



Urban Pathways

INDEX FOR SUSTAINABLE PUBLIC TRANSPORT EVALUATION



A VDL Citea SLF-120 Bus with pantograph charging in Helsinki, Finland (2019)

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The Urban Pathways project helps delivering on the Paris Agreement and the NDCs in the context of the New Urban Agenda and the Sustainable Development Goals. It has established a facility in close cooperation with other organisations and networks active in this area to support national and local governments to develop action plans and concrete implementation measures to boost low-carbon urban development. This builds on UN-Habitat's role as "a focal point on sustainable urbanisation and human settlements including in the implementation and follow-up and review of the New Urban Agenda". The project develops national action plans and local implementation concepts in key emerging economies with a high mitigation potential. The local implementation concepts are being developed into bankable projects, focusing on the access to urban basic services to create a direct link between climate change mitigation and sustainable development goals.

The project follows a structured approach to boost Low Carbon Plans for urban mobility, energy and waste management services that deliver on the Paris Agreement and the New Urban Agenda. The project works on concrete steps towards a maximum impact with regards to the contribution of urban basic services (mobility, energy and waste management) in cities to global climate change mitigation efforts and sustainable and inclusive urban development. This project makes an active contribution to achieve global climate change targets to a 1.5°C stabilisation pathway by unlocking the global emission reduction potential of urban energy, transport and resource sectors. The project will contribute to a direct emission reduction in the pilot and outreach countries, which will trigger a longer term emission reduction with the aim to replicate this regionally and globally to make a substantial contribution to the overall emission reduction potential.

This project implements integrated urban services solutions as proposed in the New Urban Agenda providing access to jobs and public services in urban areas, contributing to equality and social coherence and deliver on the Paris Agreement and the Sustainable Development Goals. This is the first dedicated implementation action oriented project, led by UN-Habitat to deliver on inclusive, low-carbon urban services. Securing sustainability and multiplier effect, the project aims to leverage domestic and international funding for the implementation projects that will follow from this initiative

Project concept

Project aims



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Urban Pathways Project and Replication Cities

IN BRIEF

A sustainable public transportation index for Latin America (SPTI – Latam) was developed to evaluate the sustainability of PT systems. The SPTI – Latam is composed by three subindexes: 1) the basic index (BSPTI) containing 29 key performance indicators (KPI) aggregated into four dimensions: environmental, social, economic and system effectiveness; 2) the extended index that addresses exogenous impacts affecting the sustainability of the system and includes 14 additional indicators; and 3) the global index which includes a fifth dimension called governance and integrated planning and 8 indicators. Fifty-one indicators compose the final SPTI-LATAM index. The BSPTI is a multi-criteria decision making (MCDM) procedure that uses budget allocation process (BAP) given by 7 regional experts that assigned weights to the different attributes and was applied to 11 Latin American cities¹. The results show a variety of challenges that transit systems have in the region to reach sustainability. The SPTI – Latam could be a powerful tool for decision makers, practitioners, and citizens to have a better understanding of public transport in their cities and the challenges to be solved.

¹ Belo Horizonte and Rio de Janeiro in Brazil, Bogotá and Medellín in Colombia, Buenos Aires in Argentina, Ciudad de México and León in México, Montevideo in Uruguay, Quito in Ecuador, and Santiago in Chile.

EXAMPLES

Sustainable Public Transport Evaluation Index for Latin America - SPTI - Latam					
Dimension	Subdimension	Indicators	Basic	Extended	Global
System Effectiveness	System capacity	SE01 Formal public transport split/share	x		
		SE02 Informal public transport split/share		x	
		SE03 Transfers per day per person per mode		x	
	Transport Supply	SE04 Public Transport Fleet Size	x		
		SE05 Index passenger per km (IPK)	x		
		SE06 Frequency	x		
		SE07 Operating time of formal PuT	x		
		SE08 Average speed	x		
		SE09 Exclusive lanes for public transport every 100.000 inh	x		
		SE10 Average travel time per day per person	x		
	PT Support system	SE11 Payment automatization	x		
Accessibility	Accessibility	S01 Transport network coverage	x		
		S02 Average user trip distance	x		
		S03 Percentage of accessible stations/vehicles	x		
		S04	x		
		S05 Average household distance close to PT stop/station		x	

Social	Safety and security	S06	Transport related fatalities in formal PT	x		
		S07	Transport related fatalities in informal PT		x	
		S08	Ratio of annual number of recorded incidents			x
		S09	Gender violence in PT in a yearly basis		x	
	Gender Inclusion	S10	Percentage of drivers between 50 and 65 y-o		x	
		S11	Percentage of female drivers in PT fleet		x	
		S12	Campaigns for female safety/special PT services for female users	x		
	Affordability	S13	Portion of income devoted to public transport	x		
	Rider comfort	S14	Average public transport place occupancy rate (%)		x	
		S15	Percentage of bus fleet with air conditioning	x		
	Customer services	S16	Percentage of PT vehicles with on-board information systems	x		
		S17	Percentage of bus stops with reliable transit passenger information	x		
Economic	Transport expenditure	C01	Annual operating cost per pkm	x		
	Market penetration	C02	Passenger km per capita	x		
	Operation efficiency	C03	Annual Costs recovery	x		
		C04	Veh-km per day	x		
	Operators' revenue	C05	Users costs	x		
		C06	Costs subsidy	x		
	Job's creation	C07	Direct jobs per million passengers in formal transit			x
		C08	Direct jobs per million passengers in informal transit			x
Environment	Air pollution & Climate Change	E01	CO2 emissions	x		
		E02	PM10 emissions		x	
		E03	NOx emissions	x		
		E04	Average Bus fleet age	x		
		E05	CO emissions		x	
		E06	Share of PT passenger-km travelled by clean-fuels vehicles		x	
		E07	Cleaner technology in Transit		x	
	Energy consumption	E08	Daily consumption of energy in %	x		
		E09	MJ/pkm; electricity consumption per km		x	
		E10	MJ/pkm; fuel and oil consumption per km		x	
Governance and Comprehensive Planning	Integrated, comprehensive and inclusive planning	G01	Availability of an O-D survey in the last 2 years for the city			x
		G02	Availability of Sustainable Urban Mobility Plan (SUMP) based in O-D survey results and aligned with SDG and Land Use Plans			x
		G03	Monitoring and evaluation methods of transit			x

Centralities and Regionalism	G04	Existence of Regional Integration Plans	x
Citizen Engagement	G05	Percentage of transport projects that follow a public participation/engagement plan	x

RESULTS

What positive effects could citizens experience as a result?

The results show that half of the cities (Montevideo, Santiago de Chile, Bogotá, Buenos Aires y Ciudad de México) achieved scores between 50 and 56 points) while the other half (Belo Horizonte, Río de Janeiro, Medellín, Quito, Lima, and León) obtained scores between 45 and 48 points, revealing that there are still some milestones to cover for a sustainable public transportation. The biggest gap is in the environmental dimension, followed by the social dimension. Better results were achieved in the economic dimension. For the environmental category the PM10 emissions, NOx emissions rates and percentage of cleaner technology in PT fleet have the lowest proportional scores. These results were expected since more than 85% of total PT fleet in Latin American cities is propelled by diesel engines. Cleaner vehicles (trams, metro, electric buses) represent less than 6% of the PT fleet in the region, except in Santiago de Chile that has incorporated 386 electric buses (15% of their total fleet are

low-emissions vehicles). In the social dimension the figures for the PT stops adapted for disabled people and with reliable passenger information, affordability, and the proportion of vehicles with air conditioning should be reinforced by transit agencies and operators. Within the system effectiveness dimension, especial attention should be given to the IPK, the average speed, and the integrated ticketing system variables. Operating hours shows better performance for Montevideo, Belo Horizonte, Santiago and Ciudad de México with a 24 h/service while Quito has the lowest operating service (14 h/day). Finally, in the economic dimension the relative high modal share for transit (45%) in comparison with European or North American cities with less than 25% of modal split, bring out the high operators' revenue and productivity. The biggest gaps are in the passenger km per capita, that is the market penetration attribute, and not sufficient subsidies for PT systems in some cities. Annual operating cost per pkm differs widely among the studied cities, being Lima the lowest cost per pkm (\$5,28/pkm) while Santiago de Chile (\$37,68) has the highest value.

TECHNICAL AND FINANCIAL CONSIDERATIONS

Summary of specific technical and financial considerations cities must take before embarking on implementing the solution

The global index accounts for 51 indicators including paratransit and gender violence inside the PT systems, both historical problems in Latin American cities. Other variables also could help to have a broader image about the current status of PT systems in Latam and the steps needed to achieve sustainability. The main challenge is to get enough good quality updated transport data. Data relevance for appropriate decision-making in transport planning is a vital step for achieving sustainability. Also, the inclusion of sustainability in all planning and operation process is missing. This would require

additional expenses and capacity building for municipalities, but also may be an opportunity for them to improve governance, planning and land use integration. The academy should also be involved and start the discussion about sustainable public transport planning. Currently, with the emergency of climate change, there is a new agenda in mobility. Electromobility, car sharing, mobility as a service or autonomous driving are new trends and their discussion should also be part of public transport policy agendas. The inclusion of civil society, operators, and other stakeholders is a key step for integrating all points of view with different visions and interests into one common public agenda for a better and more sustainable PT service.

POLICY/LEGISLATION

What are the ideal policies/legislative frameworks for the implementation of this measure?

Currently many Latin American cities are facing a transition in the regulation, planning and operation of PT services, with public tender for PT operators conformed as companies and better performance frameworks containing service quality indicators. This is a first important step to fight the traditional one bus-one owner model

and the arbitrariness in the selection of routes, fares, and operation schedules. However, additional efforts should be carried out to include substantial indicators for the social and environmental dimensions, which are missing in current evaluation frameworks of PT services. In some cities, this would need the approval of city councils and the acceptance of PT operators to be monitored permanently in the fulfilment of these requirements. Additionally, transit agencies should develop faster, digitalized and of easy understanding monitoring and evaluation procedures.

INSTITUTIONS

Just a short description on who to target with such a measure and what support they would need from other institutions

The lead agency for is usually transit agencies who plan and regulate public transport services. They would require the support and participation of civil society organizations, academy and other stakeholders for monitoring, processing, co-creating, or re-elaborating evaluation frameworks of PT and overall transport systems.

Funding support is needed for data relevance and processing including the acquisition of

digital equipment, integration of existing ones (i.e., traffic cameras), data processing platforms and programs, among others.

National policy frameworks are important regarding transversalities of sustainability on public transport operation in national transit law and other regulations.

Operators are the target to implement the indicators for sustainable PT.

Funding support is needed for sensibilization and capacity building about sustainable PT service.

TRANSFERABILITY, REPLICABILITY

TIs this replicable in other cities, regions, businesses? What are the conditions for replicating this solution?

The SPTI-Latam was developed for Latin American public transport context. Cities of different sizes and operation schemes can apply the index. The main re-

quirement is to have updated data for transport supply, travel demand, economic information, and other social and environmental information.

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