



Urban Pathways

FACTSHEET on
Tram Systems
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**Wuppertal
Institut**

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A tram system consists of vehicles, which run on tracks on urban roads. They usually share the street with other road users (private vehicles, cyclists, pedestrians), but some lines might also operate on a segregated right of way. The lines or networks on which tramcars operate (known as tramways) are powered by electricity; they are designed to be unobtrusive to allow pedestrians, cyclists and drivers to freely circulate around them, or on the infrastructure when it is not being used by the trams. Depending on the design and the region, trams may also attach to overhead electric wires.



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Examples

Many larger cities around the world have introduced tram systems because of their flexibility. Among many others, these include Melbourne (Australia), Newcastle (UK), Lisbon (Portugal), San Francisco (US), Budapest (Hungary) and Düsseldorf (Germany). Although some cities use this system as a main transport mode, they often mix it with light rail for longer commutes or bus routes to provide more flexibility in the network.

The main features in a tram system include:

- Vehicles, usually 1-4 cars in a tram
- Tramway line or network, and sometimes overhead wiring
- Signalling
- Onboard fare collection system
- Open station stops, light infrastructure

Results

Trams save three times more energy than regular buses. People also find them more enjoyable as they do not lurch, swerve and vibrate as much as buses. Trams are popular in many cities as they are cheap for riders and convenient for cities. They reduce traffic congestion and are environmental friendly; as they do not use fuel, they do not directly produce greenhouse gas emissions.

Trams, as with other road public transport systems, use space efficiently; one tram vehicle replaces about 40 private cars, which take up a far larger area of road space and move far less people. In periods of peak demand, tramcars can easily be added to the trams without needing extra staff, providing a higher capacity than similar transport systems. In Dresden (Germany), the busiest bus lines were replaced with a tram system that now runs every three minutes at peak times.

Technical and Financial considerations

Compared to other rail systems, especially metro systems, tram systems do not cost as much to construct and operate – but they cost considerably more than bus systems. The cost for 1 km of tramways can be up to \$75 million (€68.3 million) compared to \$8 million (€7.3 million) for 1 km of a Bus Rapid Transit (BRT) line. This is the reason why the latter is more popu-

lar in developing countries. On the other hand, tram systems require 20% less maintenance than buses. In short, installing tracks and purchasing vehicles cost a lot, but in the end, the maintenance and operation costs are lower.

The life of a tram vehicle is much longer than inner combustion vehicles, and the cost for propulsion resources is lower than diesel and gasoline buses. In this case, trams are highly cost effective.

Policy/legislation

Mass transport systems such as trams can be part of short- and long-term mobility solutions for large, medium and even small cities. In terms of the institutional framework, best practices clearly show the need to have a single transport agency in charge of planning, managing and controlling the different transport modes. Overall, cities must help public transport initiatives with regulations, programs and:



- Land-use planning instruments
- Environmental standards (including fuel efficiency and technology)
- Public transport service quality plans
- Fare regulations
- Public transport subsidy schemes
- Operational regulations

Institutions

Leading institutions that oversee tram systems are public transport planning institutes, public transport companies and urban transport administrative departments. Institutions that may be involved in introducing tram systems include environmental protection agencies, electric power companies, and mass transport agencies.

The hierarchy of the authority (federal, regional or local) depends on the existing institutional and legal frameworks. It is necessary to coordinate with entities responsible for the environment, urban development, public space, public works, social and economic development and social communication. Other institutions might include the secretary of state (or related local agency) and the agency in charge of finances.

Transferability

This type of rail system is adaptable to any situation. This why there are over 350 tram systems around the world, some dating from the late 19th or early 20th centuries. Even though a considerable number of these systems were closed during the mid-20th century, in recent years, trams have made a comeback in several European and American cities. Since 1985, 120 tram lines/networks have opened.

The exibility of the tram's light infrastructure makes it adaptable to any kind of urban context, topography and climate. Even so, developed countries such as the US, Australia and several countries in Europe are more likely to introduce trams. Due to its high start-up costs, developing countries find public transport such as trolley buses or BRT more suitable.

Case Study: Croydon's Tram system (United Kingdom)

Context

In the mid-1800s, the borough of Croydon in south London was rapidly growing and in need of an aordable public transport mode. This gave way to horse-drawn trams, followed by electric trams running in the area.

Today, the necessities have not changed much. Croydon and the surrounding boroughs (Sutton, Merton and Bromley) have been going through a significant urban transformation due to an investment program aimed to improve and encourage the local economy and urban and housing development.

The government saw the necessity of providing south London with reliable orbital transport links to serve the developing area. Tramtrack Croydon started construction in 1997 and began operating in 2000 with 24 trams, capable of providing service to more than 200 passengers each.

In action

The Croydon Tramlink was the first tram system in London since 1959, and became immediately popular. South Londoners quickly adopted the system, and annual passenger numbers grew from 18.5 million in the rst year to 27 million in 8 years. The tramway is 28 km long and has 39 stops. Its configuration presents a mixture of exclusive right-of-way in some public roads and street track shared with other traffic.

In 2008, Transport for London, the local government body responsible for London's transport system, bought Tramtrack Croydon and made a number of improvements to the network, which in some parts was in bad condition.

The system adds more tramcars at peaks hours and when going through key routes, carrying more than 200 passengers - almost three times more than a double-decker bus. A double track has more capacity than a dual carriageway, yet only requires one-third of the space.

All trams and tram stops are now accessible to people with a wide range of disabilities. The vehicle oors are

level with the platforms, making it easy for wheelchair users, mobility impaired passengers and parents with children in pushchairs to board. The tram interiors have colour-contrasting grab rails, designated spaces for wheelchair users, priority seats, audible and visual customer information and door warnings.

Results

According to the chief executive of the Croydon Business Improvement District, the tram network, “has quickly become symbolic of Croydon’s connectivity and is a powerful asset for our town centre and local businesses, providing easy access for employees, visitors and residents.”

It has transformed the urban image of south London and the way people move. Surveys show that 20% of Tramlink passengers used to travel by car, meaning that the Tramlink has helped remove private vehicles from the roads - contributing to the reduction of traffic congestion and pollution. Another benefit is that the vehicles are both energy and space efficient.

Surveys show that customer satisfaction scores remain high along the network. However, the system is soon to face significant challenges as the population in London is growing faster than any other European city – set to reach 10 million by 2030. In 2014/15, there were 32.3 million tram journeys, and this is expected to hit 60 million by 2030.

With the important urban redevelopment taking place in the area, trams will be crucial in the movement and connection of people to main attraction points. The Tramlink is a long-term solution to improving transport quality by reducing waiting times, and providing integration with the new layout of Croydon’s town centre.





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