Transit Oriented Development Strategic Plan for Bhopal

IBI GROUP

26th February, 2015

Sustainable Urban Transport Project (India)

INTRODUCING BHOPAL


Bhopal

Curitiba

Ottawa

	Bhopal	Curitiba	Ottawa
Population	1.79 million (2011)	1.76 million	1.2 million
Area	684.24 sq.km	430.9 sq.km	5716 sq.km
Gross Density	2616 persons/sq.km	4095 persons /sq.km	196.6 persons/sq.km
Urban Area Density	6893 persons/sq.km	4200 persons/sq.km	1860 persons/sq.km
Higher Order Transit	BRTS + proposed MRTS	BRTS	BRTS + Proposed LRT

Need for TOD in Bhopal

- **Prioritizing public transit use and reduced use of private vehicles** for daily commuting
- Providing **policy directions to establish a TOD-centric growth pattern**
- **Capitalizing upon the land value potential near BRTS and Metro stations** to attract private sector investment in joint development
- Formulating a **strategic implementation programme that outlines the phasing strategy** for investment

Step-by-Step Process

Determines the Scale and scope for the Bhopal TOD Plan taking into consideration existing nodal agency priorities, data availability, and a cursory review of existing plans

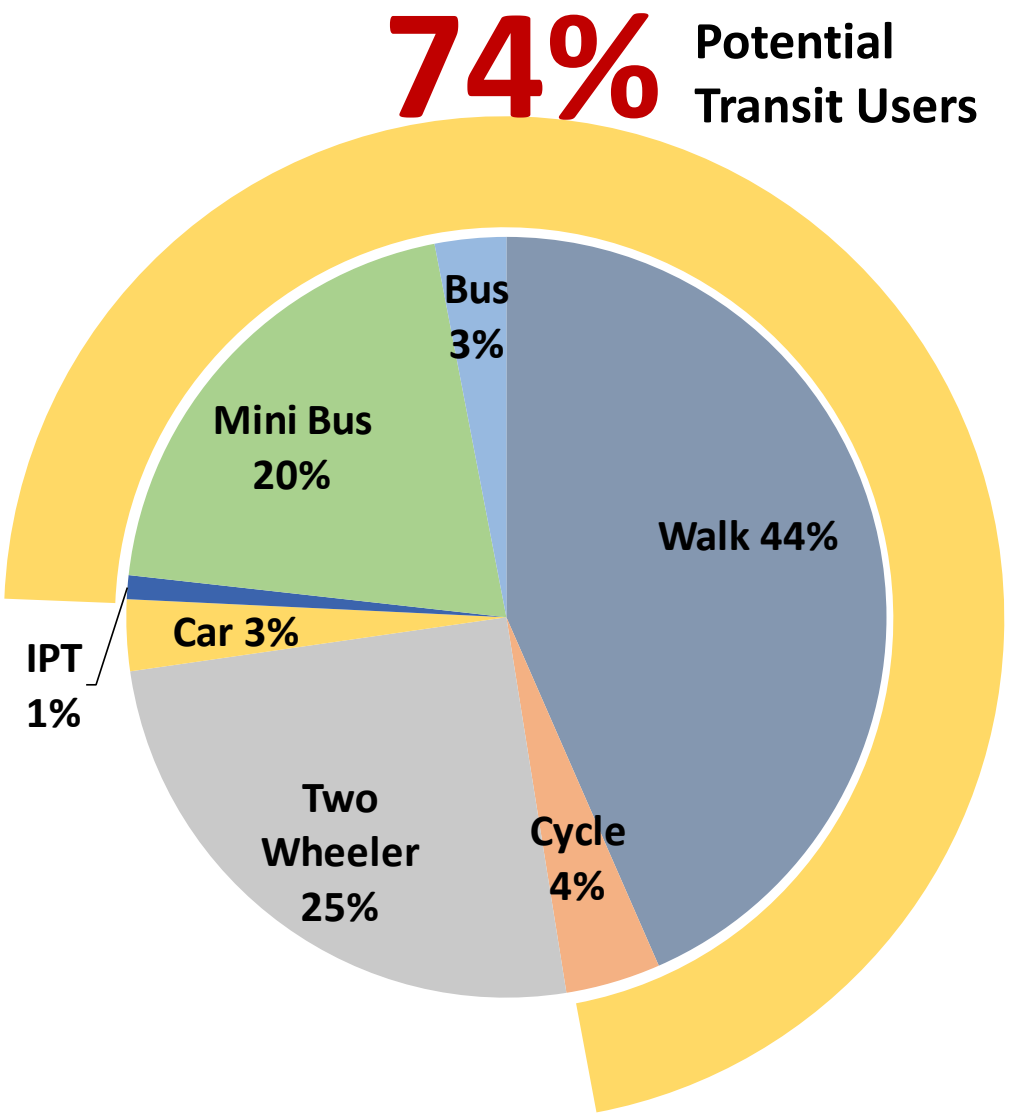
Recommendations to address these barriers in order to **strengthen the role of Bhopal's local administration in planning** and implementing TODs.

Brings forth the fundamental steps **in the development of transit and pedestrian friendly communities** in Indian cities.

The 'Invest' section presents a capital improvements programme for the implementation of the TOD Plan.

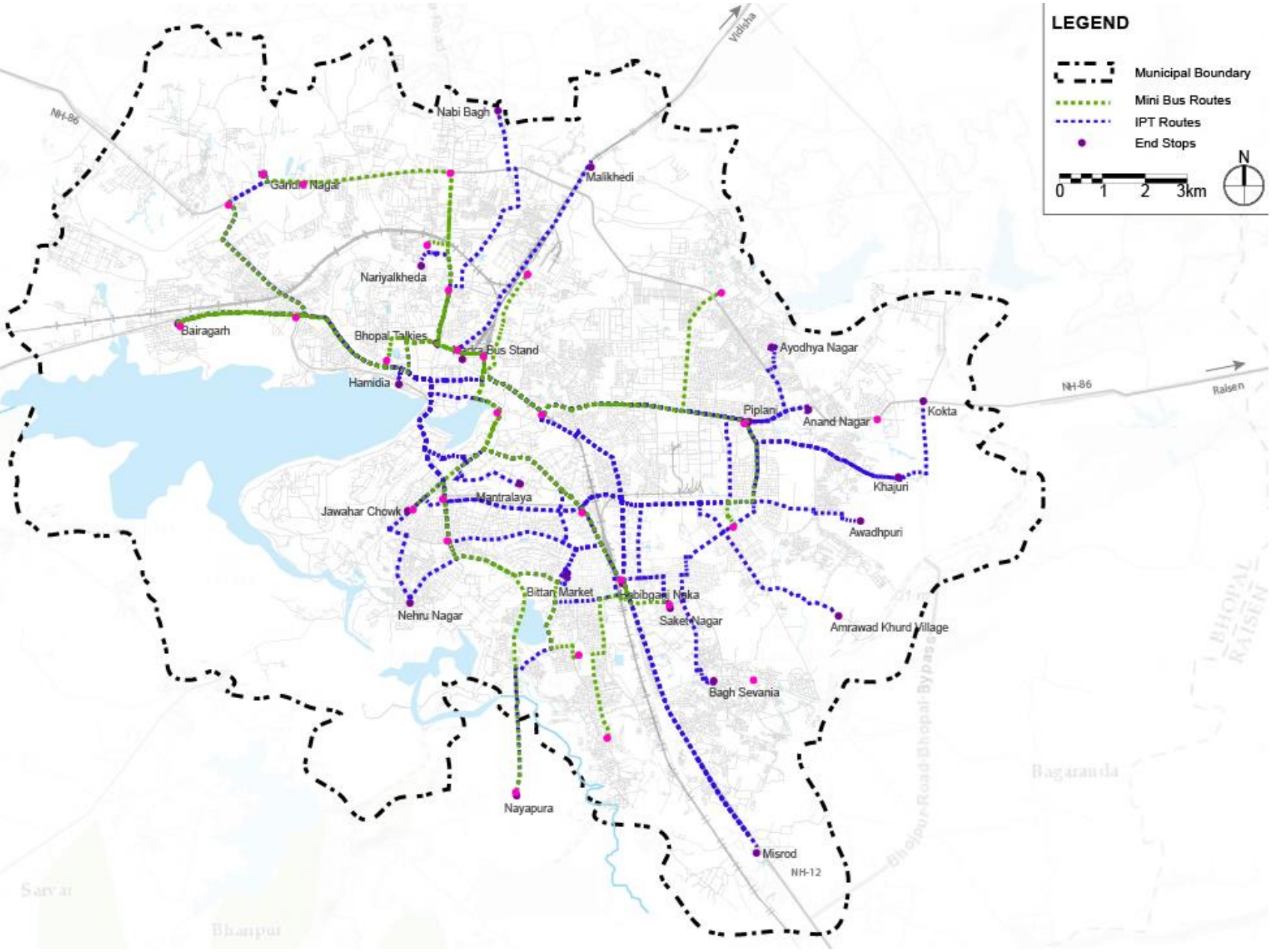
Government, experts and stakeholders formulate team with their roles and responsibilities for the process of implementation

1. Review Nature of Transit



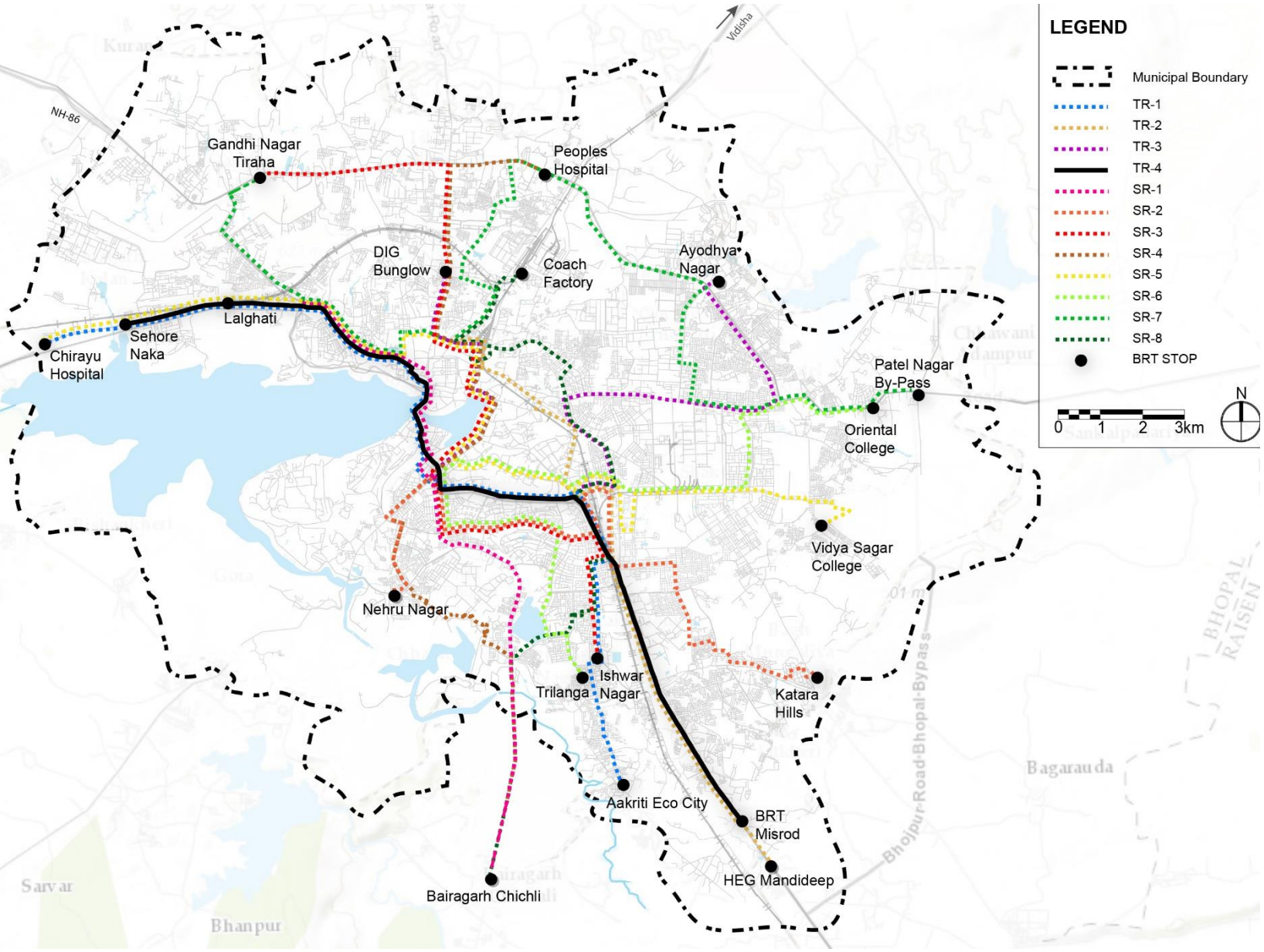
- High **NMT Modal Share**
- Expanding **higher order transit service**
  - **BRTS** (1 operational) and **MRTS (planned)**
- **10% annum growth in vehicular traffic** over the last decade, of which **80% are 2wheelers**

1. Review Nature of Transit



Public transport- Buses, mini buses and IPT modes (Tata Magic, auto-rickshaws).

1. Review Nature of Transit- BRT



Total length: 119.2 Km; 12 lines

Total Bus Stops: 573

OPERATIONAL BRT:

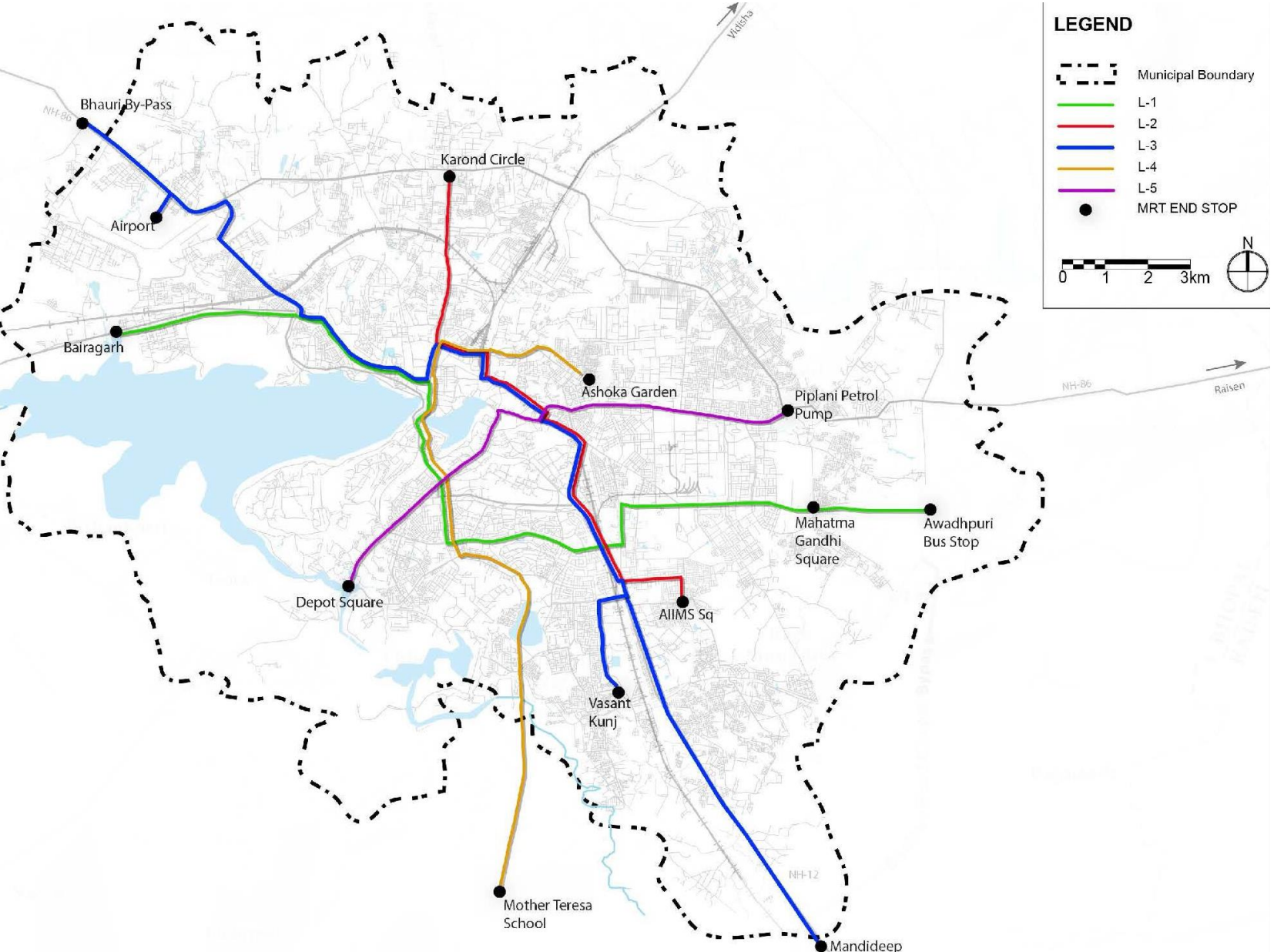
TR 4- Bairagarh/ Sehore Naka to Misrod

Bus Stops: 44

Length: 24 Km

Ridership: 1.06 lakhs passenger per day

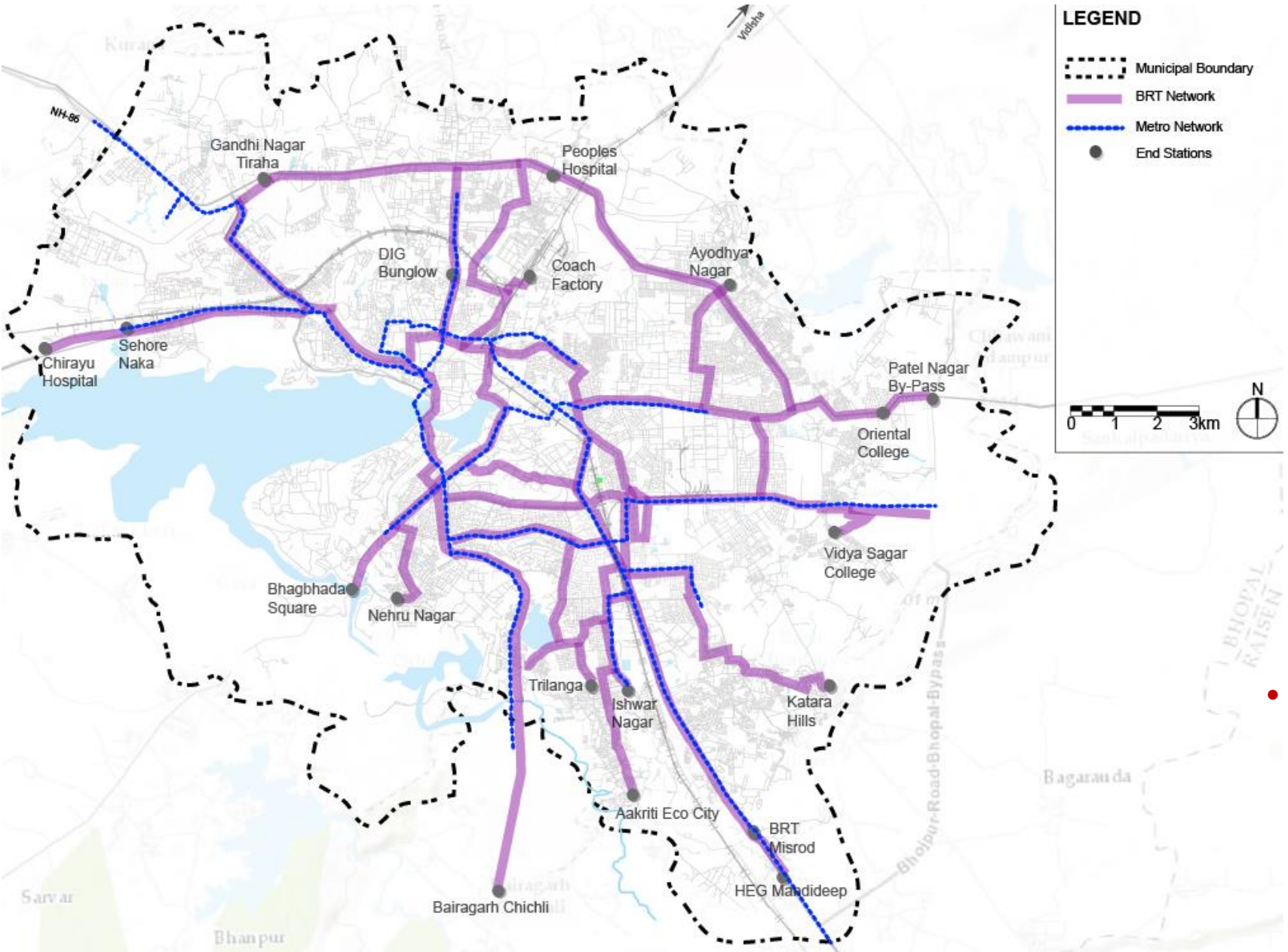
1. Review Nature of Transit- Metro



Total length: 85.66 Km; 6 lines

Total Stops: 81

1. Review Nature of Transit- Key Takeaway



- Proposed **Metro route alignment runs parallel** with the operations and proposed BRT routes
- Government intends to **gradually phase out the operational BRT route** or utilize it as a feeder system, once the Metro is operational
- **Corridor level TOD approach with multi-modal integration of different modes of transportation.**

1. Review Station Areas

Lack of multimodal integration

Poor Transit Quality

1. Review Station Areas

Unsafe access between BRT stops & surrounding development

Lack of traffic calming to improve safety for pedestrians

1. Review Station Areas

Lack of planned parking facility

High on-street parking encroaching NMT infrastructure

2. Institutional Framework

		State level			District Level			City Level			
		Town and Country Planning	Urban Administration and Development	Transportation Department	Regional Transport Office (RTO)	Collectors Office	Traffic Police	Capital Project Administration	Development Authority	Urban Local Body (BMC)	Bus SPV (BCLL)
Land Use	Policy Formulation	■									
	Plan Development	■	■						■		
	Implementation							■	■	■	
	Enforcement					■			■	■	
Urban Transport	Policy Formulation		■								
	Plan Development		■								■
	Implementation			■						■	■
	Enforcement				■		■				

- **Multiplicity of agencies**
- **Land use planning** falls under the purview of Town and Country Planning at **state level or development authority.**
- **Insufficient capacities** to develop and implement TOD projects

3. Previous Plans- Bhopal Master Plan

TOD Consistencies:

- **Differential densities** for city with higher density areas proposed around the existing and the proposed work centres
- **Proposed Mass Rapid Transit System** connecting major work centres, and traffic generating zones
- Recommends **variable FSIs** based on site context.

TOD Gaps:

- Does not **address regulatory or implementation mechanisms** for coordinated land use and transportation planning
- Does not identifies **mixed use as a land use category**
- Development controls are limited to FSI
- Does not plan for **pedestrian accessibility**

3. Previous Plans- DCRs

FAR

- **Residential Use:** 0.75- 1.33
- **Commercial Use:** 1.5-2.5
- **Mixed Use:** FAR for commercial development will be 0.75 only where FAR for residential area is 0.75

- **DENSITIES PROPOSED (Development Plan- 2005)**
  - Low- upto 125PPH
  - Medium- 126-250 PPH
  - Medium & High- 251- 400PPH
  - High- 401- 600PPH

PARKING:

- **Multi-family Residential:** 1ECS/ 100sqm
- **Commercial:**
  - 1 ECS/ 50 sq.m where shops size exceed 20 sq.m
  - 1 ECS /100 sq.m of floor space in other areas
- **Hotels and Lodges:** 1ECS/75 sq.m
- **Govt. Semi-public and private offices:** 1ECS/100 sq.m of built-up area

3. Previous Plans- Bhumi Vikas Adhiniyam

TOD Consistencies:

- **Introduces a new category of residential use R2 that permits commercial on ground floor**
- **The assessment of the shopline is based on:**
  - Infrastructure capacity
  - Traffic survey
- **Express clearance** require for permitting high-rise buildings to ensure balance of infrastructure and other utilities.

TOD Gaps:

- Does not include the **concept of Transit Oriented Development.**
- Does not include **mixed use a category** in the identified land uses that allows mix of uses other than commercial and residential
- **Allows front setbacks and boundary wall** which are not friendly for developments.
- **No single window approval** for development

3. Previous Plans- BRTS DPR

TOD Consistencies:

- Proposed typical **cross section based on different ROWs**
- **Segregated traffic lanes for BRT**, slow moving vehicles, non motorized transport and pedestrians.
- Proposed **integration of BRT with the existing feeder service**.
- Planned **the BRTS routes linking the proposed sub-cities**.

TOD Gaps:

- Does not discuss **micro-strategies to improve accessibility** to transit stations.
- **Lack of integration of parking** and with local feeder service- autos, tata magic.
- The plan does not take into consideration **universal accessibility**

4. Scale & Scope

Where does your city stand on the following?

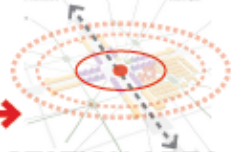
- Development Plan / City Development Plan update underway/ ongoing/ planned
- OR
- Compressive Mobility Plan under preparation
- OR
- BRT / Metro Rail system Detailed Project Report under preparation
- YES

CITY LEVEL

- BRT / Metro Rail system Detailed Project Report prepared/ under preparation
- OR
- Special Purpose Vehicle for Transit formed
- OR
- Development Control Regulation modifications/ Floor Area Ratio increase proposed
- OR
- Compressive Mobility Plan under preparation
- YES

CORRIDOR LEVEL

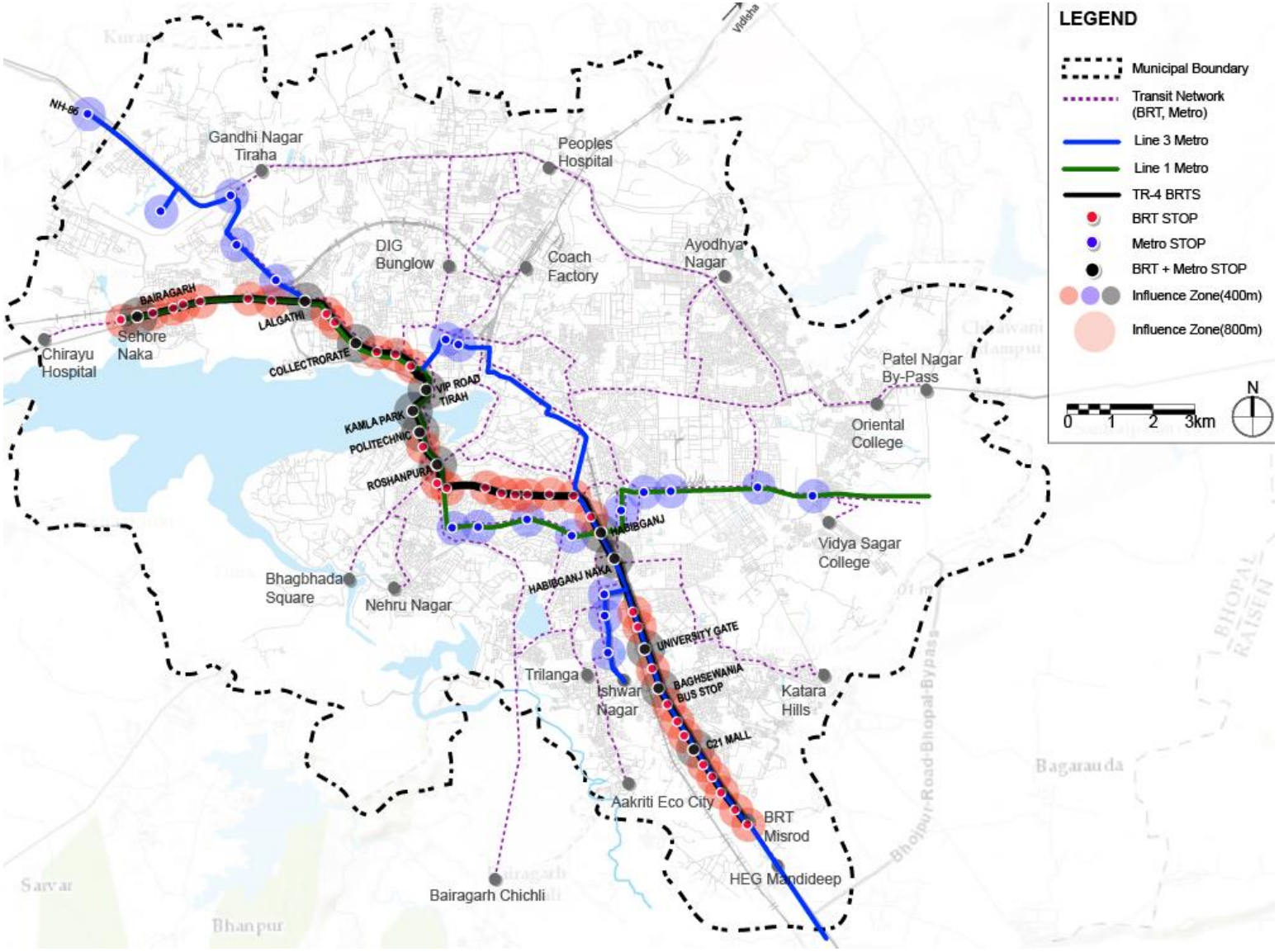
- Transit operational/ under construction
- OR
- Government owned vacant lands / Redevelopment opportunities existing near transit
- OR
- Land Banking/ Pooling Strategy underway
- OR
- Development Control Regulation modifications/ Floor Area Ratio increase proposed
- OR
- Increased pressure on existing infrastructure
- OR
- Market Interest (rapid change in property values)
- YES



STATION AREA LEVEL

- Redevelopment opportunities near transit
- OR
- In greenfields, land auctioning or development
- OR
- Land tracts of government owned land available near transit
- YES

SITE LEVEL



5. Data Availability

EXISTING DOCUMENTS AND STUDIES

Comprehensive Development Plans/ Master Plans

- [x] Bhopal Development Plan 2005
- [x] Draft Development Plan 2021

Comprehensive Mobility Plans/ Comprehensive Traffic and Transportation Plans

- [x] Comprehensive Mobility Plan- 2012

Transit Service Plan or DPRs

- [x] BRTS DPR
- [ ] Metro DPR

State Town & Country Planning Act

- [x] MP Town & Country Planning Act, 1973
- [x] Bhumi Vikas Adhiniyam- 2012

Local Area Plans/ Detailed Development Plans/ Zonal Development Plans

- [x] Draft Zonal Plan for AIIMS
- [ ] Draft Zonal Plan for 4 zones

EXISTING CONDITION INVENTORY

- [x] Existing Land Uses/ Future Land Uses
- [ ] Road Inventory
- [x] Transit Alignment & Station Location
- [*] Plot Sizes
- [*] Land Ownership
- [ ] Infrastructure
- [ ] Parking Location
- [ ] Public Facilities
- [ ] Major Nodes and Activity Center
- [ ] Pedestrian Infrastructure
- [ ] Cycle Tracks
- [ ] Real Estate circle rates

LEGEND:

[x] Available [*] Available only along the metro corridor [ ] Not Available

- **Data Limitations**
- **Multiple Agency involved**
- **Smart City Solution- centralized data clearing house**

1. TOD Task Force

Organization	TOD Principles	Roles and Responsibilities
T&CPO	Mix Land uses | Optimize Densities | Street Oriented Buildings	Integration of TOD principles in the Regulatory Framework
UADD	Interconnected Street Network | Complete Streets | NMT Network	Incorporating pedestrian related principles while formulating plans for city's mobility
BDA	Housing Diversity	Formulate tools and strategies to produce affordable housing near public transit
BMC	Traffic Calming | First & Last Mile Connectivity | Informal Settlement	Integration of traffic calming measures and first and last mile connection while planning transport infrastructure
BCLL	Multimodal Integration	Route rationalization and integrating feeder service with the transit and development
Police	Manage Parking	Enforcement and regulation of traffic and parking

2. Goal Setting

1. **Two- Pronged Approach:** BRTS vs. MRTS
2. **Eliminating Policy/ Regulations barriers-** Acts/ Development Plan / DCR modifications
3. **Differential FARs / Optimized Densities** based on Station Area Plans/ Special TOD Zone
4. **Prioritization for Development of Station Areas**
5. **Financial and non-financial incentives** to push market towards desired investment

3. Eliminating Policy level Barriers

MULTIMODAL INTEGRATION

EXISTING POLICIES

- To establish reliable, efficient multimodal public transport system (Section 3.3)
- Provide for multi nodal Regional Bus Terminal facilities following regional bus stations should be developed according to the needs and the volume of the bus users (Section 3.32)

PROPOSED AMMENDMENTS

- Intermodal integration of **formal public transport, para transit and cycle sharing should be within 200m** from each other
- Coordinate **local feeder transit service schedules and routes** to provide seamless connectivity between local, regional, and rapid transit services by reducing waiting times.
    - Bus routes along collectors and arterial roads provided every 800m- 1km
    - Transit feeder stops/local bus stops: 400m or 5 min walk
- Adopt **transit priority measures** to ensure the efficient movement of surface transit to and from the station area, including measures such as signal priority and dedicated transit lanes.

3. Eliminating Policy level Barriers

MIXED LAND USES

EXISTING POLICIES

- Mixed land use- Mixed land use zone means a use zone in the land use plan consisting of more than one use zones, in such case use premises/use activities permitted.in both the use zones shall be applicable. (Section 4.12)
- At the time of Zonal Development Plan, streets of mixed use activity shall be identified.
- Commercial activity allowed shall be only on the ground floor to the extent of 25% or 50sqm

PROPOSED AMMENDMENTS

- In all integrated schemes, a minimum of 30% of overall FAR shall be mandatory for Residential use, a minimum 10% of FAR for commercial use and minimum 10% of FAR for community facilities. Mix of uses and FAR utilization for the remaining 50% FAR shall be as per the land use category designated in the Zonal Plan.

3. Eliminating Policy level Barriers

NMT NETWORK

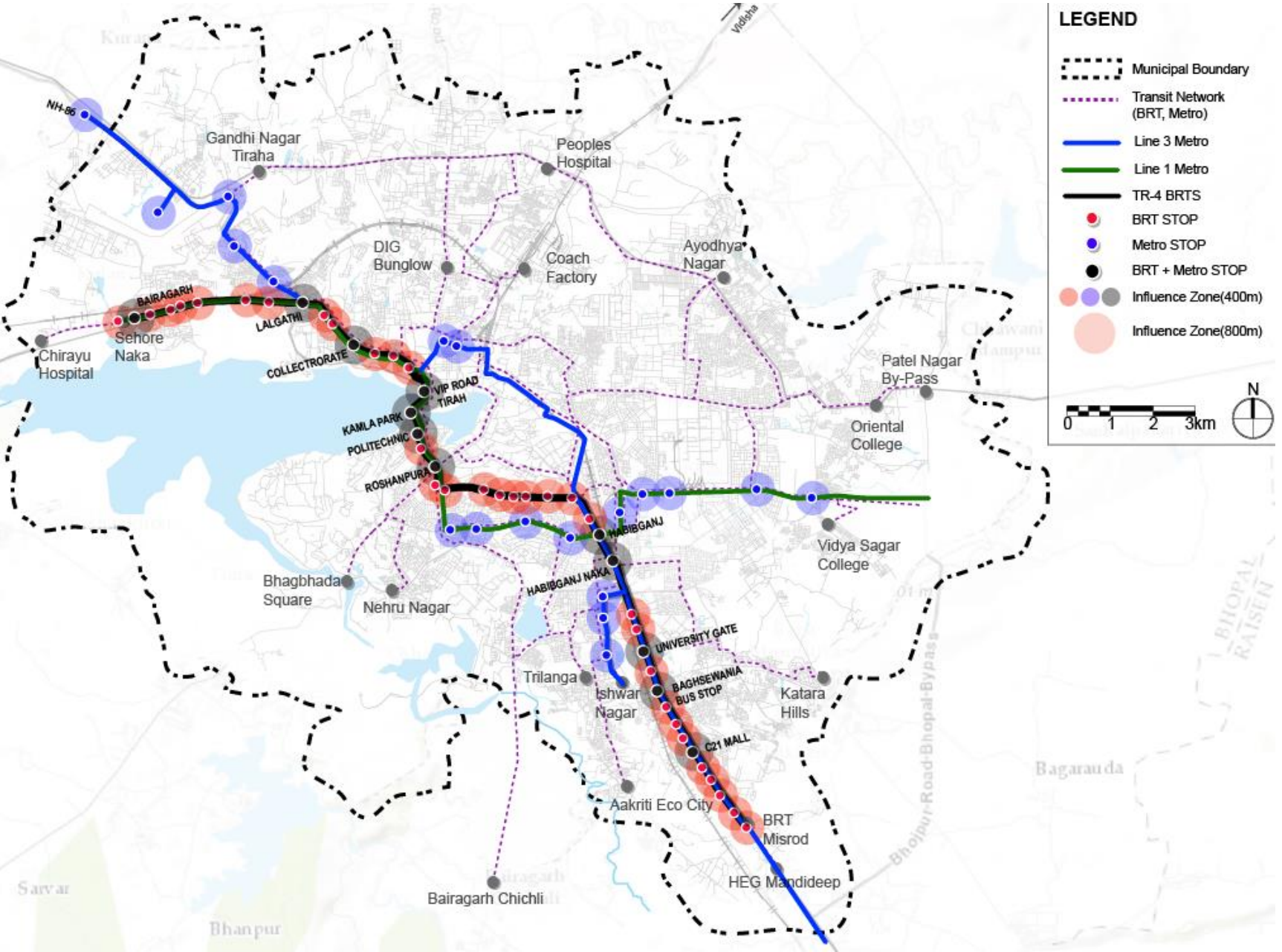
EXISTING POLICIES

- Not Addressed

PROPOSED AMMENDMENTS

- **Prioritization of public transport and non-motorized** private modes in street design.
- Maximum number of people should be able to move fast, safely and conveniently through the city.
- To **retrofit streets for equal or higher priority for public transit and pedestrians.**
- **Shift the balance of the roadway** so that it caters more to NMT users of all types within station areas and transit zones.
- Provide enough room on the sidewalk for NMT users of varying speeds, ages, and abilities.
- Create street-level activity and well-watched streets for pedestrian security and enjoyment.
- Provide **adequate amenities for pedestrians, cyclist, NMT and public transport users**.

1. Map Transit Corridor



Priority Corridor:

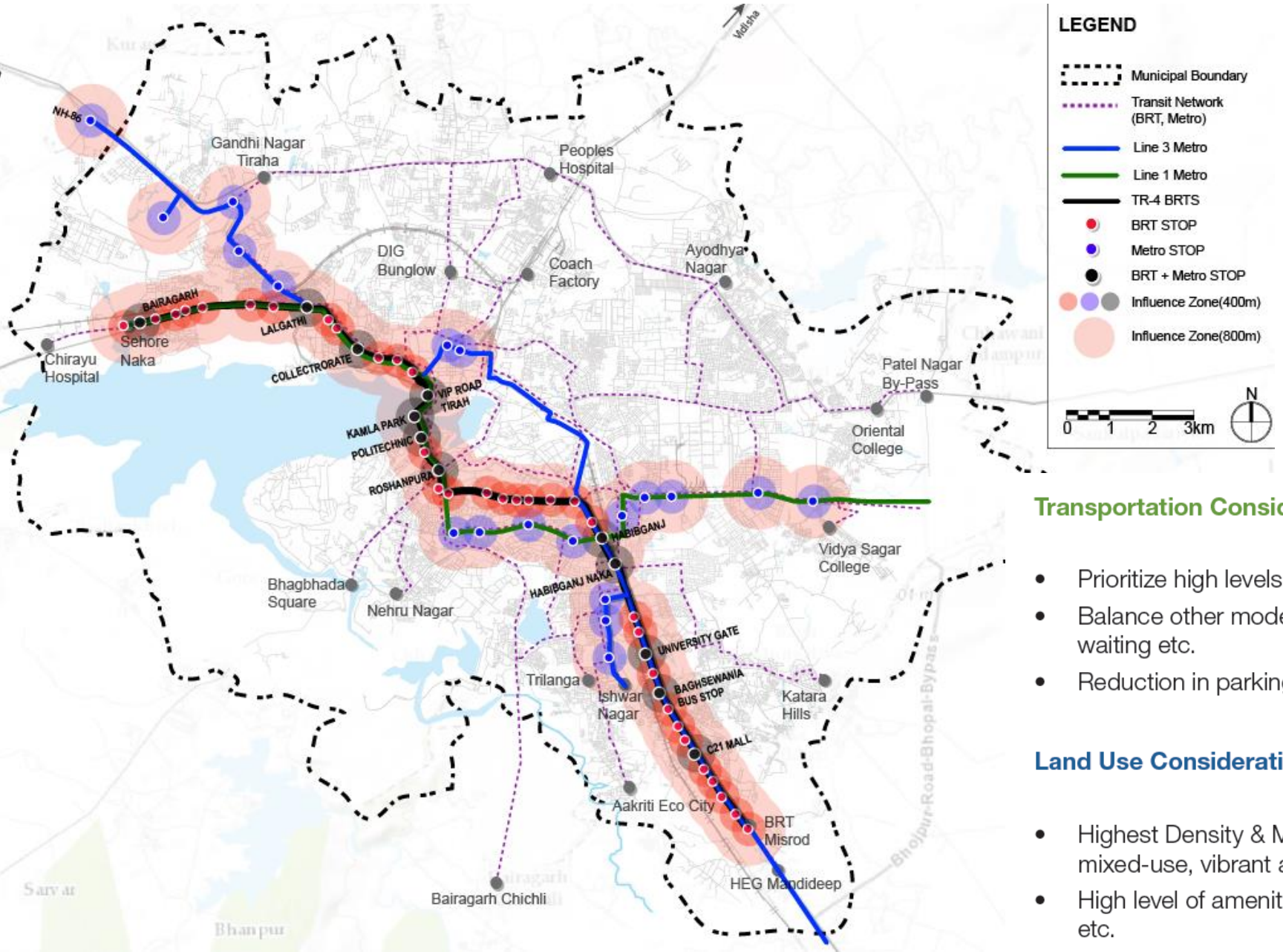
- BRTS- TR4 (Operational Corridor)
- MRTS: Line 1 & Line 3

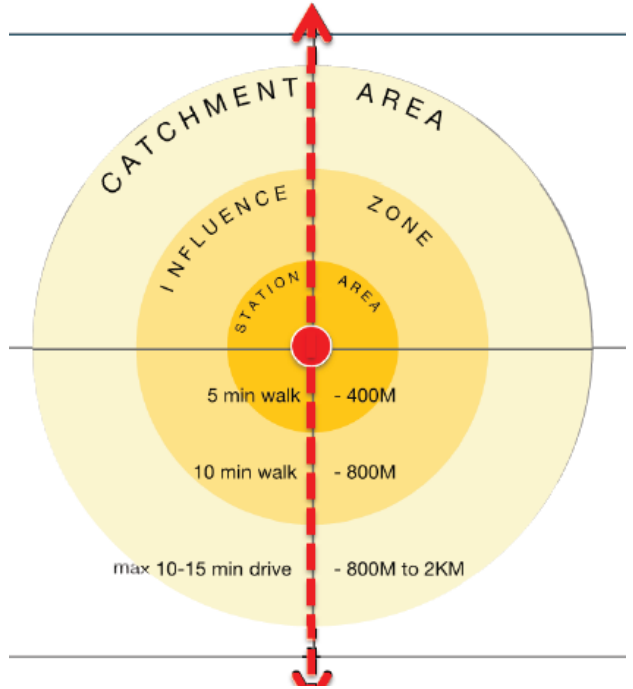
Critical link that **connects the major activity centres** in Bhopal.

Metro traces the same route except for the stretch extending from **Board Office to Mandideep** and an **additional connectivity to Airport.**

Overlapping Stretch: 14Km (Metro-21.58Km & BRT 30.59KM)

2. Influence Zone





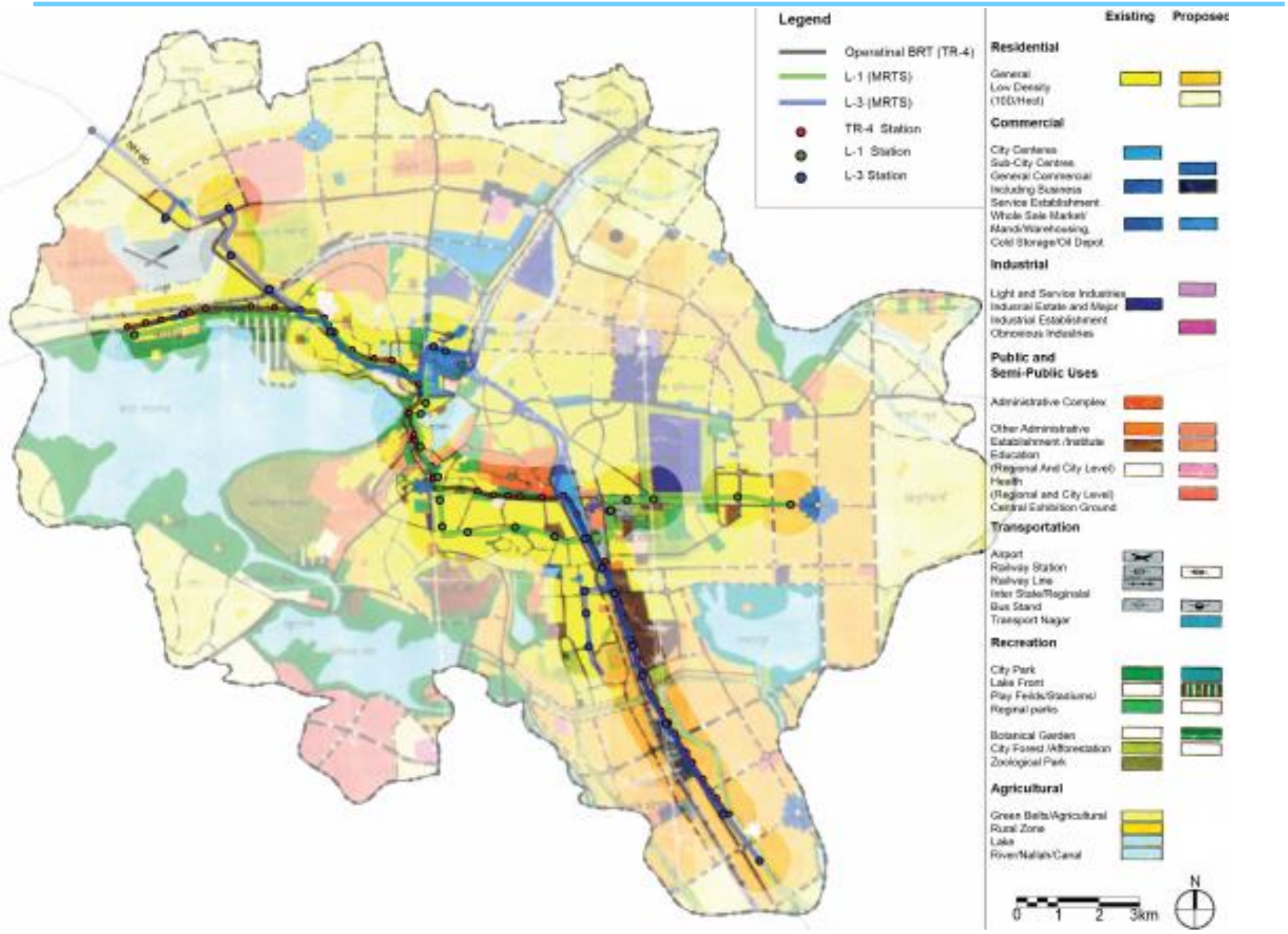
Transportation Considerations

- Prioritize high levels of pedestrian, NMT activity
- Balance other modes of access to the stations e.g. IPT, MVs, cell-phone waiting etc.
- Reduction in parking

Land Use Considerations

- Highest Density & Mixed Uses to encourage high ridership & provide a mixed-use, vibrant activity spine
- High level of amenities – retail, bike parking, businesses, traffic calming etc.

3. Analyzing Development Opportunities



Misrod- Habibganj stretch

- High availability of vacant land.
- Close proximity to the railway station is attracting a lot of economic activities.

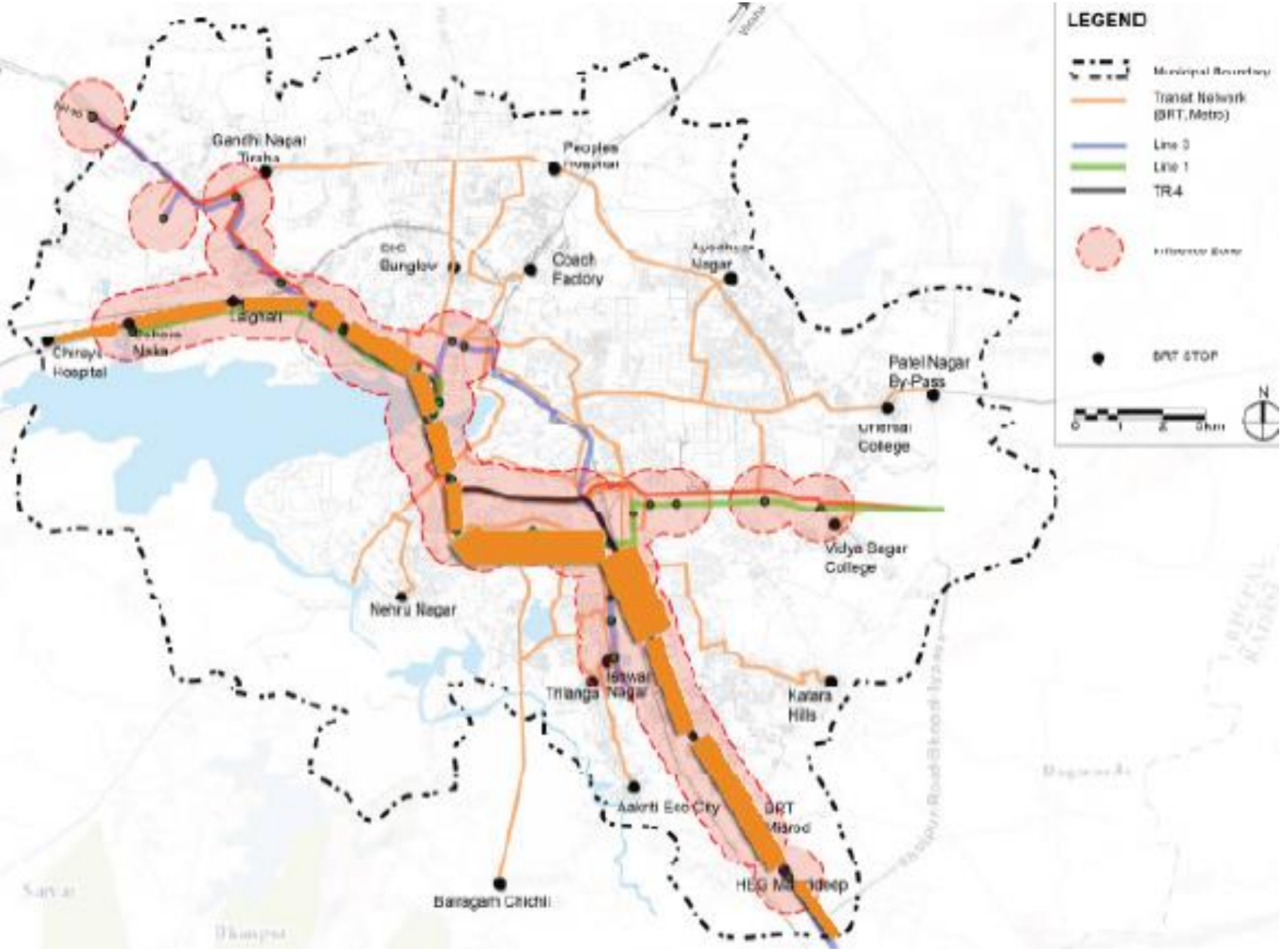
Habibganj Railway Station- T.T. Nagar is a high activity area with **large residential areas on the left side and large commercial centre** i.e. at MP Nagar on the right side.

T.T. Nagar- Kamla Park stretch has mix of activities- New Market, Kamla Park

Kamla Park- Bairagarh has a mixed use character- old area with high percentage of mix of

Towards Bairagarh- stretch maintains a mixed use character & low density development.

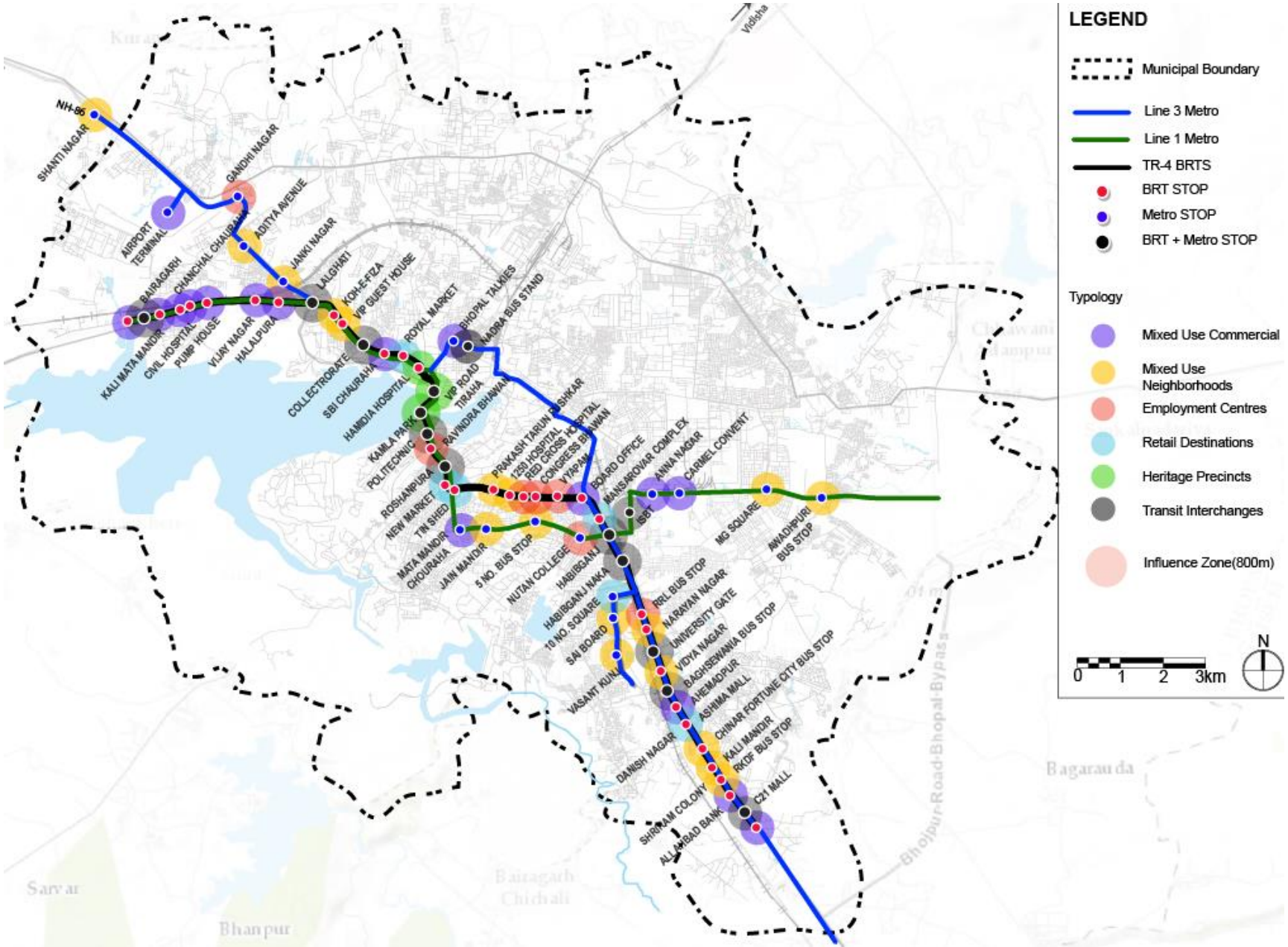
3. Analyzing Development Opportunities



Based on travel demand projections:

- Stretch from **T.T. Nagar to Board Office** is the highly used corridor;
- Stretch connecting **Board Office to Habibganj Station**

4. TOD Typologies



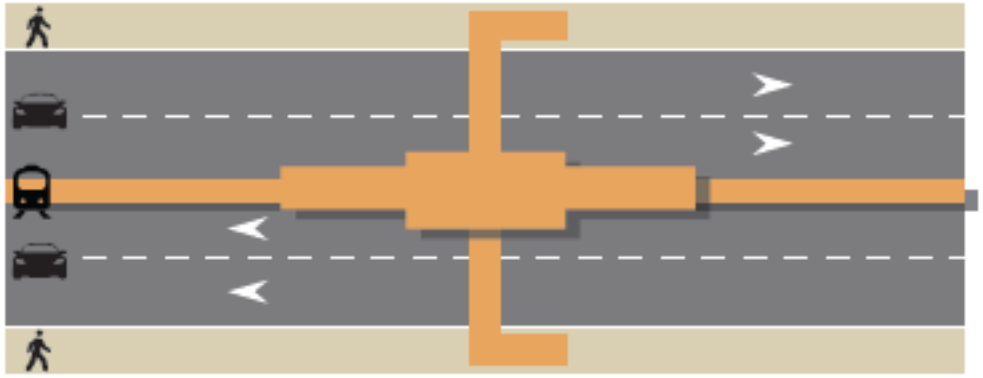
Why Typologies?

- *Provide a snapshot of* ***aspirational character***
- *Set* ***expectations for development***
- *Establish a level of magnitude for* ***possible investments***
- *Opportunity for* ***replicability and scalability*** *of standards at city scale*

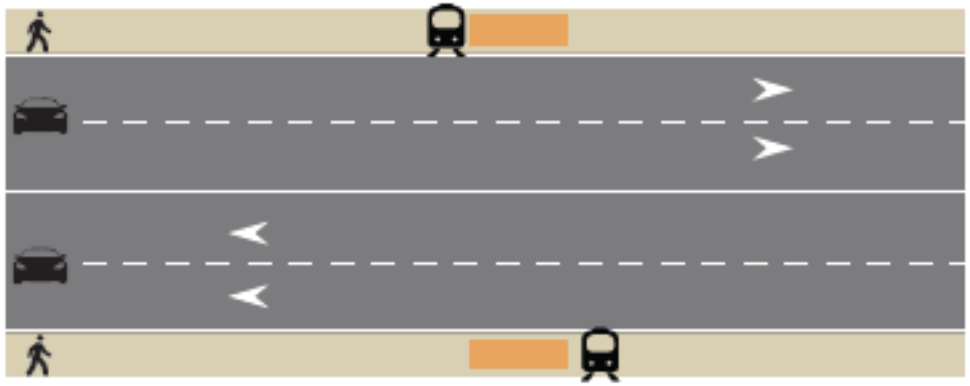
4. TOD Typologies

	Mixed Use Commercial	Mixed use Neighbourhoods	Employment Centres	Retail Destinations	Heritage Precincts	Transit Interchanges
Characteristic	Significant center of economic and cultural activity with regional-scale retail destinations.	Predominantly residential district within the core/old city area	Significant centre of economic and community activity & offices of the city + a moderate mix of retail.	Famous destinations, recreation areas, mass congregation areas	Old parts of the city with significant historical, cultural & architectural characteristics	Predominantly a mix of commercial, institutional and residential district organized around transit stations
Land Use	Residential- 30-40% Commercial- 30-50% PSP & Others- 10-20%	Residential- 50-70% Commercial- 20-30% PSP & Others- 10-20%	Residential- 30-40% Commercial- 10-20% PSP & Others- 30-50%	Residential- 30% Commercial- 50-60% PSP & Others- 10-20%	Residential- 30-40% Commercial- 10-20% PSP & Others- 10-20% Heritage Areas- 20-30%	Residential- 30% Commercial- 10-20% PSP & Others- 10-20% Transportation- 20-30%

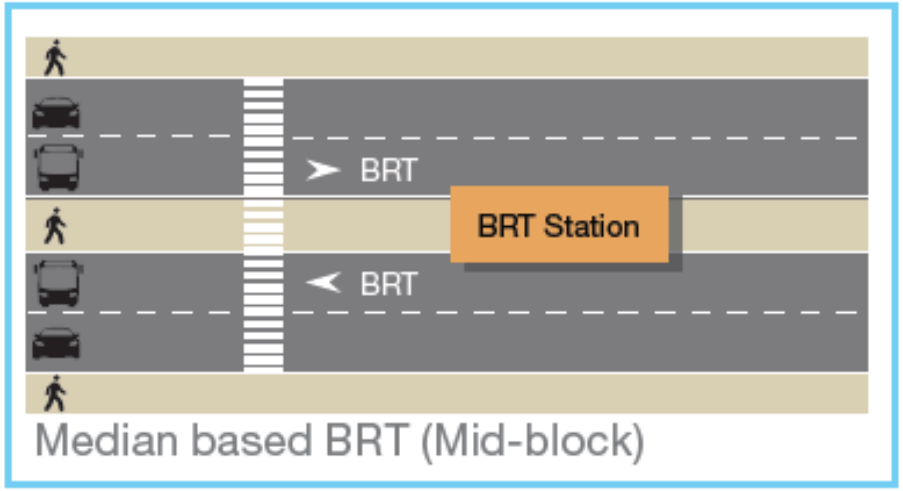
5. Accessibility



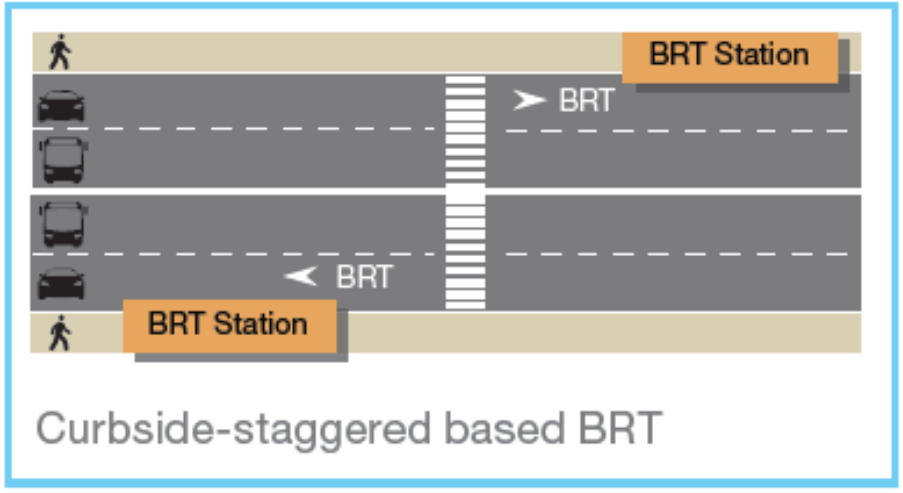
Overhead Metro



Underground Metro



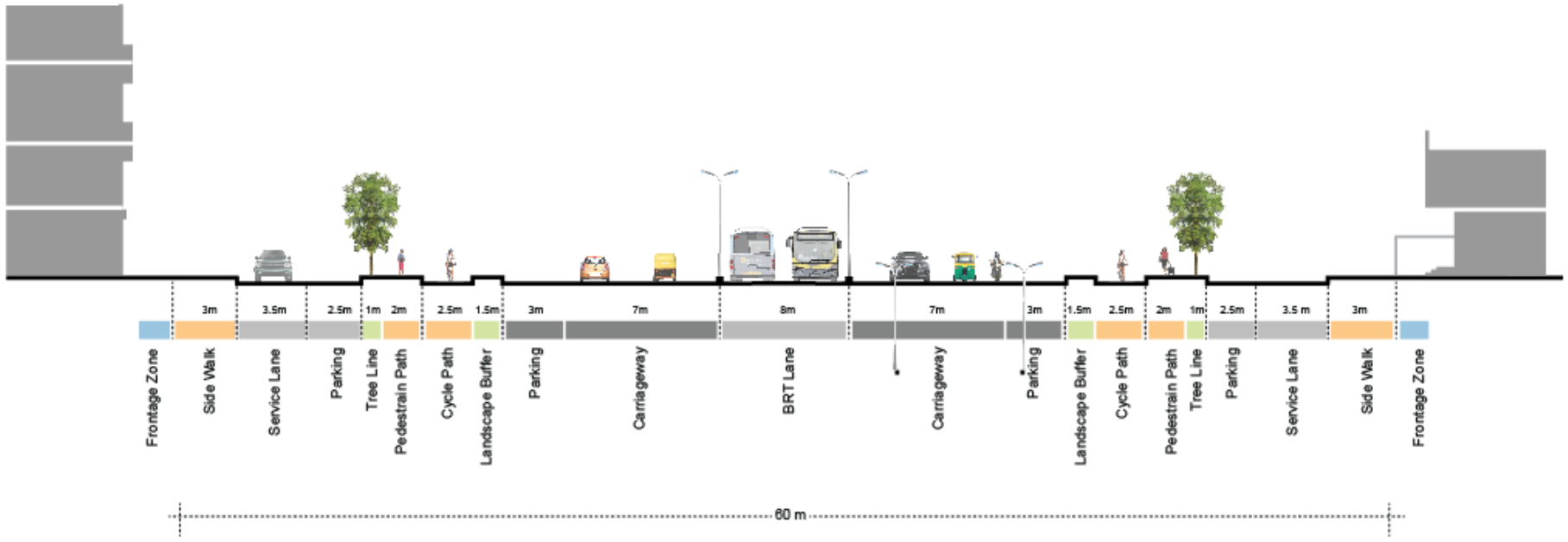
Median based BRT (Mid-block)

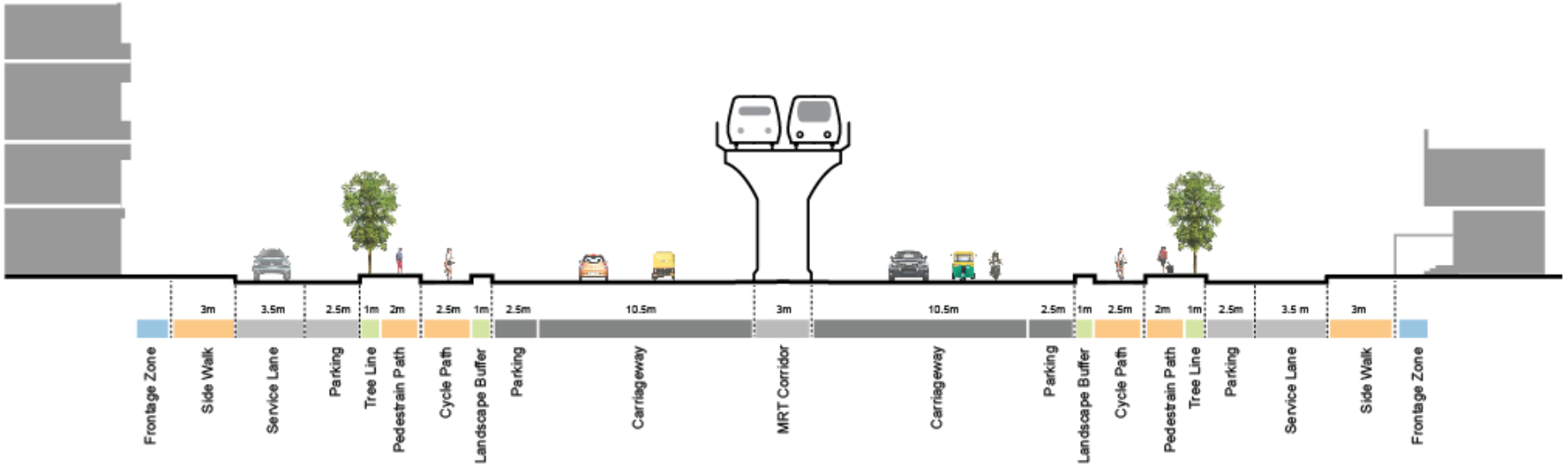


Curbside-staggered based BRT

- **Traffic calming**
- **Pedestrian crosswalks**
- **IPT integration**
- **Universal Access**

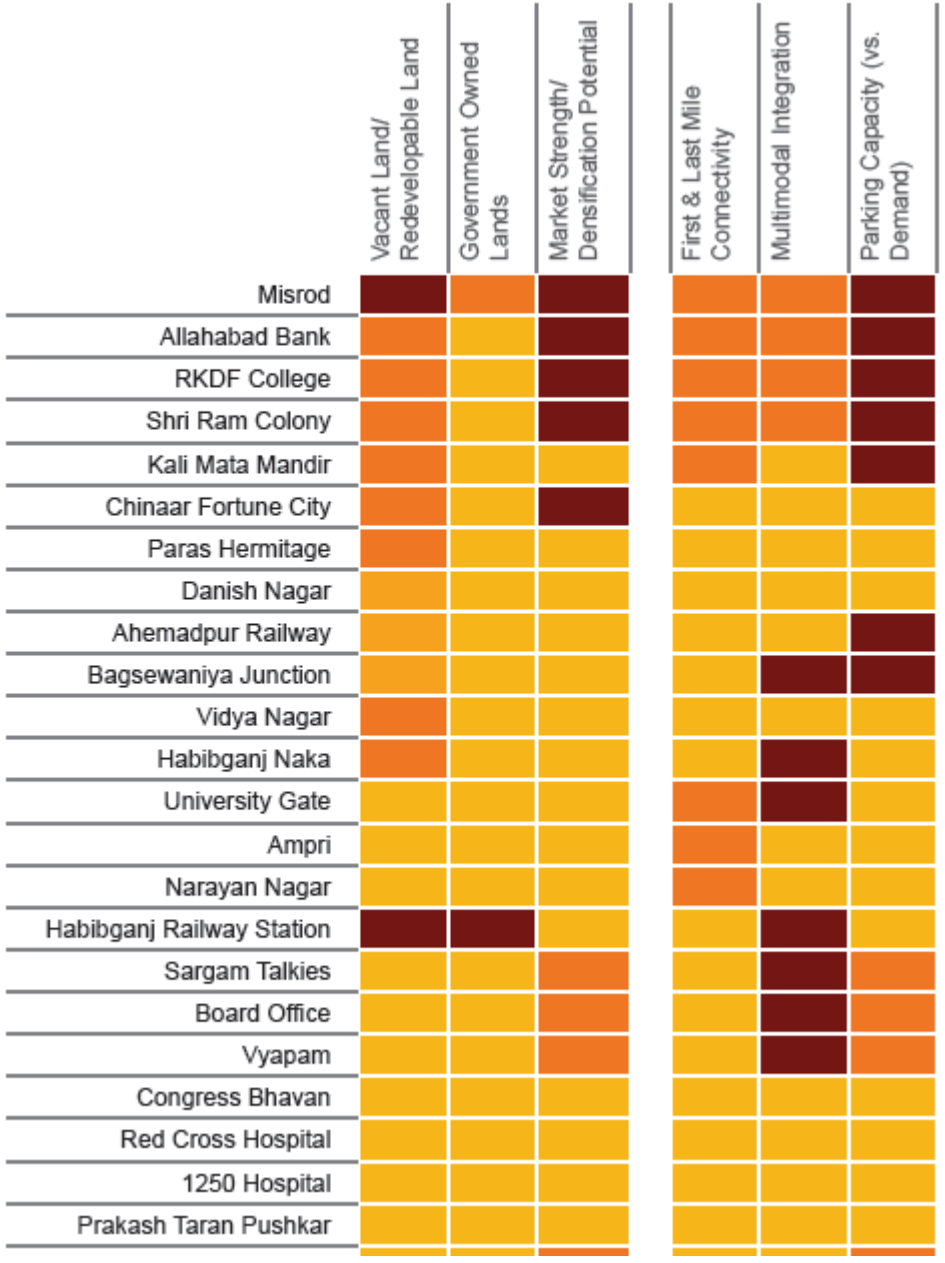
5. Accessibility

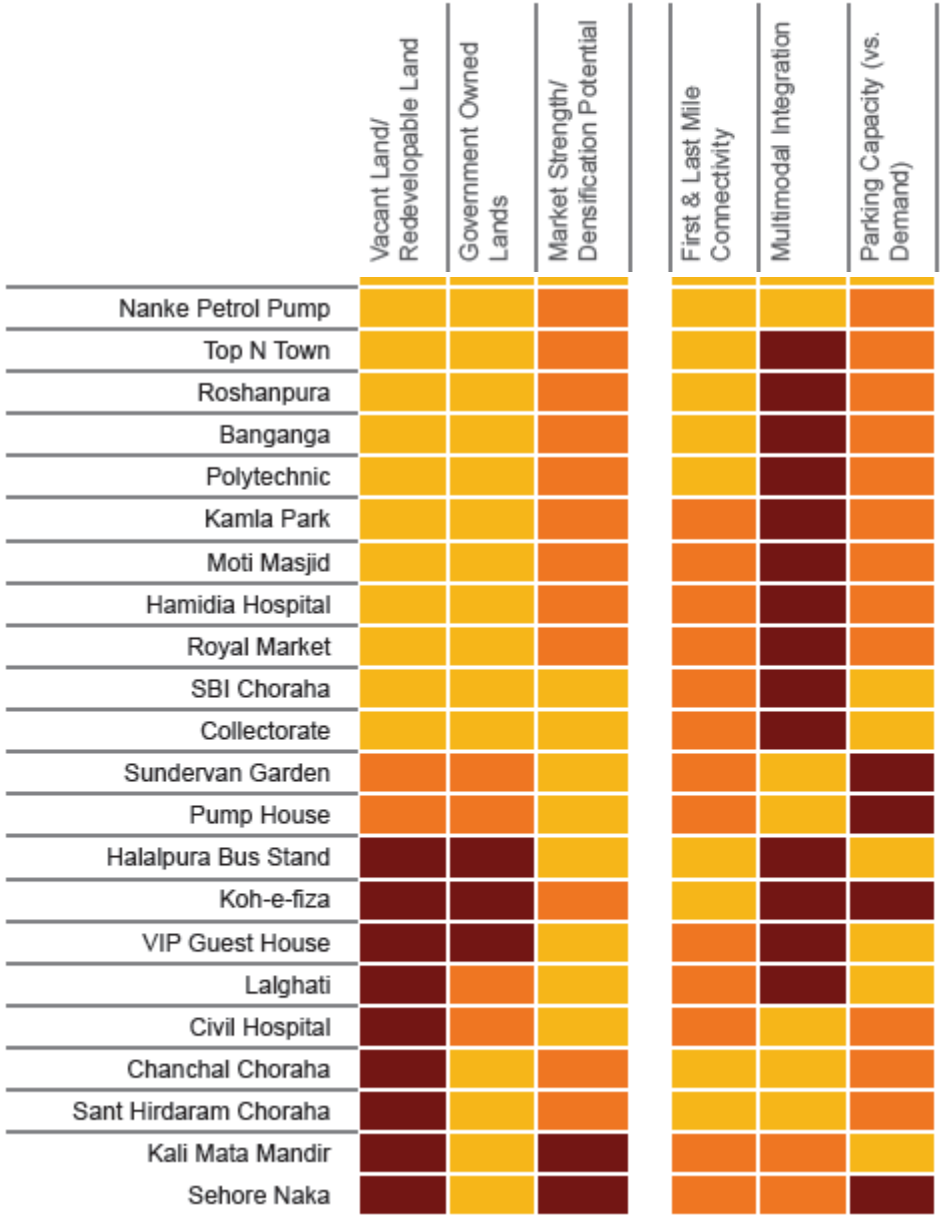


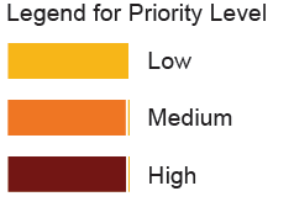


RoW: 60m

5. Priority Station Areas- BRT







5. Priority Station Areas- BRT

Development Potential

- Vacant Land Availability
- Government owned lands
- Market Strength
- Infrastructure Carrying Capacity

Improved Station Accessibility

- First and Last Mile Connectivity
- Multimodal Integration
- Walkability to Station
- Parking

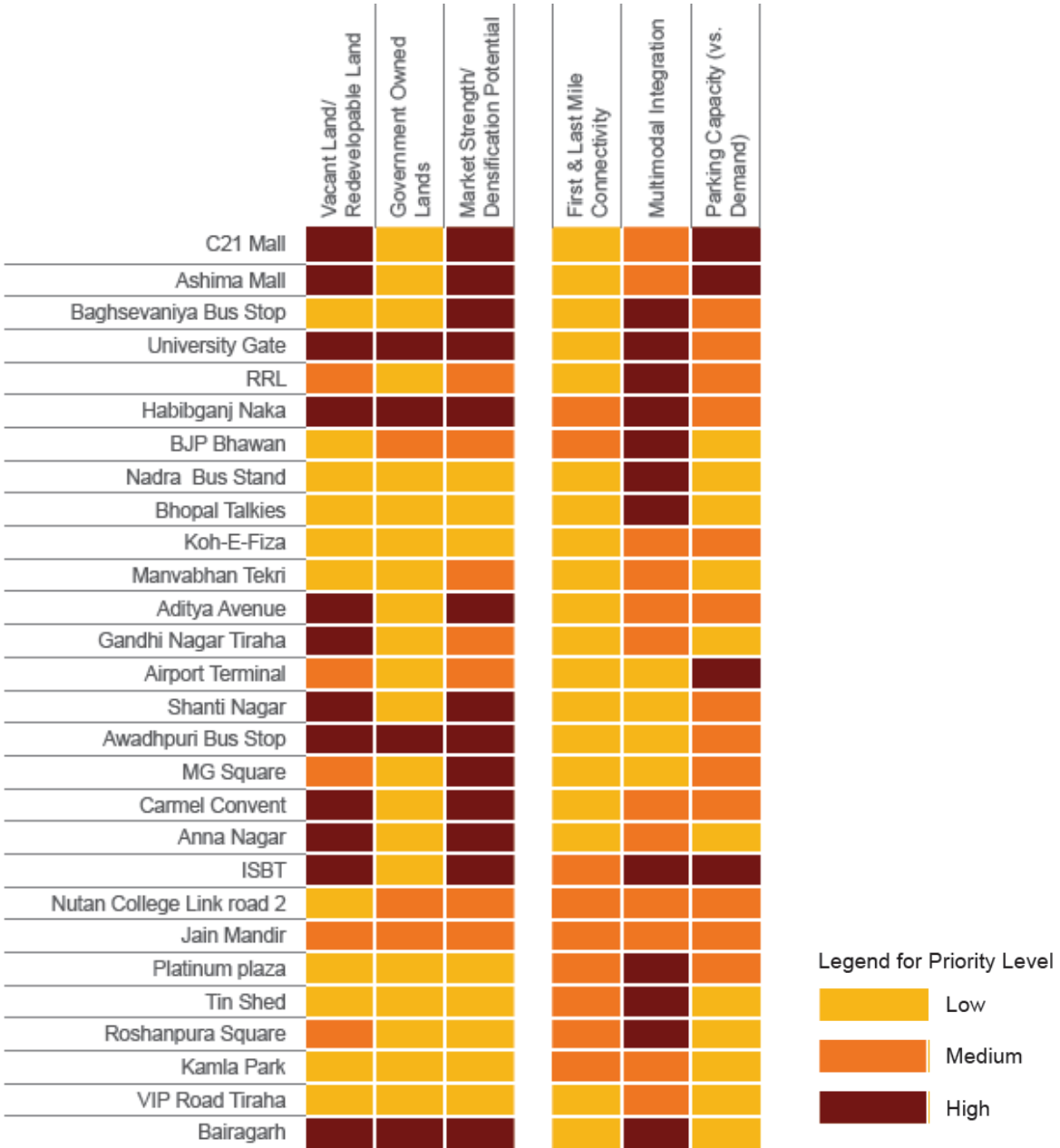
Balanced Employment + Population Distribution

- Identify Origin & Destination Station
- Land Use Mix

Timing:

- Long Term TOD Opportunity
- Short-Term TOD Priority
- Emerging TOD Market
- Inactive TOD Market

5. Priority Station Areas- Metro



Development Opportunities

- Habibganj Station
- ISBT

Accessibility

Destination areas that have high footfall of pedestrians:

- Habibganj Naka
- University Gate
- Nanke Petrol Pump
- Top N Down
- Roshanpura
- Nadra Bus Stand
- Bhopal Talkies

Financing Models

1. **Land Banking- Urban Infill**
2. **Land Pooling- TP Schemes (Greenfield)**
3. **Premium FARs in exchange of providing:**
    - Public amenities
    - Public open space
    - Achieving IGBC or Green Building certification
    - Affordable housing units
    - Public access for creating small block sizes
4. **Transit Agency: Rail + Property**
    - Land Value Capture
    - Joint Development
5. Align with **Smart City Project**/ funding & other central government programs

Implementation Strategy

- **Formulation of Task Force** to ensure continuity in TOD planning process
- Prepare **TOD policy and relevant bye-laws**
- Establish a **TOD Overlay District** as a Special Area in **Development Plan** under preparation
- **Notification of Rules & Regulations** to establish statutory relevance for TOD Principles.
- Improve **citywide Public Transport & NMT facilities** along with route rationalization for bus routes and feeder routes.
- Conduct **detailed Station Area Planning** for priority stations.
- Identify **key catalyst projects/ sites** for TOD.

Implementation Strategy- Key Sites

RETAIL PLAZA AT KNOWLEDGE HUB

MULTI MODAL INTEGRATION AT CENTRAL TOD

INTERACTIVE PLAZA AT INNOVATION HUB

MIXED USED AT PERIPHERY

Implementation Strategy- Key Sites

Implementation Framework: Who Implements TOD?

MPUCD
UADD
UMTA
TCPD
BDA
BMC
SPVs: BCLL | METRO | SMART CITY

- Alternative 1: UMTA/ MPUCD includes TOD coordination and planning
- Alternative 2: Revive BDA as the planning and implementation agency with a special TOD cell
- Alternative 3: Form a special SPV for TOD Overlay Zone under BMC?

- Detailed TOD **Planning** at varying scales
- **Project Management**
- **Enforcement & Monitoring**

Implementation- Capacity Building

TRAINING SECTORS	DEPARTMENT/ AUTHORITY
Comprehensive Planning for Urban Transport	
Formulating an Urban Transport Policy in MP	UADD
Preparation of CMPs, Scope and Purpose	BMC, BCLL
Setting up an untitled transport authority at regional level	TCPO, UADD ULB and BDA
Visioning and Goal setting for Sustainable Transport	UADD, TCPO, BMC, BDA, BCLL
Preparation of an integrated regional transport plan	BMC, BDA
Integrating Transport plan with statutory master plan	TCPO, UADD, BDA and BMC

Implementation- Capacity Building

TRAINING SECTORS	DEPARTMENT/ AUTHORITY
PUBLIC TRANSPORT AND IPT	
Planning for an appropriate organized Public Transport System	BMC, BCLL
Vehicle selection and procurement	BMC, BCLL
Transport demand surveys for route planning and preparing PT plan	BCLL
Business Model for SPV	BCLL
PPP contracts for bus operation	BCLL
Intelligent Transport Management System for bus services	BCLL
Infrastructure requirements such as depots and terminals for bus systems	BCLL
Planning and Designing a BRT including conducting feasability study	BMC, BCLL
INTEGRATING ORGANISED PT WITH OTHER PARA TRANSIT MODES	
Using Advertising on buses and bus stops for revenue collection	BCLL
Organistion and management of para transit	BMC, RTO Collectors Office, BCLL
Introduction to Cycle Sharing systems	BMC, BCLL

Implementation- Capacity Building

TRAINING SECTORS	DEPARTMENT/ AUTHORITY
STREET DESIGN WITH A FOCUS ON PEDESTRIAN AND CYCLE SAFETY	
Principles and elements of complete street design	BMC, BDA
Conducting Primary surveys such as street audits and pedestrian counts	BMC, BDA
Standards and guidelines including IRC codes for footpath and cycle track construction	BMC, BDA
Intersection Design for pedestrian and cyclist safety	BMC, BDA

Bhopal Key Inputs to Guidance Document

Learnings	*Input for Guidance Document*
• Transit planning needs to integrate TODs from the DPR stage	The Guidance Document must recognize a city's needs and be **applicable at all scales**
• Data availability challenges could potentially derail TOD process	The Step-by-Step TOD Process must be **flexible to accommodate data challenges**
• Multiple stakeholders within a TOD requires facilitated information exchange and agreements	TOD Task Force must be **multi-disciplinary and multi-agency**
• Implementation roles can affect project delivery	Implementation roles are sensitive to local political context
• Accessibility component in a TOD more critical than densification	Accessibility can be addressed at smaller scales. **Pilot projects should be encouraged**

Thank You