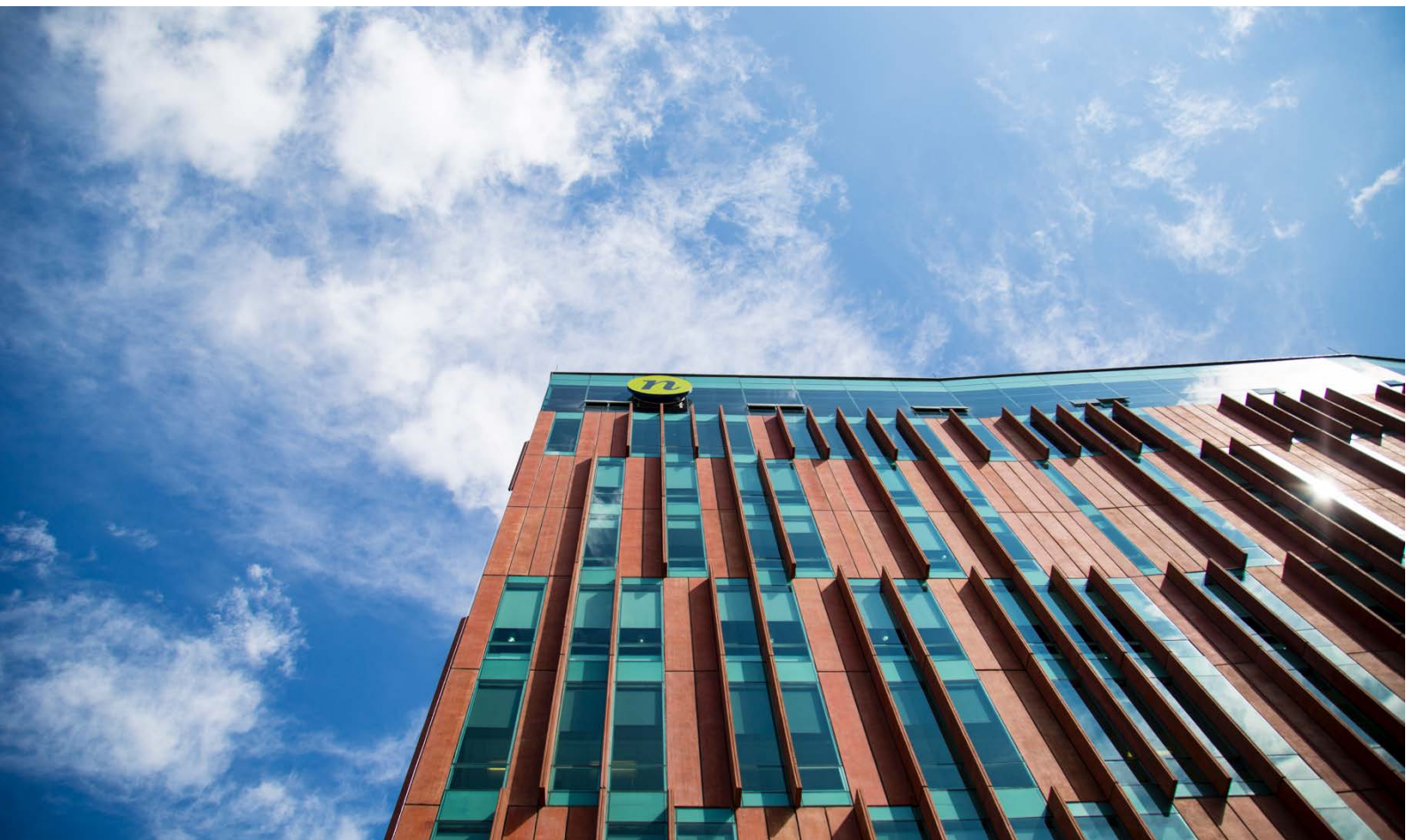


Ruta N Medellín

From drug capital to innovation hub



Medellín, Colombia





General Information

Title	Ruta N Medellín										
Pitch	From drug capital to innovation hub										
Organisation	Ruta N										
Country	Colombia										
Authors	Hacer Tercanli and Arno Meerman (University Industry Innovation Network)										
Nature of interaction	<table><tr><td><input checked="" type="checkbox"/> Collaboration in R&D</td><td><input type="checkbox"/> Lifelong learning</td></tr><tr><td><input type="checkbox"/> Commercialisation of R&D results</td><td><input checked="" type="checkbox"/> Joint curriculum design and delivery</td></tr><tr><td><input type="checkbox"/> Mobility of staff</td><td><input type="checkbox"/> Mobility of students</td></tr><tr><td><input checked="" type="checkbox"/> Academic entrepreneurship</td><td><input checked="" type="checkbox"/> Student entrepreneurship</td></tr><tr><td><input type="checkbox"/> Governance</td><td><input type="checkbox"/> Shared resources</td></tr></table>	<input checked="" type="checkbox"/> Collaboration in R&D	<input type="checkbox"/> Lifelong learning	<input type="checkbox"/> Commercialisation of R&D results	<input checked="" type="checkbox"/> Joint curriculum design and delivery	<input type="checkbox"/> Mobility of staff	<input type="checkbox"/> Mobility of students	<input checked="" type="checkbox"/> Academic entrepreneurship	<input checked="" type="checkbox"/> Student entrepreneurship	<input type="checkbox"/> Governance	<input type="checkbox"/> Shared resources
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Supporting mechanism	<table><tr><td><input checked="" type="checkbox"/> Strategic</td></tr><tr><td><input checked="" type="checkbox"/> Structural</td></tr><tr><td><input checked="" type="checkbox"/> Operational</td></tr><tr><td><input type="checkbox"/> Policy</td></tr></table>	<input checked="" type="checkbox"/> Strategic	<input checked="" type="checkbox"/> Structural	<input checked="" type="checkbox"/> Operational	<input type="checkbox"/> Policy						
<input checked="" type="checkbox"/> Strategic											
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Summary	<p>Ruta N, Medellín's Centre of Business and Innovation is leading Medellín's economic evolution towards science, technology, and innovation. Through developing entrepreneurial talent, establishing a regional network, securing capital and providing infrastructure to start-ups and innovative businesses Ruta N has provided Medellín with more than 3,000 qualified jobs, supported more than 500 projects and attracted more than 150 domestic and foreign businesses to settle on its premises within less than 10 years. Having been declared a world innovation hub, Innovative City of the Year and having hosted the Cities for Life forum, Medellín has grown from a drug capital to an innovation city.</p>										



Introduction & Overview

1. BACKGROUND

The city of Medellín has come a long way in redefining itself from the strongholds of one of the most violent drug cartels in the 1980s to the present South American model of innovation and urban transformation. A series of interventions initiated by the city's government and guided by solid local policies has underpinned this transformation. The most prominent projects include the 'Urban Development Commune 1&2', and 'Medellín Smart City' movements. These efforts did not go unnoticed: in 2013, the Urban Institute, the Wall Street Journal, and Citi Group named Medellín the '**Innovative City of the Year**' for its thriving tech sector and innovative solutions to the urban and pressing social challenges. It was only a few years later, in 2015, that the city provided itself a legitimate platform to showcase its success hosting the first 'Cities for Life' global forum. Recently Medellín was declared a **world innovation hub** by the annual ranking created by the Australian firm 2ThinkNow¹.

Ruta N 'Medellín's Centre of Business and Innovation' emerges in this context as an agent to sustain the momentum the city has reached over the long term, and lift it up further to create welfare for its people through a knowledge-based society and economy. Founded by Medellín Mayor's office and the public enterprises UNE² and EPM³ in 2009, Ruta N so far has enabled the creation of over **3,000 qualified new jobs**, with more than 150 local and international businesses that 'landed' in its premises. It has impacted more than 7,000 underprivileged school children, and close to 1,000 researchers and professionals through STEM training. Ruta N has also linked global networks to the ecosystem that have facilitated the connection of **16 funds and establishment of 20 investment mechanisms** for the launch of new innovative enterprises in Medellín and attracted 3 business development centres (Atom House⁴, Biointropic⁵ and Endeavor⁶) to scale up start-ups in specific markets. Ruta N has supported more than **500 innovation projects in 4 years**, that have grown at a rate of at least 20% per year and it has **strengthened more than 400 local companies** with innovation management capacities.

The activities of Ruta N are clustered around four major elements as enablers of innovation: **(1) developing entrepreneurial talent, (2) establishing strong networks both inside and outside the ecosystem, (3) securing capital for innovation, and (4) providing adequate and sufficient infrastructure for start-ups and innovative companies** within the city's Innovation District.⁷ The Innovation District comprises the University of Antioquia⁸, the Explora Park⁹ (local science Museum), the Planetarium, the Botanical Garden, and the Innovation and Business Center. Together, these institutions create conditions favourable for the development of an urban centre where talent and innovation flourish.¹⁰

2. OBJECTIVES AND MOTIVATIONS

The mission of Ruta N is to **lead Medellín's economic evolution towards science, technology, and innovation in an inclusive and sustainable way**. Ruta N's vision involves institutionalising innovation as the main catalyser of the city's economy and welfare, based on a world-class ecosystem.

Ruta N conceives its mission in executing Medellín's Science, Technology and Innovation (STI) Strategic Plan¹¹ that consists of three directorates: Innovation Platforms, Knowledge-based Business, and Innovation Culture.

- ▶ The **Directorate for Innovation Platforms** aims to strengthen the regional innovation system by targeting universities and other interface institutions such as business incubators and technology development centres.
- ▶ The **Directorate for Knowledge-based Business** is responsible for creating an environment for businesses and entrepreneurs to carry out knowledge-based activities, and high-value transactions.
- ▶ The **Directorate for Innovation Culture** facilitates the promotion of social appropriation of science, technology and innovation in the city of Medellín, to ensure social inclusion and sustainability.¹²

These three key goals are achieved through the focus of Ruta N on talent development, capital acquisition, network growth and infrastructural improvements.

3. STAKEHOLDERS

The main stakeholders of Ruta N are the Municipality of Medellín, and the public enterprises UNE and EPM.

Ruta N is thought to be the articulator of the different actors of the city. It works with business, universities, knowledge institutions, public institutions, investors, society, business centres among others. Its aim is to create connections through knowledge and to bring different actors together to pursue certain objectives.

In 2015 Ruta N gathered different organisations to sign the Great Pact for Innovation (Gran Pacto Por La Innovación¹³) committing to increase their investment in STI activities. The pact is currently signed by more than 2,300 organisations. Additionally, it has promoted other networks such as Sunn¹⁴, which connects innovation demand and supply and Cities for Life¹⁵ and MiMedellín¹⁶ two global and local co-creation platforms.



Implementation

4. INPUTS

Ruta N's financial input is mainly sourced from public funds and complemented by income received through provision of office spaces.

The main source of funding for the implementation of the STI Plan is channelled from the public company EPM which allocates 7% of its annual ordinary profits to Ruta N's budget since 2012. This fixed funding scheme is supported by the funds from the national royalties' system, as well as other contributions made by the city council.¹⁷ Furthermore, the city government has been taking concrete actions to increase the share of current investments to 3% by 2021, which deems realistic, given the increase from the 0.77% in 2014 to 1.15% in 2015 in the GDP shares on STI.

In respect to the physical resources, two infrastructure projects are allocated towards Ruta N: **Complex Ruta N**, the central building, and the **Medellín Innovation District**¹⁸, the urban development plan implemented by Ruta N.

Complex Ruta N is the urban symbol of the innovation and the technological development of the city. Located in the Medellín's Innovation District in the Sevilla neighbourhood, it consists of three buildings which in total measure over 30,000m². There are more than 120 companies operating in the complex, mainly oriented to the energy, health and ICT sectors. It is the first public building in Colombia with a LEED Gold Certification, an accreditation label for sustainable and environment-friendly constructions¹⁹.

Located adjacent to the University of Antioquia, **Medellín's Innovation District** is a social, urban and economic development project that aims to catalyse innovation and create economic inclusion dynamics in the territory through innovation. This technology district project is intended to act as a magnet for companies, institutions and entrepreneurs in the field of STI. Together with the local stakeholders it creates a dynamic urban centre in the district, facilitating the establishment of the knowledge-based economy in the region.

5. ACTIVITIES

The UBC activities undertaken at Ruta N can be categorised under the broad themes of talent development, start-up support, network launch, and infrastructure development.

Talent development:

Ruta N differentiates between its long and short term strategies in developing talent for innovation. Its long-term solutions include educational programmes offered to school children in the region, particularly in the IT and STEM fields.

- ▶ Created in 2014, **Horizontes** targeted sixth to eleventh grade students to develop critical thinking and problem solving skills, and orient them towards professions critical in the development of a knowledge society.
- ▶ In partnership with the Parque Explora, the Ministry of Education, and Sapiencia, **Steam Makers** aims to form STEAM (science, technology, engineering, arts and mathematics) skills through training of 1,500 school students at 11 educational public institutions in the city that in the future will have to lead Medellín's innovative businesses²⁰.
- ▶ In addition to generating programmes to empower school children, connecting universities' knowledge with businesses is also a priority. For this, Ruta N started the **Innovation Challenge**, an initiative that connects undergraduate students and firms to jointly solve industry challenges.

Short term strategies, include fast track training programmes offered through partnerships Ruta N has established with specialised private companies. These short courses aim at developing entrepreneurial skills. The target audience are mainly individuals that can make a contribution to the growth of the ecosystem and will respond to the talent demand of foreign companies settling in or around Medellín.

- ▶ Bringing together higher education, industry, and public representatives, **Vivelab Medellín** is a 27-workstation laboratory for the development of entrepreneurship animation, video games, and the digital content needed in the digital creative industry. The lab provides the participants access to training courses, diplomas and workshops.
- ▶ **Web Bootcamp** is one of the training programmes aiming to develop aptitudes in programming and software development; the skills highly demanded in the ICT sector.
- ▶ The **Leaders in Innovation** fellowship programme has grown out of the cooperation between The Royal Academy of Engineering of the United Kingdom, Ruta N, and the Newton Fund, to offer researchers with strong business potential to participate in a two-week training programme in technology and innovation with access to expert mentors, and the opportunity to be part of international networks of innovators.²¹
- ▶ One of the services currently offered to business people is a 10-month long **Innovation Managers** programme, for those who seek to build capacities to manage innovation in their businesses. The programme is on its second round, aiming to have an impact on a total of 400 companies.

Within this context, the input of the regional universities to the talent development is not at the expected level, with skills mismatches being one of the biggest challenges graduates face after graduation. However, in recent years, there have been signs of change; increasingly more programmes are modifying their curriculum to address the skillset sought by the market.

Start-up support

Limited funding opportunities for early-stage entrepreneurs from the Medellín finance sector has led to the launch of the **Ruta N Capital**, a mechanism with flexible financing and specialised mentoring services to support visionary entrepreneurs. The projects are selected based

on a three-criteria scoring system: risk measurement for the innovation, the degree of 'novelty', and the social impact of the project, which allows the system to determine the amount and conditions of financing. The mechanism incorporates both private and public resources, and has generous offers of flexible financing, with low interest rates and grace periods, and specialised mentoring services from experts.

Additionally, start-up support includes technical support services, offered not only to entrepreneurs, but also to the interested community members:

- ▶ In cooperation with the R&D public agency Colciencias²², Ruta N **offers Patent Funds** to entrepreneurs, independent inventors, universities and technology and knowledge transfer organisations to co-finance the preparation and filing of patent applications in Colombia.
- ▶ The **Intellectual Property Identification Tool** is another service provided to entrepreneurs. The tool is a guideline to identify patentable assets.
- ▶ **Support Center for Technology and Innovation – CATI** builds community capacity through training courses, workshops and seminars on IP, copyright, and related issues.

Network Launch

- ▶ The centre launched **Market Access network (MAN)**, a global community of 50+ partners that offer specialised services to facilitate innovative businesses to reach new markets and increase exports. Among the broad range of services offered are, i.e. market research, e-commerce strategy, legal advice, and soft landing.
- ▶ A community of private investors in Medellín, **Smart Capital Network** gathers 16 venture capital funds and connects them to start-ups.
- ▶ Born from a collaborative project with SL 4i Latam, **Sunn Open Innovation Platform** is an innovation search tool that connects supply and demand. Through Sunn, research groups or innovation-intensive start-ups can contact companies in need of innovation or vice-versa to create projects together and solve those needs for innovation.
- ▶ In 2015, the city government created the **Cities for Life**²³ global platform in cooperation with Ruta N to find collective solutions to the city challenges with its citizens, and connect with other innovation ecosystems.

Infrastructure provision

Several real estate projects have been transforming Medellín's Innovation District as part of the public policy created by the city's government. Fully equipped office spaces are offered to companies for approximately \$60 (€57) per month, with flexible spaces that can be adjusted according to the entrepreneur's needs. More than 60 per cent of the companies located in the Innovation District are international with just 40 per cent being Colombian. The majority of these businesses are in the IT sector, while the remaining belong to sectors such as social innovation and consulting.

The 'landing' procedures for the foreign companies in the innovation district are carried out through ACI, Medellín's investment promotion authority. The companies are not only offered locations, but also assisted through the legal pathway, receiving support with recruitment, commercial and strategic local connections, corporate by-laws, visas, national identification cards, etc

6. OUTPUTS

The four core fields of activity of Ruta N have each resulted in a significant number of outputs:

- ▶ **Talent development:** Through Horizontes, more than 7,000 unprivileged students (11-17 years old) have joined training programmes in technology sectors, including robotics, nanotechnology and engineering, while nearly 150 students have benefited from the Web Bootcamp programme. In addition, approximately 1,000 professionals have participated in "fast-track" programmes.
- ▶ **Start-up support:** More than 500 innovative projects have been proposed since 2013.
- ▶ **Network launch:** The Smart Capital Network has facilitated the connection of 16 funds, the establishment of 20 investment mechanisms, and the finance of 88 companies, with 34 per cent of which are still waiting to be invested in. Moreover, the Market Access Network has been connecting 50 allies (Chambers of Commerce) to facilitate innovative businesses to reach new markets. Co-working spaces network and Business Development Centres network are under construction.
- ▶ **Infrastructure provision:** The 172-HA Innovation District²⁴ have hosted 158 companies from 25 different countries. These companies have created 3,000 high-quality jobs. Some of these companies are: Huawei Technologies (China), IBM (US), Algar Technology (Brazil), Brainz, Payco, Pagomío, SQA, Grupo Invetrónica, Primestone, Tappsi, Vitalbox (all Colombia), Fusemobile (Australia), Newshore (Spain), Choice Technologies (Brazil), Dynamic Mobility (Mexico), Equippo (Switzerland) and Genius Sports (UK).

7. IMPACTS

The more than 150 foreign companies have created more than 3,000 qualified new jobs mainly in the IT, energy and healthcare sectors. It is predicted that the development of the 2 km² of the Medellíninnovation District will lead to the creation of 28,000 new quality jobs by 2021.

While it is challenging to assess the impact of particular Ruta N activities, the improvements observed in the region could also be attributed to Ruta N and the accompanying IT development project, Digital Medellín, with their outcomes cross-feeding each other. The two initiatives represent the commitment of the city in advancing the business environment as well as digital capabilities of its citizens, in efforts to cement the transformation process that began less than 15 years ago.

Regarding the advancements in the business environment, the programmes improved the operations and decision making processes of the companies owing to the new IT solutions and

software applications offered along with the internet access made widely available. Improvements in the IT environment enabled innovation among businesses, which was further stimulated through collaborative network-building efforts of Ruta N, to promote partnerships among local and international entities.

The empowerment of the public has been achieved through digital skill development that allowed members of the community to access information, increase their decision-making capabilities, and be better informed about the opportunities and circumstances around them, for instance, before investing in a new business project. In particular, the multi-stakeholder approach adopted in both initiatives not only helped to achieve an inclusive environment - most of the city's population is now IT literate – but also, ensured that the efforts are embedded in the social fabric that they become sustainable in the long term.





Support & Influencing factors

8. SUPPORTING MECHANISMS

Ruta N has identified three components that catalyse their innovation ecosystem:

(i) Structural Component which is crucial to keep the cohesion between the actors and elements of the ecosystem. These are the components that give the vision, planning and regulation of the city in terms of innovation as a strategic tool. The elements of structural component are:

- ▶ Public policy in Science, Technology and innovation;
- ▶ Analysis of cultural and historical conditions;
- ▶ Transformation engines: comparative and competitive advantages;
- ▶ Knowledge and capital resources;
- ▶ Cohesion between public and private actors.

(ii) Institutional component that refers to the institutional tissue with the credibility and vision to mobilise innovation. This component involves the following facilitating factors:

- ▶ Legal framework;
- ▶ Sustainability model;
- ▶ Institutional efficiency;
- ▶ Institutional interaction;
- ▶ Common vision.

(iii) Programmatic component refers to initiatives that will impact the strengths and gaps of the ecosystem. This component necessitates the development of:

- ▶ Enabling technologies (R&D);
- ▶ Innovative businesses;
- ▶ Organisational capacities in innovation;
- ▶ Innovation culture.

9. BARRIERS AND DRIVERS

It has not always been a smooth ride for Ruta N towards the success it has today. It has and still does, in its 15 years of existence faced a number of barriers. It has gone through a process of societal change and had to bring on board a wide variety of stakeholders. The different nature and mindset of these organisations (i.e. business, higher education institutions, investors, public organisations) hampered the process of growth. The lack of high-skilled labour in Medellín were the bases for its training offerings, however also lead to a shortage in potential

employees for foreign companies that are settling in Medellín. There is also a lack of quality projects coming out of universities and society to invest in. This, together with the lack of funding from banks for start-ups hinders future growth.

The most important ingredients for the success of Ruta N is the common vision adopted by the societal stakeholders. The strong buy-in of local government has eased the process of getting other stakeholders on board. Their financial and physical investments have given Ruta N the kick start it needed. However, besides all stakeholders the enormous support and interest from the local and regional society is what has truly driven Ruta N. Through the high participation of domestic and foreign companies in their facilities, and the high turn-up rate for their training offerings are some of the indicators of the shared goal and common interest of its stakeholders.

10. FUTURE CHALLENGES

The process itself has not always been smooth, however Ruta N has booked amazing progress over the past decade. Nonetheless, they are not there yet. Having brought Medellín to a whole new level, Ruta N is facing different challenges all over again.

Today, Ruta N is struggling with finding the right talent for the foreign companies it has and is attracting to settle in Colombia. If it wants to keep pulling in new business there would need to be talented labour ready to support those businesses. Besides the foreign business, there is also a lack of quality projects, potentially also due to the slow transition from research to market for investors to invest in. This could potentially keep investors away from Ruta N, and the inefficient banking system to fund start-ups would restrain future start-ups to grow their business

11. CONTEXT

It is the current development strategy of the city of Medellín and the overarching national policy environment what defines the nature of activities at Ruta N. It is also important to acknowledge that the emergence of Ruta N has been facilitated in alignment with other local initiatives that reinforced the transformation of Medellín, from a city with a long history of violence and drugs trafficking into one of the most vibrant and dynamic centres in Colombia. To understand the role of Ruta N and where it stands in its long transformation process²⁵, it is crucial to see the accompanying projects and the previous steps that helped making of the city of Medellín we know:

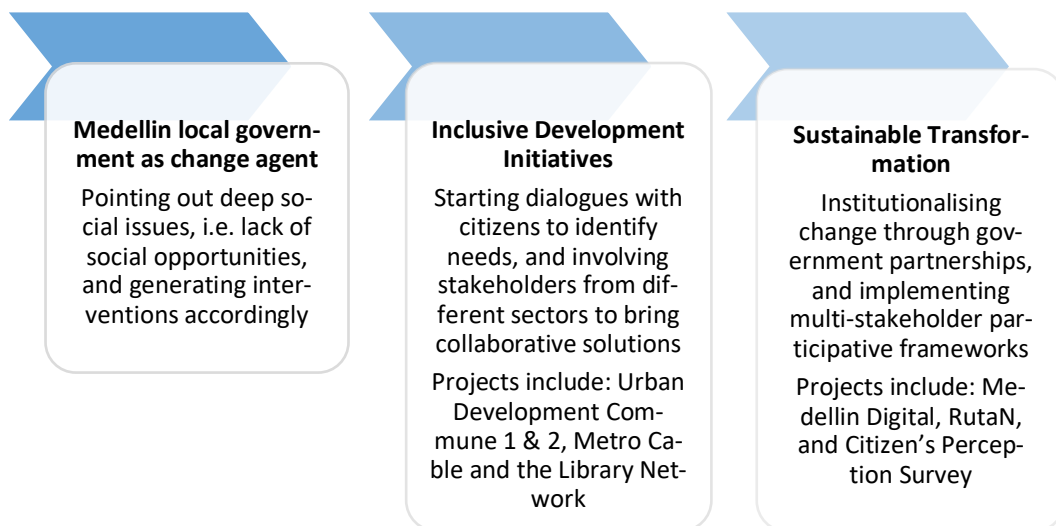


Figure 1: City of Medellín change agents and development stages (Source: Own elaboration)

Within this context, Ruta N has emerged out of the Medellín STI plan as part of the sustainable transformation efforts, along with the city government initiative 'Digital Medellín', which aimed at increasing digital literacy of the local citizens. The two ICT projects contributed to Medellín earning the IEEE Smart City affiliation²⁶, making it the first city in Colombia with a smart city-focused government programme²⁷. Ruta N has found itself a reputable place in the city of Medellín that pursues the ambitious goal of becoming a knowledge-intensive economy. It strives to fulfil its role to re-establish the city as a hub for the highly skilled talent that the knowledge and service economy requires, through the construction of a world - class innovation ecosystem

12. KEY SUCCESS FACTORS

It is without doubt that the mechanisms established by the local government have enabled a fruitful cooperation among its societal actors in instilling a culture of innovation, through a number of fora and programmes. National and local policies together have leveraged the innovation ecosystem in Medellín, and placed Ruta N in the very centre of this ecosystem to mediate the actors, promote networking, and provide access to capital for entrepreneurs from Colombia and abroad. The launch of Ruta N can be translated as institutionalisation of innovation, which empowers the institution to utilise the tools and mechanisms to further grow the ecosystem.

Some of the key factors that led to the success of Ruta N are:

- ▶ Coordination and articulation among the actors of university-industry-government
- ▶ Adjustments in public-private funding structures, i.e. tax exemptions, VC.
- ▶ Availability of human capital with the hard and soft skills
- ▶ Sufficient mechanisms available for technology transfer

- ▶ Innovation culture and social appropriation of technology
- ▶ Competitive environment, appropriate for business creation





Further Information

13. MONITORING AND EVALUATION

The evaluation of the outputs and impact of the Ruta N activities are measured through a quantitative set of indicators such as GDP invested, number of jobs generated, venture capital available per capita, among others. It has been a challenge to assess the qualitative impact, yet, the mechanisms are in place and it is a developing process until the impacts are clearly seen.

14. SUSTAINABILITY MEASURES

Ruta N defines itself as a dynamic institution that facilitates the work of the ecosystem in Medellín. By 2021 it will adopt new roles in the ecosystem to continue facilitating change through:

- ▶ Exploring opportunities that could both contribute to the development efforts of the neighbouring regions and secure funds to maintain the growth of the institution. In this direction, one idea is to launch joint projects with other Latin American countries
- ▶ Involving more private partners into the ecosystem to diversify funding resources and sustain themselves
- ▶ Investment in STEM education/innovation/entrepreneurship for school children.

15. TRANSFERABILITY

The model of Ruta N is transferrable to other contexts, 'regardless of them being Latin American or European countries' as expressed by the Ruta N representatives. The model, on the other hand, has higher chances of adoption in the Latin American countries since the structure of the societies present similarities, in terms of economic strength and shared cultural values.

From a wider perspective, replication can be achieved through careful investigation of the 'configuration of the ecosystem' to bridge the gaps. The diagnosis elements that enable the development of an innovation ecosystem are identified as to have four fundamental pillars:

- ▶ Public-private partnerships that form the basis of long term sustainability
- ▶ Open innovation to build capacities in people
- ▶ Links to the community to serve the city's most pressing needs
- ▶ Emphasis on science and technology to foster innovation

Currently, the strategic plans for the replication of the 'Smart Cities' initiative in four cities in Colombia will give Ruta N the opportunity to transfer Medellín's knowledge and good practices to other Latin American cities, which holds the prospects of the establishment of a wider regional ecosystem, connected at a national level.

16. AWARDS AND RECOGNITION

(2016) **The Innovative Funding Mechanism Award** by DNDi (drugs for neglected Diseases Initiative)

Ruta N Medellín was awarded the Innovative Funding Mechanism Award for funding leishmaniasis.²⁸

(2012) **José Celestino Mutis Biosphere Conscience Award**, in the CSR Performance category

Ruta N Vision, mission and performance, enshrined in Medellín's CTI Plan - Science, Technology and Innovation in the Business Performance with Environmental Responsibility Category in August 20, 2012.²⁹

(2016) **Bloomberg Rewards Medellín Project With One Million Dollars**³⁰

"This recognition means for the city to have an international partner Michael Bloomberg, one of the most influential billionaires in politics and the world economy. In addition to the million dollars we received to implement the pilot project will also have a process of formation in innovative government, which is one of the lines of most interest to Ruta N and the city" says Alejandro Roldan, Ruta N manager of the project.

The Ruta N Complex is the first public building in Colombia with **LEED gold** category certification

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18. LINKS

RutaN website <http://rutanMedellín.org/es/>

19. CONTACT PERSONS



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- ¹¹ <http://www.rutanmedellin.org/index.php/en/programs/87-sti-plan>
- ¹² https://www.oecd.org/cfe/leed/OECD%20LEED%20Policy%20Review_Medellin_EN_.pdf
- ¹³ <http://www.medellinnovation.org/granpacto/>
- ¹⁴ <http://sunncol.co/>
- ¹⁵ <http://citiesfor.life/>
- ¹⁶ <http://www.mimedellin.org/>
- ¹⁷ https://www.oecd.org/cfe/leed/OECD%20LEED%20Policy%20Review_Medellin_EN_.pdf
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