Public Transport Improvement

IEA Energy Efficiency in Emerging Economies
Jakarta, July 17, 2018

Retno Wihanesta
Coordinator for Smart Cities and Sustainable Transport
AN UNSUSTAINABLE URBANIZATION PATH

1.2 Million Traffic Fatalities

3.7 Million Air Pollution premature deaths

3.2 Million Physical Inactivity premature deaths

2% of the land but

70% of the CO₂ emissions

75% FINANCE
Of the 2050 infrastructure is yet to be built

Source: Land use and emissions, UN-HABITAT. Infrastructure needs, Resilient Cities. Air pollution and traffic fatalities, WHO. in WRI Presentation on India Vision Zero
DIFFERENT MODELS, VERY DIFFERENT OUTCOMES

Atlanta
USA

- Population (1990): 2.5 million
- Built-up area: 4,280 km²
- Traffic fatality rate: 9.7/100,000 pop.
- Mode share: Car 77%, Transit 3%, Biking 0%, Walking 1%

Barcelona
Spain

- Population: 2.8 million
- Built-up area: 162 km²
- Traffic fatality rate: 1.9/100,000 pop.
- Mode share: Car 20%, Transit 33%, Biking 12%, Walking 35%

Source: Alain Bertaud (2012) Clearing the air in Atlanta: Transit and smart growth or conventional economics? in WRI Presentation on India Vision Zero
Urban Development - Jakarta

Mode Share in Jabodetabek

Jakarta foots US$5b annual bill for traffic jams: Minister

News Desk
The Jakarta Post

Jakarta | Fri, October 6, 2017 | 03:59 pm
REPORTED FATALITY RATE PER 100000 INHABITANTS

Source: Cities Safer by Design. World Resources Institute
Mode Share

Bandung

Semarang

Source: Bandung Urban Mobility Project

Source: Survey ITDP & IGES 2017 in http://www.itdp-indonesia.org/blog/mengapa-harus-brt/
What do we want from an City’s Transportation System?
A good urban transport system should be

- Efficient
- Safe
- Accessible
- Affordable
- Provide a high quality of service
- Be Environmentally Sustainable and
- Contribute to the desired Urban Form of the city

Source: EMBARQ India Presentation on BRT System, 2014
What are the technology options for Mass Transit?
## Alternative Analysis

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

Source: Adapto por el autor de Halcrow Fox, 2000, L. Wright and K. Fjellstorm, 2003, y V. Vuchic in WRI Presentation on Mass Rapid Transit Options
### Alternative Analysis

<table>
<thead>
<tr>
<th></th>
<th>Metro</th>
<th>BRT</th>
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</thead>
<tbody>
<tr>
<td>Capacity Analysis</td>
<td>✔️</td>
<td></td>
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<tr>
<td>Capital Cost</td>
<td></td>
<td>✔️</td>
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<tr>
<td>Operational Cost</td>
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<td>✔️</td>
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<tr>
<td>Need for Subsidy</td>
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<td>✔️</td>
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<tr>
<td>Travel Time Impact</td>
<td>✔️</td>
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<tr>
<td>Impact on Congestion</td>
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<tr>
<td>Opportunity Cost</td>
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<tr>
<td>Local Air Pollution</td>
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<tr>
<td>GHG Emissions</td>
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<tr>
<td>Affordability</td>
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<tr>
<td>Accessibility</td>
<td>✔️</td>
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<tr>
<td>Gestation Period</td>
<td>✔️</td>
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<tr>
<td>Impact on Urban Form</td>
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<tr>
<td>Construction Risk</td>
<td></td>
<td>✔️</td>
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<tr>
<td>Political Risk</td>
<td></td>
<td>Tie</td>
</tr>
</tbody>
</table>

Source: EMBARQ India Presentation on Integrated Transport Systems for Cities, 2013
Alternative Analysis

Net Benefit Analysis

Source: EMBARQ India Presentation on Integrated Transport Systems for Cities, 2013
BRT IMPACTS

Travel Time

$142m saved
in Metrobus Line 3 in Mexico City

Traffic Safety

$288m saved
in avoided traffic injuries and fatalities in Bogota's Transmilenio

Greenhouse Gases

$392m saved
from Metrobús in Istanbul

Source: Social, Environmental, and Economic Impacts of Bus Rapid Transit, WRI
TOTAL PASSENGER OF BRT (2009)

Source: Modernising Public Transport, WRI
BRT COMPONENTS

Segregated Median Busways

Centralized Control

Distinctive Image

Stations with Prepayment and Level Boarding

Large buses with Wide doors

Source: WRI Presentation on Best Practice on Bus Rapid Transit, 2017
BUS PRIORITY SYSTEMS IN THE WORLD

- # of cities and length (km) per country

203 cities = 416 corridors = 5,347 km

source: BRTData.org, April 2016
BUS PRIORITY SYSTEMS IN THE WORLD

- Evolution of the number of cities per year

* Busway / BRT year commencement

source: BRTData.org, March 2016
BUS PRIORITY SYSTEMS IN THE WORLD

In expansion (48 cities)

In operation (203 cities)

Planned / in construction (139 cities)

source: BRTData.org, April 2016
Planning Phase

Network Development
- Road Network Model
- Public Transport Network Model
- Demand Model
- Landuse

Operational Plan
- Routes and Lines
- Headway and Frequency
- Fleet Size

Business Plan
- Business Model
- Capex & Opex
- Revenue Projection
- Financial Analysis

Legal and Institutional
- Institutional Building
- Legal Supports

Source: Implementation Plan of Trans Metro Bandung, WRI
PEMKOT SURAKARTA

DISHUBKOMINFO

BLUD TRANSPORTASI

SISTEM PELAKSANAAN SARANA ANGKUTAN UMUM MASSAL/BATIK SOLO TRANS KOTA SURAKARTA TAHUN 2009 - 2015

KOTA SURAKARTA

STUDY/GRAND DESAIN/MASTER PLAN PENINGKATAN KUALITAS SAUM KOTA SURAKARTA

REVITALISASI TRAYEK/KORIDOR

PT DAN KOPERASI

STANDAR PELAYANAN MINIMAL/SPM

MOU WALIKOTA DENGAN PT/KOPERASI TENTANG PELAKSANAAN OPERASIONAL BST

MOA SEKDA DENGAN PT TENTANG ASSET BUS BST

MOA KADISHUB DENGAN PT/KOPERASI TENTANG SOP

PT DAN KOPERASI

1. 16 PO BUS DAN 350 ANGKOTA MEMBENTUK KONSOSRIUM DAN MELEBUR MENJADI PT UNTUK BUS KOTA DAN KOPERASI UNTUK ANGKOT

2. KOTA SURAKARTA BEKERJA SAMA DENGAN PT (BUS KOTA) DAN KOPERASI (ANGKUTAN KOTA) UNTUK MENGOPERASIKAN BATIK SOLO TRANS KORIDOR 1-14 (PEMBERDAYAAN OPERATOR LAMA)

SISTEM PELAKSANAAN SARANA ANGKUTAN UMUM MASSAL/BATIK SOLO TRANS KORIDOR 1 S/D 14 BERJALAN LANCAR

PER MENDAGRI No. 101 TAHUN 2014

PENGADAAN BUS DAN BANTUAN/HIBAH BUS UNTUK SAUM MENJADI NO POL KENDARAAN PLAT MERAH

PENGADAAN BUS DAN HIBAH/BANTUAN BUS UNTUK SAUM

NO POL BUS ADALAH PLAT KUNING

1. PT DAN KOPERASI

MOU WALIKOTA DENGAN PT/KOPERASI TENTANG PELAKSANAAN OPERASIONAL BST

MOA SEKDA DENGAN PT TENTANG ASSET BUS BST

MOA KADISHUB DENGAN PT/KOPERASI TENTANG SOP

PENGADAAN BUS DAN HIBAH/BANTUAN BUS UNTUK SAUM

NO POL BUS ADALAH PLAT KUNING

IMPLEMENTASI OPERASIONAL BATIK SOLO TRANS KORIDOR 1 S/D 14 BERJALAN LANCAR

PER MENDAGRI No. 101 TAHUN 2014

PENGADAAN BUS DAN BANTUAN/HIBAH BUS UNTUK SAUM MENJADI NO POL KENDARAAN PLAT MERAH

Source: Department of Transportation (Dishub) of Surakarta Presentation on Rencana Pengembangan Batik Solo Trans Kota Surakarta, 2017
INFRASTRUCTURE DESIGN

Source: WRI Presentation on Traffic Safety for Bus Priority System, 2017
INTEGRATION WITH NMT

Photo: EMBARQ / EMBARQ Brazil
WRI’S WORK ON ROAD SAFETY AND TRANSPORT

Source: WRI Presentation on Traffic Safety for Bus Priority System, 2017
PUBLIC OUTREACH
Information material – leaflets

Source: WRI Presentation on Branding, Marketing, and Communications for Bus Rapid Transit, 2017
THANK YOU!!!