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ICLEI Local Governments for Sustainability

Which transit?

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Unattractive public transport systems

- Insufficient physical integration of various public transport modes and between public transport, walking, cycling and private car
- No integrated and transparent time schedules
- Signage, customer information on timetables, connecting services and fares not appropriate

→ discouraging the use of public transport

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Unattractive public transport systems

- Insufficient cooperation between public transport operators
- Each change of mode normally requires the purchase of another ticket
- No uniform service level standards among modes and operators

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What do citizens want?

- Convenience
- Easy Access
- Comfort
- Frequent Service
- Rapid journey
- Safety & Security
- Customer Service
- Affordability
- Have a network

Public Transport should be designed around the customer and not around a technology

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Conventional Public Transport Planning Approach

Step 1. Choose technology

Technology chosen due to manufacturer lobbying efforts

Design chosen to please existing operators

Technology chosen to help property developer

Step 2. Fit city to the technology

Reduce size of network due to financing limitations

Charge higher fares in attempt to pay for expensive system

Operate infrequent services to reduce operating losses

Require large subsidies for lifetime of system's operation

Step 3. Force customer to adapt to technology

Extensive marketing campaign to convince customers that system is in their interest

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The innovative and successful approach

Step 1. Design a system from customer's perspective

Rapid travel time

Few transfers

Frequent service

Short walk to station from home / office

Full network of destinations

Low fare cost

Safe vehicle operation

Secure environment

Comfortable and clean system

Friendly and helpful staff

Step 2. Evaluate customer driven options from municipality perspective

Low infrastructure costs

Traffic reduction benefits

Environmental benefits

Economic / employment benefits

Social equity benefits

City image

Step 3. Decision

Technology decision based on customer needs and municipality requirements

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Component	Metro	LRT	BRT
Running Ways	Rail Tracks	Rail Tracks	Roadway
Type of Right of Way	Underground/ Elevated/ At-grade	Usually At-grade – some applications Elevated or Underground (tunnel)	Usually At-grade – some applications Elevated or Underground (tunnel)
Segregation From the Rest of the Traffic	Total Segregation (no interference)	Usually Longitudinal Segregation (at grade intersections) – some applications with full segregation	Usually Longitudinal Segregation (at grade intersections) – some applications with full segregation
Type of Vehicles	Trains (multi-car)	Trains (two-three cars) or single cars	Buses
Type of Propulsion	Electric	Electric (few applications Diesel)	Usually Diesel/CNG – some applications Hybrid (Diesel/CNG-Electric) or Electric Trolleybuses

Sources: UNHabitat (2013) from Fouracre, et al. (2003), Vuchic (2007), Diaz and Hinnebaugh (2007)

Component	Metro	LRT	BRT
Stations	Level boarding	Level boarding or stairs	Level boarding (few with stairs)
Payment Collection	Off-board	Usually off-board	Off-board
Information Technology Systems	Signalling, control, user information, advanced ticketing (magnetic/electronic cards)		
Service Plan	Simple; trains stopping at every station; few applications with express services or short loops	Simple; trains stopping at every station between terminals	From simple to very complex; combined services to multiple lines; express, local – some combined with direct services outside the corridor
User Information	Very clear signage, static maps and dynamic systems		
Image	Modern and attractive		Advanced as compared with standard buses

Sources: UNHabitat (2013) from Fouracre, et al. (2003), Vuchic (2007), Diaz and Hinnebaugh (2007)

No single alternative dominates the others

Caracteristic	Bus lanes	Light Rail - Tramway	Heavy Rail - Metro	Bus Rapid Transit - Metrobus
Space Required	2-4 lanes Existing Roads	2-3 lanes Existing Roads	New Right of Way – Elevated or Underground	2-4 lanes Existing Roads
Flexibility	High	Limited	Low	High
Impacts on Traffic	Mixed	Mixed	Reducción de Congestión (?)	Mixed
Integration with Feeders	Easy	Difficult	Difficult	Easy
Level of Service (Fruquency, Occupancy)	Low	Good	Muy Good (corredor denso)	Good
Safety	Low	Buena	Muy Buena	Good
Emmissions	High	Low	Low	High Medium
Reliability	Low	Medium (bunching)	Goood	Medium
Transfers /Walking	Low	Medium	High	Medium

Sources: Adaptado por el autor de Halcrow Fox, 2000), L. Wright and K. Fjellstrom, 2003, y V. Vuchic, 1992

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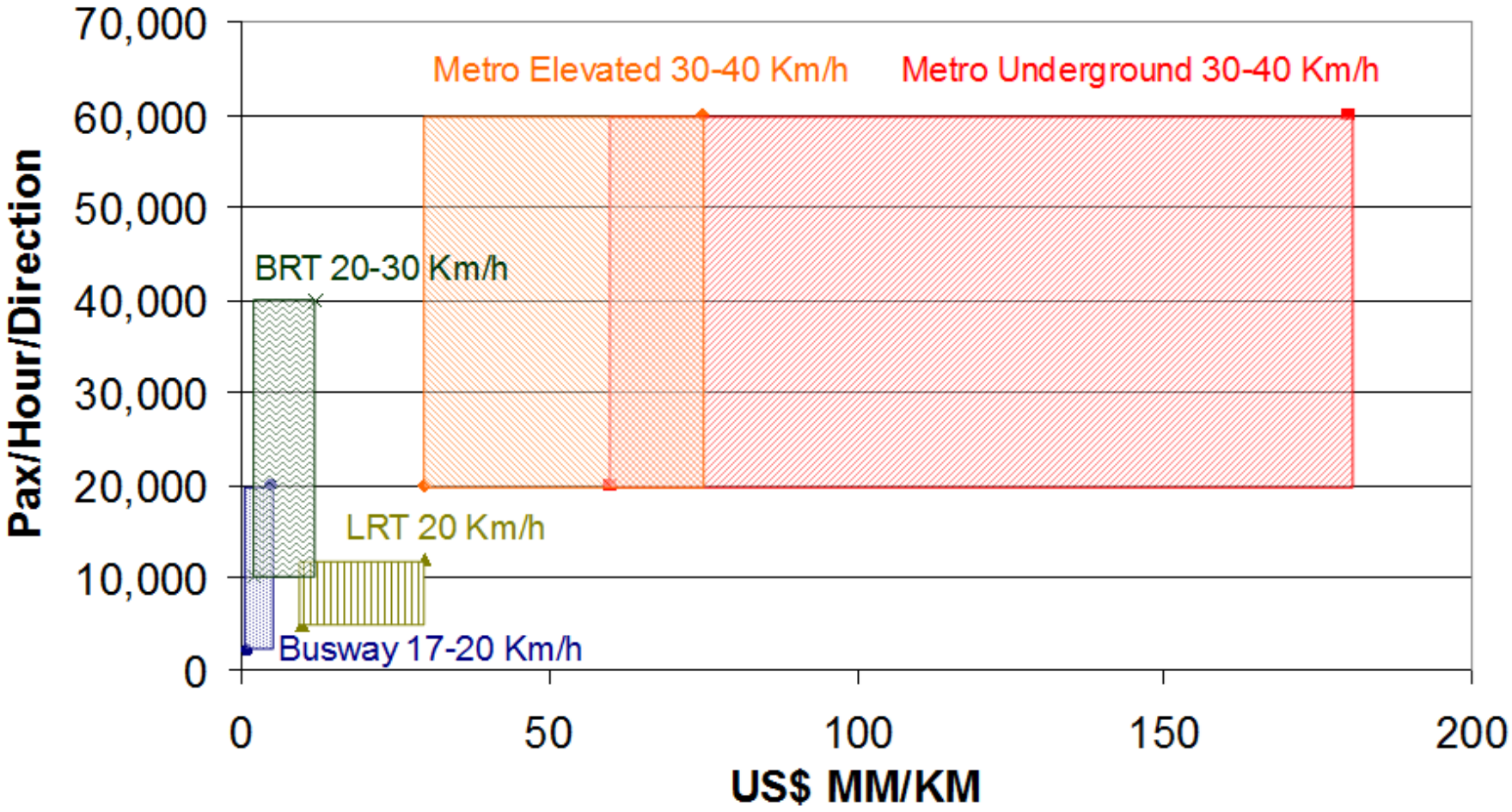
Costs vs capacity of various transit systems



Fuente: Vukan R. Vuchic. Urban Public Transport Systems and Technology. Englewood Cliffs, Prentice Hall, 1992

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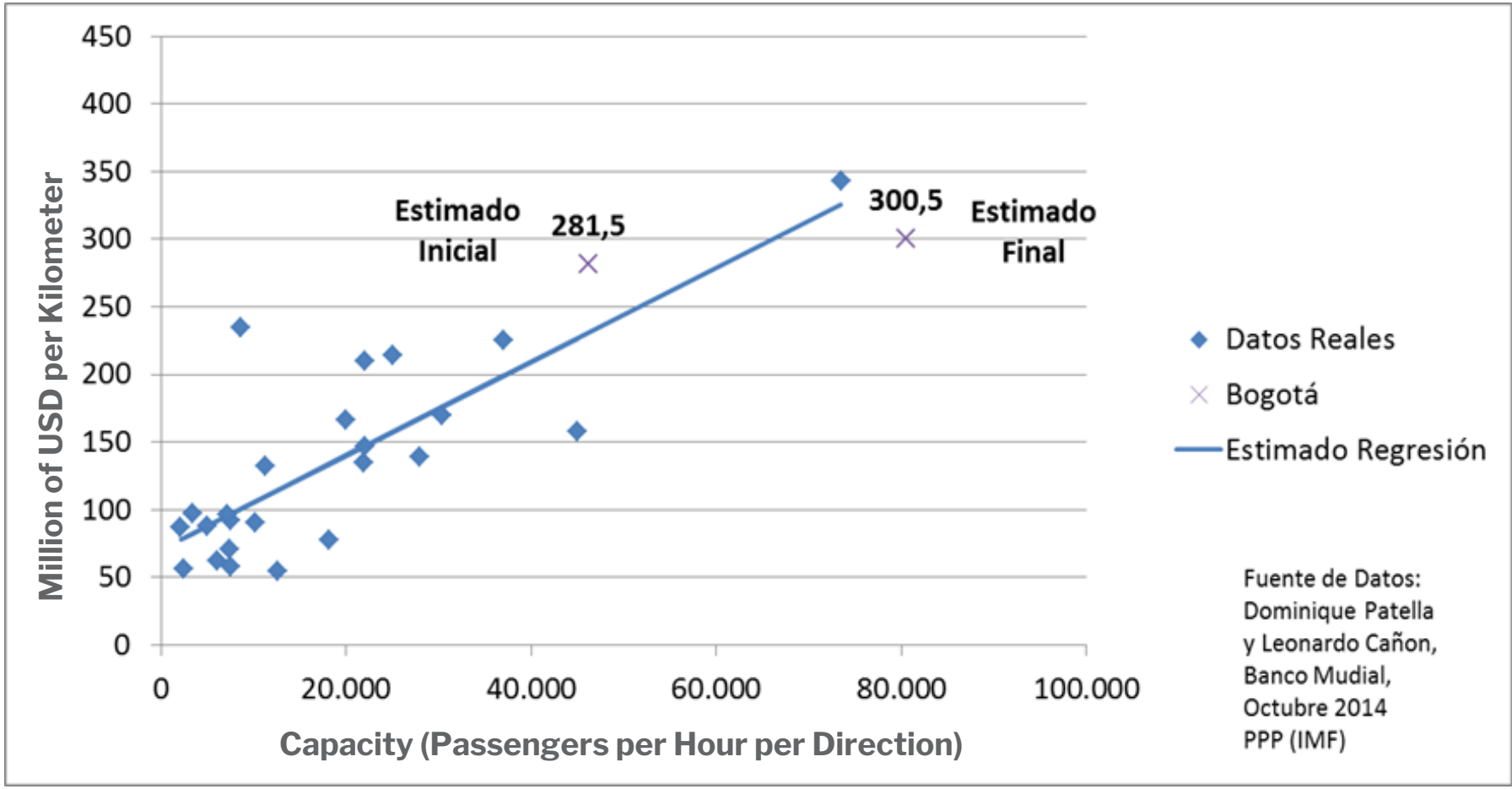
Capacity is the Main Driver of Capital Cost



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Common deviation between planning and implementation

	Actual/ Estimated (Average)
Cost	1.91
Passenger Demand	0.52

Bent Flyvbjerg,"Cost Overruns and Demand Shortfalls in Urban Rail and Other Infrastructure," Transportation Planning and Technology, vol. 30, no. 1, February 2007, pp. 9-30. DOI: 10.1080/03081060701207938
Link to published article: http://www.tandfonline.com/doi/full/10.1080/03081060701207938
12 urban rail transit projects with information before and after

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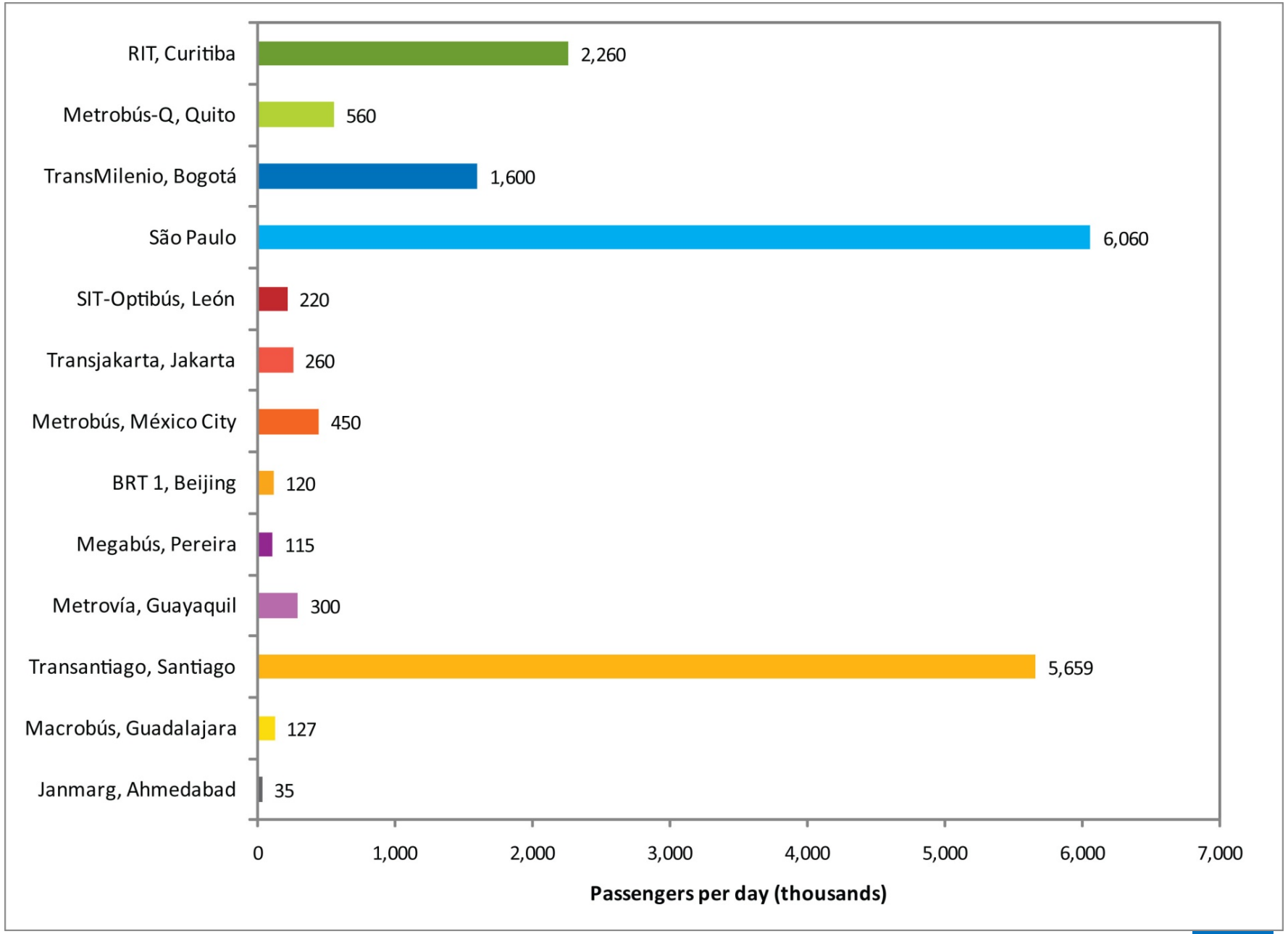
BRT Diverse Sizes



Source: http://www.wri.org/publication/modernizing-public-transportation

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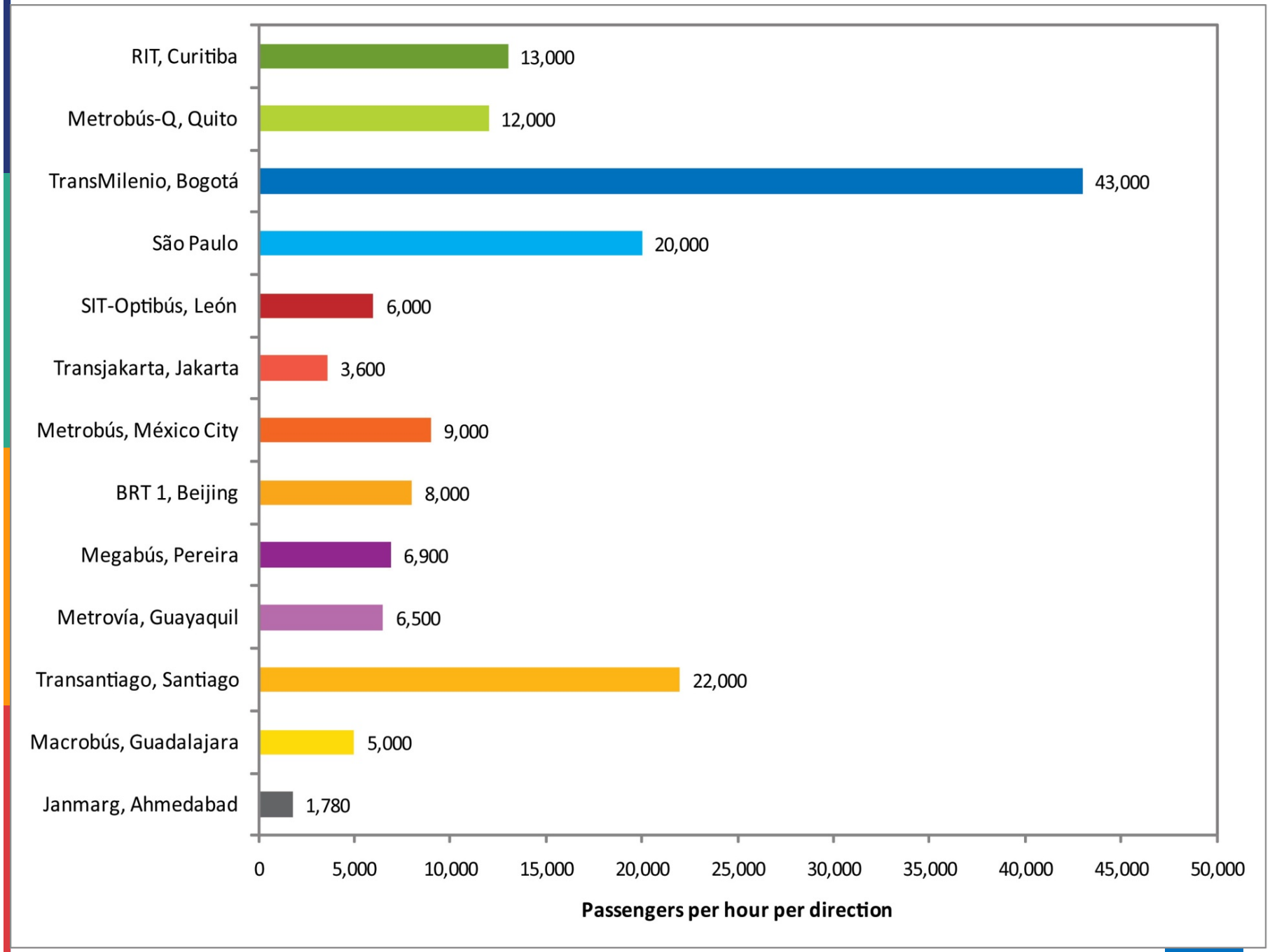
Varied throughput



Source: http://www.wri.org/publication/modernizing-public-transportation

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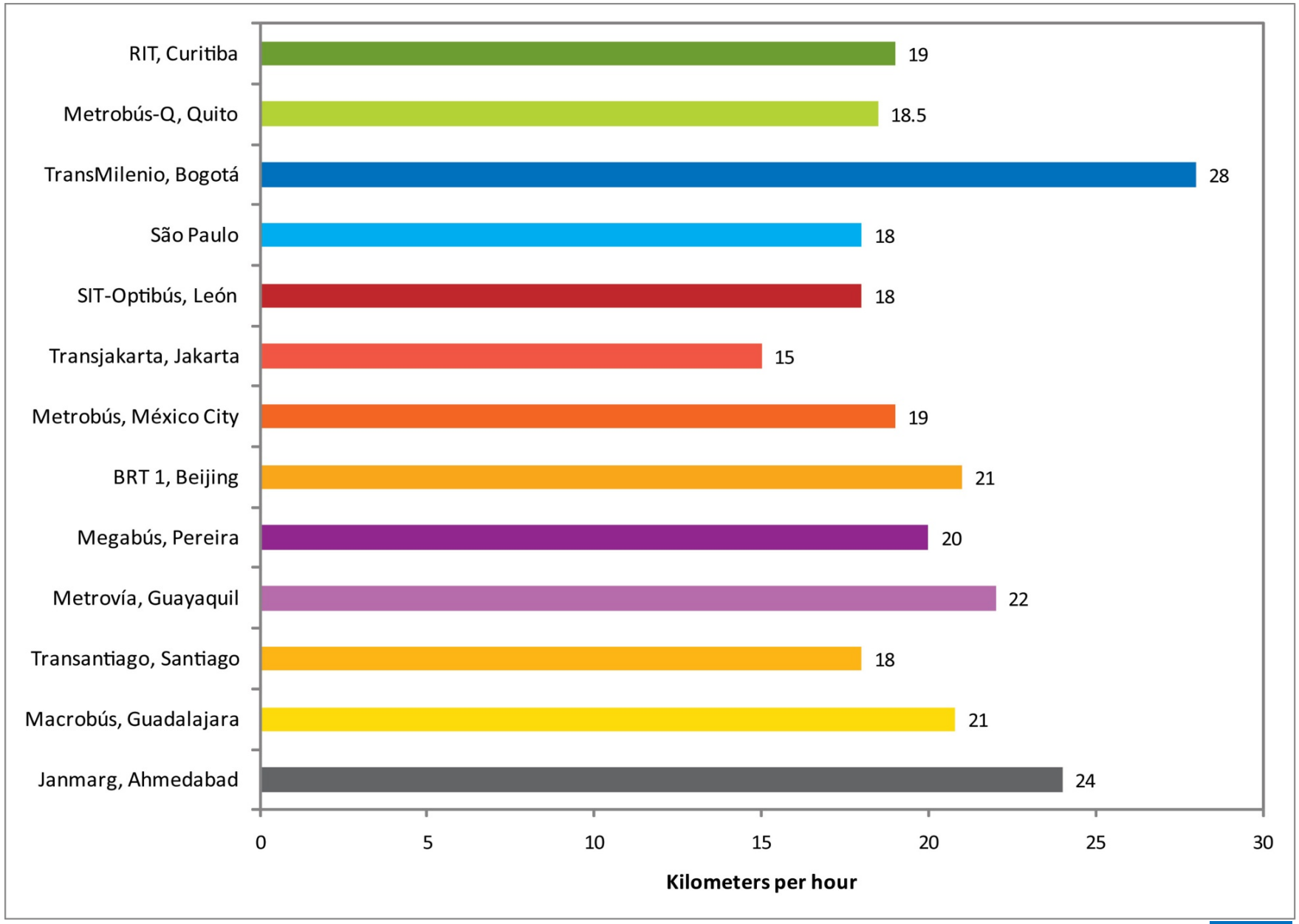
Commercial speed



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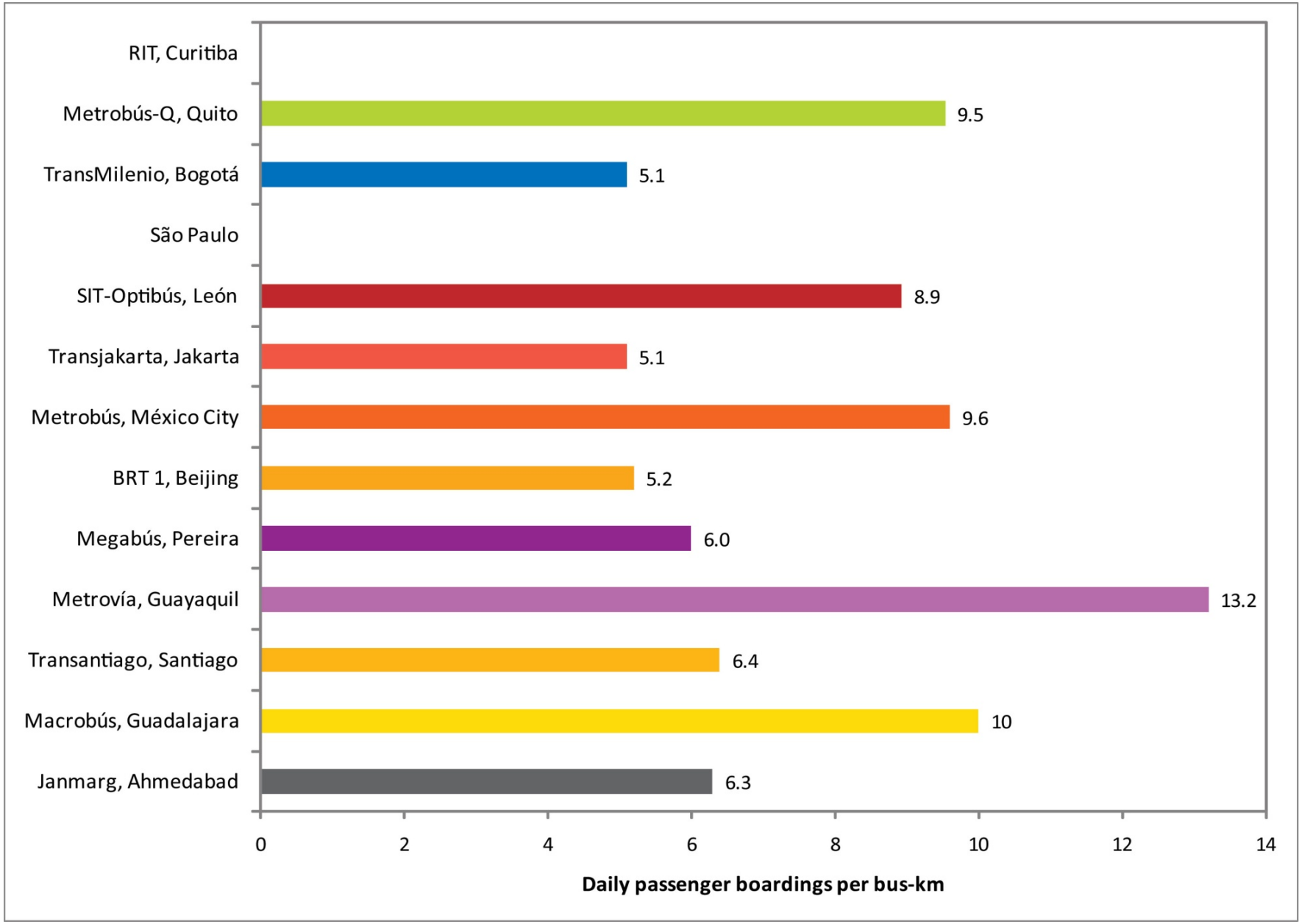
Operational productivity



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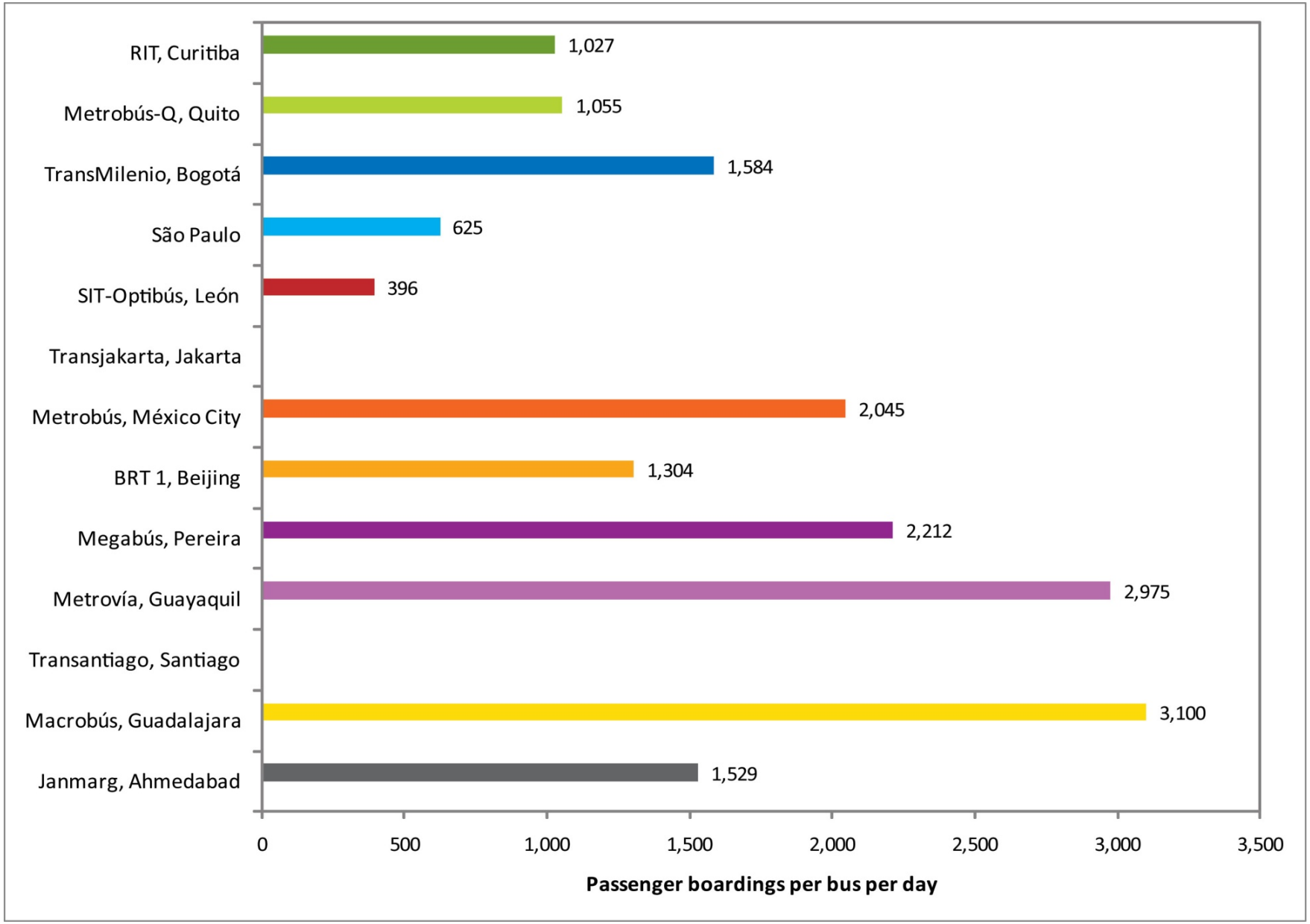
Capital productivity



Source: http://www.wri.org/publication/modernizing-public-transportation

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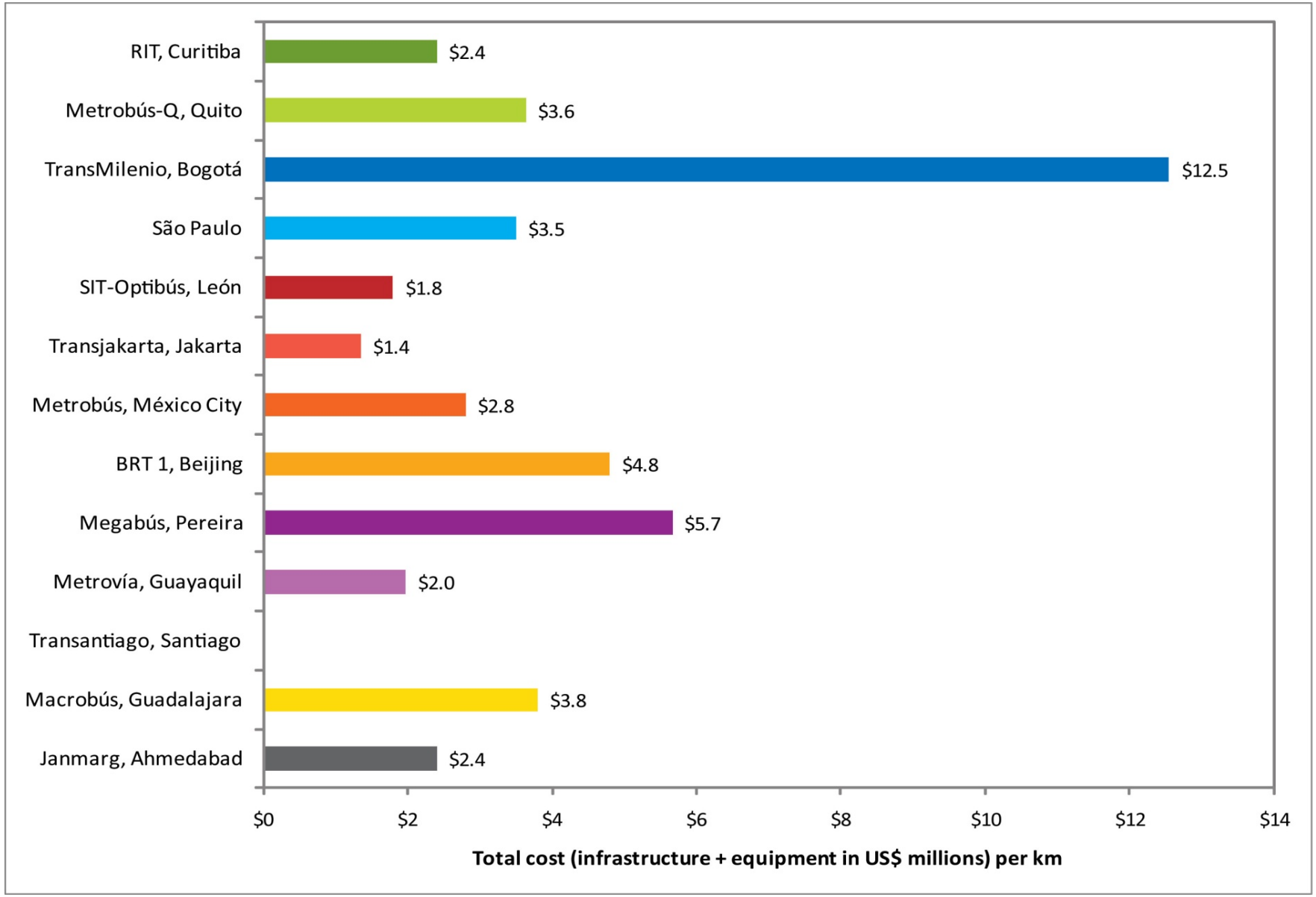
Capital Cost



Source: http://www.wri.org/publication/modernizing-public-transportation

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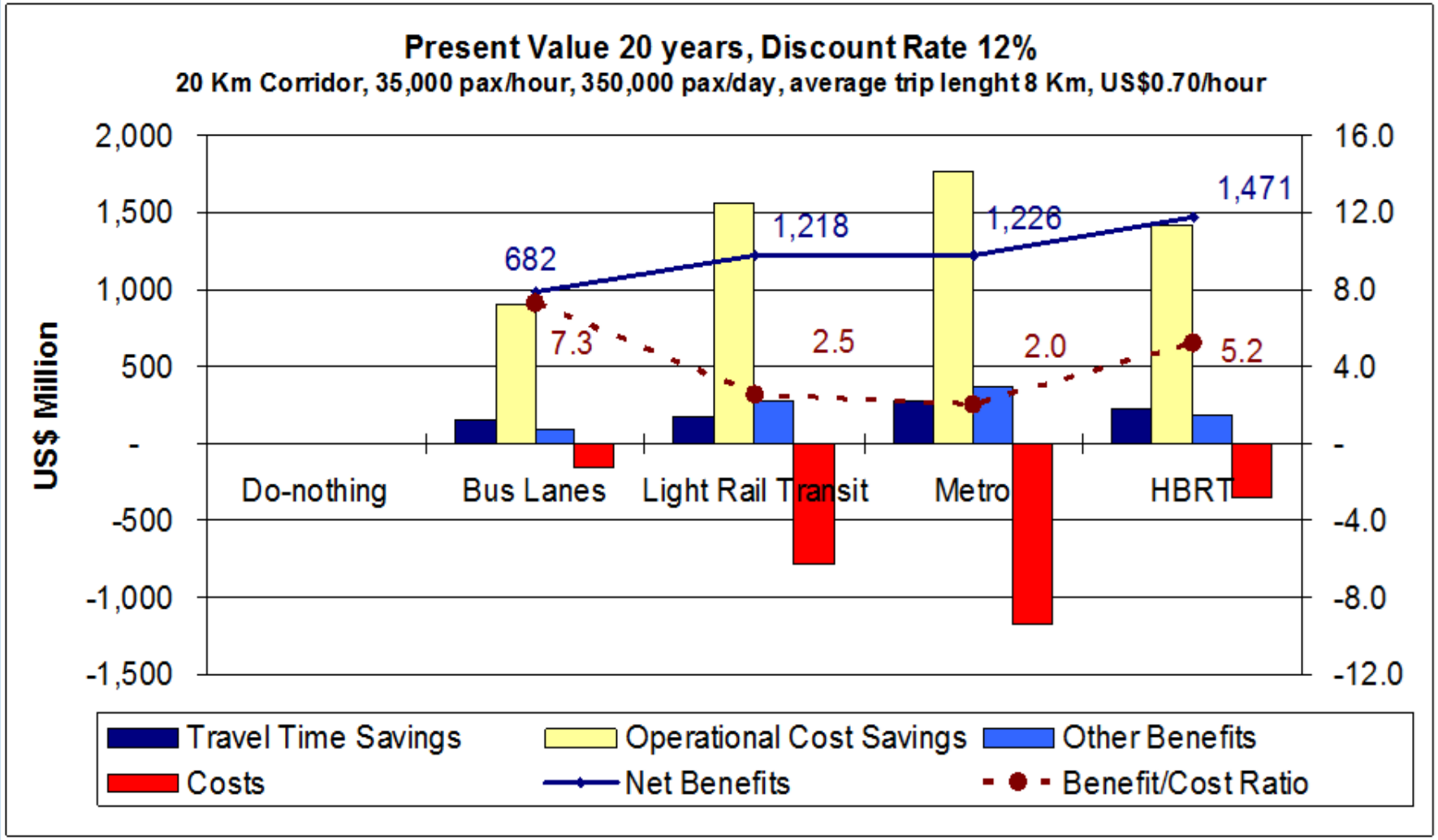
Comparing Alternatives



Source: http://trid.trb.org/view.aspx?id=777310

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So…

Do **NOT** choose the technology and then justify it

For the conditions of any city the key is integration of different services, taking most advantage of the existing systems

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