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Plan BENGALURU 2020

Bringing back a Bengaluru of Kempe Gowda's dreams

abide

Agenda for Bengaluru Infrastructure and Developement Task force

JANUARY 2010

With funding & support of
Namma Bengaluru Foundation
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BE A STAKEHOLDER OF PLANBENGALURU2020!

1. PlanBengaluru2020 marks a significant deliverable for the Abide Task force – following the various reports and recommendations already made.

2. For the first time, there is a comprehensive blueprint and reforms to solve the city's problems and residents' various difficulties. This is a dynamic document that will continuously evolve, since there will be tremendous scope for expansion and improvement, as people read it and contribute to it.

3. PlanBengaluru2020 is a powerful enabler for RWAs / residents and citizens. It will enable RWAs / residents to engage with their elected representatives and administrators on specific solutions and is a real vision for the challenges of the city.

4. The PlanBengaluru2020 suggests governance reforms that will legally ensure involvement of citizens / RWAs through Neighbourhood Area Committee and Ward Committee to decide and influence the future/ development of the Neighbourhoods, Wards and City

5. This plan is the basis on which administrators and elected representatives must debate growth, overall and inclusive development and future of Bangalore.

6. The report will be reviewed by an Annual City Report-Card and an Annual State of City Debate/conference where the Plan, its implementation and any new challenges are discussed and reviewed.

7. PlanBengaluru2020 represents the hard work, commitment and suggestions from many volunteers and citizens.

8. This Plan has been created with the funding and support of Namma Bengaluru Foundation – no funding has been accepted from the Government.

To get involved,
please send your comments,
suggestions or feedback to
citizenspeaks@abidebengaluru.in

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Hon'ble Chief Minister & Chairman ABIDe Task Force

Shri Ananth Kumar

Hon'ble Member of Parliament & Vice Chairman ABIDe Task Force

FOREWORD

BACKGROUND

Over the last decade and a half, Bengaluru has become the symbol of a new India, and an important gateway for investments into the country. And as the economic engine of Karnataka, Bengaluru is even more important to the state. It is a city that has seen great transformation in recent years, and promises to see more of this in the years ahead too. How we shape this change, therefore, will greatly impact the city that future generations will inherit.

The city has grown very rapidly over the last decade – bringing with it increased investments, economic activity and population growth. Unfortunately this growth in population and its consequent demands on infrastructure, public services and housing has not been adequately planned for – creating the current situation of a city resembling an urban chaos. There has been much written and spoken about the problems facing our city, and it is obvious that residents are increasingly dissatisfied by many aspects of the way the growth of our city is being managed and handled.
Not only is the situation today alarming, it could get worse! We must realize that by 2020, the population in the Bengaluru Metropolitan Region (BMR) will exceed 16 million (1.6 crores). If the same unplanned or under planned approach to growth continues, the historical advantages of the city and the region will be wasted, and lead to a diminished level of new investment for jobs and opportunities, and a poorer environment for its residents.

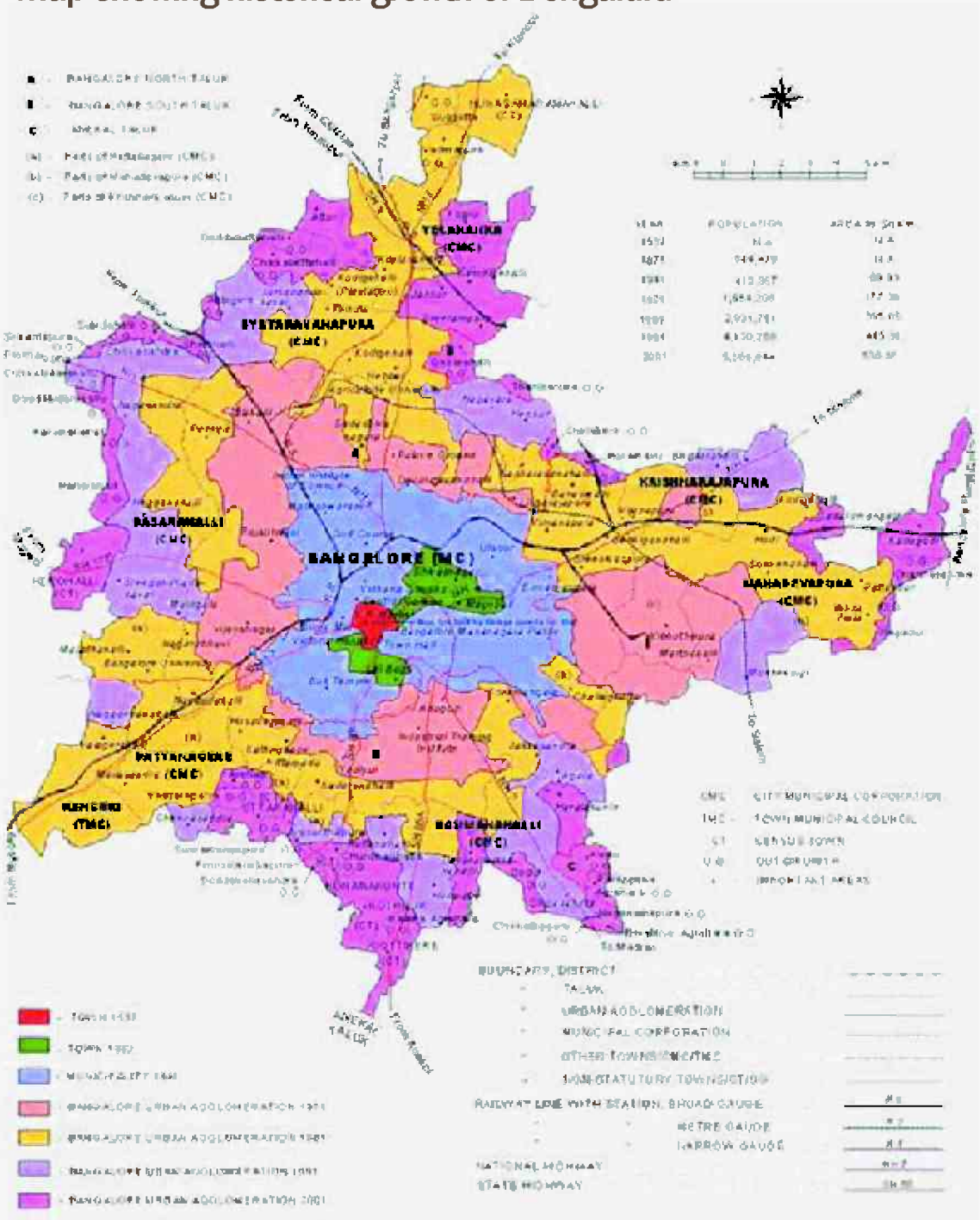
Like many of you I am a proud Bengalurean, and have also been a helpless witness to the decline of our city – as it has gone from a vibrant metropolis to a city that is creaking and groaning under the weight of its growth. We must arrest this decline. I believe that it's important that we move from complaining about what our city has become, to actively participating in rebuilding Bengaluru into a city that we all can be once again proud of.

PLANNING

Planning is by far the most important tool for coping with the anticipated growth of our city and the pressures that growth will place on housing, infrastructure and public services. The absence of proper planning leads to shortfalls in infrastructure, and to a declining standard of living. It also leaves us with little choice but to take a constantly ad-hoc approach to solving the city's - and its residents' – problems, and in the medium term itself these become much more difficult and expensive to address.

On the other hand, with proper planning, public confidence in administration and governance can be dramatically improved. Planning is the glue that holds together the ideas of elected representatives and the executive actions of administrators. In the absence of planning, residents of the city routinely and quite rightly blame poor planning for all the woes around them – bad roads, leaky pipes, absent sewerage, intermittent power, and creaky public transport. This we must fix.

Map showing historical growth of Bengaluru



CITIZEN-CENTRIC GOVERNANCE

In addition to planning for growth of the city and region in an orderly fashion, we also need reforms in Governance – with a focus on transparency and citizen involvement in various aspects of neighborhood life. In every successful modern city, citizens have a very powerful voice in the destiny and direction of development around their homes and places of work. For Bengaluru too, we must want the same.

Bengaluru has a long history of very livable residential areas, but the renowned feel of a comfortable and attractive city is now at risk. We can only hope to restore this by promoting community engagement on key issues and challenges, and developing the city based on the priorities expressed by residents. There are many advantages to building and nurturing this sense of community – a feeling of belonging, management of complex problems, and the resulting sense of safety and security while pursuing a multitude of dreams.

Yet another area of concern is the decline of the various City Government agencies and their inability to adapt to the challenges of growth. Managing various planning and administrative functions requires skill as well as continuous attention to improving the capabilities of public institutions, and on this count Bengaluru (like so many other Indian cities) has not acted with due alertness. A modern – and still growing - city needs skilled administrators who are equipped with the tools and technologies for its management. A focus on developing a cadre of dedicated city managers, and on building robust institutions that focus on residents' welfare through their administrative work, is much needed.

SUMMARY

Therefore the principal objectives for PlanBengaluru2020 are threefold – to create a comprehensive integrated region wise plan to address the region's future growth and all its consequent issues including its future social, cultural and economic needs; to develop a roadmap for a responsive administration of such a plan and to continuously improve it; and to ensure that citizens remain the primary stakeholders in this transformation. If these objectives are met, then we will have created the premier city in India, and a global metropolis at par with the best-liked cities of the world.

As I wrote in the beginning, it's time now that we as residents took an active and informed interest in directing our city's future. I hope this first version of PlanBengaluru2020 helps all Bengalureans to ask the right questions when we engage our political elected leaders as well as city government officials. In turn, I hope this document will serve as a blueprint that helps our representatives and the administrative departments they lead to imagine a great city, and to plan the way forward to make it come true.

PlanBengaluru2020 is only the first step in our efforts in transforming our city and managing its future growth. I invite each of you to contribute to the continuous improvement of this report. On my part, I will make sure that there will be an annual City report card and an Annual state of city conference where citizens and government can meet to discuss the progress that we are making in implementing PlanBengaluru2020 and our collective vision for our city.

I thank Shri B S Yeddyurappa, Chief Minister of Karnataka and Chairman of ABIDe, Shri Ananth kumar, MP and Vice Chairman of ABIDe, Members of ABIDe, Volunteers and Namma Bengaluru Foundation for their involvement, time, resources and contribution to this PlanBengaluru2020.

I look forward to your active involvement in making PlanBengaluru2020 the definitive repository of our collective imagination for the future of our city.

To get involved, please send your comments, suggestions or feedback to:
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Rajeev Chandrasekhar
Member of Parliament
Convenor, ABIDe Task Force

14th January 2010
Bengaluru

"Bengaluru has the potential to become the no. 1 city In India and an internationally prominent metropolis. To make this possible we need to adopt a new urban planning model, upgrade our infrastructure, improve the social facilities and create a better environment for good quality of life. In other words, we must re-invent Bengaluru."

Shri B. S. Yeddyurappa,
Hon'ble Chief Minister of Karnataka
and Chairman of ABIDe

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- Ms Ritu Verma
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LIST OF ABBREVIATIONS

ABIDE	Agenda for Bengaluru Infrastructure and Development Task Force
ADGP	Additional Director General of Police
AMR	Automated Meter Readings
BASIC	Bangalore Spatial Information Center
BB	Bruhat Bengaluru
BBMP	Bruhat Bengaluru Mahanagara Palike
BDA	Bengaluru Development Authority
BESCOM	Bangalore Electricity Supply Company Limited
BHR	Bengaluru Heritage Register
BIAAPA	Bangalore International Airport Area Planning Authority
BIAL	Bengaluru International Airport Limited
BMR	Bangalore Metropolitan Region
BMRDP	Bangalore Metropolitan Regional Development Plan
BMTC	Bangalore Metropolitan Transport Corporation
BOOT	Build, Own, Operate, Transfer
BPL	Below the Poverty Line
BRGA	Bangalore Region Governance Act
BUPA	Bangalore Urban Poverty Authority
BWMA	Bangalore Water Management Authority
BWSSB	Bangalore Water Supply & Sewerage Board
C3	Command and Control Center
CC	Command Center
CISF	Central Industrial Security Force
CMC	City Municipal Corporation
CMG	Crisis Management Group
CMP	City Master Plan
CPG	Crisis Preparedness Group
DCP	Deputy Commissioner of Police
EWS	Economically Weaker Sections
FIs	Financial Institutions
GDP	Gross Domestic Product
GoK	Government of Karnataka
GSM	Global System for Mobile Communications
IB	Intelligence Bureau
IGP	Inspector General of Police

IIM	Indian Institute of Management
IISc	Indian Institute of Science
IRR	Inner Ring Road
ITBP	Indo Tibetan Border Police
ITBT	Information Technology/Bio Technology
IUPG	Institute of Urban Planning and Governance
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
KCDC	Karnataka Compost Developing Corporation
KSPCB	Karnataka State Pollution Control Board
KSRP	Karnataka State Reserve Police
KSRSAC	Karnataka State Remote Sensing Applications Center
KSTDC	Karnataka State Tourism Development Corporation
LEDA	Lakes and Environment Development Authority
LIG	Low Income Groups
MPC	Metropolitan Planning Committee
MRTS	Mass Rapid Transit System
MSW	Municipal Solid Waste
NA	Neighborhood Area
NAC	Neighborhood Area Committee
NGO	Non-Governmental Organization
NHAI	National Highways Authority of India
NIAS	National Institute of Advanced Studies
NICE	Nandi Infrastructure Corridor Enterprises Limited
NSG	National Security Guard
NUTP	National Urban Transport Policy
ORR	Outer Ring Road
PPP	Public-Private Partnership
PSH	Public Security Hotline
QRT	Quick Response Team
RAAG	Risk Assessment and Analysis Group
RTO	Regional Transport Office
SDP	State Domestic Product
SOP	Standard Operating Procedures
SSZ	Special Security Zone
STRR	Satellite Town Ring Road
TMC	Town Municipal Corporation
TP	Taluk Panchayat
UAW	Unaccounted Water
ULBs	Urban Local Bodies
UNESCO	United Nations Educational, Scientific and Cultural Organization
VIP	Very Important Person
ZP	Zilla Parishad

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GOVERNANCE

GOVERNANCE

Part 1: Overview

Bengaluru is the principal gateway of investments and economic growth for the State. It is now a big city, one of the largest in the country. And along with a big city come big city problems. To tackle these big problems, good planning and governance become the most important factors in ensuring that the problems do not overwhelm the city.

Like many other cities in India, Bengaluru suffers from rapid growth. Unfortunately, the speed of the city's growth has not been matched by equal improvements /reforms in governance and delivery of public services. This has led to a worsening quality of life for the city's residents. Apart from this, the environment has taken a beating. The decline of Bangalore as competitive city to live in, will in turn have an impact on the State's ability to attract investments and economic activity.

In summary, the estimates for the future of the city are:

BMA	: 103 lakh as per Revised Master Plan
8 LPAs	: 47 lakhs
APZ-1	: 10 lakhs
Total BMR region	: 160 lakhs (16 Million)

Part 2: Issues

1. No planning for growth; lack of regional planning and fragmentation

The planning does not address population distribution and is not region wide nor is it integrated. There are several plan documents but no single coherent plan. There is fragmentation in the government structure. (Please see map 1).

2. **Public services remains very poor and non-existent in many parts**
   Public services leave a lot to be desired and in several cases, simply do not exist in many places.
3. **Citizens not involved**
   Citizens are frustrated because they cannot take part in decisions concerning their neighborhoods and areas in their vicinity.
4. **Flawed contracting**
   The current contracting framework is flawed, resulting in poor services and dissatisfied citizens.
5. **Transparency**
   There is little or no transparency.
6. **Capacity building**
   The city is not geared up for formal and institutionalized capacity-building.
7. **Financing**
   Revenues need to be boosted to fund the city's development.
8. **Environment and heritage**
   The 'green' look-and-feel of the city has greatly diminished. Like other big cities, Bengaluru now faces the menace of pollution, accompanied by allied health risks. Heritage sites suffer from neglect.
9. **Inadequate communication**
   Inadequate communication on important issues from Government to residents (Health, Security etc).

Part 3: Planned Solutions

Planning For Growth

The principal objectives for PlanBengaluru2020 are to create a plan for a population of 8-10 million people in the BB region and 6-8 million in the BM region. Please refer to map 2 as an example.

The Governance issues outlined above can only be addressed on a sustainable basis through a revised and comprehensive new legislation for our City.

This new Bengaluru Legislation that supersedes /encompasses all Bengaluru/Municipal body legislation, like BWSSB Act, BBMP Act etc – is called Bengaluru Region Governance Act, (BRGA) 2009 .

The following are the principles and objectives of comprehensive new legislation for Bengaluru.

The following are the definitions:
Jurisdiction definition: Bruhat Bengaluru (BB) Area - 800 Sq km.
Bengaluru Metropolitan Region area (BMR): 8000 Sq km
BMR will become the local planning area for Bengaluru.

Planning Agencies

The planning agencies will be the following:
For the BMR area, it will be BMRDA (BMRDA constitution to be similar to MPC proposal).

For the BB area, it will be BBMP, subject to approvals and regulated by BMRDA. The BMLTA will be the sole transportation planning arm for BMR area and will be brought under BMRDA.

The BDA planning function will be merged into BMRDA. All LPAs will be abolished. The rights and authorities of the CMCs, TMCs and Panchayats will be unchanged, except that they will have planning powers as defined and regulated by BMRDA.

Plan Documents

The following will be the plan documents:

For the BMR Area – BMR Regional Development Plan (BM RDP) and all City Master Plans (CMP) for each CMC, TMC and private township. The plans will be reviewed and updated once every 5 years. The current BDA plans will be absorbed into BM RDP.

For the BB Area – City Master Plan 2015 will be derived from BMA City master Plan 2015. The plan is to be reviewed and released afresh every five years.

Governance And Accountability To Citizens **

There could be a directly elected mayor for a 5 year term or alternatively, a Mayor-in-Council could be appointed for a 5 year term with the council drawn from non-elected specialists as well as elected corporations.

Government Land Bank Management

There should be statutory maintenance of the land asset register, updated annually. This land register must be disclosed on the internet.

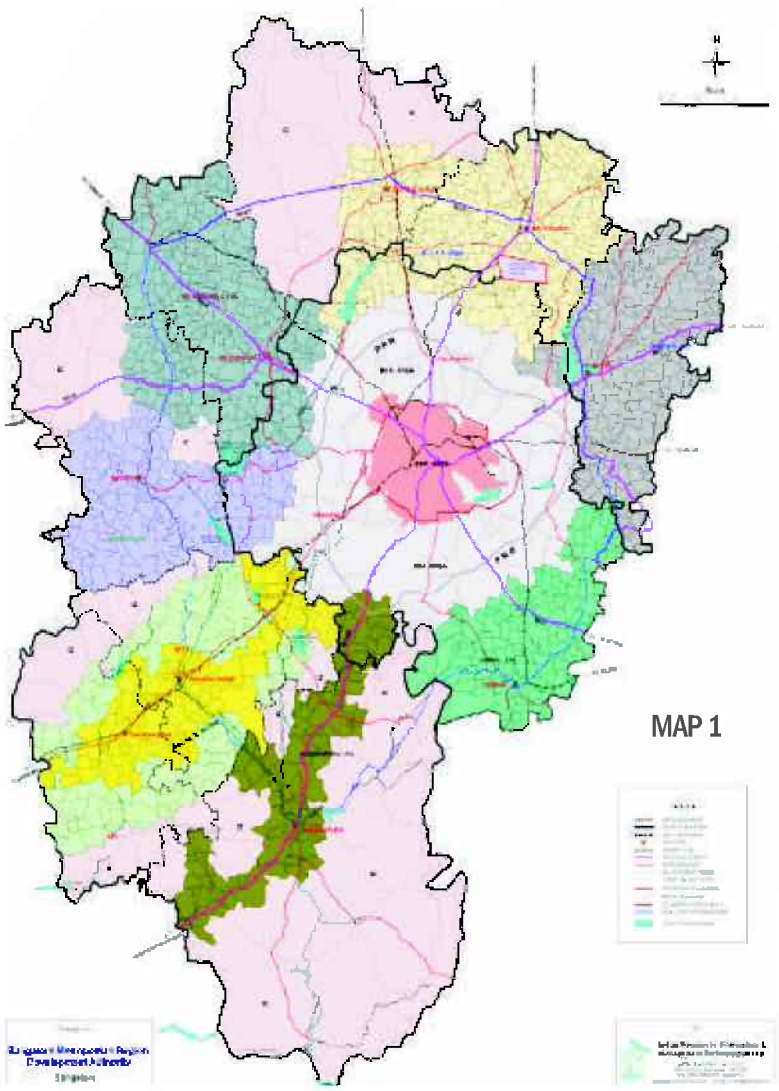
****If governance restructuring isn't done, the current scheme of various agencies and split accountability will need complete restructuring to bring accountability.**

City Municipal Agencies And Development Agencies

The BBMP will be the nodal agency for BB area and all CMCs, TMCs, ZPs and private township agencies will be responsible for the BMR Area.

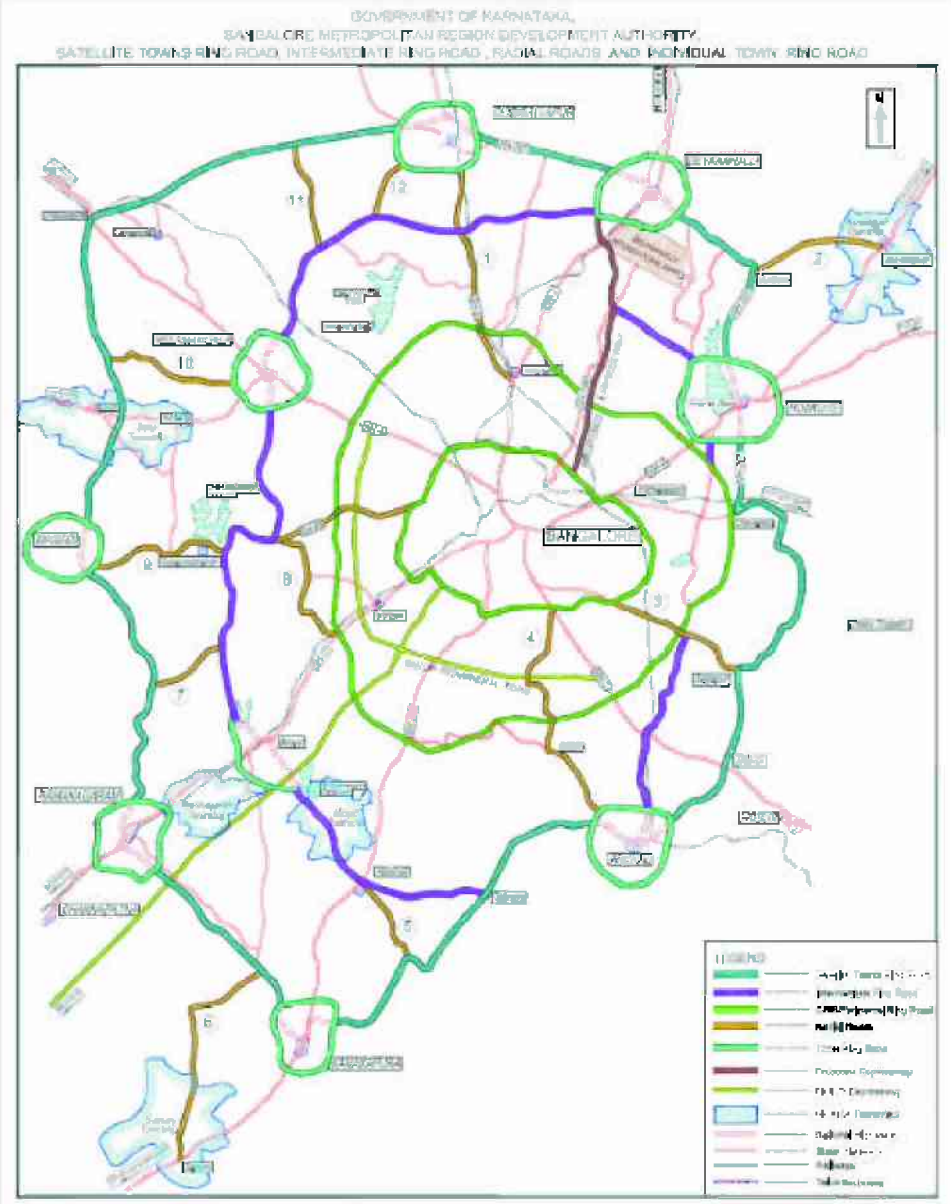
The jurisdictions for BWSSB, BMTC, Bescom are to be re-drawn to extend to the BMR area.

BANGALORE METROPOLITAN REGION | Local planning areas



MAP 1

An integrated planning approach spanning all the LPAs in the 8000 sq km metropolitan region is needed to plan distribution of 16 million population by 2020.



Map 2: New townships in the Bengaluru Metropolitan region can house 6-8 million residents and ensure distribution and creation of new infrastructure for the expanding population, away from core Bengaluru.

COMMON PLANNING TOOLS AND FRAMEWORK

The Bangalore Spatial Information Center (BASIC) should be established within BMRDA to serve as the comprehensive repository of spatial information about the city, its utilities and other structures of importance to proper spatial planning.

There will be one common shared spatial database which will be a basis for all planning in BMR Area and will reflect BM RDP and all Master Plans.

BMRDA will be responsible and accountable for this database and planning platform.

The Karnataka State Remote Sensing Applications Center (KSRSAC), will be the sole technology custodian and maintenance of these tools and information. Information integrity will be KSCRCAs responsibility.

Wards will be smallest and minimum unit for Planning in BB Area. All plans for BB must have ward-wise planning.

Neighborhood Areas (NAs) will be smallest legal, spatial unit under the act. NA's will be notified as a schedule and can be reviewed and notified every 5 years.

BRGA 2009: WARDS

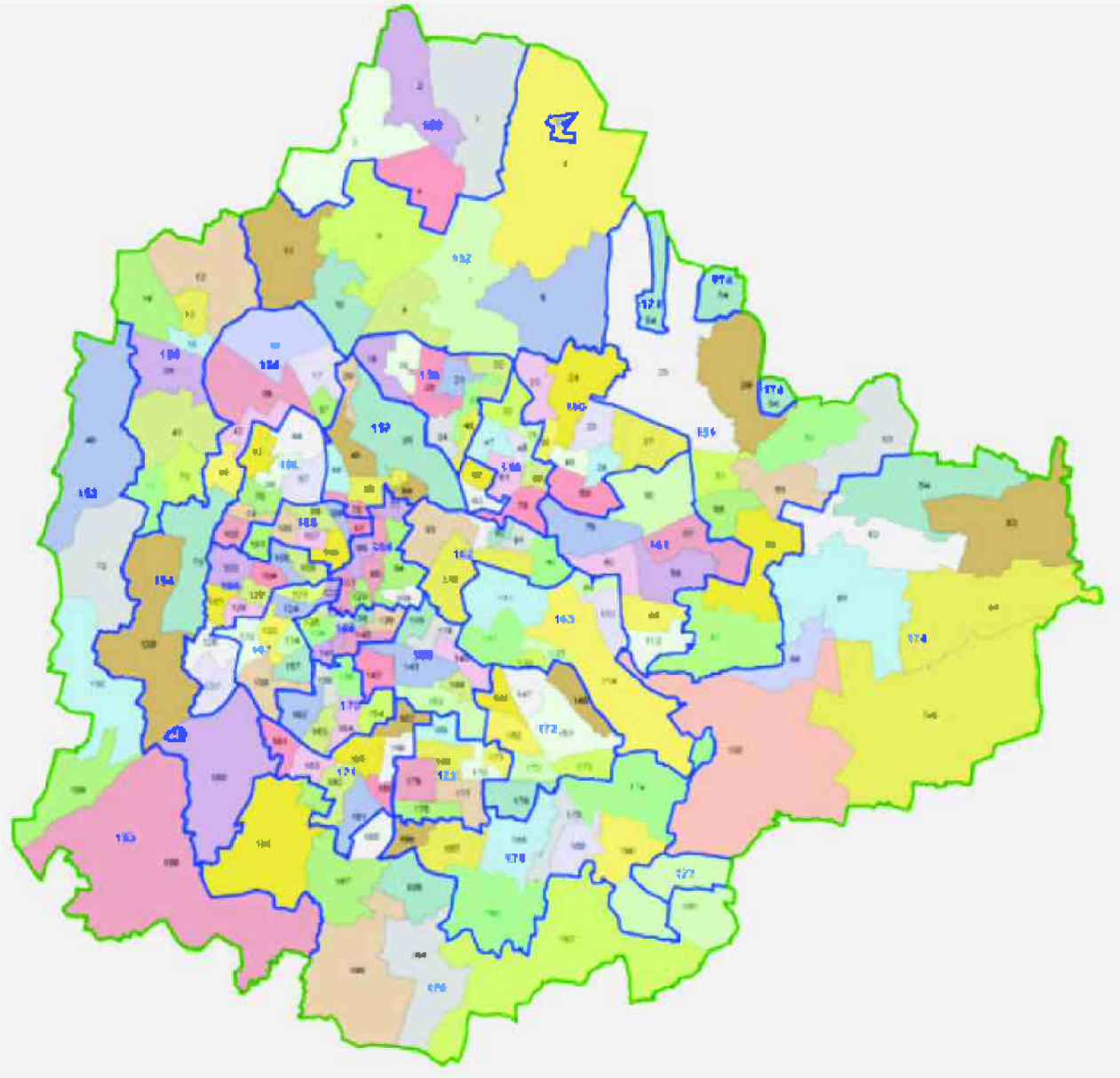
BB Area will be delimited into 198 wards as of 2009 and as notified from time to time by GoK (Government of Karnataka).

Each ward is a living, geographical area of about 40-50,000 citizens per ward. Henceforth the ward will be the smallest unit of planning and development.

BBMP will be responsible for developing a detailed ward development plan and budget each year. Each ward will be delineated into specific Neighborhood Areas each of which represents layouts, colonies, etc.

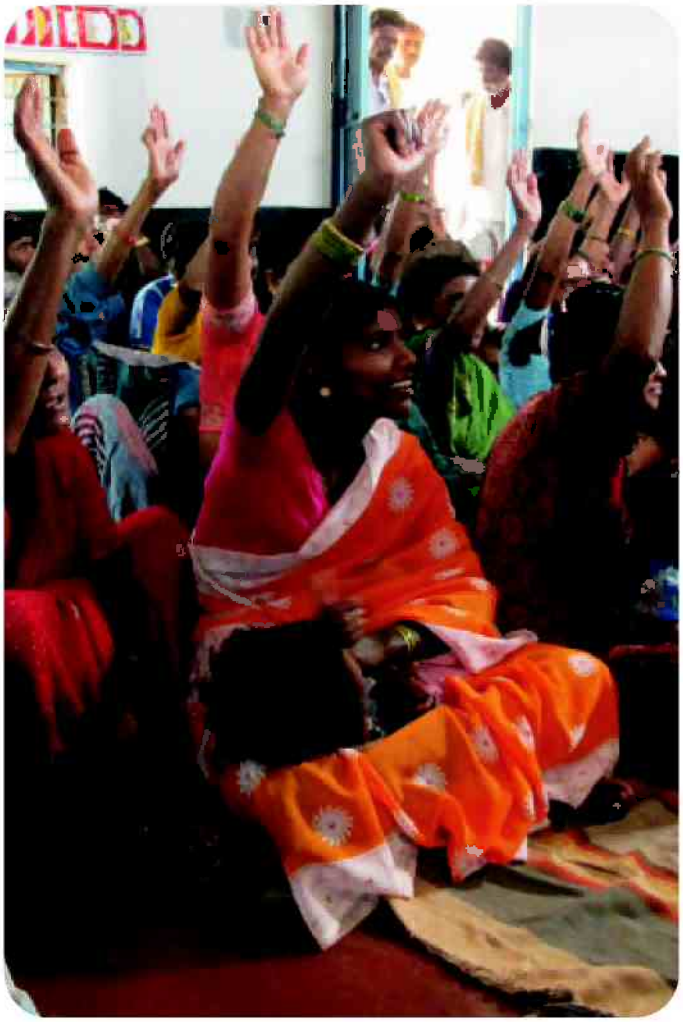
Each ward will have a minimum of at least one service center per 5000 persons. Every ward will have a Ward office. Each ward will have a Ward land register. Ward office will be the administrative center for all municipal services and be headed by a Ward-in-Charge Engineer.

Ward committees to be chaired by corporations consisting of elected and nominated members from the ward will be political unit for each ward.



Ward-wise spatial map

Issue 2 : Citizens not empowered



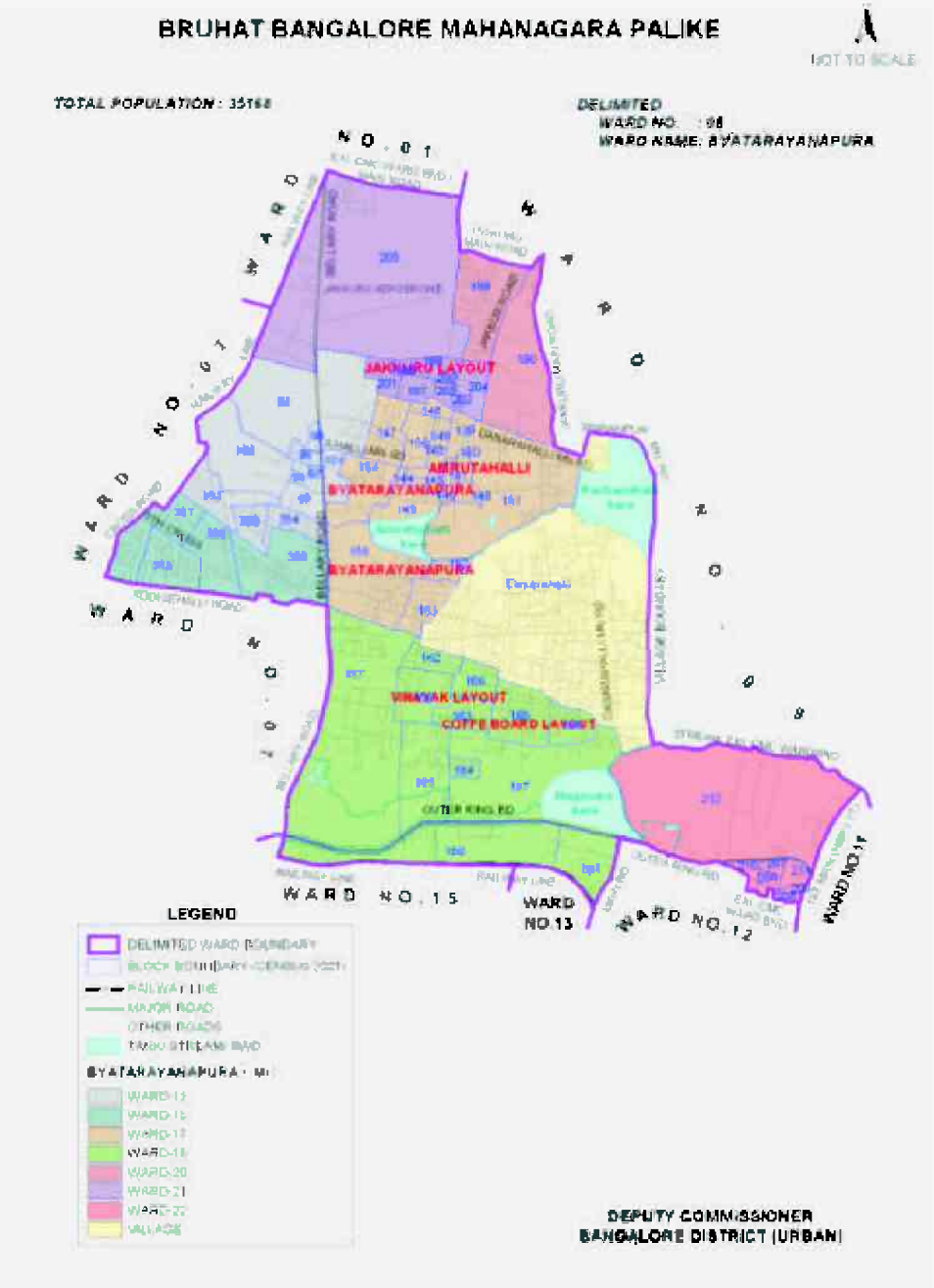
BRGA 2009: NEIGHBORHOOD AREAS

Every ward will be delineated into distinct Neighborhood Areas (NAs). The concept of Neighborhood Areas and Neighborhood Area Committees will be empowering for the citizen and allow him/her to participate in the development of his/her neighborhood.

Each neighborhood area will have a Neighborhood Area Committee (NAC). The NAC will have the right to approve or veto a specific set of issues that impact their NA.

NAC approval rights should include land use and building plan approvals, nature of commercial development, permission for pubs, bars, restaurants, parking, etc. A full list of NAC approval rights will need to be developed.

Neighborhood Areas could choose higher levels of service if they choose to pay higher taxes. Alternately, neighbourhoods should be allowed to self-manage the provision of services over and above those provided by BBMP, at their own cost.



An example of ward delineation into neighborhood areas

Issue 3 : Flawed Contracting

BRGA 2009: MAINTENANCE CONTRACTING

The current contracting methodology is leaky and flawed. It is creating poor infrastructure and dissatisfied citizens.

There is a need for a re-look at this contracting process, keeping citizens and city interest as its only objective.

The model is for the government, to focus on planning, enforcement, standards – outsourcing contracts, execution to capable private companies and contractors.

All roads in BBMP network should be uniquely named and identified and all government agencies should use this standardized naming to prevent double billing and other contractual frauds.

Each agency will create Work Packages of Maintenance Projects. Work Packages could be road, water supply, sanitation, solid waste management etc – ward or multiple ward wise.

Model contracts will exist for each of the packages. Model contracts will have the following clear definitions:

- Quality, technical specifications.
- Severe and binding performance, quality obligations from contractors and penalty clauses
- All contracts to be multi-year with annuity payments to improve the city's financing. Contractors who are able to arrange external financing and not depend on city financing alone will be preferred. (NHAI model).

All ward offices should have disclosure boards and websites for all contracts in the ward with contract/contractor details, land use conversion approvals, all new projects and plan sanctions.

Issue 4 : Transparency

BRGA 2009: TRANSPARENCY AND DISCLOSURE

The Lok Ayukta Act must be strengthened. The Karnataka Transparency Act should be amended to create flexibility of spending limits for studies, surveys, consultancies in urban and rural areas with different limits for each.

All ward offices will have disclosure boards and websites for all contracts in the ward with contract details, land use conversion approvals, and all new project and plan sanctions

.

All agencies will have websites with information on contracts with contract details, and land use conversion approvals. All new project and plan sanctions will be mandatorily disclosed on websites and ward offices.

An annual report card system will be introduced. The BBMP will ensure the publication of report cards in the public domain for all wards. The BDA will publish report cards for all areas under its mandate and the BMRDA for all private townships and Local Planning Authorities under its jurisdiction.

Annual ward-wise meets will be held to present and discuss the report cards. The Bengaluru City Report card is to be presented by the BMRDA/MPC with the Chief Minister as Chairman. An annual "State of City" summit will be held to discuss and present the report card.

Bengaluru Website: The official city website will be www.nammabengaluru.gov.in . This website shall be the fundamental platform for interaction between Government Agencies and residents. In addition Government will use mass media to communicate regularly with residents on various topics and issues.

Issue 5: Capacity building

The Government will establish an Institute of Urban Planning and Governance (IUPG). The Institute will be developed and located within IIM/IISc/NIAS. A leading International Urban Planning Institute will be associated with this effort. Urban civil servants and team members will have regular training programs in best technologies, practices and tools.

Issue 6: Financing

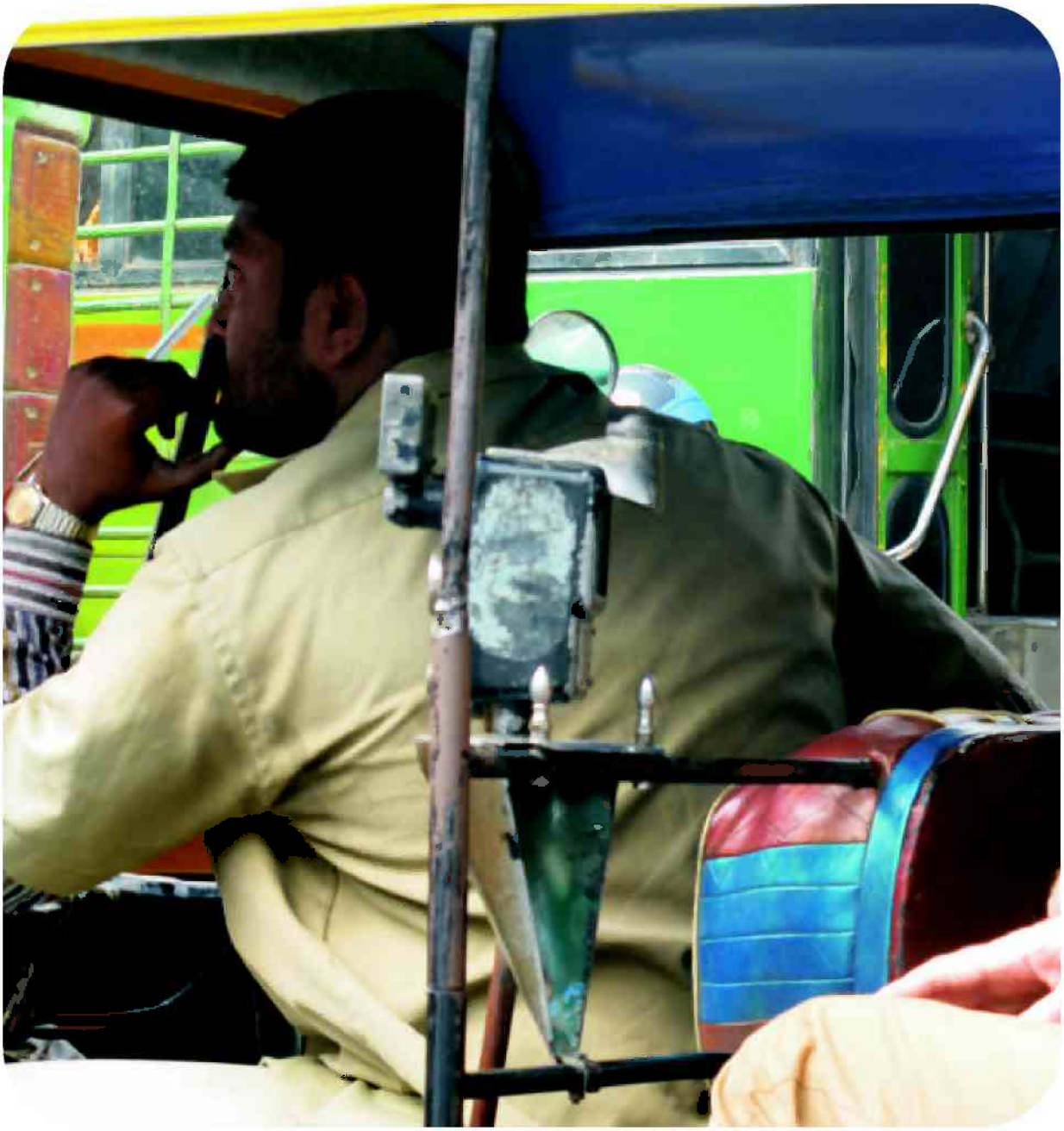
Currently, per capita tax revenue for BBMP is the lowest amongst its peer cities. Hence, revenues need to be boosted. The model of "user –pays" will be incorporated legally with subsidies for specific notified neighborhoods / households for services, i.e infrastructure cess, solid waste management charges, differential tariffs for different service levels, etc, water supply rate provisions and so on.

There should be more compliance by and tax coverage of the 16 lakhs taxable homes and new models to raise revenues from higher income Neighborhood Areas.

There should be a separation of maintenance budgeting/financing and capex /capacity enhancement budgets/financing. Moreover, capex financing will be done through PPP, non-recourse debt raising etc. There should be penalties imposed for non-compliance and default on payments.

Projects where free land is given for viability gap should be discouraged. Instead, the viability gap for such projects must be quantified and returns to the PPP project must be understood.

ROADS, TRAFFIC MANAGEMENT AND TRANSPORTATION



ROADS, TRAFFIC MANAGEMENT AND TRANSPORTATION

Part 1: Overview

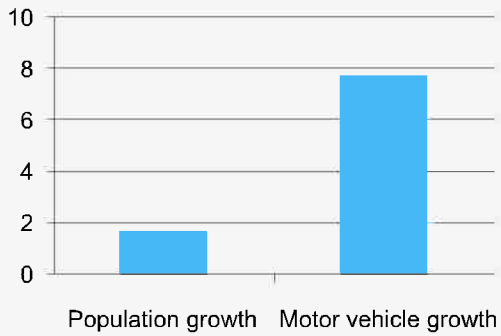
Bengaluru is not just important as a city; it forms a hub with links to Hosur, Mysore, Kolar, Tumkur and Chickballapur.

Because of the growth in the economy and the availability of financing for motor vehicles, there's been an explosive growth in the number of vehicles. But these vehicles have to operate on the limited amount of road space.

Inadequate transport infrastructure has led to private / personal vehicles as well as intermediate means such as autos and taxis, which lead to congestion of roads. This in turn has resulted in sub-optimal performance of public transport (overcrowding, delays, etc). Further, inadequate parking space has resulted in street parking on most roads, in turn reducing their carrying capacity.

Compared to international standards in developed cities, car ownership in India is still significantly low and is expected to grow over the coming years.

Poor mobility may reduce the economic growth of cities and reduce the residents' quality of life. In order to address the urban mobility issues and ensure safe and sustainable mobility in the coming decades, the Ministry of Urban Development, Government of India, formulated the National Urban Transport policy in April 2006.



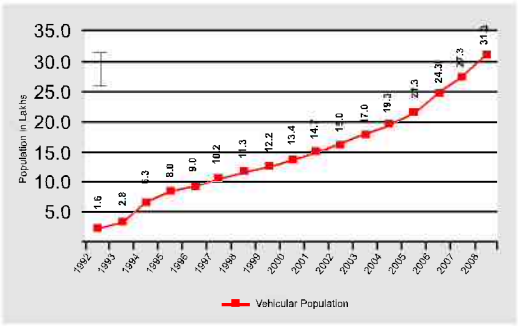
Population growth vs Motor vehicle growth (times)

Vehicle Statistics

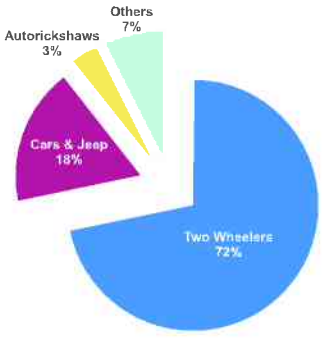
The BMR region has 31.37 lakh vehicles. Two wheelers constitute 72% of the total, with an annual growth rate of 13% per annum.

The number of registered vehicles grew from 6.28 lakhs in 1990 to 25.27 lakhs in 2006.

Moreover, vehicle ownership rates have also increased - from 58 vehicles per 1000 in population in 1981 to 365 vehicles per 1000 population in 2006. Bangalore Urban has the most number of vehicles, compared to Bangalore Rural district and Ramnagaram.



Vehicular population in BMR



Composition of Vehicles

Road Network

Two national expressways, three national highways and 12 state highways connect the major towns and cities within BMR and beyond.

With the growth of the city, travel distances have increased, along with an increase in traffic congestion and travel times. The roads, the majority of which are less than four lanes, do not have the capacity to handle such large volumes of traffic.

However, adding to the existing road capacity is not a long-term solution. Any road addition programs will need to be supported by public transport solutions.

Traffic volumes along major roads in the BMR 2008

Public Transport (Bus based)

Currently, Bengaluru and its surrounding regions are served by two public transport (bus-based) organizations – the BMTC (Bangalore Metropolitan Transport Corporation) and KSRTC (Karnataka State Road Transport Corporation).

BMTC runs what's considered to be a well-run bus system. Every day, it carries about 35 lakh passengers, on its 4,100 buses plying 1,700 routes.

However, by 2025, it is estimated that 60 lakh trips will be undertaken by buses only on all 27 grid routes. This signals an urgent need to augment and upgrade the capacities of the bus transport organizations.

Air Transport

The city is served by the BIAL (Bengaluru International Airport Ltd), located on a 4,000 acre site with a terminal building covering 70,000 sqm. The airport connects to 28 domestic and 16 international destinations. The airport can handle about 3,000 passengers per hour.
The main road leading to the airport has high traffic volumes.

Freight Infrastructure

The Container Corporation of India (CONCOR) has an Inland Container Depot (ICD) at Whitefield. The Container Warehousing Corporation (CWC) has 10 warehousing facilities.
However, transport and logistics services relating to container movement have been neglected.

Transport Agencies

In 2007, Karnataka government constituted the Directorate of Urban Land Transport (DULT). In addition, the Bangalore Metropolitan Land Transport Authority (BMLTA) was created for the BMR to facilitate the functions of the DULT.
For the implementation of a common vision relating to traffic and transport issues, this body coordinates the relevant transport related authorities such as KSRTC, BMTC, BMRCL, BBMP, PWD, BDA and so on.

Background: National Urban Transport Policy (NUTP) 2006

The key objectives of the policy were:

- Incorporation of urban transportation as an important parameter at the urban planning stage, rather than being a consequential requirement.
- Encouraging integrated land use and transportation planning.
- Bringing about a more equitable allocation of road space with people, rather than vehicles, as its main focus.
- Addressing concerns of road safety and trauma response.
- Associating with the private sector in activities where their strengths can be beneficially tapped.

In order to promote the development of integrated land use and transport plan for all cities, all urban development and planning bodies in the states would be required to have in-house transport planners as well as representation from transport authorities in their management. The government of India would extend support for the preparation of such integrated land use and transportation plans by:

- Providing 50% of the cost of preparing comprehensive city transport plans and detailed project reports.
- Offering equity participation and / or viability gap funding to the extent of 20% of the capital cost of public transport systems.
- Offering 50% of the cost of project development whenever such projects are sought to be taken up through public-private partnerships, so that a sound basis for attracting private partners can be established. The remaining cost of such project development will have to come from the city's development authority/state government and a project developer.

Background: Study on Traffic and Transportation Policies and Strategies in Urban Areas in India

A study was conducted by the Ministry of Urban Development, Government of India, in 2007 to update transportation information and projections made from the previous study, in order to review the National Urban transport Policy. (The previous study was conducted in 1994 to establish the urban transport scenario and forecast the anticipated issues that would most likely crop up in future. The report was submitted in 1998).

The salient features of the study

30 cities were selected out of a total of 87 cities including Bangalore. The factors considered for selection of cities included the following parameters:

- Size of the city
- Shape of city
- Availability of public transport
- Economic activity level of the city
- Congestion and geographical locations.

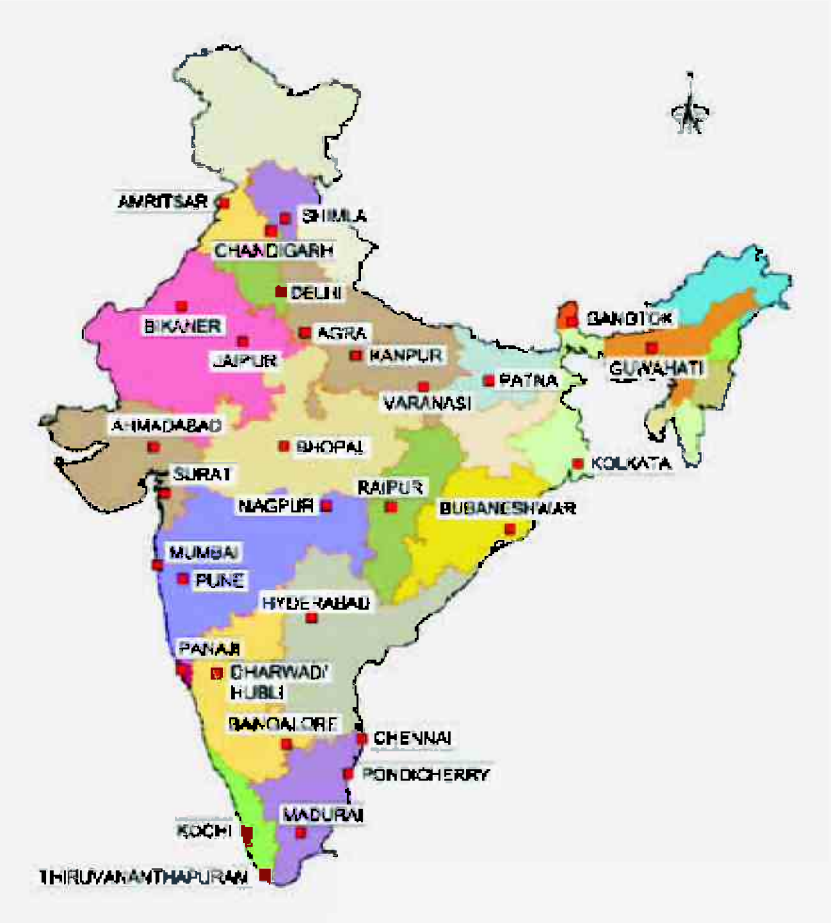
Background: Bangalore

The study found that public transport in Bangalore has dwindled, while share of personalized modes, especially 2 wheelers has gone up with growth of 12% per annum. Consequently, street congestion has dramatically increased and overall speeds on major corridors have dropped.

The study also found that operating bus services in congested roads has become difficult. Fleet sizes in most public undertakings have declined rather than grown to meet the demand.

Moreover, the study found that there was a decline of non-motorized transport, especially cycles. Many factors have contributed to reducing cycles to less than 11% of the mode share, which is down from nearly 30% in 1994.

The study further found that facilities for pedestrians are almost nil. The percentage of roads with pedestrian footpaths is hardly about 30% in most cities.



Cities Selected for Detailed Study

Average journey speed on major corridors during peak hours

Anticipated Average journey speed (kmph) on major corridors by city category

Sl No.	City Category	Population	2007	2011	2021	2031
1	Category - 1	<5 lakh	26	22	15	8
2	Category - 1	5-10 lakh	22	18	13	
3	Category - 1	11-20 lakh	18	13	10	7
4	Category - 1	21-30 lakh	22	18	12	9
5	Category - 1	31-40 lakh	19	15	10	7
6	Category - 1	41-50 lakh	17	12	9	6

Growth trend in vehicle population

Sl No.	Name of City	Annual growth rate (1995-2000)
1	Bengaluru	14%
2	Chennai	8%
3	Delhi	7%
4	Hyderabad	12%
5	Kolkata	7%
6	Mumbai	8%

The annual rate of growth of motor vehicle population in India was about 10% in the decade 1991-2001. From the above table it can be seen that the vehicle growth rate in Bangalore is higher than mega cities like Delhi, Chennai, Mumbai and Kolkata.

Share of major roads used for parking

Sl No.	Name of City	% of Major Roads used for on-street Parking
1	Bengaluru	27
2	Chennai	29
3	Delhi	17
4	Hyderabad	14
5	Mumbai	16

Share of bicycles and pedestrians in road accidents (2005)

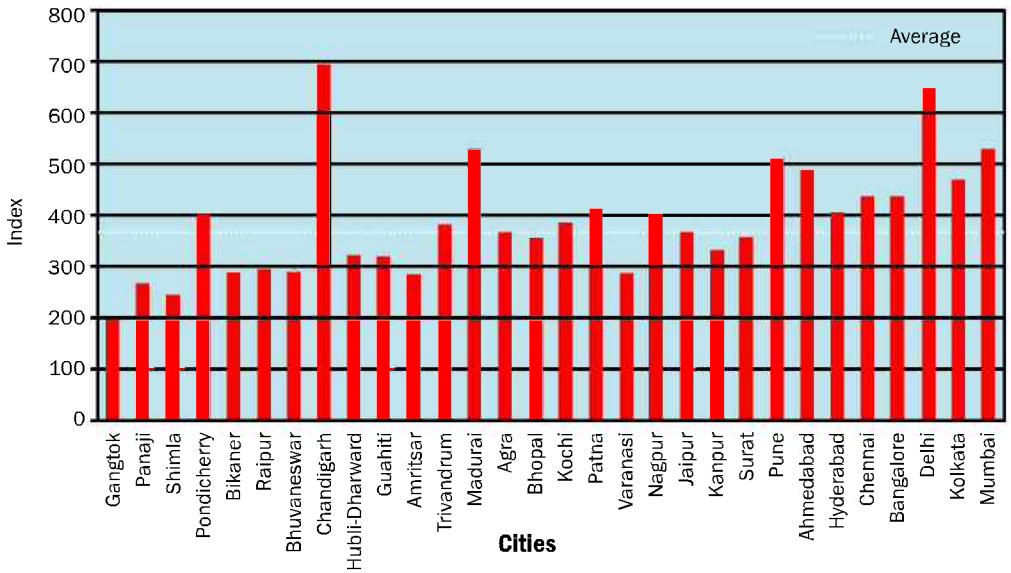
Sl No.	Name of City	Bicycle accidents (%)	Pedestrian accidents (%)
1	Bengaluru	2	2
2	Chennai	5	5
3	Delhi	5	5
4	Hyderabad	5	5
5	Kolkata	6	6
6	Mumbai	3	3

Pedestrian facility ranking

Mode share percentage

Sl. No.	City	Walk	Cycle	Two Wheeler	Public Transport	Car	IPT	Total
1	Gangtok	56	0	4	0	40	0	100
2	Panaji	34	3	26	5	27	5	100
3	Shimla	58	1	8	16	17	0	100
4	Pondichery	40	15	30	7	4	4	100
5	Bikaner	46	19	22	0	8	5	100
6	Raipur	35	28	25	0	9	4	100
7	Bhuvaneshwar	28	21	30	4	12	4	100
8	Chandigarh	23	18	10	18	28	3	100
9	Hubli Dharward	23	19	25	22	10	0	100
10	Guwahati	21	21	20	8	18	12	100
11	Amritsar	27	25	31	0	14	4	100
12	TVM	26	19	14	21	10	10	100
13	Madurai	34	18	15	16	7	9	100
14	Agra	27	21	31	2	17	3	100
15	Bhopal	26	17	31	15	9	3	100
16	Kochi	16	5	14	51	9	6	100
17	Patna	26	31	20	0	12	10	100
18	Varanasi	24	17	34	0	10	15	100
19	Nagpur	21	28	35	12	3	2	100
20	Jaipur	26	13	26	22	8	4	100
21	Kanpur	29	19	21	9	16	7	100
22	Surat	27	16	34	0	16	7	100
23	Pune	22	11	35	12	12	7	100
24	Ahmedabad	22	14	25	16	17	6	100
25	Hyderabad	22	9	19	35	9	7	100
26	Chennai	22	9	20	31	10	8	100
27	Bangalore	26	7	17	35	8	7	100
28	Delhi	21	12	5	43	14	6	100
29	Kolkata	19	11	4	54	8	4	100
30	Mumbai	27	6	7	45	8	7	100

Transportation Performance Index



The transportation performance of the selected city was evaluated by developing a Transportation Performance Index based on computing several indices such as Accessibility Index (Public Transport and Services), Congestion Index, Walkability Index, City Bus Supply Index, Para Transit Index, Slow Moving Vehicles Index, and On-Street Parking Interference Index.

Part 2: Issues

1. **Significant gap between Demand and Supply of transport (including Public transport) Infrastructure and services:** Growth and investments in transport services, facilities and infrastructure have not kept pace with the growth of the BMR.
2. **Insufficient Public transport options:** Poor connectivity and available modes.
3. **Congestion, chaos and lack of safety:** The city suffers from congestion and chaos, endangering the lives of people.
4. **Lack of proper intra city road network:** The city lacks a proper intra-city road network, including to BIAL airport.
5. **Pedestrians and Cyclists neglected:** There are few facilities for pedestrians and cyclists, resulting in hardship and danger to life.
6. **Lack of freight infrastructure:** There's a lack of containerized freight infrastructure and bulk freight infrastructure near industrial corridors such as NH4 (Bangalore-Nelamangala and Bommasandra-Jigani).

Part 3: Planned solutions

The issues identified above are together addressed in the following sections.

Guiding Principles – Policy

Available financial resources must be used efficiently. We have finite financial resources and so, the solutions must be a combination of efficiency & intelligence along with new capacity building. All new projects will be subjected to 'alternate choice, cost & benefit assessment.

Public transport & pedestrian amenities will be given top priority. A significant push to increase share of public transport to 60% is needed and must be provisioned. Mass transit and public transport must form the backbone and any new capacity addition must conform to this paradigm.

Existing sub-urban areas must be equipped to de-congest the city. To manage growth and relieve the pressure in the core city, transport infrastructure in existing suburban areas (Whitefield, Yelahanka & Kengeri) should be created ahead of demand as they provide immediate relief.

Planning should be data-led, dynamic and flexible. Planning for the long-term should allow flexibility in responding to the changing patterns (geographic as well as demographic) in the city's growth, based on regular data updates.

Guiding principles – administration

Techno-managerial governance:
Techno-managerial governance must be introduced as it is necessary to deliver noticeable changes quickly, and sustain them in the long run.

Coordinated administration:
Elimination of silos in public administration of traffic and transport is a must and these must be replaced by deliberate integration and consolidation of functions.

Data-led planning:
Continuous data-led planning and implementation must be woven into the management of traffic and transport.

Continuous demand-supply assessment:
An ongoing transport demand growth study and research focus is needed to provide data-led input into subsequent planning decisions.

Single window approach:
A single nodal agency should be responsible for data collection and management. Initially this should be housed with Abide itself.

Guiding principles – method

Improve utilization of existing capacity - identify trouble spots/corridors & streamline:

High mobility pathways must be immediately prioritized. Vehicle movement on these roads must be streamlined with massive junction streamlining. This will minimize tree cutting and across-the-board road widening.

Focus on public transport:

Public transport on arterial roads must be strengthened and integrated with high-frequency service in the Core Business District.

Highest priority for pedestrians:

Pedestrian infrastructure, safety and convenience must receive the highest priority.

Traffic impact assessment of new developments:

The impact of large business campuses, apartments, malls and other developments must be mandatorily accounted for in the traffic and transport planning.

Capacity addition vs maintenance expense:

The expenditure on maintenance must be separated from expenditure on new infrastructure capacity addition.

Recommendations

Existing Capacity Management

Big10 Arterial Roads – Between City Center & ORR

An aggressive strategy of junction elimination must be formulated, to reduce travel time on Big10 arterial roads to ORR and beyond.

The Big10 routes are Tumkur, Hosur, Bannergatta, Kanakapura, Mysore, Bellary, Magadi, Sarjapur, Old Madras and HAL Airport Rd. Additional arterial routes leading in and out of the city may also be considered Big10 roads.

Each of these Big10 roads must be surveyed to arrive at a scientific solution for junction redesign or removal. The intersections of these 10 roads with ORR should be made junction free.

At all T junctions on these 10 roads, underpasses for traffic should be provided. Roundabouts at other locations must be explored.

The U-turns on these Big10 roads should be made pre-emptive, so that motorists can take U turn before intersections, using Jug Handles with extra lanes provided for U turning traffic.

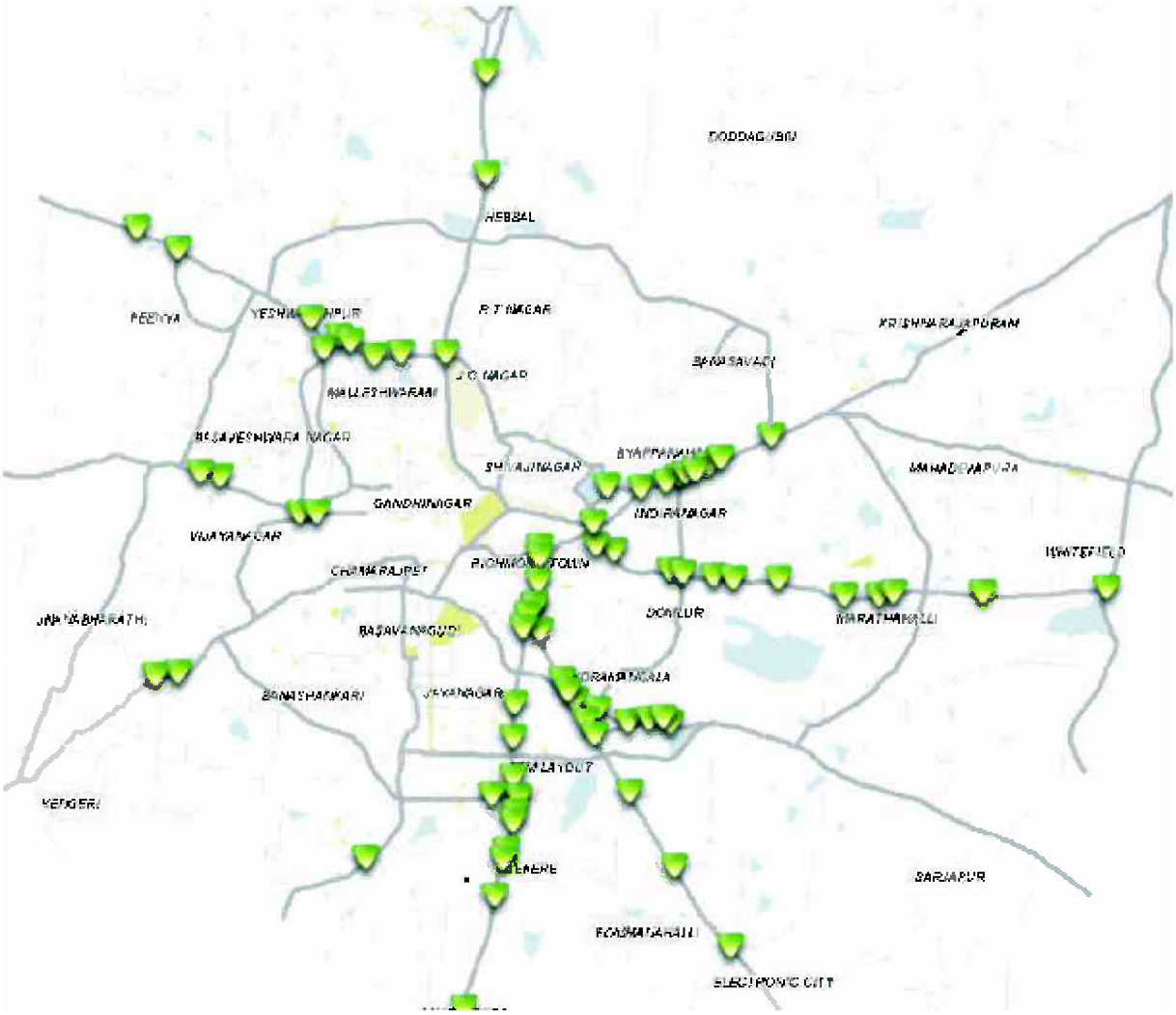
Big10 Arterial Roads – Between City Center & ORR

Bus bays & footpaths must be mandatory on all Big10 roads. Higher FSI permission should be given to owners giving land for bus bays, if required.

Priority (not dedicated) bus lanes must be marked on all these 10 routes for faster movement of public transport buses.

Big10 Arterial Roads – ORR to Suburban Towns

All Big10 arterial roads to be converted into 6-lane, signal-free and junction-free pathways between ORR and next major towns – Whitefield, Yelahanka, Kengeri, Hoskote, Sarjapura, Hosur & Nelamangala etc, with median provision for MRTS later.



Big10 Arterial Roads – Junctions

Big10

Arterial road junctions

TUMKUR ROAD
- Heserghatta
- Jalahalli Cross
- Yeshwantpur RS
- Tumkur Road Flyover
- Yeshwantpur Circle
- New BEL Road
- C N R Rao Circle
- BEL road

MAGADI ROAD
- Pete Mariappa Circle
- Kamakshipalya
- Dr Rajkumar Rd Jn
- Magadi Rd @ Chord Rd

BELLARY ROAD
- Bagalur Main Rd
- Kugulu Cross
- Kodigehalli Jn
- Yelahanka Jn
- Mekhri Circle

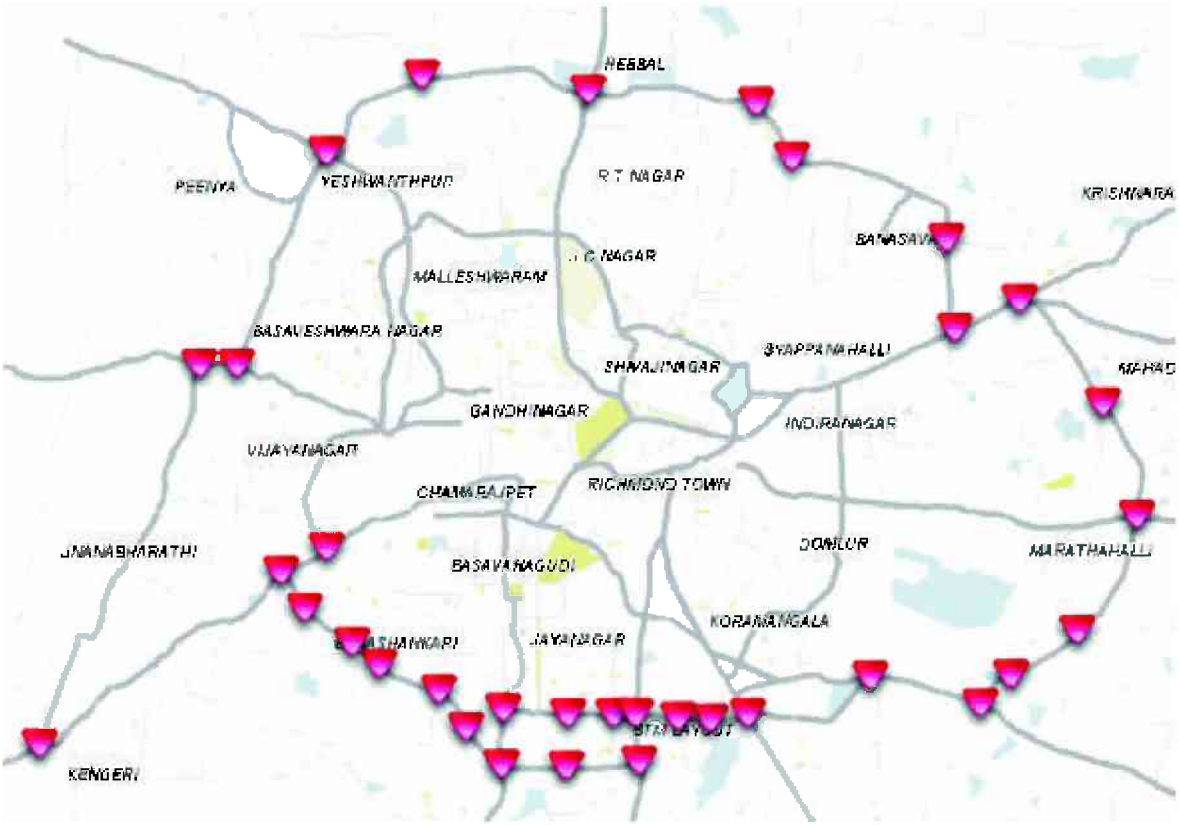
SARJAPURA ROAD
- Sector 5 Lake Road
- Jakkasandra 1st Main
- Jakkasandra 7th Main
- Krupanidhi College
- Indian Institute of Astrophysics
- Mphasis / HPCL

OLD MADRAS ROAD
- Kaggadaspura Road
- NGEF
- Suranjan Das Road OMR
- Indiranagar 80 Ft Road
- Baiyapanahalli Rd
- Indiranagar 100 Ft Rd Jn
- Indiranagar BDA Junction
- Jayalakshmi Ammal Temp
- Philips Junction

BANNERGHATTA ROAD
- Gottigere
- Hulimavu
- Arekere Gate
- IIMB South Jn / Samrat Layout
- IIM North Jn / Bilekahalli
- Devarchikkanahalli Rd Jn
- BTM 29th Main - Mantri Elite II
- BTM 29th Main - Mantri Elite
- Sarakki Jn
- Jayadeva Hospital / BTM Flyover
- Jayanagar 9th Block 39th Cross
- Sagar Appollo / Tilaknagar
- MICO Jn / Pukhraj Layout
- Marble Market

HAL AIRPORT ROAD
- Varthur Kodi
- Kundalahalli Rd
- Dodda Nekundi Rd
- Yamlur Jn
- Namjoshi Rd
- Suranjan Das Road
- Wind Tunnel Road
- Manipal Hospital
- Domlur Flyover
- Domlur Bus Stand
- Command Hospital
- Agram Junction
- Trinity Junction

HOSUR ROAD
- Jail Junction
- Novell Jn / Kudlu Road
- Begur Road
- Madivala Police Station
- Koramangala 17th Main
- Mphasis / Marigowda Rd
- Raheja Arcade / Forum
- Adugodi Jn
- Anepalya Rd Jn
- St.Patrick's Cemetery
- Langford Road CMP Gate
- Fatima Bakery
- Vellara Junction



ORR Junctions, including those on Big10 roads.

- Banashankari Bus Stand
- Chord Road Jn
- Nayandanahalli Jn
- ORR at Kengeri
- Vokkaligara College
- ORR at Magadi Road
- Goruguntepalya
- Hebbal Flyover
- Nagavara Jn
- Ramamurthy Nagar
- ORR on OMR
- K R Puram Rly Stn
- Doddenakundi Jn
- Marathahalli ORR
- Agara Kere
- JD Mara Jn / Mandovi Motors
- Silk Board
- Jayadeva Hosp. BTM Flyover
- Family Mart
- Kadabisanahalli
- Bellandur Jn ORR
- Iblur Jn
- Hennur Main Rd
- Kuvempu Circle
- Kuvempu Nagar
- NCERT
- Kathrigupe Road
- Deve Gowda Petrol Bunk
- Subramanyapura Main Rd
- Puttenahalli
- JP Nagar 24th Main Rd
- East End Circle
- Udupi Garden
- BTM 29th Main

ORR Improvements

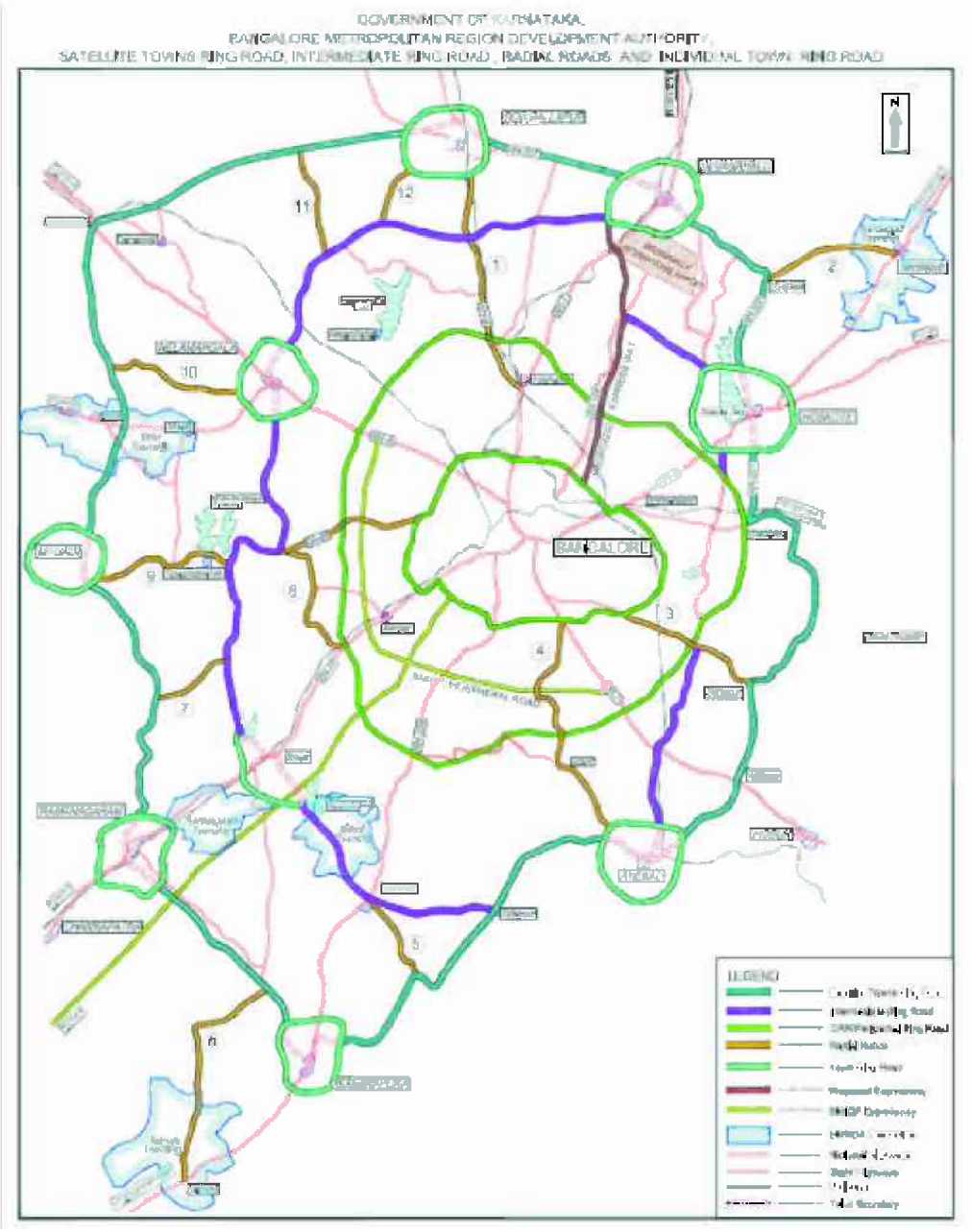
The ORR should be made signal free. The Service roads along ORR, wherever available, must be completed in all respects.

Bus bays/shelters/footpaths should be made mandatory. Priority (not dedicated) bus lanes should be marked all along ORR for faster movement/promotion of public transport

All Big10 roads' intersections with ORR should be made junction free.

Since the ORR is a major pathway, upkeep and lighting of ORR should be of the same standard as the Bellary road to BIAL. Median greening, mechanical cleaning and improved lighting should be given immediate priority.

The need for an elevated ORR on the median to augment its capacity and provide for BRTS may be assessed after it is made signal-free.



An example of a region-wise connectivity plan. High-quality connectivity between various economic hubs in the region will be critical to growth.

RECOMMENDATIONS

New capacity creation

IRR-STRR

Of these two, only STRR may be retained. The connectivity between nearby towns should be established using existing direct road linkage between them, rather than a full IRR.

PRR and NICE

Between the ORR and PRR/NICE, connectivity should be provided between each set of 2 adjoining Big10 arterial roads using the existing roads/MDRs (Major District Road). The decision to interconnect to NICE is subject to agreement on technical and commercial terms.

Airport connectivity

Single road access to BIAL using Bellary road is congestion prone & strategically flawed. Hence, the following measures should be taken.

West-Side Road Access

Connectivity between Tumkur Road (NICE at Nelamangala) and Bellary Road should be established, to ensure fast, west-side access to the airport.

East-Side Road Access

Connectivity between Old Madras Road (Hoskote) and the airport should be established via Budhigere Road to provide alternate road access to BIAL from the east side.

Rail Access

Rail connectivity to the airport should be explored along existing the SW Railway track on Chikaballapur route. An hourly service on this route from the major stations within the city (City, Cantonment, K R Puram, Whitefield) can be established using existing SW Railway lines.

Local lakeside circular roads

All lakes within the BMRDA region should be fully encircled by well developed roads. In anti-clockwise movement, a two-way bicycle and walking path should be developed to the left of the road.

No further construction to the left of this path should be permitted. In the case of lakes where such circular roads exist partially (e.g. Madivala lake), the remaining portion of the road should be constructed to provide a full circle of movement.

This approach should also be considered for all large campuses – e.g. greater than 30-50 acres. These should have circumference roads abutting their periphery and acquisition to ensure this can be considered. Such roads will also serve as boundaries for lakes and protect against encroachment in future.

Monorail and Elevated Core Ring Road

These proposals may be deferred for consideration until the recommendations here are implemented. Elevated roads in CBD should be avoided since they will cause too much damage to the city's environment and aesthetics.

Town Planning

New layout developments

Road & transport planning should be part of any township's spatial planning, with specifications to be standardized.

All arterial roads and public transport corridors should be planned with set-back and green ribbon on each side. Corner plots in new layouts and corner plots along roads of 60 feet width or more should be retained by the government, to allow bell mouthing, roundabouts, clover-leafing and other choices in the future.

STRR, when developed, should be signal free and junction free, for inter-township connectivity and for bypass. Similarly, the PRR should also be signal free, junction free (one half or 2 halves depending on agreement with NICE on 8 lane and toll).

Infrastructure Planning & Maintenance

Road maintenance and new infrastructure creation

The BBMP road network, especially the arterial roads, should be maintained through multi-year contracts as in the case of NHAI.

Safe pedestrian cross-walks should be installed underground or overhead at all major junctions. An initial list of these junctions is provided, and may be expanded by city agencies. Diagonal crossings should also be provisioned.

Specific maintenance plans and schedules for additional infrastructure, such as parking, pedestrian walkways and intersections should be developed and maintained publicly. Expenditure on the maintenance of road infrastructure should be separated from capital expenditure on new projects.

Promoting public transport & making it efficient

Emphasis on public transport

'Bus priority' (not dedicated) lanes should be marked on Big10 arterial roads. BRT Service should be explored on existing major roads having 3 lanes in each direction.

Fleet Expansion

BMTC's fleet strength should be doubled as rapidly as possible, from the current 5700 to 11,000. Care should be taken that a portion of the new additions (10-15% of the overall fleet) should be small buses capable of serving narrow lanes in neighborhoods.

Big10 Bus Service on Arterial Routes

BMTC has introduced Big10 services at high frequencies on all of the major arterial routes leading into and out of the city. Big Circle service on Outer Ring Road has also begun.

There must be an immediate expansion of these direction-based routes, along with local routes and services in many neighborhoods connecting to this grid. A circular service for the central areas of the city should also be introduced, with sufficient support to enforce 'no-parking' and availability of left lanes for buses. The HOHO service attempted in 2009 may be tweaked and re-introduced.

Efficiency

BMTC must develop specific level-of-service metrics in addition to considerations of profit.

Metro

All Metro stations should have provision for simultaneous arrival and departure of 4-5 buses integrated into their design. It should not be necessary to leave the Metro premises to board a bus. Covered walkways to bus stops from stations should be provided.

The Metro will be responsible for providing protected pedestrian access to all stations from within 500 meters of the station or nearest large junction.

This pedestrian infrastructure should be integrated with Metro station design, look & feel. The work should be started right away to boost the public image of Metro, given the hardship caused by the Metro construction.

Metro stations should have parking for sufficient numbers of cycles, 2-wheelers, autos, taxis and 4-wheelers. Terminal stations should have Park & Ride facilities sufficient to accommodate demand.

Metro expansion from Byappanahalli to ITPL should be considered in 1st phase, to improve financial viability.

Big campuses, apartment complexes & malls

Entrance to campuses, large buildings and offices on arterial roads must ensure that their gating is well inside the roadway and does not cause back-ups on the road.

A framework and ready-to-use model should be developed for private buildings, offices, apartment complexes, malls and office campuses, to provide pedestrian walkways, footpaths, over-bridge and underpasses for public use adjoining their premises.

Visitor and regular commuter parking should be adequately provisioned within the premises as part of the building plan approval process. All new plan approvals should have this mandatorily and all past plans to be allowed to do this as CSR.

When new facilities (either commercial or large residential areas) are added, their potential impact on traffic in the immediate neighborhoods should be assessed and appropriate charges should be levied to make the necessary revisions.

Large employers must promote public transport, maintain 'Traffic Footprint' indexing measures and promote schemes for improvement. The BMLTA should maintain a list of such schemes and promote these.

Traffic Management
Techno-Intelligent Management of Traffic

All signals within the city should be made intelligent, and controllable from the central traffic management center. Traffic flow on roads should be continually assessed and used to set signal timings.

All traffic junctions equipped with video cameras must also have a Public Address System (PAS) connected to the central traffic management system. This is to make announcements and educate motorists and pedestrians on traffic issues. Traffic control rooms of BTP and BMTC should be integrated into a single center with shared resources. To start with, these should be co-located, preferably on BMLTA premises.

The transport department managing vehicle registrations and driving licenses should have a centralized database accessible to traffic police, to effectively manage and monitor traffic violations and issue advisory and warnings in a timely manner.

Commuter education plans should be developed and revised on an ongoing basis. The effectiveness of these plans in improving commuter behavior should be studied by BMLTA.

Institutional Capacity Augmentation

Techno-management

The BMLTA should be strengthened and made the nodal agency for infrastructure planning and management.

The BMLTA should employ traffic and urban planners, transport engineers, designers, software and hardware professionals and other domain experts. The agency should also have expertise in project negotiations, RFP-writing, contract creation and project monitoring.

Traffic data collection and analysis on major routes should be an ongoing exercise carried out by BMLTA, using dedicated resources. Suitable infrastructure and manpower must be provided.

An ongoing transport demand growth study is needed to be carried out, to provide dynamic knowledge for subsequent decision-making.

Parking and enforcement

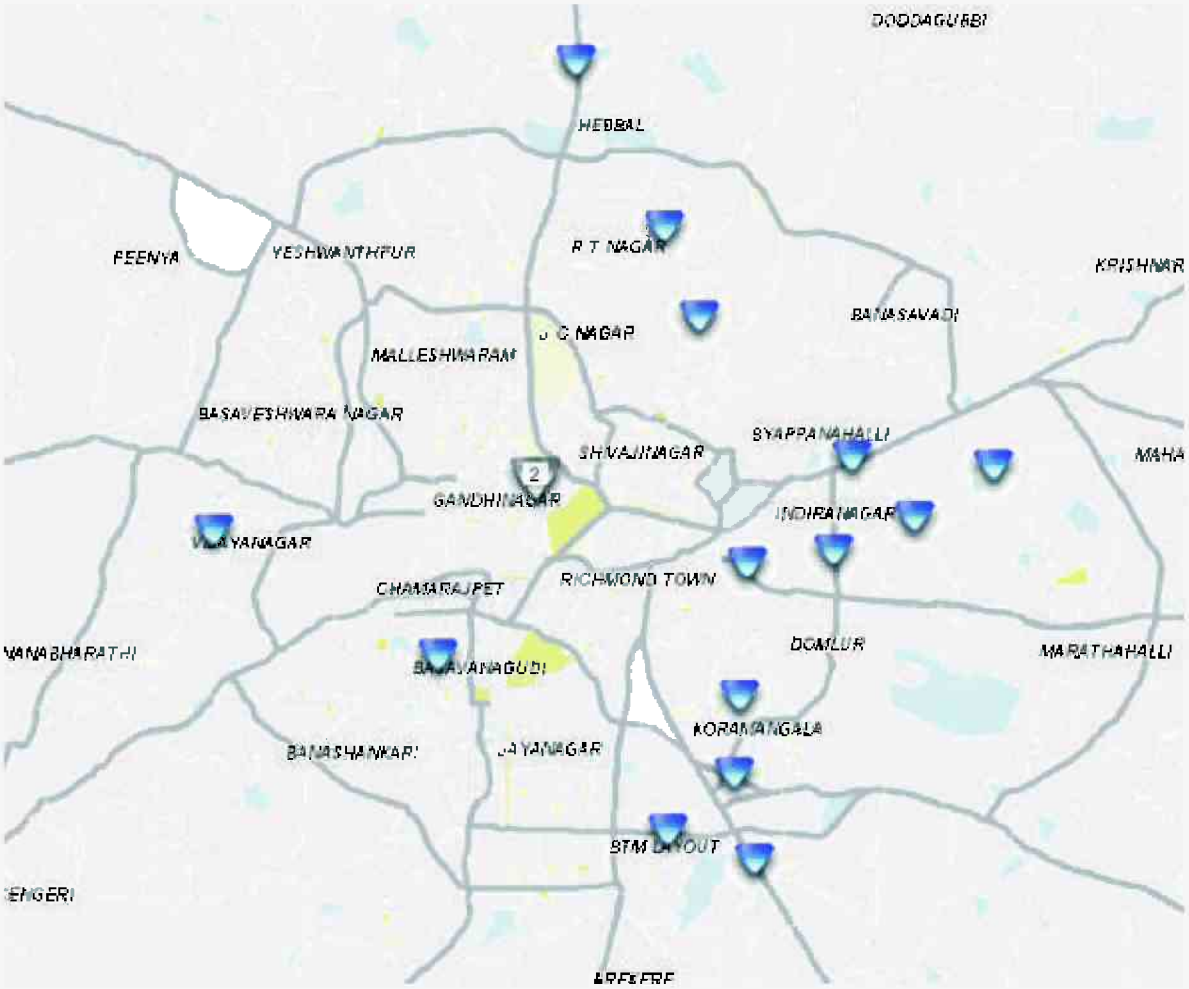
The BBMP should develop stand-alone parking facilities (surface or multi-storey) on its empty land parcels in the city using its own resources. O&M (operations and maintenance) could be outsourced to private operators on a revenue-share basis.

The current building bye-laws should be amended to provide for adequate parking facilities in line with contemporary life-style and vehicle usage patterns for all office, residential and commercial buildings. This must be done urgently.

No public parking capacity creation should be linked to a commercial complex or mall. The current proposal of developing parking capacity in conjunction with real estate development does not create sufficient net parking and should be discouraged.

Miscellaneous

A team should be constituted to focus on land relinquishment from the armed forces, central PSUs and St John's Medical College and other organizations for road widening and upgradation.



BBMP executed projects on arterial roads

Road widening

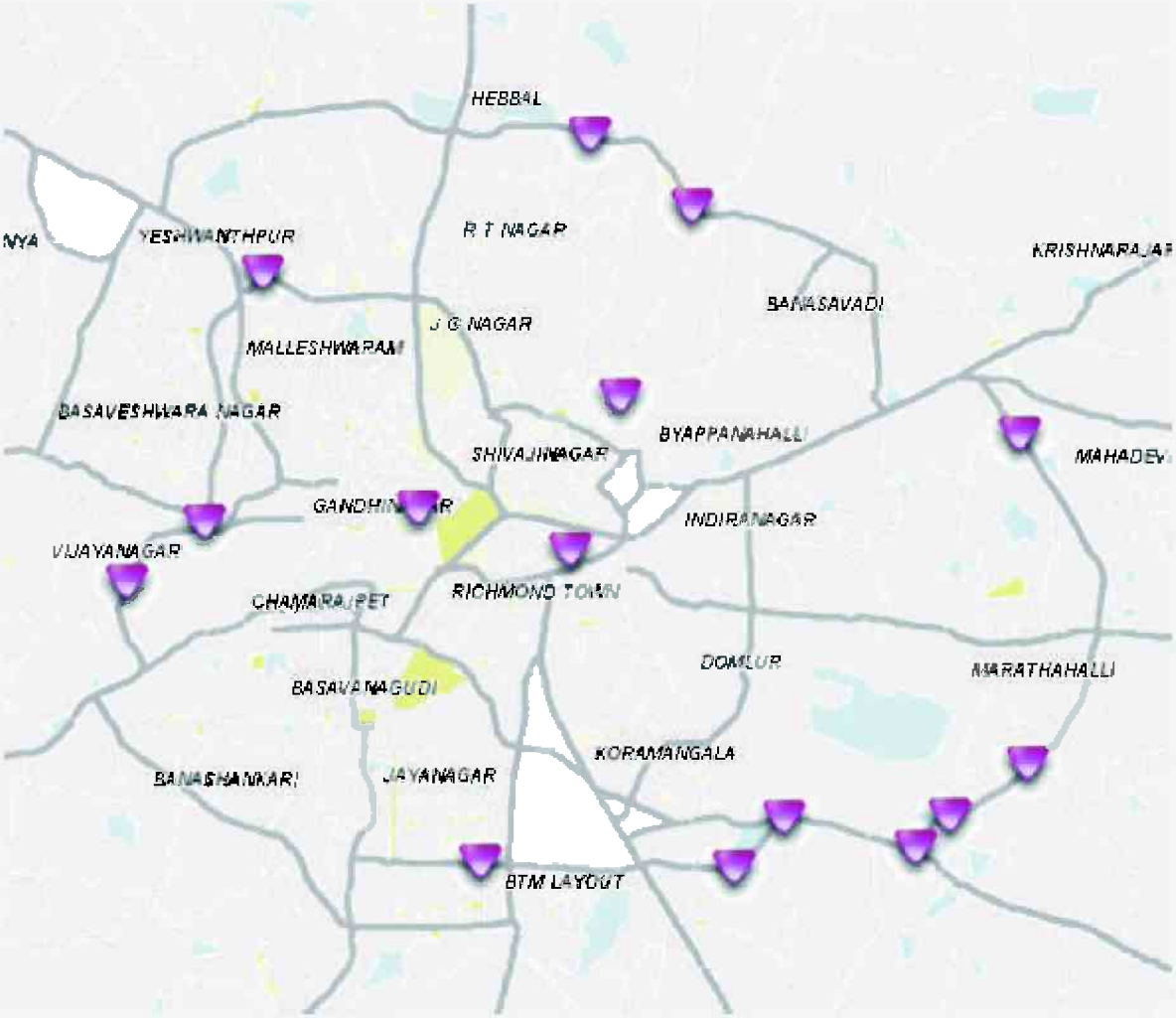
- Race Course Road
- Bellary Road
- Sarjapura Road
- Nagarbhavi Road
- Madiwala Village Panchayat Rd **
- Byrasandra Rd **
- Bull Temple Road
- Sevashram Road **
- Shampura Road
- Tannery Road
- Palace Road
- Hosur Road
- Old Airport Road up to Whitefield++
- Suranjan Das Road – HAL to OMR++

ITBT roads work

- Indiranagar 100 Feet Road
- Koramangala 80 Ft Road
- Kaggadasapura Main Road
- BTM Layout ORR Silk Board to Jayadeva++
- Old Madras Rd Ulsoor to ITPL/Hope Farm++

PIP Rd – Brookfield to Hoodi/EPIP

++ - Proposed Additions by ABIDe



BDA executed projects on arterial roads/ORR

Flyover

- Iblur Jn
- Agara Jn
- Yeshwantpur Circle

Underpass

- Forum Mall **
- Garuda Mall
- Ragi Gudda Temple
- Maharani's College

Pedestrian subway

- City Market **
- Vijayanagar Bus Stand

Rail over-bridge

- Wheeler Road

Grade separator

- Magadi Rd–Chord Rd

Signal-free ORR

- HSR Layout Jn
- Bellandur Jn
- Devarabeesanahalli Jn **
- Kadubeesanahalli Jn
- Mahadevapura Jn
- Kalyannagar Jn
- Hennur Jn
- Veeranapalya Jn

NUTP recommendations

The NUTP made the following recommendations:

- Focus transport supply in the Mass Transport domain.
- Serious attention is to be given to Non-Motorized Transport.
- Set up a Dedicated Transport Fund.
- Give a thrust to Traffic system management / intelligent Transport System.
- Create a national level database.
- The institutional setup needs to be strengthened.
- Develop transportation plans in conjunction with land use plans.

Updates have to be done at least once in 5 years. It would be suitable to carry out Comprehensive Mobility at a city level in 5 years so that the data from these can be used to update the overall transport strategy also once in 5 years.

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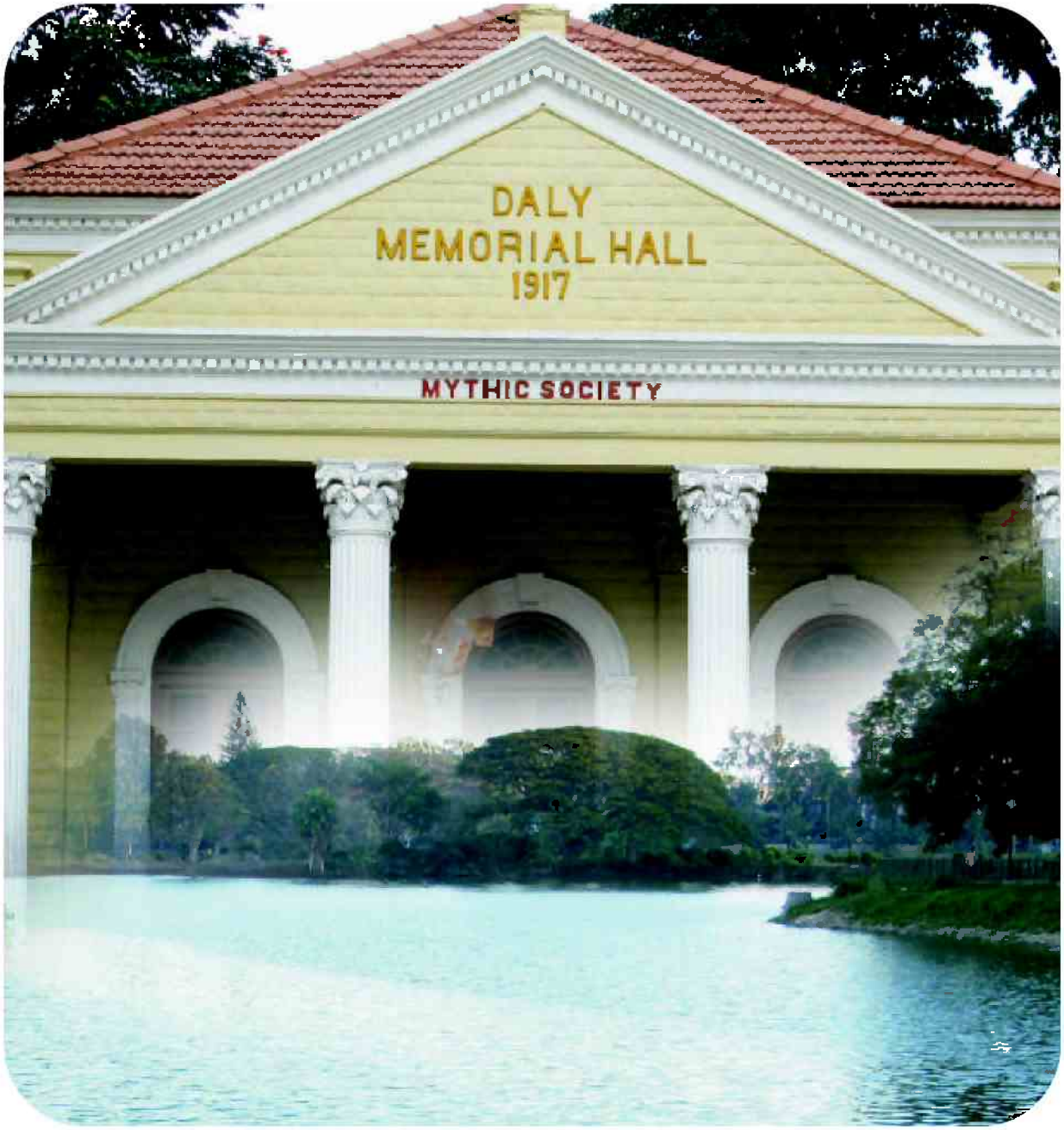
HERITAGE, ENVIRONMENT AND LAKES



HERITAGE

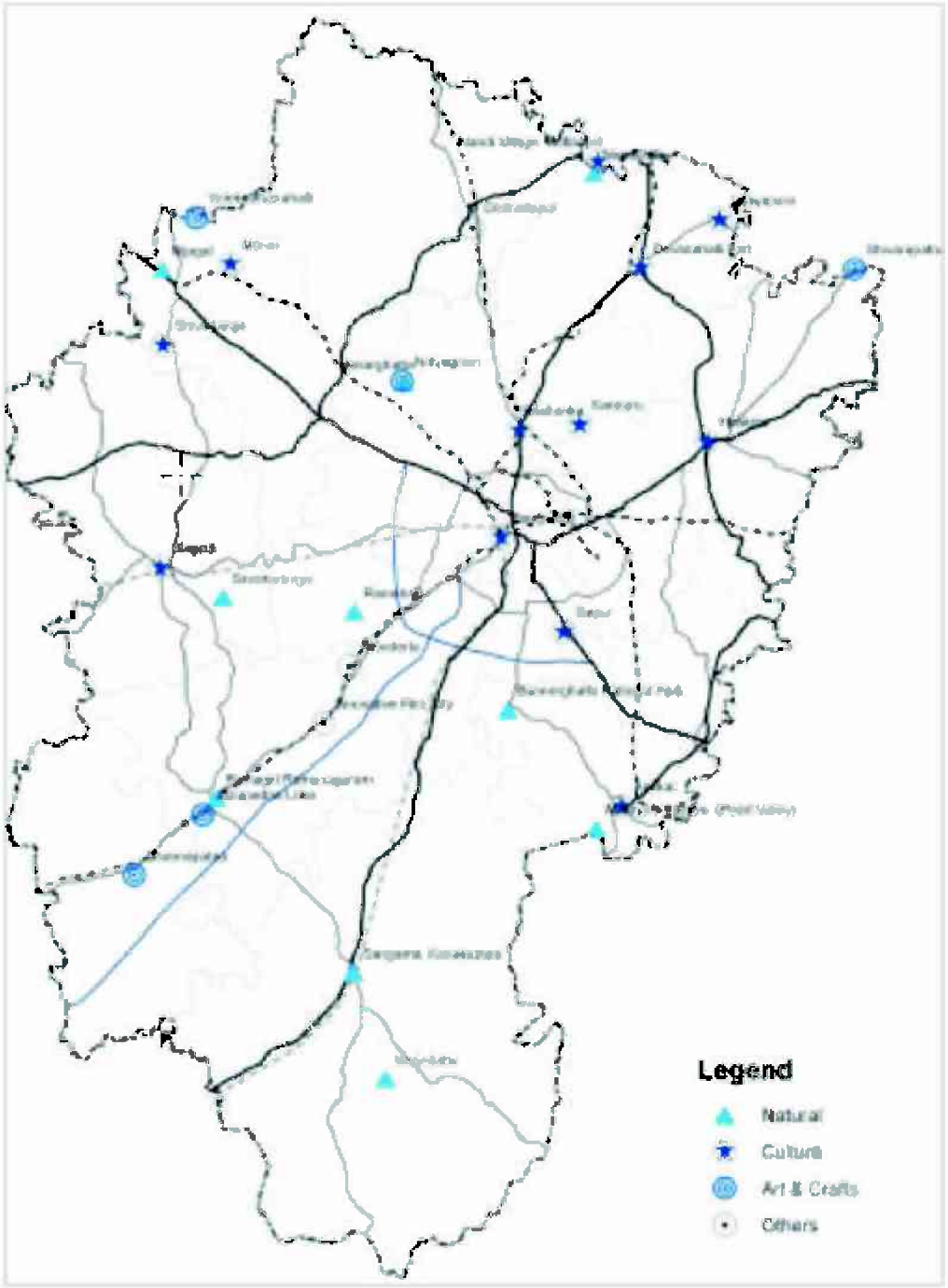
Part 1: Overview

Although Bengaluru has many historic sites and treasures, both built and natural, these have not been formally protected through an ongoing program.

With the breakneck growth of the city, it is easy for the upkeep of these treasures to take a back seat. However, it is very important for the city's heritage to be preserved and protected through formal institutional mechanisms.

Moreover, heritage should not be viewed as an ancillary activity of urban administration. Instead, the preservation of heritage must be a part of the routine urban administrative functions.

Moreover, the public need to be made more aware of the city's heritage, as public support will be the backbone of any conservation effort.



Heritage and cultural assets in the BMR region

Part 2: Issues

1 Unprotected heritage:

Any heritage site that is unprotected by the two archaeological authorities remains under threat.

2 Unidentified heritage:

Sites, buildings and other forms of heritage have not been properly identified, leaving them vulnerable.

3 No protection of cultural heritage:

There is a lack of resources for the protection of traditional and cultural heritage such as arts and crafts.

4 Unregulated development:

The city's character has suffered in certain places due to unregulated development.

5 Disfiguring of natural heritage:

Because of quarrying and other related activities on natural heritage sites, these sites have been disfigured.

6 No ownership, accountability and guidelines:

There is no agency that is either accountable or responsible for managing, nurturing and caring for the city's rich heritage and history and there are no well-laid out guidelines.

Part 3: Planned Solutions

Policies

A statutory nodal agency for the identification, protection and conservation of heritage in the Bengaluru Metropolitan Region should be established. The agency should have appropriate funding from the government for its functions, as well as autonomy in developing policies and practices.

The agency should develop a heritage policy for the BMR, which should be reviewed and revised periodically.

The nodal agency must develop a management framework for the cultural heritage of the city and coordinate with government departments, agencies and other institutions to ensure implementation of this framework.

An ongoing program of documenting heritage should be established, with periodic review. The immediate environment of heritage locations must be considered along with the sites themselves and conservation plans must include these areas as well.

Issues 1, 2 and 3: Unprotected and unidentified heritage, including cultural heritage.

Establish a Bengaluru Heritage Commission:

A Bengaluru Heritage Commission (BHC) should be statutorily established and its members should have a fixed term of 5 years. Members should be drawn from domains of expertise suitable to the identification, protection and conservation of heritage.

The secretariat of the BHC should be in the Urban Development Department of the State. Its offices should be established in a heritage building (e.g. Krishna Rao Park, Basavangudi).

The BHC will oversee heritage conservation efforts for all locations in the BMR that are not within the jurisdiction of the Archaeological Survey of India or the Karnataka Archaeology Department and it should also assist those bodies in their independent efforts.

The BHC should develop and maintain a registry of heritage sites in the metropolitan region, to be known as the Bengaluru Heritage Register.

Establish a Museum of Bengaluru:

The museum of Bengaluru to be established in the premises of the Mayo Hall. The BHC should be the governing body of the museum, which will house the permanent archive and gallery of the heritage of the region.

Create a Bengaluru Heritage Register:

The Bengaluru Heritage Register should be an exhaustive compilation of the heritage of the region. The Register should include locations identified for their importance to the architecture, culture and natural history of the region and separate listings of all three should be maintained.

Based on certain criteria (including but not limited to age, historical significance, artistic significance, aesthetics as well as natural and landscape significance), a suitable classification of the entries in the BHR should be developed. Each entry in the Register should include its classification as well as the basis on which its inclusion in the Register was warranted.

The Register should be maintained and updated every 3 years to reflect the evolving character of the city.

Built heritage

Going forward, the development of all locations included in the BHR should be subject to the approval of the BHC as well. Corresponding to the classification of heritage sites in the Register, the application methods of protection and conservation applicable must also be identified.

The BBMP (Bruhat Bengaluru Mahanagara Palike) should establish a Heritage Cell to manage and administer publicly owned heritage locations. For each publicly owned heritage location, a specific heritage conservation plan should be developed, including an awareness program to publicize its existence and importance to the city.

For privately owned locations in the Register, a consultative mechanism should be evolved that emphasizes 'support' for the preservation and protection of heritage, rather than mere identification and listing. Also, at the discretion of the BHC, a case-by-case approach to the protection of individual sites may be used in determining the appropriate conservation strategy.

Cultural heritage

The BHR should record important phases in the cultural life of the city, including the arts, literature and social and economic traditions of the people. The Register should also record institutions and people who have made important contributions to the development of its cultural, economic and civic life at various points in the history of the city .

Spatial records and plans

Create a spatial record of heritage sites:

A repository of historical maps should be gathered from various archives to present a comprehensive and coordinated record of the growth of the city (settlement patterns, population, establishment of monuments, etc.)

The collected spatial record of the city's evolution should be housed in the Museum of Bengaluru, as well as made available through the web site of the BHR and the museum itself.

The BHR should document the administrative sub-jurisdictions (wards, precincts, traffic divisions, school zones, etc) of the different city agencies within whose borders each entry in the register falls, so that proper devolution of responsibility for conservation is possible within the agencies. A conservation plan should then be developed for each agency.

Identify a special date as Bengaluru Day:

A specific date in the calendar should be identified for designation as Bengaluru Day, marking the founding of the city and celebrating its history.

Each location in the Register should be identified by a uniform, publicly visible insignia, as well as information that educates the public about the historical importance of the site. The Register should also be available online, including multimedia presentations.

Adequate access to the transportation network should be provided for each site and a tourism promotion program should be developed, based on the listed locations.

The BHC will oversee the development of material for use in schools and colleges, including training for teachers and instructors, as well as course material on awareness and promotion, conservation strategies, design, restoration and other key aspects of heritage.

The BHC will work with public forums including the media and the performing arts communities to increase awareness of heritage.

Establish a seed fund:

A seed fund should be established to create the BHR and to undertake restoration of a few publicly owned heritage sites on a pilot basis. This fund may thereafter be converted into a revolving fund with access to grants from public and private donors, to support the work of the BHC.

Annual funding for the operations of the BHC should be made available from the budget of BBMP or the BDA. The BHC will develop the budget and seek transfer of the funds under the law, as may be established.

Issue 4: Unregulated development

Create legislation:

Suitable legislation is needed to establish the Bengaluru Heritage Commission, and to give it statutory powers as identified in this report.

A review of similar laws passed elsewhere in the country, and abroad, may be carried out to identify the best legal practices in heritage protection and conservation and to identify the specific sections and clauses to be included in the law.

Issue 5: Disfiguring of natural heritage

The BHC should include natural landscape sites (e.g. water bodies, rocks and geological formations, man-made gardens, etc) associated with specific important periods or events in the city's history.

Specific restoration plans for each of these natural heritage sites should be developed. Ongoing development plans of the BDA (Bengaluru Development Authority)/BBMP and other agencies should also be subject to guidelines of the protection of such sites.

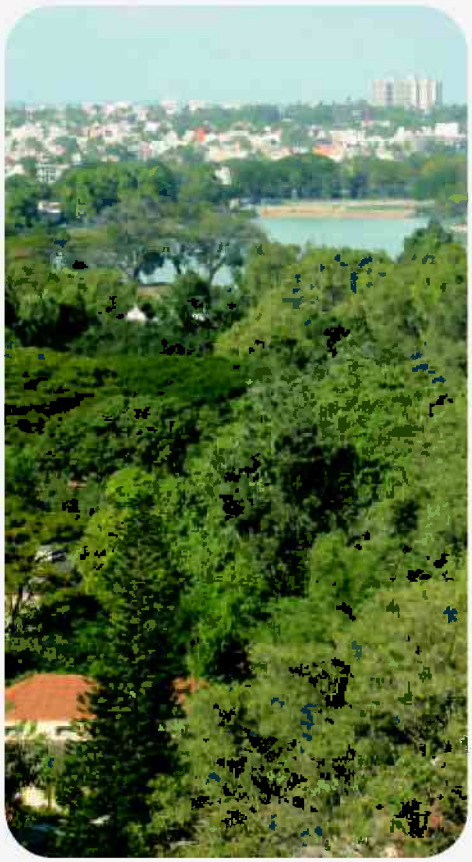
Issue 6: No guidelines

Study international standards and best practices.

A study of international standards and best practices in the conservation of urban heritage must be undertaken, to help develop the Heritage Plan for the BMR.

Guidelines from international conventions on heritage conservation (UNESCO, the Vienna Memorandum, the Venice Charter, etc) must be incorporated into the policies and administrative methods for conserving heritage in Bengaluru.

ENVIRONMENT & SUSTAINABILITY



Part 1: Overview

The environment is a critical challenge that all urban regions face and Bengaluru is no exception. With the rapid growth of the city over the past couple of decades, the degradation of the environment is a source of great concern, especially in the context of the wider issues of climate change.

Part 2: Issues

1 **Rapidly worsening environment:**
The "Garden City" is one of the fastest growing cities in India with rapidly shrinking green cover, dwindling bio-diversity, withering lakes and worsening air and water quality.

2 **Citizens not empowered:**
On the public side, citizens feel unable to stop this erosion of the environment, as they have little say and participation in the management of the city's environmental affairs.

3 **No systematic approach:**
On the government side, there has been no systematic identification, assessment or monitoring of ecosystems that provide critical ecological and environmental services to the city.

Part 3: Planned solutions

Objectives:

There are several objectives. The aim is to develop a long-term vision for the city's environment, green spaces, wetlands and lakes that takes into account the critical ecosystem services provided by these areas. In doing this, a balance must be established between development objectives for the city and their potential environmental impacts.

Also, an assessment and monitoring program must be established for the city's critical ecosystem (lakes, parks, heritage groves, etc). Moreover, community involvement and participation of educational institutions in the management of local green spaces, water spaces and wetlands, to restore and maintain them must be ensured.

Recommendations

Issue 1: Rapidly worsening environment

Lakes and wetlands:

A time-bound program of restoring all lakes should be taken up by both BBMP and BDA, with clearly identified actions to be carried out for each lake. Upstream lakes should be given the highest priority in this program.

The perimeters of all lakes should be fixed as per their original records and this should be secured by natural fencing, tree planting and lake-circular roads. Concrete and steel fencing may be limited to heavy-use areas.
Wetlands adjacent to lakes should be identified, mapped and conserved through non-urban uses.

Flow of sewage into all lakes should be stopped, either by the construction of sewage treatment plants at lake sites or by ensuring upstream treatment of sewage.
Kaluves and feeder channels should be cleared of encroachments. Sewage pathways should also be clearly separated from kaluves.

BBMP and BDA should take up programs to ensure that solid waste currently being dumped in lakes is instead fed into proper waste channels.

Bio-diversity:

There needs to be a well defined set of guidelines that identify the species of trees to be planted in different locations. This should take into consideration a number of factors including location, bio-diversity, vehicular traffic and the existence or lack of adjacent green spaces.

For instance, large streets which face high vehicular traffic especially require large canopied trees, while in residential areas, smaller, fruit bearing bio-diversity friendly trees can be planted on streets.

In parks and other protected spaces, rare, endemic, threatened or keystone species can be planted along with bio-diversity friendly shrubs and medicinal plants. A specific design for the restoration of different green spaces should be developed based on these and other 'Urban Ecology' considerations.

Green spaces:

Green spaces play multiple roles in the BMR. They should be classified as those to be used as (a) lung spaces for the city (b) recreational areas and cultural spaces (c) heritage sites (d) eco-reserves and bio-diversity hot spots and (e) educational areas.

Each ward/zone of the city should have an adequate distribution of these different types of green spaces, such that citizens living in different parts of the BMR have equal access to green spaces for different purposes. Heritage areas, eco-reserves and lung spaces should have priority for conservation and should not be cleared for developmental or expansion projects.

Street trees:

Street trees play a critical role in reducing air and noise pollution, filtering out hazardous suspended particulate matter from air, reducing temperature, providing shelter for pedestrians and cyclists and contributing to the visual and cultural scenic beauty of Bangalore's famed wooded avenues.
Old-growth, large canopied trees in Bangalore are largely located on the city's streets and play an essential role in filtering air pollution. These trees need to be recorded in a spatial database, monitored over time and protected against clearing as these trees are decades old, with critical environmental value and cannot be easily replaced by planting new saplings.

The life of street trees is severely impacted due to concreting of pavements and the lack of space around their roots – a minimum of six feet needs to be maintained around tree roots and proper management and maintenance of older trees is critical.

Issue 2: Citizens not empowered

A public-public partnership (between the government and the citizens) program, "Natural Bangalore", should be established, with ward-level committees. Their function will be to oversee the management of green spaces and lakes in their wards and to suggest customized needs and priorities for conservation, management and sustainable use of these ecosystems depending on local needs.

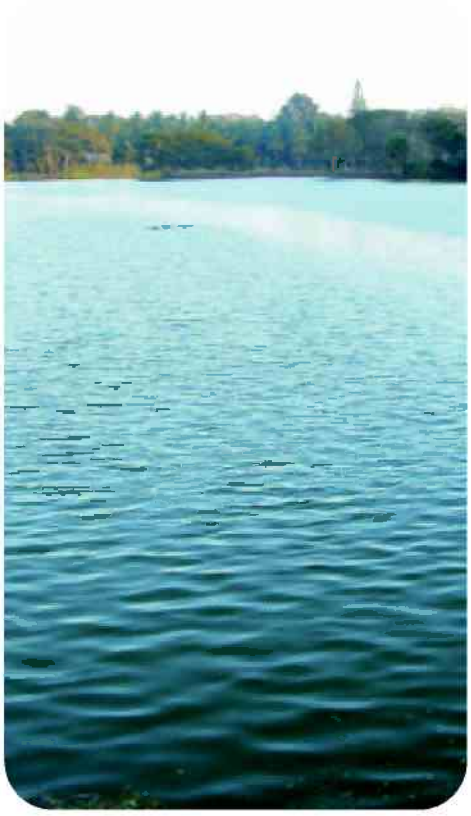
Issue 3: No systematic approach

The Bangalore Metropolitan Environment Authority should be established as the nodal agency for the management and regulation of environmental issues in the city. Such functions of the authority that are now currently with other agencies or departments should be transferred to it.

A baseline spatial map of the city's green spaces and bio-diversity should be created and regular monitoring carried out to ascertain areas of clearing and re-growth. Education programs should be drawn up for use by schools and colleges, to ensure that students can monitor bio-diversity and lakes and have an awareness of the importance of these ecosystems for the region.

Awareness programs could also be developed for providing information to local communities about the lakes, wetlands and green spaces in their areas, the bio-diversity they harbor and the specific functions they serve.

LAKES AND WATER BODIES



Part 1: Overview

Lakes are critical to the city, not only because of the water they hold but also because they are a critical part of the city's ecosystem.

Part 2: Issues

1 **Dwindling lakes:**
Bangalore's rich natural heritage of lakes has significantly dwindled during the last 30 years, resulting in the loss of an important part of the city's ecosystem, as well as potential sources of water for domestic and other needs.

2 **Encroachment:**
Many Lakes have been encroached and developed for commercial activities. The rajkaluves and other works that maintained the lakes as integrated networks have been encroached upon or contaminated by grey water and sewage.

3 **Dwindling water storage:**
Water storage area has also dwindled in most lakes, due to siltation and debris.

4 **Lack of institutional integration:**
Lakes have not been considered as part of the city development and planning exercises. Management of lakes is distributed across several agencies. Also, lakes have not been regarded as complete ecosystems but only as natural bodies.

5 **Lack of classification or guidelines:**
Lakes are increasingly being used for recreational use and there are no clear guidelines to balance this with ecological considerations.

6 **Lack of monitoring:**
Water quality and lake sustainability are not regularly monitored.

7 **Lack of public awareness:**
The public lacks awareness of the importance of lakes to the bio-diversity, environment and the residents themselves.

Part 3: Planned solutions

Objectives

Lakes and rajkaluves need to be restored to their original condition, so as to strengthen the ecology of their systems and to provide alternatives to Bangalore's growing need for water.

Biota and ecosystem studies need to be integrated into the restoration efforts, so that much more than the natural body alone is strengthened.

The recreational use of lakes must be balanced by proper management of these environments to ensure their sustainability for the future and to protect livelihoods linked to lake ecosystems.

Community involvement and participation in the management of lake environments should be an important part of efforts to restore and maintain them.

Development planning at all levels in the Bangalore Metropolitan Region should include plans for sustainable use and maintenance of the lakes in the region.

Issues 1, 2 and 3: Dwindling lakes, encroachment and dwindling water storage

A time-bound program of restoring all lakes should be taken up by both LEDA and Bangalore Heritage Commission. They should be responsible for detailed plan and restoration, with clearly identified actions to be carried out for the restoration of each lake. Upstream lakes should be given the highest priority in this program.

The perimeters of all lakes should be fixed as per their original records and this perimeter should be secured by natural fencing, tree planting and lake-circular roads. Concrete and steel fencing may be limited to heavy use areas.

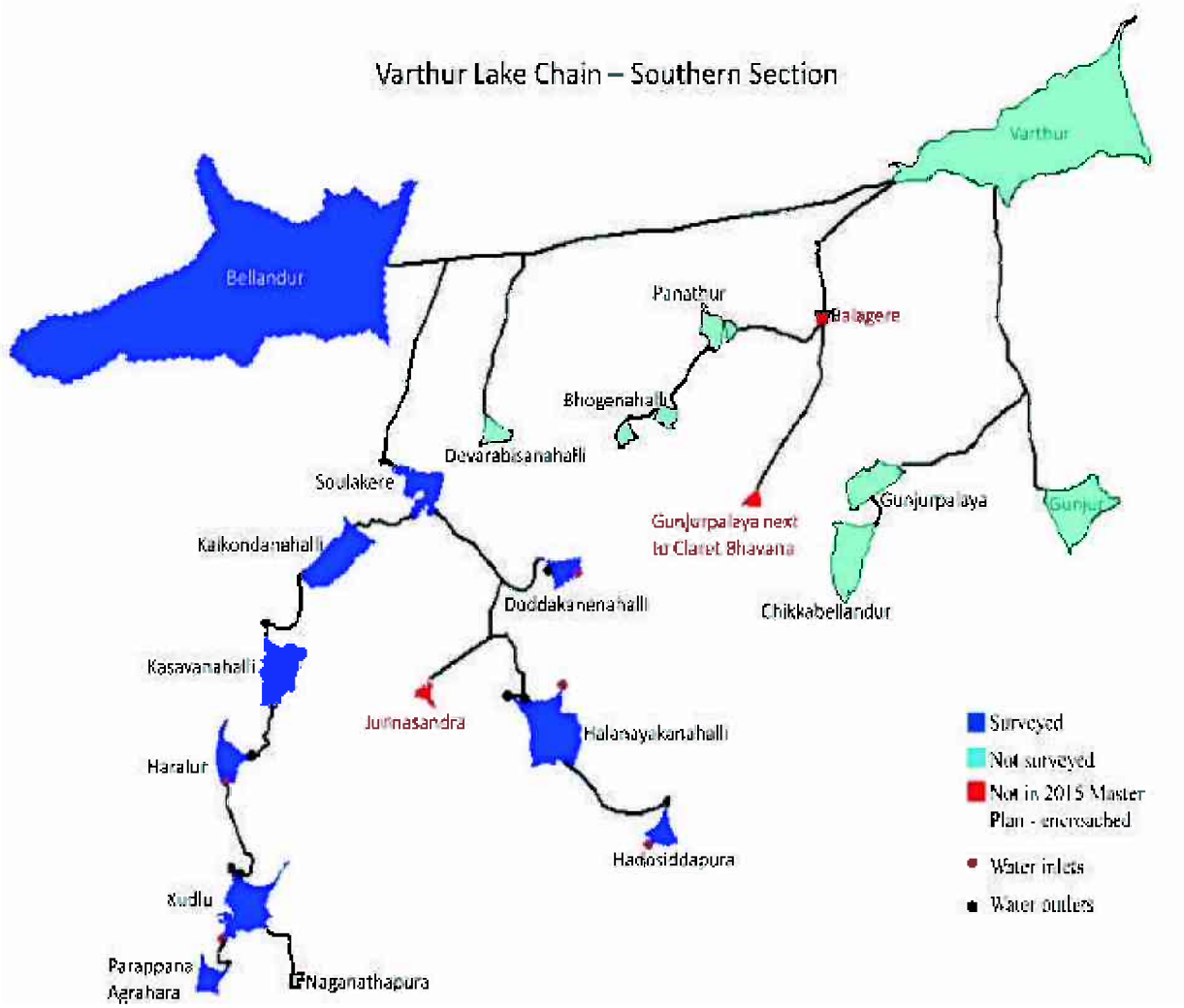
The flow of sewage into all lakes should be removed, either by the construction of sewage treatment plants at lake sites, or by ensuring upstream treatment of sewage.

Kaluves and feeder channels should be cleared of encroachments. Sewage pathways should also be clearly separated from kaluves.
BBMP and BDA should take up programs to ensure that solid waste currently being dumped in lakes is instead fed into proper waste channels.

Encroachment of lakes should attract compounded penalties under environment protection policies in addition to standard penalties applicable to encroachment itself.

The design of restoration efforts should take into consideration a number of factors - the diversity of plant and animal life, the mosaic of lake edges, islands within lakes, species of trees that are suitable for birds in the area, the varying depth of lakes, etc.

A specific design for the restoration of each lake should be developed based on these and other 'Urban Ecology' considerations.



Restoration efforts

These efforts should focus on lake networks rather than individual lakes. For each lake, inflow and outflow channels, as well as channels between lakes, the lake edges and banks must all be restored.

Issue 4: Lack of institutional integration

The upkeep and management of all lakes within BBMP limits should be transferred to the municipal corporation. In the rest of the BMR, BDA shall be the agency responsible for this function.

The Lake Development Authority should function as a regulatory body, laying down guidelines and standards for the management and use of lakes. Clear distinctions should be made between urban and peri-urban lakes, as well as between lakes used for different purposes.

All lakes should have Lake Protection Committees including citizen groups such as RWAs in addition to public officials. Their function will be to oversee the management of lakes as per LDA guidelines and to suggest customized needs for each lake.

Issue 5: Lack of classification or guidelines

Lakes in the BMR should be classified as those to be used for (a) providing a portion of the region's drinking water needs, (b) recreational purposes, and (c) eco-reserves for the region.

'Drinking-water' lakes should be identified on the basis of spread area and the quantum of water to be drawn from the lake for drinking water should be fixed by the LDA. Access to drinking-water lakes should be restricted and a list of impermissible activities drawn up.

Recreational lakes should be identified on the basis of ease of access, and suitability for both water-based and off-shore activities.

Wherever possible, the recreational activity should include natural conditions and 'paving and landscaping' should be limited to specific areas. For each lake a list of Do's and Don'ts should be prepared.

'Eco-reserve' lakes should have highly restricted access and should facilitate ground-water recharge in the region.

Issue 6: Lack of monitoring

Baseline and regular monitoring of lakes should be carried out to ascertain water quality as well as the sustainability of the lake ecosystem.

Issue 7: Lack of public awareness

A 'Lake Education' program should be drawn up for use by schools and colleges, to ensure that students have wide access to information about the importance of lakes to the region.

Awareness programs could also be developed for providing information to local communities about the particular lakes in their areas and the specific functions they serve.

WATER, SANITATION, WASTE MANAGEMENT & HEALTH

WATER

Part 1: Overview

It goes without saying that water is crucial to the survival of a city's residents. Indeed, water is the lifeblood of the city. Moreover, adequate sanitation is critical in ensuring that the city's residents stay healthy.

With Bengaluru's fast growth, the demands on the city's water supply and sanitation systems are only increasing.
The rapid pace of growth has led to a huge gap in the demand and supply. While the south and western parts of BMR are supplied with water from the Cauvery river, the northern and north-eastern parts of BMR depend on ground water. This ground water has been fully exploited, causing water levels to be depleted.

Looming water crisis

This gap between demand and supply must be bridged through a combination of efforts to (a) create new water sources for the city and (b) make better use of the water that is already available.

This situation is made worse by 'contamination' of water in a number of ways. Therefore, in addition to addressing the 'quantity' issues, we must also tackle the 'quality' issues and make more of the existing water usable and re-usable.

Further, water is being supplied to the entire city and all its citizens at subsidized rates (i.e. below cost of production). The city is moving towards an imminent water crisis – with consequent effects on health and sanitation.

Water demand and supply in Bangalore

Year	Population in Lakhs	Water Demand in MLD	Water supply in MLD	Short fall in MLD
2001	53.79	870	540	330
2007	75.00	1219	870	349
2015	88.00	1720	1470	250
2021	100.00	2125	1470	655
2036	125.00	2550	1470	1080

Demand supply analysis for water supply in the larger metropolitan region

Sl No.	Particulars	2011	2016	2021	2031
1	Source availability in MLD				
A	Surface water	1470	1535	1535	1535
B	Ground water	1601	1601	1601	1601
C	Rain water Harvesting	-	1243	1865	2487
D	Recycled water	-	400	600	800
	Total water supply available	3071	4779	5601	6423
2	Population in million	11.00	12.50	14.00	18.00
3	Water demand in MLD at 300 lpcd	3300	3750	4200	5400
4	Variation +/- Surplus/Deficit	(-)229	(+)1029	(+)1401	(+)1023

Demand estimation for Bengaluru city examined the following:

1. Water Production, Sourcing
2. Water Transportation
3. Water Supply
4. Water Recycling

·Water supply policies (including entitlements, pricing, distribution, and performance of institutions) of other global cities.

The National Urban Sanitation Policy, as well as National Water and Sanitation policies of other countries. Participatory urban sanitation programs in slums in other cities were also studied.

Water management and reuse programs of other cities (Sydney, Singapore, London), as well as dual-line water supply systems in a few cities.

Consultations with officials of the BWSSB and BBMP, including both current and retired engineers, to understand the Demand and Supply situation , source of water, strengths and weaknesses of water supply and sewage management systems in the city.

Discussions with professionals in the 'water and waste management' industries to obtain their views on the global best practices in urban areas.

Part 2: Issues

1. **Rapid growth of demand and hence shortfall of supply:**

   The city's rapid growth has led to a gap between demand and supply.

2. **Poor management of existing water resources:**

   a. Water not recycled or harvested:
   Sustainable measures such as water recycling and harvesting not used enough.

   b. No monitoring of water losses:
   Water losses not methodically monitored or measured.

   c. Borewell drilling not restricted:
   There are no restrictions on borewell drilling, without a recharge structure being in place.

   d. Inadequate network:
   The water supply network in most of the old CMC areas is incomplete and does not reach all homes.

3. **Lack of public awareness:**
   There is not enough public awareness of the issue of water depletion and the need for sustainable water use.

Part 3: Planned solutions

Issue 1: Rapid growth of Demand and hence shortfall of supply.

This issue is addressed by all the points below.

Recommendations:

Guiding principles

Water Management (Supply, Conservation and Recycling) should become a key focus area for Government.

Access to clean water and a clean sanitary environment are basic human rights, and the management of water, waste and sanitation facilities should reflect this.

Water management should be governed by an integrated focus on social, economic and ecological issues, without emphasizing one over the others.

Water must be supplied at cost of production or higher. Subsidized water should be provided at designated areas, localities

Water cannot be managed in isolation; instead, other factors that impact on water supply and quality should be co-managed alongside.

High-quality water should be used primarily for human consumption, and grey water becomes the only standard for other uses including Industrial.

Minimizing the generation of waste should receive equal focus to managing it once it is generated.

Water Subsidy Policy is to be framed.

Policies

Every family, regardless of income, shall be entitled to a minimum supply of clean water per month to meet its basic consumption needs.

Above this minimum, a comprehensive system of incentives and disincentives, as well as regulation is needed to ensure harvesting, storage and optimum use of clean water, as well as proper allocation of costs to users.

Water and sewerage should be co-managed by an integrated agency, with a primary focus on ensuring zero contamination of water supply systems by sewerage.

New infrastructure should clearly separate potable and grey water supplies. Also, for bulk consumers, regulation is needed to ensure that a significant portion of their consumption is shifted to grey water.

A system of incentives and disincentives to minimize generation of waste material, and to reflect the true costs of waste is needed.

Institutions

The Bangalore Water Management Authority should be established within BMRDA, where it shall function as the regional planning arm responsible for all issues of water supply, quality, conservation, management, pricing and distribution.

The management of storm water drains by BBMP should be should be integrated with BWSSB, to facilitate integrated management of these co-located systems. BBMP shall retain authority for deciding what works are to be carried out, with operating responsibilities alone transferred to BWSSB.

BWSSB should develop a quarterly metric of its performance including measures of water quality, finances, customer satisfaction, sustainability and resiliency, employee and leadership performance, and infrastructure stability.

New water sources

Alternate water sources, including lakes in the region, for supply to specific areas of the city should be finalised as part of the Bangalore Water 2020 Blueprint.

A specific target should be set for the quantity of water that can be supplied from lakes by 2012. BWSSB's goal for obtaining 500 MLD of water from the Integrated Water Management Project may be set as the initial target.

Water supply and tariffing

Water tariff must be determined as a commercial cost plan basis. Water cost should be higher in CBD structured to reflect cost of production and transportation. Subsidized water should only be supplied to EWS and other low income areas

For every metered connection, the first 3000 litres of supply per month shall be billed at flat rate. For example, BWSSB shall develop a tariff regime that rationalises the price of supplied water above the first unbilled slab.

All new layouts developed by BDA should include separate connections for potable and non-potable water.

The feasibility of installing ring mains for the city, along the lines of the network being installed in London, should be examined as a long-term alternative to the current approach of laying distinct lines in phases.

Issue 2: Poor management of existing water resources

a: Water not recycled or harvested

Regulation of water

BWSSB shall notify areas where rainwater harvesting structures shall be mandatory. The harvesting structures shall be of minimum sizes corresponding to the roof area of buildings, as follows (20 litres/sq.m. for residential units, and 60 litres/sq.m. for commercial units).

Use of grey water shall be mandatory in the case of all connections receiving more than 50,000 litres of supply. BWSSB shall prescribe standards for 'grey water reuse infrastructure' for such establishments.

b: No monitoring of water losses

BWSSB shall publish the percentage of Unaccounted Water (UAW) each month. The Board shall also develop an initial timetable of reducing its UAW percentages by 0.5% each month, until a target of 20% is reached.

All supply lines of diameter greater than or equal to 6 inches shall have water meters installed. All such lines shall be calibrated by BWSSB at least once in two years and a schedule of calibration shall be maintained as a public document.

Automated Meter Readings (AMR) supported by GSM-based recording shall be put into effect for all lines of diameter between 2 and 12 inches, as well as for other 'bulk' connections identified by BWSSB.

A dedicated program of fixing all leaks in water supply lines shall be taken up. The entire network should be mapped for age and condition and a hierarchy of vulnerable lines identified. Thereafter, the works shall be taken up in the identified order.

c: Borewell drilling not restricted

All borewells in the BMR area shall be registered through a program of self-registration by the owners themselves. A one-time, refundable water cess shall be levied on all borewells corresponding to the diameter of the borewell. An annual fee shall also be payable to BWSSB for each such borewell. Upon the closure of any borewell, the water cess shall be refunded. Sale of borewell water shall be banned.

BMRDA shall annually measure the water table across the BMR and develop policies and action plans to reflect the challenges posed by changes from year to year.

Issue 3: Lack of public awareness

Public awareness campaigns on the issues pertaining to water should be launched so the public are properly informed and encouraged to take appropriate action.

SANITATION

Part 1: Overview

A fully-functioning sewerage system – along with sewage treatment plants - is a must for the health of any city.

But currently the 10 ULBs in BMR do not have an underground drainage system and existing treatment plants are not performing as per their specifications.

Moreover, newly added areas to the BBMP lack sewerage systems. Because of the lack of proper sewerage systems, natural water bodies are being polluted, posing serious health risks to the city's people.

Part 2: Issues

1. **Issue 1: Lack of comprehensive plan**
There is no comprehensive plan for the city's sanitation.

2. **Inefficient functioning of storm water drains and sewerage system**
The city's sewerage system is not functioning as it should, resulting in problems such as pollution, overflowing drains and so on.

3. **Lack of underground drainage**
The majority of CMCs, TMCs and TPs in BMR do not have an underground drainage system.

4. **Lack of maintenance**
The sewerage system is not properly maintained, worsening an already bad situation.

5. **STPs not fully functional**
The functioning of many sewage treatment plants is below their full capacity. Also, in a few cases, the plants are not operational at all.

Part 3: Planned solutions

Issue 1: Lack of comprehensive plan

A comprehensive Sanitation Plan should be developed for each Neighborhood Area and Wards, addressing the needs for individual Neighborhood Areas and Wards as well as the need for sanitation infrastructure in public places, especially those with high footfall.

An experimental participatory sanitation program should be launched in a few slums, to develop both individual toilets and community facilities as desired by the residents themselves.

The feasibility of installing portable toilets in and near poor communities should be examined, as also the installation of such facilities in large low-income workplaces as well as public places with high footfall. PPPs may be considered for such establishments.

Issue 2: Inefficient functioning of storm water drains and sewerage system

Reverse gradients in the network must be eliminated. Wherever necessary, lower-diameter lines must be rectified to ensure that they are above the height of higher-diameter lines into which they empty. Also, the feasibility of a deep tunnel network for the entire city should be examined, as a long-term solution.

Storm water drains

The system of open storm water drains must be gradually done away with, to prevent clogging as well as to avoid unnecessary risks to those in the immediate proximity of the drains.

The focus on transporting all storm water must give way to in situ percolation of water based on recent advances in pervious infrastructure.

Storm water drains in new layouts should be laid so that utilities do not have to cross the drains to reach individual homes and other establishments.

All encroachments on storm water drains must be cleared expeditiously. To begin with, all construction that lies in the actual flow path of the drain must be removed.

Pilot projects in beautifying storm water drains should be taken up, to demonstrate their potential to serve as attractive public places, along the lines of projects elsewhere (e.g. Korea).

Issue 3: Lack of underground drainage

The underground drainage network must be extended to cover all urbanized areas in the BMR. In some cases, isolated communities may be better served through local, low-cost sanitation.

Issue 4: Lack of maintenance

The age, internal condition and surface wear of all lines should also be assessed and where needed, these lines should be replaced. The new lines should also be of appropriate wall thickness as per global industry standards.

For all sewers longer than 5 km, there should be vent shafts every 500 meters beyond the first 5 km, to protect pipes against excessive corrosion.

The carrying capacity of sewage lines should be augmented to ensure that no overflow occurs due to lack of capacity.

Manholes that are either damaged (for irrigation) or overflowing due to blockage by solid waste should be restored with immediate effect.

Issue 5: STPs not fully functional

All STPs in the BMR region must be restored to their full operational capacity so that sewage is treated closest to its point of origin. Commercial establishments and large residential communities must be compelled to establish and maintain STPs for their own waste discharge.

WASTE MANAGEMENT

Part 1: Overview

Solid waste needs to be managed appropriately – however, studies show that this essential service is not being performed as per existing regulations. This poses many hazards, including most important, an environmental hazard.

About 3056 tons of solid waste is generated daily in BMR, of which only 69% is collected.

If the current trends in population growth and waste generated continue, the waste generated in 2031 is estimated to be 711 tonnes/day outside BBMP area.

In the BMP area, the waste is collected by a combination of private and public participation and the remaining by BBMPI staff. Although door to door collection is almost 100% efficient, waste is not segregated at source. 70% of the waste generated by the city is placed in identified dumping sites and private-sector manure producing companies.

The Karnataka Compost Developing Corporation (KCDC), that treats the waste generated, has a capacity of 300 tons of waste/day.

Landfill sites are located at:

- Mavallipura (100 acres)
- Mandur (135 acres; 8 megawatt power generation)
- Doddballapur (100 acres for processing of 1000 MT capacity) on BOT basis

Proposed landfill sites are located at:

- Manavarthekaval .
- Dobaspet industrial area (disposal of hazardous industrial waste)
- Ramanagaram and Kanakapura (engineered landfills)

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The following urban local bodies have received authorization from the Karnataka State Pollution Control Board (KSPCB) for setting up landfills in their jurisdictions:

- Doddaballapur
- Devanahalli
- Hoskote
- Nelamangala
- Vijayapura

(All the above in Bangalore rural district)

- Channapatna
- Kanakapura
- Magadi
- Ramanagaram

(All the above in Ramanagaram district)

- Anekal

(in Bangalore urban district)

Part 2: Issues

1. **No integrated policy:**
   There is an absence of an waste-management integrated policy for the region.
2. **Inadequate waste management measures:**
   The measures for the environmentally-friendly management of waste are not adequate.
3. **New techniques unfamiliar to local bodies:**
   Local bodies have insufficient knowledge of waste management and the risks of not managing waste property.
4. **Waste not segregated:**
   Waste is not segregated at source. This results in mixed waste comprising glass, plastics, metal and other waste arriving at the treatment plants.
5. **No policies or regulations to promote re-use/recycling:**
   Polices or regulations to promote the re-use or recycling of waste are lacking.
6. **Land unavailability:**
   Land for the suitable disposal of waste is not available.
7. **NGOs and other stakeholders not involved:**
   NGOs, private agencies and other stakeholders are not sufficiently involved in waste management efforts.
8. **Technology issues:**
   Modern techniques and technologies are not applied.
9. **Lack of civic education and awareness:**
   There is an acute lack of civic literacy and awareness.

Part 3: Planned solutions

Issue 1: No integrated policy

An overarching policy needs to be established by which all of the following aspects of waste management are considered together – segregation of waste at source, linking organic and inorganic waste to various markets, the reuse of recyclable materials, conversion of waste to energy, and minimization of hazardous or non-bio-degradable waste. Also, the full cost of waste removal and management must be reflected in the strategy and the principle of "polluter-pays" must be adopted.

Issue 2: Inadequate waste management measures

To minimize waste that has to be treated, a system of decentralized waste management which ensures that only the most 'difficult to treat' material is taken to tertiary treatment plants, while the rest is treated as close to the point of generation as possible has to be introduced.

Small waste treatment plants should be established in nalas on BOOT basis and the output water from these can be used wherever suitable (construction projects, parks, washing vehicles, etc).

A city-wide program of e-waste management should be introduced to collect this material through specifically marked containers. All electronic waste must be traced to its manufacturer and a program of corporate responsibility for their collection and disposal must be made mandatory.

Issue 3: New techniques unfamiliar to local bodies

The best modern practices in waste-management must be documented and turned into educational resources – print, audio and video – for corporators in the ULBs. BBMP may itself also share some of its new practices with other municipalities in the BMR.

Issue 4: Waste not segregated

A city-wide program of domestic waste segregation at source should be developed and introduced within the next 12 months, with clear incentives for participation. A few pilots in specific areas must be launched immediately.

Issues 5: No policies or regulations to promote re-use/recycling

A system of financial incentives and disincentives must be established for each category of waste. Specific time-bound targets for the reduction of waste through recycling must also be put in place. Whenever waste is dumped into landfills or other permanent storage, the recipient community (through its local government) should be paid compensation.
The current system of paying "tipping fees" to waste hauling contractors should be replaced.

Issue 6: Land unavailability

It is better to accept that we cannot indefinitely keep finding new land for burying waste. Instead, it is better to use existing land more efficiently (through improved compaction techniques, conversion of some waste to energy). For the future, we must focus on minimizing generation of waste itself.

Issue 7: NGOs and other stakeholders not involved

Local groups and communities should be encouraged to form "waste segregation at source" teams and thereafter sort such waste for re-use and recycling. BBMP should identify land for at least three sorting stations of one acre each in every ward.

Issue 8: Technology issues

The BBMP could create a research and development fund to study and document emerging practices in management of waste. The research should also focus on developing cost benefit analyses from the application of new methods. A continuous system of pilot programs to test new ideas should also be put in place.

Issue 9: Lack of civic education and awareness

The Bengaluru Civic Literacy Program (Be-CIVIC) should be launched, and awareness material created about water supply, waste management, waste segregation and public health linked to sanitation and hygiene. BWSSB should fund the development of such material by experts in the domains as well as other experts in communication. Video and audio material to educate citizens should also be hosted on the BWSSB web site.

BWSSB should work with consumer groups to develop a 'sustainability' rating for various plumbing fixtures available in the market and promote knowledge of this widely. BESCOM should similarly develop ratings for electrical and electronic devices.

PUBLIC HEALTH

Part 1: Overview

Bengaluru is increasingly becoming an unhealthy city – diseases, particularly airborne and waterborne diseases, are creating a generation of unhealthy citizens.
In terms of healthcare, Bangalore urban has better facilities for healthcare than Bangalore rural districts.

Part 2: Issues

1 **Unhealthy citizens:**
Nutrition, environment and disease-control are all poor, leading to low quality of public health. Outbreaks of epidemics are common.

2 **Low expenditure on public healthcare leading to poor quality healthcare:**
Developed countries spend about 5%-6% of their GDP on healthcare; here the spend is a fraction of that figure.

3 **Low public confidence in government healthcare:**
Public confidence in the quality of state-provided health care is low, forcing people to seek private alternatives.

4 **Private sector healthcare costly:**
The cost of private health care is high, and even one health issue can lead a poor family to penury for several years as a result.

5 **Preventive care neglected:**
The focus on preventive care is inadequate, whereas if this were properly established many instances of secondary and tertiary care could be avoided or reduced.

6 **Lack of routine focus on health**
A broader focus on public health is not woven into the economic and social life of the city, as a result of which many avoidable health issues (like diseases linked to poor sanitation) arise.

Part 3: Planned solutions

Objectives

Preventive care, especially for children and vulnerable adults, should be widely and affordably available, so that many secondary and tertiary events are avoided.
Health insurance to protect the financial well being of families is needed and must be widely available.

Recommendations:

Regulation and Management

The Bangalore Metropolitan Public Health Authority (BMPHA) should be created to address all issues pertaining to public health and medical services in the region.

The BMPHA should consist of members drawn equally from the public and private sector, with special interests and capabilities in medicine, public health, service delivery, emergency response and other appropriate areas.

A Public Health Monitoring System should be put in place to document and respond to emerging problems. All hospitals in the region must report their patient care data to the BMPHA, which shall track this data for necessary responses.

Issues 1 and 5: Unhealthy citizens and preventive care neglected

A public health monitoring system is needed to continuously monitor the health of the city's population and ensure preparedness to any new threats.

All health facilities in the BMR shall participate in a program of reporting their routine services to the BMPHA.
Specific target indicators for human development pertaining to health care shall be developed by BMPHA and a time-bound program of achieving these targets should be developed.

This reporting program should also allow geographic variations in health risks to be assessed so that epidemics can be contained within the areas where they initially arise.
A preventive health care program should be instituted throughout the region to ensure that all infants, expecting mothers and other vulnerable populations receive a minimum degree of care, as determined by the BMPHA.

Issue 2: Low expenditure on public healthcare leading to poor healthcare

The expenditure on healthcare should be increased and the following steps taken:
All the sanctioned posts in the public health systems that are currently lying vacant should be immediately filled up.
Hospitals in the old CMC areas should be transferred to the jurisdiction of BBMP and their infrastructure and staffing should be brought on par with existing BBMP hospitals.
A minimum guaranteed level of funding for each hospital covering equipment, staff, operations, water and power supply, effluent treatment and hazardous waste disposal should be guaranteed and made available on a priority basis from the annual BBMP budget.
In all slums, preventive healthcare facilities (e.g. evening clinics) should be established.

Issues 3 and 4: Low public confidence in government healthcare and costly private sector healthcare

We have a choice to make – either we must make substantial new investments in public health (better infrastructure, more medicines, well-paid doctors, better technology, etc) or we must alternately create a financial program that allows people to access private healthcare at public cost.
The current default mode of creating public health capacity at a very slow pace must end.

A Healthy Bangalore (HB) insurance program should be created, containing a basket of insurance options available from the government as well as the private sector. HB should act as a single point from which anyone may choose the health insurance program of his or her choice.

Issue 5: Lack of routine focus on health

The routine functions of other departments should take into consideration the potential public health impact of areas under their administrative jurisdictions. For instance, an 'air quality' and 'water quality' monitoring program shall be established throughout the BMR, and this should be compared to minimum levels needed to ensure public health. A remedial program to restore environment quality to acceptable public health standards should be instituted.

The Karnataka State Pollution Control Board should establish a city-wide program of measuring air and water pollution, and make this information public regularly (daily-air, monthly-water). Air quality should be measured at a minimum of 25 representative locations in the city, and water quality should be measured in all lakes, as well as in a minimum of 25 representative points in the water supply system.

Similarly, a continuous food safety monitoring program is also needed.

BBMP's recently launched "Health Bulletin" should be made a regular and permanent publication which is published and widely distributed at least six times a year. This bulletin should provide guidance on likely public health risks and appropriate safeguards to be taken by the public.

URBAN POOR

URBAN POOR

Part 1: Overview

As cities grow economically and in other ways, a section of society tends to get left behind – the urban poor.

Bengaluru is no exception. The city's rapid growth has been accompanied by a growth in the numbers of urban poor, who may nonetheless feel better off compared to their earlier conditions, often in deprived rural areas.

The urban poor suffer not just from a lack of money; they also feel socially and culturally isolated – perhaps not in a literal sense, but in adjusting to an urban environment that is often completely alien to them.

Part 2: Issues

1. **Institutional**
   There is no government body that specifically looks after the issues of the urban poor.

2. **Housing and shelter**
   Bengaluru's rapid growth has made the city pricier –land and housing have become unaffordable for the poor.

3. **Water and sanitation**
   Drinking water and sanitation facilities are unavailable to large numbers of the poor.

4. **Health and education**
   Health and educational facilities continue to be inadequate.

5. **Livelihood and opportunities**
   As a result of the city's growth, migration has increased, along with an increase in the number of people working in the unorganized and informal sectors. Hence, job creation will be a big issue going forward.

Part 3: Planned solutions

Guiding Principles

Access to water and sanitation, shelter, health and education should be accepted as clear entitlements of all residents of Bangalore.

It is preferable to provide opportunities for development to the urban poor in their existing circumstances (location, skills, needs, etc) than to provide development schemes that displace them.

The specific initiatives undertaken to alleviate urban poverty must be based upon reliable and current data about the social and economic conditions of the urban poor.

New institutional structures are needed to examine and act upon different aspects of urban poverty in an integrated manner.

Policies

A region-wide, interdisciplinary body is needed to provide continuous planning inputs to alleviate poverty. This body must integrate the planning functions now performed by different agencies, and develop the regional plan for action against poverty.

A routine program of identifying the poor, and also quantifying their social and economic status, is needed. It should be recognised that not all the poor live in slums, and not everyone in a slum is poor.

Specific indices should be developed for all factors contributing to poverty – lack of health, education, water and sanitation, housing, etc. – and specific, time-bound targets should be set for each focus.

In-situ development of the urban poor should be pursued through a combination of housing schemes, training options, improvement in environmental conditions, as well as access to health and education.

Issue 1: Institutional

The Bangalore Urban Poverty Authority should be established within BMRDA where it will function as the regional planning arm responsible for all issues pertaining to the development of the urban poor. A low-cost housing promotion program should be established to accelerate the availability of housing – rental as well as owned – in the city.

Identifying the poor

A comprehensive new survey or the urban poor is needed, to enumerate the poor reliably and to quantify the extent of their poverty using different measures – literacy, health, access to water and sanitation, homelessness, etc. to quantify the extent of their poverty using different measures – literacy, health, access to water and sanitation, homelessness, etc.

The past policy of 'notifying' slums, and distinguishing between 'recognized' and 'unrecognized' slums should be abandoned. Instead, a policy of identifying and serving the urban poor based on economic and social indicators of individuals and families should be adopted.

Identification of those eligible for government grants and subsidies (e.g. those who are BPL) should be carried out periodically – at a minimum, once in two years.

Issue 2: Housing and shelter

In all new layouts and housing areas, 20% of land should be specifically ear-marked for the poor. 20% of revenue from auctioned lands must also be ear-marked for the development of housing for the poor.

A participatory approach for providing in-situ housing may be followed, by which local dwellers themselves decide the type of structures for housing them, and also identify the beneficiaries.

Ward committees in each ward should be responsible for identifying suitable locations for social housing, with specific annual targets in all wards.

A diversified program of providing social housing, including 'own', 'rent', 'rent-to-own' options, should be established,

allowing the poor a greater range of options for meeting their housing needs.

Construction materials, credit, planning support, and other inputs for housing should be made available through structured programs.

Property taxes on homes smaller than 300 sq. ft should be eliminated. The various fees and levies related to real estate may also be waived for such homes.

Issue 3: Water and Sanitation

A 'lifeline water' program should be established, that delivers a specific minimum quantity of water free to all slums at public locations, based on volumetric entitlements for each of the families in the slum. The costs of establishing metered connections in all slums should be waived.

Extensive water harvesting programs should be created in all slums, using community inputs to identify locations, structures, and uses for water.

An eco-sanitation program should be established in all large slums, with individual or community toilets for all, as well as areas specifically identified for DEWATS operations to treat sewage locally.

Bins for collecting solid waste, appropriately sorted, should be installed in all slums.
Waste management programs in slums, as well as garbage disposal programs, should be tailored to provide employment for slum dwellers. Specific training programs to help locals perform these jobs must also be provided.

Issue 4: Health and Education

Primary health centers should be established on a population basis throughout the city, to provide a range of minimum services to the poor without cost.

A self-sustaining health insurance program to provide coverage for medical expenses beyond the free services provided by the PHCs should be introduced. This program should be open to all for participation, whether poor or not.

Primary education centers, which also provide child care, should be established in all large slums. Primary education should also be made truly free, with no 'barrier' costs such as stationery, clothes, books, transport, etc.

Issue 5: Livelihoods and opportunities

Job-oriented training programs should be created for the poor, based on continuous assessment of industry needs for workers. A program of matching trained workers to employers, with cost-sharing by both, should be put in place.

Development of employment, housing, schools and hospitals in peri-urban areas and nearby small towns should be taken up – these will have the effect of delivering these to low income groups at far lower costs than in Bangalore itself.

A minimum-wage law for Bangalore should be introduced, with wage thresholds to be determined by BUPA.

A regulatory board to oversee the working conditions of industries must be established, with a concentration on low-income workers.

EDUCATION

EDUCATION

Part 1: Overview

Compared to other districts in Karnataka, Bangalore urban is doing relatively well. Bangalore urban has the highest education index (the education index measures literacy rates and primary and secondary school enrolment rates).
Bangalore rural has a lower education index compared to Bangalore urban, perhaps due to lack of private sector schools which tend to be concentrated in urban Bangalore.

Part 2: Issues

1. **Poor quality of government schools:**
   The quality of teaching and other facilities in government schools is declining because of neglect. Hence, public confidence in the quality of state-provided education is low. Increasingly even poor parents are opting to send their children to private schools, despite the fact that public schooling is free.

2. **Jurisdiction and accountability:**
   Education is not considered a local public service. Instead, public schools in the area are run by education department of the state government itself. As a result, there is no local accountability.

3. **Mismatch between vocational education and local opportunities:**
   The courses offered and training delivered do not match the needs of the 1.local region. Hence, graduates of vocational training institutes are unable to find jobs in their area of expertise.

4. **Regulation and accreditation of private schools:**
   The supply-demand imbalance has also allowed a number of private schools to come up, which are not of a sufficiently good standard.

5. **English language not supported, hurting job-prospects of students:**
   In an increasingly competitive environment for jobs and opportunities, parents recognize the importance of English language education for their children, but state policy on this is ambiguous.

6. **Teachers asked to do teaching-unrelated tasks:**
   Teachers in the public school system are called upon to perform too many functions that have nothing to do with teaching, thus eroding their capacity to deliver learning outcomes.

7. **Untrained teachers:**
   Teachers are not sufficiently trained to properly teach their students.

8. **Lack of regulatory authority:**
   There is no regulatory and management authority with a specific focus on Bangalore schools.

Part 3: Planned solutions

Objectives

A clear program of measuring the outcomes delivered by schools must be instituted. This must be linked to periodic review of their curricula, methods of teaching, focus, etc. It must be ensured that education in public-funded schools is affordable and accessible. The stress on parents wanting to 'admit' their children in good schools must be reduced.

Local management of schools must be developed, so that parents feel involved in the teaching and services provided to their children. This will ensure that parents have some degree of control in ensuring the continuous educational development of their children.

A management and regulatory institution that oversees both public and private education in the BMR must be created.

Those graduating from the public school system must have clear opportunities for higher education or vocational training linked to employment, based on their preferences and capabilities.

Issue 1: Poor quality of public schools

[Because quality depends on a number of other factors, this issue can only be addressed indirectly by a focus on those factors. See the sections below.]

Issue 2: Jurisdiction and accountability

The operation of public schools in the region should be transferred from the State government to the Urban Local Bodies and the panchayats. The State may continue to bear the costs of these operations, but the management and reporting structures must be revised to reflect local control.

For all public schools, local school management committees should be established, comprising of equal numbers of members from the school administration as well as the parents of currently enrolled students. The BMSA shall identify the specific functions of this committee.

Schools should be rated according to their performance on indicators established by the Authority, and this information should be freely available to all parents in the schools.

A suite of remedial programs should be developed to address shortfalls in learning that are identified by the measurement process.

Schools that fall below the 'minimum standards' set by the BMSA shall receive dedicated funding for these programs to overcome their shortfalls.

Measuring outcomes

All public schools in the BMR should participate in a program of testing, to be developed by the BMSA. Private schools wishing to admit students at government expense should participate in such testing as well, in order to be eligible.

Issue 3: Mismatch between vocational education and local opportunities

Vocational training bodies should regularly interact with local businesses to understand their requirements, and feed this back into their training courses. This will ensure that the needs of the employers are met, and students are able to obtain employment.

Issue 4: Regulation and accreditation of private schools

The 100 best schools in Bangalore should be identified, Identify the 100 best schools in Bangalore, the establishment of a self-accreditation program by these schools should be enabled. Gradually, the other schools should be brought on board with specific measured metrics for rating each school according the standards of accreditation.

Issue 5: English language not supported, hurting job-prospects of students

The government should clarify its position on 'learning a language' versus 'learning in a particular language'. Also, considering that neighboring states (e.g. Andhra Pradesh) are adopting more liberal stances towards learning in English, the government should ensure that Karnataka students do not suffer a disadvantage in the employment market as a result of language policy.

Private institutions should not be barred from teaching in a language of their choice, as this amounts to a 'denial of choice' for the parents. Instead, they may be additionally required to teach specific languages as determined by the State and the BMSA.

Issue 6: Teachers asked to do teaching-unrelated tasks

Teachers in public schools should not be called upon to perform non-teaching functions (preparing meals, assisting in elections, etc) except if it is certified beforehand by the BMSA that such functions will not interfere with their teaching duties.

Issue 7: Untrained teachers

A regular program of upgrading teaching skills through training should be instituted in all public schools. Specific employment credits should also be created to incentives such training.

Teacher training institutes should be promoted throughout the state, and particularly in the BMR to ensure that a support system of training is available to all teachers.

Issue 8: Lack of regulatory authority

The Bangalore Metropolitan School District Authority should be created to address all issues pertaining to public-funded education in the BMR. The regulation and oversight of schools in the region should be the responsibility of the Bangalore Metropolitan Schools Authority.

For public as well as private aided schools, the Authority should have the right to set curricula, identify and approve teaching methods, and also to determine appropriate measurement techniques for the performance of both private and public schools.

Every child in the region must be entitled to admission in a school of a 'minimum performance standard' as measured by the Authority. Where no such schools are available near a child's home, the child may be entitled to attend a private school (which meets the standard), at comparable government expense functions will not interfere with their teaching duties.

POWER

POWER

Part 1: Overview

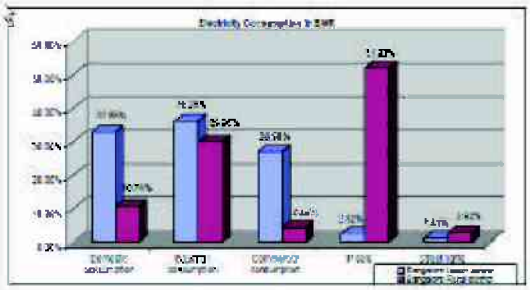
Uninterrupted power supply is critical for economic growth. Moreover, other critical requirements such as water supply are also dependent on power.

The responsibility for power supply in both urban and rural districts rests with BESCOM.

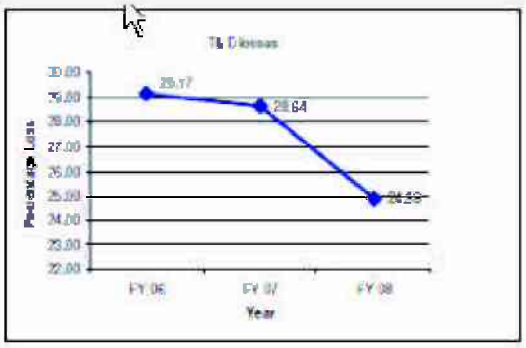
The industrial sector is the major consumer of power in Bangalore urban, while in Bangalore rural, the agricultural sector is the major consumer.

There is a gap between demand and supply.

Electricity consumption in BMR region



Over the period of 2006-08, transmission and distribution losses in the state have steadily dropped.



Transmission and distribution losses in the state 2006-08

Part 2: Issues

1. **Huge gap between demand and supply:**
   There is not enough power to meet the demands of all users. Past under-investments need to be overcome.

2. **Missing energy conservation strategy:**
   No incentives for energy efficiency'; lack of awareness.

3. **Significant amount of power is given away free or is underpriced:**
   Subsidies are not properly targeted.

4. **Poor quality of power supplied:**
   The quality of power supplied is poor, both in terms of voltage and frequency.

5. **Theft and losses:**
   There is continuing evidence of unauthorized use of power.

6. **Regulatory framework does not encourage distributed generation and consumption of power:**
   A policy on connecting to the grid is needed.

Part 3: Planned Solutions

Issues 1 and 6:

Huge gap between demand and supply, and regulatory framework issues

Substantial new investments are needed in generating new power. With an eye on the future, these investments may ideally be made in renewable energy. Distributed generation and consumption of power should also be encouraged, i.e. domestic consumers should be allowed to connect rooftop generated electricity to the grid and receive credit for such power.

Issue 2. Missing energy conservation strategy

Electrical devices should be energy labeled so that consumers are conscious of the choices they make. Awareness programs should be also created via the media, schools, colleges and so on, to enable the message to spread.

Issue 3: Significant amount of power is given away free or is underpriced

Agricultural subsidies need to be re-thoughta long the lines of Gujarat's Jyotgram program. Domestic consumption should be separated through other users through independent feeder lines.

Issue 4: Poor quality of power supplied

Stable power must be guaranteed by distribution companies through financial penalties on damages caused by instability.

Issue 5: Theft and losses

A multi-tiered system of metering that can document billed and unbilled power at several geographic resolutions (entire city, neighborhood, street, home) should be put in place. Unauthorized connections should be either turned into legal ones after payment of penalty or disconnected. Connection fees for BPL families may be waived.
Every home regardless of size should be eligible for a metered connection if its occupants request one.

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AIRPORTS & RAILWAY STATIONS

AIRPORTS

Part 1: Overview

Air traffic amounts to 12 million passengers per year (connecting to 28 domestic airports & 16 international airports) and 100,000 tons of cargo per year. These volumes are expected to grow and consequently, Bengaluru's new airport (BIAL) will play a very large role in facilitating the growth of the city's economy.

Part 2: Issues

1. **The location and distance to BIAL makes it unattractive as a long-term sustainable option for the rapidly developing areas in the south of the city:**
   In the last 10-15 years, the southern part of the city has grown tremendously. This has made accessibility to BIAL difficult and unsustainable as a long-term option.

2. **Unregulated development around the airport:**
   Airfield Environmental Management Committee exists within the BDA for regulating development around the airport. More comprehensive constitution required in wake of various types of ongoing development.

3. **Expansion:**
   Airport expansion needs to be revisited.

4. **Inadequate toilet facilities outside the terminal building:**
   The toilet facilities outside the terminal building are messy. The entrance area is congested apparently being designed to ensure that everyone pays, rather than ease of use for public. The toilets appear to be used mostly by the cab drivers for their ablutions.

5. **Unexploited synergies with other regional developments**
   The airport is the only destination in the region.

6. **Dangers posed to visitors, especially school children:** There is no dedicated facility for visitors to view the airfield and runway. Many schools arrange trips for children to visit the airport. However, the children are made to stand on the embankment – this poses a grave danger as children can slip and fall down the embankment. Further, there are no dedicated toilet facilities, leading them (boys, girls and their teachers) to urinate or defecate in the open. This is unhygienic and dangerous.

7. **Facilities for senior citizens and physically challenged:** There are no clearly marked facilities for senior citizens and the physically challenged.

8. **Presence of stray animals:** Stray dogs and other animals are frequently present outside the terminal building.

Part 3: Planned solutions

Issue 1: Location and distance to BIAL

In addition to providing high-speed connectivity to BIAL, the possibility of either reopening HAL to commercial traffic or establishing another facility towards Mysore should be examined. The government should engage BIAL in conversations about ensuring that these other choices are complementary to the finances of BIAL itself. All major metropolitan areas in the world are increasingly relying on more than one airport.

Issue 2: Unregulated development around the airport.

Bangalore International Airport Area Planning Authority (BIAAPA) and Airfield Environmental Management Committee to coordinate with various stakeholders (like the Department of Tourism etc) for coordinated development around the airport.

Issue 3: Expansion date

Phase 2 expansion date needs to be reviewed with the increase in air traffic.

Issue 4: Inadequate toilet facilities outside the terminal building

The toilets outside the terminal building are messy and dirty. They appear to be used by cab drivers to perform ablutions and hence, the toilets are frequently crowded. The cab drivers should have dedicated toilet facilities for themselves, with separate facilities for passengers and visitors.

Also, the entrance to the toilet is designed to ensure that visitors pay the fee, rather than for ease of access. This needs to be remedied.

Issue 5: Unexploited synergies with other regional developments

Since visitors and passengers have already traveled to the airport, this trip can be fully exploited through further developments – e.g. conference centers, places of interest in the region (e.g. Nandi Hills), shopping malls and so on. The aim is to help people derive the maximum benefit from traveling to the airport.

Issue 6: Dangers posed to visitors, especially school children

A viewing gallery must be created near or around the terminal building for both adults and kids, so that both are able to enjoy the airport experience. Adequate security measures can be put into place to ensure safety. The current obsession with security is killing the enjoyment of schoolchildren and instead causing dangers to the children themselves, who are being forced to watch the aircraft and airfield from dangerous vantage points. Besides, the view itself for the kids is far from clear – they are only able to get a glimpse of the airport and runway.

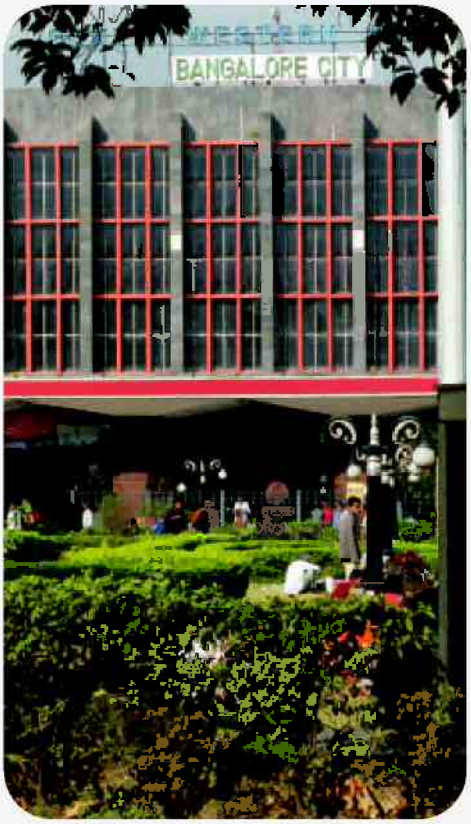
Issue 7: Facilities for senior citizens and physically challenged

A separate counter must be opened outside the terminal building, to cater to the needs of those physically challenged or in need of extra help.

Issue 8: Presence of stray animals

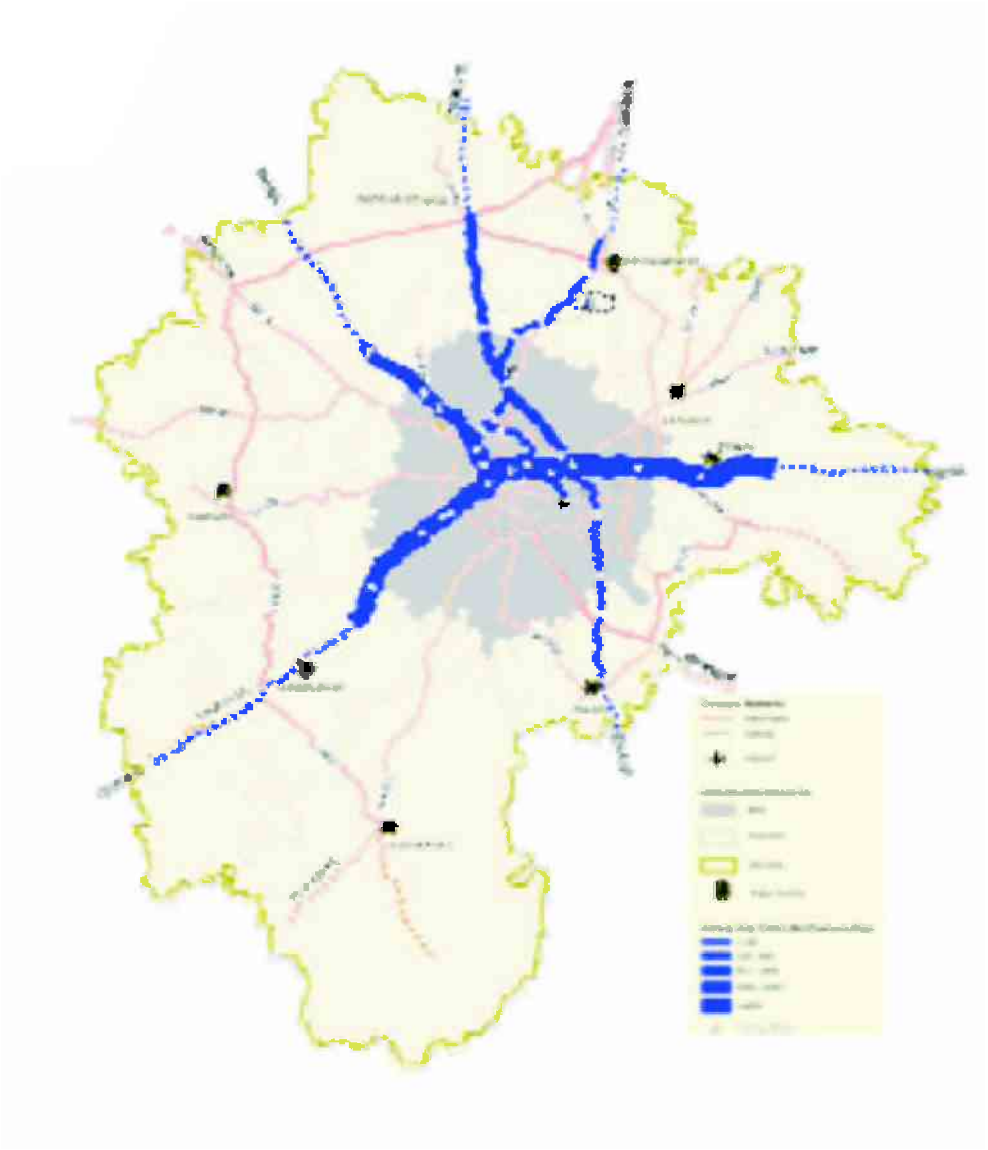
Stray animals should be humanely removed from the premises. An ongoing program of humane stray animal removal should also be put into place.

RAILWAY STATIONS



Part 1: Overview

The major rail traffic movement is in the eastern (Chennai) and the south-western (Mysore) directions. Within the BMR, the proposals to connect various important towns through broad gauge railway lines and commuter rail services are set to improve the accessibility within the region.



Rail volumes along major routes in the BMR

Part 2: Issues

1. **Inter-city rail transport facilities are concentrated in the northern half of the city:**
   This has made rail services inaccessible to residents in the south.

2. **Institutional mechanisms missing:**
   All important Railway Stations have been identified as a component of Integrated Multi-modal Interchange Hubs but the institutional mechanism for the management of the same is missing.

3. **Impact of corridor on land use not considered:**
   Although the Commuter Rail Service Line has been identified as a structuring element in the Bangalore Master Plan (2005-2015) and the BMR Structure Plan – 2031, the impact of the corridor on land use has not been duly considered.

4. **Congestion:**
   Single entry to railway stations creates bottlenecks and congestion.

5. **Lack of standardization of basic design:**
   There is a lack of standardization of the design of railway stations, creating huge discrepancies between the 7 existent railway stations in Bangalore (City Railway Station, Bangalore East, Cantonment, K R Puram, Malleswaram, Whitefield, Yeswanthpur) and inevitably turning out to be "avoidable experiences".

6. **Congested waiting areas:**
   The waiting areas are congested.

7. **Long queues:**
   There are long queues at the Ticket Reservation and Enquiry Counters.

8. **Lack of public amenities and parking space:**
   There is a lack public amenities such as clean toilets, drinking water and telephone booths. Several stations suffer from small parking areas.

9. **Lack of facilities for physically challenged:**
   Facilities such as lifts, ramps and so on, for the physically challenged and senior citizens are missing.

10. **Lack of comprehensive signage and poor quality audio announcements:**
    Signage on railway stations is not clear and comprehensive. Moreover, the sound quality of the announcements is often poor.

11. **Security:**
    There appears to be a lack of visible security in areas where large numbers of people congregate, such as concourses.

12. **Dirty railway stations and tracks:**
    Many stations appear to be unclean and dirty.

Part 3: Planned solutions

Issue 1: Inter-city rail transport facilities are concentrated in the northern half of the city

Rail facilities must be expanded to the southern part of the city as well.

Issue 2: Institutional mechanisms missing

Provide local institutional mechanisms for the management of each Integrated Multi-modal Interchange Hub and allow the railway stations to operate within this framework.

Issue 3: Impact of corridor on land use not considered

Earmark and design the railway corridor in such a manner to integrate it with the surrounding land use and create noise buffers, especially in residential areas. Redevelop railway stations along with surrounding activities as Urban Revitalization Projects to actualize them as Public Activity Nodes as designated in the Master Plan.

Issue 4: Congestion

Formalize dual access system to train stations; especially in stations like Yeswanthpur and K R Puram. Majestic to follow the multi-modal Interchange Hub Design.

Issue 5: Lack of standardization of basic design

Clearly-defined design standards for railway stations, for them to operate in an efficient and effective manner, at the same time providing a pleasant and comfortable experience to the user while marketing "Brand Bengaluru".

Issue 6: Congested waiting areas

Provide larger waiting areas (mezzanine floor may help) with seating; circulation of people should be streamlined.

Issue 7: Long queue

Provide automatic ticket dispensing machines and use digital boards and regular announcements for information dissemination.

Issue 8: Lack of public amenities and parking space

Provide multi-level Parking Area (especially Basement) to accommodate the ever-increasing rail traffic and standardize amenity provision (+ provision for hawkers) along all Platforms apart from Platform No.1. Also, provide roofs across all platforms.

Issue 9: Lack of facilities for physically challenged

Make barrier-free environment with construction of ramps and lifts (where required) mandatory. Provision of ramps alongside stairs at the edges can facilitate "luggage-pulling" – the system is extensively used in Chinese Railway Stations.

Issue 10: Lack of comprehensive signage and poor quality audio announcements

Provide well-designed signage systems to enhance legibility and streamline circulation on the train stations. Also make clear segregation between cargo and passenger circulation.

Issue 11: Security

Improve overall lighting on the railway stations to provide a more secure ambience. Penalties should be levied for unsafe crossing of platforms by running across the railway lines.

Issue 12: Dirty railway stations and tracks

Provide enough staff and monitoring mechanism to maintain acceptable levels of cleanliness on the train stations and tracks. Encourage the public to keep their surroundings clean.

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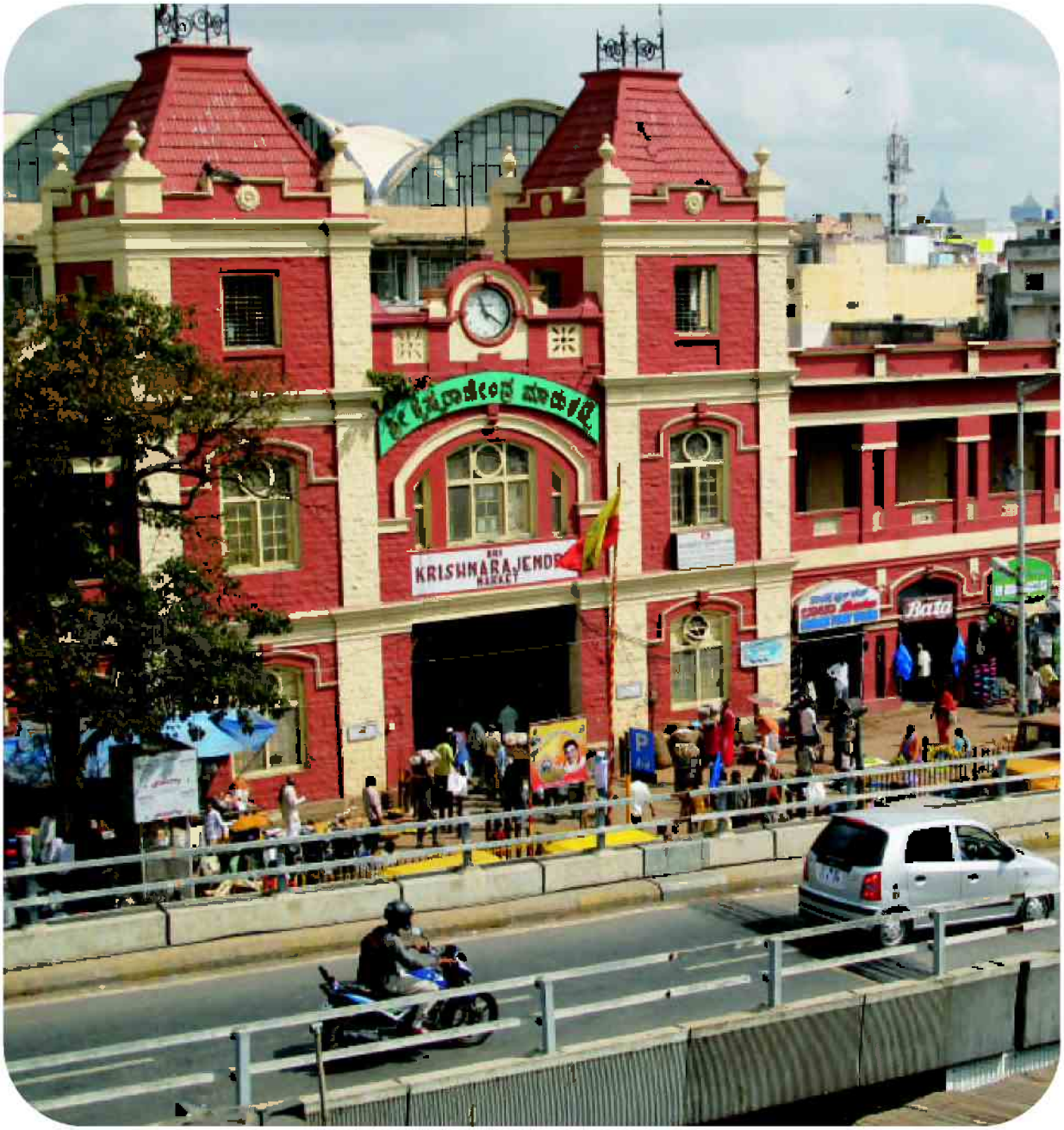
ECONOMY

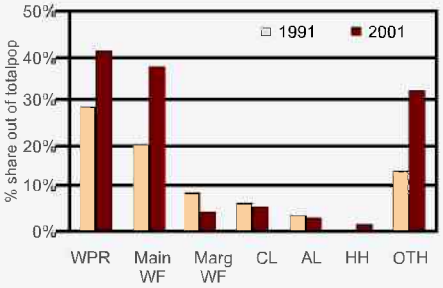


ECONOMY

Part 1: Overview

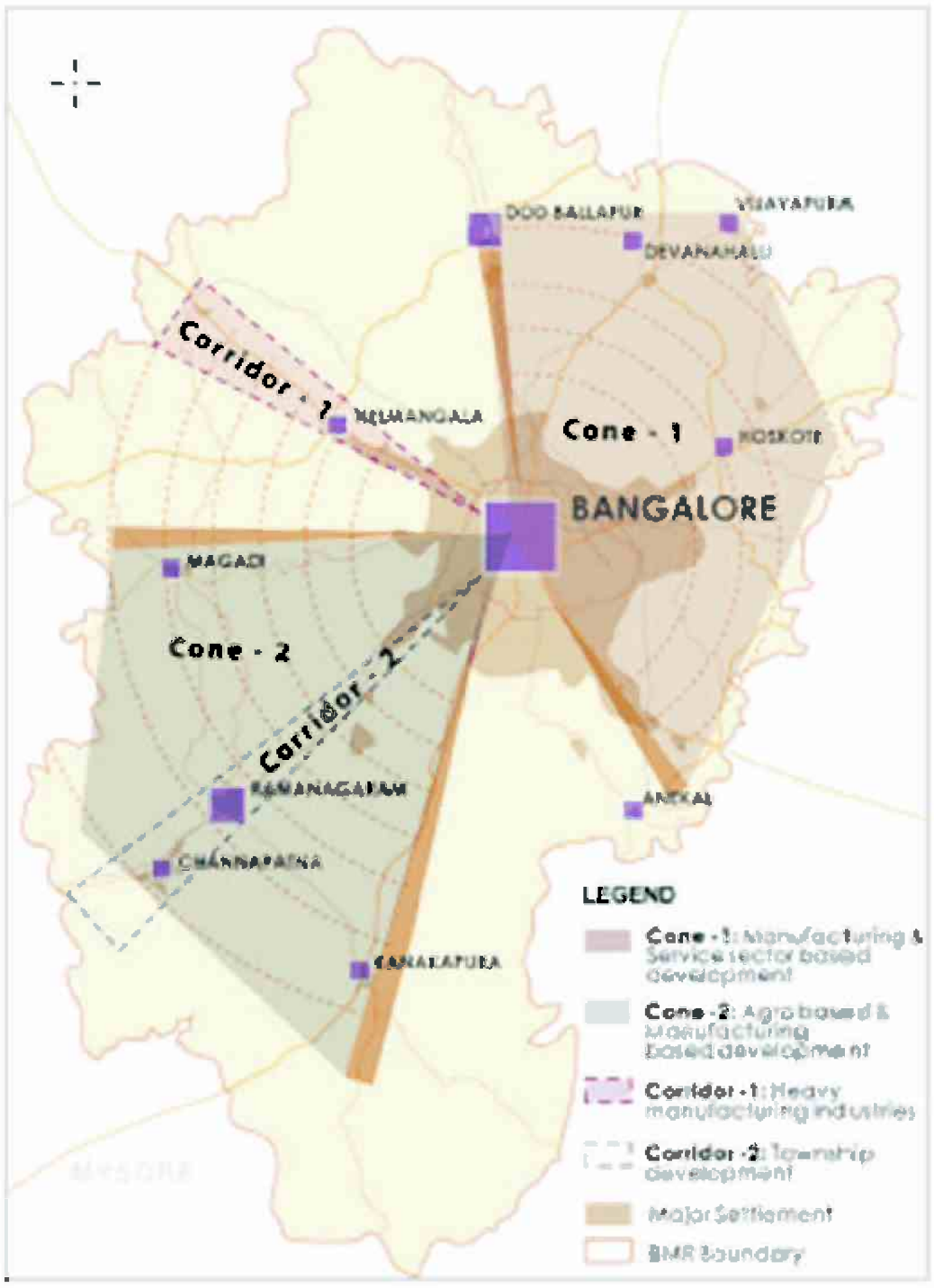
Bangalore's economic success, particularly its high-profile Information Technology (IT) industry, has drawn a lot of praise. However, Bangalore is in the 6th position among cities in India in terms of "doing business." Clearly, Bangalore has some way to go if it wants to become the no. 1 city for business in the country – in fact, the city needs to have the ambition of becoming a favored global destination.

Growth of workforce in BMR



Emerging spatio-economic dynamics:

Currently, the 'heavy' industrial belt is located in the north-west part – from Peenya towards Nelamangala and further on. The IT sector is located in the east and south-east, while the textile and agriculture-based industries are located in and around existing towns. Major investments are proposed along Kanakapura Road, Existing Mysore Expressway and proposed Bangalore-Mysore Infrastructure Corridor (BMIC). These include the emergence of six new specialized towns in this corridor. After the opening of the new airport, BIAL, there's been a growth in investment in the corridor between Bangalore and BIAL.



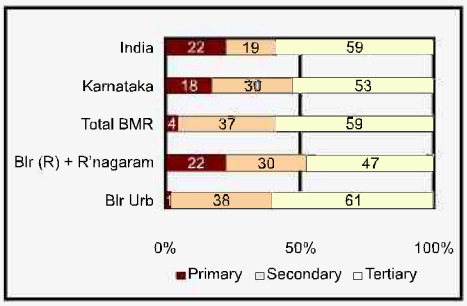
Emerging spatio-economy in BMR

Macro and micro-economic overview

Bangalore had the highest per capita income of Rs.52,550/- (as per 1993-94 prices) in 2004-2005 within Karnataka. BMR (Bangalore Urban, Bangalore Rural and Ramnagaram District) contributed 34%of the State's Domestic Product (SDP). It also contributed 37% of Tertiary Sector and 43% of Manufacturing Sector of the SDP. Contribution of registered manufacturing from BMR to the SDP was 59% which was the highest among all the districts of Karnataka.

During the same year, the gross domestic product of Karnataka (in constant prices of 1993-94) stood at Rs.35, 96,211 lakhs. Of this GDP, 34.8% came from industrial sector and 63.42% came from tertiary sector. Although the IT industry has bagged the economic headlines since 1990, the textile and real-estate industries have developed as well, helping diversification of the economy. But because of the current economic slowdown, employment has been affected and many industries in the BMR have turned sick during 2008-09.

Sectoral contribution to GDP



Local economy of towns

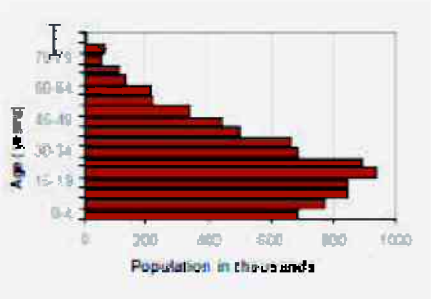
Towns in the south and south-east regions of Bangalore have textile and silk based industries. Wooden products and agro-based industries are based in the south-west.

It's important to note that the region is surrounded by a rich agricultural belt, encouraging agro-based industries in the BMR.

Employment scenario

In line with national trends, there's been a shift from agriculture-related work to non-agriculture-related work. The number of cultivators and agricultural laborers is dropping, while the number of non-agriculture based workers is rising.

Age breakdown analysis



Part 2: Issues

1. **Poor infrastructure:**
   Bangalore's infrastructure – especially in areas such as transport, power and water - has been unable to keep pace with the city's growth.

2. **Insufficient job creation:**
   A large part of economic development during the last two decades has been of the "jobless" growth variety.

3. **No dedicated skills development:**
   In many industries, e.g. construction, there is insufficient training of entry level workers, and no retraining opportunities for people whose jobs are lost.

4. **Need for urban renewal:**
   New economic development does not lead to revitalization of old areas.

5. **Lack of a dedicated investment development program:**
   The city needs an institutional way to identify and attract desirable new investments in preferred industries to build competitive strength.

Part 3: Planned solutions

Issue 1: Poor infrastructure

There is a 1.5% to 2% erosion of SDP (State Domestic Product) due to poor infrastructure.
The infrastructure issues have been addressed in the other sections of this Plan (roads, water, transport etc).

Issue 2: Insufficient job creation

Based on the job creation potential of various industries, a dedicated effort must be made to attract those industries that have potential to employ large numbers of people (retail, manufacturing etc).
A Small and Medium Business (SMB) promotion program should also be established.

Issue 3: No dedicated skills development

Job seekers should be trained according to the needs of employers. A dedicated fund must be created for retraining people who lose their jobs so that they can be re-employed gainfully.
Certification programs for unskilled and semi-skilled work (e.g. construction, plumbing etc) must be launched.

Issue 4: Need for urban renewal

Underdeveloped and abandoned parts of the city (buildings, blocks, etc) should be identified and a refurbishment program for these areas should be established. Urban intensive establishments can be promoted in these areas.

Issue 5: Lack of a dedicated investment development program

The city needs an "Invest Bangalore" program led by professionals (economists, financiers, technologists, infrastructure experts, etc) to pitch Bangalore to potential new investors and bring their investments to this region.

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HOUSING

HOUSING

Part 1: Overview

A large portion of the city's population does not have affordable housing. There are over 500 slums in the BMR and the current rate of progress in providing housing for families in these slums is very slow. Moreover, new migrants, many of them new to the city, live in desperate conditions.

This situation is made much worse by the fact that even for middle-income groups the cost of housing has risen dramatically. Between 2000 and 2010, for example, there has been an almost 300% increase in the cost of property in many areas. As a result, good quality housing is now affordable to only a very small section of the population.

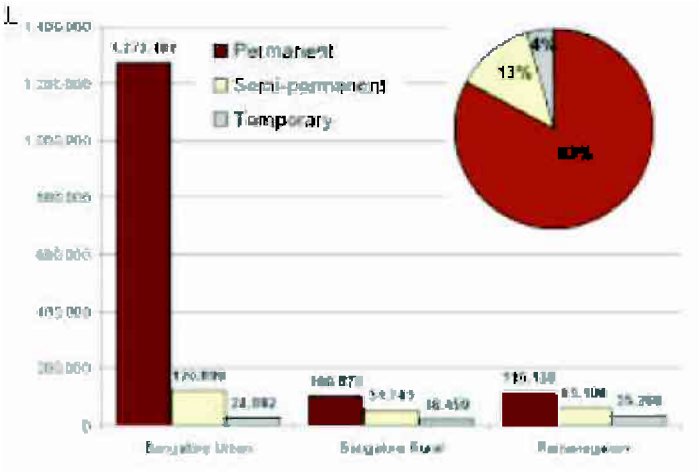
Many new buyers of homes are either speculative investors or high income individuals who often do not let their properties out to rent but prefer to keep them unoccupied as a second or third home.

All of this has contributed to an under-supply of housing in the rental market.

New home construction is also hampered by various regulations pertaining to tenancy, land use, eligibility for utility services, etc., all of which hampers the development of a robust market for housing across all income groups.

In the years 2002-07, about 35-40 thousand units were added annually in BMR, growing at a CAGR of 2%.

This amounts to about 0.4 million units per decade, growing at 2% CAGR which is very close to the 2.36% simple growth rate for urban India as mentioned in the study report of the Technical group [11th five year plan: 2007-12] on estimation of urban housing shortage, Government of India, Ministry of Housing and Urban Poverty Alleviation (MHUPA).



Housing types

Housing Demand and Supply

According to the 2001 census, 8.4 million people reside in BMR. The total available housing stock is 1.8 million units, although the liveable housing stock - comprising permanent and semi-permanent structures - is 1.72 million units. Housing demand is rapidly increasing, and housing shortage is projected to reach 2.6 million units in 2031.

Horizon Year	Pop_BMR	Avg.HH size	Demand Total Residential Housing Stock required	Available Housing stock	Gap
2001	8420000	4.5	1,871,111	1,723,264	147,847
2011	11000000	4.5	2,444,444	1,723,264	721,180
2016	12500000	4.5	2,777,778	1,723,264	1,054,514
2021	14200000	4.4	3,227,273	1,723,264	1,504,009
2031	18000000	4.2	4,285,714	1,723,264	2,562,450

Source: Available stock is based on table No.H-4, (Only permanent & semi- permanent housing stock are considered) Housing Series Table, Census of India-2001

Assumpton : The average HH size will come down to 4.4 and 4.2 by 2021 and 2031 respectively from existing 4.5

Housing demand and gap table

At this rate 2.0 million additional units are going to be added between 2001 and 2031 further leaving a gap of 0.5 million units to the total demand of 4.2 million units (existing 1.7 + 2.0 addition) . The current housing growth 2% CAGR is mainly because of the demand from the middle class as well as from higher income group for investment. The bulk of the demand is in the Rs 2 to 3.5 lakhs category, excluding the economically weaker category.

This growth may not be sustained for a longer period as most of the housing demand is from EWS (Economically Weaker Sections) and LIG (Low Income Group) sections. This leaves room for the government to intervene and make policies and programs to meet and support the demand, especially from lower sections of the society, which is to be addressed from public private and other means on a continuous basis.

Part 2: Issues

1. **Housing shortage:**
   One third of the families in the city do not have brick-and-mortar housing. An equal number is burdened by the high cost of their homes.

2. **Obstacles in the housing market:**
   Builders face many hurdles. Land records management is also weak.

3. **Regulations stifle rental housing supply:**
   Regulations that apply to housing favor renters at the cost of landlords; this suppresses the supply of rental housing.

Part 3: Planned solutions

Objectives

The cost of home-ownership must be reduced, so that home-ownership becomes more affordable to a wider section of the population in the BMR.

The quality of housing in different parts of the region must be ensured to a minimum standard, that is likely to distribute home construction regionally.

Land use and tax policies must be revised to facilitate new home construction, especially for the working poor.

Issues 1: Housing shortage

A massive program of home construction for the economically weaker sections needs to be taken up. Efficient links to financial markets are also needed to allow home ownership through long-term financing.
Short-term options to protect homeless persons must be provided.

Issue 2: Obstacles in the housing market

Land records are unreliable. The resulting lack of confidence suppresses the market. Moreover, land titles are not insured, further suppressing the market. Hence, an insurance market needs to be created.

Second and subsequent sales of homes may be made VAT-able, i.e. the owner should pay tax only on the increased value of the property since the previous transaction against it.
Land use and tax policies must be revised to facilitate new home construction, especially for the working poor.

For homes that are smaller than 500 square feet, (or communities in which more than 50 per cent of homes are of this nature) conversion of land to allow residential construction may be automatically waived.

Commercial development in business districts of the city must be linked to social outcomes, including housing for the poor, so that there is effective cross-subsidy.

The 250 sq.ft. floor on homes must be removed; all homes must be made eligible for metered water and electricity supply.

Issue 3: Regulations stifle rental housing supply

Tenancy rights of renters must be balanced by the ownership rights of owners. Landlords must be given confidence that rented properties can be recovered for their own use subject only to the provisions of the lease agreements they have entered into.

TOURISM

TOURISM

Part 1: Overview

The tourism sector aims to be one of Karnataka's sunrise industries. The unveiling of the state tourism Policy 2009-2014 which allocates Rs. 25,000 crores worth of investment into this multi-sectoral activity is a testimony to this fact. Tourism is one of the fastest growing sectors of the state's economy with tourist arrivals increasing by 40% in 2006-07

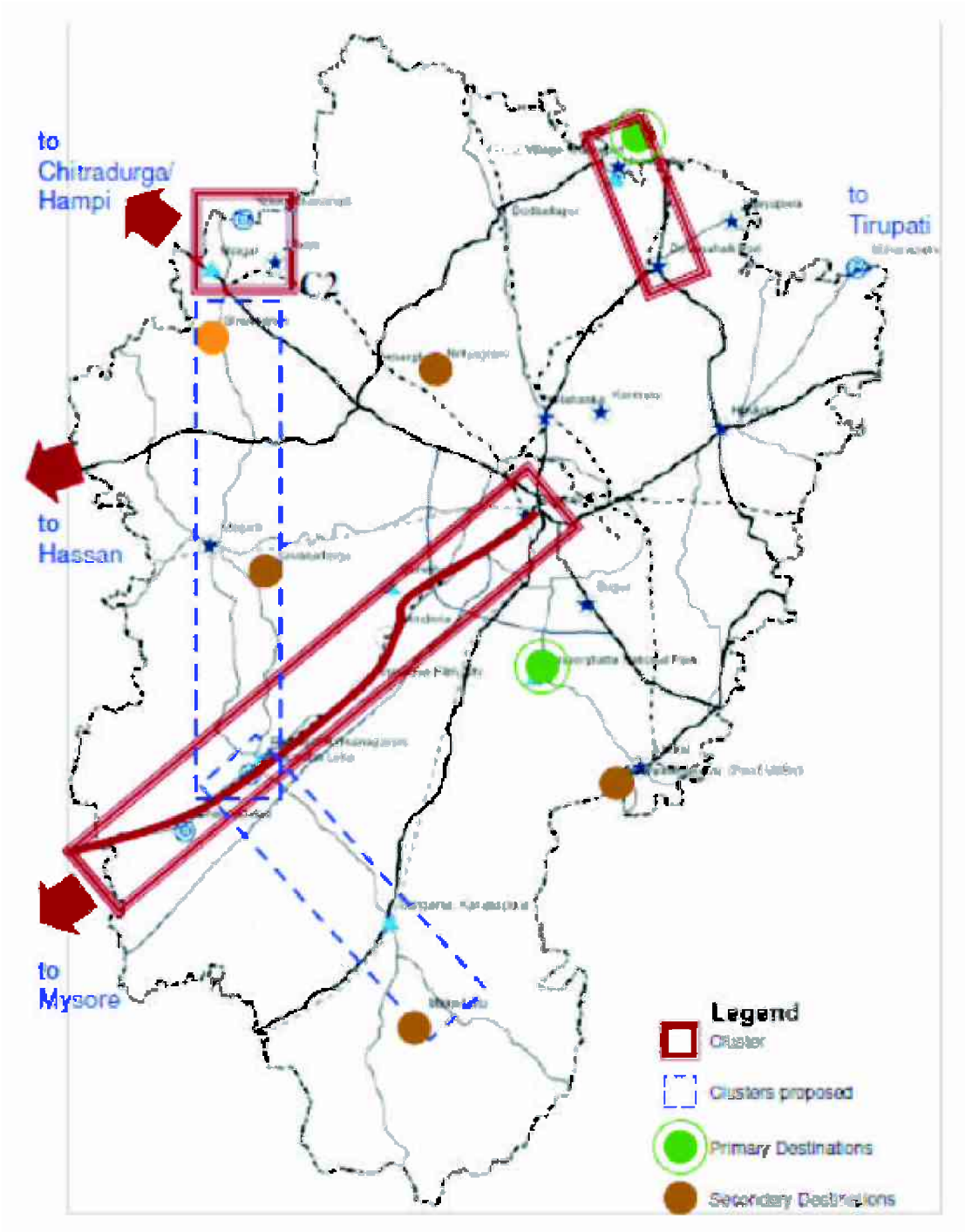
Karnataka ranks fourth as a domestic tourism destination and fifth among tourist arrivals from abroad with the share of foreign tourist arrivals to the State increasing from a mere 4% in 1991 to 15.7% in 2004.

The tourism sector has been broadly addressed in the BMR SP 2011. The focus of the sector is on open spaces, of various scales, for recreational activities; utilizing the opportunity of the International airport to showcase Bangalore and the national parks. However, major issues with regards to the tourism sector, as in identifying and linking places of significance, access and basic amenities have not been addressed in the Bangalore Metropolitan Region Revised Structure Plan – 2031.

Various initiatives need to be taken in the Bangalore Metropolitan Region and specifically within the city of Bangalore itself to make it a key tourist hub in keeping with its Capital status.

Objective

Promote sustainable development of the Tourism sector (environmental, economic and socio-cultural aspects) through the integrated development of a variety of available resources and supporting infrastructure, their planning, design and management at the macro and micro levels.



Primary and secondary tourist destinations

Part 2: Issues

1. **Uncapitalized resources:**
   Lack of capitalization of varied tourism resources in the city and the BMR as a multi-sectoral activity benefitting the economy. Only prominent places have been identified as tourist spots.

2. **Lack of tourism infrastructure:**
   Lack of supporting tourism Infrastructure, especially with respect to public transport & accommodation facilities.

3. **Lack of institutional coordination:**
   Lack of common platform for coordination between various public bodies like the Department of Tourism (GoK), KSTDC, BMRDA, BDA, rural bodies, forest department, heritage cell, the private sector and other local NGOs with respect to the tourism sector.

4. **Lack of information base:**
   Lack of a common marketing and information base (brochures, maps, ticketing etc) for local tourism destinations.

5. **No comprehensive tourism network:**
   As a part of the BMR Structure Plan 2031, potential thematic Tourism nodes and circuits have been identified with unique programs for the 8 clusters outside the City; their programmatic linkage with the City itself remains to be explored in order to establish a comprehensive tourism network in the BMR.

6. **Poorly addressed urban tourism sector:**
   Tourism as a sector remains unaddressed in the Bengaluru City RCDP Master Plan for 2005 - 2015. Although the Directive Principles to preserve natural heritage and give value to historical heritage, promotion of the Petta and the proposed development of the CBD as centralities may be considered as catalysts for urban tourism, they remain unrealized as of today – thus, making the heart of the BMR weak in terms of direct tourism potential.

7. **Unidentified urban revitalization projects:**
   Strategic Urban Design Revitalization Projects serving as catalysts for the Tourism sector remain unidentified in the District Planning Report RCDP 2015.

8. **Lack of accessibility and parking:**
   Lack of accessibility (e.g. Nrityagram + Kuteeram at Hessarghatta) and designated Parking facilities.

9. **Missing public amenities and signage:**
   Lack of public amenities and language-sensitive (sometimes only in Kannada) signages and tourist guides.

10. **Services for the disadvantaged:**
    Lack of adequate consideration for senior citizens, physically handicapped people and foreigners in terms of built environment and ticketing.

Part 3: Planned solutions

Issue 1: Uncapitalized resources

Identify, classify and promote potential tourism resources in the City and the BMR as Heritage, Cultural, Religious, Recreation and Leisure, Business and Commercial, IT (Bangalore being the Silicon Valley), MICE (International Convention Centre proposed near BIA by DoT), Education, Health/ Medical, Adventure, Eco-tourism, Wildlife (new Night Safari proposed at BNP by DoT), Rural, etc to create a comprehensive Tourism Network and use the same for multiplier effect on the economy.

Issue 2: Lack of tourism infrastructure

Provide adequate tourism infrastructure, especially open-roofed sight-seeing buses plying on the city and BMR tourism networks. Also, adequate public amenities to be provided along identified "City Walks". Good-quality budget accommodation and back-packer facilities to be adequately provided for.

Issue 3: Lack of institutional coordination

Create Tourism-specific institutional framework with representation from all relevant stakeholders, involving local bodies like Equations (which work on the socio-cultural and legal aspects of Tourism).

Issue 4: Lack of information base

Create multiple KSTDC information counters as well as online facilities for dissemination of travel and tourism related information (maps, brochures, common ticketing for multiple destinations).

Issue 5: No comprehensive tourism network

Commission Tourism Master Plans for identified Tourism Nodes & Circuits in the BMR Structure Plan – 2031.

Issue 6: Poorly addressed urban tourism sector

Commission Tourism Master Plan for the City of Bangalore as an update of Bangalore City RCDP Master Plan for 2005 – 2015, integrated with the BMR Structure Plan -2031 and the Karnataka Tourism Policy 2009-2014.

Issue 7: Unidentified revitalization projects

Undertake/ Commission Pilot Urban Design Revitalization Projects for tourism – one inside the city and the other outside the city. For example:

- Bull Temple-Gandhi Bazaar –BMS College Area Revitalization at Basavangudi
- Nrityagram-Kuteeram Area Revitalization at Hessarghatta
- Lake and Tank Revitalization is already under implementation by the DoT-GoK

Issue 8: Lack of accessibility and parking

Implement Policy TO2 – Enhance Accessibility and Amenities from the BMR Structure Plan -2031 in the BMR and for the city tourism resources.

Issue 9: Missing public amenities and signage

Undertake/ Commission complete Lighting and Signages Project (in a minimum 3 languages - Kannada, Hindi and English) for all designated Tourism Spots.

Issue 10: Services for the disadvantaged

- Provide barrier-free and safe environment at all tourism locations.
- Create non-discriminatory ticketing prices for Indians and foreigners to promote the global image of Bangalore.
- Employ trained tourist guides and other staff for proper maintenance of tourism spots.

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CITY FACILITIES

CITY FACILITIES

Part 1: Overview

The smallest step to achieving a "world class city status" is to offer world class facilities to the citizens of Bangalore and the BMR.

Part 2: Issues

1. **Lack of coordination:**
   There is a lack of a coordination, mechanism and dedicated funding to implement and maintain the city's facilities in a suitable manner.

2. **Lack of implementation:**
   City Facilities – a major component of Micro-Planning has been addressed to some extent in District Planning Report RCDP 2015, but remains largely unimplemented.

3. **Navigation problems:**
   Difficulty in navigating through the city, especially for visitors.

4. **Lack of basic public amenities:**
   Basic amenities such as public toilets, drinking water and telephone booths are lacking in a large part of the city.

5. **Poor street infrastructure for pedestrians:**
   Pedestrian amenities like good-quality paving and urban furniture are poor.

6. **Lack of adequate parking facilities:**
   Parking facilities and management are woefully inadequate.

7. **Insufficient provision of neighborhood facilities:**
   Especially in various "not-so-posh" wards.

8. **Lack of security:**
   Security-related infrastructure, especially for the nights, is lacking.

9. **Lack of civic sense:**
   Many of the city's residents lack civic sense.

10. **Inadequate graveyard and crematorium facilities:**
    These facilities are often unhygienic and ancillary facilities not available.

11. **Inefficient abattoirs:**
    Abattoirs are often inefficient and cause problems for the residents who live around the area.

Part 3: Planned solutions

Issue 1: Lack of coordination

Create a City Facilities Assessment and Monitoring Committee comprising of the BBMP, Municipal Council and other Local Bodies (Ward Committees, Rural bodies, etc), PWD, BESCOM, BWSSB, Transport and Traffic Department, Private Sector (especially the network service providers) and NGOs. Coordinated action to be taken by the respective agencies according to a "logical" timeline in the recommended areas of the city. Ward Committees to follow-up at the more local level.

Issue 2: Lack of implementation

Follow the recommendations provided in the Planning District Report RMP 2015_BDA

Issue 3: Navigation problems

Provide "You are here" maps all over the city (especially in the city center) for orientation and legibility.

Issue 4: Lack of basic public amenities

Public Amenities: Provide basic amenities like public toilets, drinking water, telephone booths, mobile charging points at regular intervals (say, at 400m-600m walking radius) on important roads and streets within the urban area. The following can be clubbed with the Metro Stations along the specified transit corridors, with petrol pumps along heavy traffic roads like national/ state highways in the BMR and also inter-city and ring roads within the city. The same should be provided in neighborhoods in the neighborhood center (BDA Complex) and in all public places, like parks and playgrounds. The frequency of the above should be maximum in the city center, despite the fact that increasing numbers of malls have these facilities.

Issue 5: Poor street infrastructure for pedestrians

Upgrade, maintain and provide for evenly paved footpaths in all commercial and residential areas. City center, important roads and streets should be made barrier-free and tactile paving should be provided for the blind. Urban furniture, like benches, should also be provided in these areas for pedestrians to rest and enjoy the environment around.

Issue 6: Lack of adequate parking facilities

As recommended by the Bangalore Master Plan, PMP (Parking Management Plan) should be followed in congested areas of the city, like the city center. City open spaces may operate as paid parking places during peak traffic hours to meet the huge parking deficit. Adequate number of petrol pumps and gas stations should be provided at regular intervals as per transportation planning standards. Also, taxi pick-up and drop-off points should be provided in major commercial, business and industrial areas. Bus by-lanes should be made, wherever possible.

Issue 7: Lack of neighborhood facilities

All residential neighborhoods should be provided with safe & well-maintained playgrounds, parks & other community (cultural + sports) facilities. The number of "Bal Bhawans" should be multiplied across the city.

Issue 8: Lack of security

Enhance street lighting in major commercial areas, like Cunningham Road-Indian Express Circle, to create a feeling of security. Also, provide multiple police booths in addition to the existing police stations to increase vigilance across the City.

Issue 9: Lack of civic sense

The provision of city facilities also calls for proper use of them by the users, without which, vandalism and theft may turn out to be the undesired results. Thus, such training maybe provided to school children to bring about this generational shift in attitude.

Issue 10: Inadequate graveyard and crematorium facilities

Alternative eco-sensitive and dignified methods to dispose the dead in safe locations away from the city center should be promoted. The 8 electric crematoriums in the city may use solar/ gassifier (like in Chennai) and other green technologies that are less power-intensive to reduce the ecological footprint of the dead.

Existing graveyards within the city can be used as green lung spaces and new ones can be provided on the periphery. All crematoriums and graveyards should be provided with adequate public amenities like toilets and washing areas and should be preserved in extremely hygienic conditions. The process should be streamlined to make it less painful and more humane and dignified.

Issue 11: Inefficient abattoirs

Small existing abattoirs / slaughter houses should be renewed by adopting high-technology, which is more hygienic, efficient and humane. Landscaped buffer areas should be created around them to isolate the smell and provide minimal disturbance to residents of the area.
Large slaughter houses, as proposed, should be relocated to Igaluru, Anekal Taluk in an eco-sensitive and economical manner. Buffer guidelines should be observed to protect the interests of the residents around the areas.

SECURE BENGALURU

SECURE BENGALURU

Part 1: Overview

The Mumbai attacks on 26 November 2008 signaled that the Indian economy, along with its various players including businesses and business people, are now prime targets of terrorists.

The repercussions of the Mumbai attacks were felt all over the country but with Bengaluru now being a major economic center in its own right, the city's businesses are a natural and likely target. The threats are immediate. The attacks could take place at a single location but it's more likely that, as in Mumbai, the attacks could be carried out in several locations simultaneously.

Bengaluru has already been a target in the past and the bomb blasts in 2008 were possible dry runs to test the responses of the Bengaluru police. The terrorists would certainly have observed the responses of the local authorities and will plan their future tactics accordingly.
Entry into Bengaluru is wide open with many access points from within Karnataka and outside the state. The lengthy coastline means that, as in the case of the Mumbai attacks, terrorists can enter the state through the sea route.

Like in any big city, commute times are high because of traffic congestion. Besides, the city lacks service roads and hence, in case of a terrorist attack, the time for the authorities to reach the location of an attack is likely to be high.

One solution that has been suggested is the creation of the National Security Group (NSG) or a similar force for the city. However, this will take time and is not a solution in terms of providing an immediate response capability.

Moreover, although the use of private security guards has proliferated in recent years, their skills and equipment are inadequate. The burden of providing security continues to rest completely with the state.

Part 2: Issues

1. **Lack of preparedness:**
   The city is not adequately prepared for terrorist acts.

2. **Lack of risk assessment:**
   The risks the city faces are not properly assessed and hence, the preparedness is consequently hampered.

3. **Poor institutional capacity to respond to crisis:**
   There is a lack of adequate crisis and response management.

4. **Fragmented intelligence:**
   Intelligence gathering between the state and center is not robust.

5. **Vulnerable coastline:**
   Karnataka's long coastline, like the one in the Mumbai , is vulnerable to terrorist incursions.

6. **Poor public communication:**
   Appropriate protocols for communication with the public, especially via the media, are not clearly laid out.

Part 3: Planned solutions

Guiding Principles

Pre-emption and preparedness

Public security systems must anticipate and prepare for a wide range of potential security threats and incidents. Also, emergency responses should be anchored within the existing functions of public officials, so that they have the highest preparedness for responding rapidly in the event of an incident.

Integrated and speedy response

The direct and other consequences of a range of public security threats must be fully managed so that there are no gaps in the response. Also, functional and oversight responsibilities should place equal emphasis of speediness of the response to an incident.

Public Communication

The public must have clearly understood familiar channels through which they can be communicated with, as part of the public security response to an incident

Policies

A continuous program of surveillance, risk assessment and analysis must be established. Further, measures of public security must be established through this program and response programs must be developed for each level of perceived threat.

An integrated structure for exercising authority and overseeing coordination between response aspects must be created and given anticipatory authority for issuing orders in response to specific events.

Appropriate responsibility must be devolved to front-line personnel so that those responding to a security event have suitable authority and training for decision-making.

Multiple systems such as health, environment and transport, are likely to be impacted by a public security event and must be identified and their functions must be woven into the various specific emergency response methods.

A public communication channel must be developed that will be available to officials even in the event of a security threat or incident.

Issue 1: Lack of preparedness

Establish a Crisis Preparedness Group

A Crisis Preparedness Group (CPG) should be established, including senior officials from the police as well as the civil services. Functional leadership roles should also be established within the group for domain experts from the private sector in various areas.

The CPG should develop readiness plans for each of the following types of institutions. These plans should be incident-specific and based on the capacity of individual facilities at different locations. The CPG should routinely verify the readiness of such institutions for a public security breach.

- Hospitals and clinics
- Fire and Rescue Services
- Police
- Utilities
- Traffic and Transport departments
- NGOs and community organizations

Professional Readiness

The administrative heads of public security functions should be chosen based on a prior record of service in these or related functions, to ensure their capacity to provide appropriate leadership in response to critical events. These officials should also have a minimum tenure of 3 years.

The principle of 'continuity' should be used in developing skills and imparting training i.e. as far as possible, the emergency response functions carried out by public servants should be linked to the existing functions of different agencies, as well as familiar methods of work (but suitably revised for emergency needs).

The technical and administrative skills needed to maintain a high level of professionalism and capacity should be identified, reviewed regularly and suitable training in these skills provided to adequate personnel in various agencies.
A training manual, including identification of specific functions to be carried out, should be developed for staff in each agency.

Issue 2: Lack of risk assessment

Establish a Risk Assessment and Analysis Group

A dedicated Risk Assessment and Analysis Group (RAAG) must be established, composed of public officials from the police, intelligence, IT network security, coast guard and public health as well as suitable experts from the private sector.

A continuous data gathering process, as well as an analytics program, should be established to help the RAAG in its work. The RAAG may call upon any public agency to share data with it, so as to facilitate its work.

The RAAG should also establish and maintain a Public Security Hotline (PSH) for people to report suspicious activities. The RAAG also should maintain a threat perception rating at all times.

Further, the RAAG should develop an initial set of responses to each grade and type of threat perception and periodically review and revise these. Where specific pre-emptive action is needed, the authority for such action should follow automatically from the RAAG's threat perception.

Issue 3: Lack of proper crisis and response management

Establish a Crisis Management Group

A Crisis Management Group (CMG) should be established, including senior officials from the police as the civil services, as well as elected leaders from local and state government. Functional leadership roles should also be established within the group for domain experts from the private sector in various areas.
In the event of a high threat perception rating from RAAG or an actual incident in the city, the CMG should automatically assume nodal leadership for emergency response. The CMG should also be the single point of coordination with national security agencies.

The CMG may assume direct management of any public agency in response to the highest level of threat perception or a public security breach.
The CMG should determine the timing of the shift from 'response' to 'recovery' operations and ensure that recovery efforts do not impinge on ongoing response operations. The CMG should also establish a sub-group to coordinate public communication. This group will be responsible for media management during the 'response and recovery' period following a critical event.

The CMG may schedule media briefings to create suitable public information. The CMG may also develop 'pooled coverage' (text, audio, video, etc.) to be used by multiple media organizations on a shared basis.

The CMG should also establish communication procedures with victims and their families and provide credible information to them.

Basic Planning

The police force must be permitted to perform professionally. Political interference in the various aspects of the running of the police force undermines the preparedness and responsiveness of the police, particularly in challenges such as terrorist attacks. Hence, the Commissioner of Police must be given the freedom to put the best policemen on the job of protecting the city.

One issue that hampers the police's performance is the lack of proper equipment. In the Mumbai attacks, it was evident that the terrorists had superior weapons compared to that of the policemen who were responding. The nature of the threat is now a full-fledged military one and the local police cannot be expected to fight such an enemy with outdated protection and weaponry. Hence, the police force needs to urgently upgrade its equipment, including helmets, bullet-proof vests, weapons and side-arms.

Response Infrastructure

The Bangalore Metropolitan Region should be demarcated into several zones, each under the supervision of the DCP officer of the police. These zones should serve as the sub-regional arms of the CCC.

Each zone should be responsible for maintaining a list of high-profile, risk-prone locations and developing and documenting effective response systems for each.

There should be intensive and visible patrolling and surveillance around these locations. Each zone should also be responsible for electronic surveillance in its jurisdiction, including effective use of information from traffic police cameras.

These surveillance inputs should all be monitored at control rooms in the zones.
A secure CMG Control Centre (CCC) should be established with direct connectivity to the zonal offices. The CCC and the zonal offices should be maintained 24X7 online.

Response capacity

Each zone should have clear local capacity of armed QRT and civil defense infrastructure (fire services, hospitals, ambulances, trauma care centers and doctors). QRT capacity should be built quickly from within local police resources (KSRP and other special detachments).
The state government may seek temporary deputation of NSG/ITBP officers to state police to manage, train and arm the QRT assets.

Response Procedures

There should be a tightly written and standard operating procedure for the CCC and each of the zonal centers with which it coordinates its functions. The Standard Operating Procedures (SOPs) should cover:

- Securing crisis zones
- VIP visits
- Media coordination
- Victim care
- Guidelines for media conduct.

Establish Special Security Zones (SSZs)

Given the travel time and traffic issues, the city should be demarcated into five or six Special Security Zones (SSZs). The capacity and scope for each zone can be built up differently as required.
Each SSZ is to be the responsibility for the DCP (Deputy Commissioner of Police or equivalent senior officer) and will have a Secure Control Center (SSZ CC) or equivalent.
Each SSZ is to have a list of possible targets consisting of high-profile locations (e.g. malls and offices), including residential localities of high-profile individuals such as prominent politicians, businesspeople and so on. Each SSZ is to have one helipad along with designated hospitals and trauma centers.

Establish a Crisis Management Command and Control Centre (CMC3)

There should be a Crisis Management Command and Control Centre (CMC3). This is to be in a secure location. The CMC3 will need full connectivity to all the SSZ CCs with wireless, fibre-optic for multiple voice, video and data channels, terminals to RTO and criminal databases, connectivity to the home ministry in Delhi, the Intelligence Bureau (IB), RAW (Research and Analysis Wing) and other critical bodies. The help of the Army and the NSG (National Security Guards) could also be sought to develop the CMC3.

The State Government should have a Crisis Management Group (CMG), including district-wise CMGs.

The RTOs (Regional Transport Office) should be completely computerized and must interface with relevant police databases.

The statewide and Bengaluru police wireless network should be strengthened and upgraded. A secure police and intelligence intranet should also be created. Better legislation needs to be introduced to support the law-enforcement authorities in their battle against terrorist acts.

A policy and framework for private sector armed security forces needs to be created. This must be done according to strict guidelines, certification, regulation, and training from the police.

To ensure that the police forces are motivated, all police welfare measures (e.g. housing, colony upgradation, etc.) must be cleared.

Prevention

Intelligence coordination between the State and Center must be institutionalized and made robust. This could include the building of a state intelligence intranet with each district intelligence operation being able to easily and seamlessly input and share intelligence.

The state police intelligence department must be upgraded and the intelligence analyst cadre needs to be strengthened.

SSZs should have visible and intensive patrolling operations around specific targets within the SSZs. The CISF (Central Industrial Security Force) and other paramilitary forces should be requested to augment forces for patrolling.

The SSZs will have full and extensive electronic surveillance throughout the zone, monitored at the SSZCC.

The police must advertise a public hotline so people can report any suspicious activities. All police stations must be instructed to give terror suspicions the highest priority.

Terrorists are often highly educated and computer-literate. Some even seek respectable employment in large, blue-chip companies. Hence, screening of corporate employees must be made tighter.

Introduce neighborhood policing schemes

Community and neighborhood policing schemes must be introduced. Community leaders should be institutionally linked to the police but without the sharing of intelligence This is important because there could be some local support and terrorists may try to mingle with locals before or after an attack.

Neighborhoods should also be encouraged to turn into gated communities with private security facilities (like in Delhi).

The RTOs must tighten the license issuing process to prevent the issue of fake licenses. The issuing of fake licenses must be made a criminal offence.

A new statewide protocol must be introduced for stolen vehicles and fake licenses. The law regarding traffic violations must be enforced.
Mobile patrols should be introduced on state and national highways. These patrols should be linked to the police network. Responsiveness must be high.

An ID card system is to be planned and rolled out, with a centralized citizen register and database and integrated to the UID, if possible.

Crisis Response

The crisis response process to be followed must be clearly written and documented for CMC3 and each of the SSZ CCS.

Standard Operating Procedures (SOPs) for various aspects of a crisis response, such as securing of the attack location(s), evacuation of the surrounding areas, media conduct, media coordination and so on, must be laid out and documented .

CMC3 and SSZ CCs must be manned 24/7 and be on the police network.

Each SSZ must have local capacity of armed QRT and civil defense infrastructure comprising the fire service, ambulances, hospitals, trauma centers and doctors).

The QRT capacity must be quickly built from within local police resources (e.g. the Karnataka State Reserve Police and other special detachments)

The state should seek temporary deputation of NSG/ITBP (Indo-Tibetan Border Police) officers to the state police to manage, train and arm the QRT.

Issue 4: Fragmented Intelligence

Institutionalize intelligence coordination

Intelligence coordination between the state and center should be institutionalized and made robust, including the establishment of an 'Intel Information network', through which each district intelligence operation can seamlessly interact with others.
The intelligence analysis cadre in the state police must be strengthened.

Routine data collection and documentation in government departments and agencies should contribute information to develop intelligence and risk analysis for public security threats [for instance, traffic cameras, RTO databases of vehicles and owners, etc. should be fully available to the RAAG].

The CPG should prepare a full list of such data sources and ensure continuous availability of this information from each agency.

Issue 5: Vulnerable coastline

Coastal Security Blueprint

A 3-tier coastal security system should be established, consisting of the following:

A designated Head of Coastal Security of the rank of ADGP/IGP to be announced.

·A Karnataka Coastal Security Command and Control System with multiple coastal stations on the same network to be established. Consultations with Army and Navy to be held to develop and design the centers.

Coastal security components – marine, air and land surveillance and patrolling – should all be linked to these command centers.

Agreements between Karnataka Police and the Navy, Coast Guard, and Coast Guard Helicopter should be established for coastal and air surveillance.

Coastal police stations to be built and strengthened and also to be on the security network. Coastal stations to be equipped with appropriate boats for close-shore patrolling. Coast guard officers to be deputed to Karnataka to train State Marine Police.

Issue 6: Poor public communication

A multi-mode, zone-specific public information system that can be used in the event of a security incident must be developed. Secure access to this system should be enabled from the CCC. This system must be routinely tested and its status reported to the CPG.
A protocol for the communication of vital information during emergency responses should be developed and agreed with the media organisations.

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