Air Quality Benefits of Transport Initiatives
HANOI URBAN TRANSPORT DEVELOPMENT PROJECT

Better Air Quality 2006

Shomik Mehndiratta

Hanoi

Hanoi, the capital of Vietnam and the key economic node of the country's north, is a booming city of around 3 million people

Urban densities are among the world's highest (272/ha in the urban districts and up to 404/ha in the central Hoan Kiem district compared to 86 in Paris, 62 in London and 3

GDP/capita has increased at over ten percent an annum for the last decade to US$1380 in 2005

... and as a result ...

Hanoi Urban Transport

...rapid motorization over the last fifteen years has been seen.

- 1.5 million motorcycles registered in 2005 that accounted for close to 70% of vehicular trips;
- Automobile population is increasing from its current base of 150,000 at over ten percent a year;

- Road network is exceptionally sparse (less than 7% of the land area) with 526 km in length, 677 intersections;
- Traffic management, congestion serious problems
- Air quality is decreasing due to traffic emission.

...and ...

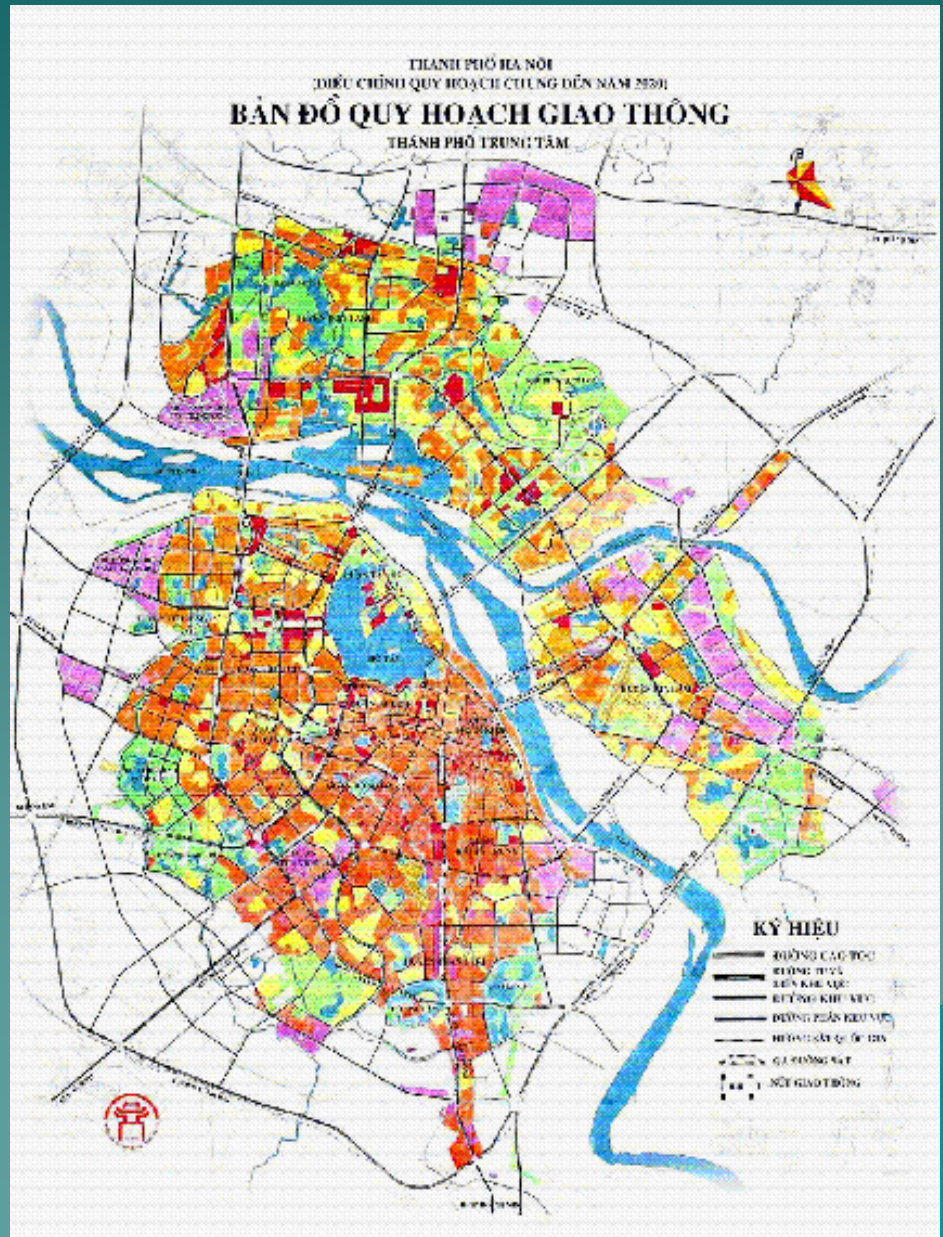
Hanoi Urban Public Transport

- **Public transport, which bus is the only kind of mode, currently accounts for only 10%** of total trips. A bus fleet of 726 operating in 43 routes carrying 850 thousands passenger/day.
- The regular bus service, though provides significant improvement in public transport, has not met the demand and imposed sense of unsafeness to two-wheel vehicle riders and pedestrians.
- Though rail systems are being planned, costs are high and implementation will take time

As transport demand rises, Hanoi is facing various issues ranging from traffic management, to congestion, traffic safety, air pollution, planning and transport sector financing.

Key development issues and rationale for the project

- Need to reduce congestion and traffic accidents
- Complete the city's road network
- Develop the northwest section of the city in accordance with Master Plan.
- Facilitation of Public Transport
- Improvement of planning methods and modes (PT, bicycles and walking) to upgrade the urban environment.
- Reduce air quality, safety impacts



Project Proposed Objectives and Components

To ‘increase urban mobility in Hanoi…’

- ✓ Through establishment of high capacity **bus-way** on major corridors
- ✓ By integrating investment in **road** infrastructure
- ✓ By Enhancing of the **institutional capacity** to implement growth strategy

Proposed Project cost by component (US$ mil.)

IDA ~US$143 million, GEF US$9.8 million

	Hanoi	GEF	IDA
BRT component	7	4	79
Road component	101	1.75	59
Inst. Strengthening (AQ, planning, management)		4	4.5
Air quality subcomponent			1.5

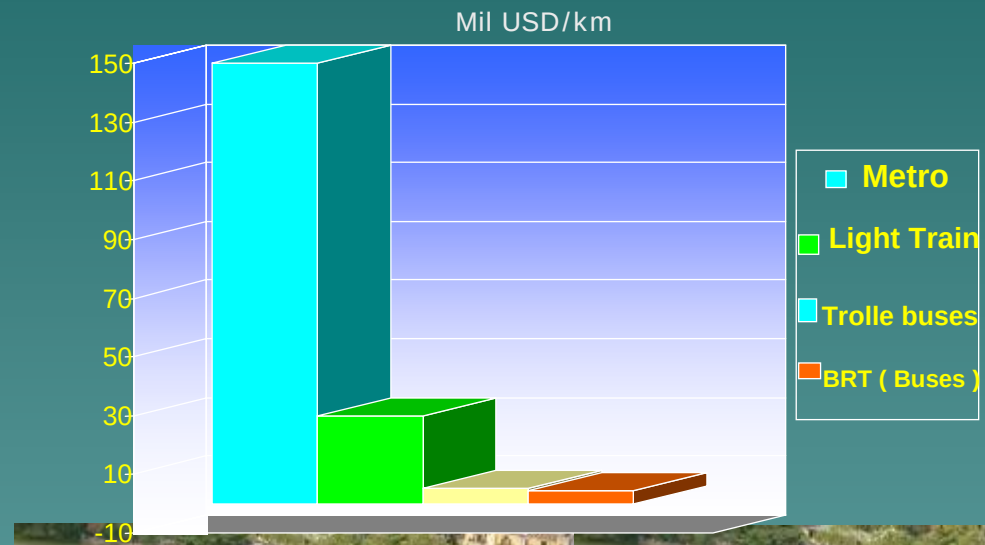
BRT component

What is BRT?

A cost – effective mass transit system able to transport people safely in a efficient way

Why BRT ?

- Low investment cost
- Short construction time
- Flexible
- High travel speed (20km/h)
- High passenger capacity
- Easy integration with other PTs
- More simple maintenance in comparison with metro and LRT



BRT component (cont.)

BRT Characteristics

At grade boarding and alighting

Wheelchair access

Payment before boarding

Closed terminals and bus stations

BRT Requirements

Lanes:

exclusive

Signal system:

bus priority

Stations and terminals:

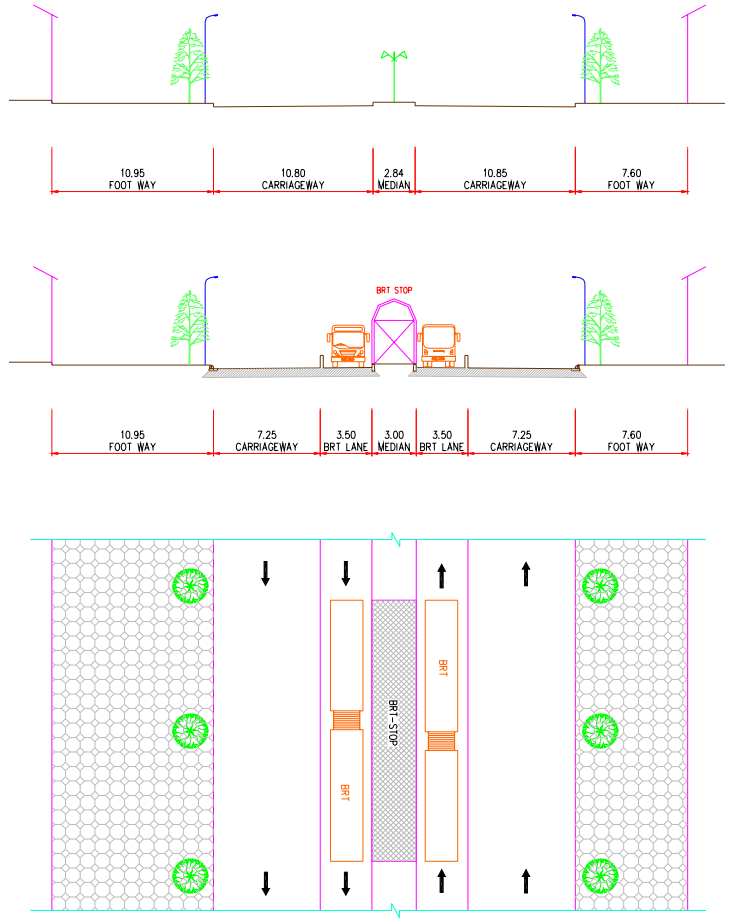
closed

Management:

high skills

BRT component (cont.)

First two BRT corridors for Hanoi



BRT component (cont.)

How BRT success?

Strong support from
Hanoi PC and related ministries

BRT component obtains commitment from HNPC leadership and related ministries

Good understanding and support of people

Need enhancement of awareness program and public consultation

Good management of public transport
In general and BRT in particular

Establishment of an high-level PTA responsible for planning, policy, management, coordination, and monitoring of all PT services: Bus, BRT, Metro, LRT.

US$4m GEF for BRT

- Public Outreach and Consultation
  - Listening
  - Study Tours
  - Marketing
- Enhancing walking and cyclist access
  - parking, intersection, secondary streets
- Enhancing quality of stations & termini
  - Attracting users of choice

Carbon benefits

- ~2 m t CO2 equivalent by 2020
  - About 350,000 daily trips in 2020 (235,000 in 2010)
  - Small shift in aggregate mode share 5%
  - No induced trips
- Bogota type methodology
  - Only mode shift benefits calculated
  - 20% of trips are ‘motorcycle switchers’
  - Car switchers negligible
  - Longer trips more likely to switch (>7km)
- Corresponding local air quality benefits

Limitations of this calculations

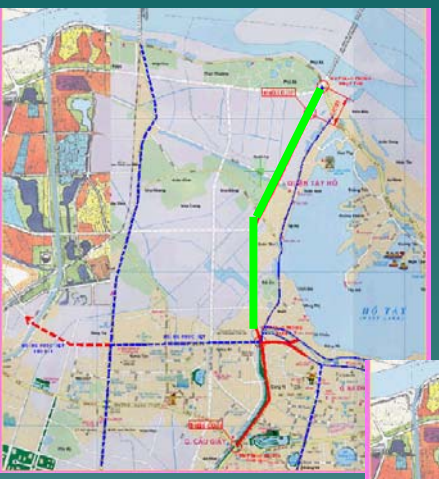
- Baseline public transport ridership too high?
  - Auto ownership rising
  - Bus speeds will fall: higher operator costs and user travel times
- Project impact underestimated?
  - Induced trips
  - Impact of lane conversion on auto travel times

ROAD component

RR2 section
6.5km

Two
Interchanges

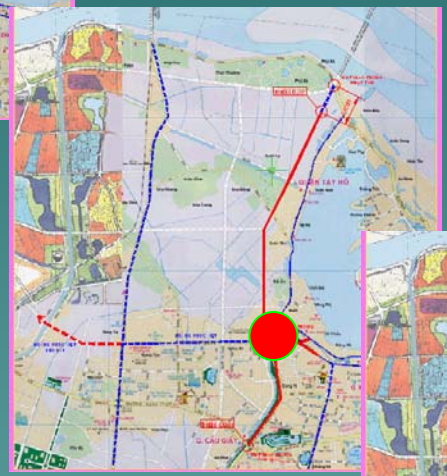
ROAD component (cont.)



RR2

Nhat Tan - Buoi

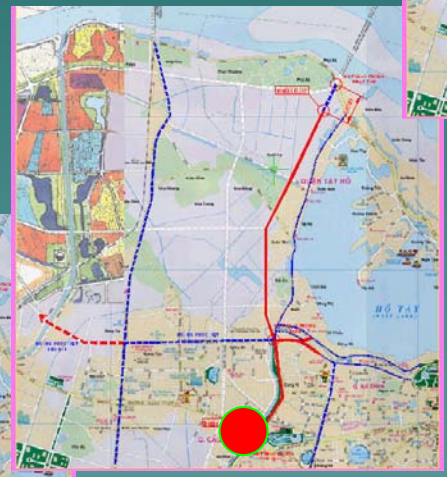
6 Motorized lanes, 1 bus lane, 2 NMT lane



Buoi Intersection

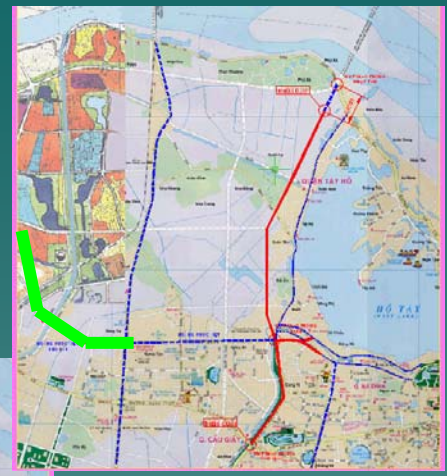
4-lane flyover with roundabout

RR2: Buoi – Cau Giay4 new Motorized lanes, 2 existing Buoi dyke lanes, 2 existing riverside lanes



Cau Giay Intersection

4-lane flyover with roundabout



HQV Extension

4 motorized lanes,

2 NMT lanes

US$1.75 m GEF for Urban Planning

US$1.75 m GEF for Urban Planning

TA PROJECT

Immediate Objectives

- Assist in developing an environmentally sustainable urban development strategy that promotes integrated transport and land use planning
- Assist in developing a strategy to encourage and sustain safer and more convenient bicycle use and pedestrian movement

HANOI URBAN TRANSPORT DEVELOPMENT PROJECT (TF 053407)

SUPPORT TO INTEGRATED SUSTAINABLE URBAN DEVELOPMENT & TRANSPORT PLAN/ POLICY

COST SUMMARY BY PROJECT TYPE

PROJECT TYPE	PROJECT INITIATIVE (U$ '000)	COST U$'000 (%)
INSTITUTIONAL / ORGAN IZATIONAL REFORM	Review of Institutional Arrangements in the Hanoi Urban Sector (U$137,000)	137,000 *(6.7)*
LEGISLATIVE / REGULATORY REFORM	Review of the Hanoi Urban Planning System (U$134,000)	478,000 *(23.0)*
	Preparation of Comprehensive Land Use Zoning / Classification System for Hanoi (U$157,000)	
	Comprehensive Review & Update Of Planning & Design Standards For Hanoi (U$177,000)	
TRAINING & CAPACITY BUILDING	Capacity Building & Training Of Key HPC Urban Sector Departments & Staff (U$445,000)	710,000 *(35.3)*
	Preparation & Installation of GIS Technology in Key HPC Urban Sector Departments: (U$269,000)	
PUBLIC INFORMATION / AWARENESS	Public Information/Awareness Campaign (Phase 1) (U$ 190,000)	190,000 *(9.4)*
PILOT DEMONSTRATION PROJECTS	Feasibility Study/ Detailed Design of Pilot Demonstration Projects (Phase 1) (U$518,000)	518,000 *(25.6)*
TOTAL		2,027,000

Institutional Strengthening component

Traffic safety & Traffic Management

✓Equipment
✓Training
✓Study tour

For Traffic Police and TUPWS

Air Quality Management

✓Reorganization of AQM activities
✓ Equipment
✓ Training

For DONRE

Transport strategy and action plan for Hanoi

US$4 million from GEF

- Support for public transport authority
- Transport planning
  - Economic instruments for control of auto ownership and use
  - BRT Phase II development
  - BRT impact evaluation
- Dissemination

Motorcycle and Air Quality

With 1.5 million MCs, a number that is still increasing fast, transport is one of the significant contributors to air pollution, and particulate emissions in

Available data suggest that particulates (TSP, PM, PM10, PM2.5) in Hanoi are at levels higher than applicable Vietnamese standards.

There is a need for Hanoi's residents and leadership to understand if MCs are playing a major role in this pollution and if so how can they lower the impact

Motorcycle Clinic Program

Under the preparation of proposed lending project Hanoi Urban Transport Development Project (HUTDP), a TF has financed a first ever motorcycle clinic program in Vietnam.

The overall objective of this program was raising awareness by helping Hanoi residents understand better the link between their MC and pollution which can be controlled with better maintenance and how this is connected with the air they breathe

Motorcycle Clinic Program

- The Hanoi Motorcycle Clinic provided free engine check-ups and minor maintenance for more than 2000 motorcycles in Hanoi. Through the check-up process:
  - Technicians conducted emission measurements of the motorcycle;
  - Volunteers used postures and brochure to educate motorcycle owners about pollution emission and health effects.

Motorcycle clinic program has been reported in many newspapers such as The Labour, Sai Gon Liberation, Family and Society, Environment & Natural Resources, Daily Afternoon new and Hanoi Television.

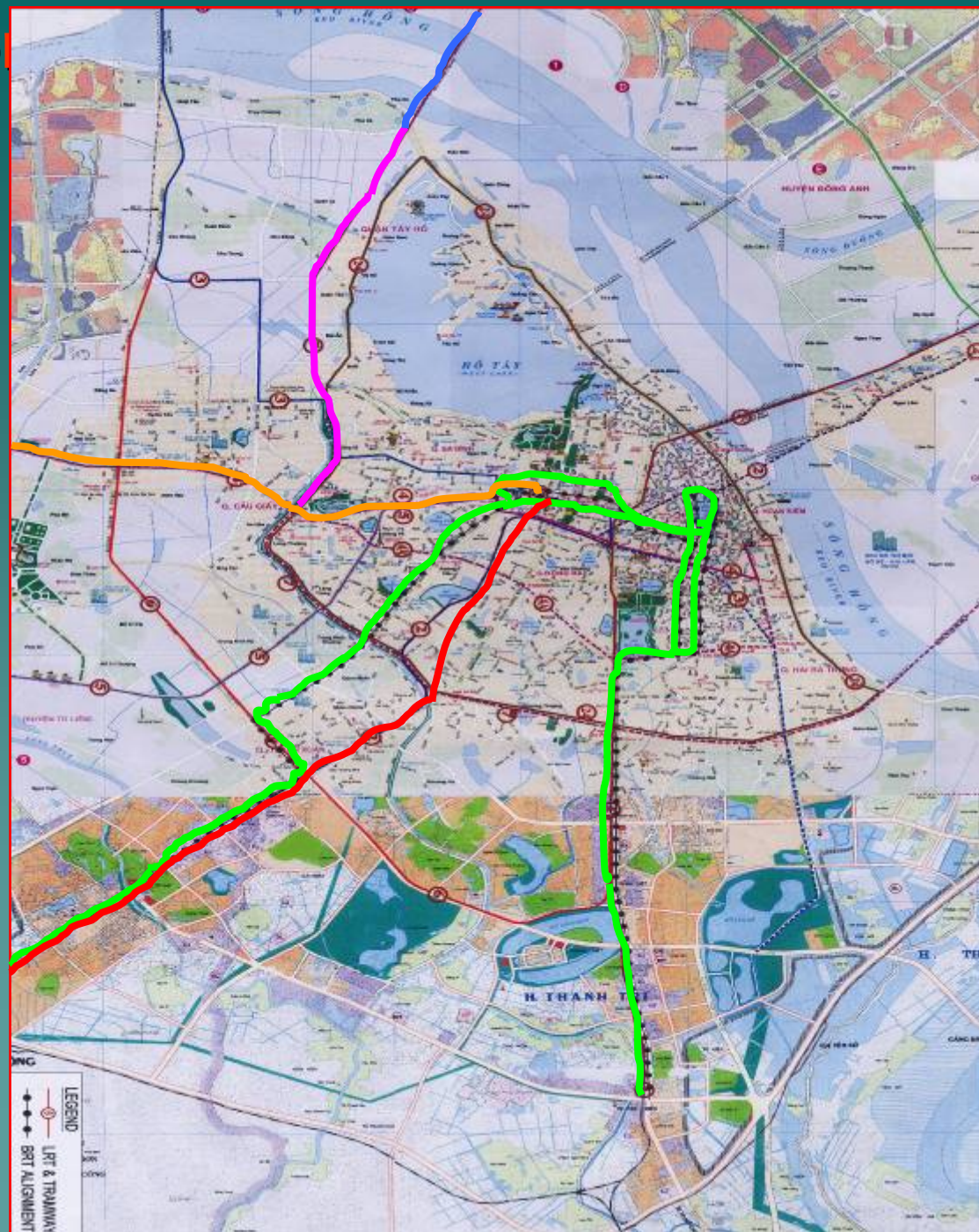
It is expected that MC clinic will be implemented regularly in Hanoi and in Vietnam.

Needs of coordinatio

- Hanoi Comprehensive Dev. Program (JICA)
- Nhat Tan Bridge (JBIC)
- Metro line (French)
- Elevated Rail (Chinese)
- Hanoi Traffic Safety (JICA)
- Swiss-Vietnam Clean Air Prog

HUTDP

- Ring Road 2
- BRT

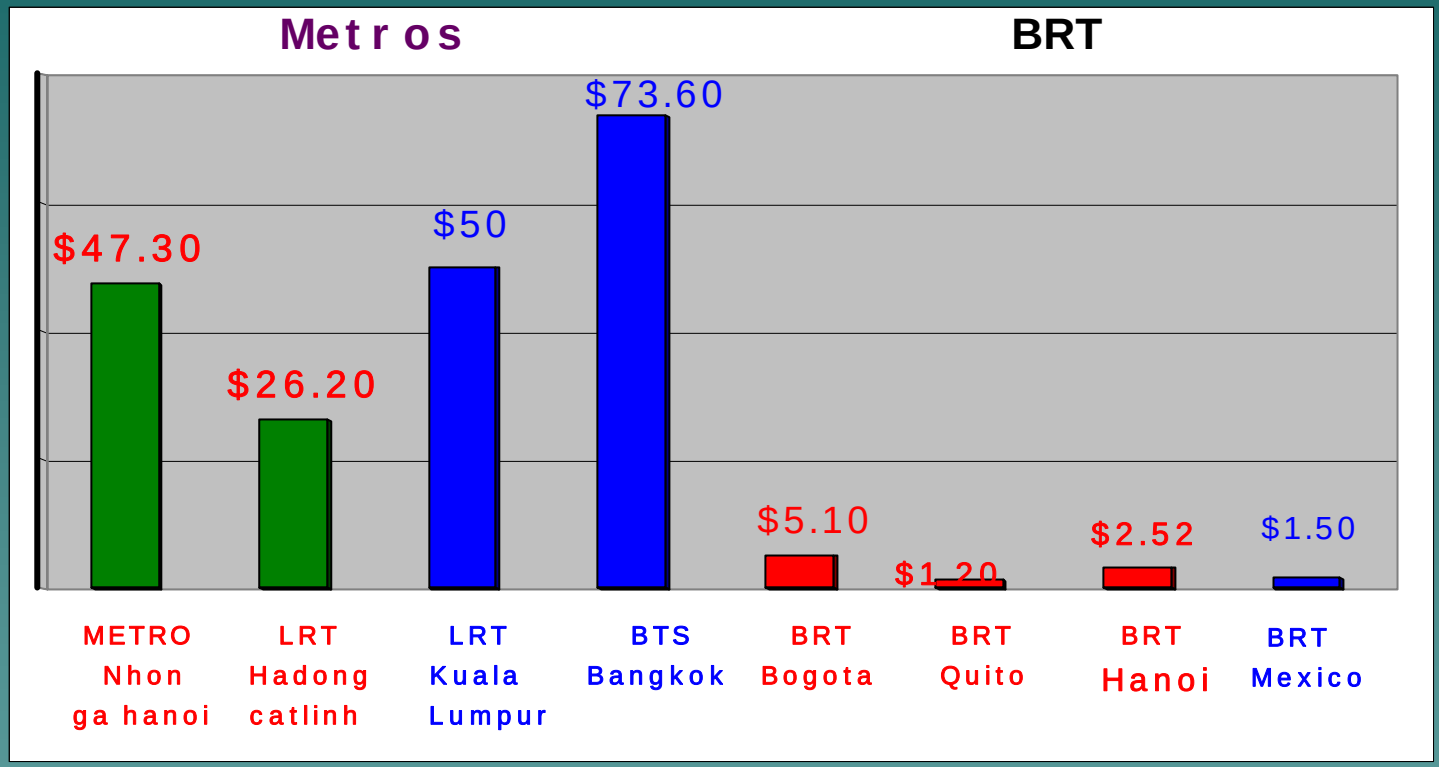


Summary

- Public transport investments
  - Reduced private vehicle use
  - Modern (relatively) low-emission vehicles
- Road investment
  - Encourage urbanization of close-in area
  - Planning assistance to promote public transport oriented development
- Air quality component
  - Financing monitoring equipment and systems in coordination with Swisscontact, others.
  - Motorcycle clinic: awareness raising
  - NILU work to provide data platform

Thank you very much for attention!

BRT construction – Cost / km (USD Mil)



Capacity by Transport Technology