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Analysis of Sensible and User Friendly Smart Cities in India

Subtheme- Goal 4 Quality Education

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Abstract:

City is a place for people to live, learn, practice, enjoy, work, rest, and many more activities of their daily lives. The city's capacity to promote its citizens' wellbeing is what is meant by being "smart." Government of India has started Smart City Mission on 25 June, 2015. The main objective of the Mission is to promote cities that provide core infrastructure, clean and sustainable environment and give a decent quality of life to their citizens through the application of 'smart solutions' (Source : <https://smartcities.gov.in/about-the-mission>)

Initially 100 cities were selected for this mission, Bhopal being one of them in Tier 2 city had designed its future smart city with Redevelopment projects as well Infrastructure development with user friendly transportation.

It has been 7 years for the Smart city mission, and hereby the Smart City of Bhopal is now questionable for its policies. To cross check the promises it was compared with a normal city in united kingdom with its daily transportation routine. And with some globally known cities for their transportation innovations. Data retrieved on how passengers were actually using public transportation, Barcelona, for instance, developed a new intelligent bus network. With the help of this new, more effective network, 95% of citizens now have access to high-quality bus service.

To enhance emergency medical services, the city also employs GPS sensors. Ambulances are detected by traffic lights, which then alter their output to allow emergency services to move through the city as rapidly as possible without endangering anyone.

This paper exhibits the case study of a true universally accessible smart city. A smart city has no established, widely used concept or collection of terms. There are numerous initiatives underway to create thorough key performance indicators for smart cities. An inter-agency United Nations team is creating a set of key performance indicators with the intention of creating a worldwide index for smart, sustainable cities.

Guidelines and laws for the smart policies were compared for the futuristic perspectives. Human centric approach and building bye laws were analysed for the practical applications. Infrastructure planning, the concept of a system approach to installation, operation and management was compared with primary survey and on site verification. Maintaining legacy infrastructure systems in wealthy nations is frequently difficult since doing so would be expensive, take up too much room, or other factors. In these nations, smart city apps might put more of an emphasis on supporting the best use of already-existing infrastructure resources and keeping an eye on how well those legacy resources are performing. However, the main goal of smart infrastructure applications should be to address society's requirements for sustainable development in both developing and developed country situations.

The implementation of smart infrastructure concepts, especially in developing countries, faces numerous challenges. This section discusses some of these challenges and the role STI communities can play in overcoming them, including some policy instruments driven by STI that could help to address each challenge

Here is a common observation as a citizen from a daily life in a developed country of Glasgow city, Scotland UK. Policy guidelines and infrastructure development which should promote the Sustainable development Goal 11.7 where public spaces and other basic amenities are user friendly.

The case study involves the application of SDG 11.7 in tier 2 cities of India with the available resources.

Examples of Bhopal, Indore and other tier 2 cities to demonstrate the user friendly open spaces designed for Old age and physically handicapped people.

Finally concluding and proposing the approach for 30 smart cities in India to revise the proposals of infrastructure, transport and other public spaces for fulfilment of the SDG 11.7.

KEY WORDS: Smart Innovation, User Friendly access, Policy Guidelines, Sensors

1 Introduction:

Smart infrastructure adoption presents a number of difficulties, particularly in poor nations. This section covers some of these issues and the part developing communities can play in resolving them, as well as possible Human centric driven policy tools that could help with each issue.

Yet, by putting together many smart buildings together, we cannot call a city smart on itself. A smart city has three layers of work in which innovation and new business models play an important role: its technology base, powered by massive communication networks; specific applications, the ones that translate raw data into insights and action items using technology; and lastly, its usage amongst the city, public and companies. If the three find a well-balanced implementation and a massive adoption amongst the city's component, a Smart City is on the rise.

It mentions that North and South TT Nagar are being developed as part of Bhopal's ABD project. The Land Monetization Policy shall be applicable to all transactions involving the sale, lease, or licence of any land or other immovable property located within the 342 acres of the ABD Area. The project involves the densification of government quarters, displacement of approximately 1000 informal commercial establishments, approximately 400 slum units, few religious structures and private residential housing. ABD area is predominantly occupied by approximately 3100 government houses. Hence Land Monetisation Policy also includes the rehabilitation and resettlement (R&R) strategy for the project displaced people.

Smart City in developed Country : **The city's capacity to promote its citizens' wellbeing is what is meant by being "smart."**

City is a place for people to live, learn, practice, enjoy, work, rest, and many more activities of their daily lives.

Here is a common Observation as a citizen from a daily life in a developed country of Glasgow city, Scotland UK. When we need to call ourselves as Smart we need to learn the concept of smart city in a real sense.

Yet, by putting together many smart buildings together, we cannot call a city smart on itself. A smart city has three layers of work in which innovation and new business models play an important role: its technology base, powered by massive communication networks; specific applications, the ones that translate raw data into insights and action items using technology; and lastly, its usage amongst the city, public and companies. If the three find a well-balanced implementation and a massive adoption amongst the city's component, a Smart City is on the rise.

The importance of Smart Cities

Essentially, Smart Cities have the potential to enhance the urban quality of life

Examples of Smart Cities in the world

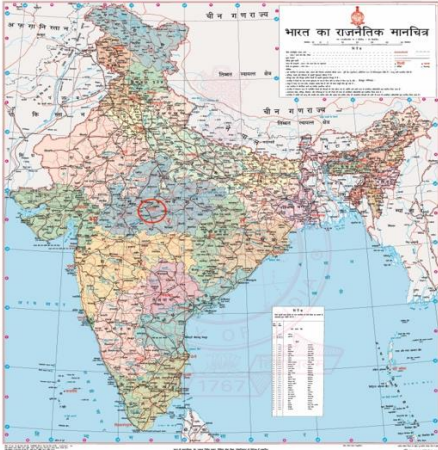
1. Dubai: Highly High-tech with sensor based movements, pedestrian movement given higher priority and strict traffic rules.
2. Boston: User friendly, Electric and fuel saving traffic movement with priority to zero carbon initiation.
3. London : Currently, London is focusing on important issues like energy management, transportation, and healthcare.
4. Oslo : Oslo qualifies as both. More than 650,000 LED lights in this metropolis are all wired to processing stations. Based on the situation, these lights can intelligently change the quantity of lighting.

5. Toronto: They intend to create a tech-focused community by turning a waterfront area into a habitable location from scratch.
6. Tokyo : A substantial percentage of Tokyo's smart city policies are focused on energy efficiency. The city is attempting to put technology into place that will assist the city become more effective and environmentally friendly.
7. Barcelona: Barcelona, for instance, developed a new intelligent bus network. With the help of this new, more effective network, 95% of citizens now have access to high-quality bus service.

New governing paradigms are required for smart cities. The management of smart cities need a strike and balance between top-down and bottom-up governance strategies. One the one hand, top-down execution methods and strong top-level leadership is needed to compile the data produced by smart sensors placed in various smart infrastructures and make policy decisions, particularly during emergencies. It's crucial to maintain a healthy balance between these two strategies. City governments can better utilise the synergy between various parties by striking this equilibrium (such as universities, the private sector, civil society and local and municipal governments). Paper discuss the prime governance and infrastructure planning, policy, management and implementation process of both cities.

2 Study Area Bhopal (India) and Glasgow (Scotland UK)

Proposed Smart Innovations in Smart City of Bhopal consist of 342 acre redevelopment land proposed to be developed with smart innovations and following amenities.

Bhopal India	Glasgow United Kingdom
 FIGURE 1 – MAP OF BHOPAL	 FIGURE -2 MAP OF GLASGOW
1. The Policy Framework of Bhopal 2. Chartered Bike system 3. Smart Parking 4. Smart Road 5. Smart Street 6. Intelligent Transport Management System – 7. Bhopal Plus – is a smart city app 8. Mayor Express – is a ‘dynamic workplace 9. Intelligent Transport System : 10. Intelligent Transport System (PIS/PAS/Real time monitoring) Project description All 225 buses equipped with GPS based Automatic Vehicle Location System (AVLS) connected with Central Control and Command Centre. 11. Real time tracking and monitoring of Bus Operations. (Source : https://www.freepressjournal.in/bhopal/proposed-smart-city-to-have-all-modern-amenities-says-bhopal-municipal-corporation-commissioner-chhavi-bhardwaj)	The Policy Framework sets out core policies and actions under the following headings, which tell the ‘story’ of what we need to do to achieve our sustainable transport future in the city. 1. Reducing the need to travel and in particular, reducing the need to travel by car 2. Applying the sustainable travel hierarchy meaningfully in our decision-making 3. Encouraging more journeys on foot, by cycles and creating quality places which support this 4. Supporting more people in the city and the region to travel by public transport by creating a world class, integrated system 5. Developing more affordable sustainable transport choices with integrated ways to pay • Creating a barrier-free transport system that supports those with disabilities or who have additional mobility needs • Creating a step change in personal security and safety 6. A fair and equitable transport system • Creating a transport system that supports Glasgow’s strong

	and inclusive economy • The movement of goods • A smart and digital city (Source : https://www.glasgow.gov.uk/CHttpHandler.ashx?id=56454&p=0)
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2.1 Research area:

Smart innovation's and strategies for a developing nation as compared to the policies adopted by the developed nations with a overview of human centric approach combined with Human computer interaction for the benefits of the public and easily accessible transport system.

The special focus is on the differently abled people and commute of elder generation with the help of smart infrastructure and smart planning.

As of now India has proposed 100 smart cities with a goal to achieve Pan India development and special area development.

The purpose of the Smart Cities Mission is to drive economic growth and improve the quality of life of people by enabling local area development and harnessing technology, especially technology that leads to Smart outcomes. One of the major aim is to make sure India is able to deal with huge influx of people.

Core Infrastructure would include: adequate water supply, assured electricity supply, sanitation including solid waste management, efficient urban mobility and public transport, affordable housing, especially for the poor, robust IT connectivity and digitalization, good governance, health, education, etc.

2.2 Smart transport and mobility: Case Study

A user-friendly transport system is a combination of intelligence, low carbon energy, and adaptable services.

Smart Mobility •Facilitates commuters choice of efficient and integrated multimodal transport, promote nonmechanized transport for short trips and maximize use of pubic transport •Alleviate traffic congestion problems through effective planning

TABLE 1 ANALYSIS

SN	Bhopal Smart City Mobility Plan	Developed Countries Smart City Planning :
1	- ATVM for Tickets and Smart Card recharge - Flap barriers / gates for Commuter entry and exit	User friendly roads and transportation.
2	Different types of Smart Cards for types of Commuters	Roads to comply easy wheelchair and luggage movement
3	All buses are equipped with GPS based Automatic Vehicle Location System (AVLS) connected with Central Control and Command Center for real time monitoring of bus operations. •	User Friendly Bus and Public transport. GPS and Emergency Alarm enabled for Physically disabled.
4	“Spot My Bus” service for citizens powered by Chalo app	Bicycle Track with enabled Traffic regulation



FIGURE 3 : SMART CITY GOALS , BHOPAL

3 Smart City Goals in Developed Countries with respect to 11.7 SDG.

	3.1 Glasgow Smart City	3.2 Bhopal Smart City
1	User friendly roads and transportation.  FIGURE 4  FIGURE 6	Roads to comply easy wheelchair and luggage movement  FIGURE 5  FIGURE 7
2	User friendly bus as per policy	Wheelchair and Pram movement accessible in bus ,Bhopal bus



FIGURE 8



FIGURE 9

Handrails for the old and weak , for women having kids in one hand etc.

- 3 No honking only signals. Stop button in each seat to make driver aware you want to get down at next stop.



FIGURE 10

- Passengers have to Shout to stop the Bus. Many Times this



FIGURE 11

Online ticket in bus itself and Wheel chair and modifiable furniture in bus.

Bhopal Smart Buses do not have Any provision for Wheel chair movement and accommodation.

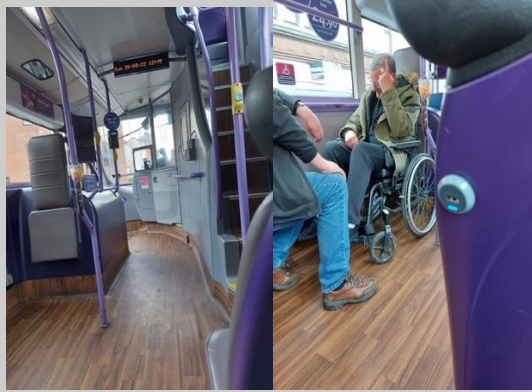


FIGURE 12

5 Ticket counter at entrance of bus to buy ticket.



FIGURE 13

User friendly wheelchairs/ electronic chairs.



FIGURE 14

6 Strict Traffic rules for vehicles, cycles and pedestrians.



FIGURE 15

Traffic lights with minimum instructions and mostly they are not working



FIGURE 16

7 Trains with wheel chair movement



FIGURE 17

Trains in Bhopal have no such provision for Wheel chair or any such physically handicap equipment.



FIGURE18



FIGURE 19

8 No BRTS, Only dedicated bus lane.



FIGURE 20

Dedicated BRTS lane but the proportion of Passengers in public transport is very less than private vehicles.



FIGURE 21

9 No dedicated bus lane only a separate lane



FIGURE 22

Dedicated bus lane but road width for remaining traffic is less.



FIGURE 23

4 Conclusion:

It is vital to adapt and improve the entire transportation system in light of global trends including climate change, urbanisation, urban sprawl, security concerns, unfavourable demographics (ageing), open markets, and the digitalization of the operational environment.

It is crucial to respond to early signals calling for change since the system has a lot of inertia. Some people have imagined a society based on hydrogen in the future. The decision-makers must have knowledge while making future projections and road maps. Early on in the race, placing a wager on the incorrect horse could prove to be a costly error. It is now difficult to predict which automotive technology will dominate in the future: will it be the electric battery car, the fuel cell car, or some other technology?

Transportation networks are changing quickly and frequently. The transportation system of today is very different from what it was just a few decades ago. The paradigm is also about to change. Instead of being viewed as a value in and of itself, transportation is now viewed as a facilitator for logistics and human movement. Although this paradigm change presents difficulties, it also offers tremendous opportunities for society and business. These possibilities open up new markets for brand-new services and technologies that various stakeholders (including the public and private sectors, consumers of transportation, etc.) should explore from their individual points of view.

Bhopal smart city developed policies with user friendly approach but inspite of smart mission and smart applications the daily public transport is still a difficult task. Many old age people are avoiding to travel not only in public transport but also in private vehicles as the whole set of infrastructure is not as per the differently abled people.

Energy use for Solar Power is successful in some area. Also solar panels on poles need som innovations to work in rainy season and also in cloudy times.

The only strategy for success is collaboration! Therefore, a paradigm change toward seeing traffic as a service and mobility as an enabler is about to occur. Additionally, the public sector, research organisations, and industry must participate in this. The world's first ITS plan was released by Finland's Ministry of Transport and Communication in 2009, and it was revised in 2013.

Bhopal needs to focus on Mobility that prioritises the needs of the customer and higher service standards; promoting the adoption of new transportation legislation; and achieving the objectives of the Smart City Mission of Government of India on Transport

Information, knowledge, and intelligence from both specialists and users are used to build on the methodical, ongoing work to evolve and adapt the transportation system. The public and private sectors work together on activities such as development, operation, and governance. One of the flagship Smart Approach programmes that should be adjusted to the ever-changing globe is TransSMART, which stands for Smart Mobility Integrated with Low-carbon Energy.

Infrastructure Planning is a combination of multiple disciplines and its major application is for policy making and integrated planning. Energy, land use, transportation and building technologies are highly interdependent and fruitful results could only be obtained if a holistic plan is being made and in that case Infrastructure planning comes into play. Its studies are combination of planning, engineering, sociology and economics. Usually engineers, architects and urban planners can take these courses.

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