



Varanasi: Innovating Crowd Flow Entrant Handbook

JUNE 2024

Foreword

Movement is at the heart of every city

Welcome to the Sustainable Cities Challenge Varanasi! This handbook will guide you in preparing your entry. It lays out everything you need to know.

This is an opportunity for innovators interested in changing how people move around a city, specifically around crowd flow management. This challenge is open to many different possibilities. From blending expertise such as tech, psychology, urban planning, and economics to harnessing new technology or tech combinations, the City of Varanasi offers a unique and varied mobility and cultural landscape for innovators to explore.

The challenge is designed to support you to develop a long-lasting and impactful solution. Participating in the challenge will give you access to grants, city leaders, mobility stakeholders, networking with fellow innovators, and specialized training as well as the opportunity to demonstrate and implement solutions in real-world contexts.

In this handbook, you'll find out more about the challenge, its structure, goals, and how to go about entering.

We wish you all the best as you prepare your entry!
The Sustainable Cities Challenge Team

Contents

This document, along with the [Frequently Asked Questions \(FAQs\)](#), [Terms & Conditions](#), and [Privacy Policy](#), will provide you with all the information you need to enter the Sustainable Cities Challenge Varanasi.

Should you have any questions after reading this handbook, please feel free to contact the Sustainable Cities Challenge team at info@sustainablecitieschallenge.org.

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1. Introduction

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1.1 Who Is Involved?



Toyota Mobility Foundation (TMF)
Funder & Lead Delivery Partner

TMF was established in August 2014 by the Toyota Motor Corporation (Toyota) to support the development of a more mobile society in which everyone can move freely. The Foundation underscores Toyota's ongoing commitment to continuous improvement and respect for people.

Find out more at toyotamobilityfoundation.org



The City of Varanasi
Host City

Varanasi is one of the oldest and continuously inhabited cities in the world and is home to many heritage sites. Situated on the banks of the sacred river Ganges in the Indian state of Uttar Pradesh, Varanasi holds immense spiritual, cultural, and historical significance for people from different faiths. 84 ghats dot the bank of the Ganges that witness rituals important rituals daily. A large number of Indian and global tourists flock to the city every year.

Find out more at nnvns.org.in



Challenge Works
Delivery Partner

Challenge Works is a global leader in designing and delivering high-impact challenges that incentivize cutting-edge innovation for social good. challenge Works is a social enterprise founded by the UK's innovation agency Nesta. They have run more than 86 prizes, distributed £124 million in funding, and engaged with more than 12,000 innovators.

Find out more at challengeworks.org



World Resources Institute (WRI)
Delivery Partner

World Resources Institute (WRI) is a global research organization that works with governments, businesses, multilateral institutions and civil society groups to develop practical solutions that improve people's lives and ensure nature can thrive.

Find out more at wri.org



89up
Public Relations & Marketing

89up was founded with a clear mission: to create a powerful integrated communications agency for the world's most important causes. 89up is now the global market leader in creating impact for NGOs.

Find out more at 89up.org

1.2 How to Use This Handbook

- This handbook aims to support anyone interested in entering the challenge. It contains key information you will need to enter, including:
 - The background and objectives of the challenge.
 - The challenge structure and timeline.
 - Who can enter, and the entry process.
- You can read sections of this handbook independently, but we recommend that you read the entire handbook before you enter the challenge.
- In addition, you will need to read these two resources on our website before entering the challenge:
 - [Frequently Asked Questions \(FAQs\)](#)
 - [The Terms & Conditions of participating in the challenge](#)
 - [Privacy Policy](#)

If you have read the handbook and the Frequently Asked Questions and have more questions, please contact the team at info@sustainablecitieschallenge.org.

This entrant handbook covers the Sustainable Cities Challenge **Varanasi** exclusively. If you are interested in the Detroit or Venice Challenges, please visit [our website](#) for more information.

2. About the Sustainable Cities Challenge Varanasi

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2.1 The Problem

Varanasi, situated along the banks of the Ganges River in northern India, holds profound spiritual significance. Its allure transcends borders, drawing tourists from across the globe throughout the year.

Large volumes of people visit Varanasi's old city of Kashi every year for pilgrimage, end-of-life activities, funerals, and other religious and cultural activities. In 2022 the annual floating population was estimated to be 35x the local population. This number is expected to grow year on year.

Kashi's narrow, winding lanes make it difficult to build infrastructure to accommodate the influx of people. Plus, a growing number of private vehicles need to navigate these lanes to sustain daily life and enable economic activities. This contributes to a complex environment prone to crowding. As a result, Kashi is immensely crowded, particularly around holy festivals, like the Kumbh Mela scheduled for 2025.

Varanasi seeks to attract pioneering solutions that will enable more effective crowd management, and in doing so position the city as a global success story.



2.2 Why do we need innovation?

How can we ensure that the crowded areas of Kashi are safer and more accessible for religious tourists, residents, and vulnerable populations, without harming the character of Kashi, obstructing individuals' abilities to enact religious and spiritual activities, or making major changes to infrastructure?

The city authorities collect a significant amount of data in the form of CCTV footage and are seeking support to leverage this data to create new and more effective approaches to crowd-flow management.

With plans in place to improve infrastructure to access Varanasi, specifically the old city of Kashi, the city foresees an increase in the annual tourist footfall. Initiatives around tourist passes and cable car routes are planned for development over the next few years, as well as the creation of a new temple corridor. However, changes to wider physical infrastructure will be challenging and unlikely to be possible.

Solutions are being sought to support the city authorities, tourists, residents, and vulnerable groups to improve safety and accessibility in the crowded areas of Varanasi. There is an opportunity to leverage the cross-section of technology and urban design to ensure that solutions are multidisciplinary and fit for purpose within the context of Varanasi.

This creates the perfect ecosystem to nurture innovation.

What could an open innovation challenge change?

An open innovation challenge provides an opportunity to trial a range of solutions that address the problem from various angles.

The first stage of the challenge has been designed for innovators to engage with users and beneficiaries in the city, exploring their needs, building relationships, and starting to test appropriate solutions. It will conclude with a small-scale demonstration within the chosen precinct to engage the city with potential solutions.

The second stage will offer support for testing and implementation across an entire precinct to demonstrate impact and develop a strategy for scaling to the entire city (and beyond).

The final aim of the challenge will be to select winners who will then continue to implement their solutions in the City of Varanasi.

2.3 Challenge Statement

The challenge statement is our **call to action to innovators**. It articulates the challenge's aims and what we want entries to deliver, without predetermining what the solutions should look like. semi-finalists, finalists and, ultimately, our winners will be selected on the basis of how well they meet this challenge statement.

Create innovative, data-driven solutions that make crowded areas of Varanasi's old city of Kashi safer and more accessible for religious tourists, local residents and vulnerable populations (such as elderly people and people with disabilities).

Successful solutions might include:

- Tools that support the city to better manage overcrowding events
- Interventions that improve citizen decision-making
- Services that support vulnerable groups.

2.4 The City of Varanasi – target areas

Innovators will be required to **plot their solutions in the old city** and **demonstrate the impact of their solutions** on the city's capabilities of managing crowds, the ability of citizens and tourists to navigate through crowds, or the accessibility of vulnerable groups to visit the old city.

Two pilot precincts have been identified in the old city with similar characteristics, road network profile, and land-use. These precincts span roughly half a kilometer with the boundaries defined along the banks of the Ganges River. Innovators need to pick one precinct to tailor their solutions. Successful entries will pilot their solutions in their chosen precinct. The details of the pilot precincts are provided later in this handbook.

Download the [precinct spatial data](#)
(you will be given access within 2 working days)

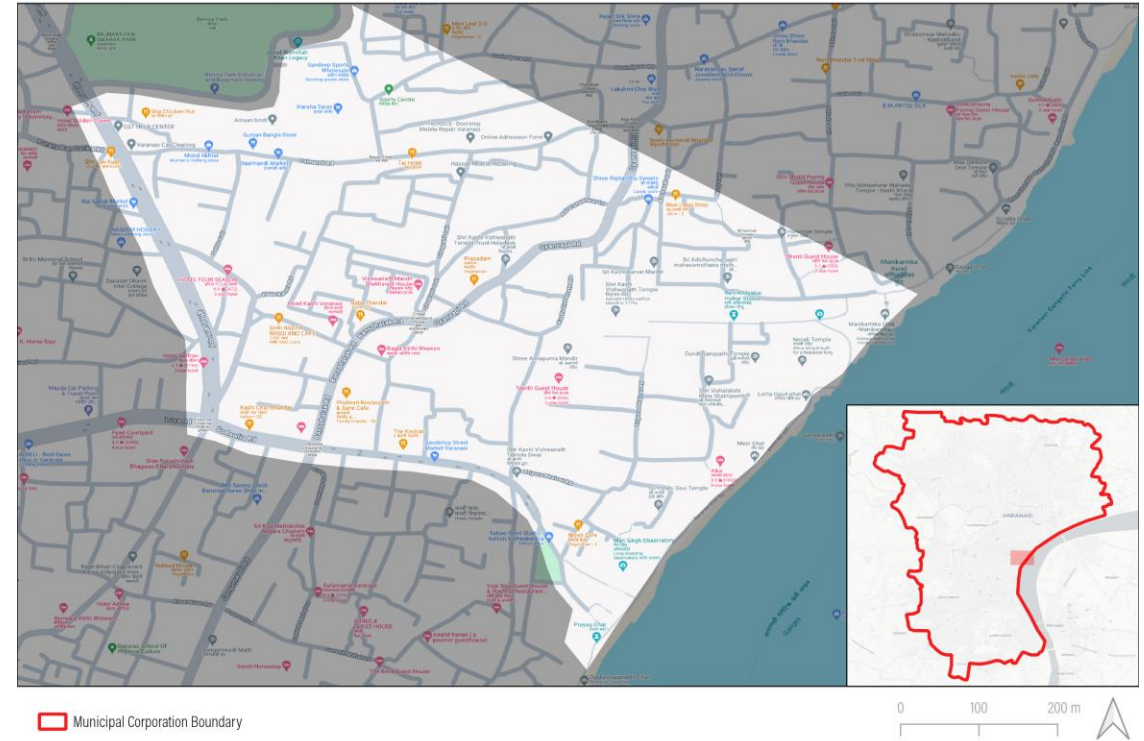
2.4 The City of Varanasi – Target areas continued

Download the [precinct spatial data](#)
(you will be given access within 2 working days)

Godowlia Precinct

This precinct stretches from Manikarnika Ghat to Prayag Ghat. It covers a total of 8 ghats, including the two boundary ghats mentioned above, along the banks of the river Ganga. It spans an area of 0.47 sq km. Manikarnika Ghat also called the burning ghat is an important cremation ground in the city and holds spiritual significance. This precinct includes the main and busy market area of Godowlia. The main market street forms the boundary to the south. Benia Bagh Road and Beniya Park form the boundaries to the west and the northwest of the precinct. Cameras are installed at 28 locations that give good coverage of important entry/exit points.

The built environment is dense with predominantly mixed land-use (33.5%). Residential units blend with commercial activities along the narrow lanes. The road network is also moderately dense. The total length of roads in this precinct adds up to 19 km – around 15 km of that are narrow lanes less than 3 meters in width. The city administration maintains most (17.1 km) of these roads while the Public Works Department maintains the remaining few.



Land use code	Percentage of total land use	Right of Way width category (meters)	Total length (km)
Residential (01)	47.3%	1-3	19.6
Mix use (09)	17.3%	3-10	2
Private vacant plot (07)	8.4%	10-15	1.1
Garden/Park (13)	5.2%	15-20	0.9
Religious (11)	4.5%		

2.4 The City of Varanasi – Target areas continued

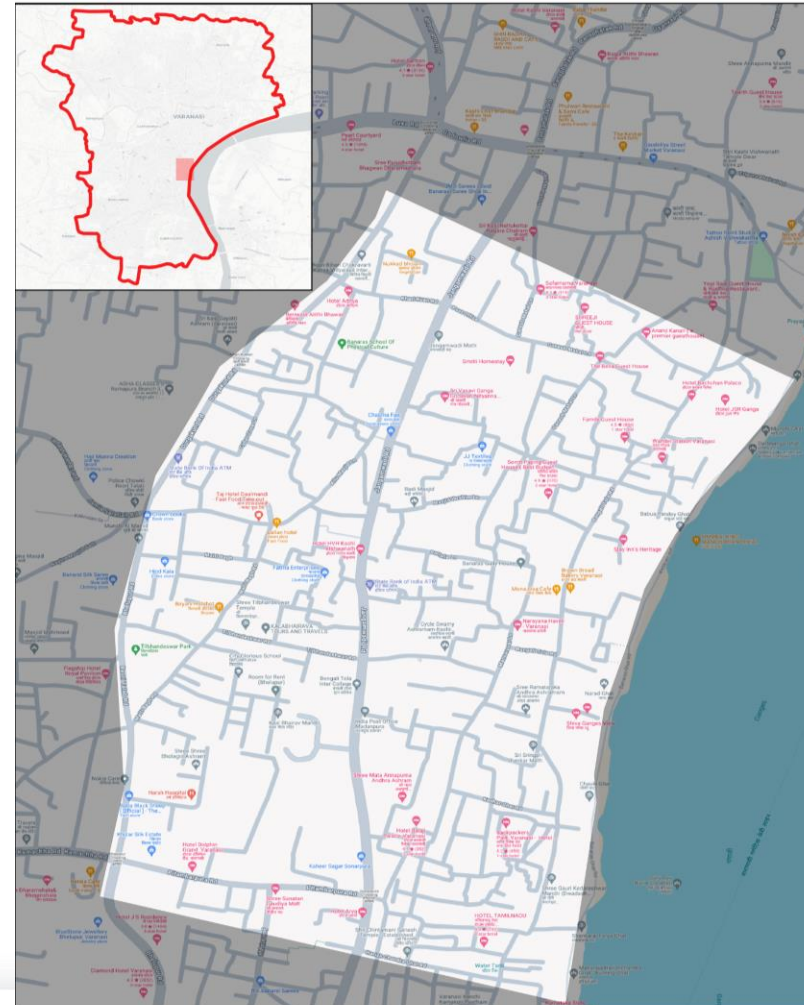
Download the [precinct spatial data](#)
(you will be given access within 2 working days)

Dashashwamedh Precinct

This precinct starts south of the Godwolia Precinct and stretches from Dashashwamedh Ghat to Harishchandra Ghat. Dashashwamedh is known for its famed weekly Ganga Aarathi ritual which attracts hundreds of locals and tourists.

This precinct covers 19 ghats including the boundary ghats along the banks of the river Ganga. It spans an area of 0.66 sq km and is bounded to the west by Bhelupur Road/Durgakund Road, while to the south it stretches just beyond Pitambarpura Road. The precinct has 29 cameras installed at different locations.

The precinct has a dense residential land use with over half of the area covered by residential establishments. However, a significant portion of these residential structures also have commercial establishments. The road network adds up to 29.1 km with a large share of lanes 3 meters or less. Like in the other precincts, most (26.2 km) of these roads are maintained by the city administration and some by the Public Works Department (PWD).

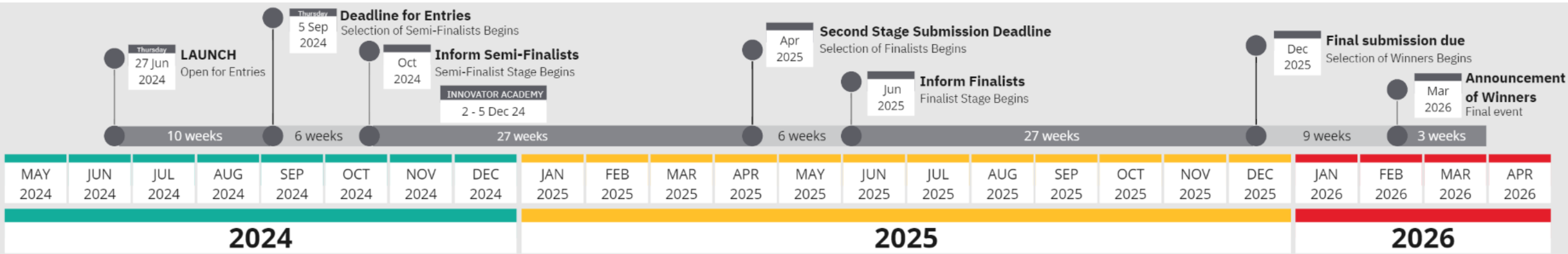


Land use code	Percentage of total land use
Residential (01)	52.4%
Mix use (09)	23.1%
Educational (10)	7.2%
Undefined (28)	5.6%
Religious (11)	4%
Commercial/Non-residential (03)	3%

Right of Way width category (meters)	Total length (km)
1-3	23.8
3-10	5.1
10-15	0.2

2.5 Structure & Timeline

Below is an overview of the timeline and structure of the Sustainable Cities Challenge Varanasi.



	Semi-finalist Stage	Finalist Stage	Winners
WHO	Up to 10 semi-finalists	Up to 5 finalists	Up to 3 winners
WHEN	November 2024 to March 2025 Contracting: To participate in the Challenge, you will be expected to sign an innovator agreement within one week of receiving the agreement	May 2025 to December 2025	March 2026 onwards
WHAT	A grant of \$50,000 <u>each</u> Solution Development & Relationship Building	A grant of \$130,000 <u>each</u> Solution Demonstration & Refinement	\$1.5 million <u>shared*</u> Implementation of Solution

**The \$1.5 million implementation grant will be shared among up to three winners. The exact allocation between winners will be determined during selection of the winners.*

All funding must be used to develop, test, demonstrate, and implement your solutions in the City of Varanasi.

The final implementation grant must also be used to scale the solution. As part of their final submission, each finalist will put forward ideas for what this implementation would look like for their particular solution, with input and discussion with TMF.

2.5 Structure & Timeline

Below is an outline of the key stages, as well as the financial support and in-kind support that will be provided to participating innovators

	Semi-finalist Stage	Finalist Stage	Winners
WHO	Up to 10 semi-finalists	Up to 5 finalists	Up to 3 winners
WHEN	November 2024 to March 2025 Contracting: To participate in the Challenge, you will be expected to sign an innovator agreement with TMF within one week of receiving the agreement	May 2025 to December 2025	March 2026 onwards
WHAT	<p>A grant of \$50,000 each If selected, you will need to attend an in-person onboarding and innovator academy in Varanasi from December 2-5, 2024.</p> <p>Solution Development & Data Collection:</p> <ul style="list-style-type: none"> • On-site testing, user engagement and understanding, and incorporating these insights into solution designs. • Relationship building and making connections to facilitate solution development in the next stage. • Baseline data and impact planning • Planning for the solution development and refinement during the finalist Stage. <p>Support that will be available:</p> <ul style="list-style-type: none"> • In-Person Innovator Academy: will involve introductions and access to key stakeholders, visits to key sites, and support sessions. • Tailored capacity building on topics such as impact and monitoring, human-centered design, or more depending on innovator needs. • One-to-one sessions with Precinct mentors sharing local contexts and facilitating engagement with key stakeholders. • On-Site Testing support (securing permissions). 	<p>A grant of \$130,000 each</p> <p>Solution Demonstration & Refinement:</p> <ul style="list-style-type: none"> • Continued user testing and engagement (for example utilizing human-centered design approaches) • Iterative development: Using insights and feedback gained from demonstration and testing to iteratively refine and enhance the solution. • Impact monitoring • Planning for implementation of the solution if selected as a winner. <p>Support that will be available:</p> <ul style="list-style-type: none"> • Tailored capacity building on topics such as impact and monitoring, human-centered design, or more depending on innovator needs. • One-to-one sessions with Precinct mentors sharing local contexts and facilitating engagement with key stakeholders. • Demonstration support (securing permissions). 	<p>\$1.5 million shared Implementation of Solution</p> <ul style="list-style-type: none"> • Implementation of solutions in Varanasi, working with TMF and the City.
OUTCOME	<p>Semi-finalists will be required to submit a demonstration plan that:</p> <ul style="list-style-type: none"> • Presents progress and findings from the development of their solution. • Outlines plans and next steps for solution demonstration and refinement <p>We will also hold a marketplace event where solutions are demonstrated in person – details to be confirmed upon selection.</p> <p>Technical reviewers and judges will review and score achievements against the judging criteria and select the finalists.</p>	<p>Finalists will be required to submit an implementation plan that:</p> <ul style="list-style-type: none"> • Presents progress and findings from the development of their solution • Outline plans and next steps for implementation (TMF and the City will provide guidance on this during the challenge). <p>We will also hold a Marketplace Event where solutions are presented to high-ranking City officials, the State, and investors – details to be confirmed upon selection.</p> <p>Technical reviewers and judges will review and score achievements against the judging criteria and select the winners.</p>	<p>Winning solutions are scaled in the City of Varanasi.</p>

2.6 Key Dates

The table below outlines the key milestones and corresponding dates for the Varanasi Challenge. Entrants must ensure they are available to participate at every point in the challenge.

Milestone	Dates
Challenge launch (open to receive entries)	Thursday June 27, 2024
Entry deadline	Thursday September 5, 2024
Up to 10 semi-finalists selected	September to October 2024
Semi-finalist stage Solution Development & Relationship Building	November 2024 to March 2025
Innovator Academy (in-person)	December 2-5, 2024
Semi-finalists submit demonstration plans	Late April 2025
Up to 5 finalists selected	June 2025
Finalist stage Solution Demonstration & Refinement	June to December 2025
Finalists submit implementation plans	Early to Mid to December 2025
Up to 3 winners selected	Late February to Early March 2026
Public Announcement	March 2026
Winners implement solutions	March 2026 onwards

3. Entering the challenge

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3.1 Eligibility Criteria

The eligibility criteria articulate who can enter the challenge and the conditions they will need to meet to be eligible. If you do not meet the criteria below your entry to the challenge will not be accepted.

- The solution must be tailored specifically for and implemented within Varanasi's old city of Kashi.
- Entrants can be single organizations or consortia.
- Teams that enter as a consortium must nominate one organization as the lead entrant. The lead entrant will enter into contracts and receive funding from the Toyota Mobility Foundation.
- Entrants must be established as a legally incorporated organization to enter.
- Entrants must have a presence in India (if a consortia, at least one company must have a presence in India)
- The challenge is open to innovators worldwide, but entries must be in English.
- Successful entrants must be willing and able to travel to the city of Varanasi as there will be expectations for on-the-ground presence during the next stage of the challenge.
- Entrants must be able to work with local government.
- Entrants must own or be licensed to use relevant intellectual property included in their entries. If your entry proposes a new idea, we expect that you will own all the resulting intellectual property, which may be registered on a local basis if you become a successful participant in the challenge. The challenge will not be able to give you specific legal advice on the protection or exploitation of intellectual property.

3.2 Judging Criteria – Overview

Below is an overview of the criteria that will be used to assess and select the semi-finalists, finalists, and eventually the winners.

Innovation	Effectiveness	Data	Viability	Team Capacity
The solution is different from what has been tried in Varanasi before; it is tailored to the unique needs of the city and takes a creative multi-disciplinary approach to addressing the problem.	The solution significantly and tangibly increases the safety and accessibility of crowded areas of Varanasi's old city of Kashi for the target groups.	The solution is data-driven and evidence-based .	The solution is viable beyond the life span of the challenge. The solution is future-proofed , accounting for the evolving nature of the city. The solution has the potential to scale or to be replicated in other contexts.	The innovator team has the capacity and wider resources to develop and demonstrate their solution within the challenge timeframe.

3.2 Judging Criteria – Selection of semi-finalists

Below is more detail on what the judges and assessors will be looking for as they assess entries and select the semi-finalists.

Innovation	Effectiveness	Data	Viability	Team Capacity
<p>The solution is different from what has been tried in Varanasi before; it is tailored to the unique needs of the city and takes a creative multi-disciplinary approach to addressing the problem.</p>	<p>The solution significantly and tangibly increases the safety and accessibility of crowded areas of Varanasi’s old city of Kashi for the target groups.</p>	<p>The solution is data-driven and evidence-based.</p>	<p>The solution is viable beyond the lifespan of the challenge. The solution is future-proofed, accounting for the evolving nature of the city.</p> <p>The solution has the potential to scale or to be replicated in other contexts.</p>	<p>The innovator team has the capacity and wider resources to develop and demonstrate their solution within the challenge timeframe.</p>
<p>The entry demonstrates:</p> <ol style="list-style-type: none"> 1. The proposed solution is expected to be novel, compared to what has been tried in Varanasi before. 	<p>The entry demonstrates:</p> <ol style="list-style-type: none"> 1. The proposed solution has the potential to significantly and tangibly increase the safety and accessibility of crowded areas of Kashi for the target groups. 2. The proposed solution identifies KPIs to assess safety and accessibility, against which the impact of the solution will be measured through the semi-finalist Stage. 3. An initial understanding of the needs, preferences and behaviors of intended users and beneficiaries. 4. A clear and feasible plan to engage with users and beneficiaries to build a better understanding of their needs, preferences, and behaviors 	<p>The entry demonstrates:</p> <ol style="list-style-type: none"> 1. A clear presentation of the data that will be used to develop the solution & how additional data will be collected through the semi-finalist Stage if required. 2. A long-term approach, with consideration of how solutions can adapt to the evolving context of the city (e.g. increased tourism, changing behavior patterns or new infrastructure). 	<p>The entry demonstrates:</p> <ol style="list-style-type: none"> 1. A clear and realistic business or operational model that outlines a pathway to financial sustainability 2. The potential to be scaled or replicated in other contexts 3. A realistic plan to develop, further test and implement the solution within the challenge timeframe. 	<p>The entry demonstrates:</p> <ol style="list-style-type: none"> 1. Adequate availability, or a realistic plan to ensure adequate human resources, equipment, technology, or other resources required to develop, test, and demonstrate the solution. 2. The availability of, or a realistic plan to ensure the relevant expertise and skills required to develop and demonstrate their solution. 3. A plan to leverage any required partnerships, networks, or collaborations, which may enhance the team’s ability to develop and demonstrate their solution. 4. The team is either currently able to work in the City of Varanasi (meeting legal and regulatory requirements) or has a realistic plan to do so by the end of the semi-finalist Stage. 5. The team’s plans to visit the city as and when necessary for the demonstration and pilot testing.

3.3 Entry Process

To enter the challenge, you must submit an entry via the online form. **The deadline for submitting your entry is 18:30 IST (13:00 UTC) on Thursday September 5, 2024.** We will not be able to accept any entries after this time. If you are entering as a consortium, the lead organization will need to submit the form.

Before submitting your entry, please ensure that:

- You have read and understood the [Terms & Conditions](#) and [Privacy Policy](#)
- You meet the eligibility criteria (see page 18 of this handbook)
- Your entry is aligned with the challenge statement (page 11 of this handbook) and judging criteria (pages 19-20 of this handbook).

You can download a PDF of the entry form using the link provided in this handbook. However, please note that only entries submitted through the online form will be accepted.

If you have any questions about the challenge or the entry process, please send them to us at info@sustainablecitieschallenge.org by **August 29, 2024**. After this date, we may not be able to respond to you in time.

Need support with your entry?

We offer a range of support to help you as you prepare your entry to the challenge; visit [our website](#) to sign up for a webinar or book a one-to-one session with the team.

ENTRY DEADLINE:

**18:30 IST (13:00 UTC)
Thursday September 5, 2024**

[Link to the online entry form](#)

[Link to downloadable PDF entry form](#)

Remember that only entries submitted online will be accepted.

3.4 The Entry Form

[Link to the online entry form](#)

[Link to downloadable PDF of entry form](#)

ENTRY DEADLINE:

**18:30 IST (13:00 UTC)
Thursday September 5, 2024**

Remember that only entries submitted online will be accepted.

The Eligibility Form:

When you click on the **online entry form** you will first be directed to an **eligibility form**:

- The eligibility form will help you understand if you are eligible to enter the challenge. You must read and understand the eligibility criteria in full.
- Entries that do not meet the eligibility criteria will not be processed further and entrants will be informed accordingly.

The Entry Form

There are four sections in the entry form, and only one of these sections will be assessed against the judging criteria:

Entry Form Section	Details	How will this be assessed?
Part 1: Your Details	You will be asked for: <ul style="list-style-type: none">- Basic details about entering organizations.- The main point of contact and an alternate.	This section will <u>not</u> be assessed against the judging criteria. Information here may be used for due diligence processes and additional eligibility checks.
Part 2: Your Solution	You will be asked to explain your proposed solution, how it fits the challenge statement and the challenge judging criteria	This is the section that <u>will be</u> reviewed and scored against the judging criteria by assessors and judges.
Part 3: Additional Information	You will be asked to provide information that will help us with our impact reporting and due diligence checks.	This section will <u>not</u> be assessed against the judging criteria. It will help us to understand the challenge's impact and to conduct due diligence.
Part 4: Declaration	You will be asked to confirm that the information you have provided is true and correct to the best of your knowledge.	This section will <u>not</u> be assessed against the judging criteria.

4. Get in Touch

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Trouble submitting your entry?

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