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Government of India

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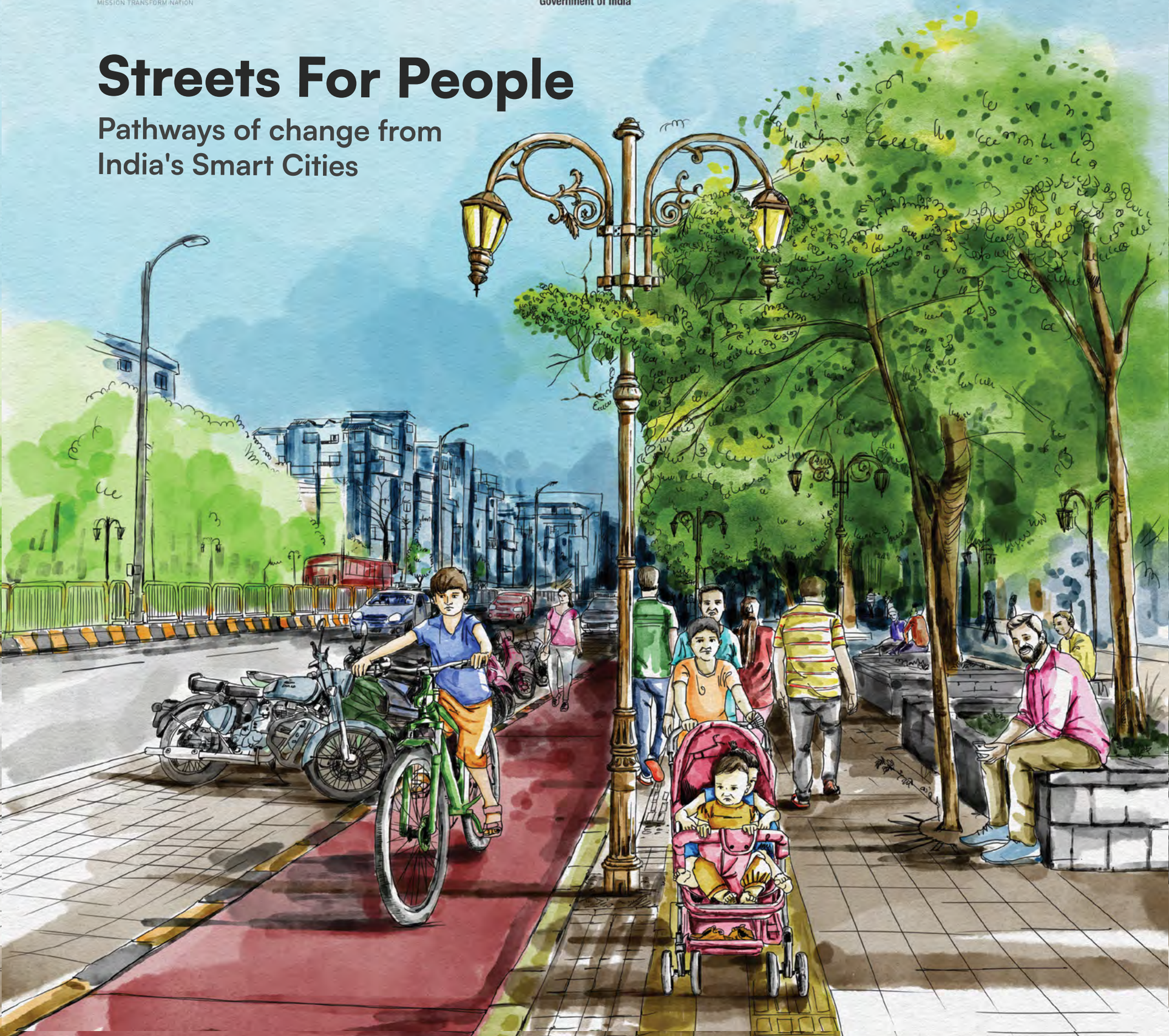
Streets For People

Pathways of change from India's Smart Cities



SMART CITIES MISSION, MINISTRY OF HOUSING AND URBAN AFFAIRS, GOVERNMENT OF INDIA

Streets For People:
Pathways of change from India's Smart Cities

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Please note, all project case studies are provided by partners and cities do not take the onus of ensuring every claim as true.

Streets For People

Pathways of change from India's Smart Cities

हरदीप एस पुरी
HARDEEP S PURI

आवासन और शहरी कार्य मंत्री
पेट्रोलियम एवं प्राकृतिक गैस मंत्री
भारत सरकार
Minister of
Housing and Urban Affairs; and
Petroleum and Natural Gas
Government of India

Message

I am happy to note that the Smart Cities Mission is releasing the compendium **Streets For People: Pathways of change from India's Smart Cities** to document and disseminate learnings from 50 streetscape projects in India.

Creating vibrant urban spaces has been a key focus area of the Smart Cities Mission. Through various projects and policy guidance, the mission has supported cities in creating sustainable and vibrant urban spaces that enhance the quality of life for the citizens. In recent years, the mission has been working towards developing safe walking and cycling infrastructure, and implementing policies and guidelines for creating healthy and comprehensive streets. These efforts have culminated in the transformation of streetscapes into people-centric environments through initiatives such as 'Streets4People' and the 'India Cycles4Change' Challenge.

This publication showcases inspiring case studies of street transformation projects from various corners of our country. I commend the creativity displayed by our city officials, urban designers, and all our partners who have contributed towards the transformation of our streets. These projects are not just about enhancing aesthetics, they represent a holistic approach to urban revitalisation, encompassing accessibility, sustainability, and community engagement.

I am confident that this compendium will be well received and shall serve as a blueprint for future projects of urban street transformation. It has the potential to inspire us all to take bold steps towards building thriving and inclusive cities.

(Hardeep S Puri)

New Delhi
03 January 2024

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Foreword

Manoj Joshi
Secretary, Ministry of Housing and Urban Affairs

Public spaces give the city its character. The Smart Cities Mission has been a torchbearer in creating vibrant and liveable public spaces that resonate with both sustainability and aesthetics, ultimately enriching the lives of their citizens. India is at an interesting inflexion point. Our urban population today may double over the next 2 and a half decades thanks to the rapid urbanization we are witnessing.

This publication, replete with captivating case studies of street transformation initiatives spanning the breadth of our diverse nation, stands as a testament to our collective resolve towards this much-needed endeavor. Within these pages, you will embark on a journey through inspiring projects that breathe new life into our urban landscapes. I extend my heartfelt appreciation to the cities that have showcased their remarkable achievements. Your dedication, innovation, and unwavering determination is truly inspiring. I urge you to continue your efforts and serve as beacons of change for others.

To those cities that are on a similar transformative journey, I encourage you to persevere. The road to transformation is challenging, but the rewards are immeasurable. Learn from the experiences shared here and adapt them to your unique contexts. As you delve into these case studies, let them ignite your passion and inspire you to create better more sustainable urban spaces.

Foreword

Kunal Kumar
Joint Secretary and Mission Director, Smart Cities Mission, Ministry of Housing and Urban Affairs

I jokingly use the phrase 'burden of smartness' to underwrite the fact that the tag of being 'smart' cannot be earned easily. 'Being smart' is equated to 'being perfect', which is quite simply impossible to achieve, let alone achieve in a window of 5 to 10 years. Nevertheless, it is the combined force of many such local aspirations that acts as the Mission's fuel. Cities are but, their people. And by putting the hopes and aspirations of their citizens at the core of their work, smart cities may run the risk of being criticized due to the potential achievement-aspiration gap but would never run the risk of being irrelevant and unresponsive. For the ability to adapt to the ever-changing needs of its citizenry is the true measure of 'smartness' of a city.

Streets are the canvas upon which our cities paint their character, and the evolution of India's streets has been entwined with the accelerating pace of urbanization. Embracing collaborative action becomes imperative to navigate this transformative journey.

This first of its kind document, a reservoir of practical wisdom derived from successful initiatives, serves as a compass guiding us toward streets designed for resilience. By adopting these insights and fostering partnerships, we lay the foundation for cities that echo with vibrancy, sustainability, and a spirit of collective progress.

I urge all Indian cities to engage with the project partners and cities featured in this compendium. By exchanging ideas and translating them into action, cities can forge their paths toward a sustainable future. Best wishes!

Messages from the Knowledge Partner and Experts

Messages from Knowledge Partner

Heather Thompson

Chief Executive Officer, Institute for Transportation and Development Policy (ITDP)

Creating cities that can enable a shift to low-carbon mobility modes like walking and cycling will be crucial to meeting India's ambitious commitments for climate action. I'm thrilled to witness the transformative impact of the Smart Cities Mission, which has initiated an impressive transformation in this direction in over 100 cities across the country.

This compendium is a testament to the remarkable strides made by Indian cities in embracing a new paradigm of urban development to redefine urban living by creating walkable neighborhoods, cycling-friendly streets, and vibrant spaces. As a repository of collective knowledge and innovation, this compendium can serve as a comprehensive resource for policymakers, urban practitioners, and enthusiasts, and accelerate this shift towards creating people-centric cities.

I commend the dedication and commitment of these cities, and look forward to the next phase of their journey as they scale up these efforts towards a sustainable future for all Indian cities.

Aswathy Dilip

Managing Director, ITDP India

Our streets hold the key to unlocking vibrant and sustainable cities. It's imperative to recognize the critical role that collaborative action plays in transforming them. As a repository of invaluable experiences of successful initiatives, the compendium can guide us towards a future where functional, resilient, and beautiful streets are the norm in Indian cities.
By embracing these insights, fostering partnerships, and investing in capacity-building, we can transform our paradigm of urban development and create more liveable cities across the country.

I am grateful to everyone whose work has made this publication possible—city officials, design consultants, and other stakeholders who have been pioneers in showing us that a better way forward is not just desirable, but achievable.

Finally, my heartfelt thanks to the team from Smart Cities Mission and ITDP for co-anchoring this effort and putting together this document. I am sure this is only the beginning, and I look forward to working with more Indian cities as they embark on their journeys of street transformation.

Messages from Experts

Niki Shah

Director of Urban Design, HCPDPM, Ahmedabad

The evolving need for city infrastructure upgrades highlights the pivotal role of street transformation in urban functionality. The Smart Cities Mission has showcased scalable street transformation projects, serving as valuable case studies for emerging cities. This compendium encapsulates successes and pitfalls, offering a crucial learning resource. Its comprehensive data empowers authorities to propel this agenda. Design experts can leverage this reference to refine approaches, fostering a shared learning culture and minimizing urban development errors. Such documents, portraying the tangible impact of missions, should be crafted across Smart Cities subjects.

Ar. Prasanna Desai

Practising Architect & Urban Designer, Professor & Director PVP College of Architecture, Pune

Streets, often overlooked as mere conduits for vehicles, conceal untapped potential as bustling public domains in Indian cities. Neglecting pedestrians, cyclists, hawkers, and social interactions has relegated these vital spaces. Development endeavors must prioritize pedestrian safety, enhancing life quality, and tackling local traffic issues. Over the past decades, inclusive street designs, orchestrated by Architects, Urban Designers, and Planners as 'Doctors of the City,' hinge not on colossal investments but on understanding user behavior and fostering civic engagement. These initiatives birth success stories, transforming streets into vibrant community spaces, enriching citizens' lives without expanding the street footprint, thereby nurturing walkable, socially inclusive cities. This compendium narrates the success stories of street projects that has created pathways of change in cities of India.

Vikas Thakar

MD, Pavetech Consultants India

Cultivating vibrant urban streets and spaces demands a fusion of innovation, sustainability, and community-centric design. As one of the pioneering engineers involved in execution of Street works in India under the Smart Cities Mission, I've dedicated myself to shaping streets that breathe life into cities, fostering connectivity, safety, and offer durable street infrastructure to the general public. This compendium stands as a testament to our collective commitment to redefining India's streetscapes, paving the way for dynamic, people-centric and sustainable urban street environment.

Ankit Bhargava

Co-founder, Sensing Local

Despite the diversity among our cities, the issues we face today share remarkable similarities. This underscores the immense value of the Streetscape compendium. It equips government bodies, civic organisations, design offices, planners, and citizens with the means to envision change. By allowing us to compare our ideas with similar initiatives elsewhere, understand the challenges and their resolutions, it will foster collaboration and help us collectively build upon each other's efforts.

Sujata & Akash Hingorani

Principals, Oasis Designs Inc

Streets are the most frequented public realm in our cities, streets define imageability and can influence perceptions, street-designs can showcase climate-action and serve the message to a wider audience. Creating shaded and ambient microclimates and low-impact stormwater management facilities should become not an exception but a rule for our city streets. This compendium captures the initial steps taken by cities across India towards holistic street transformations. All cities should strive towards scaling up the work through climate-sensitive designs.

Nithya Ramesh

Director - Urban Design, Jana Urban Space Foundation

The urban road is perhaps the one piece of infrastructure that affects all of us visibly and viscerally regardless of age, gender or economic background. Yet it remains a pain point in the movement of people, goods and utilities and poses several dangers during monsoons. For the last decade and a half many of us have championed for a more equitable design and division of the road, for robust and sustainable construction, for storm water management and pedestrian safety. This compendium brings much of it together, and instead of just listing out the challenges, gives all practitioners real life examples of how to solve the problems and scale up across different cities. Looking forward to seeing more and more remarkable streets across our country.

Anuj Malhotra

General Manager - Planning and Urban Development Srinagar Smart City Limited

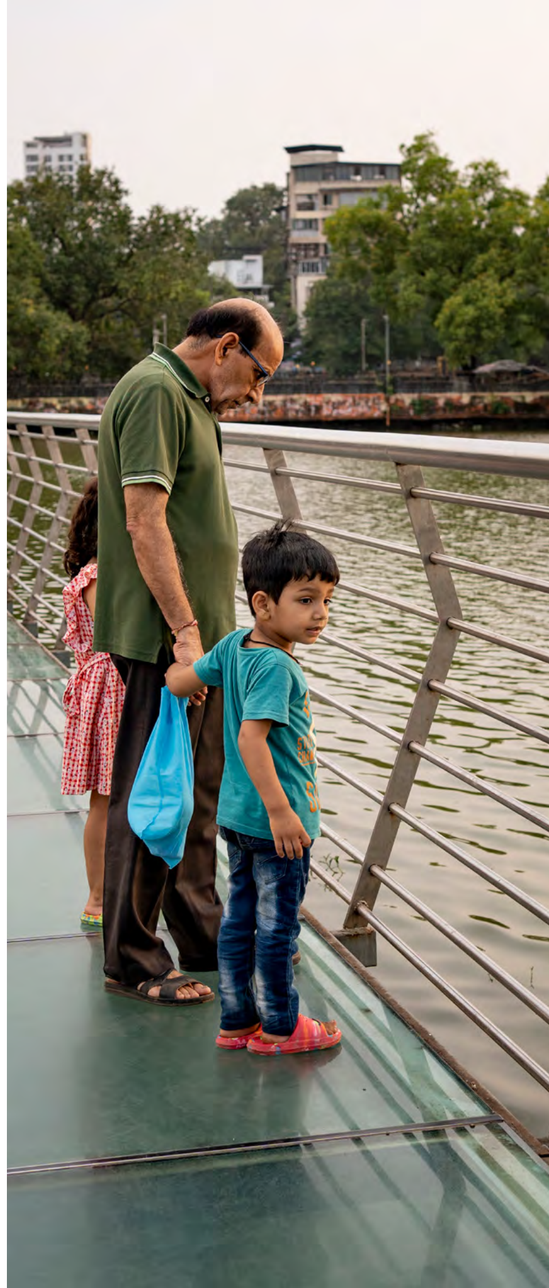
In Indian cities, streets reign as the most utilized yet neglected public areas, reduced to mere conduits for vehicles. Pedestrians, cyclists, and hawkers lack their space and social interactions are almost negligible. The developmental projects in cities should revolve around pedestrian safety, elevating life quality, and reducing air pollution. This compendium showcases unique narratives of rejuvenated streets which now are vibrant community spaces that enrich people's lives and promote walkability. It's a great demonstration of how cities can champion social inclusivity and safety for its people.

Dr Sanskriti Menon

Senior Programme Director Centre for Environment Education

The featured street design projects give hope that India can make the right choice for sustainable mobility, enabling walking, cycling, and access to public transport where possible. They showcase the transformation possible in Indian cities with political will, government agencies, design professionals and the public coming together. The best design street design processes are not only the physical design that results. These are opportunities to listen to each other, share, reflect on what we really value, and foster the change towards safer, nurturing, more humane cities.

Contents



Acknowledgements

The Ministry of Housing and Urban Affairs is the apex authority of Government of India to formulate policies, coordinate the activities of various central ministries, state governments, and other nodal authorities, and monitor programmes related to issues of housing and urban affairs in the country.

The Smart Cities Mission was launched by the Ministry in 2015 to promote sustainable and inclusive cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions.

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The Institute for Transportation and Development Policy (ITDP) is a global non-for-profit organisation that works with cities worldwide to promote transport solutions that reduce traffic congestion, air pollution, and greenhouse emissions while improving urban liveability and economic opportunity. ITDP is represented in India by ITDP Pvt Ltd and works with governments, multilateral agencies, and civil society to make visible, on-the-ground improvements by providing technical expertise, policy solutions, research publications, and training programmes.

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Contributors
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We would also like to extend our sincere gratitude to the organisations - Oasis Designs Inc., Prasanna Desai Architects, Jana Urban Space Foundation and StudioPOD for sharing the project journey stories with us.

January 2024

About the compendium

Over the last eight years, the Smart Cities Mission has significantly impacted the quality of life in more than 100 cities through its streetscape and public space transformation projects. Many cities across the country have initiated their street transformation journeys by executing pilots of people-centric Healthy Streets. However, these examples have not been documented adequately and their impact—qualitative and quantitative—is yet to be determined.

This compendium by the Smart Cities Mission and the Institute for Transportation and Development Policy (ITDP) is an attempt to celebrate the collective efforts of these cities by compiling case studies of street transformation projects from cities across the country—their design processes, challenges, impacts, and learnings.

It aims to provide an extensive database of best-practice examples that decision-makers, city engineers, urban practitioners, academicians, and local citizen champions can use to advocate for nationwide scale-up.

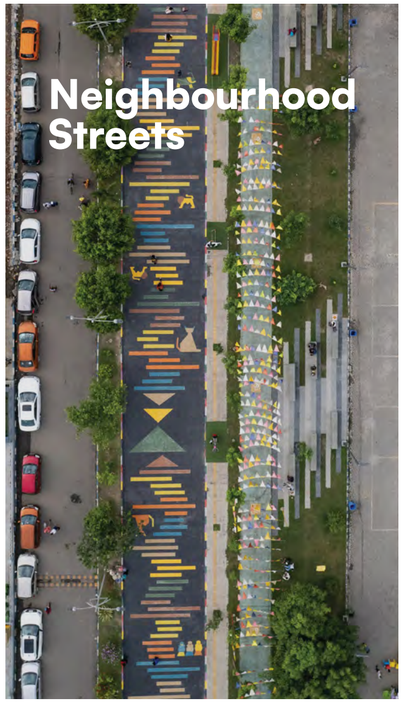
The compendium includes 50 streetscape projects, including

- **15 detailed case studies** that capture the street design and implementation process, challenges, impacts, and learnings from the planning, design and execution of these projects.
- **35 overview case studies** that highlight the project approach and its impact.

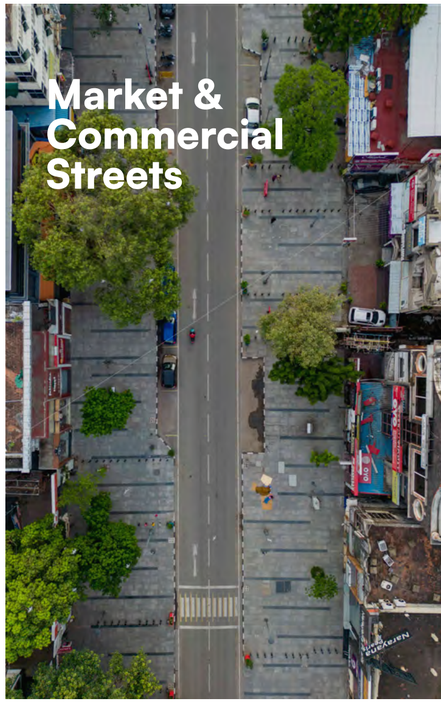
By providing these learnings in a comprehensive and accessible way, this compendium aims to play a pivotal role in supporting the scale-up of street transformations and furthering the Mission's goal of creating people-centric cities across India.

The compendium categorises streets into 3 broad typologies

1. Transit Streets,are mostly arterial or sub-arterial streets connecting major parts of the city. With a mix of la.nd uses along them, these streets are typically designed for easy movement of high volume of vehicles. These streets have lower pedestrian volumes compared to vehicles. However, these streets present an opportunity to improve these for everyone using them and can ensure better safety.



2. Neighbourhood streets are mostly collector or local streets within or connecting neighbourhoods. With predominantly residential land use along them, these streets see short trips for a variety of activities school trips, grocery shopping. and other recreational activities. These streets typically accommodate all kinds of transport modes, and all the users share the street space. These need to be designed to ensure the right balance of street space for all modes.



3. Market & Commercial streets are streets that serve as destinations with mostly commercial activity along both sides. These streets see bustling pedestrian activity and require wide footpaths to account for the volume of pedestrians.

How will this compendium help you?

Citizens

Citizens can play a critical role in street transformation projects by engaging with the city throughout the decision-making process to provide valuable inputs that can improve the quality of projects. This compendium includes lessons from street design projects from across the country, including various citizen engagement processes adopted by cities. The information about project journeys can also educate and empower citizens to participate in their local-level decision-making processes and take ownership of projects to transform the streets in their cities.

Government Officials

The successful implementation of street transformation projects requires coordinated action of stakeholders across various tiers of the government—the municipal authority, the land development agency, the transit agency, and other departments in charge of infrastructure development and maintenance. It also requires cities to collaborate effectively with urban practitioners to formulate and implement Healthy Streets through a strategic planning approach.

With a variety of case studies—including transit-focused corridors, neighbourhood streets, and market streets—this compendium presents the step-by-step journey of planning and implementation of projects and lessons from them that can serve as an invaluable resource to decision-makers and officials.

Urban Practitioners

Urban practitioners such as urban designers, urban planners, placemakers, and transport planners play a significant role in holistically transforming our cities. This compendium presents technical knowledge about planning and implementing streetscape projects in Indian cities, which can help budding urban practitioners build an understanding of the challenges and learnings from the experience of these cities.

Urban Local Bodies / Planning Authority

This compendium presents and demonstrates case studies of streets in the Indian context. All these case studies reflect Indian street models, that are built around transit or waterbodies or developed through a highly congested old ward or in commercial areas, which have incorporated ways for non-motorized mobility and facilitated ease of moving in cities. The project journey demonstrated in the compendium includes 4 key steps of the implementing streetscape project-

1. Laying the foundation of developing the street project,
2. Building India's muscle,
3. Doing things together, and
4. Monitoring learning and improving in addition to the spatial planning and design of the project. The urban local bodies play a key role in enabling stakeholder participation in the decision-making process which is the key for developing streetscape projects.

How to read this compendium?

This compendium provides a menu card of proven good practices of Smart Streets and Roads across several Smart Cities. All information related to these projects is gathered through partner deliberations, online discussions, and crowdsourcing from cities. These projects are categorized under three broad typologies- Transit Street, Neighbourhood Street and Market Street.

Additionally, the compendium also indexes the projects across various project stages to enable easy navigation to address specific challenges in the project journey:

For Detailed Case studies

01 Laying the Foundation

02 Building the team's muscle

03 Doing things together

04 Monitoring, Learning and Improving

For Overview Case studies

01 Laying the Foundation

02 Key Actions

Going ahead, the compendium also introduces with a section on institutionalising the approach with three chapter:

01 Pillars of change for future streets

02 Funding & Financing of Street Transformations

03 Enabling Impactful Healthy Streets

This could help cities to learn and apply in their future streetscape projects.

Designed to cater to city leaders, city managers, urban practitioners, government authorities, policymakers, the compendium intends to stimulate and promote people friendly street design. The compendium allows to pick up bits and pieces, or even the entire journey of the projects, and replicate them through contextualisation and drawing local strategies.

To make the process easy, we have colour-coded themes on each project page-
Colours for thematic areas:

Transit Streets

Neighbourhood Streets

Market & Commercial Streets

Identifying types of case studies

1 Detailed Case Studies

1 Overview Case Studies

How to read detailed case studies?

The following content of the chapter includes these four components, **Design Highlights, Project Journey (Capacity Building Workshop, Site Visits, Stakeholder Consultation) Challenges, Outcomes, Impact Stories, Way Forward**

How to read overview case studies?

1
Setting the context

India's Urban Streetscape

From the narrow alleys of old Delhi to the boulevards of Mumbai, from the winding coastal paths of Panaji to the hilly roads of Kohima, the streets of India reflect the country's diversity. By connecting places, people, and goods, streets play a critical role in Indian cities, going beyond mobility to also facilitate social interaction and economic development. Designing these streetscapes is a complex and dynamic process that is continuously evolving.

Many Indian cities still face challenges such as inadequate infrastructure, haphazard development, and traffic congestion that limits the potential of their streets. Hence, improving street design in India requires a comprehensive approach considering every city's unique needs and challenges.

Over the last eight years, the Smart Cities Mission has built the capacity of cities across the country to design and implement liveable, adaptive, and resilient projects across multiple contexts in the country. Through various national challenges—like Streets4People and India Cycles4Change—several cities have implemented pilot projects and initiated a definitive shift from haphazard vehicle-centric streets to lively and vibrant people-centric streets.

However, India has a long way to go in its journey of street transformation. It requires cities to go beyond pilot projects, and develop comprehensive city-wide plans to scale up efforts and create long-term change.

The Challenges of Streets in Indian Cities

For the last few decades, economic growth and urbanisation have gone hand in hand in Indian cities. Cities have been expanding rapidly as more people move to cities in search of opportunities, in turn increasing the need for efficient urban mobility. Our streets and public transport systems have not expanded and improved at the same pace, leading to existing infrastructure in Indian cities getting overwhelmed.

This has led to a rapidly increasing dependency on personal motor vehicles resulting in ever-widening roads and massive flyovers gradually taking over our cities. This increasing motorisation has further contributed to issues like haphazard parking and high vehicular speeds making streets extremely unsafe for vulnerable users, like pedestrians and cyclists.

Traditionally, streets in India have been more than just a means of mobility, acting as vibrant public spaces that facilitate the livelihoods of a large section of the population. Massive infrastructure projects such as flyovers prioritise the fast movement of motorised transport and sideline non-motorised modes like walking and cycling, leading to streets developing as vehicle-friendly spaces, rather than people-friendly public spaces.

However, many cities across the country have taken steps towards reversing this trend by designing people-friendly streets that prioritise walking, cycling, and public transport. This has been further accelerated through support from various national-level initiatives such as the Smart Cities Mission. The role of the Mission has been further elaborated in the following section.

The Smart Cities Mission's Role in Transforming Streetscapes across India

Since its launch in 2015, the Smart Cities Mission has emphasised the need for networks of safe, inclusive, accessible, and liveable streets as a strong foundation on which smart cities can grow.

The Mission developed guidelines for the design of Healthy Streets to support the creation of safe walking and cycling infrastructure. In 2020, as Covid-19 brought our cities to a halt, citizens across India took to walking and cycling not just to exercise, but also to access essentials and services. Leveraging this opportunity, the Smart Cities Mission launched two national initiatives—the Streets4People and India Cycles4Change Challenges—to inspire Indian cities to work with their citizens and urban practitioners to create walking and cycling-friendly streets.

Over 1300 Smart Mobility projects have been implemented under the Mission including over 2500 km of Smart Streets with universal accessibility and designated pedestrian paths, and over 570 km of cycle tracks.

15 cities have adopted the Health Streets Policy and 9 cities are working towards its implementation. 19 cities have prepared 3 year action plans with network plans for scaling up walking and cycling transformation.

To increase the uptake of cycling, cities have also deployed public bicycle-sharing systems with over 10,000 bicycles and launched several awareness campaigns such as Cycle to Work.

With support from the Mission, cities across the country have been able to achieve dramatic transformations of their streets. This compendium aims to capture the learnings from these projects to provide inspiration and valuable lessons for other cities across the country to scale up this transformation nationwide.

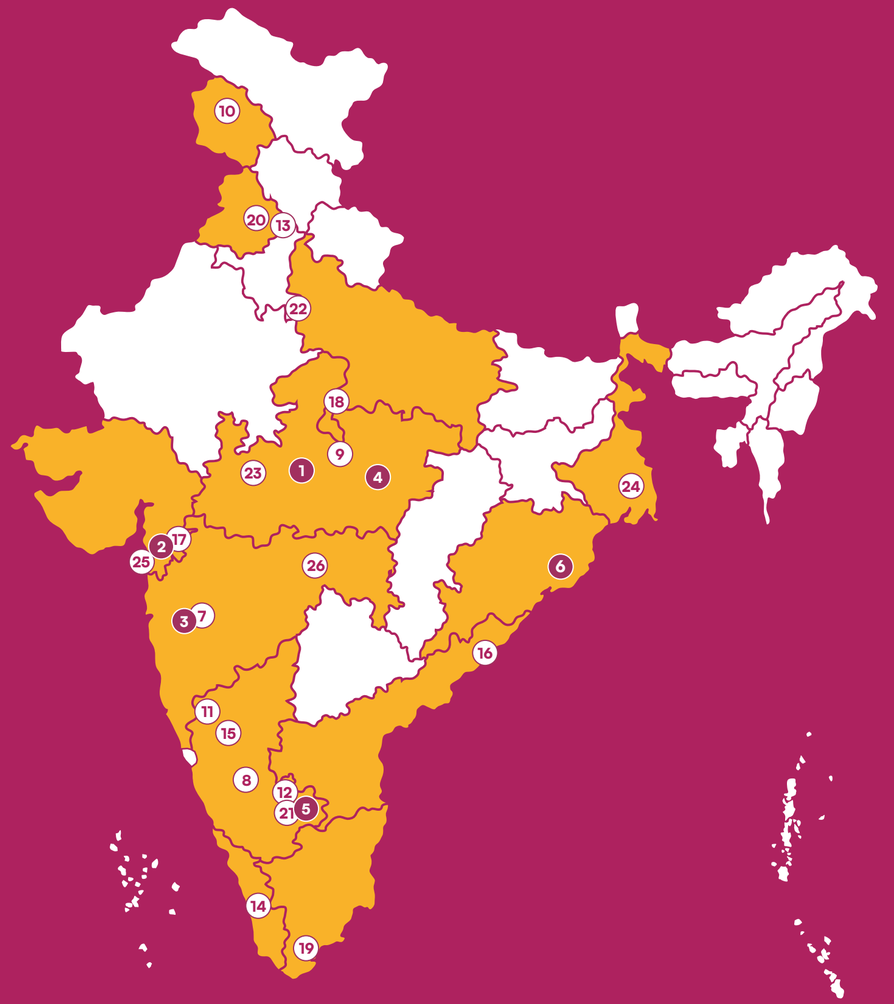
2
50 Case Studies of Streets

A

Transit Streets

Transit streets are mostly arterial or sub-arterial streets connecting major parts of the city. With a mix of la.nd uses along them, these streets are typically designed for easy movement of high volume of vehicles. These streets have lower pedestrian volumes compared to vehicles. However, these streets present an opportunity to improve these for everyone using them and can ensure better safety. Transit case studies covers 26 smart streets/ road projects developed across different smart cities. Out of these 26 case studies 6 are detailed case studies and rest 20 are overview case studies.

1	Atal Path, Bhopal
2	Canal Corridor, Surat
3	Linear Garden Street, Pimpri Chinchwad
4	MR4 Road, Jabalpur
5	Planetarium Road, Bengaluru
6	Smart Janpath, Bhubaneswar
7	Sangvi-Kiwale BRTS Road, Pimpri Chinchwad
8	Alkola Circle Road, Shivamogga
9	Civil Lines, Sagar
10	Dal Lakefront Promenande, Srinagar
11	Dharmnath Marg, Belagavi
12	Dr Radhakrishnan Road, Tumakuru
13	Dedicated Cycle Track, Chandigarh
14	Ernakulam Smart Roads, Kochi
15	Green Mobility Corridor, Hubbali- Dharwad
16	Harbour Park Road, Visakhapatnam
17	Iconic Road, Surat
18	Iconic Road Project, Jhansi
19	Jeyaraj Road, Thoothukudi
20	Malhar Road, Ludhiana
21	Race Course Road, Bengaluru
22	Smart Road, Faridabad
23	Smart Road Development, Ujjain
24	Street 165, 166, New Town Kolkata
25	Saily Police Training Road, Silvassa
26	Wardha Road, Nagpur



Transit Streets

Name of Street	City	Catagory	Landuse	RoW (m)	Length (km)	Total Cost	Duration (years)	Funding Sources	Project Initiated by	Public Participation	Temporary Testing	O&M Responsibility
1 Atal Path	Bhopal	Arterial		45	1.7	₹ 47.52 Cr.	3.4		SPV	✓	✗	
2 Canal Corridor	Surat	Arterial		60	3	₹ 54.39 Cr.	2.3		ULB	✓	✗	
3 Linear Garden Street	Pimpri Chinchwad	Arterial		45	3.93	₹ 28.84 Cr.	2.4		SPV	✓	✓	
4 MR4 Road	Jabalpur	Sub-Arterial		36	2.6	₹ 14.35 Cr.	2.6		SPV	✓	✓	
5 Planetarium Road	Bengaluru	Sub-Arterial		10.5	0.5	₹ 14.5 Cr.	2.9		ULB	✓	✗	
6 Smart Janpath	Bhubaneswar	Arterial		60	5.8	₹ 79.57 Cr.	4.8		SPV	✓	✓	
7 Sangvi-Kiwale BRTS Road	Pimpri Chinchwad	Arterial		45	3.8	₹ 32 Cr.	2.4		ULB	✓	✓	
8 Alkola Circle Road	Shivamogga	Arterial		35	2.8	₹ 21.28 Cr.	3.0		SPV	✓	✗	
9 Civil Line	Sagar	Arterial		21	3.5	₹ 54.25 Cr.	1.8		SPV	✓	✓	None
10 Dal Lakefront Promenande	Srinagar	Arterial		6	5.1	₹ 30.97 Cr.	1.6		SPV	✓	✓	
11 Dharmnath Marg	Belagavi	Arterial		30	2.4	₹ 32.68 Cr.	0.6		ULB + SPV	✗	✓	
12 Dr Radhakrishnan Road	Tumakuru	Sub-Arterial		20	0.65	₹ 5.74 Cr.	4.0		SPV	✓	✗	None
13 Dedicated Cycle Track	Chandigarh	Arterial		2.4	220	₹ 22.5 Cr.	5.5		ULB	✓	✓	

Residential Commercial Institution Public Open Spaces Industrial

National-SCM State ULB ✓ Yes ✗ No Government Private

Transit Streets

Name of Street	City	Catagory	Landuse	RoW (m)	Length (km)	Total Cost	Duration (years)	Funding Sources	Project Initiated by	Public Participation	Temporary Testing	O&M Responsibility
14 Ernankulam Smart Roads	Kochi	Arterial		7.5	5.5	₹ 52 Cr.	1.6		SPV	✓	✗	
15 Green Mobility Corridor	Hubbali-Dharwad	Sub-Arterial		3.5	9.25	₹ 165.68 Cr.	0.3		SPV	✓	✓	SPV
16 Harbour Park Road	Visakhapatnam	Sub-Arterial		15	1.1	₹ 8.81 Cr.	4.6		ULB	✓	✗	
17 Iconic Road	Surat	Arterial		60	2.1	₹ 14.1 Cr.	3.2	PPP	SPV	✓	✗	
18 Iconic Road Project	Jhansi	Arterial		30	1.6	₹ 8.96 Cr.	0.11		ULB	✓	✓	None
19 Jeyaraj Road	Thoothukudi	Arterial		12	0.7	₹ 7.69 Cr.	2		ULB	✓	✗	
20 Malhar Road	Ludhiana	Sub-Arterial		27	1.1	₹ 32 Cr.	3.2		SPV	✓	✗	
21 Race Course Road	Bengaluru	Arterial		29	0.6	₹ 2 Cr.	4.0		SPV	✓	✗	
22 Smart Road	Faridabad	Arterial		30	24.25	₹ 306.54 Cr.	3.6		SPV	✗	✗	
23 Smart Road Development	Ujjain	Local		12	5.14	₹ 53 Cr.	4.3		SPV	✓	✗	
24 Street 165, 166	New Town Kolkata	Sub-Arterial		18	1.3	₹ 2.55 Cr.	1.8		SPV	✓	✓	
25 Saily Police Training Road	Silvassa	Sub-Arterial		15	0.6	₹ 2.16 Cr.	0.3		SPV	✓	✗	
26 Wardha Road	Nagpur	Arterial		30	6	₹ 57 Cr.	2.6		SPV	✓	✓	

Residential Commercial Institution Public Open Spaces Industrial

National-SCM State ULB Public Private Partnership ✓ Yes ✗ No Government Private

1 Atal Path

Bhopal, Madhya Pradesh

Scan here

Category
Arterial Street

RoW
45m

Length
1.7 km

Duration
Nov 2017- Feb 2020
(3 years 4 months)

Total Cost
₹47.52 Cr.

Nodal Authority
Bhopal Smart City Development Corporation Ltd. (BSCDCL)

Implementing Partners
Bhopal Smart City Development Corporation Ltd. (BSCDCL), Bhopal Municipal Corporation, Ernst and Young LLP (PMC), Tata Consulting Engineers Limited (Project Design and Implementation)

Profile of the City

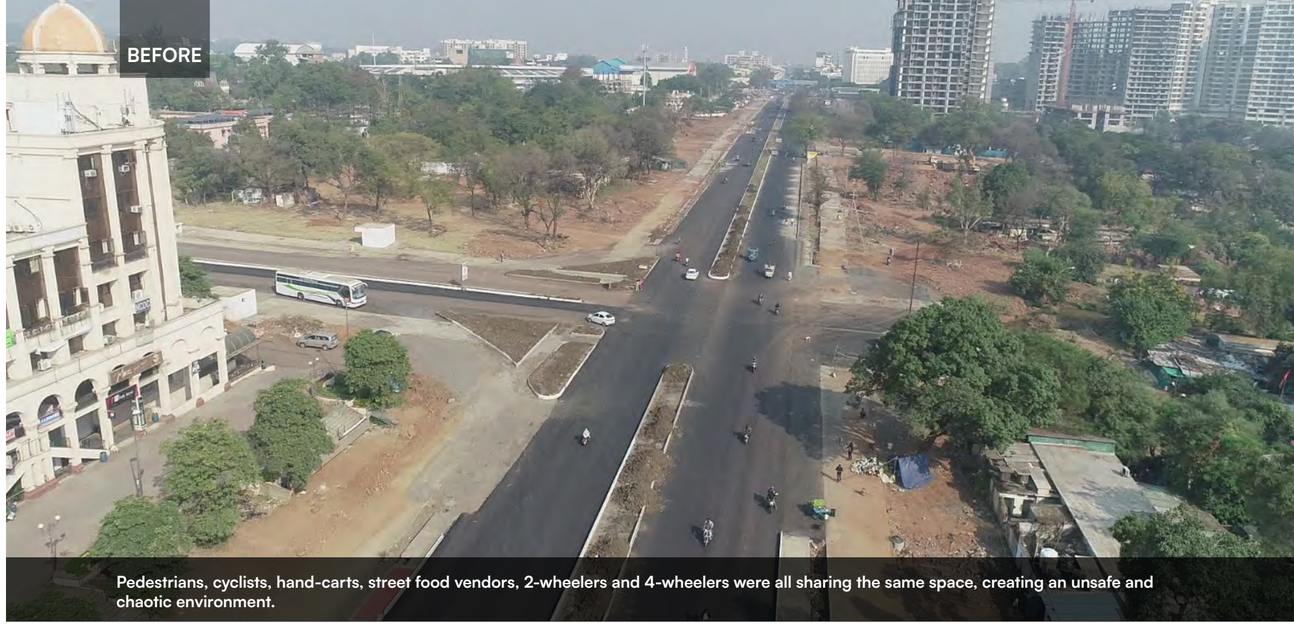
Bhopal was declared a Smart City in the first round of the Smart City selection process. With a population of nearly 18 lakhs and an area of 285.9 sq km, the city has undertaken 83 projects worth ₹3105 Cr. under the Smart Cities Mission of which ₹380 Cr. of Smart Mobility projects were implemented.

Context of the Project

Bhopal undertook an Area Based Development (ABD) of the New Market area, based on the principles of Transit-oriented Development. Atal Path is the central spine for this ABD and is developed as a model next-generation road with modern utilities and inclusive RoW for all modes of transport. The project is developed as a pedestrian and cyclist-friendly spine running through the New Market area. This project is first of a kind project in Bhopal, that has integrated underground utility ducts as part of the RoW construction.

Vision of the Project

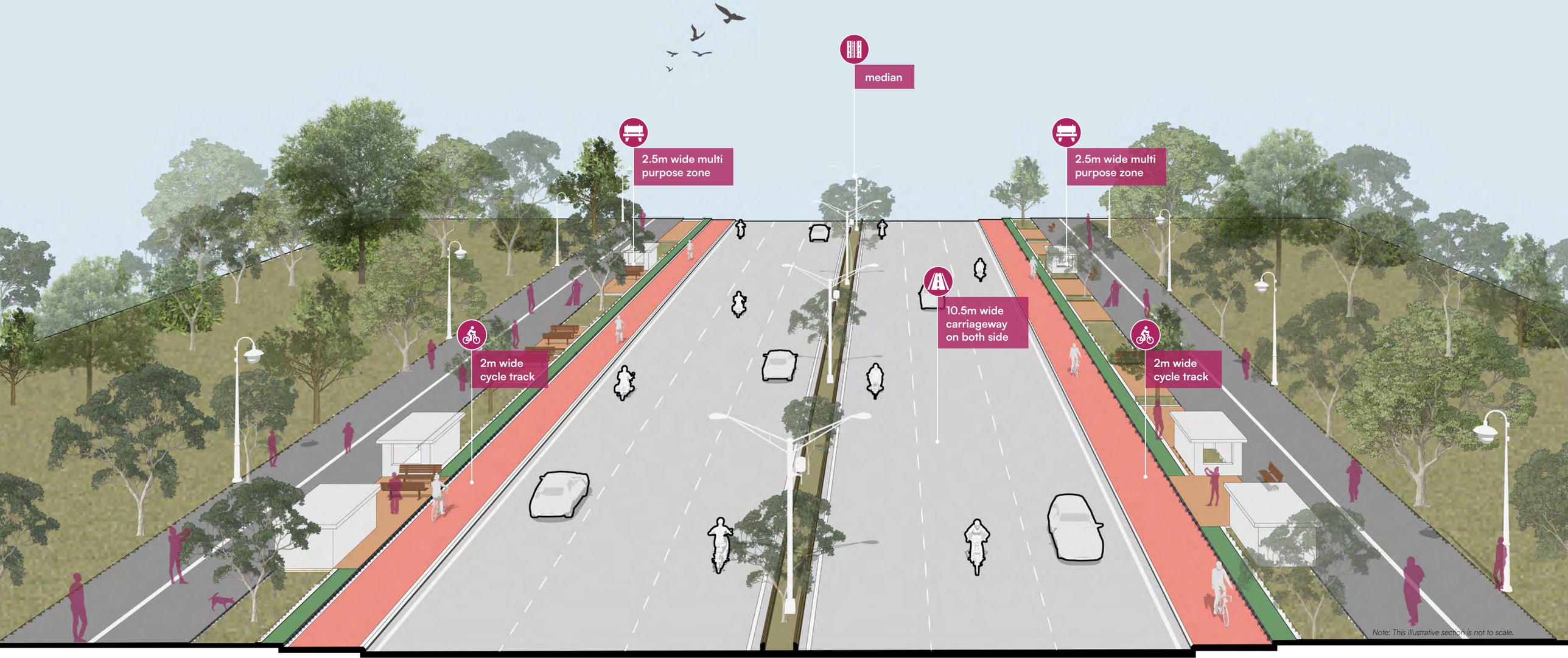
The project aimed to develop state-of-the-art street infrastructure, in the ABD area, that incorporates all design elements of a Healthy Street and establishes a benchmark for future projects.



Pedestrians, cyclists, hand-carts, street food vendors, 2-wheelers and 4-wheelers were all sharing the same space, creating an unsafe and chaotic environment.

Atal Path is envisaged as a street where the street space is clearly segregated for vehicles, pedestrians and cyclists, making all the users feel safe and comfortable.

Cross Section of Atal Path



Design Highlights

01 A 8.6m wide continuous footpath with elements like raised property entries are incorporated to maintain a, continuous walking surface at a uniform level.

02 2.5m wide segregated cycle tracks on both sides at the footpath level along with cycle boxes at junctions have been implemented to improve cycling infrastructure.

03 Green verges are implemented to guide pedestrians to cross at the junction crossings.

04 Cobblestone strips are provided on the carriageway surface for traffic calming.

05 The junctions are realigned and made compact to reduce the speeds of the turning vehicles. Further to improve walking and cycling continuity at the junction, cycle tracks are lowered at the carriageway level. Bollards are installed along the crossings to ensure motor vehicles do not encroach the pedestrian/ cyclist zone.

06 Addition of the utility trench below the cycle track was one of the key design features of the street transformation.

07 Materials like bituminous concrete, Kota stone, tactile tiles for footpath, and Thermodrin FRP Covers have been used as part of the design.

Around 27,500 sq m was reclaimed from the vehicular space for Non-Motorised Transport (NMT) infrastructure.


Wide footpath for walking


Newly designed public realm with walking, cycling and seating areas


Newly designed streetscape

Project Journey


Discussion at site

01
Laying the Foundation

Bhopal Smart City adopted the Health Streets Policy and the Street Design Guidelines for to implement Healthy Streets in the city.

✔ Completed ✖ Not yet started ● Ongoing

- ✖ Parking Policy
- ✖ Vending Policy
- ✔ Healthy Streets Policy
- ✔ Street Design Guidelines

Stakeholder engagement

02
Building the team's muscle

Further, Bhopal Municipal Corporation, Madhya Pradesh State Electricity Board, Madhya Pradesh Water Resources Authority, Indus Towers for laying of Optical Fiber Cables were taken on board to ensure effective coordination, efficient decision-making, and quicken the approval process during the construction of the project. A robust team consisting of engineers from the Bhopal Smart City Development Corporation and Bhopal Municipal Corporation along with external consultants for Strategy and Project Monitoring, Project Design and Implementation was formed. In addition, there were regular capacity building workshops were conducted for the engineers of Smart City and Corporation.

03
Doing things together

- ✔ Stakeholder Engagement
- ✔ Public Engagement
- ✖ Tactical Trial

Extensive Citizen Engagement

As this was first of its kind project in the city, the Bhopal Smart City team conducted extensive citizen engagements to ensure the successful implementation of the project. To ensure the street development focuses on citizens' needs and meets future demands, Bhopal Smart City organized consultations with residents, consultants, engineers, government agencies, planners and contractors. At these meetings feedback and possible solutions for the street were discussed. These were conducted through focused group discussions and on-site citizen engagements programmes.

The team also assessed the public opinion through targeted feedback forms. Consultation and Feedback from Residents and Property owners was done on a one-to-one basis, in person.

04
Monitoring, learning and improving

Monthly Review Meeting

Monthly Progress Review Meetings were held with Project Design Consultant and the Construction firm with the Engineer-in-charge of BSCDCL.

Operation and Maintenance

The Street is currently under the defect's liability period for five years therefore the O&M is under the responsibility of the construction contractor.

CCTV Monitoring

Several acts of vandalism have been reported damaging street furniture and dustbins on the street. Smart city has filed complaints in local police station, the installation work of CCTV cameras at Atal Path, also commonly known as Boulevard Street to deter such future occurrences will commence shortly.

Impact Assessment of the project

Assessment for the same is under process though Atal Bihari Vajpayee Institute of Good Governance and Policy Analysis.


Construction Phase

Innovative Solution:
Utility Management

Utility management was one of the primary focuses of the street transformation. Under this initiative, utility trenches were laid below the cycle track to carry key utilities like the water supply, stormwater, sewage line, etc. The design and laying of utilities was done with discussions with the departments in the city.

In order to avoid obstructions in the cycle track, an 800 m deep ventilation shaft is provided adjacent to the trenches, below the multi-utility zone. The city has provided access to the tunnel at around ten locations through this ventilation shaft. This design detail ensures lesser disruption to the NMT infrastructure during the repair and maintenance of the underground utilities.

Challenges

- **Site clearance and relocation of government officials:** In order to integrate the smart road with dedicated bicycles and pedestrian paths the site was cleared, and additional land was acquired. The government quarters that were adjacent to the road were demolished to obtain additional land. The demolition process was challenging, as it was a time-consuming process. However, all the government officials have been relocated to another government housing complex project made under the Smart Cities Mission.

- **Laying of utility ducts:** The biggest challenge was to construct underground utility ducts on both sides of the road. For the laying of the underground ducts hard rock excavation was done through controlled blasting.

- **Relocation of shop owners:** There was major pushback from the shop owners along the road stretch. However, through regular stakeholder consultation with the shop owners, the shops were relocated at a subsidized rate to the Haat Bazaar a prime market in the ABD Area.

Outcomes

- **Enhanced connectivity and local economy:** The project has enhanced connectivity, improved accessibility, and has contributed to an increase in local employment. This street is considered one of the most sought after and attractive spaces in Bhopal. The improved infrastructure has made it easier for customers to reach out, resulting in increased footfall and a subsequent boost in sales because of the pre-established refreshment shops. There has been a 15% increase in sales for the local businesses in the area post the implementation of this project.

- **Increase in property rate:** The project has led to a significant increase in local real estate. Post implementation of the project and with the improved infrastructure there has been an increase in the desirability of the area which led to a surge in demand for residential as well as commercial property in and around the area. Residential property prices saw an increase of 15% over the last few years.

Impact Stories

Atal Path has increased the footfall in the area, my daily income has almost doubled due to the newly designed road. People come here in the evenings to relax with family and enjoy the street food.

-Mr Milan Gupta, Milan Chinese stall owner at Platinum Plaza Junction

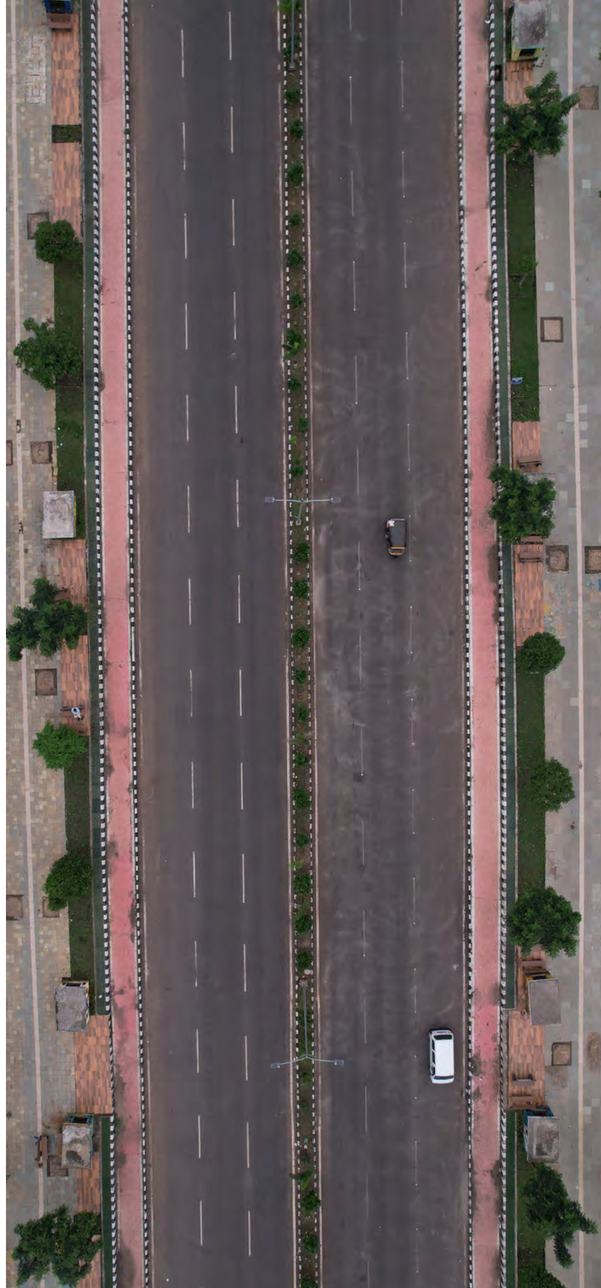
Way Forward

Scaling-up the transformation

Bhopal Smart City Development Corporation Ltd. focuses on developing NMT infrastructure as a step towards creating a more sustainable, healthy, and livable city. By prioritizing NMT, Bhopal is not only promoting sustainable commute and reducing pollution but also enhancing social and economic inclusion.

The NMT Network Plan for ABD in Bhopal is developed to identify and transform a combined length of 29 km of segregated cycling track and footpath in a three phased manner. The network plan design has taken into consideration the principles of Healthy Streets—with pedestrian and cycling friendly streets proposed across the varying RoWs. The development of this NMT infrastructure would prioritize needs of all users and create a safe, accessible, and pleasant environment for the community members. This model has already been utilized as a framework in construction of a combined length of 15.5 kms NMT infrastructure in the ABD area.


Atal Path




Welcome TO
BHOPAL Smart City's
BOULEVARD STR

2 Canal Corridor

Surat, Gujarat

Scan here

Category
Arterial Street

RoW
60m

Length
3 km

Duration
Nov 2017- Feb 2020
(2 years 3 months)

Total Cost
₹54.39 Cr.

Nodal Authority
Surat Municipal Corporation (SMC), Surat Smart City Development Limited (SSCDL)

Implementing Partners
Centre Environmental Planning and Technology (CEPT) and Sardar Vallabhbhai National Institute of Technology (SVNIT) for Planning and Design, Ranjit Buildcon (Contractor), Mahimtura Consultant Pvt. Ltd (PMC)

Awards and Recognition
'Project Award under 'Built Environment' category by ISAC 2020 Innovation Award under 'Innovative Idea - Projects" category by ISAC 2022

Profile of the City

Surat, the 8th largest city in India and 2nd largest in Gujarat, is one of the biggest contributors to the GDP of the country, owing to its robust diamond and textile industry. The city has a population of 47 lakhs (Census 2011) and covers an area of jurisdiction of approx. 475 sq km. Consistently ranked the best performing smart city among the 100 selected smart cities in the country, Surat Smart City has enhanced the quality of life of the citizens by providing equal access to the best quality physical infrastructure, social infrastructure, and mobility, while protecting the ecology and preserving the culture of the city. The city has undertaken 82 projects worth ₹2638 Cr., of which it has already completed 98% of the projects.

Context of the Project

Canal Corridor is located in a prime residential zone and the unattended open space was used as a garbage dumping area. This led to the degradation of the canal, causing issues for the residents. Surat Municipal Corporation initiated the project to transform the corridor into a vibrant, safe, healthy street for its residents. For this, the city introduced a recreational zone along the canal, on either side, with an average 13.5-meter-wide multi-purpose, recreational, and landscaped area that runs through the center of the road.

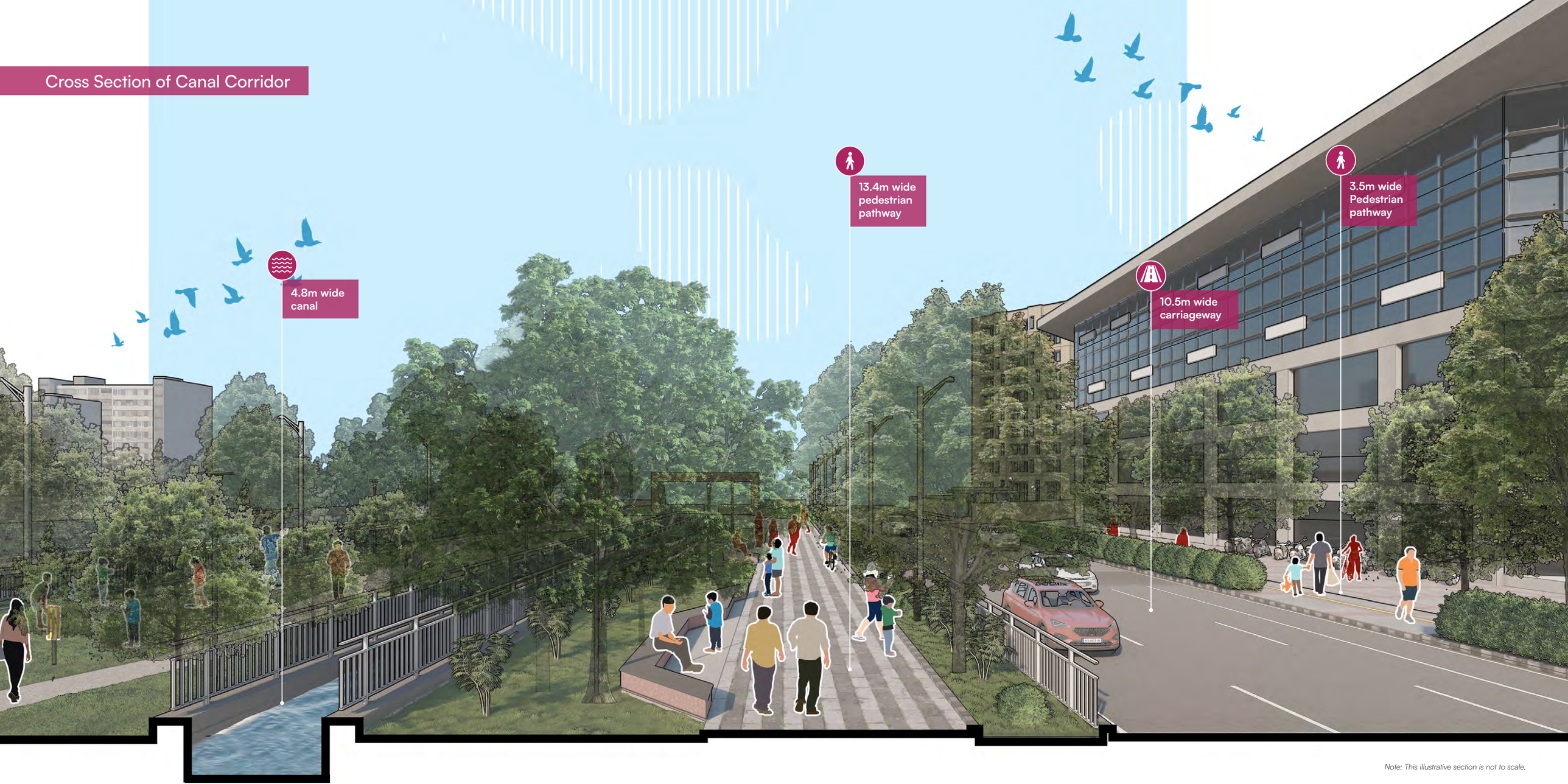
Vision of the Project

The project aimed to improve mobility and liveability of the neighbourhood by resolving the unhealthy conditions prevailing around the canal, curbing the on-street encroachments and developing a vibrant recreational space along it.

Earlier, the shoulder space along the canal was used as a dump site with encroachments on the wide carriageway.

The carriageway was streamlined to develop a linear median park along the Vesu Canal with state-of-the-art walking and cycling facilities and several place-making interventions like a play zone, a food court, and other kids' and elderly activity zones.

Cross Section of Canal Corridor



Note: This illustrative section is not to scale.

Design Highlights

01 13.5m wide linear park was developed on both sides of 5m wide canal. This resulted a total of 30-33m wide median linear park at the middle of Canal Corridor. It includes walkways, recreational activities, food zone, and kids play area.

02 The road is exclusive, dedicated and attractive 10.5 m Cement Concrete road with a 2.5m footpath on both sides including street furniture.

03 The design of the footpath includes a 1.0m buffer zone with trees and shrubs to achieve an obstruction-free walking zone and avoid the misuse of footpath as parking space. Traffic and road signs are also erected in buffer zone roads to guide/ caution road users.

04 The tactile paving tile and bollards are installed at entry points to ensure universal access.

05 Rumble strips were used to traffic calm the street. Cautionary signages were also integrated with the street design.

06 Slip form paver are used for the construction of this cement concrete road.

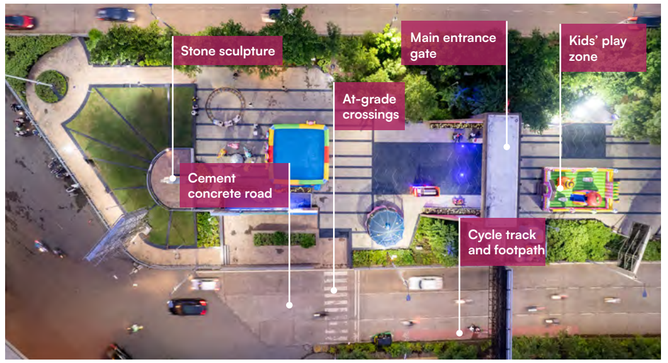
07 Use of seasonal plants in landscape, material selection, etc. was done keeping in mind the sustainability of all the interventions.

08 The overall landscape has been designed in such a way that specific species of columnar trees and flowering shrubs are planted at the edge of road. This was done to ensure that the landscape does not block the pedestrian path and does not hide elements like traffic sign boards, light poles, etc

09 Stormwater drains are provided to prevent waterlogging on the street.

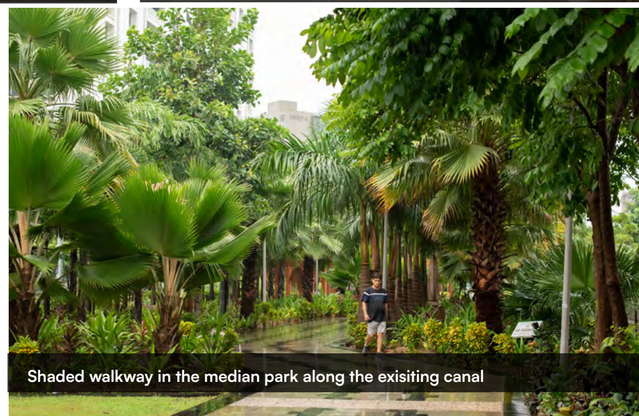
10 Utility crossings were provided at every 250m interval on both side of canal to prevent future digging.

Shaded walkway in the median park along the exisiting canal



Bollards to restrict entry of vehicles in the central park. Ramps and adequately spaced bollards at the entry points of the park to ensure accessibility

Seatings along the landscaped areas



Shaded walkway in the median park along the exisiting canal

Project Journey

Team of technical experts

01
Laying the Foundation

Surat Street Design Guidelines have provisions for different types of right of way, junction design, intersection design, food park guidelines and street marking guidelines. Use of the manual is mandated for various engineers working in different zones and departments of the ULB. This ensures appropriate and adequate street infrastructure in the city.

✔ Completed ✕ Not yet started ● Ongoing

- ✔ Healthy Streets Policy
- ✕ Vending Policy
- ✔ Parking Policy
- ✔ Street Design Guidelines
- ✔ Exposure Visits
- ✔ Capacity Building Workshops

02
Building the team's muscle

Team of technical experts

A consortium of technical experts from CEPT University Ahmedabad , for architecture planning and design and SVNIT Surat, for infrastructure and civil design was formed for the project. These teams worked closely with the contractor and the management consultants.

Being a local institute, SVNIT reviewed most of the infrastructural projects in the city.

03
Doing things together

Synergised Initiatives

The primary implementing agency for the project was the Surat Municipal Corporation that worked closely with the Surat Smart City to implement the project.

The key challenge during the project was to shift existing network of utilities that obstructed the road construction but with coordinated efforts of the Corporation, Smart City and the team from the technical experts it was implemented successfully.

- ✔ Stakeholder Engagement
- ✔ Public Engagement
- ✕ Tactical Trial

Operations and maintainence

04
Monitoring, learning and improving

Private Sector Operation and Maintenance

The total maintenance and housekeeping work and operation of various amenities are carried out by the agency named Tejas Publicity, and the contract has been awarded for a period of 20 years.

The agency carries out the operation and maintenance of the project from the revenue generated from food zone operations, advertisement rights, parking rights, etc.

Revenue Generation

The canal corridor project is designed to be self-sustaining by providing the operation and maintenance to a third-party agency and generating revenue for the smart city.

Innovative Solution:
Parking Management

The project has provisions for food kiosks, kids' play zone, multi-utility space, and parking management to ensure self-sustainenance of the project. The revenue generated from these activities is used for operations and maintenance of the entire street.

The parking is managed by the third-party agency through a warden-based ticketing system. The parking pricing is primarily based on Surat's Parking Policy, adopted in 2018.

The agency Tejas Publicity, was onboarded through a tender bid, in which they bid for approx ₹13 lakhs to ₹15 lakhs per year to Surat Municipal Corporation for a contract period of 20 years.

Challenges

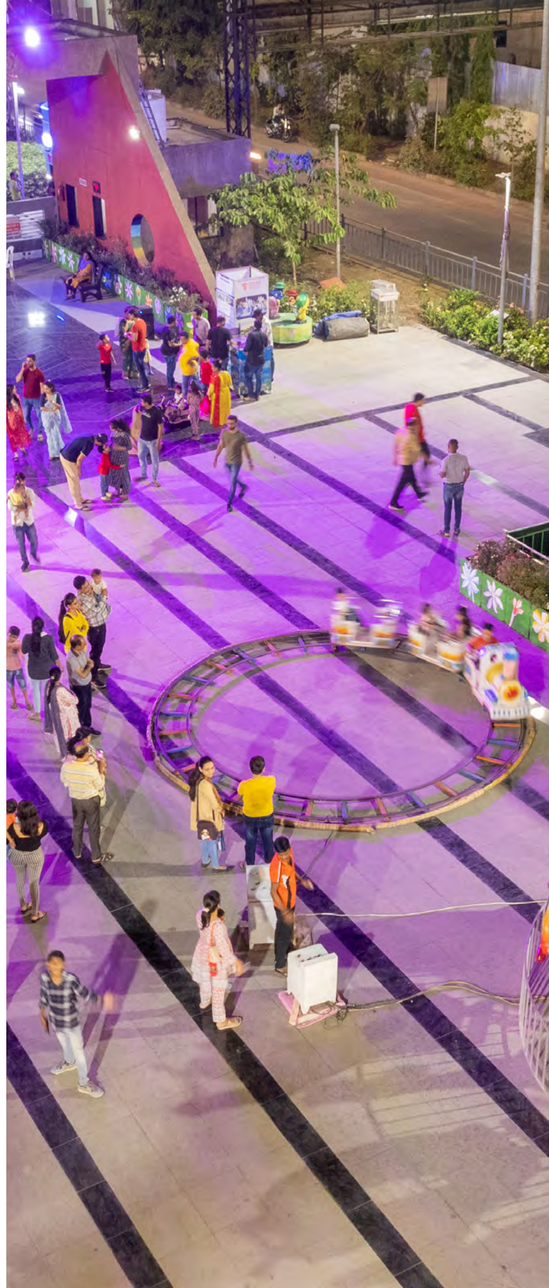
- **Alignment of underground utilities:** As the canal passes through the centre of the street, managing the existing utilities below the pavement was a challenge. With continuous coordination with Hydraulic department, Drainage department, Storm water department, Street light department and South West Zone of Surat Municipal Corporation and other utility providers such as Reliance Jio, Reliance Infra, BSNL, DGVCL, helped to resolve the issue.

- **Development of linear park:** Initially the part of road was occupied for vehicular movement, which was challenging during the construction stage. However, through effective implementation of town planning scheme, the road was redesigned by integrating Linear park corridor at the median of the road.
  The simultaneous development of pavement and the linear park was a challenge and the organized planning helped timely completion of the project.

Outcomes

- **Increase in footfall:** After the implementation of the project the footfall and recreational activities increased manyfold. On the weekends, the footfall reaches around 3000 people per day, and the vehicular traffic flow has also been streamlined

- **Reclaimed space for people:** 75000 sq m of space was transformed as linear garden while 7500+sq m for pedestrians and cyclists after the implementation of the project.



Impact Stories

This space is the best place for outdoor activities for our children. Before this project, our children used to play with the mobile phones. Now, in the evenings, we are able to take them to a safe and beautiful space where they can play with their friends and enjoy nature.

- Dr Hetal Patel, Paediatrician

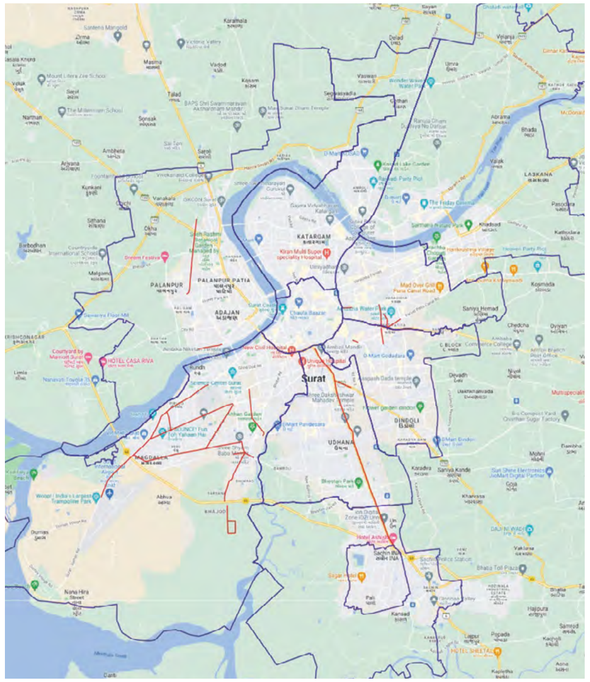
Way Forward

NMT Scale-up Plan

Surat Smart City has proposed a phase-wise cycle network plan for the entire city which will be executed in seven phases over the next 3 years.

In addition, Surat has also developed a three year action plan consisting of the following programmes-

- A network of cycling infrastructure in industrial areas,
- Makeway 30- Making a neighbourhood cycle and pedestrian friendly.
- Cycle to School- Making safe schools zones



Scaling-up the transformation

By investing in dedicated cycling and walking paths, involving the community in decision-making, and implementing supportive policies, the city aims to create a sustainable and inclusive transportation system throughout the city. Through strategic planning, Surat City aims to create an environment where active mobility becomes a natural and convenient choice for all, leading to a greener, healthier, and more vibrant cityscape.

The Canal Corridor was a project of convergence- we had to converge funds from several State and Central schemes. It is also one of the most successful PPP project in the city. Surat plans to extend the Canal Corridor to other parts of the city.

Ms. Shalini Agarwal
Municipal Commissionor of Surat


Canal Corridor

3 Linear Garden Street

Pimpri-Chinchwad, Maharashtra

Scan here

Category
Arterial Street

RoW
45m

Length
3.93 km

Duration
Aug 2020- Dec 2022
(2 years 4 months)

Total Cost
₹28.84 Cr.

Nodal Authority
Pimpri Chinchwad Smart City Ltd. (PCSCL)

Implementing Partners
KPMG, Prasanna Desai Architects, B G Shirke

Awards and Recognition
Placemaking Marathon Winner for 8 to 80 Park at Sudarshan Chowk, Architects Engineers and Surveyors Association Beharay Rathi Award 2023 for Street Landscape and Placemaking

Profile of the City

Pimpri Chinchwad Smart City (PCMC) is an urban agglomeration of 181 sq km area situated in Maharashtra with a total population is approx. ₹29.6 lakhs. The city was selected as part of the Smart cities Mission in Round 3 of the challenge. Since then the city has proactively contributed towards creating citizen friendly streets and public spaces. Till date, the city has executed multiple projects on smart mobility that includes public bike sharing, smart streets and many more. Among the smart mobility project, Linear Park Garden Street project is one of the significant project executed by the Pimpri Chinchwad Smart City, that has prioritized walking and cycling and has integrated them as part of the transit oriented corridors.

Context of the Project

Pimple Saudagar and Pimple Gurav stand out as rapidly developing areas within Pimpri Chinchwad. This has prompted the selection of these neighborhoods, their connecting streets, and the main BRTS road for a comprehensive streetscape project within the Area Based Development zone of the Pimpri Chinchwad smart city initiative.
The street's transformation integrates essential elements such as continuous footpaths with tactile paving, signage, strategically placed dustbins, and ample street lighting, ensuring ease of movement & creating a picturesque promenade beneath the sprawling tree canopy.

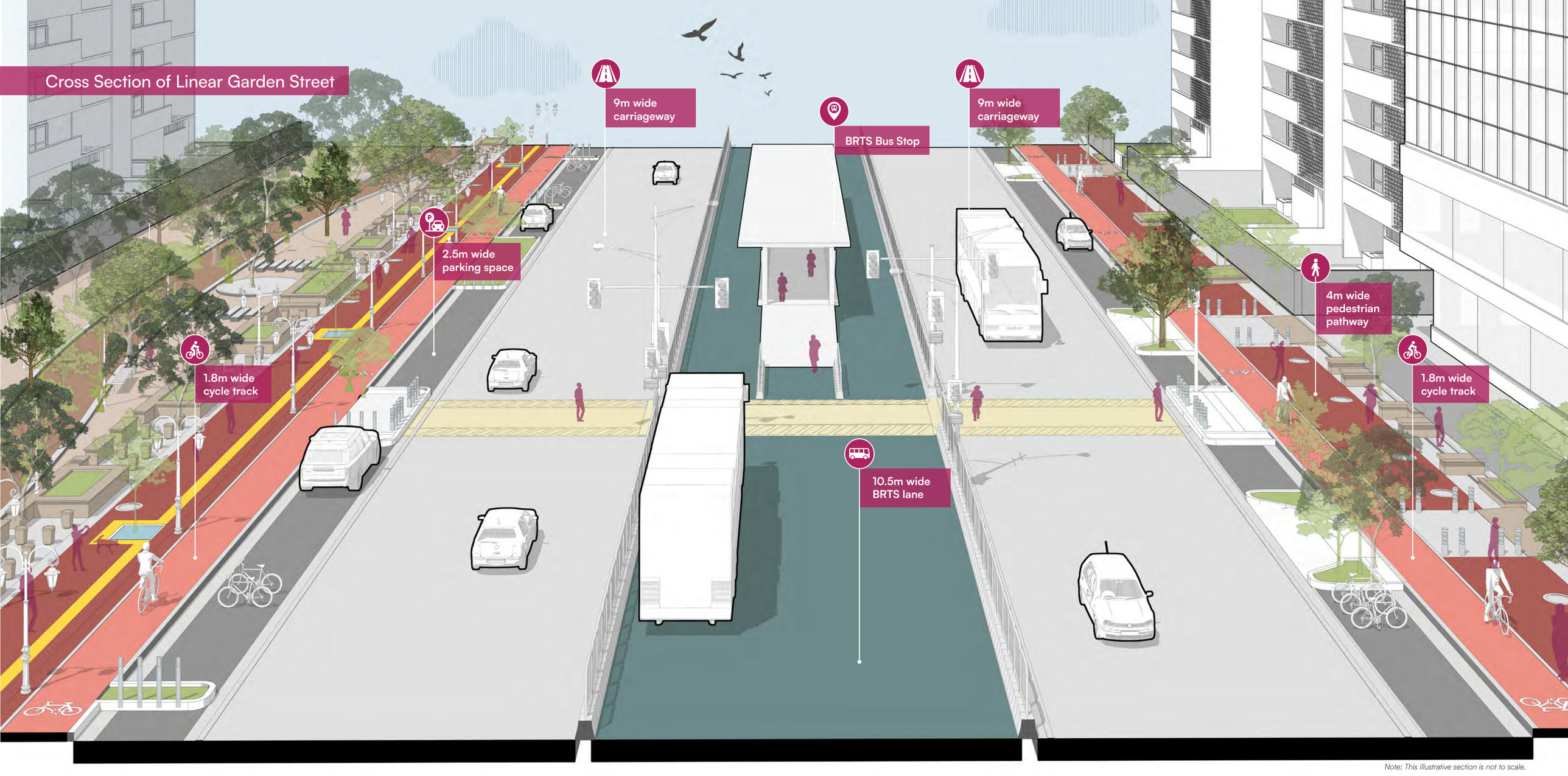
Vision of the Project

To segregate vehicles, pedestrians and cyclists by streamlining the vehicular traffic and providing dedicated space for pedestrians, cyclists, prams and wheelchairs, to enhance safety for all street users.

Poorly maintained street edge with a fence disconnects the public garden from the street, limiting the usage of both

Integrated linear garden with a well-designed street edge having NMT infrastructure and seating spaces improves its usability

Cross Section of Linear Garden Street



Note: This illustrative section is not to scale.

Design Highlights

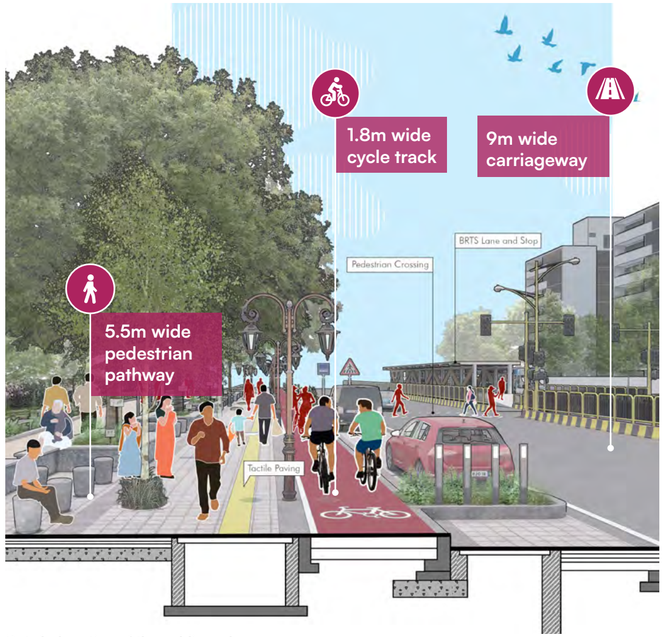
01 The Linear Garden Street has an existing BRT lane at the centre and infrastructure elements like tabletop crossings at bus stops. However, the street edges are consisted of discontinuous footpaths, unorganised parking and halt areas.

02 The project focused on improving the street edges, merging the 1.5m width of the Linear Garden with the streetscape, creating a promenade under the tree canopy. Public amenities like signage, dustbins, and streetlights are provided along the street edges and the existing tabletop crossings are integrated with the innovative design.

03 High-quality precast elements, like kerbs and circular Mudas (seating elements) were manufactured by the contractor as per the design requirements and transported to the site.

04 Locally available Basalt stone was handcrafted by the local craftsmen to construct seating around the existing trees. This design element not only promoted the local crafts that have been prominent in this region but also provided the necessary breathing space for the trees. Open aggregate was used to create unique design patterns called Kashmiri embroidery around about 370 seating alcoves.

38,000 sq m space from the park and front margins of the private properties were incorporated into the public realm to increase the available pedestrian space.

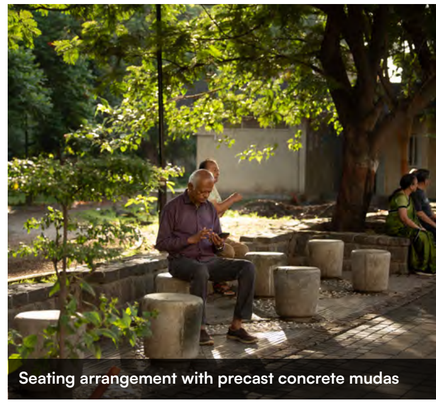


Detailed section of the public realm

Stone aggregate floor pattern called as 'Kashmiri embroidery'

Basalt stone seating around existing trees along the garden edge

Stone aggregate floor pattern as a central element to the basalt stone seating alcove



Seating arrangement with precast concrete mudas

Designated cycle ways and pedestrian ways for all-aged people

Newly designed streetscape integrated with the adjacent linear garden

Project Journey


Stakeholder engagement

01
Laying the Foundation

✔ Completed ✖ Not yet started ● Ongoing

- ✔ Healthy Streets Policy
- ✔ Healthy Streets Cell
- ✔ Parking Policy
- ● Street Design Guidelines

02
Building the team's muscle

- ✔ Capacity-building workshops
- ✔ Exposure Visit


Discussion at site

On-site demonstrations

Typical details, like ramp slopes were demonstrated on the site to not only enable a standard method of execution but also to test the usability on site.

03
Doing things together

Traffic Management

Traffic was strategically diverted through the BRT lane, in close coordination with the traffic police to minimise traffic disruptions and ensure a seamless movement during the construction phase.

Tactical Trial

A tactical trial was conducted for the typical RoW along the entire street to identify unique conditions on-site.

- ✔ Public Engagement

Stormwater Drain Relocation

An overlap between the stormwater drain and cycle track location led to multiple manholes on the surface of the cycle track, creating an obstruction for cyclists. Therefore, in coordination with the Smart City team, most manholes were shifted to another location by creating dummy chambers to ensure a smooth surface for the cyclists.

Stakeholder Engagement

The proposal underwent various stakeholder consultations which involved public and multilateral departments. The traffic police department, electrical department, BRTS department, Water Supply and Drainage Department were a part of the consultation process. Public consultations were also conducted with local public representatives, RWAs, shopkeepers, etc., through focused group discussions. Apart from these consultations being conducted at the proposal/ design stage were also carried out during the construction phases of the project.

04
Monitoring, learning and improving

On-street parking management

The on-street parking management system executed as part of this project faced gaps in implementation, like lack of data collection from the service provider, revenue leakage and overall customer dissatisfaction. Therefore, it was paused after a few months.

Currently, the City team is taking initiatives to implement the Parking Policy and an efficient Parking Management System through an app-based QR code that will be integrated with the city's official website.


Construction Phase

Innovative Solution: **Junction Detail**

Pedestrian and cyclist safety is not compromised by ensuring continuity for the segregated footpath and cycle track at the junctions. Making box were also introduced for cycle u-turns. Additional carriageway space is created at the junctions to incorporate free left-turn as demanded by various stakeholders.

Weekly stakeholder discussions were organised to resolve and agree on unique conditions along the street, especially junctions. Several junction trials were conducted to decide the final road geometry. Various design iterations were prepared according to the feedback received.

PK Chowk, Pimple Saudagar, Pimpri Chinchwad

Challenges

- **Acquisition and Encroachment:** Land acquisition and encroachment were one of the major challenges before the execution of the project, mitigated with the help of the police and the PCMC encroachment squad. During this process, all encroachments like temporary shops, were notified one month in advance to clear the site. The enforcement squad continues to function till date with CCTV surveillance at every junction.

- **Traffic Congestion Issues:** Resistance from citizens was observed because of traffic congestion and mismanaged traffic during construction. To address this issue, traffic was diverted temporarily through the BRT lanes to avoid congestion on site. However, on thorough completion of the project, the traffic flow was improved.

- **Execution of Parking Management:** Parking provided for parallel for four wheeler and perpendicular for two wheeler addressed by design of designated parking bays management was another challenge faced after execution- due to gaps in implementation of parking policy, malpractices, revenue leakage and lack of data collection from the service provider. To meet this problem, PCMC Smart City is taking active initiatives to implement the Parking Policy and an efficient Parking Management System throughout the city. It is testing a digital platform (app based and QR code) to aid parking management while minimizing revenue leakage and ensuring real-time data collection. This application will be integrated with the official website of Smart Sarathi.

Outcomes

- **Pedestrian Safety:** 51,000 sq m of space has been reclaimed for NMT after the execution of the project. The pedestrians have a safe, secure and dedicated footpath space for movement. No citizens are seen walking along the edge of the motor vehicle lane, reducing the chances of accidents and other mishaps. Safety of all users is ensured through provisions of speed tables, cycle boxes, etc.

- **Cycling:** Citizens of Pimpri-Chinchwad use dedicated cycle tracks provided to commute, which creates a safe and organised route for cyclists.

- **Socially Interactive Space:** The percentage of citizens coming out on the street for exercise as well as recreation has gone up after the execution of the project. Children can be seen cycling and playing on the street in their designated zones, reducing the risk of their proximity with the traffic on the motor vehicle lane.

Impact Stories

I am new to Pune as I was residing in Mumbai before. What I love is the 4 km uninterrupted stretch of footpath along the garden. Every evening I come here for a run. I find the cycle track very useful and I see citizens using it happily. Congratulations to the citizens as they are lucky enough to have such beautiful connectivity of footpath and cycle track in the city and congrats to the Smart City and other government agencies who were instrumental for this beautiful initiative.

Ms. Pranjali Shetty, student pursuing Architecture

Way Forward

Existing NMT Street Network in 2023

Source: Prasanna Desai Architects

Proposed NMT Street Network in 2032

Source: Prasanna Desai Architects

Scaling-up the transformation

The Linear Garden Street is implemented as a model street for Pimpri-Chinchwad. Moving ahead, 'Harit Setu' Master Plan aims to transform Pimpri-Chinchwad into a liveable city by 2030 by transforming it into smaller 15-minute NMT-friendly neighbourhoods.

'Harit Setu' Master Plan is an outcome of the concept of 'connected greens' included in the smart city proposal. It aims to enhance existing connections and create new green links connecting several residential, commercial, institutional, campuses to improve and encourage NMT modes for short trips in the city.

Our strategy for the Harit Setu Plan is to create shorter commute distances for NMT users—through greenways passing through various land uses, river/nallah edges, railway edges, small back alleys etc. We aspire to make commute safe, comfortable, and convenient for all pedestrians and cyclists across the city.

Mr Bapu Gaikwad

Senior Executive Engineer, Pimpri Chinchwad Smart City


Linear Garden Street

4 MR4 Road

Jabalpur, Madhya Pradesh

Scan here

Category
Sub-Arterial Street

RoW
36m

Length
2.6 km

Duration
Sep 2018- Mar 2021
(2 years 6 months)

Total Cost
₹14.35 Cr.

Nodal Authority
Jabalpur Smart City Limited (JSCL)

Implementing Partners
Jabalpur Development Authority, Jabalpur Municipal Corporation

Profile of the City

Jabalpur, having a population of ₹10.5 lakh, was selected in Round 1 of the Smart Cities Mission. It has an ABD area of 3 sq km out of a total area of 152 sq km in the city. Jabalpur Smart City has executed various projects in the Smart Cities Mission among which 26 projects worth ₹246 Cr. have been completed in the mobility sector. To enhance mobility, Jabalpur has undertaken projects like — Multi Level Car Parkings (MLCPs), Junction Improvement, Inter State Bus Terminals (ISBTs), NMT focused infrastructure, Procurement of E-Rickshaws, etc., through the journey of the Mission.

Context of the Project

MR4 street is one of the crucial mobility corridors in the city of Jabalpur. The corridor faced several pedestrians and cyclists safety and water logging issues. As a result, Jabalpur Smart City had nominated this street under it's India Cycles4Change Challenge submission. As a part of this Challenge, the street was developed using a test-learn-scale method to resolve the existing issues on the street.

Vision of the Project

The project aimed to create a resilient, safe and inclusive model prioritizing Non-Motorized Transport along with creating a public realm infrastructure for all strata of society.

Earlier, the carriageway was wider, with a wide earthen shoulder on either side of the street. There were several dark spaces along the MR4 road.

The transformed street reduced the carriageway width and reclaimed space for cycling from the carraigeway and shoulder space. The existing footpath was enhanced with adequate lighting and seating spaces.

Cross Section of MR4 Road

Note: This illustrative section is not to scale.

Design Highlights

01 Pedestrian and cyclist mobility was an integral focus point, especially to address and improve the last mile connectivity.

02 The carriageway width was reduced by 2m. The reclaimed space was then converted to the painted cycle lane.The cycle lane is segregated with the help of plastic bollards.

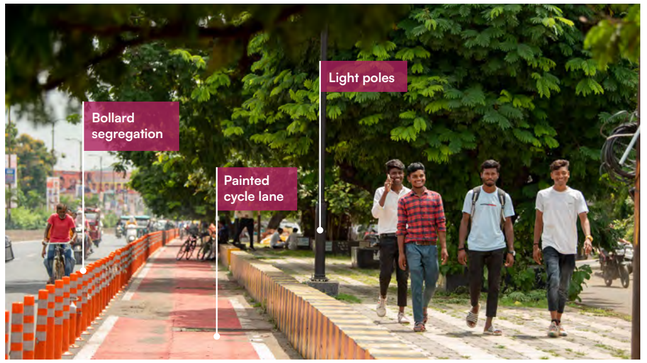
03 To combat water logging, the city created an RCC drain below the cycle lane, with inspection chambers at regular intervals.

04 JSCL has maintained a minimum 1.2m-wide obstruction-free cycle lane beyond the drain covers of these chambers to avoid any hindrances for the cyclists.

05 Cycle tracks were painted so that they could stand out and become identifiable at a distance. The paint used was PlastiDry - a specialised cold paint for zebra crossings and cycle tracks.

06 Interlocking flagstones pavers are used for the footpath. Pedestrian safety has been enhanced due to raised pedestrian crossings.

07 Landscaping with 3-seater chairs, tree guards, dustbins and provision of Water ATMs at some locations.



2.5m wide cycle track with 1.2m unobstructed cycling space beyond the drain cover

Bollard segregation with cat eyes to ensure cyclists safety at night

Seatings around the existing trees

Project Journey


Measuring site elements

01
Laying the Foundation

✔ Completed ✖ Not yet started ● Ongoing

- ✖ **Parking Policy**
- ✖ **Vending Policy**
- ✔ **Healthy Streets Policy**
- ✔ **Street Design Guidelines**

02
Building the team's muscle

- ✔ **Capacity-building workshops**
- ✔ **Exposure Visit**

Institutional setup
Under the India Cycles4Change Challenge, Jabalpur set up a NMT Cell with several officials involved in the day-to-day street design works. Jabalpur also formed an Apex Committee, to review and discuss reviews transport-related initiatives in the city periodically. Both these institutional set-ups are headed by the Municipal Commisioner.

Regular capacity building of the engineers
Capacity building workshops for street design and implementation, parking management, etc are conducted on a regular basis for the engineers of the Jabalpur Municipal Corporation and Jabalpur Smart City.

03
Doing things together

- ✔ **Stakeholder Engagement**
- ✔ **Public Engagement**

On-Site demonstrations
Typical details, like ramp slopes were demonstrated on the site to not only enable a standard method of execution but also to test the usability on site.

Encroachment removal
The service road abutting the footpath was encroachment by vendors. The city conducted several on-site discussions with the vendors to gain their support for the project and provided alternate locations for vending. The corporation is also ensuring an encroachment-free infrastructure by conducting regular checks and encroachment drives.

Tactical trials
Initiated under the India Cycles4Change Challenge, JSCL used road marking and temporary bollards to test the design along 0.5 km of the street. The city also tested design solutions at the junction.

Citizen engagement
Through these open street campaigns the vision and designs for the street were shared with the citizens. The feedback received from these engagements were incorporated in the permanent design implementation. In addition to this, several focused group discussions were also conducted with the residents of the neighbourhoods along the pilot stretch.

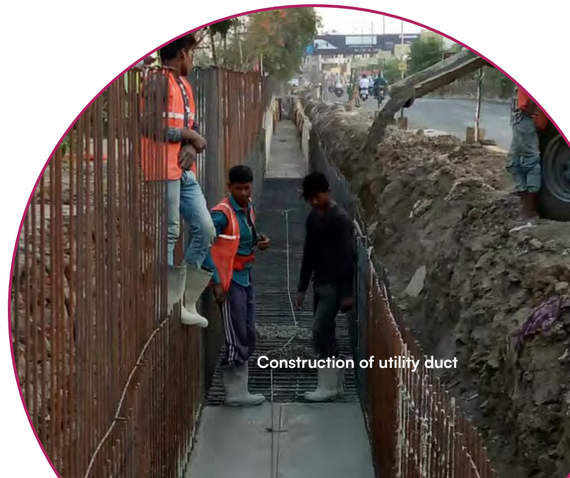
The Smart City team also conducted several public engagement activities through programmes like open street campaigns, etc.

The stakeholders were involved in the pre-design phase to identify the existing issues on the street. Further, to address and resolve citizens' on-site concerns- like inadequate lighting, traffic diversion, etc- JSCL has created a group of neighborhood residents through social media. JSCL also created a WhatsApp group for grievance redressal during the implementation phase.

04
Monitoring, learning and improving

Maintenance
Currently, Jabalpur Municipal Corporation looks after the maintenance of the street. The Garden Department looks after the watering and pruning the trees and landscape on the verge and medians of the street. There is a dedicated department for removing encroachments regularly. The traffic police department has installed traffic signals to for traffic management.

Community Ownership
Vandalism was a challenge that the city faced in most projects. Learning from this, the city addressed it by planning and organising multiple community engagement involving the local residents in the design process, which helped to develop a sense of belongingness towards the project. This led to citizen-led monitoring to restrict and reduce vandalism of the project.


Construction of utility duct

Challenges

- The removal of encroachment of shops, vendors, etc., took significant amount of time.
- Traffic management during construction was a major challenge faced.
- The utilities were re-built. Therefore, removal of the existing pipelines and ducting was a cumbersome task and pushed the timelines of project completion.
- The project was undertaken during the pandemic, which resulted in delays and lack of availability of materials.
- After project completion lowering the speed of the vehicles was necessary. To resolve the issue, JSCL installed traffic calming elements and developed safe junctions for pedestrian crossings.

Outcomes

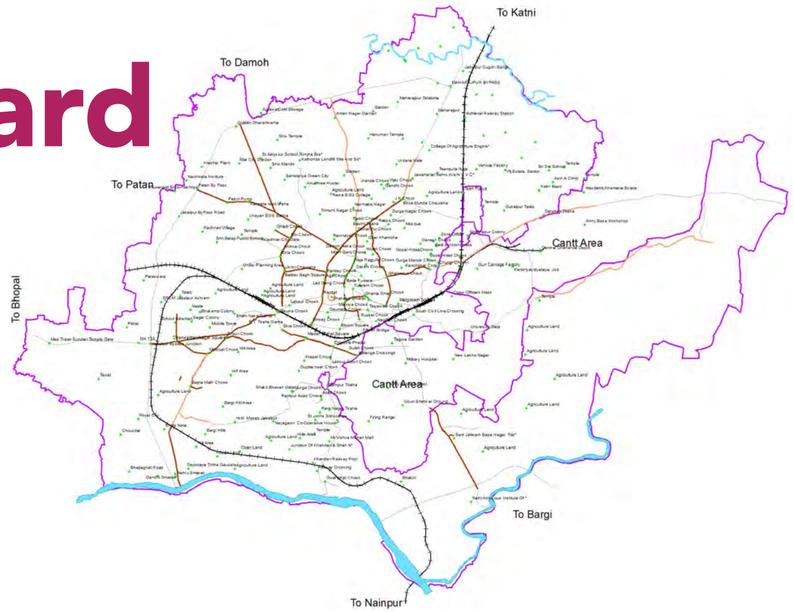
- Safety features have been enhanced by providing segregated spaces for pedestrians for pedestrians, cyclists and motorised vehicles.
- Cyclists can be seen in larger numbers because of the cycle track provided.
- 1300 sq m of space for pedestrians have been reclaimed.

Impact Stories

The city has beautifully transformed this vehicle dominated road into a pedestrian and cycle-friendly corridor, by integrated dedicated NMT lanes. The shaded seating areas along the pedestrian pathway allow people to congregate and share their daily chit chats.

Raj Kumar Sahu, resident of Yadav Colony Area, Jabalpur

Way Forward



Scaling-up the transformation

Vision: Transforming Jabalpur into a vibrant regional economic and cultural hub through inclusive urban regeneration, to act as a magnet for investment and new opportunities for the youth.

Jabalpur's Cycling Network Plan was devised based on the city's NMT Policy and Street Design Guidelines. The plan recommends appropriate infrastructure type and location, in order to plan, design, and implement dense, continuous walkable and cyclable streets around the city. The network plan visually depicts the street hierarchy at the neighborhood- and city-level. Further, the phasing plan also sets the direction for the implementation strategy.

Every city should ensure extensive citizen engagement for any public project execution. The key learning through MR4 was that when we started incorporating citizens' design suggestion in the project, the usability and in turn the footfall of the project improved drastrically. Through our public engagements, we will scale up the network of champions in our city.

Shri. Sambhav Ayachi
Assistant Commissioner, Jabalpur


MR4 Road

5 Planetarium Road

Bengaluru, Karnataka

Scan here

Category
Sub-Arterial Street

RoW
10.5m

Length
0.5 km

Duration
Jul 2019- Apr 2022
(2 years 9 months)

Total Cost
₹14.5 Cr.

Nodal Authority
Bengaluru Smart City Limited (BSCL)

Implementing Partners
Design Consultant- JANA urban Space foundation, PMC- M/S Infrastructure Development Corporation (Karnataka) Limited (IDECK), Contractor- M/S ACR Projects Pvt Ltd.

Awards and Recognition
India Cycles4Change

Profile of the City

Bengaluru, the IT hub of India has a recorded population of 84.4 lakhs spanning an area of 741.9 sq km in which 21.8 sq km has been demarcated as the ABD area. The city was selected in Round 3 of the Smart Cities Mission — since then, it has undertaken 48 projects worth ₹1,033 Cr. in multiple sectors, out of which 16 projects worth ₹534 Cr. belong to the mobility sector. These projects majorly comprise of road redevelopment based on the Tender S.U.R.E guidelines. This fosters walkability, universal accessibility, and improvement in the basic services of the streets in the city.

Context of the Project

Planetarium road attracts high traffic flow daily as it is one of the major roads linking Bengaluru's corporate hubs. The aim of the project is to prioritize pedestrians and cyclists, based on the Tender SURE guidelines to prevent road disruptions due to recurrent excavations.

Vision of the Project

"Liveable Bengaluru- Healthy, Connected and Vibrant".

Earlier, the carriageway was wider, with narrow pedestrian pathway. There was no provision for dedicated cycle lanes.

The transformed street integrates wider pedestrian pathways with the NMT lane. The newly designed street encourages people to walk and cycle.

Cross Section of Planetarium Road

Note: This illustrative section is not to scale.

Design Highlights

01 **Uniform Carriageway Surface:** Ensures a consistent and smooth road surface, enhancing safety and comfort for all users.

02 **Optimising Right of Way:** The proposed street design having 3 lanes in the carriageway initially faced as a pushback as city officials thought that reduced carriageway width will cause congestion.

03 **Pedestrian-Friendly Design:** Emphasizes wide and well-designed sidewalks with amenities such as seating, street furniture, and greenery to enhance the pedestrian experience.

04 **Accessibility Features:** Ensures accessibility for differently abled individuals through the incorporation of ramps, tactile pavements, and other universal design elements.

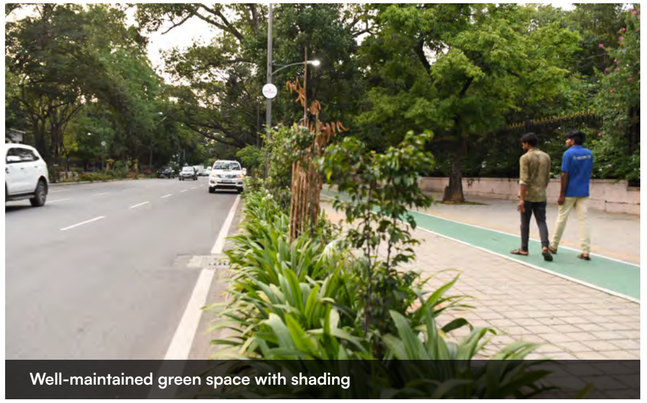
05 **Utility Ducts:** The main feature of the Tender S.U.R.E guidelines are the underground utilities. It Incorporates underground utility ducts to streamline the placement and maintenance of utility services, reducing disruption caused by frequent road digging.

06 **Street Furniture and Lighting:** Effective lighting contributes to the overall safety, usability, and attractiveness of the urban environment.

07 **Shared Cycle Lane:** Due to space constraints and promote the use of cycles, a shared cycle lane along with the footpath has been incorporated.

08 **Landscaping and Greenery:** Green spaces along the road have been contributing to environmental sustainability creating aesthetically pleasing urban landscapes.

810 sq m of space has been reclaimed for pedestrians and cyclists.



Well-maintained green space with shading

Shared cycle lane

Continuous walking space along the carriageway

Seating area along the pedestrian pathway

Project Journey


Implementation stage

01
Laying the Foundation

The city has also adopted the Directorate of Urban Land Transport Policy for cycle tracks to design and manage the city's cycle network.

✔ Completed ✖ Not yet started ● Ongoing

- ✖ Healthy Streets Policy
- ✖ Healthy Streets Cell
- ✔ Parking Policy
- ✖ Street Design Guidelines


Construction of road near Raj Bhavan area

- ✔ Site Visits
- ✔ Capacity-building workshops

02
Building the team's muscle

The city conducted regular capacity building workshops and site visits to other cities for peer to peer learning.

03
Doing things together

Stakeholder engagement
Stakeholders were involved during pre-execution of the project and during the preparation of DPR through focus group discussions at the ward level.

- ✔ Public Engagement
- ✖ Tactical Trial

City Level Advisory Forum (CLAF)
CLAF constituted of 4 MLAs, Assistant City Comissioner and City Commisioner. The CLAF was headed by the MP and reviewed the work progress every three months.

Traffic management
Work was planned such that implementation happened only on one side and traffic flow was managed on the other side.

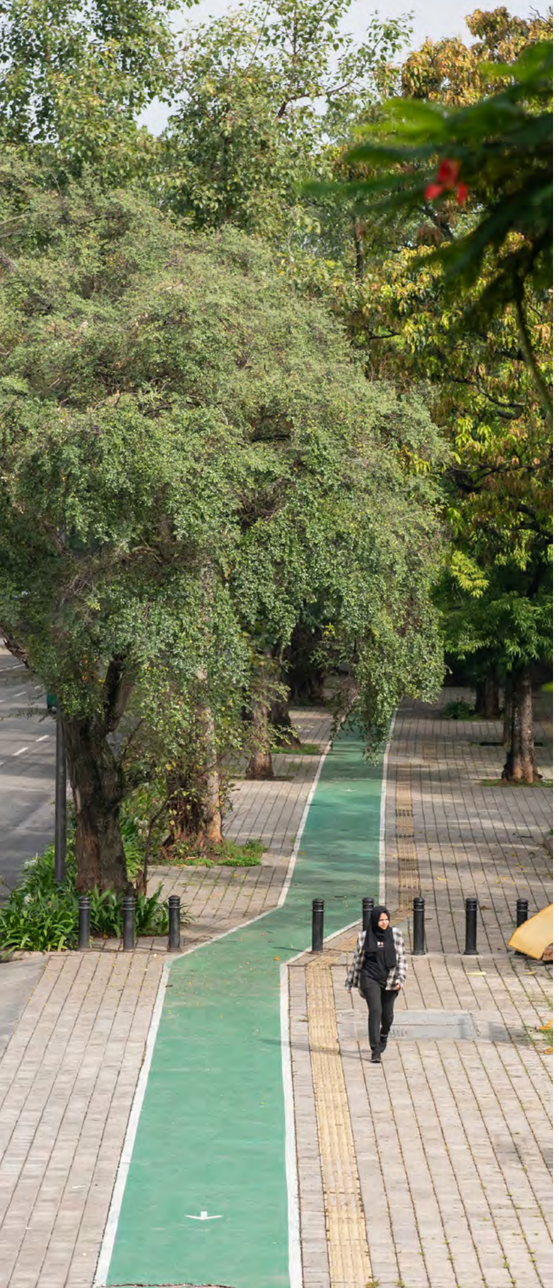
Optimising the Right of Way
The carriageway width was optimised to ensure that there is no extra space for parking and other encroachments.

04
Monitoring, learning and improving

Operations and maintenance
Operations and maintenance of built assets for a duration of three years is part of the contract.

Impact Assessment
The city is conducting Impact Assessment to asses the perception of all the stakeholders.


Stakeholder Consultation



Challenges

- After execution of the Tender S.U.R.E Road, other parastatal agencies could damage the completed road stretch. To avoid the re-work, all stakeholder coordination meetings were conducted.

Outcomes

- 810 sq m of space has been reclaimed for pedestrians.
- The number of cyclists using the street has increased after the project implementation. This positive impact has also nudged the city to take up similar projects across the city.

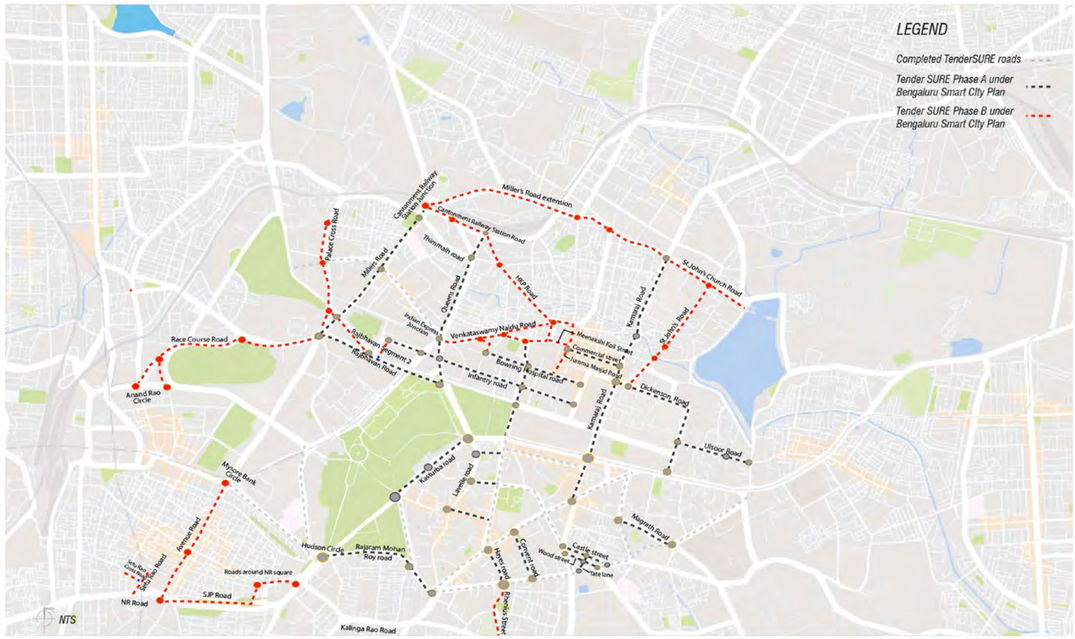
Impact Stories

Cities like Bengaluru, require pedestrian and cycling sensibilities. The city has taken right step by developing this road with dedicated footpath and cycle lane, that has provided safer mobility space for cyclists and pedestrians. Today, parents in the city don't encourage their children to cycle due to lack of NMT infrastructure. But with this move, everyone will have the opportunity to cycle in the city.

- Dasarathi GV, cyclist for past 20 years

Way Forward

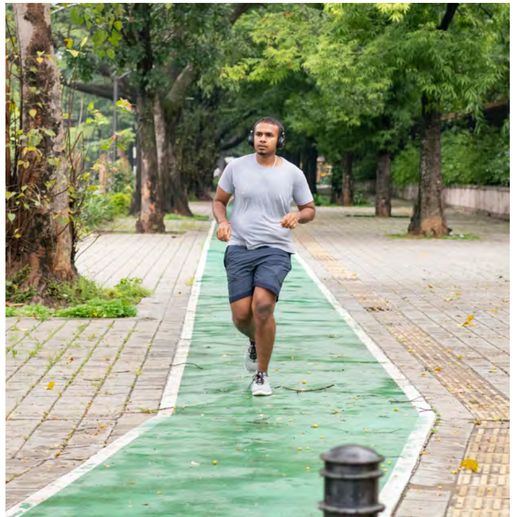
The street development being carried out in Bengaluru based on the Tender S.U.R.E guidelines showed positive feedback from the citizens and government officials due to their uniqueness. It was among the first few streets in the country to have a designated footpath, underground utilities, parking spaces, public plazas, etc. Recognizing this change, the Bengaluru Smart City Plan included a phased development of a series of streets marked in the centre of the city.



Scaling-up the transformation

At present, a 30 km long network of these streets is being executed as part of this plan. Once complete, the Tender S.U.R.E roads will result in one of the most pedestrian and cycle friendly streets in India, connecting Public transport like buses and metros to around 100 institutions and landmarks. The map above shows a phased development plan of the network being developed in Central Bengaluru. w


Planetarium Road



6 Smart Janpath

Bhubaneswar, Orissa

Scan here

Category
Arterial Street

RoW
60m

Length
5.8 km

Duration
Oct 2017- Feb 2022
(4 years 8 months)

Total Cost
₹79.57 Cr.

Nodal Authority
Bhubaneswar Smart City Limited (BSCL)

Implementing Partners
M/S EGIS India Consulting, M/S IBI India Limited, M/S Ernst and Young.

Profile of the City

Bhubaneswar ranked 1st position among the 100 cities selected under the Smart Cities Mission of the first planned cities in the country and is renowned as a Temple City. Having a total area of 135 sq km with a population more than 8 lakhs, Bhubaneswar Smart City has undertaken projects, worth ₹910 Cr., of which 90% of the projects by value (₹809 Cr.) are already completed under Smart Cities Mission. Bhubaneswar has implemented many unique projects under the Smart Cities Mission, including the iconic Smart Road at Janpath and the Bhubaneswar Operations Center (ICCC). Further, the Bhubaneswar Smart City has introduced initiatives such as Child-Friendly Smart City and Socially Smart Project that demonstrated inclusive thinking and decision-making processes ensuring citizen participation and responsive planning.

Context of the Project

Smart Janpath Road is one of the busiest roads, connecting different parts of the city, and has a metro station and provides access to Inter-State Bus Terminal (ISBT) and airport. Being one of the longest streets in the city, it was selected as a model street and envisioned to demonstrate a people-friendly transit-oriented development. This 5.8 km long Smart Janpath is a visionary project that caters to pedestrians and cyclists with dedicated pathways, active public plazas, and improved crossings. The project's success lies in its community-friendly approach, transforming the road into a pedestrian and cyclist-friendly haven.

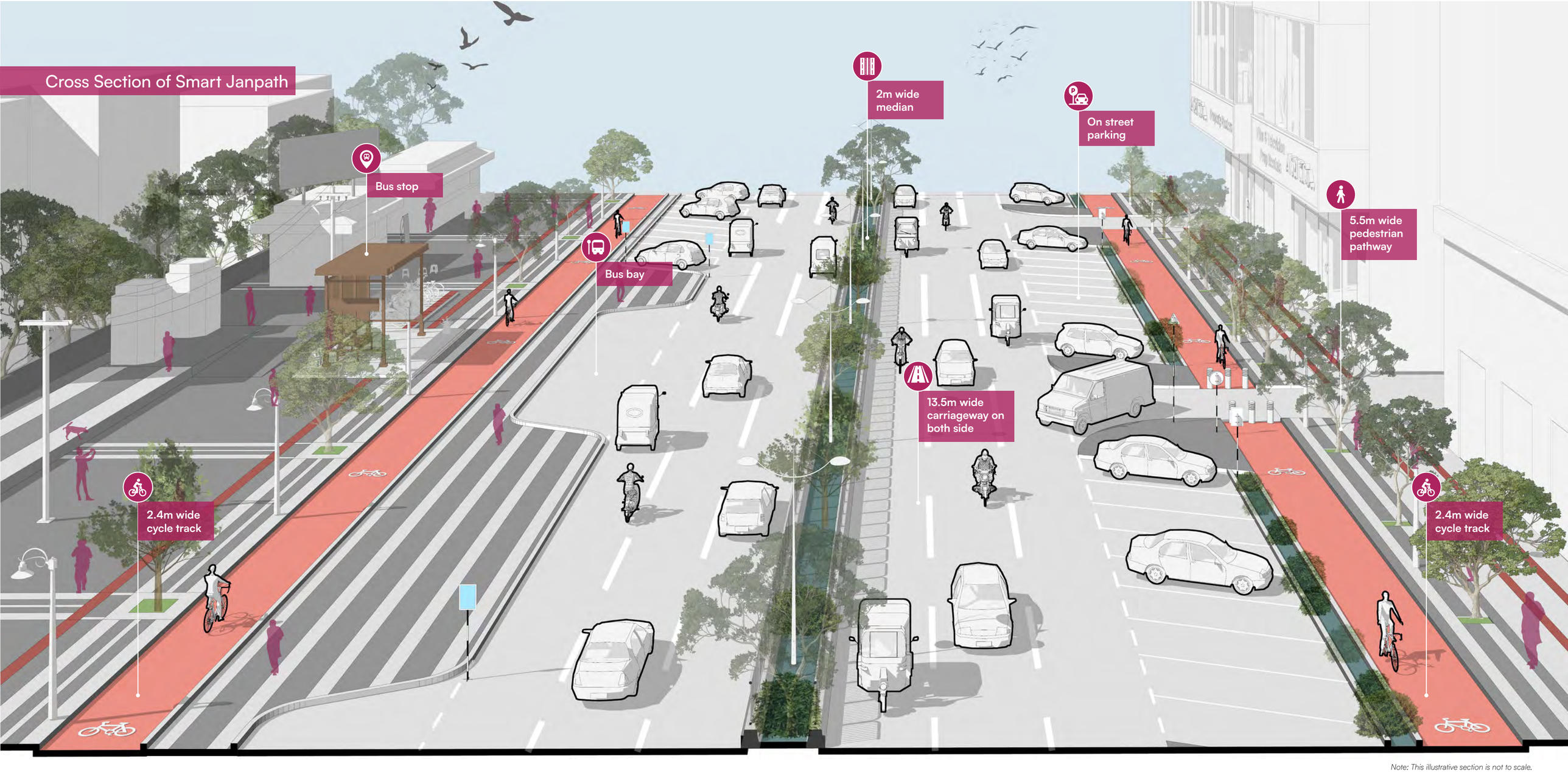
Vision of the Project

Revitalising urban life, the project envisioned transforming an arterial street into a vibrant community hub integrated with amenities while also ensuring its seamless connection to regions outside the city.

All underground utilities being integrated as per the IRC and Bhubaneswar Street Design Guidelines

A revitalised urban space integrated with segregated cycle track, footpath, and on-street parking facilities.

Cross Section of Smart Janpath



Note: This illustrative section is not to scale.

Design Highlights

01 Segregated footpath, cycle track, on-street parking management, dedicated vending zones, and bus stops integrated with amenities are the key features of this street design.

02 All the utilities are consolidated underground and traffic-calming measures, like rumble strips, zebra crossings, and bollards are integrated into the street design to regulate the pedestrian and bicycle movement.

03 Placemaking initiatives have transformed the street edge into inclusive public places integrated with public amenities like seating, street lighting, dustbins etc.

04 Pre-stressed concrete, stamped concrete and sand aggregate are used for the footpath, cycle track, and landscape elements respectively.

05 Bamboo filters are used in the median for green barricading and to ensure visibility from both the sides. Bamboo structures are also created along the edge to enhance the street identity.

This design celebrates the region's local materials and crafts.


Active street edge creates an inclusive streetscape

Public Bicycle Sharing stops integrated with bus stops


At-grade pedestrian crossings improve safety and accessibility


Segregated cycle track protected with a green buffer and seating provided under tree shade

Project Journey


Construction phase

01
Laying the Foundation

The city has also institutionalised a Street Vending Policy to organise and manage street vendors.

✔ Completed ✘ Not yet started ● Ongoing

- ✔ Healthy Streets Policy
- ✘ Healthy Streets Cell
- ✔ Parking Policy
- ✔ Street Design Guidelines
- ✔ Capacity-building workshops


Laying of underground pipes

02
Building the team's muscle

Peer-to-peer learning
Selected city engineers visited the street design projects in Pune and shared their observations with other team members enabling a peer-to-peer learning for the entire team.

03
Doing things together

Stakeholder engagement
All the stakeholders (including RWA, business owners, residents, NGO representing transgender community) were engaged throughout the project duration through stakeholder consultations and field visits on a regular basis for redressal and resolution of legal issues. Further, officials from Bhubaneswar Municipal Corporation, Bhubaneswar Development Authority, Public Works, Water Resources, Energy, Housing and Urban Development Department, Government of Odisha and communication agencies like BSNL, AIRTEL, TATA etc. were taken on board during the planning and decision-making process.

- ✔ Public Engagement
- ✔ Tactical Trial

Media engagement
Media was engaged for the outreach and to generate awareness about stakeholder consultation sessions.

24x7 Redressal Team
24x7 tracking and redressal of issues was ensured through WhatsApp groups and on-ground staff from the Bhubaneswar Municipal Corporation. The MD and CEO of Bhubaneswar Smart City received updates on a daily basis.

04
Monitoring, learning and improving

Monitoring
Two dedicated teams ensure proper enforcement in the area. They discourage mobile vendors, ensure symmetrical arrangements of vending kiosks, oversee proper parking of vehicles in assigned spaces, and tow vehicles. Moreover, the officials of Bhubaneswar Smart City were also entrusted with supervision duties in the Smart Janpath to monitor the same.

CCTV Surveillance
CCTV surveillance near bus stops focuses on people waiting as well as passengers boarding and de-boarding the buses to ensure safety.

Operations and Maintenance
The project contractor has been assigned a contract of four years for O&M of the street. Sanitation and street lighting is being managedd by the Bhubaneswar Municipal Corporation.

Innovative Solution:
On-street Parking Management

Lack of designated parking spaces near the existing commercial shop-fronts were a major concern for the business owners as well as the visitors. To tackle this, the street was redesigned to include on-street parking bays. These parking bays can be booked online. The system is being managed by a NGO, run by the transgender community.

The newly designed street with on-street parking bays accommodates 1080 designated parking bays that allow people to park close to their destination and has improved accessibility, boosting the businesses as well.

Challenges

- **Encroachment by vendors:** Initially the roads were encroached on by street vendors. There was major pushback from these vendors and from local people, however, this issue was resolved through several stakeholder engagements.
- **Laying of underground utilities:** Relocating underground utilities along the smart road. Through efficient engineered mechanism and stakeholder consultation with the officials from Bhubaneswar Development Authority, Public Works, Water Resources, Energy, Housing and Urban Development Department, Government of Odisha, this issue was resolved.
- **Pushbacks from Citizens:** Citizens filed cases in the court as they felt the design was not contextual. This was mitigated through participatory approach, where citizens were invited for workshop to provide feedback to the design consultants that satisfy the citizen's needs.

Outcomes

- **All Inclusive space:** The project has crafted an all-inclusive and vibrant public space with dynamic public plazas, fostering a sense of community and providing spaces for lively gatherings.
- **Reclaimed space for people:** 60000 sq m of space was reclaimed for pedestrians and cyclist after the implementation of the project.
- **Boosting local businesses:** The Smart Janpath has benefited 1,000+ business establishments on one side of the road and 100+ residential plots on the other side.

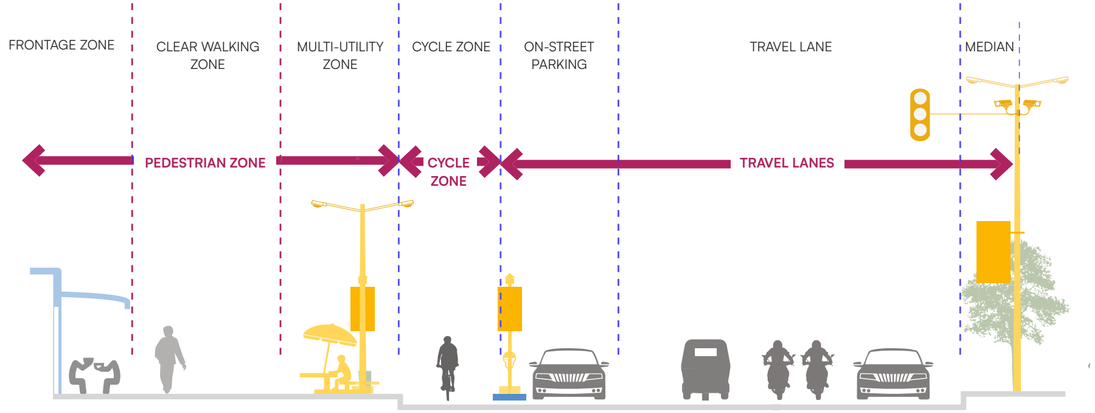
Impact Stories

Smart Janpath has truly transformed the heart of our city, Bhubaneswar. It's not just a road; it's a vision brought to life. The pedestrian and cyclist friendly pathways, vibrant public spaces, and dedicated vending zones have not only made it more accessible but also more enjoyable. Smart Janpath has quickly become a beloved part of our daily lives, reflecting the forward-thinking spirit of our community and setting a shining example for urban development.

- Mr. Sri Nirmal Kumar Mohapatra, Resident

Way Forward

Typical cross-section of future streets of Bhubaneswar



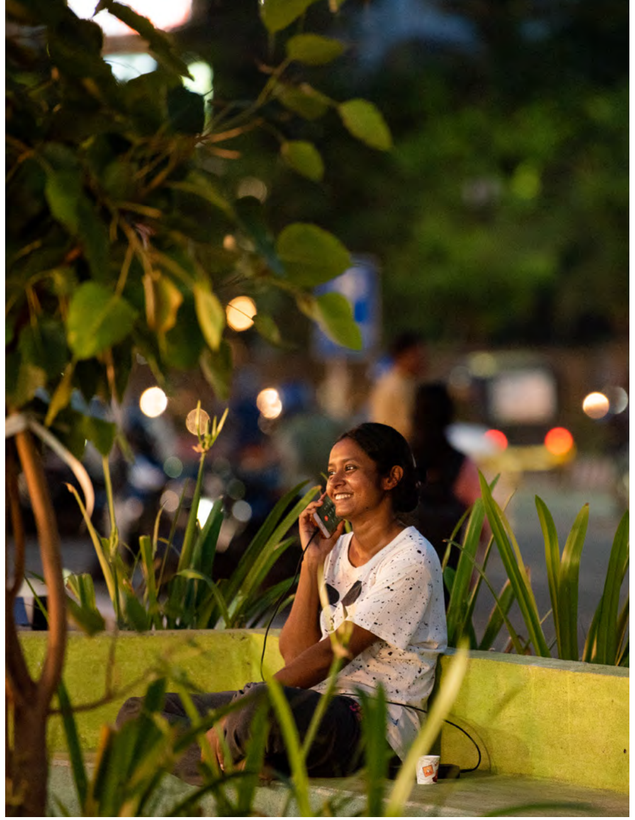
Scaling-up the transformation

To unlock the potential of urban streets, the Bhubaneswar Development Authority has launched the Urban Regeneration through Bhubaneswar Streets (URBS) Project, aiming to enhance the city's liveability. This initiative takes a multi-pronged approach, with Street Design Guidelines forming a crucial part. These guidelines will set the framework for the urban regeneration of streets and public spaces in Bhubaneswar.

In 2021, after the implementation of Smart Janpath the Street Design Guidelines and standards for Bhubaneswar was prepared to design the roads where space is allocated to safely balance the needs of all road users including pedestrians, cyclists, transit, and motorists. In a nutshell, the guideline provided a step-by step approach formulating a COMPLETE STREET.

Apart from the Street Design Guidelines, there are other multiple components of URBS such as placemaking initiatives, walkable neighbourhoods, Multimodal transport network, institutional support and mobilizing behavioral change initiatives (NMT day, cycle day, Car free day etc.) intended to achieve the overarching goal into a city that is safe for all ages of society.


Smart Janpath




TOILET

7 Sangvi-Kiwale BRTS Road

Pimpri Chinchwad, Maharashtra

Category
Arterial Street

RoW
45m

Length
3.8 km

Duration
Jun 2021- Nov 2023
(2 year 4 months)

Total Cost
₹32 Cr.

Nodal Authority
Pimpri Chinchwad Smart City Ltd (PCSCL)

Implementing Partners
Local Administration: Pimpri Chinchwad Municipal Corporation, Design Consultant: Prasanna Desai Architects, Project Contractor: Nikhil Construction Group Pvt. Ltd., PMC: EnviroSafe Consultants

Context of the Project

The Sangvi-Kiwale BRTS Road, a vital connection between Pune and Pimpri Chinchwad, was characterized by heavy vehicular traffic and large institutions. Further, it provides an important connection to IT Hub- Hinjewadi. Despite high footfall and cyclist numbers, it lacked essential walking and cycling infrastructure. Recognising this need, the project was conceptualised to address the above challenges and transform it into a pedestrian and cyclist-friendly corridor with enhanced access to the BRTS.

Vision of the Project

The project aims to create continuous and dedicated walking and cycling infrastructure while enhancing access to the BRTS.

Project Journey

Laying the Foundation

In 2018, Pimpri-Chinchwad Municipal Corporation (PCMC) initiated the Urban Streetscapes Programme, adopting the NMT Policy in 2021. Later the Harit Setu Plan was developed which serves as the city's NMT Master Plan. To foster implementation of NMT infrastructure, a team dedicated to streets development was set up which ensured regular capacity.

Key Actions

As part of the India Cycles4Change Challenge, tactical trials were carried out, introducing a 1 km pop-up cycle lane. Positive public feedback led to the implementation of permanent walking and cycling infrastructure along the entire 3.8 km corridor. Furthermore, to develop a desirable NMT network, citizens and cyclist groups were involved through handlebar surveys to evaluate usability, while perception surveys were employed to gauge public opinions. The entire stretch is lined with several institutional land uses, making it a very low-footfall zone. To activate the street PCMC has planned for six placemaking interventions, out of which three have been executed. potential locations for similar infrastructure improvements.

Design Highlights

For a seamless pedestrianization and cycling infrastructure, the design included continuous and segregated walkways and cycle tracks, landscaping elements as buffers from the carriageway, and multi-utility zone. Since it is a high speed corridor, to maintain the green cover existing trees were preserved, and tree pits were made for water percolation for ground water recharge.

Challenges

- One of the major challenges was - heavy vehicular traffic across the road stretch, due to which the NMT infrastructure had to be carefully planned.
- Since a long NMT network had to be incorporated, it became very crucial for public surveys and public consultations to understand the desirability of the project.

Outcomes

- Socially active streets have been developed in the city.
- This NMT network encouraged PCMC to adopt a planned network approach in its master plan.
- Enhanced pedestrian connectivity along the significant connector with Pune.

8 Alkola Circle Road

Shivamogga, Karnataka

Category
Arterial Street

RoW
30m

Length
2.8 km

Duration
Mar 2018- Dec 2021
(3 years)

Total Cost
₹21.28 Cr.

Nodal Authority
Shivamogga Smart City Ltd.

Implementing Partners
PMC: Tata Consulting Engineers, Contractor: HD Infrastructure, Local Administration: Shivamogga City Corporations, MESCOM, KUWSandDB, Water Supply Department

Context of the Project

The Smart Road project in Shivamogga City aims to enhance road safety and improve the level of service (LOS) for road users. This initiative prioritises Non-Motorised Transport (NMT) infrastructure like footpaths and cycle tracks. It also involves the conversion of overhead electrical lines to underground cabling within the ABD area. This project spans from Ashoka Circle to Prof. Krishnappa Circle and includes all features which improves the quality of life.

Vision of the Project

The project envisions promoting growth through zoning regulations, transportation infrastructure, and business district development. It strives to improve air quality, aesthetics, and safety for all road users.

Project Journey

Laying the Foundation

Recognizing the importance of developing one of the important streets stretches in the city, the project was initiated by Shivamogga Smart City Ltd. and was developed based on the principles mentioned in the Healthy Streets Policy.

Key Actions

Stakeholder consultations were conducted in the initial stages of the design development through focused group discussion, ward level citizen/ stakeholder engagement or through NGOs and third-party organizations. Apart from the regular in-person consultations, site visits were also conducted to give an idea of the proposal. The collection of feedback responses was done through online public grievance portals.

Design Highlights

The street has been designed with segregated footpath, segregated cycle track, on-street parking management, at-grade crossings and interactive multi-purpose spaces. Street furniture like granite seatings, play equipment, streetlights, etc. have also been placed. In addition to this, a dedicated bus stop, PBS stations and public toilets enhance the completeness of the street.

Challenges

- Variations in the RoW widths led to multiple design changes related to footpath and corridor separation which consumed time.
- Another challenge faced was getting the clearance for land acquisition and encroachment clearance. After execution there were persistent unorganized spaces for the auto-rickshaws and street vendors.

Outcomes

- The public has started utilizing cycle tracks as well as footpaths which were absent earlier.
- 22000 sq m of space has been reclaimed for pedestrians and cyclists.

9 Civil Line

Sagar, Madhya Pradesh

Category
Arterial Street

RoW
21m

Length
3.5 km

Duration
Mar 2021- Nov 2022
(1 years 8 months)

Total Cost
₹54.25 Cr.

Nodal Authority
Sagar Smart City Limited (SSCL)

Implementing Partners
Sagar Municipal Corporation, Madhya Pradesh Road Development Corporation Limited, Town and Country Planning Department Sagar, NH-PWD, Grant Thornton Bharat LLP(PMC), Sreeji Infrastructure India Pvt. Ltd. (Contractor)

Awards and Recognition
HUDCO Award for Best Practice

Context of the Project

Sagar Smart City was selected in the round 3 of the smart cities challenges as one of the smart cities from Madhya Pradesh. As part of the Master Plan 2031, the city envisions on improving pedestrian movement and enhance connectivity. This particular road running from Civil Line to Tili Junction is part of the Smart Road Project undertaken by the Sagar Smart City. This street connects major parts of the city—from the corporate offices, banks, coaching institutes, and food courts in the Civil Line area to the Central University, Officers Colony, colleges, and playgrounds in other parts of the city.

Vision of the Project

The project strived to enhance traffic flow, connectivity, and urban living by creating a modern road equipped with streetlights, footpaths, and essential infrastructure, aligning with the city's development vision.

Project Journey

Laying the Foundation

The project strictly adhered to IRC guidelines and government codes for different types of work, ensuring compliance with the required standards.

Key Actions

Through focused group discussions, capacity building workshops, Ward level citizen and stakeholder engagement, social media campaigns, street design inputs from the stakeholders and citizens were incorporated into the design. During the implementation, the roads' profile was corrected to ensure proper gradients. Furthermore, streetlights, walkways, green spaces, underground multi service- ducts, and parking spaces were implemented as part of the project.

Design Highlights

Design highlights include segregated footpath, on-street parking management, organised on-street vending, underground utilities, cycle parking areas, multi-purpose open spaces, seating areas, landscaped corridors, public toilets, and food plaza.

Challenges

- The project faced encroachment issue, however, with the help of Municipal Corporation and Sagar Collectorate this issue was resolved during the pre-execution stage.
- During the implementation stage, the biggest challenge was to accommodate a 800mm diameter of Underground Water Supply Pipeline System as part of the street design. The design was then modified to include a 100mm diameter pipe.
- Post implementation, the people started encroaching the road with vehicular parking, which resulted in major traffic congestion. However, through on-site parking management, Integrated Traffic Management System, help from Traffic police and continuous public campaign this issue was resolved.

Outcomes

- The project has improved pedestrian safety, streamlined vehicle movement, and enhanced the quality of life.
- 14000 sq m of space was reclaimed for pedestrian and cyclist infrastructure as part of the is Smart Road Project.

10 Dal Lakefront Promenade

Srinagar, Jammu and Kashmir

Category
Arterial Street

RoW
6m

Length
5.10 km

Duration
May 2022- Nov 2023
(1 year 6 months)

Total Cost
₹30.97 Cr.

Nodal Authority
Srinagar Smart City Limited (SSCL)

Implementing Partners
Hassan Roads Construction Company (HRCC)

Context of the Project

The Northern Foreshore Road (NFR) being an important vehicular connection is also an important lakefront destination that is thronged by visitors and local cyclists and pedestrians. However, the road lacked sufficient pedestrian walking and safe space for cyclists. Srinagar Smart City Limited (SSCL) has developed a Dal Lakefront promenade with a wide walkway and dedicated cycling facility spanning 5.10 km from the famous Nishat Bagh to Habak along Northern Dal Lakefront. The promenade has ensured safe movement of pedestrians and cyclists and enhanced the ambience of Dal Lake.

Vision of the Project

The project aims to transform Dal Lakefront into a vibrant and inviting public space, offering an exhilarating walking and cycling experience amidst the breathtaking waterscape of the pristine Dal Lake.

Project Journey

Laying the Foundation

Aligning to the city's vision of making people-friendly streets, the Srinagar Smart City adopted NMT plan to enhance the safety of pedestrians and cyclists. Coupled with a dedicated cycle track and pedestrian pathways, this promenade poised to bridge the gap and facilitate easier and more enjoyable passage between key nodes of city, while enhancing the overall experience for visitors and locals.

Key Actions

The 5.10 km long Dal Lakefront promenade has ensured safe and secure space for walking and cycling along with dedicated shaded space for social activities. To ensure inclusivity and universal accessibility, kerb ramps, tactile pavements, and rumble strips are incorporated as part of the promenade.
For fostering late-night activities high-quality lighting has been installed that creates an inviting ambiance conducive to evening activities.
The removal of visual clutter, such as wires and billboards, has significantly enhanced the visual panorama, allowing for unobstructed and improved interaction with the stunning beauty of the Dal Lake.

Design Highlights

The streetscape design includes a 3m wide dedicated two-way cycle track, public bicycle docking facility along with 2.5m wide pedestrian walkway. Tactile flooring and kerb ramps are used for universal accessibility. Viewing decks with open seating areas and gazebos provided. Street furniture like bollards, signages and LED streetlights have been also incorporated as part for the design.
The design follows local architecture style in order to respond to the context.

Challenges

- The development of a 6M wide promenade has been challenging as the site offers an extremely low bearing capacity of less than 1.5 MT. To overcome this an efficient structural system was developed with a network of pile systems and cantilevered decking.
- The Reinforced Cement Concrete (RCC) piling and decking work has been executed in a record-breaking timeline in extreme cold weather conditions.

Outcomes

- **Active Dal Lakefront:** The Dal Lakefront has undergone a remarkable transformation, evolving into a bustling and lively public space attracting locals and visitors.
- **Enhanced Safety:** The establishment of a dedicated two-way cycle track and a spacious pedestrian walkway has significantly improved safety for cyclists and pedestrians. This has effectively reduced accidents and fatalities.
- **Improved Connectivity:** The 5.1 km pathway and cycle track, constructed on a cantilever deck slab over the lake shoreline, create a seamless connection between Nishat and Habak, Naseembagh.
- **Tourism Promotion:** The project's completion elevates the area's tourism potential, turning it into a major attraction. Visitors can now enjoy a safer and more enjoyable experience while exploring the Dal Lakefront, consequently boosting tourism in the region.
- **Vibrant nightlife:** The nightlife along the Lakefront has seen an incredible surge, completely transforming the dynamics of the area. This has boosted new economic opportunities.

11 Dharmnath Marg

Belagavi, Karnataka

Category
Arterial Street

RoW
30m

Length
2.4 km

Duration
Sep 2019- Mar 2020
(6 months)

Total Cost
₹32.68 Cr.

Nodal Authority
Belagavi Smart City Limited (BSCL)

Implementing Partners
Design Consutants: Tractebel Engineering Pvt. Ltd., Local Administration: City Corporation of Belagavi Corporation, BSCL, KUIDFC

Awards and Recognition
Smart Project Awards in the category "Smart and Successful Citizen Engagement" was presented to Belagavi Smart City for the Multi-Dimensional Inclusive Project on 26 August 2022 in the event — Smart Urbanization, Mumbai.

Context of the Project

The project was initiated jointly by the Belagavi City Corporation and Belagavi Smart City Limited, in coordination with the Karnataka Urban Infrastructure Development and Finance Corporation (KUIDFC). It was divided into five packages, covering 27.25 km of roads, focusing on specific construction and enhancement initiatives in the city's most congested areas as part of a comprehensive road improvement plan under the Smart Cities Mission.

Vision of the Project

The aim is to provide core infrastructure, enhancing the quality of life for citizens, and offering smart solutions for operations and maintenance services.

Project Journey

Laying the Foundation

The project has been implemented on the principles of Healthy Street policy and undertook capacity-building initiatives, such as peer-to-peer learning from other cities through site visits.

Key Actions

The project standardized lane widths, created pedestrian friendly footpaths, cycle lanes and planned utilities. Contractors were engaged in operations and maintenance (O&M) of the street. Local civic authorities and common public were involved through meetings, mobile applications, and social media (LinkedIn, Twitter, Instagram). Additionally, digital tools such as online surveys, webinars, and virtual workshops helped crowdsource design ideas and feedback.

Design Highlights

The street was designed with with IPT bays, on-street parking and underground utilities. Street furniture like smart street poles with LED lights and CCTV surveillance have also been installed. To create public spaces on the street, elements of placemaking have been incorporated.

Challenges

- Encroachment was one of the key challenges faced in Belagavi Smart City leading to design changes. As a result, there were various amendments to the original scope of work. Elements like cycle track, HDPE Pipe laying for utility, reduction of the RoW, etc. had to be descoped to avoid encroachments which had implications on the project timelines, costs and deliverables.
- After completion, a few challenges related to parking management emerged. Removing on-street parking spaces resulted in the requirement of dedicated parking spaces like MLCPs, etc.

Outcomes

- Significant cycling activity is observed on the street after the implementation of a dedicated cycle track in which the cycling count per hour has increased from 372 to 425.
- 4252 sq m of space was reclaimed for pedestrians and cyclists.
- A modal shift has been observed after the implementation of the street — the pedestrian count has increased from 970 to 1050 pedestrians/ hour after implementation of a dedicated and seamless footpath.

12 Dr. Radhakrishnan Road

Tumakuru, Karnataka

Category
Sub-Arterial Street

RoW
20m

Length
0.65 km

Duration
Mar 2019- Mar 2023
(4 years)

Total Cost
₹5.74 Cr.

Nodal Authority
Tumakuru Smart City Limited (TSCL)

Implementing Partners
Tumakuru Smart City Limited (TSCL), Karnataka Urban Infrastructure Development and Finance Corporation (KUIDFC), IPE Global Ltd (PMC), M/s Sri Srinivasa Constructions (I) Pvt Ltd.

Context of the Project

Dr. Radhakrishnan Road is part of the Bengaluru-Honnavar Highway that runs through Tumakuru. The street has been redesigned to include wide footpaths on both sides and a linear green space and cycle track in the center of the road. These interventions have improved the livability aspect of the street.

Vision of the Project

The project aims to improve connectivity, prioritize pedestrians, and enhance urban aesthetics, aligning with the city's broader development vision.

Project Journey

Laying the Foundation

The city's unique initiative involved extensive public consultations to address pedestrian needs and transform the congested highway into a people-friendly thoroughfare.

Key Actions

In the initial stage, the city organised mass community engagement sessions with stakeholders and citizens, in community halls to get feedback on the planning and the design of the project. Further, monthly ward-level consultations facilitated public input, with Deputy Commissioner of Tumakuru and MD and CEO of TSCL co-chairing to tackle urban issues.
During the implementation stage of the project, the City Police and Corporation worked together to remove the encroachments on the road. To enhance the greenery of the street, 15 new trees were planted, and 18 mature trees were relocated during the expansion of the road.

Design Highlights

Notable design elements include a segregated cycle track, spacious footpaths, parking spaces for shopkeepers and street amenities like lighting, furniture, and public bicycle sharing stations. The design included tabletop crossing to regulate the vehicle speed and to facilitate pedestrian crossings. Materials used are locally sourced and the shredded plastic wastes are used in the asphalt works of the road. CCTVs and Emergency call box/ panic buttons are installed on the street to ensure safety.

Challenges

- The biggest challenge was the clearances of the encroachment on the street. With immense support and coordination of the City Police and Corporation the issue was resolved.
- During the excavation works, the underground utilities such as existing BSNL cables, water supply lines were carefully safeguarded by the implementing agency.
- Post the completion of the project, the pedestrian paths were encroached by vendors that was managed under the City Corporation.

Outcomes

- The street observed an increase of pedestrian footfall from 423 to 655 during the peak hours
- 2600 sq m of space was reclaimed for pedestrian after the implementation of the project.

13 Dedicated Cycle Tracks

Chandigarh

Category
Arterial Street

RoW
2.4m

Length
220 km

Duration
Jan 2017- May 2022
(5 year 5 months)

Total Cost
₹22.5 Cr.

Nodal Authority
Chandigarh Smart City Limited (CSCL)

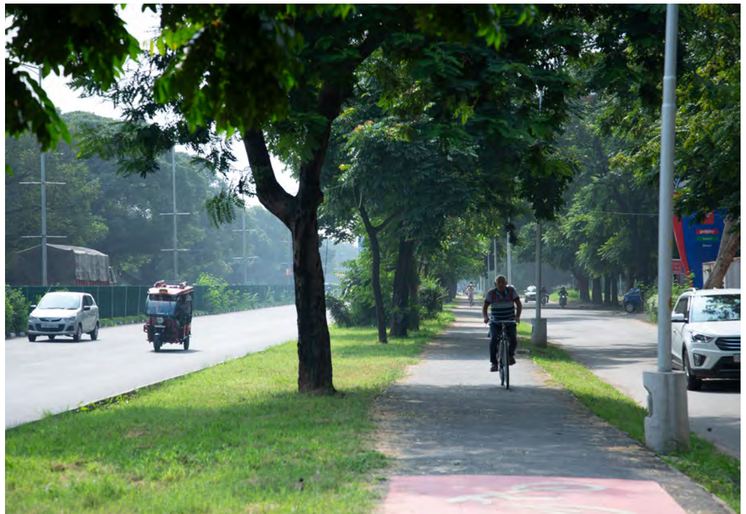
Implementing Partners
Chandigarh UT Administration, Engineering Department Chandigarh Administration.

Context of the Project

Driven by high per capita vehicle ownership, Chandigarh initiated the project to promote cycling in order to encourage modal shift to sustainable modes of transport. The project constitutes an extension of the existing 200 km cycle network and footpathalong the city's seven categories of streets, commonly known as the 7 Vs. It encompasses vital road segments, including Uttar Marg, Sukhna Path, Sarovar Path, and Purv Marg. The city is committed to achieving carbon neutrality and has introduced India's largest Public Bike Sharing system, comprising 5,000 bicycles and 617 docking stations which has led to a reduction of over 1000 MT of carbon emissions.

Vision of the Project

Chandigarh aspires to embrace bicycles as a clean and affordable mode of transportation to become "The Bicycling Capital of India".



Project Journey

Laying the Foundation

As the foundation of the project, a Healthy Streets Apex Committee was formed. The city adopted policies such as the Healthy Street Policy, Bicycling Vision Policy and Healthy Street guidelines.

Key Actions

The city embraced various strategies to involve the citizens in the process and raise awareness. They conducted regular cycling events and citizen outreach programs, gathered user testimonials, set up feedback mechanisms. In addition, they also conducted cycle rallies, cyclothons, cycle training workshops, and cycle2work campaigns. Citizen participation surveys and focused stakeholder discussions were carried out to finalize the proposals to meet the city's requirements. The city also conducted pilot interventions along several corridors in the city. In-house officials from the various departments such as Engineering Department, Horticulture Department, Urban Planning Department and Traffic Safety and Security department were appointed to ensure proper maintenance of the newly constructed cycle track and also taking care of the safety and security of the cycle users in the city.

Design Highlights

Design highlights include pelican crossings, illuminated cycle tracks, table-tops for traffic calming and junction redesigning. Street light poles were added at a later stage to provide well illuminated cycle tracks for the cyclists.

Challenges

- Cyclists found it difficult to cross the junctions safely. The city then focused on redesigning the junctions for safety and also improved the cycle timings in the traffic signals.
- Keeping in view the safety aspects of bicycle users, street light poles and surveillance cameras were installed alongside the cycle tracks and are being monitored in ICCC of Chandigarh.

Outcomes

- After the construction of segregated cycle tracks/lanes, more people can be seen using cycle to make commute, resulting in project's success.
- Citizens can be seen adopting cycling in their daily use and stepping towards a healthy lifestyle.

14 Ernakulam Smart Roads

Kochi, Kerala

Category
Arterial Street

RoW
7.5m

Length
5.5 km

Duration
May 2022- Nov 2023
(1 years 6 months)

Total Cost
₹52 Cr.

Nodal Authority
Cochin Smart Mission Limited (CSML)

Implementing Partners
Kochi Municipal Corporation,
IPE Global Limited (PMC),
Deens Group (Contractor)
KIIFCON Private Limited

Context of the Project

With the introduction of metro rail and the integration of various modes of transport, there was an urgent need to upgrade the existing infrastructure. This demanded the development of the major roads within the ABD area of Kochi Smart City to world-class standards, by providing underground provisions for the utilities and designing safe and lively streets. Aligning to this, Kochi transformed the existing road networks such as Abraham Madammakkal Road, Shanmugham road, Park Avenue Road, Banerji Road, and Durbar Hall Road into Smart Road by providing dedicated cycle tracks, pedestrian pathways and world class underground utilities.

Vision of the Project

The project envisions developing an inclusive and complete arterial system with high class infrastructure and basic amenities to meet world class standards.

Project Journey

Laying the Foundation

The project commenced with identifying and shortlisting a network of streets—streets which were the main thoroughfares and streets that ran along the main waterfront projects in the city. The strategic locations of these roads created opportunity for implementing the pilot stretch. All the selected roads were well connected and also runs along the major landmarks and transit nodes such as Ernakulam boat jetty, Maharajas College, Durbar Hall, KSRTC bus station of the city.

Key Actions

The city aspired to create world-class street infrastructure with a people-centric design approach. The scope of the project mainly includes relaying of roads, creating footpaths, painted cycle tracks, aligning of underground utility duct, reconstruction of stormwater drainage system, upgradation of the defined carriageway as per the standards, junction improvement, provision of bus bays, multi-utility zones hawker zones, and parking. The project was developed in collaboration with mutiple city departments, ULBs.

Design Highlights

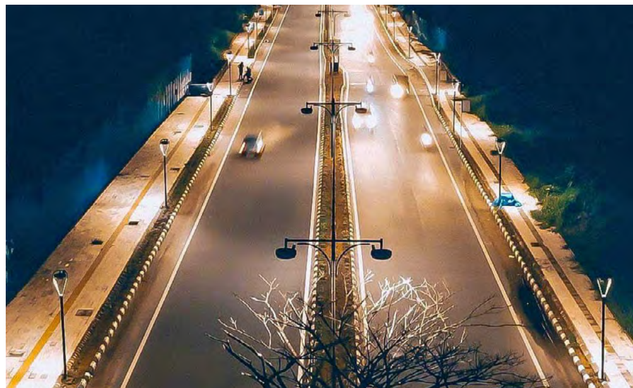
The streetscape design includes well-illuminated dedicated pedestrian pathways and cycle lanes, with wayfinding signages placed along the road stretches. The dedicated pedestrian pathways were designed as per the standard guidelines and with innovative street furniture.

Challenges

- Breakage of existing underground utilities occurred during excavation, which necessitated the replacement of old utilities with new ones.
- The construction of footpaths encountered resistance from shopkeepers. To address this, the city sought to build the support of the shopkeepers by conducting multiple consultations with them and other stakeholders.
- Protests arose from the public regarding the reduction in road width after footpath construction. However, the city built public support for the project and resolution was achieved through multiple discussions with people representatives, residents' associations, and ward councilors.

Outcomes

- The development of the road has enhanced the quality of life for citizens, and ensured the safety for cyclists and pedestrians.
- The stretch promotes NMT and reduces traffic congestion.
- There is an increase in footfall of people on the pedestrian pathways after the renovation work.
- The project is adjacent to many commercial buildings, business establishments, retail shops, food cafes, and restaurants. The development of the Smart Roads along this stretch has boosted the local economy and have fostered the socio-cultural growth of the region.
- This project has improved connectivity to other parts of the city of Ernakulam and facilitated easy access to the West Kochi area.



15 Green Mobility Corridor

Hubballi-Dharwad, Karnataka

Category
Sub-Arterial Street

RoW
3.5m

Length
9.25 km

Duration
May 2023- Aug 2023
(3 months)

Total Cost
₹165.68 Cr.

Nodal Authority
Hubballi-Dharwad Smart City Ltd. (HDSCL)

Implementing Partners
KVR Contractors, Aminbhavi and Hegde, Local Administration — Hubballi Dharwad Municipal Corporation

Context of the Project

The project had been taken up under the CITIIS program of the Smart Cities Mission. The project underwent a phased approach, emphasizing environmental sustainability, NMT corridors, and public spaces along the Unkal Nala. The project is divided into 3 phases. Phase I included a pilot quick win project of 0.6 km, Phase II consisted of 5 km and the remaining 3.6 km was taken up in Phase III. This initiative focused on rejuvenating Hubballi's Unkal Nala, a drainage channel, transforming it from a simple stormwater drain into a holistic community space.

Vision of the Project

The project envisions converting Unkal Nala into a green mobility corridor, fostering sustainable urban mobility, flood management, sewage treatment, waste control, and green space expansion.

Project Journey

Laying the Foundation

The project is developed under CITIIS program. The foundational pillar of this project is to contribute to social inclusion, environmental resilience, and sustainability.

Key Actions

The project went through a maturation stage that included systematic planning and monitoring before on-ground implementation of the project. In this stage, the stakeholders engagement, public consultation, and tactical trials are conducted. For the acceptance of this project, various awareness initiatives were implemented to enagage citizens. This includes radio shows, bicycle rallies, pamphlet distribution, door-to-door engagement, and Plog runs.

Design Highlights

The project employed Natural Hybrid technology and treated 3 MLD of sewage water. The inflow of sewage water was reduced by 28 MLD into the nala. Solid waste management was an important aspect in the project which curbed 16 tonnes/day of littering. The addition of 22 acres of green cover includes 6 parks developed in the city. For public consultations, citizen and stakeholder engagement at the ward level included NGO's and third-party organisations. Over 4,000 household surveys were conducted during the maturation phase and feedback was gathered via focused group discussions. The project incorporated like Gabion walls to prevent flooding. In areas where there was not enough land available to construct the cycle track, a cantilever was erected inside the nala, instead of acquiring private lands. A 10 ft high chain-link fence is erected all along the nala, and at all the 12 bridges. The other features include cycle and walking track, children's play area, public activity zone, landscape areas, open gyms, public bike sharing stations etc.

Challenges

- The entrance to Unkal nala and the area surrounding it was an overgrown swamp, filled with weeds and snakes without any clear boundaries. An ADLR survey was conducted, and boundaries were marked in consultation with Hubballi Dharwad Municipal Corporation.
- Unlike traditional infrastructure projects, the project required labour and machinery to work in the slush and smell of a live nala. The water had to be diverted at every stretch. The labour sometimes had to deal with fresh sewage entering the site where they were working. Despite all these challenges, work continued at a brisk pace as safety, environmental and social safeguards were followed. The nala carried an unhygienic mix of lake overflow water, storm water and sewage. Hence, a new UGD trunk line had to be laid 1.5m below the nala floor with chambers extending up to a height of 4m, above the Highest Flow Level (HFL) of the nala. This was challenging as the large pipes had to lowered into trenches where it was nearly impossible for labour to even stand.

Outcomes

- The Green Mobility Corridor project has transformed the landscape of an important part of the city. The stakeholders, i.e. the residents living along the nala opine that the nala does not stink anymore. This is primarily due to construction of a dedicated UGD line underneath the nala to prevent mixing of storm water and sewage, and secondarily due to the reduction in solid waste dumping inside the nala.
- People have also been using the bicycle track as a walking path and as a shortcut to get from one area to another within the city. In addition to this, 15,000 sq m of space has been reclaimed for the pedestrians and cyclists.

16 Harbour Park Road

Visakhapatnam, Andhra Pradesh

Category
Sub-Arterial Street

RoW
15m

Length
1.1 km

Duration
Jun 2018- Dec 2022
(4 year 6 months)

Total Cost
₹8.81 Cr.

Nodal Authority
Greater Visakhapatnam Smart City Corporation Limited (GVSCCL)

Implementing Partners
Greater Visakhapatnam Municipal Corporation, AECOM India, Shapoorji Pallonji Group

Context of the Project

Visakhapatnam was selected as one of the Smart Cities in Round 1 of the Smart Cities Challenge. Having a total area of 514 sq km, the city has implemented various streetscape projects. To prioritize a pedestrian-friendly environment over a vehicle-dominated road, the Visakhapatnam Smart City developed Harbour Park Road that leads to RK beach.

Vision of the Project

Visakhapatnam aspires to become a "pedestrian-friendly city" by prioritizing pedestrian safety and enhancing the urban environment.

Project Journey

Laying the Foundation

The city formed an Apex Committee and adopted NMT network plan to promote pedestrian-friendly streets.

Key Actions

A participatory planning approach was embraced, coupled with effective communication tools, regular citizen outreach programs, and feedback mechanisms to engage citizens and drive behavior change. Further, the city conducted initiatives like street cleaning, parking drives, and collaborated with the Traffic Police to kickstart the on-ground transformation.

Design Highlights

Project incorporated design elements, such as pelican crossings, table-tops for traffic calming, junction redesigning, pedestrian pathways, and the inclusion of car and bike parking facilities.

Challenges

- During the initial phase of implementation, there was resistance from several stakeholders for the project. However, with continuous rigorous stakeholder and citizen-inclusive workshops, the design was formulated, and the issue was resolved.
- The terrain was one of the biggest challenges. The efficient alignment of the carriageway with parking and pedestrian pathways was very critical at the design stage, which led to a successful implementation of the road.

Outcomes

- Harbour Park Road is one of the major spines that connects to the most important attraction of the city that is the RK Beach. After the development of the streetscape, the footfall has increased during the peak hours.
- The wider pedestrian pathways with seating areas have encouraged social interaction during the evening hours,
- Road is well illuminated and safer now for pedestrians, as the road safety measures have been incorporated as part of the street design.

17 Iconic Road

Surat, Gujarat

Category
Arterial Street

RoW
60m

Length
2.1 km

Duration
Jan 2017- Aug 2019
(3 years 2 months)

Total Cost
₹14.1 Cr.

Nodal Authority
Surat Municipal Corporation (SMC), Surat Smart City Development Limited (SSCDL)

Implementing Partners
Road Development Department (SMC), South West (Athwa) Zone (SMC), Bhosekar Vikas and Nilima (Design Consultants)

Context of the Project

This street is a major connector between the city and the airport, facilitating access to the National Highway, which, in turn, leads to the major industrial hub of Surat, Hazira. Additionally, this thoroughfare intersects with Surat's renowned Dumas Beach, a popular tourist destination. Initially plagued by congestion due to vehicular traffic and lacking walking and cycling infrastructure, the project's objective was to promote walking, cycling, and public transportation.

Vision of the Project

The project envisions a balanced road for pedestrians, cyclists, and vehicles, promoting public health, improved mobility, and a positive city image.

Project Journey

Laying the Foundation

To ensuring the sustainability of the project, the city has already laid a strong operation and maintenance strategy for 15 years, which is to be executed by a private agency through Public Private Partnership model.

Key Actions

In the initial stage of the project, extensive public consultation was conducted to co-create a uniform vision for the street. During the implementation stage, the project adopted a creative approach of using pile and raft foundations for the installation of hoardings, bus stops, underground water tanks, drip irrigation, and plant sprinklers to minimize the need for relocating existing utilities. With high salt content, the top 3 feet of existing soil were removed and replaced with garden clay soil for shrub plantation.

Design Highlights

1.5m wide of segregated footpath, 2.5m of dedicated cycle track, on-street parking, and underground utility ducts are key elements of the streetscape. Multi-purpose spaces with seating, play areas, jogging tracks and landscaped elements are incorporated as part of the design.

Challenges

- The shifting of utilities such as water, drainage pipeline and storm line, was challenging during the construction stage of the road.
- The utility lines were found to be overlapping with the pedestrian walkways. This needed to be addressed as it was affecting the design of the road. However, through effective design solution, this issue was resolved.

Outcomes

- The segregated tracks for joggers and walkers have improved safety. Before the implementation of the project, cyclists and joggers were using the main vehicular lane which resulted in accidents. Improved pedestrian and cyclist safety.
- More than 16,800 sq m of space have been reclaimed for pedestrian and cycleways, as part of the projects.

18 Iconic Road Project

Jhansi, Uttar Pradesh

Category
Arterial Street

RoW
30m

Length
1.6 km

Duration
Jan 2023- Nov 2023
(11 months)

Total Cost
₹8.96 Cr.

Nodal Authority
Jhansi Municipal Corporation (JMC)

Implementing Partners
Engineering Department, Jhansi Municipal Corporation

Context of the Project

Iconic Road was a busy arterial street connecting two major universities, hospitals and commercial establishments. The 30m wide RoW faced issues of traffic congestion, unregulated parking and vending along with cordoning-off of street shoulders leaving no space for the high pedestrian flow in the area. The project vision was to develop a walking highway connecting a series of vibrant urban spaces where people, especially students, can meet, eat, walk, cycle and interact. The interventions included development of walk-cycle track, public bike-sharing stations, landscaped sit-outs, on-street parking, variety of vending zones and urban art installations.

Vision of the Project

To introduce Jhansi's citizens to the benefits of Healthy Streets and inspire stronger walk-cycle communities.

Project Journey

Laying the Foundation

Jhansi has adopted Healthy Streets Policy and has formed Healthy Streets Design Cell within Jhansi Municipal Corporation. Street development projects are being undertaken by both, Jhansi Municipal Corporation and Jhansi Development Authority under the visionary leadership of Divisional Commissioner, Jhansi. Jhansi has also completed its Comprehensive Mobility Plan Study and created its Network plan so that planned development of Healthy Streets continues.

Key Actions

Workshops/meetings, events and social media have been the major tools of engagement with citizens along with one-on-one discussions. Jhansi has conducted multiple workshops with citizens and government departments to discuss plans, identify demands and priorities as well as assess feasibility of planned interventions. Jhansi Smart City regularly hosts events of various nature, including two successful editions of Raahgiri Jhansi to build positive relations with citizens and encourage engagement with public spaces. Social media is used for outreach and taking opinion feedbacks.
Jhansi has followed the Test-Learn-Scale approach for its street development projects because it is not only valuable as a learning tool but also as a trust-building tool with the citizens. Projects are first run in trial phase wherever necessary and then permanent interventions are undertaken- the best example of this is redesign of Elite Circle which is the busiest city junction of Jhansi.

Design Highlights

- The design of the streetscape incorporates a 7m wide pedestrian corridor, featuring a dedicated walking track that seamlessly connects various elements like water features, bridges, play equipment, vending areas, and vibrant paving patterns.
- The inclusion of well-placed sit-outs and diverse lighting enhances the overall aesthetic and functionality of the space.
- The city has undertaken multi-faceted interventions to support the project. Such interventions include smart parking management system, public bike sharing project, elimination of garbage-vulnerable points, activation of city parks, development of vending zones across the city, regular anti-encroachment drives etc.

Challenges

- Lack of awareness and exposure for on-site implementation which was overcome through detailed instructions and monitoring.

Outcomes

- 11,200 sq m of public space reclaimed for pedestrians.
- The project's success is evident as the Mayor advocates for the expansion of a 32 km walk-cycle infrastructure in the city. This achievement is reflected in the vibrant scenes of citizens strolling along footpaths, taking pleasure in the provided seating areas. The environment mirrors that of a street-side park, offering a blend of urban activity and a sense of security.
- Residents relish the lively atmosphere while comfortably seated on shaded benches nestled among hedges.

19 Jeyaraj Road

Thoothukudi, Tamil Nadu

Category
Arterial Street

RoW
12m

Length
0.7 km

Duration
Jan 2020- Dec 2021
(2 years)

Total Cost
₹7.69 Cr.

Nodal Authority
Thoothukudi City Municipal Corporation (TCMC)

Implementing Partners
M/s Mother Land Builders, M/s. CS and Associates Pvt Ltd

Context of the Project

The Jeyaraj Road is vital road in the Thoothukudi Smart City, that connects the Thoothukudi-Palayamkottai Highway and Buckle Odai, thus facilitating the heavy traffic flow towards the New Bus Stand and Madurai. The government launched this project of transforming the Jeyaraj Road to a smart road, with a strong emphasis on developing a sustainable transportation network.

Vision of the Project

The project aims to enhance walkability, promote cycling, alleviate traffic congestion, and create safe and peaceful walking experiences through street design interventions and urban landscaping.

Project Journey

Laying the Foundation

The project initiated with the stakeholder consultation, where the officials form the city corporation, Tamil Nadu Electricity Board (TNEB), Tamil Nadu Water Supply and Drainage Board (TWAD) were taken on board.

Key Actions

Stakeholder meetings were conducted every 3 months with NGOs, RWAs, Shop Keeper Associations to receive feedback and suggestions on the project. Through focused group discussions, ward level citizen/stakeholder engagement, feedbacks were taken. Post the stakeholder engagement, a design consultant was contracted for the project to ensure successful implementation of a NMT priority street. The progress and plans of the project were reviewed by Chief Minister, Collector, Corporation Commissioner. The CCTV Cameras installed in the area also monitors and ensures safety of the area.

Design Highlights

The road is constructed in RCC provided with pedestrian pathway on both sides and drainage facilities. Paver blocks were laid as part of the pedestrian pathway. The center median is provided with LED street lighting poles. As part of the design bus stops, cycle parking, drinking water facilities, public toilets, open seating spaces with fountain and selfie point have been provided. Further, ACP materials and glowing thermos plastic paints are used for construction.

Challenges

- Being located in the center of the city and close to the market, managing traffic during construction was a major challenge.
- During the construction the alignment of the water supply and EB Supply lines, were critical. However, the corporation executed the project without stopping the water supply and EB supply for the public.

Outcomes

- With the introduction of traffic calming measures, the speeds of motor vehicles has reduced which has caused a reduction in accidents.
- The project has reduced the cost of road maintenance and repairs by providing real-time information about pavement conditions and traffic flow, allowing for targeted maintenance and repairs.
- The efficient drainage system incorporated as part of the road construction has also reduced water stagnation during the monsoon season.
- 1320 sq m of space was reclaimed for the pedestrians as part of the project.

20 Malhar Road

Ludhiana, Punjab

Category
Sub-Arterial Street

RoW
27m

Length
1.1 km

Duration
Nov 2018- Jan 2022
(3 years 2 months)

Total Cost
₹32 Cr.

Nodal Authority
Ludhiana Smart City Limited (LSCL)

Implementing Partners
Design Consultants and PMC: AECOM Asia Company Limited, Contractor: Deepak Builders and Engineers Pvt Limited, Local Administration: Municipal Corporation Ludhiana, Punjab State Power Corporation Limited, Punjab Police, Traffic Police.

Context of the Project

Malhar Road, being a prominent thoroughfare with commercial and institutional establishments, frequented by the business community and the public, required a comprehensive plan to accommodate the different street users. The city administration decided to redesign this street as a Healthy Street where clear space was identified for the carriageway, landscape, footpaths, cycle tracks, amenity zones, underground services, and more.

Vision of the Project

By reducing car dependence, traffic congestion, and improving air quality, Ludhiana aspires to be a sustainable business hub with inclusive job growth and technological empowerment of citizens.

Project Journey

Laying the Foundation

The project adhered to the principles mentioned in the NMT/ Healthy Streets Policy and Parking Policy.

Key Actions

The street was revamped for walking, cycling, and social interactions, featuring organised vending zones and rainwater-recharging landscape. This led to organised parking and clear walkable spaces, boosting pedestrian footfall. Stakeholder engagement comprised focused group discussions throughout conceptualisation, execution, and mid-term reviews, accompanied by regular public interactions and citizen feedback.

Design Highlights

The project incorporated segregated footpaths, cycle tracks, and speed calming measures such as raised tabletop junctions and crossings. Additionally, interactive multi-purpose spaces were integrated to promote social interactions.

Challenges

- Challenges were faced in convincing stakeholders and business establishments in favor of the proposed design for the street, which was addressed by conducting knowledge sessions, explaining the advantages of street development.
- Another issue faced during implementation was the high volume of traffic. To combat this, the traffic was diverted in a phase wise manner from junction to junction during all the stages of construction.

Outcomes

- Organized parking of vehicles on street.
- Effective utilization of spaces by pedestrians.
- Increase in number of people visiting the stretch.
- 1750 sq m of space was reclaimed for pedestrians and cyclists after the execution of the project.

21 Race Course Road

Bengaluru, Karnataka

Category
Arterial Street

RoW
29m

Length
0.6 km

Duration
June 2019- June 2023
(4 years)

Total Cost
₹2 Cr.

Nodal Authority
Bengaluru Smart City Limited (BSCL), Bruhat Bengaluru Mahanagara Palike (BBMP)

Implementing Partners
Bangalore Electricity Supply Company Limited (BESCOM), Bangalore Water Supply and Sewerage Board (BWSSB), Karnataka Power Transmission Corporation (KPTC), Bengaluru Traffic Police (BTP), IDECK (Project Management Consultant)

Context of the Project

Race Course Road is an important artery for the city supporting a heavy volume of vehicles through the roads. It runs along the Bangalore race course, and hence its name. A lot of out-station buses use this road for pick-ups and drop off's in the mornings and late nights.

This project focuses on enhancing a crucial network of sixteen roads, Race Course Road being in the package. These roads play a pivotal role in supporting business hubs, historical landmarks, public buildings, and schools. The redesign aims to bolster these functions, preserve historical landmarks, and prioritize pedestrians and non-motorized transport. A comprehensive set of elements were included as part of the streets redesign, which includes street furniture, street furniture, utilities, drainage systems, intersections, parking lighting, safety, and public transport facilities, ensuring a holistic approach to urban improvement.

Vision of the Project

The project envisions creating a safer, efficient urban landscape by optimizing road networks, promoting non-motorized transport and enhancing overall accessibility and aesthetics.

Project Journey

Laying the Foundation

The project adheres to Tender SURE guidelines, ensuring compliance with relevant policies for design, parking, and overall urban development.

Key Actions

The project engages stakeholders through meetings and public participation sessions before execution, showcasing a consultative approach. Based on the feedback from the consultation, in the CBD, one-way loops were introduced to manage traffic. Excess land from the carriage way was repurposed for public spaces, featuring cycle tracks and parking. Safety is prioritized with colored paver-block marked cycle lanes integrated with pedestrian paths.

Design Highlights

The streetscape includes uniform carriageway, 3m wide footpaths with shaded cycle tracks and continuous landscape, safe pedestrian crossing every 250m with junction improvement and well-designed utility services. The width of the cycle lanes varies between 1 to 2m. At all signalized intersections, an exclusive signal phase is dedicated for cyclists and a cycle waiting box is created in between zebra crossing and stop line, where cyclists can wait for their turn to make turnings.

Challenges

- It was challenging to convince Traffic Police and other relevant departments to reclaim land and to reduce the carriageway width.
- Initially, one of the biggest challenges was to convince the local residents as there was resistance from their end towards the project. The stakeholder consultation and the co-creating vision exercise with citizens, helped to resolve this issue.
- Traffic management was also challenging during the construction period.
- During the project implementation stage, the laying of new underground utility ducts with 900mm diameter storm water drain, and other 6 service utilities were challenging. However, the city ensured of the laying the new duct without affecting existing utilities and the adjacent private property.

Outcomes

- Well illuminated footpaths with along with cycle tracks have encouraged people to adopt cycling and walking as part of their daily mode of transport.
- Well-designed junctions with efficient traffic calming measures and safe pedestrian crossings, have ensured safety of pedestrians.

22 Smart Road

Faridabad, Haryana

Category
Arterial Street

RoW
30m

Length
24.25 km

Duration
Sep 2019- Feb 2023
(3 years 6 months)

Total Cost
₹306.54 Cr.

Nodal Authority
Faridabad Smart City Limited (FSCL)

Implementing Partners
Faridabad Smart City Limited (FSCL)

Context of the Project

Under the Smart Cities Mission, a 24.25 km road network has been developed in the Faridabad Smart City ABD Area. The road design focuses on improving the infrastructure, installing advanced traffic control, safety elements, giving each road a unique name and embedding distinctive features through landscape and urban design elements. The project covers key stretches such as Ambedkar Road, Talab Road, Main Bandh Road, Metro Road, and roads in sectors 21D and 21B. This helped alleviate congestion and create safe spaces for walking.

Vision of the Project

The project aims at providing well connected, accessible and eco-friendly mobility corridors in the city.

Project Journey

Laying the Foundation

The project had to take multiple approvals and clearance for the line departments for the execution of the work. The project focused on implementing street elements that promote non-motorised transport.

Key Actions

After the clearance from the Forest Department and other relevant departments, the project started the execution work. During the construction stage, the project involved improvement in cement concrete and bituminous road infrastructure. All the activities related to procurement and execution were carried out in coordination with Dakshin Haryana Bijli Vitran Nigam (DHBVN). Further, regular review meetings with contractor agencies were undertaken to resolve the bottlenecks and speeding up the work on site.

Design Highlights

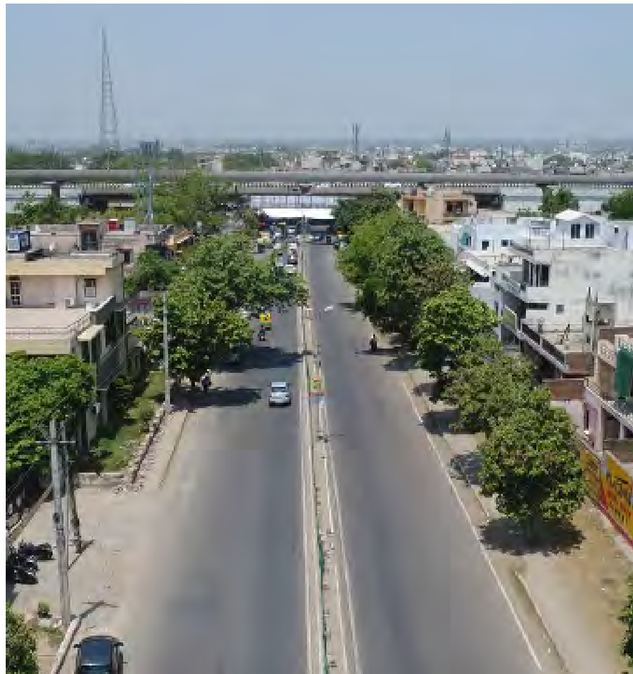
The project includes two lanes of 9m of carriage ways, 2m wide pedestrian paths on the either side, 2m wide cycle tracks, landscaped areas, Intelligent Traffic Management System (ITMS) elements, and on-street four-wheeler parking facilities. All the utility services such as water supply lines, storm water drainage, sewage systems, electrical lines, OFC duct were laid underground. Smart street lights were incorporated as part of the streetscape. Wayfinding signages were also incorporated at the median of the street. The project has a Defect Liability Period of two years and Operation and Maintenance for a period of five years.

Challenges

- The site was initially encroached, which was resolved through regular stakeholder meetings with concerned departments
- The construction work was paused due to the ban by the National Green Tribunal. However, it was lifted within a month.
- The Covid 19 lockdown and heavy rains were the biggest challenges, due to which the works were delayed for months.

Outcomes

- The project enhanced non-motorized transportation like walking and cycling in the city.
- The network of well-designed roads has also helped in reducing the traffic congestions.
- The integration of smart infrastructure like ITMS have also helped the city to manage the traffic congestion.



23 Smart Road Development

Ujjain, Madhya Pradesh

Category
Local Street

RoW
12m

Length
5.14 km

Duration
June 2018- Sep 2022
(4 years 3 months)

Total Cost
₹53 Cr.

Nodal Authority
Ujjain Smart City Limited (USCL)

Implementing Partners
Ujjain Smart City Limited, Ujjain Municipal Corporation, Tata Projects, IPE Global (PDMC)

Context of the Project

The Smart Road project, with underground ducting and well integrated NMT infrastructure, represents an effort to build a modern, sustainable, and well-connected city. Its main aim is to streamline crowd and traffic management around the Shri Mahakaleshwar Temple premises. The project was developed as part of the City Mobility Plan.

Vision of the Project

The project envisions to create a modern, sustainable, and connected street that ensures smooth traffic movement around Shri Mahakaleshwar Temple premise.

Project Journey

Laying the Foundation

To initiate the preparation and planning of a large-scale project the city adopted multifaceted process that required careful consideration and strategic thinking. The city also adopted NMT Policy, Vending Policy and Parking Policy for the implementation of project.

Key Actions

Ujjain Smart City Limited (USCL), in consultation with Shri Mahakaleshwar Temple Management Committee (SMTMC), District Administration, Traffic Department, TNCP, Ujjain Development Authority, PWD, Police Department, Water Department, MPEB etc., planned and designed the layout of the road under this project. Further, a team comprising of USCL, PDMC, and Tata Projects collaborated for the execution of the project. The project was initiated through stakeholder consultation that was undertaken through a series of physical and online meeting. The collaborative approach of various authorities and stakeholders in the planning and execution of the project was instrumental in ensuring the implementation of the highest standards of smart road. In conclusion, the involvement of multiple authorities and stakeholders played a critical role in seamless and effective execution of the project. The operation and maintenance of the project has been undertaken by Tata Project which will be transferred to the Ujjain Municipal Corporation.

Design Highlights

The project includes segregated cycle tracks and pedestrian pathways along the main vehicular carriageway. Several traffic calming measures have been taken to reduce the speeds of the vehicles. The design components also include on-street vending zones, interactive open spaces with seating areas and play equipment, that have been strategically placed along the pedestrian path. The project also emphasised on using environmentally sustainable and locally available materials for the construction of the project. The key materials used for civil work and streetscaping include concrete, asphalt, bricks, pavers, stone, and metal, among others. The road integrated underground ducts such as water supply, electricity internet connection and drainage lines.

Challenges

- In the implementation phase, the Ujjain Administration faced three key challenges such as land encroachment, land acquisition, and managing regular construction while ensuring smooth crowd movement.
- Land encroachment caused delays in the project implementation and increased project costs.
- Land acquisition process was also challenging as the complex process of acquiring land from private owners or government agencies for public use was time-consuming.
- During the construction, the regular management of the project was a significant challenge as it required efficient management of pedestrian and vehicular movement. However, the Ujjain Administration resolved these issues by conducting regular inspections, engaging with stakeholders, and implementing crowd management measures.
- Due to the COVID 19 lockdown there was a delay in implementation of the project on ground.

Outcomes

- Through this project, the citizens have benefitted as the project has boosted the economic growth and enhanced the quality of life.
- The successful implementation of the project has led to improved road safety and traffic flow by minimising the risk of accidents and reducing congestion.
- The sourcing of materials from local vendors also provided employment opportunities for the local workforce of Ujjain.

24 Street No. 165, 166

New Town Kolkata, West Bengal

Category
Sub-Arterial Street

RoW
18m

Length
1.3 km

Duration
Aug 2021- May 2023
(1 year 8 months)

Total Cost
₹2.55 Cr.

Nodal Authority
New Town Kolkata Green Smart City Corporation Ltd. (NTKGSCCL)

Implementing Partners
New Town Kolkata Development Authority, Abin Design Studio

Context of the Project

New Town Kolkata Green Smart City Corporation Ltd. developed two sub-arterial streets, Street 165 and Street 166, as model streets with wide segregated footpaths and cycle tracks, to facilitate safe walking and cycling in the city.

Vision of the Project

The aim of this street transformation project was to promote a more human friendly environment, syncing all possible network and technologies together for a safer and more walkable/cycling realm.

Project Journey

Laying the Foundation

An Apex Committee has been constituted in the city to oversee the development of NMT infrastructure. The city also adopted a Healthy Street Policy to promote non-motorized transport and pedestrianization in the city.

Key Actions

The city authority invited feedback/suggestions on the project through various stakeholder consultations. The city also adopted a test-learn-scale approach for promoting pedestrianization in the city. To build momentum the city organized several car free days and awareness generation programmes. This project is a model pedestrian friendly zone, that was conceived and approved by the Board of New Town Kolkata Green Smart City Corporation Ltd. and thereafter by the City Level Advisory Forum of NKGSCCL. The City Level Advisory Forum (CLAF) was also involved in periodic monitoring/review of the project during implementation stage. Further, the city organised several campaigns for raising awareness about the benefits of cycling among the residents, encouraging people to use cycles for short trips and discourage encroachments/parking on cycle tracks and footpaths of the city.

Design Highlights

The key materials used for civil work and streetscaping include precast concrete kerb stone, interlocking concrete paver block, and tactile finish vitrified tiles. The project additionally includes CCTVs (ANPR cameras) and speed breakers to reduce overspeeding of vehicles. Additional features includes universally accessible design elements, street furniture street furniture mainly seating arrangements, dustbins, tree planters, and kiosks at regular intervals. Vending kiosks were also set up at select locations.

Challenges

- During the initial phase of implementation, there was resistance from residents residing in the area, primarily because they faced difficulty in moving their cars in and out of their parking area due to the ongoing footpath construction in front of their house. However, the engineers from the city authority regularly interacted with the residents, shared their work plan in advance and provided alternative locations for parking their cars during the time of construction.
- After the implementation, vehicular parking on cycle tracks was one of the key challenges faced by the city authority. To address this concern and raise awareness amongst the citizens, the city authority of New Town undertakes regular awareness drives in the city and police department for removal of encroachments and parking from cycle tracks in New Town.

Outcomes

- The universally accessible design elements have encouraged elderly citizen for daily walks.
- 14333 sq m space was reclaimed for pedestrians and cyclists.

25 Saily Police Training Road

Silvassa, Diu

Category
Sub-Arterial Street

RoW
15m

Length
0.6 km

Duration
Sep 2022- Apr 2023
(3 months)

Total Cost
₹2.16 Cr.

Nodal Authority
Silvassa Smart City Ltd. (SSCL)

Implementing Partners
Contractors — L&T Construction, Local Administration — U.T. Administration of Dadra and Nagar Haveli and Daman and Diu

Context of the Project

This thoroughfare establishes a vital link between the Saily International Cricket Stadium and Namo Medical College, enhancing accessibility and fostering regional development. Inaugurated by Prime Minister Narendra Modi on April 25, 2023, this project signifies a steadfast commitment to Smart City objectives. It harmoniously integrates infrastructure development and sustainable urban planning, aiming to elevate community life. Notably, to enhance sight visibility and traffic flow on the Saily Police Training School Road, the project involved removing the compound walls of the Saily Cricket Stadium and Saily Police Training School, creating a seamless curve for efficient traffic movement.

Vision of the Project

To create sustainable, well-connected, and technologically advanced urban spaces that improve the quality of life for residents and visitors while promoting economic growth and community development.

Project Journey

Laying the Foundation

The project was strategically chosen by the SPV to induce developmental changes in the region. Therefore the design of the street was undertaken in-house based on the principles laid out in the Healthy Streets Policy.

Key Actions

The locational impact of the street had to be taken into consideration while implementing. Therefore, there were various stakeholder consultations involved before execution through focused group discussions and site visits. The officials of the Dadra and Nagar Haveli and Daman Diu UT administration visited the site to direct Silvassa towards the way forward of the street. In addition to this, in order to be at par with the other developmental works in the nation, representatives from Silvassa Smart City visited other cities to learn about the best practices of street design being implemented.

Design Highlights

The SPT road was constructed with locally sourced materials with provisions for carriageway, footpath, underground utilities etc mentioned below:

- **Road Construction:** 15m-wide, 684m-long vital transportation artery has been created for a smooth traffic flow.
- **Storm Water Drainage:** Integrated system manages rainwater runoff, preventing flooding and ensuring road longevity.
- **Street Lighting:** Well-planned, energy-efficient lighting enhances safety and security during nighttime hours.
- **Underground Utilities:** Water, electricity, and optical fiber cables installed underground for a clean, uncluttered environment, minimizing disruptions, and enhancing visual appeal.

Challenges

- To improve sight visibility and movement of traffic, the compound walls of the Saily Cricket Stadium and Saily Police Training School were removed for placing a smooth curve for traffic movement, which involved co-ordination with the planning and development authority and DNH police department.
- Diversion of traffic during the construction period was also one of the major challenges involved in construction. This was addressed by chalking out an alternative route to the public and timely co-ordination with the traffic police department.

Outcomes

- It has been observed that after construction of the road, the serviceability of the road has increased and an increased number of different age groups have started visiting the Cricket Stadium for sports and recreational activities.
- After the implementation of the project, the space reclaimed for the citizens is: 3370 sq m.

26 Wardha Road

Nagpur, Maharashtra

Category
Arterial Street

RoW
30m

Length
6 km

Duration
July 2021- Dec 2023
(2 years 6 months)

Total Cost
₹57 Cr.

Nodal Authority
NH Division

Implementing Partners
Another Earthling Studio, Drishti Structural and Engineering Private Limited (DSEPL)

Context of the Project

It is a national highway entering the city, flanked by vibrant commercial areas and recreational zones. This project is Nagpur's second road designed on the principles of Healthy Streets to match international standards. It features a 6 km long cycle track and footpath. The initiative has revitalised public spaces and enhanced last-mile connectivity. The project focuses on improving road safety, and better organisation of street space.

Vision of the Project

The project's vision is to transform the city by creating a robust Non-Motorized Transportation (NMT) infrastructure while simultaneously enhancing the city's livability aspect.

Project Journey

Laying the Foundation

Streets4People challenge, India Cycles4Change Challenge, and Nurturing Neighborhood challenge set the stage for urban street transformation of Wardha Road in Nagpur. An apex committee has been constituted in the city to oversee the development of NMT infrastructure.

Key Actions

The city adopted a Test-Learn-Scale approach including testing new ideas, learning from the results, and scaling up the successful ones. A 28 km street network with NMT facilities was identified, initiating projects on three streets and one exclusive cycle track by collaborating with various governing agencies. Extensive citizen engagement with RWAs, shop owners, and Maha Metro resulted in improvements along significant stretches.

Design Highlights

Dual-sided cycle tracks, continuous footpaths, placemaking elements, metro station integration,on-street parking facilities, bulb-outs, urban furniture, defined property entrances, and improved junctions across the 6 km stretch are some of the notable features.

Challenges

- Since the road is an important transit corridor, there were 7 major metro stations that were present along the stretch. The street had to be carefully designed in order to integrate multiple modes of transportation and accessibility.
- Angular parking on the street reduced the efficiency of the third lane. This had to be addressed by introducing parallel parking for better street channelisation.
- Due to the width of the road, there were many residual spaces at junctions, which created accident prone areas. These spaces were transformed for efficient traffic movement.

Outcomes

- Multi modal integration has been achieved enhancing last mile connectivity.
- The movement of traffic has been optimised along the stretch and the junctions.

B

Neighbourhood Streets

Neighbourhood streets are mostly collector or local streets within or connecting neighbourhoods. With predominantly residential land use along them, these streets see short trips for a variety of activities school trips, grocery shopping. and other recreational activities. These streets typically accommodate all kinds of transport modes, and all the users share the street space. These need to be designed to ensure the right balance of street space for all modes. There are 14 case studies on Neighbourhood Streets, out of which 5 are detailed case studies and 9 are overview ones.

1	Aundh Street, Pune
2	Conservancy Lanes, Shivamogga
3	Lanes of Old Kashi, Varanasi
4	Race Course Road, Coimbatore
5	Street 106, New Town Kolkata
6	Child Friendly Street, Dehradun
7	Hiran Magari, Udaipur
8	Housing Board Colony Streets, Karimnagar
9	Marine Drive Walkway, Kochi
10	Mauli Medical Road, Aurangabad
11	Manveeyam Veedhi, Thiruvanthapuram
12	Pashan Sus, Pune
13	Pedestrian Walkway, Namchi, Sikkim
14	Saptagiri School Road, Davangere, Karnataka

Neighborhood Streets

Name of Street	City	Catagory	Landuse	RoW (m)	Length (km)	Total Cost	Duration (years)	Funding Sources	Project Initiated by	Public Participation	Temporary Testing	O&M Responsibility
1 Aundh Streets	Pune	Sub-Arterial		24	15	₹ 21 Cr.	4.6		ULB	✓	✓	
2 Conservancy Lanes	Shivamogga	Local		4	14.4	₹ 17.28 Cr.	2.4		SPV	✓	✗	
3 Lanes of Old Kashi	Varanasi	Local		1	42	₹ 84.96 Cr.	2.9		SPV	✓	✗	
4 Race Course Road	Coimbatore	Sub-Arterial		30	2.5	₹ 16 Cr.	4.0		SPV	✓	✓	
5 Street 106	New Town Kolkata	Sub-Arterial		46	0.2	₹ 5.2 Cr.	0.8		SPV	✓	✓	
6 Child Friendly Street	Dehradun	Local		5.5	10	₹ 3.05 Cr.	4.5	International	ULB	✓	✓	
7 Hiran Magari	Udaipur	Arterial		40	2.7	₹ 48.17 Cr.	3.11		SPV	✓	✓	
8 Housing Board Colony Streets	Karimnagar	Local		9-15	11	₹ 71.5 Cr.	3.0		SPV	✓	✓	None
9 Marine Drive Walkway	Kochi	Local		18.8	2.45	₹ 1.07 Cr.	1.0		SPV	✓	✗	None
10 Mauli Medical Road	Aurangabad	Sub-Arterial		40	0.4	₹ 0.5 Cr.	1.6		ULB	✓	✗	
11 Manveeyam Veedhi	Thiruvanthapuram	Arterial		15	0.25	₹ 1.25 Cr.	0.4		ULB	✓	✓	
12 Pashan Sus	Pune	Sub-Arterial		36	1.2	₹ 6 Cr.	2.9		ULB	✓	✓	
13 Pedestrian Walkway	Namchi	Local		4.5	6	₹ 8 Cr.	1.3		SPV	✓	✗	
14 Saptagiri School Road	Davangere	Sub-Arterial		30	0.66	₹ 0.87 Cr.	1.3		SPV	✓	✓	None

Residential Commercial Institution Public Open Spaces Industrial

National-SCM State ULB ✓ Yes ✗ No Government Private

1 Aundh Streets

Pune, Maharashtra

Scan here

Category
Sub-Arterial Street

RoW
24m

Length
15 km

Duration
June 2016- December 2020
(4 years 6 months)

Total Cost
₹21 Cr.

Nodal Authority
Pune Smart City Development Corporation Limited (PSCDCL)

Implementing Partners
IBI Group, Prasanna Desai Architects, Pavetech

Profile of the City

The city of Pune in Maharashtra has been a historically significant town due to the seat of the Maratha kingdom. Since then, it grew into a modern urban settlement with a population of 50.5 lakhs — as one of the important locations for education, industrial development, IT hubs, etc. Pune was selected in the Round 1 of Smart Cities Mission with an ABD area of 3.6 sq km. The smart city has executed 17 projects worth ₹599 Cr. focusing on mobility out of 49 projects worth ₹1,613 Cr. These projects involve — intelligent transport management system (ITMS), e-vehicles, public bike sharing, street design etc.

Context of the Project

A package of 9 streets with a total of 15 km was selected for development in the Aundh neighborhood of Pune — which was a part of the Aundh-Baner-Balewadi ABD area. This plan included local streets, market streets and significant corridors of the neighborhood which formed a complete loop. The idea was to develop a continuous NMT zone to enhance the quality of life of the citizens. Therefore, the ITI and DP road which are adjacent to each other, depict implementation of the part plan giving an idea of the overall concept.

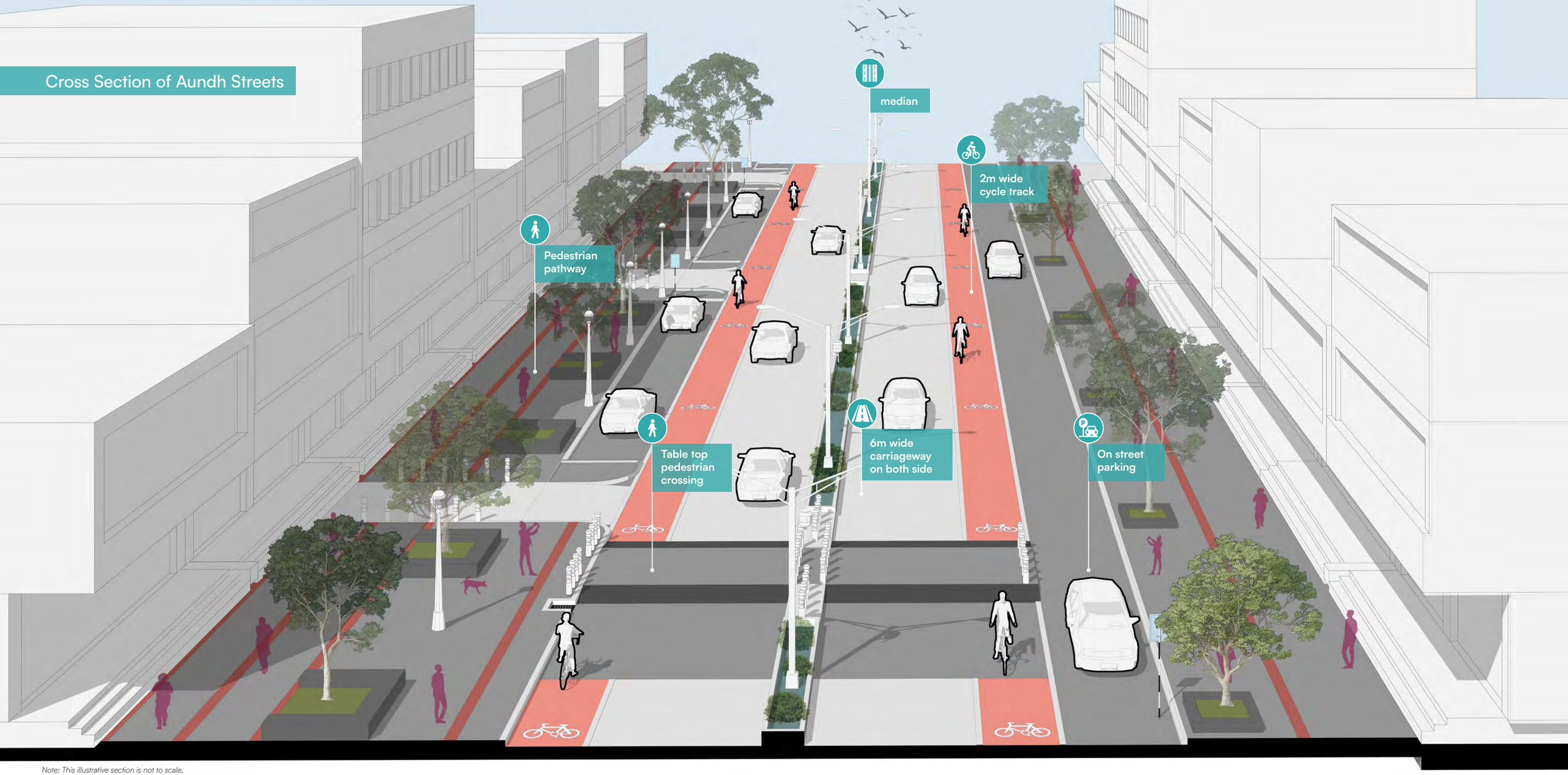
Vision of the Project

The aim of the Aundh Streets Project is to revamp the neighborhood's accessibility, catering to all ages from 8 to 80. The focus is on creating safe cycling zones for children, easily navigable roads, and enjoyable footpaths for pedestrians.

The street had a wider carriageway with almost inadequate NMT infrastructure, unsafe crossings and unmanaged parking

The transformed street has wide footpaths with an at-grade painted cycle lane. It also has other interventions like designated parking bays, safe crossing infrastructure like raised crossings and speed-calming and placemaking initiatives like open gym, kids' play area, and seatings at regular intervals.

Cross Section of Aundh Streets



Note: This illustrative section is not to scale.

Design Highlights

01 **Footpath:** A consistent 0.15m elevated footpath extends seamlessly across the streets, ensuring universal accessibility by maintaining this uniform level even at pedestrian crossings. Additional space from shop frontages, resulting in a wider footpath and spacious walkway that caters to the residents' needs.

02 **Cycling Infrastructure:** A designated cycle lane was allocated within the MV lane, creating a shared space aimed at encouraging cycling. Strategically positioned bike stands, equipped with bike-sharing options, were installed along the footpath at specific points. These locations were aligned with the Pune Cycle Plan network, synchronising with the citywide cycling infrastructure.

03 **Seatings:** Seating areas along these streets have been carefully integrated with the existing trees, ensuring no disruption to the foliage. This approach enhances the street's visual appeal while preserving the natural environment. The concept aimed to safeguard the trees' natural base and create a secure buffer, allowing for their unimpeded growth.

04 **Raised pedestrian crossings:** Table-top crossings were provided across the streets to make walkability easier for kids, specially abled, elderly, etc. To enhance the efficiency of these crossings, speed calming measures were adopted in which the approach to the crossings was covered with a 15m long stretch of cobble stones.

05 **Wheelchair friendly ramps:** Curved ramps were provided in places where the crossings are at-grade especially at junctions. These wheel-chair friendly ramps are guarded by bollards to regulate traffic as well as for the safety of the users.

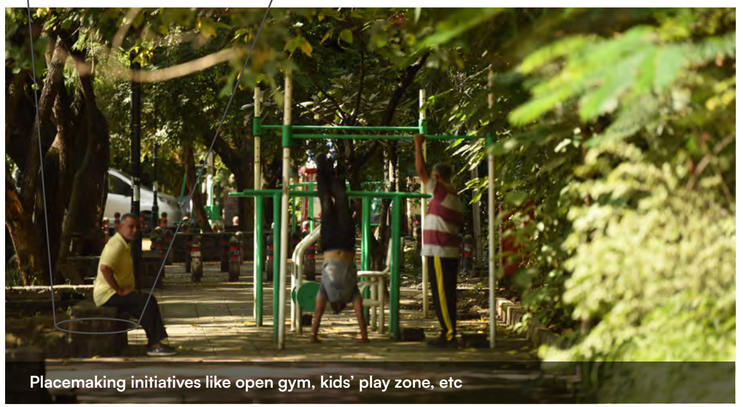
06 **Tactile paving:** The streets feature a continuous tactile system comprising directional and cautionary tiles, seamlessly guiding pedestrians along their path for improved navigation and safety.

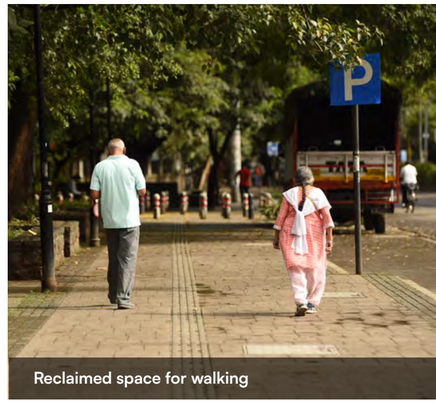
07 **Utilities:** MSEB boxes, SWDs, manholes, underground ducting etc., have also been an integral part of the street. These utilities have been incorporated such that the aesthetic value of the street does not get disturbed.

The ITI and DP road have been designed on the principles of walkability, universal accessibility, and cycle friendly streets. Therefore, to achieve these, there are various elements that strengthen the concept and design on these streets.

Seatings designed to restrict people from sitting along edges where the adjacent footpath is not wide enough

Traffic calming initiatives like cobble stone stop strips, raised mid-block crossings to ensure pedestrian safety


Placemaking initiatives like open gym, kids' play zone, etc


Reclaimed space for walking


Universally accessible infrastructure


Safe crossing infrastructure like tabletop crossings, refuge islands alonng the median

Project Journey


Design review

01
Laying the Foundation

Pune Street Design Guidelines is an easy-to-use manual that simplifies street design into a three step process: Determine the available right-of-way, identify the character of the street from the surrounding land uses, and finally choose the correspondingly right template.

✔ Completed ✘ Not yet started ● Ongoing

- ✔ **Healthy Streets Policy**
- ✘ **Vending Policy**
- ✔ **Parking Policy**
- ✔ **Street Design Guidelines**

02
Building the team's muscle

Capacity building workshops
Regular capacity-building workshops for the engineers of the Road Department were conducted by external experts and experts from the NMT Cell.

Sites Visits

Peer to peer learnings from other cities
The administrative decision-makers, including Commissioners and Road Department engineers, undertook multiple site visits to learn from exemplary national and international models, such as Singapore, to gather insights from best practices in the field.


Stateholder Consultation

03
Doing things together

Stakeholder engagement
Being one of the initial few pedestrian-friendly, complete streets in the city, a very strong stakeholder engagement process was conducted. In order to engage more citizens, innovative outreach and engagement measures were used. Several public discussions were hosted at society levels, auditoriums, and PMC ward offices. Further, to create awareness about the project, a street exhibition about the design was curated with the help of the local representatives. During this street exhibition, the citizens also reviewed the designs, and their suggestions were noted down.
The local representative was actively involved in getting stakeholder engagement for the implementation of the street design, including convincing the private and commercial owners to give up their shop frontages. The Pune Biennale Foundation was also involved in the design and creation of street art - wall paintings, murals, and sculptures.

Public Engagement

Tactical trial
A week-long tactical trial was conducted on the street to engage more citizens. In parallel to this, extensive communication and citizen engagement campaigns were conducted by the design consultant with the help of an external public engagement consultant.

04
Monitoring, learning & improving

NMT Cell
In 2010, Pune Municipal Corporation has also established an advisory cells with experts to oversee planning, review implementation, and maintenance of various NMT initiatives in the city.

Monitoring and maintenance
Earlier there was an O&M for five years with the contractor. However, post-expiry of the contract, the maintenance is now handed over to the ward office. In addition, the local political representative is also voluntarily involved in the maintenance of certain elements like the open gym equipment, wall painting, and landscaping.


Project implementation

Challenges

- Overhead cabling created issues in the city, therefore an underground ducting framework structure was implemented.
- On-street parking was a challenge, as there was no space for parking prior execution. It was provided at strategic locations, after the street plan was implemented.
- During the initial phases of implementation, the shopkeepers association had to be briefed about the benefits of developing the streets, who feared the reduction of their business due to curbed on-street parking in front of their shops. Demonstrations were made to explain the advantages to utilizing their shop frontages for the development of wider footpaths.

Outcomes

- Citizen engagement and recreational activities like fitness activities and the citizen engagement dialogue sessions happen very frequently.
- Children enjoy landscaping and the painted games on the footpath.
- Students and working people utilize space for Wi-Fi hotspots.
- Food joints have helped increase the vibrance of the streets.
- 12,000 sq m of space has been reclaimed for the pedestrians.
- There has been a significant improvement in the usage of walkways and cycles to commute on the street. The pedestrian count has increased from 1,468 to 3,670 per hour. Similarly, cycling has also increased from 546 to 1,290 per hour.

Impact Stories

The landscaping and green cover in the area help regulate the temperature. The developed area has provided us with safe, fresh, and clean air for morning fitness, as well as opportunities for recreational activities without the concern of vehicles intruding on citizens. The small recreational activities on the weekends allow citizens to enjoy and relax in the vicinity throughout the entire time. Streetlights ensure that the roads in this stretch are safe for children, senior citizens, and women. The cycle track and disability-friendly infrastructure have been well-planned.

Prashant Chaudhary, Resident at Aundh

Way Forward

Pune Cycle Plan

Legends

- Segregated (Dedicated) Retrofitted Existing Cycle Track
- Segregated (Dedicated) Proposed Cycle Track
- Segregated (Dedicated) Proposed Greenway Cycle Track
- Segregated Merged with footpath Proposed Cycle Track
- Proposed Painted Cycle Track

Scaling-up the transformation

The Aundh streets have seen a stark improvement in the neighborhood after execution. As mentioned earlier, the plan aims at developing all the nine streets demarcated for development. The concept of these streets is versatile and precise which can be used to develop other neighborhoods in the city.

Pune Cycle Plan

The Pune Cycle Plan was initiated in 2016. The Comprehensive Bicycle Master Plan was approved by the PMC's General Body in December 2017.

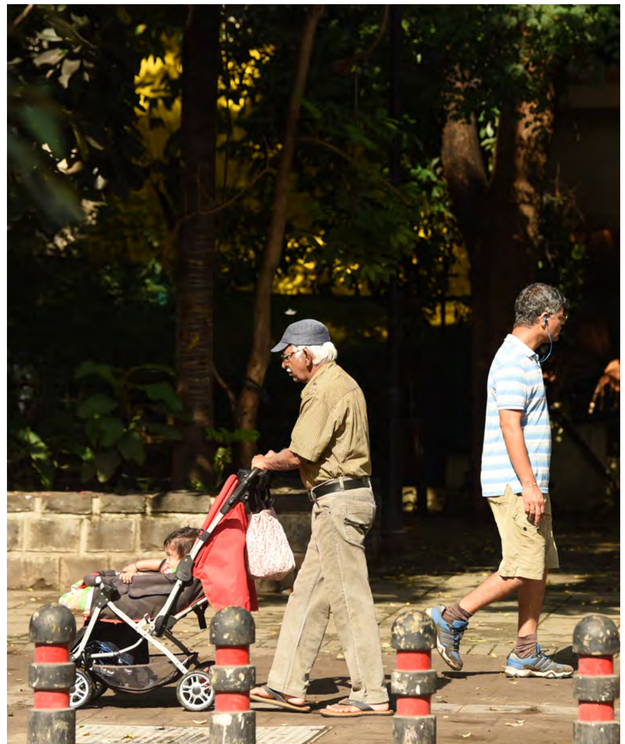
The plan was recognised by UN Habitat World Urban Forum, 2020

Vision: To make Pune a cycling-friendly city where cycling is safe, comfortable, convenient, attractive and enjoyable. The plan also aims to increase the modal share of cycling from the current 3% to 25%, by the year 2031.

Features of the Plan:
The Cycle Plan includes proposals for a city wide cycle network (cycle tracks and lanes), support for Public Bicycle Share systems, cycle promotion activities, participatory reviews of plan implementation, etc. Along with the cycle network plan, PMC's Urban Cycling Design Guidelines and a policy for Public Bicycle Sharing were adopted to enhance the quality of insfrastructural provisions. A Bicycle Cell was also to be set up at PMC to ensure smooth coordination with all stakeholders within PMC and other agencies like Traffic Police, PMPML, PSCDCL and Pune Metro. In 2020 Pune Cycle Plan was presented at the UN Habitat World Urban Forum by the Pune Municipal Corporation, sharing the experiences thus far, challenges, and seeking cooperation and long-term support for implementation. The Pune Cycle Plan has been conceptualised by ITrans as lead consultant in collaboration with Prasanna Desai Architects, Pune as Urban Design Consultant and Centre for Environment Education, Pune as Public Engagement Consultant.

> *The aim of the plan was to make city wide cycling network a reality in Pune. It is a tool to implement PMC's vision for sustainable mobility in Pune and a healthy environment. Pune can be a city where cycling is safe, attractive, comfortable and a travel mode of choice for children, women, seniors, daily wage workers as well as professionals.*
>
> **Mr. Kunal Kumar**
> **Erstwhile Commissioner, PMC**

Aundh Streets



2 Conservancy lanes

Shivamogga, Karnataka

Scan here

Category
Local

RoW
3-4m

Length
14.4 km

Duration
Dec 2019- Jul 2022
(2 years 4 months)

Total Cost
₹17.28 Cr.

Nodal Authority
Shivamogga Smart City Limited (SSCL)

Implementing Partners
Shivamogga Municipal Corporation, TATA Consulting Engineers, JANA Urban Space, HD Infrastructure

Awards & Recognition
ISAC Award 2022- First Runner up under Urban Environment Category

Profile of the City

Having an urban population of 3,22,650, Shivamogga was selected as a Smart City in Round 2 of the India Smart City Challenge. Over the past few decades, the urbanization rate of Shivamogga city has picked up pace and the city has grown at a considerably good pace. The city managers have tried to ensure that the provision of city infrastructure is at par with its growth. The total area of the city is 76.7 sq km, with 6.1 sq km as ABD area.

Context of the Project

Shivamogga has 176 conservancy lanes, with a total length of 17 km, located mostly within the older part of the city. The width of conservancy lanes varies from as low as 2 meters up to 5.5 Meters. These conservancy lanes were used as service corridors in the past where each individual house was connected to its respective septic tanks or common septic tanks. These lanes were in dilapidated conditions and were also used as solid waste dumping zones and waste disposal areas. Thus, the Shivamogga Smart City realized that it is imperative to revitalize these lanes into productive spaces.

Under this project 108 conservancy lanes located in prime residential and commercial areas with a total length of 7 km were rejuvenated and transformed into accessible vibrant public spaces. Out of these 108 Conservancies, only 23 are earmarked for revenue-yielding activities. This project has set an example of how old parts of cities that have space constraints can be revitalised and brought back to functional uses with minimal interventions.

Vision of the Project

This project envisioned to revitalise infrastructure in the city's inner core, alleviating congestion and fostering multifunctional spaces that can serve as inclusive gathering points for everyone.

The lanes were filled with debris and stagnated water, rendering it unusable with poor hygiene and encroachment

The lanes are revitalised based on their adjacent building-use; for example, gym & play equipment in residential area

Cross Section of Conservancy lanes

Note: This illustrative section is not to scale.

Design Highlights

01 The conservancy lanes are divided into five packages. Each conservancy package typically has provision for off-street parking wherever the adjoining land-use is commercial.

02 Residential lanes are designed for recreational purposes for the community, integrating street elements like play & gym equipment.

03 The conservancy lanes in mixed-use zones are transformed to integrate street vendors, public toilets and seating for the users wherever possible.

04 Grey water from the residences has been diverted to underground service line by providing house service connections. This has improved the hygiene of the lanes, and reduced the pollution of Tunga River considerably.

05 As part of the project, 1240m long drains, 2005 sq m of pavers, 160m of sewage lines, 650 numbers of UGD connections, and 6 children's play areas have been implemented.

This design integrates activities that are suitable to the context.

Concrete interlocking pavers, red and yellow are used to demarcate space

Eating hub with shaded seating for people

Public toilets installed in the streets to improve hygiene

Organised overground utility boxes to ensure unobstructed movement

Project Journey

Manual labour and small machines being used due to space constraints

01
Laying the Foundation

The city has also institutionalised a parking management system that enables online tracking of parking spaces.

✔ Completed ✕ Not yet started ● Ongoing

- ✕ Healthy Streets Policy
- ✕ Healthy Streets Cell
- ✕ Parking Policy
- ✕ Street Design Guidelines

02
Building the team's muscle

- ✔ Site visits
- ✔ Capacity-building workshops

03
Doing things together

Stakeholder engagement
Project Management consultant along with SSCL staff conducted focus group discussions with residents on a daily basis to get feedback on the ongoing work. This ensured that citizen grievances were collected on a daily basis. PMC-TCE has conducted the stakeholders meeting and designed the conservancies as per the requirements of stakeholders along with existing utilities conditions.

Stakeholder engagement

- ✔ **Public Engagement**

City perception survey
A city-level perception survey was conducted to collect user feedback. The survey was conducted both online and offline. to ensure maximum participation.

Awareness programmes
RWAs and NGOs, alongwith the local administration, educated the residents about the need for cleanliness and proper utilisation of conservancy lanes. This helped in clearing the existing encroachments.

- ✕ **Tactical Trial**

Design process
Around 10 different design options were developed for each of these lanes. Initially parking of vehicles was done on the street which is shifted to conservancy lanes in the design options, that helped in reducing traffic congestion. The design options also include, 2-wheeler cum cycle parking, Auto Stand, Food Courts, Vending zone, installation of Children's Play area, and landscaped areas with Open Gym.

04
Monitoring, learning & improving

Maintenance
A trust called Shivamogga Smart City Development Society has been formed and registered under the society act. The prime focus of the trust is to ensure maintenance of the conservancy lanes.

Operation
Out of the 108 Conservancy lanes, only 23 are earmarked for revenue-yielding activities. All remaining conservancy lanes would not have any rent or charge levied.

Communication method
One City One App is being developed through ICCC for innovative communication methods to engage stakeholders.

Education programmes
RWAs are educating residents to maintain cleanliness in the conservancy lanes. Through various education programmes, the City aims to imbibe ownership for these conservancies to ensure proper usage by the citizens.

Taskforce on the ground for inspecting the maintenance

Challenges

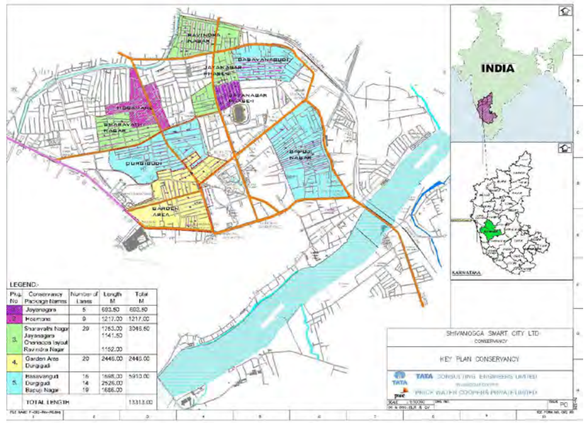
- **Encroachment:** Encroachment of the site was one of the major challenges before the execution of the project, which was mitigated with the support of the Urban Local Bodies (ULBs).
- **Unhygienic Condition:** Located in the backyard of the residential areas, these conservancy lanes became the dump yard over time. Further, the wastewater from the residents was directly flown in open drains of conservancy lanes, which led to the stagnation of water and propelled unhygienic conditions of the lane. However, this issue was resolved, when the city officials, connected the residence's UGD wastewater lines to the city sewer lines.
- **Due to their limited width**, some of the conservancy lanes were not accessible to construction machines. In such cases, the entire work was done through manual skilled labour.
- **Congestion:** Initially parking was done on the streets which is now shifted to off-street locations near the conservancy lanes. This has helped in reducing congestion on the streets.

Outcomes

- **Improved quality of life:** The facilities incorporated in the conservancy lanes have encouraged the use of public sanitation facilities and hence discouraged the people from the practice of open urination and defecation, which has improved quality of life.
- **Enhanced cleaner and hygienic condition:** Littering and dumping of garbage have been reduced, which has fostered a cleaner, and more hygienic environment for the citizens and commuters.
- **Reduced on-street parking:** Many of these conservancy lanes were also converted into parking areas at a nominal fee to reduce the tendencies of on-street parking.
- **Reduced Trip impact:** The decentralization of vending to small neighbourhoods of the city has reduced trip impact of the citizens, saving their time and energy.

Way **Forward**

Existing NMT Street Network in 2023



Impact Stories

In the congested city life, it is difficult to find children's recreation facilities in the neighborhood areas. But projects like conservancy lanes have provided children's play equipment and recreation facilities at the rear side of our houses. We are thankful to Shivamogga Smart City for developing such spaces for children in the city.

- Aruna P, Resident from Basavana gudi area

Scaling-up the transformation

Through this project, the Shivamogga Smart City has succeeded in its participatory approach to address problems in the core city area.

To scale-up the effort, Shivamogga Smart City has identified about 140 conservancy lanes in the non-ABD area, adding to a total length of approximately 16 km.

The city municipal corporation is in the process of revitalising such lanes around the commercial areas based on the learnings of the previous package.

The focus of the City is to improve sustainability of this development by generating a continuous revenue for maintenance of the assets created under conservancies. For this, stringent policy amendments are being proposed in consultation with citizens and enforcing authorities.

Shri. Chidanad S Vatare
Managing Director

Conservancy lanes

Retail shop owners reported an increase in sales by ***10 to 15%*** *From Dec 2021 compared to sales of the same period in 2019 and 2020*

3 Lanes of Old Kashi

Varanasi, Uttar Pradesh

Scan here

Category
Local Street

RoW
1-1.5m

Length
42 km

Duration
Mar 2020- Dec 2022
(2 years 9 months)

Total Cost
₹84.96 Cr.

Nodal Authority
Varanasi Smart City Limited (VSCL)

Implementing Partners
Municipal Corporation, Water Distribution Department, Integrated Power Distribution System IPDS

Profile of the City

Varanasi, having a population of ₹11.9 lakh, was selected in Round 2 of the Smart Cities Mission. It has an ABD area of 5.6 sq km out of a total area of 82 sq km in the city. Varanasi Smart City has executed various projects across all beach heads in the Smart Cities Mission among which 16 projects worth ₹329 Cr. have been completed in the mobility sector. To enhance mobility, Varanasi has undertaken projects like — Smart Roads, Smart Parking, redevelopment of wards, E-buses etc., through the journey of the Mission.

Context of the Project

Varanasi is famous for its complex network of narrow lanes throughout the old city, called "galis", often described as the city's nervous system. Through the Smart Cities Mission, the Varanasi Smart City planned to transform six wards through the "Redevelopment of Wards of Old Kashi" project. Through these efforts, the city hopes to provide its residents with a better quality of life and attract more tourists. The project involves various components, such as the revitalization of sewage and water lines, Pavement of Traditional Chauka Stones and Thematic Wall Art.

Vision of the Project

The project aimed to revitalize and modernize the old city core of Varanasi while preserving its unique heritage character and increasing public amenities.

The lanes were dilapidated, with over ground utilities with unclean and uneven paving surfaces / 5

The utilities are moved undergorund. The lanes are rejuvenated with the local Chauka stone pavements and vibrant wall paintings

Cross Section of Lanes of Old Kashi

Note: This illustrative section is not to scale.

Design Highlights

01 The project was executed in six wards under which more than 100 lanes were undertaken.

02 The project's primary focus was efficient utility management, ensuring the provision of sewage and water pipelines for the residents' benefit.

03 To maintain the heritage character of Kashi, traditional Chauka stones were used for pavements.

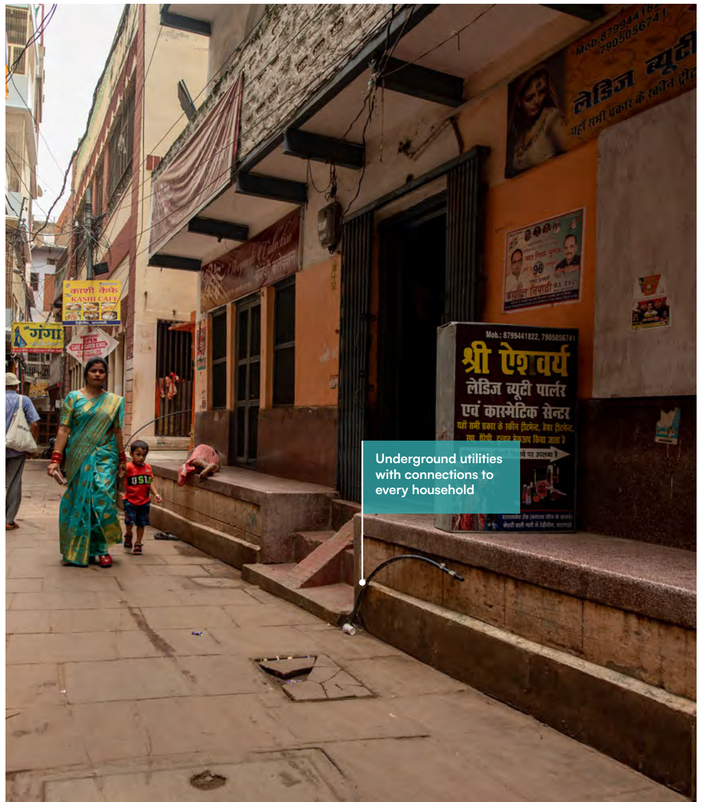
04 Owing to the narrow widths, most of the lanes were designed as shared streets.

05 Placemaking elements like seatings, garbage bins, etc were provided.

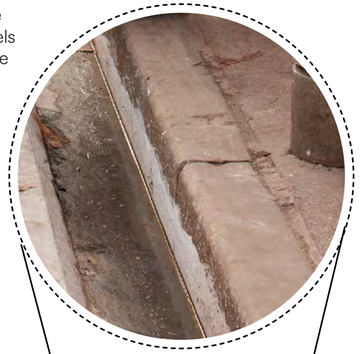
06 According to the lane widths available, specific zones were designated to organize parking and vending activities, all while ensuring clear and unobstructed walking space for pedestrians.

07 Beautification of these lanes were done through thematic wall paintings that depicted the traditional, historical and mythological folklore of that particular lane.

The project is equipping Varanasi with modern amenities while attempting to preserve its unique heritage.



Precast Concrete Drainage Channels installed along the street edge.



Street transformation in the residential zones (narrower lane widths)


Shifting the utilities underground cleared up space for safe walking lanes in the neighbourhood


Existing kattas (plinths) along the houses being used for recreational placemaking

Project Journey


Project construction stage

01
Laying the Foundation

✓ Completed ✕ Not yet started ● Ongoing

- ✕ Parking Policy
- ✓ Vending Policy
- ✕ Healthy Streets Policy
- ✕ Street Design Guidelines
- ✕ Site Visits
- ✓ Capacity Building Workshops

Project Management Committee
Further, a committee of stakeholders, including the in house engineers, project mangers, technical experts from IIT, local representatives, engineers from jal kal department and other stakeholders affected by or involved in the project was created.

02
Building the team's muscle

Public Relations Office
Getting support from all the residents of all six wards during the construction was difficult. Many grievances and court cases were filed. Smart City's dedicated Public Relations Officer was very effective in ensuring that issues of all the affected users were heard and resolved. More than 65000 grievances were successfully redressed during the time of public duration.

03
Doing things together

Expert Reviews
As the designs were developed inhouse and in most cases were changed on-site, based on the context and the issues faced, the designs were reviewed by the committee of experts. The Corporation engineers along with the Jal Kal Department would visit the sites weekly. The issues faced by them was then discussed in the larger committee meetings that were conducted on a fortnightly basis. Most of the issues faced were due to the complexities of dilapidated houses and services.

Stakeholder Engagement
A series of programs including stakeholder consultations, workshops, and meetings were organized to facilitate discussions on the project's objectives, plans, and anticipated outcomes, ensuring active public engagement. Valuable feedback gathered from these engagements was utilized in designing public spaces and preserving heritage buildings. The implementation was focused on six identified wards as part of the initiative.

Outreach
Varanasi Smart City team conducted a massive awareness and discussion campaign through Print-media, Radio, Advertising, Tableau vehicles and social media for the outreach among to residents.

Public engagement and grievance redressals
Varanasi's smart city initiative established a dedicated grievance management cell aimed at promptly resolving residents' on-site issues. Subsequently, comprehensive public consultation meetings involving political representatives, ward councillors, local members, and other stakeholders were conducted. To engage public effectively and address their concerns, diverse communication methods were employed including focused group discussions, door-to-door grievance redressal, and public feedback mechanisms.

Tactical Trial

04
Monitoring, learning & improving

Operations and Maintenance
Post-completion, the project has been handed over to the jal kal department. During the handover all the stakeholders conducted a joint visit to the sites and a detailed inventory of all the concerned streets was created.
The underground utilities are maintained by the Jal Kal department, while the cleanliness is taken care by the Nagar Nigam. A dedicated committee including the Jal Kal department and other local stakeholders was formulated to look after the operations and maintenance of these streets and the underground utilities.

Vandalism
Most of the artwork and amenities are protected and maintained by the local residents.


Stakeholder consultation at site

Challenges

- The project faced significant challenges due to the narrow lanes in Old Kashi. Mechanized machines were hindered by the limited width, necessitating much manual labor. Complicating the situation further, key lanes served as primary routes to the popular Shri Kashi Vishwanath Temple, leading to congestion from devotees. To overcome this, the project team opted to conduct renovations during midnight hours when the temple was closed, minimizing disruptions. Collaborating closely with the local community and temple authorities, the team ensured the work preserved the temple's sanctity and caused minimal inconvenience to devotees. Despite obstacles, the project succeeded in safeguarding Old Kashi's cultural heritage.

Outcomes

- The project has left a lasting positive impression on the local residents. Being the first renovation effort of its kind since independence, the project holds particular significance for the community. The tangible improvements have positively influenced the daily lives of the locals, fostering a sense of gratitude towards the dedicated efforts of the project team.

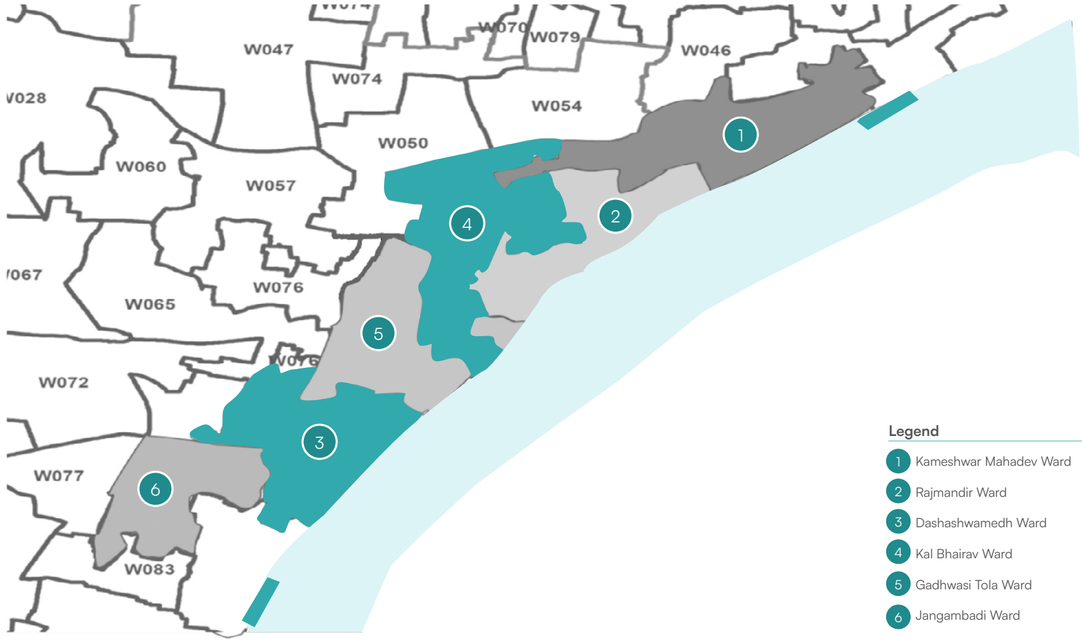
Impact Stories

It is heartening to see that the Redevelopment of Wards of Old Kashi project has positively impacted our lives. It is also noteworthy, that this was the first monsoon in 72 years with no waterlogging in these redeveloped lanes, which is remarkable.

-Sarala Devi, 97 yrs old resident of Kashi

Way Forward

Redevelopement of Wards of old Kashi



Scaling-up the transformation

Vision: To rejuvenate the oldest Indian living city of Varanasi as a great place to live and visit by conserving and showcasing its enriched heritage, culture, spirituality and traditions through innovative social and financial inclusion solutions.

Lanes of Old Kashi

4 Race Course Road

Coimbatore, Tamil Nadu

Scan here

Category
Sub-Arterial Street

RoW
30m

Length
2.5 km

Duration
May 2020- May 2023
(4 years)

Total Cost
₹16 Cr.

Nodal Authority
Coimbatore Smart City Limited (CSCL)

Implementing Partners
Coimbatore City Municipal Corporation, M/s. SGS India Private Limited, Residents Awareness Association of Coimbatore (RAAC), Race course & Neighborhood Association (RANA), M/s. P & C Projects Limited, M/s Oasis Design Inc., Delhi (Design consultant)

Awards & Recognition
ISAC Award 2022- Winning project under Built Environment Category

Profile of the City

"Manchester of South India" or the "Textile City", Coimbatore- a vibrant and bustling city located in the Indian state of Tamil Nadu. It is the second largest city in Tamil Nadu after Chennai in terms of population and features among top 20 largest urban agglomerations in India as per the census 2011. With a total population of 10,50,721, the city was selected in the Round 2 of the India Smart City Challenge. Under the aegis of the Smart Cities Mission, the city has completed projects worth ₹825 Cr. These projects focus on themes like water body restoration, model roads, waste management, and energy conservation.

Context of the Project

Racecourse Road is an oval loop in a residential neighbourhood, frequently visited by citizens due to its connectivity to key landmarks, institutions and markets. It is one of the streets in the City's NMT corridor that is part of the Seven Lakes Project. Identified in the Smart City proposal, the redevelopment of Race Course Road has significantly benefited local residents and enhanced the city's infrastructure and sustainability. This project rejuvenated the core city area, establishing an inclusive leisure and recreational streetscape while integrating a storm-water management system to mitigate flood risk.

Vision of the Project

The vision of the project was to demonstrate a complete street that has a universally accessible walking plaza with continuous pathways, ramps, bollards & other elements to ensure a barrier-free design.

The walkway was restricted by toe walls on both sides, creating a segregation between the landscape and walking space

Landscape and walking space are integrated as one space that improves the user experience

Cross Section of Race Course Road

Note: This illustrative section is not to scale.

Design Highlights

01 The existing street had a dedicated walkway and sufficient trees for shade. Therefore, the focus of this project was to enhance the activities and improve the user experience by providing necessary amenities to sit, play, rest and walk.

02 The seating spaces are designed as long benches to allow large groups of people to be seated together.

03 Kiosks, play and gym equipment are integrated in the streetscape to create an interactive environment and promote usage of the street for longer durations.

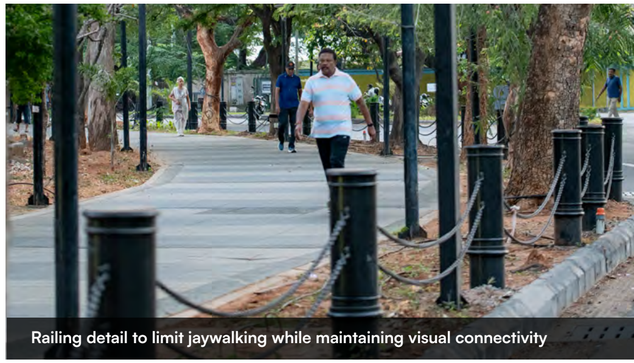
04 The design limits hardscape area to the minimum required for usability. Materials are chosen such that they enable groundwater recharge, for example, the tree gratings are made of porous concrete.

05 A unique stormwater management system is created within the landscape zone that further connects to the city's drainage system.

Earlier, this area was prone to flooding, due to which a unique stormwater management system is created within the landscape zone that further connects to the city's drainage system.

This design mitigates flood with a stormwater management system.

Stormwater swale within the landscape zone



Railing detail to limit jaywalking while maintaining visual connectivity

Walking space integrated with the landscape zones

Public toilets provided

Seating spaces that allow flexible use

Daily morning walks on newly designed pathways

Project Journey


Project implementation at site

01
Laying the Foundation

In 2017, responding to the proposals for model roads and eco-mobility corridors under the Smart Cities Mission, the Coimbatore City Municipal Corporation (CCMC) adopted the "Coimbatore Street Design and Management Policy". This laid the foundation for NMT-related projects in Coimbatore city. Happy Streets, an initiative started with the Race Course Road project, thrives to be a weekly event in the City.

✓ Completed ✕ Not yet started ● Ongoing

- ✓ Healthy Streets Policy
- ✓ Healthy Streets Cell
- ✕ Parking Policy
- ✕ Street Design Guidelines

02
Building the team's muscle

- ✓ Site visits
- ✕ Capacity-building workshops


Design review with the stakeholders

03
Doing things together

Stakeholder engagement
Weekly site meetings were organised with the local residents' associations - RANA & RAAC. District-level meetings were conducted at regular intervals with the collector, elected representatives, officials of district administration, and Non-Governmental Organizations.

- ✓ **Public Engagement**

Awareness programmes
Citizen engagement was done through public display boards, media engagement & ward level Focus Group Discussions. Happy streets events were organised on a regular basis to garner support.

- ✓ **Tactical Trial**

Design process
Meetings at the site were also conducted with the local resident associations and valuable inputs were also incorporated in the designs and implemented. The design of the walkways included sturdy materials, paper blocks and a little bit of granite.

04
Monitoring, learning & improving

Review schedule
Monthly reviews were organised with the Joint Secretary, MoHUA and fortnightly reviews were organised with the Additional Chief Secretary, Municipal Administration and other departments to coordinate the work. Further, a weekly review was organised with the City Commissioner and Managing Director of Coimbatore Smart City.

Managing Encroachment
The design elements like bollards, paving pattern to demarcate walking space have been instrumental in managing encroachment.
CCTV cameras are installed & Traffic Police is deployed for regular surveillance.

Activating the lakefront
Resident associations have been against any commercial activity on the Race Course Road. Currently the City is in the process of identifying other activities along the lakefront and identifying CSR initiatives with the help of RANA for revenue generation.


Monitoring and review of the project

Innovative Solution:
Integrating Stormwater Management System

There are two systems integrated in the streetscape - one is a Swale to collect the surface runoff from footpaths and other is a water recharge put in the carriageway area that collects all the surface runoff from the carriageway. All the water first gets into the Swale and then into the city system.

The swale is intentionally designed in a meandering path, expanding its surface area, slowing down the speed of water to soak a larger quantity.

Challenges

- **Interdepartmental coordination for utility shifting:** During the project implementation the interdepartmental coordination for the aligning of the utilities was one of the key challenges, which was resolved through regular monthly review meetings with all the implementing agencies and stakeholders.
- **Traffic management:** During the construction stage of the project, traffic management was also a critical issue. To ensure the smooth implementation of the project, traffic rerouting and efficient traffic management was required. With the support of the traffic police, the city resolved the issue and ensured traffic movement without any hindrance in the construction.
- **Parking Encroachment:** After construction, some of the non-parking areas were encroached for car parking. The Coimbatore City Municipal Corporation and Coimbatore Smart City Limited prepared an area-level parking management plan to resolve this issue.

Outcomes

- **Increased pedestrian and vehicular counts:** After Implementation the road observed a Pedestrian Count of 7464 / day (weekend) and Vehicular Count - 2857 / day (weekend).
- **Vibrant public space for all:** After the development of the project, people from all groups come for their morning & evening walks. Visitors from different age group visit this place for daily activities like walking, jogging, cycling, yoga and sports.
- **Enhanced healthy lifestyles:** Dedicated cycle track and pathways, have encouraged people to adopt cycling and walking as the part of the daily activities of their life.
- **Solving decades of problems:** The unique stormwater management system - bioswales incorporated in the streetscape has helped mitigate floods.

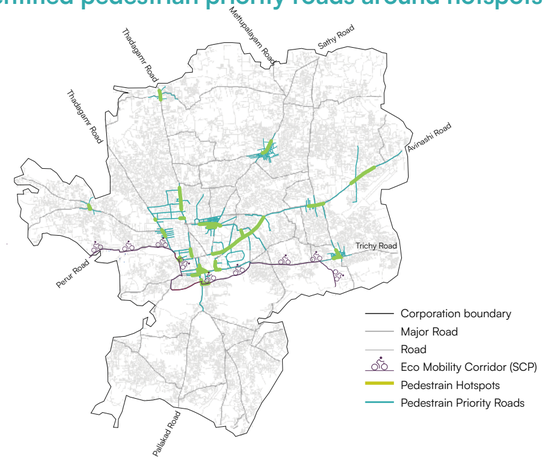
Impact Stories

We organized a cycling event starting from Race Course Road, passing through the neighbourhood lake promenades, and ending near RS Puram. The scenic beauty along the Race Course Road while cycling really enriched our cycling experience. Many of us cycle along the dedicated cycling lane and take our daily morning walks on the segregated pedestrian ways of the newly designed race Course Road.

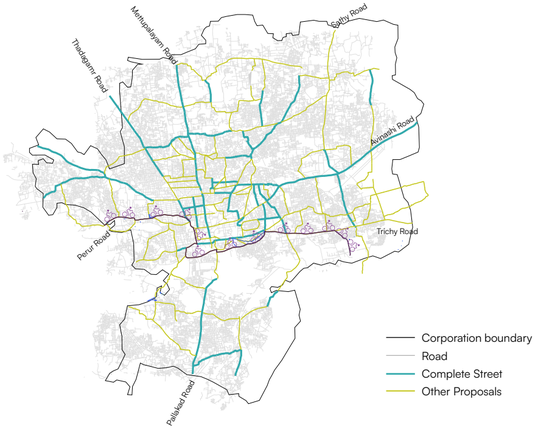
- P Robert Anthony Raj, Member of western Valley Cycling, Coimbatore Smart City

Way Forward

Identified pedestrian priority roads around hotspots



Proposed NMT Street Network in 2032



Scaling-up the transformation

The prime purpose of the NMT Network Plan is to set forth a comprehensive set of measures which would put the city on the path to a sustainable, low-carbon mobility system by the year 2035.

The NMT Network Plan identifies the safest possible routes connecting the public transport hubs, shopping centres, religious centres, recreation spots, institutions and other local amenities.

It should be noted that the proposed NMT network and pedestrian hotspots are being developed to complement and connect the proposed ecomobility corridor in the "8 Lakes Rejuvenation and Restoration Plan" under the Smart Cities Project

Mr. Bhaskar,
General Manager,
Coimbatore Smart City Limited


Race Course Road

5 Street 106

New Town Kolkata, West Bengal

Scan here

Category
Sub-Arterial Street

RoW
46m

Length
0.2 km

Duration
Oct 2021- Jun 2022
(8 months)

Total Cost
₹5.2 Cr.

Nodal Authority
New Town Kolkata Development Authority (NTKDA)

Implementing Partners
City Level Advisory Forum (CLAF), Malabi Makur & Associates, M.M Enterprise (Contractor)

Profile of the City

New Town, Kolkata was declared as a potential Smart City under the Smart Cities Mission, in the Round-1 (Fast Track) of the challenge of the smart city. Having a total area of 28 sq km, the city has implemented more than 50 projects on Smart streets and smart mobility, total worth ₹430 Cr. Under the Smart Cities Mission, the city has taken multiple initiatives that promote non-motorized transport while facilitating seamless network of dedicated cycle tracks and pedestrian pathways.

Context of the Project

Street 106, situated at the core of New Town Kolkata, despite regular footfall was rendered lifeless during evenings. As part of the Smart Cities Mission's initiative — Street4People Challenge, the project was conceived and aimed to introduce new engaging activities, such as a food truck park, to activate the street during late hours.

Vision of the Project

This project revitalised the street with engaging activities, converting it into a pedestrian-friendly street ensuring safety and vibrancy, fostering a lively space for the community throughout the day.

The street was used as only a mode of commute, while limited activities along the street kept it inactive during late evenings

The street is now a vibrant and safe public space for the people, with a variety of activities even in the late evening hours

Note: This illustrative section is not to scale.

Design Highlights

01 The project conceptualisation initiated with a design competition to crowdsource ideas. An integral part of the selected design was the efficient traffic circulation for converting Street 106 into a pedestrian-friendly zone.

02 The carriageway is refurbished and vibrant paints are used to demarcate the pedestrianised stretch. Footpath abutting the carriageway is converted into children's play zone with outdoor play equipment. A segregated cycle track is also created along the street length.

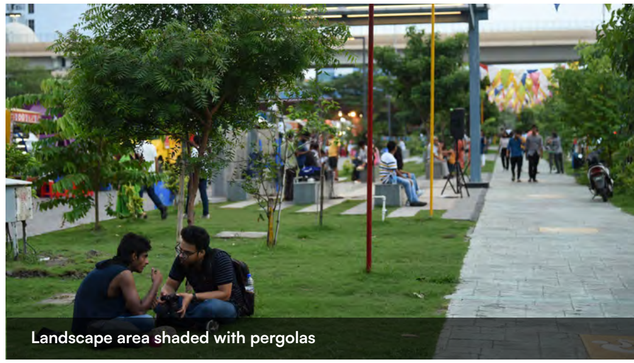
03 The service lane is converted into a food truck zone, integrated with necessary amenities like seating spaces, to popularise the street and keep it active in the late evening hours.

04 A permanent dais is integrated in the street design to offer a platform for performances during public events. NTK radio is an active contributor to the space.

05 Some of the materials used are: Cement concrete, galvanized iron sheet, polycarbonate sheet, synthetic enamel paint, exterior grade acrylic primer, decorative acrylic exterior emulsion paint, interlocking concrete paver block, kota stones (polished, honed, leather finish), high quality children playground equipment, etc.'

The street is now a vibrant and safe public space that becomes a food street at night

Coloured floored patterns created to demarcate the pedestrian-only zone



Landscape area shaded with pergolas

Outdoor play equipment along pedestrian-only zone

Continuous walking space along the carriageway

Project Journey

01
Laying the Foundation

The city formed the Non Motorised Transport (NMT) cell which is now part of the New Town Kolkata Green Smart City Corporation Ltd. The city also developed Street design guidelines which was followed during the implementation of other streets in New Town Kolkata

✔ Completed ✕ Not yet started ● Ongoing

- ✔ Healthy Streets Policy
- ✔ Healthy Streets Cell
- ✕ Parking Policy
- ✔ Street Design Guidelines

02
Building the team's muscle

- ✔ Capacity Building Workshops
- ✕ Site Visits

Online & offline Juries
Local experts were involved in the competition juries to share contextual suggestions on the designs submitted by the participants.

Walking audits
Walking audits were organised with the participants of the design competition to ensure that they are aware of the on-ground situations.


Construction phase of the project

03
Doing things together

Design Competition
Crowdscourcing ideas through a design competition helped in ensuring community engagement.

Stakeholder engagement
Street 106 lies in one of the three action areas identified by NTK. Weekly citizen grievance meetings were organised for each action area where city officials, including engineers, CEO, and the chairman of ULB, interacted with citizens, NGO, shopkeepers association, transgender community, women association, to resolve their issues. This led to a smooth implementation as people started trusting the grievance redressal system. All the stakeholders were engaged through out the project period through mutual consultation, filed visit for redressal and resolving legal issues on continuous basis.

04
Monitoring, learning & improving

Traffic management
The city authority of New Town Kolkata along with the Bidhanagar Police Commissionerate played an important role in working out an alternative traffic circulation plan, for pedestrianising Street 106.

- ✔ Tactical Trial
- ✔ Public Engagement

Monitoring
The project was regularly monitored by the engineering section of the West Bengal Housing Infrastructure Corporation (WBHIDCO) and the NMT Cell of New Town Kolkata, that was created during the Streets4People Challenge. Moreover, the project was also periodically monitored by the Board of Directors of NKGSCCL and the City Level Advisory Forum through weekly review meetings.

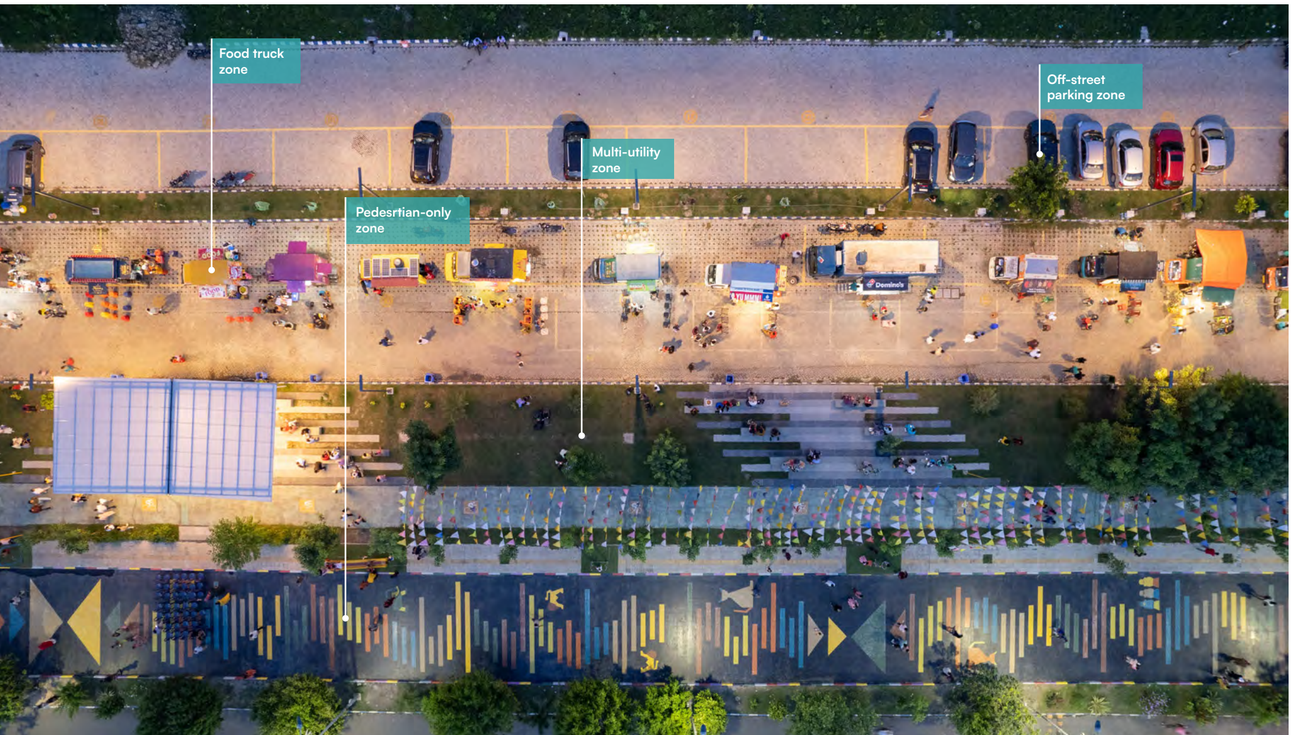
Food Truck Policy
The New Town Kolkata Development Authority (NKDA) developed a food truck policy where registered commercial vehicles can be licensed to run food trucks in this zone.
The design included a dedicated space for only 5 food trucks but later based on the citizen demand, an additional parking bay accommodating up to 20 food trucks is created.
The revenue generated from the rentals provided by food trucks is directed to the general fund of NKDA, which takes care of the operations & maintenance of the space.


Citizen engagement

Innovative Solution: **Integrating the Food Truck Zone**

The food trucks with their plethora of food options act as a 'pull factor' for attracting citizens to the place, especially during late evening hours.

The food truck zone was initially not part of the design. The service lane was later converted into food truck zone to popularise the destination. For efficient management of visitor car parking, a dedicated off-street parking location is also created by the authority after project implementation. It is managed by a vendor selected by the city authority through a competitive bidding. The New Town Kolkata Development Authority (NKDA) developed a food truck policy where registered commercial vehicles can be licensed to run food trucks in this zone.



Challenges

- **Resistance from the citizens:** At the initial stage of the project, there was major pushbacks of the citizens on the pedestrianisation approach of the street. However, this was mitigated through regular stakeholder consultation with the citizens. Further, during the implementation the service lane was redesigned as a dedicated parking bay for food trucks to ensure smooth traffic and pedestrian circulation.
- **Traffic management:** During the implementation of the project, there was an issue with the vehicular traffic movement. However, the city Authority of New Town Kolkata collaborated with the traffic police, for the efficient management of traffic by providing alternate routes to ensure smooth pedestrianisation of Street 106.

Outcomes

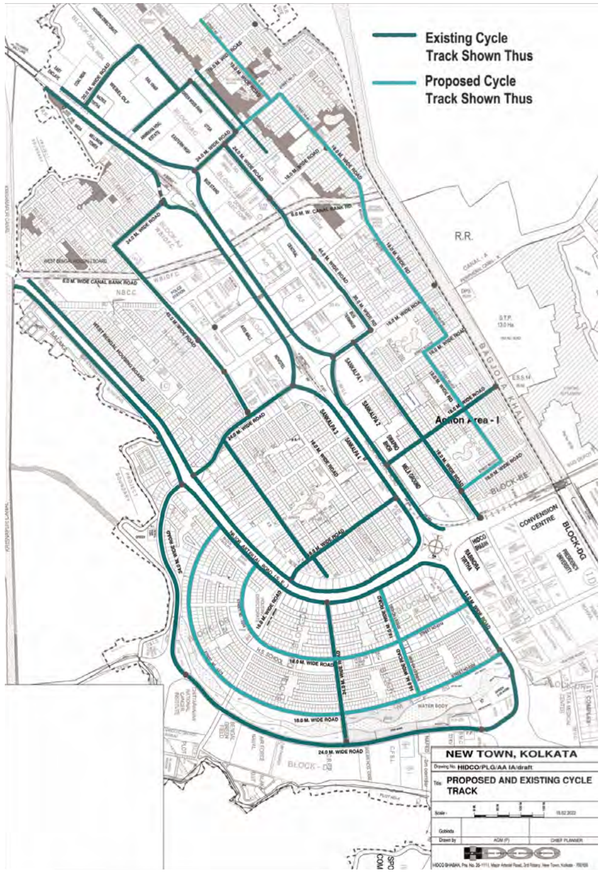
- **Revenue generation:** The revenue generated from the rentals provided by food trucks is directed to the general fund of NKDA, which takes care of the operations & maintenance of the space. Presently, the operating food trucks generate around 1 lakh revenue (on weekdays). The revenue figures substantially increase to over 2 lakhs on weekends when the place is bustling with people and activities.
- **Increase in footfall:** On weekdays, the site records a footfall of around 250 — 300 persons per day which increases manifold during the weekends 1000 — 1500 persons per day.
- **Reclaimed space:** 1275 sq m of space was reclaimed for pedestrians and cyclists.
- **Enhanced Air quality:** Post implementation of this project here has been a 1.86% improvement in AQI index, and 28.83% reduction in PM 10 AVG ($\mu g/m^3$) in New Town Kolkata.
- **Change in Design Thinking:** The success of the Streets4Peopple Challenge as seen at the Street 106, led the city to take up another Happy Street which is currently being executed. Tactical trials, initiated during this projects are now part of the system for all street projects in NTK.

Impact Stories

Network of well-lit pedestrian street with dedicated food truck lane, has created this space more vibrant and safer in New Town. Directly connecting to the Community zone below the flyover, this place has become new cultural and social hub of the city. People from different part of Kolkata come here over the weekends to spend quality times with their friends and family

- Ms. Deepa Aditya, Government Service & Resident of New Town

Way Forward



Scaling-up the transformation

New Town Kolkata's 3-year Action Plan aims to implement traffic-calmed streets in 5 neighbourhoods/wards after testing solutions through tactical methods.

New Town Kolkata Smart City aims to double the Healthy Streets Network and has planned the implementation in 3 phases. The City also aims to implement parking management in 2 model neighbourhoods and initiate impact assessment of all the completed streets in the City.

The City also aims to host regular Healthy Streets campaigns to build awareness.

The 3-year Healthy Streets Action Plan is a step towards committing to and ensuring a long-term transformation, by laying down a roadmap. We aim to provide adequate physical infrastructure to increase the mode share of pedestrians and cyclists by 70% and eliminate road fatalities.

Mr. Debashis Sen, IAS
Chairman, New Town Kolkata Development Authority (NKDA)


Street 106

6 Child Friendly Street

Dehradun, Uttarakhand

Category
Local Street

RoW
5.5m

Length
10 km

Duration
Aug 2019- Dec 2023
(4 year 5 months)

Total Cost
₹3.05 Cr.

Nodal Authority
Dehradun Smart City Limited (DSCL)

Implementing Partners
Dehradun Smart City Limited

Context of the Project

Many streets in Dehradun lack pedestrian infrastructure. The existing walkways are narrow and hence people prefer to walk on the roadways instead of the narrow pathways. This has resulted in blocked passageways. Additionally, as India motorises, the sheer number of on-street vehicle parking has increasingly become problematic. Thus, this project provides an opportunity to provide safe walkways and calm traffic to improve the safety of school children crossing the streets.

Vision of the Project

Vision is to establish safer streets and secure lives by enhancing the perception of walking safety, elevating the usage of Non-Motorized Transport (NMT) modes within the city, and co-creating recreational amenities tailored for children within school zones.

Project Journey

Laying the Foundation

The city is aiming to evolve as a child friendly city by encouraging the use of public transport and creating safer pedestrian paths. This project proposes to refocus towards specific interventions around schools such as amenities, vending zones, medians, curb extensions, and traffic calming measures. Regulatory and self-enforcement measures were adopted to improve safety.

Key Actions

Initially, all the schools around the project interventions were involved in the consultations. To ensure that all inputs are captured, during the COVID phase, the consultations with the students were held online. Citizens were also reached out through media engagement to raise awareness about the project and gain their support. Tactical urbanism exercise (pilot project) was undertaken to demonstrate the impact of the project to the school children. Students were invited to visit the pilot site and were involved in the designing and painting of identified areas marked as pedestrian areas. The Public Works Department, the traffic police played significant roles during and after the project implementation. Special capacity building sessions were also conducted for the PWD officials and traffic police working on the project. For ensuring cleanliness and respecting the designed spaces, the communication programs helped the residents and schools to 'own' the project for ensuring sustainability.

Design Highlights

The project envisages the following infrastructure interventions:

- Retrofitting existing walkways within school access zones
- Creating safe pedestrian crossings at major junctions and mid-blocks
- Installing traffic-calming elements
- Other complementary elements such as beautification through wall paintings and murals

The goal is to drive behavioral change through targeted communications and outreach efforts. With a focus on enhancing road safety and instilling discipline, DSCL plans to collaborate with the traffic police to strengthen enforcement around schools. As part of the pilot project, the intended footpath width was delineated on the street using paint, while the reclaimed pedestrian area was highlighted with vibrant colors.

Challenges

- During the execution of the project there was a limitation of the availability and variety of materials for tactical interventions (pilot project). However, the team worked on it strategically and implemented the intervention with available materials and red carpets to level the uneven unpaved surface and overcome this challenge.

Outcomes

- The traffic calming measures helped curtail the motorists behaviour of speeding.
- The project provided safe routes to schools by implementing dedicated walking and cycling routes and thus increased the habit of walking and cycling among the children.
- The colourful paints on roads helped to visualize the width of the footpath and remaining carriageway post-implementation.

7 Hiran Magri

Udaipur, Rajasthan

Category
Arterial Street

RoW
40m

Length
2.7 km

Duration
Feb 2019- March 2023
(3 years 11 months)

Total Cost
₹48.17 Cr.

Nodal Authority
Udaipur Smart City Limited (USCL)

Implementing Partners
Udaipur Municipal Corporation (UMC), Urban Improvement Trust (UIT), Udaipur and EPTISA Servicios de Ingeniería S.L. (PMC)

Context of the Project

The 2.7 km long road stretch from Hiran Magari to Jadav Nursery is one of the busiest and most significant roads in Udaipur Smart City. Despite its importance, the street was underutilized, plagued by illegal encroachments, and lacked pedestrian crossings, footpaths, parking, and basic amenities.

Vision of the Project

The project aimed to alleviate traffic congestion, improve parking management, improve pedestrian safety, promote environmental sustainability, and incorporate smart technology for more efficient and safe transportation.

Project Journey

Laying the Foundation

The Udaipur Smart City Limited has taken a participatory approach in engaging with stakeholders throughout the implementation of the Hiran Magri Smart Road Project. The city engaged with city residents, NGOs, local business owners, and other government departments such as Public Works Department, the Municipal Corporation, and the Transport Departments during the planning and implementation phase of the project. Further, the Street Design Guidelines and Parking Policy are also being adopted by the city to enhance non-motorized transportation.

Key Actions

To ensure successful implementation of the project, the SPV conducted regular consultations with stakeholders, including local residents, business owners, and government officials, to gather feedback and suggestions for improving the project. The implementing agency conducted stringent quality control measures to ensure that the project's construction and installation adhered to industry standards and specifications. Further, third party auditors were involved to review the project's implementation and provide feedback and recommendations for improvement. Overall, Udaipur Smart City Limited implemented a robust review mechanism to ensure the successful implementation of the Hiran Magri Smart Road Project and its alignment with the objectives of the smart city mission.

Design Highlights

The design components included several traffic calming measures to improve safety and reduce traffic congestion. Other features included dedicated bicycle lanes, well designed walking promenade, landscaped corridor, seating areas, seating spaces, kid's play area.

Challenges

- Initially, the public participation was challenging as the community had diverse needs and expectations, and it was difficult to balance these with the overall project goals. However, through continuous participation and handholding this issue was resolved.
- The project involved coordination with multiple agencies, including the local government, utility providers, and contractors. This coordination was often complex and time-consuming, leading to delays in project timelines.
- One of the biggest challenges was the traffic management. The project team had to implement effective traffic management strategies to minimize the impact on the daily lives of residents and businesses.

Outcomes

- The project has reclaimed 4800 sq m space for pedestrians and cyclists.
- The Hiran Magri Smart Road Project has significantly improved the quality of life for the community by promoting safety and enhancing the local economy.
- The installation of street lighting and decorative light facilities has greatly improved the driving experience during evenings and nights.
- The newly developed walking promenades have encouraged the elderly and young people to take daily morning walk.
- The project has enhanced business opportunities for local vendors.

8 Housing Board Colony Streets

Karimnagar, Telangana

Category
Local Street

RoW
9-15m

Length
11 km

Duration
Jan 2019- Jan 2022
(3 years)

Total Cost
₹71.5 Cr.

Nodal Authority
Karimnagar Smart City Ltd. (KSCL)

Implementing Partners
PMC: Aarvee Associates, Contractors: Nanitha Constructions, Local Authority: Municipal Corporation, Town planning Department, Public Health Department

Context of the Project

The Housing Board Colony comprises of three different income groups — LIG, MIG and HIG. The project sets an example of economic and neighborhood upgradation through simple design interventions and organization of spaces through multi-stakeholder consultations. Initially, the neighborhood lacked proper roads, transport, drainage and basic services. On initiation of the project by the SPV and the public, the streets of the neighborhood were designed with an MV Lane, MUZ and a separate channel for storm water drainage. The MUZ contained all the piping and ducting like electricity cables, water pipelines, sewage pipelines, etc. The design consisted of a simple yet efficient street organization, providing services and pedestrian friendly walkways.

Vision of the Project

To develop the neighborhood such that it provides necessities to its residents including transportation and socially interactive spaces.

Project Journey

Laying the Foundation

The project was initiated as the third package of smart road development projects initiated by Karimnagar Smart City. In this package, the Housing Board Colony was specifically chosen on the demand of the public and the RWAs of the colony.

Key Actions

There were various stakeholders like the municipal corporations, corporators, residents, etc. with whom in-person consultations were conducted within the colony. Additionally, permissions had to be sought for relaying the existing partial drainage system.

Design Highlights

The streets in the colony have been designed with an MV lane to carry the flow of traffic; an MUZ with pavers so that any repair work can be taken up without disturbing the vehicular traffic; a storm water drain besides the MUZ to capture the run-off efficiently and a 1-1.5m wide pedestrian walkway to enhance pedestrian safety. On-street parking has also been provided in strategic locations where the MUZ has been brought at-grade, carving extra space for vehicular parking. Additionally, for the holistic development of the neighborhood, various streetlights and furniture have also been installed.

Challenges

- One of the major challenges that was faced during the execution of these streets was encroachment or spill overs on the RoW. There were boundary walls, shop facades and frontages which created maximum spill-overs in the neighborhood. The removal and acquisition of these took around 12-15 months amidst the execution of the project. To satisfy the property owners, monetary compensation or TDR was provided to ensure fair practice.
- Another challenge occurred on the discovery of the differential levels between the existing partial drains and the designed road level. Therefore, there were major design changes which delayed the process of execution and completion.

Outcomes

- Streetlights have helped to create a sense of safety among the residents.
- Pedestrianization has increased, which was completely non-existent prior to the development.
- Organised on-street parking has been implemented.

9 Marine Drive Walkway

Kochi, Kerala

Category
Local Street

RoW
18.8m

Length
2.45 km

Duration
Feb 2020- Feb 2021
(1 year)

Total Cost
₹1.07 Cr.

Nodal Authority
Cochin Smart Mission Limited (CSML)

Implementing Partners
Cochin Smart Mission Limited, Greater Cochin Development Authority

Context of the Project

Kochi is among the first 20 cities selected under Government of India's Smart Cities Mission. Under the revitalization of public spaces in Kochi, Kochi Smart City has renovated 2.45 km stretch of marine drive walkway linking Rajendra Maidan on the south of the corridor up till Tata Canal to the North Corridor. The Marine drive in Kochi features a scenic walkway that encourages and strengthens the social fabric of the society. Places like these across the city are very important to improve walkability in the city.

Vision of the Project

The project aims at revitalising all the public spaces, along the western water edge of Ernakulam mainland, by improving the accessibility, introducing various activities and linking the same with each other to create an active corridor for recreational facilities.

Project Journey

Laying the Foundation

The project was initially conceived as part of the larger non-motorized transport (NMT) network of the ABD area. Through several discussions with stakeholders, the project was implemented as an open space corridor linking two open spaces in the ABD area.

Key Actions

This 2.45 km walkway has ensured safe, inclusive, and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities in the project. For giving a distinct identity to the place - landscaped areas and vending kiosks have been provided. By installing ample lighting and implementing people-friendly streetscaping, the project has improved accessibility to the area. Along the walkway, efficient shoreline protection have been provided at the backwater edge.

Design Highlights

The design includes components such as streetscaping, open seating, LED street lighting and landscaping, vending kiosk, advertisement provision & play equipment. To attract all the age groups to this area, a family play area and Gym have been incorporated. For a cleaner and safer space, dustbins were provided, and a proper waste collection system have been ensured. A proper drainage system has been provided to avoid waterlogging issues. Green cover along with native trees and flowering plants were provided along the 2.45 km stretch has helped in increasing the green coverage of the city. This walkway is remotely monitored by the police using a CCTV network to assure the safety of the citizens.

Challenges

- Being developed on the reclaimed land, the Marine Drive walkway faced disturbance during the construction stage. However, the issue was resolved by providing efficient shoreline protection along the walkway.
- Due to the COVID lockdown, there was delay in the execution of the project on ground.

Outcomes

- The corridor promotes NMT and reduces dependency on motorized transport by providing pedestrianized access.
- The project has significantly reduced carbon emissions and contributed to SDG Goal 7.
- The renovated walkway provides individuals with a space to rest and exercise.
- There is an increase in footfall of people after the renovation of the place. Both young and old people, college students, couples, people who just got off work, etc. all visit the place regularly for morning and evening activities.
- The redevelopment has also triggered people to follow a healthy lifestyle by walking, jogging, cycling, and using the open gym and the yoga area.

10 Mauli Medical Road

Aurangabad, Maharashtra

Category
Sub-Arterial Street

RoW
40m

Length
0.4 km

Duration
Sep 2022- May 2023
(1 year 6 months)

Total Cost
₹0.5 Cr.

Nodal Authority
Aurangabad Smart City Limited (CSML)

Implementing Partners
Water department, Municipal Corporation, IIT Bombay, Town Planning Department, Yash Innovations

Context of the Project

The stretch between Mauli Medical to Bhavsingpura Kaman, connects the city to a low-income residential area, mainly used by pedestrians and cyclists. Each day about 1 lakh people traverse this street, majorly women who walk to work. The street is transformed to ensure a safe and pleasant walking and cycling experience, while also allowing the passage of emergency vehicles. Earlier it was in deplorable condition, posing severe challenges for pedestrians and cyclists, particularly during rainy seasons. The initial design primarily focused on vehicular traffic but was later revised to include footpaths and cycle lanes due to the significant pedestrian foot fall. The project received strong support from MLAs and former corporators.

Vision of the Project

The project aimed to enhance pedestrian and cyclist safety and comfort, with a focus on accommodating emergency vehicle access in areas without water pipelines. It aligns with the city's development vision and improves the overall quality of life for residents.

Project Journey

Laying the Foundation

Citizen participation and stakeholder engagement was the foundation of this project. Samadhan Helpline portal was established to facilitate communication and gather feedback from the stakeholders and public. Operations and Maintenance (O&M) plan was also prepared for the next 10 years.

Key Actions

Citizen and stakeholders' feedback was collected through the ULB's website/ application, with the assistance of media analysts who monitor and report on citizen concerns and street quality. In coordination with the Water Department, utilities were relocated to expand the Right of Way (RoW) and removed encroachments to create footpaths. Further, a design cell was established with a team from IIT Bombay, they were engaged for the review and monitoring of the project.

Design Highlights

Considering the high number of pedestrians and cyclists in the city, the street design incorporated speed calmers, and increased RoW with dedicated footpaths and street furniture. The design highlights also include on-street parking management, at-grade crossings, underground utility ducts, and multipurpose open spaces, which encompass seating areas, play equipment, and placemaking. The street included a section over an old bridge, where bitumen was used instead of concrete. Paved tabletops are placed at every 100 meters to control the speed of the vehicular movement.

Challenges

- The change in RoW and the overall street design caused a lot of approval from different departments, which resulted in delays during the implementation stage.
- Traffic congestion was resolved by taking several traffic management.

Outcomes

- There is an increase in pedestrian footfall.
- Almost 1600 sq m of space was reclaimed for pedestrians after the implementation of the project.

11 Manaveeyam Veedhi

Thiruvanthapuram, Kerala

Category
Arterial Street

RoW
15m

Length
0.25 km

Duration
May 2023- Aug 2023
(4 months)

Total Cost
₹1.25 Cr.

Nodal Authority
Smart City Thiruvanthapuram Limited (SCTL)

Implementing Partners
Kerala Rail Development Corporation Ltd, Kerala Road Fund Board, Kerala Water Authority, Public Works Department Kerala, Kerala State Electricity Board & Steel Industries Kerala Ltd.

Context of the Project

Manaveeyam Veedhi is a 0.25 km road stretch from Museum-Vellayambalam Road to the Althara junction in Thuryvanthapuram Smart City. The street is renowned for its vibrant cultural performances and Keltron side wall art. As the part of the project, the 15m stretch was renovated which aimed to revitalize this cultural street, making it universally accessible with features like food kiosks, amenity blocks, street lights, open libraries, sculptures, and more. The street boasts tree lighting and gobo projector art, enhancing its charm during cultural events.

Vision of the Project

The project envisions transforming Manaveeyam Veedhi into a dynamic Cultural Street, embracing diversity and fostering artistic expression while offering a pedestrian-friendly, inclusive urban environment.

Project Journey

Laying the Foundation

Thiruvanthapuram Smart City adopted NMT/Healthy Streets Policy, Parking Policy, Vending Policy to promote people-friendly streets. The city conducted regular capacity-building workshops before implementing the project on the grounds. Furthermore, a permanent committee was set up to resolve stakeholder issues.

Key Actions

Citizens were engaged through participatory planning. Several participatory tools were involved such as voting, competitions and hackathons to derive the key design components of the streets. Further, Stakeholder input was gathered through focused group discussions and engagement with citizen at the ward level. Public involvement methods included voting, competitions, and hackathons. The inputs and the recommendations gathered form the stakeholders are then reflected into the design and implementation of the project.

Design Highlights

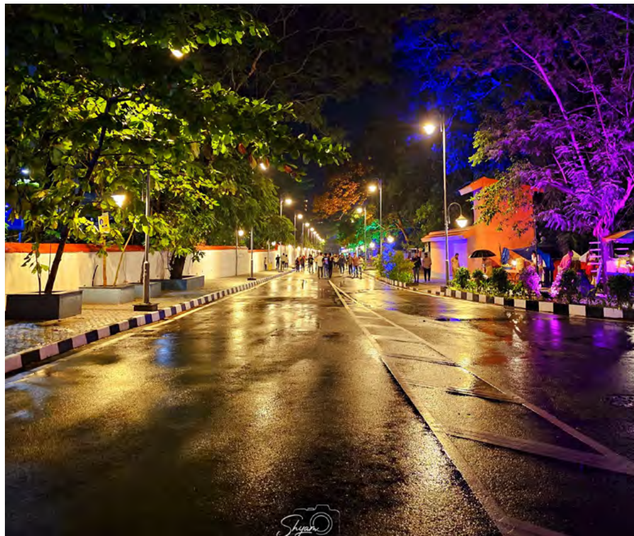
As a result of the stakeholder engagements and the needs of the citizens, the street was designed with a green buffer segregating carriageway and footpath, with underground utilities. The design also included spacious pedestrian ways with seating areas, designated public bicycle sharing stations, Food Kiosks, , Open Street library, Sculptures display, Street art area, Exhibition Area, Pergola for cultural activities, Fitness zone for yoga, congregation spaces, street lighting, gobo projector lighting, Wifi zones and street surveillance bia CCTV.

Challenges

- During the initial phase of the project, there were several pushbacks from stakeholders and street vendors. However, through regular stakeholder engagement workshop and group discussions with the citizens and permanent committee, the challenges were resolved. Further, during the project implementation phase, the vehicular traffic movement was regularized, and the existing vendors were rehabilitated while assuring their livelihoods. Through meticulous planning and asset management, these challenges were overcome.

Outcomes

- Reclaiming 2340 sq m for pedestrians, the street has witnessed a surge in footfall from 100 counts/hr to 15,000 counts/hr.
- The development of this neighborhood street has led to a substantial reduction of anti-social activities and substance abuse.
- This street now serves as a creative canvas for differently-abled students to express their art through wall graffitis.
- It has enhanced nightlife activities in the city while boosting the local economy.



12 Pashan Sus Road

Pune, Maharashtra

Category
Sub-Arterial Street

RoW
36m

Length
1.2 km

Duration
Aug 2021- Apr 2023
(2 years 9 months)

Total Cost
₹6 Cr.

Nodal Authority
Pune Municipal Corporation (PMC)

Implementing Partners
Institute for Transportation and Development Policy (ITDP) India

Context of the Project

Pashan Sus road is an important suburban street located near the north-western boundary of Pune city. It connects the Pashan-Sus residential neighbourhood to Pune city. With the growing residential population, and increasing social activities in the Pashan-Sus neighbourhood, the street was overdue for a design overhaul as per the Pune Urban Street Design Guidelines.

With the Streets for People National Challenge being announced in late 2020, PMC decided to include Pashan Sus Road as its entry. Pune Municipal Corporation (PMC) conducted a design competition by inviting several urban designers to propose designs for the same. Taking cues from winning designs, PMC also developed a 500m stretch through tactical urbanism intervention for the residents to experience the same. With solid data and documentation, PMC designed the stretch yet again and implemented the solutions suggested by residents and competition winners. First 500M stretch was completed by December 2021 and was open to public. The whole street measures around 2.2 km, and they will be completed by mid-2024.

Vision of the Project

The vision was to create a street that would suit the needs of all including the children, elderly and the specially-abled. A street that would give identity to the neighbourhood and provide means for active mobility, recreation and leisure.

Project Journey

Laying the Foundation

Pune Municipal Corporation adopted Walksmart Policy 2016, Pune Cycle Plan 2017 and developed Pune Urban Street Design Guidelines 2016.

Key Actions

Formidable feedback was solicited through focused group discussion, interviews and perception surveys. Outreach was done through print and social media. WhatsApp groups are used for design and execution communications. PMC conducted a design competition by inviting several urban designers to propose designs for the same. Taking cues from winning designs, PMC also developed a 500M stretch through tactical urbanism intervention for the residents to experience the same.

Design Highlights

The design of the streetscape includes segregated cycle track, kids' play area, skateboarding area, senior citizens' leisure area, and organized parking. Further, water water percolation pits are placed at every 200M, to restrict water seepage.

Challenges

- The entire street has a two-way slope towards the street edges. Due to this, negotiating property entrance slopes and level differences was a major issue. In some cases, with the support of the concerned properties, the entrance slopes were moved within their respective premises.
- In addition, designing the stormwater treatment for the large quantity of surface water run-off was critical. These issues were solved on-site at specific issue locations. PMC's design team and road department engineers visited the site every week to ensure efficient designs to resolve these issues.

Outcomes

- Play and recreational spaces for kids and the elderly have increased.
- The number of kids on the street, especially those using the kids' play area and skating zone, has increased.
- As compared to the earlier situation, the space under the NMT infrastructure has increased by 50%.
- The street transformation organised on-street parking through designated parking bays.
- Property rates along the street have substantially increased.

13 Pedestrian walkway

Namchi, Sikkim

Category
Local Street

RoW
4.5m

Length
6 km

Duration
Sep 2021- Dec 2022
(1 year 3 months)

Total Cost
₹8 Cr.

Nodal Authority
Namchi Smart City Limited (NSCL)

Implementing Partners
M/s K B Tamang, Class 1AA Contractor (SPWD, Govt. of Sikkim)

Context of the Project

Namchi Smart City, as part of the Indian Smart Cities Mission, sought to foster innovative, sustainable, and resilient development. It is one of the smart cities of Sikkim and got selected in the second round of Smart Cities Mission Challenge. The city has always prioritized non-motorized transport as part of the mobility plan. Further, during the Smart City Proposal stage, the stakeholders and the citizens had expressed the need for a safe and seamless network of pedestrian walkways to restrict motorized vehicular movement. To address the need of the people, the Namchi Smart City Limited has constructed a well-designed 6 km of pedestrian walkways connecting neighbourhoods, urban centres, tourist spots, parking infrastructures, and roads at various level.

Vision of the Project

Enhancing pedestrian friendly mobility network that fosters inclusivity as the core of development.

Project Journey

Laying the Foundation

Under the gamut of multiple projects, Namchi Smart City has cautiously made decisions toward developing pedestrian friendly streets and citizen centric spaces within the city. Based on the Smart City's proposal and the need of having safe and seamless network of pedestrian walkways as recommended by citizens, the city has developed well designed interconnected pedestrian walkways throughout the council while carving out spaces to accommodate seating areas as part of the streetscape.

Key Actions

The Namchi Smart City (NSCL) has constructed pedestrian infrastructures at various location to the tune of 6 km cumulative within Namchi Municipal Council. These interventions have created a series of well networked non-motorized infrastructures facilitating and encouraging the local adoption of such infrastructure. This intervention has reduced the trip length and has encouraged the people to adopt a healthy lifestyle of walking. A network of pedestrian infrastructure connecting various parking infrastructures has also assisted the visitors and tourist to park their vehicle safely and access the town center with ease and safely.

Design Highlights

As part of the walkways, the NSCL has also implemented more than 4200 LED streetlights to illuminate the existing streets and connected pedestrian walkways.

- 4200 LED streetlights have been installed along 42 kms of roads and 3 kms of the pedestrian pathways.
- 6 km of well-designed pedestrian walkways, is well illuminated by LED lighting, and has safety handrails and rest areas.
- The constructed pedestrian walkway is 1.5m wide, and has accessible design features where the terrain have been gentle.
- The chequered tiles in combination of yellow and terracotta color have been used to provide distinct visible identity of the infrastructure.

Challenges

- The project faced a major challenge during the implementation phase. During the implementation, accessing the right of way (RoW) was opposed by landowner. The NSCL managed to sort out the intricacies with the local communities through continuous engagement and were assisted by the ward councilors to remove such barriers.
- Technical and implementation challenges were exacerbated by hilly terrain and dependency on the manual carriages of the construction materials.
- The biggest challenges include integrating public aspirations and securing buy-in for sustainability of the infrastructure.

Outcomes

- The project has enhanced safety for pedestrians, children, women, entrepreneurs, and motorists. and has expanded the economic activities of the entrepreneurs.
- The illuminated streets have become much safer, more pedestrian-friendly, and have expanded gender equity avenues.

14 Saptagiri School Road

Davangere, Karnataka

Category
Sub-Arterial Street

RoW
30m

Length
0.66 km

Duration
Aug 2020- Nov 2021
(1 year 3 months)

Total Cost
₹0.87 Cr.

Nodal Authority
Davanagere Smart City Limited (DSCL)

Implementing Partners
iDeck, K Srinivas Reddy

Context of the Project

The Saptagiri School Road project addressed urbanization induced traffic congestion in Davanagere' s CBD area. Spanning 660 meters, it connected peripheral regions to the developed CBD, improve accessibility, and boosted the economy. Noteworthy for its interconnectivity, the road integrated with key sections like PB Road and the clock circle, preserving Davanagere's legacy.

Vision of the Project

The project aims to foster seamless connections among people, markets, and services, with a primary focus on enhancing connectivity and promoting walkability.

Project Journey

Laying the Foundation

The design adhered to Indian Roads Congress guidelines, for road geometric standards and Urban Street design guidelines for designing street elements.

Key Actions

Stakeholder interactions occur in city-level advisory forums and Davanagere Smart City board meetings, incorporating feedback through focused group discussions. Further, a digital terrain model visualized the topography at project' initiation, and soil samples were collected. Traffic assessments along the stretch provided valuable insight for tactical planning, optimizing route utilization. This initiative involved rigid pavement, walkways, stormwater drainage, and afforestation, emphasizing a Test-Learn-Scale approach for sustainable urban mobility.

Design Highlights

Tangible elements included as part of the design such as cycle tracks, pedestrian pathways, stormwater drains, solar-powered LED street lights and increased green cover. For the design of horizontal and vertical geometry and other road elements, design standards referring to the guidelines of Indian Roads Congress are used.

Challenges

- During the project implementation City corporation faced challenges in shifting and aligning underground utility lines such as , water supply pipe lines, electrical pole, 24*7 water supply project pipe line, BSNL pipeline etc.

Outcomes

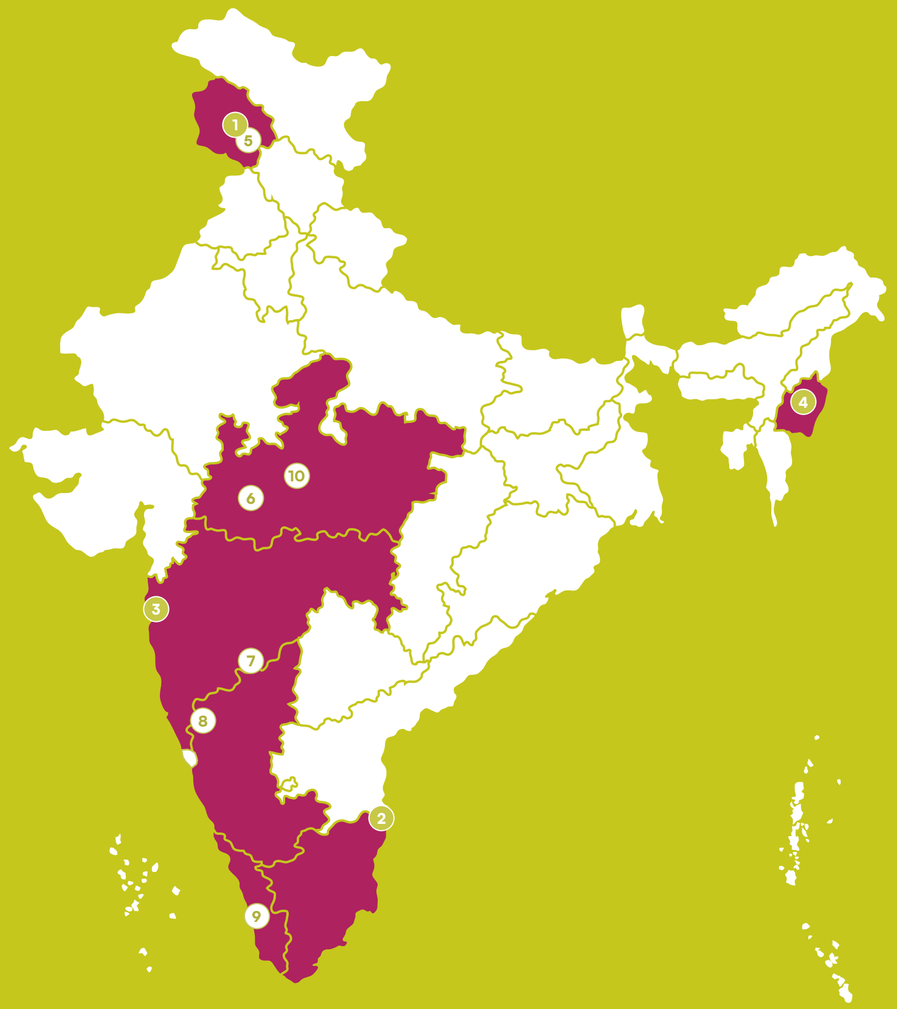
- The project intervention enhanced economic and social life of citizens by providing better mobility and improved quality of travel, and enhanced walkability; thereby reduce pollution levels and GHG emissions.
- 3168 sq m space was reclaimed for the pedestrians and cyclist
- After the development of the street the adjacent land value have increased.

C

Market and Commercial Streets

These streets serve as destinations with mostly commercial activity along both sides. These streets see bustling pedestrian activity and require wide footpaths to account for the volume of pedestrians. Under this category 10 case studies on Markets streets have been illustrated that include 4 detailed and 6 overview case studies.

1	Polo View Street, Srinagar
2	Pondy Bazaar, Chennai
3	Thane Station Road, Thane
4	Walkable Streets, Kohima
5	Apsara Road, Jammu and Kashmir
6	Chappan Dukan, Indore
7	Street Bazaar, Solapur
8	Mahila Market, Belagavi
9	Jew Street, Kochi
10	Smart Street, Bhopal



Market & Commercial Streets

Name of Street	City	Catagory	Landuse	RoW (m)	Length (km)	Total Cost	Duration (years)	Funding Sources	Project Initiated by	Public Participation	Temporary Testing	O&M Responsibility
1 Polo View Street	Srinagar	Local		35	0.2	₹ 3 Cr.	1.0		SPV	✓	✗	Public
2 Pondy Bazaar	Chennai	Sub-Arterial		25	1.4	₹ 39.86 Cr.	1.5		SPV	✓	✓	
3 Thane Station Road	Thane	Collector		45	13	₹ 94.9 Cr.	2.4		SPV	✓	✗	
4 Walkable Streets	Kohima	Sub-Arterial		7.5-10	0.4	₹ 9.96 Cr.	1.1		SPV	✓	✓	State
5 Apsara Road	Jammu	Local		7-9	13.6	₹ 46.22 Cr.	1.8		SPV	✓	✓	
6 Chappan Dukan	Indore	Local		30	0.2	₹ 5 Cr.	0.4		SPV	✓	✗	
7 Street Bazaar	Solapur	Sub-Arterial		8.5-9	0.35	₹ 3.05 Cr.	1.6		SPV	✗	✗	
8 Mahila Market	Belagavi	Local		20	0.2	₹ 12 Cr.	1.7		ULB	✓	✗	
9 Jew Street	Kochi	Local		4	0.073	₹ 1.52 Cr.	1.0		SPV	✓	✗	
10 Smart Street	Bhopal	Sub-Arterial		3-4	0.09	₹ 7.32 Cr.	3.9		SPV	✓	✗	

Residential · Commercial · Institution · Public · Open Spaces · Industrial

National-SCM · State · ULB · ✓ Yes · ✗ No · Government · Private

1 Polo View Street

Srinagar, Jammu and Kashmir

Scan here

Category
Local Street

RoW
35m

Length
0.2 km

Duration
Apr 2022- Apr 2023
(1 year)

Total Cost
₹3 Cr.

Nodal Authority
Srinagar Smart City Limited (SSCL)

Implementing Partners
Fortress Infracon Ltd.

Profile of the City

Srinagar is a great example of a 'living lab' for a Smart City where innovation meets excellence to address urban challenges in real-time with direct involvement from its citizens. Covering an area of 246 sqm, the city was chosen in Round 3 of the Smart Cities Mission. The city has implemented nearly 40 Smart Mobility projects valued at ₹1,098 Cr. under the Smart Cities Mission.

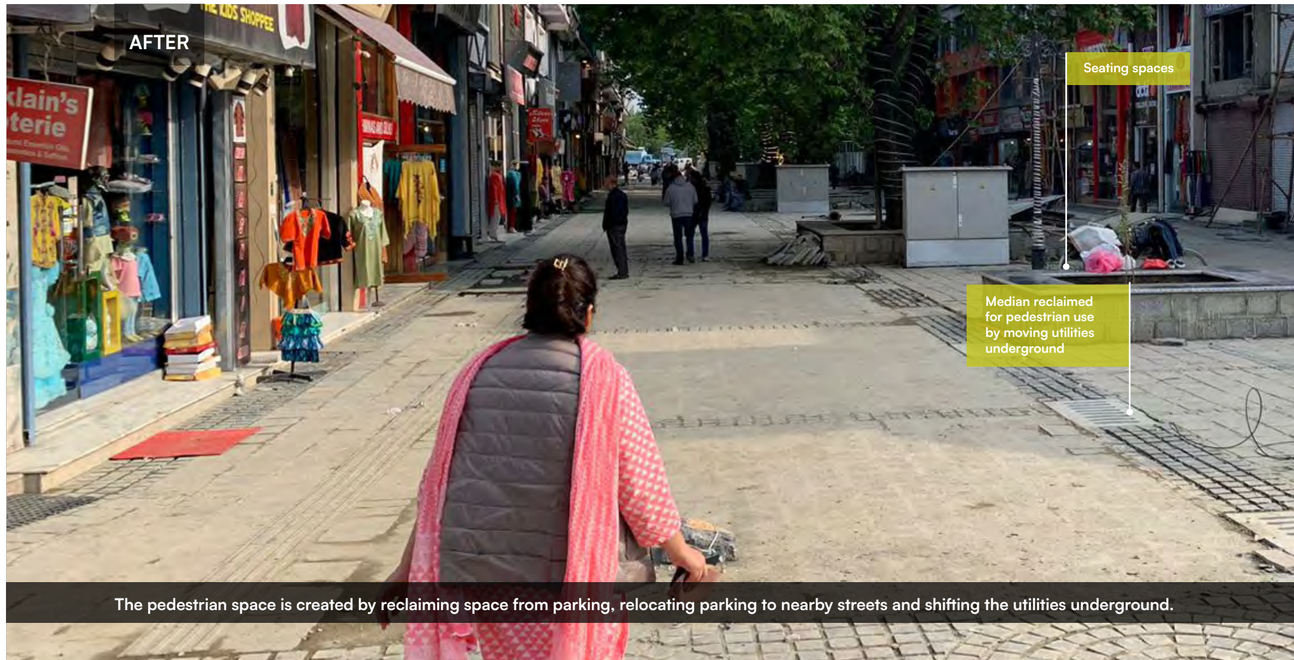
Context of the Project

Located at the heart of the Lal Chowk CBD area, Polo View Street is the first pedestrianised shopping street in Srinagar. The project was initiated after the local traders' union requested Srinagar Smart City Limited to address the existing issues of insufficient pedestrian space, unmanaged parking, inadequate street lighting and defunct drainage system. Srinagar Smart City Limited initiated the complete redevelopment of Polo View Street with an aim to create a sociocultural hotspot in the heart of the city.

Vision of the Project

Polo View Street Revitalisation aimed to boost local business while enhancing the shopping experience on the street by redeveloping it as a pedestrian-priority socio-cultural hub at the heart of the city.

Over the years, the pedestrian accessibility to the shop fronts had reduced due to increasing vehicular parking on the street. Haphazard placement of utilities and dangling wires in the median space made it unusable and hazardous.



The pedestrian space is created by reclaiming space from parking, relocating parking to nearby streets and shifting the utilities underground.

Cross Section of Polo View Street

15m multi-utility zone integrated with pedestrian pathway cycling ways and seating areas

Note: This illustrative section is not to scale.

Design Highlights

01 The design primarily aimed to convert the existing vehicle centric street into a pedestrian-priority walkway integrated with lighting, Public Bicycle Sharing (PBS) infrastructure.

02 Design interventions like hydraulic retractable bollards restrict vehicle entry into the space while permitting the entry of emergency vehicles.

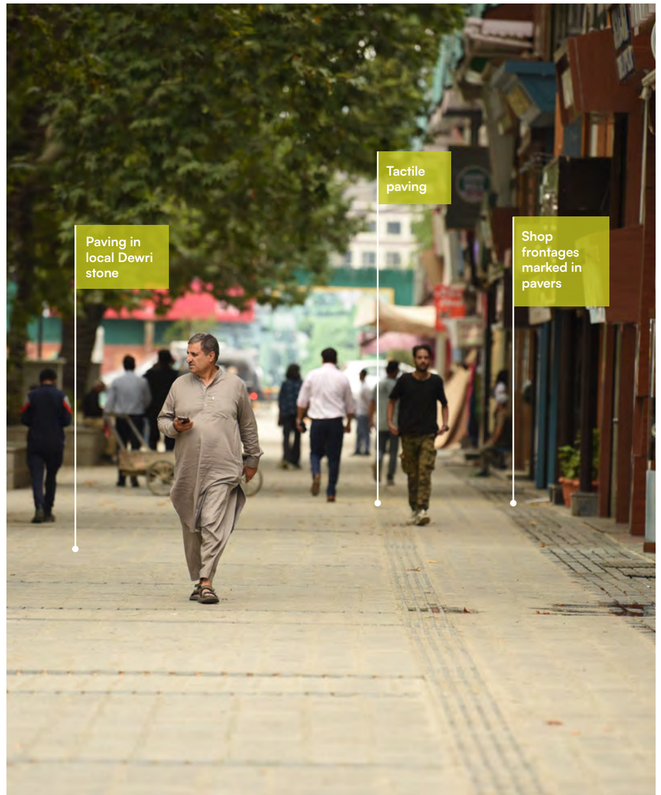
03 Multiple plazas and seating spaces were carved out by converting the space previously used by taxi-stands and pedestrianising it.

04 The design also included on-street parking management, at-grade crossing, Organising on-street vending (Dedicated vending zones through design), multi-purpose spaces with seating spaces under heritage chinars.

05 The project also focused on improving utility management by transferring overhead wires underground, and laying adequate stormwater drains and sewage network.

06 To enhance the heritage value of the street, the building facades were rejuvenated with improved illumination. Most of the materials used for the implementation of the project was locally sourced. The major stone used in paving is a locally sourced traditional dewri stone. The other materials used for construction are tactile tiles, cobblestones, and granite. The cobble stones were used for traffic calming on table tops, regular pedestrian crossing and signals, and on rumble strips.

Pedestrianising the street, SSCL reclaimed about 6000 sq m area for pedestrians and cyclists.



Laying of a stormwater network along the plaza and adjacent streets resolved existing issues of water logging


Stone seating around existing heritage Chinar trees

Plaza is lined with traditional Dewri stone laid on a high grade concrete base to take additional load of the freight and emergency vehicles.


Facade and lighting improvements to enhance the heritage chracter of the street

Public bicycle sharing station at the pedestrian plaza

Project Journey

Construction at the site

01
Laying the Foundation

Srinagar Smart City adopted the Healthy Streets Policy in 2022 and the Parking Policy in 2011. The Polo View Street redevelopment project was sparked by a plea from the local traders to address various concerns like limited pedestrian space, chaotic parking, insufficient street lighting, and a dysfunctional drainage system. Srinagar Smart City Limited took the lead in transforming Polo View Street into a vibrant hub that celebrates the city's social and cultural essence.

✓ Completed ✕ Not yet started ● Ongoing

- ✓ Healthy Streets Policy
- ✕ Vending Policy
- ✓ Parking Policy
- ✕ Street Design Guidelines

02
Building the team's muscle

- ✓ Capacity -buiding worshops
- ✓ Site Visits

Visits by experts from frontrunner cities
Experts from Pune, Pimpri-Chinchwad, Ahmedabad and Bangalore, along with a team from MoHUA, visited the project during its construction phase. This team of experts reviewed the design and the ongoing implementation work. They shared insights on improving the design, construction details, and also suggested alternate materials.

Planning Cell of Srinagar Smart City
SSCL's in-house Planning Cell played a pivotal role in ensuring the success of the project. The cell was involved in project inception, conducting participatory workshops with stakeholders and decision-makers, incorporating their feedbacks in the design and regular monitoring of design implementation.

03
Doing things together

Stakeholders enagement to ensure effective design
Key stakeholders like the shoppers' association and taxi stand were involved from the initiation of the project. Major concerns raised by them were regarding parking, transportation of goods and water logging on the street. These stakeholders were also actively involved in the design implementation phase. To resolve the issue of water logging, several drainage slopes were tried. The final slope was executed in consulation with the shopkeepers' association. Further, other stakeholders like officials from Power Distribution Corp. (PDCL), Jal Shakti Dept., Traffic Police, UEED, Sports Council and Srinagar Municipal Corporation were consulted at multiple stages of the project.

- ✓ Public Engagement
- ✕ Tactical Trial

Stakeholder engagement with the shopkeepers

04
Monitoring, learning & improving

Agreement with shopkeepers for maintainence of Polo View Street
A Memorandum of Understanding (MoU) has been signed between shopkeepers association and SSCL for effective operations and maintenance of Polo View Street, to ensure regular cleaning, keeping check of vandalism, controlling the operations of retractable bollards for entry during emergency movement and loading-unloading of goods. CCTV cameras used for monitoring the safety and security of the place.

Innovative Solution:
Area-level Parking Management

Project Phasing

The project was implemented in two phases. "In the first phase, a parallel street connecting MA Road and Residency Road was identified to channel the vehicular traffic which previously flowed through Polo View Street. In the second phase, the Polo View Street was transformed into a pedestrian plaza.

Parking Management

To pedestrianise the street, SSCL proposed shifting the existing parking from Polo View Street to the parallel street. This street had designed on-street parking bays and an off-street parking lot. However, the perception that parking spots were being reduced resulted in a huge backlash from the locals. To tackle this, the Smart City team with support from the Market Association, demonstrated the parking plan through tactical interventions using paint. This helped gain the support from the locals.

Challenges

- **Traffic and parking management during construction:** Located in the busy Lal Chowk ABD area, the on-site redevelopment work at Polo Street View was challenging. However, with the help of the Corporation and Traffic Police, this issue was addressed by providing an alternate parallel road with designated on-street parking.
- **Extreme weather conditions:** Due to extreme weather conditions, the project was fast-tracked to ensure completion before the harsh weather set in. To enable this, a proper scheduling of construction activities was undertaken.
- **Shortage of material for construction:** Cities could not experiment much with the use of different materials due to a shortage of materials, However, the project used local and easily available materials for the project.

Outcomes

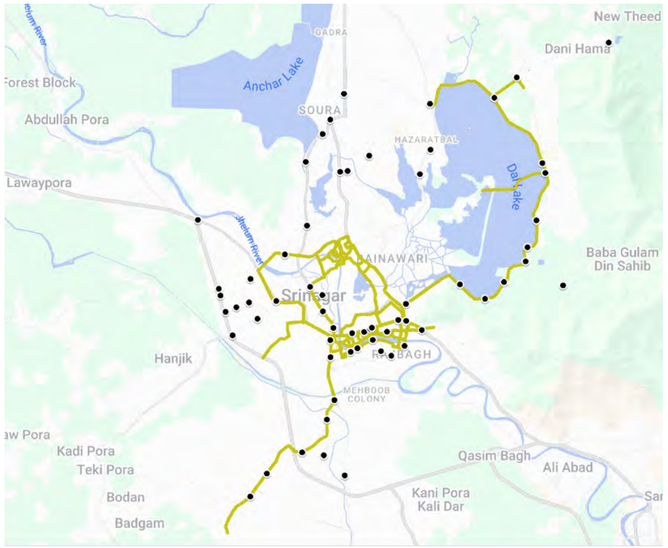
- **Vibrant Space for All:** The redevelopment of the area, has become a hotspot for tourists and citizens, which has substantially increased the footfall. The street has become livelier for shopping and social interactions.
- **Reclaimed space:** After the implementation of the project Srinagar Smart City Limited reclaimed about 6000 sq m area for pedestrians and cyclist.
- **Revenue generation:** The redevelopment of Polo View Street has greatly increased the shopping activity, that has boosted the local economy and helped in the substantial increase in revenue generation.

Impact Stories

The Polo View Street project has made a big difference in our lives. I have a shop near Polo View Street and I've seen remarkable changes happen. The project has transformed a vehicular road into a pedestrian street that has provided more accessibility to the shop fronts. This has also completely removed the traffic congestion that were previously caused due to vehicular movement.

- Ms. Annapurna Sharma, Shopkeeper

Way Forward



NMT Network

Public Bike Sharing Docking Station

Source- Srinagar Smart City Limited

Scaling-up the transformation

Vision: Creating a people-centric, resilient and socio-economically vibrant city that celebrates its natural and cultural heritage creating opportunities for all.

NMT Master Plan

The development of Non-Motorized Transport (NMT) facilities in Srinagar is part of the overall road development program outlined in the NMT plan. Approximately 120 km of road network within the city have been earmarked for widening or enhancement. These streets will be transformed into complete streets, equipped with NMT-friendly facilities. Furthermore, the radial roads connecting to the ring roads will undergo widening and development, incorporating sufficient NMT infrastructure to enhance overall accessibility and efficiency in the transport network. The NMT plan also includes the establishment of dedicated "Hawker Zones" along NMT infrastructure, aiming to alleviate congestion in major corridors and commercial areas, ensure encroachment-free footpaths, and enhance on-street safety by promoting increased vigilance.

We are looking to revitalising the city. And based on our experience from Polo View Street, we have understood the importance of public engagement in ensuring the success of any project. This is where the team should hold on to the vision and principles and share it to the people.

Anuj Malhotra

General Manager,
Srinagar Smart City Limited


Polo View Street

2 Pondy Bazaar

Chennai, Tamil Nadu

Scan here

Category
Sub-Arterial Street

RoW
25m

Length
1.4 km

Duration
June 2018- Nov 2019
(1 year 5 months)

Total Cost
₹39.86 Cr.

Nodal Authority
Chennai Smart City Limited, Greater Chennai Corporation (GCC)

Implementing Partners
Institute for Transportation and Development Policy (ITDP) India, Pondy Bazaar Shop Keeper Association, Darashaw and Studio R+R

Awards & Recognition
Winner of the acclaimed international Ashden Awards 2020 in the Sustainable Mobility (International) category.

Profile of the City

Chennai was selected as Smart City in the Round 1 of the Smart City Challenge. Under the Smart Cities Mission, the city has implemented multiple Smart mobility projects that worth ₹194 Cr. Chennai is one of the first cities in India to adopt and implement Non-Motorized Transport (NMT) policy to encourage and promote pedestrianization. The city has an area of 175 sq km with a population of 85 lakhs. Prioritizing Non-Motorized Transportation, the city developed pedestrian plaza in the ABD region of the city.

Context of the Project

The Greater Chennai Corporation(GCC) and Chennai Smart City Limited have collaboratively implemented a 1.4 km long pedestrian plaza in the ABD area of T Nagar. The primary objective was to optimize the additional road space to provide pedestrian amenities and to create a traffic-free social space for the citizens of Chennai. Located in the bustling commercial hub of the city, this newly transformed pedestrian plaza witnesses a daily footfall of over 4000 pedestrians. The adoption of the NMT Policy, catalysed the implementation of this project where a commercial thoroughfare was transformed into an inviting, safe, and vibrant open street mall, fostering shopping and recreational experiences for all age groups.

Vision of the Project

The project was envisioned to transform 1.4 km of prime commercial space in the heart of the Area-Based Development (ABD) region of T Nagar by converting additional road space into broadened walkways and providing all necessary amenities for pedestrians.

Parking encroachment on the footpath detered pedestrian movement and obstructed access to shopfronts

Wide footpaths provide a comfortable walking experience & on-street parking management reduces traffic congestion

Cross Section of Pondy Bazaar

Note: This illustrative section is not to scale.

Design Highlights

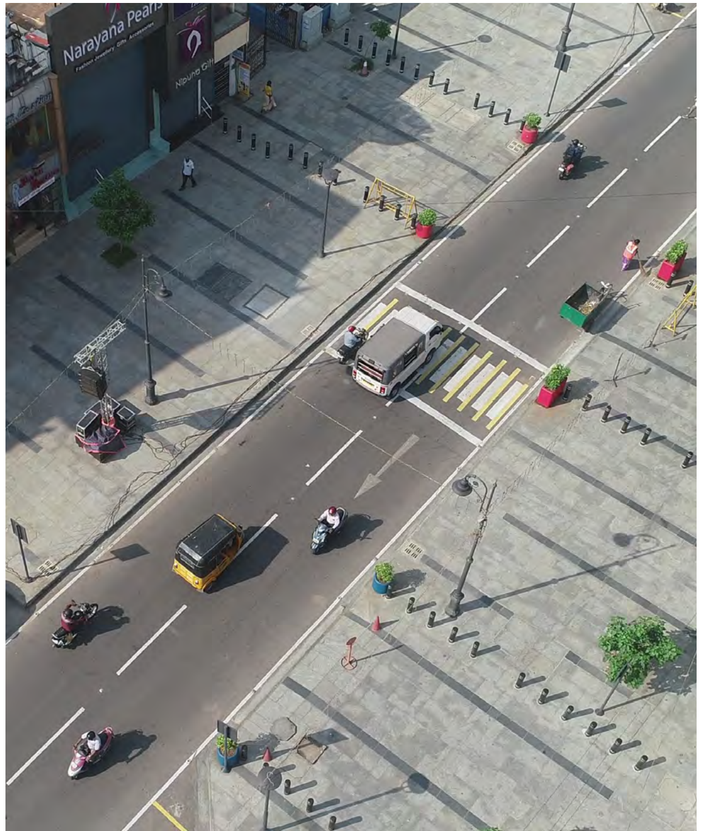
01 The project intended to make the walking experience safe and lively while adding elements that can transform the street into a fun place.

02 The design provided all necessary amenities for pedestrians, including seating clusters, sheltered bus-stops, motor-free walkways, toilets, covered dustbins, and inclusive play space for people. It also included traffic calming measures such as Speed breakers, and Intersections with round-abouts and curb stone surfacing.

03 The existing tree canopy was retained and additional trees were planted to ensure the street is well-shaded throughout. CARE Earth Trust, an NGO based in Chennai, were roped in to ensure appropriate measures are taken for this.

04 All underground utilities were integrated with the street design and overground utilities were realigned to ensure an unobstructed walking space.

This design provides >50% of the RoW for walking, sitting, playing & more.



Flexible seating elements that can be arranged as per user preferences

Continuous walking space

Play area created during a Happy Streets event

Designated parking bays along the carriageway edge

Project Journey


Public engagement on site

01
Laying the Foundation

After the adoption of the NMT Policy the project was proposed to demonstrate a unique project that can elevate citizen's shopping and recreation experience. Further, a NMT sub-committee was also formed.

✓ Completed ✕ Not yet started ● Ongoing

- ✓ **Healthy Streets Policy**
- ✕ **Healthy Streets Cell**
- ✕ **Parking Policy**
- ✓ **Street Design Guidelines**
- ✓ **Capacity-building workshops**
- ✓ **Site visits**


Stakeholder consultation during the design development

02
Building the team's muscle

The Smart City and the Special Projects Department of GCC conducted regular capacity building workshops and encouraged peer-to-peer learning from other cities through site visits.

03
Doing things together

- ✓ **Stakeholder engagement**
- ✓ **Public Engagement**

Designing with Community
The first design iteration proposed only public transport and non-motorized transport (NMT) infrastructure, along with organized space for street vendors. However, upon discussions with the Pondy Bazar shopkeepers' association, one-way traffic movement with provisions for short-term organized parking was integrated. Responding to the shopkeepers' association's request, the street vendors were relocated to a vending complex, and the design was modified accordingly.

Review Schedule
Monthly review and inspection was done by NMT sub committee headed by the Commissioner. The committee ensured coordination among all the departments involved. Weekly meetings were organised with the executive engineers for project monitoring. Designs were reviewed by ITDP and the Special Projects Department.

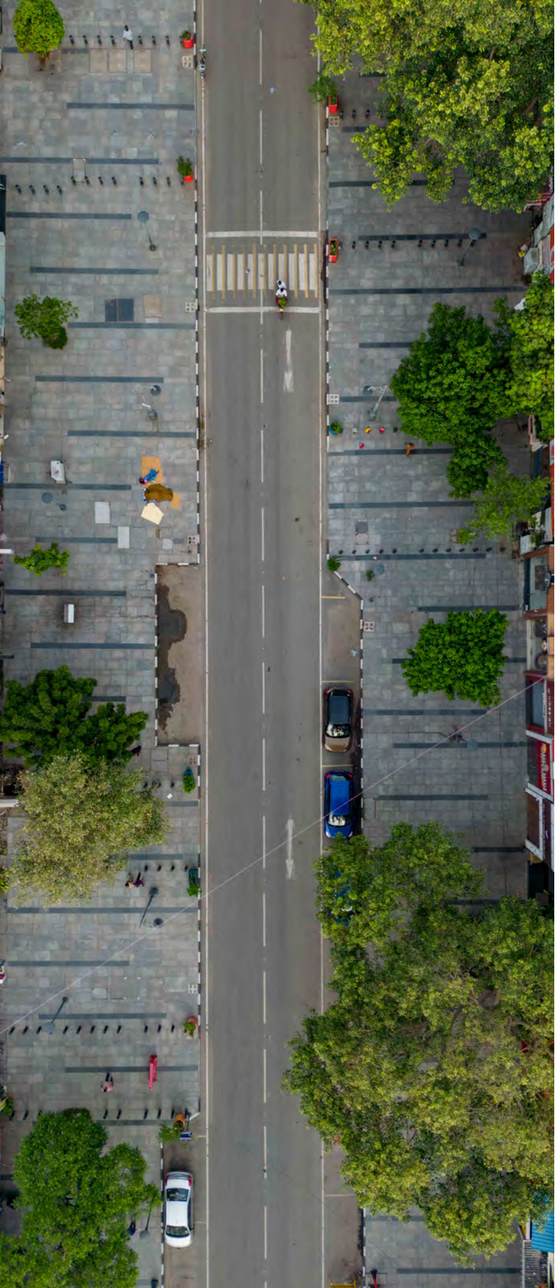
PMC to ensure consistency of work quality
The street was divided into three parts and each part was assigned to one contractor to enable quick delivery. A PMC was appointed to coordinate with the contractors, ensure consistency of work quality and enable peer learning.

Tactical Trial
Two trial runs were conducted for collecting citizen feedback & building support for the project.

04
Monitoring, learning & improving

Off-street parking
In response to the shopkeepers demand for parking, a MLCP is constructed on one end of the street.
Parking management system is in place with a third party contract & Traffic Police conducts regular parking drives to enforce it.


Wider pedestrian corridor restricting vehicular movement



Challenges

- Coordination with multiple service departments was a major challenge during the implementation of the project. However, this issue was resolved by conducting regular meetings with NMT subcommittee and other stakeholders.

- The site being in the busy shopping street, the execution of the project during the daytime was difficult. To mitigate this, most of the construction was done during nighttime to minimize disturbance to pedestrians and vehicular traffic.

Outcomes

- **Reclaimed space for pedestrians and cyclists:** 14000 sq m space was reclaimed for pedestrians and cyclists, after the implementation of the project. This has drastically increased the number of pedestrians using the space. People were observed to be spending more time on the street than before.

- **Increase in land value:** Residential property prices have seen an increase of 20% over a period of 2 years after the inauguration of the Pedestrian Plaza.

- **Increase in revenues:** Retail shop owners reported an increase in sales by 15 to 20% during Nov 2020- Feb 2021 compared to sales of the same period in 2018 and 2019.

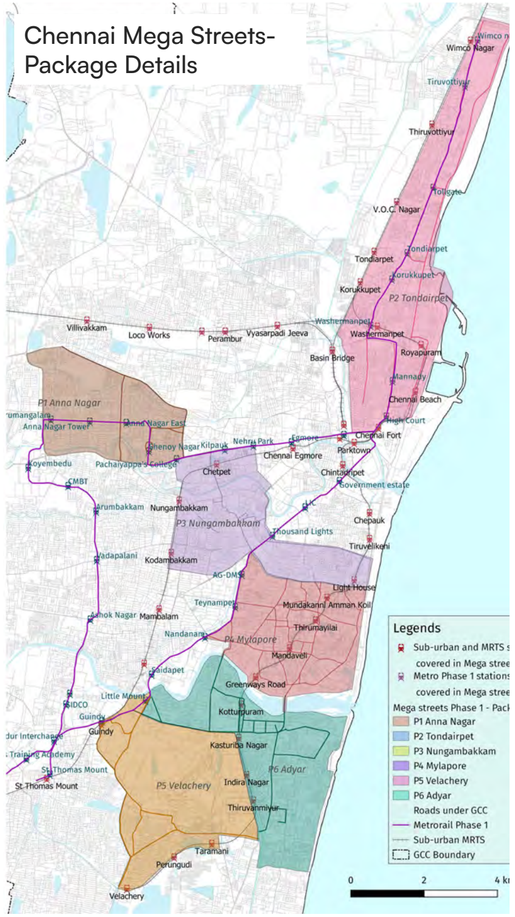
- **Greater safety and mobility of pedestrians:** The well-designed Pedestrian Plaza with on street play areas has allowed children to play outside for longer hours and provided more convenient shopping experience for women and the elderly people.

Impact Stories

I would have never imagined a busy commercial street like Sir Theyagaraya Road to be transformed completely into a Pedestrian Plaza. It is awesome how the design of the street has provided 10 feet wider footpaths for universal accessability.

- Varsha AV, Data Analyst

Way **Forward**



Scaling-up the transformation

Chennai's Mega Streets Project focuses on creating a network of high-quality and equitable streets and vibrant public spaces, uplifting the face of 6 selected neighbourhoods.

This focuses on three key points:

- Integrated planning and design of resilient under and above ground utilities
- Equitable distribution of street space and ensuring accessibility for all to promote walking and cycling
- Comprehensive neighbourhood planning, managing parking, vendors and adding iconic public spaces

Shopkeepers have come back and said how their revenue has improved post this project and its very heartening to hear

Dr J. Radhakrishnan

IAS, Additional Chief Secretary / Commissioner Greater Chennai Corporation

Pondy Bazaar

3 Thane Station Road

Thane, Maharashtra

Scan here

Category
Collector Street

RoW
45m

Length
13 km

Duration
Aug 2020- Dec 2022
(2 years 4 months)

Total Cost
₹ 94.9 Cr.

Nodal Authority
Thane Smart City Limited

Implementing Partners
Design Consultants — M/s StudioPOD
Contractor — M/s Pragati Enterprises
Project Management Consultant — CRISIL

Profile of the City

Thane, a residential suburb of Mumbai, is home to around 30 lakes. It has a recorded population of 18.4 lakhs spanning an area of 128 sq km in which 4.3 sq.km has been demarcated as the ABD area. The city was selected in Round 2 of the Smart Cities Mission — since then, it has undertaken 52 projects worth ₹1,845 Cr. in multiple sectors, out of which 6 projects worth ₹422 Cr. belong to the mobility sector. These projects comprise of multimodal transit hubs, MLCPs, ITMS, street design initiatives, upgradation of existing infrastructure etc. Recognising the importance for NMT, Thane has undertaken various works worth over ₹390 Cr. in the development of streets, pedestrian pathways, road infrastructure, etc.

Context of the Project

Over the past few decades, with the influx of IPT vehicles, street vendors, personal motor vehicles, etc.; across the West Station Access Road, many unorganized spaces were created. To ensure dedicated organized spaces along this significant corridor, the Thane West Station Access Improvement project was identified by Thane Smart City. This project in the ABD area, aimed to reclaim space for pedestrians around the station improving accessibility and mobility in the core city.

Vision of the Project

The project aimed to improve the pedestrian access to the railway station by organizing the existing activities like vending, auto-stands and bus stops on the station access road.

The existing 1.5m wide footpath was not sufficient for the heavy pedestrian footfall. In addition, the commercial spillover, on-street vending and utilities like DP boxes were obstructing the pedestrian walkway.

The footpath was increased to 6m by reclaiming space from the carriageway. The utilities were moved underground and the on-street vending and commercial spillovers were restricted to ensure an obstruction-free pedestrian space.

Cross Section of Thane Station Road

Note: This illustrative section is not to scale.

Design Highlights

01 The project tried to reduce the vehicular space by transforming the access road to a one-way street.

02 The reclaimed space from the carriageway has been integrated with the walkway to provide a continuous 6m-wide pedestrian space.

03 The entry of vehicles into the station area is restricted by the use of metal bollards.

04 The edge of the footpath has been barricaded restrict vehicles from entering the space. This helps in creating dedicated spaces for activities like walking, cycling, vending etc.

05 On-street vending and adjacent commercial activities were organized to improve pedestrian experience.

06 The project also organized autorickshaws by providing a dedicated, sheltered auto-stand.

07 To strengthen the corridor with multi-modal transit, bus stops were also provided as part of the project proposal.

The interventions increased the people carrying capacity of the street by 4500 people per hour.

Unlike the other projects in the ABD project, Shahabad stone was used for the footpath in this stretch keeping in mind the high pedestrian volumes

Removed and restricted encroachment by adjacent commercial activities

Several vendors setup their stalls along the closed commercial shops in the early morning. They close their stalls during the business hours of the shops. This temporal usage of the space helps keeping the street lively, while maintaining the pedestrian space for walking.

Continuous walking space along the carriageway

Project Journey


During construction of the project

01
Laying the Foundation

✔ Completed ✕ Not yet started ● Ongoing

- ✕ Parking Policy
- ✕ Vending Policy
- ✔ Healthy Streets Policy
- ✕ Street Design Guidelines

02
Building the team's muscle

- ✔ Capacity -buiding worshops
- ● Site Visits

Dedicated team of consultants
TSCL appointed one consultant each for the ABD and Pan City Initiatives. The consultants work closely with the internal team of engineers at TSCL. The Delivering Change Foundation (DCF) was also onboarded with a specific focus of participatory community development.


Implementation of project on ground

03
Doing things together

Onboarding design experts
CRISIL- the consultancy experts for the ABD initiatives appointed external design consultants as urban design experts for the project.
The urban designers developed the Station Area Improvement Plan along with design details for Thane Station Road project. Their scope of work for the streetscape also included conducting surveys to understand the existing situation, and also the post-implementation impact of the design. The urban designers were also actively involved in the implementation phase. The consultants and engineers regularly met on site to ensure smoother implementation.

- ✔ Public Engagement
- ✕ Tactical Trial

Involving stakeholders in the process
The team have several meetings on-site with the shopkeepers and Traffic Police Department to convince them for the street intervention.
Even though the idea of the project was simple, the execution was very difficult due to the high pedestrian volumes using the street 24x7. There was a lot of push back from both these user groups due to hindrances caused by the construction works. As a result, the construction work was carried out during the nights.

04
Monitoring, learning & improving

Data-informed design decision-making
The design consultants conducted detailed analysis of the data available with the city to derive the minimum width of the footpath to cater to the daily commuter footfall of approx. 3.73 lakhs people. Further, the modal split data- 55% walking vs 15% IPT and private vehicles was used to support the interventions like restricting the vehicular space by converting the street to one-way.


Footpath under construction

Challenges

- **Traffic Congestion:** Due to the limited width of the street, traffic related problems occurred especially during the construction phases.
- **Public interferences:** Shopkeepers, local public, auto-rickshaw drivers raised concerns against the execution of the street. This was then solved by conducting sessions which explained the economic benefits of executing the street.
- **Footpath encroachment:** In due course of time, shop frontages, vendors and auto-rickshaws took up space for their day-to-day business, causing unorganised spaces in the precicnt. To deal with this, organised spaces were carved out on the street.

Outcomes

- Dedicated and organized spaces for vendors, rickshaws, buses, etc.
- 25 sq m of space has been recovered for the pedestrians.
- The pedestrian footfall has increased significantly; from 2000 persons to 6500 persons per hour.

Impact Stories

"The street which was congested earlier has been completely transformed into a pedestrian zone with the all the amenities present before. It has been well equipped with spaces for all."

Mr. Rushikesh Bhatkar, Citizen

Way Forward

Scaling-up the transformation

Station Area Improvement Plan

Built in 1853, Thane is one of the busiest stations in the Mumbai Metropolitan Region. Over the past few decades, the vehicles had reduced the pedestrian access to the station, creating issues of pedestrian inaccessibility and safety. The Thane West Station Area Improvement Plan is a network of 12km of streets identified by the Thane Smart City Team to reclaim pedestrian space around the station and to improve access to the station.

The Station Area Improvement Plan included redesigning of several streets forming an accessible network of streets connecting the railway station. The 13km of identified streets were redesigned by rethinking the right of way, resolving intersections, and adding street furniture and landscape elements to improve the pedestrian accessibility and comfort in the neighbourhood.

The Station Area Improvement Plan aims to reclaim around 11.32 acres of NMT space. In addition, 1236 new trees, 4.68 acres of newly landscape areas, 512 seatings, a new 1-acre contiguous park along the Lakefront have been proposed. All of this have been achieved purely by reconfiguring the Right-of-Ways of existing streets.

Thane Station Road

4 Walkable Streets

Kohima, Nagaland

Scan here

Category
Sub-Arterial Street

RoW
7.5-10m

Length
0.4 km

Duration
Mar 2022- Apr 2023
(1 year 1 month)

Total Cost
₹9.96 Cr.

Nodal Authority
Kohima Smart City Development Limited (KSCDL)

Implementing Partners
Kohima Municipal Council, Kohima Village Council, Kohima Village Youth Organization, Kohima Municipal Council, Kohima District Administration.

Profile of the City

Kohima occupies pride of place as the capital city of Nagaland. With a resident population of around 1 lakhs, it is the second largest city in the state. In Round 2 of the India Smart City Selection process, Kohima was selected as the only Smart city from Nagaland. Having a total area of 11 sq km with an ABD area of 1.2 sq km, Kohima Smart City has already completed SCM funded projects, worth ₹512 Cr. These projects focus on urban transportation, walkable streets, sanitation, water supply management etc. All of these projects have significantly contributed in achieving the objectives of Smart Cities Mission through the fulfillment of needs and aspirations of the citizen.

Context of the Project

To make people aware of the importance of sharing street space wisely for walking and cycling, and to create space for everyone, including the elderly, children, and those with different abilities, Kohima Smart City transformed parking spaces into lively walkable streets for citizens.

Vision of the Project

This project created a vibrant public place for people by reclaiming the existing parking spaces, and further enhancing its usability by prioritising pedestrian safety and fostering local businesses.

The open space along the street was either filled with parked vehicles or left unused leading to poor pedestrian safety

The open space is reclaimed for the people, creating a vibrant community space along one of the busiest streets in Kohima

Cross Section of Walkable Streets

Note: This illustrative section is not to scale.

Design Highlights

01 The project was initiated with a tactical trial, showcasing the advantages of the proposed design to various stakeholders, including local residents, businesses, and authorities.

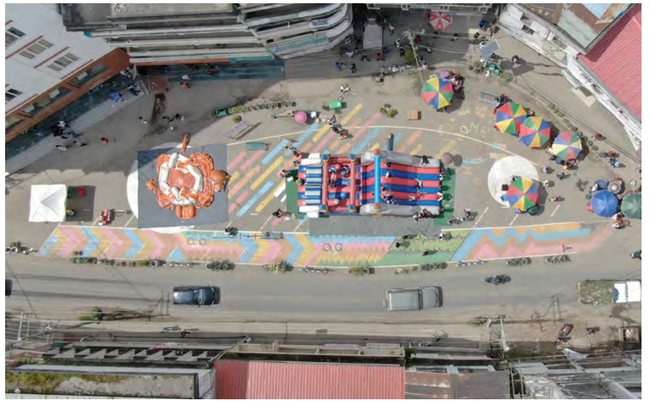
02 Bright coloured paints were used to demarcate the reclaimed space for people.

03 Movable planters and barricades were used to regulate the traffic movement.

04 To foster community engagement, a series of sensitisation events, encompassing cultural performances, health camps, and more, were organised in collaboration with the district administration, local NGOs, and business communities.

The tactical design approach helped foster stronger bonds within the community.

Temporary shading devices to ensure comfort for the people



Street performances attracted a high footfall

Traffic-calming measures to create a safe crossing

Play equipment for children surrounded by street vendor stalls

Project Journey


School children involved during the tactical trial execution process

01
Laying the Foundation

State Government of Nagaland initiated the project emphasizing the need of safe pedestrian for the general public and providing space for local vendors to boost the local economy and promote local produce.

✓ Completed ✕ Not yet started ● Ongoing

- ✓ Healthy Streets Policy
- ✓ Healthy Streets Cell
- ✕ Parking Policy
- ✕ Street Design Guidelines
- ✓ Capacity-building workshops
- ✓ Site visits


Kohima smart city volunteers and officials prepare for the execution process.

02
Building the team's muscle

The city organised several site visits to Bengaluru and Pune for peer-to-peer learning from other cities.

03
Doing things together

Kohima Village Council as a mediator

The Kohima Village Council acted as a mediator between the business owners and the implementation agency. Multiple meetings were organised with all the stakeholders to brief them about the project, highlighting its benefits for the people.

Stakeholder engagement

Stakeholders were engaged in the pre & post implementation process. In Kohima, about 80% of the land is under private ownership, therefore, reclaiming land for the public involved several stakeholders. The Kohima Municipal Corporation, along with the district administration organised intensive discussions with the public, land owners, and business communities, to convince them about the benefits of the project.

04
Monitoring, learning & improving

On-street parking management

In response to the shopkeepers demand for parking, an MLCP is constructed on one end of the street. Parking management system is in place with a third party contract and traffic police conducts regular parking drives to enforce it.

Making interventions permanent

After a well-executed tactical trial, which spanned several months and garnered unanimous stakeholder support, the City initiated permanent implementation of the project. The permanent implementation is executed as per the tactical trial and includes materials like concrete paver blocks for the reclaimed open space and steel for railings.

Traffic management

The Kohima Village Youth Organisation, which is a part of the Kohima Village Council, in coordination with the district administration and traffic police, helped in regulating traffic to resolve congestion issues during the implementation phase of the project. Alternate routes were identified and business hours were extended to ensure minimum disruption.

- ✓ Tactical Trial
- ✓ Public Engagement


The project reclaiming streets for people

Challenges

- **Overcoming knowledge gap:** Due to the shortage of skilled labours and technical gaps for implementing particular works of the project, Kohima Smart City Project and Planning team visited different cities and attended workshop online & offline to strengthen their capacity and issue this problem.
- **Traffic management:** On-street car parking was one of the key challenges of the project, however, the implementation of a real-time monitoring system via the Integrated City Control Center (ICCC) has streamlined of traffic-related issues.

Outcomes

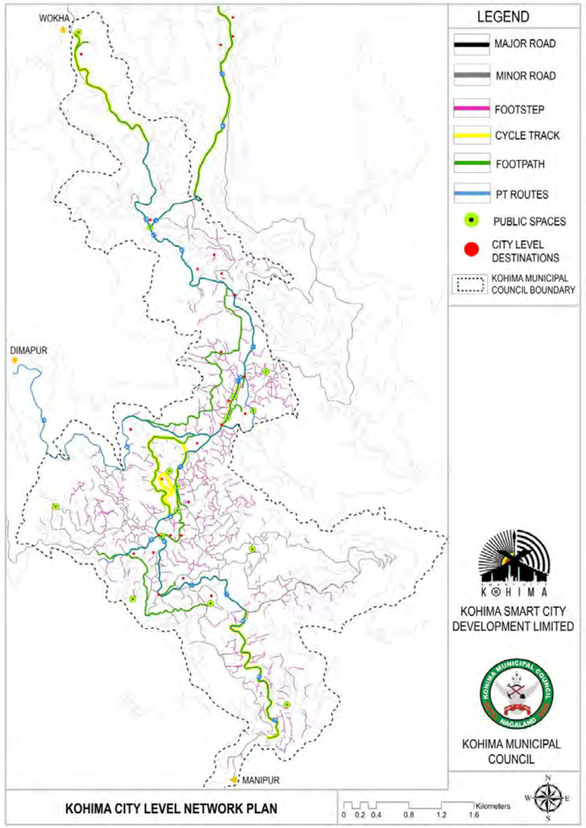
- Kohima Smart City has witnessed an increased presence of street vendors and an overall improvement in walkability.
- This project has helped to reclaim 245 sq m of space for pedestrians and cyclists.
- After the project implementation, the space observed a footfall of 2950-3000 people/ hour.

Impact Stories

The Walkable Street project undertaken by Kohima Smart City has contributed immensely to the upliftment of the living standards of the citizens in multiple spheres of life. The dedicated pedestrian zones and traffic calming measures have encouraged people to walk while providing them safety.

Mr. Vibalie Jack Ado Senior citizen, Kohima

Way Forward



Scaling-up the transformation

Kohima's 3-year Action Plan aims to implement traffic-calmed streets in 5 neighbourhoods/wards after testing solutions through tactical methods.

Kohima Smart City aims to double the Healthy Streets Network and has planned the implementation in three phases, including the implementation of parking management in two model neighbourhoods.

The City also aims to initiate impact assessment of all the completed streets and continue hosting regular Healthy Streets campaigns to garner support.

Our vision for Kohima is to make it a walking and cycling friendly city for citizens of all ages, genders, abilities, and income groups by 2035. We aim to provide adequate physical infrastructure to increase the mode share of pedestrians and cyclists by 70% and eliminate road fatalities.

Mr K Theunuo
Chief Executive Engineer

Walkable Streets

5 Apsara Road

Jammu, Jammu and Kashmir

Category
Local Street

RoW
7-9m

Length
13.6 km

Duration
June 2020- Jan 2022
(1 year 8 months)

Total Cost
₹46.22 Cr.

Nodal Authority
Jammu Smart City Limited (JSCL)

Implementing Partners
Hassan Road Construction Company Limited Srinagar

Context of the Project

The Apsara Road, Gole Market area along with adjoining roads in Jammu holds regional significance, addressing commercial and institutional needs and congestion in older markets. This development project focuses on integration of parks with streets, parking management, designing vending zones and improving walkability on streets, strategically contributing to planned colony development. Serving as a strategic model for planned development, this street is designed for all users, including pedestrians, local shop owners and serves as an incubator for young entrepreneurs of J&K.

Vision of the Project

To enhance market area, and its adjoining roads to create a more pedestrian-friendly environment, foster equitable public spaces, improve parking efficiency, and provide a delightful shopping experience.

Project Journey

Laying the Foundation

The city adopted the "Complete Streets" concept, ensuring that streets are designed for all users, including pedestrians and addressing commercial as well as institutional needs of the people.

Key Actions

The participatory planning approach is adopted to gather feedback and ideas from residents, and shopkeepers making them active stakeholders in the development process. The city adopted the dynamic 'Test — Learn Scale' Approach. As part of the project implementation, the city tested street elements like lighting solutions, walkways through the "High Street" project. Development plan prioritizes the integration of existing amenities like parks, parking and vending zones into the overall design.

Design Highlights

The design included well-maintained sidewalks for pedestrians and included textured surfaces, ramps, and clear signage for universal accessibility. Apart from the well-designed sidewalks, the design also incorporates energy-efficient streetlights, cobbled ways, wayfinding strategies, public seating and benches that encourage social interaction. The city also installed bollards and barriers for safety and to separate pedestrian areas from vehicle traffic where necessary.

Challenges

- There was initial pushback from the vendors during stakeholder engagement. However, with efficient coordination between stakeholders and regular workshops the issue was resolved.
- Alignment of utility and other service ducts with the alignment of the street was initially challenging.

Outcomes

- Ensured well-lit streets at night, enhancing safety and aesthetics.
- Provided green spaces, and shaded areas for pedestrians providing a livable environment.

6 Chappan Dukan

Indore, Madhya Pradesh

Category
Local Street

RoW
30m

Length
0.2 km

Duration
Dec 2019- Mar 2020
(4 months)

Total Cost
₹5 Cr.

Nodal Authority
Indore Smart City Limited (ISCL)

Implementing Partners
Indore Municipal Corporation, Indore Smart City Development Limited, 56 Dukan Association, Jila Prasharan, 9 Squares Consultants, AVi Enterprises.

Awards & Recognition
Clean Street Food Hub 2021, ISAC Award — Built Environment 2022, Smart Solution Award — 2022.

Context of the Project

Apart from being a smart city, Indore is considered the food hub of central India, and Chappan Dukan (56 Shops) is considered one of the significant projects of Indore Smart City that aligns with the ethos of Indore's culture. Chappan Dukan is a 200-metre-long series of shops serving delectable delicacies that are famous in Indore. Situated in the center of the city, this food street is served as one of the major tourist destinations. Before revamping, the street was in haphazard condition without any on-street parking and public amenities for the visitors. The street used to be a 30m wide motorized road, which was converted into a pedestrian-friendly street. The design and implementation process employed in the redevelopment of Chhappan Dukan can and should be replicated in all urban projects, specifically similar street markets in India. Indore's first-ever street to be designated as a vehicle-free zone. ISCDL ensured a democratic design and implementation process through continual citizen engagement.

Vision of the Project

Transforming a 30m wide vehicular road to a pedestrian-friendly street flanked by 56 shops.

Project Journey

Laying the Foundation

In the year 2019, this project was initiated with the idea of transforming the space in front of the existing 56 Dukan into a pedestrian plaza. Through several stakeholder meetings and awareness sessions, the project was initiated.

Key Actions

The design of the pedestrianized Chappan Dukan was developed by the design consultants in cooperation with the key stakeholders. The completed design exercise took 10 days. Post the design exercise, the construction at the site was initiated. To complete the project, a target of 56 days was set on timer as display. The project incorporated multiple unique construction techniques like underground drainage system, use of dynamic lighting, use of tactile, anti skid tiles, ornamental plantation etc. The project was completed with 54 days without any hurdles. Currently Indore Smart City is handling the Operation and maintenance of 56 Dukan. The maintenance work is being executed by 1 supervisor, 4 sweepers, 1 electrician, 2 gardeners and 3 labors. The 56 dukan premise is currently in the process of being handed over to Indore Municipal Corporation for further O&M after November 2023.

Design Highlights

The design implemented various theme-based seating areas, including social seating spaces, semi-open team enclosures, enclave seating, and open area theater seating. Abundant shaded green spaces were created for pedestrians. Street corners were furnished with benches and amenities, expanding pedestrian areas, improving user experience, and providing safe waiting spots for crossing. All shop facades were designed to mirror the vibrancy of street food, aligning with the street's theme. Additional elements such as LED lights, designer pavement spaces, lush plantations, and greenery were incorporated for enhanced visual appeal. Furthermore, CCTV cameras were installed to ensure security and monitoring.

Challenges

- One of the key challenges faced by the authority in developing 56 dukan was on boarding shop keepers as the development work was going to affect their business and convincing the shopkeepers to revamp the façade of the shops at their own expense.
- The shops were open throughout, hence it was difficult to manage footfall of around 7000 people every day with the ongoing work.
- With efficient coordination between ISCL and consultants and the contractors, the project was timely implemented.

Outcomes

- The area has seen a huge increase in footfall from 6,000 to 15,000 per day.
- The city stands to gain in revenue a betterment charge calculated at 5% of guideline value in 3 years, on-street and off-street parking charges, and a premium on digital advertisement rights for 10 years.
- The revenue from Chappan Dukan is around 40% of the annual Rs. 5000 crores. turnover from food markets in the city. The project has reduced conflicts between vehicles and pedestrians.
- 4050 sq m of space was reclaimed for pedestrians.

7 Street Bazaar

Solapur, Maharashtra

Category
Sub-Arterial Street

RoW
8.5-9m

Length
0.35 km

Duration
June 2019- Nov 2020
(1 year 6 months)

Total Cost
₹3.05 Cr.

Nodal Authority
Solapur City Development Corporation Limited (SCDCL)

Implementing Partners
Solapur City Development Corporation Limited, SGS India Pvt. Ltd. (design consultant), M/ S Anil S Patil (contractor)

Context of the Project

Under the aegis of Smart Cities Mission, the Solapur City Development Corporation Limited developed the Street Bazaar to provide economic opportunities for the local artisans. The project has been envisioned to host a 'night market' for the artisans and vendors to showcase their work, while giving them a platform to sell artworks.

Vision of the Project

The project aims to foster seamless links among people, artisans, markets, and services, with a primary focus on enhancing local economy and promoting walkability.

Project Journey

Laying the Foundation

In alignment with the city's vision for pedestrian-friendly, non-motorized streets, this particular street was developed. The streetscape project was strategically implemented to create a healthy environment conducive to pedestrian activity.

Key Actions

Initially the street was underutilized and thus devoid of basic amenities. Looking into this gap, the city revitalized this area through a streetscape design exercise, while providing pedestrian walking areas, vending kiosks, streetlighting, segregated waste bins, and smart toilets for the citizens. At present the operation and maintenance is being conducted by Solar City Development Corporation Limited.

Design Highlights

The project incorporated design elements such as cycle tracks, pedestrian pathways, underground utilities, solar-powered LED streetlights and planter beds with seating facilities. The design also incorporates vending kiosks for vendors and stepped seating that encourages social interaction.

Challenges

- During the execution of the project encroachment of street vendors along the stretch posed challenges.

Outcomes

- The night market has helped in the revenue generation of the shops that are aligned along the Street Bazaar.
- The street has become prime hotspot for citizens, as it attracts more visitors which benefits the artisans and the local economy.
- The dedicated pedestrian walkways and cycle ways have encouraged people to walk and cycle and have increased outdoor time substantially.
- 1900 sq m space was reclaimed for the pedestrians and street vendors.

8 Mahila Market

Belagavi, Karnataka

Category
Local Street

RoW
20m

Length
0.2 km

Duration
June 2020- Jan 2022
(1 year 7 months)

Total Cost
₹12 Cr.

Nodal Authority
Belagavi Smart City Limited (BSCL)

Implementing Partners
Belagavi City Corporation, Belagavi Smart City Limited Technical team,, Karnataka Urban Infrastructure Development and Finance, Tractebel Engineering Pvt Ltd.

Awards & Recognition
Smart City Council of India Award (Smart and Successful Citizen category)

Context of the Project

The Mahila Market—Khau Katta is a vibrant space for trying street food in Belagavi. The place was formerly a dumpyard that has been transformed into a well-maintained street plaza with shops owned by women entrepreneurs. It used to be a dump site but is now a clean street plaza with shops run by women entrepreneurs. The project aimed to help women overcome challenges, empower them, and boost the local economy by offering space, support, and networking opportunities for their businesses.

Vision of the Project

The project envisions a vibrant street featuring a spacious pedestrian plaza, eateries, and opportunities for women to own and operate shops, advancing women's economic empowerment.

Project Journey

Laying the Foundation

In 2014, the city embraced the Street Vendor Policy Act. The project, following this policy, started with the goal of helping women entrepreneurs overcome challenges. It aimed to provide a special space to encourage and support their businesses.

Key Actions

City Level Advisory Forum was formed for the Advisory role and stakeholders' engagement. Based on the recommendation the design proposal was prepared, which was approved by the competent authority for the execution on the site. The participation of the stakeholders including public opinion played an important role in the successful selection, planning, development, and completion of the sub-projects. Effective communication channels were implemented, such as online surveys via the ULB's website and social media, encouraging public participation and crowdsourcing ideas through virtual events. During the implementation, a common traffic calming measure was taken improving road safety and creating a more pedestrian-friendly environment.

Design Highlights

The design of the retaining wall was carefully planned to ensure stability and durability, as well as aesthetic appeal. In addition to the retaining wall, fencing was also installed to enhance safety and security in the area. The footpaths were designed to be wide and well-maintained, with proper lighting and signage to ensure visibility and improved accessibility for safer movement while benefiting both pedestrians and vendors.

Challenges

- In the initial stage one of the key challenges was interdepartmental coordination with different departments.
- After the project was finished, cities faced challenges with traffic congestion during peak hours. They had to take proactive steps, like using ITMS, to deal with this issue effectively.

Outcomes

- The project is oriented towards women empowerment and entrepreneurship, the majority of which are first-generation entrepreneurs.
- The project boosts the local economy with weekend revenue often exceeding ₹2.5 lakh.
- Total of 52 shops with daily earnings almost exceeding ₹2,000 each.

9 Jew Street

Kochi, Kerala

Category
Local Street

RoW
4m and above

Length
0.073 km

Duration
Dec 2020- Dec 2021
(1 year)

Total Cost
₹1.52 Cr.

Nodal Authority
Cochin Smart City Limited (CSML)

Implementing Partners
Cochin Smart City Limited (CSML), Kochi Municipal Corporation, IPE Global Limited (PMC), Deens Group

Context of the Project

Jew Street is part of CSML's Area Based Development Plan, which turned 30 km of streets in Fort Kochi and Mattancherry into pedestrian-friendly zones. It serves as a key link connecting tourist spots like Mattancherry Palace to the Synagogue in Kochi Smart City. Previously, it faced issues with random parking and traffic congestion. Given its unique heritage and market character with high foot traffic, the project aims to create pedestrian-friendly streets with a mix of traditional and modern architectural designs. The development of the Jew Street emphasizes a blend of traditional architectural elements with contemporary design concepts.

Vision of the Project

A town steeped in historical significance, it now stands as an essential destination for global travelers. It aims to connect all streets, bolstering the area's basic infrastructure and amenities, thus creating a vibrant cultural landscape where heritage and modernity coalesce.

Project Journey

Laying the Foundation

The city has set up a up a Neighbourhood Development Programme to scale up the street development in the city. An Apex Committee was set up which engaged with key stakeholders to implement micro-level strategies.

Key Actions

In the initial stage, regular consultations and open dialogue with local shopkeepers were conducted. A national-level Design competition was organised that served as a catalyst for profound insights. A 3 year DLP (defect liability period) included in the project scope.

Design Highlights

The entire lane has been finished with natural stone considering the heritage nature of the area. There are 11 antique style lamp posts and seven three-seater cast iron armchairs on the lane. The street was repaved with cobblestones & even the drainage covers in the entire lane has been finished with natural stone. An underground duct was laid in the middle of the road for utilities. The entire street was re-paved with cobblestones including the drain covers. All the utilities are designed to be underground effectively preventing water stagnation and removing the visual clutter by eliminating over-head cable wires.

Challenges

- Through continuous meetings with stakeholders such as residents' association, ward councilors, the protest from the shopkeepers during the construction of footpaths, was resolved.
- During the excavation there were few breakages of existing underground utilities, which was replaced with the newly constructed utility ducts.

Outcomes

- Transformations in Jew Street and the surrounding neighborhood has increased the influx of visitors.
- It is indicative of a renewed attraction among tourists and local residents alike.

10 Smart Street

Bhopal, Madhya Pradesh

Category
Sub-Arterial Street

RoW
3-4m

Length
0.09 km

Duration
July 2017- March 2021
(3 year 9 months)

Total Cost
₹7.32 Cr.

Nodal Authority
Bhopal Smart City Development Corporation Limited (BSCDCL)

Implementing Partners
Bhopal Smart City Development Corporation Limited, Bhopal Municipal Corporation, M/s Trishul construction Company

Context of the Project

Situated in the city's financial hub with busy crowds, MP Nagar hosts government offices, businesses, and educational centers. As part of the Smart Cities Mission, the Bhopal Smart City Development Corporation Limited and Bhopal Municipal Corporation transformed the area from Board Office to Jyoti Talkies squares into a walkable and pedestrian-friendly space. They used 'tactical urbanism' to create better streets for walking and vibrant, safe public spaces.

Vision of the Project

The project aimed at re-thinking existing public spaces and designing them to suit the needs of the people.

Project Journey

Laying the Foundation

Aligning to the city's vision towards smart urbanism, the city integrated tactical urbanism to create vibrant, sustainable, and livable urban spaces that provide a good quality of life to citizen. The city adopted the 'complete street' model to execute this project. Steering Committee was formed to streamline project challenges and facilitate the stakeholder engagement.

Key Actions

The project was initiated with a participatory planning approach. Citizen engagement and stakeholder consultation workshops specially with local hawkers/ vendors were organised. The several engagement workshops provided a platform where citizens and the local vendors shared their inputs for the design of the space. During the construction phase, prefabricated tensile structures were used and were customized as per the requirement of the space. All the designs were planned according to the Indian Standard Code. Post the construction and implementation, the project is now being operated and maintained through a PPP model for a period of 10 year, with a minimum expected revenue is ₹ 47,38,044 per year.

Design Highlights

As the part of the design, prefabricated tensile membrane structures were used for the vending kiosks and food stalls. The project also included 2m pedestrian walkways, smart bicycle parking area, car parking facilities, local hawker's corner, open recreation area, a bus interchange terminal etc. All the utilities such as the electricity supply lines, drainage pipes have been kept underground. Further, the entire has been illuminated by solar lights, for which solar panels have been installed at 4 areas.

Challenges

- There was a major pushback from the local hawkers and the florists' store, which was initially resolved through rigorous stakeholder consultation.
- Further, during the construction stage, the site was encroached by the street vendors which resulted delay. To address this issue, the city corporation and the SPV immediately relocated these street vendors to newly designed kiosks. The relocation also helped the street vendors to revive their business without any financial loss.

Outcomes

- The project provided better access and provided wider pedestrian pathways that increased walkability among the citizens.
- The food courts and the kiosks facilitated in generating revenue for the vendors and boosted the local economy.
- The rentals of the parking facility also generated revenues for the smart city.
- The recreational open green space boosted the social interaction.
- 833 sq m space was reclaimed for the pedestrians and street vendors

3
Pillars of change for future streets

Common Challenges Faced by Cities in Transforming Streets: **A Path to Overcoming Barriers**

In the journey towards sustainable urban development and the transformation of city streets, cities across India have encountered several common challenges that hinder progress. These challenges, while daunting, are not insurmountable. By recognising these hurdles and adopting innovative strategies, cities can pave the way for more successful and impactful street transformation projects.

Lack of Long-Term Vision and Roadmap for Scaling Up Street Transformation

One of the foremost challenges faced by cities is the absence of a comprehensive long-term vision and roadmap for urban mobility including the scale-up of street transformation. While individual projects may be successful, without a broader strategic plan, cities risk fragmented efforts and missed opportunities for synergy.

To address this challenge, cities must invest in robust urban mobility master plans that outline clear goals and strategies for sustainable transport ensuring that projects are aligned with a broader vision for a sustainable urban future.

Low Government Capacity for High-Quality Detailed Project Reports (DPR)

Accessing funding from development agencies is often contingent upon the submission of high-quality Detailed Project Reports (DPRs). Unfortunately, many cities, particularly Tier II cities, lack the in-house capacity to prepare such reports or hire experienced consultants to guide and review their work.

To overcome this capacity constraint, cities must either hire technical experts to prepare DPRs in-house or seek technical assistance from experienced organisations and development partners. This assistance can help unlock potential funding opportunities and ensure that projects meet the standards set by development agencies. Simultaneously, there is a pressing need to invest in capacity development for the city's engineering teams and local contractors to ensure the high-quality implementation of projects.

Personnel Changes and Lack of Political Will

Frequent transfers and transitions of key officials and the lack of consistent political will can disrupt the continuity of projects and hinder long-term progress. Additionally, there is often a shortage of qualified personnel within the government to lead and administer complex urban transformation projects.

To address this challenge, city governments should focus on building resilience. This can be achieved through partnerships with local organisations and institutions that can provide continuity and expertise even during periods of political transition. Furthermore, investing in training and capacity building programmes for government officials is essential to ensure a pool of qualified individuals who can lead sustainable urban initiatives.

To mitigate this challenge, cities should adopt policies, guidelines, and plans that mandate consistent budget allocation to low-carbon projects, irrespective of changes in leadership. By institutionalising a commitment to sustainability, cities can ensure that projects continue to receive the support and funding they need, regardless of administrative shifts.

Lack of Coordination between Planning and Implementing Agencies

Efforts to transform streets often involve multiple agencies, each with its own priorities and mandates. The lack of seamless integration and coordination between these agencies can result in poor quality implementation and the suboptimal use of financial resources.

To tackle this challenge, cities must create unified platforms for key stakeholders, fostering a culture of collaboration and coordination. Establishing inter-agency task forces and shared project management systems can help streamline the planning and execution of street transformation projects. This integrated approach can minimise inefficiencies and ensure that the various components of a project work together harmoniously.

Lack of Public Awareness and Consistent Support

Public awareness and consistent support are essential for the success of street transformation projects. Inadequate public engagement can lead to undesirable travel behaviour and pushback against projects and policies that promote sustainability.

Cities must invest in robust campaigns that can educate residents about the benefits of projects, build a sense of ownership, and involve them in the decision-making process.

While cities across India face common challenges in their journey to transform streets, these challenges offer opportunities for innovation by learning from the experience of other cities. By adopting proactive strategies, investing in capacity building, and fostering collaboration, cities can overcome these hurdles and create more sustainable, vibrant, and inclusive urban environments for their citizens.

4

Funding & Financing of Street Transformations

Why invest in **Healthy Streets?**

To reduce socio-economic costs incurred to cities

- **Prevent road crashes by designing safe streets and intersections**
  A life lost in a road crash in India incurs ~91 lakhs worth of socio-economic costs. Road crashes cost Indian economy about 3-5% of GDP each year
  Source: MoRTH 2018, World Bank 2022

- **Build resilience against disasters by integrating public utilities and services in street design**
  The overall economic loss due to Chennai 2015 floods is estimated at ~Rs. 15,000 crores
  Source: ASSOCHAM

- **Improve citizens' health by promoting walking & cycling**
  India can incur an economic loss of $4.58 trillion during 2012—30 due to non-communicable diseases.
  Source: Benefits of cycling in India, TERI

To nurture a thriving local economy

- **Boost retail sales by improving the public realm**
  High street walking, cycling, and public realm improvements can increase local sales by upto 30 percent.
  Source: TfL 2014, Lawlor 2013

- **Free up disposable income by reducing travel costs for citizens**
  One car trip (average 7km, 5 days/ week) less for one month means Rs.1,500 saved and 144gms CO emissions reduced
  Source: Central Pollution Control Board

To attract employers and boost workforce participation

- **Reduce economic loss to employers by preventing congestion on streets**
  Bengaluru IT companies suffered a loss of Rs. 225 crore in a day as their employees were stuck in traffic for around five hours.
  Source: Hindustan Times

- **Encourage women workforce participation by ensuring safety**
  Safe infrastructure is a contributor for advancing gender equality in India which could add ~$700 billion of GDP in 2025
  Source: Elsa Marie D'Silva, McKinsey Report

To reduce recurring operations & maintenance costs

- **Eliminate the costs of road**-cutting and frequent re-laying of roads by integrating underground and aboveground utility management with street design

- **Ensure long-lasting street infrastructure** with minimal expenses to Urban Local Bodies by including 'Defect Liability Period' under the executing contractor

How much investments would **Healthy Streets initiatives require?**

Abstract costs for street redevelopment

Based on the scope of work, Healthy Street works can be categorised into:

A COMPLETE RECONSTRUCTION

Rs. 12 - 18 cr/km*

Involves **complete reconstruction** of the NMT zone, equipped with footpaths, cycle tracks, designated parking, elaborate placemaking, landscaping, and complete new underground utility laying.
These are usually arterial or sub-arterial streets.

B PARTIAL RECONSTRUCTION

Rs. 5 - 8 cr/km*

Involves **partial reconstruction** of the NMT zone including footpath (cycle track could be painted or excluded), designated parking and seaters. Placemaking is not as elaborate as type A.
There are usually sub-arterial or collector streets.

C MINIMUM RECONSTRUCTION

Rs. 1 - 3 cr/km*

Minimum reconstruction - maximum use of existing infrastructure and materials. The prime focus is creating usable, and safe streets. Utilities are not considered - or minimal component is considered.
These are usually collector or local streets.

*Note: * Cost as per 2022-2023 rates*

Pondy Bazar Ped Plaza, Chennai

A

32m RoW | **2018**

- Walking infrastructure- **YES**
  Full reconstruction - Granite Finish
- Cycling Infrastructure- **NO**
- Parking bays- **YES**
- Placemaking- **YES**
  Seating clusters and play elements (Both sides)
- Utilities - **Yes.**
  Underground trenches for telecom, electrical, and stormwater drain. Aligning electrical boxes, and lighting
- Carriage way- **NO**
- Maintenance- **NO**

Jangali Maharaj Road, Pune

A

30m RoW | **2016**

- Walking infrastructure- **YES**
  Full reconstruction - Paver blocks
- Cycling Infrastructure- **YES**
  Full reconstruction - Concrete finish
- Parking bays- **YES**
- Placemaking- **YES**
  Seating clusters, designated vending and play elements (Both sides)
- Utilities - **Yes.**
  Shifting all utilities underground.
- Carriage way- **NO**
- Maintenance- **YES**
  5 year maintenance

Pashan Sus road,
Pune

B

30m RoW | **2022**

Walking infrastructure- **YES**
Full reconstruction - Paver blocks

Cycling Infrastructure- **YES**
At grade - Tar Finish

Parking bays- **YES. Partially**

Placemaking- **YES**
Seating clusters and play elements (One side)

Utilities - **Yes.**
Shifting utilities underground

Carriage way- **NO**

Maintenance- **NO**

Raman Street,
Chennai

C

15m RoW | **2018**

Walking infrastructure- **YES**
Full reconstruction - Rubber moulded pavers (One side)

Cycling Infrastructure- **NO**

Parking bays- **NO**

Placemaking- **NO**

Utilities - **Yes.**
Underground HDPE duct for OFC telecom cables

Carriage way- **NO**

Maintenance- **NO**

Mooparappan road,
Chennai

C

15m RoW | **2018**

Walking infrastructure- **YES**
Full reconstruction - Concrete finish

Cycling Infrastructure- **NO**

Parking bays- **NO**

Placemaking- **NO**

Utilities - **Yes.**
Underground HDPE duct for OFC telecom cables

Carriage way- **NO**

Maintenance- **NO**

How can we **Optimise Costs?**

1 Prioritize complete reconstruction only for high-impact streets

At the cost of implementing complete reconstruction (Type A) for 1 km, you can transform upto 10+ km of streets through minimum reconstruction (Type C) with safe footpaths and traffic calming.

2 Align street redevelopment with utility repair/replacement works

Through proactive collaboration with line agencies and utility mapping prior to project conception, we can reduce upto 20% of project cost. Phase out the implementation of street redevelopment in alignment with the schedule of shifting/repairing utilities.reconstruction (Type C) with safe footpaths and traffic calming.

3 Do not include relaying of asphalt unless necessary

By adopting clean project construction and management practices, you can save upto 30% of costs by avoiding carriageway works. Interventions to improve safety & accessibility like traffic calming, table top crossing and pedestrian refuges should be prioritised.

Street design needs to be planned & implemented to make use of the REDUCE, RECYCLE and REUSE principles with detailed thought to the inclusion or exclusion of utilities to minimize the construction costs.

Here are **10 Ways To Fund And Finance Healthy Streets**

1 National- or State-level funds

These are one-time/recurring large-scale budget allocations for capital investments on urban infrastructure/sustainable mobility interventions from the national- or state governments.

To optimise on these funds, cities could package Healthy Streets projects to improve three key urban infrastructure challenges - mobility, utility, and liveability.

Examples of **National-level funds:**

- *Smart Cities Mission Fund*
- *National Clean Air Programme Fund (NCAP)*
- *Nirbhaya Fund*
- *Gati Sakthi Scheme*

Examples of **State-level funds:**

- *Urban Road Infrastructure Fund (Tamil Nadu)*
- *City Infrastructure Development Fund (Assam)*
- *Urban Infrastructure Fund (Maharashtra)*

Chennai allocated ~**110 cr** of Smart Cities Mission Fund for developing walking- and cycling-friendly interventions.

2 Healthy Streets Fund

Set up a Healthy Streets Fund as part of your city's annual budget. Prioritise recurring funding allocation for roads and related amenities, from your city's own tax revenue or partly redirect funds from the state department for road construction.

In the long-term, set up a Healthy Streets Cell/Department with dedicated internal capacity to implement high-quality infrastructure.

Example of city-level Healthy Streets funds:
*Chennai's **Bus Route Roads Department** was allocated ~90 crores was spent on implementing footpaths in 2019-20.*

*Over the last 7 years through a dedicated fund, Chennai has implemented **150+ km** of footpaths across the city.*

3 Development funds from political representatives

Every ward councillor and constituency representative (MLA/MP) shall have access to a **dedicated, recurring annual development funds.**

While these may not be sufficient for projects that require complete reconstruction, it could be optimised for complementary interventions: street lights, traffic calming measures, etc

Examples:
- *Member of Legislative Assembly Constituency Development Scheme (MLACDS) in Tamil Nadu - available as Rs. 3 Cr/ yr*
- *Member of Parliament Local Area Development Scheme (MPLADS) - available upto Rs. 5 Cr/ yr*
- *Councillors' Ward Development Fund in Chennai - Rs. 35 lakhs / yr*

4 Grants from Development Agencies

Grants from development agencies are generally available and allocated to a limited number of cities or projects with focused goals.

An effective pitch would help scaling up Healthy Streets through **grants for technical assistance** *(DPRs, Feasibility studies, hiring experts, etc.).*

Examples:
City Investments to Innovate, Integrate and Sustain (CITIIS) Challenge - 2018 offered grants for procuring technical assistance

Cities including Amritsar, Dehradun, and Hubballi Dharwad optimised on CITIIS Challenge - 2018 to implement high-quality sustainable mobility projects.

5 Opportunities from global development sector

Other than grants routed through the national/state departments, various global development agencies also offer opportunities for capacity building and technical support through direct 'call for proposals'.

While the funding sum could be limited, they enable access to expertise and could showcase your work at an international forum to attract more investments in the future.

Examples:

- *GDCI's Streets for Kids - Leadership Accelerator Program*
- *Bloomberg Initiative for Cycling Infrastructure*

Thrissur, Kerala is part of the **GDCI's Streets for Kids - Leadership Accelerator Program 2022**, which covers capacity building and implementation grants up to ~0.2 crores

Global Designing Cities Initiative

6 Revenue from Travel Demand Management (TDM)

Progressive TDM policies should be based on incentivizing sustainable mobility, as much as disincentivizing polluting private modes.

Pricing-based regulation could persuade long-term behaviour change, while offering short-term revenue source for strengthening street infrastructure.

(Note: For successful implementation of on-street parking management, curb alignment and presence of footpaths are crucial. Hence, the both should go hand-in-hand.)

Examples:

- *Parking charges*
  (Conservative estimates show that Bengaluru can unlock approx. Rs. 300 cr/year through effective on-street parking management)
- *Congestion pricing*
- *Green Tax*

Bengaluru's Parking Policy 2.0 commits to ring-fence the revenue from parking management for implementing NMT-friendly infrastructure.

7 Land Value Capture (LVC) Mechanisms

Land value capture can promote inclusive and equitable urban development, by accounting the increase in property value due to public infrastructure, levying relative charges, and reinvesting them for high-quality public infrastructure.

The impact of street transformation projects are not only is limited to the right-of-way, but extends to change business activities, service access for residents, and change the lives of people in that neighborhood.

Hence, it is important to look through the real estate perspective and optimise the benefits.

Examples:

- *Infrastructure and Amenities Charges*
- *Station Connection Fees*
- *Betterment Charges*
- *Impact Charges*

Chennai opitimises ~100 cr of their Infrastructure and Amenities Fund for implementing Healthy Streets initiatives under Mega Streets Project.

8 Contributions from non-governmental partners

This reduces the dependency on city budgets for small-scale neighbourhood-level interventions. This also provides the opportunity for catalysing community-driven transformation.

Contributions from non-governmental partners could be tapped into for intersection redesign, tactical urbanism tests, placemaking projects, and pilot street segments.

Examples:

- *Corporate Social Responsibility Funds*
- *Public donations*

One Green Mile project in **Mumbai** was implemented with contributions of from private sector

9 Market-based financing mechanisms

Market-based tools will help cities increase and diversify own-source revenues. It gives direct access to capital market and avoid unplanned growth or deficient infrastructure supply.

Note: A total of Rs 1,747 Crores ($291 Million) of debt across 27 projects has been raised by municipalities in India since 1997. (Source: Janaagraha)

Examples:

- *Public Private Partnership based on Out-of-Home advertising potential*
- *Municipal Bonds & Credit rating: Debt securities issued by the cities directly or pooled by state government*
- *Carbon Credits and trading*

VMC'S 'successful listing' of municipal bond now case study for US Treasury

Indore Municipal Corporation's green bonds oversubscribed 5.91 times on final day

10 Low- or zero-interest loans *(Soft loans)*

Low- or zero-interest loans could help in increasing the capital investments for resilient urban infrastructure. This also opens up opportunities to collaboratively work with Development Banks and tap into international expertise.

Cities could package street redevelopment works with other projects including Social Housing, Metro/other public transport infra, etc

Examples:

- *City Investments to Innovate, Integrate and Sustain (CITIIS) Challenge - 2018 (Agence Française de Développement (AFD) and the European Union (EU)*
- *Chennai City Partnership (World Bank)*
- *Project Readiness Financing (PRF) loan - Nagaland (Asian Development Bank)*

Chennai has collaborated with the World Bank for transforming arterial and sub arterial streets, through the Chennai City Partnership.

Creating Healthy Streets:
Lessons from Frontrunner Cities

Cities like Chennai, Pune, Pimpri Chinchwad, Coimbatore, Delhi, Ahmedabad, and Mumbai to name a few have set a precedent for creating transformative urban spaces through careful planning, effective resource allocation, and community engagement. In this chapter, we delve into the six fundamental principles that enabled these cities to create impactful Healthy Streets.

Laying the Foundation: Policies, Plans & Guidelines

These cities have understood that setting a strong foundation grounded in visionary policies and necessary institutional reforms is crucial to ensure the resilience of street transformation initiatives.

Healthy Street Policies & Design Guidelines:

These cities have been at the forefront of adopting progressive policies to advance their vision for promoting walking and cycling. It wasn't just about putting words on paper; it was about policies that could translate into actionable change. To strengthen these policies, they also developed Street Design Guidelines, city-wide Network Plans, and Impact Assessment frameworks. These provided a strong foundation for city planners, designers, and engineers to create streets that prioritise the health and well-being of the community.

Walking & Cycling Network Plans with 3-Year Action Plans:

Infrastructure works best when it's well-connected, not in isolated segments. Recognising this, frontrunner cities took the initiative to create long-term, city-wide network plans that seamlessly integrated walking and cycling paths into the urban fabric. For example, Pune developed a Comprehensive Bicycle Plan, while Chennai embarked on a Mega Streets Programme, aiming to transform over 110 kilometres of streets across six neighborhoods. These comprehensive plans are aimed at ensuring that every part of the city would be connected and accessible for pedestrians and cyclists.

Healthy Streets Design Cell and Apex Committee:

Implementing such transformative changes required dedicated teams and cross-functional collaboration. Frontrunner cities formed Design Cells and Apex Committees to oversee the implementation of their Healthy Streets initiatives. These teams brought together professionals with diverse backgrounds, including urban designers, data experts, transport planners, and community engagement specialists. The diversity within these teams promoted innovative solutions and a holistic approach to urban transformation.

Sourcing the Funds: Budgeting and Financing for Healthy Streets

Planning finances and identifying sustainable funding sources are key elements in ensuring the long-term success of Healthy Streets initiatives. Further, cities should also assign budgets for maintenance works that include retrofitting curbs, ramps, and pedestrian crossings for existing developed roads.

Chennai, a frontrunner in the Healthy Streets movement, took a multifaceted approach to funding its street initiatives. The city tapped into the funds under the National Clean Air Programme, a government initiative aimed at improving air quality in urban areas. Additionally, Chennai leveraged the TURIF programme, a state-level road infrastructure programme, to fund specific street projects. Furthermore, the city secured funding from the Nirbhaya Fund, which supports initiatives related to the safety and well-being of women, and attracted investments from international financial institutions like the World Bank.

Pune, another pioneer in creating Healthy Streets, demonstrated a remarkable commitment to financing their initiatives. The city allocated more than 50% of its annual transport budget toward improving walking, cycling, and public transport infrastructure. This dedicated funding allocation reflected Pune's vision of creating streets that prioritise the health and mobility of its residents.

Hiring a Competent Team: Designers, Contractors, and Project Managers

These frontrunner cities understood that the long-term success of Healthy Streets hinged on ensuring high-quality design and implementation. One of the key factors behind the success of these cities was their ability to hire competent designers and work with skilled local contractors by preparing and publishing robust Requests for Proposals (RfPs). This approach attracted top-tier design talent, allowing them to bring innovative ideas and creative solutions to the table. By doing so, they ensured that the designs were not only functional but also beautiful, contributing to the well-being and vibrancy of their urban environments.

Building the Team's Muscle: Conducting Capacity Development and Training

Frontrunner cities have demonstrated a commitment to building the capabilities of their teams. They appointed dedicated staff members with specialised training in implementing street design. This investment in human capital was a crucial factor in enabling these cities to realise their vision for transformation.

These frontrunner cities recognised the importance of nurturing a dedicated internal team with diverse backgrounds and skills. This included urban designers, data experts, transport planners, and other professionals who brought a holistic perspective to the planning and implementation of Healthy Streets. They also conducted regular workshops, launched training courses, and provided ongoing professional development opportunities to ensure that their teams were well-equipped.

Doing Things Together: Community Engagement and Inter-Departmental Coordination

These frontrunner cities recognised that creating Healthy Streets is a collaborative effort that requires active engagement with the community through participatory processes and seamless coordination among various departments.

These cities recognised the importance of involving residents, businesses, and other stakeholders in the planning and decision-making processes. They actively engaged with political leaders and local champions who played a crucial role in garnering support for Healthy Streets initiatives. Events like Mumbai's Sunday Streets and Delhi's Raahgiri Days prioritised people on streets, creating a sense of ownership and participation among the community.

Successful cities understood that liaising with all primary stakeholders and line agencies was essential. Initiatives like NMT subcommittees in Chennai and Pune ensured seamless inter-departmental coordination, breaking down silos that often hinder progress. By involving stakeholders and breaking down bureaucratic barriers, they fostered a sense of ownership and collective responsibility for the success of their initiatives.

Monitoring, Learning, and Improving

Cities adopted impact assessment frameworks to measure the effectiveness of their projects. These frameworks allowed them to assess the tangible benefits of Healthy Streets, from increased physical activity to improved air quality.

They also actively sought feedback from residents and observed usage patterns to understand how people were interacting with the newly designed streets. This citizen-centric approach helped them assess the impact of projects and gather insights to shape future projects.

These frontrunner cities have showcased that creating impactful Healthy Streets is not just an aspiration but a tangible reality achievable through meticulous planning, resource allocation, and community involvement. Their experiences provide invaluable lessons for cities around the world looking to transform their urban spaces into healthier, more vibrant environments.

5 Appendix

Glossary
References

Glossary

CITIIS: CITIIS, or the City Investments to Innovate, Integrate and Sustain, is a sub-component of the Government of India's Smart Cities Mission. It is a joint program of the Ministry of Housing and Urban Affairs, Agence Francaise de Development (AFD), the European Union (EU), and the National Institute of Urban Affairs (NIUA).

C4C Challenge: The India Cycles4Change Challenge is an initiative of the Smart Cities Mission, Ministry of Housing and Urban Affairs, Government of India to inspire and support Indian cities to implement quick cycling-friendly initiatives in response to COVID-19. The Ministry of Housing and Urban Affairs launched the Challenge on June 25th, 2020.

Complete Streets: Smart Cities Mission-Ministry of Housing and Urban Affairs launched 'Complete Streets' Strategy to help cities transform their dangerous roads into Completes streets that cater to all user groups—regardless of their age, gender, ability, or mode of transportation. The Complete Streets Framework Toolkit consists of six volumes: (i) Complete Streets Policy Workbook; (ii) Complete Street Policy Framework; (iii) Complete Streets Evaluation Matrix; (iv) Developing Complete Streets Masterplan; (v) Complete Street Implementation Guidelines; and (vi) Complete Streets Design Streets Design Guidelines. Complete Street Sector Framework documents are intended to be used by city managers, municipal commissioners, CEOs of smart cities SPVs for development & integrated planning. These framework documents will help develop capacities of these officers to better understand this sector in terms of policy perspective, designing, financing, technology and overall development.

NMT: Non-motorised Transport (NMT) is a foundational sustainable mobility concept that prioritizes planning for walking and cycling over automobiles.

Smart Road: In the context of Indian Smart Cities, Smart Road is defined as those roads that integrate Internet of Things (IoT) devices to ensure safer mobility and efficient traffic management. These roads further integrate physical infrastructure such as utility ducts (with several service lines) as part of the streetscape.

S4P Challenge: The Streets4People(S4P) Challenge is an initiative of the Smart Cities Mission, Ministry of Housing and Urban Affairs (MoHUA), Government of India, to support cities to create walking-friendly streets. As COVID-19 brought our cities to a halt, citizens across India took to walking and cycling to access essentials and services, and even exercise. Leveraging this opportunity, the Streets4People Challenge was launched to inspire Indian cities to work with their citizens and experts to implement permanent walking-friendly infrastructure, embed institutional reforms, and build momentum for walking and placemaking.

SPV: The implementation of the Smart Cities Mission at the City level is done by a Special Purpose Vehicle (SPV) created for the purpose. Each Smart City has an SPV which is headed by a full-time CEO and has nominees of Central Government, State Government and ULB on its Board. The States/ULBs ensure that, (a) a dedicated and substantial revenue stream is made available to the SPV to make it self-sustainable and could evolve its own creditworthiness for raising additional resources from the market and (b) Government contribution for Smart City is used only to create infrastructure that has public benefit outcomes. The execution of projects is done through joint ventures, subsidiaries, public-private partnerships (PPP), turnkey contracts, etc. suitably dovetailed with revenue streams.

UT: A union territory (UT) is a type of administrative division in the Republic of India. Unlike the states of India, which have their own governments, union territories are federal territories governed, in part or in whole, by the Union Government of India. India has total of 8 Union Territories.

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