

## **“Transport Budget Analysis in Indian Cities”**

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A city’s budgetary allocation can be very well used to understand it’s vision and evaluate the expenditure allocated for development. The research work is undertaken to highlight the linkages between budget allocations and associated inequities in transportation. The paper seeks to study the budget of four cities of Bhopal, Ranchi, Patna, and Chennai to analyze the equity in the distribution of the amount spent on transportation infrastructure in these cities. It focuses on the share of money spent over four categories of transport infrastructure identified by the author for the purpose of the study. The categories are motor- vehicles, public and non- motorized transport. The distinct categories highlight the disparities in fund allocation and preference for specific modes. Spending under Smart City Mission was also analyzed for transport equity concerns.

The paper stresses the need for making equitable fund allocation to all modes while addressing specific needs of public and non- motorized transport. The analysis of cities showed a common trend of an increased share of the budget being spent on motor-vehicle related projects. The study further revealed the poor compliance of the budgetary allocations with the city’s goal of promoting sustainable transport and increasing the use of non-motorised and public modes of transport.

**Keywords:** Budget, Equity, Motorised Transport, Non- Motorised Transport

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### **1 Introduction**

#### **1.1 Background**

Transport evaluation is often done to discern if a project should be done or not. While transport evaluation and auditing remain significant, equity consideration in planning remains few. There are basic factors that determine equality in any type of finance mechanism. It depends upon the structure of mechanism, type of transportation alternatives it offers to users, and the aspects of equity which it considers as most important (TRB, 2011). Existing mechanisms have not encouraged any equity considerations. Studies so far have been done to assess the diverse impacts that transport policies and investments have on infrastructure facilities within a city, mobility of people and on different population groups. Transport policies focus on ways to minimize harm to lower-income groups and create more mobility avenues rather than addressing equity concerns. Very less concern has been given to transport equity and the need to have a better understanding in terms of accessibility, mode of transportation and mobility.

Transport systems to this day are mostly based upon a utilitarian framework that continues to overlook the woes of pedestrians and non-motorised transport users. Transport funding by municipalities and proposed infrastructure also promote a motorized mode of transportation thus favouring people who can afford it. The distribution of space on roads also favours vehicles rather than people raising significant equity concerns.

In order to sustain and renew the city's road transport, municipalities are working out ways to raise revenues and address equity issues in financing surface transportation. Inequities in the share of funds allocated for motorized transport and non-motorised transport often create land-use patterns that become difficult to be traversed by non-motorised users. Revenue collected at state and federal levels via taxes and charges is also utilized to pay for projects and infrastructure that widen the gap between the different economic groups in their access to transport options. Transit equity to date has focused majorly on federal policy and mostly overlooked the need for funding by state and local authorities.

MoHUA in 2007 encouraged the preparation of Comprehensive Mobility Plan (CMP) by City authorities to avail funding under Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and ensure that the transport projects being undertaken are in compliance with the NUTP policy i.e. the major focus is on mobility of people and not vehicles, priority is given to pedestrians, Non-Motorized Transport (NMT) and all modes of public transport. Cities spend a large percentage of their budget on transportation without essentially being aligned with the objectives of NUTP, with higher share often targeting motorized vehicles and low levels of investment for improvement in Public Transport.

## 1.2 Need

Transport planning and investment decisions very seldom cater to the needs of all communities. Inequalities in transport lead to the isolation of a wider community in terms of the social exclusion of particularly those who live in an automobile-dependent area, have low income, or are unable to own an automobile. Inequalities in investments lead to unequal land-use patterns, poor health, and economic impacts. Examples of such inequities can be found across the globe. A 2.9 billion state rail project in Baltimore that would have improved the transportation access for low-income groups was cancelled in order to fund highway projects. Similarly, in New York City, City Bus service which caters to two million bus trips daily was scrapped in order to facilitate a sub-urban project that serves 1,62,000 trips. Equity in transportation focuses on including social, spatial and financial factors into its assessment criteria.

In a developing country like India, the inability to align public transportation services with the needs of the population who rely heavily on transit is a big shortcoming of equity planning. Assessment of Municipal budgets of various cities shows that too often transport leaders turn a blind eye towards social injustice implications of the various policies and institutes that fund and operate transport systems. Planning for equity needs to identify the

most pressing unmet needs and align investments and drawn benefits in achieving those needs. There is a need for public policy makers to define nature of proposals and activities, especially the ones that are concerned with collection and use of revenue. This can help achieve impartiality in funding mechanisms that are dependent more on application details.

The municipal budget for transportation in cities of Bhopal and Ranchi highlights the prejudice towards funds allocated to public transit in spite of the various environmental and economic benefits offered by it.

Cities have mostly undertaken projects which are not a part of the CMP document. It is very much necessary that the funds allocated to the city under different missions like Smart City Mission, NUTP, JNNURM along with its own funds are properly utilized to achieve the overall goal of transport policy. More than often, a very less share of the budget is allocated to public transport. The absence of any prescribed guidelines for allocation of municipal budget to different sectors further raises a discrepancy in accordance with the objectives of CMP and transparency of the entire process.

Urban transport in Indian cities is troubled with rising issues of congestion, pollution, and safety. Vehicular growth, both two-wheelers, and cars remain the prime cause of concern due to its high modal share which pushes demand for greater roads and flyovers and developing parking lots. On the other hand, Non-Motorised and public transport continue to shrink.

Equitable access to high-quality transport services should be promoted to generate more inclusive cities by providing more opportunities for people from all backgrounds. It should be promoted not only because it is the right thing to do but to also reap better business opportunities.

## **2 Literature Review**

Cities in developing countries contribute as much as 15% to 25 % of their annual expenditure to transport sector. Road transport service accounted for 3.3 per cent of the country's gross value addition (Ministry of Road Transport and Highways, 2015-16). A low share of fund allocation to transport management and higher percentages of motorization are causing a negative impact on economies.

Growth process in developing countries like India is putting an increasing pressure on urban transport systems. Use and ownership of motor vehicles continue to grow at a rate that is higher than growth of population. Vehicle ownership growth rate of 15% to 20% per year is common in some developing countries. In India, the total number of registered motor vehicles has increased from about 0.3 million in 1951 to 230 million in 2016; recording a growth rate of about 10.7% annually. The share of cars, jeeps and taxis in total number of Registered Motor Vehicles was 13.1% for 2016. The total share of buses for the same year was 0.8%. (Ministry of Road Transport and Highways, 2015-16). The increasing car

ownership adds upto existing road traffic congestion, causing a decrease in travel speeds and deterioration of travel environment for pedestrians and non- motorised vehicles. The large variation highlights the indifferent attitude towards public mode of transit in India. The resulting issues are reflected in on-road congestion and delays which leads to a decline in national GDP .

Access to high-quality public transportation can make cities more inclusive by increasing mobility and opportunity, particularly for people with low incomes. This can lead to prioritizing transportation investments that better enable people to meet their day-to-day needs— getting to work, school, the grocery store, the doctor’s office, and social and leisure activities. Allowing people to meet these needs creates long-term economic opportunities and helps people escape poverty (Inclusive Transit, 2018).

Reallocation of the transport budget can promote more socially equitable transport systems. Making equitable allocations in transport to benefit all economic groups can lead to unified prosperity. Equitable funding creates reliable transport options which in turn improve access to healthcare, education, job, and services. Thus investments in transport provide for upward mobility of lower-income groups. This helps in overall economic growth. In addition to improvements in existing infrastructure and changes in present budget allocation, multiple government stakeholders are also required to make equity goals and strategies a part of planning exercise and policy decisions.

### **3 Scope and Methodology**

To assess the equitable access to different transport services and infrastructure in all the four identified cities, budgets of the year 2016-2017 are discussed and analyzed to know the percentage spending on transport as a share of total city expenditure. It is followed by detailed segregation for the transport-related entries centered around author identified categories which are expenditure on Motorised vehicles, Non-Motorised Transit, general infrastructure commonly used by all modes like street lights, storm-water drains and expenses over public transit. Municipal funding is discussed under Revenue and Capital Expenditure with special emphasis on different ways by which municipalities generate their own revenues through provision transport-related services and infrastructure.

Out of the four selected cities, Chennai is a tier 1 city with a population of more than four million. The remaining three cities are tier 2 cities with a population greater than 1 million.

The share in different categories is discussed to bring out the inequities in the allocation of funds to different modes. The percentage share under four selected categories is further discusses in coherence with the ideal situation and targets as mentioned in the city’s Comprehensive Mobility plan and objectives of National Transport Urban Policy. Fund allocation under Smart City Mission for the cities is also discoursed in brief to highlight that a

significant share of funds under the mission is allocated to Mobility targeting pedestrian-friendly environment and encouraging non-motorized transport.

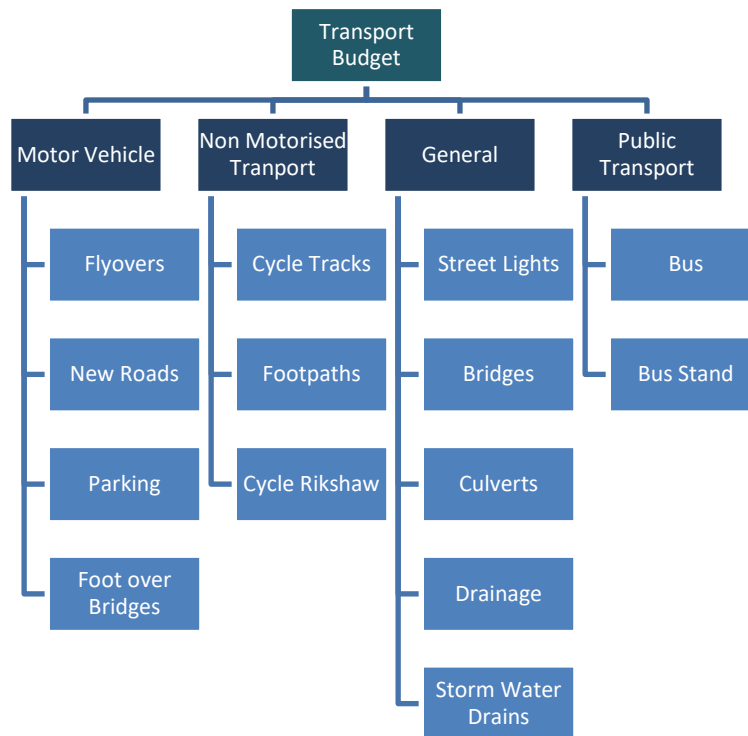
The area of study is limited to the transport component of the budget. The research work caters to services run under Urban Local Body only with no consideration for transport services and provisions made by separate organizations. Due to vast differences between the formats of the city's municipality budgets, the criteria analysed tend to vary. While cities like Ranchi and Chennai have clearly demarcated functions for funding under JNNURM (Jawaharlal Nehru National Urban Renewal Mission), cities like Bhopal and Patna provide consolidated details of the grant under the scheme making it difficult to know the exact category for which funds are being utilized.

Municipal Budgets don't reflect the funding done by private agencies for providing transport services. The paper won't thus consider the funds for the same.

### 3.1 Classifying the Transport Budget

The total amount allotted for Transportation includes a range of projects. The budget document does not classify allocations based on specific heads. Municipal budgetary heads vary from city to city. Thus to create a common platform for assessment, the author has divided the funds into four different categories for drawing comparison depending upon the purpose fulfilled.

1. **Motor vehicle-** It includes all budgetary allocations that benefit private motor vehicles by reducing their travel time and on-road congestion. This category includes work related to flyovers, roads, elevated roads, parking lots, widening (or concretization) of existing roads, Foot over Bridges, etc. within the city. However, a lot of literature says that the construction of such infrastructure encourages greater use of personalized motor vehicles leading to increased travel times and distances.
2. **Public Transit-** All budgetary allocations that aim at improving or expanding present services related to rail, bus are a part of this category.
3. **Non- Motorised Transport-** All monetary allocations in a budget that benefit Pedestrians or cyclists. It includes pedestrian walkways, cycle tracks, bicycle provision, etc. Pedestrian subways, causeways, Foot over Bridges, etc. are all included in Motor Vehicles category, since the provision of this infrastructure enables majorly the speedier movement of motorized vehicles
4. **General Category-** Such works and infrastructure are beneficial to all categories. It includes provisions like street lights, culverts, traffic signals, storm-water drains, etc.



#### 4 Budget Allocation Process

The growing need for urban infrastructure poses an increased burden on Municipalities, making them unable to fulfil their requirements by the revenue generated by them and thus they depend significantly upon the resources and grants provided by Central and State governments. Municipalities use these funds to perform the 18 functions listed in the 12<sup>th</sup> schedule of the Constitution of India.

Most Municipalities follow the structure laid down in the National Municipal Accounting manual for their budget but a lot of variations are found in the presentation of details across different Municipalities. The basis of a budget document includes revenue receipts, revenue expenditure, capital receipts, and capital expenditure.

#### 5 Comprehensive Mobility Plans of Cities

Comprehensive Mobility Plans provide a long term strategy for improving the mobility of people and achieving sustainable transportation. It is a key document for 20 years, with intermediate targets set out at 5 and 10 years, which provides a rationale for proposals in transport. The document focuses on aims to address urban transport problems, facilitate provisions for pedestrians and Non-Motorised modes, and promote better use of existing infrastructure and improvement of public transport.

Main goal of CMP Bhopal 2012 is to achieve convenient and cost effective mobility of people through development of transportation network and infrastructure for all modes

including pedestrians, cyclists and intermediate public transport (IPT). It also aims to develop standards to assess the quality of public transport, NMT, pedestrian mobility and parking systems.

ITDP and several NGOs came together to establish Ranchi Mobility Partnership to advocate equitable, safe, affordable, accessible and sustainable transport systems in the city. Ranchi Mobility Charter prepared to deal with the city's mobility issues puts the focus on achieving equity by targeting the movement of people and not vehicles.

Ranchi Mobility Charter has been prepared by Ranchi Municipal Corporation to guide transport planning in the city. Its key principles include equity, sustainability and liveability. Equity concerns with planning to meet needs of all the people. Charter aims to achieve equity by promoting all modes through creation of a bus based public transport system for the city, equitable road space allocation among all and development of compact neighbourhoods that are pedestrian friendly and are built around public transport corridors.

CMP Patna recommends the most appropriate, sustainable, and cost effective investments by creating long term mobility facilities for all modes of transportation.

In past two decades, Chennai has seen an increasing vehicle ownership and traffic volume with rising traffic and transportation issues. The Comprehensive Transportation Study conducted by Chennai Metropolitan Development Authority emphasis on development of public transport system and provision of mass transit systems. Various long-term, medium-term and the short-term schemes (proposals) have been developed for the CMA through the Chennai Comprehensive Transportation Study. The objective is to achieve equity by creating a balanced modal mix. It intends to discourage the use of personalized transport, and substitute it by provision of mass public transport options; To create a marked departure from vehicle oriented strategies to a people centric approach by providing adequate, accessible and affordable modes. Shortcomings in exiting transport networks however are mainly due to lack of financial resources.

## **6 Comparative Analysis**

To assess and analyse the performance of Municipalities across the country, the Ministry of Housing and Urban Affairs has launched the first-ever Municipal Performance Index 2019. For the assessment process, as per the Municipal Performance Index- Assessment Framework 2019, five verticals have been identified of which finance is one. It evaluates the effectiveness with which funds are utilized. The pillar is further divided into four subcategories- Revenue Management, Expenditure Management, Fiscal Responsibility, and Fiscal Decentralisation to assess performance.

The basic analysis was done to draw a sense of the Total Municipal Budget Allocation in the selected cities. The following Table 1 shows the city-wise total budget expenditure.

	<b>Bhopal</b>	<b>Ranchi</b>	<b>Patna</b>	<b>Chennai</b>
<b>Receipts Total</b> (Rs in Lakhs)	2,09,250	1,83,599	42,792	4,69,100
<b>Expenditure Total</b> (Rs in Lakhs)	2,09,596	1,66,914	52,606	4,87,800
<b>Population</b>	17,98,218	11,26,741	16,84,222	46,46,732

Table 1 City wise Budget

Source: (GCMC, 2016-2017), (BMC, 2016-2017), (RMC, 2016-2017), (PMC, 2016-2017)

Chennai Municipal Corporation has the highest total budget expenditure amongst the selected four cities. City Corporation makes a positive contribution to the city development even though it receives a budget lower than the other two metropolitan cities of Bengaluru and Mumbai. Chennai is managed by not just Municipal Corporation but a host of other agencies engaged in operation and management of services. However, it is the corporation that plays a major role in works related to street lights, drainage, parks, playground, non-major roads, bridges, and subways.

The next highest total city expenditure after Chennai is for Bhopal followed by Ranchi and Patna. Though the population of Bhopal is comparable to that of Patna, their expenditure varies greatly.

	<b>Bhopal</b>	<b>Ranchi</b>	<b>Patna</b>	<b>Chennai</b>
<b>Transport Expenditure</b> (Rs in Lakhs)	21,572	29,350	6,675	13,778

Table 2 City wise Expenditure on Transport

Source: (GCMC, 2016-2017), (BMC, 2016-2017), (RMC, 2016-2017), (PMC, 2016-2017)

The city-wise expenditure on transport as per Table 2 shows that Ranchi, has huge capital investments. The city Municipal Corporation has limited finances of its own to accomplish the major responsibilities of providing basic services. The corporation has limited revenue sources and is heavily reliant on state and central for financial assistance. The city



contributed maximum amount in INR for the fiscal year 2016-2017 when compared to other cities followed by Bhopal whose budget allocation includes huge funds for cycle tracks and Bus Rapid Transit Systems (BRTS).

As per (Simi Mehta, 2019) Ranchi presently faces deficiencies in public-transport with only 65 buses catering to a total population of 11.2 lakhs against the standard requirement of 50 buses per 1 lakh population. Use of personal vehicles is rapidly increasing in the city causing congestion and safety issues.

Bhopal being a land-locked city, surface transportation forms the backbone of Industrial/ Tourist and Socio-Economic development. High municipal expenditure is required to develop high-quality Road Network and allied transportation infrastructure throughout the city.

The city of Chennai is not just managed by Mayor or Councillors at Urban Local Body but a host of other agencies including the Chennai Metropolitan Development Authority – the nodal planning agency, Chennai Metropolitan Water Supply, and Sewerage Board (CMWSSB), Metropolitan Transport Corporation, Chennai Traffic Police.

Various State level departments like Highways Department are responsible for works related to laying of major roads, bus route roads, and district roads and construction of Road over Bridges, Road under Bridges and Pedestrian Subways. Implementation and management work is performed by the Public Works Department.

	<b>Bhopal</b>	<b>Ranchi</b>	<b>Patna</b>	<b>Chennai</b>
<b>Transport Expenditure as a Percentage of Total</b>	10.3	17.58	12.7	2.82

Table 3 City wise Transport Expenditure

Source: (GCMC, 2016-2017), (BMC, 2016-2017), (RMC, 2016-2017), (PMC, 2016-2017)

As per the data given by City Municipal Budgets as shown in Table 3, Ranchi shares 17% of its total City Budget expenditure for transport-related activities and infrastructure followed by Patna which has a share of 12% that is comparable to the city of Bhopal.

Ranchi Municipal Corporation has allocated funds for widening and maintenance of around 155 km of the major arterial roads.

Since expenditure for Flood Relief Works for Chennai was not taken into consideration, it has the lowest percentage share. The city receives and spends a huge amount of its allocated budget over flood expenses which include road construction and repair works, lighting arrangements and bridges work.

Table 4 below shows the distribution of categories under transportation for which identified four cities generate revenue and capital expenditure.

Transport Category	Function	BHOPAL	RANCHI	PATNA	CHENNAI
<b>MOTOR VEHICLES</b>	Roads and Pavements	Yellow	Yellow	Yellow	Yellow
	Bridges and Flyovers	Yellow	Yellow	White	Yellow
	Subways and Causeways	Yellow	White	White	Yellow
	Car parking	Yellow	Yellow	Yellow	White
	Roads and Drains	White	White	Yellow	White
<b>NON-MOTORISED TRANSPORT</b>	Cycle Rikshaw	White	Green	White	White
	Cycle Track	Green	White	White	White
	Footpath	Green	White	White	White
<b>GENERAL</b>	Public Lighting	Pink	Pink	Pink	White
	Storm Water Drains	Pink	Pink	Pink	Pink
	Traffic Signals	Pink	White	White	White
	Culverts	White	White	White	Pink
	Street Lighting	White	Pink	Pink	Pink
	Traffic Improvement	White	White	White	Pink
	<b>PUBLIC TRANSIT</b>	BRTS	Blue	White	White
Bus Stand Construction	Blue	White	Blue	White	
Bus Purchase	Blue	Blue	White	White	



<b>Bhopal- Percentage share in total Transport Expenditure category wise</b>	
<b>Motor Vehicle</b>	45.9 %
<b>General</b>	39.3 %
<b>NMT</b>	5.9 %
<b>Public Transit</b>	8.8 %

Table 5 Bhopal- Percentage share in total Transport Expenditure

Provisions of roads and pavements including operation and maintenance, bridges and flyovers, parking lots, etc. as per

Table 5 hold a greater percentage share and benefit motorized vehicles more than the pedestrians which CMP of Bhopal otherwise aims at. It is obvious from the distribution that such a budget allocation is not aligned towards achieving equity or fulfilling the goals as per the CMP document.

The good public transit services in the city, however, show a level of equity concern. The public transit system catered to by Bus Rapid Transit System (BRTS) offers a quick and comfortable mobility in the city. BRTS project is financed by GoI under JNNURM holding 50 percent stake, Government of Madhya Pradesh (GoMP) with 20 percent and Bhopal Municipal Corporation (BMC) with 30 percent stake respectively.

Residential areas are mostly served by Intermediate Para Transit (IPT). IPT routes provide connectivity to passengers from innermost areas to BRTS routes. It is further enhanced by the feeder connectivity of city bus services.

BRTS further contributed to equity in various terms. It helped to integrate land-use and transport, allow for distribution of economic activities away from the congested core area, promote effective utilization of exiting road system, minimize private ownership and encourage upward economic mobility of lesser influential people and provide equitable access to major part of the city.

As per the CMP, road infrastructure in terms of lane marking, signages and street lighting have been proposed. It includes provisions for creation of footpaths, cycle tracks, rail over bridges, new street lights and repair works for defunct once, installation of traffic signals for pedestrians, improvement of existing traffic signals, the percentage share of budget allocated to general and NMT together make only 45% of the total with very less for NMT i.e. just 6%.

**Initiatives under Smart City Mission**

The city is one of 15 largest cities of India and was shortlisted in top 20 for Smart City Challenge. The city’s mission along with others puts strategic focus on Transit Oriented Development. Efficient urban mobility and public transport are one of the identified core infrastructures. Equity concerns are addressed in the mission with as much as 1 billion being allocated to mobility for promoting pedestrianisation through pathways, encouraging non-motorised transport and Non-vehicle streets/zones. A considerable share has also been given to intelligent traffic management, smart parking and public bicycle sharing.

The project proposes to improve commercial areas of the city by incorporating changes to the built environment. Principles of Tactical Urbanism shall be used to create an active street for improved user experience and provide equal motivation for pedestrians

**6.1.2 Ranchi**

Ranchi, being the capital city of Jharkhand is urbanizing fast and witnessing a rapid rise in population. It is the most important urban economic centres in the state. The city was selected as one of the 13 fast-track cities in 2016 with a goal of making it a hub for educational excellence along with an efficiently managed traffic and transportation system-based city supported by information technology.

The rapid industrialization and booming multi-brand retail sector have made the city a major business hub in the region. This has led to increased congestion and safety issues in the core city centre area. In the absence of any formalized public transit system, people are largely dependent on personal motor vehicles or paratransit for the daily commute. There is inequity in major development projects as most of them are being done as shown in Table 6 for Motorised vehicles through initiatives like road widening and flyover construction.

<b>Ranchi- Percentage share in total Transport Expenditure category wise</b>	
<b>Motor Vehicle</b>	69.8 %
<b>General</b>	28.28 %
<b>NMT</b>	0.68 %
<b>Public Transit</b>	1.2 %

Table 6 Ranchi- Percentage share in total Transport Expenditure

There has been an increase in travel distances and demand for motorised vehicles due to outward expansion of the city. With weak revenue base, poor quality public transport falls incompetent to fulfil the required demand. With an increase in income, the use of individual motorised vehicles is also rising rapidly.

In spite of the accepted equity principle, the highest percentage of Municipal Funds are allocated to Motor Vehicles i.e. 70% followed by 28% expenditure in the general category. Share of total transport funds allocated to Motorised vehicles is made majorly for the provision of roads and pavements and bridges and flyovers. This also includes funding for its operation and maintenance. Capital expenditure on roads holds the highest share.

There is lack of equity in mobility options as there is no adequate public transit system. As per the budget document, only 2% funds are allocated to provision of street lights and as much as 71% for its operation and maintenance. Mobility on highways, several roads and housing colonies is thus restricted due to lack of street lighting. Transport options for intra-city mobility majorly include private shared autos, taxis, cycle rickshaws and e-rickshaws. However, gender equality and safety is catered to by a flagship system dedicated to women passengers. It employs “pink autos” (a total of 125) which are women-driven and connect different parts of the city.

There is a need for City Corporation to move beyond construction and widening of roads and flyovers. It should put greater emphasis on improvement of public transport which at present occupies just 1.2%.

### **Initiatives under Smart City Mission**

Ranchi was selected as one of the 13 fast-track cities in 2016. One of the identified goals under the mission is to reduce travel time and make Ranchi a safe city for pedestrians and commuters. The basic idea is to create a lively walking environment for the users and promote public commute systems through integrated multi-modal public transport and bicycle sharing. Also, under the Ranchi Smart City, an integrated traffic and transport system RITTS is to be developed to incorporate all present and future solutions related to transport and traffic.

The funding under the mission caters to both Non-Motorised transport and public transit systems. Under Area Based Development, as much as 2 billion have been allotted for transport and circulation with pedestrian facility. Under PAN city, initiatives are to be taken in the city to address the issues related to public transport.

Under the initiative, Ranchi aims to increase its public transport by 50 percent by expanding its fleet of buses by five times. It also focuses on providing comfortable access to public transport and promotes walking and cycling. Street interventions include provision of wide,

safe and continuous footpaths; safe crossing facilities clearly demarcated parking bays and uniform carriageways (Simi Mehta, 2019).

### 6.1.3 Chennai

The city of Chennai in past two decades have undergone a rapid growth in population, witnessed an increased urban sprawl, vehicle ownership, traffic volume and economy leading to transport issues like congestion, pollution and environmental hazards. As per (ITDP, 2013) Chennai has witnessed inefficient investments in Public Transport from past two decades, with no considerable allocations made for its provision. The travel patterns of locals are heavily influenced by motor vehicle based infrastructure.

<b>Chennai- Percentage share in total Transport Expenditure category wise</b>	
<b>Motor Vehicle</b>	53.18 %
<b>General</b>	46.8 %
<b>NMT</b>	-
<b>Public Transit</b>	-

Table 7 Chennai- Percentage share in total Transport Expenditure

*Public Bus service in Chennai is under the operation of the Metropolitan Transport Corporation which is Government of Tamil Nadu undertaking. The municipal budgets therefore do not reflect any considerable funding made under public transit.*

The increase in vehicular growth with motor vehicle accounting for highest share highlights the enhanced dependence on use personal motor vehicle and the resulting declining share of public transport. Total vehicle population of CMA as of the year 2009 was 28.14 lakhs. The fleet of buses on the contrary has seen a marginal increase. The two wheelers experienced a notable increase from 4 lakhs (1991) to 21.6 lakhs (2009). Average vehicles per household have increased to 1.26 indicating significant motorization levels. All this has led to severe congestion on prominent radial arterial roads leading to the City. The inequities in transport system is evident by the average volume carried by the principal corridor Anna Salai that connects to CBD to rest of the city, which is about 1.86 lakh PCUs per day as against its capacity of 60,000 PCUs per day (CMDA, 2010).

Non- motorised transport- walking and cycling account for approximately 34% of the total trips and yet the infrastructure provision for these modes such as footpaths is little. Cycle lanes are largely non- existent. This trend highlights the inequities in Municipal’s attitude towards this mode of transport with major proportion allocated in favour of motorised

vehicles. The number of person trips using cycles have thus radically reduced to 6% for the year 2008, from 20% in 1970 (CMDA, 2010).

This has far reaching consequences in terms of increased costs due to travel delays, loss of productivity and deteriorating environment. The Municipal Corporation thus needs equitable allocation for public transport and non-motorised transit and an adequate and efficient transport system to fulfil the requirements of rising population.

### **Initiatives under Smart City Mission**

The initiative promotes smart mobility in Chennai through redesign of streets and roads to allow equitable allocation of road space. It aims to employ holistic design and an unbiased approach by incorporating primary design elements like footpaths, cycle tracks and carriageways. Smart mobility basically refers to using varying modes of transportation alongside in different forms like ride-sharing, car-sharing, public transportation, walking, etc. A large percentage of funds have been allocated under the mission for pedestrian and Non-Motorised transport infrastructure. The funding has been done for storm water drainage, pedestrianised streets, differently abled footpaths, bicycle lanes, cycle sharing and e-rickshaws. A remarkable share has also been given to street lighting and on-street parking management system.

The major focus is to encourage citizens to minimise vehicular usage and make all spaces accessible to all in spite of their age, gender and physical ability. The mission specifically targets Non-motorised transport through creation of bicycle lanes to promote use of bicycle over short distances or as first/last mile solution. These lanes are dedicated to cycling but van also be shared with pedestrians and other non-motorised users (GCC, 2019).

#### **6.1.4 Patna**

<b>Patna- Percentage share in total Transport Expenditure category wise</b>	
<b>Motor Vehicle</b>	46.4 %
<b>General</b>	53.6 %
<b>NMT</b>	-
<b>Public Transit</b>	-

Table 8 Patna- Percentage share in total Transport Expenditure



The key strategies as per Patna CDP 2030 includes improvement of road intersections, creation of new traffic infrastructure which includes a truck terminal, bus stand, parking and construction and widening of new roads. The lack of past initiatives and funds for public transit highlights the indifference towards public transport systems prevailing in the city. In absence of any efficient city run mass transit system, an estimated increase of 4.7% in private vehicle has been observed from 1996-2001. The CDP thus focuses on development of integrated public transport system. (Government, 2010).

A large share of municipal funds has been allocated for street lighting and storm water drains. In motor vehicles, major share is for roads and parking. This can be attributed to large private vehicle ownership and corresponding need for more parking spaces. There is an indifferent approach towards non-motorised transport or pedestrians as no measures or provision has been made for the same.

The city Municipal Budgets don't reflect any funding for public transit as there are no City corporation run buses. The predominant mode for inter-city movement is private buses. The bus services are poor due to poor management and maintenance. A large inequity is thus observed in municipal budget with no funding catering to improvement of existing services or provision for better public transit options.

Existing bus service has a frequency of 1.5 to 2 hour per day. Public transport system in the city is inadequate, inefficient, and unplanned. Proposed municipal budgets 2011-2020, yet continue to lay emphasis on motor vehicle related projects which includes widening and strengthening of roads. It was only in 2018 that the transport department introduced city bus services in Patna. The service has led to an increase in demand and the authority thus plans to expand the existing route.

### **Initiatives under Smart City Mission**

Patna was nominated in the 3rd list of smart cities. Under the mission justice has been done for fund allocation as it caters to public transport through provision of e-buses and public transport stands. An amount of 5 billion has been allocated for creation of foot over bridges to apparently promote seamless mobility of pedestrians. This highlights the continued indifferent attitude of authorities towards non-motorised modes.

### **7 Inequities in Parking**

There has been an increase in population and vehicle ownership with total number of registered motor vehicles depicting a growth rate of about 10.7% annually. This continues to generate a demand for an increasing parking space on scarce land. The demand for parking is growing rapidly across all cities and states.

The private motor vehicles in urban areas use road network for only twenty percent of the time. A large amount of traffic is caused by people on road, travelling to somewhere rather

than those who have already reached at their destination. The remaining time these vehicles remain parked either at residences, work places or in public or commercial areas. The lack of organised parking in public spaces leads to congestion caused by people cruising around to park their vehicles.

It is on roads, footpaths and available area in busy areas that have highest parking pressure. A 2008 study by Wilbur Smith Associates for the Union Ministry of Urban Development shows that in most cities, a high share of road networks is under parking pressure.

Many cities like Nagpur, Pune, Surat, Patna, Kochi, Bhopal, Agra, Madurai, Varanasi, Amritsar, Shimla, Thiruvananthapuram, Guwahati, Puducherry and Ahmedabad have as much as 40 per cent of their total road networks under on-street parking (CSE, 2018).

The situation becomes more pressing in cities with compact urban fabric. On street parking leads to inequitable access to available infrastructure and services and reduces number of potential pedestrians in a space. It widens the inabilities of physically challenged to access walkways and streets. Short-distance climate friendly walking trips are replaced by motorized trips when people feel obstruction in smooth flow.

It not only leads to an increased dependency on personal vehicles but also hinders the function of public transit like bus and metro systems, by negotiating a safe access to these modes. It encourages more car ownership and causes the land required for other activities being used to meet parking needs. This compromises with the equitable use of urban land. It thus takes away safe walking and cycling space, hampers pedestrian character and augments unsafe conditions. Consequently, parking stresses lead to forced encroachment of opens grounds and green spaces, hamper access to buildings and homes, bus stops, markets etc. It also severely affects the aged, children and the disabled.

The demand for parking is limitless and has highlighted the failure of corporations and conventional parking policies that fail to cater to rising needs with appropriate interventions and policy measures.

The Table 9 below shows the total revenue earned by city municipalities by levying parking charges.

	<b>Bhopal</b>	<b>Ranchi</b>	<b>Patna</b>	<b>Chennai</b>
<b>Parking Receipts</b> (Rs in Lakhs)	700	300	300	600
<b>Parking Receipts</b> as a percentage of total revenue	.33%	.16%	.7%	.13%

Table 9 Revenue earned from Parking Charges

The percentage revenue gained from parking fees is not even 1 percent of the total municipal receipts. Due to flexible policies and rules, urban local bodies have not been able to gather enough revenue from parking. Minimal parking rates cause municipalities reeling in deficits unable to recover their cost of expenses. Since, demand for parking is market-driven, its price should be determined by the market forces.

According to the 2016 Handbook of Urban Statistics of Ministry of Urban Development, India has the lowest parking fees in the world. Cheap and free parking motivates more private car ownership and acts as a subsidy to rich car owners. In most of the Indian cities, on-street parking is free which increases inequity by hindering the access of people to public transit. Unorganised and free parking also aggravates crimes within a city because of forced capture of parking areas by neighbours, or people from other neighbourhoods.

In an attempt to make cities more liveable and equitable for all modes of movement, city governments are framing various parking policies to bring down congestion on roads and in public places. Cities like Delhi, Chandigarh, Pune, Hyderabad and Bengaluru are doing intensive work to manage parking by designing rules that cater to need of providing parking along with reducing the overall demand for it (CSE, 2018).

The old policies aim at earmarking public land and providing more parking spaces needs to be revisited. This calls for an intelligent pricing policy to regulate the parking requirement. The personal vehicles users should thus pay for the space they use for parking. The pricing of parking should be governed by 'user pays' principle. Government should not subsidize this cost.

There is a need for Local governments to tell people about advantages of organized parking and the need of restraining policies. It has been established globally, that measures like this provide various alternatives to people like car sharing, non-motorised vehicles, reduction in number of car trips, and use of public transport and para-transit. It further prevents congestion by reducing crowding and spill-over of parked vehicles from surrounding public spaces and neighbourhood areas. It has also been proven that parking limitations, along with pedestrianisation in selected commercial areas can encourage increased pedestrian volumes and this can help to escalate business volumes due to improved environment (CSE, 2018).

## **8 Conclusion**

The analysis of budgets for all the four cities reveal the inequities in fund allocations made which prefer motorised transport. In spite of the large budgetary allocations made to the transportation sector, the cities fall short to tackle the issues related to it. The funds allocation within the sector is highly disproportionate viz-a-viz goals of mobility plans.

	Bhopal	Ranchi	Patna	Chennai
Motor Vehicle				
General				
Public Transit			-	-
Non-Motorised vehicles			-	-

In all the four cities, maximum allocation is made for motorised vehicles, followed by funding for general expenditure including storm water drainage, street lighting, bridges and culverts etc. The heavy allocation for motorised vehicles has led to over- investment on roads and highways. Sprawl at city peripheries have made public transportation inaccessible to large section of society. There is a common tendency of municipal bodies to allocate least percentage share for Public Transit and Non-Motorised vehicles. It is only after introduction of Smart City Mission that public transport and non-motorised transport has been encouraged. Funds have been allocated for pedestrian and Non- Motorised transport infrastructure including footpaths, e-vehicles, and bicycle lanes. Focus has been shifted away from motor vehicles to create walkable neighbourhoods to encourage citizens to minimise dependency on vehicular usage. It also aims to promote equitable access for people from all ages and make all spaces accessible regardless of their age, gender and physical ability.

Car traffic balances are essential to parking schemes and the lessening of traffic in urban centres. This article describes a study about the effect of parking schemes in lessening car traffic. Concluding, the author states that only city-wide parking concepts are an effective measure towards traffic calming in so far as they are integrated in a broad approach of pull-and-push measures. Every city needs its specific approach.

There is a pressing need for local urban bodies to accept the need and importance of a sustainable approach towards transportation of the city, and make infrastructure and provisions for an equitable promotion of all modes of travel. City officials need to create inclusive policies to incorporate social and economic mobility while making budgetary allocations.

## 9 References

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