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RE-IMAGINING URBAN STREETS WITH WELL-INTEGRATED CYCLING NETWORK IN AURANGABAD

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ABSTRACT

Rapid growth in urbanization increased urban population. The growing urban population places a significant burden on civic infrastructure and service like sanitation, water, sewage, housing, electricity and public transport. Large share of road is used by vehicular traffic which leads to increase in carbon footprints, road accidents, traffic congestion, pollution, etc. To overcome all such problems, we need to push ourselves towards clean, healthier and more efficient mode of transport. The use of bicycle is being gradually promoted by urban designers and planners. In order to increase the bicycle share and to provide safer, faster and more direct routes, a bicycle infrastructure is proposed for urban areas in a city of Aurangabad. The study identifies the potential of increase in bicycle use and will resolve traffic problems, reduces emissions and increase accessibility. Integrating cycling into everyday life provides a promising approach to improve urban streets and create liveable integrated communities, increase physical activity promotion and social interaction. **Key Words:** Urban Streets, cycle use, bicycle infrastructure.

1.0 INTRODUCTION -

Global world is changing due to urbanisation. According to United Nation forecasts, more than 70% of population will live in cities by 2050 (UNPD 2006). The present proportion of

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the people living in urban areas is 1:2, i.e., one of two persons live in the cities. Migration is a major reason as 75% of global economic production is done in cities by World Bank study.

India is one of the fast developing countries. Census of India 2011 data reveals that 377 million Indians live in urban areas; the number further expected will be 600 million by 2030 (HPEC Report 2011). This indirectly brings tremendous pressure on the urban infrastructural services such as water, drainage, electrical, road, housing, etc. To cater to the population, the current public transport is insufficient. Hence, people started using their own vehicles which increased the ownership of vehicles. Indirectly the public transport suffered as people who could not afford vehicles started using bicycles or adopted walking, to reach their destinations. The number of private motorised vehicle increased rapidly which resulted into air pollution, accidents and wastage of time in traffic congestion which disturbs city environment and social balance. Many cities in the world are proposing NMT (Non-Motorised Transport) today. Providing safe and easily accessible NMT facilities as an alternative means of transport will develop a greater number of sustainable and liveable cities and well integration of transport and land use at city level. Non-Motorised Transport is a sustainable mode of transport which includes walking, cycling, cycle rickshaws and other forms of mobility. These types of modes are cost effective and have many benefits such as less energy consumption, low carbon footprint and are not dependent on fossil fuel.

National Urban Transport Policy of India, 2006 clearly lists out the role of NMT as a last mile connector for the urban transport systems and as an independent mode for short distances (NUTP 2006). The share of NMT in early 1980 in Indian cities was 40 to 60% which recently is declining because of motorization. Even the bicycle ownership has also declined in India from 46% in Census 2001 to 41.90% in Census 2011.

Jan Gehl in one of his books, 'Cities for People' has quoted that "the city is for the people and not for cars". He successfully promoted cycling in Copenhagen. Through research, Gehl found that what people want and what creates life in the city is social interaction. There are two types of interaction – Direct and Indirect – in which direct is verbal and indirect is non-verbal communication. Hamilton-Baillie (2004) juxtaposes these two design logics as traffic zone for car space, which is the domain of traffic engineers and social zone for sidewalk space which is the domain of urban designers.

Marathwada Region is one of the 5 divisions of Maharashtra State. Aurangabad is the administrative headquarters of Aurangabad district and is the largest city in the Marathwada region (Aurangabad, Wikipedia). Consisting of the population of 11.75 lakhs, according to the 2011 Indian Census, Aurangabad is the fourth most populous urban area in Maharashtra. Aurangabad is one of the major tourist cities and industrial cities in Maharashtra. It has a vast history of heritage; it is also known as the 'City of Gates' on account of the presence of many historic gates in the city. In 2019, Aurangabad Industrial City (AURIC) became the first

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Greenfield industrial smart city under the Smart Cities Mission. Aurangabad Municipal Corporation (AMC) and the Aurangabad Smart City Development Corporation Limited (ASCDCL) are also planning to develop cycle tracks in the city under the Smart Cities initiative and coining it the phrase "Cycles4Change".

In this case of urban design, to achieve an excellent road infrastructure, we must invest into making 'Complete Streets.' A Complete Street is multi-modal which means the street section consists of all users of the street, i.e. pedestrians, cyclists, public transit and motorists. Thus, the goal is to integrate pedestrians, cyclists, transit users, and scooters, without increasing traffic conflict.

2.0 NEED OF THE RESEARCH -

Bicycle is a sustainable low-carbon transport mode. However, insufficient or unplanned infrastructure leads to decrease in the share of bicycle in many Indian two tier cities. In order to increase the bicycle share and to provide safer, faster and more direct routes, a development of bicycle infrastructure is proposed in Aurangabad under smart city mission. Physically segregated high-quality bicycle lanes will attract non cyclist and tourist also. New bicycle infrastructure is identified all over city. Constructing new cycling routes, with pause space, green space, will reduce the carbon emission as well as carbon footprint in turn we will get safe and healthier environment.

3.0 LITERATURE REVIEW –

3.0 Literature Reviews – Reviews of books, journal articles, research papers, magazines,

Etc.

a. Urban Streets – What are the variables for an efficient urban tissue to be well-integrated within the neighbourhood to neighbourhood?

Promotion of cycling as an efficient mode of transportation

Unity in any urban fabric of a city is determined on the form of the layout adopted and its connectivity and consistency within itself. That means the emphasis is on the streets as they carry the movement between places and are the main interface for social interaction as well. As Jane Jacobs states, "If the city's streets look interesting, the city looks interesting and if they look dull, then the city looks dull."

Thus, for an active transportation, these streets need to be self-regulating. A city street not dominated by the motorcar but one where movement is largely by public transport, or on



foot, or by bicycle, opens up a whole new prospect for the design of public space. ¹And with the ever increasing environmental issues there needs to be a possible modal change.

If the bicycle infrastructure in a city is working effectively, it encourages more people to use the cycle. The countries like the Netherlands, Denmark and Germany are one of the leading countries in making cycling safe and to promote the use of it.

The main reason for it is that the Government has increased the cost of cars and car spaces. Also there are policies implemented further increasing the taxes and other restrictions with the use of cars. This, thus, makes the citizens turn to the other modes of transport, especially the public mode of transport. The Government then has made better connectivity and enhancing cycle accessibility. The better the public transport, the more people shift from private vehicles to public transport and non-motorised vehicles.

When it comes to cycling, the safety part of it comes at the foremost of the setup. Due to the increase in traffic and traffic congestion, the important determinant for an increase in cycling as a mode of transport is safety concern. Consistency and continuity of bike lanes makes it easier to move through these cities as continuous bicycle tracks are effectively for a better cycling experience. When bicycle infrastructure is infused with pedestrian infrastructure, it enhances the usability of both.

Urban designers have started showing keen interest in the development of pedestrian-oriented street networks since faster modes of transport like cars and bikes have put a tremendous pressure on the streets with the ever increasing traffic congestion, air pollution by CO_2 emissions and general lack of safety on the roads. We as urban designers have to understand that cyclists or bicycle users have needs that differ from pedestrians, motorists or transit users. They stand as a complete different category as they cannot be included in the pedestrian category as a faster pedestrian or in the motorist category as a vehicular user. Thus, it is necessary to acknowledge their perception and role as cyclists when it comes to them being a distinctive category of a street user.

3.1 AIM -

To understand the character of Indian urban streets for people and bicycle infrastructure.

3.2 OBJECTIVES -

- a. To develop cycling infrastructure that integrates in the urban fabric of the city.
- b. To create a toolkit that enhances the street section with the insertion of bicycle infrastructure.

¹ Moughtin, C. (2003). Urban Design – Street and Square, Architectural Press, Elsevier Science, Third Edition. AR. DAKSHA SHROFF TUSHAR PAITHANKAR TUSHAR PAITHANKAR 4P a g e

3.3 RESEARCH QUESTIONS -

- a. What is the potential of bicycle infrastructure in a Tier II city of Aurangabad?
- b. What implications will the urban fabric of the city go through so as to insert a cycling network?

3.4 SCOPE –

This research will focus on the urban streets walking and cycling network in urban fabric of Aurangabad city.

3.5 LIMITATION –

This research will be limited to the proposed infrastructure for people along urban street and the installation of cycle tracks in the city of Aurangabad.

4.0 RESEARCH METHODOLOGY

The research is both a qualitative and quantitative research concerned with and verifiable by study, observation and experience from the study area of the city of Aurangabad.

The data collected is based on primary and secondary data collection. Primary data will be collected based on observations and analysis of the current cycle use in the urban context. Secondary data by studying Indian and Foreign case studies, literature reviews and observations, findings and analysis respectively.

This approach to collecting data will enable a holistic understanding of the potential of bicycle network and infrastructure as a mode of transport in a tier-two city of Aurangabad.

The research methodology contains the following parts -

4.1 Understanding the context.

- a. Aurangabad Smart City Mission (ASCDCL) to develop to 17km cycle tracks in the city.
 - Identifying the 5 roads selected for the implementation.

4.2 Case Studies

a. Study different types of bicycle tracks projects in Indian and Foreign Cities.

4.3 Comparative Analysis of the Case Studies

4.4 Findings and Inferences

4.1 UNDERSTANDING THE CONTEXT - STUDY AREA -

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Aurangabad Municipal Corporation (AMC) has cleared a 17km cycle track as a part of the Cycles4Change initiative under the Smart Cities Mission projects. To develop a pollution-free environment and encourage the trend of bicycle riding in the city, the Aurangabad Smart City Development Corporation Limited (ASCDCL) will be developing the cycle tracks under Phase I in the city (Lokmat, Oct 2020).

Live sites under Smart City Proposal -

Five roads are identified for cycling track –

- 1. Cidco Bus Stand to Harsool T Point. 4.9km
- 2. Harsool T- Point to Delhi Gate. 2.3km
- 3. Delhi Gate to Bibi ka Maqbara. 3.4km
- 4. Taj Hotel to Central Naka passing through Seven Hills. 7.3km
- 5. Railway Station to Airport passing through Kranti Chowk. 10.4km

The project looks for better connectivity within the city with eco-friendly dedicated cycle track.



Figure 1 Five roads

It is not just the question about laying down physical demarcations or separations in the urban tissue that counts as successful implementation. Improvements like these need due thinking and detailed planning beforehand. The cycling infrastructure should be planned in connection with the municipal master plan and local plans.

4.2 CASE STUDIES –



For this research work, 2 cities (Pune and Copenhagen) are selected which have implemented bicycle infrastructure partly or completely in their road systems. The bicycle infrastructures in these cities are studied based on the parameters such as its significance, scale of the project implemented, people it caters and social importance in today's context.

Along with the use of these systems, these urban public spaces provide a range of people's activities as well as a range of urban design components and physical features.

4.2.1 Jangli Maharaj Road and Fergusson College Road, Pune

Jangli Maharaj (JM) Road and Fergusson College (FC) Road are important arterial roads in Pune. These roads run north-south and connect the Shivajinagar and Ganeshkhind areas to the Deccan Gymkhana and old city areas. The area has a number of educational, commercial and recreational establishments making these two roads one of the busiest in the city.



Figure 2 Jangli Maharaj Road Source: Oasis Designs Inc.



Figure 3 Fergusson College Road Source: Oasis Designs Inc.

Before

In February 2009, a one-way plan was proposed on these roads and was implemented after a few months. Inadequate development of public transport infrastructure in the city had resulted in rapid increase in the number of private vehicles and overall traffic congestion. This resulted in a number of traffic jams which in turn made way for the one-way scheme to improve the condition. But there was still a concern that this strategy would create even more problems for all kinds of road users except motorists. The more space given to private vehicles the more their number would increase on the street.

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Figure 4 Jangli Maharaj Road Before 1 Source: Oasis Designs Inc.

NEGLECTED FOOTPATHS



Figure 5 Jangli Maharaj Road Before 2

Source: Oasis Designs Inc.



Figure 6 Jangli Maharaj Road Before 3 Source: Oasis Designs Inc.



Figure 7 Fergusson Road Before 1 Source: Oasis Designs Inc.

Findings and Analysis - Observations, Issues, Concerns and the Effects

a. Pedestrians -

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- i. Since the roads were made one-way, the dividers were demolished to make way for more vehicles to pass unobstructed through the carriageway. This resulted in continuous traffic flow at very higher speeds.
- ii. The removal of dividers in the middle of the road endangered pedestrians further since it removed the pedestrian refuge islands that earlier existed on the roads. At crossings or intersections, it was of very little use.

b. Cyclists -

- i. Cycle tracks were provisioned but were never included into the street section.
- ii. Therefore, there was no distinctive space for cyclists and hence, they either had to travel with the motorists or not use cycles at all.
- iii. This increased the lack of safety and thus cyclists deemed the scheme undesirable to commute.
- c. Bus Users
 - i. One-way traffic scheme increased the distance between two bus stops. Hence, the bus commuters or any public transport users had to walk long distances to get to the next bus stop.
 - ii. The old bus stops present when the roads were two-way became redundant on the opposite side of one-way traffic, thus obstructing the pedestrian movement.
- d. Motorists
 - i. The speeds of the vehicles began to increase causing more fatalities on the roads.
 - ii. Even of the traffic police imposed the speed limit to 30km/hr, this was seldom followed.
 - iii. The ever increasing use of private vehicles caused even more traffic congestion than solve the existing one as predicted.

After

Under the Pune Streetscape Programme (PSP), complete reclamation of the streets was carried out by Ar.Prasanna Desai Architects, Pune. With the one-way scheme still going on, the streets have been reclaimed with space along the roads and repositioned them as destination public spaces. The roads were designed to create cycle track and wide pedestrian plaza spaces to allow people to walk around safely. Each street was being treated as a public open space to integrate with all the public land uses adjoining the street be it a park, religious plaza, destination places, landmark buildings, heritage objects, retail shops, etc. to create a cohesive, all-inclusive connected public realm for the city. (Oasis Designs. Inc.) Pune is now the first city to have a Comprehensive Bicycle Plan that was approved by the City's Municipal Council in 2017.

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Figure 8 Jangli Maharaj Road After 1 Source: Oasis Designs Inc.



Figure 9 Jangli Maharaj Road After 2



Figure 10 Jangli Mahraj Road After Source: Oasis Designs Inc.

Source: Oasis Designs Inc.



Figure 11 Fergusson Road After

Issues,

Findings and Analysis – Observations, Concerns and the Effects

- a. Pedestrians
 - i. Increased widths of footpaths along with various activities encouraging social interaction, facilitated the feeling of safety and comfort for the pedestrians.
 - ii. These pathways and sidewalks are thus, adequate in catering to the future needs of the people using them.
- b. Cyclists
 - i. Dedicated bike lanes and infrastructure facilitated the use of more bicycles and thus led to a positive attitude towards the use of cycles.
 - ii. Large portions of 'unbuilt' reclaimed into available space for streetscape.
- c. Bus Users
 - i. Bus Stops and Bus lanes efficiently created that do not obstruct the flow of traffic as well not hamper the pedestrian or the cycle track space.
 - ii. Safe refuge stops for bus commuters not in the way of the carriageway.
- d. Motorists
 - i. Sufficient parking for incoming vehicles provided.
 - ii. Clearly defined road edges and signages for road safety, and facilitate smooth flow of vehicular traffic.

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Figure 12 Street Section Source: Oasis Designs Inc.

4.2.2 Copenhagen

Cycling is an important means of transportation in Denmark. When the City of Copenhagen introduced its Cycle Policy 2002-12, it had already introduced priority cycle lanes and green cycle routes (Cycling infrastructure in Copenhagen, Centre for Public Impact). Cycle planning is now a vital feature of urban development in Copenhagen.

In the 21st century city plans dealing specifically with cycling include -

- The Copenhagen Cycle Policy (2002-2012).
- The Copenhagen Transport and Environment Plan 2004.
- Copenhagen Bicycle Strategy (2011-2025).
- The Copenhagen Cycle Priority Plan (2006-2016).

(Urban Sustainability Exchange – Cycling in Copenhagen)

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Source: Cyclists & Cycling Around the World – Creating Liveable and Bikeable Cities

The main principle for Copenhagen cycling infrastructure is that they have established cycle tracks on both sides of all major roads. This means that cyclists have been allotted their own dedicated space next to the footpaths and pavements. Cars are also parked on the outside of the cycle tracks.

The very first cycle track in Copenhagen was established in 1905.² Bicycle infrastructure in Copenhagen currently includes approximately 350 kilometres of curb segregated cycle tracks, 23 kilometres of on-street cycle lanes and 43 kilometres of off-street green bicycle routes running through parks and other green areas.



Figure 14 Traditional Copenhagen Cycle Track

Source: Cyclists & Cycling Around the World – Creating Liveable and Bikeable Cities



Figure 15 Cycle Lane

Source: Cyclists & Cycling Around the World – Creating Liveable and Bikeable Cities

² Jensen, N. (2013). *Planning a Cycling Infrastructure, Cyclists & Cyclists around the World*, Creating Liveable and Bikeable Cities

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Findings and Analysis

The bicycle infrastructure has been integrated into the city's public transport network which has also facilitated mixed-mode commuting.



Chart 1 Copenhagen Cycle Infrastructure

Table .	1	Impacts	of	Bicycle	Infrastructure	on t	he	city
		1		~	5			~

	Urban Fabric	Public	Economy	Utility
	Dense urban proximities, short	Bicycle traffic has risen to 45% in	The cityhasestimatedthat	Many companies operate cycle
	distances and flat	2014, as compared	every kilometre	rickshaws/ Velotaxi
⊠our	eterraine relonglic Withho	t@pyehicular traffic	cycled brings a net	s in the city.
UR	an integrated cycle	which has risen to	gain for society of	
СT	infrastructure –	18%.	1.22 DKK.	
RU	Bicycle-friendly			
STI	city.			
RA	Compact city	150,000 people	Bicycle Rental	Mail and
NFI	planning.	cycle to work or	Shops -	newspapers
EII		educational	The tourism sector	delivered majorly
CLI		institutions every	is also regarded to	on bicycles –
X		day. (City of	both receive and	Bicycle
BIC		Copenhagen's	provide additional	Messengers.
)F]		Bicycle Strategy	economic benefits	
S C		2011-2015).	to the city.	
CT		Bicycle is the most		
PA		popular transport		
IM		in the city.		
	DAVCILA CUDOFE	TUCHAD DATTIAN		

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Figure 16 Cycle Tracks at Crossings 1 Source: Cyclists & Cycling Around the World – Creating Liveable and Bikeable Cities



Figure 17 Cycle Tracks at Crossings 2 Source: Cyclists & Cycling Around the World – Creating Liveable and Bikeable Cities

With the advent of the use of cycles in Copenhagen, the Government and other officials have successfully incorporated the cycling infrastructure into the city's planning. The upgradation and maintenance has led to the expansion of the cycling infrastructure into the most sought after and chosen mode of transport for the citizens.

5.0 COMPARATIVE ANALYSIS -

Table 2 Comparative Analysis of Case Studies

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E C Boad and IM Boad	Fratian City
F.C. Koad and J.M. Koad	Entre City
% OF CYCLISTS	% OF CYCLISTS
Only 18% of the people use cycle	There are 675.000 bicycles and just
tracks in the city. The cycle culture has	120,000 cars in Copenhagen, meaning
begun to take effect in the city and needs to expand extensively.	bikes outnumber cars by more than five-to-one.
Jangli Maharaj (JM) Road – 1.87 Km.	Entire City
Pergusson College Road – 2.4 Km.	Approximately 350 kilometres of curb segregated cycle tracks, 23 kilometres of on-street cycle lanes and 43 kilometres of off-street green bicycle routes running through parks and other green areas.
	F.C. Road and J.M. Road % OF CYCLISTS 18% Only 18% of the people use cycle tracks in the city. The cycle culture has begun to take effect in the city and needs to expand extensively. Jangli Maharaj (JM) Road – 1.87 Km. Fergusson College Road – CAT, 1000 - 54 december 2000

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• The new development has caused • Dense urban proximities, sh U increase in footfall with the distances and flat terrain along w
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5.1 FINDINGS AND INFERENCES -

From the above case studies, integration of pedestrians, cyclists, transit users and motorists in a balanced manner without increasing any traffic conflict is essential for a successful facilitation of transport planning. Even though bicycles have existed for a long time, it took until 1970s for transportation authorities to inculcate and embrace cycling infrastructure as part of the comprehensive road strategy.

Multi-Utility Zone –

The concept of Multi-Utility Zone seems to have been successfully implemented in these cities. All the elements on the street are organised in a dedicated space which results in obstruction-free streets.

Verge	Greens and Pavements (with parking)	Greens and Pavements (without parking)
Width	3M wide footpath.	3M wide footpath.
	2.5M wide cycle track.	2.5M wide cycle track.
	MUZ parking at intervals.	

Table 3 Multi-Utility Zone

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To plan out the streets having different lanes for vehicles and pedestrian lanes, they should have proper connectivity. It is not enough to reorganise roads and add a bike lane, rather an overall network needs to be planned. The manner in which a public road network is designed can have a significant impact not just on the people using it but also on the image of the city's urban fabric.



Figure 18 Street Network o Aurangabad City Source: OpenstreetMap



Figure 19 & 20 Aerial View of Aurangabad City Source: Aurangabad Drone View (Google)

Aurangabad being a medieval city has a dense urban fabric. Jalna Road divides the city into two parts, i.e., the Old City Core and the New City. The old city has narrow roads and high densities as compared to the new city. The many historical monuments and buildings scattered all over the city and on the outskirts of the city enhance the architectural character of Aurangabad city. In the late 90s, it was also regarded as Asia's fastest developing city.



Chart 3 Flow Chart explaining the concept of People-oriented structure

Walking and Cycling being the main modes of NMT, are generally ignored and not given due consideration in the street section. The needs of these users are not considered and often ignored. A developing city like Aurangabad has poor quality infrastructure for NMT. AR. DAKSHA SHROFF TUSHAR PAITHANKAR TUSHAR PAITHANKAR 17P a g e



Dedicated corridors are largely absent, and where they exist, they are often at high risks of being encroached upon for commercial purposes or used for the widening of motorised carriageways.³ Although it is agreeable that what has been implemented in one place may not necessarily work here or elsewhere. Thus, instead of implementing the network as a whole, an incremental or piecemeal approach as a mobility plan can be taken into action. Active transportation will only then occur when emphasis is made on the smooth movement between places by any mode of transport.

Even a Tier II city of Aurangabad, priority to transport infrastructure that may help in decongesting the city should be effectively given, or else migration from these type of small towns to Tier I cities may cause them to suffer from inadequateness of infrastructure. While different kinds of infrastructure are required to facilitate efficient running of the urban areas, it is largely the transportation sector that makes or mars quality of life of city dwellers.⁴



Figure 21 Jalna Road, Aurangabad Source: Google



Figure 22 Kranti Chowk FlyOver, Aurangabad Source: Google

Instead of road widening or building flyovers which means adding to the already existing congestion, following the National Urban Transport Policy (NUTP) of minimizing use of personal motorised vehicles can be one of the first steps to decongestion on the streets. There is rapid urbanisation happening all over the world and Aurangabad is no exception to the effect. The right approach is to provide for an improved public transport and NMT mobility.

In the old core of the city, with the dense fabric of narrow roads and high density, traffic congestion arises as the roads are not able to move a large number of vehicles during the major part of the day. Furthermore, lack of proper pedestrian facilities and bus lanes cause an additional chaos as all the users merge into one carriageway. Vehicular parking obstructs the movement as well. But these compact urban blocks with high density are suitable for the implementation of the NMT as they provide the ideal distances for walking and bicycling. The argument then remains of how can the excess traffic be minimized so as to improve the existing mobility conditions of the old city.

³ Singh, K. (Oct 2018). *Mobility & NMT in Sustainable Urban Development – Role of City Developers*, Eleventh Regional EST Forum in Asia (Mongolia).

⁴ Badami, S. (Jan 2012). *Inherent competitive advantage Tier 2 and Tier 3 cities possess*, MoneyLife, CITIZENS' ISSUES.

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Figure 23 Traffic Chaos - No organization or dedicated lanes. - Aurangabad Source: Google



Figure 24 Motorists taking up the majority of the road. - Aurangabad Source: Google

The town of Aurangabad was strategically planned on the principles of a military camp. Fort walls and monumental gates were constructed at various locations throughout the city. One of the things that make Aurangabad stand out from several other medieval cities in India, was its '52 Gates', each of which had a local history or had individuals linked with it, thus Aurangabad is known as the 'City of Gates' (Gates in Aurangabad, Wikipedia). Out of the 52, only 4 main and 9 subordinate gates have survived. Each of these gates are at an average distance of 2.5km from each other. These heritage sites also intermingle, i.e., fall on the proposed routes for the cycle infrastructure in the city.



Figure 25 Historical Gates in Aurangabad Source: Author

Table 4 SWOT Analysis of Aurangabad for Cycle Infrastructure

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ST	RENGTHS	W	EAKNESSES
•	Strong industrial base – 4 MIDC areas – Waluj, Chikalthana, Shendra and Railway Station. IT Parks and Special Economic Zones	•	Urban mobility heavily dependent on private vehicles, giving significant rise to chaos on urban roads. Lack of pedestrian infrastructure and
•	(SEZ) creating huge employment opportunities. Gateway to UNESCO Heritage Sites and forms a part of 'Mega Tourism Circuit'.	•	public transport. Uncontrolled and unplanned development of the urban sprawl.
O	PPORTUNITIES	TH	IREATS
•	The Nagpur-Aurangabad-Mumbai super corridor project under implementation will boost regional connectivity and economic development. Implementation of better public transport will improve urban mobility.	• •	Maintenance and upgradation of the developing infrastructure. Might increase the probability of migration to other developed urban areas.

Source: Aurangabad Smart City Plan (Round 2)

To have self-regulating streets will also decide where our urban mobility is headed. Since cycling has a close to zero environmental impact and provides cost mobility, the following table shows an assessment of the condition of cycle as a mode of transport in the city of Aurangabad and relevant recommendations are provided to cater to the issues and concerns for improving and executing an effective cycle-inclusive planning.

 Table 5 Assessment of the condition of cycle as a mode of transport

 OWNERSHIP OF DECKCHES

OWNERSHIP OF BICYCLES					
PROBLEM	Affordability issue for low income households. Finance for purchase of cycles is not available. – Decline in ownership of cycles.				

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RECOMMENDATION	 Government schemes with exemption of taxes on the purchase of cycles to the low income groups. Increase ownership of cycles by school children – easy access to bicycles and promotion of sustainable mode if transport as well as cost effective. 	
USE OF BICYCLES		
PROBLEM	Lack of safety, lack of innovative cycle schemes, bike culture – use of cycles limited – seen as only a poor man's mode of transport – Decline in the use of bicycles.	
RECOMMENDATION	 Promotion of cycle infrastructure – cycle tracks on all arterial and sub-arterial roads along with a safe interface with the motorists. Ensure that road design and city mobility networks include cycle tracks as a key element. 	
FUNDING AND POLICIES		
PROBLEM	Policies and Schemes implemented, yet cycle infrastructure not given due recognition into the urban planning. Inadequate funding from the	

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	Government.	
RECOMMENDATION	 Make NMT a mandatory requirement – through schemes like JNNURM, NUTP Policy, ensure provision of cycle infrastructure imperative. Urban Transport related projects – NMT costs included into the overall costs of the projects. 	
AWARENESS CAMPAIGN	SAND PROMOTIONS	
PROBLEM	Cycle is still seen as a low income group mode of transport. Bike culture limited to certain percentage of the population.	
RECOMMENDATION	 Mass Awareness Campaigns can be held by State Governments explaining the benefits of cycling – health and welfare, environmental, social and economic. Change of modal choice. 	

Source: TERI

6.0 CONCLUSION

This study will help us to design bicycle track and pedestrization for any tier two cities in India. Study will help us to understand the people and urban fabric of the city. After studying these points success rate of any project will be maximum.

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