

Sustainable Intra-City Mobility (A Case Study of Gurugram and Faridbad Districts)

Manoj Shukla

Associate Professor, Aggarwal College Ballabgarh, Faridabad, Haryana, India

Abstract- Individuals' ownership and riding on fossil fuel driven mode of transportation or in its modern avatar e- vehicles are obnoxious to environment and highly detrimental to seamless, reliable and eco-friendly Intra-city connectivity so necessary for sustaining efficiency and productivity of the systems and people across vital sectors of the city life. To address the twin challenges of faster and reliable modes of transportation with minimum carbon footprints, there is need for new plans and policies for people adopting sustainable mobility which shall give robust impetus to the smart city initiatives contributing to the enhanced productivity. Growing urbanisation necessitates the need for an efficient transportation system to citizenry who commutes every day to far of destination using various modes of transport depending on their income level and distance from the home. The article opines that mobility has to be sustainable so as to minimise various economic and social cost related to city transport. The present study is based on the field survey of three hundred randomised selected respondents in Faridabad and Gurugram districts to gauge the intentions for owing individual motorised transport. The paper highlights the need for collaboration and collective efforts by the urban local bodies, citizenry and the Civil society to adopt such policies and practices so that people prefer collective and eco-friendly modes of transport rather than individuals using personal vehicles.

Keywords: Ownership, Sustainable, Motorised, Collective

I INTRODUCTION

Initially adaption instead of mitigation should be the preferred policies for addressing the ills of cities' and towns' transportation in developing economies particularly in India as it comes with least dependency on finance and foreign technology which developed world responsible for global warming are not ready to share. Adaption refers to nudging and motivating people to bring about behavioural change and adopt collective eco-friendly mode of transport whereas mitigation refers to reducing carbon

emissions and carbon capturing using modern technology. Those who promoted fossil fuel driven two wheelers, three wheelers and four wheelers for seventy-five years now after the hue and cry over the environmental pollution want to replace fossil fuel driven with e –vehicles without considering our resources, infrastructure availability and needs. Increasing population and concomitantly urbanisation spur mobility of people for myriad socio-economic purposes round the clock. The towns and cities in India do not have much space to construct roads and by lanes within peripheries of towns for vehicles' movements. Families in urbanised India areas no longer shares vehicles rather within a family individual's ownership of vehicle is preferred which not only increase the number of vehicles' on the inadequate, unplanned and poorly constructed roads further exacerbating the parking problems in public space particularly in the neighbourhoods due to non avlability or less avlability of parking spaces. Those responsible for planning and polices for transportation in independent India could not visualize that neither technology nor income for import of fuel is available for individuals' relishing motorised transport at the huge social and economic cost to the society and further jeopardising the lives of future generation. The ownership of individual's motorised was promoted, facilitated with easy avlability without planning for roads, by lanes, parking spaces and utterly neglecting the spaces for pedestrian and cyclist the real green ambassadors. This wanton inculcation of unsustainability in the city life needs to be addressed in time with active involvement of the citizenry by convincing and nudging them for adopting sustainable mobility so as to reduce carbon emission so necessary to control global warming and making intra city mobility safer, faster and economical. There is need for readopting our traditional behaviour of walking and cycling for covering small distances and using collective mode of

transport for long distant travelling. The people choose personal modes of transport- cars, two –wheelers and those who do not own vehicles have to use auto-rickshaws and minibuses. Taking cue from the message from our scriptures “Prakriti Rakshati Rakshitah”(Nature protects if she is protected) Prime Minister Narendra Modi has given a new initiative LIFE(Life Style for Environment) wherein he emphasizes that community should priorities climate change adaption over mitigation. As two third of Greenhouse gas emission are attributed to household consumption and life style, the people on the planet have a responsibility to contribute through adopting green practices and adopting sustainable mobility should be the top priority.. The cultural and values in the European countries and even in Japan and China are such that populace particularly young no longer love and use cars for daily commutation. The local authorities adopt anti car policies so as to deter the car usage for short distance local mobility. There is need for building and nurturing a new cultural in the newly urbanised India where accessibility, affordably and reliability entice people to use city bus system and cycling to schools, local markets and workplaces is no longer ultra-din. In the light of the above discussion the present article discusses the following issues:

- 1 Socioeconomic factor enticing masses to own and use private vehicles
- 2 Need and ways for nudging masses to adopt sustainable mobility practices: Bus transport, cycling and walking.

II LITERATURE REVIEW

Road transport and highway minister Nitin Gadkari at the Global Business summit (March 2023) opined that roads and highways must not be in isolation but in sync with other parts of the mobility sector-rail. Air, mass urban transport, mass regional and suburban transport, waterways etc. The idea of mass public transport that is affordable, accessible and reliable is key to improving mobility that are less energy intensive and polluting (The Economic Times. 20 February2023). To reduce their transport ramification, it is necessary to encourage the public to change their behaviour in mode choice from private vehicle to public transportation (Ercan et al 2017). There are various factors which entice people to use individual vehicles for intra-city movement. The transportation system

factors play a key role in influencing public transportation usage because the choice to use public transportation laid on the grand comparison between public and private vehicle. (Sua et al 2002). Sustainable transportation requires green transport whether individual or collective. Bicycling, however, is a sustainable form of transport that does not pollute, poses very little risks to other road users, is healthy mode of transport and take up very little space, compare for example to car.(Koglin2013). Cities and particularly town in India are evolving without considering its impact on the mobility of goods and people culminating in chaos and logjams. Both local, regional and national policies are important to create good conditions for bicycle planning and cities like Copenhagen and Amsterdam do not only have a strong history of bicycle oriented city planning but also relatively strong natural support in shape of policies and planning(Ekblad 2016). The challenge is to nudge both young and elderly to use bicycling and walking for short distances and avoid motorised transport. For non-motorised transport (NMT), a typical thought process for choice of transportation can be broken in two three parts: Initial consideration, route consideration and destination related considerations (Krizek et al 2005). The car usage carries status, convenience and comforts but comes with irredeemable humongous social and economic cost to the society. European who are harbinger of the cultural of car usage are now nudging masses to deter the car and their mission have been quite successful. The civil societies are running anti car usage and ownership campaign and in America by 1997, 44% of the country’s 16 –year –olds had driving licenses but in 2020, the most recent year for which figures are available, the number has fallen to just 25% and youth say that “ Why in our society is our identity so tied to car use? ----young adults are proving resistant to the charms of owning a set of wheels and in Britain the proportion of teenagers able to drive has almost halved, from 41% to21%, in the past 20 years (The Economist February 18th , 2023).The collective mode of transport shall save energy and minimize traffic congestion. The economic and environment performance of cities can be enhanced by connecting resources to destination effectively and facilitating mass mobility (Bok and Kwon, 2016). The bus system is the most efficient collective mode of intra-city transport. Satisfaction level with bus service plays a

significant role to user and customers and passengers satisfaction towards bus services comprised several perspectives (Bakar, MFA et al 2022). There are cities in Europe and in China where people do love and use bicycles for commuting to the railway stations and bus stands. The bicycles have lost its sheen in India. The car centric development is only leading to construction of flyovers which disrupts cycling and the biggest problem is that there are no end-to- end cycle routes (TOI August,23,2022). Cycling and walking need to be a norm for short distance, That require scientifically designed interlinked footpaths and cycle lanes. City footpaths are like a nerve system and when these are interlinked people are encouraged to walk on them and this help reduce city’s carbon footprints (TOI March ,20 23)

III METHODOLOGY

Faridabad and Gurugram districts of Haryana having combined population of 43 lakhs chosen for this study are thriving hubs of industrial and commercial activities in the National Capital region-Delhi. Millions of people from neighbouring states and districts enter in these two districts during daytime using their own vehicles or three-wheelers pick them up from district border to take them to their respective work destination. It is exploratory, pure and longitudinal study. The data for the analysis has been retrieved from secondary sources like the previously published related woks in journals, articles and the newspapers. A field survey of three hundred randomised selected respondents owning and using motorised transport was conducted to know the sentiments and views of the citizenry in the twin districts. A structured questionnaire was given to respondents to know their opinions.

IV SUSTAINABLE MOBILITY

Three prerequisites for building, sustaining and leveraging hassle free intra-city mobility and at the same time addressing adverbial environmental concerns are City bus service, cycling and walking. Non availability of bus transport, footpaths and cycle lanes leads to increase in personal vehicles like cars, scooters, motorbikes, auto-rickshaws and a few use bicycles. The survey covers respondents who have opted for cars for local mobility. It is necessary to know those factors which either entice or compel

people to use car. Middle class families in India dream and have strong urge to own a car irrespective of its utility and capital loss over the period of time. The survey finding covering 300 respondents found wherein seventy four percent respondents shared that they bought a car as people in the neighbourhood, relatives and colleagues have already purchased cars confirms the working of demonstration effect given by Prof Duesenberry. Fuelling their desire to own cars is easy availability and affordability of bank credit with the fifteen to twenty percent margin requirement for car loans and they could afford a car on easy instalment of seven years. The survey findings show different motives for preferring car instead of bus transport for local mobility. Table 1 highlights the motives for car usage.

Table1-Motives for car usage

Motives	% of Commuters
Punctuality	54
Convenience	42
Comfort	64
Status	12
Official Perk	5
Avoiding Pollution	32
Flexibility	48
Non avlability of Bus Service	56

Source: Field Survey

A car is a fixed capital that need to be used in optimal way so as to get full return. Negative externalities due to car usage is very high that need to be measured and minimized. Per car emissions and space covered on the road is same whether car is being utilized at full capacity or at suboptimal level. Table 2 shows the car capacity Car Capacity Utilization

Table2-Car Capacity Utilization

Capacity	% Of Cars
Full Capacity	22
2-4 persons	43
1 person	35

Source: Field Survey

The choice of mode of transport for intra-city movements depends on the purpose which is to be fulfilled by the use. Table 3 shows the purposes for the car usage.

Table3-Purpose of Car Usage

Purpose	% of Cars
Commuting to workplace	34
Family obligations	12
Social Outing	14
Shopping	22
Business purpose	18

Source: Field Survey

The survey also reveals three reasons and motives for citizenry for using cars for intra-city mobility. The findings show that seventy-four percent of the respondents opined that they use cars due to non-availability of efficient bus transport, twelve percent of the respondents are very cautious and want to experience bus journey before taking a decision and fourteen percent of them are not willing to leave cars as others related to them use cars and they have high income to enjoy this status. The coverage by The Tribune (07 December 2019) on the city bus service shows that in Faridabad out of 160 buses included in the city bus fleet in 2011, only 35 are left and out of that 12 state buses are in operation and due to non-availability of an efficient local transport (bus service) has also led to unchecked growth of three-wheeler auto mafia in the city which are not only unsafe but a cause for traffic chaos on roads as well. However, the Gurugram Metropolitan City Bus Limited has been able to provide effective bus service using the fleet of two hundred buses but seeing the population size and the round-the-clock need of the citizenry, its inadequate and immense scope exists for innovation for convenience and comforts in the city bus systems.

V ROLES AND RESPONSIBILITIES OF MUNICIPAL CORPORATIONS

An efficient and green intra-city mobility is the sole responsibility of respective municipal corporations. A scientific need-based urban mobility system and policies shall go a long way in addressing both the environmental pollution and chaos and congestion on the city roads. The corporations should work on two prongs simultaneously: An Efficient Bus System and Anti-car usage campaign and policies.

Efficient Bus System

A bus can accommodate forty-two passengers for one trip whereas nine cars are required for the same journey. The cars after reaching their respective destinations shall remain stationary till evening whereas the bus shall be making round-the-clock trips and hence effective rate of return on capital invested. The CO₂ and SO₂ emissions by nine cars are much higher than one bus and not only that the harmful emissions during production and disposal of cars come with huge social costs. There is no better way to address climate change and high consternation of particulate matter in

the city air than to provide an alternate to the cars, two-wheelers and three-wheeler usage by the communities. An efficient bus system holds the key to socioeconomic ills of the city. The euphoria and charms of owning cars by the families in the newly urbanized India need to be discouraged. The increasing density of cars in the dense localities, public spaces and marketplaces is causing chaos, congestion and carbon emissions incessantly neutralizing comforts and convenience of owning a car. For seventy-five years, the policies in India particularly on city transport have been such that they promoted individual ownerships of vehicles and an efficient public transport was never on the agenda of urban planning. International car companies and oil-abundant countries have vested interest in prompting the car culture in developing economies and their efforts could reap huge dividends for them for a very long time. Seeing the hue and cry over the heavy pollutants due to fossil fuel burning, the same international lobby along with China also wish to replace the internal combustion engine with the hybrid or e-vehicles. In near future India may not be having the resources and technical knowledge to produce these cars on its own. Owning a motorised vehicle in the beginning two-wheelers and later on the car has been considered status symbol and sign of different class with high income.

Nudging people to use bus instead of cars, two-wheelers or auto-rickshaws require change in behaviour and values and this shift is possible only when the city bus system is efficient reflected in reliability, regularity, adequacy, availability, safety and convenience. Leaderships both at the social platforms and at the institutional level have to involve and inspire others to be apart of new culture of urban mobility where collective mode of transport shall be preferred. Incentives and concessions, monthly plans for fare should be provided to regular bus passengers. Celebrities, institutional leaders and govt officials should use city bus service to inspire and to make this attractive. Increasing the female work force in the city bus operations shall be highly motivating for female passengers. Pensioners, persons above seventy and students should be given high concessional tickets. An IT-enabled city bus information system shall make bus journey comfortable and convenient.

Anti-car usage campaign

The public institutions have no moral and legal right to carry out a campaign which may not be of common interest. That should not deter the municipal corporations from nudging masses through guidance and goad them to adopt eco-friendly modes of transport for wider socio-economic benefits. Bus commuters, pedestrians and cyclist need to be given percentile treatment over the car owners. Municipal Corporations should have special budgets and expert officials for footpaths and cycle lanes. The entry of cars in the main markets should be banned and only cyclist and pedestrians should be allowed. The car parking fee should be progressive, so that the fees increase with parking duration. The municipal authorities should issue tenders for cycle hiring companies in the city apps so that cycles are accessible to all. The public and market have should create cycle parking zones. The Car ownership in the municipality area should be at a cost and hence the municipality should impose cess on the car owners and included in the property tax of the building.

Cycling and Walking

Promoting and nurturing the cultural of cycling and walking should be essential part of anti-car usage initiatives. These two practices shall be highly beneficial to both the practitioners and the society at large. The study of transportation systems in the mature and developed countries show that provision, construction and maintenance of pathway and cycle lanes are an essential part of policies for urban mobility. The path to local markets, public offices, bus stops and metro stations should be such that people either walk or use cycles to cover short distance with full convenience and safety. The mushrooming of auto-rickshaws or e-rickshaws outside the public spaces of metropolises in India outnumbers the actual requirements culminating in chaos and frustration for commuters. Pedestrians and cyclist have never been recognised as important constituent of urban mobility. The survey finding shows the either the footpaths and cycles lanes were not constructed, or existing ones are not being maintained or encroached by the street vendors. People shall love cycling and walking if adequate facilities are available for local short distance mobility.

VI.CONCLUSION

The combined use of cycles, walking, bus transport and metro rail shall be highly effective and efficient in addressing the infirmities, inefficiency and friction in the intra-city mobility with minimum carbon footprints culminating in peaceful, progressive and harmonious communities. Nudging rather than legislation is the right approach. The fulfilment of promise by municipal authorities for providing an efferent bus system and cycle lanes shall entice people to prefer bus and bicycles. The onus is on the civil societies and institutions to awake, inspire and involve teen-agers and youths in the mission of walking, cycling and enjoying bus ride and also motivate others to be a part of this collective endeavour for global cause through addressing local concerns.

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