Decongesting Bengaluru

Principles and Methods

TYPES OF CONGESTION

Inside the city

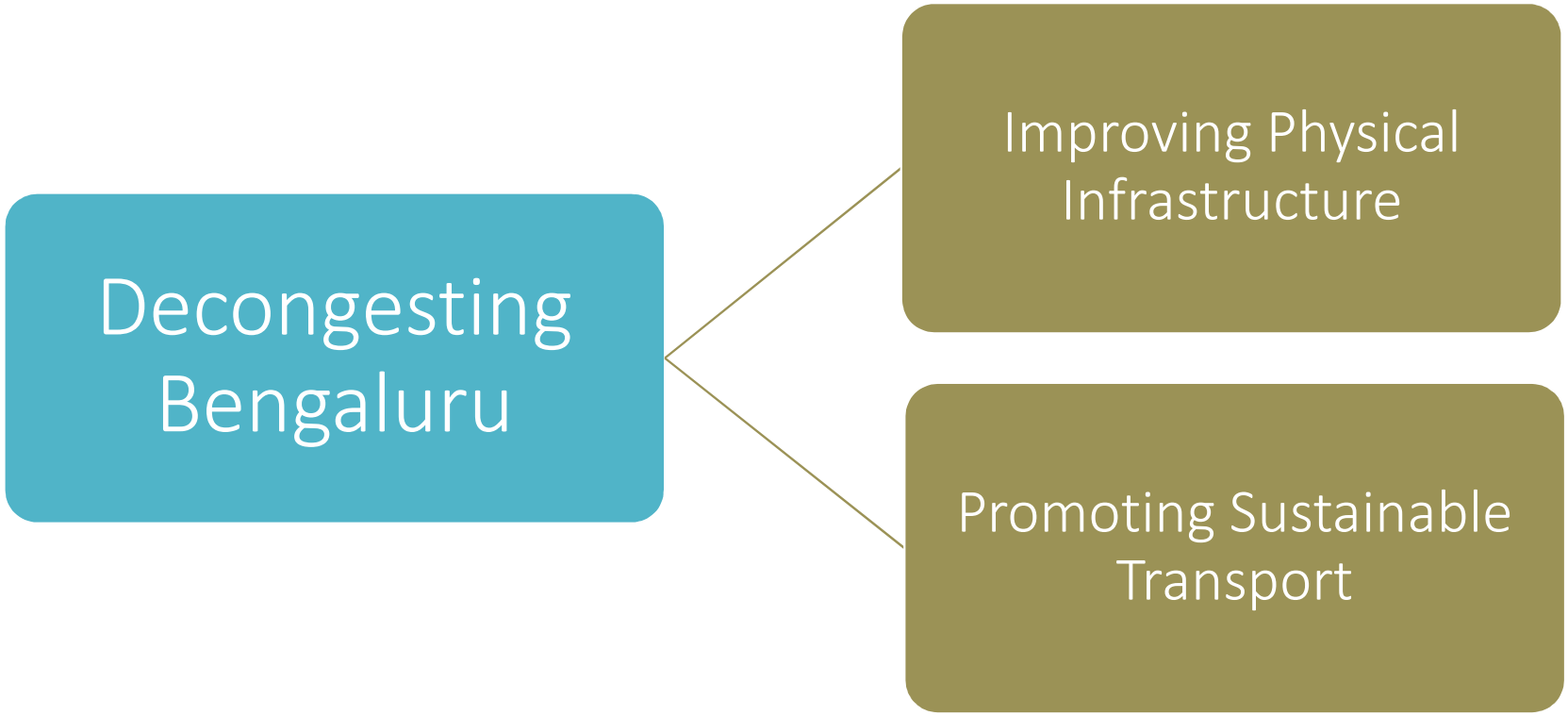
- No difference between major roads and others
- Constant jams, gridlock
- Needless waste of fuel, time

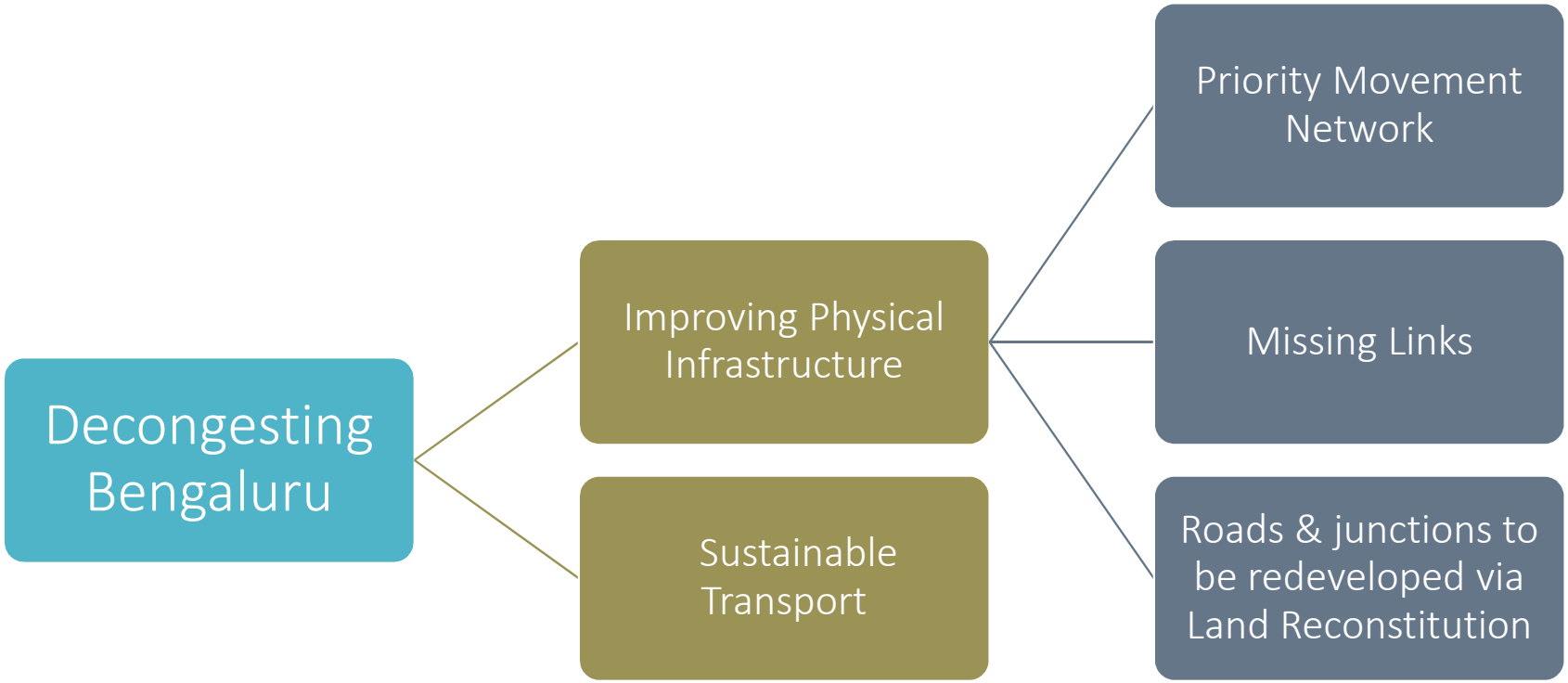
Outskirts / Suburbs

- Choked city exit/entry points
- High risk for pedestrians at all entry points
- Poor design of public infrastructure

Travel from and to nearby towns

- Long commute times to/from city
- Major bottleneck for taking up jobs in city
- Most settle for nearby jobs, lower wages


Decongesting Bengaluru
Improving Physical Infrastructure
Promoting Sustainable Transport


Decongesting Bengaluru
Improving Physical Infrastructure
Sustainable Transport
Priority Movement Network
Missing Links
Roads & junctions to be redeveloped via Land Reconstitution

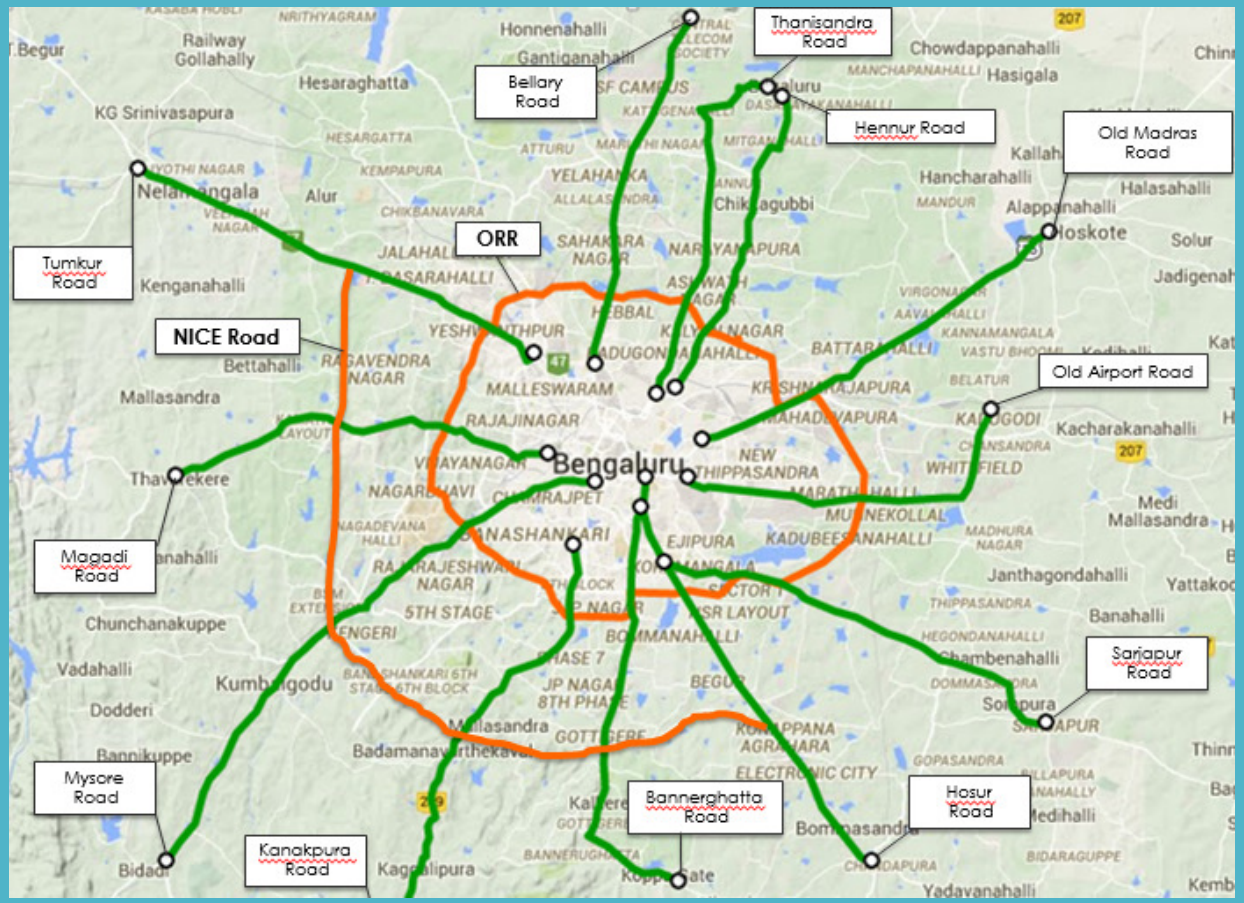
Priority Movement Network

- This refers to the collection of roads along which the majority of vehicular movement takes place
- These roads must perform well - not only to reduce congestion, but also for the economic and social well being of the city
- The Priority Movement Network must be identified and must become the main focus of improvement – It is the backbone of the city's transportation network
- The Priority Movement Network should become the ***preferred road network*** along which people want to travel

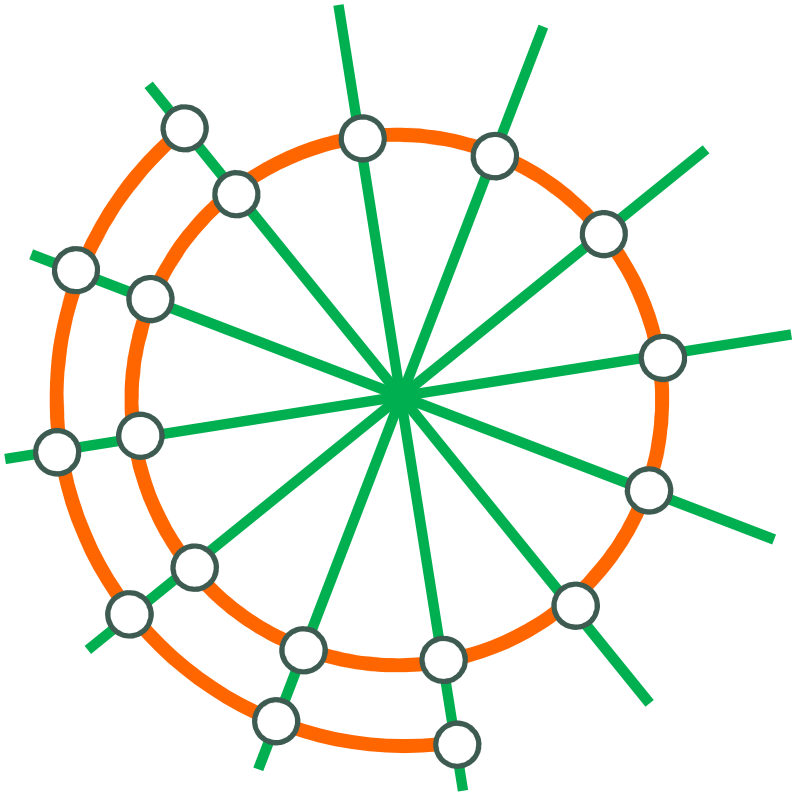
Priority Movement Network

For radial and circumferential movement in the region.

Major radial and circular pathways



Priority Movement Network



Radial Roads (12)
+
Outer Ring Road
+
NICE Road
+
Intersections (18)

Priority Movement Network Design

Corridors

- Consistent Width
- Reinforced Surfacing
- Raised Median
- Access Control
- Signage
- Bus Bays
- Quality Footpaths
- Performance Monitoring

Intersections

- Intermodal Hub
- Concrete surfacing
- Priority PT Movement
- Conflict Free Vehicle Movement
- Pedestrian Crossing Infra
- Complete Street Network
- High Density Zoning

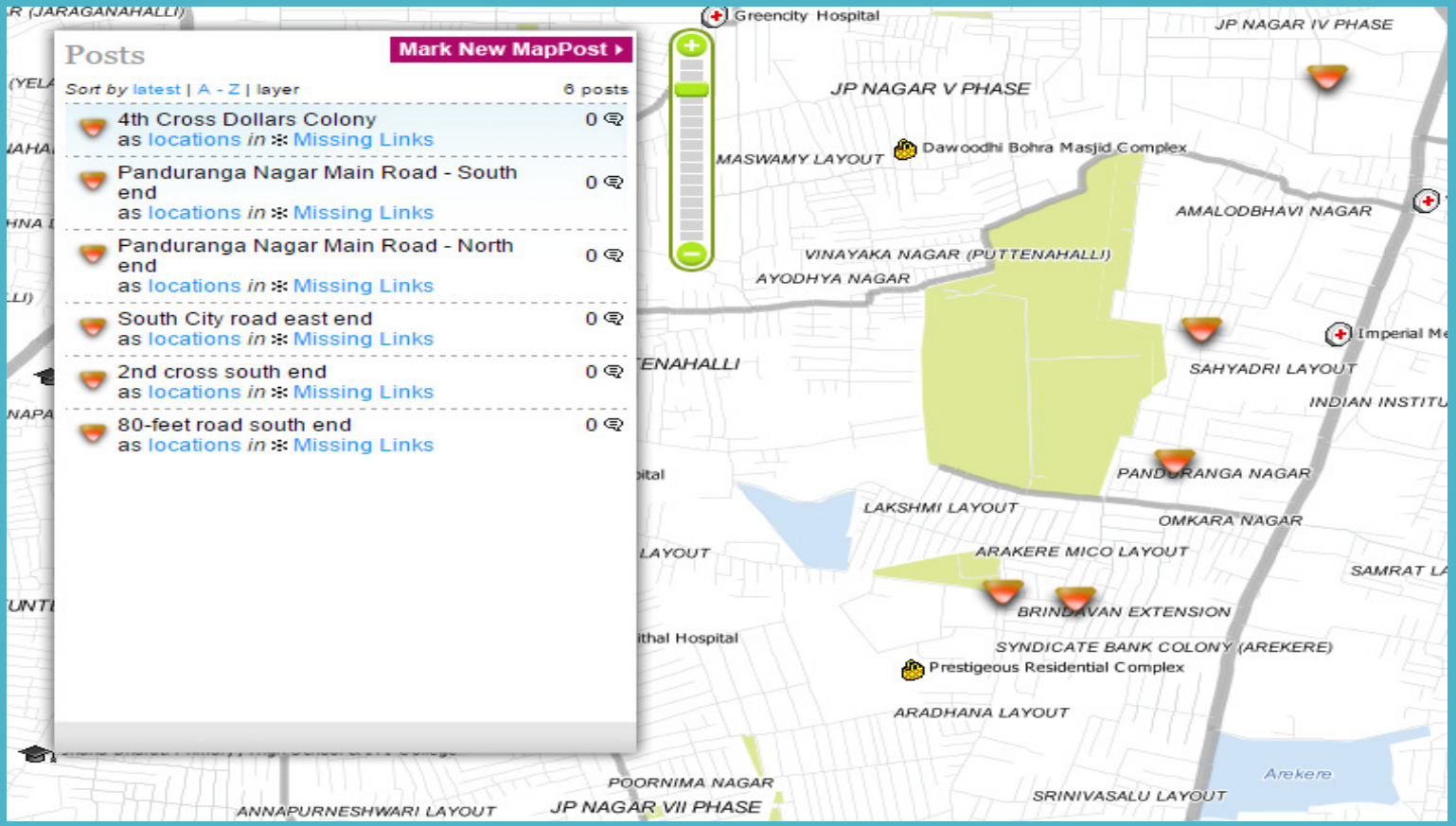
Missing links

Quick fixes that can improve traffic flow

Missing Links

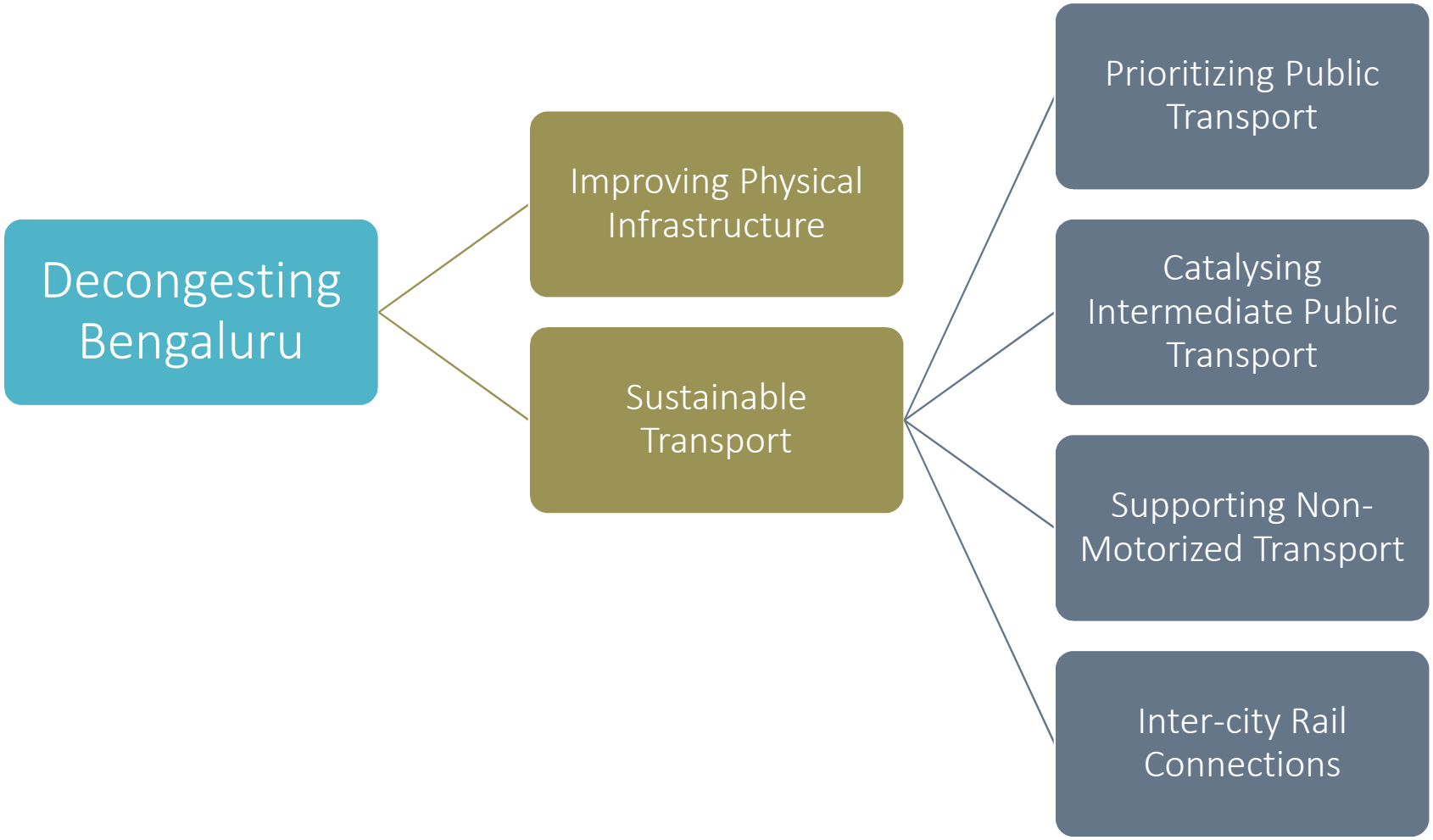
- In many areas of Bangalore, the road network is incomplete i.e. there are many Missing Links
- For example, many neighbourhoods have 60-, 80- or 100-feet roads
- Development will occur along these wide roads
- But because these roads do not connect to each other, it results in congestion along narrow connecting roads

Map of missing links (missing-links.mapunity.org)



Missing Links in major infrastructure

- Metro-facilitation at stations
- Interchanges on NICE Road
- More on-ramps to NICE Road
- East-side entry to Airport
- Railway service in South Bangalore
- Off ramps on Tumkur Road and Electronic City expressways
- Bellary Road – Tumkur Road section of PRR
- Connecting NICE Road to Electronic City Expressway.


Decongesting Bengaluru
Improving Physical Infrastructure
Sustainable Transport
Prioritizing Public Transport
Catalysing Intermediate Public Transport
Supporting Non-Motorized Transport
Inter-city Rail Connections

Prioritizing Public Transport

- Increasing Public Transport ridership will provide the largest de-congestion benefit – it is the **only** long-term solution

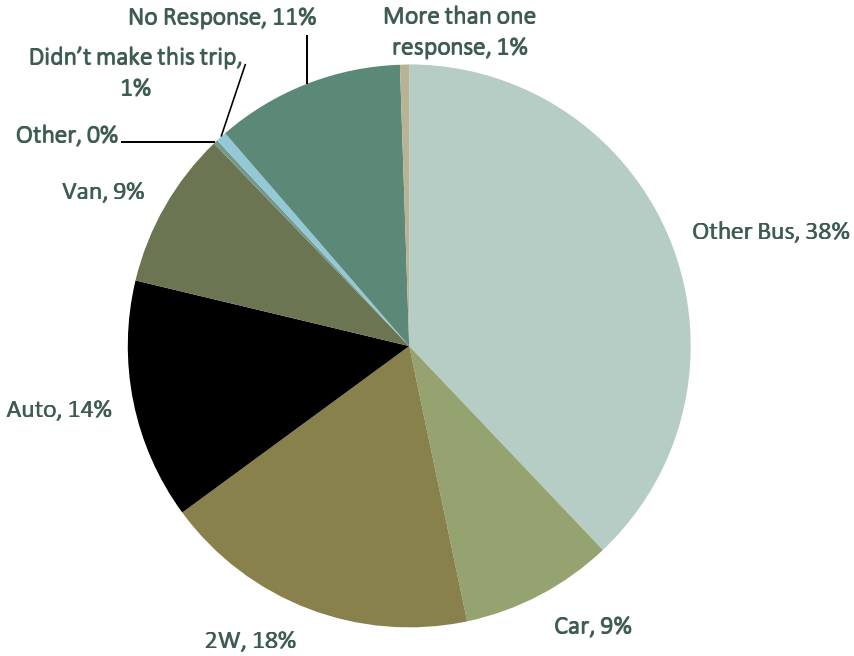
- Metro is necessary but not sufficient - implementation takes a very long time.

- Significant Investment & Support required for Bus Transport:

  Bus Rapid Transit (on non-Metro corridors)
  Bus Movement Priority (Bus Lanes, Signal Priority)
  Increased & Renewed Fleet
  Network & Route Rationalization
  Fare Subsidies

Mode-shift impact

*With only 65 buses, **~15,000 people every day** have shifted from Cars & 2-Wheelers*



Catalysing Intermediate Public Transport

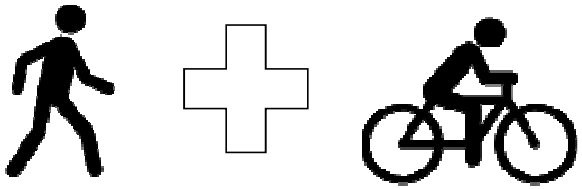
- IPT refers to Auto-Rickshaws & Taxis
- IPT can serve as crucial last-mile connectivity to public transport
- Increased availability of these modes will reduce dependency on private vehicles
- Initiatives can include:

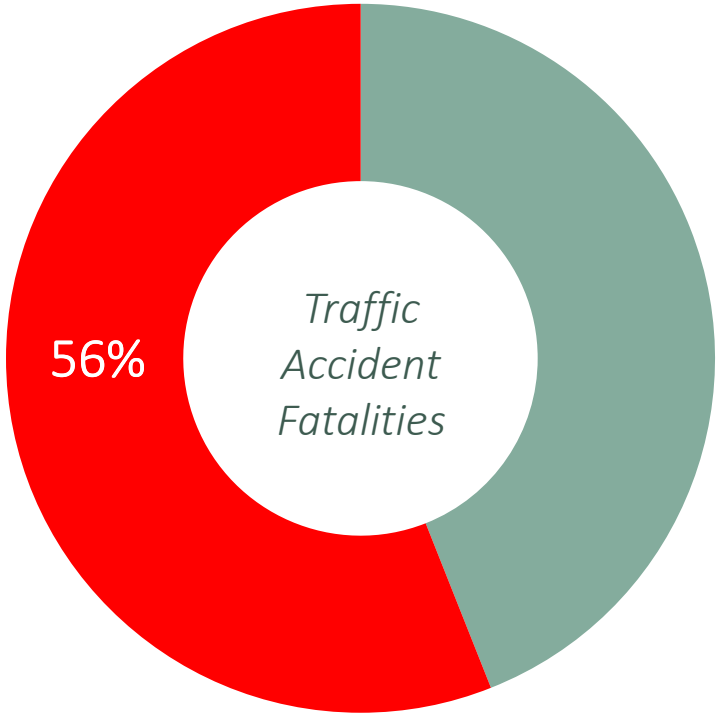
  Introducing Curb-side Taxi Service
  Incentives to increase radio-taxi fleet size
  Infrastructure support for IPT (Auto Stands etc.)
  Fare integration with Public Transport

Non-Motorized Transport (NMT)

- NMT refers to walking and cycling
- NMT should be used for local, neighbourhood level trips – reducing the requirement of cars and two-wheelers for short-distance trips
- However this requires more allocation of space for NMT than at present
- This includes:
  - High Quality Pedestrian Infrastructure
  - Cycling Infrastructure (Lanes, PBS, Racks) – can be quickly established around lakes
  - Conversion of street-side parking into wider paths for pedestrians and cycles

Safety of NMT

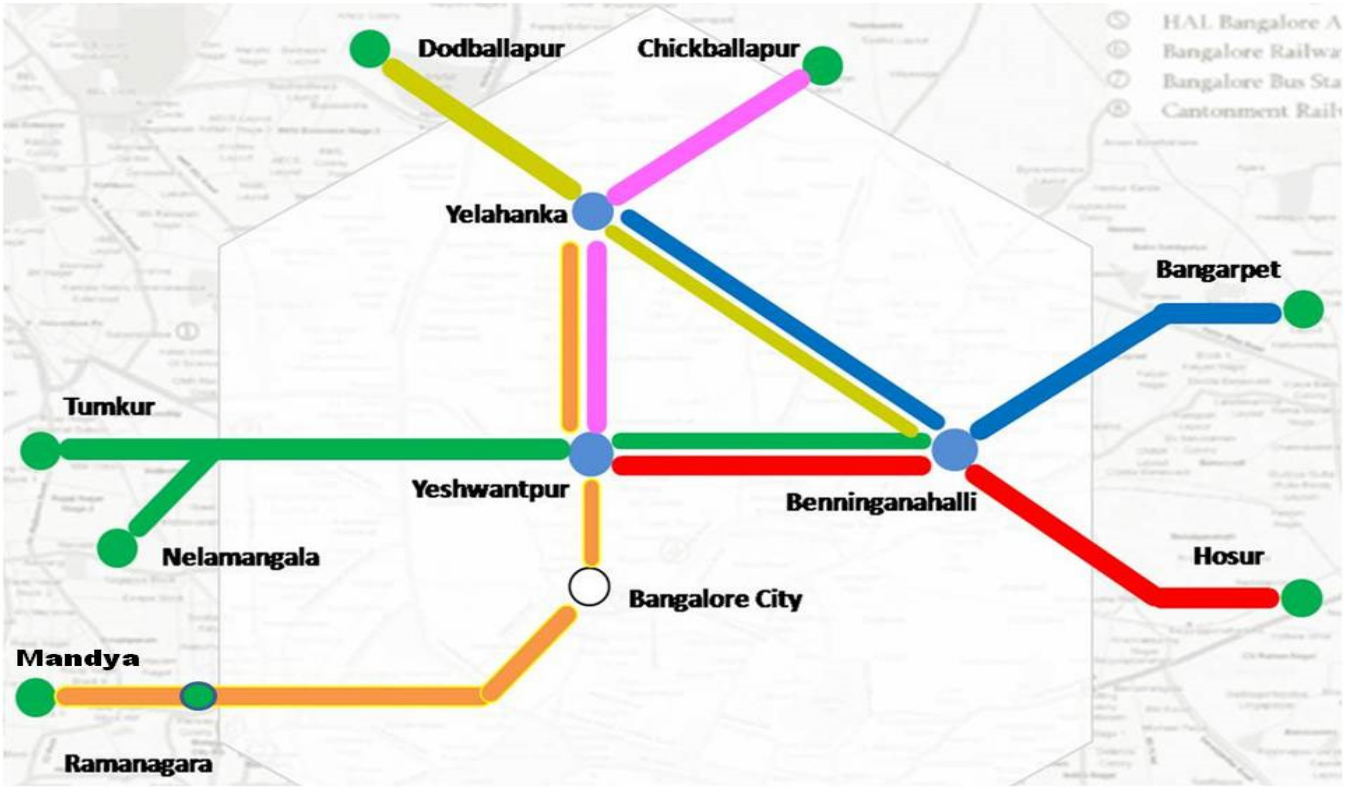




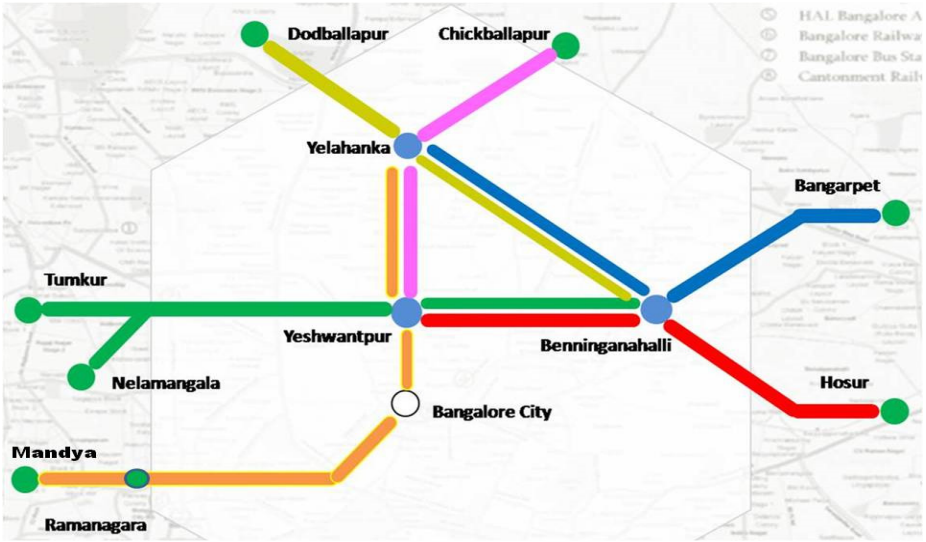
Inter-city connections by rail

To ease the pressure on the roads.

Namma Railu – move half the load to railways



Findings of RITES Report



- Frequency
- Reliability
- Cost to Commuters
- Cost of Operations
- Reduction in CO2 Emission
- Decongestion on City Roads
- Growth Dispersion
- Socio-Economic Benefits

Land pooling and reconstitution

For development of major roads, as well as key junctions.

Comparison between land acquisition and land reconstitution.

Advantages of Reconstitution

No dispossession, and therefore much more fair

Orderly development of good infrastructure

Fewer disputes, and therefore faster to implement

Permitted under Town and Country Planning Act as a TP Scheme

Steps in land reconstitution

- Identify ‘zone of benefit’ and notify low FSI (0.7 or lower) for this zone.
- Identify land needed for all new infrastructure
- Calculate % land loss for each land-owner
- Notify draft Town Planning Scheme
- Get land-owners’ consent
- Develop and Implement the scheme
- Revise ownership records as per new development
- Raise FSI to 1.25 or higher.

Land reconstitution can be used @ …

- IRR
- STRR
- All ORR intersections with Big10 roads
- All road widening schemes in the city
- Development of new layouts.

A multi-pronged approach to mobility in the city will be needed for de-congestion to be successful.

Implementation Plan

Setting time-bound targets for each focus

Physical Infrastructure

Priority Movement Network

	Short Term	Medium Term	Long Term
Institutional & Strategy	• Establish dedicated PMN cell	• Develop land-use planning strategy to complement PMN	• Change Development Control Regulations to reflect Land Use-PMN Integration
Priority Movement Network Corridors & Junctions	• Develop Design Guidelines and Parameters for PMN Corridors & Junctions (eg: adapting/updating TenderSURE for major arterial roads) • Conduct Design & Performance Audit of PMN Corridors & Junctions	• Design Consultancy for upgrading of PMN Corridors & Junctions • Budgetary Allocation for Construction & Long Term Maintenance of PMN Corridors & Junctions • Identify future additions to PMN • Develop Plan & Strategy for development and integration of future additions to PMN	• Implementation of upgrading of PMN Corridors & Junctions • Regular, Timely & Consistent Monitoring & Reporting of PMN Performance

Physical Infrastructure

Missing Links

	Short Term	Medium Term	Long Term
Missing Links – Neighbourhood Level Streets	• Ward-wise identification of Missing Street Links	• Design Consultancy for fixing Missing Street Links • Budgetary Allocation for fixing Missing Street Links	• Construction of Missing Street Links
Missing Links – Major Infrastructure	• Identification of Missing Links in Major Infrastructure eg: Extending NICE to Bellary Road, Train Station in South Bangalore, Ramps for existing elevated roads, East side Airport access etc	• Design Consultancy for building Major Infrastructure Missing Links • Budgetary Allocation for building Major Infrastructure Missing Street Links	• Construction of Major Infrastructure Missing Links

Physical Infrastructure

Land Reconstitution for Road & Infrastructure Development

	Short Term	Medium Term	Long Term
Major Road Projects (PRR, IRR, STRR etc)	• Identify Pilot Road Development Project for application of Land Reconstitution method (eg: Anekal – Hoskote, 16 MCRs) • Alter notification for land acquisition for identified pilot project, into a land pooling scheme.	• Develop detailed strategy for Land Reconstitution method for Pilot Road Development Project • Issue Notification for Land Reconstitution for identified Pilot Road Development Project	• Implement Pilot Road Development Project through Land Reconstitution • Adopt Policy/Government Order for using Land Reconstitution for all major road building projects
Transport Infrastructure within City Limits	• Identify Pilot City Transport Infrastructure Project for application of Land Reconstitution method within city limits (eg: Junction Redevelopment at Hebbal, Silk Board, KR Puram, Marathahalli, Nayandahalli)	• Develop detailed strategy for Land Reconstitution method for Pilot City Transport Infrastructure Project • Issue Notification for Land Reconstitution for identified Pilot City Transport Infrastructure Project	• Implement City Transport Infrastructure Project through Land Reconstitution

Sustainable Transport

Promote Public Transport

Aspect	Short Term	Medium Term	Long Term
Bus Transport (BMTC)	• Permanent Budgetary Allocation for procurement of 1,000 buses per year • Permanent Budgetary Allocation for Operational Subsidy of Rs. 1,000 per bus per day • Approval of ORR BRTS Project	• Expand BIG Bus Network City Wide • Rationalize Fare Structure • Introduce Integrated Fares • Plan & Budgetary Allocation for City-wide Bus Priority Network (BRT where appropriate, bus lanes, junction priority, etc)	• Implement ORR BRTS • Implement City Wide Bus Priority Network Plan • Develop high quality passenger infrastructure including bus shelters at all bus stops • Adopt policy of low bus fares with requisite operational subsidies
Metro (BMRCL)		• Fare Integration with BMTC (single city-wide fare structure)	• Implement Station Area Accessibility Plans
Commuter Rail System	• Pursue implementation of CRS	• Budgetary allocation for implementation of CRS • Introduce CRS services which can be started immediately	• Implement CRS
Parking	• Adopt proposed Paid Parking Policy	• Develop city wide paid parking strategy	• Remove minimum parking requirement regulations

Sustainable Transport

Catalyse Intermediate Public Transport (IPT)

Aspect	Short Term	Medium Term	Long Term
Auto-Rickshaws	• Develop rule-based formula for fare revision	• Review existing regulation to identify changes to improve auto-rickshaw service quality	• Enable entrepreneurship in rickshaw ecosystem by adopting/amending relevant regulations • Enable establishment of infrastructure for clean-fuel mobility
Taxis & Minivans		• Introduce curb-side taxi service	
Minivans		• Develop strategy for formalizing & regulating existing minivan operators	

Sustainable Transport

Support Non-Motorised Transport (NMT)

Aspect	Short Term	Medium Term	Long Term
Pedestrian Infrastructure	• Clearing Sidewalk encroachments	• Budgetary Allocation for improving Sidewalks and developing Road Crossing Infrastructure	• Implement city-wide pedestrian infrastructure improvement program
Cycling Infrastructure	• Cycle Parking Infrastructure at all Government buildings and other relevant properties	• Budgetary allocation for expanding neighbourhood level cycle lane development program, and for cycle lanes around the 30 largest lakes. • Develop Cycle Masterplan for Bangalore	• Develop extensive city-wide cycle lane network
General	• Support for Bangalore Open Streets initiative to promote NMT	• Development and adoption of Vision Zero approach for Road Safety of NMT Users	• Stringent Road Safety Design Requirement Regulations for all major transport projects