



## Intracity light rail



Seville, Spain  
Photo: Ko Sakamoto

### Intracity light rail explained

Light rail transit (LRT) is an electric rail form of transport for urban centres that range from a conventional on-street tramway to segregated rapid transit systems. Light rail systems bridge the gap between conventional bus services and urban heavy rail or underground metro railways. Light rail systems have only been implemented in relatively wealthy developing cities. Recent examples include the elevated Putra and monorail system in Kuala Lumpur.<sup>1</sup>

### Performance, evaluated

Capacity	High: 170 persons per six-axle tram and 250–350 per multi-articulated light rail vehicle; approximately 12,000 passengers per direction per hour.
Geographical range	Low to high (from up to 5km to beyond 20 km)
Implementing cost	High (above 1 million USD per km): The cost varies, based on a number of factors, including the extent of grade separation, geological conditions and the price of labour and materials. <sup>2</sup> The capital costs of a light rail system in the United States, for example are on average US\$21.6 million per km.
Payback period	Medium to high (within 10 or more than 10 years)
Applicable city size	Medium and large (from 500,000 to more than 5 million inhabitants)
Applicable stage of development	Developing and developed countries
Examples	<ul style="list-style-type: none"><li>• Putra light rail in Kuala Lumpur, Malaysia</li><li>• LRT and urban revitalization in Japanese cities (Hiroshima)</li><li>• Large-scale LRT in more than 20 French cities</li></ul>

### Strengths of bus rapid transit

- Flexible and expandable compared with the heavy and metro railways.
- Intermediate capacity, between metro and bus and applicable to a range of passenger capacities and city sizes. It offers a sound solution for small cities, even those where passenger demand is fewer than

<sup>1</sup> Lloyd Wright and K. Fjellstrom, *Sourcebook Module 3a: Mass Transit Options* (Eschborn, Germany, GIZ, 2004).

<sup>2</sup> *ibid.*

3,000 passengers per hour per direction.<sup>3</sup> LRT is also applicable to larger cities, making the approach very flexible to a range of circumstances.

- Effective at supporting a modal shift from cars, if well designed.
- Positive impact on the development of land at interchange points.
- Produces no tailpipe emissions.<sup>4</sup>

## Challenges to using bus rapid transit

- Potential resistance from private vehicle users.
- High levels of initial investment required. In most cases subsidies from local government are required.
- Implementation is institutionally demanding, especially for countries where there is often a fragmented institutional set-up.

## Limitations

- Requires the provision and enforcement of a segregated lane.
- Costs may limit the geographical extent of the service.
- Construction on steep gradients is technically and financially difficult.

## Implementing strategies

**Highlight the benefits of an LRT:** to help secure the buy-in of senior politicians; for example, that it supports the development of the city and a modal shift from private vehicles.

**Consider setting up a central body:** responsible for the operations, maintenance and administration of urban transport and ensure that there is a team with dedicated responsibility for the LRT.

**Consider sources of funding** to support implementation and operation.

### BOX 1: Success factors for implementing the LRT in France

The LRT has proven to be particularly successful in France and is changing the face of its cities. By 2005, more than 20 cities had introduced or were planning an LRT. The success factors include:

**Adoption of an integrated approach to transport and urban regeneration.** The French approach looked to return the streets to the people instead of the motor car. French cities combined the introduction of a tramline with making city centres more amenable to pedestrians, the reorganization of the local road network and a restructuring of the underlying bus network to support – and not compete with – the tramway.

**A local business tax covering the cost of implementation.** Since the early 1980s, businesses have been required to pay a local transport tax, known as the Versement Transport, which provides a constant and reliable source of funding.

**Dedicated right of way.** Dedicated lands for the light rail lanes provided some separation from normal road traffic and helped to improve the operational reliability and increase average speeds.

**Technological advancements supporting an effective service.** Technological solutions have enabled vehicles to be matched with local requirements, including seating arrangements, on-board facilities and the driver's cab and control panel.

## Further reading

“Light rail transport is changing the face of French cities”, by M. Knutton, *International Railway Journal* (2005).

*Sourcebook Module 3a: Mass Transit Options*, by L. Wright and K. Fjellstrom (Eschborn, GTZ (GIZ), 2004).

<sup>3</sup> Mike Knutton, “Light rail transport is changing the face of French cities”, *International Railway Journal* (2005) March. Available from [http://findarticles.com/p/articles/mi\\_m0BQQ/is\\_3\\_45/ai\\_n13502068/](http://findarticles.com/p/articles/mi_m0BQQ/is_3_45/ai_n13502068/) (accessed 22 February 2012).

<sup>4</sup> Lloyd Wright and K. Fjellstrom, *Sourcebook Module 3a: Mass Transit Options* (Eschborn, Germany, GIZ, 2004).