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SMART MOBILITY

Revolutionizing Urban Transport for a Sustainable and Resilient Growth through Innovative Technology

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INTRODUCTION

Introduction

India's Ascendancy:
A Nation on the Move

1.4 Billion Population of India

3rd Largest Economy by 2030

14% of Total Carbon Emission

Carbon Emission doubled by 2050
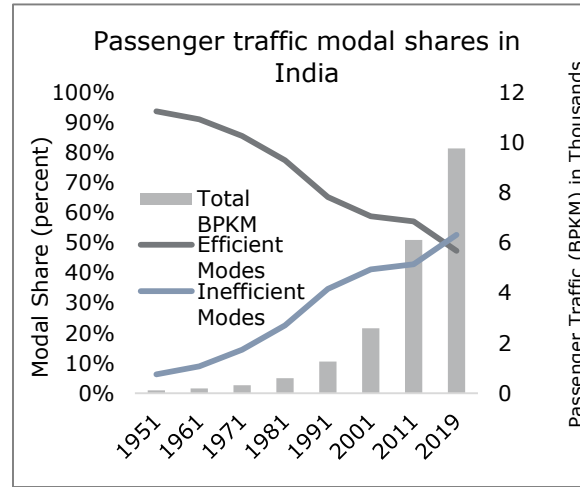
India's Target to Net Zero by 2070

This **dynamic growth** is reshaping the **nation's economic landscape** and also driving a **surge in mobility demand,** as millions seek greater opportunities and a better quality of life.

The Mobility Dilemma: *Declining mode share of Public Transport*

Increase in private vehicles, financial strains on public transport, and fragmented urban planning, have resulted in decline of public Transportation.

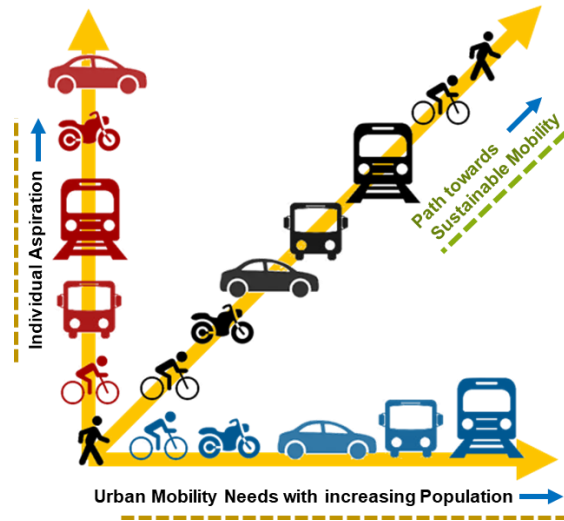**What solutions can reduce transportation's negative impacts and enhance the appeal of sustainable modes?**

Passenger traffic modal shares in India

The Mobility Dilemma: *Individual Desires vs. Urban Necessity*

Balancing personal vehicle ownership with a shift towards mass transit is essential to meet individual aspirations while ensuring efficient use of urban space and resources.

How can we harmonize individual aspirations with the collective necessity for efficient and sustainable public transport?

Individual Aspiration

Path towards Sustainable Mobility

Urban Mobility Needs with increasing Population

Negative Externalities

Air Pollution

Increase Congestion and Travel Time

448 kg CO_2

271 kg CO_2

transport-sector carbon emissions will nearly double

CHALLENGES
Advancing towards Sustainable Urban Mobility

Increased preference for personal vehicles

Depleting revenues of public transport modes

Rising operating costs, and inadequate and inconsistent funding
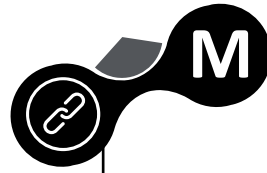
Inefficient planning

Smart Mobility: The Catalyst for Urban Transformation

Developing **five key components of smart mobility** is essential for creating a **resilient, efficient, and user-friendly transport system** to ensure a **sustainable urban future in India.**

S — Sustainable

Sustainability can be achieved through smart mobility by integrating **efficient, connected, and eco-friendly transportation** solutions that **reduce emissions, energy consumption, and traffic congestion.**

M — Multimodal and seamless

With smart services, all modes of transport from **first mile, middle mile and last mile can be available on a single platform**. Users can plan the journeys in advance and **book tickets** on a **digital platform** which reduces the waiting time and enables a seamless experience.
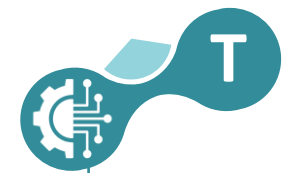
A — AI Enabled

The availability of **big data and AI models** to process this data to execute decisions for **mobility services** have the capacity to enable smart solutions **to identify patterns, predict mobility demand hotspots** and help the users and service providers to **plan operations well in time.**

R — Resilient & Safe

Resilient and safe cities can be ensured through smart mobility solutions by **integrating real-time data, adaptive infrastructure,** and **advanced technologies** to optimize traffic flow, enhance safety, and reduce environmental impact.

T — Technology transition

Smart technologies can influence the users to uptake sustainable and newer mobility solutions even if they have a higher cost of acquisition as the **tech can significantly improve the user experience.**

"SMART" MOBILITY

" SMART " MOBILITY

SUSTAINABILITY

1

Financial Sustainability: Refers to the ability of a city to generate surplus revenues to sustain its expenses.

2

Operational Sustainability: Refers to the capacity of a city to maximize service efficiencies.

3

Environmental Sustainability: Refers to the city's alignment to Net-Zero targets.

Role & Enhancing of Smart Solutions

Adoption of EV including battery electric vehicles and plug in hybrid electric vehicles.

Mobility-as-a-Service (MaaS) integrating various services on a single platform for seamlessness.

For **safety and efficiency,** vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication technology.

MULTIMODAL & SEAMLESS

1

Service Integration Streamlining Services to bring all modes of public transport under on platform.

2

Physical Integration: Integration of hardware device infrastructure on a single platform

3

Fare Integration: Standardization of fare across all modes of transport

Role & Enhancing of Smart Solutions

Enhances using unified digital platforms and offering real time data for the user and provider.

Smart Technologies including Vehicle-to-Everything, Blockchain Internet of Things **facilitate fare and service integration.**

Government improves the infrastructure and creates **eco-friendly, and energy-efficient** public transit fleets

AI ENABLED

1

Reactive: Deploy data to identify data trends, without the casual analysis behind the trends.

2

Predictive: explores the impact of multiple measures on the data trends.

3

Prescriptive: Analyze the data to identify critical trends, understand their causes, and propose solutions.

Role & Enhancing of Smart Solutions

AI-powered predictive maintenance can identify potential issues early, ensuring **reliable public transit**.

AI helps policymakers assess the effectiveness of current policies and **predict the impact of proposed policies.**

Strengthening the cyber security measures, so that the data processed by AI can be used in the public domain.

" SMART " MOBILITY

RESILIENT AND SAFE

1

Adaptable:
Increasing the adaptability of advanced solutions

2

Secure:
Increasing capabilities of security measures for data and citizens

3

Future Proof: Making cities ready for advanced technologies and challenges

Role & Enhancing of Smart Solutions

Conduct Comprehensive Flood and Climate Risk Assessments

Implement **sensors and cameras** for proactive measures like **mobile flood gates and early warning systems**

Equip emergency teams with smart mobility systems for efficient city-wide monitoring and resource deployment.

TECHNOLOGY TRANSITION

1

Disruptive
Changing the old operational methods and bringing better solutions to solve problems.

2

Adaptive: Enhancing capabilities without altering the base case.

3

Empowering: Increasing capacities of existing systems to deliver better and faster results.

Role & Enhancing of Smart Solutions

Alternative fuels are **eco-friendly and economical**. They also offer better **storage**.

Creation of Infrastructure for the renewable sources and EV Charging stations is crucial for modernizing transport services.

Programs involving private sector partnership for funding, skill development, and manufacturing, a transition to advanced mobility.
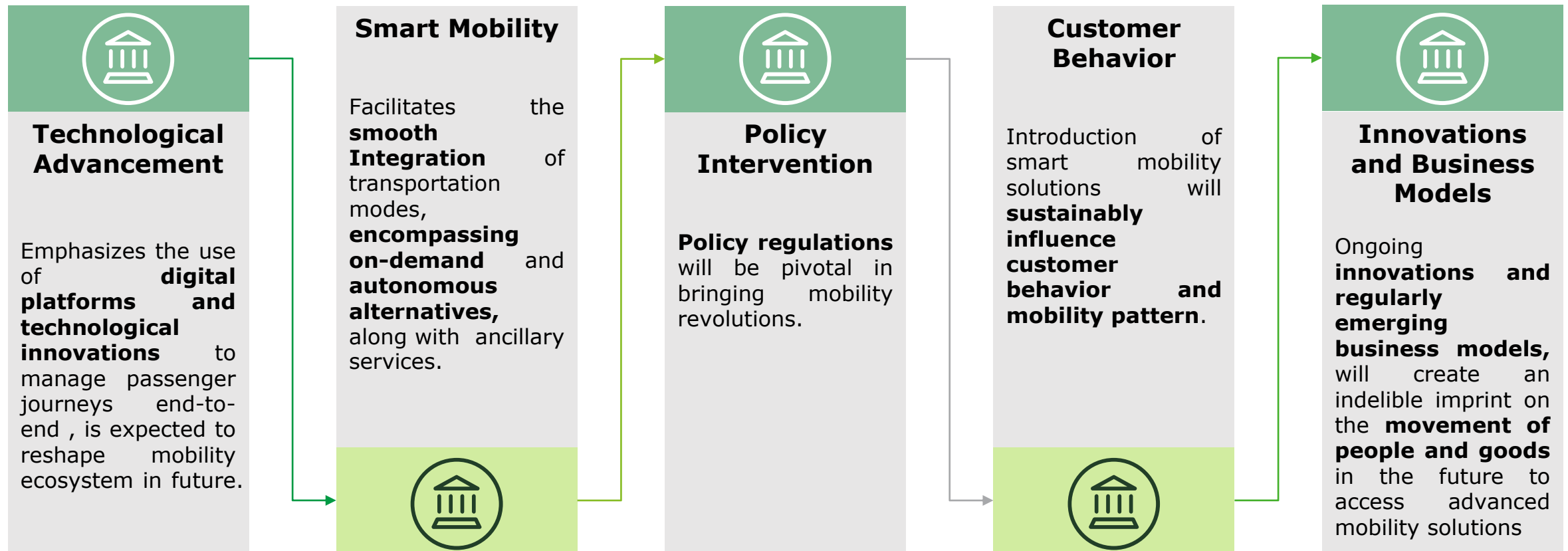
"SMART"
Mobility

Transforming the Mobility,

Fostering a seamless, resilient, safe, and inclusive transportation ecosystem.

8

CONCLUSION

Conclusion

Technological Advancement

Emphasizes the use of **digital platforms and technological innovations** to manage passenger journeys end-to-end , is expected to reshape mobility ecosystem in future.

Smart Mobility

Facilitates the **smooth Integration** of transportation modes, **encompassing on-demand** and **autonomous alternatives,** along with ancillary services.

Policy Intervention

Policy regulations will be pivotal in bringing mobility revolutions.

Customer Behavior

Introduction of smart mobility solutions will **sustainably influence customer behavior and mobility pattern**.

Innovations and Business Models

Ongoing **innovations and regularly emerging business models,** will create an indelible imprint on the **movement of people and goods** in the future to access advanced mobility solutions

" **By integrating advanced technologies with transport infrastructure, smart mobility can bridge the gap between service providers and end-users, creating a seamless, accessible, and inclusive transport ecosystem that enhances sustainability and safety across all transportation modes.**

THANK YOU

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