Land-Use and Urban Transport Planning

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Urban Transport Challenges

The transport paradox - *"**Transport** is unique as the only development sector that **worsens as incomes rise**. While sanitation, health, education and employment tend to improve through economic development, **traffic congestion tends to worsen**."*

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Growing Economy

- Car ownership | Traffic Volumes | Congestion

Urban Sprawl

- Increased trip lengths | Time wasted in traffic | Increased infrastructure costs

Climate Change

- Higher emissions | Global Warming | Air pollution

Road Safety

- Higher speeds | Increased fatalities | Conflict among modes

Energy Consumption

- Transport consumes about 30% of energy | GHG gas emissions

What to do?

Over time, achieving greater sustainability in transport means ...

... investing in schemes and initiatives that improve accessibility and developing more effective transit cities.

Urban Transport Planning Approaches

Traditional Approach

- Focus on automobiles
- Expand road networks
- Predict and Provide
- Parking is a need for cars

Sustainable Approach (non-traditional?)

- People centred planning
- Focus on green areas
- Walking, Cycling and Public Transport
- Car restraint measures

Experience from Traditional Approach

- High demand for space
- High impact on health and environment
- High impact on traffic
- High demand to travel
- Urban sprawl
- Increased trips and lengths

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Is the use of space efficient?

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Car-oriented planning

Delhi: current situation

China: The Future we are heading to ?

Car-oriented planning: indicators

Low density

Segregated zoning

Excessive road infrastructure

Sources:

1. Colorado Springs, Colarado, USA – Source: http://en.wikipedia.org/wiki/File:Suburbia_by_David_Shankbone.jpg

2. Houston, TX, USA – Source: http://www.photohome.com/pictures/texas-pictures/houston/downtown-houston-4a.jpg

3. Ontario Highway 401, Canada – Source: http://en.wikipedia.org/wiki/File:Highway_401.png

Car-oriented planning: impacts

Congestion

- Increase in automobile use

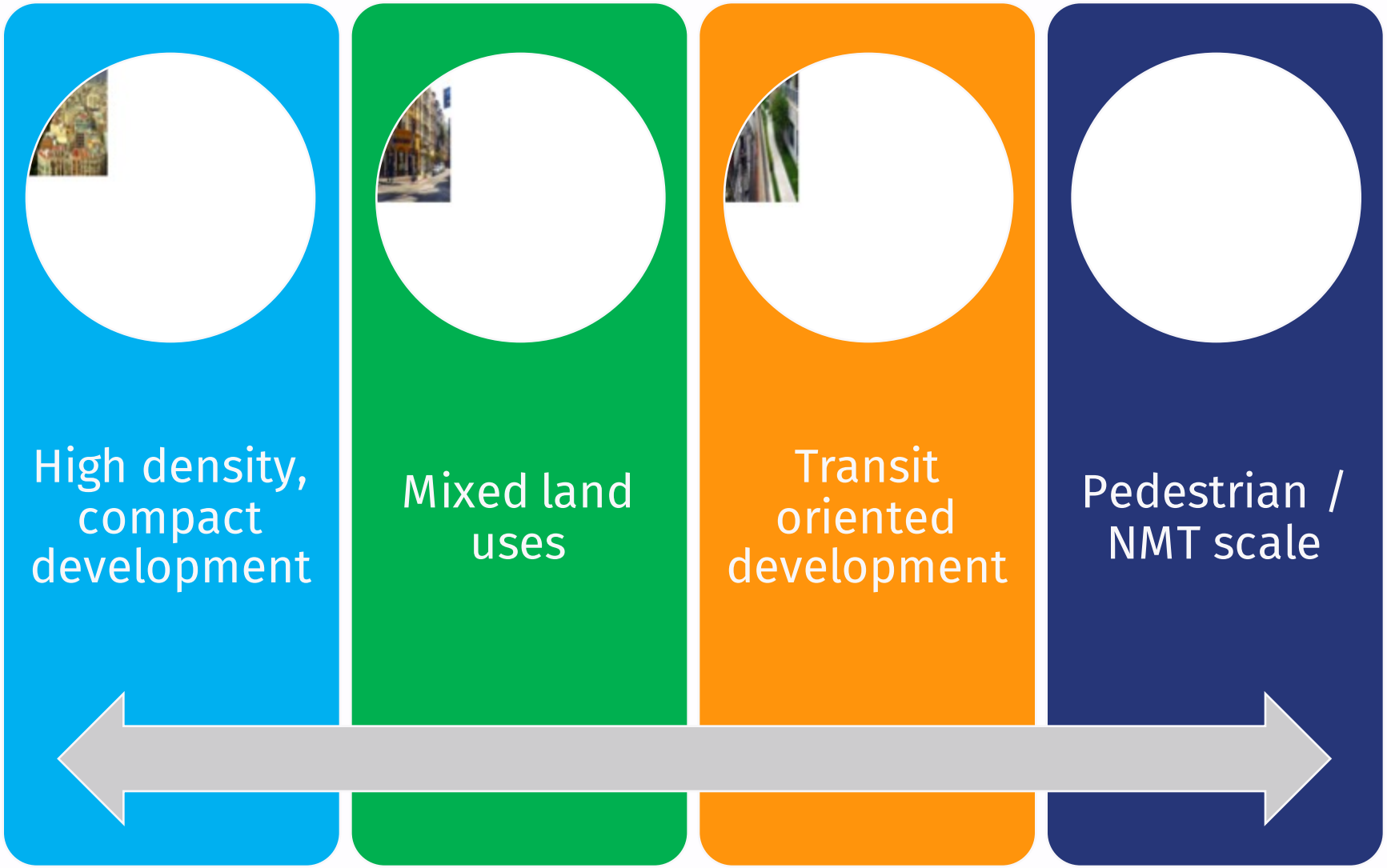
Pollution

- Top polluting cities are in the developing world

Safety

- 1.6 million people die annually in road accidents

Principles of Sustainable approach



High density / compact development

High density does not necessarily mean high-rise

- High rises require large setback that result in similar density as low rise development
- Mid-rise development (say 80% residences in 6-10 storey apartments) is optimal.
- It is important to note that most S. Asian cities already have high densities

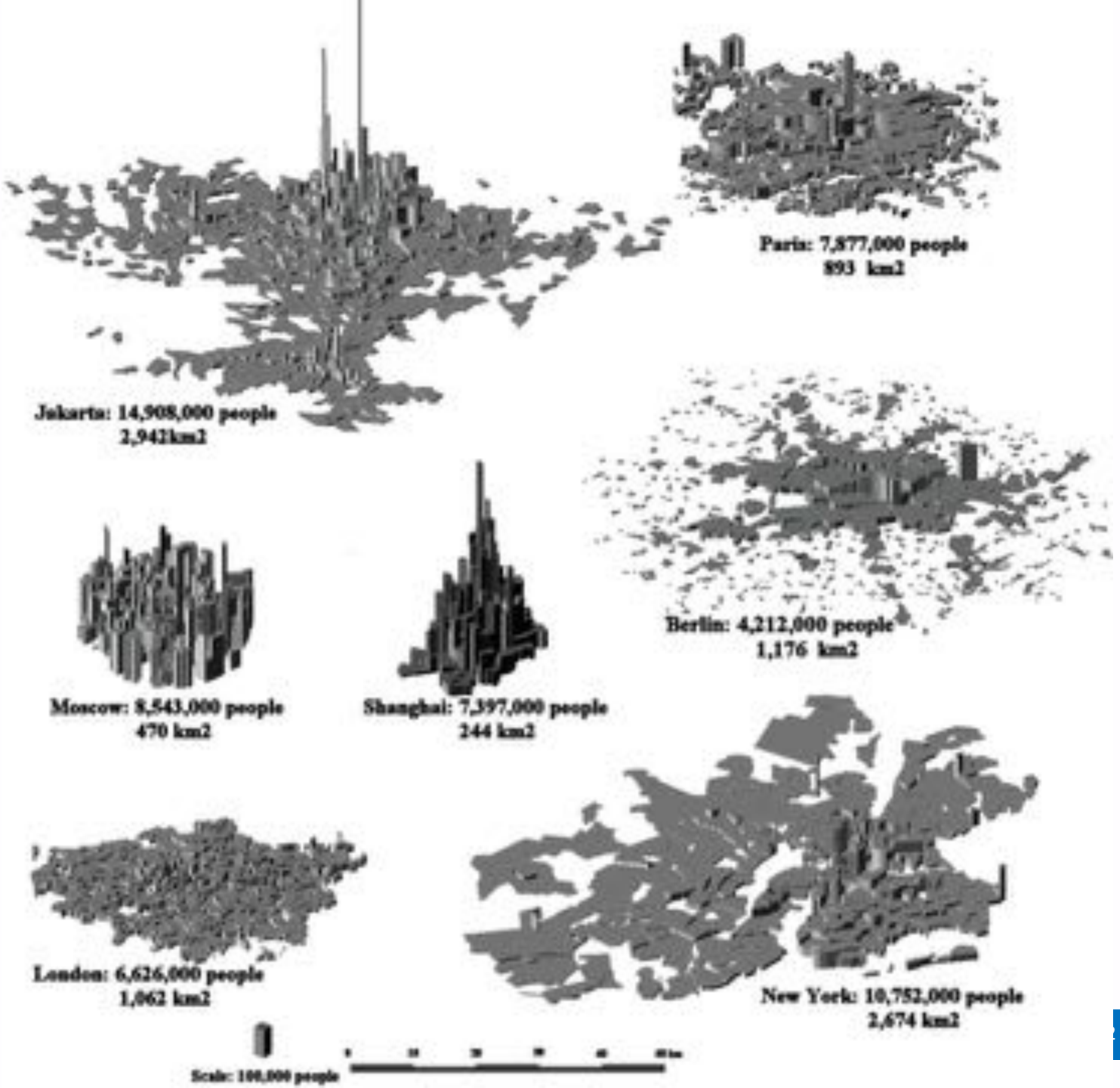
Barcelona, Spain – Source: http://www.indie-holidays.com/destinations.php?city=2

Historically, cities were compact

Automobile oriented planning led to expansive cities

Population Density

Cities need to embrace some of the existing benefits



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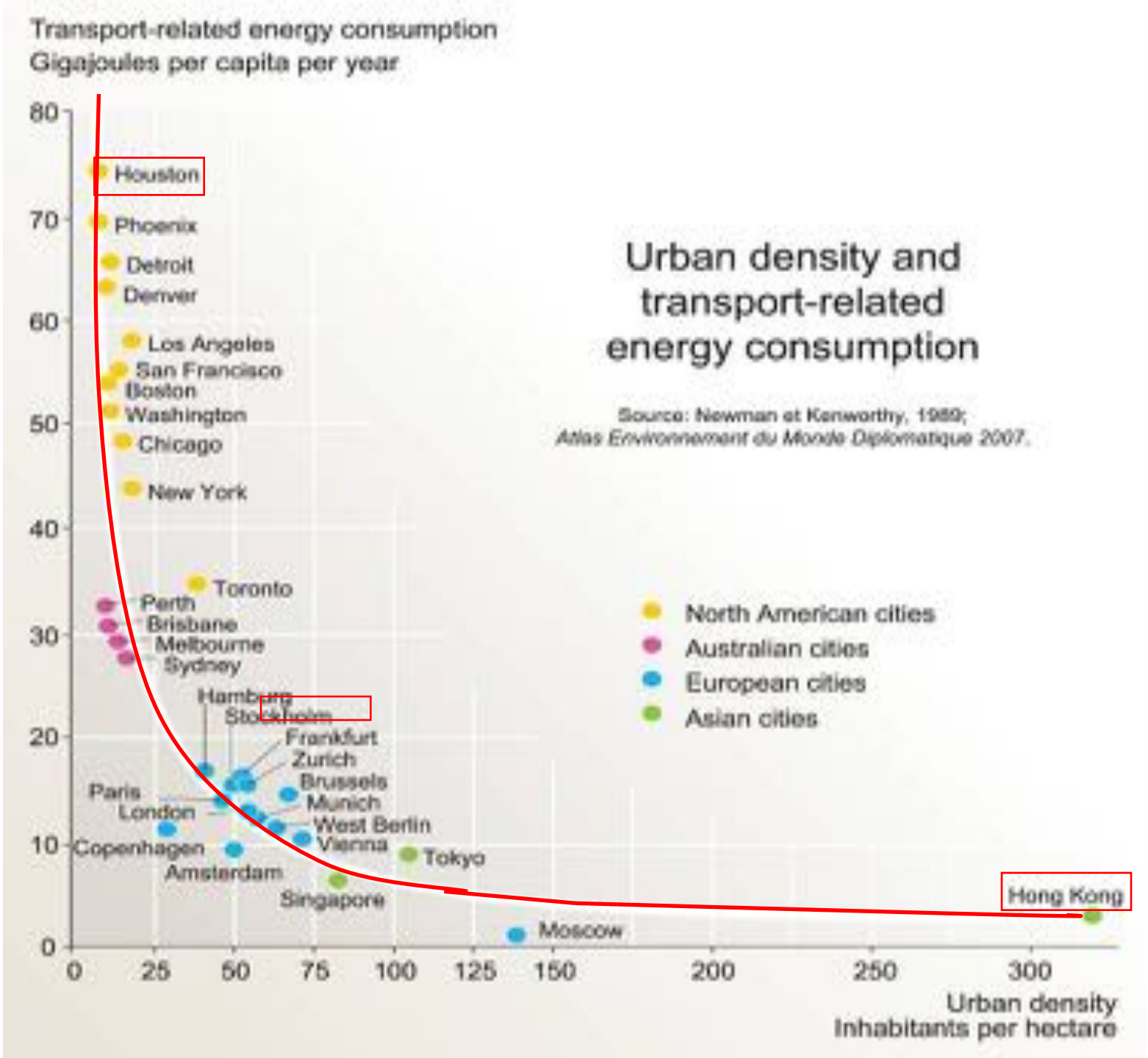
Urban density and energy



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Urban Planning

- It is clear that we need to plan for:
  - Higher densities
  - Mixed Land Use (business, residential, commercial)
  - Lower road capacity
  - Higher green areas
  - Compact urban centres
  - Multi-utility urban spaces

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How to make the most out of our plans

The answer is

Integrating land use and transport

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Integration is not rocket science

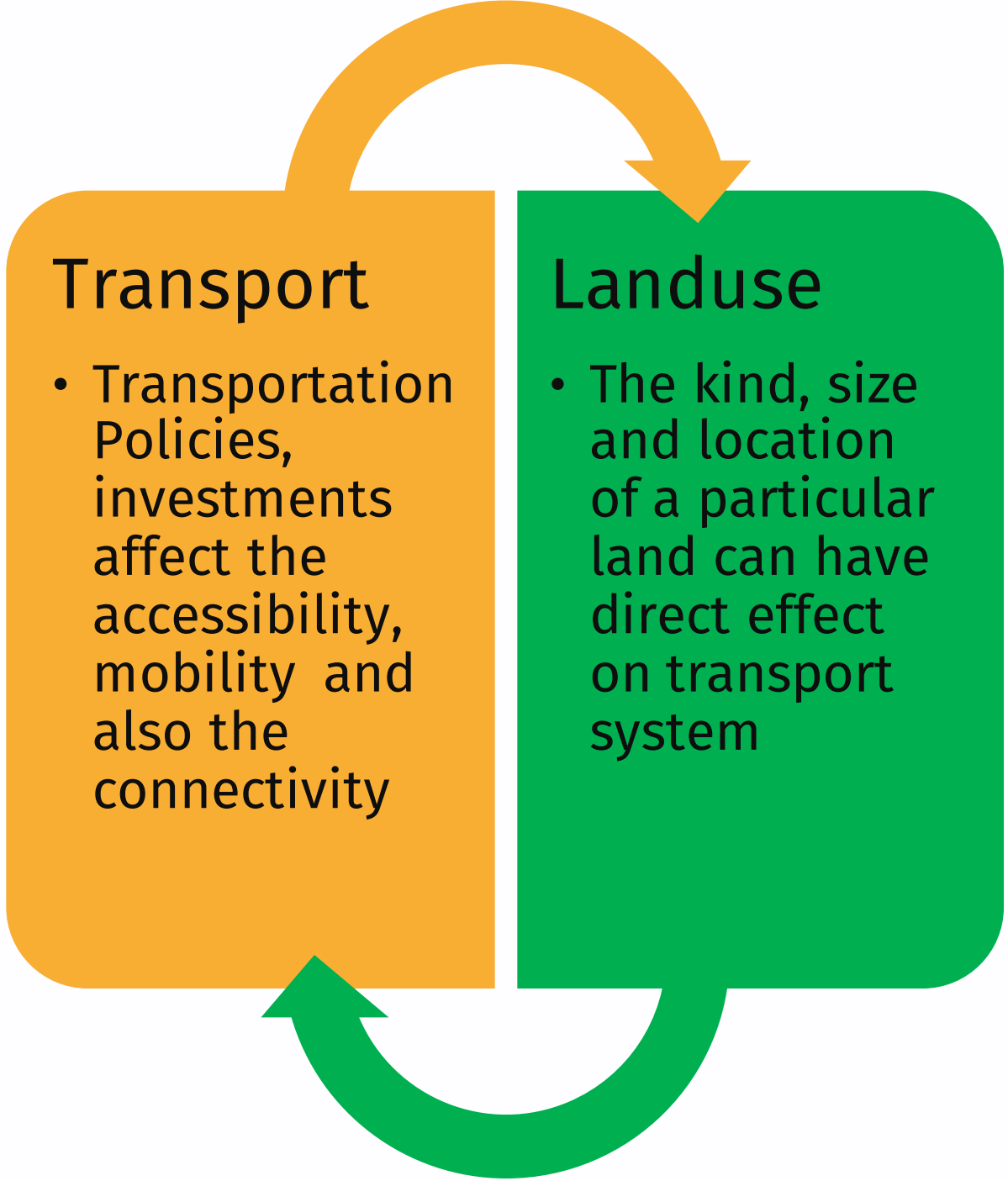
Or the Objectives of Integration

- To increase access to Public Transport, Walking and Cycling so as to reduce dependency on personalized modes.
- To encourage people to travel short distances and make fewer trips.
- To encourage compact mixed use development near new or existing public transportation infrastructure that provides housing, employment, entertainment and civic functions within walking distance of transit.
- To reduce the fuel and energy consumption in the motorized forms of transport, reducing pollution and adverse impact on natural environment.

Accessibility + Mobility

Accessibility: the ease of reaching a desired destination

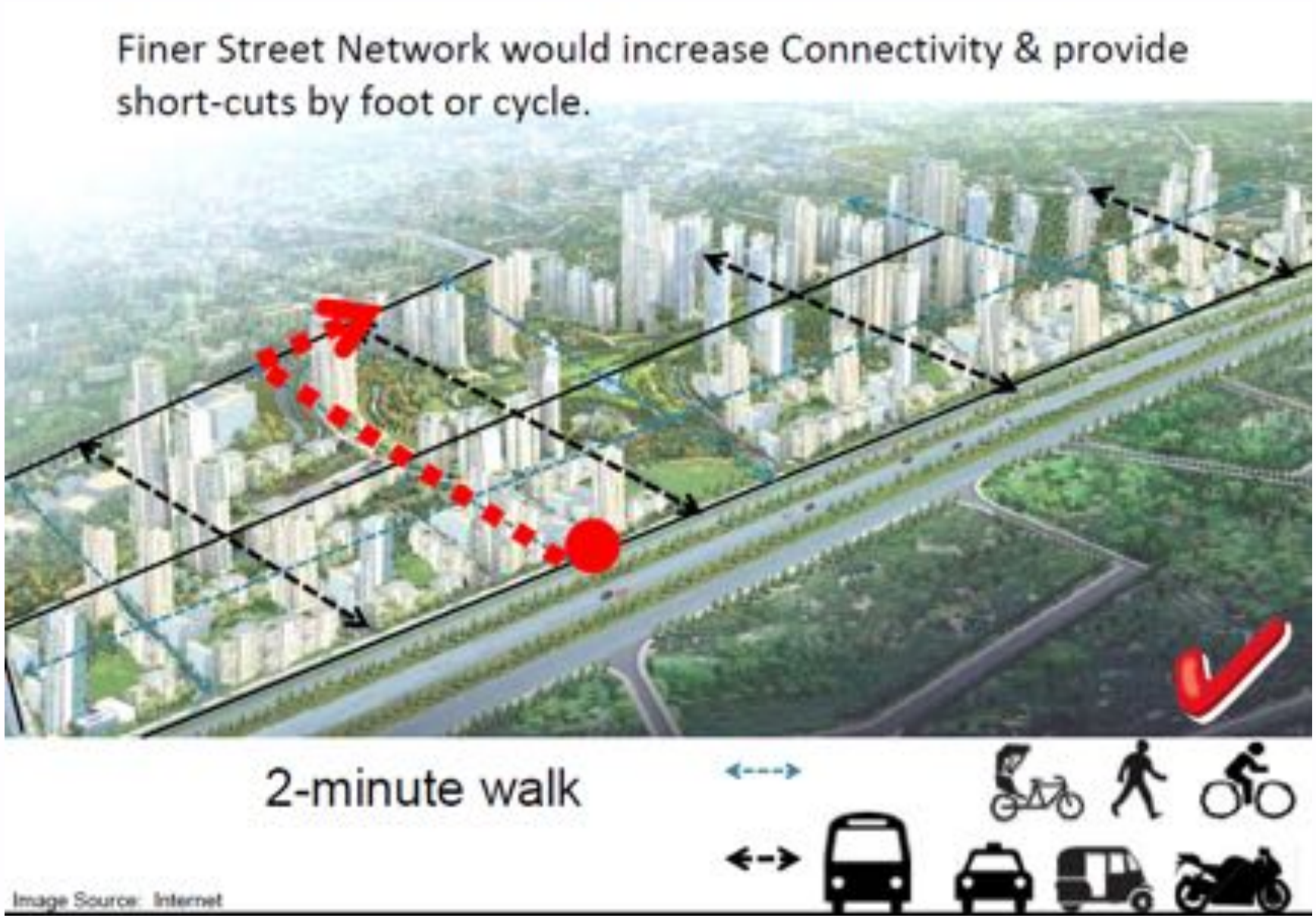
Mobility: Movement required (type of movement..)



Example


Current Norms encourage Large block sizes: increase walking distances, thus encouraging vehicle use.
Bus/ MRTS Stop
15 min Walk
Image Source: Internet

Example...
contd.



LandUse and Transport integration with focus on transit is Transit Oriented Development (TOD)

- A vibrant mix of uses, including:
  - ✓ Residential
  - ✓ Retail
  - ✓ Office
  - ✓ Commercial
  - ✓ Institutional
- Thoughtfully designed community spaces, parks
- Exciting, pedestrian friendly areas for live, work and play
- Transit Station as prominent feature

The 5 D's of TOD

1. Density

- Increased density tends to reduce per capita automobile travel and increase public transport ridership

2. Diversity

- The more diverse the land uses, lesser the need to travel outside the area. Think of a well connected area with jobs, housing & shopping avenues within a small radius.

3. Design Elements

- These include elements such as footpaths & safe roadway crossings for pedestrians, safe & efficient bicycle paths, and a closely spaced grid-like roadway network

4. Destinations

- This variable represents the attractiveness or vibrancy of an area. Availability of jobs or shopping areas for instance would influence this variable.

5. Distance to Transit Service

- The closer a transit stop, higher the probability of a transit trip in lieu of a trip by personal automobile

Encourage Compact and Mixed Land use

- Mixed Land-use reduces the necessity to make some trips
- Distance traveled is greatly reduced

Source: GTZ Photo DVD

Encourage Compact and Mixed Land use

- Complemented by a good public realm with space for walking and cycling

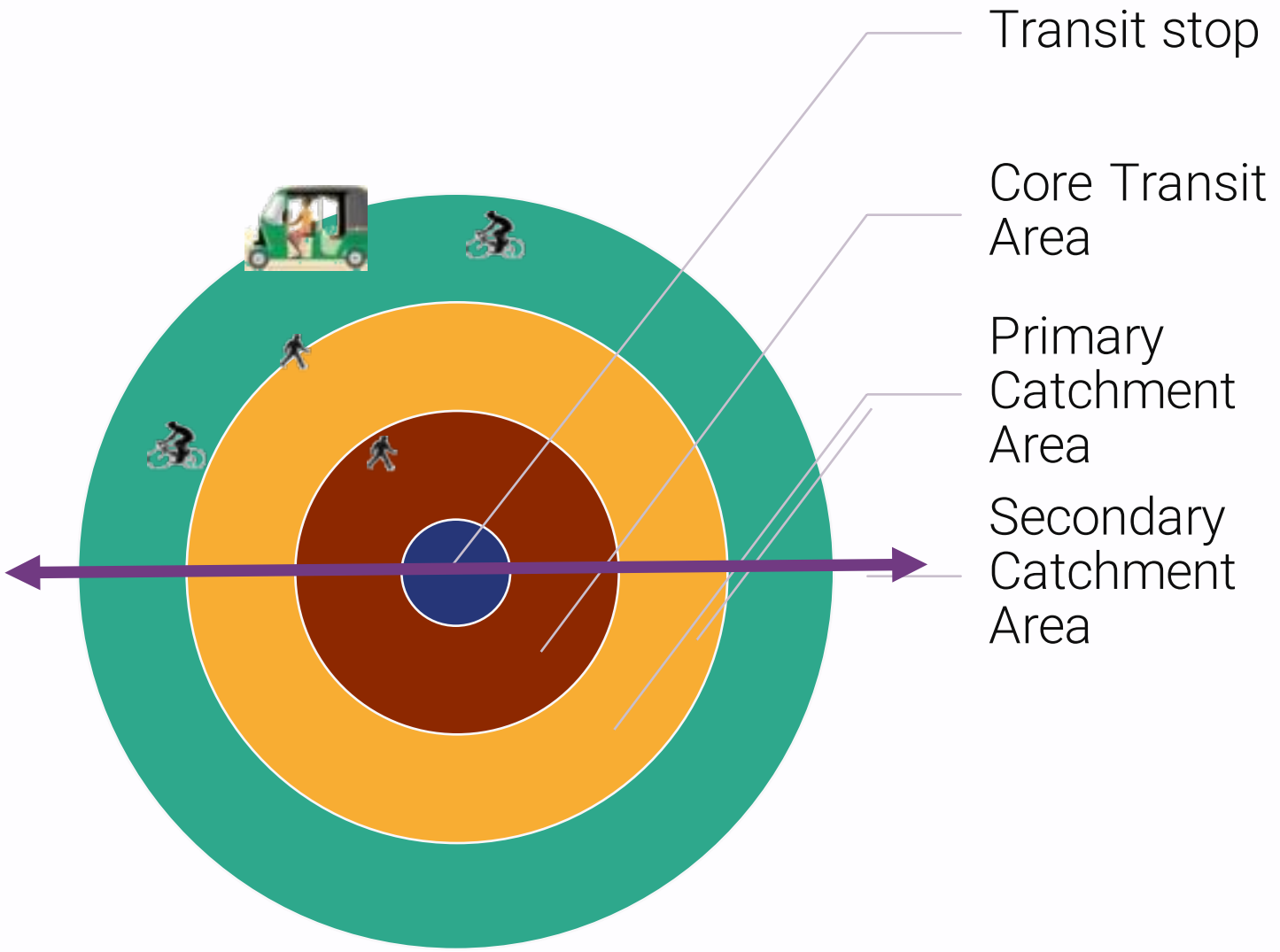
Mixed Land Use within accessible distance of transit stops

Pedestrian friendly connections
to encourage walkability

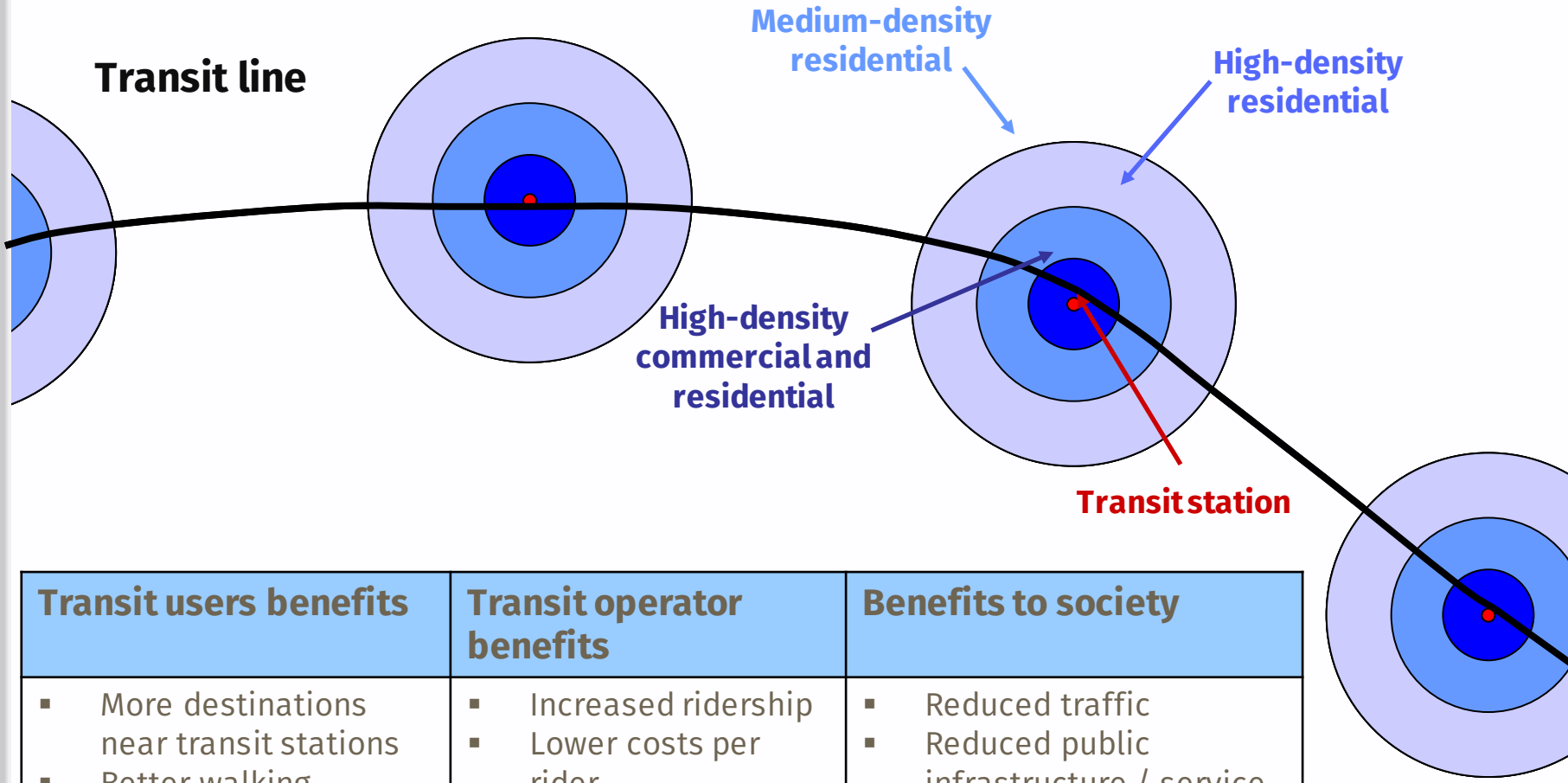
Place Making : vibrant places, inclusive communities

Influence zones of transit

- Core station area (400m): Pedestrian access generates a significant portion of transit trips.
- Primary catchment area (800m): Bike and pedestrian access are major contributors to ridership
- Secondary catchment area (1.5 km): Bike, feeder transit, and auto are the primary access modes to and from the stop or station.



Transit Oriented Development (TOD)



Transit users benefits	Transit operator benefits	Benefits to society
▪ More destinations near transit stations ▪ Better walking conditions ▪ Increased security near transit stations	▪ Increased ridership ▪ Lower costs per rider ▪ Better image	▪ Reduced traffic ▪ Reduced public infrastructure / service costs ▪ Community liveability ▪ Increased property values / business activity / tax revenues

Source: Litman, 2006

Policy Intervention

- Govt. to locate public facilities (schools, colleges, recreational centers, etc.) along PT corridors

http://thecityfix.com/blog/boosting-property-values-near-brt/

Example: Bogota built several schools along TransMilenio corridor

Policy Intervention

- Priority to be given to Transit Centers and corridors when public investments are made to improve footpaths, roads, parks, public utilities and services such as water, sewage, electricity, etc.

http://www.destination360.com/north-america/us/rhode-island

Example: Rhode Island Transportation Improvement Plan (TIP) gives priority to projects that encourage compact development. Less money is spent on expanding roads.

Policy Intervention

- Zoning Codes – up zoning areas along transit corridors; down zoning areas off transit corridors

Curitiba High-rise towers flank iconic tubular bus stations. Note the modern buses.
http://www.coha.org/bus-rapid-transit-and-the-latin-american-city-successes-to-date-but-miles-to-go/

Example: In Curitiba, high-rise development is allowed only along BRTS corridors. This has resulted in striking increase in ridership

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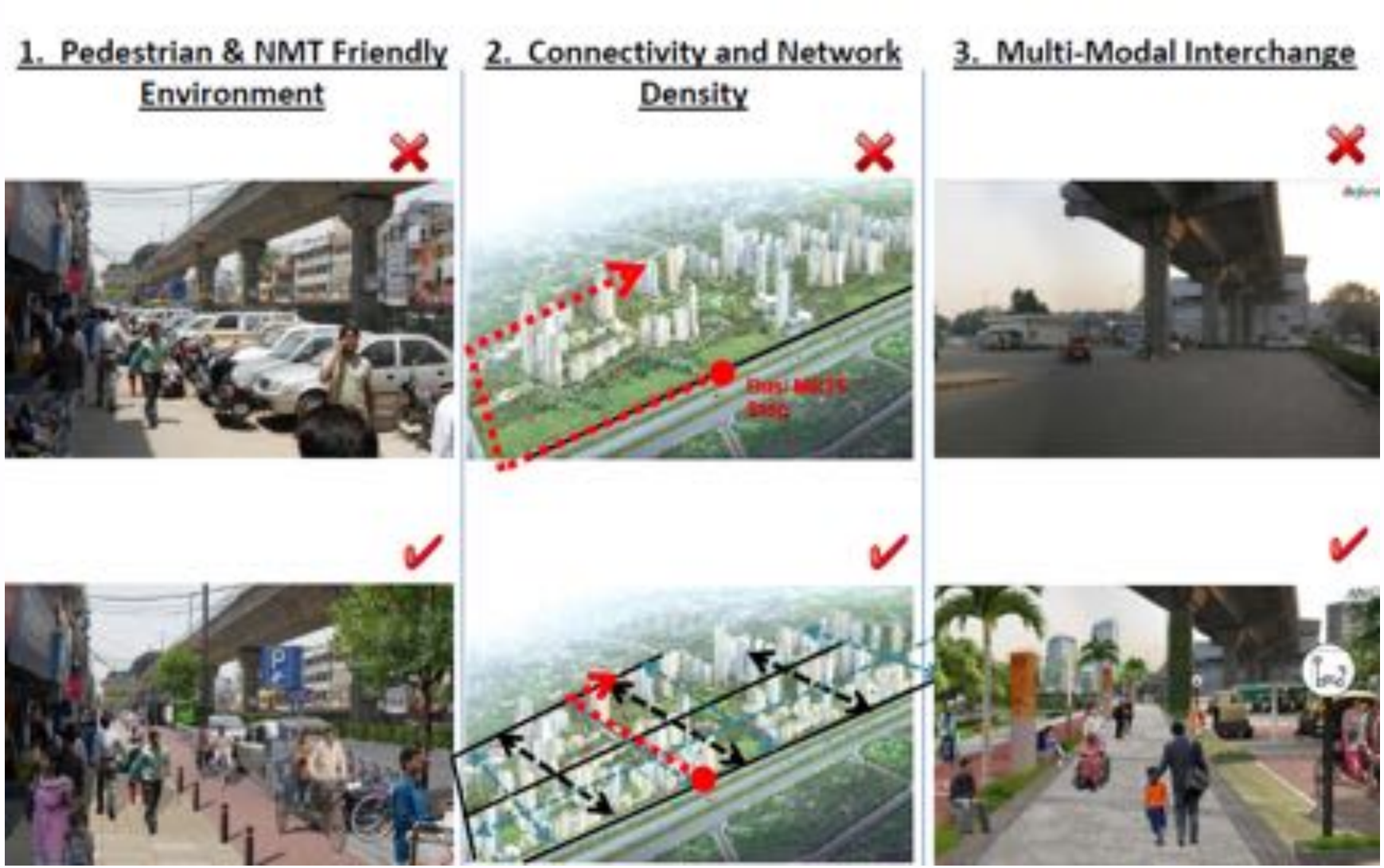
Integrated Planning



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Integrated Planning

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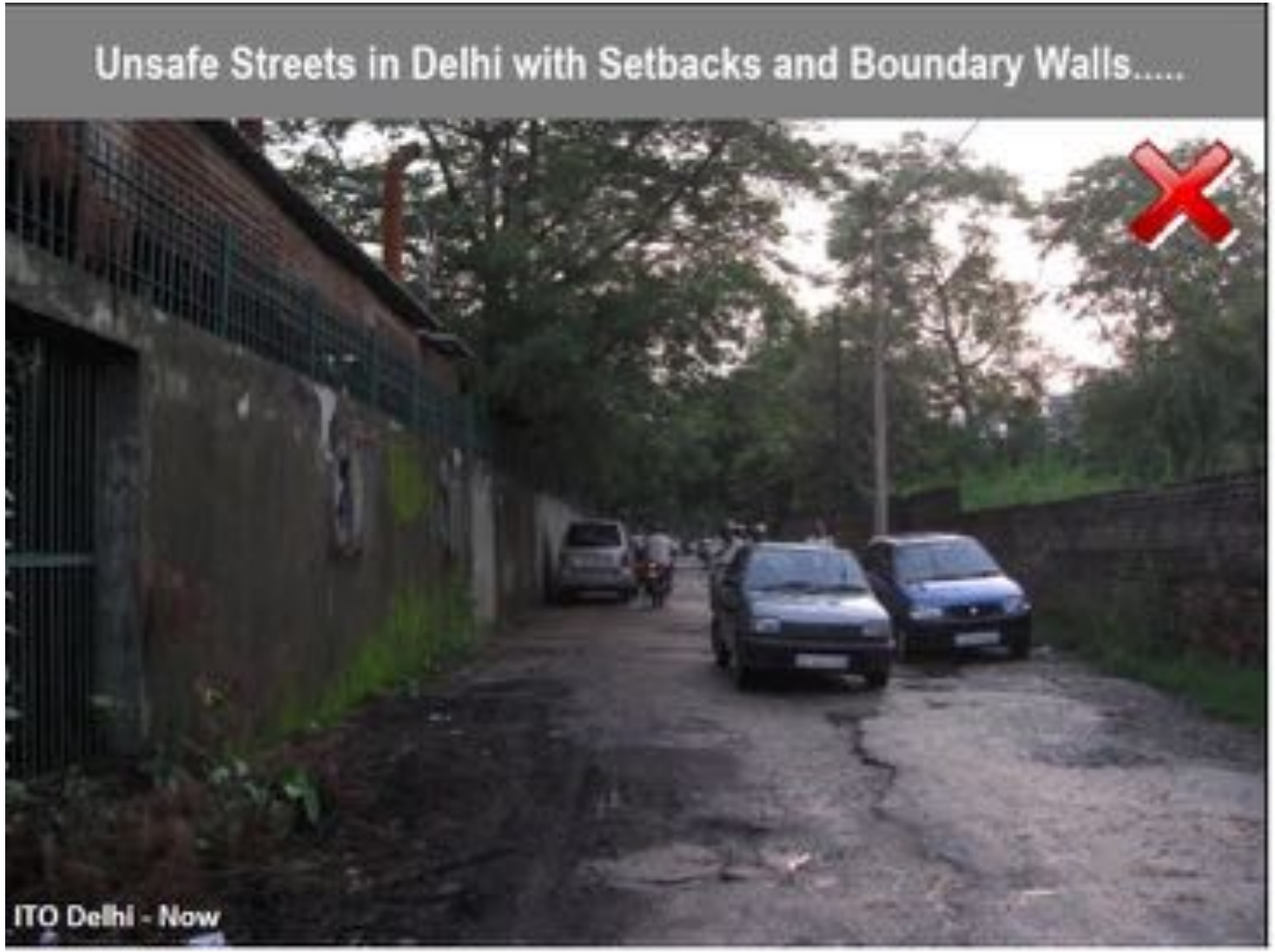
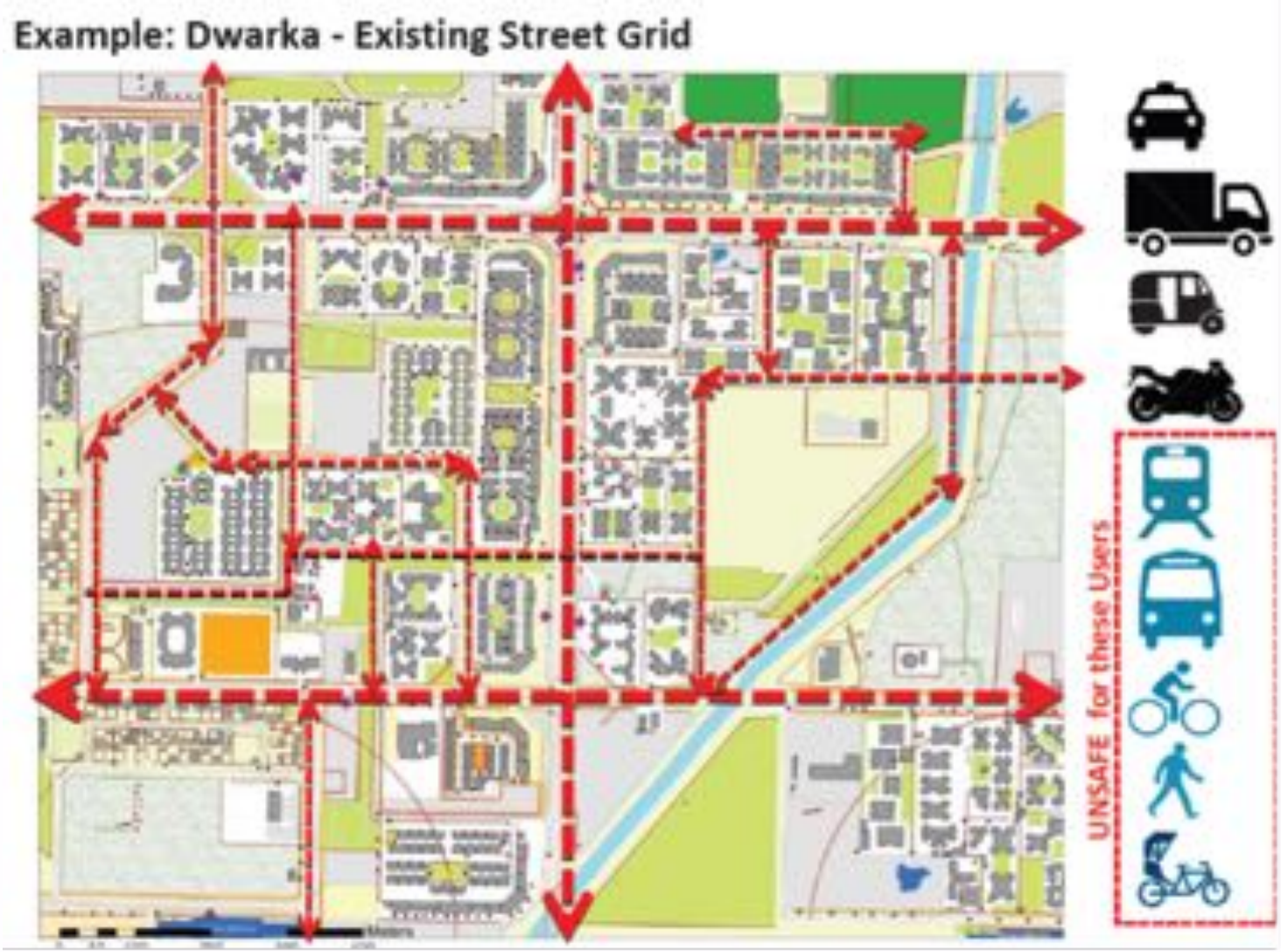


Connected streets



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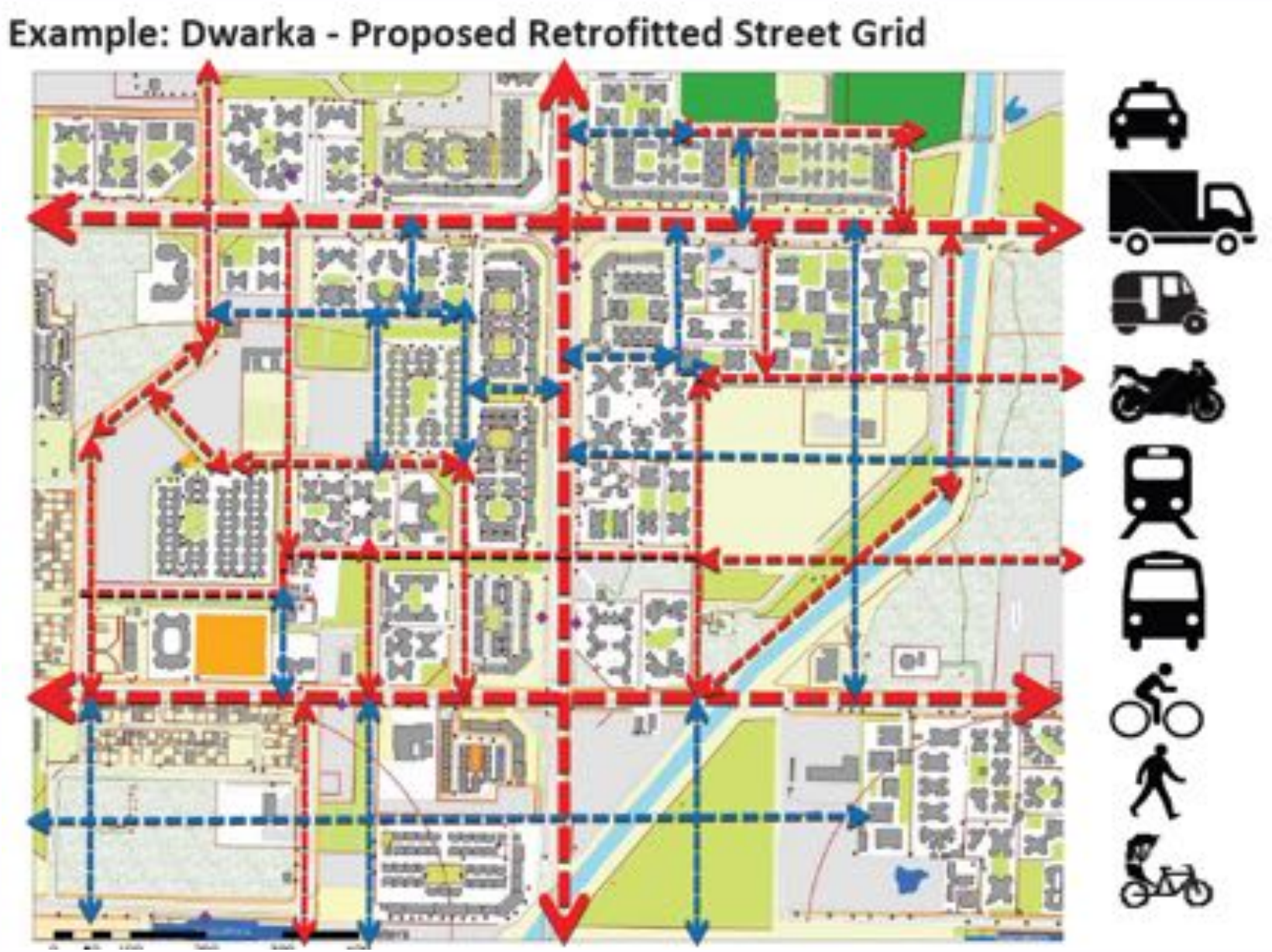

What needs to be done

1. Policymakers' positive views towards sustainable transport
2. Improve quality of service of public transport
3. Change Citizens' negative perception of public transport, bicycles and walking
4. Change people's feeling of a car as something very important
5. Improve citizen's behavior towards road safety
6. Ensure Institutional Integration and Capacity Building

Goal: Change people's travel choices

Thank You!

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Picture: Breithaupt