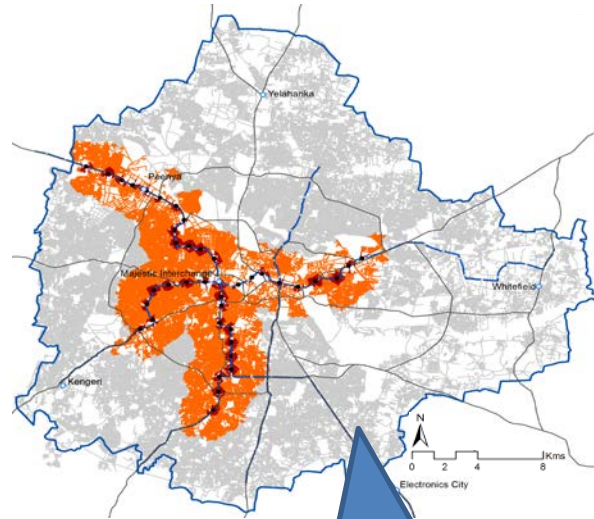
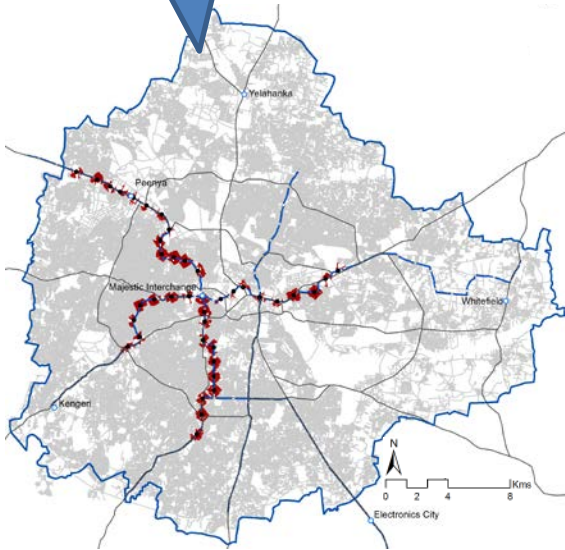


“Taking Metro Rail to People’s Doorsteps”

By
O.P. Agarwal
CEO, WRI India
4-6 November 2017

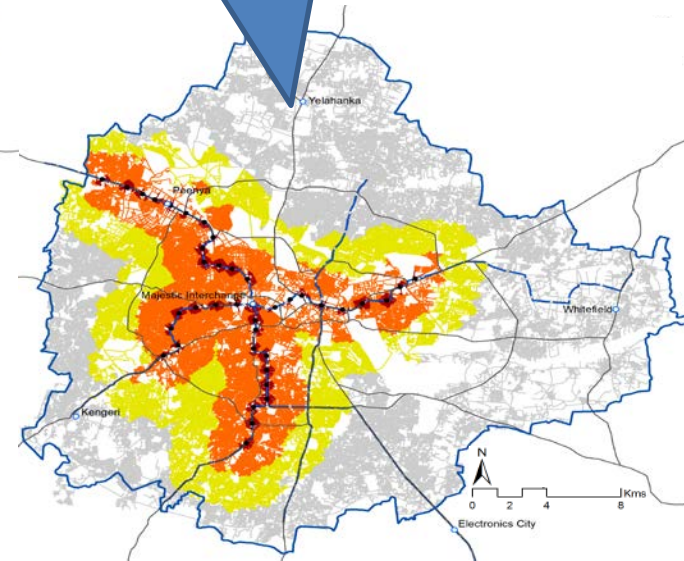
Bangalore Metro: Captive Population

0.7 million people live within 0.5 kms (8% of 2011 City Population)



3.7 million people live within 2.5 kms (45% of 2011 City Population)

6.1 million people live within 5 kms (73% of 2011 City Population)



This is the case for connecting the metro to people's doorsteps

This needs a comprehensive and well planned adoption of several measures

Several Mass Transit Projects

City	Length of Metro line (km)	City	Length of Metro line (km)
Delhi	325	Lucknow	29
Mumbai	44	Jaipur	12
Bangalore	115	Chennai	80
Hyderabad	71	Gurgaon	12
Kochi	27	Ahmedabad	35
Pune	31	Nagpur	38

Approx 810 kms already approved – more under consideration

Nearly 800 potential station areas and more to come

Comprehensive set of measures

Transit Oriented
Development

Brings people
closer to mass
transit

Feeder systems

Takes mass
transit closer to
the people

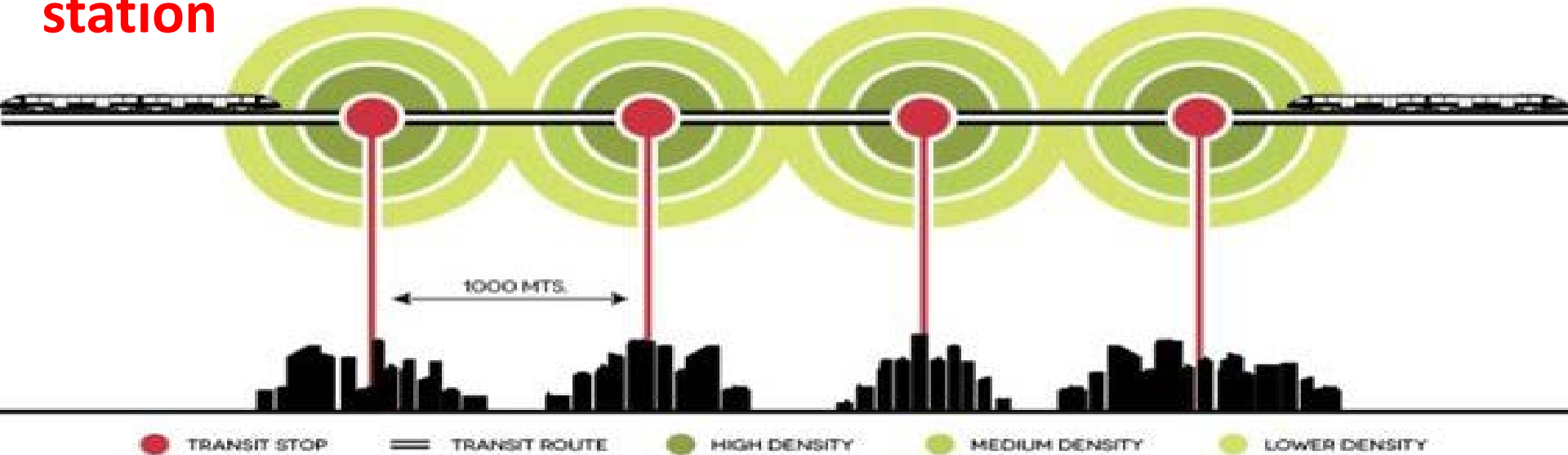




TRANSIT ORIENTED DEVELOPMENT

Density near metro station

Mixed Land Use



Easy and convenient access to transit

Safe, comfortable and pleasing walking environment



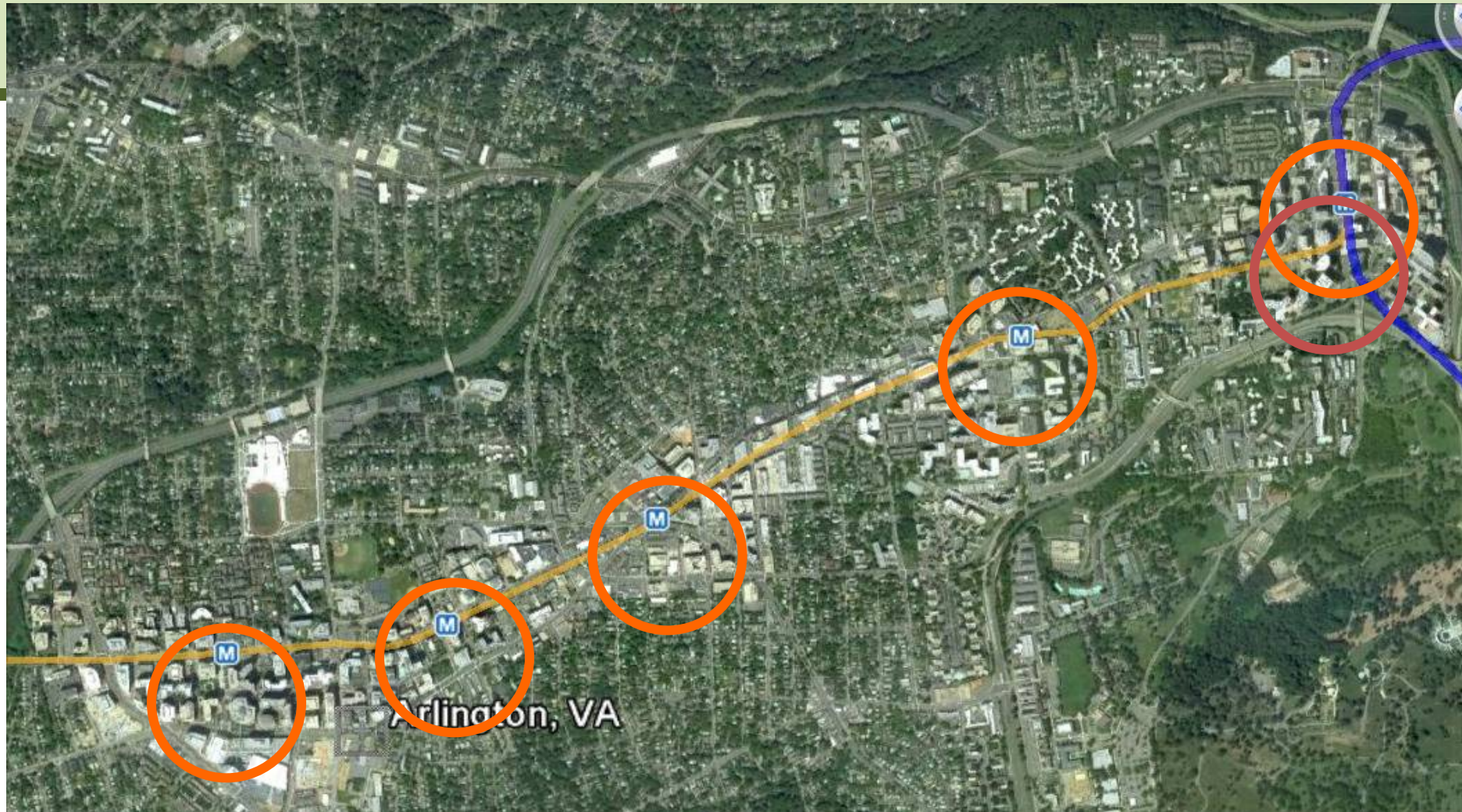
Benefits of TOD

- Reduces the need for motorized trips
- Shortens trip lengths when mixed use development is emphasized
- Can help raise additional revenues

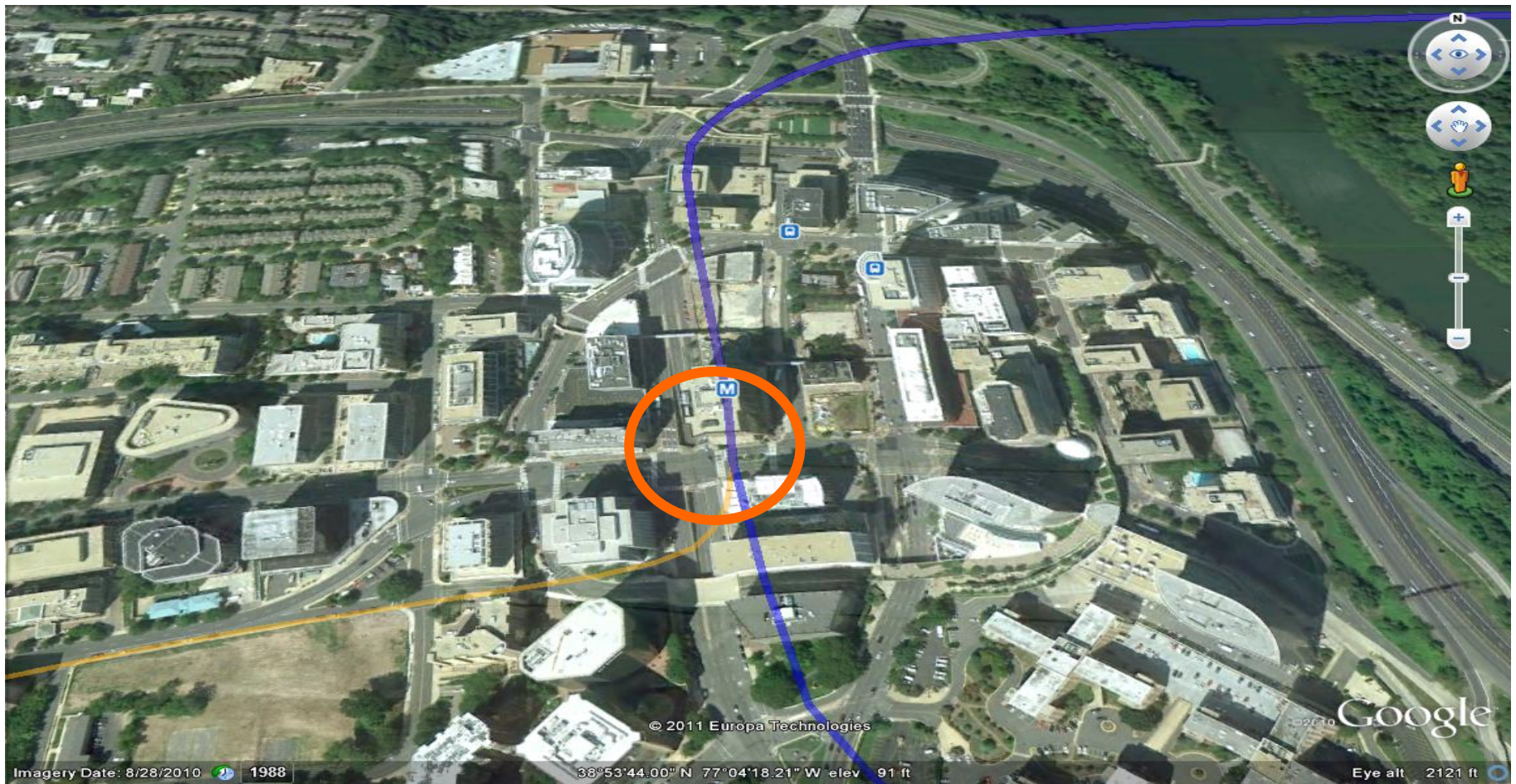
Example: Arlington, Virginia



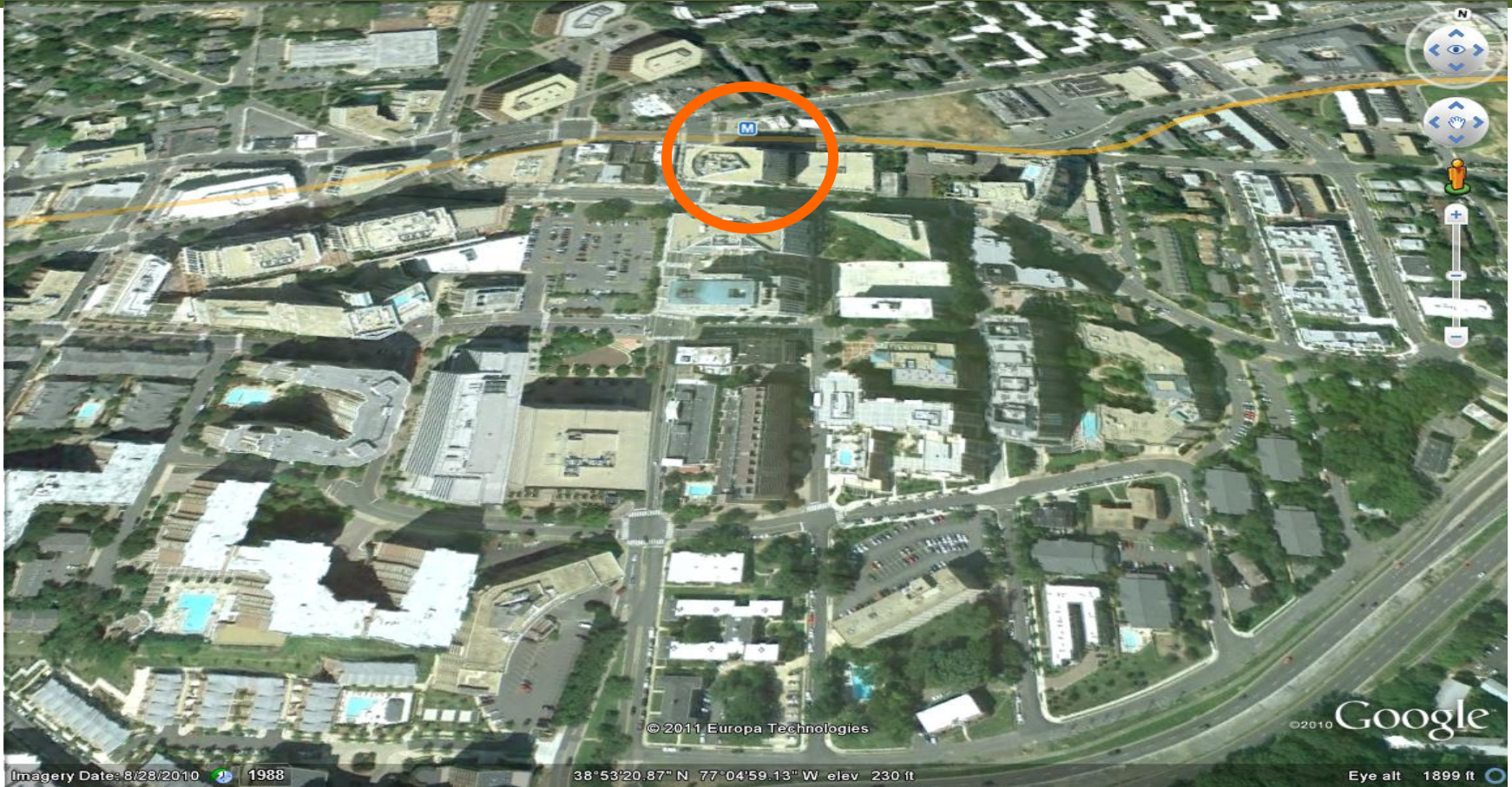
Rosslyn-Ballston stretch



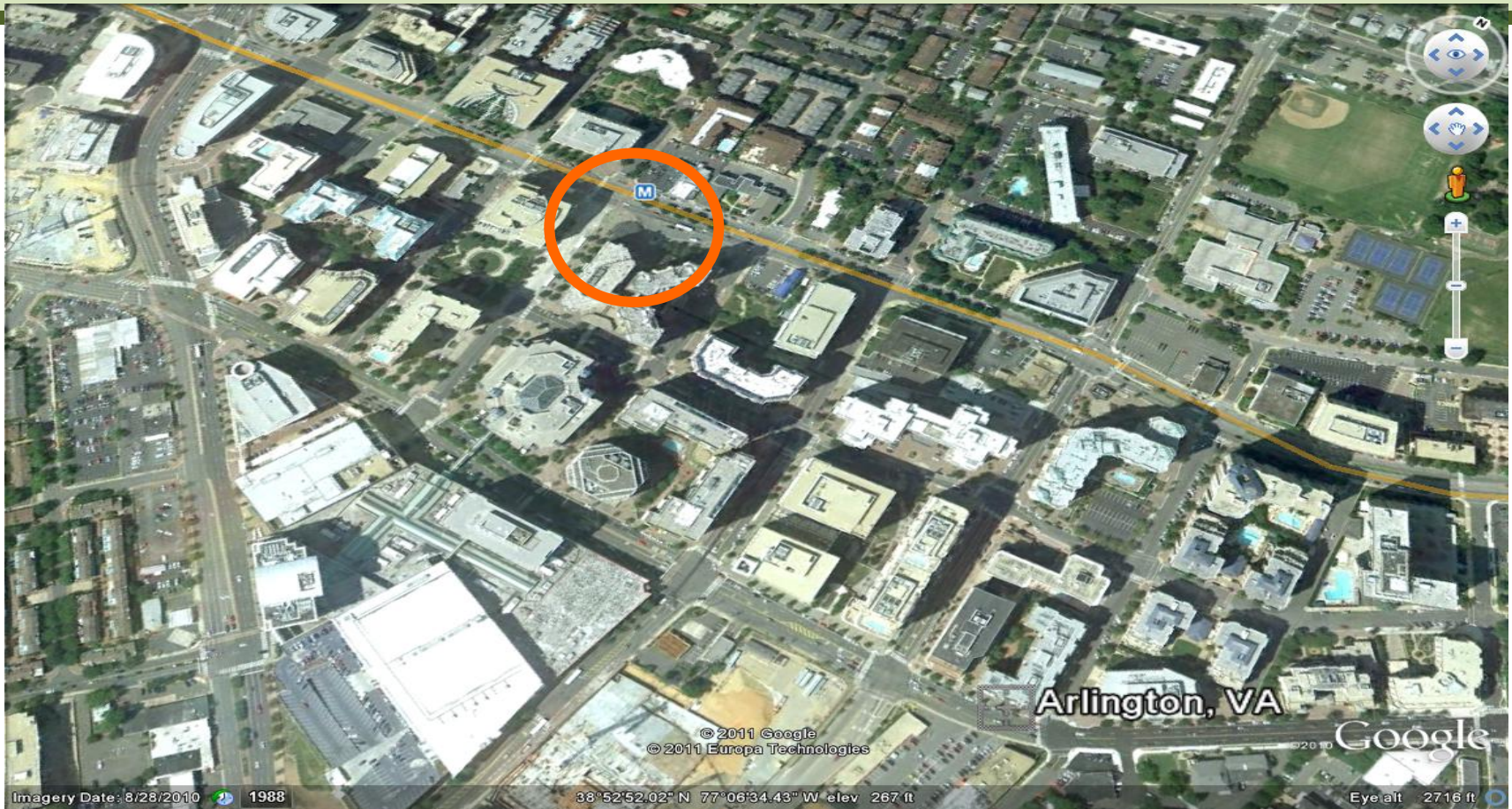
Rosslyn



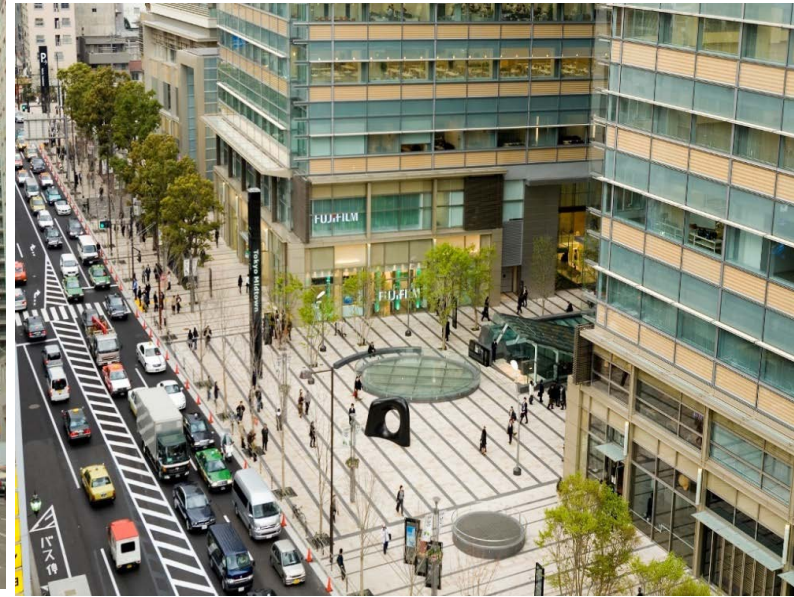
Courthouse



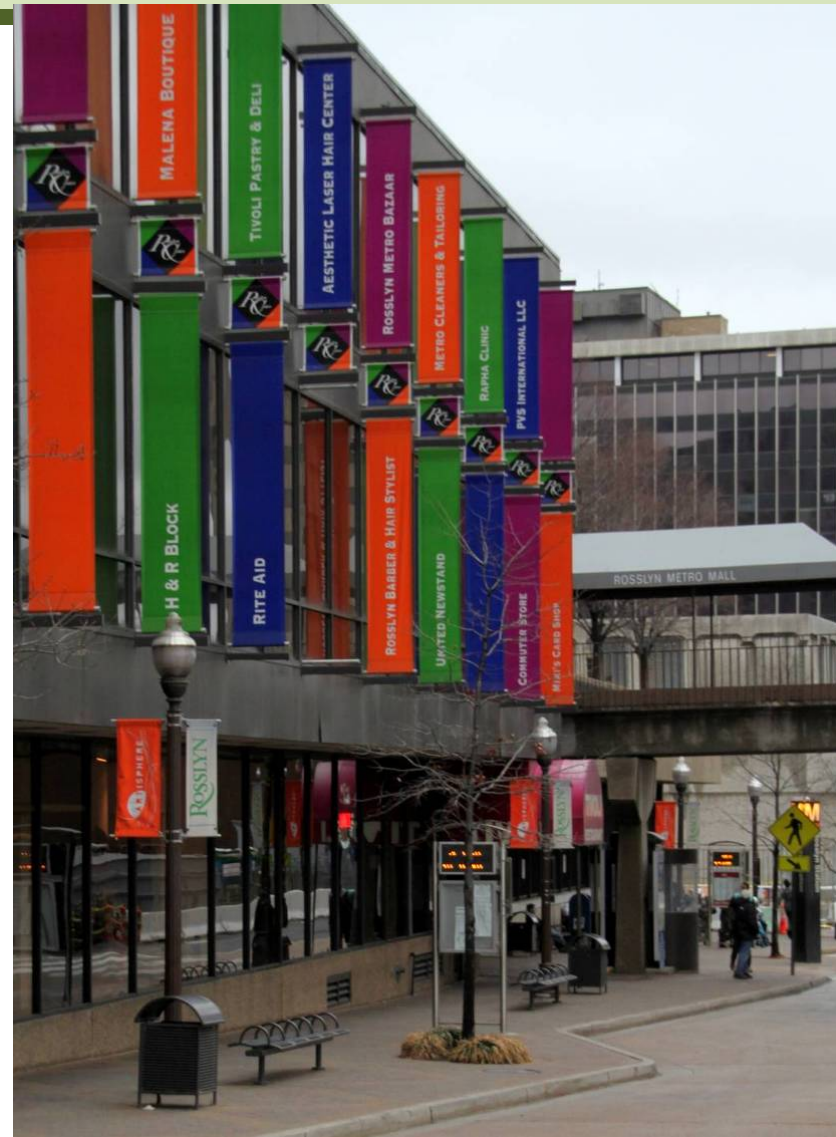
Ballston



Safe and Pleasing Walking Environment



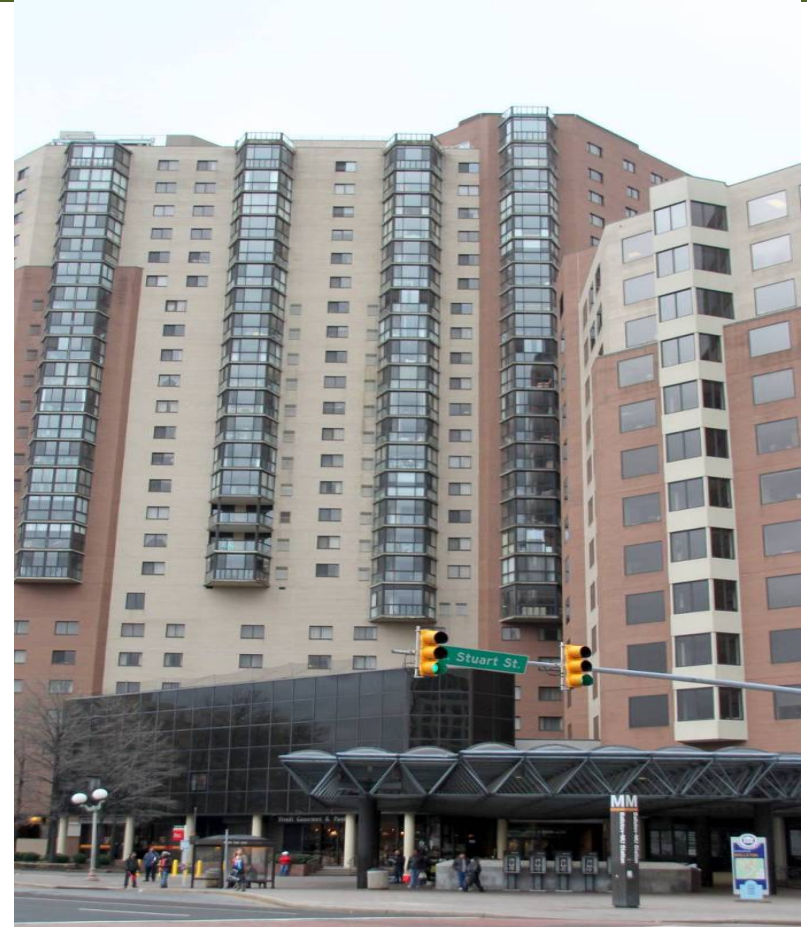
Mixed Use Above Metro Station



University over metro station



Offices, Hotel, Apartments, Shops, Restaurants Parking - all in One Building



Apartments over shops



Image: Tai Wai Station
(Hong Kong) with
Adjacent Residential
Developments



Implementation Issues – Who's responsibility?

- Metro companies:
 - Do not have the expertise
 - Have a different, and critical responsibility
 - Needs multiple agencies to come together
- Development Authorities
- Municipal Corporation
- Private Sector



Respective roles

Role of Public Sector

- Assistance in Land consolidation
- Zoning and zonal planning, according statutory approvals
- Increasing utility capacity – water, sewer, electricity, etc.
- Providing connectivity

Role of Private Sector

- Land Consolidation
- Construction Financing and Marketing



Implementation Issues - Land

- TOD requires relatively large sites to be available
- But, in core city areas only small and disconnected vacant plots would be available
- Special measures required to undertake / support land assembly
- Peripheral stations would be easier

Features of the Indian situation

- Institutional fragmentation – who will coordinate TOD
- Densities already quite high – but on a citywide basis – need for granular densities
- Inadequate attention to mixed used planning
- Poor walking environment
- Inadequate utility capacity – who will pay for enhancement



FEEDER SYSTEMS

Multiple types of feeders

- Integrated bus services
- Technology enabled and integrated para-transit
- Convenient walkways from adjoining properties
- Cycle tracks and public bike sharing systems
- Parking facilities
 - Cars
 - Scooters
 - Paratransit
 - Cycles
- Drop and pick up zones
- **Needs “feeder friendly” station design**



What is needed

- Comprehensive land use and mobility plan
- Estimate future property requirements, based on future vision
- Early planning for TOD and feeder systems at each station of mass transit proposals
- Notification of granular, and graded, FARs
- Identification of feeder routes and feeder systems needed at each station
- Preparation of a comprehensive TOD and feeder plan for each station
- **Area based components of “Smart Cities” plans offer an opportunity**

Thank You

