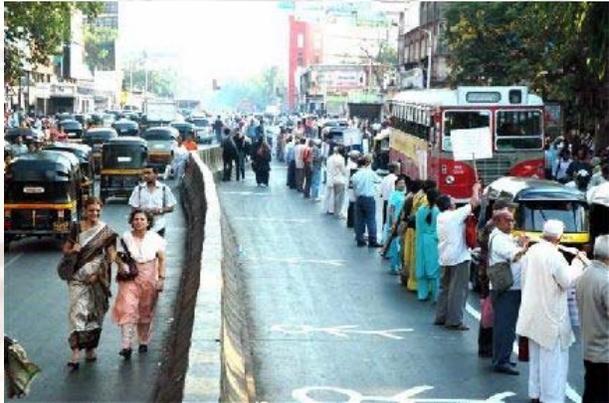


Policy Paper for Pedestrian Movement In the Bangalore Metropolitan Region

Draft Report



Directorate of Urban Land
Transport, Bangalore
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Abbreviations

ADT	:	Average Daily Traffic
AQI	:	Air Quality Index
BDA	:	Bangalore Development Authority
BBMP	:	Bruhat Bengaluru Mahanagara Palike
BMRDA	:	Bangalore Metropolitan Regional Development Authority
BMRTL	:	Bangalore Mass Rapid Transit Limited
BMTC	:	Bangalore Metropolitan Transport Corporation
BWSSB	:	Bangalore Water Supply & Sewerage Board
CTM	:	Chief Traffic Manager
CDP	:	City Development Plan
CRS	:	Commuter Railway System
CTTP	:	Comprehensive Traffic and Transportation Plan
DULT	:	Directorate of Urban Land Transport
GOK	:	Government of Karnataka
KSRTC	:	Karnataka State Road Transport Corporation
KSPCB	:	Karnataka State Pollution Control Board
KUIDFC	:	Karnataka Urban Infrastructure Development Finance Corporation
LRT	:	Light Rail Transit
LSGIs	:	local self government institutions
MSL	:	Mean Sea Level
ORR	:	Outer Ring Road
P & SP	:	Public and Semi Public
PT	:	Public Transport
PHPDT	:	Peak hour peak direction trips
SPM	:	Suspended Particulate Matter
STRR	:	Satellite Town Ring Road
T & T	:	Traffic and Transportation

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“Streets and Their side walks are the main public places of a city; they are its most vital organs. Think of the city and what comes to the mind? Its streets” - Jane Jacobs, 1961.

1 Purpose of the document

1. This policy paper is devised with intent of creating a framework for regulating and co-coordinating programs as well as actions by various stakeholders such that there is increased comfort, convenience and safety to the pedestrians and their movement.
2. The policy paper is devised by capturing the salient pedestrian issues that are specific to Bangalore and the key concerns of the various stakeholders related to promoting the “pedestrian”. Through a Consultative model, the various aspects have been elaborated and recommendations carried out.
3. The document also picks the key issues that need treatment in comprehensive manner and highlights key action areas that are necessary in the immediate term.

2 Limitations and disclaimers

4. Though this document refers to the standards and specifies the requirements, this document is not to be substituted for the engineering standards and Codes. The document also calls for comprehensive review of various aspects related to the pedestrian movement and the roles of various players concerned with the provision, management and use of the pedestrian infrastructure.
5. During the short duration of the exercise, secondary data sources were utilized. The policy document has extensively referred to the CTTS 2007 for primary data and survey findings related to the realm of parking and pedestrian as well as public transport. The Governing statutes and circulars given by the Ministry central and state have been referred to.

3 Introduction

The word “Pedestrian” refers to the non motorized movement mainly to person/s traveling on foot. This includes movement by physically challenged, visually impaired, old and very young for different purposes such as work related, recreational, social interaction and shopping activity.

On a sidewalk, the typical pedestrian walking speed is 1.5m/s (the same as 5.4km/h or 900m in 10 minutes).

Though walking appears less attractive, as it is considered as slow means of transport- Pedestrian movement is re-gaining centre stage in all planning efforts and due importance is given to pedestrian movement all over the world. This is mainly due to the associated benefits:

3.1 As an alternative to intense growth of vehicular traffic

- The increase in distances between various activities and segregation of land uses has encouraged the growth in number of vehicles leading congestion and pollution. People are using the motorized vehicles for even very short distances putting enormous stress on the parking and road infrastructure, thereby leading poor quality of life.
- The auto rickshaws act as substitutes for pedestrian and cycling. They are found at important places in the city as link between public transport and the destination. They are growing at the rate of 5-6 % per annum. This means of transport though convenient and affordable to many contribute to accidents and traffic indiscipline due to the easy maneuverability.
- Encouraging Pedestrian movement will enable environmentally and effective means of transport decreasing the demand for motorized transport.
- Walking /pedestrian are closely linked with the public transportation- pedestrian emphasis will influence the use of public transportation. Every public transport trip has a component of walk at its both ends. Facilities created to service the pedestrian will encourage use of public transportation.
- The pedestrian movement is restricted to short distance traveling and they occur through out the city and complement the use of public transport.

- The recognition of “pedestrian system” will also lend focus on non motorized transport in the city. Bicycling, walking will gain importance allowing as a suitable alternative to motorized transport.

3.2 Economical and cost effective means

- The use of non motorized transport -especially walking is of great significance, as pedestrian means can reduce the short trips and resulting in reduced consumption of fuel. This will result in savings for the national exchequer and reduced energy dependence. Urban transport contributes to 30% percentage of the fuel consumption.
- The increased expenditure on transportation by the poor has bearing on their livelihood and productivity. The dependence on the motorized vehicles needs to be decreased by facilitating walking and cycling to work/ other activities.

3.3 Environmentally friendly option

- Walking is a healthy and environmentally friendly activity.
- For short distances, the frequent starting and switching off the engines leads to increased burning of fuel leading to increased pollution levels. The disuse of vehicles for short distances can contribute to reduced emissions.
- The Pedestrian and bicycling will contribute to minimizing the carbon foot print and in reduction of greenhouse gases. This has bearing on the efforts to fight climate change at the macro scale.
- The increased use of vehicles and stopping at locations can lead to heat island effects. This can damage the micro climate conditions in the city.
- Noise is an associated aspect with the use of the vehicles. The excessive noise is detrimental to the health and the productivity.

3.4 Safety

Increased pace of vehicular movement in all parts of the city including neighborhoods, school areas and main arteries have led to increased accidents and reduced safety to the pedestrians. Pedestrians are exposed to danger due to conflict between the vehicular and pedestrian, and due to the poor pedestrian infrastructure facilities. It is

recorded that on an average, one death occurs per day due to accidents, with pedestrians figuring in 38% of the road accident deaths in Bangalore.

Table: Incidence of Road Accidents

Year	No of Accidents			No of Persons	
	Fatal	Non-fatal	Total	Killed	Injured
1998	685	7675	8360	726	6358
1999	605	7291	7896	639	6026
2000	626	7765	8391	659	6347
2001	668	8358	9026	703	6929
2002	783	9073	9856	820	7577
2003	843	9662	10505	883	7980
2004	875	8226	9101	903	6921

(Source: Bangalore Traffic Police, 2006)

3.5 Pedestrian Accidents

The high share of Pedestrian accident cases can be known from the high percentage 39-40% of pedestrians in the total fatal cases. Pedestrians constitute nearly 31-37% in the total injured category. The point of curiosity here is that Pedestrians constitute only 16.26% in total trip category but have very high fatality and injured rates. The high pedestrian fatality rates are emphasized in order to project poor pedestrian facilities existing in Bangalore.

Year	Total Killed	Total injured	Pedestrians Killed	Pedestrians Injured
1999	639	6026	257	1921
2000	659	6347	273	1968
2001	703	6929	282	2199
2002	820	7577	328	2362
2003	883	7980	348	2967

*Basic Data: <http://www.hindu.com/2004/10/24/stories/2004102413300300.htm>

3.6 Social interactions and quality of life

The increased (motorized) vehicular traffic and resulting provision of infrastructure has been partly responsible for reduced quality of life. The distinction between roads

(arteries, sub arteries) and streets based on the character is hardly made. Roads are primarily meant to act as conduits for movement of the vehicles.

The movement of the vehicles affects the character of the space. "Streets" comprise of well designed pedestrian facilities and have a vibrant character. Such Streets support social interactions, chance meetings and appreciation of the overall urban environment.

In India, the National Urban Transport Policy envisions and recognizes that people must occupy the centre stage in our cities and all plans would be for their common benefit and well being. The NUTP also lays emphasis on the priority to the non-motorized transport especially on the pedestrian and bicycling.

3.7 World Wide experiences

The Global experience indicates that there is a renewed effort to encourage Pedestrian at the centre stage of the transport plans and mobility plans. The interest in pedestrian movement is emerging from the recognition by the public stakeholders and by advocacy groups which are insisting to have complete auto free zones and introduction of the pedestrian facilities.

Many cities in Europe and Bogotá notably have begun to work on the construction of dedicated walking routes and creating pedestrian facilities along with Public transport improvements and design.

4 Key Issues and concerns for Pedestrian movement in Bangalore

There are several reasons and issues related to the pedestrian movement in Bangalore, notably they are:

4.1 Need for integration of land use and transportation

A critical component related to the development of effective transportation system and facilitate mobility is linked to the degree of integration of land use and transportation. In case of Bangalore, the links are weak.

City structure and form:

The City structure is characterized by the star shape configuration with arteries leading to the centre of the city. With no physical barrier, the city has taken a radial shape allowing developments to occur in circular and concentric manner. The developments have taken form over a period of time. The provision of infrastructure are varied and differentiated by the jurisdiction in which the area comes under.

The high density areas are serviced by corridors. The public transport is not in a position to service the complete city wide needs. These have lead to the excessive dependence on private vehicles.

On the macro scale, the form of the city, the roads and the public transportation and land use patterns in the city influence the pedestrian movement.

The implementation of several schemes of transportation also indirectly encourage the use of private vehicles by emphasis on the creation of black top, creation of one ways and space allocation and accommodation.

The Land use planning has merely stated its intent and objectives of land use integration with transport. No concrete “operational planning” is provided to achieve the same.

It is observed that a few projects conceived to help transportation has not insisted on the pedestrian facilities during the conceptualization & its implementation. The poor support to creation of pedestrian infrastructure leads to poor use of these facilities.

This not only increases the use of motorized vehicles but also creates a culture where the vehicle is a necessity with no options available.

Trip lengths and distances:

The overall urban planning process must focus on the shortening the trip length, decrease in travel time and allow for public transport along with pedestrian focus. The land uses are largely segregated and the distances are large. The community user groups such as students, institutions that can accommodate pedestrian and bicycling are mostly at the periphery. The un-reliability of the public transport and the distances along with increased convenience to access to different land uses allow people to adopt to private means of transport. The lack of facilities at the short and medium distances has aggravated the situation by forcing people to use motorized transport for even short distances.

Walk ability index:

In a study commissioned by the MoUD, Bangalore is ranked 12th among the 30 sampled cities on the walk ability index. It's estimated that 16% to 58% trips in Indian cities are made on foot. A higher index reflects better pedestrian facilities in the city concerned. The walk ability index is calculated as $(W1 \times \text{availability}) + (W2 \times \text{facility rating})$. Here, W1 and W2 are parametric weights, assumed as 50% for both. The availability is the footpath length/ length of major roads in the city and facility rating is the score based on the opinion on available pedestrian facilities.

The study shows Bangalore has 0.63 as the index. Chandigarh with 0.91 tops the list of the 30 sampled cities. The average index for all the sampled cities is 0.52. In London, the index is roughly estimated as between 1.5 and 1.7.

The study raises concerns over pedestrian infrastructure, amenities and services being sidelined during the urban planning process.

Need for strengthening the public transport:

As the city spread (sprawl) is large with over 1500 sq.km of area, puts pressure on the public transportation to extend its reach and reliability. The mode of public transport has been predominantly the bus system and the IPTs and in the current context, this does not fulfill the needs of the commuters. The excessive dependence on the private

vehicles will have to be reduced and a shift to the Public transportation is needed. This can be achieved by paying attention to the improvement of the PT and as well as improvement to pedestrian and encourage the use of bicycles. The last mile link to the stations / stands must be established effectively for the PT to work. This can be a combination of non motorized means and small carriers.

4.2 Lack of statutory backing

The provision of Pedestrian infrastructure and safety conditions are largely few and far to have an impact on the development. In the Urban Context, development is guided and stipulated by the statutory provisions.

The Master Plan is an important document that identifies transportation networks mainly that of the Land use and road network along with reservations and accommodations. The Revised Master Plan for BDA and the Interim Master Plans for the five Planning authorities in BMR do not contain any clauses for the provision of Pedestrian facilities or guidance. The Zonal regulations and guidelines for the new development also have no references to this aspect of urban planning and design.

While the planning is governed by the Master Plans, the development and Maintenance of the pedestrian facilities such as side walks are to be carried out by the BBMP. The ward works list and development of the key arteries contain the development of sidewalks.

The CTTS 2007 approved by the Government provides a master template for the key transportation initiatives in the city and the associated investment required to put to operations. The role of managing the cross functional tasks is left to the unified land transport authority.

There is urgent need for bringing about provisions such that the pedestrian and associated facilities get enough attention leading to design, implementation and maintenance effectively.

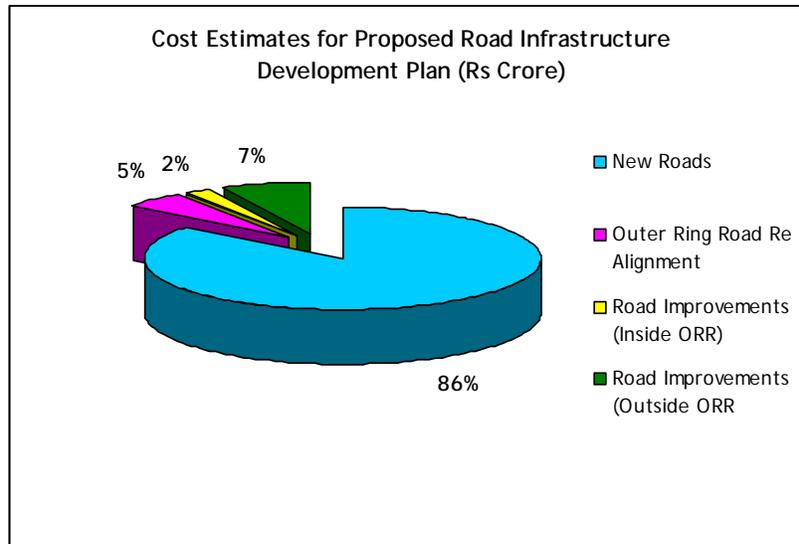
4.3 Investment in the road sector

The investment in the road sector has undue bias for development of the road surface with the pedestrian facilities taking a back seat. The investment is mostly on the black top for smooth flow of traffic. This needs a minor shift in priority.

The CTTS envisages an investment of about 46944 Crore over the 15 years time frame. The CTTS emphasizes on the increasing the pie of the mass transportation to over 70 percent share by asking for substantial investment outlay. However the percentage share for pedestrian is less than 1.0 % in the overall required spend. The investment required for increasing share of the pedestrian mode to about 25 % will necessitate a recasting the numbers in accordance with the priority. The numbers need to be revisited during the preparation of the CTTP by BMRDA for Bangalore Region.

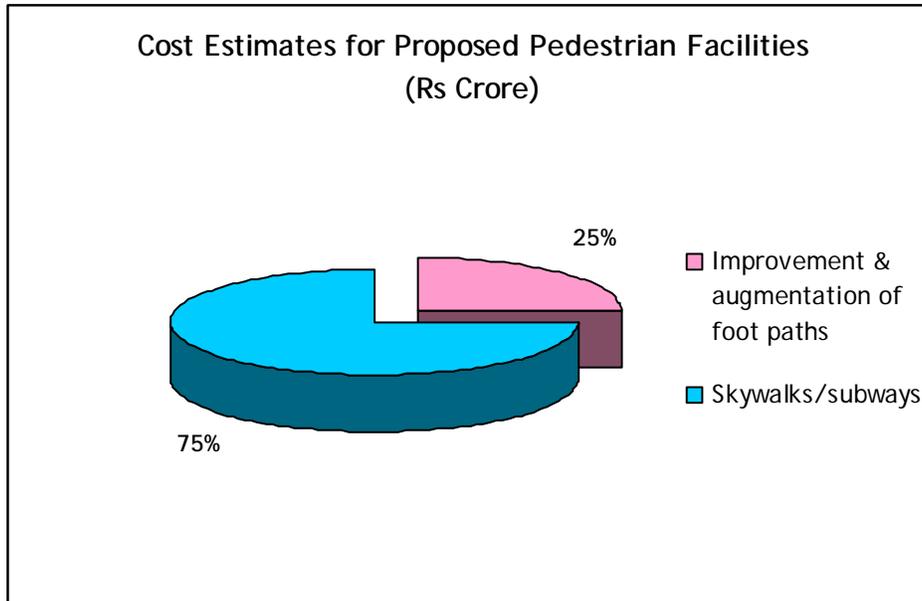
4.3.1 Cost Estimates- Proposed Road Infrastructure Plan (Rs Crore)

Roads	Amount in Crore
New Roads	10384
Outer Ring Road Re Alignment	622
Road Improvements (Inside ORR)	283.46
Road Improvements (Outside ORR)	862.62

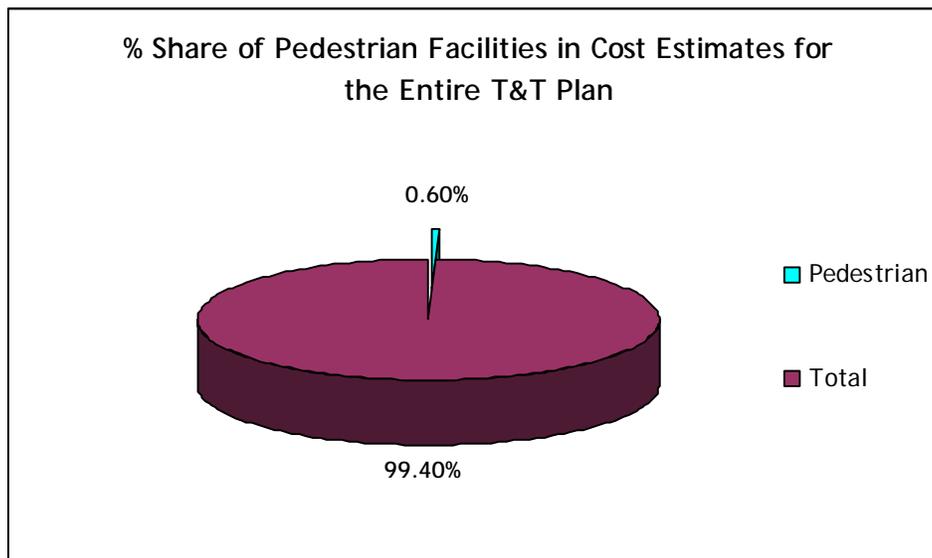


4.3.2 Cost Estimates for Proposed Pedestrian Facilities (Rs Crore)

Particulars	Amount in Crore
Improvement & augmentation of foot paths	70
Skywalks/subways	211



4.3.3 % Share of Pedestrian Facilities in Cost Estimates for the Entire T & T Plan



4.4 Governance related issues:

The institutional arrangement determines the provision, maintenance of the pedestrian facilities including that of the management and enforcement.

Institutional arrangement:

Planning Authorities: The role of planning authorities is to insist on the planning norms, preparation of land use & transportation master plans and approve of development plans by public and private players. There are five LPA s in the BMR, which have recently prepared their interim master plans. The BDA RMP 2015 governs the Planning for the entire BMA area.

Urban Local Bodies:

The ULBs are responsible for the management and maintenance of the infrastructure. The Development is to be carried out by the Development authority and handed over to the ULB. However this has not been the case due to several reasons:

1. The layouts and schemes developed by the authorities are not fully developed as the growth is incremental.
2. The entire urbanization is not carried out by the development authority, as there are a number of layouts (subdivision of lands) by private players comprising both legal and illegal developments. In this context, the creation of infrastructure is unplanned and is not coordinated.
3. Beyond the city limit jurisdictions, especially on the highways, the provision of facilities for non motorized transport is completely absent.
4. The Villages coming within the BMR also do not have any guideline for the provision, management of the pedestrian infrastructure.

Within the BBMP limits though the responsibility of undertaking the works and maintenance vests with BBMP. The encroachment of the foot path and parking on the sidewalks is still an issue as the enforcement responsibility is shared by Police and BBMP. A joint working mechanism may be the answer along with the clarity on the roles and responsibilities.

There is a need for insisting the pedestrian facilities and infrastructure such as connected paths, walkways on desired lines of movement in the new plans for sanction and development.

The Key symptom of the ineffective governance is observed in the following instances and they are significant issues related to the pedestrian movement in the city.

Misuse of foot paths:

Parking:

The side walks are extensively used for parking and this creates huge nuisance and disturbance to the movement of the pedestrian. The side walks or the shoulders of the road should be used for the parking.

Encroachments:

Various establishments put their wares on display on the sidewalks. Numerous temporary structures protrude in the side walk area. Demarcation of the side walk areas and prevention from encroachments should be insisted.

In hawking areas, regulation for the use of foot path by restricting the time for use should be insisted. There is a need for Food streets, hawking areas to be governed for the use of space, lend cleanliness and hygiene.

Riding on the foot paths:

The misuse of the foot path through users riding on the foot path, mainly by two wheelers is a serious offence and this requires to be strictly enforced by monitoring and awareness creation.

4.5 Engineering

All pedestrian activity is dictated by the connectivity and contiguity. Currently, the sidewalks are implemented as part of the standard road infrastructure components and are not designed to meet either the demand or destination. There are mismatches between the supply and demand in dense areas.

In most cases the contiguity aspect is almost neglected and the pedestrian is forced to negotiate several levels making convenient movement impossible.

Due to lack of sufficient “right of Way” available on the roads, it is perceived that the most of the space available must be dedicated to the black top. This results in moving vehicles faster.

4.5.1 Code specification and clarification:

1. The road engineering is specified by the Indian Roads congress (IRC). The Provisions covered by the IRC for pedestrian facilities 103-1988, govern the provision of the pedestrian facilities. The main guidelines are :

- Sidewalks/ foot paths on both sides of the carriageway/road
- The width of the sidewalks is dictated by the level of service with a minimum of 1.5 m on two sides of the road.
- As the sidewalks abut the areas such as commercial and residential, it is important to provide a dead width of 0.5 m.
- The foot path is to be maintained at a higher level from that of the carriageway and supported by non mountable kerbs.

The codes also allow for the utilities to be buried under the sidewalks, they are mainly the Telecom cables, water, power, etc. The IRC code for utility needs careful adaptation through the means of appropriate ducting, locating the utilities through mapping and provision for effective management. The burying of the utilities also poses another set of problems with that of digging/ cutting open the pedestrian sidewalks for maintenance and up gradation. These will have to be tackled to preserve the sidewalks for pedestrian movement.

Over ground utilities:

The pedestrian space is often taken up the overhead lamp posts, electric poles, transformers, utility data boxes. These are major obstructions to the pedestrian movement.

The IRC code stipulates the standards, but there is no inclusion of pedestrian amenities and street furniture in the provisions. Along with this, there is no mention of

the associated infrastructure, such as the paths, walkways, or streets. The mere provision for the PCU in the network will allow the street to act as a service corridor.

4.5.2 Safety standards

The non motorized modes of transport especially the bicycling and pedestrian are exposed to greater risk of accidents as they share a common right of way with motorized vehicles. At important transit points, it is important to minimize conflict between the vehicular and pedestrian movement. The protection of the pedestrian from traffic through creation of refuges, railing barriers, pedestrian cross overs including that of the sub ways/ overhead crosses overs. The locational aspect has bearing on the use of the facility and providing safety to the users.

The safety aspects also include the providing comfort, convenience, hygienic conditions for the pedestrian.

4.6 New Infrastructure and Road widening

The city authorities have been pursuing a model where carriage way expansion is given a priority. In this pursuit, the roads have been widened to accommodate more traffic. In the new areas that have been recently urbanized, the existing paths, roads have been strengthened to carry the traffic. It is observed that on these roads, the pedestrian facilities are almost absent.

1. The widening of the roads has led to decrease of side walks- sometimes they are in the range of 0.6 m or 0.3 m. The decrease of the sidewalks has led to pedestrian spill over to the road.
2. BBMP has gone ahead with the road widening schemes for the city in Two Phases (Phase -1 comprising of 45 roads and Phase-2 - 45 roads)
 - The widening of the roads does not have complete focus on the creation of the pedestrian facilities.
 - While the important implementation of the various funded road projects have been taken up, the desired safeguards have not been followed, and pedestrians are exposed to danger during construction.

3. One Way system:

BBMP and Police have put designated 19 roads as “ One way roads” this makes the roads to have exceeding road speeds over 65 kmph. The impact of this is on two systems:

- 3. A: As the speeds are high, crossing the roads become very difficult.
- 3. B: The curb side parking is removed and this has pushed the parking to the bylines and cross roads, where due to shortage of space, the sidewalks are occupied by vehicles. This forces pedestrians to walk on the roads.

4. International Airport road - National Highway:

In case of the road leading to the international airport - there is inadequate pedestrian facilities. Numerous accidents are noted on this corridor.

Cross over, side walks and adequate lighting and signage must be provided in order to make the corridor safe and convenient to both the vehicle user and pedestrian.

5. Provision of the foot over bridges and Sub ways:

Foot over bridges or subways are not successful as people avoid taking these structures due to the associated problems. They are mainly:

- A. Difficulty in negotiating the levels.
- B. Poor Lighting and hygienic conditions
- C. Perceived lack of security
- D. Not located on the Desired line of movement
- E. Lack of awareness by the user
- F. Poor design and detailing.

The various pedestrian overhead cross overs put up in the city are not being fully utilized to the above reasons. As places for advertising, the Overhead and underground cross overs are most amenable.

BBMP has recently (Jan 2008) called for tenders for putting up the Foot over bridges through Design, Build, Finance and Operate, transfer model. This is yet to be taken up for implementation. See annexure

4.7 Socio-economic and cultural issues

Planning Passive recreational spaces needs to include cycling and walking as a priority. Historically, people of Bangalore have used walking and cycling as means of transport and as recreational activity. The revival of bicycling by the younger generation mainly in form of bicycling clubs is an interesting phenomenon. The provision of walking spaces in the parks, lakes surrounds and in recreational areas is necessary.

The pedestrian side walks in the dense and commercial areas serve another aspect other than mere walking. They serve as areas where the hawking and informal commercial activity occurs. The blanket clearance of the pedestrian/sidewalks is not desirable as they disturb the informal economic structure in the city. The strategy to clear the side walks must be done in a manner conducive to the encouragement of the local social and economic aspects. This will require area level planning for systematic and selective clearance.

5 Studies and Reports

The Comprehensive Traffic and Transportation Studies (CTTS) recognizes the need for increase of public transport. At the same time the role of Non Motorized Transport (Cycles, horse drawn, Pedestrian, etc) especially the pedestrian has not been fully addressed. The current low rate of pedestrian movement is about 14-17% as documented by various studies (Comprehensive Traffic and transportation studies).

The report says that the Bangalore city is witnessing considerable pedestrian traffic in core area and some other areas. Footpath facilities are generally not adequate and their condition is deteriorating. With the increase in the commercial activity in some of the important areas like Koramangala, M G Road, Shivajinagar, K G Road etc., there is an increased demand for better pedestrian facilities. Therefore up gradation of their facilities is very important.

A pedestrian survey was carried out at some important locations with heavy inflow of pedestrians to ascertain the volume of pedestrian traffic. Some of the key points are covered under the following heads.

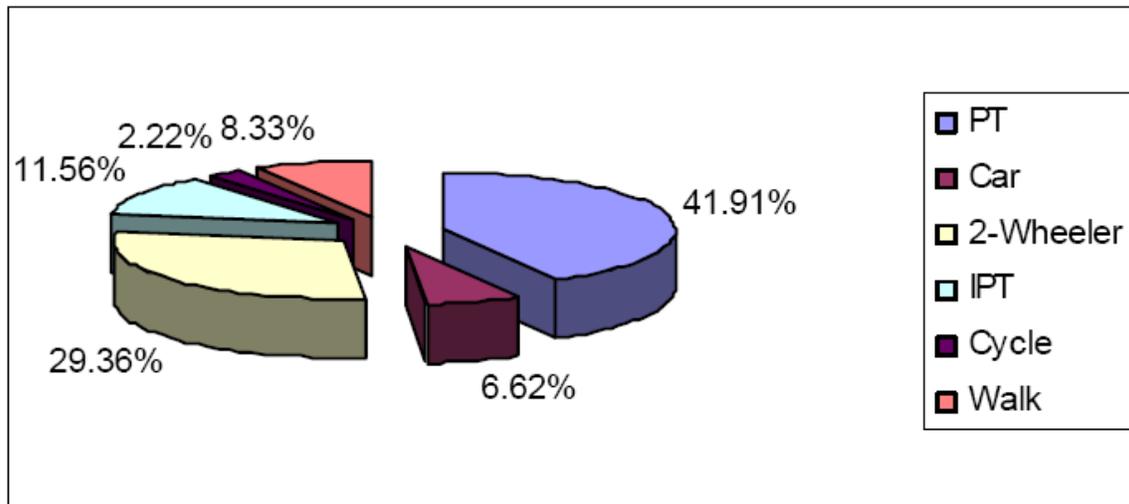
5.1 Trips by Mode of Travel

The majority of the trips (41 to 45%) are performed by bus followed by two-wheeler (29 to 32%). Figure shows graphical presentation of modal split.

Distribution of Trips by Mode of Travel

PT	Car	2-Wheeler	IPT	Cycle	Walk	Total
With Walk						
2634471	416304	1845476	726425	139407	523597	6285680
41.91%	6.62%	29.36%	11.56%	2.22%	8.33%	100.00%
Without Walk						
2634471	416304	1845476	726425	139407	0	5762083
45.72%	7.22%	32.03%	12.61%	2.42%	0.00%	100.00%

Modal split with walk trips



5.2 Trips by Mode & Trip Length

Trips by Mode & Trip Length

The distribution of trips by mode & trip length as shown in Table below reveals that 68% of bus trips are made for covering distance varying from 10 Km to 20 Km while it is 47% in case of car trips & 33.5% in case of two-wheeler trips for the same distance.

Nearly 30% of cycle trips are performed for a travel distance of up to 5 Km while it is 43% for distance of upto 2 Km by cycles.

Distribution of trips by mode & trip Length

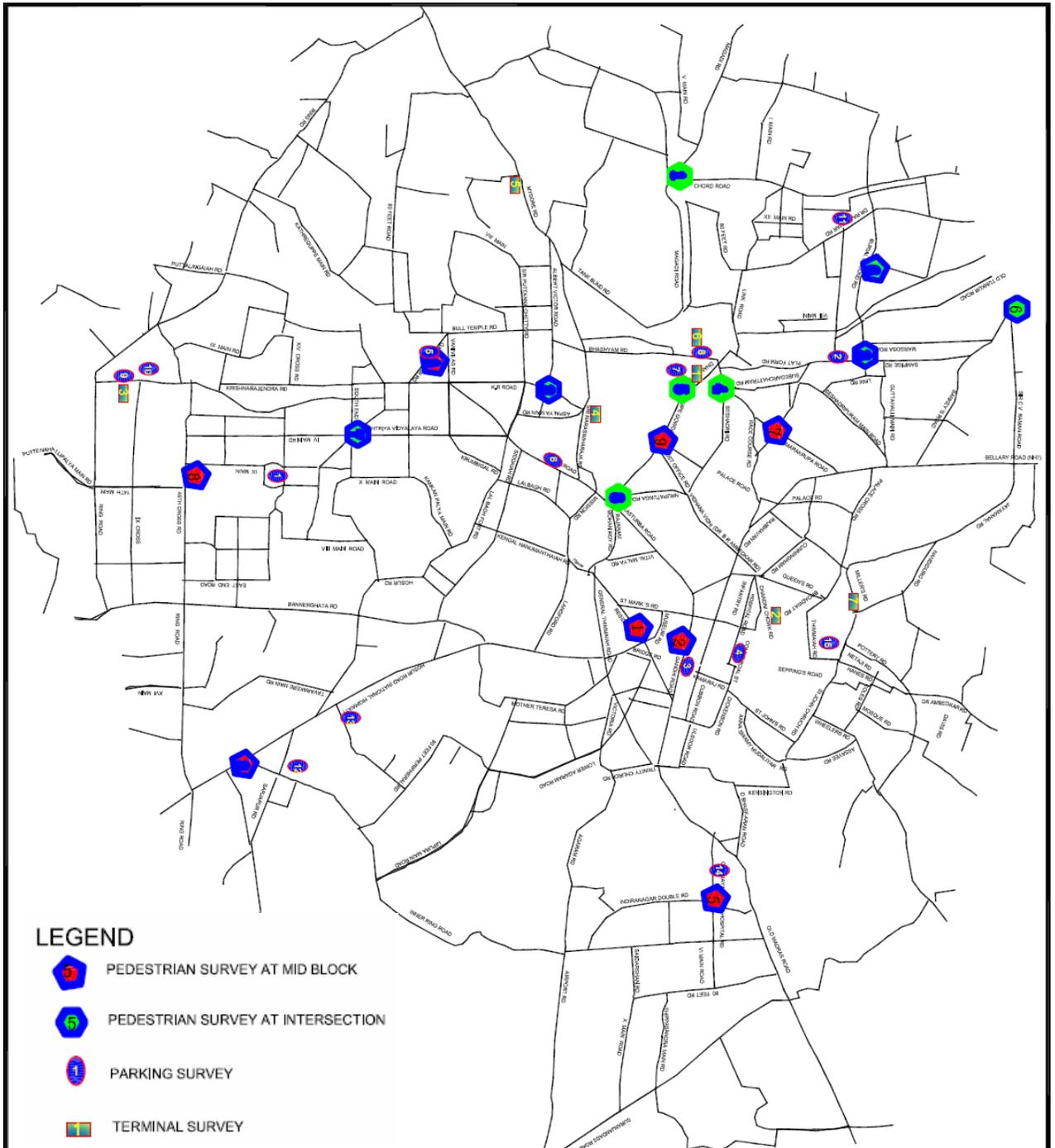
Trip Length (Km.)	Bus	Car	Two Wheeler	Three Wheeler	Cycle	Walk	Total
0-2	197	46	142633	0	59137	521061	723074
2-5	117434	27809	482306	279891	45390	2536	955365
5-10	134333	151603	725082	165814	25509	0	1202342
10-15	1429620	152409	316173	192265	6560	0	2097026
15-20	612694	65318	135503	82399	2811	0	898725
20-35	329555	17627	43779	5675	0	0	396636
>35	10639	1492	0	381	0	0	12511
Total	2634471	416304	1845476	726425	139407	523597	6285680
Average Trip Length	14.99	11.59	8.02	8.59	3.88	1.01	10.57

5.3 Trend in Modal Split in Bangalore Metropolitan Area

The longer access distance, low frequency and high travel time combined with longer waiting times have caused lower patronage of bus transport. Majority of commuters are reluctant to walk more than a quarter kilometers to the bus stop or from bus stop to destination. All these have caused a number of commuters who would have otherwise traveled by bus to prefer a two wheeler for travel. Thus, over the years, the numbers of private vehicles on roads have gone up causing congestion, which in turn has further reduced average speed of buses making them less attractive.

From the Pedestrian surveys, it is observed that the pedestrian traffic is highest along 9th Main Road (Jayanagar 4th Block) followed by M G Road. It is also observed that the pedestrian traffic is at its peak during holidays / weekends at 9th Main Road (Jayanagar 4th Block), M G Road, Brigade Road and Gandhi Bazaar Road. The volume of pedestrian traffic is maximum between 10 AM and 11 AM in the morning and between 5 PM and 6 PM in the evening.

5.4 Pedestrian, Parking and Terminal Survey Locations



5.5 Volume of Pedestrian Traffic at Mid Block Locations

Sl. No.	Road Name	Pedestrian Volume (12 Hours)
1.	Along Brigade Road (Near Rex Theatre)	5198
2.	Along M G Road (Near Plaza Theatre)	5366
3.	Along Hosur Road (Near Madiwala Police Station)	3426
4.	Along Gandhi Bazaar Road (Near Roti Ghar)	2578
5.	Along CMH Road (Near HDFC Bank)	2273
6.	Along Kuvempu Road (Near Varalakshmi Nursing Home)	1203
7.	Along Hare Krishna Road (Near Shivananda Bus Stop)	1787
8.	Along 9th Main Road (Jayanagar 4th Block near Janata Bazaar)	5797
9.	Mysore Bank Circle	19168

5.6 Pedestrian Traffic Volume on Major Junctions

Sl. No.	Name of the junction	Peak Hour Pedestrian Traffic
1.	Mysore Bank Circle	19168
2.	K G Circle	10761
3.	Ananda Rao Circle	9002
4.	Yeshwantpur Circle	5475
5.	South End Circle	4870
6.	Malleswaram Circle	3579
7.	Toll Gate Junction	2937
8.	K R Circle	2778
9.	Prof. Shivashankar Circle	2114

Zebra crossings have generally not been provided on busy roads. Heavy pedestrian traffic is observed in the core areas of the city.

5.7 Identification by the CTTS

The proposed Traffic and Transportation plan for Bangalore contains the following types of proposals for pedestrian movement, which will cater to requirements of the projected travel demand up to the year 2025.

Pedestrian/NMT Facilities

- Footpaths
- Skywalks/Subways
- Pedestrian zones
- Cycle Tracks

While framing proposals priority has been given to public transport and non motorized transport such as pedestrian facilities. For the balance travel demand, road improvement proposals have been formulated.

5.7.1 Pedestrian Facilities

It has been observed that most of the footpaths along the major arterial and sub arterial roads need extensive repairs and up gradations. For this purpose tentatively it has been estimated that footpaths along 350 km of roads are required to be taken up. The important principles for construction of new footpaths and improvement of existing ones are as under:

- Adequate ramp facilities for physically challenged people at junctions and crossovers.
- Proper merger of footpaths with skywalks/ underpasses/zebra crossings and junctions be provided with pedestrian priority signaling.

5.7.2 Pedestrian Zones

Substantial areas inside the core ring road has quite a few streets which are either fully commercial or majority of whose frontage is being used as shopping. The commercial activities on these roads can broadly be divided into the following two categories:

1. Retail and general Shopping like general merchandise, clothing garments and allied products, household white goods, consumer electronics, groceries & kitchen ware, Food & sweet shops etc., which are more or less regularly visited by shoppers.
2. Wholesale and specialized shops dealing in machinery, building materials, Hardware etc. which are occasionally visited by customers with specific requirements and need bulk handling through Trucks and MCV's As far as these commercial activities are concerned attempt should be made to shift them out side the ORR along wide corridors where adequate loading / unloading facilities can be provided along with required parking facilities for visitors / shoppers. For

shifting of these wholesale activities both strong measures against their functioning in their present locations in the core areas and incentives for shifting to the new locations will have to be provided.

The majority of the customers visit the core area to meet their retail needs through first type of establishments. As per the plan, this central area is going to be very well served by:

- 3 Metro Links namely
 - Baiyyappanahalli to Mysore Road (East-West Corridor)
 - Peenya to Banashankari (North-South Corridor)
 - Yelahanka R.S to PRR via Nagavara and Electronic City
- An elevated core ring road surrounding this area with provision for BRT
- Adequate park & ride facilities out side the core area at Bus Terminal cum Traffic & Transit Management centers, Metro Termini & important metro Stations, BRT stations, along side Core Ring Road and Monorail Termini & Stations.

Thus the entire core area will be fully covered by elaborate public transport network and as such the entry of all private vehicles, especially during the shopping hours 10 A.M. to 9 P.M. should be minimized.

5.7.3 Proposed Pedestrian Zones

As starting point, the CTTS identifies two important zones that can be Pedestrian oriented. To start with following two areas are being suggested for pedestrians.

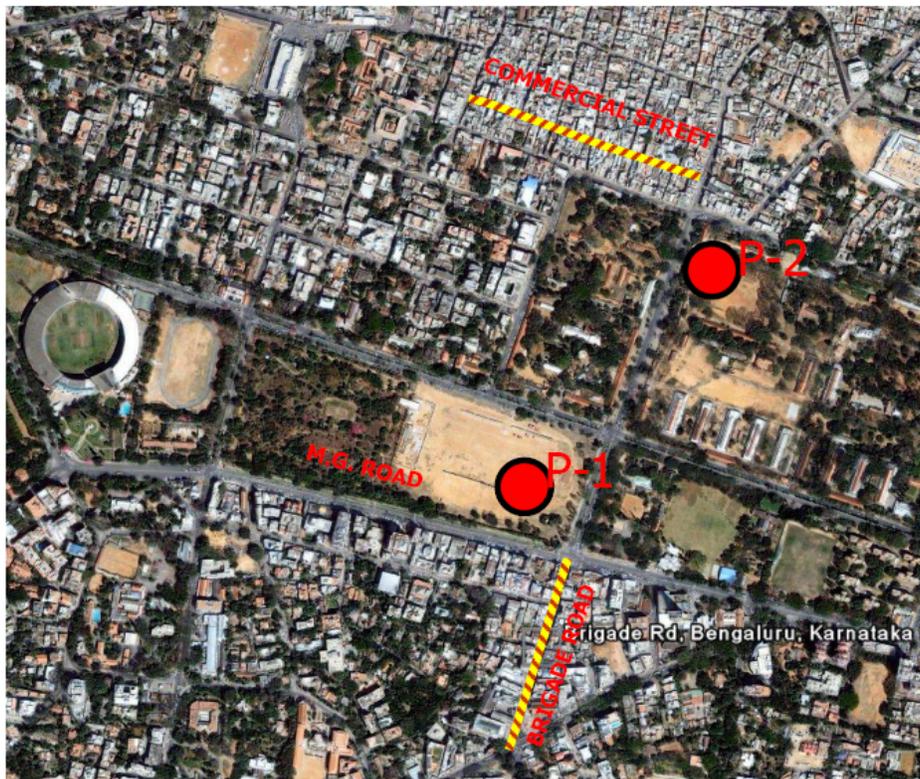
1. Gandhi Nagar & Chickpet Areas- The area surrounded by Seshadri Road, Kalidas Marg, K.G.Road, Dist. Offices Road, N.R.Road, Mysore Road and Bhashyam Road, Tank Bund Road & Dhanvantri Road can be converted into two pedestrian zones I & II on either side of K.G.Road. The two Zones can be inter connected through a semi depressed under pass near Alankar Plaza and Janatha Bazar. All the private vehicles will be required to move on Seshadri Road, Kasturba Road, NR Road and Bhashyam Road, while K.G.Road and District Offices Road be used by Public Transport -Busses & Trams.

2. In the surrounding areas 5 mechanical parking spaces with a capacity of 500 vehicles each will be provided at;
 - P13- Behind Sagar
 - P14- Kanteerava Stadium
 - P15-Near City Market
 - P16-Near Bakshi Gardens
 - P17 - KSRTC Bus Depot
3. Commercial Street - To be designated as 'CLOSED FOR VEHICLES FROM 10 A.M TO 9 P.M.' and supported by parking P-2 near Kamaraj Road
4. Brigade Road - To be designated as 'CLOSED FOR VEHICLES FROM 10 A.M TO 9 P.M.' and supported by parking P-1 near M.G.Road

These proposals are indicated in the Figure.

Pedestrian Zones





Commercial Street & Brigade Road

The Limitations for designating the areas as fully Pedestrian zones are:

1. Linkages to Public Transport: The Available Public transport does not support the needs of these areas. The destination bound traffic and thorough fare traffic cannot fully be transferred to the Public transport. The feeder services required for the last kilometer is not in place.
2. Lack of pedestrian facilities: The Sidewalks, shelters, the refuge islands for safety and the whole system of pedestrian facilities are not available.
3. Regulation of vehicles and timings: There is no program that has been accepted by consensus on the operational part of the vehicles entry and timing.
4. Perceived loss of business: The owners of the commercial shops and establishments perceive a loss of business if no vehicle was allowed to enter the area or street, as in Case Of Commercial Street.
5. Lack of an “operational Plan “and joint working group for stakeholder consensus on implementation.

5.8 Summary of key issues related to “pedestrian movement”

6. The road design needs differentiation for the design of pedestrian movement. Though all roads are designed as per IRC. Special care needs to be taken for the design of streets that encourage - leisure, window shopping, work and social interaction. At different zones of the city, differentiation of the pedestrian infrastructure must be differentiated.
7. Informal markets play an important role in the social and economic setup of the city, they find place on the sidewalks and needs to be tackled in a sensitive manner.
8. Enforcement will require consideration of the issues -social, economic and alternative arrangements.
9. Parking needs to be integrated with the major transit points and the project plans must accommodate parking and pedestrian movement.
10. Pedestrian movement is priority and the investment towards pedestrian movement should be done based on the user needs and demand rather than mere supply side management.
11. Night parking on the roads and parking on the sidewalks, etc should be completely banned and as well as enforced.
12. Lack of proper side walks and pedestrian facilities - poor engineering, poor maintenance and lack of ROW for incorporating sidewalks, and parking on the pedestrian.
13. Enhancement of the Public transportation systems.
14. Associated Pedestrian infrastructure needs provision, such as bus bays, Shelters, toilets, signages.
15. Need for adoption of Urban Planning principles.
16. Need for insistence of pedestrian facilities during the plan approvals, implementation
17. Insistence of safety standards followed in the project implementation
18. Side walks and Pedestrian facilities should be made “disabled” friendly.

Chapter 2.0 Development of the Policy Guidelines

6 The Strategic intent:

The intent of developing policy guidelines is to help design, provide, manage and maintain pedestrian infrastructure in such a manner that walking (Pedestrian) becomes a significant Transportation choice for short distances, thereby leading to efficient, healthy social and economic conditions. This would translate in terms of metrics to increase in NMT modal share to about 20 % by the CTTS period.

“The vision of the policy is to enhance Non motorized Transport especially the Pedestrian movement to about 20 % of modal share by the end of the CTTS period “

6.1 Objective:

The objective of the Policy is to encourage the provision of Safe, comfortable, user friendly and meaningful pedestrian facilities by design and re-orienting land uses.

6.2 Opportunities for Pedestrian Planning

The increase of the share in percentage of the pedestrian movement can be mainly through:

- Plan for pedestrians separately from planning for bicycles; the needs of the two groups are different and the planning approach for each should be separate.

6.3 Strategies:

S.No	Goals	Strategies
1	Integration of land use and transport	<ul style="list-style-type: none"> • Plan and build compact, mixed-use communities in order to support walking as a viable mode of transportation. The negative externalities of mixed use should be mitigated through planning. • Focus on the Public transportation system.

		<ul style="list-style-type: none"> • Integrate high-quality pedestrian facilities with all land use and transportation planning and design. • Provision of well Protected and safe pedestrian routes. • Provide Shelter from rain , sun, wind,etc
2	Re-orienting spaces for pedestrian	<ul style="list-style-type: none"> • Adopting key principles of planning that encourages pedestrian movement. • Provide pedestrian routes that are of engaging character and feel secure and safe. • Improve existing pedestrian routes and build missing links. • Decrease conflicts between users on pedestrian facilities through design, education and enforcement.
3	Infrastructure creation	<ul style="list-style-type: none"> • Creation of necessary infrastructure such as side walks, foot over bridges, underpasses, including minor expansion of the space for the accommodating the large congregation of pedestrians, refuge islands, etc. • Following necessary Engineering standards and codes, wherever this requires modifications, it must be affected.

4	Creation of pedestrian priority zones	<ul style="list-style-type: none"> • To be carried out area level planning - through setting a priority for the pedestrian movement. • Sensitizing and creating awareness on the need for walking, non motorized form of transport. • Regulation of Traffic and vehicles entry • Consensus on plan with the users of the area • Public transport linkages and feeder services • Parking facilities • Hybrid Pedestrian zones. • Converting areas for pedestrian movement.
5	Safety and awareness	<ul style="list-style-type: none"> • This is to be carried out by sensitization and creating awareness.
6	Financing	<ul style="list-style-type: none"> • The pedestrian cross overs can be developed on PPP model • The percentage of the SFC grants must be utilized for the financing and viability gap funding if any . • Compulsory collection of fees as fund for the development of pedestrian facilities.
7	Implementation	<ul style="list-style-type: none"> • Special joint working group under DULT/ BMLTA to work out the implementation phases and details. • Police and BBMP to remove the encroachments in the BBMP area.

6.4 Pedestrian zones

During the numerous interactions with the various stakeholders, it is observed that implementing a complete pedestrian zone is difficult. The pedestrian zone requires to be conceived as an “hybrid zone” with regulation of preventing the entry of the vehicles into the zone. The few vehicles that enter should not cause hindrance to the pedestrian movement. The overall traffic calming of such areas are utmost important. Private players including the shop keeper association may be given the responsibility of managing the area. The Parking initiatives must be dovetailed with the pedestrian. The “mixed use zone philosophy supports the walking at conceptual level, at a practical level, it will be important to recognize that there will conflict of movement between the vehicular, pedestrian movements.

With inadequate space, the vehicles are left to be parked on the pedestrian areas. Restriction on the parking on the foot path is necessary and these will have to be mitigated through careful planning and removal of the vehicular movements.

The key words that are required to be detailed for putting the concept to work are:

- Pedestrian facilities must be provided such that comfort, convenience and safe.
- Regulation- management guidelines for private players. The reduction of vehicles and based on time is necessary.
- Parking facilities: Parking facilities must be extended such that the pedestrian facilities are not encroached.
- Calming of traffic: The overall calming of traffic is necessary as the entire zone cannot be curtailed off from the traffic. It is important to make distinction on the type of the road, street to allow for the pedestrian movement.
- Encouraging pedestrian based activity - small commercial and others.
- Public transportation and feeder service: the Stop points pick up points and feeder service infrastructure must be put in place for having the pedestrian zones.

Chapter -3.0: Policies for Pedestrian Movement

7 Planning and Design

1. Integration of the Land use and Transport:

The integration of the land use and transport refers the mutually supporting form of development. As envisaged in the structure plan and CTTS, the transportation hubs and the surrounding land uses must be linked by effective transport and population densities. The surrounding areas to the transport corridor must be in position to utilize the system conveniently. For all activities related to work, activity, leisure or stay, it must be possible for the major portion of the trip must be convenient to walk. For long distances for example, it is imperative , that on leaving the doorstep of the house, a person must be able to walk to the bus stop, alight from the bus at nearest point to the destination and then be able to reach the destination. The paths must have adequate infrastructure such as shelters, walking paths, refuges, etc for completing the trip with comfort. This in essential would be land use integration with transport. Such kind of integration will allow for greater use of non motorized form of transport especially bicycling and walking.

2. All development plans shall incorporate pedestrian movement planning and design.

3. Urban areas have to be re-oriented for greater pedestrian movement. This is done by primarily focusing on :

1. Connectivity
2. Routes free of obstructions
3. Character and a feeling of security and safety

Connectivity

- For walking to be viable for transportation, direct, convenient, safe and comfortable pedestrian routes must be provided between land uses and across barriers such as high-volume roads, railway tracks, or bodies of water. In communities, block lengths or pedestrian links should be no greater than 90m to 150m apart:

- On roadways, convenient crossing points are needed every 90m because pedestrians need a way to cross streets without going more than 45m out of their way.
 - Walking will be an attractive choice if people do not need to travel more than 50% out of a direct route to reach their destination.
4. At the Planning level, mixed use can be facilitated to make the walk to work concept, but this requires area level intervention as the walking distances cannot be too long and extended. The Work- home relationship must be established in all developments.

5. Demarcation of the zones

The areas in the city must be demarcated as zones. The old areas mainly coming under the BBMP area is markedly different in terms of functions and needs from that of the old CMC areas and the periphery.

The high density areas of the Begur, Sarjapura, electronic city, Peenya have large percentage of people who move on these corridors and work places. The pedestrian facilities in those areas require augmentation very urgently.

6. The dense urban areas which have hawking, weekly markets need to be provided with spaces for carrying out their activity. The areas can be zoned for the pedestrian movement by designating areas for hawking, saanthe's (weekly market) - empty grounds, CA sites can be used for temporary use.
7. While some areas are designated for weekly markets and some can be designated as routine (daily markets). The identification of such markets are essential and they need to be developed in consensus with the end users.
8. Identification of the work centers that have predominant share of NMT is to be considered and the pedestrian, (NMT) should be encouraged with the right provision of infrastructure and management.
9. For the zones to work, the most important aspect of destination must be identified through studies and travel desire lines must be utilized before any investment is made.

New Developments and approvals

10. In the design and implementation of new townships- it will be important to have integrated design - with walk to work spaces, network of pedestrian paths and connectivity as well as linkage to main public transport.
11. In the new developments, it will be necessary to identify a pedestrian plan along with road network plan; the focus will be on connecting all pedestrian paths, so that people can move effortlessly.
12. Large campuses can also be insisted to have pedestrian facilities, see the example of Haryana Government box.
13. In Building development plans, it will be useful to terminate the vehicular movement at important locations and allow for paths leading to lobbies- only services /goods can move close to the lobby. This should be insisted in the Byelaws.
14. In all layout and development plans, the pedestrian movement plan must be insisted during the sanction of the project and enforcement of the same must be carried out.
15. Based on demand, the road sections must be developed to meet the requirements.

8 Engineering and technology

8.1 Components of the Pedestrian Infrastructure

The components of the pedestrian infrastructure are discussed from the following engineering standards:

1.0 Sidewalks and footpaths

2.0 Shelters and protection

3.0 Sign posts and signals

4.0 Pedestrian crossings :

- a. At Grade
- b. Subways
- c. Overhead Cross over.
- d. Refuge islands
- e. Railings

8.1.1 Side walks and Footpaths



The most common place to find a pedestrian is on a sidewalk-the roadway of the pedestrian. Therefore, a well designed sidewalk should be paved in a relatively smooth, durable material with a good coefficient of friction and be of sufficient size to handle the capacity of the expected load. Ideally, sidewalks should have a minimum clear usable width of at

least 36 inches at every point along their length.

Sidewalks should be built and maintained in all urban areas and needed on both sides of all streets. To the extent feasible, sidewalks should have the minimum cross slope necessary for proper drainage; with a maximum of 1 inch of fall for every 50 inches of width. Longitudinal grades should be limited to a maximum of 8 percent, and if steep

grades are longer than 30 feet, a five foot level area shall be provided. This is advisable because walking down a steeper slope on crutches or with artificial limbs is extremely hazardous, as these appliances are designed to limit rearward motion of the feet.

Handrails are also required in many cases. It must also be remembered that going up a steep grade in a wheelchair or with crutches can raise a person's heart rate by as much as 70 percent. Thus, in areas where it is impossible to avoid steep grades, an alternative route, such as an elevator in a nearby building should be provided.

The side walks must be at grade as far as possible to enable movement with ease including the physically disabled. The location of the zebra crossings are to be determined by the speeds that move on the road - codes specify for speeds of movement by vehicles under 35 mph with 85 % percentile speeds to have crossings.

The need for grade separators comes in with speeds over 65 kmph. This means all our arterials will need grade separators for facilitating pedestrian movement at regular intervals depending on the actual calibration, the zebra crossings must be provided.

8.1.2 Shelters and Protection

In order to make the transit smooth and enable smooth mobility, it will be necessary to have protection structures against rain, wind and sun - mainly all the adverse climatic conditions. It will be important to create the shelters for rest and protection structures at main paths and important transit points. For e.g. someone who has to cross a distance of 100 m between the bus station and railway station/ or public transport, it will be important to protected shelters that can be made with the use of roofing materials such as polycarbonate sheets, meta colour sheets. Careful design has to be carried out to meet the ground situation. The following guidelines for positioning of street furniture should be considered:

- No street furniture should hang less than 80 inches high over a circulation path.
- No object mounted on a wall or post, or free standing should have a clear open area under it higher than 27 inches off the ground.
- No object higher than 27 inches, attached to a wall, should protrude from that wall more than four inches.

- No protruding object should reduce the clear width of the circulation path to less than 36 inches. This is extremely important as an object in this area will not be detected by a visually impaired person using a cane.

8.1.3 Sign posts and signals



The sign posts and signals play an important role in the direction and guiding the pedestrian movement. Language may create a problem for the people who don't know that particular language but sign and signals are universally accepted and known. The Pedestrian Signal and signages are covered in the appendix.

8.1.4 Signage



- The sign must be securely mounted on its own post or a light standard, at an angle perpendicular to the street. The sign must be easily visible to the approaching bus driver, ideally within 4 feet of the edge of the street. The sign should neither block nor be blocked by other jurisdictional signs. To prevent the sign from being struck by the bus, mirrors, signs should be placed at a sufficient distance not to impede with bus mirrors and affect the pedestrian path of travel. The Details of the Signages are covered in the appendix.

8.1.5 Subways:



- The experience in building the subways and the utilization has been dismal. The subways are seen as areas of crime and encroachment. People hesitate to use these structures due to the reasons discussed in the earlier chapters. The provision of the subways needs to be carried out after detailed

studies for the roads where these structures are proposed for. The CTPP 2007 has recommended potential locations for the placement of the subways.

- For provision of the Subway, it is necessary to have subways with adequate lighting, ventilation. For ease in movement escalators & ramps should be provided depending on the site conditions.
- The implementation of the subways should be carried out with care for safety and using modern construction techniques- like tunneling, etc.

8.1.6 Pedestrian Cross Over

- The Pedestrian cross over must be limited and must be provided with lifts rather than escalators or stairs that occupy substantial foot print of the road space.
- The private participation must be limited to viable sites, where there is no viability, the funding of the Government will be important.
- As they have the height component - it will be important to have an Urban Design guideline on advertising and posters.
- The maximum number of such structures should be capped.

8.1.7 General Planning Considerations for Pedestrian Subway and Cross over

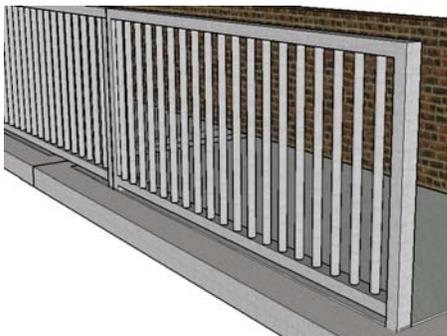
1. The provision of the sub way/ over pass depends on the location. Identified locations must be tested for the technical feasibility and desired lined of movement by the pedestrians.

2. The sizing of the facilities must be driven by the user base; standards sizes rarely serve the size. It must be done by careful study and be designed to the location.
3. The pedestrian hourly volume should be more than 300 in the four highest continuous hour periods if the vehicle speed is more than 40 mph or 65 Kmph and the proposed sites are in urban areas and not over or under a freeway. Otherwise, the pedestrian volume should be more than 100 pedestrians in the four highest continuous hour periods.
4. Vehicle volume should be more than 10,000 in the same four-hour period used for the pedestrian volume warrant or have an ADT greater than 35,000 if vehicle speed is over 40 mph and the proposed site(s) are in urban areas. If these two conditions are not met, the vehicle volume should be more than 7,500 in the four hours or have an ADT greater than 25,000.
5. The proposed site should be at least 600 feet from the nearest alternative "safe" crossing. A "safe" crossing is defined as a location where a traffic control device stops vehicles to create adequate gaps for pedestrians to cross. Another "safe" crossing is an existing overpass or underpass near the proposed facility.
6. A physical barrier is desirable to prohibit at-grade crossing of the roadway as part of the overpass or underpass design plan.
7. Artificial lighting should be provided to reduce potential crime against users of the underpasses or overpasses. It may be appropriate to light underpasses 24 hours a day and overpasses at night time.
8. Topography of the proposed site should be such as to minimize changes in elevation for users of overpasses and underpasses and to help ensure that construction costs are not excessive. Elevation change is a factor that affects the convenience of users.
9. A specific need may exist for a grade-separated crossing based on the existing or proposed land use(s) adjoining the proposed development site that generates pedestrian trips. This land use should have a direct access to the grade-separated facility. This can be the case of Malls, transportation hubs/centres and important activity centers, offices, institutions.
10. Funding for construction of the pedestrian overpass or underpass must be made through support and concessions. Private sector participation may be sought for the implementation of the same.

8.1.8 Refuge Island

The Refuge Island is very important structure in the pedestrian infrastructure component. This component assists in creating a temporary waiting area for the pedestrian while crossing the road. The IRC stipulates the various refuges required. Insistence on the refuge is a must in design and implementation of the roads.

8.1.9 Railing guards



The guard railing is necessary part of the infrastructure as they segregate the pedestrian from traffic movement. They also keep the pedestrian from stepping into the carriage way, even accidentally. Continuous railing not necessarily metal /MS, concrete, etc can be proposed after detailed studies such that the MS railing are not scrapped due to weathering and vandalism /stolen away. This will prevent the motorists trying to get on the sidewalks as alternate path/road.

8.1.10 Dust Bin

Aesthetically designed and functional litter bins are part of the Street furniture. All pedestrian paths must be kept clean and well managed so to allow the pedestrian movement unhindered.

The Bins and thrash Cans maintenance must be dovetailed with the solid waste management plan for the area. The responsibility of keeping the pedestrian paths clean will be that of the local authority based on the jurisdiction.

8.1.11 Lighting



The issue of lighting plays an important role as design element for the pedestrian. The shape of fixtures, the height at which it is placed, intensity, colour of lighting characterizes the visual quality of a pedestrian space. The street lighting sometimes is tree covered and dark patches in the key high density corridors have a negative impact on the design/visibility on the roads.

9 Financing the Pedestrian infrastructure and management:

- The proposal for the levy of congestion tax will be useful for the management and funding of the Pedestrian facilities.
- For financing the pedestrian related infrastructure - it may be worth while to dedicate about 1% of the 12 th SFC. The finance can be tied to creation of public toilets, pedestrian facilities and parking subsidy to catalyse some action.
- A portion of the motor vehicle tax should be contributed to BBMP, as most of the economic activity is taking place in Bangalore and this can be invested in the pedestrian facilities.
- The parking charges and fees collected should be utilized for the pedestrian facilities along with the regular Municipal budgets allocation.

10 Institutional mechanism

To develop a successful pedestrian safety program, DULT, Police and BBMP must conduct studies of pedestrian accident types and the location of these accidents and compile information on sites with unsafe pedestrian and motorist behaviour (e.g., jaywalking, pedestrian and motorist signal violations, speeding motorists, drunk driving and walking). The best project alternatives should be evaluated before implementation.

- In this same line of discussion, it may be possible to set up a special cell for the Non Motorized Transport in the same lines of the Pune, which has focus on NMT.
- The audit of the existing, proposed and future projects will have to be carried out by the technical cell for vetting the pedestrian facilities provision.
- As the utilities are buried mostly under the side walks, it is necessary to have co-ordination of the utilities and the maintenance of sidewalks.
- Encourage pedestrian - by setting infrastructure standards and incentives such community prizes for best maintained pedestrian areas.

Local Authorities	Roles and Responsibilities
BBMP	<ul style="list-style-type: none"> • Fund , develop and maintain the pedestrian facilities • Offer concessions for Private sector Participation • Ensure the co-ordination with utility service providers during cutting and maintenance of the sidewalks. • Police will work jointly with BBMP in clearance of encroachments on sidewalks, movement of the bus stops, zebra crossings, overhead and sub way crossings, signalization, etc.
Police	
Others	

11 Awareness and Sensitisation programme:

- Creation of awareness on the benefits of Walking.
- Need for sensitizing the drivers on the role of giving priority to pedestrians.
- Need for educating the traffic symbols and signs.
- Education on the road safety and design is a must - it should start early in schools and ongoing to inculcate discipline and obligations/ rights of the user.
- The bus shelters must have bus bays and the drivers must be sensitized on the use of the stops.

12 Programme implementation and monitoring

- Program monitoring is key to the project implementation. Local resident groups along with third party quality control measures need to be introduced.
- Citizens and locals/ users must be involved in overseeing the effectiveness of the engineering works. Though they do not engage in the engineering, they can assess the outcome and lend their perceptions.
- Citizens or associations, wherever groups can be formed they may be entrusted with the responsibility and empowered for setting right the pedestrian facilities.
- For ease of the Pedestrian movement, the end users must be involved in the design.

- For high density pedestrian paths, it will be important to remove encroachments and obstacles. This must begin as demonstration for a few roads and must be scaled to the entire city. The main issues are with the utilities and road side shops/hawkers.
- Common Pools of Parking needs to be developed which have proximity to the commercial centers so that pedestrian activity can
- Identification of open spaces and lands belonging to government, private needs to be carried out.
- A combined team of officials are required to focus on clearance of encroachment of the sidewalks; fines must be imposed, wherever it is necessary.

13 Short term Action:

- Systematic clearance on the footpath encroachments
- It is possible as short term initiative that we take up 100 most congested areas.
- Some zones can be zoned with priority on the Pedestrian movement.
- At key intersections, the Bus stops must be moved away from the junctions by creating adequate pedestrian space.
- The road works taken up under different schemes must be technically analyzed for the provision of sidewalks, underpass, overhead walkways, zebra crossings and crossings, components can be introduced, where ever necessary.
- Creation of dedicated fund for the improvement and provision of pedestrian fund.

14 Summary and benefits

Benefits of walking

Social

- Improved health (e.g. reduced risk of cancer and heart disease)
- Universal mobility walking is available to all people, regardless of income, mobility, ability, age or culture

- Walking supports and encourages the growth of services within short distances, fosters interaction between people and sustains public transit service.

Environmental

- Improved air quality
- Decreased greenhouse gas emissions
- Decreased energy consumption
- More efficient use of land
- Lower health care costs
- Increased employee productivity due to physical activity and overall wellness
- Increased attraction of new residents, businesses and tourism to the areas
- Reduced personal transportation cost

Annexure

List of One way roads in Bangalore

List of one ways : (source : Bangalore City Police Website)

One-Ways in Bangalore City

Increases in volume of traffic have led to traffic jams and congestion on most of the roads in Bangalore City. Since widening of roads is not possible in near future, one solution for de congestion is convert high density roads into one-way. In last 30 years about 260 roads have been converted into one-ways.

Some of the important roads which are converted into one-ways are:

1. J.C.Road
2. Kempegowda Road
3. N.R.Road
4. S.J.Park Road
5. R.R.M.R. Road
6. Sheshadri Road
7. Nrupathunga Road
8. Rajbhavan Road
9. Infantry Road
10. Queen's Road
11. Cunnighaum Road
12. Millers Road
13. Commercial Street
14. Brigade Road
15. Avenue Road
16. Old Madras Road
17. Richmond Road
18. Residency Road
19. Victoria Road

BRUHAT BANGALORE MAHANAGARA PALIKE

No. EE/RW2/PR/215/07-08

Office of the Executive Engineer
Road Widening Division -2
2nd Floor, J.C.Road.
B.B.M.P. Commercial Complex,
Bangalore, dated: 26/12/2007

Expression of Interest for Empanelment of Agencies for Design, Build, Operate and Transfer (DBOT) of Sky Walks with Escalators in Bangalore City.

Bruhat Bangalore Mahanagara Palike intends to erect sky walks with escalators at important busy 56 locations at 14 packages in the city to facilitate road crossing for pedestrians as under:

Package No.	Locations of Sky Walks	No. of Sky Walks
1	Cauvery Bhavan to Education Department Building and to Law College to Mysore Bank crossing KG Road. (Proposal Width – 30.00m)	3 nos
	Opposite NTI connecting Guttahalli Road and Palace (opposite Bus Stop) on Sankey Road.	1 no
2	Arya Bhavan Sweets to Kanthi Sweet to Himalaya Theatre, crossing KG Road	2 nos
	Lalbagh Main Gate (Javaraiah Circle)	1 no
	BG Road near Jayadeva Hospital	1 no
3	BTS Main Bus Stand to Amar Lodge Building in Majestic Area.	1 no
	KSRTC Kempegowda Bus Station to BTS Main Bus Station.	1 no
	At Kengeri Bus Stand, Mysore Road.	1 no
	At Byatarayanapura on Bellary Road (near Junction of BBMP office complex).	1 no
4	BTS Main Bus Station to Railway Station Premises	1 no
	Shanthala Silk House to KSRTC Main Bus Station and to Good-Shed Road	2 nos
	RNS Motors, Tumkur road	1 no

5	Near Webb junction	1 no
	Near Kamakhya, Kathriguppe Ring Road	1 no
	Gandhi Bazaar Main Road	1 no
	Near Kanteerava Stadium, near Mallya Hospital	1 no
6	Before Agricultural Department gate to SJP gate.	1 no
	In front of Shopper's stop (Mantri Elegance) on BG Road	1 no
	On JC Road near Ravindra Kala Kshetra	1 no
	On Hosur Main Road near BMP Shopping Complex	1 no
7	On Raja Ram Mohan Roy Road, near Pallavi theatre	1 no
	On Richmond Road near D'Souza Circle.	1 no
	On Race Course Road near Chalukya Hotel. (Proposal Width – 30.00m)	1 no
	On Commissariat Street near Garuda Mall.	1 no
8	On Residency Road near Mayo Hall.	1 no
	On Kamaraj Road near Commercial Street	1 no
	Near Water Tank junction on Airport Road.	1 no
	On Hosur-Luskar road(Near Forum)	1 no
9	On Tumkur Road, near SMS Railway Junction	1 no
	On Air Port Road, Marath Halli at Village Road.	1 no
	On Air Port Road, Marath Halli at Junction of Under Pass DRR	1 no
	K.R. Pura Bus Stand in front of BBMP Office	1 no
10	Bharatiya Vidya Bhavan, Devaraj Aras Road	1 no
	On Hosur Road "T" Junction with Tavarekere Main Road (Opposite Sai Sadan & Prestige Acropolis) (High Rise Apartments Condominium).	1 no
	Mission Road at the foot of Fly over.	1 no
	Vidhana Veedhi near M S Building	1 no
11	In between Khoday Circle and Anand Rao Circle [Before starting of Flyover).	1 no
	Indiranagar 100ft. Road [In front of New Horizon Public School].	1 no
	Palace Road in front of Mount Carmel College.	1 no
	In front of BBMP Head Office to Ulsoor Gate Police Station.	1 no

12	Kuvempu Circle Junction on Air Port Road.	2 no
	Near Overhaul Division on Air Port Road from Northern side to Southern side.	1 no
	Near Charles School on Hennur Main Road.	1 no
13	In front of Satelite Bus Stand on Mysore Road.	1 no
	Sudhamnagar near Urvashi Theatre on Lalbagh Road.	1 no
	Coles Park near St. German School.	1 no
	Near Bhagwan Mahaveer Jain Hospital, College and Nursing On Miller Road.	1 no
14	Queen's Road near Congress Office.	1 no
	ASC Centre, at the Junction of Lower Agram Road and Victoria Road.	1 no
	In front of Kanteerava Stadium on Southern side.	1 no
	In front of Vokkaligara Bhavan to Museum Road Bus Stop.	1 no
	TOTAL	56 Nos.

These are proposed to be erected on DBOT system, where BBMP provides the land and the DBOT partner shall design, erect, operate and maintain the sky walks with escalators. These sky walks are proposed with attractive escalators of adequate capacity on both sides of the road which shall facilitate the vertical movement of the users for climbing as well alighting purposes. The DBOT Partners would be offered advertisement rights as per BBMP Byelaws so as to recover the cost of construction, operation and maintenance for a specified period of time.

In this connection, BBMP proposes to call for expression of interest from interested agencies so as to empanel them. Those of the agencies which are desirous of participating in this venture may submit their company profile giving the following details in duplicate so as to reach the address given below before 4.00 PM on 25-01-2008.

- a. Details of the company or firm including organization structure, financial status including turnover during the previous 3 years.
- b. Details of experience of the firm in carrying out similar projects.

The highlights of the Project are:

- BBMP will provide the land.
 - The DBOT partner shall design, erect, operate and maintain the skywalks with escalators after conducting pedestrian traffic volume study.
 - The operating cost of the escalators, which includes electricity, back-up power and the personnel, repairs and maintenance, will be borne by the DBOT partner.
 - The DBOT Partners would be offered commercial advertisement rights as per BBMP Byelaws to enable them to recover the cost of construction, operation and maintenance for a specified period of time.
-
- Documents received later than the specified date will not be accepted.
 - Further details, required if any, may be obtained from the office of the undersigned.
 - 41 agencies who have been already short listed and empanelled in response to notification No.BMP/CE(I)/Empanelment/PR/2006-07, Dated:05-02-07 may need not submit their details.
 - Any suggestions/objections from the public may be informed to the concerned.

Executive Engineer (Road Widening Division -2)
2nd Floor, J.C.Road,
BBMP Commercial Complex,
Bangalore.
Phone No. 080-22221338
E-mail : bbmpserw@yahoo.co.in
Website: www.bmponline.org

Executive Engineer
Road Widening Division – 2,
BBMP.

एम० रामाचन्द्रन
M. RAMACHANDRAN

शहरी विकास मंत्रालय
निर्माण भवन, नई दिल्ली-110011
MINISTRY OF URBAN DEVELOPMENT
NIRMAN BHAVAN, NEW DELHI-110011
Tel. : 23062377, Fax : 23061459
E-mail : secyurban@nic.in

सचिव, भारत सरकार
Secretary to the Government of India

D.O.No. K-14011/07/2007-UT
02nd January, 2008.

Dear Chief Secretary,

Sub: Promoting pedestrianisation and non motorised transport.

With the rapidly increasing number of personalised vehicles, pedestrians and cycle users are being edged out. The unfortunate part is that whatever pedestrians and non motorised transport (NMT) facilities are existing, they are being greatly diminished while doing widening of roads to facilitate movement of personalised vehicles. As such, the roads are increasingly becoming unsafe for the pedestrians and non motorised transport because these modes have to share the same right of way with the motorised modes. This is leading to drastic reduction in the share of pedestrians and NMT trips in the city. Even the flyovers which are being constructed quite often have no concern for the needs of pedestrians, cyclists and public transport but rather focus only on movement of personalised vehicles.

2. As you are aware the pedestrians and the cyclists use the least space on the road and these modes are most environment friendly modes of transport. Every public transport user is also a pedestrian, as no public transport trip can be completed without a pedestrian trip. The National Urban Transport Policy, 2006 emphasises the greater use of public transport, pedestrianisation and non motorised modes. In the present scenario of global warming, the need of the hour is to reduce carbon emissions and promote environment friendly modes of transport.

3. As such, whatever roads are being built, new or widened, enough provision should be made for dedicated paths for pedestrians and cycle users with properly designed pedestrian and cycle paths. Such provision should be made available while planning road length in the city, where it is not possible to provide dedicated paths for pedestrians and cyclist, traffic calming measures need to be adopted to limit the maximum speed of motorised vehicles to 30 kmph or so. Even the flyovers which are being constructed should have proper design for taking care of movement needs of pedestrians and cyclists.

4. While preparing Master Plans, which comprise of both proposed land uses and major transportation corridors, it would be desirable to incorporate complete network of bicycle tracks to promote safe cycling practice between homes and schools and work centres in particular. Further, when State Governments develop IT/BPO Towns, Satellite Towns, SEZs, etc. these proposals must make provision for both cycle tracks and pedestrian movement as viable alternatives to use of personalised motorised modes. State Governments also need to adhere to UDPFI Guidelines, 1996 (MOUD) which prescribe norms and standards for urban roads design considerations including sidewalks (footpaths) and cycle tracks.

5. You are, therefore, requested to issue necessary instructions to the concerned officials and agencies in this regard so that we can address the safety and environment concerns of urban transport.

With regards,

All Chief Seceratry

Yours Sincerely,

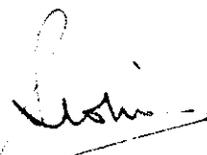
Sd/-

(M. Ramachandran)

Copy to:

Secretary, Ministry of Road Transport & Highway, Transport Bhawan, Parliament Street, New Delhi.

✓ Principal Secretary/ Secretary (Urban Development)/ Transport/ PWD of all States/UTs



(S.K.Lohia)
Director (UT)

**Cost Estimates for Proposed Road Infrastructure Development Plan (Rs
Crore)**

S. No.	Corridor	Length km	Unit Cost per Km (Rs. Cr.)	Total Cost (Rs. Cr.)	Phase-I 2007-12	Phase-II 2013-18	Phase-III 2019-24
New Roads							
1	Core Ring Road (CRR) (elevated)	30	40	1200	1200		
2	Arterial Roads crossing CRR	30	1	30	30		
3	Peenya Industrial Area To Bangalore Mysore Expressway	2.2	10	22	22		
4	Peripheral Ring Road (PRR)	114	30	3420	3420		
5	Air Port Link Road (Expressway)	26	20	520	520		
6	Link from Tigalarapalaya main road to Nelagadaranahalli (Cost included in Item 42 of parallel ring road)	1.23					
7	Link from Hesarghatta main road to Shettihalli and Madarahalli to Mohammed Sabi Palya (Cost included in Item 43 of parallel ring road)	4.02					
8	Link from Sampigehalli to CRPF parade ground (Cost included in Item 25 of parallel ring road)	1.72					
	Total	209.17		5192	5192		
Outer Ring Road Re Alignment							

1	Elevated road along Bang. University Road (excluding cost of Construction of ORR connecting Mysore Road to Magadi Road including underpass across Bangalore Mysore Rly Line accounted for at item no. 9 of RUB/ROB List)	2.5	20	50	50		
2	Realigning ORR between Magadi Rd. and Pipe Line Rd	1.9	10	19	19		
3	Realigning ORR at Tumkur Rd through CMTI	1.2	10	12	12		
4	Realigning ORR from Kasturi Nagar to Mahadevapura along Salem railway line	5	10	50	50		
5	Elevating ORR along common portion with Sarjapur Rd (excluding cost of grade separators at Agara & Ibbalur at item no. 6 & 7 of list of Grade separators)	2	10	20	20		
6	Elevating ORR along common portion with Bannerghatta Road	1	40	40	40		
7	PESIT to Janabharti Entrance Bangalore University	3	40	120	120		
	Total	16.6		311	311		

Road Improvements (Inside ORR)

1	Bellary Rd	7.6	1	7.6	7.6		
2	Palace Road	1.75	1	1.75	1.75		
3	Seshadri Road	0.5	1	0.5	0.5		
4	Nrupatunga Road	1.1	1	1.1	1.1		
5	Vidhana Veedhi	0.2	1	0.2	0.2		
6	Mission Road	1	1	1	1		
7	Devanga Hostel Road	0.5	1	0.5	0.5		
8	Sankey Road	3.4	1	3.4	3.4		
9	Lalbagh Road	0.41	1	0.41	0.41		
10	Jaymahal Road	2.8	1	2.8	2.8		
11	Hosur Road	1.6	1	1.6	1.6		
12	Hosur Laskar Road	4.3	1	4.3	4.3		
13	Victoria Road	1.6	1	1.6	1.6		

14	Lower Agaram Road	2.4	1	2.4	2.4		
15	Sarjapur Road	3.35	1	3.35	3.35		
16	Hosur Road	4.3	1	4.3	4.3		
17	Bannerghatta Road	4.11	1	4.11	4.11		
18	80' Koramangala	4	1	4	4		
19	Dickenson Road	0.3	1	0.3	0.3		
20	Ulsoor Road	0.6	1	0.6	0.6		
21	Kensington Road	0.32	1	0.32	0.32		
22	Murphy Road	1.7	1	1.7	1.7		
23	Old madras Road	1.7	1	1.7	1.7		
24	Richmond Road	5.2	1	5.2	5.2		
25	Airport Road	5.2	1	5.2	5.2		
26	Goods shed Road	1.35	1	1.35	1.35		
27	Cottonpet main Road	1.2	1	1.2	1.2		
28	17th main J CNagar in ward13	1.5	1	1.5	1.5		
29	5th cross Malleshwaram	1	1	1	1		
30	Commissariat Road	0.74	1	0.74	0.74		
31	A M Road	0.75	1	0.75	0.75		
32	Lalbagh fort Road	1.35	1	1.35	1.35		
33	Race Course Road	1.66	1	1.66	1.66		
34	Kasturba Road	0.77	1	0.77	0.77		
35	A S char street & BVK Iyengar Road	1.21	1	1.21	1.21		
36	Vanivilas Road	0.85	1	0.85	0.85		
37	Suranjan Das Road	3.85	1	3.85	3.85		
38	Mysore Road	3.9	1	3.9	3.9		
39	Mt joy Road & Kattriguppe main Road via vidyapeeta Circle	3	1	3	3		
40	Mahalakshmi layout & Nandini Layout road via Ayyappa temple & Singapore layout	2.7	1	2.7	2.7		
41	Dinnur main Road and kavalbyrasandra Road (via ganganagar sulthan palya)	4.5	1	4.5	4.5		
42	Hoskerehalli main Road(via girinagar)	2.05	1	2.05	2.05		
43	Vasanth nagar main Road	0.62	1	0.62	0.62		
44	K R Road	1.16	1	1.16	1.16		
45	Sulthan Road	0.42	1	0.42	0.42		
46	1st main Chamarajpet	0.15	1	0.15	0.15		
47	3rd cross Chamarajpet & Bull temple Road	1	1	1	1		
48	Link Road	0.63	1	0.63	0.63		
49	Padarayanapura main Road	1.86	1	1.86	1.86		

50	Bull temple Road via N R Colony, Chennamma tank bed & 30th main BSK 3rd stage	1.1	1	1.1	1.1		
51	Infantry Road	1.83	1	1.83	1.83		
52	Park Road	0.5	1	0.5	0.5		
53	Hospital Road	1.1	1	1.1	1.1		
54	Dispensary Road	0.5	1	0.5	0.5		
55	K Kamaraj Road	1.25	1	1.25	1.25		
56	Dharmaraj Road	0.4	1	0.4	0.4		
57	Chandini chowk	0.45	1	0.45	0.45		
58	Meenakshi koil street	0.6	1	0.6	0.6		
59	Thimmaih Road	2.1	1	2.1	2.1		
60	Old poor house Road-Haine's Road	1	1	1	1		
61	Millers tank bund Road	0.52	1	0.52	0.52		
62	Station Road	1.3	1	1.3	1.3		
63	Queen's Road	0.95	1	0.95	0.95		
64	Millers Road	1.42	1	1.42	1.42		
65	Cunningham Road	0.8	1	0.8	0.8		
66	Road in front of Russel market	0.25	1	0.25	0.25		
67	Dr. Ambedkar Road (tannery Road)	4.43	1	4.43	4.43		
68	Hennur Road	3.62	1	3.62	3.62		
69	Banaswadi Road & Wheelers Road (via Banaswadi)	6.35	1	6.35	6.35		
70	Hare Krishna Road	0.7	1	0.7	0.7		
71	HMT main Road	2.1	1	2.1	2.1		
72	Magadi Road	2.4	1	2.4	2.4		
73	Baiyyappanahalli main Road	3.35	1	3.35	3.35		
74	Bapujinagar cross Road	0.8	1	0.8	0.8		
75	Kumaraswamy layout main Road	1.75	1	1.75	1.75		
76	South link Road	0.5	1	0.5	0.5		
77	MTB Road	0.5	1	0.5	0.5		
78	Kurubarahalli main Road in ward 16	1	1	1	1		
	Total	141.73		141.73	141.73		

Road Improvements (Outside ORR)

Radial Roads

1	From Peenya II Stage to Andrahalli (via Peenya II Stage, Industrial area, Andrahalli)	4	0.75	3	3		
2	Tumkur Road-NH4	8.8	0.75	6.6	6.6		

3	New BEL Road	3.4	0.75	2.55	2.55		
4	Jalahalli Main Road to Attur via Yelahanka	28	0.75	21	21		
5	Yeshwantpur to Yelahanka	20	0.75	15	15		
6	Doddaballapur Road.	6	0.75	4.5	4.5		
7	Devanahalli - Hebbal Bellary Road	25	3	75	75		
8	NH-7 Kogilu Junction to Nagavara Main Road	8	0.75	6	6		
9	Dasarahalli Main Road	16	0.75	12	12		
10	HBR Ring Road to Nagavara Main Road leading to Jakkur	20	0.75	15	15		
11	HBR Ring Road to Hennur Main Road	16	0.75	12	12		
12	Old Madras Road	5.25	0.75	3.94	3.94		
13	ITPL Road from Ring Road to Hope farm	8.5	0.75	6.38	6.38		
14	Varthur Road from Marathalli to Varthur Kodi	5	0.75	3.75	3.75		
15	Varthur to Outer Ring Road via Belegere and Panathur	6.5	0.75	4.88	4.88		
16	Kaigondanahalli to Sarjapur	10	0.75	7.5	7.5		
17	Bannerghatta Road - ORR to National Park	8.6	0.75	6.45	6.45		
18	Bannerghatta Road - National Park to PRR	2.4	0.75	1.8	1.8		
19	Begur Road from Hosur Road to Begur	7	0.75	5.25	5.25		
20	Kanakapura Road	10.7	0.75	7.8	7.8		
21	Ring Road to Kanakapura Road (via Ittumadu)	7	0.75	5.25	5.25		
22	Rajarajeshwari Nagar Arch to PRR	10	0.75	7.5	7.5		
Connector Roads							
23	From Magadi Road to NH 4(Via Sunkadakatte, Hegganahalli Main Road, Peenya II Stage, NTT circle, KIADB Main Road)	6	0.75	4.5	4.5		
24	Peenya II Stage to Ring Road (via Peeya II Stage Bus stop, Rajgopal Nagar Main Road, Peenya Industrial Area)	3	0.75	2.25	2.25		

25	NH-7 to Nagavara Main Road through Jakkur	16	0.75	12	12		
26	NH-7 to Nagavara Main Road	12	0.75	9	9		
27	Hennur Main Road to Hoskote Ring Road	10	0.75	7.5	7.5		
28	Horamavu-Agara to HBR Ring Road	4	0.75	3	3		
29	Horamavu Road from Outer Ring Road to Kalkere	4.2	0.75	3.15	3.15		
30	T C Palya main Road from ORR to Anandapura	5.5	0.75	4.13	4.13		
31	Devasandra main road from NH 4 to Basavanapura Road	1.7	0.75	1.28	1.28		
32	Kundalahalli Road from Devasandra main Road to Kundalahalli gate via Hoodi	7	0.75	5.25	5.25		
33	ITPL Road to Varthur Road via Pattanadur Agrahara & Nellurahalli	4	0.75	3	3		
34	Sarjapur Road to Ring Road(near Devarabisanahalli)	7	0.75	5.25	5.25		
35	Nagarthapura to Matha Amruthamayee College	5	0.75	3.75	3.75		
36	Hosur Road to Nagarthapura (Hosur Road)	4	0.75	3	3		
37	Begur to Hosur Road (via Begur tank Bund, Chikkabegur and Manipal County)	7	0.75	5.25	5.25		
38	Bannerghatta Road to Begur (via DoddaKammanahalli, Yelenahalli)	8	0.75	6	6		
39	Kottur Dinne to Bannerghatta Road	5	0.75	3.75	3.75		
40	Harinagar to Kottanur Dinne	4	0.75	3	3		
41	Corporation Bank to Ring Road via Javaraiana doddi	4	0.75	3	3		
Parallel Ring Road							

42	From Magadi Road to NH 4(Via Herohalli, karivobanahalli, Andrahalli, Tigalarapalya, Nelagadaranahalli, Nagasandra)	8	0.75	6	6		
43	Hesaraghatta Main Road to SM Road (via Mallasandra, Shetty halli, Abbigere, Kammagondanahalli main Road, Gangammagudi Circle)	6	0.75	4.5	4.5		
44	Vidyaranya pura Main Road to Hennur main Road	35	0.75	26.25	26.25		
45	Nagavara Main Road to Kalkere Junction	8	0.75	6	6		
46	Sarjapura Road to Kalkere via chikkaballapur, Gujurpalya, Varthur, Hope farm, Kadugodi, Sadaramangala, Kodigehalli, Basavanapura, T.C.Palya	31	0.75	23.25	23.25		
47	Matha Amruthamayee to Sarjapura Road(Kaigondanahalli)	5	0.75	3.75	3.75		
48	Kanakapura Road-Amruthnagar to Harinagar	4.5	0.75	3.38	3.38		
49	Kengeri to Konanakunte via Uttarhalli(end of Kanakapura Road)	13.5	0.75	10.13	10.13		
50	Kengeri 80' Ring Road to Ullalu Main Road via Matha Mata	10.5	0.75	7.88	7.88		
51	Begur Road to Hosur Road and Kudlu	6	0.75	4.5	4.5		
52	B G Road to Begur Road(via BTM Layout, Kodichikkanahalli)	5	0.75	3.75	3.75		
53	Chunchaghatta Road to B G Road	6	0.75	4.5	4.5		
54	GnanaBharati Circle to Magadi Road	11	0.75	8.25	8.25		
	Total	502		431.31	431.31		

Cost Estimates for Proposed Pedestrian Facilities (Rs Crore)

SI No	Name of Road	Length (km)/No	Unit Cost per Km	Total Cost (Rs. Cr.)	Phase-I 2007-12	Phase-II 2013-18	Phase-III 2019-24
1	Improvement & augmentation of foot paths	350	0.2	70	70		
Skywalks/subways							
2	Cauvery Bhavan to KG circle crossing across KG Road and Distt. Office Road	1	10	10	10		
3	Opposite NTI connecting Guttahalli Road and Palace (opposite Bus Stop) on Sankey Road.	1	3	3	3		
4	Arya Bhavan Sweets to Kanthi Sweet to Himalaya Theatre, crossing KG Road	1	3	3	3		
5	Lalbagh Main Gate (Javaraiah Circle)	1	3	3	3		
6	Bannergatta Road near Jayadeva Hospital	1	3	3	3		
7	BMTC Main Bus Stand to Amar Lodge Building in Majestic Area	1	3	3	3		
8	KSRTC Kempegowda Bus Station to BMTC Main Bus Station.	1	3	3	3		
9	At Kengeri Bus Stand, Mysore Road	1	3	3	3		
10	At Byatarayanapura on Bellary Road (near Junction of BBMP office complex).	1	3	3	3		
11	BMTC Main Bus Station to Railway Station Premises	1	3	3	3		
12	Shanthala Silk House to KSRTC Main Bus Station and to Good-Shed Road	1	3	3	3		
13	RNS Motors, Tumkur road	1	3	3	3		
14	Jalahalli Circle, Tumkur Road	1	3	3	3		
15	Near Webb junction	1	3	3	3		
16	Near Kamakhya, Kathriguppe Ring Road	1	3	3	3		

17	Gandhi Bazaar Main Road	1	3	3	3		
18	On Vittal Mallya Road near Mallya Hospital	1	3	3	3		
19	Seshadri Road near Maharani College	1	3	3	3		
20	On JC Road near Ravindra Kala Kshetra	1	3	3	3		
21	On Hosur Main Road near Madivala Check post	1	3	3	3		
22	On Raja Ram Mohan Roy Road, near Pallavi theatre	1	3	3	3		
23	On Richmond Road near D'Souza Circle.	1	3	3	3		
24	On Race Course Road near Chalukya Hotel	1	3	3	3		
25	On Commissariat Street near Garuda Mall	1	3	3	3		
26	On Residency Road near Mayo Hall.	1	3	3	3		
27	On Kamaraj Road near Commercial Street	1	3	3	3		
28	Near Indira Nagar 100 feet Road & Water Tank junction on Airport Road	1	3	3	3		
29	On Hosur Road (Near Forum)	1	3	3	3		
30	On Tumkur Road, near SMS Railway Junction	1	3	3	3		
31	On Air Port Road, Marath Halli at Village Road	1	3	3	3		
32	On Air Port Road, Marath Halli at Junction of ORR Under Pass	1	3	3	3		
33	K.R. Pura Bus Stand	1	3	3	3		
34	Bharatiya Vidya Bhavan, Devaraj Urs Road	1	3	3	3		
35	On Hosur Road "T" Junction with Tavarekere Main Road (Opposite Sai Sadan & Prestige Acropolis) (High Rise Apartments Condominium)	1	3	3	3		
36	Mission Road at the foot of Fly over	1	3	3	3		

37	Vidhana Veedhi near M S Building	1	3	3	3		
38	Tumkur Road near Yeshwantpur Circle	1	3	3	3		
39	At South End Circle	1	3	3	3		
40	30 no. Sky -walks / Sub-Ways along the eastern crescent of the ORR	30	3	90	90		
	Sub-Total	68		211	211		
	TOTAL			281	281		

Summary of Cost Estimates for the Entire T&T Plan (2007 prices) (Rs Crore)

ITEM	Length kms/Nos	Total Cost (Rs. Cr.)	Phase-I 2007-12	Phase-II 2013-18	Phase-III 2019-24
MASS TRANSPORT CORRIDORS					
Metro System	137	19921	11086	8835	0
Mono Rail / LRT System	60	5100	3825	1275	0
Commutor Rail System	204	3060	690	1620	750
BRT System	291.5	3498	1866	1632	0
IMPROVEMENT IN CITY BUS SYSTEM					
Improvement in City Bus System		5721	4401	660	660
ROAD INFRASTRUCTURE					
New Roads	209.2	5192	5192	0	0
Outer Ring Road Realignment	17	311	311	0	0
Road Improvements (Inside ORR)	142	142	142	0	0
Road Improvements (Outside ORR)	503	433	433	0	0
GRADE SEPARATORS					
Grade Separators-Road (Nos.)	28	713	713	0	0
Rail Over Bridges / RUBs-Rail (Nos)	18	432	432	0	0
Elavated Roads (Kms)	16.5	990	990	0	0
PEDESTRIAN FACILITIES		281	281	0	0
PARKING FACILITIES (No. of car spaces)	10000	380	380	0	0
Integrated Freight Complexes (IFC):	6	270	135	135	0
B-TRAC		500	500	0	0
Grand Total		46944	31377	14157	1410

'Walk to work' concept to tread into industrial policy

(<http://in.news.yahoo.com/48/20081104/804/tnl-walk-to-work-concept-to-tread-into-i.html>)

Tue, Nov 4 03:37 AM

The state government will introduce the concept of 'walk to work' in its new industrial policy to give corporate players investing in Punjab the added advantage of next-door housing for employees.

The concept is also aimed at easing out the pressure on infrastructure and transport system that may sooner or later hamper everyday living. Principal Secretary, Industry, S S Channi said the idea was to bond housing with industry. "There is a plan is to incorporate a clause that prohibits the industry from selling the houses. The modalities are being worked out. It will be like official accommodation given to government officials who are suppose to vacate it once they move out."

The government also plans to put a cap on the selling price of the housing unit to make it affordable for the company. Channi said a private developer could be roped in for the project in case the industry was reluctant to develop it.

Punjab's new industrial policy, a strategic roadmap for which was prepared by the United Nation's Industrial Development Organisation (UNIDO), would be finalised shortly.

Punjab is also preparing its own SEZ Act, a draft of which is almost in place. A meeting with Chief Minister Parkash Singh Badal to finalise the SEZ Act draft was scheduled for November 6, but has been now put off to November 19.

R K Verma, Managing Director of Punjab InfoTech, said the 'walk to work' concept would save the time spent on road by company officials and improve employee efficiency. "We are viewing various options, including leasing out the housing set-up or its outright sale."