

# Fast moving walkways could move 7,000 people per hour

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LE TROTTOIR ROULANT ET LE PHARE ALLEMAND

Le trottoir roulant a l'aspect d'un ruban sans fin; il est formé de deux plates-formes mobiles animées de vitesses différentes et d'un trottoir fixe permettant de passer de l'arrêt à la vitesse. Notre photographie est prise au moment où le trottoir quitte le quai d'Orsay pour suivre l'avenue de la Bourdonnais. On aperçoit au fond le Tour du Monde et le Phare Allemand.

In the Paris world's fair in 1900 the moving sidewalks were a must. Credit: Brown University

EPFL researchers have been studying futuristic transport solutions for car-free urban centers. They have come up with an optimal design for a network of accelerating moving walkways.

Could moving walkways help people get where they want to go in cities? This is not a new idea. The first moving walkways were seen in Chicago in 1893, and seven years later they were used at the world's fair in Paris. Since then, the idea periodically resurfaces in sci-fi books, but also in the minds of transportation engineers and urban planners in search of eco-friendly transport solutions. In a breakthrough study, EPFL researchers have analyzed the feasibility of fast moving walkways in an urban setting. Their results are encouraging.

Their task consisted in imagining a world – or a city – without private cars in which space designed for automobile use could be repurposed. Individual transport needs would be met by a combination of conventional methods (buses, metros, trams, taxis, bikes, etc.) or by more innovative methods like bike- or car-sharing or urban cable cars. It was with this in mind that EPFL's Transport and Mobility Laboratory studied accelerating moving walkways, which can go up to 15 km/h, to see if they could compete with other means of transport.

## **Geneva as a case study**

"15 km/h is around the average speed at which people travel through most large cities during rush hour," said Riccardo Scarinci, the lead author of the article that will be published in the European Journal of Transport and Infrastructure Research. Researchers at the Transport and Mobility Laboratory focused on the feasibility of a network of moving walkways. They attempted to come up with the optimal design, taking into account the road network, demand, the speed required to make the system competitive, energy consumption and operational and budgetary constraints.

The researchers used real data from Geneva in developing their mathematical model. They explored various configurations of the following factors: speed, acceleration, length and width, not to mention intersections and entry and exit points.

They optimized their network by closely analyzing people's daily travels in Geneva – from start to end – along primary, secondary and tertiary roads. The ideal network they developed begins with a small ring around a car-free urban center and extends out along primary roads on 47 different links equipped with 10 gates for a total length of 32 kilometers. There are 37 intersections where expressways would be set up using bridges or underpasses.

## **A high-capacity and sustainable solution in limited space**

Moving walkways offer two advantages. First, they are narrower than roads: they measure 1.20 meters across versus 2.5 to 3.5 meters for a roadway. That means that one road is wide enough to hold moving walkways in both directions while still leaving room for other means of transport. In terms of volume, a moving walkway can handle 7,000 passengers per hour, while a roadway can accommodate between 750 and 1,800 vehicles.

The question of cost is of course fundamental. Moving walkways consume less energy than buses, which are the most fuel-efficient transport method these days. "Because they are entirely electric, moving walkways represent a sustainable and eco-friendly [transport](#) system," according to the authors. And their operating cost is similar to that of buses. "The main downside is the cost of construction. It will cost about as much to install one line as to build a new tram line," says Scarinci. "But the cost could drop somewhat if the system were installed on a

large scale. That's why a network of walkways only makes sense in dense and highly congested cities."

## **Handing off to urban planners**

"We have not come up with a turnkey solution," says Michel Bierlaire, the director of the Transport and Mobility Laboratory. "But this study proves that the concept is credible and that a car-less, pedestrian-centric city is conceivable. This is a useful starting point for [urban planners](#) to evaluate the feasibility of accelerating moving walkways."

Provided by Ecole Polytechnique Federale de Lausanne

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