TRANSIT ORIENTED DEVELOPMENT

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Why TOD?

- **Economic** – Increased Density in prime, Convenient Locations

- **Environmental** – Create quality urban place, Conceal unsightly and noisy transport infrastructure

- **Social** – Enhance connectivity & provide public realm

- **Financial** – Capture Value Created by Rapid Transit Development
Characteristics and benefits

Characteristics

- Proximity to transit station
- High quality transit
- Compact mixed-use buildings
- Housing options
- Moderate to high density
- Pedestrian orientation/ connectivity
- Transportation choices
- Reduced parking
- High quality design
TOD – Tool to internalise positive externalities
The Challenge of Metro Funding

Source: MTR
Metro Funding Models across the World

Source: MTR
SOME SUCCESSFUL TOD EXAMPLES
The BRT corridors are zoned for 10 to 20 story buildings on either side of the BRT avenues, with 4 to 7 story buildings on adjacent blocks.
Concept of **TRINARY, three parallel roadways** with compatible land use, building heights that tapers with distance from BRT corridor.

The first two floors along the busway, doesn’t count against FAR and are devoted to retail use.

Above second floor, building must be setback at least 5m from plot line, to allow sun on busway.

The inclusion of **upper level housing allows property owner to density bonus**, which balanced the bus flow in both the directions and ensure the efficient use of BRT.

CURITIBA: Strategic Alignment & TOD
Bogota: TransMilenio BRT

- Bogota has first class BRT system called TransMilenio.
- For further enhancement of the service, BRT system has adopted a trunk feeder model by establishing segregated bus ways on cities major arterial road.
- Feeder buses also operate in low income neighbourhood on the urban periphery.

Factors supporting Bogota TOD
Transportation demand management to lessen traffic congestion
Connecting affordable housing: Metrovivienda.

Metrovivienda provide serviced land on which private development entity can construct affordable housing for low income group on the areas near transit so that low income group can afford shelter and transport together.
BOGOTA — World’s Best BRTS

- Population (City): 68 Lakh.
- Urban Pop. Density: 184 PPH
- PT Share: 64%
- Corridors: 110 KMs
- BRTS Buses: 1140
  (Articulated) - 17 lakh passangers
- Feeder Buses: 20000
- Daily Ridership: 60 Lakhs
BOGOTA - PT modes

Transmilenio
- Transmilenio BRT
- Transmilenio Feeder

Private
- Collectivos
- Collectivos

Integrated Public Transport system (SITP)
- Urbano
- Supplymentary
- Special
### Bogota BRT System – FULL BRTS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route Length operational</td>
<td>110km</td>
</tr>
<tr>
<td>BRTS Stations</td>
<td>114</td>
</tr>
<tr>
<td>Daily Ridership</td>
<td>1,650,000</td>
</tr>
<tr>
<td>Bus Capacity</td>
<td>140 / 210</td>
</tr>
<tr>
<td>System Capacity</td>
<td>45,000 pphpd currently</td>
</tr>
<tr>
<td>System Speed (avg.)</td>
<td>28.0 kmph</td>
</tr>
</tbody>
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HONGKONG — PROPERTY + RAIL MODEL

TOD Practices in World

Hong Kong SAR, China: Profitable transit

- Hong Kong, land value capture as a tool for mobilising finance through “Rail + property” (R+P) programme.
- MRTC purchases development right from local government at a before rail price and sells these rights to a selected developers at an “after rail” price.
- Fare and other revenues with the income from supplementary real estate development was able to supplement the full cost of transit investment, operation and maintenance.
- MRTC’s involvement in all property-related activities produces 62% of total income (more than twice as much as fare).
- Benefits society by reducing sprawl, air pollution, energy consumption and higher ridership through increased density.

The break up of revenues is as follows –

| Railway Operations 24% | Property Rental 22% | Property Development 26% | Station Commercial Development 24% | Revenue from outside HK 04% | Study Conceptualisation | Understanding TOD | Case Studies | TOD in Indian Context | Conclusion |
A PROCESS ORIENTED APPROACH
Ahmedabad Municipal Corporation; Ahmedabad Urban Development Authority; Government of Gujarat
Land Management

3 Stage Process Under the Gujarat Urban Development and Town Planning Act-1976

Development Plan

• **Provides Overall Development Framework**
  – Overall Direction of Urban Expansion
  – Landuse Zoning
  – City level road network
  – Rapid Transit Network
  – Transit Reazedy Streets
  – City Level Infrastructure (Utilities & Amenities)
  – Reservations of Land for other Public Purposes
  – Development Control Regulation/rules

Ahmedabad DP’s
Second Revised Draft Development Plan 2021

AUDA Area 1866sqkm
CMP – Public Transport Proposals

Centre of Excellence in Urban Transport, CEPT University, Ahmedabad
INTEGRATED LAND USE WITH MASS TRANSIT 2021

Ahmedabad
Today 6.4Mn Population
2021- 8.8 Mn Population projected
Base FSI in Ahmedabad 1.8
Land Management Process
*Under the Gujarat Urban Development and Town Planning Act-1976*

**Town Planning Scheme (TPS)**

- **A land readjustment tool to adapt land for urban use**
  - Reconstitution of land holdings
  - Appropriation of land for public uses without acquisition
  - Local level road network
  - Local level social and physical infrastructure
  - Land Bank for Urban Poor
  - Infrastructure Cost Recovery
    - Land appropriation compensation adjusted against land value increments due to infra. provision
    - Land for Financing of infrastructure (15%)
**Town Planning Scheme**

*Under the Gujarat Urban Development and Town Planning Act-1976*

**Land Area for Public Purposes**

- Appropriation of land for public uses *upto 50%*
- Road Network –*upto 20%*
- Local level social and physical infrastructure (*upto 5%*)
- Land for Economically Weaker Section Housing (*upto 10%*)
- *Land Bank for Financing of infrastructure (upto 15%)*
“Town Planning Schemes” to be read as “Town Planning Schemes or Local area Plans”

Development Plan” (Macro Level) (Since 1954)  

“Town Planning Schemes” (Micro Level) (since 1915)  

Local Area Plan” (Micro Level) (Since 2014)

Zoning Proposals  
Regulation for Development  
City level Transportation and infrastructure planning and implementation

Land reconstitution  
Neighborhood level road network, social and physical infrastructure  
Financing of neighborhood level infrastructure

Detailed area level plan with urban design interventions  
Planning for TOZ  
Amendment in Gujarat Town Planning & Urban Development Act, 1976  
-Local Area Plan
200mt Buffer Along BRTS and MRTS corridor - FSI 4.0
TOZ Area Planning Distribution
NO LAND USE MIX PROPOSED (DELHI - 30% MINIMUM MANDATORY RESIDENTIAL)
NO DWELLING SIZES SPECIFIED; DELHI HAS 50% UNIT SIZES 32-40SQM; 50% UNIT SIZES 62 SQM.
TPS PROVIDES LAND FOR EWS. ALSO DP PROPOSED AFFORDABLE HOUSING ZONE; NO PROPOSAL
Street related Interventions

- **Future ROW**: Land identified as public ROW and to be developed as and when property is redeveloped
- **Flexible ROW**: Public ROW that can be flexibly located by the property owner connecting predefined network links on either side
- **Pedestrian ROW**: Existing Private roads to be notified as Public ROW
- **Public Domain**: Part of the roadside margin identified in LAP to be kept as public domain used as foot path to be kept open for public use (FSI provide as compensation or monetary compensation is also provided)
Existing Street Network – TOZ Wadaj

TOTAL ROUTE 11.77KM
TOTAL AREA 4.32 SQKM
Street Hierarchy
Public Domain - Margins
Public Domain - Margins
Block Sizes - Proposed

BLOCK SIZES: 165 x 170 to 350 x 620
AVG BLOCK SIZE: 250 x 350
NUMBER OF BLOCKS: 116

DIMENSIONS ARE IN METERS
Resource mobilization

Average FSI 3.2

Number of Cases using 4 FSI – 125
Amount received by sale of FSI – 365 Crores
AMC collects the FSI Charge.
To be shared with: AUDA, MEGA, Narmada

*For Green belt TP areas, the average net FSI achieved of 3.80 in rest of the area has been considered.
Existing BRTS Station

BEFORE
Propose Plaza at BRTS Station
Propose Schematic View Near MRT Station
Proposal for Special area development - Wadaj
Proposal for Special area development - Wadaj
Proposed Inter Model Hub
Thank You
AMC/AUDA/CEPT