Surat Resilience Strategy

बहुजनहिताय बहुजनसुखाय

Surat Resilience Strategy

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Resilience
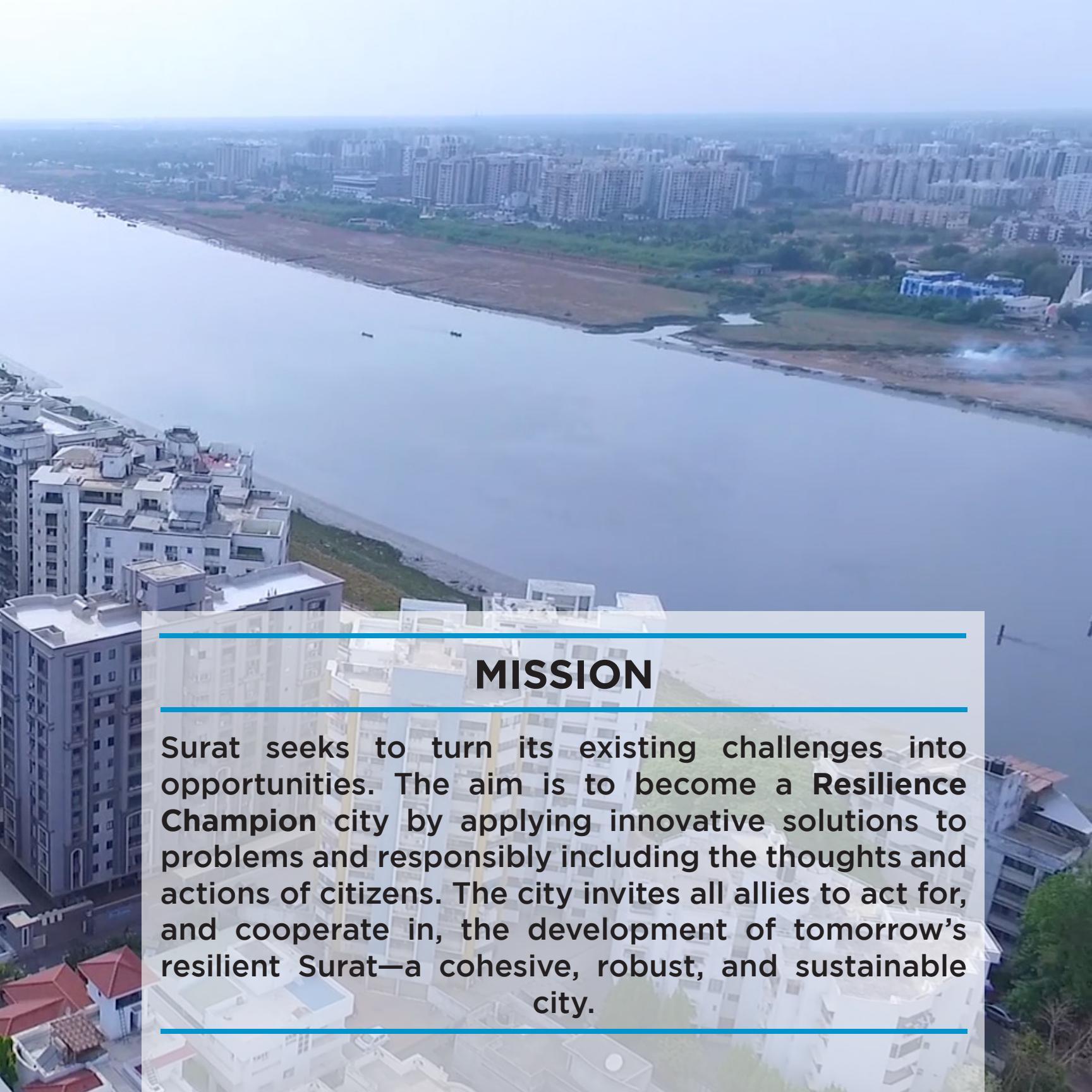
VISION

A resilient Surat which fosters robust and thriving communities that are healthy, just, economically viable, and environmentally sound.
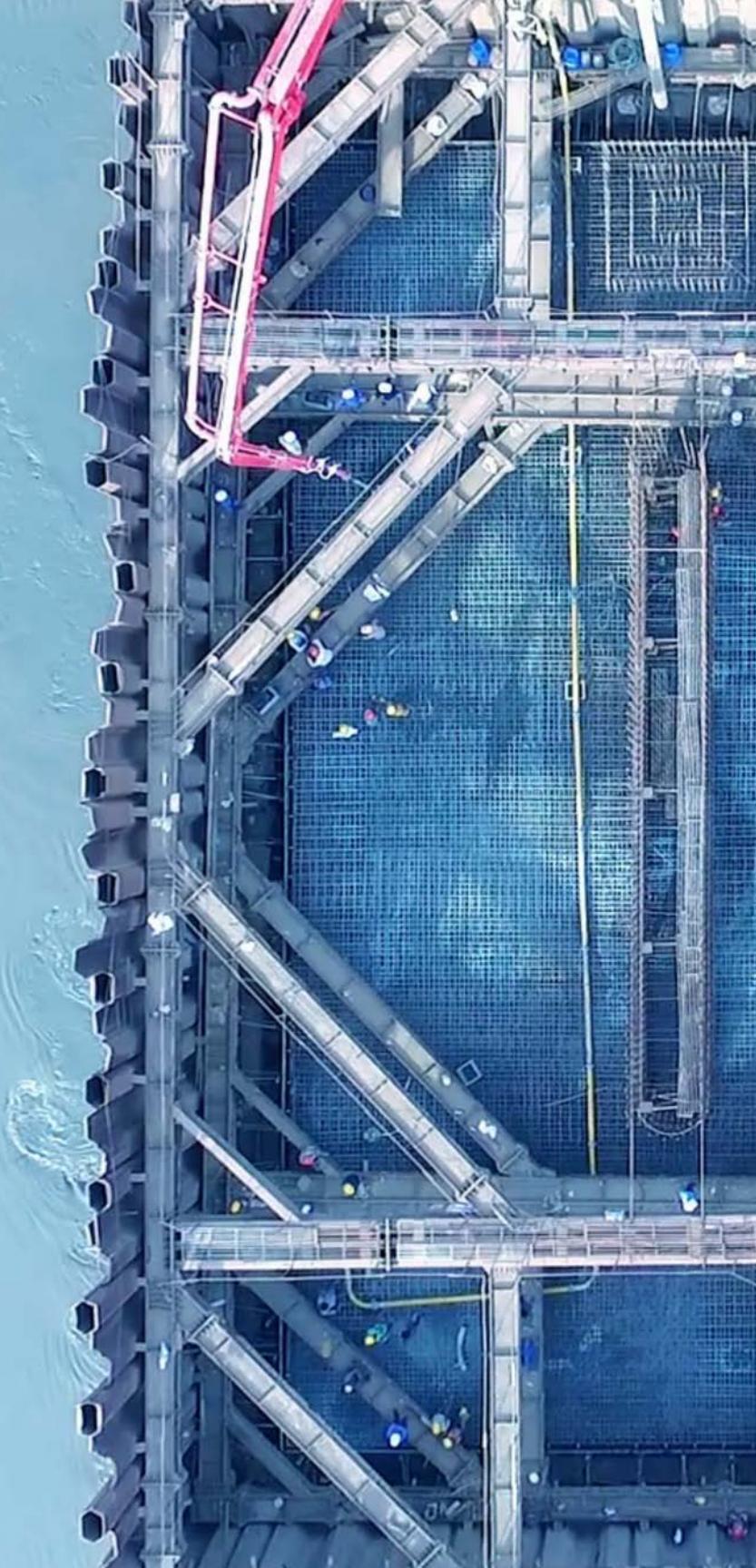
Surat City & River Tapi
Photograph Credit: Piyush Patel, Surat

MISSION

Surat seeks to turn its existing challenges into opportunities. The aim is to become a **Resilience Champion** city by applying innovative solutions to problems and responsibly including the thoughts and actions of citizens. The city invites all allies to act for, and cooperate in, the development of tomorrow's resilient Surat—a cohesive, robust, and sustainable city.

Pandit Dindayal Upadhyay cable stay bridge
across River Tapi joining Athwa & Adajan
Photograph Credit: Piyush Patel, Surat

Contents

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ABBREVIATIONS

100RC	100 Resilient Cities
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AMSL	Above Mean Sea Level
BNR	Biological Nutrient Removal
BPMCA	Bombay Provincial Municipal Corporations Act
BRTS	Bus Rapid Transit System
CBO	Community-based Organization
CDMP	City Disaster Management Plan
CEPT	Centre for Environmental Planning and Technology
COP	Conference of the Parties
CPCB	Central Pollution Control Board
CREDAI	Confederation of Real Estate Developers' Associations of India
CRF	City Resilient Framework
CRO	Chief Resilience Officer
CSS	Center for Social Studies
CWC	Central Water Commission
DGVCL	Dakshin Gujarat Vij Company Ltd.
DIC	District Industries Center
DPR	Detailed Project Reports
DRR	Disaster Risk Reduction
EIA	Environmental Impact Assessment
FAS	Fixed Activated Sludge
FGD	Focus Group Discussion
FOSTTA	Federation of Surat Textile Traders Association
GCZMA	Gujarat Coastal Zone Management Authority
GIS	Geographic Information System
GMFB	Gujarat Municipal Finance Board
GPCB	Gujarat Pollution Control Board
GSDMA	Gujarat State Disaster Management Authority
GTPUDA	Gujarat Town Planning and Urban Development Act
HADA	Hazira Area Development Authority
HNA	Hazira Notified Authority
IAS	Indian Administrative Services
IMD	India Meteorological Department
JNNURM	Jawaharlal Nehru National Urban Renewable Mission
KII	Key Informant Interviews
LPCD	Litres per Capita per Day
MMF	Man Made Fiber
MLA	Member of Legislative Assembly
MoHFW	Ministry of Health and Family Welfare
MoUD	Ministry of Urban Development
MP	Member of Parliament
NDMA	National Disaster Management Authority
NGO	Non-Governmental Organization
NHM	National Health Mission
NWRWS	Narmada Water Resource and Water Supply
PRA	Preliminary Resilience Assessment
R&BD	Roads & Buildings Department
RAY	Rajiv Avas Yojana
RTO	Regional Transport Officer
SBR	Sequencing Batch Reactors
SCCT	Surat Citizen Council Trust
SCCT	Surat Climate Change Trust
SCET	Sarvajanik College of Engineering & Technology
SDA	Surat Diamond Association
SGCCI	Southern Gujarat Chamber of Commerce and Industries
SGVCL	South Gujarat Vij Company Limited
SLD	Shared learning dialogues
SMC	Surat Municipal Corporation
SMIMER	Surat Municipal Institute of Medical Education and Research
SUDA	Surat Urban Development Authority
SVNIT	Sardar Vallabhbhai National Institute of Technology
TRAM	Traffic Regulation & Management
TTP	Tertiary Treatment Plant
UCCR	Urban Climate Change Resilience
UDD	Urban Development and Urban Housing Department
UHCRC	Urban Health and Climate Resilience Center
ULB	Urban Local Body
UTID	Urban Transport and Infrastructure Design
VNSGU	Veer Narmad South Gujarat University

MRS. ASMITABEN P. SHIROYA
Mayor, Surat

Our community's resilience rests on our people and our ability to live well in good times and bounce back stronger than ever from the inevitable hard times. Developed with input and insights from the people of Surat, the Resilience Strategy is designed to articulate solutions that make our city more resilient not only to physical challenges, such as floods and aging infrastructure, but also to social challenges, such as cohesion and urban health. Surat's Resilience Strategy is the launch point for several programs that foster these connections and partnerships. These programs that I am excited about, will enable several community-based organizations to serve as hosts for training and conduits to services that are tailored to meet the needs of people. These programs are good example of what the practice of resilience looks like—it addresses more than one challenge at once and creates multiple benefits for many people.

I am proud of the many partnerships that have made the Resilience Strategy possible, and I look forward to forming many additional partnerships that will enable its implementation. 100 Resilient Cities (100RC)—pioneered by The Rockefeller Foundation—has provided invaluable support, guidance, and access to technical assistance. Other Indian cities— Chennai, Pune, and Jaipur—are also participating in 100RC, and continued collaboration in the region will help to amplify our work beyond the boundaries of our respective cities. Most of all, I am grateful to the Surat community for contributing to the Resilience Strategy and for what you do every day to make Surat the active, dynamic, and highly engaged community that it is. I invite all community members to review this report with an eye towards how you can join your friends, neighbors, and colleagues in making Surat a model of city resilience.

Best wishes,

Mrs. Asmita Shiroya
Mayor, Surat

MR. MICHAEL BERKOWITZ
President, 100 Resilient Cities

On behalf of the entire 100 Resilient Cities family, I want to congratulate the city of Surat, Mayor Asmitaben Shiroya, and Chief Resilience Officer Kamlesh Yagnik, on the release of the Surat Resilience Strategy, a major milestone for the city and 100RC's partnerships with it. A dynamic city with a rich history, Surat builds on its past as its lays the foundations for a resilient future. This document sets forth an extraordinary vision of urban resilience for all the residents who call this city home.

Surat's resilience work builds on years of close collaboration with the Rockefeller Foundation, which began with the Asian Cities Climate Change Resilience Network. The Resilience Strategy reflects this through the amazing progress the city has made in understanding its resilience challenges and embracing the holistic thinking and planning that true resilience requires. Through initiatives and actions that strengthen the city as a whole, the Strategy enables Surat to addresses its past challenges while also recognizing the increasing unpredictability of the future.

While the Strategy addresses the fissures formed by the city's rapid growth, it goes much further. Alongside the enforcement of traffic rules, driving license norms, quality of life assessment, and guidelines on open public space, the Strategy also includes innovative and progressive initiatives such as a health and action plan that emphasizes the connection between urbanization, climate change and public health, support for women entrepreneurs, and promotion of civic engagement. Through this multifaceted blueprint for the city's present and future, Surat has the opportunity to lead not only in India, but throughout the 100RC network, and the world.

Central to all of these efforts are the people of Surat. The Strategy provides for creative public outreach to spread awareness of the city's challenges and the role of all residents in working to strengthen the city. It also dedicates an entire pillar to social cohesion that celebrates the city's heritage while also embracing the city's immigrants and their contributions to their adopted home.

This Strategy is a new and exciting chapter of Surat's resilience work and its relationship with 100R. It is also a beginning. It marks the start of exciting work to come in the months and years ahead. Now we can collectively begin implementing the actions and initiatives contained in the following pages, which will positively impact the lives of all who call Surat home. We at 100 Resilient Cities could not be more pleased to be a partner in these efforts.

Best wishes,

Mr. Micheal Berkowitz
President, 100 Resilient Cities

MR. M. THENNARASAN, IAS

Municipal Commissioner,
Surat Municipal Corporation

The 100 Resilient Cities (RC) Challenge seeks to work with 100 cities across the globe to build resilience to address social, economic, and physical challenges that are faced by cities in an increasingly urbanized world. 100RC facilitates the building of a global practice of resilience among governments, NGOs, private sector, and citizens.

Surat Resilience Strategy provides a platform for people from across sectors, institutions and interest groups to come together and help address the critical question of what can we do to protect and improve the way of life of citizens of Surat in the present and in the future. At the behest of SMC various stakeholders worked together to identify issues that impact Surat's resilience.

I am confident that Surat will become India's champion for resilience, extending and integrating our already ground-breaking work in fields such as climate change adaptation, sustainable service provision, and integrated planning, and provide an example for other cities in 100RC to learn from.

Best wishes to all who are working on this endeavor. Surat Municipal Corporation provides wholehearted support to this strategy.

Regards,

Mr. N. Thennarasan, IAS
Municipal Commissioner,
Surat Municipal Corporation

MR. MILIND TORAWANE, IAS

Secretary, Urban Development
Department, Government of Gujarat

In building resilience, we will reduce dependency. Surat Resilience Strategy creates a safer tomorrow for our community. Working together will give us the best defense to face the next shock or stress.

Regards,

Mr. Milind Torawane, IAS
Secretary
Urban Development Department
Government of Gujarat

MR. M. NAGARAJAN, IAS

Chief Executive Officer,
Smart City Development Ltd, Surat

Involvement of citizens in leading to transform Surat into Smart & Resilient City is amazing. Surat Strategy aims to integrate the smarter needs of resident of Surat City. Smart and resilient city is about transformation, rejuvenation, and future design. Smart and Resilient City is about the processes to be followed and evolved not a final destination. Our vision is of a smart and resilient city that places citizens at the center of its projects by continuous involvement of all actors.

Mr. M. Nagarajan, IAS
Chief Executive Officer,
Surat Smart City Development Ltd, Surat

MR. JATIN SHAH

Advisor, Surat Municipal Corporation

The Resilience is in the blood of the Suratis (popularly referred to people of Surat). The Surat Resilience strategy seeks to turn its existing challenges into opportunities. The aim is to become a champion city by applying innovative solutions to problems and responsibly including the thoughts and actions of citizens. The city invites all allies to act for, and cooperate in, the development of tomorrow's resilient Surat—a cohesive, robust, and sustainable city. We are very positive towards this movement to thrive towards resilient and adaptation to climate change.

Mr Jatin Shah
Advisor, Surat Municipal Corporation
Managing Trustee, Surat Climate Change Trust

MR. KAMLESH YAGNIK

Chief Resilience Officer, Surat

Surat faces a diverse range of issues. Tidal flooding and flash floods, sanitation and waste management, and congestion among others, are the issues the city currently deals with. Surat city's government, together with all of the city elements, has worked to overcome these challenges, both through improved physical and non-physical infrastructures. As for the future, I hope that with this City Resilience Strategy Document, Surat, along with all its challenges, will become a more resilient city and develop into a modern and sustainable city.

Mr. Kamlesh Yagnik
Chief Resilience Officer, Surat

The daily problems of traffic jams and choked roads in Surat affect **connectivity and mobility.** This is especially an issue during peak hours when even ambulances and other emergency vehicles could get stuck in traffic. Surat also suffers from a lack of enforcement of the traffic management system. Factors such as a large number of private vehicles, an inefficient public transport system, inadequate parking facilities, unsatisfactory footpaths for pedestrians, encroachments on existing footpaths and road margins, as well as informal and small-time business activities on major corridors—all contribute to the congestion of roads in the city. To curb encroachments, it is necessary for the traffic police to come up with an effective mechanism which would also ease traffic flow in the city. WRI through its UCRA engagement will be supporting Surat to understand & potentially resolve issues relating to informal settlements access to public transit

A wide range of industrial and commercial activities take place in Surat. People from rural areas and other less-developed states flock to the city seeking employment opportunities in the industrial, allied, and service sectors; in trade and business activities; and in hawking, retailing, carting, and other such activities. This has resulted in slums and low income settlements along the riverside and in low-lying, risk-prone areas. There is a huge demand for **affordable housing** in the city to cater to the migrant population. According to a research report by the real estate consulting firm, Cushman & Wakefield, Surat tops a list of 11 Indian cities that are witnessing a surge in housing demand (TOI, 2016). PWC & WRI respectively will support Surat in understanding & finding solution related to affordable housing.

The Surat Municipal Corporation manages the water needs of the city. At present, the main source of water for the entire city is the river Tapi. The river's water quality is deteriorating—anthropogenic activities and development along the riverside contribute to large-scale pollution of the river's water. In such a situation, both **water quality and quantity** will be a big challenge for Surat. Options for finding alternate sources of water, such as getting water from Kakrapar weir by pipeline, need to be worked out. Also, the city needs to work on various water models, for example, the 'Four National Taps' model of Singapore (PUB, 2016). [1] Potentially Surat will tie with partners like Veolia & Deltares to work its water related initiative.

Surat, known for its polishing, textile manufacturing, and diamond cutting industries, is heavily dependent on the latter two **dominant economic sectors.** Recession in these two sectors has had a significant impact on the city's economy (UNDP, 2009). The economy is also characterized by a large number of small and medium scale unorganized industries. The industrial base is labor-intensive. The level of unemployment is low; wages are also low and the workers are generally deprived of social and other security benefits. The city should invite different alternative industries, such as information technology, automobile, tourism, etc., as backup livelihood providers in case economic crises occur.

The **environment and ecosystem** of the city and its surrounding areas—critical determinants of the health of its inhabitants—impact work-related productivity and urban quality of life. Situated on the banks of the river Tapi, and with its proximity to the Arabian Sea, Surat has a sensitive ecosystem. Industrial growth, as well as high population growth and density, put pressure on this ecosystem. Implementation of environmental policies, such as coastal regulation and enforcement of laws in industrial areas, is important. More green spaces need to be developed and maintained. The Tapi is depleting due to rapid siltation and development along both sides of the river. The environmental cell should be more active and efficient in monitoring air pollution and water pollution, as water supply to the city is dependent on the river. CDIA will support Surat in understanding & finding solution related to coastal preservation.

Social cohesion and social networks are weak in Surat. Communities are at peace in the city, but they are not connected. Stronger efforts from society and the government should be made to establish social connectivity and stability. Regulations and policing will be crucial for the city to manage a population that is quite large, with much diversity existing among the communities. To sustain stability, a sense of unity and cultural values must be embraced by the people and administration. PWC will support Surat in understanding City's Social Cohesion issues.

Surat has a well-developed health infrastructure, including government health centers and private health services, but there is a need for skilled and specialized human resources. The upscaling of **public health** needs to be achieved by increasing awareness and capacity building against urban health challenges. Surat is infamous for vector- and water-borne diseases. The seasonality of vector-borne diseases is likely to keep changing, there may be an expansion in the disease transmission period due to increased temperatures and changes during the humid season. Being an urban ecosystem, Surat is also prone to increase other lifestyle diseases and pollution caused diseases. Potentially Save The Children will support Surat in understanding & finding solution related to Public health.

[1] The Public Utilities Board (PUB) is a statutory board under the Ministry of the Environment and Water Resources. It is Singapore's National Water Agency.

Flood affected citizens in Surat
Photograph Credit: TARU, India

Brief Profile of Surat City

Location

Surat, located in the western part of India in the state of Gujarat, on the banks of the river Tapi, is an important historical trade center and serves as a trade link between India and the Gulf countries. Even during the Mughal period, Surat was a gateway to the Deccan plateau and an important port and trading center. Today, the city has one of the highest proposed investments and almost zero percent unemployment. It is one of the fastest growing cities in India.

Surat is an important commercial city in south Gujarat, and is approximately 250 kilometers (km.) north of Bombay. The city is located at 21°10' N – 72°49' E, with an altitude of about 13 meters (m.) above mean sea level (AMSL).

Located at the mouth of the Gulf of Khambhat, Surat experiences a tidal range of about 5 to 6 m. The monthly high tide reaches the western parts of the city. Surat district is surrounded by Bharuch, Narmada (North), Navsari, and Dang (South) districts. The Gulf of Khambhat is to the west of the city. Surat is a port city; the nearest port now is Hazira, located at the mouth of the Tapi. In the distant past, the old city had flood protection systems, including flood walls and gates, which are not present any more.

Surat has a tropical monsoon climate. Summer temperatures in Surat range from 37 to 44 degree Celsius and winter temperatures drop to 22 degree Celsius. Monsoon begins in June and lasts till the end of September, with the average temperature being around 28 degree Celsius during those months. Average annual rainfall is approximately 1,200 millimeters (mm.) (IMD, 2016).

Surat, located between Ahmedabad and Mumbai, has a good connectivity in terms of roads and railways, and more recently by air. The Golden Quadrilateral—a highway network connecting Delhi, Mumbai, Kolkata, and Chennai—passes through Surat. The city is connected to NH8 through a 16-km. connector highway. NH6 and NH228 pass through Surat, connecting various major towns and cities of India. The airport at Surat is functional since 2008 and connects Surat with Delhi and Mumbai.

Like the major business centers of early historical times, which developed along the banks of rivers, Surat too developed along the banks of the Tapi which flows into the Arabian Sea, just 16 km. from the city. The river dictates the topology of the city as the landscape slopes gradually from Northeast to Southwest.

Surat has seen an unprecedented growth in the last four decades, recording one of the highest growth rates in the country and a 10-fold population rise. It now ranks as the eighth largest city in the country (Census, 2011). Coupled with this, a spillover of population into the peripheral areas has also been observed. From time to time, the jurisdictional limits of the Surat Municipal Corporation (SMC) have been extended to include the growth.

Surat faces risks of both sea level rise and flooding. The Ukai multipurpose dam built upstream, 94 km. from Surat, was meant for flood control management, besides irrigation and power generation. During the last two decades, Surat and the surrounding metropolitan region has witnessed major floods.
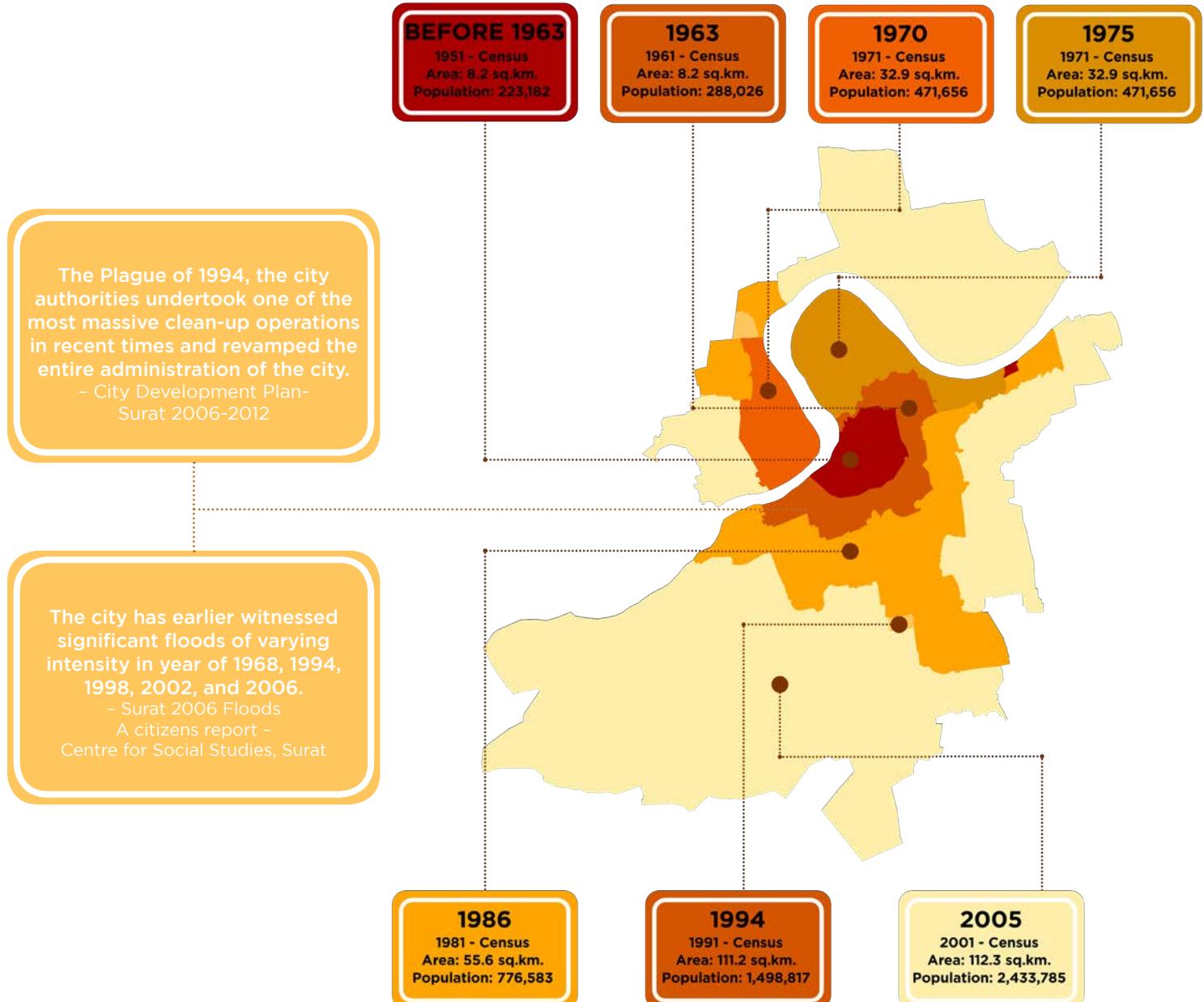
The city is prone to high tides, flooding, extreme heat, and subsequent health risks.

City Growth

Before 1961, Surat comprised an area of 8.12 sq. km.; by 2009 it had expanded to 326.5 sq. km. The oldest part of the city developed between the train station and the parts known as Athwalines. Since the 1990s, most new development, including the most desirable locations for the city's burgeoning middle and upper class, has taken place in the areas lying between Athwalines and the Arabian Sea.

Growth Pattern of Surat

BEFORE 1963
1951 - Census
Area: 8.2 sq.km.
Population: 223,182

1963
1961 - Census
Area: 8.2 sq.km.
Population: 288,026

1970
1971 - Census
Area: 32.9 sq.km.
Population: 471,656

1975
1971 - Census
Area: 32.9 sq.km.
Population: 471,656

The Plague of 1994, the city authorities undertook one of the most massive clean-up operations in recent times and revamped the entire administration of the city.
– City Development Plan-
Surat 2006-2012

The city has earlier witnessed significant floods of varying intensity in year of 1968, 1994, 1998, 2002, and 2006.
– Surat 2006 Floods
A citizens report –
Centre for Social Studies, Surat

1986
1981 - Census
Area: 55.6 sq.km.
Population: 776,583

1994
1991 - Census
Area: 111.2 sq.km.
Population: 1,498,817

2005
2001 - Census
Area: 112.3 sq.km.
Population: 2,433,785

CHAPTER 1

BACKGROUND

Gopi talav, Surat
Photograph Credit: SCCT, India

1.1 Background

Resilient Cities

Pioneered by The Rockefeller Foundation, 100 Resilient Cities (100RC) helps cities around the world become more resilient to the physical, social, and economic challenges that are a growing part of the 21st century. 100RC views resilience not just as shocks—earthquakes, fires, floods, etc.—but also as stresses that weaken the fabric of a city on a day-to-day or cyclical basis. Examples of these stresses include high unemployment, an overtaxed or inefficient public transportation system, endemic violence, or chronic food and water shortages. By addressing both the shocks and the stresses together, a city is better equipped to respond to adverse events and is overall better able to deliver basic functions in both good times and bad to all populations.

Resilience Strategy
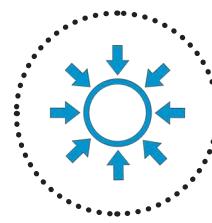
A resilience strategy helps cities prepare for, adapt to, and quickly rebound from, shocks and stresses. The objective of the resilience strategy is to provide a roadmap for the Chief Resilience Officer (CRO) to build resilience in the city.

The resilience strategy serves as a tactical roadmap to build resilience in the city. It articulates the city's priorities for building resilience through specific initiatives for immediate implementation as well as the city's longer continued path. The resilience strategy triggers action, investment, and support within city government and from outside groups. Rather than a static roadmap, the resilience strategy is a living document to be continuously fine-tuned as priorities are addressed and initiatives get implemented.

ACUTE SHOCKS

Acute shocks include hurricanes, flooding, heat waves, fire, hazardous materials accidents, tornados, terrorism, disease outbreaks, riots/civil unrest, infrastructure/building failures, etc.

CHRONIC STRESSES

Chronic stresses include lack of affordable housing, pervasive/high unemployment, poverty/inequity, homelessness, aging infrastructure, water or air pollution, droughts and water shortages, rising sea levels and coastal erosion, crime and violence, societal instability, depressed macroeconomic conditions, etc.

RESILIENCE

Resilience is the capacity of individuals, communities, businesses, and systems within a city to survive, adapt, and grow, no matter what kinds of chronic stresses and acute shocks they experience.

1.2 100RC Network Collaborations

The Rotterdam 100RC Water Exchange held in October 2015 focused on the complex intersection of climate change, aging infrastructure, flood management, urban development, and social connectivity combined with the diverse perspectives brought by participating CROs from nine cities. This offered a rich learning experience for Surat.

Rotterdam Water Exchange Event
Photograph Credit: CRO, Surat

Over five days in Mexico City in November 2015, Surat had a chance to collaborate with other cities and, by shaping and sharing its own learning, came to a better understanding of resilience. Surat learnt about real-world resilience challenges and solutions by visiting 'Living Laboratories'. It catalyzed enthusiasm and commitment among CROs.

The Second International Symposium for Resilient Communities in Koriyama, Japan, was co-organized in April 2016 by the Institute for Resilient Communities and the Fukushima Renewable Energy Institute. It brought together scientists, engineers, public health experts, educators, policy makers, and others to collaborate on building resilient communities. Surat educated itself about interdisciplinary research programs to address critical issues in resilience, and learned how to engage with various public activities to foster interactions between experts and communities.

Second International Symposium for Resilient Communities in Koriyama, Japan
Photograph Credit : CRO, Surat

The urban infrastructure of Asian cities faces social, political, environmental, and financial risks due to climate change induced shocks and stresses. This creates the impetus for city stakeholders to assess their cities' vulnerabilities and to look for investment opportunities in designing and building resilient urban infrastructure. Training on Urban Climate Change Adaptation and Resilience is aimed at improving climate change and urban resilience knowledge among the SMC's senior level managers and to help them design projects. This training in Singapore was organized by Cities Development Initiatives of Asia in May 2016, under its Cities and Climate Change Training Series.

CDIA Training, 2016
Photograph Credit: CRO, Surat
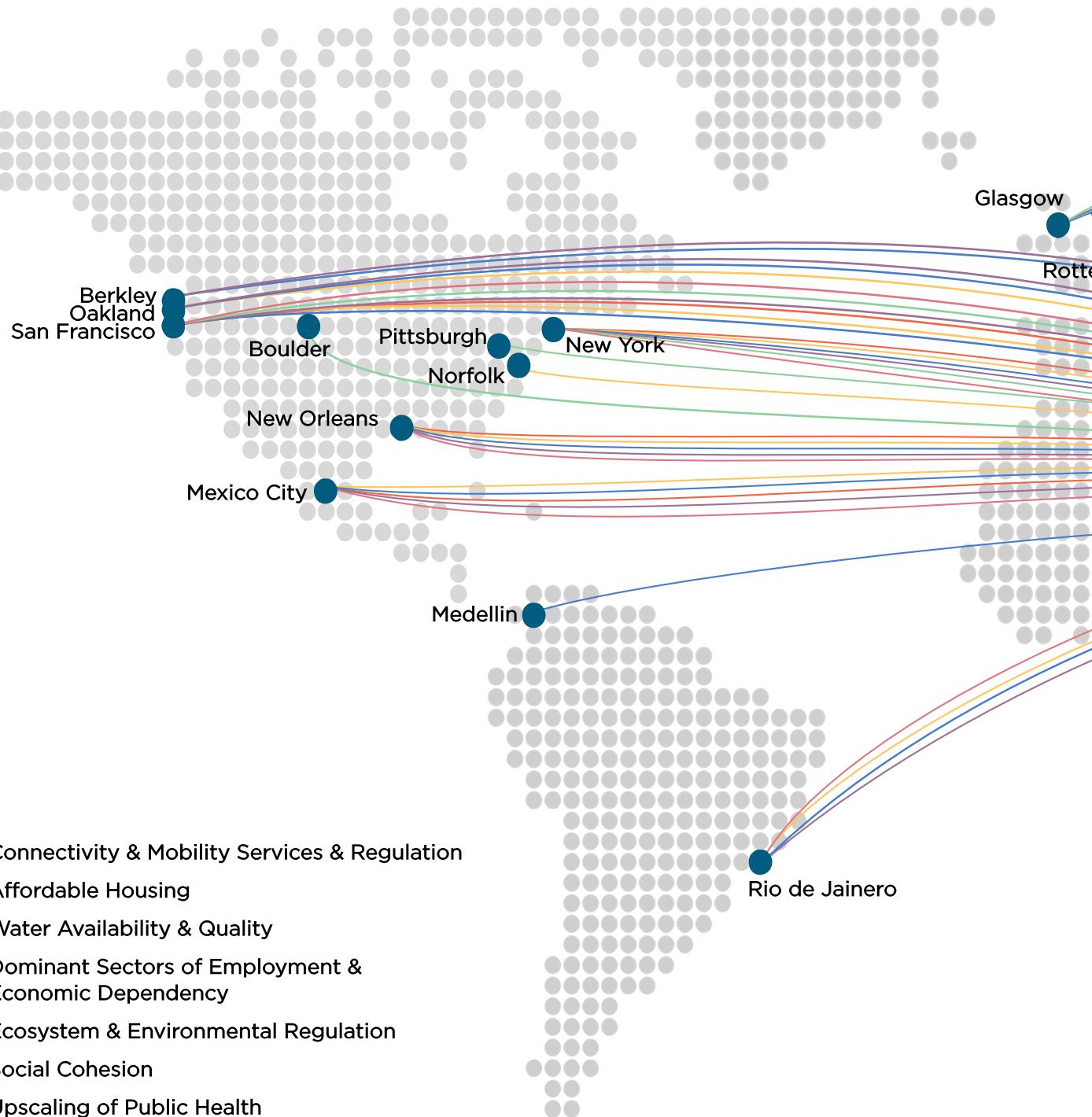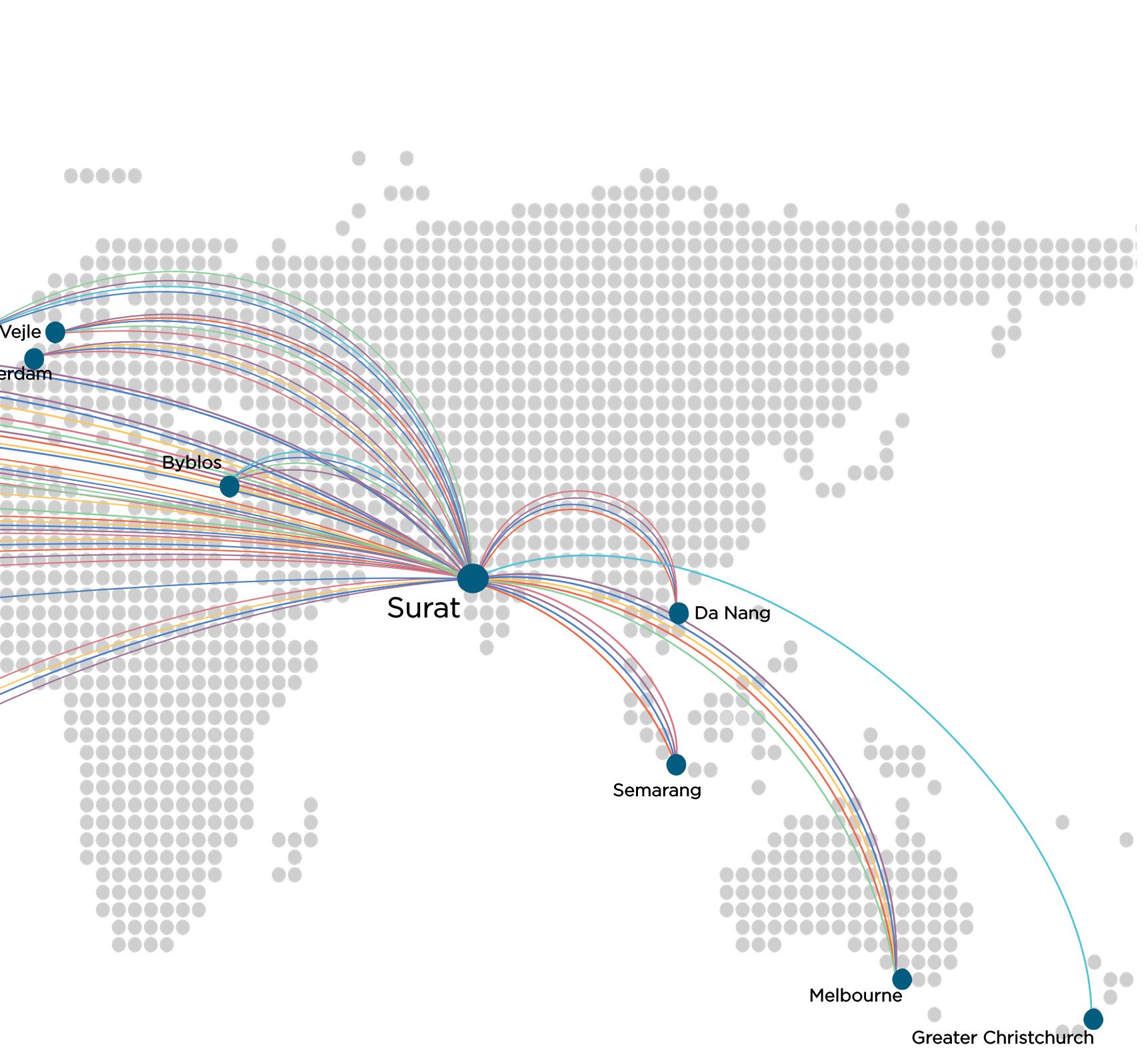
The July 2016 Singapore Regional Summit was designed to achieve objectives built on the experience of earlier summits and best practices. It built and strengthened relationships among CROs, Resilience Team Members, and partners to better leverage the network of practitioners. It increased the City Resilience Team's capacity to work around problem definitions and city actions. It fostered a regional cohort by bringing to the fore regional priorities to help advance collective action.

The Smart Cities Innovative Summit Asia Conference in South Korea was organized in September 2016. It provided the Surat CRO an opportunity to discuss Smart City plans with many Smart City Leaders of other Asian countries. The 'leadership of management' and 'policy issues for 4th revolution and ICT business' were also deliberated along with the Smart City initiation agenda of budgeting, funding, challenges, management, and cooperation.

Fellow member cities' resilience initiatives serve as an inspiration for Surat's resilience strategy. The Surat resilience strategy initiatives indicate city linkages, showing the relevance of networking with similar issues of resilience within the 100RC network.

Figure 1.1: 100RC Network for Surat: Inspiration from the other 100RC cities

Glasgow
Rotte

Berkley
Oakland
San Francisco
Boulder
Pittsburgh
New York
Norfolk
New Orleans
Mexico City
Medellin
Rio de Jainero

— Connectivity & Mobility Services & Regulation
— Affordable Housing
— Water Availability & Quality
— Dominant Sectors of Employment & Economic Dependency
— Ecosystem & Environmental Regulation
— Social Cohesion
— Upscaling of Public Health

Vejle

erdam

Byblos

Surat

Da Nang

Semarang

Melbourne

Greater Christchurch

CHAPTER

2

GATEWAY TO RESILIENCE:
SURAT RESILIENCE STRATEGY

2.1 Stakeholder Engagement

The strategy development process was started by identifying and engaging with relevant stakeholders and city champions under the aegis of the city administration. Seven discovery groups were formed, comprising decision makers, planners, municipal engineers, academicians, researchers, entrepreneurs/businessmen, builders' associations, water resource managers, public health practitioners, and energy/gas suppliers.

Surat is considered a model city for good governance as well as for providing effective service delivery in comparison with many other Indian cities. Surat also has the advantages of efficient city administration, strong political consensus, and sufficient municipal finances.

In the past, the city has demonstrated its capacity to build resilience by improving the quality of its lifeline services such as disaster management, water supply, sewerage, solid waste disposal, and health. The mission of the city is to strengthen its infrastructure, withstand future shocks and stresses, build redundancies, and improve resilience. The SMC has improved its capacity to deal with shocks and stresses, and has taken up proactive initiatives in urban development, community health, and disaster management, working closely with industry and citizens. Inputs from multistakeholder groups led by the SMC can not only address various issues at city level but also influence policy at state and central levels. Therefore, any progress in this city will be keenly observed and can act as an example for urban resilience in other Indian cities, including the 100RC cities.

Innovative methods and tools were used in the strategy development process. Some of the key highlights of the process are:

- Consultations with policy makers and decision makers at the city/municipal administration.
- Shared learning dialogues (SLDs) with enforcement authorities, such as city/district police administration and Surat range police administration.
- Key informant interviews (KIIs) with state-level government departments and institutions.
- Meetings with elected members of city-, state-, and national-level political systems.
- Focus group discussions (FGDs) with city steering committee members and discovery group members.
- Consultations with subject matter specialists.
- Conduct of time-bound research studies to understand different aspects of the current situation and obtain information from secondary literature and primary surveys.
- Engagement with a new generation of planners/engineers/researchers via the Urban Transport and Infrastructure Design (UTID) Studio (with transport planning students).
- Participation in community engagement events to capture the perceptions of citizens.

The supporting images show an array of activities, including academic activities, community level activities and academic engagements as part of 100RC Surat, experts' participatory exercises in chart-based activities for cross discovery analysis, and voting excercise with the Android application.

Resilience Workshop,
Photograph Credit: TARU, India

Academic Collaborations
Photograph Credit: TARU, India

Discovery Area Group Meeting
Photograph Credit: TARU, India

U-Turn Event, Surat
Photograph Credit: TARU, India

Group activities for discovery area diagnosis
Photograph Credit: TARU, India

Innovative methods used during strategy development.

RESEARCH   AWARENESS

ENFORCEMENT   IMPLEMENTATION

Strategy orientation

QR codes for supporting reference documents

2.2 Resilience Orientation

Initiatives within this resilience strategy are oriented around one of four categories, as shown in Figure 2.2.

Figure 2.1: Resilience Orientation

Transdisciplinary research on resilience issues in complex urban systems will generate knowledge in relation to the seven pillars. Research is a continuous process and will require constant engagement with institutions and stakeholders. Awareness plays a significant role in achieving the aim of resilience strategy. Some amount of awareness has already been created by engaging stakeholders on the key shocks and stresses. Enforcement also plays a very important role in implementing rules and regulations especially in traffic and pollution management which is now taken care by various agencies. Agencies uses advanced technology for law enforcement such as surveillance cameras to monitor traffic at various locations across the city.Some of the long term initiatives are aligned towards physical infrastructure development which needs implementation support from urban local body.

Resilience Synergy

Synergy was established between national- and state-level policies, and programs; projects and institutions were linked to incorporate the lessons.Efforts were made to ensure that the resilience goals and initiatives identified aligned with various national- and state-level policies, programs, and projects. The current resilience strategy includes plans to inform and influence national- and state-level stakeholders by sharing lessons learned from city resilience interventions. There is a need to enhance networking and sharing of experiences to ensure resilience-informed policies at local and state levels.

Resilience Demonstration

The resilience strategy adopts a multiscalar approach to address various resilience issues. The interventions aim to improve multistakeholder participation, and empower citizens to take informed decisions post strategy development. It is necessary to test these concepts through small pilot projects and research studies to ensure their effectiveness while replicating them across the city. These concepts can be built on the existing mechanisms and help in providing timely information.

Resilience Timeline

Resilience goals and initiatives introduced through the Surat resilience strategy are categorized based on the time required for successful implementation. Short-term interventions are initiatives which may span from one to two years (2016–2018) and medium-term interventions are initiatives which may span from one to five years (2016–2020). Long-term initiatives may require longer time (2016–2025), more resources (financial and human), and may require considerable political and administrative will for execution.
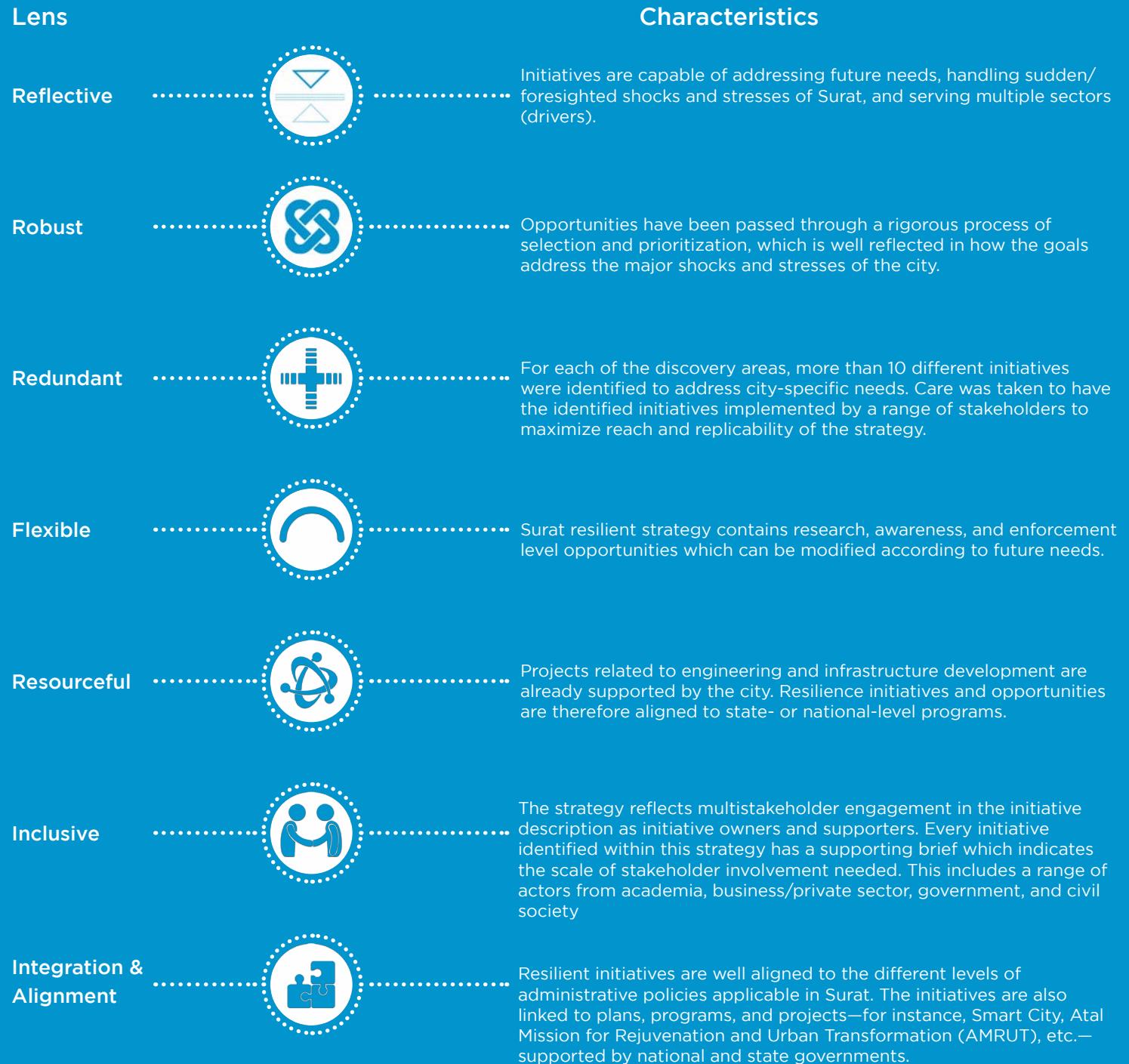
Resilience Incubation

During the strategy development process, various institutions and organizations were identified as resilience incubators. These institutions will be custodians of knowledge, technology, and experience. Data/information collected during various phases of the resilience-building exercise can be stored in these institutions to ensure access over time, leading to continued sustainability of the efforts. These institutions and organizations were brought on-board from the begining.

Bouquet of Initiatives

Resilience is a multisectoral process. It requires cross-sector links to develop a robust strategy with implementable actions. Surat's resilience strategy is aimed at generating multi- and cross-sectoral information which can broaden the scope of planning and designing initiatives. The development of Detailed Project Reports (DPRs) can be the next logical step for the city government to access financial resources apart from the state or national government. To facilitate that process, several studies and research for informing DPRs have been identified and highlighted.

Figure 2.2: Characteristics of Surat Resilient Initiatives

Lens		Characteristics

Reflective — Initiatives are capable of addressing future needs, handling sudden/ foresighted shocks and stresses of Surat, and serving multiple sectors (drivers).

Robust — Opportunities have been passed through a rigorous process of selection and prioritization, which is well reflected in how the goals address the major shocks and stresses of the city.

Redundant — For each of the discovery areas, more than 10 different initiatives were identified to address city-specific needs. Care was taken to have the identified initiatives implemented by a range of stakeholders to maximize reach and replicability of the strategy.

Flexible — Surat resilient strategy contains research, awareness, and enforcement level opportunities which can be modified according to future needs.

Resourceful — Projects related to engineering and infrastructure development are already supported by the city. Resilience initiatives and opportunities are therefore aligned to state- or national-level programs.

Inclusive — The strategy reflects multistakeholder engagement in the initiative description as initiative owners and supporters. Every initiative identified within this strategy has a supporting brief which indicates the scale of stakeholder involvement needed. This includes a range of actors from academia, business/private sector, government, and civil society

Integration & Alignment — Resilient initiatives are well aligned to the different levels of administrative policies applicable in Surat. The initiatives are also linked to plans, programs, and projects—for instance, Smart City, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), etc.— supported by national and state governments.

CHAPTER

3

RESILIENCE PILLARS, GOALS, AND INITIATIVES

3.1 Resilience Pillars, Goals, and Initiatives

The Surat resilience strategy has been developed around seven strategic pillars, 20 goals, and 63 initiatives/actions. This section includes the initiatives that Surat will further develop and implement between 2016 and 2025. Each pillar is defined by a number of goals and associated initiatives. Figure 3.1 shows the resilience pillars and their orientation; Figure 3.2 shows the resilience pillars, goals, and initiatives in Surat's strategy.

Figure 3.1: Surat Resilience Pillars and Orientation

|	Research	Awareness	Enforcement	Implementation
	Improve Mobility and Connectivity through Research	Raise awareness on road safety by education and training	Promote law enforcement for better traffic management	Ensure Safer Road Infrastructure
	Spatial assessment of demand and supply of affordable housing	Awareness to Improve Outlook and Maintenance of Affordable Housing		Engineering & Technology Interventions for Providing Affordable Housing
	Qualitative & Quantitative & Research Monitoring for City Water Resources	Awareness generation and water education to citizens	Pollution Control Guidelines at Various Levels of Community & Industrial for Water Quality Standards	Innovative Engineering & Technology Intervention for Water Supply & Quality
	Diversified Business Sector and Opportunities	Skill Development through Training & Capacity Building		
	Research on Urban Climate Change Resilience	Citizen Awareness about the Urban Ecosystem	Regulation & Enforcement of Environmental Laws	Innovative Urbanism Tactics for Balanced Ecosystem
	Research on Local & Regional Social Cohesion	Social Cohesion through Awareness Generation		
	Research on Healthier Citizens in Healthier Cities			

Figure 3.2: Surat Resilience Pillars, Goals, and Initiatives

3.2 Strategy Linkages : Pillar Initiative Linkages

The Surat resilience strategy identifies seven pillars (discovery areas), 20 goals, and 63 initiatives—the lattermost will create a resilient impact on all the pillars, thus increasing their resilient value.

Eleven initiatives were identified around **Connectivity and Mobility**. These initiatives were more targeted towards shared mobility, public transport, nonmotorized transport (NMT) solutions for traffic hotspots, traffic awareness and education. During expert group discussions, these initiatives were prioritized by committee members and subject experts. Later, these initiatives were investigated with other pillars to check the interdependencies between resilience issues, using various impact scenarios. The results indicate that connectivity and mobility centric initiatives have higher levels of interdependencies with other initiatives in the areas of Environment and Ecosystem, Public Health, and Social Cohesion. As public transport forms the backbone of any efficient urban mobility system, adequate public transportation will contribute to the other ongoing environment friendly and safety initiatives. Currently the city administration is increasing the number of public buses and also planning to develop new and alternate modes including BRTS and Metro Rail system.

Seven initiatives were identified around **Affordable Housing**. These were focused on housing demand and supply assessment, availability of financial aids for affordable housing, identification of affordable localities in the city and neighborhoods, and green infrastructure. The results indicate that the initiatives of affordable housing have higher levels of interdependencies with other initiatives in the areas of Employment and Economic Dependency and Social Cohesion. In the case of affordable housing in Surat, key industrial nodes can serve as workplace hubs, where similar income groups can live together in a cohesive social environment.

Thirteen initiatives were identified to address **Water Availability and Quality**. These were focused towards innovative infrastructure for better management of water supply, aiming for zero water waste, and conservation of rainwater and groundwater resources. The identified initiatives of the water sector have higher levels of interdependency with initiatives in the area of Ecosystem and Environment and Employment and Economic Dependency pillars. The textile industry also contributes much to the city's economy and employment. Solutions to these key environmental issues, therefore, will ensure that the city and its economy grow in an environmentally sustainable manner.

Five initiatives were identified under **Employment and Economic Dependency**. These are targeted towards developing alternative employment opportunities in new and emerging sectors such as information technology, shipping and technical skill development programs in addition to financial aid to encourage entrepreneurship. The majority of textile industries rely heavily on local roads and regional transport networks (rail and road) to procure raw materials and to export processed products.

Fourteen initiatives were identified around **Environment and Ecosystem**. These initiatives are more focused on environmental regulations and policies, new infrastructure interventions for natural resource conservation, energy efficiency, and community-level awareness for environmental conservation. These initiatives will have positive impacts on Water Availability and Quality, Economy, Public Health, and Affordable Housing. Discussions with expert committee members highlighted the fact that the initiatives this pillar have a higher level of interdependencies with initiatives of Water Availability and Quality, Public Health, and Employment and Economic Dependency. Therefore, the indicators of water and health require continuous monitoring in the city due to the geo-climatic location and due to historical flood and plague events.

Ten initiatives were identified around **Social Cohesion**. These are inclined towards encouraging public participation at the community level and cooperation with the government by developing community-level activities. Such programs and community spaces will help create a better, livable environment and encourage cultural conservation which will, in turn, enhance the local identity of the city. The results indicate that the initiatives of Environment and Ecosystem have higher levels of interdependency with the pillars of Connectivity and Mobility, Environment and Ecosystem, and Public Health.

Three initiatives were identified under **Public Health**. These are focused towards skill development, which will increase the availability of general health care facilities and make it affordable. The initiatives under this pillar are also inclined towards urban climate–health challenges to create a healthy, livable urban ecosystem in Surat. The city needs more affordable and general health care, especially during disaster-like situations.

U-Turn Event

U-Turn is an initiative of Surat City Police supported by Surat Municipal Corporation to bring out joy & creativity in our lives at a community level. Here, at U-Turn people gather, do exercise, create street paintings, play games and much more. It gives a platform for the urban communities to participate, communicate, and spread awareness about various social, environmental and cultural issues.

U-turn Event, Surat
Photograph Credit: Tejas Ghariwala, Surat

PILLAR 01

CONNECTIVITY & MOBILITY SERVICES AND REGULATION

Emerging Issues:

- Rapid growth of private vehicles
- Inadequate parking facilities
- Lack of traffic segregation
- Lack of pedestrian facilities
- Inefficient and poorly maintained public transport

Platform Partner

WRI INDIA — ROSS CENTER

World Resources Institute

We share these challenges with

San Francisco | New York | New Orleans | Mexico City | Vejle | Da Nang | Semarang

Resilience Incubator

CEPT UNIVERSITY

Faculty of Technology, Centre for Environmental Planning and Technology (CEPT) University, Ahmedabad

Civil Engineering Department, Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat

For supporting reference documents, please click or scan.

BACKGROUND

Surat is one of the fastest growing cities in India. In the last few years, with changing lifestyles, the number of vehicles has grown tremendously in the city. As per recent reports, the number of registered vehicles in the city is more than 2.6 million, and this includes all categories of vehicles (TOI, 2016). A drastic shift is evident: people are moving from nonmotorized to motorized transport and from two-wheelers to four-wheelers. Comprising more than 70 percent of the total number, two-wheelers take the maximum share, while cars constitute more than 9 percent of the vehicles. In 2015, the city had 2.18 million vehicles plying on the roads, of which 1.7 million were two-wheelers and 0.26 million cars. This means that for every two residents in the city, there is one vehicle (TOI, 2016).

Coupled with high growth of private vehicles, an inefficient public transport system, inadequate parking facilities, and lack of pedestrian facilities, encroachments on footpaths and road margins, informal activities, and small-time business activities along the major corridors have increased traffic congestion in the city.

Absence of public transport for over a decade has led to para-transits, especially auto-rickshaws, emerging as a major public transport provider, as well as an increase in individual modes of transport. Para-transits, apart from being illegal, add to problems such as unorganized operations, overloading, poor services, pollution, overcharging, and restricted service hours.

Even though there is an increase in the number of private vehicles in the city, there is not much improvement in traffic behavior. A lack of traffic sense and awareness leads to issues of traffic management. The people of Surat have a bad reputation for being rash and careless drivers. An increase in the number of nonlicensed drivers has also been observed in the city.

To build resilience, the city needs to implement an efficient traffic management system and move towards ensuring an adequate public transport system. Several research studies are necessary to identify the scale of interventions required. These include increasing public parking and pedestrian facilities, improving junctions and rail crossings, and provisioning traffic signals and lane separators to segregate traffic. An effective enforcement mechanism by the traffic police is also necessary to enforce smooth traffic flow in the city.

Traffic congestion in Surat
Photograph Credit: TARU, India

RESILIENCE CHALLENGES

Public Transport: Public transport is one of the concerns highlighted by a majority of the stakeholders. There is less public transport than what is needed, the service frequency is low, and it covers limited areas only. Further, a majority of the population find it difficult to use it due to limited signage and poor comfort levels.

Illegal Parking: Surat has commercial areas and markets situated in the center of the city. Access to these places is through narrow lanes, and there are no authorized parking facilities. Even major roads with high attraction points lack parking facilities. This leads to people parking their vehicles under bridges, footpaths, and on the sides of main roads, leading to reduced space for vehicular traffic and increased traffic congestions.

Footpath Encroachment: Encroached pedestrian lanes on both sides of the roads decrease free movement of pedestrians and compromises on safety. Lanes and footpaths are usually occupied illegally by vendors or vehicles parked along the roadside. Currently, only limited residential and commercial areas have clearly demarcated pedestrian lanes or footpaths. Footpaths in some of the newly developed areas, like Gaurav Path (in Piplod) and University Road (in Vesu), are occupied by mobile food joints, which attract citizens for recreational activities.

High Number of Rickshaws & Private Vehicles: Lack of public transport has led to increased numbers of private transport providers and private vehicles.

Airport Connectivity: The city has one domestic airport. The current frequency of flights is limited and caters to only two destinations—Delhi and Mumbai. Such limited connectivity has an adverse impact on trade and mobility.

Industrial Logistics: Industrial units located within the city operate in a congested environment. Lack of proper roads and reduced carriage width due to roadside parking contribute to existing traffic problems. There is a need to develop a detailed logistics plan for these industries.

GOAL 1.1

IMPROVE MOBILITY AND CONNECTIVITY THROUGH RESEARCH

Orientation

Research

Shocks and Stresses

- Migration influx
- Insufficient transport network
- Less regulation and enforcement

Spatial assessment of accessibility to public transport

OBJECTIVE To assess and map public transport accessibility in Surat

BRIEF

Accessibility to public transport is the key challenge within the city. The city needs to assess accessibility to its public transport facilities and highlight the areas which need improvement. To achieve this, a detailed Public Transport Accessibility Levels (PTAL)—which takes into consideration average walking speed and time, distances to public transport stops, and peak-hour route frequencies of different modes of public transport—is needed. Geographic Information System (GIS) based mapping tools can be used to generate a visual representation for strategic future transport planning.

OWNERS

- Traffic Cell, Surat Municipal Corporation
- BRTS Cell, Surat Municipal Corporation

SUPPORTERS

- Civil Engineering Department, Sardar Vallabhbhai National Institute of Technology
- Faculty of Technology, Centre for Environmental Planning and Technology University
- Traffic Department, Surat City Police
- Surat Climate Change Trust
- 100 Resilient Cities Program

ALIGNMENT

- Gujarat State Road Policy – 2015 (Special emphasis is given to Road Safety Research in Policy Statement X)
- Development Plan (DP), 2035
- Surat Smart City Program
- Bus Rapid Transit System Project
- Surat Metro Rail Project

TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	Da Nang, Mexico City, New York
STRATEGY LINKAGES	5.3.1

Spatial and statistical analysis of road accidents

OBJECTIVE To access and map major road accident hotspots in Surat

BRIEF

The city will conduct a detailed road accident study, which will be aimed at identifying existing hotspots for accidents. It will also highlight areas where road safety issues are persistent issues. The research study will use images from more than 600 surveillance cameras installed by city police and will use GIS based spatial analysis tools to assess vehicle movements, traffic patterns, road safety issues, and resulting accidents. The study will be highly useful for Suraksha Setu (Safe City Project) of Surat. This research will help the Surat City Police department in identifying hotspots and also address the problem at its roots by linking it with their ongoing awareness initiatives.

OWNERS

- Traffic Cell, Surat Municipal Corporation
- Traffic Department, Surat City Police

SUPPORTERS

- Civil Engineering Department, Sardar Vallabhbhai National Institute of Technology
- College of Architecture, Sarvajanik College of Engineering & Technology
- Surat Climate Change Trust
- Surat Traffic Education Trust

ALIGNMENT

- Gujarat State Road Policy – 2015 (Special emphasis is given to Road Safety Research in Policy Statement X)
- Surat Smart City Program
- Suraksha Setu (Safe City Project) of Surat Traffic Police

TIMELINE	Short Term (2017-2018)	■□□□□
STATUS	Ongoing	
CITY LINKAGES	Mexico City, New York	
STRATEGY LINKAGES	-	

Road safety audit

OBJECTIVE To carry out road audit to find engineering and design issues for better traffic management and safety of citizens in Surat City

BRIEF

The city will conduct detailed road safety audits at critical junctions for on-site assessment of the shortcomings in road and traffic control systems that lead to unsafe travel. Based on this assessment, suitable measures will be suggested to facilitate safe, smooth, comfortable, and efficient movement of traffic. The safety audit will include development of survey tools that can be used for monitoring the transportation system for its current performance and future improvement.

OWNERS

- Traffic Cell, Surat Municipal Corporation
- Traffic Department, Surat City Police

SUPPORTERS

- Civil Engineering Department, Sardar Vallabhbhai National Institute of Technology
- College of Architecture, Sarvajanik College of Engineering & Technology
- Surat Climate Change Trust
- Surat Traffic Education Trust

ALIGNMENT

- Gujarat State Road Policy – 2015 (Special emphasis is given to Road Safety Research in Policy Statement X)
- Smart City Surat Program
- Suraksha Setu (Safe City Project) of Surat Traffic Police

TIMELINE	Short Term (2017-2018)	■□□□□
STATUS	Ongoing	
CITY LINKAGES	New York	
STRATEGY LINKAGES	-	

GOAL 1.2

RAISE AWARENESS ON ROAD SAFETY BY EDUCATION AND TRAINING

Orientation

Awareness

Shocks and Stresses

- Migration influx
- Insufficient transport network
- Less regulation and enforcement

Traffic awareness

| OBJECTIVE | To raise awareness about road safety, traffic rules and regulation and use of public/shared transport. |

BRIEF

A detailed annual plan for awareness generation will be prepared for 2017. This will include activities such as street plays (U-Turn events), public meetings at various schools, colleges, and public spaces. Awareness will also be generated through print and electronic media. Citizens will be trained when applying for new, or renewing existing, licenses. A mobile-based application will be developed for Surat City Transport, which will be linked to train timings, regional bus timings, and office/school timings, besides offering real-time public transport information. This mobile application will benefit commuters in the city.

OWNERS
- Traffic Cell, Surat Municipal Corporation
- Traffic Department, Surat City Police
- Regional Transport Officer

SUPPORTERS
- Surat Traffic Education Trust
- Sarvajanik College of Performing Arts

ALIGNMENT
- Gujarat State Road Policy – 2015 (Special emphasis is given to awareness in Policy Statement II)
- Suraksha Setu (Safe City Project) of Surat Traffic Police
- Traffic Week Program of Surat Traffic Police

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	Melbourne, New York, Vejle, Bangkok
STRATEGY LINKAGES	-

Traffic management education

OBJECTIVE
To educate a new generation of vehicle drivers (including students in schools and colleges) and other users with compulsory courses on traffic management.

BRIEF

Compulsory and voluntary courses on traffic management will be introduced. Taking note of the rise in road accidents, a sizable number of which involve youngsters, introduction of traffic management courses within school curriculum, with support from Central and State Education Boards, will increase the number of volunteers to support the initiative. It will create a cadre of volunteers who can be called for on a 'need-to' basis during mock drills or in times of crisis.

OWNERS

- Traffic Cell, Surat Municipal Corporation
- Traffic Department, Surat City Police
- District Education Office

SUPPORTERS

- Regional Transport Office
- Surat Traffic Education Trust
- All Schools and Colleges within Surat city limit

ALIGNMENT

- Gujarat State Road Policy – 2015 (Special emphasis is given to awareness in Policy Statement II)
- Suraksha Setu (Safe City Project) of Surat Traffic Police

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Bangkok
STRATEGY LINKAGES	1.3.1

Sustainable and shared mobility

OBJECTIVE
To establish mechanisms to increase sustainable and shared mobility.

BRIEF

A smart, simple, secure, sustainable, and shared mobility plan will be developed along with the mechanisms for implementation. It will be introduced to citizens on a pilot basis across selected institutional areas. This initiative will be linked with existing or upcoming projects such as BRTS and Metro Rail project. Also, an integrated transit plan for the city comprising all mechanisms, including vehicle sharing mechanisms, para-transit systems, intermediate public transport, BRTS, metro, city bus, state bus, and other modes connecting the regions will be developed.

OWNERS

- Traffic Cell, Surat Municipal Corporation
- Traffic Department, Surat City Police

SUPPORTERS

- Surat Traffic Education Trust
- Surat Climate Change Trust
- Surat Citizen Council Trust
- Civil Engineering Department, Sarvajanik College of Engineering and Technology
- Civil Engineering Department, Sardar Vallabhbhai National Institute of Technology

ALIGNMENT

- Gujarat State Road Policy – 2015 (Special emphasis is given to Road Safety Research in Policy Statement VIII)
- Suraksha Setu (Safe City Project), Surat Traffic Police

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Mexico City, New York, San Francisco, Semarang
STRATEGY LINKAGES	5.3.1

GOAL 1.3

PROMOTE LAW ENFORCEMENT FOR BETTER TRAFFIC MANAGEMENT

Orientation

Enforcement

Shocks and Stresses

- Migration influx
- Insufficient transport network
- Less regulation and enforcement

Enforcement of traffic rules and regulations

OBJECTIVE	To promote strict enforcement of traffic rules and regulations by using advanced technology and penalizing violators with the support of Surat City Police.

BRIEF

Traffic rules will be enforced and implemented with the support of Surat City Police and Regional Transport Office. This initiative will be linked with existing/ongoing projects such as Suraksha Setu (CCTV monitoring and digital challan), which is a community policing initiative launched by the Government of Gujarat for strengthening police-public partnership. In addition, the city will promote traffic helplines on which road users can register their grievances, which would then be addressed in a time-bound manner. Traffic violators, especially non-licensed drivers, will also be controlled.

OWNERS

- Traffic Department, Surat City Police
- Regional Transport Office

SUPPORTERS

- Traffic Cell, Surat Municipal Corporation
- Surat Traffic Education Trust

ALIGNMENT

- Gujarat State Road Policy – 2015 (Special emphasis is given to enforcement in Policy Statement VIII)
- Existing/ongoing Programs of RTO Surat/City Police, Surat
- Suraksha Setu (Safe City Project), Surat Traffic Police

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	-
STRATEGY LINKAGES	1.2.2, 1.3.2

Driving license norms

OBJECTIVE | To promote and implement strict norms for issuing new, or renewing existing, driving licenses.

BRIEF

Strict norms for issuing new, or renewing existing, driving licenses will be established by studying the existing driving practices of citizens and using innovative technology with support from the Regional Transport Office (RTO). Central government initiatives taken by the Ministry of Road Transportation and Highways will also be supported. A mobile application will be developed for the city, which will assist the RTO, Surat, and can be an inspiration for other cities in Gujarat.

OWNERS

- Regional Transport Office

SUPPORTERS

- Ministry of Road Transportation and Highway
- Traffic Department, Surat City Police
- Surat Traffic Education Trust
- Traffic Cell, Surat Municipal Corporation

ALIGNMENT

- Sarthi and Vahan Applications of Ministry of Road Transportation and Highway
- Gujarat State Road Policy – 2015 (Special emphasis is given to enforcement in Policy Statement VIII)
- Existing/ongoing Programs of RTO Surat/City Police, Surat

TIMELINE	MediumTerm (2017-2020)
STATUS	Ongoing
CITY LINKAGES	-
STRATEGY LINKAGES	1.2.3, 1.3.1

Traffic congestion in Surat
Photograph Credit: TARU, India

GOAL 1.4
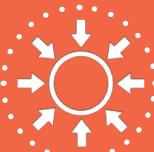
ENSURE SAFER ROAD INFRASTRUCTURE

Orientation

Implementation

Shocks and Stresses

- Migration influx
- Insufficient transport network
- Less regulation and enforcement

Non-motorized transport strategy

OBJECTIVE — To develop a nonmotorized transport (NMT) strategy for Surat.

BRIEF

An NMT strategy will be developed with the objective of preserving NMT modal shares, improving NMT infrastructure, and with zero tolerance for pedestrian injuries and fatalities. The existing comprehensive mobility plan will also be revised. The NMT strategy will also cover better signage and signal systems, especially for pedestrians.

OWNERS

- Traffic Cell, Surat Municipal Corporation

SUPPORTERS

- Town Planning Department, Surat Municipal Corporation
- Town Development Department, Surat Municipal Corporation
- Surat Smart City Development Limited
- Surat Urban Development Authority
- Surat Climate Change Trust

ALIGNMENT

- Gujarat State Road Policy – 2015 (Special emphasis is given to safer road infrastructure in Policy Statement IV)
- Surat Smart City project

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Mexico City, New York
STRATEGY LINKAGES	3.4.7, 1.4.2

Better roads, better cities

OBJECTIVE — To develop and enhance street furniture, signage and landscape with more visual attractions.

BRIEF

Work will be carried on in Surat based on the idea that "better roads connect communities better." The city will identify pilot road sections where street furniture, signage, and landscaping can be enhanced. This initiative can be linked with the Surat Smart City Project. The city will also develop a handbook of road landscaping options to encourage citizen participation. The city will join hands with state- and national-level institutions to develop guidelines which can be adapted for other cities in the region.

OWNERS
- Traffic Cell, Surat Municipal Corporation

SUPPORTERS
- Surat Smart City Development Limited
- Surat Climate Change Trust
- Roads and Buildings Department, Govt. of Gujarat

ALIGNMENT
- Gujarat State Road Policy – 2015 (Special emphasis is given to safer road infrastructure in Policy Statement IV)
- Surat Smart City project

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Mexico City, New Orleans
STRATEGY LINKAGES	3.4.7, 1.4.1

Urban mobility infrastructure for physically-challenged citizens

OBJECTIVE — To develop urban mobility infrastructure accessible to physically challenged citizens

BRIEF

The city will conduct accessibility audits at various locations, such as major cross roads/junctions, bus stops, railway station, airport and taxis/auto-rickshaw stands. This proposed campaign can be linked to Accessible India Campaign (Sugamya Bharat Abhiyan) funded by the Department of Empowerment of Persons with Disabilities, Ministry of Social Justice and Empowerment, Government of India. Based on the findings from the audits, sensitization on these issues can be conducted through specially designed zonal awareness workshops. As a follow-up step, PwDs (Persons with Disability) friendly Urban Mobility Infrastructure can be developed at selected locations within the city.

OWNERS
- Traffic Cell, Surat Municipal Corporation
- BRTS Cell, Surat Municipal Corporation

SUPPORTERS
- Gujarat State Road Transport Corporation
- Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat
- Indian Railway
- Surat Smart City Development Limited
- Surat Urban Development Authority
- Surat Climate Change Trust

ALIGNMENT
- Accessible India Campaign (Sugamya Bharat Abhiyan), Government of India
- Gujarat State Road Policy – 2015 (Special emphasis is given to safety of vulnerable road users in Policy Statement VII)
- Surat Municipal Corporation is also developing policy for disabled people to conveniently access public transport.

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Semarang
STRATEGY LINKAGES	1.4.1

Housing for economically weaker section, Surat
Photograph Credit: TARU, India

PILLAR 02

AFFORDABLE HOUSING

Emerging Issues:

- Unprecedented population growth
- Rise in migration
- Increase in number of slums
- Lack of affordable housing for urban poor
- Unregulated and speculative land and real estate market
- Less availability of land within the corporation area for affordable housing

Platform Partner

Pricewaterhouse Coopers

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Oakland |San Francisco | New York | New Orleans | Mexico City | Norfolk | Rio de Janeiro | Rotterdam | Melbourne

Resilience Incubator

Architecture College, Veer Narmad South Gujarat University , Surat

Faculty of Architecture, Sarvajanik College of Engineering & Technology (SCET), Surat

For supporting reference documents, please click or scan.

BACKGROUND

The city of Surat has rapidly grown since the 1960s in terms of population as well as industry, thus placing a concomitant pressure on resources. The city has also expanded over time (major expansion happened in 2006); it currently covers an area of around 326 sq. km. The population of the city in 2011 was 4,466,826 (Census of India). The actual population may exceed these figures, especially because of rapid development in the Surat metropolitan region.

The decadal growth of the city's population was at its maximum from 1931 to 1941. For two decades following this period, the city showed a decrease in the decadal growth. From 1961, a positive trend continued till 1991 before declining again from 1991 to 2001. Surat has seen an unprecedented growth in the last four decades, recording one of the highest growth rates in the country and a 10-fold population rise. The city now ranks as the eighth largest city in the country. Coupled with this, a spillover of population into the periphery has also been observed.

Similar to other urban cities in India, Surat has its own share of slums. The slums have mostly migrant populations who are unable to afford formal housing. As per the 2001 Census, about 307 slums, with a population of 0.49 million, existed in Surat. The number of slums has since gone up to 773 (Census of India, 2011) with the expansion in the city's limit in 2006. Many of these slums are located along the tidal creeks, between river embankments and other drainage lines. These slums face a higher risk of flooding (pluvial, fluvial, and tidal). Having recognized this, efforts to relocate the slums were initiated by the government under various schemes—mainly during the last decade under various national projects including the Jawarharlal Nehru National Urban Renewal Mission (JNNURM), and Gujarat Rural Urban Housing (GRUH)—more than 30,000 permanent houses were provided at safer locations to slum dwellers. In 2001, according to Census figures, 20 percent of Surat's population lived in slums. Census 2011 showed a reduction of 10 percent due to continuous improvement efforts by government schemes. Slum dwellers and citizens falling in the economically weaker sections (EWS) of society are eligible to avail ready-built houses on plots of land away from the existing slums, in a hygienic environment.

With an increase in the city limit and development of new zones, a boom has been observed in the real estate market. This has increased the land values in some areas, making it unaffordable for all classes. This has caused a gap between demand and supply, leaving about 90 percent of houses in the newly developed areas unoccupied.

Built House Approach: The SMC has implemented several housing projects under the government's housing schemes for urban poor. Also, slum dwellers living at the intersection of roads and other inappropriate locations have been shifted to the houses built under the housing schemes. The built house approach for the rehabilitation of slum dwellers and urban poor is carried out under the following five categories:

- *EWS Housing*
- *VAMBAY Hosuing*
- *LIG Housing*
- *Mukhya Mantri Gruh Yojana*
- *Pradhan Mantri Avas Yojna*

RESILIENCE CHALLENGES

Less Rental Housing: Rental housing can be a logical solution for meeting affordable housing needs of a city that has a large migrant population. Rental housing should be promoted as a temporary solution for housing, since vacant housing is not affordable.

Lack of Involvement of Private Sector for Affordable Housing: There are no formal policies to involve the private sector for affordable housing. As an ULB, the SMC has the freedom to adopt a model in which the city can benefit from its strong private sector, especially for affordable housing.

Affordable Criteria for EWS, and for LIG, MIG, and HIG (Low-, Middle-, and High-Income Groups: Affordable housing can be delivered by taking into consideration criteria such as cost-effective materials, optimum use of carpet area, and affordable land availability for the housing schemes. Affordable housing can be achieved by providing certain subsidies or tax deduction on material or land.

Disparity in Demand and Current SUDA plan: As a part of discovery area diagnosis, the SUDA's plan needs to be reviewed to see how it provides for the affordable housing sector. Surat has growth in population and the area of the city has also grown simultaneously. The study can show projections for demand keeping in view criteria such as population growth, city expansion, affordability, and economic growth as well.

Spatial Distribution: Spatial distribution of LIG/MIG/HIG needs to be ensured, based on the affordability of the amenities/utilities. For example, the Vesu area has a certain lifestyle and cost of living which is suitable for HIG housing. Planning LIG or MIG in this area will not serve the idea of affordability, resulting in vacant housing and unserved need of housing facilities. Housing for all requires the right distribution, based on affordability of a locality for consumers in terms of day-to-day utilities.

GOAL 2.1
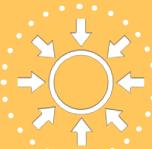
SPATIAL ASSESSMENT OF DEMAND AND SUPPLY OF AFFORDABLE HOUSING

Orientation

Research

Shocks and Stresses

- Migration influx
- Lack of affordable housing
- Lack of social security

Housing demand assessment

OBJECTIVE To assess and map spatial demand of affordable housing—for EWS, LIG, MIG, and HIG—and compare with housing schemes proposed in the Development Plan–2035.

BRIEF

The city will conduct a GIS-based survey across different socioeconomic classes (SECs) to map spatial distribution, and demand for affordable dwelling units. The city will also develop innovative tools for the survey. While working on this initiative, the city will identify options for its integration within the existing Development Plan–2035.

OWNERS

- Slum Upgradation Cell, Surat Municipal Corporation
- Town Development Department, Surat Municipal Corporation
- Town Planning Department, Surat Municipal Corporation
- Surat Urban Development Authority

SUPPORTERS

- Shri Gijubhai Chhaganbhai Patel Institute of Architecture-Interior Design and Fine Arts of Veer Narmad South Gujarat University
- College of Architecture, Sarvajanik College of Engineering & Technology
- The Southern Gujarat Chamber of Commerce & Industry

ALIGNMENT

- Housing for All Scheme, Govt. of India
- Development Plan, 2035
- Mukhya Mantri Gruh Yojana
- Pradhan Mantri Avas Yojana
- Affordable housing policy Gujarat
- Gujarat Town Planning and Urban Development Act, 1976

TIMELINE	Short Term (2017-2018)
STATUS	Ongoing
CITY LINKAGES	New York, New Orleans
STRATEGY LINKAGES	2.1.2

Affordable locality audit

OBJECTIVE

To identify affordable localities in Surat where amenities and public utilities/services, such as public transport, affordable health care, affordable education, food, etc., are available at low costs.

BRIEF

Overall living cost of a location is very important for lower income group and middle-income group households. Along with an affordable housing unit, it is very important to know/understand the other parameters of affordability, such as affordable transport, fuel/gas, health care, education, livelihood options. The city will conduct affordable locality audits under this initiative. The suitability criteria will be based on the accessibility of infrastructure and amenities within the location, that is, LIG and MIG closer to the public transport network, fair price shops, and further low-cost lifestyle amenities.

OWNERS

- Slum Upgradation Cell, Surat Municipal Corporation
- Town Development Department, Surat Municipal Corporation
- Town Planning Department, Surat Municipal Corporation

SUPPORTERS

- Surat Urban Development Authority
- Shri Gijubhai Chhaganbhai Patel Institute of Architecture-Interior Design and Fine Arts, Veer Narmad South Gujarat University
- Surat Climate Change Trust

ALIGNMENT

- Pradhan Mantri Avas Yojana - Housing for All (Urban), Govt. of India
- Mukhya Mantri Gruh Yojana, Govt. of Gujarat
- Development Plan – 2035
- Affordable Housing Policy of Gujarat
- Gujarat Town Planning and Urban Development Act, 1976

TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	Oakland, San Francisco
STRATEGY LINKAGES	1.1.1

Housing for economically weaker section- Surat
Photograph Credit: TARU, India

GOAL 2.2
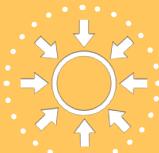
AWARENESS TO IMPROVE OUTLOOK AND MAINTENANCE OF AFFORDABLE HOUSING

Orientation

Awareness

Shocks and Stresses

- Migration
- Lack of affordable housing
- Lack of social security
- Less regulation
- Civil unrest

Initiative 2.2.1

Right to housing

OBJECTIVE	To build resilience by raising awareness amongst citizens through cultural activities.

BRIEF

The city has seen an unprecedented growth in the last four decades. Surat now ranks as the eighth largest city in India. With the support of Confederation of Real Estate Developers' Associations of India, other business and builder associations the city administration will start a large-scale awareness-raising program for all SECs (especially in LIG and MIG) on issues of the right to housing. The city will also take the support of the Center for Social Science and Sarvajanik College of Performing Arts for streamlining these awareness activities.

OWNERS

- Slum Upgradation Cell, Surat Municipal Corporation
- Town Development Department, Surat Municipal Corporation

SUPPORTERS

- Confederation of Real Estate Developers' Associations of India
- The Southern Gujarat Chamber of Commerce and Industries
- Surat Diamond Association
- South Gujarat Textile Processors Association
- Centre for Social Studies
- Sarvajanik College of Performing Arts

ALIGNMENT

- Development Plan, 2035
- Mukhya Mantri Gruh Yojana
- Pradhan Mantri Awas Yojana
- Affordable Housing Policy Gujarat
- Gujarat Town Planning and Urban Development Act,1976

TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	New York, Norfolk, Melbourne
STRATEGY LINKAGES	2.2.2

Affordable housing finance schemes

OBJECTIVE To promote innovative housing insurance schemes, soft loans, and subsidies for low and middle income groups of citizens in the city.

BRIEF

This initiative will create awareness among LIG and MIG residents about housing insurance and other security options. This will help raise awareness amongst them about housing insurance and other security options for their welfare. The city will also promote and raise awareness about government subsidies and soft loans, which will promote house ownership amongst the EWS, LIG, and MIG groups. These soft loans can be provided without much collaterals, with options for subsidized interest rates. They can also partner with the National Housing for All Schemes offered by the Government of India.

OWNERS

- Slum Upgradation Cell, Surat Municipal Corporation
- Town Development Department, Surat Municipal Corporation
- Gujarat Housing Board

SUPPORTERS

- Housing and Urban Development Corporation (HUDCO)
- National Housing Bank
- Confederation of Real Estate Developers' Associations of India (CREDAI), Surat Chapter

ALIGNMENT

- Insurance Regulatory and Development Authority(IRDA) Act 2000
- Gujarat Affordable Housing Policy (PPP) 2014
- Foreign Direct Invest (FDI) 2015
- Real Estate Regulatory Act (RERA) May-2017

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	New York, Norfolk, Melbourne, Oakland
STRATEGY LINKAGES	2.2.1

Development of online rental housing system

OBJECTIVE To support and assist migrant influx in the city by developing rent-ready programs connecting landlords and renters.

BRIEF

UNSECO reports inform that Surat has one of the highest migrant populations in India. Diamond and textile workers migrate to Surat for better livelihood opportunities. Rental housing schemes at affordable costs will be very useful to these workers. An online system will be designed to provide necessary support to migrants by developing rent-ready programs connecting landlords and renters. A portal for registration will also be developed with short- and long-term rental request forms.

OWNERS

- Slum Upgradation Cell, Surat Municipal Corporation
- Town Development Department, Surat Municipal Corporation
- Gujarat Housing Board

SUPPORTERS

- Surat Diamond Association
- Textile Association, Surat
- Confederation of Real Estate Developers' Associations of India (CREDAI), Surat Chapter

ALIGNMENT

- Housing and Urban Development Corporation Schemes Rent to Own
- Slum Upgradation: Mukya Mantri Gruh Yojana: online registration
- Gujarat Rent Control Act

| TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Norfolk, Oakland
STRATEGY LINKAGES	2.2.1
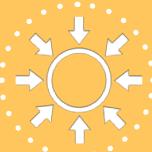
GOAL 2.3

ENGINEERING AND TECHNOLOGY INTERVENTIONS FOR PROVIDING AFFORDABLE HOUSING

Orientation

Implementation

Shocks and Stresses

- Lack of affordable housing
- Lack of social security
- Less regulation
- Economic crises
- Migration influx

Affordable building techniques

OBJECTIVE	To use innovative building techniques (by design and engineering intervention) to construct affordable houses in the city.

BRIEF

The city will promote innovative building techniques (by design and engineering intervention) to cut down average cost per unit area for LIG/MIG/HIG, without compromising the usable area and quality of services as indicated within the government schemes. The city will secure land to construct sample houses using these techniques within ongoing schemes. Innovative landscaping and building designs can lead to increased carpet area and a better, livable environment.

OWNERS

- Slum Upgradation Cell, Surat Municipal Corporation
- Town Development Department, Surat Municipal Corporation
- Gujarat Housing Board

SUPPORTERS

- Surat Urban Development Authority
- Slum Upgradation Cell, Surat Municipal Corporation
- Town Development Department, Surat Municipal Corporation
- Confederation of Real Estate Developers' Associations of India (CREDAI), Surat Chapter

ALIGNMENT

- Housing for All Schemes (Govt. of India)
- Gujarat Town Planning and Urban Development Act 1976,
- Affordable Housing Policy under the Mukhya Mantri GRUH (Gujarat Rural Urban Housing) Yojana
- Smart City Proposal: Affordable housing & inclusiveness: Developing affordable housing for EWS and LIG under PMAY and PPP

TIMELINE	Long Term (2017-2025)
STATUS	New
CITY LINKAGES	Norfolk
STRATEGY LINKAGES	5.1.2, 5.2.2

Increasing thermal comforts of buildings

OBJECTIVE	To adapt green, blue, white, and black building techniques, leading to low energy consumption and cost.

BRIEF

Innovative building designs such as green, blue, white, and black building techniques will used and promoted. Techniques like cool roofs and passive ventilation, for affordable housing, will help provide thermal comfort to low income residents, especially during summers—an inventory of government buildings will be carried out in the city to demonstrate the efficiency of these techniques. These pilots will give quantitative outputs of thermal comfort techniques and will be useful for replication at the community level.

OWNERS

- Slum Upgradation Cell, Surat Municipal Corporation
- Town Development Department, Surat Municipal Corporation
- Gujarat Housing Board

SUPPORTERS

- Surat Urban Development Authority
- Slum Upgradation Cell, Surat Municipal Corporation
- Town Development Department, Surat Municipal Corporation
- Confederation of Real Estate Developers' Associations of India

ALIGNMENT

- Housing for All Schemes (Govt. of India)
- Gujarat Town Planning Act
- Redevelopment policy, Gujarat
- Indian Green Buildings Council Guidelines- 2001
- Cool Roof Passive Ventilation(CRPV) - ACCCRN

TIMELINE	Long Term (2017-2025)
STATUS	Ongoing
CITY LINKAGES	San Francisco, Mexico City
STRATEGY LINKAGES	5.1.2, 5.2.2

Economically weaker section housing- Surat, Photograph Credit: TARU, India

Tapi river Surat
Photograph Credit: TARU, India

PILLAR 03

WATER AVAILABILITY AND QUALITY

Emerging Issues:

- High dependency on Ukai dam and Tapi river
- No alternative source of water
- River Tapi catchment management
- Coastal environment and salinity issues
- Climate variability and climate change

Platform Partner

Deltares
Enabling Delta Life

VEOLIA

Deltares   Veolia

We share these challenges with

Oakland | Berkley | San Francisco | New York | New Orleans | Mexico City | Rio de Janeiro | Glasgow | Vejle | Rotterdam | Byblos | Da Nang | Semarang | Melbourne | Medellin | Greater Christchurch

Resilience Incubator

Civil Engineering Department, Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat

For supporting reference documents, please click or scan.

BACKGROUND

Water needs of the city residents are currently being managed by the SMC. Tapi, a perennial river, is a major source of water supply. The network of piped water supply was started in 1898. The city has been investing in water supply systems for over a century, on account of which it has a well-managed water supply system now. In 2015, the average water supply was 980 million liters per day (MLD), which included demand from domestic, industrial, commercial, and institutional consumers.

In the recent past, it has been observed that the river water quality is deteriorating. Causes contributing to the pollution of the river water are sometimes beyond the control of the SMC, as they are outside the city boundary. Hence, options for finding alternate sources of water—such as getting water from Kakrapar weir by pipeline—are being worked out. In such an eventuality, both quality and quantity issues will be a big challenge for Surat. Currently, water supply is intermittent, with an average duration of three hours per day. About 95 percent of the complaints related to water supply are being solved by the SMC.

To meet the rising population demands of water over the next two decades, the SMC has envisaged various water supply infrastructure projects. Water supply schemes were supported by the national and state governments between 2010 and 2015. During this period, various water supply projects were sanctioned under the JNNURM scheme for the newly-merged Eastern area of the city. In January 2013, a 90-MLD capacity fully-automatic water treatment plant with Supervisory Control and Data Acquisition (SCADA) was commissioned at Kosad Water Works. In 2014–15, a pilot project of 24x7 water supply scheme for the New North area and New Southeast area were commissioned with a total project cost of Rs. 34.54 crore.

By fast-tracking the implementation of projects, the SMC has achieved 30 percent increase in water supply, from 750 MLD in 2010 to 980 MLD in 2015. The SMC is now poised to achieve the goal of 100 percent coverage of extended area and population by 2016.

Currently, river Tapi is the main source of water supply in Surat. Droughts and late onset of monsoon are already creating stress on Surat's water supply system during peak summers. For meeting the demand of a population pegged at more than 8 million in 2020, at least 1,200 to 1,500 MLD water is required. Apart from domestic use, additional water will be needed for industries in Hazira.

With tremendous increase in the population within city limits, there is likely to be an obvious increase in the water demand. The city has the capacity to store for approximately three months only, in case of any drought or natural calamity, which highlights the need for reuse of water in the city. Lack of water conservation practices may lead to a crisis in the near future in the absence of the present water source, Tapi. Taking the effects of climate changes into account, good water conservation methods need to be planned. The city is reusing a negligible amount of water, about only 8 percent. Salt water intrusion is another big problem for the city due to its proximity to the Arabian Sea. This situation may increase the competition over limited resources currently allocated for irrigation and power generation. Water scarcity will become an issue, unless major changes in allocating Ukai dam water takes place.

RESILIENCE CHALLENGES

Water Quality: Being close to the Arabian Sea, and more than 40 percent of the city lying in low elevation coastal zones, tidal action and subsequent salt water intrusion is one of the key challenges the city faces.

Water Conservation: While the existing water quality is good in Surat due to water availability from Ukai dam, the citizens do not follow proper water conservation and management approaches. River and groundwater pollution needs to be monitored in the city. There is a need for regulations such as incorporation of rainwater harvesting as a part of building bylaws and also for raising awareness among citizens on conservation and limiting wastage of water.

Tertiary Treatment Plan - Surat: Treatment methods vary for different types of wastewater. For example, different sets of microbes will be required for treating different wastes. However, in Surat, this is not done currently. The city is reusing only 8 percent of waste water for industrial purposes.

Demand Assessment: Conflicting demand from various sectors such as resideConflicting demand from various sectors such as residential, industrial, irrigation, natural/ecological cycles require assessment. Domestic water demand is something which will unquestionably increase in the future as the population increases. Town planning and engineering techniques are very important in this sector since they also play a crucial role in groundwater availability and recharge over long term. Keeping soil moisture and water table in mind, design aspects should be adapted in such a way that the water table gets recharged.

Increasing Pollution and River Tapi Depletion: Primarily untreated sewage from upstream settlements along with industrial effluents has led to high water pollution. Industrial pollution does not have major impact on Tapi river but it has impact on various creeks leading to Mindhola river. Surat, also called mini India, celebrates many different festivals which also cause river pollution and increase biological oxygen demand (BOD) levels in the river. Issues of water siltation and untreated effluents are likely to impact the quality of river water. In addition, groundwater pollution has been recorded in many areas of the city. Thus there is a need for environmental management of the river and the results should be shared with the public to initiate collective actions. The city encounters many water-borne diseases which need to be checked.

GOAL 3.1
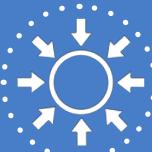
QUALITATIVE AND QUANTITATIVE RESEARCH AND MONITORING FOR CITY WATER RESOURCES

Orientation

Research

Shocks and Stresses

- Salt water intrusion
- Droughts
- Water pollution/ shortage
- Disease outbreak

Groundwater status

OBJECTIVE	To conduct research/aquifer mapping on situation analysis of groundwater level and quality at various locations in the city

BRIEF

The city will initiate situation analysis of groundwater level and its quality at various locations in the city, especially around low elevation coastal zones and industrial areas. The research will provide insights into the quality of groundwater for different land uses, such as residential and industrial areas. Boreholes will be constructed and basic parameters, such as total dissolved solids, turbidity, pH, conductivity, total hardness, calcium hardness, magnesium hardness, total alkalinity, and chemical oxygen levels will be evaluated. This information will show the status of alternative water resources other than from the Tapi river.

OWNERS

- Hydraulic Department, Surat Municipal Corporation

SUPPORTERS

- Narmada Water Resource and Water Supply Department
- Central Ground Water Board
- Centarl Water Commission
- TIFAC-CORE in Environmental Engineering, Surat
- Civil Engineering Department, Sardar Vallabhbhai National Institute of Technology

ALIGNMENT

- Existing and proposed efforts in aquifer mapping by SMC and NWRWS

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	Mexico City
STRATEGY LINKAGES	-

Real-time river health monitoring of Tapi

OBJECTIVE	To monitor real-time water quality covering the hydro-ecological parameters of the Tapi.

BRIEF

The city will monitor real-time water quality of the Tapi (the main source of water supply) by developing a river health monitoring application. The initiative will be aimed to monitor river health by evaluating its hydro-ecological state. The application will use parameters of hydrology, water quality, aquatic life, physical form, habitat, and the riparian vegetation. River health monitoring practices will fall into four main actions
- Routine monitoring;
- Compliance checking;
- Special investigations during monsoon and festive seasons; and
- Management audits.

OWNERS

- Hydraulic Department, Surat Municipal Corporation
- Narmada Water Resource and Water Supply Department

SUPPORTERS

- Gujarat Pollution Control Board
- Surat Climate Change Trust
- Central Water Commission

ALIGNMENT

- End-to-End Early Warning System (EWS) under Asian Cities Climate Change Resilience Network (ACCCRN)
- Water quality monitoring by Hydraulic Department of Surat Municipal Corporation (SMC)
- MINARS Project: Monitoring the water quality from 102 sampling station located on various rivers like Sabarmati, Narmada, Tapi, Ambica, etc
- GEMS Project: Assessment of the quality of water of major rivers of Gujarat Narmada, Tapi, Mahi and Sabarmati etc

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	Medellin, Oakland, Semarang, Byblos, Rotterdam, Rio de Janeiro
STRATEGY LINKAGES	5.1.3

City water supply network audit

OBJECTIVE	To monitor the water supply to detect freshwater theft and wastage within the supply network.

BRIEF

The water supply network status can provide crucial information for a water supply master plan, indicating the areas where repair and restoration is required. The audit will cover technical components of the water supply network affected mainly by the following factors:
- Network design;
- Aging infrastructure;
- Selection of appropriate materials;
- Quality of their manufacturing;
- Quality of installation and construction;
- Service life of the individual components of the network;
- Pressure and flow ratios;
- Quality of water distribution;
- Operational parameters;
- Frequency of maintenance and repair; and
- Availability of funds.

OWNERS

- Hydraulic Department, Surat Municipal Corporation

SUPPORTERS

- Surat Climate Change Trust (SCCT), Surat

ALIGNMENT

- Non-Revenue Water (NRW) cell of Surat Municipal Corporation
- Zone wise leakage mapping (NRW)
- 24 hours water supply pilot project, Surat Municipal Corporation
- Water meter installation drive by Surat Municipal Corporation

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	New York, Da Nang, Semarang, New Orleans, Mexico City
STRATEGY LINKAGES	-

GOAL 3.2
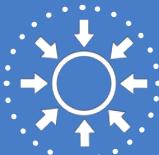
AWARENESS GENERATION AND WATER EDUCATION TO CITIZENS

Orientation

Awareness

Shocks and Stresses

- River flood
- Salt water intrusion
- Drought and water shortage
- Water pollution
- Disease outbreak

Demonstrate environmental responsibility and promote stewardship among citizens

OBJECTIVE	To create awareness among citizens about wastewater treatment techniques; to encourage the use of reusable water resources wherever possible; and motivate them to not only prevent wastage and leakage but also to reuse water for washing and gardening.

BRIEF

The city will increase awareness among its citizens regarding water use. Awareness program will focus on community-level decentralized wastewater treatment techniques and usage guidelines for different types of reusable/treated water. The campaign will focus on developing methods and practices to use recycled water for secondary uses such as building maintenance, cleaning and gardening. Demonstrating the benefits of water conserved in each community (residency) can encourage people to reuse treated water, leading to freshwater conservation.

OWNERS

- Urban Community Development Center, Surat Municipal Corporation
- Hydraulic Cell, Surat Municipal Corporation

SUPPORTERS

- Non-Government Organizations
- Rotary Club, Surat
- Surat Climate Change Trust
- Sarvajanik College of Performing Arts

ALIGNMENT

- Street plays for public awareness through Sarvajanik College of Performing Arts (SCOPA)
- U-turn Event

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Greater Christchurch, Semarang, Norfolk, Da Nang, Medellin, Rotterdam
STRATEGY LINKAGES	5.1.1

Risk awareness center

OBJECTIVE To strengthen community risk management, risk reduction, and knowledge transfer by establishing risk awareness centers in the city.

BRIEF

The city will establish a risk awareness center which will exclusively work on tracking risks and creating awareness at the community level. Surat may face flood risk and industrial hazards. New technologies, such as emergency operation center (EOC) with digital displays and other technical facilities, will be added to the system, and progress will continue to happen with support from the SMC. The risk awareness center can carry forward EWS projects for better flood risk awareness, established under Asian Cities Climate Change Resilience Network Program, under the guidance of the SMC.

OWNERS

- Hydraulic Cell, Surat Municipal Corporation
- Environmental Cell, Surat Municipal Corporation

SUPPORTERS

- Gujarat State Disaster Management Authority
- Surat Climate Change Trust
- Narmada Water Resource and Water Supply Department
- Central Water Commission
- India Meteorological Department

ALIGNMENT

- Early Warning Environmental System, Asian Cities Climate Change Resilience Network
- Water quality monitoring, Surat Municipal Corporation
- City Disaster Management Plan, Surat
- District Disaster Management Plan, Surat
- Gujarat State Disaster Management Act

TIMELINE	Medium Term (2017-2020) ■■■□□
STATUS	Ongoing
CITY LINKAGES	Greater Christchurch, Semarang, Norfolk, Da Nang, Medellin, Rotterdam
STRATEGY LINKAGES	5.1.1

U-turn event, Surat
Photograph Credit: TARU, India

GOAL 3.3
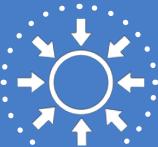
POLLUTION CONTROL GUIDELINES FOR WATER QUALITY STANDARDS AT COMMUNITY AND INDUSTRIAL LEVELS

Orientation

Enforcement

Shocks and Stresses

- Salt water intrusion
- Water pollution/ shortage
- Disease outbreak

Preservation of river and tidal creeks

OBJECTIVE To enforce pollution control guidelines effectively to improve water quality.

BRIEF

Enforcing law and policies associated with water pollution is a major challenge for Surat. The city will declare the banks of the Tapi river and tidal creeks as environmentally sensitive zones, where commercial and residential activities will be periodically monitored. Through periodic monitoring of industrial effluents released into the river, this initiative will focus on reducing river pollution. Treated effluents discharged into the river will also be checked. Surveillance cameras can be installed at key locations and linked to the smart city center. A penalty system will be introduced to discourage polluters which will, at the same time, generate additional revenue for sustaining the initiative.

OWNERS

- Environmental Cell, Surat Municipal Corporation
- Gujarat Pollution Control Board
- Narmada Water Resource and Water Supply Department

SUPPORTERS

- Central Pollution Control Board
- Surat Climate Change Trust

ALIGNMENT

- CPCB Guidelines: The Environment (Protection) Act, 1986
- CPCB Guidelines: The Water (Prevention and Control of Pollution) Cess Act, 1977
- GPCB Guidelines: Water (Prevention and Control of Pollution) Act, 1974
- Environmental Audit Scheme and The Guidelines for Environmental Auditor -2006
- Water supply policy: ISO-9001-2008 Certification for Water Supply

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Byblos, San Francisco, Semarang
STRATEGY LINKAGES	5.1.3

River Tapi, Surat
Photograph Credit: TARU, India
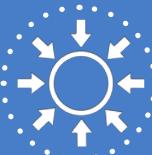
GOAL 3.4

INNOVATIVE ENGINEERING & TECHNOLOGY INTERVENTION FOR WATER SUPPLY AND QUALITY

Orientation

Implementation

Shocks and Stresses

- Salt water intrusion
- Droughts
- Water pollution/ shortage
- Disease outbreak

Advanced smart water supply system

OBJECTIVE To ensure sufficient, timely, continuous water supply and to safeguard against breakdowns.

BRIEF

The city will develop a Smart Water Management Technology with Intelligent Sensing and ICT for the Integrated Water System. Surat city initiated the SCADA system in 2007. Currently, the SMC has increased water supply by 30 percent (from 750 in 2010 to 980 MLD in 2015). There is a plan to expand this system to cover all parts of the city. In parallel, the city administration is also planning to double its area from the existing 326 sq. km. Using an advanced smart water supply system will give it an advantage in not only dealing with the current problems but also in addressing the future scenarios.

OWNERS

- Hydraulic Cell, Surat Municipal Corporation
- Surat Smart City Development Limited

SUPPORTERS

- Surat Smart City Development Limited
- Irrigation Circle, Surat
- Civil Engineering Department, Sardar Vallabhbhai Nation Institute Technology
- Narmada Water Resource and Water Supply Department

ALIGNMENT

- Water Supply Master plan
- Water Supply Schemes
- Water Supply Grid System - for uninterrupted water supply
- 24x7 Water Supply Pilot Project, Surat Municipal Corporation
- Private Sector Participation in Hydraulic department: Valve operation in the different parts of the city

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	Rio de Janeiro, Rotterdam, Mexico City, Semarang
STRATEGY LINKAGES	3.1.3

Rainwater harvesting

OBJECTIVE	To implement rainwater harvesting in all existing and new buildings to spearhead water conservation practices.

BRIEF

According to the Gujarat Development Control Regulation, it is mandatory for high rise buildings to install rainwater harvesting units at the time of construction. Initially the city will start rainwater harvesting within government and institutional buildings and promote it as a best practice. If implemented, this will reduce the water supply demand, especially in the institutional areas, and lead to conservation of natural water resources. As a secondary benefit, such enforcement will also help save energy used for water supply. As a second entry point, an inventory can be developed for large institutional, commercial, and residential buildings, where rainwater harvesting units can be installed.

OWNERS

- Hydraulic Department, Surat Municipal Corporation

SUPPORTERS

- Civil Engineering Department, Sardar Vallabhbhai National Institute Technology
- Engineering College, Sarvajanik College of Engineering and Technology
- Roads and Buildings Department

ALIGNMENT

- Indian Green Buildings Council Guidelines- 2001
- Gujarat Development Control Regulation
- Affordable Housing policy- Gujarat
- SMC: Rebate scheme for Rain Water Harvesting
- RWH: Subsidy offered by SMC for People participation

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	Melbourne, Semarang
STRATEGY LINKAGES	2.3.1, 2.3.2

Implementation of the water reuse guidelines

OBJECTIVE	To adapt innovative technology, anaerobic for wastewater treatment, and develop options to encourage citizens to reuse wastewater.

BRIEF

The city will develop water reuse guidelines titled 'Closing the Water Loop Guidelines', which will be first of its kind in the country. The city will use anaerobic treatment for wastewater, which is good for concentrated wastewater. Anaerobic processes are also frequently used to ferment aerobic sludge and fluid organic waste. The city will promote anaerobic purification in various sectors, especially in the industrial sector.

OWNERS

- Hydraulic Department, Surat Municipal Corporation
- Gujarat Pollution Control Board

SUPPORTERS

- Surat Climate Change Trust (SCCT), Surat

ALIGNMENT

- 10 Existing STP plants managed by Surat Municipal corporation with total capacity of 892.5 MLD
- 6 upcoming STP projects providing capacity of 580 MLD (by SMC)
- 140 MLD TTP at Bamroli and additional 40 MLD TTP at Dindoli which is in tendering stage for industrial usage for Pandesara and Sachin GIDC
- SMC has already adopted advanced technology such as SBR, BNR, FAS etc

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Rio de Janeiro, Byblos, Da Nang, Semarang, Berkley
STRATEGY LINKAGES	-

Interlinking water resources

OBJECTIVE	To develop a proposal for water resources, interlink projects to increase all-weather water availability in the city.

BRIEF
There is an existing project titled, 'Par Tapi Narmada Link', to transfer water from water surplus regions to water deficit regions. Along with this project, initiatives will be taken to review the traditional water bodies within the city and link them to ensure year-round water availability. An inventory of existing water bodies and their capacities will kick-start a campaign for conservation of lakes. Surveys can be done of existing water resources vis-a-vis the quality of water and a proposal can be prepared to interlink them.

OWNERS
- Hydraulic Department, Surat Municipal Corporation
- Narmada Water Resource and Water Supply Department

SUPPORTERS
- Surat Climate Change Trust
- Gujarat Water Resources Development Corporation
- Surat Urban Development Authority

ALIGNMENT
- Proposal of Par- Tapi- Narmada River interlink project, Government of Gujarat

TIMELINE	Long Term (2017-2025)
STATUS	New
CITY LINKAGES	Da Nang, Berkley
STRATEGY LINKAGES	-

Groundwater resource augmentation

OBJECTIVE	To adapt indigenous techniques for filtration of stormwater and groundwater recharge.

BRIEF
The city will adapt indigenous techniques such as French well for filtration of stormwater and groundwater recharge. It is a simple and affordable technology that can contribute to rainwater harvesting and groundwater recharge. In spite of having good water supply, many residential and institutional areas depend on ground water/bore wells, which can lead to groundwater degradation. The initiative can have:
- Location survey and mapping in the city for French wells; and
- Certain areas can be especially mandated to install the French drain technology for rainwater harvesting and groundwater recharge.

OWNERS
- Hydraulic Department, Surat Municipal Corporation

SUPPORTERS
- Surat Climate Change Trust
- Narmada Water Resource and Water Supply Department

ALIGNMENT
- Gujarat State Water Policy-2015

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	-
STRATEGY LINKAGES	1.4.1, 3.4.7

Water monitoring

OBJECTIVE To develop digital infrastructure for monitoring water demand and supply scenario across the city.

BRIEF

The SMC works 24x7 to provide safe and reliable drinking water to the citizens at their doorstep through a water supply distribution network. Water supply schemes are being implemented at present under various central and state government sponsored programs.
- Review the master plan for existing water supply in terms of changing climate and an expanding city;
- Develop a system to monitor water uses based on special requirements such as during festival seasons and summer, and generate water use bill through email and SMS for all users.

OWNERS

- Hydraulic Department, Surat Municipal Corporation

SUPPORTERS

- Surat Climate Change Trust
- PPP based interventions with technology based industries

ALIGNMENT

- User Charges and Water Meter Policy: (Effective from Date 01-04-2015)
- Residential and Religious Purpose Water and Sewerage Charges- 2015-16
- Non-Residential purpose Water & Sewerage Charges: 2015-16

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	New York, Rio de Janeiro
STRATEGY LINKAGES	-

Urban design & landscape intervention

OBJECTIVE To implement urban design and landscape interventions for increased permeability of urban spaces, reduced runoff, and facilitate groundwater recharge which will support water resource conservation.

BRIEF

According to the Gujarat Integrated Township Act, 2008, 20 percent of built urban landscape should have green cover/vegetation. However, rapid urbanism changes the land cover to impervious surface and leads to problems like urban water logging, degradation of the groundwater table, etc. The city will integrate the policy with specific plantations leading to water recharge. The city will also develop guidelines for impervious surface construction to increase groundwater recharge. Techniques such as permeable pavements on footpaths, tabletops, and traffic refuge islands can also add to groundwater recharge. Development of the Tapi riverfront can incorporate urban design, supporting the initiative. The city will use pollinator-friendly plants in parks and medians, and plants that produce less litter, to for a cleaner environment.

OWNERS

- Hydraulic Department, Surat Municipal Corporation
- Surat Urban Development Authority

SUPPORTERS

- Town Planning Department
- Confederation of Real Estate Developers' Associations of India

ALIGNMENT

- Guidelines for conservation. development and management of Urban Greens., Ministry of Environment Forest & Climate change
- Gujarat Integrated Township Policy, 2008

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Byblos, Berkley, Mexico, Da Nang, Rio de Janeiro, New York
STRATEGY LINKAGES	1.4.1

PILLAR 04

DOMINANT SECTORS OF EMPLOYMENT & ECONOMIC DEPENDENCY

Emerging Issues:

- Economy is dependent mainly on two business sectors
- Both the sectors are highly dependent on migrant workers
- Imbalance in diamond business due to growing market of synthetic diamond
- Risk by consolidation of dominant sectors
- High dependency on global economy & market

We share these challenges with

Glasgow | Greater Christchurch | Byblos

Resilience Incubator

SGCCI

Southern Gujarat Chamber of Commerce & Industries, Surat

Department of Economics, Veer Narmad South Gujarat University, Surat

For supporting reference documents, please click or scan.

BACKGROUND

Surat is the eighth largest city in terms of population, and largest among noncapital cities, in India. As per the Mayor's foundation report, Surat is the fourth fastest growing city globally, with a decadal growth of 55 percent to 60 percent in the last four decades. The GDP rate is 11.5 percent. Among the highest income tax paying cities in Asia in 2010–11, Surat contributed Rs. 22,000 million to the national exchequer. It has the highest average annual household income and has practically zero percent unemployment.

Crisil and ICRA have graded Surat at the top of the list as an urban civic body on operating and financial efficiency. The city has a very vibrant economy. It is the hub of the diamond and textile industries.

The current economy of Surat is dominated by diamond cutting, textiles, gold thread making, dyeing, and printing industries that cater to both domestic markets and exports. Diamond cutting and polishing, however, mainly cater to the export market. The medium- and large-scale industries are mostly located in the five industrial estates in and around the city. The city accounts for:

- 90 percent of the world's total rough diamond cutting and polishing;
- 99.99 percent of the nation's total rough diamond cutting and polishing;
- 90 percent of the nation's total diamond exports;
- 60 percent of the nation's total man-made fabric production;
- 28 percent of the nation's total manmade fiber production;
- 18 percent of the nation's total man-made fiber export;
- 12 percent of the nation's total fabric production; and
- 14 percent of the nation's total foreign exchange.

Along with textiles and diamonds, other sectors in the city include petroleum, oil and gas, shipping, cement, metallurgy, paper, chemical, fertilizer, etc. Hazira INA, Magadalla, Ichchhapore, and Olpad near Surat have giant industries, such as Oil and Natural Gas Corporation Limited, Gas Authority of India Limited, ABG Shipyard, Narmada Cement, Ambuja Cement, Ultratech Cement, NTPC-KGPP Power Plant, ESSAR group of Industries (steel/power/chemical/oil/shipping), Larsen & Toubro, and Reliance Industries. Microsoft's CityNext initiative has tied up with information technology (IT) services majors, Tata Consultancy Services and Wipro, to leverage technology for the sustainable growth of cities in India. The first smart IT city in India is being constituted by the Microsoft CityNext Initiative in Surat, Gujarat.
In general, Surat's industrial system is a complex blend of home-based, small-scale, and medium-scale industries largely dependent on semi-skilled and unskilled labor. In-migration from other states is encouraged to meet the demands of labor in these industries.

If looked through the resilience lens, the economy of Surat is heavily dependent on two dominant sectors, diamond and textile. These two income generators are dependent on global markets and economy. Recession in these two sectors has a significant impact on the economy of the city. Thus, the city should invite different alternative industrial sectors, such as technology, automobile, tourism, food industry, etc., as backup livelihood providers in case of economic crisis. In addition, there is no comprehensive and organized framework for skill upgradation in the city.

RESILIENCE CHALLANGES

Access to Finance: The economy of the city is strong, but there are also issues like income disparity. Small-scale industries and businesses need easy access to finances such as soft loans at low interest rates, subsidies, insurances, etc.

Monochrome Livelihood Opportunities: Since the diamond and textile industries are the two major employers in the city, there is limited diversity of opportunity. Lack of resilience prevails in the economy. The city needs to provide a platform to make the existing sectors stronger and sustainable, besides providing space for new sectors to grow.

Unregulated Industries: The city has a large number of industries clustered in specific locations. Much of the activities in these areas go unregulated due to limited access and policing. Industrial safety norms and environmental policies should be enforced strictly through regular audits and Environmental Impact Assessment (EIA) activities.

Education Level and Lack of Skill Training: There are many educational institutions within the city. Unfortunately, they lack in quality of education and skill development programs.

Workers in the diamond industry, Surat. Photograph Credit: TARU, India

GOAL 4.1
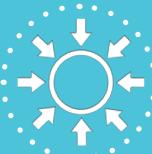
DIVERSIFIED BUSINESS SECTORS AND OPPORTUNITIES

Orientation

Research

Shocks and Stresses

- Economic crisis
- Unemployment

Promote and support innovative business opportunities using information, communication, and technology

OBJECTIVE	To promote innovative and diversified economic enterprises which can create future business opportunities in the city with the help of information communication technology (ICT).

BRIEF

The ICT industry has witnessed excellent growth in the past two decades in Gujarat. Investor/business-friendly IT policies, which would encourage both local entrepreneurs and foreign direct investments (FDI) will be developed. This will lead to Surat becoming one of the favorite destinations for ICT investment. E-commerce and e-business will also be developed. As a major output, it will provide alternate business environment in addition to textiles and diamond polishing.

OWNERS

- District Industries Center
- Deputy Director, Department of Labour and Employment
- Individual or Business Groups

SUPPORTERS

- Urban Community Development Center, Surat Municipal Corporation
- The Southern Gujarat Chamber of Commerce & Industry
- Economics Department, Veer Narmad South Gujarat University

ALIGNMENT

- Make in India Initiative, Govt. of India
- The National Skill Development Mission, 2015 of Govt. of India
- Gujarat Skill Development Mission of Department of Labour and Employment, Government of Gujarat
- Vibrant Gujarat 2017: Focus Sector: Skill Development

TIMELINE	Long Term (2017-2025)	
STATUS	-	
CITY LINKAGES	Glasgow	
STRATEGY LINKAGES	-	

Micro, small, and medium-sized enterprises

OBJECTIVE To promote and support micro, small, and medium-sized enterprises in Surat.

BRIEF

The micro, small, and medium enterprises sector has emerged as a highly vibrant and dynamic sector. The following activities will support this initiative in the city:
- Organize events (such as Expos) with SGCCI for micro, small and medium enterprises;
- Organize skills development training programs;
- Sign Memorandums of Understanding (MoUs) with national-level institutions such as the Entrepreneurship Development Institute and the Indian Institute of Management;
- Facilitate access to finance by linkages with banks; and
- Establish Livelihood Business Incubator under the ASPIRE Scheme of the Government of India.

OWNERS
- District Industries Center
- Deputy Director, Department of Labour and Employment
- Individual or Business Groups

SUPPORTERS
- Urban Community Development Center, Surat Municipal Corporation
- The Southern Gujarat Chamber of Commerce & Industry
- National Institute of Micro, Small and Medium Enterprises

ALIGNMENT
- The Micro, Small, and Medium Enterprises Development Act, 2006
- Various schemes of Ministry of Micro, Small and Medium Enterprises, Govt. of India
- Assistance to SME for raising Capital through SME Exchange, Govt. of Gujarat

TIMELINE	Long Term (2017-2025)
STATUS	New
CITY LINKAGES	Byblos, Greater Christchurch
STRATEGY LINKAGES	-

Promote women entrepreneurs

OBJECTIVE To promote and support women entrepreneurs and start-up businesses by offering business counseling/training and access to finance.

BRIEF

Women entrepreneurship has been recognized as an important source of economic growth. This initiative can be achieved by:
- Organize events (such as Expos) with SGCCI for micro, small and medium enterprises;
- Organize skills development training programs;
- Sign Memorandums of Understanding (MoUs) with national-level institutions such as the Entrepreneurship Development Institute and the Indian Institute of Management;
- Facilitate access to finance by linkages with banks; and
- Establish Livelihood Business Incubator under the ASPIRE Scheme of the Government of India.

OWNERS
- District Industries Center
- Deputy Director, Department of Labour and Employment
- Individual or Business Groups

SUPPORTERS
- District Industries Center
- Deputy Director, Department of Labour and Employment
- Individual or Business Groups

ALIGNMENT
- Trade Related Entrepreneurship Assistance and Development Scheme for Women, Ministry of MSME, Govt. of India
- Support to Training and Employment Program for Women of Ministry of Women & Child Development, Govt. of India

TIMELINE	Long Term (2017-2025)
STATUS	New
CITY LINKAGES	Greater Christchurch
STRATEGY LINKAGES	4.1.1, 4.1.2

GOAL 4.2
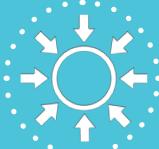
SKILL DEVELOPMENT THROUGH TRAININGS AND CAPACITY BUILDING

Orientation

Awareness

Shocks and Stresses

- Economic crisis
- Unemployment
- Low education levels

Establishment of center of excellence and incubation center

OBJECTIVE

To propose a Center of Excellence and Incubation Center to promote textile education initially, and also to conduct research and development for diverse business opportunities and skill development

BRIEF

An idea/incubation center will be established in the city to:
- Conduct research on innovation in the textile sector by preparing the research plan for the next five years;
- Prepare research proposals for the Ministry of Textiles for future funding;
- Establish links among national level institutes;
- Connect the existing efforts of the national and state governments; and
- Review the Dhaka model of textile and clothing industries and develop the Surat model.

OWNERS

- Centre for Entrepreneurship Development
- District Industries Center
- Deputy Director, Department of Labour and Employment

SUPPORTERS

- Urban Community Development Center, Surat Municipal Corporation
- The Southern Gujarat Chamber of Commerce & Industry
- Economics Department, Veer Narmad South Gujarat University

ALIGNMENT

- Make in India Initiative, Govt. of India
- The National Skill Development Mission, 2015 of Govt. of India
- Gujarat Skill Development Mission of Department of Labour and Employment, Government of Gujarat
- Vibrant Gujarat 2017: Focus Sector: Skill Development

TIMELINE	Long Term (2017-2025)
STATUS	-
CITY LINKAGES	Glasgow
STRATEGY LINKAGES	-

Enhancement of business skills

| OBJECTIVE | To develop skills through trainings and capacity buildings and field training missions to various other states and countries as per existing industry demand and to produce new generation of entrepreneurs in Surat |

BRIEF

Development of skills through training and capacity-building events (including conferences/workshops/field missions for training missions to various states and countries). This initiative can be achieved by:

- Upgrading entrepreneurship skills of small- and medium-sized enterprises (SMEs) in the city, especially new technology interventions for the textile industries.
- Integrating general, vocational, and technical education to open opportunities for international training providers to showcase their expertise.
- Developing programs and events for skill upgradation.
- Associating with potential national and international institutions to incorporate their best practices/initiatives and stay informed about the latest training techniques;
- Establishing opportunities for tie-ups to increase skill levels in the manufacturing sector, thereby supporting the 'Make in India' initiative;
- Establishing skills facilitation centers and linking them with existing national and state level programs and projects; and
- Establishing smart commercial complexes and trade centers through public-private partnerships in municipal commercial lands

OWNERS

- District Industries Center
- Deputy Director, Department of Labour and Employment
- The Southern Gujarat Chamber of Commerce & Industry

SUPPORTERS

- Urban Community Development Center, Surat Municipal Corporation
- Entrepreneurship Development Institute of India
- Economics Department, Veer Narmad South Gujarat University

ALIGNMENT

- Make in India Initiative, Govt. of India
- The National Skill Development Mission, 2015 of Govt. of India,
- Gujarat Skill Development Mission of Department of Labour and Employment, Government of Gujarat
- Vibrant Gujarat 2017: Focus Sector: Skill Development

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Glasgow
STRATEGY LINKAGES	4.2.1

Worker at textile industry- Surat
Photograph Credit: SCCT, Surat

PILLAR 05

ECOSYSTEM & ENVIRONMENTAL REGULATION

Emerging Issues:

- Air and Water Pollution
- Solid waste management
- Coastal environment and salinity issues

We share these challenges with

Oakland | Berkley | San Francisco | New York | New Orleans | Mexico City | Rio de Janeiro | Glasgow | Vejle | Rotterdam | Da Nang | Semarang | Melbourne | Byblos

Resilience Incubator

Department of Environmental Science, Sarvjanik College of Engineering Technology, Surat

Sardar Vallabhbhai National Iinstitute of Technology, Surat

For supporting reference documents, please click or scan.

BACKGROUND

Situated on the banks of the river Tapi, in close proximity to the Arabian Sea, Surat has a sensitive ecosystem. Industrial growth, and high population growth and density place pressure on the ecosystem of Surat. The two important tasks to be attended in Surat are: implementation of environmental policies such as Coastal Regulation Zones; and enforcement of laws in industrial areas. There is a need for more green spaces to be developed and maintained. The Tapi is depleting due to rapid siltation and development activities taking place along both sides of the river. Pollution level checks should be carried out on a regular/frequent basis. The environmental cell should be active and efficient in monitoring air, sound, land, and water pollution throughout the city.

Water and Sewerage: River Tapi is one of the major sources of water available to Surat. This has led to the discharge of domestic used water and sewage from peri-urban areas into the river. Pollution, including disposal of sewage and industrial effluents, and reservoir impoundment vegetation, has led to growth of algae, underwater hydrilla, and water hyacinth. Reuse of water is negligible, with only 2 percent of water being reused in the city. Water conservation practices are lacking in the city. A reduction in the water table and groundwater pollution are noticed in many areas.

Solid Waste: The SMC currently manages about 1750 MT of solid waste per day. Around 98 percent off total solid waste generated is disposed of effectively through well-established sanitary landfills, centralized bio-medical waste collection, transportation, treatment, and final disposal facilities. These landfill and dumping sites are a problem and account for greenhouse gas emissions. Hence, efforts are required to segregate and reuse the waste. The initiative for solid waste management (SWM) initiatives, with regard to the new Management of Solid Waste (MSW) Rules, 2015, are to be mandated in the city.

Air Quality: Vehicular pollution accounts for 60–70 percent of the total pollution load of the city. The main causes are two-wheelers, auto-rickshaws, and multi-axle vehicles. According to the Gujarat Pollution Control Board, Surat is one of the cities which does not maintain the required air quality standards, since more than the permissible amount of suspended particulate matter (SPM) has been recorded in the city (2004–05). Efforts, such as Compressed Natural Gas conversions in vehicles, and BRTS and Mobile Pollution Measuring Vans, have helped in reducing the SPM levels but not in reducing the greenhouse gas contribution.

RESILIENCE CHALLANGES

Creek Flood: There is no storage or control mechanism in or around the tidal creeks in the city. Development along the creeks and poor maintenance of creek banks have led to siltation and degradation of water quality. Further, pollutants discharged from untreated and unregulated industries worsen the situation. The growth of vegetation and subsequent reduction in the drain areas lead to frequent flooding in the creeks.

Extreme Rainfall: Due to climate change, it is observed that the total rainfall may be reduced but the intensity of occurrence has and will continue to increase.

Industrial Accidents: Surat has a lot of industrial units, among which Olpad Cyanide Industrial Area and HNA are critical areas. They account for various accidents, and this needs to be addressed efficiently to avoid future risks. Also, Surat should not neglect the possible risk from Kakrapar Nuclear Power Plant situated on the banks of the river Tapi.

Salt Water Intrusion: Illegal groundwater use has been noticed in the city. Unregulated groundwater use will eventually lead to salt water intrusion through the creeks and river into the ground.

Heatwave: It has been observed that the duration of the summer season is elongated and irregular. Heat waves have been increasing with the changing climate. This leads to health issues and currently the citizens are not aware of the long-term effects of a heat wave.

Insufficient Regulation: Lack of regulation and low law enforcement is a major cause of all environment- and ecosystem-related issues in Surat. This is a major issue in Surat, especially in industrial areas, leading to unregulated and untreated industrial discharge into the river and air pollution. One of the reasons for the depletion of rivers in the festive seasons is due to lack of regulation and enforcement.

Lack of Risk Awareness: Sensitivity of the citizens towards the environment is missing in the city. The citizens should be made aware of the consequences of their actions on the environment and thus take responsible steps.

GOAL 5.1
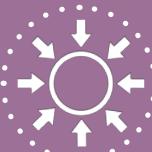
RESEARCH ON URBAN CLIMATE CHANGE RESILIENCE

Orientation

Research

Shocks and Stresses

- Extreme rainfall
- River flood, Urban flood
- Creek flood
- Industrial accidents
- Less regulation and enforcement
- Lake of awareness of risk
- Air, water pollution

Multi hazard risk assessment and mapping

OBJECTIVE	To monitor the impacts of climate change trends, and integrate with multi-hazard risk assessment and mapping for the city

BRIEF

Surat is highly vulnerable to multiple hydro-met hazards such as river floods, creek floods, and storm surges. Risk exists in Surat since reclaimed land in the sea can cause high tidal effects. Due to major industrial activities, fire incidents have also been noticed in the city. To monitor climate change trends and impacts and to integrate them with multihazard risk planning, the city will conduct regular GIS-based spatial analysis of vulnerability and risks to strengthen preparedness for future resilience. The city will also enhance its existing Early Warning System, which currently keeps Surat prepared to mitigate the flood risk. It can be linked with a high-end Emergency Operation Center (EOC) and mapping of new growth areas.

OWNERS

- Surat Climate Change Trust

SUPPORTERS

- Environment Cell, Surat Municipal Corporation
- Gujarat State Disaster Management Authority
- Surat Urban Development Authority
- Hazira Notified Area, Surat
- The Southern Gujarat Chamber of Commerce and Industry, Surat

ALIGNMENT

- State Disaster Act: Gujarat State
- District Disaster Management Plan
- Hazard Risk and Vulnerability Assessment, Gujarat
- City Disaster Management Plan
- Early Warning System Guidelines
- Asian Cities Climate Change Resilience Network
- Urban Flood Management Guidelines

TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	Rio de Janeiro
STRATEGY LINKAGES	3.2.2

Review of environmental policies

OBJECTIVE	To review existing environmental and industrial polices, and make an inventory or handbook for better enforcement and environmental regulations.

BRIEF

Due to its sensitive coastal environment, the rapid growth of Surat city demands the implementation of environmental policies, regulations, and guidelines. An inventory book of environmental policies relevant to Surat city will be developed. The policy inventory will also present policies that overlap or cross-link to help in improvisation and integration in future.

OWNERS

- Gujarat Pollution Control Board (GPCB)

SUPPORTERS

- Environment Cell, Surat Municipal Corporation
- Gujarat Ecological Commission
- National Disaster Management Authority
- Hazira Notified Area, Surat
- Gujarat Industrial Development Corporation, Surat
- Gujarat Coastal Zone Management Authority
- Surat Climate Change Trust
- Department of Environment Engineering, Sarvajanik College of Engineering And Technology, Surat
- Department of Environment Engineering, Sardar Vallabhbhai National Institute of Technology, Surat

ALIGNMENT

- Central Pollution Control Board Guidelines
- Gujarat Pollution Control Board Guidelines
- Costal Regulation Zone Guideline
- Environmental Policies, Strategies, Acts for Gujarat

TIMELINE	Short Term (2017-2018)	■▢▢▢▢▢
STATUS	New	
CITY LINKAGES	Da Nang, Rio de Janeiro, Berkley, New York	
STRATEGY LINKAGES	-	

Development of a pollution zoning atlas

OBJECTIVE	To monitor zone/ward pollution—noise, air, water, land—and to develop a zoning atlas for Surat for pollution reduction measures.

BRIEF

The city will develop a zone/ward level pollution atlas to identify the spatio-temporal distribution of major pollutants, level of the pollution, and their pattern over time, especially during festivals. The information provided in the atlas will be further analyzed to identify the source of the pollution and options for regulation. The information will also be used to provide awareness, alerts and warning to the members of the public to take appropriate health measures. Pollution alerts displayed at key locations and major junctions will further increase public outreach to visitors, in-migrants, and citizens.

OWNERS

- Environment Cell, Surat Municipal Corporation

SUPPORTERS

- Central Pollution Control Board
- Surat Climate Change Trust
- Gujarat Industrial Development Corporation, Surat
- Hazira Notified Area, Surat
- Department of Environment Engineering, Sarvajanik College of Engineering And Technology, Surat
- Department of Environment Engineering, Sardar Vallabhbhai National Institute of Technology , Surat
- Gujarat Pollution Control Board
- The Southern Gujarat Chamber of Commerce and Industry , Surat

ALIGNMENT

- Zoning Atlas for Surat District by Central Pollution Control Board
- Ambient Air Quality Monitoring Programs
- National Air Quality Monitoring Programs
- State Air Quality Monitoring Programs
- Water Quality monitoring

| TIMELINE	Short Term (2017-2018)	■▢▢▢▢▢
STATUS	New	
CITY LINKAGES	Bangkok	
STRATEGY LINKAGES		

GOAL 5.2
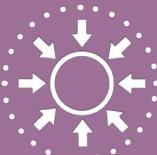
CITIZEN AWARENESS ABOUT THE URBAN ECOSYSTEM

Orientation

Awareness

Shocks and Stresses

- River flood
- Less regulation and enforcement
- Lack of awareness of risk
- Water pollution
- Extreme rainfall
- Creek flood
- Industrial accidents
- Low education level
- Loss of ecosystem services

Initiative 5.2.1

Awareness about the ecosystem

OBJECTIVE	To generate awareness among citizens about the strengths and assets of the city and its conservation practices to build long term resilience.

BRIEF

Citizens can be made aware of the current status and educated on innovative ways to address this problem. Awareness and mitigation can also be improved through community participation. The city will do the following activities to support the initiative:

- Create an annual plan for ecosystem awareness events in the city;
- Organize 'U-Turn event engagement' on weekends & holidays;
- Organize a students' education fair on the ecosystem;
- Involve students to create awareness;
- Support and promote more NGOs and community-based organizations working in the ecosystem sector; and
- Develop inventory of natural and manmade resources in the city and of their resilience benefits.

OWNERS

- Environmental Cell, Surat Municipal Corporation
- Urban Community Development Cell, Surat Municipal Corporation

SUPPORTERS

- Nature Club, Surat
- Gujarat Ecological Education and Research Foundation
- Gujarat Ecological Commission
- Gujarat Ecological Society
- Department of Environment Engineering, Sarvajanik College of Engineering And Technology, Surat
- Department of Environment Engineering, Sardar Vallabhbhai National Institute of Technology, Surat
- Gujarat Pollution Control Board
- The Southern Gujarat Chamber of Commerce and Industry , Surat
- Veer Narmada South Gujarat University, Surat
- GEER foundation, Surat
- Lions Club, Surat
- Rotary Club, Surat

ALIGNMENT

- National Green Corps, 200-2002
- National Environmental Awareness Campaign, 2014-2015
- National Environment Policy, 2006
- Publications by Nature Club, Ecological Commission

TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	Vejle
STRATEGY LINKAGES	-

Awareness about renewable energy

OBJECTIVE	To promote use of renewable energy for residential, commercial, institutional, and industrial sector

BRIEF

To promote the use of renewable energy as much as possible, workshops and conferences will be organized on the use of renewable energy in association with the Gujarat Energy Development Agency. Mobile applications, innovative brochures, and flyers will be developed in local languages to encourage the use of renewable energy. MoUs can be signed with the National Institute of Solar Energy (Government of India) on research and development. A proposal for a Center of Excellence on Solar Research in Surat will also be developed. An annual plan will be prepared for energy awareness events in the city, where solar equipment will be displayed at various locations to create enthusiasm and awareness.

OWNERS

- Energy Efficiency Cell, Surat Municipal Corporation
- Environmental Cell, Surat Municipal Corporation
- Surat Smart City Development Limited

SUPPORTERS

- Gujarat Energy Development Agency
- Dakshin Gujarat Vij Company Limited
- Torrent Power Limited, Surat
- The Southern Gujarat Chamber of Commerce and Industry, Surat
- Gujarat Gas Limited, Surat
- Surat Electricity Company
- Gujarat Energy Development Agency
- Electrical Research and Development Agency

ALIGNMENT

- Gujarat Solar Power Policy - 2015
- Waste to Energy Policy – 2016
- Gujarat Wind Power Policy-2016
- Gujarat Small Hydel Policy – 2016
- Subsidy for Residential Rooftop Solar Plants
- House Energy Audit, External Energy Audit, Energy Efficiency Cell, Surat Municipal Corporation

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Oakland, Rotterdam
STRATEGY LINKAGES	-

Tapi River, Surat
Photograph Credit: TARU, India

Pollution awareness by voluntary clean-up program

OBJECTIVE	To engage citizens and encourage their participation in keeping the city clean and to generate awareness for waste segregation, water pollution, and reuse at home.

BRIEF

The SMC has many ongoing waste collection and city cleaning practices spearheaded by its solid waste department. But citizens' awareness and participation is currently low. For better waste management, it is very important to have the support and participation of civil society. Awareness will be created among citizens, for instance, by pointing out water pollution levels during festivals and effect of waste disposal into the river. The following activities will be carried out to achieve this goal:

- Create citizen awareness on waste segregation at home;
- Organize clean-up drives in the city during the festive season;
- Generate awareness through electronic and print media;
- Conduct street plays on SWM practices; and
- Organize workshops and conferences on Clean Surat Drive.

OWNERS

- Environment Cell, Surat Municipal Corporation

SUPPORTERS

- Natures Club, Surat
- NGOs, Surat
- Solid Waste Management Department, Surat Municipal Corporation
- Surat Climate Change Trust

ALIGNMENT

- Swatchha Bharat Abhiyan
- Nirmal Gujarat
- Swatchha Bharat Swatchha Surat
- Clean Tapi Campaign

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	New York
STRATEGY LINKAGES	-

Resilience building capacity

OBJECTIVE	To generate awareness and enhance capacity on resilience across the city.

BRIEF

The capacity of institutions, communities, and individuals to adapt to climate change has been increased with previous efforts in the city under various programs. However, to ensure maintenance, continuous efforts are needed with the following activities:

- Share the climate resilience strategy methodology with government agencies for peer review and learning;
- Design and conduct local ecosystem conservation programs for urban practitioners;
- Develop a resilience toolkit based on 100RC and CRF and introduce it to the regional and state governments;
- Conduct capacity building workshops with relevant stakeholders for environmental resilience based on CRF components of 100RC;
- Conduct debates on urban climate change issues;
- Write articles in print and electronic media to spread awareness; and
- Organize street plays on climate change and resilience issues by students.

OWNERS

- Environment Cell, Surat Municipal Corporation
- Surat Climate Change Trust

SUPPORTERS

- Gujarat Ecological Commission
- Gujarat State Disaster Management Authority
- Gujarat Urban Development Mission

ALIGNMENT

- Capacity Building Scheme for Urban Local Bodies under JNURM scheme, World Bank, and UNDP programs
- Capacity Building Program on Disaster Management for Government officials, and representative of Panchayat Raj institutions and local bodies at district level by National Disaster Management Authority

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Rio de Jainero
STRATEGY LINKAGES	3.2.2

U-Turn Event

U-Turn is an initiative of Surat City Police supported by Surat Municipal Corporation to bring out joy & creativity in our lives at a community level. Here, at U-Turn people gather, do exercise, create street paintings, play games and much more. It gives a platform for the urban communities to participate, communicate, and spread awareness about various social, environmental and cultural issues.

U-Turn event, Surat
Photograph Credit: TARU, India

GOAL 5.3

REGULATION & ENFORCEMENT OF ENVIRONMENTAL REGULATIONS

Orientation

Enforcement

Shocks and Stresses

- Industrial accidents
- Less regulation & enforcement
- Law education level

Pollution-free Surat

OBJECTIVE	To conduct frequent pollution audits in industrial areas and to conduct regular vehicular pollution emission checks at key/sensitive locations and major junctions.

BRIEF

Due to its large industrial setup and vehicular growth, the city needs air quality monitoring. In the absence of air pollution data, it is difficult for authorities to act. To achieve these goals, the city will:

- Support existing efforts on air quality monitoring in the city by developing a monitoring and alert system;
- Install digital display boards at key locations and major junctions;
- Install fixed and mobile devices in the city to capture area-specific measurements;
- Publish names of individual and industrial in electronic and print media on weekly basis;
- Conduct pollution audits frequently in industrial units/areas to cut down on pollution sources; and
- Check vehicular emissions, especially in intermediate public transport.

OWNERS

- Environment Cell, Surat Municipal Corporation
- Gujarat Pollution Control Board

SUPPORTERS

- Surat Climate Change Trust
- Gujarat Industrial Development Corporation, Surat
- Hydraulic Department, Surat Municipal Corporation
- Traffic Department, Surat City Police
- Regional Transport Office, Surat

ALIGNMENT

- Ambient Air Quality Monitoring Programs
- Clean Tapi Campaign
- National Air Quality Monitoring Programs
- State Air Quality Monitoring Programs

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	Bangkok
STRATEGY LINKAGES	5.2.3, 1.3.1, 1.3.2

Coastal areas' conservation

OBJECTIVE — To conserve coastal areas along the city by enforcing Coastal Regulation Zone Guidelines/Act.

BRIEF

South Gujarat's coastal zone has abundant coastal and marine ecosystems that include a wide range of mangroves, coral reefs, sea grasses, salt marshes, mud flats, estuaries, lagoons, and unique marine and coastal flora and fauna. This initiative can be linked to the Integrated Coastal Zone Management project which is implemented by the Gujarat Coastal Zone Management Authority

- Develop an association with the Gujarat Coastal Zone Management Authority for various ongoing activities along Surat's coast;
- Develop and restore Dumas beach;
- Create a coastal watch group with the help of Surat's city police and the SMC to implement CRZ guidelines;
- Install CCTV cameras along the coast to monitor coastal activities; and
- Enforce coastal regulation policies and conduct regular audits and control at the Hazira Notified Authority's industrial units.

OWNERS

- Environment Cell, Surat Municipal Corporation
- Forest and Environment Department, Government of Gujarat

SUPPORTERS

- Gujarat Ecological Commission
- Gujarat Maritime Board
- Gujarat Coastal Zone Management Authority
- Surat Climate Change Trust
- Hazira Notified Area, Surat
- Gujarat Pollution Control Board ,Surat
- Surat Irrigation Circle

ALIGNMENT

- Coastal Regulation Zone Act and Guidelines

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	New York
STRATEGY LINKAGES	-

Green building concept

OBJECTIVE — To enforce green building concepts in upcoming residential, commercial, institutional, and industrial buildings in the city.

BRIEF

The SMC promotes the concept, and is in the process of finalizing designs for its own buildings. The following activities will be carried out to achieve the goals:

- Develop green building guidelines for the city, keeping its location and growth pattern in mind;
- Discuss the concept with Roads and Buildings and Gujarat Housing Board to implement this in their upcoming buildings; and
- Develop ready-to-use green concepts for residential, commercial, institutional, and industrial buildings.

OWNERS

- Environment Cell, Surat Municipal Corporation
- Energy Efficiency Cell, Surat Municipal Corporation
- Surat Smart City Development Limited

SUPPORTERS

- Surat Urban Development Authority
- Indian Green Building Council
- Green Rating for Integrated Habitat Assessment
- Confederation of Real Estate Developers' Associations of India
- Gujarat Gas Limited, Surat
- Surat Electricity Company
- Gujarat Energy Development Agency
- Electrical Research and Development Agency

ALIGNMENT

- National housing policies
- Redevelopment policy, Gujarat
- Indian Green Buildings Council Guidelines, 2001
- Cool Roof Passive Ventilation Project

| TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	Berkley, Oakland
STRATEGY LINKAGES	2.3.1, 2.3.2
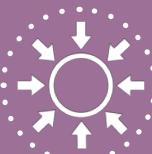
GOAL 5.4

INNOVATIVE URBANISM TACTICS FOR BALANCED ECOSYSTEM

Orientation

Implementation

Shocks and Stresses

- Flood risk
- Water pollution
- Heat wave
- High energy cost

Community-level rainwater harvesting system

OBJECTIVE — To implement rainwater harvesting in various buildings in the city; to initiate rainwater harvesting and water conservation practices.

BRIEF

The SMC promotes the concept and is in the process of finalizing designs for its own buildings. The following activities will be carried out to achieve the goals:
- Start rainwater harvesting clubs, which will promote this concept;
- Start campaigns and membership drives by adding more and more people;
- Establish linkages with ongoing government efforts, at specific locations and major junctions, to cut mobile pollution sources.

OWNERS

- Environment Cell, Surat Municipal Corporation
- Hydraulic Department, Surat Municipal Corporation

SUPPORTERS

- Sardar Vallabhbhai National Institute of Technolog, Surat
- Sarvajanik College Engineering and Technology, Surat
- Confederation of Real Estate Developers' Associations of India, Surat
- Surat Climate Change Trust

ALIGNMENT

- Indian Green Buildings Council Guidelines- 2001
- Development Control Rule, Gujarat
- Affordable Housing policy- Gujarat
- SMC: Rebate scheme for Rain Water Harvesting
- RWH: Subsidy offered by SMC for People participation

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	Melbourne
STRATEGY LINKAGES	-

Innovative urban design and landscaping

OBJECTIVE	To increase the green cover of the city by placing green street furniture using innovative urban design and landscaping.

BRIEF

Green cover in the city leads to cleaner air and lower noise pollution, and it also lessens the effect of urban heat islands and intensity of heat waves. The city will take up different urban designs, landscaping, and green street furniture to increase the green cover in the city. The following activities will be carried out to achieve the goals:

- Plan for a design competition at local-level academic institutions for new Town Planning schemes in the city;
- Develop a plan for urban design and landscaping intervention at the river-front, and in various parks and gardens, and at Surat's Dumas beach;
- Develop a guideline on green furniture for roads, traffic islands, bus stops, riverside, creek side, parks, and open spaces in the city; and
- Develop inventory for areas where such development can take place.

OWNERS

- Environment Cell, Surat Municipal Corporation
- Surat Urban Development Authority
- Surat Smart City Development Limited

SUPPORTERS

- Town Planning Department, Surat Municipal Corporation
- Confederation of Real Estate Developers' Associations of India

ALIGNMENT

- Guidelines for conservation. development and management of Urban Greens., Ministry of Environment Forest & Climate change
- Gujarat Integrated Township Policy January, 2008

TIMELINE	Medium Term (2017-2020) ▪▪▪▫▫
STATUS	New
CITY LINKAGES	Berkley, Glasgow, Byblos, New Orleans , Oakland
STRATEGY LINKAGES	-

Installation of solar rooftop systems

OBJECTIVES	To increase use of solar energy and reduce dependencies on existing sources to meet future energy demand. To support the city in becoming energy efficient by maximizing the use of solar energy.

BRIEF

Gujarat is all set to be the solar capital of the world. It is the first state in the country to announce Solar Power Policy, 2009, complete with targets and implementation mechanisms. The following activities will be carried out in the city to achieve the goals:

- Develop green building guidelines for the city, keeping its location and growth pattern in mind;
- Discuss the concept with Roads and Buildings and Gujarat Housing Board to implement this in their upcoming buildings; and
- Develop ready-to-use green concepts for residential, commercial, institutional, and industrial buildings.

OWNERS

- Energy Efficiency Cell, Surat Municipal Corporation
- Environment Cell, Surat Municipal Corporation
- Surat Smart City Development Limited

SUPPORTERS

- Indian Green Building Council
- Green Rating for Integrated Habitat Assessment
- Confederation of Real Estate Developers' Associations of India
- Gujarat Gas Limited, Surat
- Surat Electricity Company
- Gujarat Energy Development Agency
- Electrical Research and Development Agency
- Dakshin Gujarat Vij Company Limited
- Torrent Power Limited

ALIGNMENT

- Gujarat Solar Power Policy - 2015
- Existing efforts of Surat Municipal Corporation

TIMELINE	Medium Term (2017-2020) ▪▪▪▫▫
STATUS	Ongoing
CITY LINKAGES	San Francisco, Rotterdam, Byblos, Rio de Jainero, Oakland, Berkley
STRATEGY LINKAGES	-

Decentralization of solid waste management

| OBJECTIVE | To implement community-level SWM practices using innovative measures. |

BRIEF

SWM needs to be decentralized in the city so as to reduce the load on dumping sites and sanitary landfills, which are big emitters of greenhouse gases. The city will implement the MSW Rules, 2015. To decentralize the SWM, the following measures will be taken up:

- Innovative measures to create awareness among citizens to not litter;
- Check waste being disposed of in the river during festivals;
- Conduct awareness drives on waste segregation;
- Organize street plays on SWM practices; and
- Implement pilot projects in public buildings or institutions to showcase the ease of SWM and treatment at the community level.

OWNERS

- Solid Waste Management Department, Surat Municipal Corporation
- Environment Cell, Surat Municipal Corporation

SUPPORTERS

- Surat Smart City Development Limited
- Energy Efficiency Cell, Surat Municipal Corporation
- Green Rating for Integrated Habitat Assessment
- Confederation of Real Estate Developers' Associations of India

ALIGNMENT

- Swatchha Bharat Abhiyan
- Nirmal Gujarat Yojana
- Existing efforts of Surat Municipal Corporation: Litter Prevention system

TIMELINE	Medium Term (2017-2020)
STATUS	Ongoing
CITY LINKAGES	Rio de Jainero
STRATEGY LINKAGES	-

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Festival of lord Ganesh at River Tapi, Surat
Photograph Credit: SCCT, Surat

Emerging Issues:

- Non-availability of migrant records
- Community unrest: Reservation issues
- Depletion of cultural values

We share these challenges with

San Francisco | New York | Boulder | Glasgow | Vejle | Byblos | Melbourne | Medellin | Pittsburgh

For supporting reference documents, please click or scan.

PILLAR 06

SOCIAL COHESION

Platform Partner

pwc

Pricewaterhouse Coopers

Resilience Incubator

Department of Sociology, Veer Narmad South Gujarat University (VNSGU), Surat

Centre Social Science (CSS), Surat

Sarvajanik College of Performing Arts (SCOPA), Surat

BACKGROUND

Surat is a city of industry and trade. The recent population growth of the city is mainly due to two main labor-intensive industries: textiles and diamond polishing. The spurt in the population is due to a combination of factors, mainly natural growth and in-migration. Surat claims to be a zero-unemployment city. This has attracted rural migrants from within the state (Saurashtra and arid northern parts) and other states (especially Maharashtra, Uttar Pradesh, and Orissa).

Surat reflects the pace of Mumbai. In spite of a fast-paced life, social cohesion and mutual support are quite high among the Surtis (that is, people of Surat). Social networks are strong among most communities, especially those from the arid and semi-arid zones of Gujarat. Research has shown that higher social capacity indices are observed in middle and upper SECs compared to lower SECs and slum dwellers, which are dominated by a diverse immigrant population.

For a city that is under a constant risk of floods and other hydro-meteorological disasters, strong social capital is an asset. Therefore, strengthening social capacities, especially among migrants, will be necessary to enable people in lower SECs to build resilience through better coordination and mutual support.

Unfortunately, the NGO and microfinance coverage in Surat is limited compared to many other Indian cities. Therefore, other avenues to build social cohesion have to be explored. .

RESILIENCE CHALLENGES

High Migration: Migration rate is growing every year and it is becoming increasingly difficult for the city administration to regulate this growth. This further increases the stress on the city's management, existing infrastructure, and crime rates. Increase in migration also leads to increase in the number of slums and engineered buildings to cater to the housing demand. This leads to inequality in society, thus affecting social cohesion.

Lacking Sense of Social Responsibility: With the increasing number of migrants, there is an underlying feeling among the local population that the sense of social responsibility (including contributing to city management, such as, keeping the city clean, following rules and regulations) has decreased over time. The city administration needs to bring back this feeling of belonging among the citizens.

Loss of Local Culture: Surat is a major industrial hub, attracting people mainly for its economic opportunities. Increased demand for housing has also led to the demolition of heritage structures to give way to high-rise buildings. Surat is said to have lost its unique culture, since many different communities come together here for industrial activities.

Crime and Law Enforcement: The city needs strong law enforcement to deal with problems such as encroachment of public spaces, traffic jams, accidents, and crime.

High Property Rate: Surat has a very strong real estate sector providing housing and building structures for both residential and commercial purposes. The number of buildings in the city has grown several-fold in the past decade. Nevertheless, many of these buildings cater to the needs of middle income and high income communities, making it unaffordable for the low-income groups. A majority of home owners are people who have invested in more than one property, therefore leading to an artificial housing shortage. One of the concerns of the citizens is the increase in the number of vacant high income houses, but shortage in low and middle income houses.

Night life at Gaurav Path, Surat
Photograph Credit: SCCT, Surat

GOAL 6.1

RESEARCH ON SOCIAL COHESION

Orientation

Research

Shocks and Stresses

- Civil unrest/riot
- Migration
- Lack of social security
- Lack of risk awareness

Research on social issue

OBJECTIVE	To develop a research profile/portfolio on social issues and cohesion aspects by academic/research institutions in city

BRIEF

Social institutions (research and academic) involved in social change will be facilitated. Theory will be linked to practice by combining empirical research with action-oriented programs. A research portfolio for the next five years will be developed and linked to international research programs. Links will be established with research institutions in 100RC cities by signing MoUs with them. International researchers and students will also be invited to be part of this effort.

OWNERS

- Center for Social Studies
- Department of Sociology, Veer Narmad South Gujarat University

SUPPORTERS

- Urban Community Development Center, Surat Municipal Corporation
- Surat Climate Change Trust

ALIGNMENT

- Academic institutes and their studies

TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	-
STRATEGY LINKAGES	-

Urban quality of life assessment

OBJECTIVE	To develop quality of life index for Surat city with spatial assessment of quality of life at ward and zone level for city

BRIEF

Quality of life is the general well-being of individuals and societies, outlining negative and positive features of life. It observes life satisfaction, including everything from physical health, family and education, to employment, wealth, religious beliefs, finance and the environment. This can be achieved in the following ways:
- Develop a quality of life index for Surat; and
- Do a spatial mapping of urban quality of life.

OWNERS

- Urban Community Development Center, Surat Municipal Corporation
- Surat Climate Change Trust

SUPPORTERS

- Surat Smart City Development Limited
- Center for Social Studies, Surat
- Department of Sociology, Veer Narmad South Gujarat University
- Surat Climate Change Trust

ALIGNMENT

- Asian Cities Climate Change Resilience Network
- 100 Resilience Cities Program
- Smart city Program

TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	Glasgow
STRATEGY LINKAGES	-

Guidelines for public open space

OBJECTIVE	To assess existing public open spaces and develop a public open space strategy and guidelines for the city

BRIEF

The existing public open spaces in the city will be assessed. GIS, remote sensing, and other technologies, such as land surface and air surface temperatures, will be used for monitoring the urban heat island effects. It will also highlight issues of current practices such as use of malls, footpaths, Dumas, riverfront walkways, etc. Existing guidelines of central and state governments will be reviewed to figure out the provision for open spaces. The existing guidelines will also be renewed based on the current population-to-open space ratio. Community asset mapping will also be linked with this initiative.

OWNERS

- Town Development Department, Surat Municipal Corporation
- Surat Urban Development Authority

SUPPORTERS

- Surat Climate Change Trust
- Surat Smart City Development Limited

ALIGNMENT

- Smart City Program
- Surat Development Plan, 2035
- Tapi Riverfront Project, Surat

| TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	New York, Melbourne, San Francisco
STRATEGY LINKAGES	3.4.7

GOAL 6.2
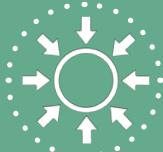
SOCIAL COHESION THROUGH AWARENESS GENERATION

Orientation

Awareness

Shocks and Stresses

- Civil unrest/riot
- Migration
- Lack of social security
- Lack of risk awareness

Initiative 6.2.1

Centre for community resilience

| OBJECTIVE | To establish a center for cultural resources, visual arts, and community resilience in the city. |

BRIEF

A city like Surat has huge diversity of culture and social values, and can be symbolized as 'mini India' due to the plurality of its culture. A center for cultural resources and visual arts will be established in the city for building community resilience. The proposed cultural center will be focused on various cultural activities, such as:
- Cultural festivals;
- Awareness about ownership for the city;
- Surat Day celebrations; and
- Cultural conservation practices.

OWNERS

- Urban Community Development Center, Surat Municipal Corporation

SUPPORTERS

- Center for Social Studies

ALIGNMENT

- Programs of Govt. of India, Govt. of Gujarat and Surat Municipal Corporation

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TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	Boulder
STRATEGY LINKAGES	6.2.6

Awareness through community level events

OBJECTIVE — To generate awareness through campaigns, community-level events, and street plays on various resilience issues in the city.

BRIEF

Surat will conduct campaigns, community-level events, and street plays on resilience issues to help generate awareness. This will be linked with the activities of the center for cultural resources, visual arts, and community resilience:
- Plan and organize 'U-Turn'-like events;
- Organize street plays on the seven discovery areas; and
- Conduct mock drills to educate people about disaster management (for instance, floods), and climate change issues.

OWNERS

- Urban Community Development Center, Surat Municipal Corporation

SUPPORTERS

- Center for Social Studies, Surat
- Sarvajanik College of Performing Arts, Surat

ALIGNMENT

- Programs of Governmentt of India, Govt. of Gujarat and Surat Municipal Corporation
- U-turn Event, Surat
- Happy Street, Surat
- Society for the Promotion of Indian Classical Music and Culture Amongst Youth
- SMC Drama Competitions
- Surat Tapi Utsav
- Surat Food Festival
- Swami Vivekananda National Book Fair, National Horticulture Fair and Shilp Gram Fair
- Cycle-Marathon, Surat
- Tapi Boat Festival, Surat

TIMELINE	Medium Term (2017-2020)	■■■□□
STATUS	-	
CITY LINKAGES	Vejle	
STRATEGY LINKAGES	6.2.6	

Promoting civic engagement

OBJECTIVE — To encourage and strengthen civic engagement and participation in city decision making and future planning process.

BRIEF

Civic engagement will be encouraged where citizens or their representatives from the city will be able to engage and influence development processes, so that they can achieve larger civic objectives and goals. Civic engagement initiated during the Smart City program will be strengthened by the following activities:
- Hold public debates on key developmental issues;
- Organize city center presentations on upcoming projects;
- Conduct online and offline opinion polls on new initiatives; and
- Start a Citizen Collaboration Center.

OWNERS

- Urban Community Development, Surat Municipal Corporation
- Surat Smart City Development Limited

SUPPORTERS

- Surat Climate Change Trust
- Center for Social Studies

ALIGNMENT

- Smart City Program
- AMRUT Program
- Surat Municipal Corporation Mobile Application

TIMELINE	Short Term (2017-2018)	■□□□□
STATUS	New	
CITY LINKAGES	Byblos	
STRATEGY LINKAGES	6.2.5	

Heritage restoration

OBJECTIVE To restore and redevelop the heritage and cultural landmarks of the city.

BRIEF

The city of Surat is endowed with a rich architectural heritage that is vital to the identity of the city. Two years ago, on World Heritage Day, the SMC had announced a heritage policy and promised to protect the heritage buildings in the city, for which it set up a heritage cell. Under the heritage policy, 2,417 properties in the old city and 574 in the old village of Rander, which were 80-years-old or more, were identified for conservation efforts. To support this initiative and achieve the goal, the city will:

- Prepare and submit a proposal, for the restoration and redevelopment of heritage sites, to the Archaeological Survey of India, and also to key business groups for restoration and redevelopment funding under their corporate social responsibility programs;
- Develop a website dedicated to heritage issues, and have brochures and pamphlets to promote the heritage locations; and
- Develop video and audio documentaries on Surat-specific heritage locations.

OWNERS

- Surat Municipal Corporation, Surat
- Urban Community Development Center

SUPPORTERS

- The Archaeological Survey of India, Vadodara
- Indian National Trust for Art and Cultural Heritage, New Delhi
- Surat Climate Change Trust, Surat
- Center for Social Studies, Surat

ALIGNMENT

- Draft Heritage Policy, 2011
- Heritage City Development and Augmentation Yojana

TIMELINE	Medium Term (2017-2020)
STATUS	New
CITY LINKAGES	Byblos
STRATEGY LINKAGES	6.2.5

Heritage walks in Surat

OBJECTIVE To create awareness among citizens of the historic value of the city and encourage local communities to conserve and preserve their own heritage and inculcate a sense of pride and appreciation among them.

BRIEF

Heritage walks/heritage trails will be an innovative way to encourage citizens and tourists to better understand the local cultural, natural, social, and historical importance of the city. Various walks/trails will be designed and organized to help people understand the importance of key locations and neighborhoods across the city. Some interesting itineraries could include:

- Cemetery walks (Dutch, American, English);
- Fort area walk;
- Dumas heritage walk; and
- Hope bridge walk.

The city will link this with the heritage website and will promote these walks/trails.

OWNERS

- Surat Municipal Corporation, Surat
- Urban Community Development Center

SUPPORTERS

- The Archaeological Survey of India, Vadodara
- Indian National Trust for Art and Cultural Heritage, New Delhi
- Surat Climate Change Trust, Surat
- Center for Social Studies, Surat
- Architecture College, SCET, Surat

ALIGNMENT

- Draft Heritage Policy, 2011
- Heritage City Development and Augmentation Yojana

TIMELINE	Short Term (2017-2018)
STATUS	Ongoing
CITY LINKAGES	Byblos
STRATEGY LINKAGES	6.2.4

Celebration of Surat day

OBJECTIVE — To plan and celebrate Surat Day to bring more citizens together at one location

BRIEF

One day in the calendar year will be declared as 'Surat Day'. This day will be celebrated across the city, centered around the river Tapi. It could also be announced as the Tapi Festival. This will attract Surtis to one location and bring them together for a celebration. This will also attract people from outside the city. Various events could be planned on this day to encourage public, private, and government collaborations.

OWNERS

- Urban Community Development Center, Surat Municipal Corporation

SUPPORTERS

- Surat Climate Change Trust
- Center for Social Studies, Surat
- Traffic Cell, Surat
- CBOs & NGOs

ALIGNMENT

- Existing projects of Surat Municipal Corporation

TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	Vejle, Pittsburgh
STRATEGY LINKAGES	6.2.2

Pedal for social cause

OBJECTIVE — To plan and organize cyclothon and marathon events in Surat to create awareness about social causes and issues.

BRIEF

Cyclothon and marathon events can be aligned with ongoing and planned events by national, state, or local governments. Surat can plan and organize cyclothon and marathon events to create awareness about various social issues, including the following: Disease-free Surat, Sugar-free Surat, Tobacco-free Surat, Clean Tapi, Clean Air, Clean Dumas, Communal Harmony, Civic Sense, etc.

OWNERS

- Urban Community Development Center, Surat Municipal Corporation

SUPPORTERS

- Surat Climate Change Trust
- Center for Social Studies

ALIGNMENT

- Department of Social Justice & Empowerment, Surat
- U-turn, Surat
- Happy Street, Surat
- Cycle Club, Surat

TIMELINE	Short Term (2017-2018)
STATUS	New
CITY LINKAGES	-
STRATEGY LINKAGES	6.2.2

Urban Health Center, Surat
Photograph Credit: TARU, India

Emerging Issues:

- Access to general health care
- High cost medical services
- Lack of Affordable health care
- Health care facilities in emergency

We share these challenges with

San Francisco | New York | New Orleans |
Mexico City | Vejle | Da Nang | Semarang

For supporting
reference documents,
please click or scan.

PILLAR 07

UPSCALING OF PUBLIC HEALTH

Platform Partner

Save the Children

Resilience Incubator

UHCRC
URBAN HEALTH & CLIMATE
RESILIENCE CENTER

Urban Health and
Climate Resilience Center
(UHCRC), SCCT, Surat

BACKGROUND

Public health is a major concern for a tropical city such as Surat. Located in a nearly flat coastal terrain, Surat was once infamous for vector- and water-borne diseases. The seasonality of vector-borne diseases is likely to change, and the disease transmission period is likely to expand, due to increases in temperatures and changes in the humid seasons. Many health sector studies raise concerns on the changes in vector propagation and recommend conducting continued action research on climate and vector-borne diseases. This is especially important since this region is a malaria-endemic area and faces recurrent outbreaks of leptospirosis. Location, climate, and socio-demographic structure, coupled with the developmental activities of the city, are high risk factors for the breeding of vectors, as well as their ability to survive and spread infections.

Located on riverbanks and close to the sea, Surat has a number of water pools which are breeding sites for mosquitoes. Climate change, increasing population, high in-migration, change in land use, and inaccessible services such as water supply, sewerage, and solid waste create an environment that could lead to an increase in vector-borne diseases.

The SMC is aware of the situation and is already putting in place clean city initiatives, including monsoon preparedness to avoid problems. Surat is also known for its knowledge and experience in managing malaria cases. Various health sector studies have highlighted the near-extinction of filarial diseases due to the extension of underground sewerage across the city, which shows that the efforts of the ULB have worked. Similarly, malaria is under control due to a strong citywide monitoring system, which includes urban health centers. Mosquito vector control measures, such as door-to=door monitoring to prevent breeding, a system of fines/penalties, and fogging further reduce the chances of the disease occurring.

RESILIENCE ISSUES

High Cost Medical Services: There are many government and private health care centers, but the critical medical services are very expensive and therefore less accessible to low income populations. Increase in the quality of medical services for these segments is needed.

Children in low-income settlement
Photograph Credit: TARU, India

GOAL 7.1
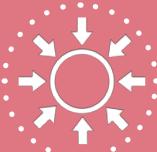
RESEARCH ON HEALTHIER CITIZENS IN HEALTHIER CITIES

Orientation

Research

Shocks and Stresses

- Migration influx
- Heat wave, cold wave
- Extreme rainfall
- Disease outbreak

Center of excellence for urban health & climate resilience

OBJECTIVE | To establish a Center of Excellence (COE) for Urban Health and Climate Change, which will conduct actionable research for urban health and climate change trends.

BRIEF

Surat has an Urban Health and Climate Resilience Center (UHCRC), which has been participating actively in urban health issues and research. This initiative should be sustained, and the UHCRC developed as a Center of Excellence with support from academic partners. The scope of actionable research for the COE will cover integrated emergency medical care network, skill training modules, climate change and urban health, noncommunicable diseases including malnutrition, food safety and security, equity-focused urban health care services, climate and health, coastal city vulnerability assessment and adaptation plans, and creating a child-friendly resilient city.

OWNERS

- Health Department, Surat Municipal Corporation
- Urban Health and Climate Resilience Center

SUPPORTERS

- Surat Climate Change Trust
- Surat Municipal Institute of Medical Education and Research

ALIGNMENT

- Health Department of Surat Municipal Corporation
- Urban Health and Climate Resilience Center

TIMELINE	Medium Term (2017-2020)
STATUS	-
CITY LINKAGES	Rio de Janeiro, Rotterdam, New York
STRATEGY LINKAGES	-

Urban health climate observatory

OBJECTIVE To develop urban health and climate change information systems to monitor health care scenarios and climate trends.

BRIEF

The city will develop an urban health and climate information system, with real-time data, under the urban health climate observatory. This is an evidence-based health management system and services for sustained climate science research program that improves capacity, communication, and societal understanding, thus helping to reduce morbidity and mortality due to extreme climatic conditions. The system will provide Surat city-specific real-time climate data and impact indicators to support the health sector infrastructure operating in the city. The system will be technology-supported; it will have updated information and alerts. It can be developed and managed by an external technical expert unit.

OWNERS

- Health Department, Surat Municipal Corporation
- Urban Health and Climate Resilience Center

SUPPORTERS

- Surat Climate Change Trust
- Surat Municipal Institute of Medical Education and Research

ALIGNMENT

- Existing efforts of Health Department of Surat Municipal Corporation

TIMELINE	Medium Term (2017-2020)
STATUS	-
CITY LINKAGES	Rio de Janeiro, Rotterdam, New York
STRATEGY LINKAGES	-

Urban health & climate resilience skill laboratory and promotion centre

OBJECTIVE To establish training and capacity building, set up under the Urban Health and Climate Change Promotional Center for skill development.

BRIEF

The Health and Climate Resilience Skill Laboratory will be a multistakeholder set-up for urban practitioners. The Centre will provide the formal and informal training programs. It will also serve as a health promotion center for community-level health awareness and education display (as a museum), for knowledge transfer, and awareness at institutional as well as community level. The Centre will also promote extensive education efforts and build outreach workers' capacity in the urban health sector. It will perform as community participation consortiums at different levels such as academicians, citizens, schools, urban agriculturists, to generate urban health awareness.

OWNERS

- Health Department, Surat Municipal Corporation
- Urban Health and Climate Resilience Center

SUPPORTERS

- Surat Climate Change Trust
- Surat Municipal Institute of Medical Education and Research

ALIGNMENT

- Existing efforts of Health Department of Surat Municipal Corporation

TIMELINE	Medium Term (2017-2020)
STATUS	-
CITY LINKAGES	Rio de Janeiro, Rotterdam, New York, New Orleans
STRATEGY LINKAGES	-

CHAPTER

4

WAY FORWARD

Way Forward

Surat, prima facie would work upon the prioritization of the initiatives. Based on time frame and priority, initiatives will be implemented in the city. Despite being financially more independent compared with many other cites, Surat still has to depend on State and Central finances for various developmental projects. To incorporate resilience in not only the existing but forthcoming city-level projects as well and to leverage funds, the resilience strategy suggests developing synergy with ongoing and planned programs. The prioritization of the initiatives would thus help in aligning with the State or Central on going policies. The resilience strategy includes plans to inform and influence State and National level stakeholders through sharing the lessons learned from the city resilience interventions.

Therefore, developing a series of resilience informed, ready to use DPRs will be important for the city to access funds and other resources from various programs as and when the opportunities arise. These DPRs will empower the city to leverage resources for building resilience as well as develop capacities to appreciate resilience. Inputs from International and National platform and strategic partners and best practices will be useful for developing sector-specific DPRs. 100RC network has provided the cities, at large with refined, prestigious and excellent expertise platform partner and expert advisors to be associated with and helping the city connect with them. Identifying and approaching the platforms partners and expert advisors would be a next step further to help city implement its resilience initiatives with peer interested partners.

Currently, the city largely depends on National and State Government funding, apart from local sources. Surat has a wide spread economic sector, with which innovative ideas could be adopted to raise resources with public private holdings. Identifying the resources would align the city towards Spear Heading implementation of the resilience initiatives.

The best way forward is to align the city with the hierarchy of the initiatives with their importance and the level of implementation period while connecting it with the platform partners, advisors, identified funds and resources with local, state or central policies. As rightly said, now this is not the end; it is not even the beginning of the end. But it is, perhaps, the end of the beginning.

GLOSSARY:

Chief Resilience Officer—The driver and principal owner/author of the city's resilience strategy.

Field of opportunity—The range of initiatives a city could undertake to build resilience, generated in the strategy process and assessed at the end of Phase II.

Discovery area – Important areas for discovery during Phase II activities of the resilience strategy.

Discovery working group—Various individuals representing diverse, multidimensional stakeholder interests from within and outside of city government who contribute their time, and expertise to conduct analysis in Phase II of the resilience strategy

Phase II—Building on the mobilization and analysis of Phase I. In Phase II, the CRO will partner with diverse and interdisciplinary teams and platform partners to explore the challenges and innovate solutions generating from the city's defined discovery areas.

Platform partner—Partners from private, public, academic, and non-profit sectors who have agreed to provide 100RC member cities with free access to resilience-building tools, services, and technical assistance.

Preliminary resilience assessment—Establishes a baseline understanding of the city's strengths and weaknesses using a holistic understanding of resilience as described in the City Resilience Framework.

Resilience lens—An analytical framework to evaluate options and ensure city actions achieve multiple positive outcomes while mitigating negative consequences.

Resilience strategy—A tactical roadmap to build resilience in the city. The strategy articulates the city's resilience priorities and specific initiatives for short, medium, and long-term implementation.

Risk—A function of the likelihood/probability of a shock or stress combined with the consequence of the shock or stress.

Scope of work—An outline of the customized approach, methods, and roles and responsibilities of the CRO, city, strategy partner, and other partners for Phase II of the strategy development process.

Stakeholder—Individuals and groups within and outside of city government with the influence or capacity to build resilience; representatives of diverse interests and needs of the civic, private and public sectors

Steering committee—A small group of high-level multisector decision-makers responsible for overseeing the governance and support of the resilience strategy.

Strategy—The overall collection of priorities, initiatives and action plans that the CRO and stakeholders will identify and implement to build resilience in the city.

Strategy partner—The consultant team hired by 100RC to support the CRO through the strategy development process.

Working team—The team responsible for the day-to-day tasks to carry out the resilience strategy development process. This team, at minimum, includes the CRO, strategy partner and 100RC relationship manager.

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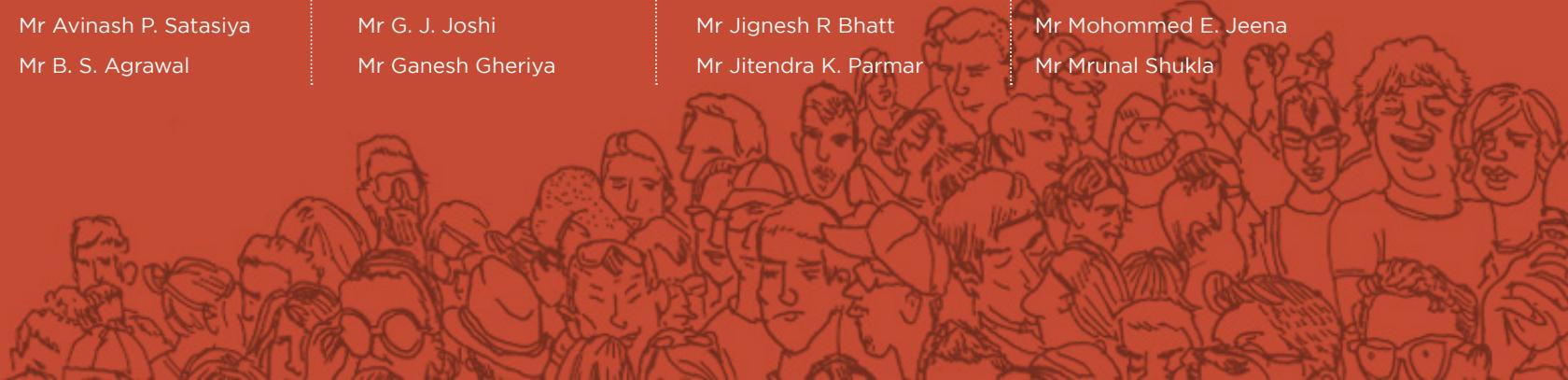
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