

*Urban growth - transport
development- the costs.*

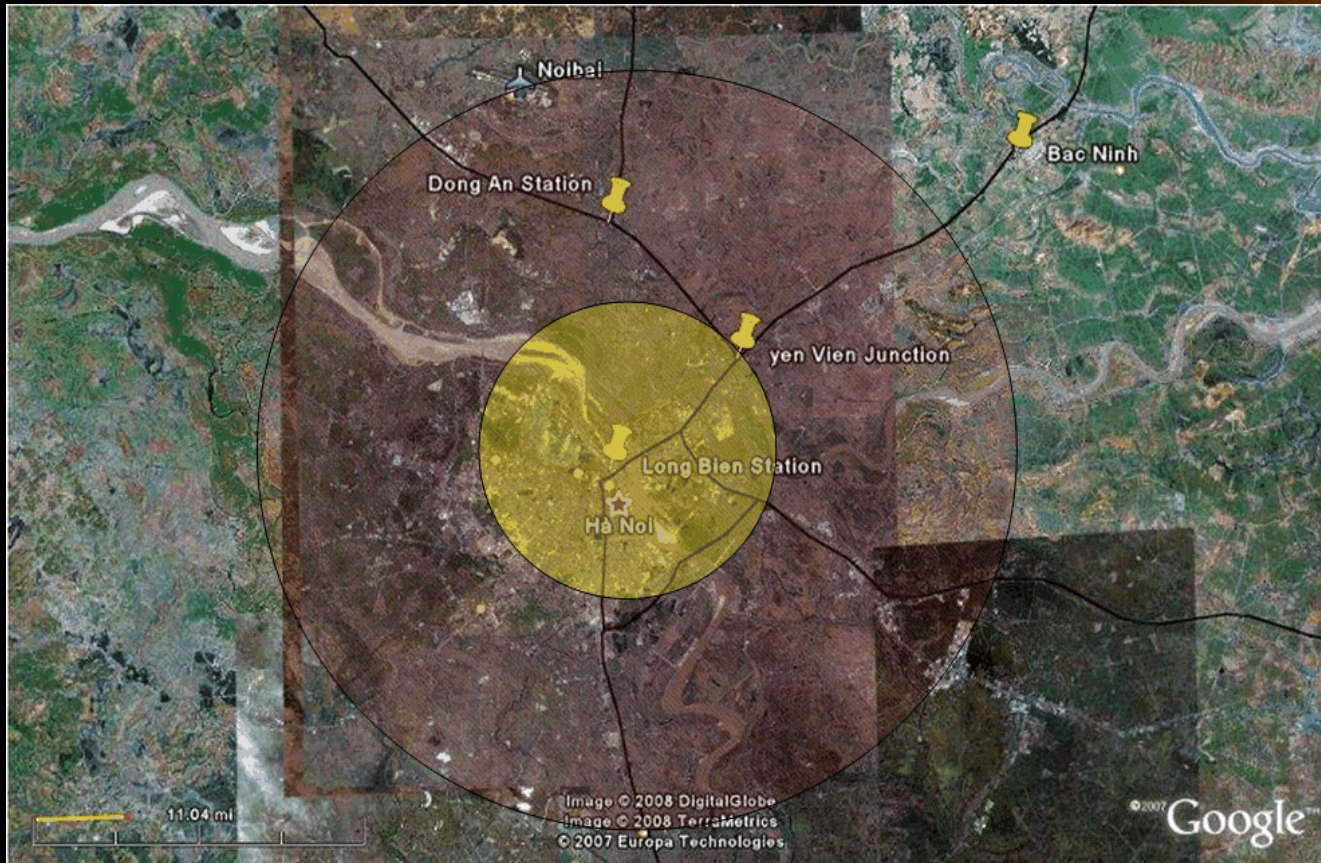


A forecast to 2020
and
development options.

Economic growth and urban growth

- As a consequence of strong economic development, the urban population of Vietnam will increase from 25% to 50%.
- Assume an annual growth of Hanoi population of 11.5% per year.
- The built up area of Hanoi will expand, as indicated in the masterplan. Population density will go down from 336 people per ha to 117 people per ha.

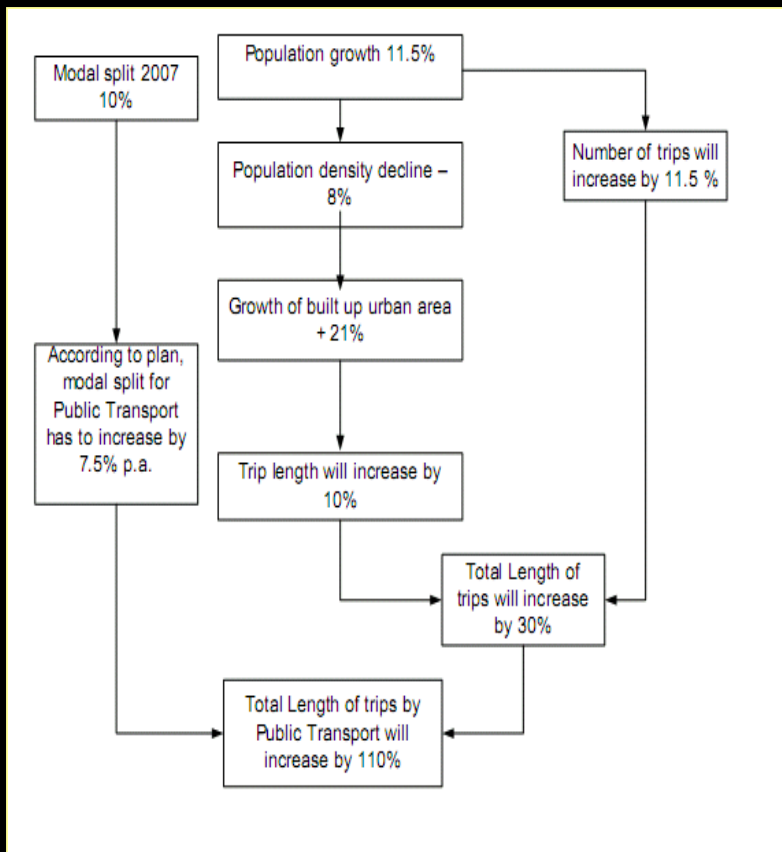
A graphic representation of Hanoi 2007 - 2020.



Today, a population of about 3.8 Million lives mostly within the yellow circle, which has a radius of 6 km.

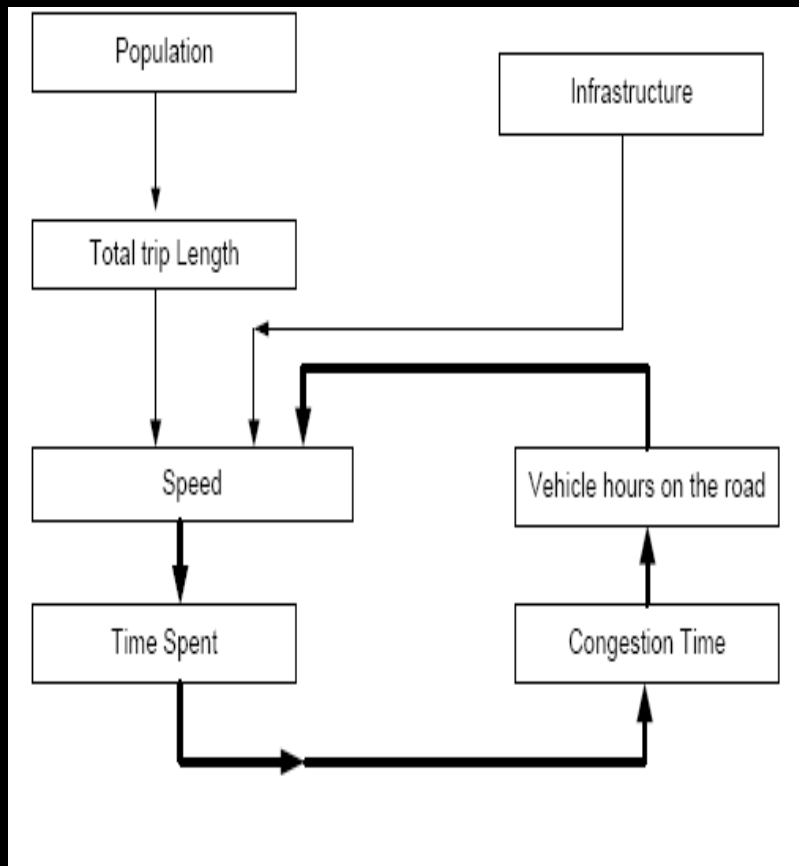
2020, a population of about 15 Million will live within the brownish circle, which has a radius of 20 km.

Factors of growth



Year	2007	2020
Population In 1000	3 800	15 600
Area ha	11300	133800
Total Length of trips 1000 km per day	40 764	576 900
Total Length of trips by Public Transport 1000 km per day	3 960	165 448

The congestion trap.



As more people enter traffic and travel longer distances, existing road infrastructure gets overcrowded and speed goes down.

As speed goes down and people clog the streets in congestion, speed goes further down. Road capacity is reduced when it is needed most

What is MRT?

Mass	Rapid	Transit
= many people with a high capacity transport system	= reliable speed, suited for the size of the city. Not more than 1 hour to reach the centre,	= Linking all parts of the city

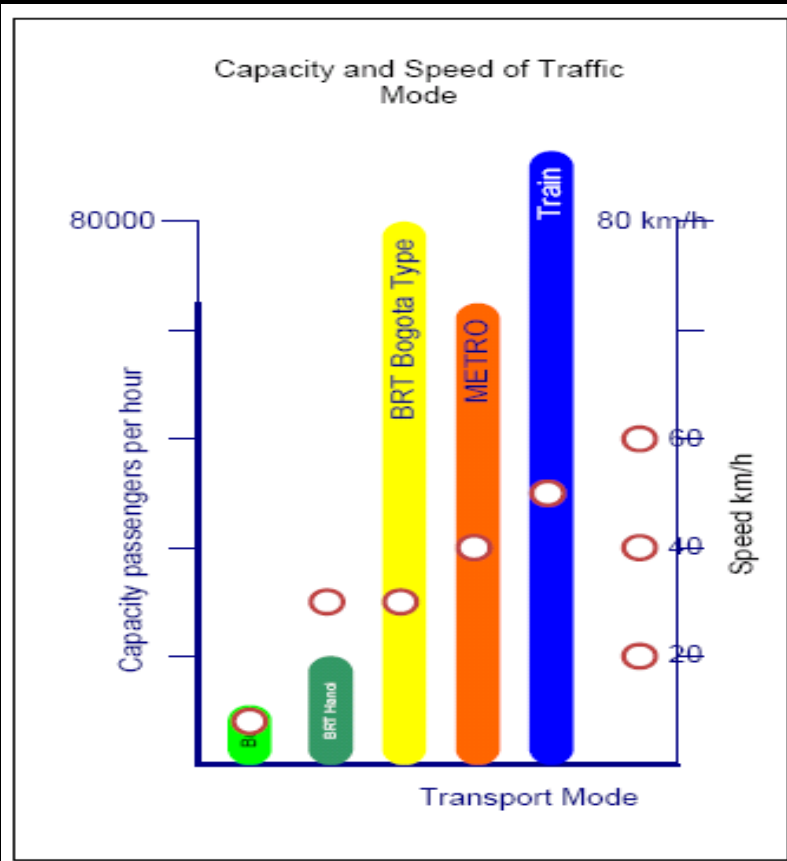
Productivity = unit size * operation speed.

Capacity = units per time.

Data for modes of transport

	Train	Metro	BRT
Unit possible size	200 m long	100 m long	18 m
Special feature	Electric or Diesel powered units – no locomotives	Electric motorized units	Articulated bus
Capacity per unit	2 000	1 000	180
Operation speed km/h	40 and higher	40	30
Minimum headway	5 “	2 “	5 busses per minute
Stations	200 long, level boarding	100 m long level boarding	60 m long, level boarding
Infrastructure	Can use existing rail	Tunnelling and elevated	Dedicated lane on wide road.
Length of Line recomm.	30 km and more	20-30 km	Not more than 30 km

Capacity by mode of Public Transport



The BRT in Jakarta. Buses on the dedicated line bypass the jam, escaping from the congestion trap.

Savings by MRT compared to conventional bus.

	BRT	Train	Metro
Savings over all	79%	85%	90%
Fuel t per year saved	771 000	829 000	880 000
Fuel cost Million \$US saved	1022	1 100	1 166

A mix of modes.

2 Metro Lines	To serve the inner city of Hanoi
Rail services	To Bac Ninh/ Dong Anh/Hai Duong and to the South
6 BRT Lines	Ha Dong and
Conventional Bus	As Feeder busses to Metro, BRT and Rail and for minor Lines.
Bicycles	The best mode for short distances and as feeder to MRT

Suburban Rail to Bac Ninh/Dong Anh

Replace	360 busses by 9 trains
Invest in trains	100 Mio US\$ - 36 Mio US\$ which busses would cost.
Invest in Infrastructure	10 Mio US\$ - not including rehabilitation of Long Bien Bridge. Financing promised by France.
Save	40 Mio US\$ per year

Thank You

