

# BRT – ETT FLEXIBELT VERKTYG I STADSPLANERINGEN



# What is Bus Rapid Transit (BRT)?\*

- Special Vehicles
- Dedicated Lanes
- Special Stops
- System Support
  - Pre-board ticketing
  - Passenger info system
  - Traffic management central
- Distinct Brand



\* Embarq definition



## HOW MUCH PUBLIC TRANSPORT DOES A BILLION DOLLARS BUY?



10 kilometres of subway



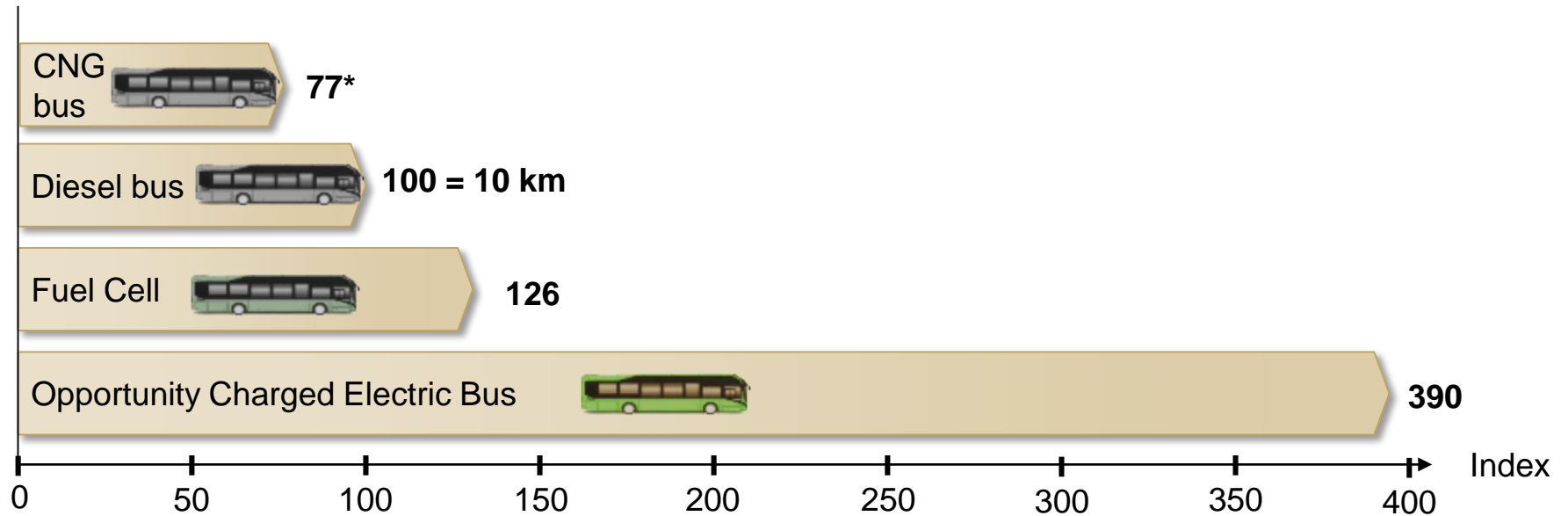
50 kilometres of lightrail



250 kilometres of BRT

# Electric buses have superior energy efficiency

How far does 180 MJ of energy take you in a City bus?\*



SOURCE: FCH JU , International Energy Agency 2011

\* Well to wheel comparison:

- 5l diesel
- 5 Nm<sup>3</sup> CNG
- 50 kWh of electricity





# Indoor Noise

Constant Speed: - 15 dBA



# Creating new opportunities for urban planning



# Busstrain – scalable system with electric buses in platooning

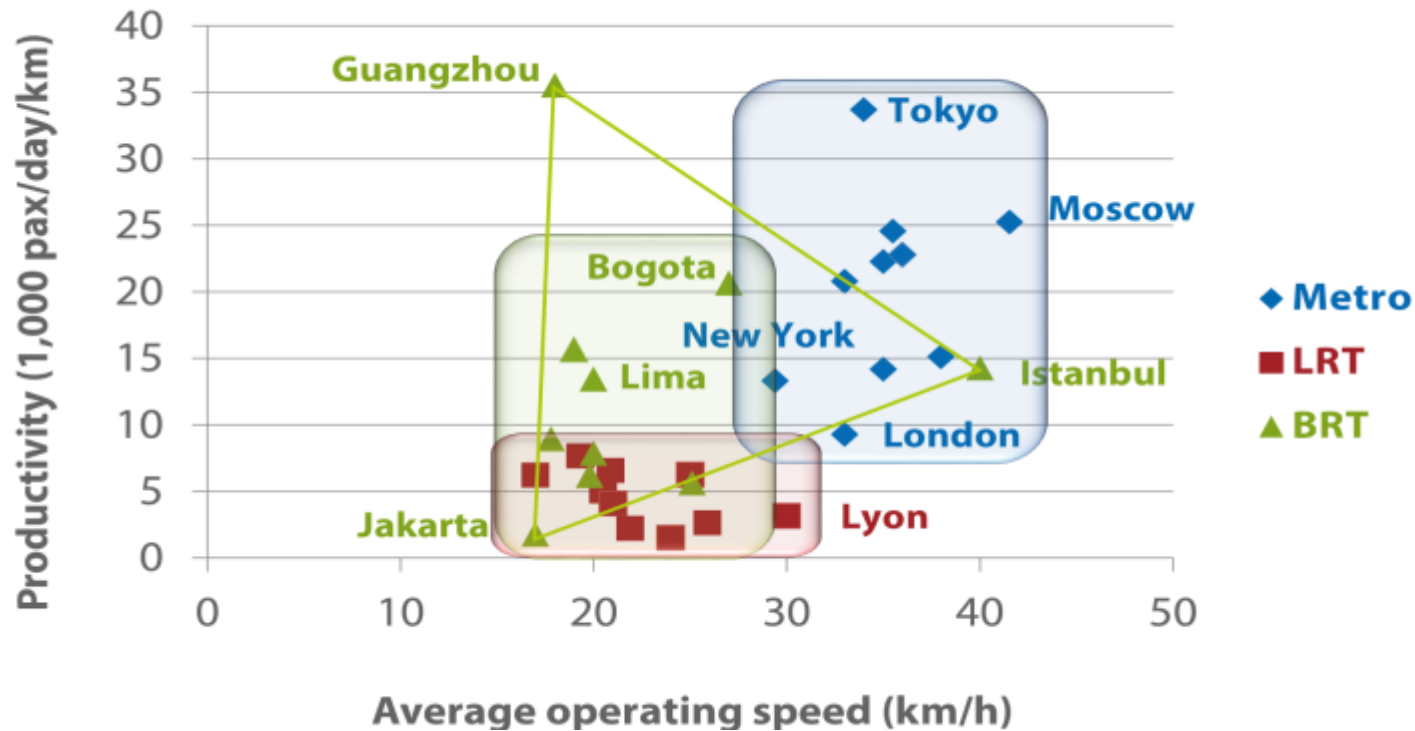
- High capacity and flexibility
- Low emission and noise
- Indoor buss stops
- Dedicated lanes
- Attractive design
- Energy efficient drive





# Electrical buses will create a new mode of public transportation

Capacity of top BRT, LRV & Metros in the world



Source: Petzhold, 2012





# Volvo electrified buses – three tools in a toolbox

## HYBRID BUSES



- 30-40% Fuel reduction
- Silent take-off
- 40% lower on road emissions

## ELECTRIC HYBRID BUSES



- 75% fuel & 60% energy reduction
- Electrical drive 70% of route
- Silent
- 75% CO<sub>2</sub> reduction\*
- Charging 3-6 min at end stations

## FULL ELECTRIC BUSES



- 80% energy reduction
- Electrical drive 100% of route
- Silent
- Minimum local emissions
- 100% CO<sub>2</sub> reduction\*
- Charging 3-6 min at end stations

\* With CO<sub>2</sub> neutral electricity



# Three cornerstones of Volvo Buses' e-mobility strategy

## Product portfolio

The future will be a mix of:

- Hybrid
- Electric Hybrid
- Electric



## Complete system offering

- Buses, infrastructure & services
- Battery charged by km
- Competitive Life Cycle Cost vs Diesel



SIEMENS

ABB

## Open interfaces

- One open and standardized interface for charging infrastructure
- Enable buses from other suppliers
- Driving standardisation together with Siemens & ABB



# Suppliers declaring inter-operability

## Press communication on March 15 2016



### European bus OEMs agree on charging standardisation

Europe's electric bus segment has received a boost in the form of an agreement for standardised charging equipment. By Michael Nash

A group of European bus manufacturers has voluntarily agreed to adopt an "open" and "transparent" approach when it comes to charging equipment. VDL Bus & Coach, Volvo Buses, Irizar and Solaris will ensure the interoperability of electric buses with charging



**Bus électriques : accord sur une interface commune de charge**  
Les constructeurs d'autobus européens Irizar, Solaris, VDL et Volvo ont accepté d'assurer l'interopérabilité des autobus électriques au moyen de l'infrastructure de charge fournie par ABB, Heliox et Siemens. L'objectif est d'obtenir une interface commune entre les autobus électriques et l'infrastructure de recharge afin de faciliter l'introduction de systèmes d'autobus électriques dans les villes européennes. Des interfaces communes et privilégiées seront mises à disposition de tous les participants et utilisées pour des autobus électriques à charge intermédiaire (charge rapide aux terminus) et pour des autobus électriques chargés pendant la nuit. Le groupe s'est engagé dans des activités de standardisation européennes. D'autres constructeurs d'autobus et de systèmes de charge ont été invités à rejoindre ce groupe. Pour la chaîne intermédiaire, le système comprenant un



... and more companies joining



