

## COLLABORATION AND INNOVATION

**SIMON ARANGO-VELÁSQUEZ**

Smart Cities Leader, Ruta N Corporation,  
Medellín

**SOFÍA BOTERO-NIETO**

Smart Cities Professional, Ruta N Corporation,  
Medellín

**YESSICA GUTIÉRREZ-LÓPEZ**

Leader of the Think and Action Tank,  
Ruta N Corporation, Medellín

**SARA RAMÍREZ JIMÉNEZ**

Smart Cities Professional, Ruta N Corporation,  
Medellín

# Experimentation as an Asset for the Transformation of Territories



Aerial view of Medellín.  
Image: Ruta N

**Medellín, Colombia's second-largest city, has undergone a remarkable urban transformation. Fuelled by visionary leadership, bold decision-making, and a strong commitment to inclusive growth, Medellín has evolved from a city historically marked by deep social and economic challenges into a leader in science, technology, and innovation (STI) and a model for cities striving for sustainable urban renewal.**



**Medellín's efforts and commitment to collaborative innovation gained international recognition. Medellín has continued to strengthen its position as a regional technology powerhouse.**



## Introduction

Recognising the power of collaboration, Medellín has brought together successfully the public, private, and academic sectors to drive economic and social progress. The Medellín City Hall, Ruta N Corporation, and the University Network, alongside the Government and Productive Sector Committee (CUEE), have played a crucial role in creating a thriving environment for entrepreneurship, research, and technological advancement.

Medellín's status as Colombia's Special District of Science, Technology, and Innovation (STI) was founded on various pioneering technological, educational, and cultural projects. Amongst its achievements are the development of Colombia's unique transportation system and largest textile industry, along with investments in public libraries and library parks to bring educational resources, culture and knowledge to marginalised and underserved areas.

Medellín's efforts and commitment to collaborative innovation have gained international recognition. In addition to being named "the most innovative city in the world" by Citigroup and the Wall Street Journal in 2013, Medellín received the prestigious Lee Kuan Yew World City Prize in 2016 for its groundbreaking policies that enhance urban liveability and economic dynamism. The Australian agency, 2ThinkNow, also recognised Medellín as a knowledge hub for leading ICT research, development, and innovation processes in 2017.

Medellín has continued to strengthen its position as a regional technology powerhouse, with institutions like Ruta N and the Centre for the Fourth Industrial Revolution (C4IR Medellín) leading efforts to attract top-tier investment, accelerate AI adoption, and expand access to digital skills. These initiatives are not only key to driving technological advancements,

## Colombia's First Special District for STI: Establishing Medellín's innovation ecosystem

they also ensure that innovation benefits all communities—reinforcing Medellín's mission as a model city for urban resilience and sustainable development.

This article explores how Medellín's STI-focused vision and strategies—in particular, its open-air innovation hub and smart cities—have enabled the city to leverage creativity, partnerships, and technology to solve complex urban challenges, even with limited resources.

In 2021, when Medellín was designated Colombia's first Special District of STI, this status as a regional leader in technological and urban transformation allowed the city to establish Special Treatment Zones (STZs)—strategic areas designed to supercharge STI activities through tax incentives, business connectivity, and technology-driven economic development.

Global success stories, like Shenzhen in China, demonstrate the game-changing potential of STZs in transforming local economies and establishing cities as leading technology hubs. Through fostering the development and application of advanced technologies and research, these zones attract

investment, promote innovation, and enhance territorial competitiveness in science and technology.

For Medellín, STZs would act as engines of growth by attracting foreign investment, stimulating international trade, and enhancing competitiveness in cutting-edge industries.

Medellín established its first STZ, FutuMed, in the North Zone—an area with immense potential for urban and social revitalisation. Led by Ruta N, this initiative was designed to achieve two key objectives:

1. **10-Year Action Plan:** Focusing on five critical components—Economic Development, Infrastructure, STI Service



Medellín as an innovation leader: Special treatment zones as development hubs.  
Image: Ruta N Medellín



Medellín: epicenter of experimentation and knowledge



Solution to city challenges: A methodology aimed at generating well-being.  
Image: Ruta N Medellín

Future models will expand into areas such as health and education, to reinforce Medellín's role as a leader in STI experimentation and urban innovation.

Offering, Social Appropriation, and Governance Model—this plan serves as a roadmap for strengthening and consolidating the STZ. To function as a real-world testing ground for emerging technologies, FutuMed STZ will utilise this structured plan to transform public spaces into living labs for innovation—a model that can be replicated in cities worldwide.

## 2. Experimentation Methodology:

This promotes technology development and validation through community participation. Actively engaging local communities in developing innovative solutions will foster civic participation, cultural activation, and economic growth, ensuring that innovation drives both business success and social well-being. Three initial experimentation models have been launched:

- **Habit.4R:** Focusing on testing innovative technologies for residential environments and introducing smart home solutions for improving citizens' quality of life.
- **AirLab:** Focusing on providing infrastructure for experimenting with urban air mobility solutions, such as Urban Air Vehicles, for enhancing transportation efficiency.
- **ECOnecta:** Focusing on piloting sustainable mobility solutions, like electric vehicles, hydrogen transport systems and smart charging stations, for fostering clean and connected urban mobility.

Future models will expand into areas such as health and education, to reinforce Medellín's role as a leader in STI experimentation and urban innovation.

Urban needs are identified, in line with Medellín's STI and District Development Plans. Proposals are evaluated on their social, economic, and environmental impact, technical and financial viability, scalability, and innovation potential. Selected solutions undergo pilot testing.

### **Solution to City Challenges: a Methodology Aimed at Generating Well-being**

Having established STZs like FutuMed to foster advanced technological development and collaboration among businesses, academia, government, citizens, and international partners, Medellín was set to embark on its Smart Cities strategy. Embracing a dynamic methodology to identify and solve urban challenges using STI, this strategy unfolds across three phases:

1. **Planning:** Urban needs are identified, in line with Medellín's STI and District Development Plans. Challenges are prioritised based on potential impact, institutional alignment, and opportunities for applying emerging technologies.
2. **Selection and Contracting:** Proposals are evaluated on their social, economic, and environmental impact, technical and financial viability, scalability, and innovation potential.
3. **Execution:** Selected solutions undergo pilot testing to validate effectiveness and scalability. Pilots are evaluated based on citizen adoption rates and their capacity to drive structural changes within the city.

This Smart Cities strategy has resulted in innovation, sustainable development, and technology-based urban solutions, like CITIZEN 360 and GeoThreats Monitoring. Beyond technological advancements, Medellín's approach puts people at the centre, ensuring that innovation translates into real improvements in quality of life.

To illustrate:

1. **CITIZEN 360:** To enhance citizen interaction with public services, Medellín is developing an integrated platform that centralises local government services. This solution simplifies administrative processes and offers a more personalised, intuitive, and efficient user experience. By utilising data analytics and system interoperability, the platform tailors services to individual needs, incorporating continuous feedback mechanisms to drive improvements.

This initiative not only strengthens the relationship between citizens and the administration, it also fosters more transparent and efficient governance that prioritises citizen well-being.

### **2. GeoThreats Monitoring:**

As Colombia's first Special District of STI, Medellín is advancing urban resilience through technology-based risk management solutions. An intelligent monitoring system is being developed to anticipate and respond to natural disasters, like landslides, floods, and earthquakes. By integrating advanced sensors, data modelling, and predictive analytics, the system enhances early risk detection and decision-making.

In line with the broader Smart Cities strategy, this initiative turns Medellín into an open-air innovation laboratory, promoting technological experimentation in partnership with academia, the public sector, and private enterprises. The project strengthens the city's resilience and fosters a shared management model to ensure long-term sustainability.



Colombia's First Special District for STI: Establishing Medellín's innovation ecosystem.  
Image: Ruta N Medellín

### Challenge & Solution 1

Medellín is transforming the way citizens access public services. The fragmentation of procedures and channels limits the user experience. To change this, a digital platform is being developed to centralise and personalise attention, adapting to the needs of each person. With data analytics, interoperability, and continuous feedback, this initiative not only optimises resources, it also redefines the relationship between citizens and government, guaranteeing faster, more equitable, and more transparent access.

### Challenge & Solution 2

Medellín, as the first Special STI District in Colombia, promotes technological solutions to strengthen urban resilience. To more effectively anticipate and respond to natural disasters, an intelligent monitoring system is being developed with advanced sensors, data modeling and predictive analytics. Integrated into its Smart Cities strategy, this project turns Medellín into an open-air innovation laboratory, promoting strategic alliances and the social appropriation of knowledge for a safer and more sustainable city.

## In Conclusion

Medellín's transformation into a hub for science, technology, and innovation has positioned the city as a regional leader in urban development. Its collaborative, innovation-driven approach—encompassing strategic initiatives such as STZs, its Smart Cities strategy, and technology-based urban solutions like CITIZEN 360 and GeoThreats Monitoring—has proven to be scalable, sustainable, and impactful. Cities seeking transformation can look to Medellín as a global reference for a STI-driven framework and urban solutions for achieving their well-being, sustainability, and innovation objectives. 🌐