

The European Commission's
**INTELLIGENT CITIES
CHALLENGE**

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Valongo: Intelligent City Transformation Overview

ICC Final Deliverable



Executive summary [1/5]

- ❑ Valongo is one of the **fastest-growing municipalities in the Porto Metropolitan Area**. Significant public investment has been made over the last decade in general infrastructure, rail and road accessibility, urban qualification and construction of cultural, social and sports facilities.
- ❑ Although there is an increasing interest in the various brands for which Valongo is recognised outside its borders (e.g., bakery and biscuit, popular festivities, industrial and religious heritage, traditional toys, slate), **nature tourism has very relevant growth potential** considering the territory's extensive natural landscape, which is part of the Porto Mountains Park.
- ❑ The balance between the preservation of local mountains with economic and leisure activities, as well as the environmental protection against threats that may jeopardise the natural heritage, have been at the heart of local policies. Putting into practice **digital solutions that could contribute to the municipality's environmental sustainability** (but also to economic and social sustainability), has been one of the main aims of ICC Valongo.

Executive summary [2/5]

- ❑ Under the ICC city needs analysis, the **topics in which the city revealed best performance** are the promotion of nature-based tourism in a sustainable way, focusing on special products and selected types of visitors; the measures that have been taken to protect the environment; the fact that electronic public services are being largely used for personal and business transactions via digital platforms; the trend that waste production is stabilising and slightly decreasing; and the development of local food systems for urban agriculture.
- ❑ Among the **identified challenges**, the following have particularly been highlighted: conciliation between the preservation of natural landscape and tourism; industrial disturbances; limited local policies for circular economy; need to improve water management; and few open data available. With the exception of water management, it was decided that all those topics would fully or at least partially be addressed by ICC Valongo.

Executive summary [3/5]

- ❑ After consultation with stakeholders, including a questionnaire, interviews and workshops, the **main ambitions of the municipality for the 2030 time horizon were established**: provide world-class nature-based tourism by creating unique visitor experiences and being a family-friendly destination; foster an environmentally sustainable development by empowering the territory to protect its natural resources; and promote a digitally and socially connected city, where a skilled local community will improve its living standards by increasingly using digital technologies in their social, professional and leisure activities.
- ❑ Such broad consensus among the main stakeholders that Valongo has the potential to provide excellent nature-based tourism whilst preserving the quality of its extensive natural and historical heritage with the support of advanced digital solutions, gave rise to the following shared, **long-term vision** for the territory:
 - Valongo will be internationally recognised for creating outstanding nature, leisure, cultural and gastronomic experiences, while promoting its unique identity and history, the quality of life of its citizens and the sustainability of natural resources.

Executive summary [4/5]

- ❑ Two solutions have been prioritised to achieve those vision and ambitions: **1) Environmental Monitoring**, divided into three initiatives (**#1 - Environmental sensors**, **#2 - Smart City platform** and **#3 - Open data**); and **2) Environmental Awareness**, split into two initiatives (**#4 - Information and educational materials**, and **#5 - Mobile app**).
- ❑ The implementation of the ICC Valongo's roadmap and action plan is contributing (or shall contribute in the near future) to better monitor and decrease local pollution, while protecting local ecosystems and biodiversity, and supporting a more sustainable growth in nature-based tourism (**initiative #1**). It will also foster the collection of crucial data for better decision-making and effective management of the territory by local authorities (**initiative #2**) and will allow public availability of open data sets, which can contribute to greater efficiency and transparency in the delivery of municipal services, and to support businesses and other organisations to make more well-informed decisions and investments by gathering meaningful insights (**initiative #3**).

Executive summary [5/5]

- ❑ ICC Valongo is also playing an important role in raising awareness on environmental and sustainability issues, especially among the young population, through the creation and dissemination of digital and printed materials about the territory's nature, culture and history (**initiative #4**). This includes the launch of a mobile app (**initiative #5**) for which specific content is being developed (e.g., photos, AR content, audio guides, trivia, etc) and that serves also as "people-as-a-sensor " under initiative #1 on environmental sensors.
- ❑ In the upcoming years, Valongo will continue to place at the centre of local policies the promotion of a digitally skilled and connected community, which will improve its living standards by increasingly using digital technologies. At the same time, measures will be implemented towards an environmentally sustainable development capable of offering residents and visitors a clean and healthy environment that enhances local quality of life.
- ❑ Measures will continue to be put in practice to ensure a fair balance between the preservation of natural heritage and the tourism sector, providing visitors with high-quality amenities, services and information, and affirming Valongo as a family-friendly destination, offering excellent standards of safety, accessibility, leisure and educational experiences.

Mayor Foreword

“Valongo has been promoting a profound but gentle transformation in the way it allows citizens to experience its territory. Through projects that place the citizen at the centre of political decisions, it has been possible to create conditions for the local economy to grow based on the use of cutting-edge technologies, and the ICC has become an ideal partner and launch pad for such a pressing challenge.

Taking advantage of the natural features that make the county unique, the municipality has sought to invest in projects that enhance the existing heritage and allow its enjoyment by the population.

The Cucamacuca Staircase that connects the city centre to the top of the Santa Justa Mountains was an ambitious project, which combined environmental concern with a technological aspect, and when fully completed, will have a great impact on visitors, whether citizens or tourists. Besides promoting a valuable natural heritage, the staircase will be a starting point for the discovery of the entire territory by using tools that allow the user to "travel" through the county and its history”.

*José Manuel Ribeiro
Mayor of Valongo*

The city of Valongo pursued an EU-supported transformation over four main stages, and this document details that journey by these sections

Overview to the city's journey and structure of this document



1 Preparation & assessment

5 months:
September 2020 – January 2021



2 Ambition & roadmap

3 months:
February 2021 – April 2021



3 Implementation

15 months
May 2021 – July 2022



4 Review & way forward

2 months
August 2022 – September 2022

*Reported as
one section*

Summary

Find out **where Valongo is, where it should go** and who in the ecosystem should be **mobilised to make things happen**. To better understand the **city needs**, several initiatives were carried out in conjunction with several stakeholders, including the application of a large-scale **questionnaire ("city scan")**, **individual interviews** and organisation of two **events** attended by local organisations and citizens. **Vision and ambition statements** were established and priorities were defined.

A **concrete plan** to achieve **measured improvements** was developed together with the community. A **roadmap** was prepared with detailed information on the actions to be implemented, including key activities, goals, contributors, budget, funding and timing. A **governance structure** was set up while actively **engaging Valongo's local community** (a specific event was held for the roadmap) and strengthening the **cooperation with other ICC cities**.

ICC Valongo priorities and **initiatives were implemented** and monitored during this phase in accordance with the roadmap/action plan.

The last step was about measuring success and commit to **keep connections and improvements going**. An evaluation exercise of **key performance indicators** - both quantitative and qualitative - was carried out considering both direct **outputs** from the ICC initiative and overall **impact on city performance**. Key lessons were learned, and commitments and main targets were defined for the coming years.

Section

1

Valongo: Preparation and assessment

ICC transformation

September 2020
to January 2021

Introduction


Valongo's participation in the Intelligent Cities Challenge (ICC) is **aligned with key city strategic priorities** implemented in the last years to make Valongo a more sustainable and digital community.


In particular, the ICC initiative fits into and contributes to the following municipal strategies:


- ❑ **Environmental protection**, particularly the preservation of local mountains and their vast natural heritage.
- ❑ **Sustainable tourism**, namely by conciliating the preservation of natural landscape with tourism activities and complementing nature tourism with cultural, historical and gastronomic tourism.
- ❑ **Digitalisation**, strengthening local policies to digitalise city services and increase the literacy of the local community and businesses.

City needs: State of the city overview

Significance of insight to what we want to do on the ICC

 Of critical importance to ICC journey and we should be working to change

 Of importance to ICC journey, and we should act to change this along the journey as opportunity presents

 Contextually relevant, but not major point of attention in ICC and unlikely to be impacted on the journey

The state of Valongo today

- Pride in local traditions and a sense of belonging and identity around the Valongo six brands: mountains and rivers; bakery and biscuit; slate; traditional toy; religious heritage; and popular festivities.
- Considerable socio-economic dynamism.
- Growing demand for nature-based tourism.
- Measures taken to protect the environment.
- Increasing digitalisation of municipality services and local economy.
- Heterogeneous territory regarding geography, economy and demography.
- Deindustrialisation of local economy.
- Efforts to reconcile the preservation of natural landscape with tourism.
- Challenge of complementing nature tourism with cultural, historical and gastronomic tourism.

Key insights from city performance analysis

Higher performance observed

Lower performance observed

1	The Municipality is taking initiatives to promote a sustainable tourism with special products and selected types of visitors 	1	The Municipality suffers from significant industrial disturbances 
2	Waste production is stable or is slightly decreasing 	2	A limited number of policies regarding Circular Economy 
3	The Municipality is developing local food systems for urban agriculture 	3	A need to improve water management in the Municipality 
4	Electronic public services are largely used for personal and commercial transactions via totally digital platforms 	4	Few open data available 
5	The Municipality has a Municipal Urban Management Plan with several sustainability principles 	5	No regular energy performance measurements in the built environment or plans for continuous improvement 

City ecosystem

■ Shared aspirations and vision.

There is broad consensus among the main stakeholders that Valongo has the potential to provide world-class nature-based tourism, while preserving the quality of its extensive natural and historical heritage with the support of advanced digital technology solutions.

■ What we bring and how we work together.

There is a sense of belonging and common identity strengthened around the Valongo brands (i.e. mountains and rivers; bakery and biscuit; slate; traditional toy; religious heritage; and popular festivities), and there is also considerable citizen participation in relevant decision-making processes, such as the most recent review of the Municipal Master Plan (PDM), the Participative Youth Budget, and the Management Plan for the Porto Mountains Park. The school community and local associations show noteworthy vitality. Fruitful cooperation has been established between private and public actors in fields such as environment, tourism, culture, transport and sports, as well as between private players in sectors such as tourism. There are therefore positive dynamics within the local community that can favour the implementation of the ICC strategy.

■ Urban resources for transformation.

Valongo has overall a skilled population. Local organisations and businesses can draw on several training institutions and have relatively easy access to nearby RTDI entities. The various economic and social actors (and particularly the Municipality of Valongo) have been able to attract relevant financing for their activities, especially public funding available at regional and national levels (mostly through EU structural funds).

ICC strategy: vision and ambition statements

Vision:

Valongo will be internationally recognised for creating outstanding nature, leisure, cultural and gastronomic experiences, while promoting its unique identity and history, the quality of life of its citizens and the sustainability of natural resources.

Digitally and socially connected. A skilled local community will improve its living standards by increasingly using digital technologies in their social, professional and leisure activities.

Creating unique visitor experiences. Visitors will be provided with high-quality amenities, services and information to help them unlock the best version of Valongo, which will increase their likelihood of returning as visitors or to work, invest or trade.

Family-friendly. A child- and family-friendly destination, offering excellent standards of safety, accessibility, leisure and educational experiences.

Environmentally sustainable development. A territory increasingly empowered to protect natural resources and foster sustainable development, offering residents and visitors a clean and healthy environment that enhances local quality of life and preserves the future for the next generations.

City strategy: Justification [1/3]

- ❑ After consultation with local stakeholders, major **ambitions** for the city by 2030 were identified around the following themes:
 - Sustainable development.
 - City digitally and socially connected.
 - High-quality tourism creating unique visitor experiences.
 - Family-friendly destination.
- ❑ The results of the **city scan questionnaire** revealed that citizens and local organisations consider these to be the five main challenges for the city:
 - Significant industrial disturbances.
 - Limited policies regarding Circular Economy.
 - Need to improve water management.
 - Few open data available.
 - No regular energy performance measurements in the built environment.

City strategy: Justification [2/3]

- ❑ In the 1:1 interviews, as well as in the "needs assessment" and "ecosystem" events, the following topics were particularly identified by the stakeholders for improvement:
 - Balance between the preservation of local mountains with economic and leisure activities that take place there.
 - Environmental protection against threats such as the presence of people and vehicles, eucalyptus monoculture, dumping of garbage and forest fires.
 - Limited digital literacy in certain segments of the population, preventing a better use of digital services (despite some measures launched in this area by several local entities, in particular by the Municipality of Valongo).
 - Insufficient digital skills in SMEs and micro-enterprises, especially in the tertiary sector (e.g., trade, restaurants).
 - Local economy still generating insufficient employment for residents (especially qualified jobs).
 - Difficulties for employers to recruit certain specialised profiles in the labour market.
 - Still relatively low demand from companies for research and innovation services provided by RTDI entities.

City strategy: Justification [3/3]

- Taking into account the context outlined above, the ICC Valongo strategy encompasses the following two **strategic priorities**, whose common ground is the ICC initiative coordinated by the governance bodies established for its implementation:
 - **Environmental monitoring** implemented through three key initiatives: environmental sensors, smart city platform, and open data platform.
 - **Environmental awareness** put into practice through two key initiatives: information and educational materials, and mobile app.

Section

2

Valongo: Ambition and roadmap

ICC Transformation

February 2021 to May 2021

Priority solutions and initiatives

Priority solutions	Initiatives
Environmental Monitoring	#1 - Environmental sensors
	#2 - Smart City platform
	#3 - Open data
Environmental Awareness	#4 - Information and educational materials
	#5 - Mobile App

High level implementation roadmap (“10000m plan”) [1/3]

Activity  Milestone 

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8
1 Initiative #1 – Environmental sensors	Planning and kick-off	★ Action plan delivered						
	Air quality				★ Air quality sensors installation completed			
	Water quality				★ Water quality sensors installation completed			
	People-as-sensor							★ People-as-sensor mobile app feature completed
	360° camera				★ 360° camera installation completed			
2 Initiative #2 – Smart City platform	Planning & kick-off	★ Action plan delivered						
	Implementation of the Smart City platform				★ Smart City platform installation completed			
	“Environmental monitoring” vertical							★ Integration of “environmental monitoring” vertical

High level implementation roadmap (“10000m plan”) [2/3]

		Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8
3 Initiative #3 – Open data	Planning and kick-off		★ Action plan delivered						
	Platform creation and integration of first datasets								★ Open data platform installation completed
	Integration of a national open data base								★ Integration of national open data base completed
4 Initiative #4 – Information and education materials	Planning & kick-off		★ Action plan delivered						
	Content acquisition								
	Development of the materials in various formats						★ Materials ready for distribution and use		
	Dissemination of materials among the target audiences								★ Materials presented and distributed to the public

Activity

★ Milestone

High level implementation roadmap (“10000m plan”) [3/3]




Rationale to roadmap

- ❑ The roadmap represents the commitment of Valongo to continue its transformation process into a **smarter and sustainable community**, aiming at the well-being of its citizens, businesses and visitors through the offer of digitally enabled solutions.
- ❑ Addresses a number of **challenges** identified by local stakeholders (e.g., environmental protection and sustainable tourism) and is aligned with other ongoing **municipal strategies** (e.g., environment, digitalisation, tourism).
- ❑ **Puts into action two major strategic axes** identified under Phase I: **1)** environmental monitoring and **2)** environmental awareness, to be both implemented by 2022.
- ❑ Establishes an integrated **governance structure** to ensure that the different identified needs are addressed in a collaborative way by involving the stakeholders who have the necessary skills and resources for the co-creation and co-production of the required actions.
- ❑ **Funded by the Municipality of Valongo** and implemented under ongoing **international cooperation** with the participating cities in ICC.

Initiative #1 - Environmental sensors

Strategy

Description  Implementation of an environmental monitoring system in the Valongo's mountains to monitor in real time the quality of local environment (e.g. quality of air, river water, incident detection, etc).

Link to vision



Valongo will be internationally recognised for creating outstanding nature, leisure, cultural and gastronomic experiences, while promoting its unique identity and history, the quality of life of its citizens and the sustainability of natural resources.

Link to ambition statement



Digitally and socially connected. A skilled local community will improve its living standards by increasingly using digital technologies in their social, professional and leisure activities.
Environmentally sustainable development. A territory increasingly empowered to protect natural resources and foster sustainable development, offering residents and visitors a clean and healthy environment that enhances local quality of life and preserves the future for the next generations.

Expected impact and timing



Decreased air, rivers, noise and visual pollution; protected local ecosystems and biodiversity; sustainable activity and growth in tourism; increased quality, efficiency and transparency of municipal services; businesses and organisations to have more informed decisions and better use of existing resources by gathering meaningful insights. Impact from mid 2022.

Stakeholders involved

Solution lead: Municipality of Valongo



Solution working team: Municipality of Valongo; Porto Mountains Park (*Parque Serras do Porto*)



Contributors: Porto Mountains Park (*Parque Serras do Porto*); several local organisations, including non-governmental organisations (NGO's); local citizens and tourists.




Risks and mitigation



- 1) Technology in the middle of nature.
- 2) Access and creating conditions.
- 3) Electric power.
- 4) GPDR limitations in monitoring systems.

The team in charge of this initiative endeavoured to find the best technical and market solutions for its implementation, as well as the best internal and external funding solutions.

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost  30k€
 Funding mainly provided by the Municipality of Valongo,

Solution maturity outputs



- 1) Number of sensors deployed: 10
- 2) Number of features (data) provided by the app: 5


City performance outcomes and impacts




- 1) Increase in number of tourists in the first month after the completion of the initiative (%): >10%
- 2) Increase in detected incidents in the first month after the completion of the initiative (%): >50%


Initiative #2 - Smart City platform

Strategy

Description  This initiative was to provide a global and integrated view of the county's territory, presenting data from various domains related to local environmental conditions (e.g. quality of river water, atmosphere, incident detection etc). This information is presented in a single control panel, allowing the Municipality to obtain crucial data for better decision-making and effective management of the territory.

Link to vision  Valongo will be internationally recognised for creating outstanding nature, leisure, cultural and gastronomic experiences, while promoting its unique identity and history, the quality of life of its citizens and the sustainability of natural resources.

Link to ambition statement  **Digitally and socially connected.** A skilled local community will improve its living standards by increasingly using digital technologies in their social, professional and leisure activities.
Environmentally sustainable development. A territory increasingly empowered to protect natural resources and foster sustainable development, offering residents and visitors a clean and healthy environment that enhances local quality of life and preserves the future for the next generations.

Expected impact and timing  Decreased air, rivers, noise and visual pollution; protected local ecosystems and biodiversity; sustainable activity and growth in tourism; increased quality, efficiency and transparency of municipal services. Impact from mid 2022.

Stakeholders involved

Solution lead: Municipality of Valongo




Solution working team: Municipality of Valongo





Contributors: Porto Mountains Park (*Parque Serras do Porto*); external service provider.




Risks and mitigation 
1) Technical challenges.
2) Costs related to the platform implementation.
3) Market solutions availability and maturity.
As mitigation measures, the team in charge of this initiative endeavoured to find the best technical and market solutions for its implementation.

Inputs, outputs, outcomes and impacts


Source of funding and estimated cost  70k € plus 4.5k month fee
Funding mainly provided by the Municipality of Valongo.

Solution maturity outputs 
1) Aggregation of information related with ICC (e.g., environment, tourism, security etc.) in the Smart City platform: >70%
2) Number of verticals integrated with ICC in the Smart City Platform: 2

City performance outcomes and impacts 
1) Number of actions defined resulting from data interpretation in the first month after the completion of the initiative : 2
2) Integration of data sources related with the project in the first month after the completion of the initiative: >70%

Initiative #3 - Open data

Strategy

Description  An open data platform was launched by the Municipality of Valongo. It provides initially information related to urbanism but will progressively encompass other domains, including data obtained and processed within ICC Valongo's initiatives #1 (environmental sensors) and #2 (smart city platform).

Link to vision



Valongo will be internationally recognised for creating outstanding nature, leisure, cultural and gastronomic experiences, while promoting its unique identity and history, the quality of life of its citizens and the sustainability of natural resources.

Link to ambition statement



Digitally and socially connected. A skilled local community will improve its living standards by increasingly using digital technologies in their social, professional and leisure activities.
Environmentally sustainable development. A territory increasingly empowered to protect natural resources and foster sustainable development, offering residents and visitors a clean and healthy environment that enhances local quality of life and preserves the future for the next generations.

Expected impact and timing

Protected local ecosystems and biodiversity; sustainable activity and growth in tourism; increased quality, efficiency and transparency of municipal services; businesses and organisations to have more informed decisions and better use of existing resources by gathering meaningful insights. Impact from mid 2022.

Stakeholders involved

Solution lead: Municipality of Valongo



Solution working team: Municipality of Valongo



Contributors: AMA – National Agency for Administrative Modernisation (dados.gov.pt - public administration open data portal);



Risks and mitigation



- 1) Data security.
 - 2) Technical challenges, namely release data in actionable formats conforming to open data standards.
 - 3) Provide high value, easy-to-use datasets to the public.
- The initiative team looked for the best technical and market solutions, as well as the best internal and external funding options.

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost 5k €
 Funding mainly provided by the Municipality of Valongo.



Solution maturity outputs













- 1) Number of available project-related datasets in the first month after the completion of the initiative: 6
- 2) Number of types of project-related datasets in the first month after the completion of the initiative: 4

City performance outcomes and impacts




- 1) Number of downloads in the first month after the completion of the initiative: 6
- 2) Dataset types available from the Municipality in the first month after the completion of the initiative: >10
- 3) Awareness increase about the availability of open data in the municipality in the first month after the completion of the initiative: >50%


Initiative #4 - Information and education materials


Strategy	Stakeholders involved	Inputs, outputs, outcomes and impacts
<p>Description  The initiative aimed at creating digital and printed materials on the Porto Mountains Park (e.g., environment, culture, history, etc.) improving the knowledge about its unique characteristics among citizens, tourists and students, and raising awareness on sustainability and cultural values.</p>	<p>Solution lead: Municipality of Valongo </p>	<p>Source of funding and estimated cost  10k € Funding mainly provided by the Municipality of Valongo.</p>
<p>Link to vision  Valongo will be internationally recognised for creating outstanding nature, leisure, cultural and gastronomic experiences, while promoting its unique identity and history, the quality of life of its citizens and the sustainability of natural resources.</p>	<p>Solution working team: Municipality of Valongo; Porto Mountains Park (<i>Parque Serras do Porto</i>). </p>	<p>Solution maturity outputs  1) Number of types of media sets: 4 2) Number of students involved in the first month after the completion of the initiative: 150</p>
<p>Link to ambition statement  Creating unique visitor experiences. Visitors will be provided with high-quality amenities, services and information to help them unlock the best version of Valongo, which will increase their likelihood of returning as visitors or to work, invest or trade. Family-friendly. A child- and family-friendly destination, offering excellent standards of safety, accessibility, leisure and educational experiences.</p>	<p>Contributors: Porto Mountains Park (<i>Parque Serras do Porto</i>); local school community, </p>	<p>City performance outcomes and impacts  1) Number of people reached in the first month after the completion of the initiative through all supported formats: 500 2) Percentage of tourists with positive feedback (equal or more than 3 stars rating): >70%</p>
<p>Expected impact and timing Significant promotion of awareness and education on environmental and sustainability issues. Expected impact from the second half of 2022 onwards.</p>	<p>Risks and mitigation  Information collection and processing, in particular geo-context information. The team in charge of the initiative endeavoured to ensure all the necessary resources for its full implementation in order to mitigate the above-mentioned risks.</p>	

Initiative #5 - Mobile App

Strategy

Description  This initiative aimed at creating a mobile app. Specific content was developed, including photos, AR content, audio guides, trivia, etc. This application is also to serve as a "people-as-a-sensor" under initiative #1 - environmental sensors.

Link to vision  Valongo will be internationally recognised for creating outstanding nature, leisure, cultural and gastronomic experiences, while promoting its unique identity and history, the quality of life of its citizens and the sustainability of natural resources.

Link to ambition statement  **Digitally and socially connected.** A skilled local community will improve its living standards by increasingly using digital technologies in their social, professional and leisure activities.
Creating unique visitor experiences. Visitors will be provided with high-quality amenities, services and information to help them unlock the best version of Valongo, which will increase their likelihood of returning as visitors or to work, invest or trade.
Family-friendly. A child- and family-friendly destination, offering excellent standards of safety, accessibility, leisure and educational experiences.

Expected impact and timing Significant promotion of awareness and education on environmental and sustainability issues. Expected impact from the second half of 2022 onwards.

Stakeholders involved

Solution lead: Municipality of Valongo



Solution working team: Municipality of Valongo; Porto Mountains Park (*Parque Serras do Porto*).



Contributors: Porto Mountains Park (*Parque Serras do Porto*); local school community,





Risks and mitigation Information collection and processing, in particular geo-context information.




The team in charge of this initiative endeavoured to find the best technical and market solutions for its implementation, using several sources to collect the relevant information.

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost  **25k €**
 Funding mainly provided by the Municipality of Valongo.

Solution maturity outputs  **1) Number of possible combinations for an ever-changing app experience with the same user: >20**
2) Number of modules developed in ICC for the Valongo Tourism application: 1

City performance outcomes and impacts  **1) Number of uses in the first month after the completion of the initiative: 300**
2) Number of interactions (survey responses, gamification inputs, etc.) via the app in the first month after the completion of the initiative: 500
3) Number of app uses in "Accessibility Mode" (visually impaired) in the first month after the completion of the initiative: 5

Key Performance indicators – overview [1/2]

Solution/Initiative	Activities – Inputs and actions	Solution Maturity – outputs	City performance – outcomes and impacts
Environmental Sensors	<ul style="list-style-type: none"> Installation of air and water quality sensors Development of a people-as-a-sensor mobile app feature Installation of a 360° camera 	<ul style="list-style-type: none"> Number of sensors deployed: 10 Number of features (data) provided by the app: 5 	<ul style="list-style-type: none"> Increase in number of tourists in the first month* (%): >10% Increase in detected incidents in the first month* (%): >50%
Smart City Platform	<ul style="list-style-type: none"> Development of a Smart City Platform Integration of a vertical on "environment" in the platform 	<ul style="list-style-type: none"> Aggregation of information related with ICC (e.g., environment, tourism, security etc.) in the Smart City platform: >70% Number of verticals integrated with ICC in the Smart City Platform: 2 	<ul style="list-style-type: none"> Number of actions defined resulting from data interpretation in the first month*: 2 Integration of data sources related with the project in the first month*: >70%
Open Data	<ul style="list-style-type: none"> Platform creation and integration of first datasets Integration of a national open data base 	<ul style="list-style-type: none"> Number of available project-related datasets in the first month*: 6 Number of types of project-related datasets in the first month*: 4 	<ul style="list-style-type: none"> Number of downloads in the first month*: 6 Dataset types available from the Municipality in the first month*: >10 Awareness increase about the availability of open data in the municipality in the first month*: >50%

* First month after the completion of the initiative

Key Performance indicators – overview [2/2]

Solution/Initiative	Activities – Inputs and actions	Solution Maturity - outputs	City performance – outcomes and impacts
Information and Education Materials	<ul style="list-style-type: none"> Gathering of relevant information Production of materials in printed and digital formats Dissemination of materials among target audiences 	<ul style="list-style-type: none"> Number of types of media sets: 4 Number of students involved in the first month*: 150 	<ul style="list-style-type: none"> Number of people reached in the first month* through all supported formats: 500 Percentage of tourists with positive feedback (equal or more than 3 stars rating): >70%
Mobile App	<ul style="list-style-type: none"> Development of audio guides Gathering and selection of visual materials Development of Augmented Reality (AR) content Preparation of trivia information about the municipality of Valongo 	<ul style="list-style-type: none"> Number of possible combinations for an ever-changing app experience with the same user: >20 Number of modules developed in ICC for the Valongo Tourism application: 1 	<ul style="list-style-type: none"> Number of uses in the first month*: 300 Number of interactions (survey responses, gamification inputs, etc.) via the app in the first month*: 500 Number of app uses in "Accessibility Mode" (visually impaired) in the first month*: 5

* First month after the completion of the initiative

Key Performance indicators - Cross cutting indicators

Cross cutting indicators

Number of tourists

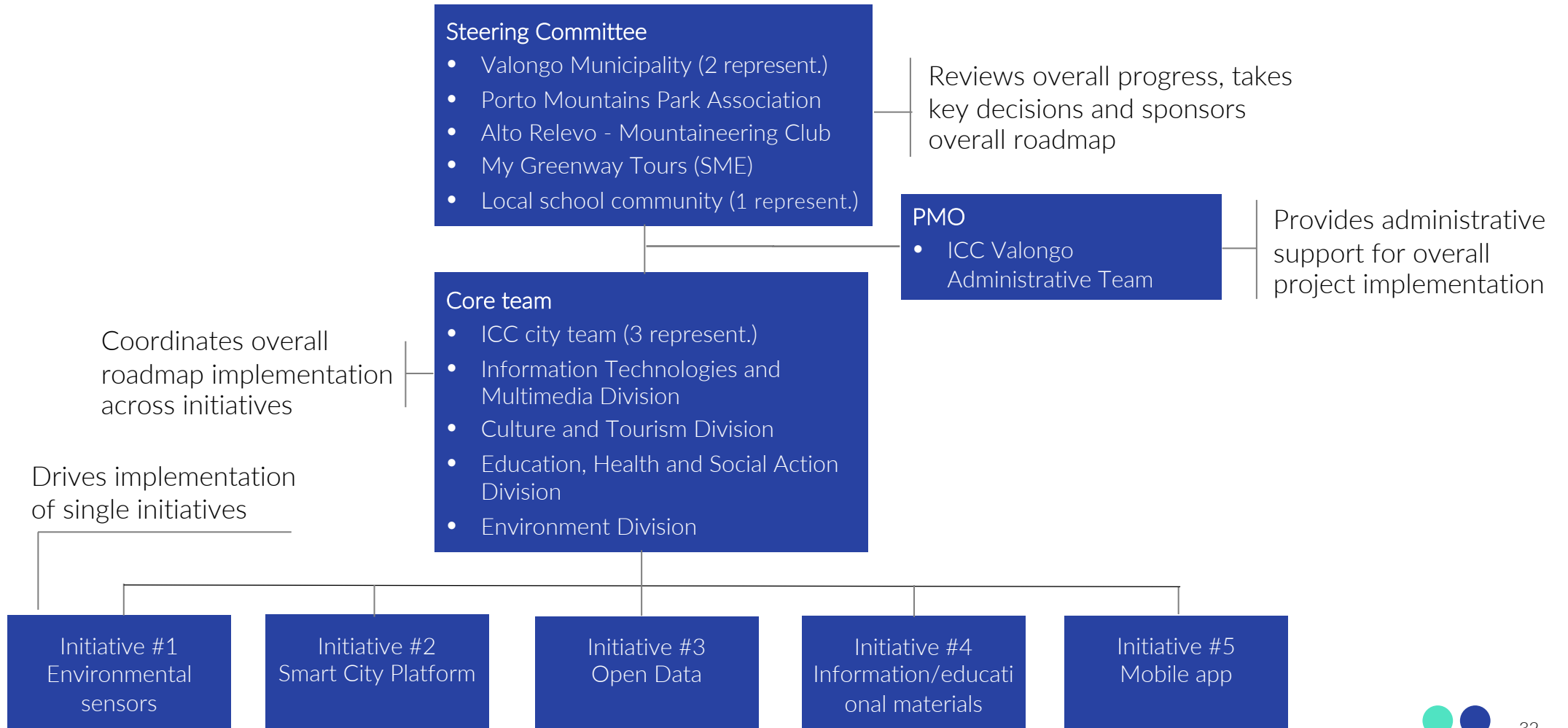
Percentage of tourists with positive feedback

Rationale to KPI approach

Key performance indicators have been chosen considering the following main aspects:

- ❑ **Relevance.** The chosen performance indicators relate to key aspects of the process of transforming Valongo into an intelligent community through digitally enabled actions. Such selection took into consideration:
 - Identified needs (interviews, city scan questionnaire, local workshops).
 - Ambitions and vision.
 - City strategic priorities and on-going strategies (e.g., environment, digitalisation, sustainable tourism).
- ❑ **Availability.** KPIs have been established also considering data accessibility. The measurement of performance indicators should be as much as possible within the reach of the city and not excessively dependent on external sources.
- ❑ **Trackability.** Whenever possible indicators have been selected to allow the observation of developments over relatively short periods of time (i.e., a year or less).

Governance structure for roadmap implementation



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Section

3+4

Valongo: Impact

ICC Transformation

February 2021 to May 2021

Impact executive summary [1/3]

- ❑ The priority solution on **Environmental Monitoring**, when fully completed, will represent an important step forward taken by Valongo to better monitor and protect its natural heritage and to support the sustainable growth of nature-based tourism, while allowing the collection of data for a more effective territory management and public sharing of open data that can help the activities of companies and other entities.
- ❑ The three initiatives launched under this priority - **environmental sensors**, **smart city platform** and **open data platform** - are at different stages of implementation for the time being. While the development of the open data platform is proceeding according to schedule and is already being accessed by citizens, businesses and other organisations in an increasing number of data sets, the smart city platform (and consequently the environment sensors) is lagging behind to the plan, due to the public procurement process that is still ongoing. For that reason, it is not yet possible to measure the respective KPIs.

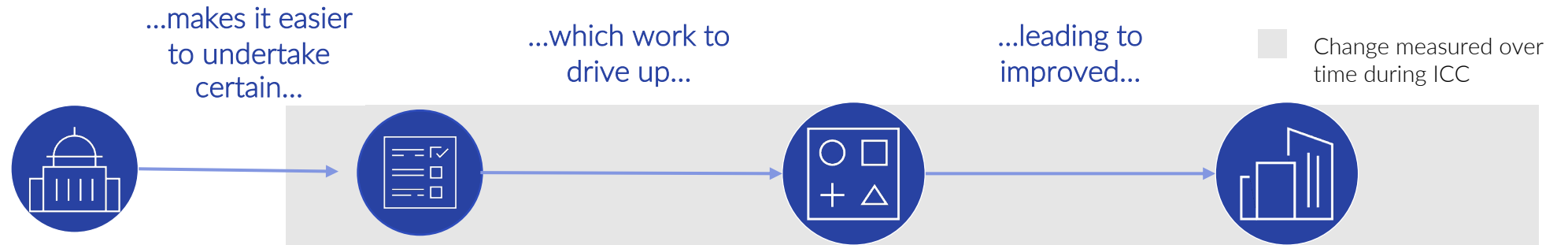
Impact executive summary [2/3]

- ❑ The priority solution on **environmental awareness** is to play an important role in raising awareness on environmental and sustainability issues, both among local population (e.g., students) and tourists. The two initiatives launched under this solution - **education/information materials** and **mobile app** - are at different stages of development. While many of the materials (digital and printed) have already been produced and disseminated together with schools and the community, the mobile application awaits the completion of public procurement procedures. This delay also impacts on the environmental sensors initiative above mentioned, as the app serves also as a "people-as-a-sensor" in addition to spreading information about the territory. Some relevant KPIs cannot therefore be measured without the app being fully developed, tested and utilised by users.
- ❑ Despite the project's initial delay caused by the pandemic, which shortened the implementation period and makes it difficult to assess the results for the moment, ICC represents an **important milestone for Valongo** regarding **digitalisation, environment and tourism policies, stakeholders' engagement and international collaboration** with other cities.

Impact executive summary [3/3]

- In the coming years, the municipality is committed to **carry on the investment in advanced digital technologies**, as well as continue to test new methodologies and tools in a joint learning process with other cities.

There are four types of measurable concepts that come together to drive success in the ICC



Idea	Local enablers – city characteristics	Activities – actions and inputs	Technology maturity – outputs	City performance – outcomes and impacts
Description	Each city has unique strengths and weaknesses that help action happen . These can be stakeholder networks, local capabilities, cultural factors or many more that drive success in ICC projects.	A cities main intervention on the ICC is to take actions . These can be direct (e.g., procuring technology), or indirect , (e.g., forming a working group on a topic). The right actions can lead to the right inputs going in to the ICC (e.g., funding, time)	Cities can drive technological solutions to try and improve city performance. How well these solutions are currently used can be described as their 'maturity' , - considering whether they are available for stakeholder use, what stakeholders think of them, and so on	Success of an intelligent city is ultimately measured by its ability to address city needs . These can be considered an improved quality of citizen life and a better environment for stakeholders
Example	A history of strong collaboration between city and a local university...	...allows the creation of a new e-health pilot project using social housing in the city...	...leads to the launch a new tele-health solution utilising 4G data connections...	...resulting in pre-emptive diagnosis and lower wait times at medical facilities

Assessment of city performance - progress against KPIs [1/3]

City performance		Where we started	Midway through the challenge	Final results
1	Increase in the number of tourists (first month)	Not applicable	Not applicable	Not determined
2	Increase in detected incidents (first month)	Not applicable	Not applicable	Not determined
3	Actions defined resulting from data interpretation (Smart City platform) (first month)	0	Not applicable	Not determined
4	Integration of data sources related with the project (Smart City platform) (first month)	0	Not applicable	Not determined
5	Number of downloads (open data platform) (first month)	0	Not applicable	Not determined

Note: Due to delays in the public procurement process, some “midway” indicators will not be applicable and only “final results” will be hopefully possible to achieve.

Assessment of city performance - progress against KPIs [2/3]

City performance		Where we started	Midway through the challenge	Final results
6	Dataset types available from the municipality (open data platform) (first month)	0	12	Not determined
7	Awareness increase about the availability of open data in the municipality (first month)	Not applicable	~20%	Not determined
8	Number of people reached through all supported formats (information and education materials) (first month)	0	Not applicable	Not determined
9	Percentage of tourists with positive feedback (equal or more than 3 stars rating)	Not applicable	Not applicable	Not determined
10	Number of uses (mobile app) (first month)	0	Not applicable	Not determined

Note: Due to delays in the public procurement process, some “midway” indicators will not be applicable and only “final results” will be hopefully possible to achieve.

Assessment of city performance - progress against KPIs [3/3]

City performance		Where we started	Midway through the challenge	Final results
11	Number of interactions (survey responses, gamification inputs etc.) via app (first month)	000	Not applicable	Not determined
12	Number of app uses in “accessibility mode” (visually impaired) (first month)	00	Not applicable	Not determined

Note: Due to delays in the public procurement process, some “midway” indicators will not be applicable and only “final results” will be hopefully possible to achieve.

Assessment of city performance - discussion

- ❑ The creation of the Open Data platform and the number of available datasets have been contributing to an **increased awareness of the availability of open data**, which has been used by citizens for several purposes. It is also contributing to the transparency that cities need to have with their citizens.
- ❑ **Information and education materials have also been produced** in order to feed the mobile application and several printed and digital materials. The engagement of schools and the community have contributed to this, in a joint effort that has been very positive.
- ❑ The public procurement process of the Smart City platform and the Mobile Application has significantly delayed the project. Subsequently, it has conditioned the installation of the environmental sensors and the data acquisition that will result from the Mobile Application. Many of the KPIs can only be measured with those two components fully deployed, tested and adopted by people (in the case of the Mobile Application).

Assessment of solution maturity - progress against KPIs [1/2]

	Where we started	Midway through the challenge	Final results
Initiative 1 – Environmental sensors			
1 Number of sensors deployed	0	Not applicable	Not determined
2 Number of features (data) provided by the app	0	Not applicable	Not determined
Initiative 2 – Smart City platform			
1 Aggregation of information related to ICC in the Smart City platform	0	Not applicable	Not determined
2 Number of verticals integrated with ICC in the Smart City platform	0	Not applicable	Not determined
Initiative 3 – Open data			
1 Number of available project-related datasets (first month)	0	48	Not determined
2 Number of types of project-related datasets (first month)	0	12	Not determined

Note: Due to delays in the public procurement process, some “midway” indicators will not be applicable and only “final results” will be hopefully possible to achieve.

Assessment of solution maturity - progress against KPIs [2/2]

	Where we started	Midway through the challenge	Final results
Initiative 4 – Information and education materials			
1 Number of types of media sets	0	4	Not determined
2 Number of students involved (first month)	0	25	Not determined
Initiative 5 – Mobile app			
1 Number of possible combinations for an ever-changing app experience with the same user	0	*	*
2 Number of modules developed in ICC for Valongo's Tourism application	0	2*	2*

*As the application is still under development, numbers are not determined or may change

Note: Due to delays in the public procurement process, some “midway” indicators will not be applicable and only “final results” will be hopefully possible to achieve.

Assessment of solution maturity - discussion

- ❑ Two critical components of ICC Valongo are not yet deployed as they are being contracted by the Municipality: **Smart City Platform** - with several verticals integrated and with the aggregation of information related with ICC (e.g., environment, tourism, security etc.) in the Smart City platform; and the **Mobile Application** with modules developed in ICC for the Valongo Tourism application. These two components are in the critical path of the project and have delayed its execution. Yet, all the preparatory work has been conducted and it is expected that as soon as they are deployed, the respective solutions will be ready and KPIs will be measured.
- ❑ One example of this preparatory work is the **Open Data platform** that is up and running, and already including several data set types and sets of data accomplishing KPIs. Another example is the **Information and Education Materials**. The several types of media sets (for the mobile application and for printed and digital contents, and for information panels) had the involvement of students and the community and are ready for deployment.
- ❑ In the team's opinion, KPIs can be fine tuned but in general are suitable and measuring the right things. Scaling solutions is foreseen, but as mentioned, there is no data to support this at this point.

Assessment of city ecosystem and activities - discussion

- ❑ ICC Valongo is progressing and running (in content, structure and ambition) accordingly to **the initial plan**. The only draw back is related to the public procurement processes of the Smart City Platform and Mobile Application, which has delayed the project execution.
- ❑ The **majority of KPIs cannot be assessed at this point** without the Smart City Platform (with all its sensors and data sources) and the Mobile Application. Therefore, it is impossible at this point to infer about the success of the project regarding a number of KPIs.
- ❑ Yet, the several **stakeholders and the team are confident about the success of the initiative**. At several local events, it was possible to verify the optimism and will to collaborate from the ecosystem. Although this process ran in a period that was heavily conditioned by the pandemic crisis, collaboration was possible (in particular with schools and for content-related activities).

5 key lessons

Lesson	Reflections
1	Design and develop a solution/application, without initial funding guarantees.
2	Design of the technological solution in conjunction with the learning obtained in ICC, increased the know-how and use of new methodologies.
3	Early stage of the ICC project had many delays, derived from COVID-19.
4	Need of better organisation of sessions with stakeholders.
5	The ICC application boosted our decision to implement the designed solutions.

Reflections on city collaborations

- ❑ The main lesson learned was the **identification of new methodologies** for the implementation of pilot projects and new ideas.
- ❑ Through the sessions organised by ICC, and particularly at peer to peer sessions, we had the chance to **discuss with other cities different approaches** to the challenges we face.
- ❑ **New processes and new technologies** were our main learning benefit.
- ❑ As a specific example, we can highlight the **cooperation established with the city of Bratislava** (Petra Dzurovčinová), which very kindly shared with us their manual of pilot project management, where they specify how to conduct a city laboratory for testing new and innovative solutions.
- ❑ With this **shared knowledge**, we can now better address some important aspects like:
 - Correctly grasp and name the problems that need to be solved;
 - Define those issues as key challenges in line with strategic documents;
 - Test multiple alternative solutions;
 - Try the solution first in small scale before possible procurement;
 - Etc.

Commitments

Commitments to on-going resources

- ❑ Preserving, maintaining and expanding the sensor and monitoring network.
- ❑ Add more routes to our tourism and environmental mobile app, based on what our city has to offer.

Commitments to on-going collaboration

- ❑ Keep the mobile application dynamic with the contribution from our students, while adding more interaction to it.

Commitments to on-going KPIs

- ❑ Keep collecting data, giving us a real understanding about our city.

3 Year plan - ambitions

Building on the ICC, what would will the city aim to achieve in 3 years time?

We want to increase the app's capabilities, get more data and with that information work on what is detected, in order to reach and involve a greater number of people/users.

What steps will you take over the next 3 years to achieve these goals?

To achieve our goals, we will develop the platform/app to get more variables available to users; extend monitoring by installing more sensors and allocating more resources; disseminate/communicate the app and its applicability and provide user guides and workshops to facilitate the handling of the app.

3 Year plan – targets [1/2]

KPI	Category	What commitments will the city make to this end?
1 Increase in the number of tourists	City Performance	In addition to the tourism strategy implemented by the municipality based on the main identity brands of Valongo, digital solutions started under ICC to promote sustainable tourism will be further developed (e.g., monitoring of local environment, full implementation of the tourism mobile app).
2 Percentage of tourists with positive feedback	City Performance	In the framework of the city's tourism strategy, the opinion of tourists will be more systematically collected. The tourism app is to be a key tool used for this purpose.
3 Smart City platform: actions defined resulting from data interpretation	City Performance	Valongo's smart platform will be further developed to integrate information from different systems providing a holistic view of the overall performance of the city and its various functions.
4 Open data platform: number of downloads	City Performance	As a result of the investment in the open data platform, the use of open data by companies, other organisations and citizens will be increasing.
5 Mobile app: number of uses	City Performance	A city mobile app will be launched and gradually improved in order to promote and inform about Valongo, as well as to raise awareness on environmental sustainability.
6 Mobile app: number of interactions	City Performance	Investments will be made so that the mobile app will be increasingly used by visitors, becoming a relevant tool for the promotion and information about Valongo.
7 Mobile app: number of uses in "accessibility mode" (visually impaired)	City Performance	As part of Valongo's inclusive tourism, the mobile app will have content in accessibility mode, being increasingly improved to better serve visually impaired people.

3 Year plan – targets [2/2]

KPI	Category	What commitments will the city make to this end?
8 Number of students involved in ICC Valongo-related themes through activities organised by the municipality	City performance	A strategy of strong engagement of the school community in initiatives promoted by the municipality related to environmental sustainability and protection of Valongo's vast natural heritage will continue to be implemented.
9 Environment sensors: number of sensors deployed	Solution maturity	Valongo's environmental sensor network will continue to be expanded, collecting more and more real-time data that will allow for better monitoring and management of the local territory.
10 Smart city platform: number of verticals integrated related to ICC	Solution maturity	Investment in the smart city platform will continue. The number of integrated verticals related to ICC topics (as well as other topics) will be increased, making the platform an increasingly relevant tool to enhance operational efficiency, improve the quality of city services, and share information with the public.
11 Open data: number of available ICC-related datasets and number of types of ICC-related datasets	Solution maturity	The open data platform will be enlarged by increasing the number and types of datasets, including ICC-related datasets.
12 Mobile app: number of modules developed	Solution maturity	After the first module developed under ICC, more modules are to be built, tested and released in the mobile application.

Appendix

Valongo: Additional information

ICC Transformation

February 2021 to May 2021

City Needs: State of the city – detailed analysis [1/10]

Higher performance areas – Valongo is taking initiatives to promote a sustainable tourism with special products and selected types of visitors

Key insight	Data points	Interpretation	So what?
As a Municipality with a large forest area, there is a strong commitment of promoting a sustainable tourism based of outdoor activities and in the intermunicipal association for the promotion of the Porto mountains.	58% of the panel indicated that there are several sustainable tourism initiatives underway. 33% even claim that it is in the centre of the Municipality Strategy.	The several stakeholders in Valongo recognise the "green" attitude of the Municipality in a city with a strong influence of forestall areas. As the executive, soon, realised the importance of this asset as an exclusive feature that would benefit the Porto area, there are now several equipment and possibilities available for tourism, all of them with sustainability requirements and also aligned with environmental education policy of the Municipality.	This is very much aligned with ICC. As this diagnosis already identified sustainable tourism a present strategy and as a direction for the future, other, even more ambitions, measures may take place taking into advantage the ICC project, its network, and the participation of local stakeholders.

City Needs: State of the city – detailed analysis [2/10]

Higher performance areas – Waste production is stable or is slightly decreasing

Key insight

The different stakeholders have expressed the idea that waste production is stable or slightly decreasing. Although, factual data show that is not.

Data points

Only 8,3% responded that waste production is growing.

Interpretation

This misconception is probably related with the perception of the increasing effort and success of waste separation and new strategies to collect waste. Even before the pandemic of COVID19 there was an increase of waste production per capita that does not correspond to the vast majority of the inquired panel.

So what?

This result demonstrate the importance of having well informed citizens. How else would they modify their behaviour in such an important thing as waste production. For that, it is important to consider strategies that may inform the citizens of the facts with reliable sources of information in order to change behaviours or to create awareness for problems such as environmental sustainability or the need for circularity concerns (as consumers or producers). This suggestion may be valid for several other topics where similar misconceptions may be happening.

City Needs: State of the city – detailed analysis [3/10]

Higher performance areas – Valongo is developing local food systems for urban agriculture

Key insight

Responses demonstrated that the Municipality is developing local food systems for urban agriculture.

Data points

66,7% of the responses recognised this and the very high occupancy rate in Municipal Vegetable Gardens.

Interpretation

The Municipality has created several vegetable gardens very close to dense populational urban areas, providing the ability of people growing their own vegetables close to home. This provides the perception to the population and the panel involved that a strong effort is being developed in this important topic.

So what?

There are several advantages in having such local food systems for urban agriculture:

- Local food agriculture systems minimise environmental impacts related with intensive agriculture and related emissions or impacts;
- Less waste production related with packaging or transport;
- Less costs related with food;
- More healthy food;
- More efficient water usage;
- Better quality control (less pesticides, etc.);
- Improves stress management promoting mental health.

City Needs: State of the city – detailed analysis [4/10]

Higher performance areas – Valongo is offering a significant part of its services digitally

Key insight

All the inquired stakeholders recognise that Municipal services are digital and or online.

Data points

58,3% responded that services are mostly online and 41,7% responded that are digital.

Interpretation

The Municipality of Valongo is already underway with a profound digital transition process with the dematerialisation of processes, the availability of electronic citizens balconies, several information portals to promote transparency and several participative processes (all of them available online and digitally). This result is probably related with the “better than average” results that it provides in “time-to-solution” or in the relation in the citizens (providing more efficiency in the relation with the citizen).

So what?

This is a very important result as it provides tools for engaging and connecting with the citizen more easily, being more efficient, more transparent, more accessible, more environmentally sustainable and closer.

The pandemic situation has showed this resiliency and provided support to the continuous functionality of services to citizens even in lockdown scenarios or in non-presential situations. Being online and being digital, in the relation a Municipality needs to have with citizens, is a very useful tool for supporting future initiatives.

City Needs: State of the city – detailed analysis [5/10]

Higher performance areas – Valongo has a Municipal Urban Management Plan with several sustainability principles

Key insight	Data points	Interpretation	So what?
The inquired stakeholders responded that the Municipality has several sustainability principles in the urban management.	75% of the responses recognised two or more sustainability principles.	Although the City Scan inquiry did not provide the ability to discriminate the sustainability principles that were recognised, the interview process and the workshops led us to conclude that the following were probably the ones envisioned: <ul style="list-style-type: none">- avoiding urban expansion;- connectivity;- integration;- social inclusion.	This result demonstrates that Valongo is aligned with the sustainability principles that are the pillars for the future. The only principle that was not mentioned was the “resiliency to climate change” where water management deficiencies or fire prevention/management issues were identified.

City Needs: State of the city – detailed analysis [6/10]

Lower performance areas – Valongo suffers from significant industrial disturbances

Key insight

The Municipality suffers from significant industrial disturbances mostly due to a Waste Disposal Facility situated in the urban perimeter of Valongo. Truck freighter is also contributing to this feeling as the industrial areas are logistic-based causing some traffic.

Data points

City Scan has identified that 58% of the stakeholders think there are significant industrial disturbances. The remaining 42% also recognise some disturbance.

Interpretation

The Waste Disposal Facility of Sobrado (Valongo) is contributing with air quality issues (smells essentially). This issue has been present in every people's mind as it has been on TV and people from Sobrado has been complaining in public protests.

In another dimension, several significant logistic hubs are present in Valongo and contribute to large volumes of traffic causing disturbances in mobility for citizens and the degradation of roads.

So what?

The Municipality opposes to the Waste Disposal Facility of Sobrado, but their authority in this matter is limited as the license to operate is issued by the government. Because of that there isn't much to do about it, other than to join citizens in protests.

As for the mobility, there are road alternatives to the traffic caused by these logic hubs. The only problem are the tolls that cause these trucks to go via the other Municipal roads contributing to this issue.

City Needs: State of the city – detailed analysis [7/10]

Lower performance areas – Valongo has limited number of policies regarding Circular Economy

Key insight

Stakeholders did not recognise significant policies regarding circular economy.

Data points

City Scan has identified that 58,3% of the stakeholders believe that there is a limited number of policies. 25% responded that they don't recognise any policy.

Interpretation

Circular economy policies are not always easy to be detected by citizens. There may also be a problem to completely understand the range of circular economy policies. For instance, the urban vegetable gardens are included in a policy that is related with decreasing the consumption of products that have a small circularity. For instance, the use of digital solutions can be great assets in circular economy policies (e.g. water meters, mobile data applications for mobility solutions, applications for energy saving, etc.).

So what?

In one hand there is room for improvement for sure in the Municipality regarding this topic. However there is also the possibility that the inquired stakeholders may not be aware of several policies that are in place.

Because of that, the suggestion is to inform, educate and grow awareness of the current policies and to develop others with the participation of citizens.

City Needs: State of the city – detailed analysis [8/10]

Lower performance areas – There is a need to improve water management in Valongo

Key insight

A significant part of the participants believe that there is room for improvement regarding water management.

Data points

City Scan has identified that 66,7% believe that the Municipality needs to improve water management.

Interpretation

Water management is probably one of the most critical sustainability matters for the future. People have demonstrated to realise that. Some of the participants, when asked about this, responded to remember inefficient watering process of public gardens, roundabout fountains, the price of water and some historical problems in water shortage in one of the cities of the Valongo county: Ermesinde.

In another dimension, people also focused this response in the water pollution of two passing rivers: Leça and Ferreira. They claimed water treatment issues and poor water quality.

So what?

Inducing a water saving behaviour is critical for the future. This is probably one of the most critical climate resiliency measures to adopt and people should be inspired by the example of the public administration in water management.

If in one hand water price may be a consequence of water treatment and distribution, it can also be a pedagogical instrument to minimise water consumption.

In another hand, the Municipality should embrace the challenge of being more efficient with drinkable water or in case it is already efficient, it should inform the citizens about what is being done, in order to provide the example and demonstrate their effort and induce sustainable behaviours.

Finally, it is of critical importance to improve the water quality of rivers for environmental reasons (habitats, biodiversity, etc.) but also for the promotion of tourism. Poor water quality may be very negative for this.

City Needs: State of the city – detailed analysis [9/10]

Lower performance areas – There are a few open data available in Valongo

Key insight

People do not recognise the availability of open data in the Municipality.

Data points

City Scan has identified that 83,3% believe that is few or non open data available.

Interpretation

This is mostly because it is true. The Municipality is about to inaugurate its open data platform and therefore it is natural such a response.

So what?

The first step will be to inform the population about this new possibility. It will promote transparency, data usage by companies or other stakeholders, artificial intelligence for the benefit of the Municipality, citizen awareness and also the possibility to benchmark several dimensions of Valongo (mobility, urbanism, environment, etc.).

City Needs: State of the city – detailed analysis [10/10]

Lower performance areas – There is no regular energy performance measurements in the built environment or plans for continuous improvement

Key insight	Data points	Interpretation	So what?
No regular performance measure measurements or plans for continuous improvement were recognised in the built environment.	City Scan has identified that 66,7% believe that the Municipality does not have any performance measure measurements or plans for continuous improvement in the built environment.	This is probably due to the fact that such performance measures or plans are not typically visible or public. If there are performance measures or plans, people are not aware of them.	<p>It's important to conduct these type of performance measures and/or plans for continuous improvement. The built environment is responsible for something as 40% of the total emissions. It is, therefore, crucial to assess this to continuously improve its performance in order to be more sustainable.</p> <p>In case they are already being conducted, it's important that people know this.</p> <p>Again, this is an example of something in which the Municipality should lead by example in order to inspire citizens to do the same.</p> <p>Currently these type of measurements/evaluations are made only when there is a construction/reconstruction process or if there is a real-estate operation.</p>

City Needs: bottom-up perspectives [1/5]

1. What stakeholders considered is going well:

□ Overall perceptions

- ❖ Pride in local traditions and a sense of belonging and identity around Valongo's brands.
- ❖ Demographic growth, young population, residential attractiveness.
- ❖ Tradition of the bakery and biscuit industries.
- ❖ Natural landscape as part of the Porto Mountains Park ("Parque das Serras do Porto"), including biological, geological and archaeological heritage.
- ❖ Historical heritage, namely religious and industrial.
- ❖ Traditional toy and school blackboard (slate extraction and processing) industries.
- ❖ Popular events, festivals and processions that attract increasingly number of visitors.

□ Digital and green future

- ❖ Increasingly digitalised municipal services (e.g., online services, automation and dematerialisation of processes).
- ❖ Investment in digital technologies by industry and some service sector businesses.
- ❖ Pandemic as an opportunity for companies and organisations to boost the use of digital technologies.
- ❖ Environmental education at local schools.

City Needs: bottom-up perspectives [2/5]

❑ Private sector/entrepreneurship

- ❖ High economic potential of nature tourism (growing demand for leisure and well-being activities, active tourism, adventure sports etc).
- ❖ Valongo mountains as home to numerous activities such as hiking, trail running, mountain biking, speleology, paragliding, equestrian routes, etc.
- ❖ Positive performance of the industrial sector and (before the pandemic crisis) of other sectors such as trade, tourism and services.
- ❖ Newly created companies in the last few years (e.g., large logistics platform); some moved their headquarters to the municipality; and new business hosting areas were established.
- ❖ Local environmental, historical and cultural assets with potential to create new businesses and jobs.

❑ Policy and the public sector

- ❖ Positive evolution of the quality of municipal services, including online services.
- ❖ Municipality's effort to get closer to citizens (e.g., "Espaços do Cidadão" (citizen's spaces throughout the council), and online services).
- ❖ Good public (and private) transport network with suitable connectivity to the main centres of the Porto Metropolitan Area.

City Needs: bottom-up perspectives [3/5]

❑ Collaboration, community and identity

- ❖ Citizens' participation in decision-making processes, such as the Participative Youth Budget, Municipal Master Plan (PDM), Management Plan for the Porto Mountains Park ("Parque das Serras do Porto").
- ❖ The creation of the six brands of Valongo.
- ❖ Vitality of the local community, in particular the school community and local associations.
- ❖ Cooperation between private and public sector actors (e.g., environment, sports, culture, tourism, transport).
- ❖ Cooperation between private actors in the tourism sector (e.g., nature tourism and restaurants/catering).

❑ Capabilities and skillsets in the population

- ❖ In general, sufficient existence of labour force with suitable skills to respond to the needs of the main sectors of the local economy.
- ❖ Training actions provided by various local actors (e.g., AIEV, ADICE, CENFIM, Escola Profissional de Valongo).

❑ Research and innovation

- ❖ Some good examples of cooperation between local institutions and businesses, and national knowledge centres for RTD and innovation activities.
- ❖ Such cooperation has been increasing.

City Needs: bottom-up perspectives [4/5]

2. What stakeholders considered to be the main challenges to address:

❑ Overall perceptions

- ❖ Heterogeneous territory in its geography, demography, economy and culture.
- ❖ Still image of a residential council.
- ❖ Local economy still generating insufficient employment for residents (especially qualified jobs).
- ❖ Tertiary sector (e.g., traditional trade) with an aging workforce needing reskilling actions.

❑ Digital and green future

- ❖ Online services/interactions with the municipality with potential to grow.
- ❖ Limited digital literacy in certain segments of the population, preventing a better use of digital services (despite some measures launched in this area by several local entities, in particular by the Municipality of Valongo).
- ❖ Insufficient digital skills in SMEs and micro-enterprises, especially in the tertiary sector (e.g., trade, restaurants).
- ❖ Balance between the preservation of local mountains with economic and leisure activities that take place there.
- ❖ Environmental protection against threats such as the presence of people and vehicles, eucalyptus monoculture, dumping of garbage and forest fires.
- ❖ Insufficient green and wooded spaces in the urban centres/residential areas (despite positive evolution).

City Needs: bottom-up perspectives [5/5]

❑ Private sector/entrepreneurship

- ❖ Widespread difficulties in almost all economic sectors with the pandemic (particularly trade and restaurants, where several businesses have permanently shut down).
- ❖ Relatively sparse existence of industry.
- ❖ Inclusion of the Valongo county in wider tourist routes, taking in particular advantage of tourists visiting the city of Porto, and complement nature tourism with cultural, industrial and gastronomic tourism.

❑ Policy and the public sector

- ❖ Services provided digitally by the municipality have potential for higher use.

❑ Capabilities and skillsets in the population

- ❖ Difficulties for employers to recruit certain specialised profiles in the labour market.
- ❖ Limited digital literacy in certain economic sectors (e.g., small traditional businesses).
- ❖ Difficulty in engaging human resources of small and micro-enterprises in training actions.

❑ Research and innovation

- ❖ Still relatively low demand from companies for research and innovation services provided by RTDI entities.