TOP-SUPPORTED**
- GD Monocable Detachable Gondola
- 2S Bicable Detachable Gondola
- 3S Tricable Detachable Gondola
- PULSED GONDOLA
- AERIAL TRAM

**BOTTOM-SUPPORTED**
- FUNICULARS
- INCLINED ELEVATORS
- MINI-METRO
Ropeway systems ideal for urban applications

Tricable ropeways (TD)

Monocable ropeways (GD)
CHARACTERISTICS OF ROPEWAYS

Overview

- Low space requirement
- A great view
- Clearing obstacles
- Exclusive route
- Continuous transportation
- Quick to build
- Handle steep slopes
- Connection to recreation areas
- Central drive and positive energy footprint
- Environmentally sustainable
- Small capital investment and operating costs
- Accessibility
- Comfortable cabins
- Safety
- Social impact
- Architecture
APPLICATIONS OF URBAN ROPEWAYS

Ideal for

- Little available space
- Short to medium distances
- Overcoming gradients
- Clearing obstacles
- Tourism
- Environmentally friendly transportation
- Continuous transportation

Some potential applications (dashed lines)
CHARACTERISTICS OF URBAN ROPEWAYS

Low space requirement

Ropeway stations and towers take up little space and can blend harmoniously into the urban landscape.

Bottom station of the Renon ropeway - Bolzano city center
A great view

Passengers enjoy a unique view during their journey.

This will invariably make ropeways something of a tourist attraction as well, providing an additional source of revenue.
CHARACTERISTICS OF URBAN ROPEWAYS

Clearing obstacles

Being airborne, ropeways can overfly obstacles.

Running over a river and houses in Tbilisi, Georgia.
There is no conflict with other traffic users, since the route is used exclusively by the ropeway.
Aerial tramways are not affected by ground level traffic. The air transit route for the exclusive use of the cable guarantees consistent and regular travel times.

Passengers are transported continually—with no timetable and no waiting times.
CHARACTERISTICS OF URBAN ROPEWAYS

Quick to build

Right after the order, ropeways can be constructed over a short period of time. This is mainly possible thanks to the use of a modular construction.

Example: GD8 Narikala in Tblisi (GE) has been realized in only one year.
CHARACTERISTICS OF URBAN ROPEWAYS

Handle steeper slopes than any other vehicle

Ropeways are designed to handle steeper slopes than any other vehicle.*

A ropeway can be aligned flexibly to the area.

Limit value former standard of ropeways was 100% now it is unlimited

The road snakes its way – the aerial tramway takes the direct route
Ropeways are particularly used for the connection to sensible and recreation areas.
Ropeways are operated **environmentally friendly** with electrical power.

Energy consumption can be adjusted to the number of passengers.

Many vehicles can be powered by a single central drive unit in a station.

One engine is sufficient. Extremely efficient: LEITNER DirectDrive
Environmentally sustainable

As well as being powered by environmentally friendly electricity, ropeways also have a lower environmental footprint and emit less CO$_2$.  

Metro de Medellin, Colombia
In comparison with other transport systems, ropeways require relatively small capital investment and operating costs.

A ropeway costs up to 50% of a tramway and up to 10% of an underground system.
All cabins offer accessible boarding and deboarding (level-walk-in).

Cabins travel through stations very slowly, enabling passengers to board and deboard with ease.

Stop-and-go technology also allows cabins to be stopped completely for short periods of time.

Bikes, baby strollers, etc. can be taken on to all cabins.
Comfortable cabins

Modern ropeway cabins can be fitted with seat heating, WiFi, and multimedia, as well as offering air-conditioning and lighting functionality.

Cabins can be tailored to customer requirements.
URBAN DESIGN ADAPTABLE TO CHANGING NEEDS
In comparison to other transport systems:

Vehicle accident investigation of the statistics federal office Wiesbaden of 2011 (time period 5 years – referring to the travelled passenger kilometers):

- **Aircraft:** 1 accident to 113 Mill. km
- **Ropeways:** 1 accident to 17.1 Mill. km
- **Car:** 1 accident to 1.46 Mill. km
- **Train:** 1 accident to 1.31 Mill. km
- **Bus:** 1 accident to 616,000 km
- **Tram:** 1 accident to 225,000 km

→ After aircrafts, ropeways are the second secure transport system

By changing the common base number from the number of carriage kilometers to the number of carriage the safety of ropeways is out of reach.
A faster route to the city center and thus also to a job.
Architecture

With a ropeway system architecture offers more numerous possibilities for creativity:

Architecture can: Freely design the stations - Be involved in the type of construction and color of the support towers - Have an influence on the appearance of the cabins
Autonomous or connected to a multimodal public transit network, AIRWAY solutions are adapted to the most complex urban layouts and the most intense flow of passengers.
GD10 Ecapetec 1+2

- 2,919 / 1,805 m
- 55 / 62 m
- 3000 p/h
- 650 / 650 kW
- 108 / 76
- 20 / 16
GD10 Gardens of the world

- 1,514 m
- 83m
- 3000 p/h
- 623 kW
- 62
- 10

Berlin / DE 2017
GD10 Mio Cable

- Length: 2,037 m
- Height: 65 m
- Capacity: 3,000 p/h
- Power: 525 kW
- Speed: 90 m/min
- Height: 14 m
GD10 Yenimahalle 1+2 / 3

- 3,228 m
- 198 m
- 2,400 p/h
- 440 kW / 720 kW
- 106 +2VIP
- 25
GD10 Cambulos - Villamaria

- 705 m
- 27 m
- 2,100 p/h
- 150 kW
- 22
- 4

GD10 Cambulos – Villamaria, Manizales / CO 2013
GD8 Telefèric de Montjuïc

- Distance: 753 m
- Vertical rise: 85 m
- Passengers per hour: 2,990 p/h
- Power: 410 kW

GD8 Telefèric de Montjuïc, Barcelona / ES 2016
MiniMetro Perugia

MiniMetro Perugia, Perugia (IT) 2007

3,027
161
3,000
1,100
CASE STUDY: AEROVIAS DE GUAYAQUIL

PROJECT LOCATION – GUAYAQUIL, ECUADOR

General Description
- Aerovias de Guayaquil is an aerial tramway project located in Guayaquil, the most populated city in Ecuador (pop. 2.3 million)
- The Project will connect the Guayaquil city center with neighboring city Duran, a suburb of Guayaquil located across the Guayas River
- Commute time in this 4.1 km stretch will be 17 minutes. Aerovias de Guayaquil will have 4 passenger stations —three in the city center and one in Duran, plus a technical station—and will operate using 154 cable car vehicles

Contract Structure
- Aerovias is being tendered by the Municipality of Guayaquil as a Design, Finance, Build, Operate and Maintain concession contract
- **Financing:** under the concession contract, the Project will be financed through a mix of (i) a public sector loan to the Municipality of Guayaquil (up to 85% of the Project costs) and (ii) financing obtained by the Consortium, composed of equity and potentially senior secured non-recourse project finance debt.

<table>
<thead>
<tr>
<th>Project Highlights</th>
<th>Value</th>
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<tbody>
<tr>
<td>Total Length</td>
<td>4.1 km</td>
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<tr>
<td>Stations</td>
<td>4 (Duran, Malecon 2000, Julian Coronel, Parque Centenario) + technical station (Hospitales)</td>
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| Tariff             | Full tariff across River: $0.70/passenger  
 Full tariff intra-Guayaquil: $0.50/passenger  
 50% Reduced Tariff for minors, disabled citizens, and seniors |
| Total project cost | USD 134 million |
| Concession Term    | 30 years (from signing) |
| Construction Period| 24 months |