

Strategies for High-Quality Bus/BRT

by

Juan Carlos Muñoz

Pontificia Universidad Católica de Chile

Nigel Wilson

MIT

**Across Latitudes and Cultures- Bus Rapid Transit
Centre of Excellence www.brt.cl**

What can we say about bus service?

Bus is critical to providing a good door-to-door transit alternative for many journeys:

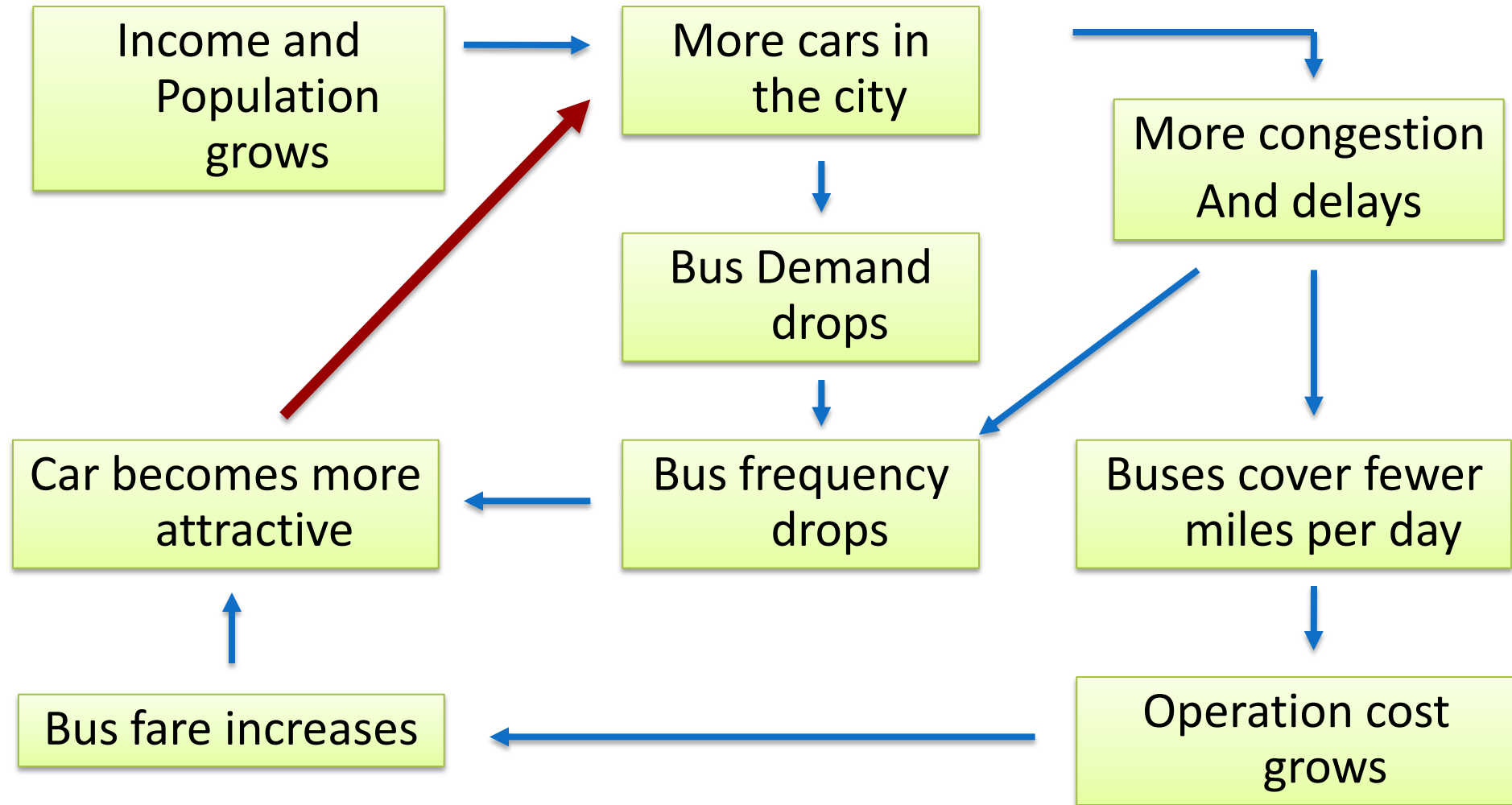
- **Much higher network density and coverage than rail**
- **Greater flexibility in network structure**
- **Low marginal cost for service expansion**

BUT

Bus as traditionally operated also has serious limitations:

- **Low-speed**
- **Subject to traffic congestion**
- **Unreliable**
- **Harder to convey network to the public**
- **Negative public image**

This feeds this vicious cycle



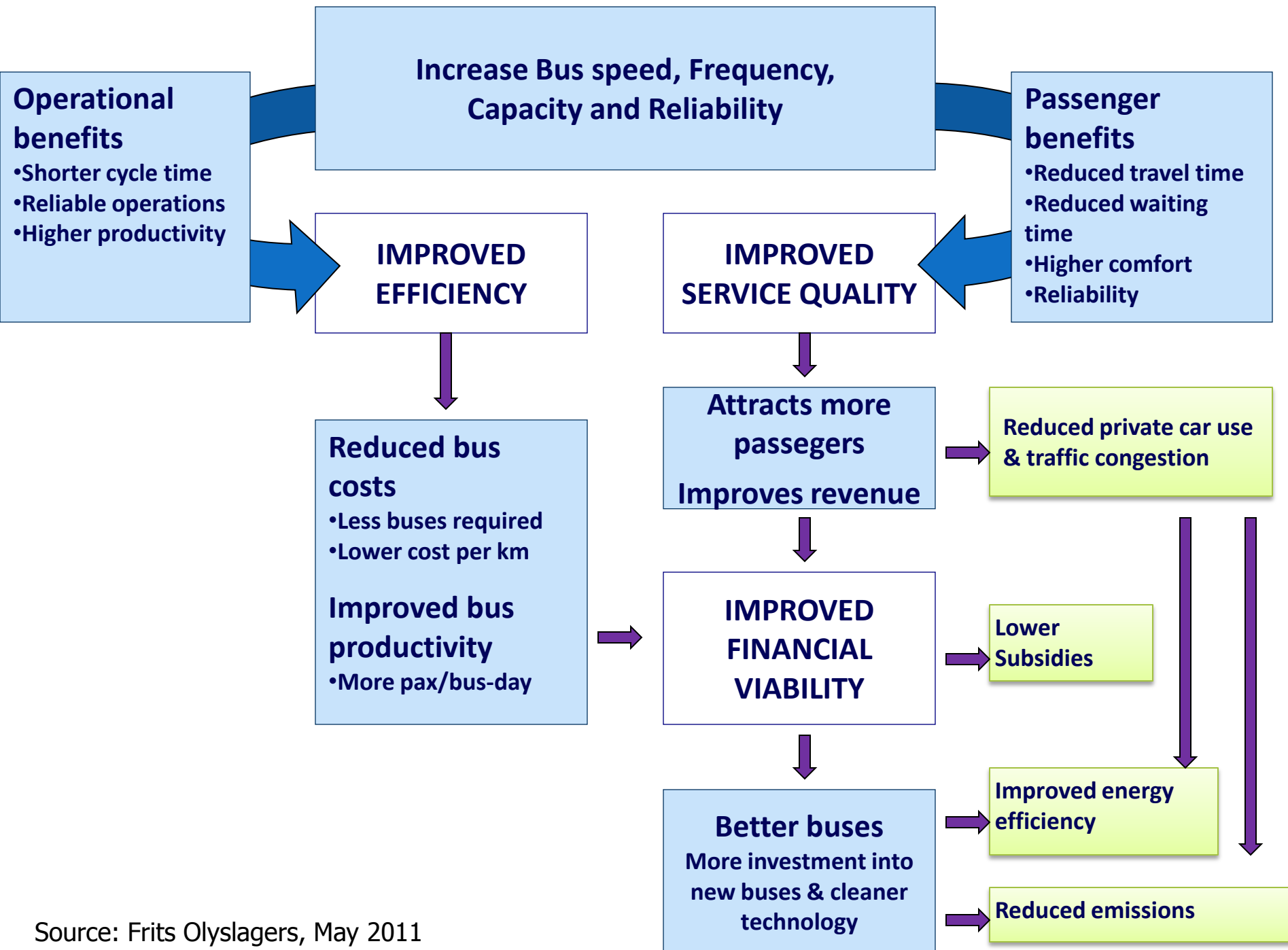
Buses were not operated to be as attractive as cars and mentioned

However, this doesn't affect Metro as much

- **Fast**
 - **Low wait time**
 - **Comfortable**
 - **Reliable**
 - **Good information**
 - **Branding**
- Can we provide Metro-like service with buses?**

Can we provide Metro-like service with buses?

- **Fast**
- **Low wait time**
- **Comfortable**
- **Reliable**
- **Good information**
- **Branding**



Can we provide Metro-like service with buses?

OF COURSE WE CAN!

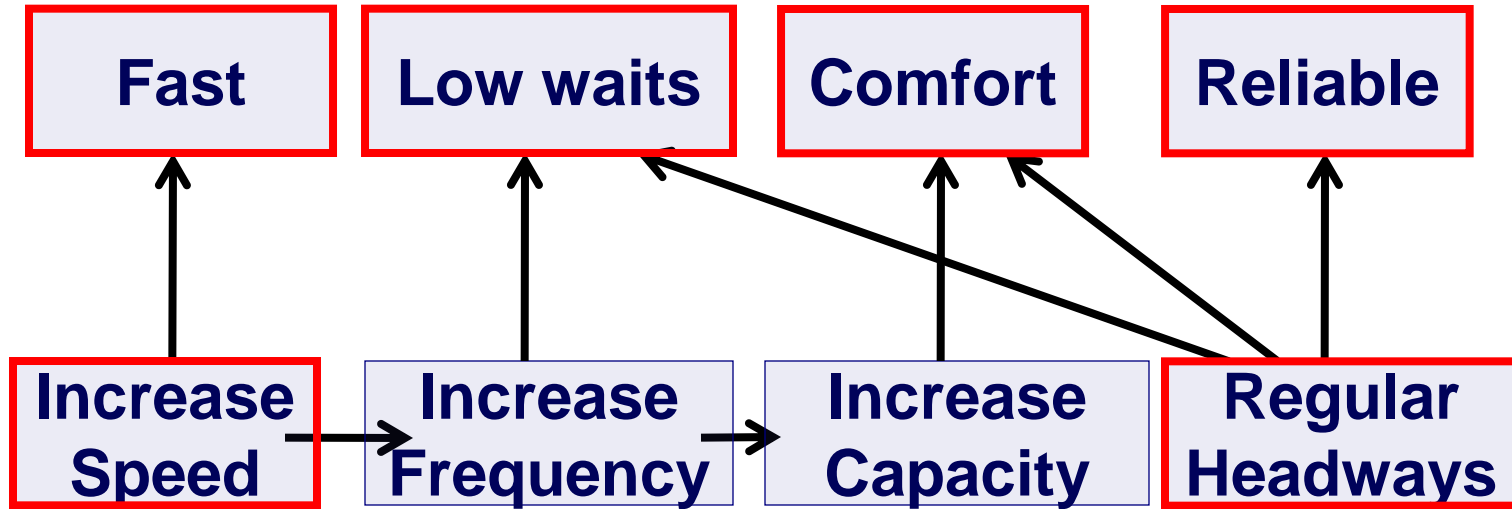
(several pieces are already there in cities worldwide)

The good news are:
COURAGE WILL BE REWARDED

Metro
Attributes

Main
drivers

Actions

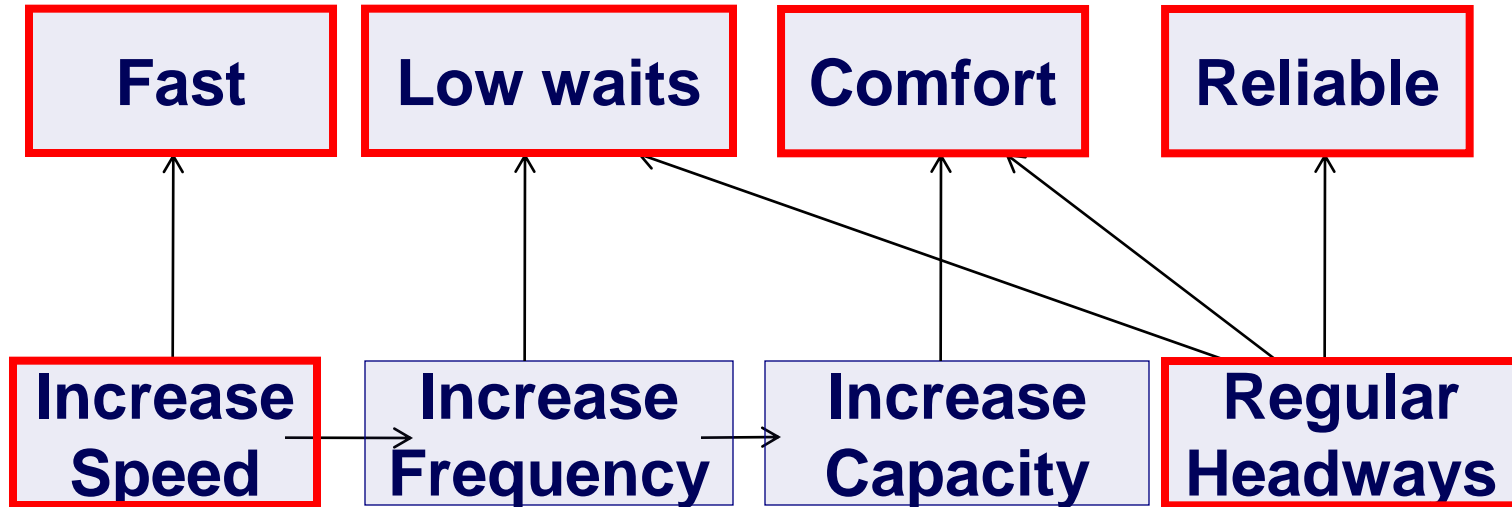


•Segregated ways/lanes

Metro
Attributes

Main
drivers

Actions

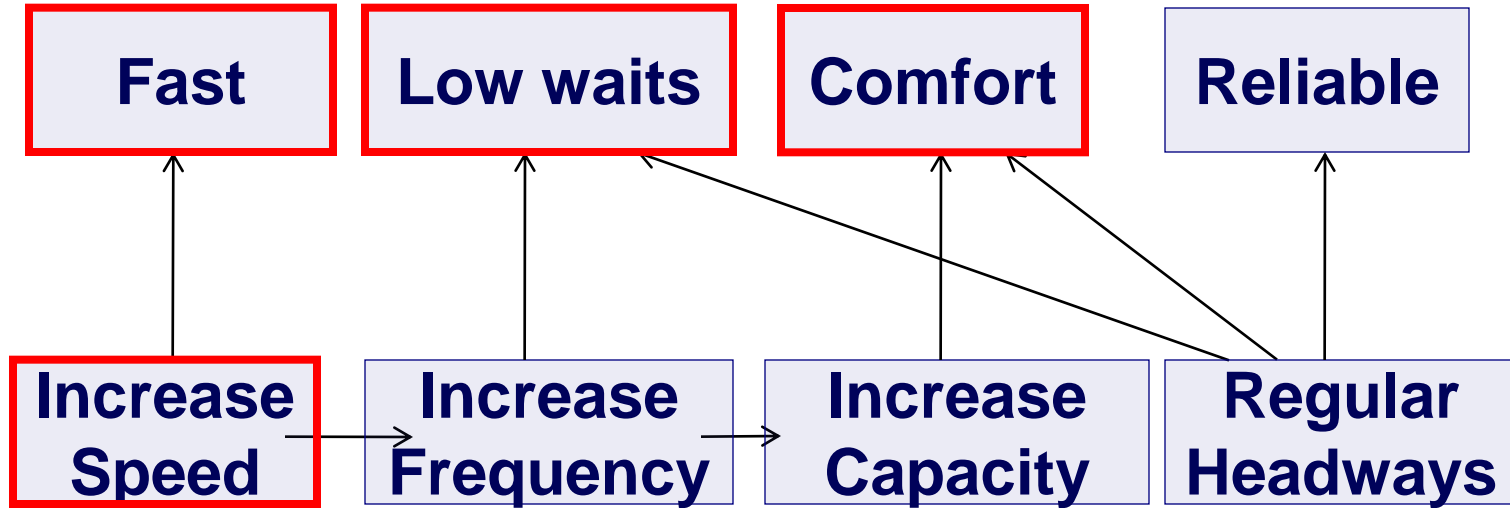


- Segregated ways/lanes
- Reduce dwell times
 - Fare payment off-bus
 - Buses with multiple doors

Metro
Attributes

Main
drivers

Actions

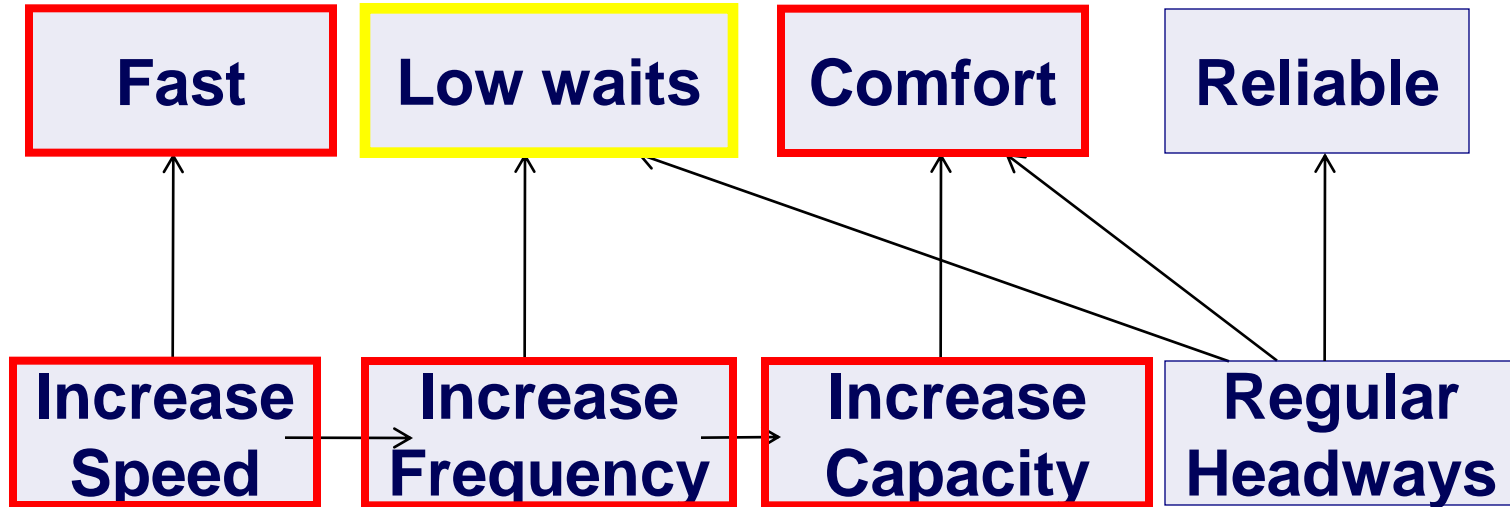


- Segregated ways/lanes
- Reduce dwell times
 - Fare payment off-bus
 - Buses with multiple doors
- Increase distance between stations

Metro
Attributes

Main
drivers

Actions



- Segregated ways/lanes
- Reduce dwell times
 - Fare payment off-bus
 - Buses with multiple doors
- Increase distance between stations
- Express services

Metro
Attributes

Fast

Low waits

Comfort

Reliable

Main
drivers

**Increase
Speed**

**Increase
Frequency**

**Increase
Capacity**

**Regular
Headways**

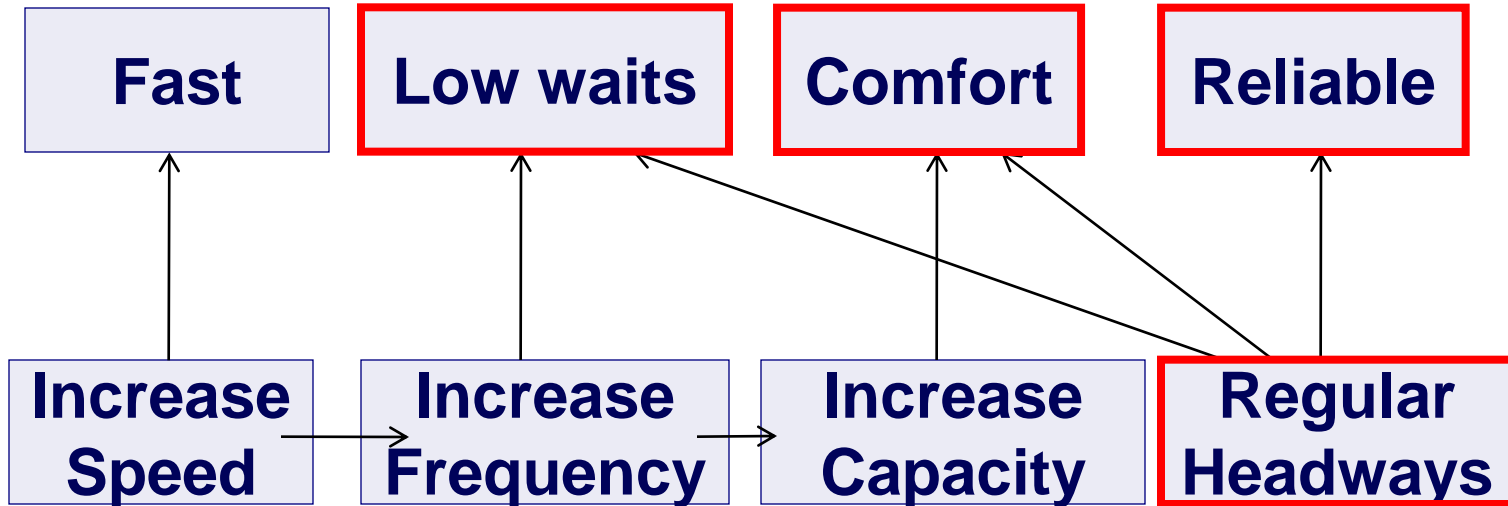
Actions

- Segregated ways/lanes
- Reduce dwell times
 - Fare payment off-bus
 - Buses with multiple doors
- Increase distance between stations
- Express services
- **Traffic signal priority**

Metro Attributes

Main drivers

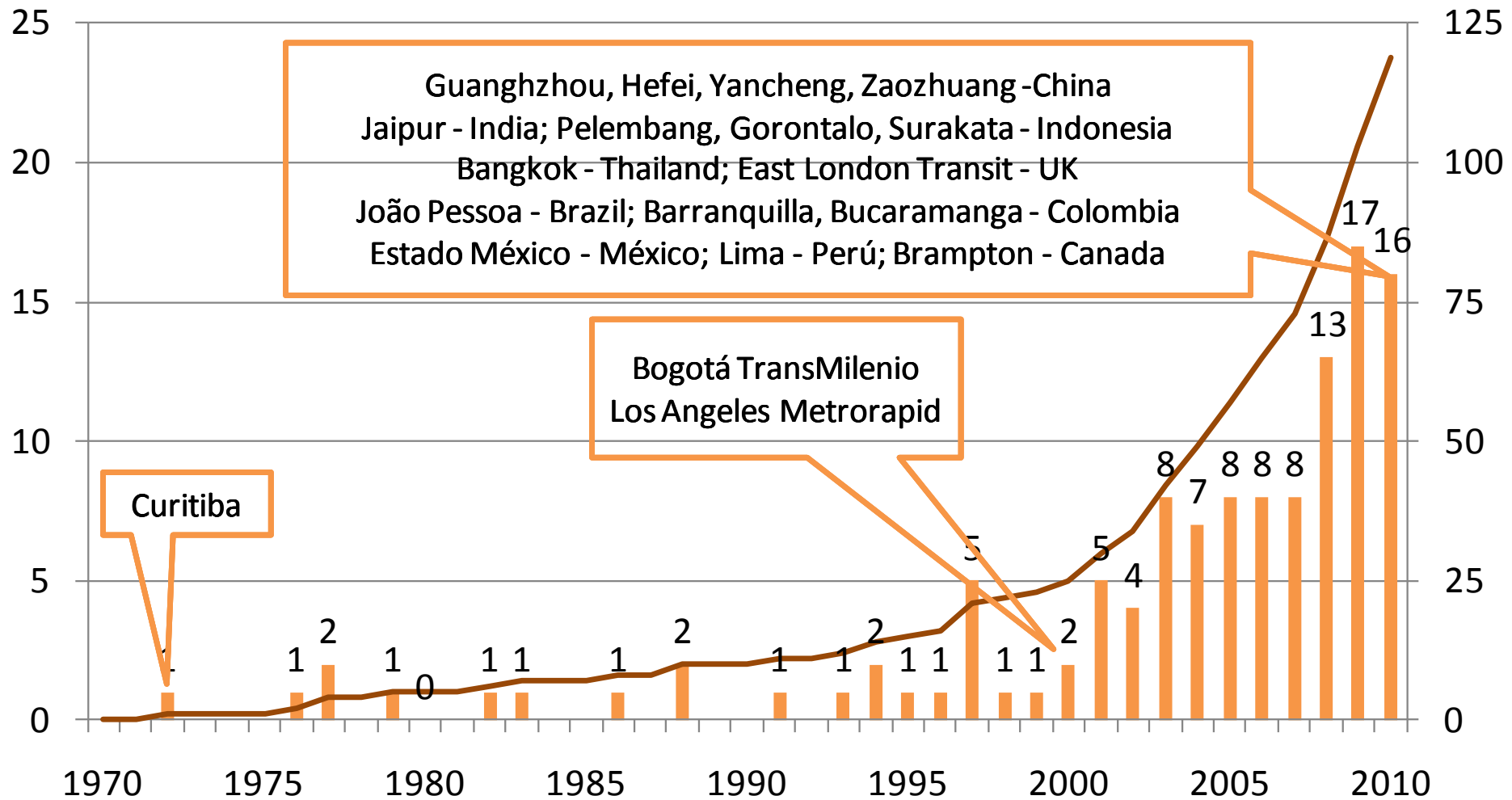
Actions



- Segregated ways/lanes
- Reduce dwell times
 - Fare payment off-bus
 - Buses with multiple doors
- Increase distance between stations
- Express services
- Traffic signal priority
- Improved headway control

**BRT should achieve these features
Some examples...**

Cities with BRT/Bus Corridors



Rapid growth of BRT Systems and Bus Corridors in 2010, specially in developing cities

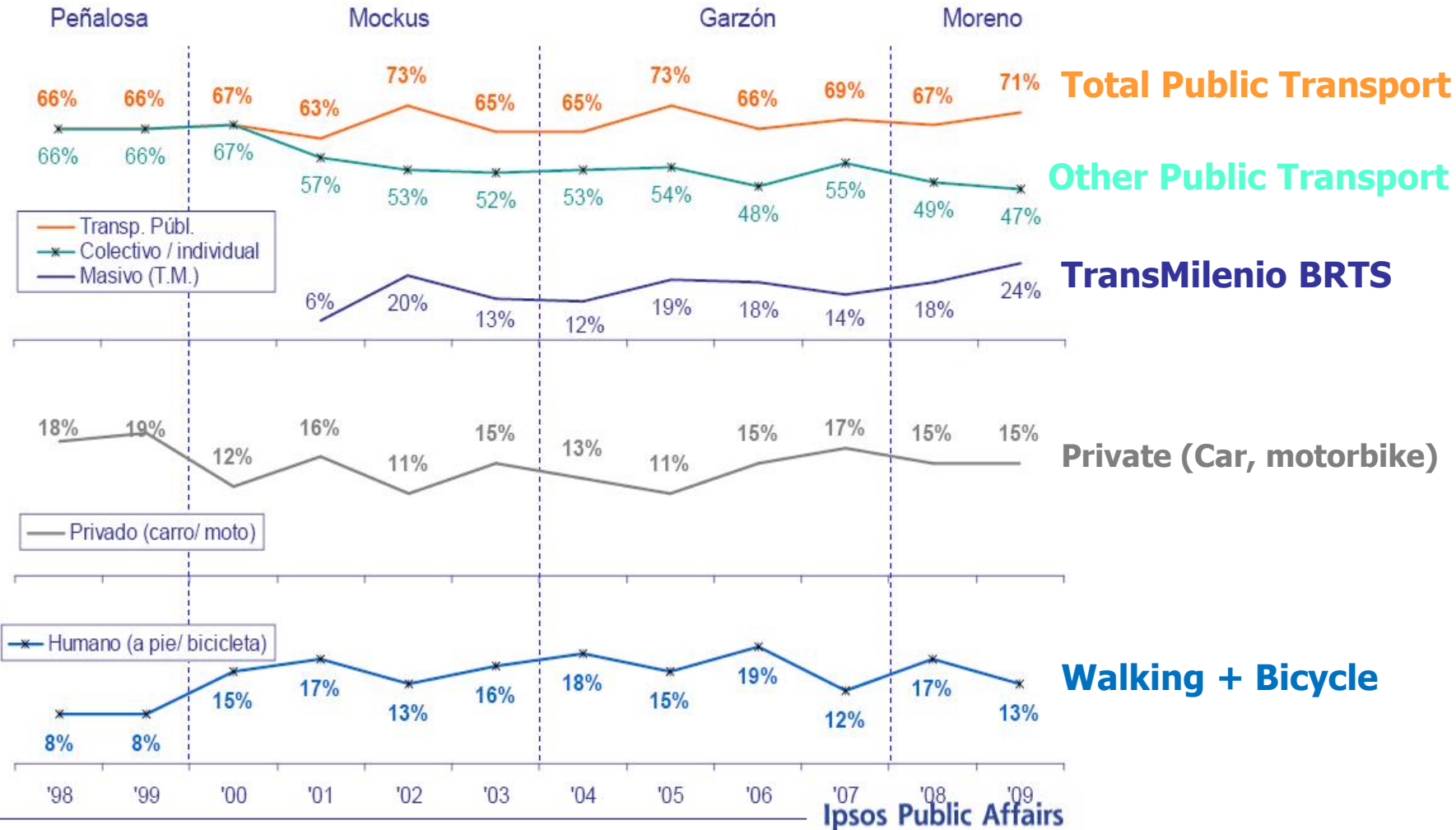
- **16 cities started operations in 2010 (13% growth)**
 - **China (4), Indonesia (3), Colombia (2), India, Thailand, Brazil, México, Perú, UK, Canada**
 - **21 corridors; 396 km; 464 stations; 2,047 buses**
 - **1.4 million passengers per weekday (5% growth)**
- **7 cities expanded corridors in 2010, 125 km**
- **49 new cities with corridors under construction**
- **16 cities expanding their corridors**
- **31 new cities in planning stages**

Transmilenio, Bogotá

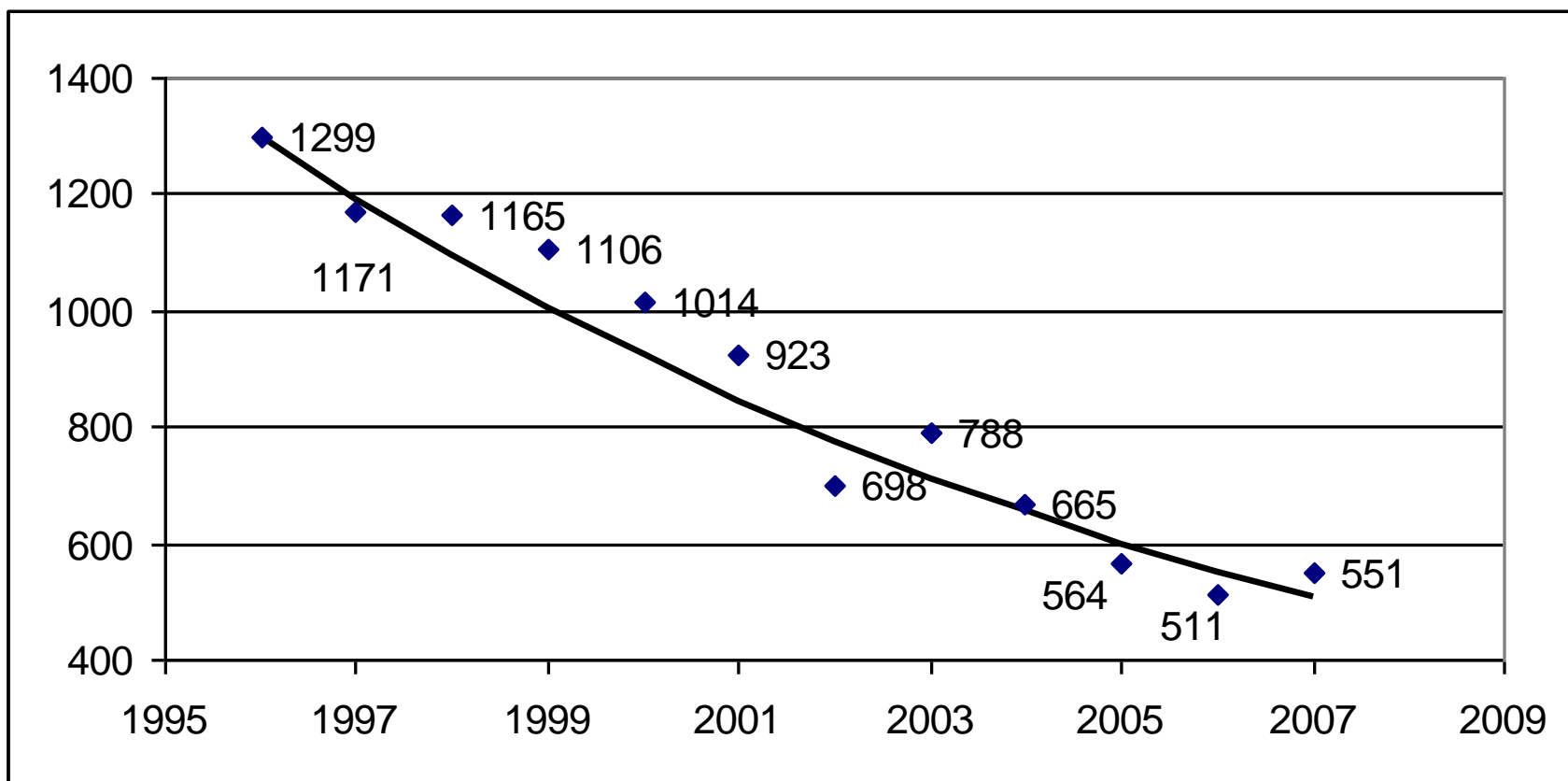




Main mode of transport 1998-2009



Fatalities in Bogotá Over Time



Source: Anuario Estadístico, Ministerio de Transporte, Colombia

Guangzhou BRT, China

- **Trunk and feeder logic relaxed**

- **22.5 km dedicated busway**
- **26 stations (prepayment, level boarding – some buses, passing lane, up to six platforms)**
- **Peak supply: 340 buses/hr/direction**
- **40 routes (in and out the system, no transfers)**
- **Peak demand: 26,900 passengers/hr/direction**
- **Daily demand: 800,000 pax/per weekday**



Photo by Benjamin

In Bucaramanga, Colombia

•Bus only lane through downtown



Photo: <http://www.metrolinea.gov.co/>

Regarding Service Design

- **The user must perceive a system**
- **Integration does not end in fare collection**
- **With integration transfers blossom...**
 - **Make them fast, safe, informed, less painful**
 - **Reduce them when possible**
- **Bring express services (10 % social costs reduction)**
 - **Lower operational cost per mile**
 - **Less time spent by passengers**
 - **Increase capacity**

Strategies for High-Quality Bus/BRT

by

Juan Carlos Muñoz

Pontificia Universidad Católica de Chile

Nigel Wilson

MIT

**Across Latitudes and Cultures- Bus Rapid Transit
Centre of Excellence www.brt.cl**