# Sustainable Mobility Initiatives in Hyderabad Metropolitan Area

**Prof. CSRK Prasad**

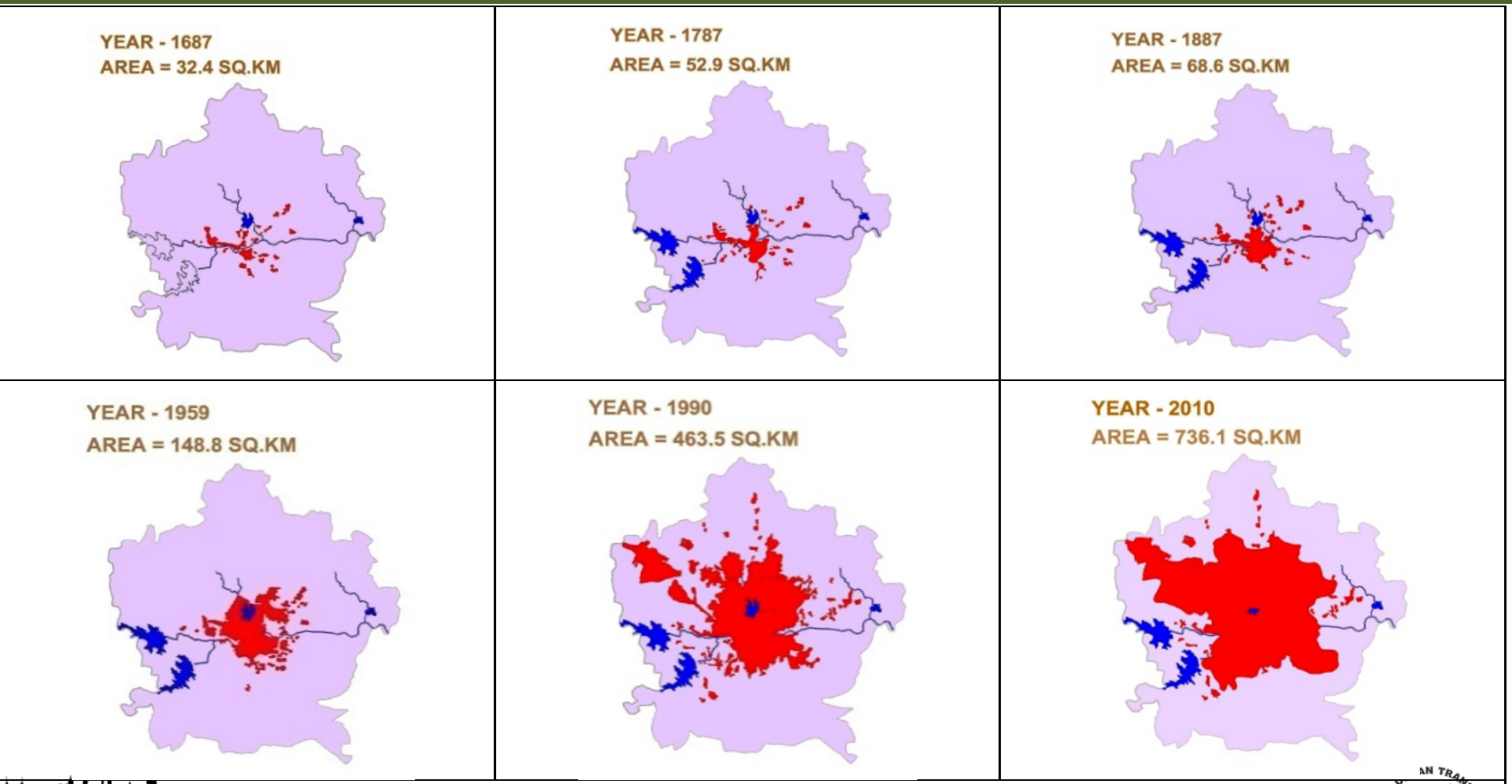
**NIT Warangal**

# Flow of Presentation

- HMA – Present Travel Scenario
- Travel Demand Forecast
- Mass Transportation Strategies
- TOD / TOG Centres
- ITS  Initiatives

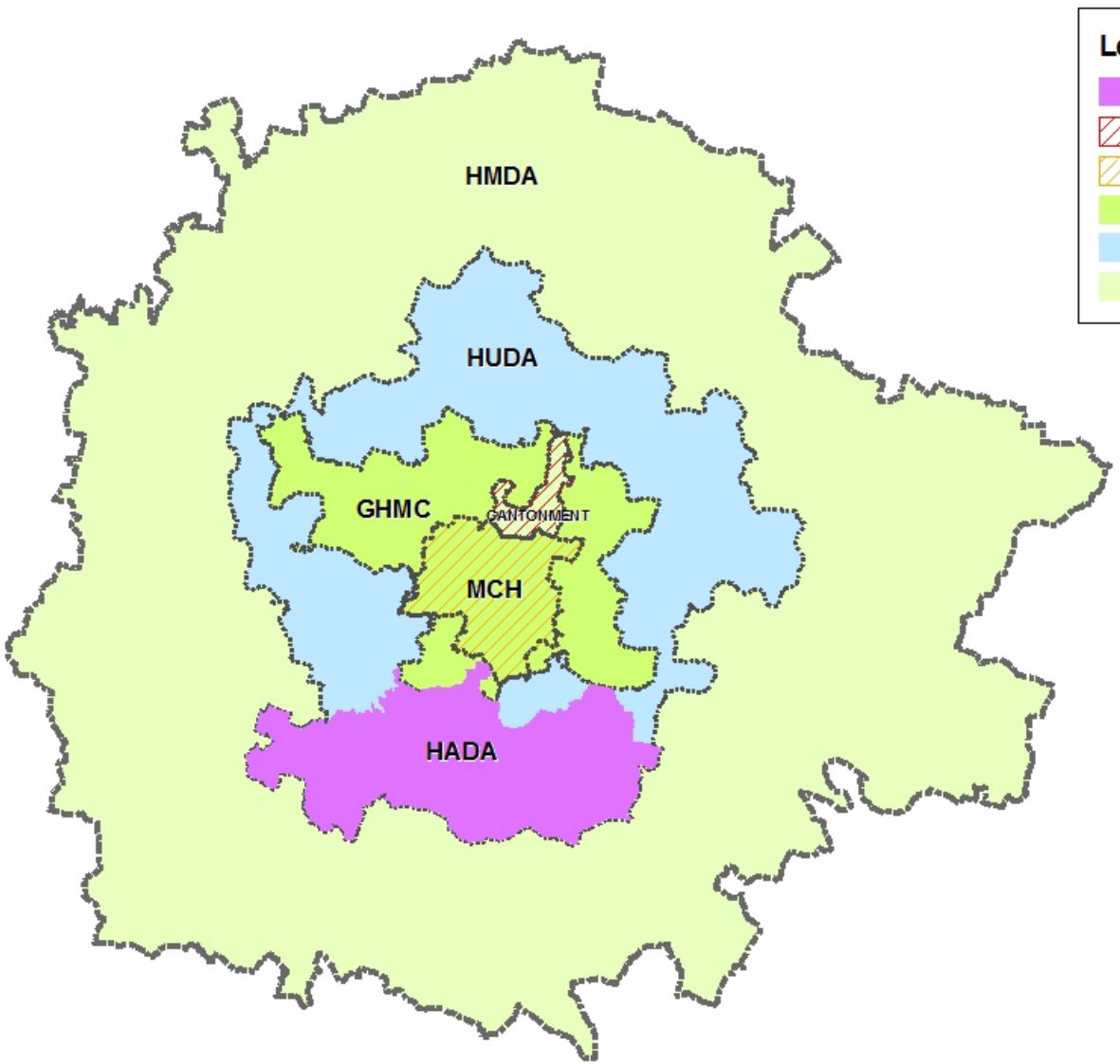
# HMA – PRESENT TRAVEL SCENARIO

# Hyderabad Urban Sprawl



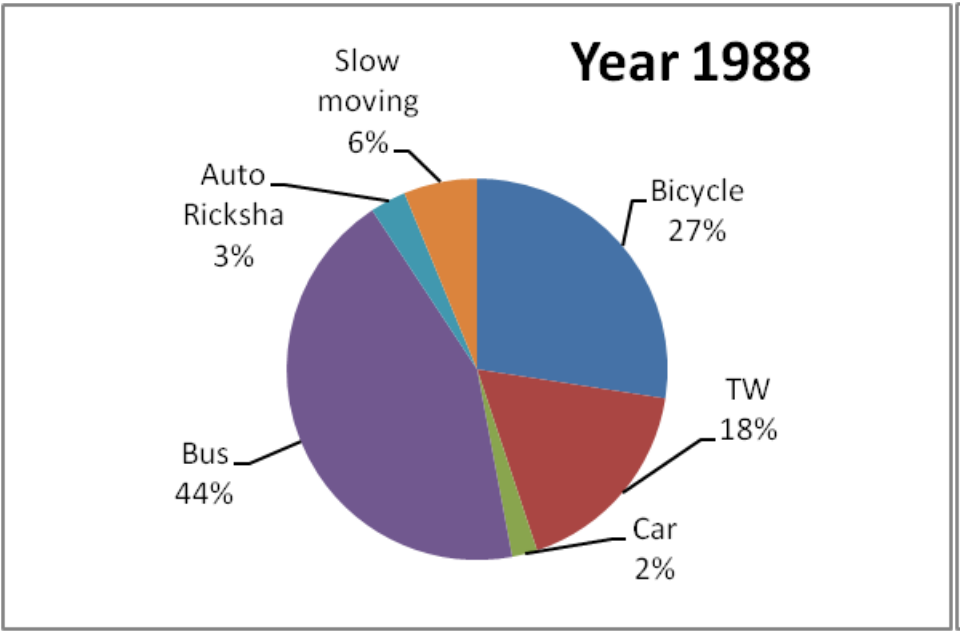

**Hyderabad Urban Agglomeration Area from Year 1687 to Year 2010**

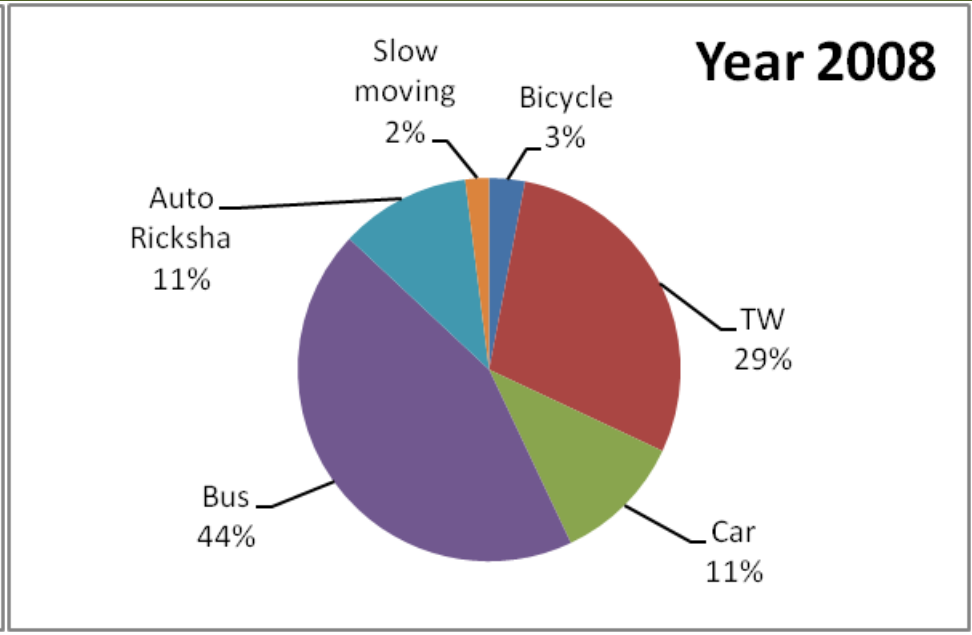
# HMA




| S No | Components of HMDA | Approximate Area (sq.km) |
|---|---|---|
| 1 | GHMC (including MCH) | 625.00 |
| 2 | Cantonment | 40.17 |
| 3 | HADA | 458.96 |
| 4 | Rest of HUDA area * | 992.00 |
| 5 | Extended Area of HMDA | 4917.00 |
| | **Total** | **7146.13** |

# Modal Shares



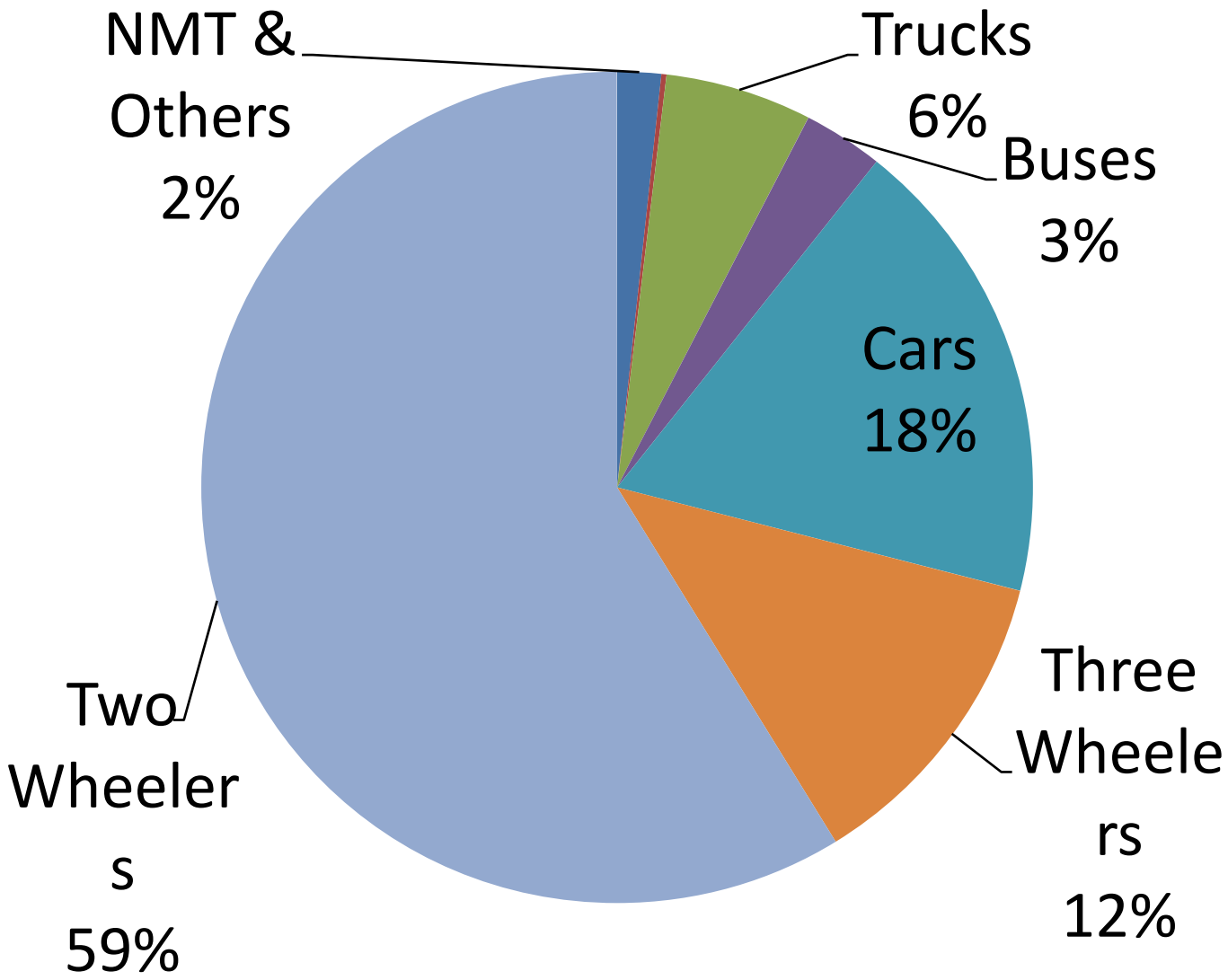

**Walking is significant (30%)**

**NMTs reduced from 33 to 5%**

**Private & IPT increased from 23 to 51%**

**Public Transport Share remained at 44%**

# HMA – Traffic Composition 2011



# TRAVEL DEMAND FORECAST

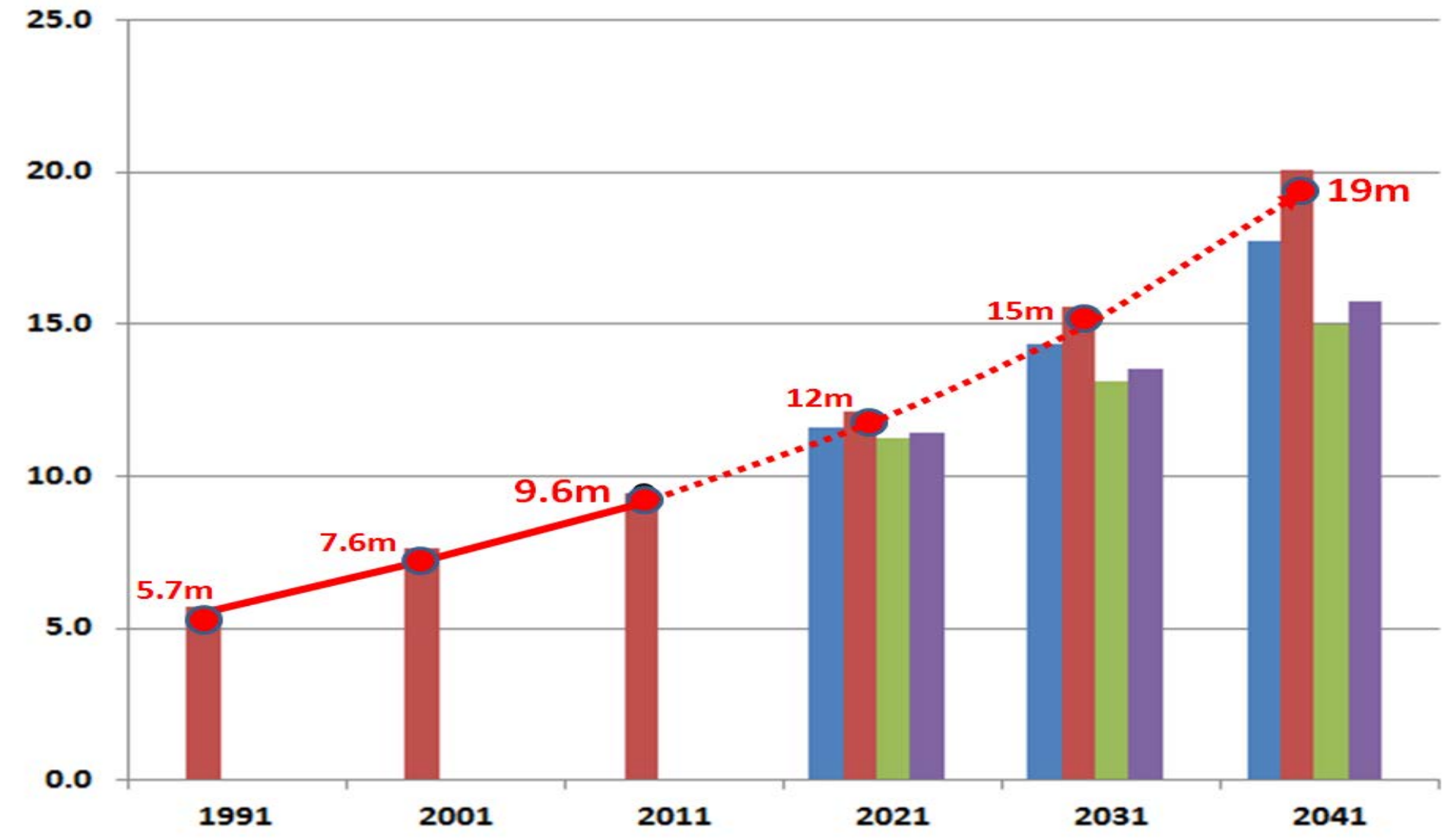
# Hyderabad Metropolitan Area (HMA) Studies Carried

- Metropolitan Development Plan – 2031
- Hyderabad Growth Corridor Limited (HGCL) – Outer Ring Road (ORR)
- Comprehensive Transportation Study for HMA
- ITS Master Plan for HMA
- Highway Traffic Management System (HTMS) for ORR
- Contextual Refinement and Revalidation of CTS for HMA

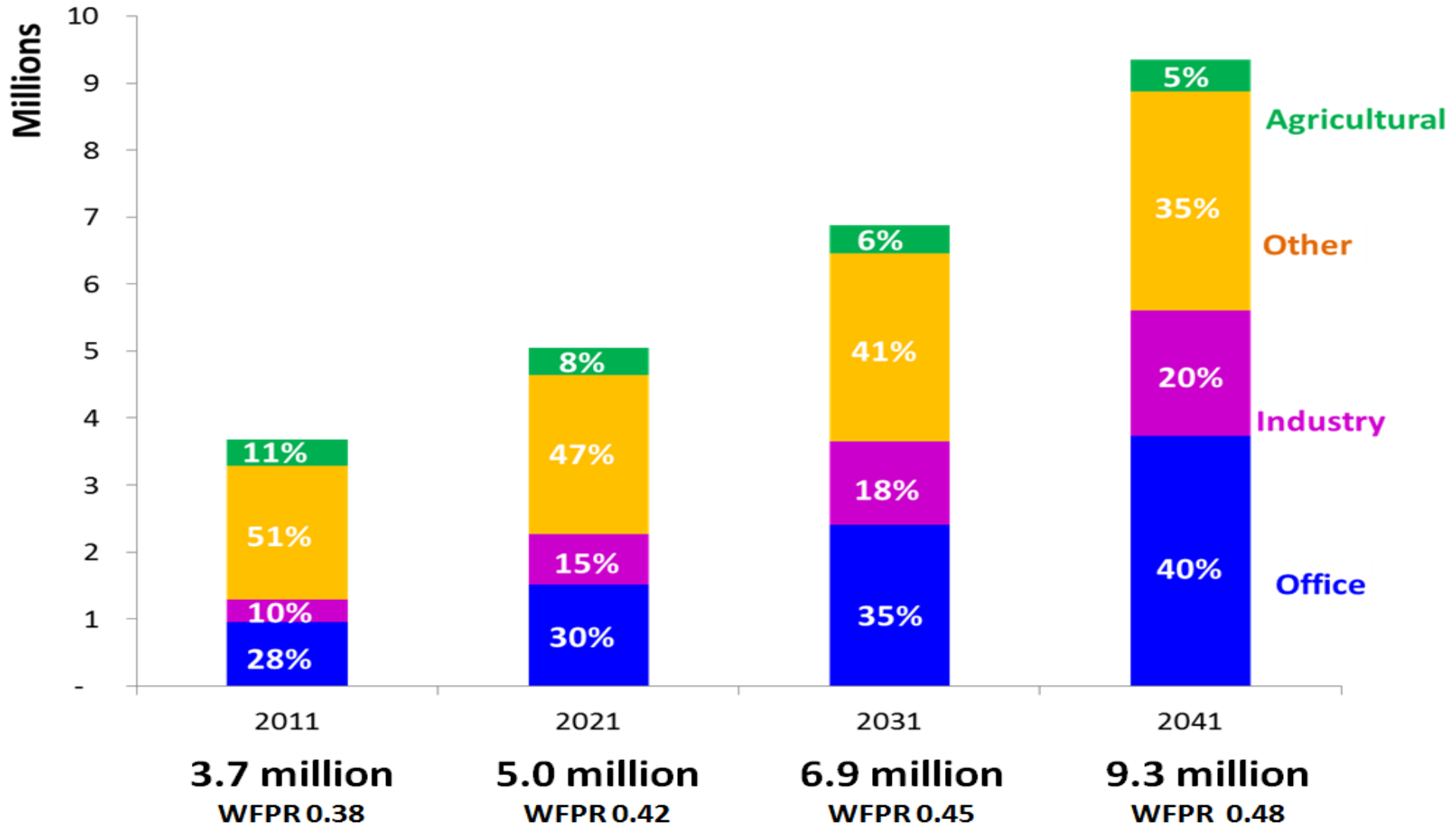
# National Urban Transport Policy: Mobility (2006, 2014)

- Integrated Land Use and Transport Planning
- Comprehensive Mobility Planning (CMP)
- Transit Oriented Development (TOD)
- Multi-Modal Integrated MRT Network
- Intelligent Transport System (ITS)
- Non-Motorised Transport (NMT)
- Institutional Framework

# HMA Population Forecast



# HMA Employment Forecast

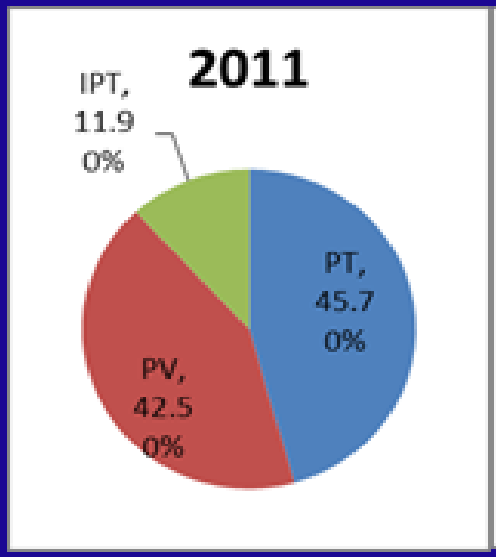


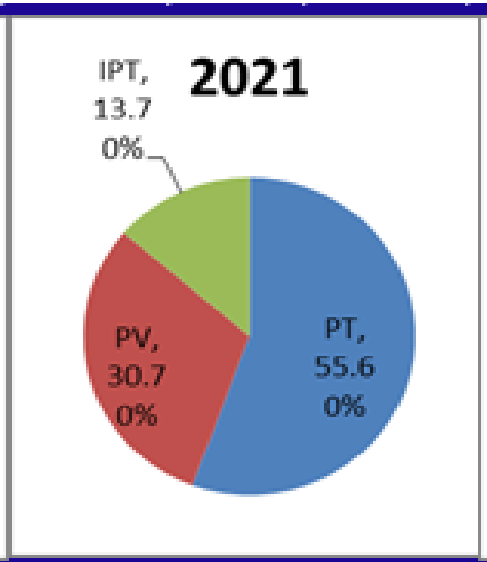
# Travel Demand

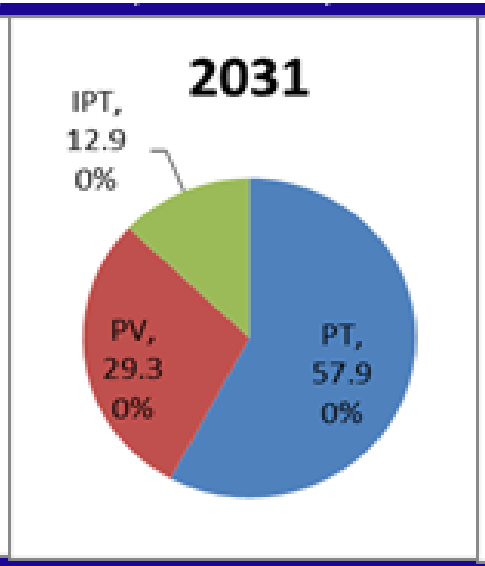
| Modes | 2011 | | | | 2041 | | | |
|---|---|---|---|---|---|---|---|---|
| | Pass/day (millions) | % | Pass-km /day (million) | % | Pass/day (millions) | % | Pass-km /day (millions) | % |
| PV | 3.9 | 43.3 | 46.6 | 39.5 | 6.6 | 29.2 | 93.3 | 22.4 |
| IPT | 1.2 | 13.9 | 13.1 | 11.1 | 2.6 | 11.5 | 24.1 | 5.8 |
| PT | 3.8 | 42.8 | 58.4 | 49.4 | 13.3 | 59.3 | 298.5 | 71.8 |
| Total | 8.9 | 100 | 118.2 | 100 | 22.5 | 100 | 415.8 | 100 |

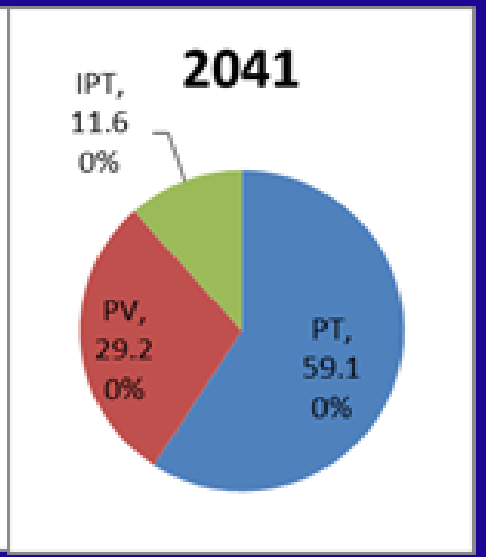
# Travel Demand by Mode (%)

| Year | MMTS | Bus | Metro | Car | 2W | Auto | Taxi | Total | Person Trips (millions/day) |
|---|---|---|---|---|---|---|---|---|---|
| 2011 | 2.9% | 39.9% | | 4.9% | 38.5% | 9.2% | 4.8% | 100% | **8.9** |
| 2021 | 2.5% | 26.6% | 26.5% | 2.5% | 28.2% | 8.4% | 5.3% | 100% | **12.1** |
| 2031 | 2.6% | 24.2% | 31.1% | 3.2% | 26.1% | 7.7% | 5.2% | 100% | **16.5** |
| 2041 | 2.6% | 21.7% | 34.8% | 3.9% | 25.3% | 6.8% | 4.8% | 100% | **22.5** |



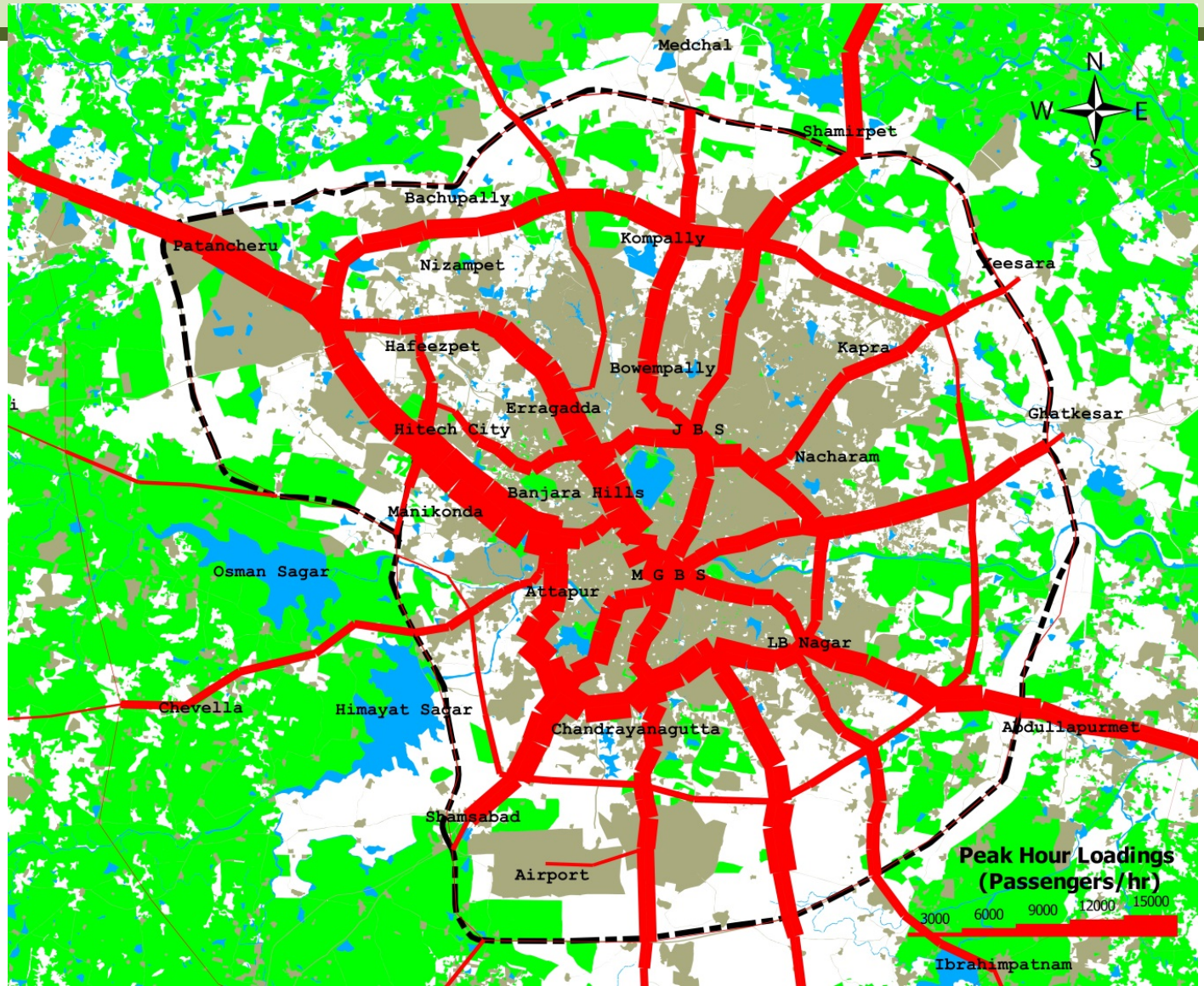



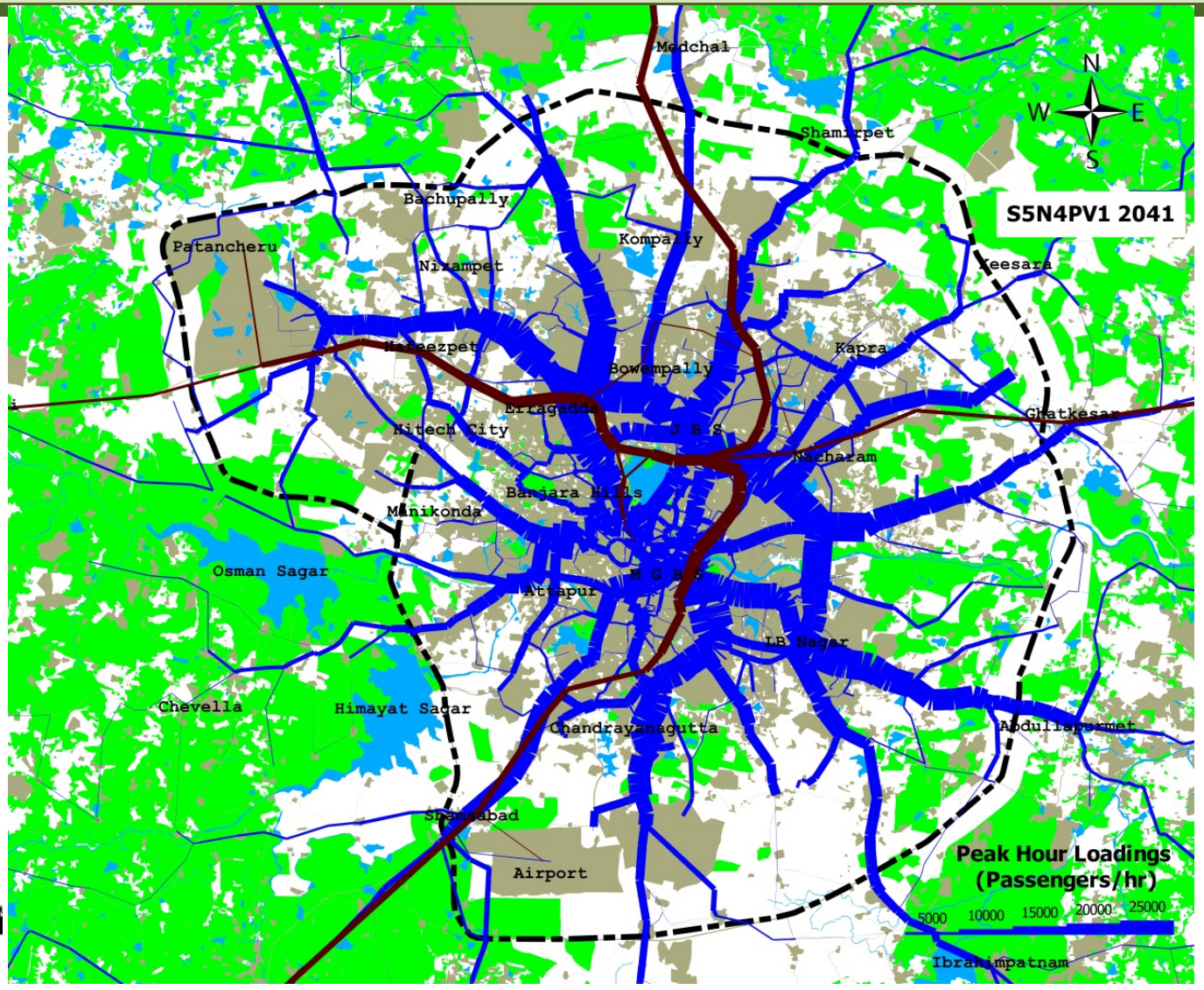



# MASS TRANSPORTATION STRATEGIES

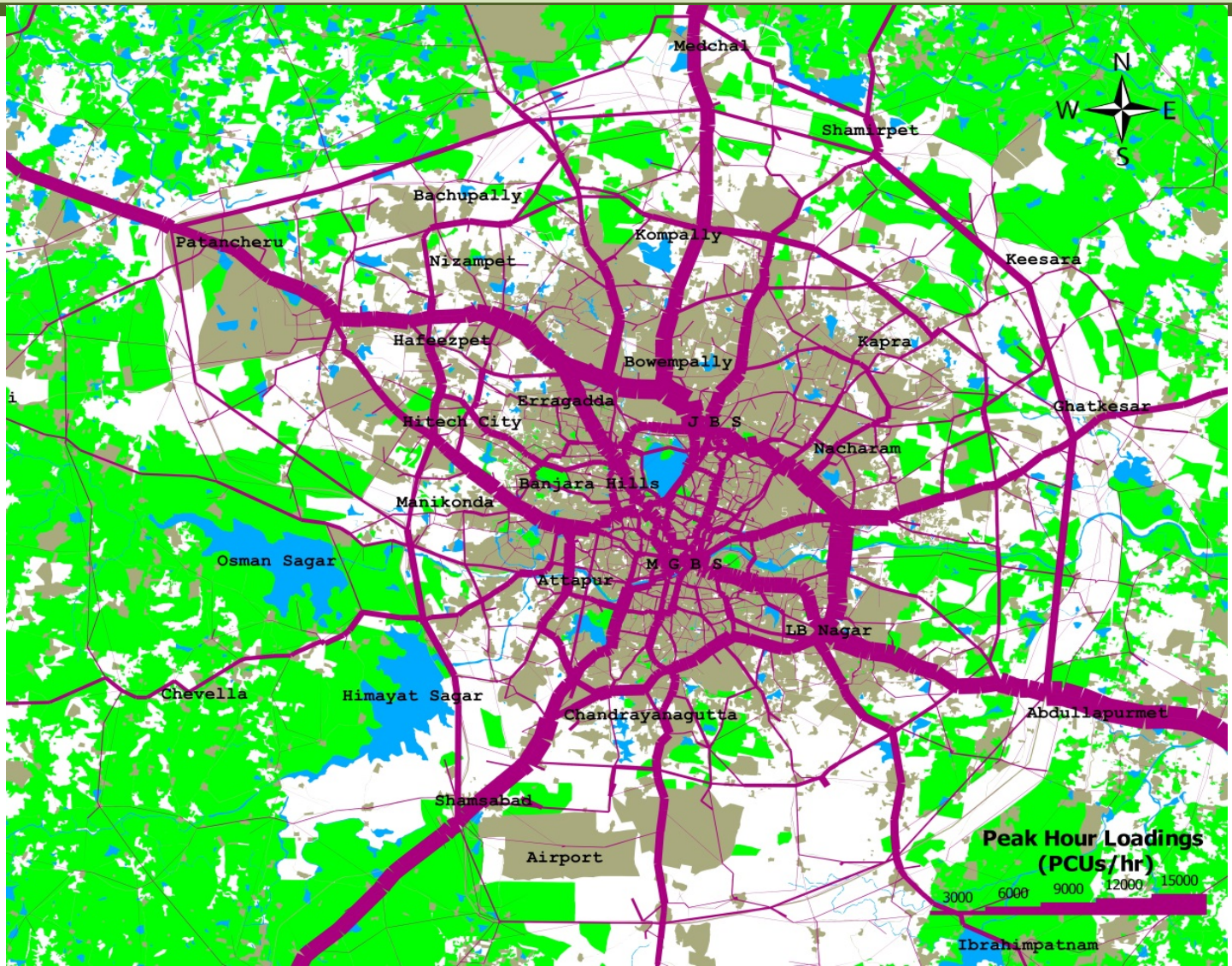
# Peak Hour Passenger Flows on Mass Transit System by 2041



# Peak Hour Passenger Flows on Bus and MMTS System by 2041



# Peak Hour Traffic Flows on Roads by 2041



# Desirable PT System by 2041 (To Achieve 60% PT Share)

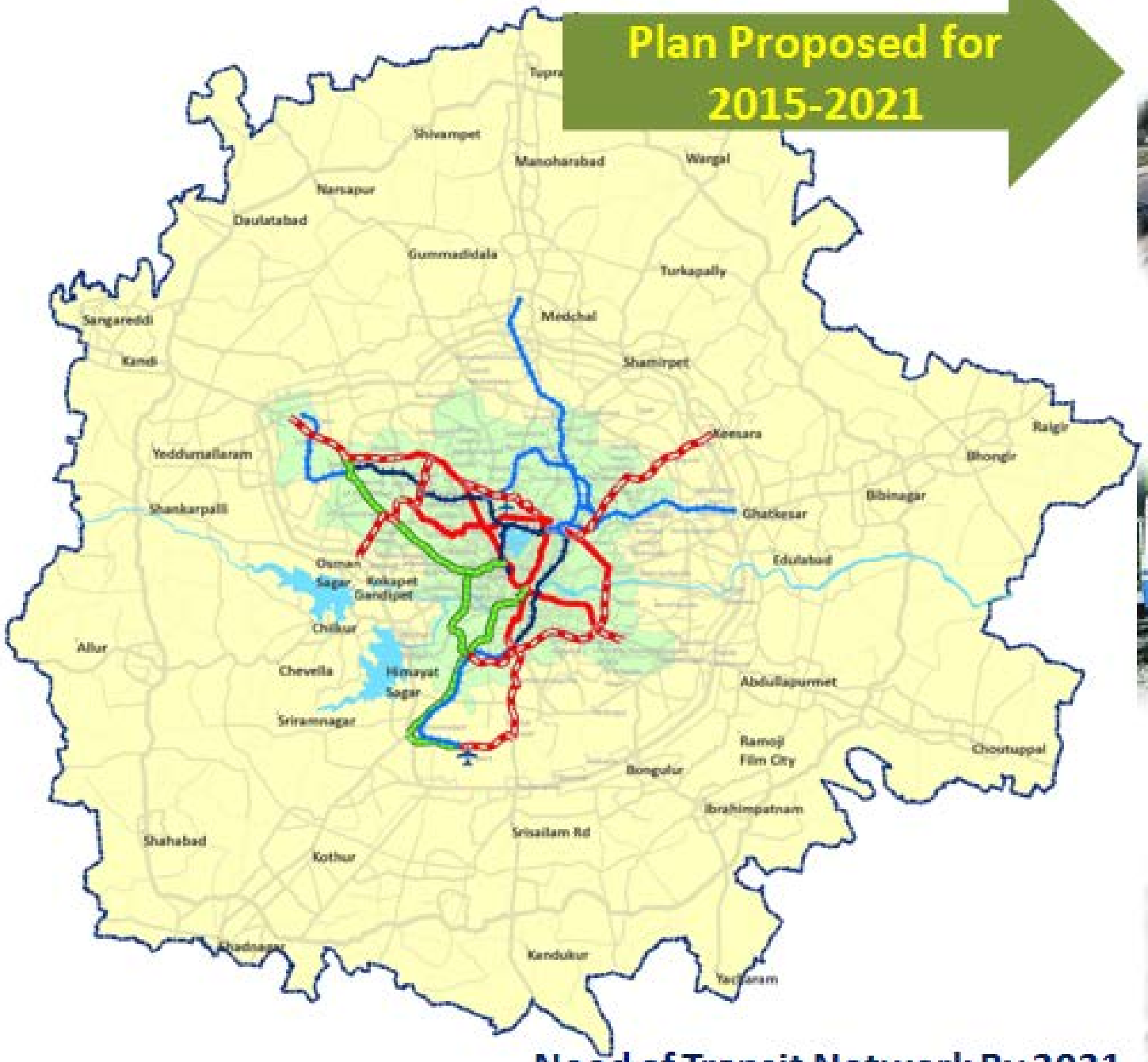
- **Metro Network**
  - Phase I : 72 km (72)
  - 2014-21 : 26 km (98)
  - 2022-31 : 175 km (273)
  - 2032-41 : 48 km (321)
  - **Total : 321 km**

- **MMTS Network**
  - Existing : 46 km (46)
  - Phase II (2021) : 102 km (148)
  - Phase III (2031) : 116 km (264)
  - Phase IV (2041) : 164 km (428)
  - **Total : 428 km**

Existing Suburban 54 km

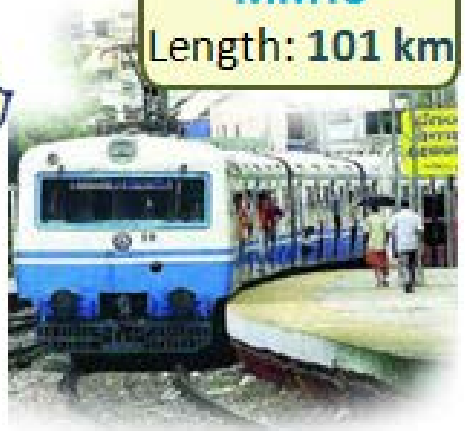
- **BRTS/ LRT Network**
  - 2014-21 : 67 km (67)
  - 2022-31 : 53 km (120)
  - 2032-41 : 273 km (393)
  - **Total : 393 km**

# Plan Proposed for 2015-2021




**BRTS**
Length: **58 km**

**MMTS**
Length: **101 km**



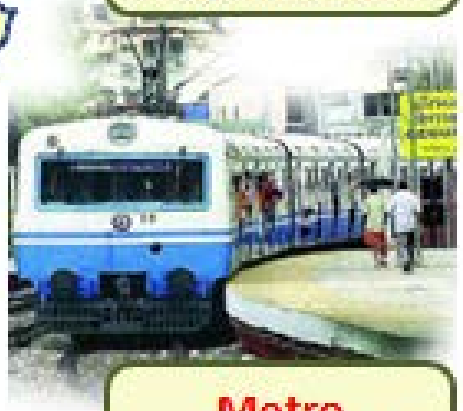
**Metro**
Length: **91 km**

## Need of Transit Network By 2021

# Plan Proposed for 2021-2031

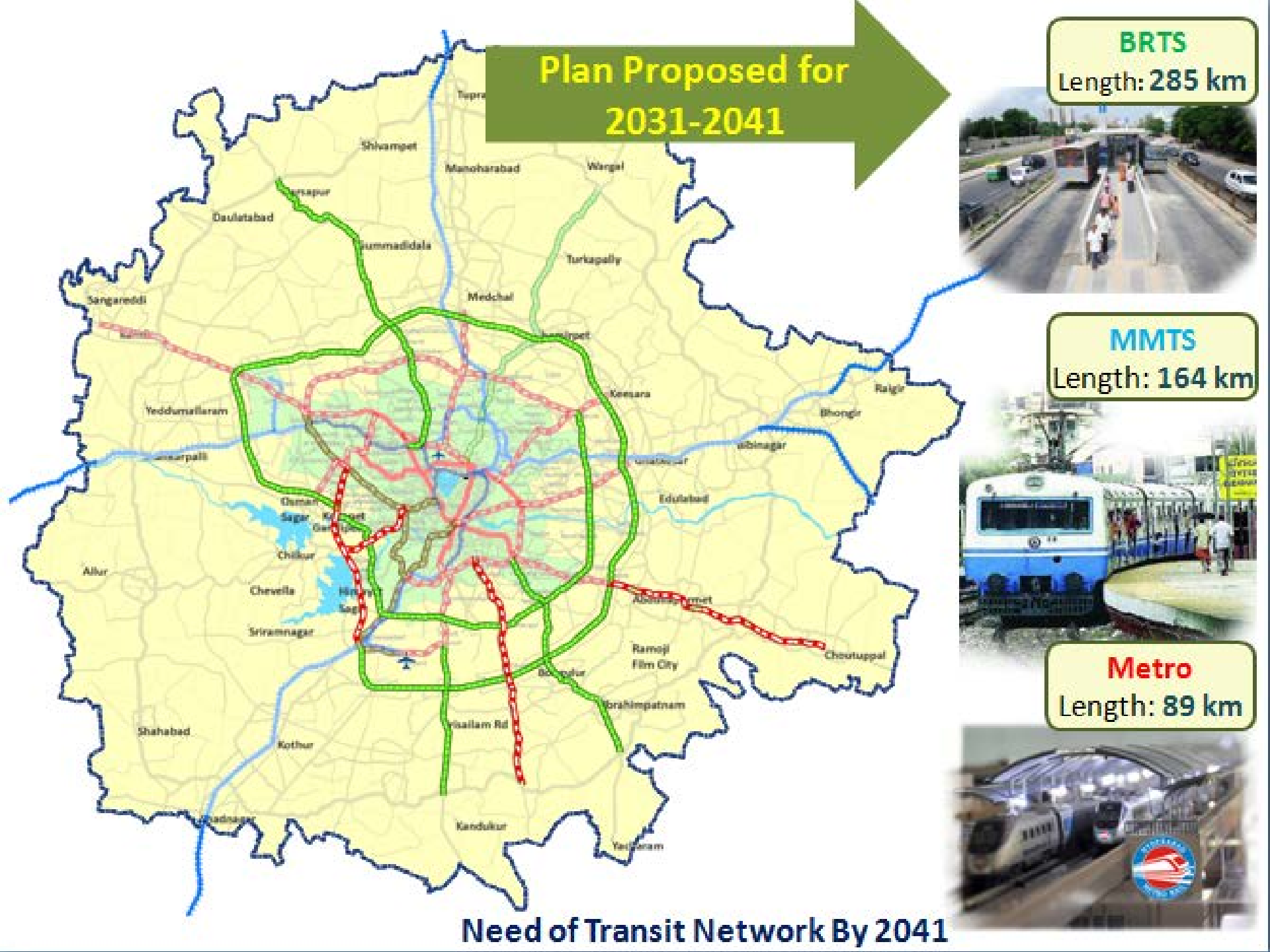

**BRTS**
Length: 95 km

**MMTS**
Length: 116 km

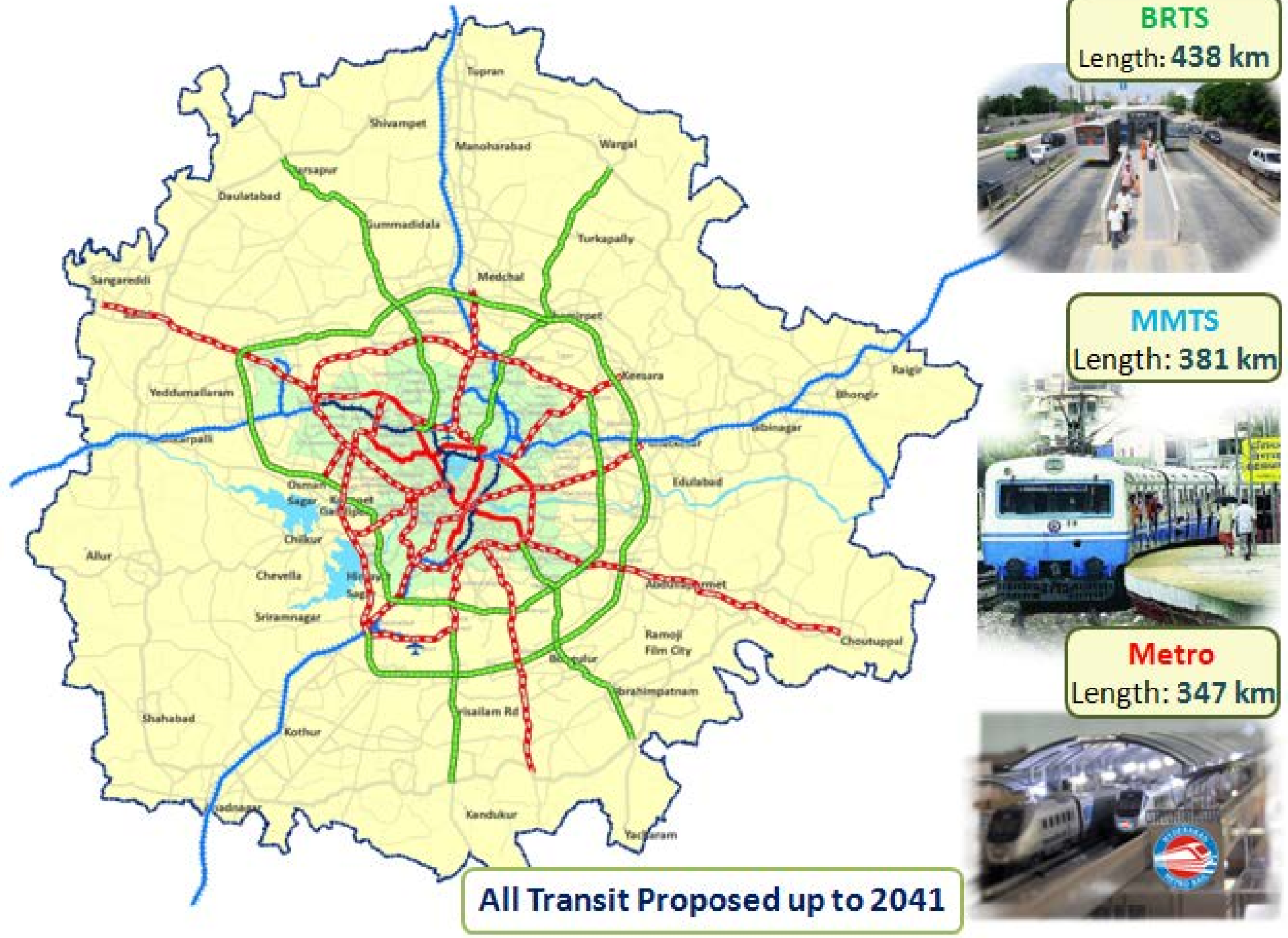


**Metro**
Length: 167 km

**Need of Transit Network By 2031**




Need of Transit Network By 2041




**BRTS**
Length: **438 km**



**MMTS**
Length: **381 km**



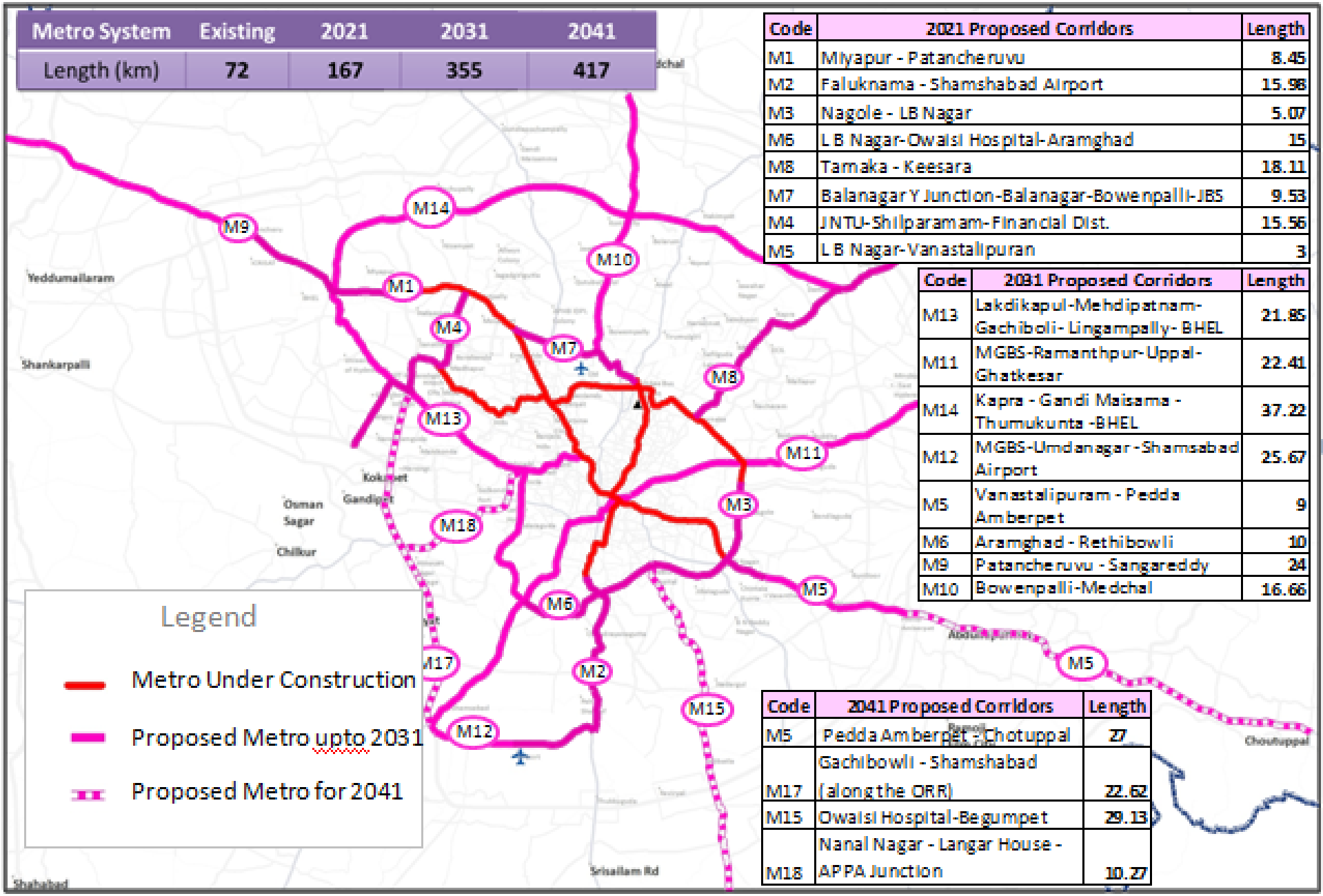
**Metro**
Length: **347 km**



**All Transit Proposed up to 2041**

# Proposed Metro System

| Metro System | Existing | 2021 | 2031 | 2041 |
|---|---|---|---|---|
| Length (km) | 72 | 167 | 355 | 417 |




| Code | 2021 Proposed Corridors | Length |
|---|---|---|
| M1 | Miyapur - Patancheruvu | 8.45 |
| M2 | Faluknama - Shamshabad Airport | 15.98 |
| M3 | Nagole - LB Nagar | 5.07 |
| M6 | L B Nagar-Owaisi Hospital-Aramghad | 15 |
| M8 | Tarnaka - Keesara | 18.11 |
| M7 | Balanagar Y Junction-Balanagar-Bowenpalli-JBS | 9.53 |
| M4 | JNTU-Shilparamam-Financial Dist. | 15.56 |
| M5 | L B Nagar-Vanastalipuran | 3 |

| Code | 2031 Proposed Corridors | Length |
|---|---|---|
| M13 | Lakdikapul-Mehdipatnam-Gachiboli- Lingampally- BHEL | 21.85 |
| M11 | MGBS-Ramanthpur-Uppal-Ghatkesar | 22.41 |
| M14 | Kapra - Gandi Maisama - Thumukunta -BHEL | 37.22 |
| M12 | MGBS-Umdanagar - Shamsabad Airport | 25.67 |
| M5 | Vanastalipuram - Pedda Amberpet | 9 |
| M6 | Aramghad - Rethibowli | 10 |
| M9 | Patancheruvu - Sangareddy | 24 |
| M10 | Bowenpalli-Medchal | 16.66 |

| Code | 2041 Proposed Corridors | Length |
|---|---|---|
| M5 | Pedda Amberpet - Chotuppal | 27 |
| M17 | Gachibowli - Shamshabad (along the ORR) | 22.62 |
| M15 | Owaisi Hospital-Begumpet | 29.13 |
| M18 | Nanal Nagar - Langar House - APPA Junction | 10.27 |

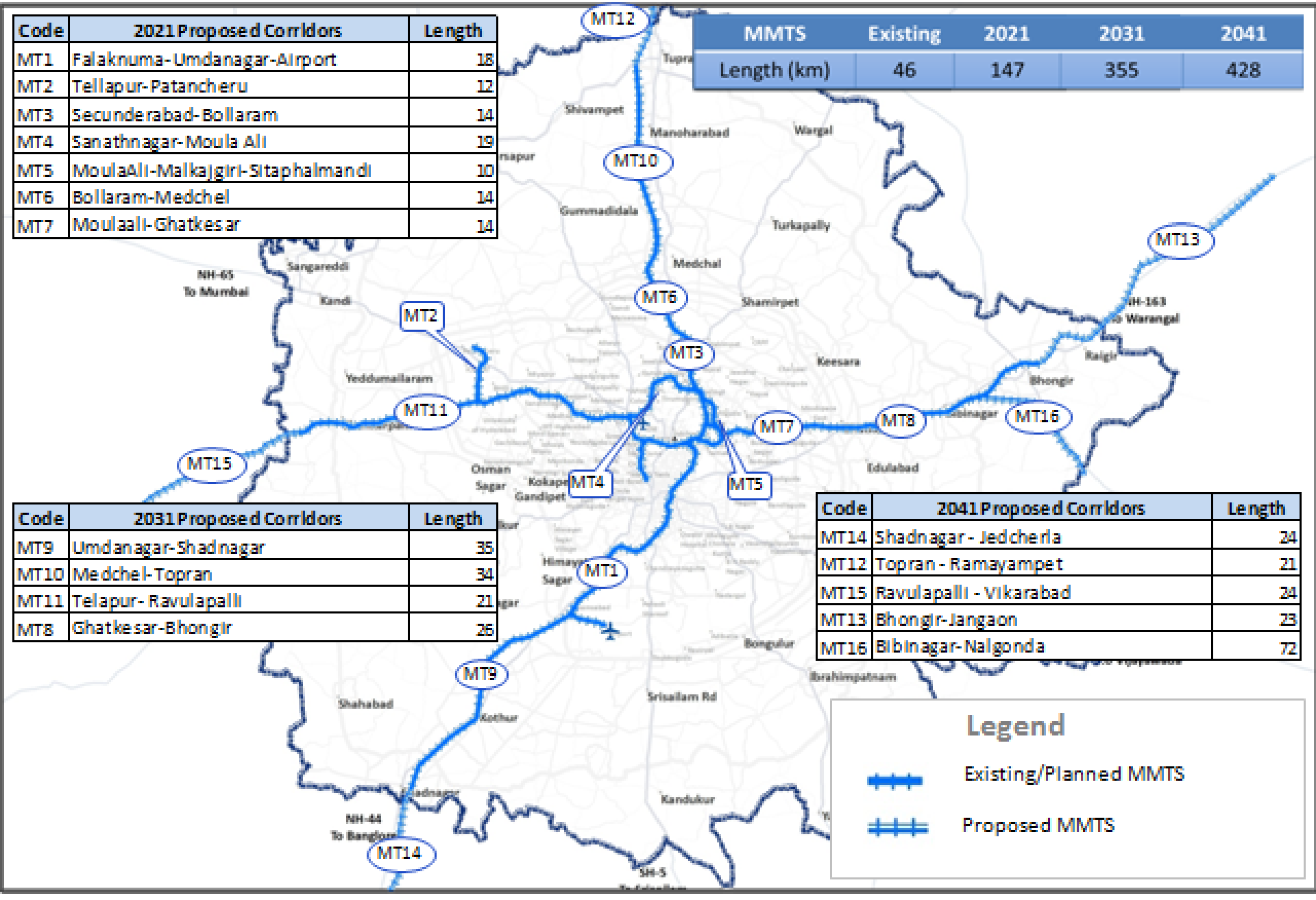
# Proposed MMTS Corridors

| Code | 2021 Proposed Corridors | Length |
|---|---|---|
| MT1 | Falaknuma-Umdanagar-Airport | 18 |
| MT2 | Tellapur-Patancheru | 12 |
| MT3 | Secunderabad-Bollaram | 14 |
| MT4 | Sanathnagar-Moula Ali | 19 |
| MT5 | MoulaAli-Malkajgiri-Sitaphalmandi | 10 |
| MT6 | Bollaram-Medchel | 14 |
| MT7 | Moulaali-Ghatkesar | 14 |

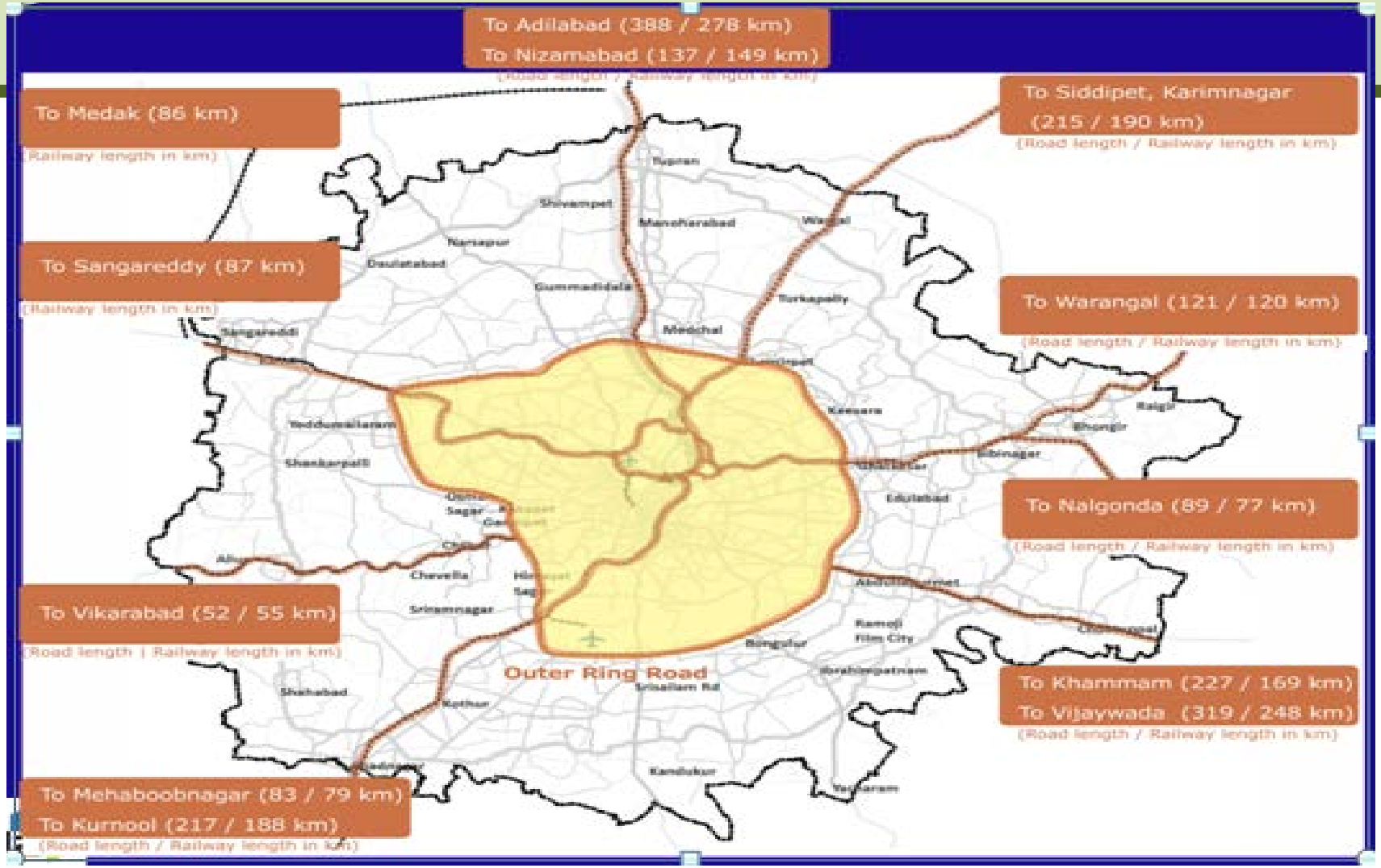
| MMTS | Existing | 2021 | 2031 | 2041 |
|---|---|---|---|---|
| Length (km) | 46 | 147 | 355 | 428 |

| Code | 2031 Proposed Corridors | Length |
|---|---|---|
| MT9 | Umdanagar-Shadnagar | 35 |
| MT10 | Medchel-Topran | 34 |
| MT11 | Telapur- Ravulapalli | 21 |
| MT8 | Ghatkesar-Bhongir | 26 |

| Code | 2041 Proposed Corridors | Length |
|---|---|---|
| MT14 | Shadnagar - Jedcherla | 24 |
| MT12 | Topran - Ramayampet | 21 |
| MT15 | Ravulapalli - Vikarabad | 24 |
| MT13 | Bhongir-Jangaon | 23 |
| MT16 | Bibinagar-Nalgonda | 72 |

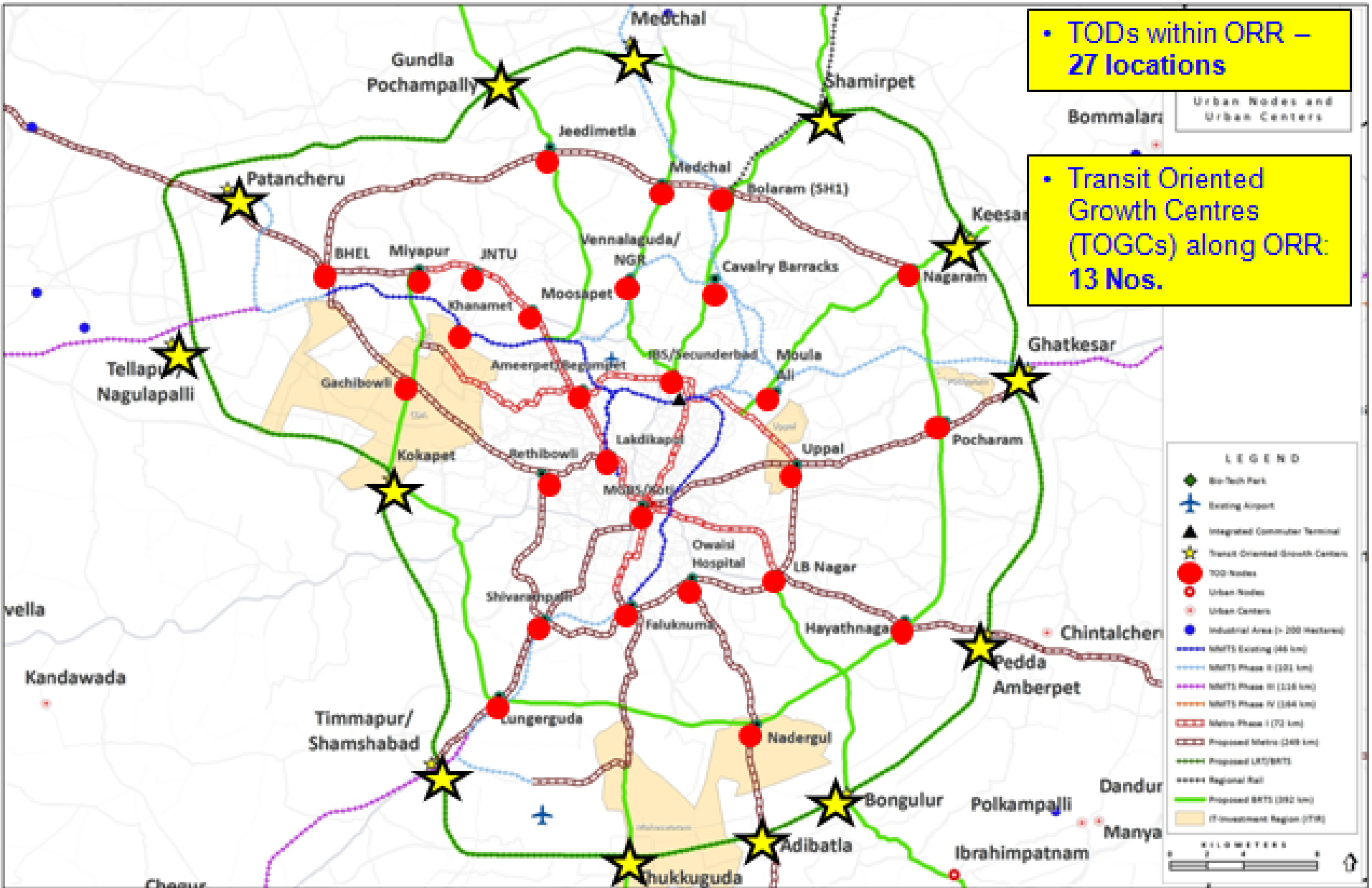


# Regional Commuter Rail System

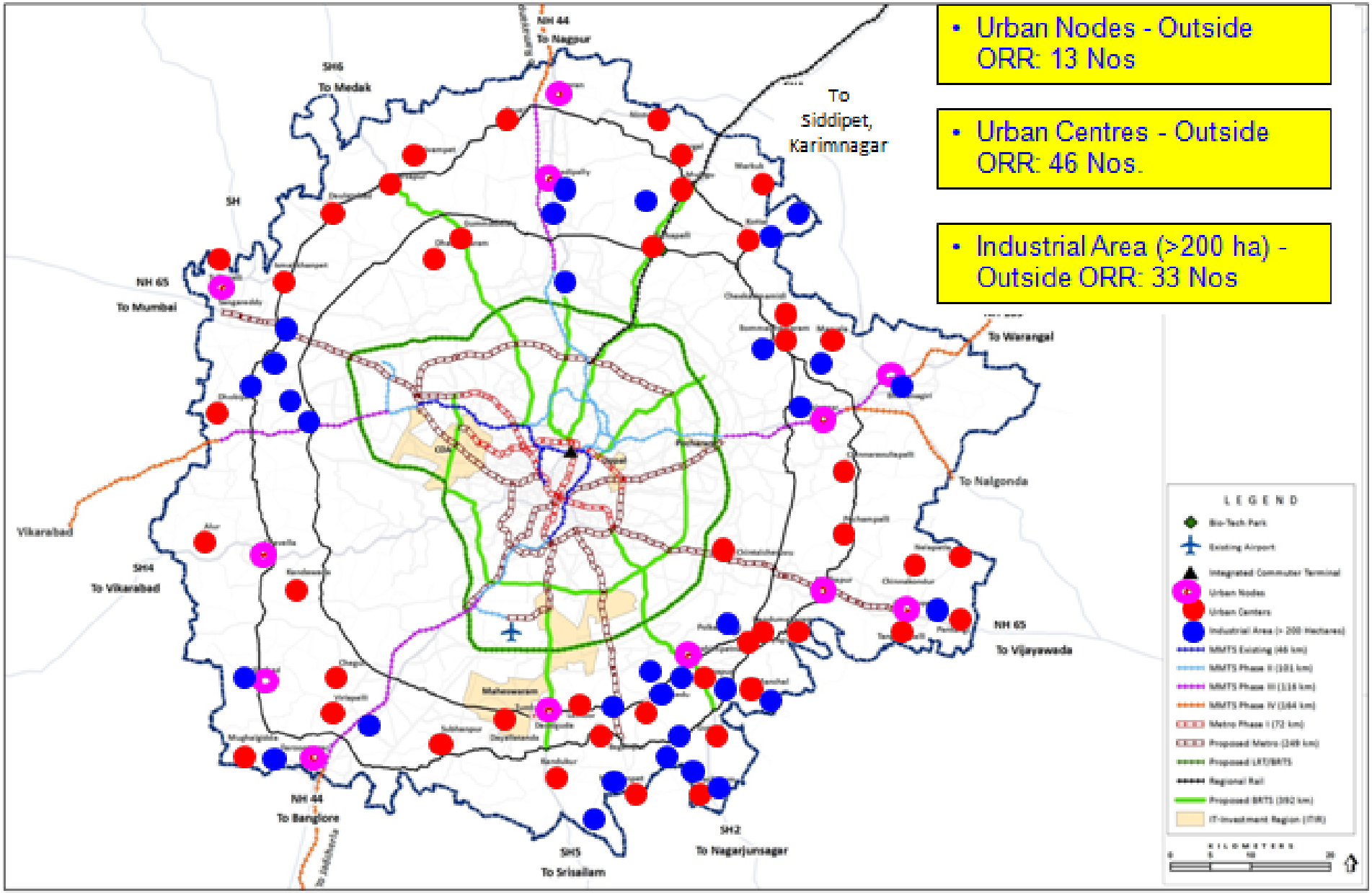


# TOD / TOG CENTRES

# TOD & TOG Centres



# Outside ORR – Urban Nodes, Urban Centers and Industrial Areas

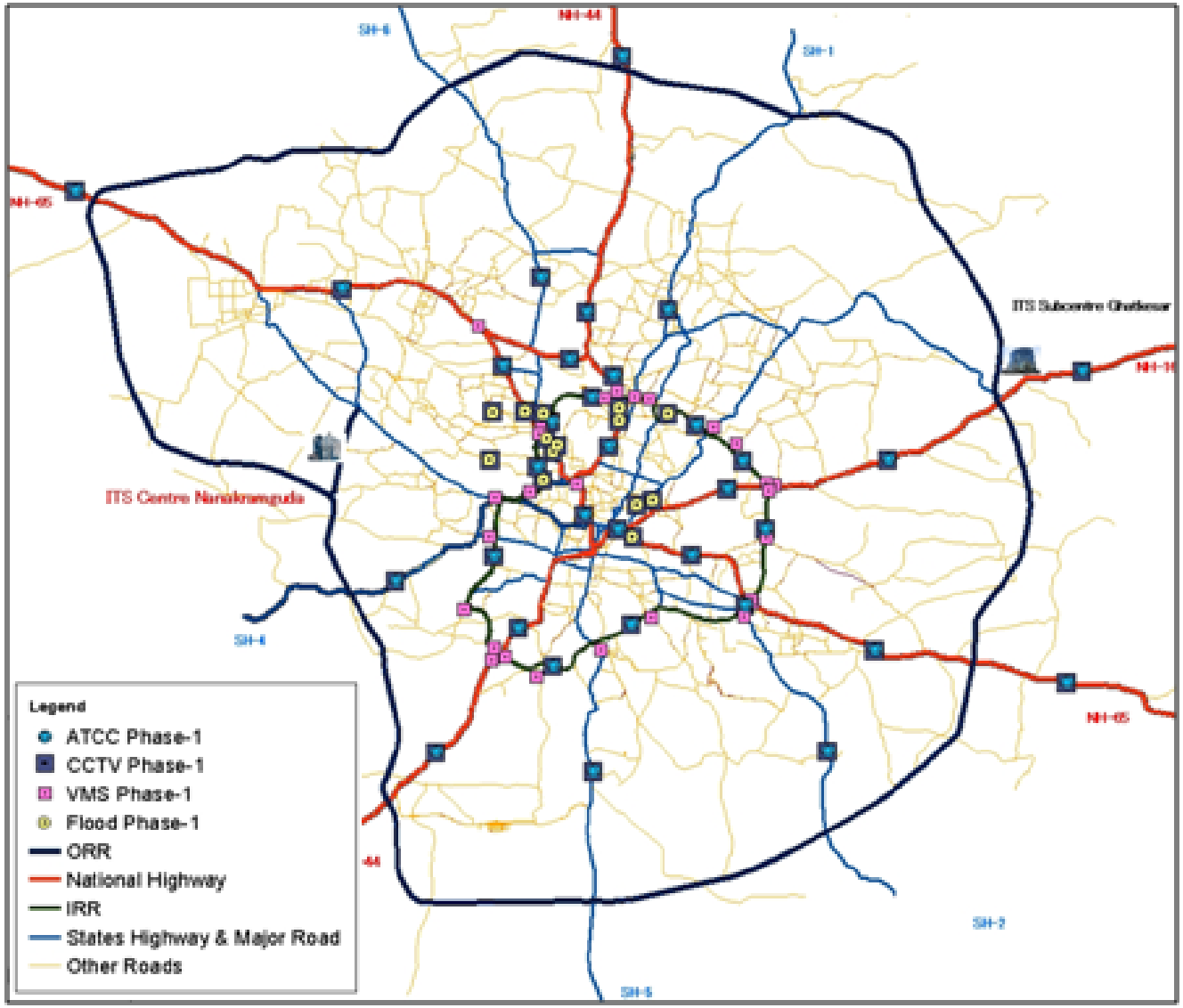


# ITS INITIATIVES

# Proposed ITS for HMA

| ITS Equipment | Phase-1 (1-5 years) | Phase-2 (6-10 Years) | Phase-3 (Above 10 years) | Total |
|---|---|---|---|---|
| Traffic Signals | 221 (HTRIMS) | 179 | 222 | **622** |
| Pedestrian Signals | 600(HTRIMS) | 400 | 500 | **1500** |
| ATCC(Traffic Counters) | 68 (34 locations) | 170 (85 locations) | 454 (227 locations) | **692** |
| CCTV | 55 | 375 | 449 | **879** |
| VMS | 42 | 54 | 100 | **196** |
| Flood sensors | 14 | 111 | Nil | **125** |
| Weather Stations | 63 in HMA (APSDPS) | Nil | Nil | **63** Existing |
| Pollution Sensors | 21 in HMA (APPCB) | - | - | **21** Existing |
| Probe car system | 1350+2400 City Buses, APSRTC | Additional Buses, Taxis, Autos | Extension of Phase-2 | **3750** |
| Electronic Road Pricing (ERP) | Nil | Nil | 10 | **10** |
| Lane Control | Nil | Nil | 20 | **20** |
| Parking System | Nil | Nil | 30 | **30** |
| **Cost including O&M in crores** | **150** | **425** | **605** | **1180** |

# ITS Implementation: Phase I

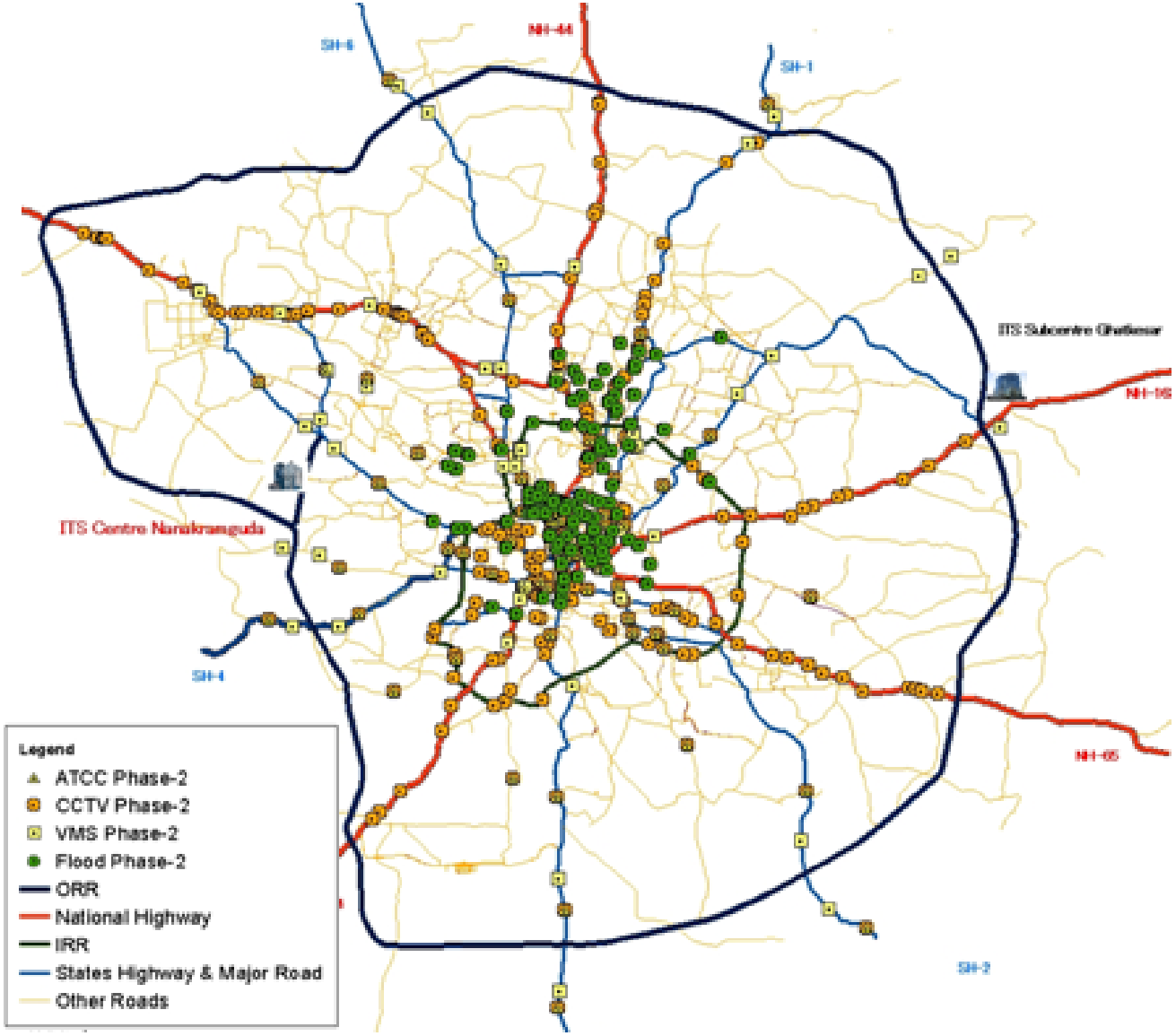



| ITS Equipment | Phase-1 (1-5 years) |
|---|---|
| ATCC(Traffic Counters) | 68 (34 Locations) |
| CCTV | 55 |
| VMS | 42 |
| Flood sensors | 14 |

| | |
|---|---|
| Traffic Signals | 221 (HTRIMS) |
| Pedestrian Signals | 600 (HTRIMS) |
| VMS(HTRIMS) | 17 |
| Weather Stations | 63 Existing (APSDPS) |
| Pollution Sensors | 21 Existing (APPCB) |
| Probe car system | 1350+2400 City Buses APSRTC |
| Cost including O&M | 150 crores |

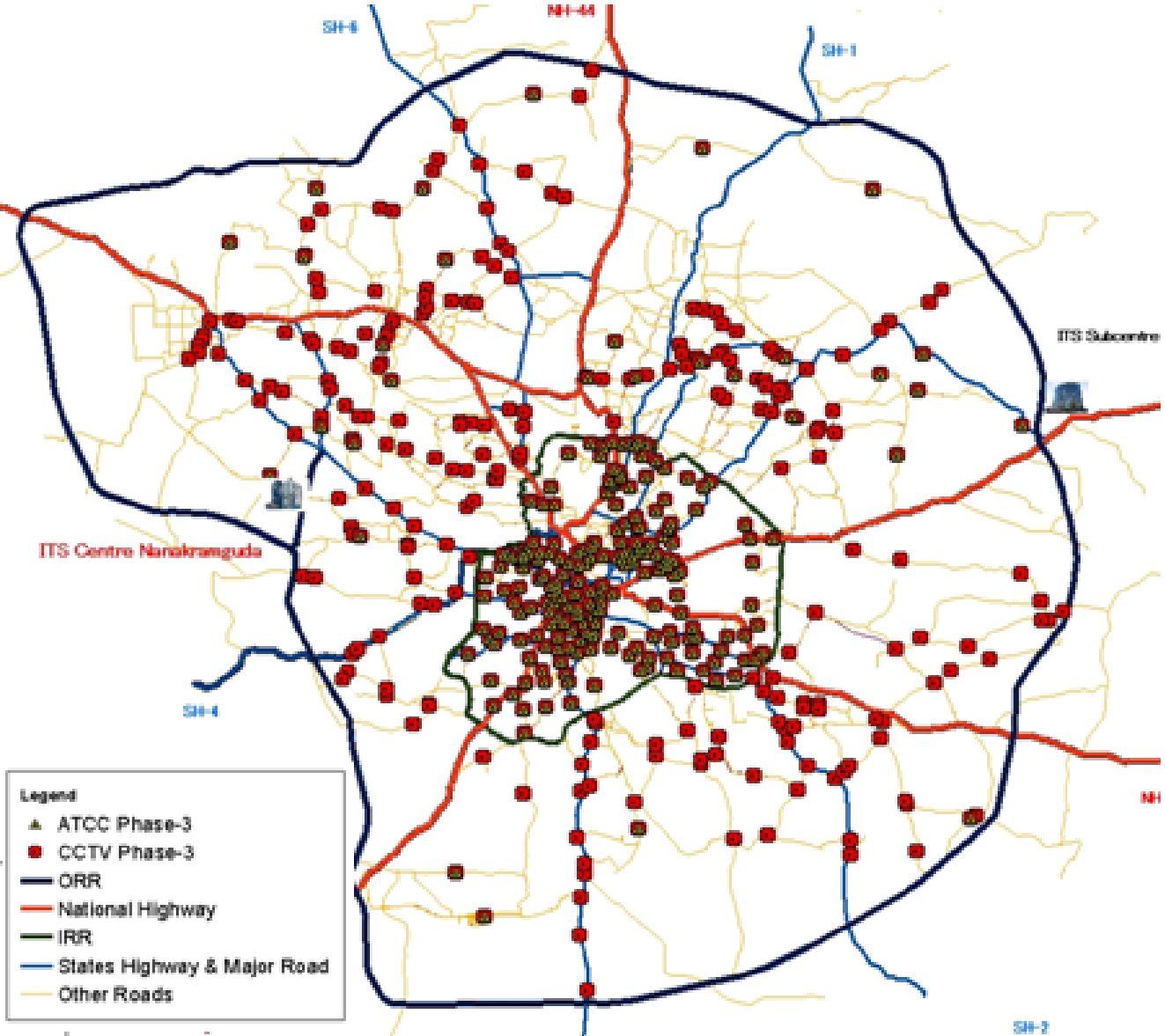
G.O. Ms. No.174 dt 01.5.2013

# ITS Implementation: Phase II



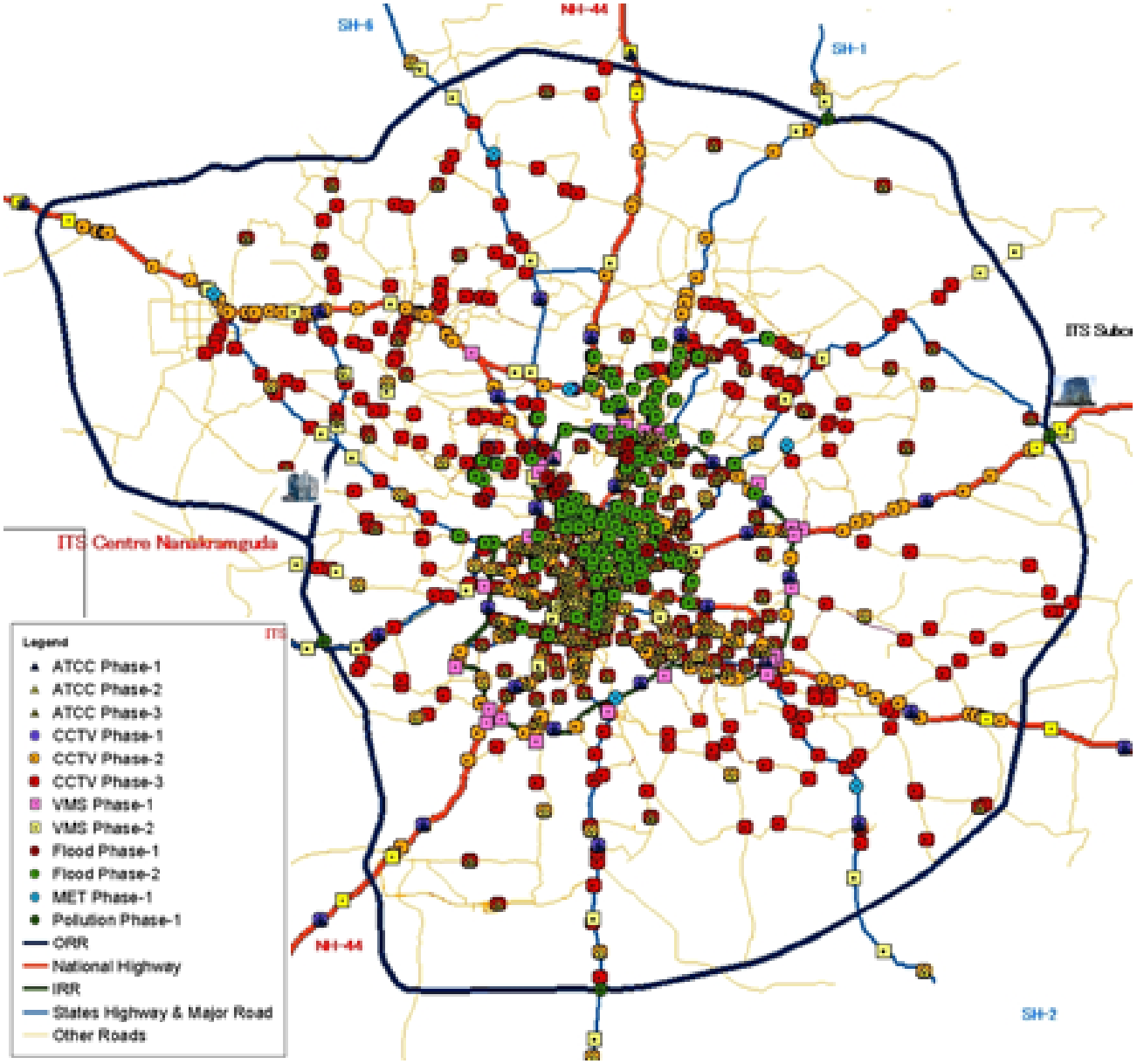

| ITS Equipment | Phase-2 (6-10 years) |
|---|---|
| ATCC(Traffic Counters) | 170 (85 Locations) |
| CCTV | 375 |
| VMS | 54 |
| Flood sensors | 11 |
| Traffic Signals | 179 |
| Pedestrian Signals | 400 |
| Probe car system | Additional Buses, Taxis, Autos |
| Cost including O&M | 425 crores |

# ITS Implementation: Phase III




| ITS Equipment | Phase-3 (Above 10 years) |
|---|---|
| ATCC(Traffic Counters) | 454 (227 Locations) |
| CCTV | 449 |
| VMS | 100 |
| Traffic Signals | 222 |
| Pedestrian Signals | 500 |
| Probe car system | Extension of Phase-2 |
| Electronic Road Pricing (ERP) | 10 |
| Lane Control | 20 |
| Parking System | 30 |
| Cost including O&M | 605 crores |

# ITS Implementation: All Phases




| ITS Equipment | All Phases |
|---|---|
| ATCC(Traffic Counters) | 692 (346 Locations) |
| CCTV | 879 |
| VMS | 213 |
| Traffic Signals | 622 |
| Pedestrian Signals | 1500 |
| Flood Sensors | 125 |
| Weather Stations | 63 |
| Pollution Sensors | 21 |
| Probe car system | 3750 Buses, Taxis, Autos |
| ERP | 10 |
| Lane Control | 20 |
| Parking System | 30 |
| Cost including O&M | 1180 crores |

# Thank You for your kind Attention!

Contact

M: 9440 347 348

E: csrk@nitw.ac.in