INTEGRATED URBAN LAND USE - TRANSPORT PLANNING (IULTP)

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(An Initiative of Ministry of Urban Development, Government of India)
Urban share of total population - 2011 (%)

Source: United Nations and Government of India
Presentation by Based on Dr. Isher Judge Ahluwalia
Urbanisation is an inevitable outcome of development process

- Urban India with 377 million people account for 31% of the total population
- By 2031, 600 million people about 40% population will live in India
- Second Largest Urban System - 8000 towns and cities
- Most cities are likely to double their population and more than double their area before they reach stable growth
- About 50% of urban population to live in 87 no. of Mill+ population Cities
- Another 70 no of 5 lakh+ Popn. Cities will also face severe transport perspective
- Urbanisation is accompanied by income growth
- Rapid motorisation to follow
Urbanisation & Economic Growth - Increase in Travel Demand

- **More Travellers (Million)**
  - Mumbai
    - 1980 - 10
    - 2005 - 21
  - Jakarta
    - 1985 – 14
    - 2002 – 23

- **More Trips (Because trip rate will increase) - Jakarta**
  - HH Income
    - Low
    - Middle
    - High
  - Trips per person
    - 1.87
    - 2.21
    - 2.3

- **Longer Trips -kms - Jakarta**
  - Work Trips
    - 1985 – 6.7
    - 2002 - 9.6
  - Education Trips
    - 2.7
    - 5.5

- **Mode Shift – NMV & Public-> 2-wheeler-> Car**

Source: based on Jose A. Gomez
Trends in Vehicle and Car ownership in different countries

<table>
<thead>
<tr>
<th>Year</th>
<th>Delhi</th>
<th>Ahmedabad</th>
<th>Bangalore</th>
<th>Chennai</th>
<th>Mumbai</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>117</td>
<td>50 (25)</td>
<td>50</td>
<td>45</td>
<td>25</td>
</tr>
</tbody>
</table>

(actual would be about 50% of registered vehicles) 140 2-wheelers
<table>
<thead>
<tr>
<th></th>
<th>HYDERABAD (760 sq.km)</th>
<th>BANGALORE (853 sq. kms)</th>
<th>AHMEDABAD (344 Sq.Km)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CITIES ARE SPRAWLING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population Density (Urban Built in persons/sqkm)</td>
<td>10526</td>
<td>9378</td>
<td>17441</td>
</tr>
<tr>
<td>Population Density (Urban Sprawl in persons/sqkm)</td>
<td>6265</td>
<td>5869</td>
<td>15574</td>
</tr>
<tr>
<td>Compactness index</td>
<td>0.60</td>
<td>0.63</td>
<td>0.90</td>
</tr>
<tr>
<td>Arterial road Density</td>
<td>1.47</td>
<td>1.40</td>
<td>1.85</td>
</tr>
<tr>
<td>Public transport Use</td>
<td>48%</td>
<td>51</td>
<td>24%</td>
</tr>
<tr>
<td>NMV Use</td>
<td>21%</td>
<td>24%</td>
<td>32%</td>
</tr>
<tr>
<td>Trip Length (total) km</td>
<td>10.5</td>
<td>11</td>
<td>5.7</td>
</tr>
<tr>
<td>Vehicle km/capita</td>
<td>10.81</td>
<td>8.90</td>
<td>6.4</td>
</tr>
<tr>
<td>Road fatalities per</td>
<td>518</td>
<td>865</td>
<td>263</td>
</tr>
<tr>
<td><strong>POPULATION (Million)</strong></td>
<td>8.5</td>
<td>8.5</td>
<td>6.0</td>
</tr>
</tbody>
</table>

**Source:** School of Planning, CEPT, Ahmedabad
I. CITIES IN INDIA ARE SPRAWLING – LACK OF INTEGRATED PLANNING
Urban Sprawl & Trip Length

Average Trip Length (km) vs Urban Sprawl (sqkm)

\[ y = -4E-06x^2 + 0.0108x + 3.97 \]
\[ R^2 = 0.7281 \]
$y = 9.1695x^2 + 15240x + 461913$

$$R^2 = 0.9701$$
Vehicle kms and Accidents

Accident vs Vehicle-kms

$y = 0.0002x + 1538.8$

$R^2 = 0.7167$
### Urban Landuse - Transport Scenario

<table>
<thead>
<tr>
<th>Cities are Sprawling</th>
<th>Environmental Degradation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declining Public Transport &amp; NMT,</td>
<td>Low Investments</td>
</tr>
<tr>
<td>Supply Side Focus</td>
<td>Poor Enforcement</td>
</tr>
<tr>
<td>Multiple Institutions</td>
<td>Education of People</td>
</tr>
</tbody>
</table>

**Urban Transport Focus – Since 2006 (NUTP & JnNURM)**
Land use and Transport are intricately linked to each other
A 2way relationship

- Land Use/Activity distribution determines the demand for transport
- Transport supply influences land use/activity distribution
- Planning is undertaken separately as two different exercises; often by two different agencies
- Making separate plans is like clapping with one hand
- Lack of integration leads to un-intended consequences
Are land use & urban transport related?

- Land Use
- Activities
- Transport Infrastructure
- Accessibility

Source: http://people.hofstra.edu/geotrans/eng/methods
Integrated Land Use Transport !!

- Land Use Planning Framework - Statutory
  - Land Use Plans with an objective to protect environmentally sensitive lands provides for a spatial framework for future urban expansion (to create livable communities)

- Plan Elements
  - Location & Intensity of Land Use – Plan/Map
  - A set of DC Regulations – FSI, Zoning, Setbacks,…

- Issues
  - Takes a long time to prepare; Revisions – once in 10 years ?
  - Lack integration – economic development, environment, urban poor/Informal activities & of course transport
  - Focus on New Developments – Expansionist - No renewal
  - Networks form a part
  - Levels ? Regional – **Urban** – Local/Rural
  - Practice – Stagnant; Norms/standards - basis ; Not Strategic
  - Implementation & Monitoring

MORE OFTEN PLANNING – NOT MORE DETAILED PLANNING
Integrated Land Use Transport!!

- Urban Transport Planning Framework – Not statutory

  - Content
    - PREDICT & PROVIDE & NOT Strategic
    - Future is uncertain but process is:
      - Data Hungry – ‘Technical – Deterministic’
      - Based on PCU & PHPDT !!!!
      - Vehicle Centric- Capacity Focus
      - Mobility Focus – What we need is Access
    - Inputs & Outputs – Not Outcomes
    - Projects & Not Strategies
    - Investment Focus – Not Management
    - Big Ticket Projects - Mode bias – Affordability?
    - Driven by Funding /Donor /Technology Provider
    - Takes Land Use as Given – Generated Traffic – Ignored
    - Usually unrealistic

  From CTTS ➔ CMP ➔ IULUT
Agencies responsible for the plan preparation?

Development Authorities

- Land use planning and zoning
  (Under respective T&CP Acts)

- Municipalities

- Town & Country Planning Agency

Transportation planning

- Multiple agencies
  (Urban roads, public transport, railways, metro, traffic management)

  - National,
  - State level
  - Local level

Lack of coordination
Integration of transportation plans with land use/sectoral plans

Development Plan / Master Plan
- Guides and regulates urban development
- Addresses planning issues

City Development Strategy
- Identify, prioritize & implement infrastructure projects
- Financing strategies for projects

Transportation Plans (CTTS/CMP)
- Long term Transportation plan
- Focuses on identifying projects/programmes related to mobility needs and reducing congestion levels
Land Use - Transport Linkage

- Compact Cities
  - Polycentric
  - Higher population and Employment Densities
  - Complete Network & Streets
  - Mixed Use

- Quality & Quantity Public Transport

- Local Access

- Quality Public Places

- Reduce Trip Length
- Reduce personal Vehicle Dependence
- Greater Transit & Non-motorised veh. Use
- Improving Access to employment, facilities & Amenities
- Reduce Green House Gas/Pollution
- Affects Land value & affordability
CO2 emissions (in tons)

Base Year 2011

Future Projection

Proactive Scenario
Unmanaged Scenario

BAU

30027
43829
28576
71941

70000
60000
50000
40000
30000
20000
10000
0

80000
Elements of IULTP

- Enabling Urban Structure
- Strategic Alignments
- Accessibility Improvements
- Complete Network & Complete Streets
- Transit Oriented Development and Value Capture
- Integrated Transit Facilities
- Inner city and Transit
- Legal & Financial Instruments
How do we develop integrated land use & transport strategies?

**Enabling Urban Structure**

- Settlement Size - Area Vs Population Dynamics
- Distribution of population density – Inner and Outer areas.
- Distribution of “centres” (concentrations of activity) – Mono centric V/s Polycentric
- Mix of land uses
- Transport network, both public and private

**Strategic Alignments**

- Densification of less intensive areas along existing public transport network
- Connect major activity center (Singapore)
- Ensure efficient movement
- Ensure availability of Right of way
- Proper accessibility to Public transport by all kind of users
How much area would we like to urbanise?
Corridors & Travel

Houston

Curitiba
CURITIBA

3 million people

17000 buses
60 kms of underground Rail
260 kms of light rail
The Concept Plan 2001 will provide a variety of housing choices and a comfortable living environment.

Concept plan 2001 indicates Metro lines along with the land use around the lines.

- The Concept Plan 2001 will provide a variety of housing choices and a comfortable living environment.
How do we develop integrated land use & transport strategies?

Accessibility Improvements

- Neighborhoods with a complete street network and easy access to transit services

- Promote sustainable mode for travel (walking, cycling & public transport)
  - Street design should be pedestrian-friendly and cyclist-friendly
  - In India, National Urban Transport Policy (NUTP) recommends
    - To integrate land use and transport planning in cities, and to bring about comprehensive improvements in urban infrastructure

Complete Network & Streets

- Complete network pattern with hierarchy of streets.
- Availability of alternate routes for users (Stockholm -Grid streets with traffic calming measures, increase connectivity of various neighbourhoods to the city centre)
- Higher accessibility to public transport
- Safety and comfort of pedestrians and NMV users
- Missing links in intermediate ring
- Only higher level roads proposed
- All rings are complete
- Radials are clearly visible
- Road network detailed till three levels
How do we develop integrated land use & transport strategies?

Transit Oriented Development
- High densities around transit stations
- Provides multiple transportation choices by multimodal integration
- Mixed land use
- Pedestrian friendly and walkable neighborhoods

Integrated Transit Facilities
- An integrated multimodal system needs to be developed
  - To provide a viable and low cost solution of transport
  - To minimizes the need to change modes in a trip
  - To provide convenient, comfortable and time saving journey
**How do we develop integrated land use & transport strategies?**

<table>
<thead>
<tr>
<th>Inner city and transit</th>
<th>Financial/Legal Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Re-densification of low density areas with mixed land use</td>
<td></td>
</tr>
<tr>
<td>□ Redevelopment of brown field areas and areas with other types of dereliction</td>
<td></td>
</tr>
<tr>
<td>□ Provide high quality infrastructure facilities</td>
<td></td>
</tr>
<tr>
<td>□ Build Strategies for efficient and optimum utilization of existing urban land and services</td>
<td></td>
</tr>
<tr>
<td>• Increase in FAR</td>
<td></td>
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<tr>
<td>• Transferable development rights</td>
<td></td>
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<tr>
<td>• Mixed use zoning</td>
<td></td>
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<tr>
<td>• Spot zoning</td>
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<tr>
<td>• Land pooling</td>
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</table>
A regional plan for integrating the main city and surrounding nodes/towns. Regional Rail & Ring Rail & Road
Area - 3000 sq.km

A Compact City Plan Multi-Modal Integrated
AREA – 800 sq.km

Bicycle & Electric Mini Buses
AREA – 40 sqkm

Source: IMP report, 2010-11

Centre of Excellence in Urban Transport, CEPT University
ISSUES

I. Legal Framework
   ■ New Act or tweak existing TP & UD Act
   ■ Role of Central Government
   ■ NUTP, NMSH, ...

II. Agencies to prepare & Implement IULTP
   ■ New Agency of Strengthen Existing
   ■ UDA, Municipal Corporation or UMTA!
   ■ Inter agency coordination

III. Capacity Building
   ■ Education focused on disciplines – interdisciplinary
   ■ No of programmes
   ■ Training (Whom to train!)
   ■ Exposure Visits, Visits, Visits

IV. Funding
   ■ To develop information base
   ■ To develop City ILUTP Model
   ■ To Plan
   ■ To Implement (Incentivize land value capture)
   ■ Project Funding -> Systems Funding

V. Technical Support
   ■ Manuals/Tool Kits
   ■ Best practice material

IS THIS TIME TO CREATE A CADRE OF PLANNERS!!