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How to make public transport an attractive option in your city

[Finance and Economics](#)[Transport](#)[Urban Planning and Design](#)Originally Published: **March 2019**Author(s): **C40 Cities Climate Leadership Group, C40 Knowledge Hub**

Successful public transport is essential for any transport sector emissions reduction strategy. It is a public good, delivering benefits for transport efficiency, pollution reduction, the local and national economy, and social inclusiveness. To make public transport an attractive and everyday choice for residents, cities must design the service well, and overcome physical and cultural barriers. High quality public transport services are reliable, frequent, fast, comfortable, accessible, convenient, affordable and safe, serving routes for which there is demand.

This article introduces the essential infrastructure, service considerations, network planning and public messaging needed to realise public transport's full potential.

Understand existing service quality, and current and potential usage, to inform upgrade decisions

The core consideration for analysis are:

- **Current travel behaviour and mode choice:** Examine factors including travel distance, routes, mode(s), trip purpose, travel time, cost, and the availability of parking to understand travel patterns and determine the attractiveness of transit compared to other modes of transportation. Also consider current journeys taken by car that could be taken by public transport.

- **Transit service characteristics:** Assess transit frequency, reliability, coverage, speeds, fare structure, and connectivity with other modes of transportation. These factors influence the convenience and attractiveness of transit, and can impact ridership.
- **Land use and accessibility:** The spatial distribution of land uses and the accessibility of destinations play a significant role in determining transit demand. Map employment centres, public services, educational institutions, commercial areas, as well as residential densities, to understand the potential demand for transit in different areas.
- **Policy and planning factors:** Consider the impact of policy and planning initiatives aimed at promoting transit usage, such as transit-oriented development, congestion pricing, parking policies and subsidies, which can influence travel behaviour.
- **Theoretical transit demand:** Use modelling and forecasting techniques such as travel demand models and stated preference surveys to estimate theoretical transit demand. These techniques help quantify the relationships between different factors and predict the potential ridership for different transit scenarios.

This analysis should inform decisions such as where new transit routes should go, or how frequently these lines should operate on them at different times of day.

Cities can use GPS, automatic fare collection systems and other technology to make it easier and cheaper for transit planners to harness rich data. Cities should complement quantitative data with nuanced qualitative data about users' public transport experience.

Analysis should be ongoing to enable the public transit network to develop alongside other changes in the city – too often routes and services remain static.

Employ a scenario-based approach route planning and expanding transport networks

Transport planning practices have historically followed the 'predict and provide' approach, which uses data on current or historical transport usage and traffic patterns to determine the future need for infrastructure. However, this tends to maintain the status quo by perpetuating dependence on the private car through provision of additional highway capacity.¹ Instead, a scenario-based approach considers scenarios informed by the city's vision for the future, and the desired and anticipated changes to travel patterns that are needed to meet that vision, to develop transport infrastructure and services to meet evolving needs.

- **Vancouver** adopted a scenario-based approach to route planning and expanding its transport networks, aiming to grow sustainable transportation options. The city's analysis of different growth patterns, land use scenarios and transportation demand projections supported significant investments in public transit expansion, including the SkyTrain rapid transit system and bus networks, as well as in cycling infrastructure and pedestrian-friendly streets.

- **Stockholm** used scenario analysis to assess population growth, urban development and transportation demand. The analysis has informed investment in expanded public transport systems, including the metro, buses, and commuter trains, in addition to the implementation of road infrastructure improvements and congestion pricing measures to optimise traffic flow and reduce emissions.

As part of this analysis, cities should seek to understand how different groups use public transport systems and identify underserved groups and their specific needs.

Raise revenues, seek public and private investment, and be prepared to subsidise operational costs

Mass transit options such as metro, light rail transit (LRT), trams and bus rapid transit (BRT) are the most efficient and sustainable ways to move large numbers of people across the city. However, the COVID-19 pandemic hit municipal transport budgets hard due to both decreased fare revenues and increased operating costs. Investing now in the future of public transport is essential if cities are to make it an everyday choice in the months and years to come.

Building dedicated bus lanes for BRT and improvements to bus service frequency can usually be implemented relatively quickly and cheaply, compared to other forms of mass transit. Large physical infrastructure projects which typically transport more people without taking up road space – particularly rail and metro – are comparably expensive, politically complex and usually take many years to be planned, financed and implemented. Therefore, mass transit needs to be integrated into long-term transport and urban development strategies, informed by assessment of the most appropriate mass transit option(s) locally.

By clearly laying out a programme of intended future transit investments, cities can build political coalitions behind projects, coordinate the multiple parties involved in planning and delivering them, and make it easier to secure financing from both government or private sources.

The main financing options are:²

- **Public finance.** Cities will usually require a combination of national, state and local funding sources to build public transit infrastructure. This includes municipal bonds or loans, for example. Loans and grants from national banks help to mobilise investment capital and improve the bankability of large-scale projects.
- **Public subsidy.** This is nearly always required to cover operational costs. The notion that a



English

is a common

successful public transport system fully pays for itself through passenger fare revenue. This is a common myth; rather, it delivers vast external economic benefits including improved health outcomes and congestion. The fare and level of subsidy is a political decision. To set the fare, transit agencies should consider factors including local wage distributions, social equity and the negative externalities relating to private vehicle use. A study for Auckland, for example, found that private vehicles generate 28 times the external cost of public transport.³ The subsidy agreed or requested is the difference between the expected revenue from fares and the operational cost, plus the level of funds that enable the city to improve transport service quality rather than simply maintain current levels of service.⁴

- **Raised revenue.** For example, from fares, road pricing, transport taxes, parking fees, land-value capture and other transport-related policy.
- **Private investment.** This includes public-private partnerships and bonds.
- **Multilateral development banks.** Developing country cities may be able to obtain financing support from multilateral development banks.

Each of these instruments has advantages and disadvantages, and their feasibility will vary depending on the project type and local political and financial context. For more information about financing public transport, read *Six effective ways for cities to invest in climate action* and follow the links to access further resources.

Take a whole-network approach to public transport planning

Promoting a whole-network, intermodal approach to physical transit planning, fares and operations includes:

- **Physical planning.** Mass transit routes, as well as walking and cycling infrastructure, should be planned to intersect each other, so that passengers can easily move from one mode to another to complete their journeys. NACTO's *Transit Street Design Guide* offers practical and comprehensive guidance on all aspects of this, including on designing transit lanes, intersections, stations and stops.
- **Integrated fares.** Payment systems should be integrated so that passengers only pay once for trips that include multiple public transit modes. Smart ticketing systems automatically adjust the fare that is charged to take into account each passenger's specific journey and travel frequency.
- **Integrated operations.** Ideally, a single agency should be responsible for managing all public transport systems in the city. This allows for seamless intermodal integration and timetabling, smart ticketing and single apps for users to find information. London is a good example of this: Transport for London is responsible, either directly or through licenses and franchises, for managing London's metro, bus and tram (DLR and Tramlink) systems, city-wide cycling infrastructure, taxis and water buses, in addition to London's Major Road Network (most smaller roads are managed by Borough councils).

Additionally, take a whole-city, integrated approach to public transport and urban planning.

Prioritise transit-oriented development, whereby jobs, housing, services and amenities are clustered around public transport hubs, and adopt a ‘15-minute city’ vision to promote easy and equitable access to amenities with strong walking, cycling and public transport connections.

Improve local air pollution by shifting to zero emission buses. Travel using a diesel bus exposes riders to high levels of air pollution.⁵ Renewing outdated, polluting bus fleets by shifting to electric buses reduces air pollution exposure for bus riders and on city streets, while providing a more modern and comfortable bus experience. Read *How to shift your bus fleet to zero emission by procuring only electric buses* for information on how to do this.

Ensure mass transit investments are adapted to the city’s climate risks. *Reducing climate change impacts on mass transit* provides a concise overview of the approaches that cities can take.

Improve the bus transit experience through reliable and easy-to-use services

In many cities, bus networks are inefficient, overlapping, irregular, have hard-to-read route maps, unbalanced coverage of the city and differing operating hours. This is often due to their organic historical expansion. Nevertheless, these systems are widely used and hold huge potential.

Cities such as Seattle, Houston, Barcelona and São Paulo have successfully invested in redesigning their networks and improving service standards by:

- **Optimising bus routes to minimise overlap and ensure coverage across the city in line with demand.** Houston re-specified their service after the LRT was put in place to reduce overlapping of these services and to ensure transit coverage in other areas of the city. This resulted in a 7% increase in ridership on local bus and light-rail from 2015 to 2016.⁶
- **Designing an intuitive network and easy-to-read bus map.** Since 2010, Barcelona has maximised the design value of its grid-based road network to incrementally implement a bus network with vertical North-South routes, horizontal East-West routes and diagonal routes – an intuitive design that makes it easy and practical for citizens to use.
- **Providing high-frequency, reliable services.** The bus network can be divided into main routes and local routes, with different frequencies. Bus routes on main city arteries and roads used for longer distance travel will require a frequent service, at least every 15 minutes. This is the minimum frequency at which the service is usually considered good enough for travellers to turn up without

consulting a schedule. On local routes, a less frequent service may be sufficient, depending on demand and provided that the service operates punctually according to the timetable. São Paulo has implemented this dual frequency network timetable for the night shift, increasing night-time ridership by over 70%.

- **Building regular bus stops for easy access.** In Barcelona, the maximum distance between transit stops in the new bus network is 350m. In Seattle, the bus network upgrade plan will increase the percentage of households within 800m of frequent transit routes from 43% in 2015, to 73% by 2040.

Use the *BRT Standard*, and read the *Transit Street Design Guide*'s chapters on Stations & Stops, Station & Stop Elements, and Transit System Strategies for guidance on this.

Reallocate road space to build public transport infrastructure

Most cities' streets are designed for private vehicles first. This spatial bias must be rebalanced for public transport to deliver the reliable, high frequency service necessary to become a viable alternative. The high visibility of road space reallocation also helps to encourage people to use these services.⁷

Reclaiming road space for public transport can be quick, low-cost and incrementally implemented, but must be part of a long-term, holistic process. This includes:

- Allocation of street space for street-level mass transit options, particularly BRT and LRT. Both typically require dedicated corridors and lanes, ideally operating permanently.
- Prioritisation of mass transit, alongside cyclists and pedestrians, in traffic management systems. For example traffic lights can be programmed to recognise and prioritise buses over other vehicles, especially when they are detected as running late.
- Improved bus shelters, upgraded transit terminals and space surrounding those terminals, ensuring a comfortable transit experience from journey start to end, including in waiting areas.

Read the *BRT Planning Guide* and *BRT Standard* for detailed guidance on planning and implementing a successful BRT system, and again the *Transit Street Design Guide* is a useful resource on this.

Fortaleza's street transformation

Across many Brazilian cities, only 2-4% of the road network gives priority to buses. This forces buses to share road space with other traffic, resulting in slow, unreliable and uncomfortable services. In 2018, the city of Fortaleza tackled this imbalance by investing in 108km of dedicated bus lanes that allow buses to bypass congestion, improving bus terminals and introducing an integrated fare for the entire transit system.

Alongside investment in the bus system, Fortaleza delivered 225km of bike lanes, integrated bike-share systems with public transport, reduced the speed limit, narrowed roads for cars, raised pedestrian crossings

and redesigned intersections in favour of cyclists and pedestrians. The initiative won the city  English Sustainable Transport Award in 2019.⁸

Improve governance of informal transport systems

In many Global South cities, a large volume of passenger traffic is often handled by the informal public transport sector (paratransit). The vehicles are usually small – minibuses or converted vans – privately-owned and with little regulation. These businesses are usually completely reliant on fare revenues, meaning that the operators' jobs and livelihoods are precarious, and many lost them during COVID-19 lockdowns.⁹

In these cities, alongside improving the city's main bus system, transit agencies should seek to organise and improve regulation of privately-owned transit industry. High-volume routes should be prioritised for large, formalized bus services, while smaller paratransit operators are better suited to low-volume routes.¹⁰ Agencies can establish vehicle and service standards on procurement renewals, or establish new formal public-private contracts to offer more security and stability. The Rea Vaya BRT in Johannesburg, South Africa, is an example of this approach. Read *Negotiating the deal to enable the first Rea Vaya bus operating company* for insights on how this can be achieved.¹¹

Cities should also plan how city paratransit and BRT routes interact with other forms of transit, as shown by two innovative city examples:

- Jakarta, where the BRT system reached one million passengers per day in 2020, has created a network to connect smaller paratransit vehicles alongside BRT buses and their lanes – thus serving parts of the city that would not otherwise be accessible.¹²
- Medellín famously built a cable car network to improve city access from the most underserved informal settlements on the city's hillsides, and integrated this Metrocable with the metro network, reducing travel costs and transforming economic and social opportunities for low-income residents in the hillside areas.¹³

Give the public transport system an attractive identity

Transit agencies must work to overcome the common cultural barriers that discourage people from choosing public transport. These will differ between cities but include ideas that public transport is 'only' for low income people, or that it isn't fashionable.

Car manufactures and new private car hire companies advertise their products and services using slick and intelligent public relations campaigns. Public transit agencies should do the same to improve the public image of their services, and increase ridership numbers and fare revenues.

Marketing campaigns should highlight positive personal stories of how individuals have benefited by using public transit. They should also be aligned with a compelling branding strategy that gives the public transit system a clear and attractive public identity.

In Gothenburg, for example, the public transport agency Västtrafik ran an award-winning advertising campaign pointing out how “it gets crowded when we’re not travelling together”, illustrated in the digital leaflet below.¹⁴

Folding Ad



Make use of new technologies and apps

Transit agencies can make use of new technologies, such as smartphone applications, to make their services more fashionable and easier to use. At the same time, it will improve data collection, user perception of the service and reduce operational costs.

- During the COVID-19 pandemic, Auckland’s transport operator issued an app to inform passengers whether an approaching bus or train had space for the recommended 2 metres of social distancing.¹⁵ These kinds of tools can help outside of a pandemic by helping public transit users to avoid busy buses and train carriages.
- Dar es Salaam’s DAR City Navigator app provides users with real-time information on multiple transit modes, allowing travellers to plan journeys in advance rather than simply hoping for the best when they set out for work.

- Bogotá's Safetipin app allows women to rate their perception of personal safety on the English transit system. This geo-referenced data will then be used by the city to design and prioritise interventions to improve the transit system and other public spaces.¹⁶ Quito is also using technology to combat a persistent issue of sexual harassment in the public transport system. Following research into the problem, victims of harassment can send a simple SMS message to alert the driver and set off an alarm inside the bus, after which the police or other authorities can get involved.¹⁷
- Cities can partner with the private sector to develop these services. The Citymapper app, for example, uses mobile and open transport data to help locals and visitors navigate public transport systems. Their consumer application operates in over 100 cities, mainly in Europe and North America, while their customisable software has global coverage. Google Maps, meanwhile, is adding transit crowd predictions covering 10,000 transit systems in 100 countries.¹⁸

Join The Future Is Public Transport campaign alongside workers, mayors, union leaders and city residents globally who are calling on world leaders to make transformative investments in safe, reliable and affordable public transport. In doing so, cities can help to drive a green and just economic recovery, create millions of jobs, and confront the climate crisis.¹⁹



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