

URBAN TRANSPORT IN BANGALORE

– THE WORSENING CRISIS

“ QUALITY OF LIFE IS A GOAL IN ITSELF. IT IS ALSO CRITICAL IN THE ‘KNOWLEDGE ECONOMY’, FOR ATTRACTING & RETAINING HIGHLY QUALIFIED & CREATIVE INDIVIDUALS “

PREAMBLE

Efficient & reliable transportation systems are crucial for a city to sustain high growth rates. All services & manufacturing industries require people movers to bring & take workers & connect production facilities to the logistics chain. Unfortunately, growth, a direct result of improved economic conditions, brings with it several negatives along with its many benefits, & Bangalore is perhaps one of the prime candidate cities to demonstrate the adverse effects of growth. Very high levels of traffic congestion, pollution & safety hazards experienced in the 1970s & '80s in Kolkata have demonstrated the dangers of un-restructured public sector combined with un-regulated private providers for public transport services.

Limiting or stifling growth is neither avoidable nor necessary & to facilitate some degree of orderly city development, the Bangalore Development Authority, or BDA, the nodal planning agency had in late 2007, prepared a Comprehensive Development Plan, titled CDP-2015 that covers an extremely large area, almost the whole of Bangalore district. This extremely large coverage of land areas in the latest CDP is the result of an earlier such attempt by BDA when the previous CDP had to be drastically revised as the population anticipated for 1991 had been reached ten years earlier, by 1981 itself. It is relevant here to emphasize that the CDP/s are mostly zoning documents & do little to address congestion, particularly street congestion levels within the city as they have no bearing on transport matters nor do they provide recommendations for transport development in the newly added areas or the existing city areas. Thus, the city has not formalized a comprehensive urban transport strategy linked to an urban development strategy.

Pressures from growth leading to increases in population with land scarcity & increasing living costs are aligned with development patterns prevalent in most developing economies, & are unavoidable in this context, indeed for all cities & urban areas in this country & elsewhere, & therefore, fall outside the scope of this paper.

The resultant problems with street congestion, excessive traffic, difficulties for daily travel, poor & time consuming mobility options, air pollution, poor quality of living standards & the unsafe road & pedestrian conditions with undisciplined traffic are some of the areas that accompany growth that can be tackled successfully with corrective steps, though the task can be formidable to eradicate all of them completely.

Most of these have been problems for the city for several decades now, though they were not as much in severity earlier. Some city residents & welfare organizations have been attempting serious focus on various types of solutions since the local administration has clearly not been up to

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

the task, despite some efforts to wean people away from private vehicles by introduction of better quality, low floor air-conditioned buses for the better-off commuters.

Bangalore's economy is actually much broader than its international "IT & Technology Hub" image. Most employment is in fact provided by trade & commerce, manufacturing & traditional activities like silk weaving & garments. Its road system is diffuse & complicated. This is in tandem with the fact that rail lines in the city were neither designed nor operated to cater for urban & regional traffic. So, the city's growth & mobility patterns have been very much road-dependent from the start.

It is also noteworthy that even though the maximum permitted FSI is limited to under 4.0, Bangalore & indeed almost all other cities in India, suffer from severe street congestion. In sharp contrast, cities such as New York or Hong Kong where an FSI of the order of 16.0 or over is quite common, street congestion levels are much better controlled, primarily due to far more efficient public transport & the resulting travel habits of residents who rely mainly on them. Allocation of street space based on local needs is another important factor that helps reduce congestion levels.

This is thus a first cut attempt to examine these issues in some detail & to explore possibilities for solutions. The subject is vast & complex, & it has therefore been necessary to define the limits under purview to facilitate addressing only those problems that might have feasible solutions.

CITY TRAVEL – AN UNDERSTANDING OF THE DEMANDS

*It is very simple to have a city with great quality of life ...
It only has to be designed for people, much more than for cars.*

It must first be noted that despite rapid levels of motorization, the split of daily travel by mode is still not dominated by motorcycles & cars, but by public transport services & walking. According to recent surveys, walking & bicycling carry about 11% of all trips, & public transport carries about 42%. Individual motor vehicles carry a lesser 36% (*Source: Comprehensive Traffic & Transport Survey, 2007*). The visual evidence of unrestrained dominance by 2-wheelers & cars on the traffic scene, though a matter for serious concern, is rather misleading. This is very different from the mid-1960s, when bicycles accounted for almost 70% of all traffic.

One of the reasons for the importance of non-motorized & public transport modes is that economic growth has left many people far behind. The new wealth is in sharp contrast to concurrent poverty, with inequalities deepened by skewed growth processes, or new ones generated as rural migrants pour into the city.

In spatial terms, many of the lowest income people live in informal settlements in peri-urban areas, in older city slums, or encroach any place where development by leapfrogging has left some

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

land unused. It is not that lower-income groups have not benefited from economic growth. Many did, but growth for this stratum of residents is in the informal sector, low-paid & unstable jobs held by unskilled workers in construction, hospitality, the new informal services such as manual security monitoring, vehicle driving & low skill manufacturing.



Street congestion – the large split of public transport buses & 3-wheelers is evident in this picture, though the proportion of private vehicles is perceived to be higher.

Different income strata have different expectations of the urban transport system. The poorer sections, employed generally as unskilled labour, expect very low fares. Lack of conveniences is not of much concern for this group, though they expect quick travel with minimal delays.

Rising incomes have also increased service expectations of some public transport passengers, especially if they own or aspire to own a motor vehicle. They expect higher-quality services, easy access, a comfortable seat, high travel speed & air conditioning (during hot climate). Since the majority of public transport services operate on city streets, public transport passengers are also interested in the performance of the road system, as are public transport operators – Bangalore Metropolitan Transport Corporation, or BMTC; & Karnataka State Road Transport Corporation, or KSRTC.

Those owning individual motor vehicles, be they households or businesses (the latter including goods vehicles) expect a good road system with well-maintained pavements, efficient traffic control, high travel speeds, easily available parking, etc..

In terms of relations between motorization & incomes, car-based motorization is linked to higher & high-middle income households (in addition to business owners). Motorcycles on the other hand are bought by low-middle & low-income households. From transport planning point of view, two-wheelers are generally used by people who were 'normally' major users of public transport services, but opted out due to deteriorating punctuality & inconveniences with use of public buses for commuting.

This simple segmentation of the travel market in Bangalore does not capture what actually takes place on the ground. For example, the high-tech & engineering businesses have quite

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

different transport habits & requirements than those with traditional businesses. The former are highly motorized, their job & familial networks are spread widely (well beyond Bangalore, in fact), whereas the traditional businesses are more location-bound, with kin businesses locating in close proximity, & walking retaining importance for interaction between partners & clients. These businesses may also be concerned for the ease & cost of longer-distance urban transport by motor vehicles, but within their large activity areas they do not mind congestion, but actually thrive on it.

This said, the worrying factor is that motorization levels are not yet close to those in other more developed parts of Asia, Europe or North America, though street congestion levels are much worse & highly chaotic, given the diffuse nature of roads with the very large number of intersections. Thus, there is a pressing need to seek solutions to meet travel demands urgently & squarely to reverse the prevailing trend of very large increases in motor vehicles on the streets.

Bus services are infrequent and slow moving, buses are hard to get on/off, are often overcrowded with uncomfortable ride quality, & often polluting. The BMTC network is diffuse, trying to connect the maximum number of origins with the maximum number of destinations to avoid transfers (this implies low frequency of service on individual routes). Some suburban rail services are in operation but frequencies & difficult access to /from stations has meant a low quality of service patronized generally by the lower income groups.

The worst off are the pedestrians due to non-existent, or broken-down and/or obstructed & uneven sidewalks, large height differences between sidewalks & frequent driveways /alleyways, danger at street crossings & flooding in monsoon seasons. The next on the list of poorly served travellers are bicycle riders, who have no exclusive-use lanes while gradually & systematically being pushed out of busy roads by motor vehicles, be these 2-wheelers, 3-wheelers, cars or buses.



High quality Pedestrian & Bicycle Infrastructure in Bogota, Columbia – Such public facilities are non-existent in Indian Cities.

This, in part, explains why Pedestrians & Bicycles are often seen as obstructionists on busy streets, a long-held, biased mindset that needs to be changed.

Traffic casualty data show that pedestrians are the highest group among those killed in traffic accidents. The very poor condition of pavements, low travel speeds (down now to about 13 km/h), frequent intersections, high intersection delays, & poor or non-existent parking facilities have meant that people use by-lanes or the lanes on the sides of main streets, or over sidewalks for

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

parking, particularly to minimize delays during their trips. Traffic accidents, numbering some 7000+ per year, are also on the high side with very large no. of fatalities (more than 700 per year), over a third of these being pedestrians.

In response to these unsafe conditions, as also to generally streamline traffic within the city, the government (Traffic Police Dept.) has now embarked on a project called BTRAC (Bangalore Traffic Improvement Project), primarily to reduce accidents by a projected 30%. The project involves traffic management with Information Technology on a budget of some 350 crores. It also includes many technology innovations & is said to be the first such initiative in the country.

Finally, and certainly not the least important aspect, a good-quality road system & good-quality public transport services are essential parts of a “package” that Bangalore would want to offer to potential investors from outside, in direct competition with other cities in India, Asia & elsewhere in the world.

It must be emphasized that the city’s population growth as also the prevailing population is a mixture consisting of various income groups, with very large sections of wealthy people with cars. The mushrooming of various educational institutions coupled with job creation in the hi-tech & research industries has given rise to new demands for better & higher quality travel options that penetrate all parts & cover much larger distances, in addition to the present low-quality, low-cost mobility options that are patronized generally by the lower income groups. High quality services for the city’s comparatively larger proportion of higher income groups (when compared with other cities in India) also demand sufficient capacity & frequency for quicker mobility for these groups.

As a caricature, these are the same groups that are conscious of traffic speeds & delays, seek flyovers & urban expressways & demand multi-level garages in order to facilitate quicker movements with private vehicles. This growing trend has resulted in an overly accommodative response by the authorities to pro-growth forces with higher emphasis on road infrastructure development to cater to cars & two-wheelers. Though these private modes are a boon for city commuters, the consequences of offering road facilities for their primacy are unfortunately quite negative for traffic flow, safety & air pollution, & seriously impacts performance of public bus transport & it’s users.

These generalizations apart, the ranking of ‘push-away’ factors are as follows: low travel speed, lack of punctuality, poor connectivity & low frequency. Most bus users are not captive & make their modal choice on the basis of some calculus based on price, travel time, comfort, convenience, etc., most of which are hard to sustain by public transport bus services due to increasing traffic. Thus, the flight of users to private modes continues.

This unfavourable evaluation of urban transport performance may be seen as unfair by those actively involved in the operations & planning of transport systems in Bangalore. While acknowledging that valiant efforts have been made, & some real improvements achieved, it is also clear that efforts have not sufficed to keep up with loads & expectations generated by

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

demographic & economic growth. Generally, the working hypothesis of various responses have been supply-focused rather than demand-oriented.



A wide, pedestrianized street in Guangzhou, China.

Bangalore has no such Pedestrian exclusive streets. Brigade road, Commercial street, Sampige road, streets around Jayanagar shopping complex, & bylanes within Chikpet, City market & Gandhinagar are similar.

Vehicles must not be permitted to enter these streets & areas.

It is also readily acknowledged that the scale & diversity of the demands posed by this enormous growth, both by population & income increases would probably have proved taxing for most world cities, & not merely for Bangalore or any other Indian city.

STEPS BEING TAKEN BY THE AUTHORITIES – REGRESSIVE, AGAIN

The city's road designs, laid out in the 1940s, when Bangalore had a population of less than half a million, preceded motorization, & in fact inhibited it later on. Thus, generally, the road network is underdeveloped in terms of size, structure, continuity & connectivity. The city corporation has been responding to growth in vehicle volumes by attempting to increase the capacity of road networks generally & in addition to building facilities for the neo-rich technology clusters that had begun to spring up in the south & east of the city, to meet the demands of industry.

It has most often been argued that the available street space is much too low. This position is then used to argue not only for widening & building more roads, but also for the construction of off-road public transport systems, be these Metro-rail, Commuter-rail or Mono-rail. Some argue that the road space is not the problem, but its management is. In all likelihood, both are right. The street space needs to be managed much better, & building new roads & exclusive-track public transport system is warranted in the city that has been trying to cope with traffic loads for which its network was certainly not designed. The essential questions are, of course, who is going to get the street space available at present, how much new road space is to be provided & which off-street systems are going to be built.

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS



WHAT TYPE OF CITY DO WE WANT ? THE FRIENDLIER TO CARS A CITY IS, THE LESS HUMANE IT BECOMES. WHY DO WE NOT OPPOSE THE CAR LOBBIES ?

The more recent policy approach of addition of massive new road capacity (by road widening on a large scale, building multi-grade interchanges, elevated radial roads & several expressway/s, notably the road to the new airport) without any focus on bus-based rapid transit routes is supply-oriented & traffic growth-biased. It conflicts with the principles outlined in the National Urban Transport Policy (NUTP-2006) in a number of ways. It neglects mass mobility for all income groups, especially the non-motorized ones. It does not involve any use of traffic restraining tools & hence leaves street-based public transport services (the 'work-horses' of the city transport system) to the mercy of unrestrained competition from individual motor vehicles. Moreover, it favours the rich by massive infusion of capital into the road system, which may not be warranted for the comparatively smaller number of users who demand very large street space, whilst simultaneously ignoring the needs of other passengers who depend on public bus transport. In effect, it subsidises the richer motor vehicle owners in perpetuity whilst seriously disadvantaging public bus services.



The gigantic Hebbal Fly-Over, the largest in the country, is now proving insufficient after the opening of the new Bangalore International Airport.

Plans are afoot now to widen the main ramp.

A special case of traffic restraining has to do with public bus transport services – No matter how excellent the supply side of public transport operations, services will only have as much quality as the traffic conditions will allow it to be.

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

In the longer term, the emphasis on increasing road capacity without offering priorities to street-based public transport encourages two-wheeler & car-based urban development patterns, similar to cities in the United States where expressways & throughways had been developed almost all through the last century with very negative environmental impacts. The actual policies, as opposed to NUTP-2006 in principle, thus appear to be socially regressive, financially unsustainable & environmentally unfriendly.

The neglect of bus-based rapid transit modes is proportional to the affection for rail-based modes, especially the Metro system. This may have to do with the larger-than-life role that railways played in India's history & a common association of Metros with the great cities of the world. Rare is an account of urban transport in India that does not mention the Delhi Metro, despite its poor patronization levels. The resulting bias has an operational form with a view that railways, operating on exclusive tracks, such as the Metro system, are of better quality, whilst buses belong on the street & to connect nearby villages, implying lower service standards. When sustainable low-cost options, such as exclusive bus lanes are neglected or rejected, only the more expensive ones remain on the table. At the very least, this means that fewer corridors can be provided with quick mass-transits.

However, it is also clear now that without very high capital investments on an off-street guided rail mass transit (such as the Metro system under construction) that can add huge capacities between transport links, the city will surely be heading towards complete chaos & breakdown.



Cars on sidewalks, or parking bays where there should be sidewalks suggest that citizens with cars are more important than those who don't have them.

OTHER FACTORS

There are also several other factors, all interconnected, that explain this unsatisfactory state of affairs, as detailed below :

- ◆ The state's political establishment tends to dominate the direction of the city's development due to its economic importance based largely on industry demands & this produces transport policies & investments that are not well aligned with long-term futuristic interests of the city.

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

- ◆ The proliferation of state & local institutions & parastatals is unusually high, resulting in diluted regulatory /funding authority & accountability for urban transport matters. In the forest of institutions that already exist or have been created newly, no single body has been mandated to make comprehensive policy or medium-to-long term transport investment plans. Most of these institutions merely cling to pieces of the pie without co-ordination between one another in the absence of a stable umbrella agency.
- ◆ The city has not been able to develop capacity for public transport regulation, despite formal appointment of a lead authority (BMLTA, or Bangalore Metropolitan Land Transport Authority) as recommended by NUTP-2006.
- ◆ Large-scale investments (elevated expressways, ring roads, Metro rail, etc.) tend to get more attention than innovative, simpler & cost efficient right of way bus services on available wider roads. These biases in spending that favour large investment projects, some with dubious rationale (such as the 11km & 9km elevated toll-ways), leave large urban & social segments poorly served whilst facilitating the better-off motor vehicle owners, & encouraging more vehicle ownership.
- ◆ The use of competitive mechanisms is underdeveloped, as is the reliance on private sector funding & the know-how. In fact, it is limited to outsourcing of some bus services, contract-based street maintenance, & a budding effort to charge for on-street parking (this last has also been suspended during the last few years, further encouraging the use of private modes for commuting).
- ◆ The Laissez-faire attitude that continues with regard to no allocation of street space between competing types of users would result in further losses to: (a) pedestrians; (b) bicyclists; & (c) public transport vehicles.

On the positive side, attempts by city authorities to seamlessly integrate various modes by building several IMTCs & TTMCs (Inter-Modal Transit Centres; & Traffic & Transit Management Centres) is proof of recognition of the prevailing difficulties for public transport users, though pedestrians & bicyclists continue to be ignored.

“ Transport is not a technical problem. It is not an infrastructure problem. It is not even a financial problem. Most often, it is a Political problem. ”

THE CONSTRAINTS

Although the recent Transport Survey (CTTS-2007) had recommended several different modes of Public Transport for the city, it is now becoming apparent that some of these modes may not be

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

feasible owing to complex issues, again for similar reasons enumerated under 'Other Factors' above.

The Commuter Rail Option on existing rail tracks within the city appears to be a casualty of the lack of concerted efforts between the city, state & the national railways, despite the responsible wing from the railways being headquartered within the state. This may also have to do with the abysmal record of construction & running of such urban rail systems in other large cities within the country (Chennai, Kolkata, Delhi, etc.), most of which have been financial drains for the respective rail sub-divisions.

Transport is unique as the only development sector that worsens as incomes rise. While sanitation, health, education & employment tend to improve through economic development, traffic congestion tends to worsen !

Likewise, bus-based rapid transit options are viewed through the prism of the difficulties that it is facing in Delhi, opposition by car owners & the formidable English media, in general. Examples of well-planned & successful BRT models within the country at Indore & Ahmedabad (still in the building stages at Ahmedabad) are not being focussed on with the argument that street widths are insufficient for BRT options. This same argument is however, being used to widen as many as 91 streets to begin with, followed by several more, but BRT options are being held in limbo, whilst development of road infrastructure is being planned with no focus on according even the more simpler priorities for street based bus transport services.

Issues related to development of common ticketing systems & the complex mechanisms involved with this between Metro-rail authorities & the feeder bus operator/s (BMTc) is another area that could pose serious problems for commuters. The time penalty & higher costs if such systems are not developed could restrain patronization levels not to mention the financial health of the Metro-rail authority as also the bus operator/s. Another problem appears to be the total disconnect between Metro-rail officials & the bus operator (BMTc), as a result of which no progress has been made on development of feeder bus routes yet, though construction of the Metro rail is now well underway, with services expected to begin by 2012.

The Monorail or Light rail feeder options for Metro also appear to have been similarly scuttled by the authorities, though interested firms have made proposals. This would then imply that Metro rail would operate as a stand-alone service provider as also BMTc, & this is possibly where a battle between the two modes is likely to take place for dominance & where a strategic approach is called for to complement one another's services for mutual benefits as also for the larger interests of the commuting public.

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

Integration of Inter-City Rail at Schiphol Airport, Amsterdam (below); & The Metro Connection at Copenhagen Airport (right): Seamless Integration has meant easy accessibility between City & Airport.



A WAY FORWARD

Given that massive new road developments are being relentlessly pursued despite opposition from several quarters, it also provides opportunities for solutions for all classes by way of street-based prioritized transport, subject to authorities focussing & seriously pursuing solutions.



Bicycles parked outside Copenhagen Central Rail Station – an indication of the widespread use of bicycles by all sections of society in Europe, despite their wealth.

Also note the lack of large areas for car parking – these are confined to lanes at the entrance for pick-ups & drop-offs only & some slots further away from the station (not seen in picture).

To conform more closely to the directions recommended by NUTP-2006, the city needs a demand-segmented, service-oriented urban transport strategy, which would balance growth with

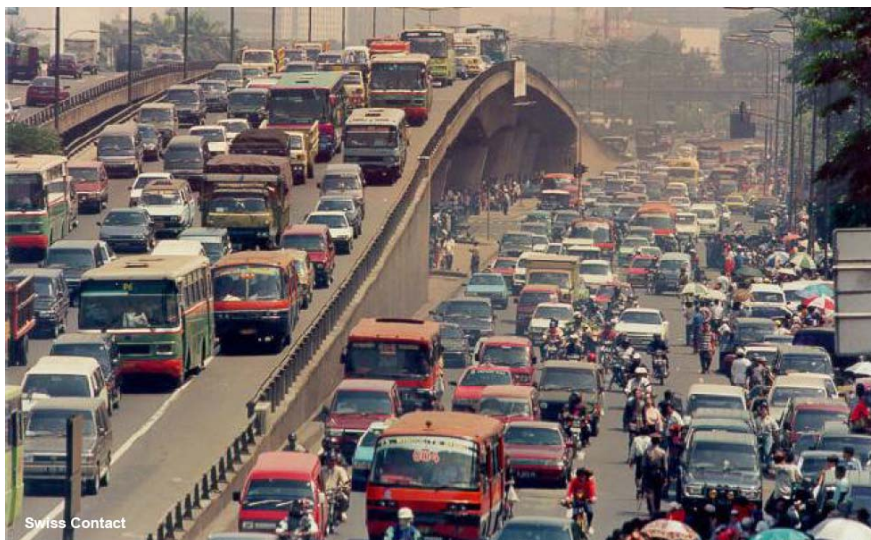
URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

equity concerns, with a strong but cost-conscious orientation in favour of public transport modes. Practically, this would involve a progression of steps from simple to the more difficult :

- Accord substantial powers to the appointed Unified Transport Authority (BMLTA) in all matters related to city urban transport, including mandate/s to liaise with various city bodies, industry & local welfare bodies. This would, in effect mean that the state government steers away from transport matters, but only plays a facilitative role.
- Enable mechanisms for BMLTA to develop sufficient capabilities & expertise to handle various transport issues, including capacities to recommend urban transport infrastructure developments to various concerned bodies.
- Develop mechanisms to measure & evaluate the performance of the transport system regularly, from the point of view of different societal groups. This would also fall under the purview of the lead authority, the BMLTA.
- Introduce road & street design standards & practices that are walk & bicycle-friendly. The additional road widths that would be available with the on-going road widening would not pose obstacles to provide right of ways for pedestrians as also for bicycle tracks at the sides on many streets.
- Re-allocate the existing road space to provide substantial exclusivity & priority of use to public transport vehicles on arterial streets. The corollary of this is that general traffic would be restrained.
- Intensify traffic control with restraints such as higher taxes at purchase & also higher road taxes (annually, rather than life-time, as at present).
- Intensify parking management activities with variable time-bound parking costs based on demand. This would imply higher rates within the core areas & reduced rates in suburbs.
- Intensify monitoring & policing activities with regard to pedestrian walkways, bicycle tracks, public spaces & traffic at most, if not all major & sub-major intersections. Since this may pose serious challenges with widespread misuse of facilities, private sector involvement would be both desirable & necessary since governmental efforts have been failing.
- Shift attention & resources to repairing & improving secondary & tertiary urban road networks within low-income & poorer areas, & connecting them to the arterial network.
- Address the issue of public transport fares, subsidies & service levels, balancing social protection & modal split concerns. Introduce common ticketing between different modes of public transport.
- Implement a transport regulatory reform aimed at getting substantially higher quality services &/or lower costs with incentives & a gradual move to privatization & competition (this would involve breaking the monopoly of BMTC, step by step).
- Introduce rigorous project evaluation for large, financially risky projects, such as future extensions of the Metro rail, & the planned airport high-speed rail.

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

- Focus on developing at-grade bus-based rapid transit lines with facilities for much quicker movements & escaping intersection delays with publicly-owned infrastructure & with well structured service contracts, competitively awarded, inclusive of feeder/distributor networks.
- Ensure that all new primary roads include a provision for rapid public transport modes, such as plans afoot for the Peripheral ring road (PRR).



From 1990 through 1998 the city of Jakarta directed 88% of its urban transport budget to roads even though only 12% of the population had access to private motorised vehicles.

CONCLUSIONS

With the measures outlined above, the general trend that will likely follow would be a systematic shift in the way people from all income groups travel within the city. Public mass transport, particularly street based bus transport enjoying priority on roads would be the dominant mode operating in conjunction with the Metro-rail system, with common ticketing facilities.

A detailed description for planning BRT on the city's streets with single bus lanes on the wider streets & /or circular routes to act as a feeder service for Metro-rail had earlier been presented. This concept can easily be extended to the roads planned for widening to accord substantial right of ways on many roads & for many more areas.

It is clear that the city must promote much more bus travel as this is the only cost efficient mode for travel that also lends itself to changes & modifications as & when necessary, unlike capital hungry rail or other fixed guide systems that have huge installation & fixed operating costs, & cannot penetrate many of the city's areas.

The focus on encouraging the prevalent unsafe & also unhealthy patterns of motorized individual travel must be changed to include much more of walking, bicycling & public transport. This can only succeed by discouraging & restraining private vehicles at all stages. Typically,

URBAN TRANSPORT IN BANGALORE – THE WORSENING CRISIS

motorized vehicle use would have to become much more expensive for travel followed by high parking costs at each main street & also along by-lanes that lead up to these important streets.

It is hoped that the authorities shift attention from the present focus on offering more & more road space & facilities for private modes of commuting & take steps toward a more 'inclusive' pattern of growth for all sections equally, which simultaneously discourage large increases in vehicle volumes.



If a city is good for children & old people, by themselves, it will be good for everybody else.

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