The European Commission's
INTELLIGENT CITIES
CHALLENGE

Gavà - Castelldefels Consortium : Intelligent City Transformation Overview

ICC Final Deliverable

European Commission | The Intelligent Cities Challenge is funded by COSME, the EU programme for Competitiveness of Enterprises and SMEs

Executive summary

Our ICC consortium has promoted improvements for the integrated management and resilience of sensitive areas of our cities (coast, agricultural park, natural parks, ...) based on data and predictive models and defined through a newly formed local ecosystem network of quadruple helix actors for innovative co-creation (Startups, universities, research centers, entities...).

Due to climate change and sudden weather changes, changes will happen in the Llobregat river delta line, where the cities of Gavà and Castelldefels are located. As well as sudden changes in the streams and the increase in pollution as we are part of the metropolitan area of Barcelona, a zone of a high density of people and critical infrastructures but with important natural spaces.

The ICC program allowed us to form a highly trained working team that, through other cities' experiences seen during the ICC city labs, allowed us to anticipate a public management system of natural spaces and urban areas of more risk during the COVID19 pandemic. The management system consisted of the installation of sensors and 360º cameras. These cameras collected data on a platform that, thanks to the definition of forecasting models, AI and IoT, neurological models improved in real time the calculation of the capacity of the beaches and the publication of this data for the users, and thus be able to distribute the public better and guarantee safety in the use of this spaces, among other measures.

This first test allowed us to analyze the implemented system and define the bases for developing a risk management project that has been drawn up by all the members of the ICC Gavà-Castelldefels consortium. This project takes into account the collection and analysis of data on the occupation of sensitive areas of our cities, the weather conditions and pollution episodes that occur, the monitoring of changes in coastal dynamic, etc., to visualize them through a management platform and publish them in a public information app. The final product is a risk monitoring and management system for rapid decision-making and response.

Mayor Foreword

The “Intelligent Cities Challenge” program is an initiative of the European Commission that is helping us to promote emerging technologies and ambitious measures to improve citizens' quality of life and guarantee growth, sustainability, and resilience of our cities. It is a joint project of a consortium that has constituted Gavà and Castelldefels to create a strategy based on resilience and digitization in partnership with research centers, public-private companies, and universities. The consortium is formed by the Polytechnic University of Catalonia (UPC), CETAQUA, Aigües de Barcelona, and Tinkerers, INNOBAIX I UC Gavà. The research center of the *Institut de Ciències del Mar* (CSIC) is also giving support and advice to the ICC Gavà and Castelldefels ICC consortium.

The technical tasks and the projects developed by the consortium are excellent and susceptible to be presented to the different calls for the NextGenerationEU funds, which will allow us to obtain economic resources and program support strategies to develop them that we cannot waste.

The ICC consortium is led by the Gavà City Council, whose former mayor, Raquel Sánchez, and now Gemma Badia as mayor, actively participate in reflection and action networks that promote the transition towards an alternative model of green, sustainable and circular economy. Castelldefels City Council also participates in the consortium, whose mayor, María Miranda, shares the defined objectives and gives her support to the mayor of Gavà in developing the action plan defined during the ICC program.

The ICC's action plan also has the political support of the first deputy mayor of Gavà, Jordi Tort, to whom the areas of economic and human resources also report, and Esther Niubó, deputy mayor and councilor for the Presidency, Department of Communication and New Technologies of Castelldefels. They combine efforts and priorities to develop this initiative together with the internationalization of cities.

The cities of Gavà and Castelldefels 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

Summary

Find out where a city is, where it should go and who in the ecosystem will mobilize to make things happen

Develop a concrete plan to achieve measured improvements, collaborate with the community, and push action with immediate benefits

Get "big moves" and see results; take action in partnership with others

Measure success, and commit to keeping connections and improvements going

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Section

1

Gavà - Castelldefels Consortium: Preparation and assessment

ICC transformation

September 2020 to January 2021

European Commission | The Intelligent Cities Challenge is funded by COSME, the EU programme for Competitiveness of Enterprises and SMEs

Introduction

Gavà and Castelldefels are two adjacent municipalities in the **Barcelona Metropolitan Area (Spain)**. They are 18 km from Barcelona, in the southwest, following the Mediterranean coast, and they have a **population of 113.775 inhabitants**. The consortium members have made a **political commitment to lead the "green revolution"** with a fundamental change in the economic fabric along with the development of the SDG (of which 60% must be implemented in the cities) and the values of the 2030 Agenda that both Gavà and Castelldefels represent.

The territory has the political support of the two Mayors of Gavà and Castelldefels and the leadership of the **first deputy mayor of Gavà, Jordi Tort**, and **Esther Niubó, deputy mayor and Councillor for Presidency**, Communication and New Technologies Department of Castelldefels. They join forces and priorities to develop the ICC initiative with the strategy of articulating municipal policies and actions to improve the resilience of our cities based on data analysis and predictive models generated with digital tools and solutions. Likewise, from day one, a multidisciplinary work team has been set up in both town councils, which has made it possible to align the different sectoral strategies that were being worked on independently into a single one.

On the other hand, the local ecosystem made up of other supra-municipal administrations, technological and research centers, the business fabric, and citizens have been involved and committed to the project, actively participating in the joint identification of the primary needs as well as in the definition of the strategy and the proposed solutions. In this sense, it has been possible **to identify different projects being worked on by the local ecosystem, which fit perfectly with the proposed solutions and have enriched the perspective and scope of some of them.**

City needs: State of the city overview

The state of Gavà - Castelldefels Consortium today

Both municipalities have used the City Scan tool to assess the degree of maturity of the main areas of municipal management.

The results coincided, identifying economic growth and the natural environment as the aspects that are best worked on. On the other hand, it was found that there is room for improvement in the areas of Government services and social connectivity, Transport and Urban Infrastructure, and Green Economy. These priorities align with those established in the City Agreements, and the Municipal Action Plans were recently revised due to the pandemic.

Furthermore, in the course of this first phase, a "Technical workshop" was held along with the local advisors and the city council's internal Departments involved (environmental dpt, digitalization dpt, waste management dpt,...) in which it was agreed that the priorities for action should focus on the following thematic tracks:

(1) Green economy and enhancing resilience capacity;

(2) Followed by eGovernment and digitizing public services;

(3) Enhancing citizen participation and connectivity;

(4) Efficient waste, energy, and water systems management;

Key insights from city performance analysis

Higher performance observed

1. Political commitment to implement actions to promote the circular economy and improve the management of natural risks for people and the territory, as well as mitigate the effects of climate change and reduce the impact of climate change.
2. Availability of different politically approved sectoral municipal Plans and Programs that advocate strategy and action plans in the fields of Climate Change Adaptation Plan, Sustainable Energy Action Plan, Strategic Noise Map, ...
3. Human capital is made up of multidisciplinary teams from both city councils. The existence of a local ecosystem that is motivated involved and developing projects that are closely aligned with the proposed strategy.
4. Availability of technology that can be applied to the proposed strategy: Municipal digital platforms (Gavius and HATom) and 5G connectivity being deployed in beach environments.

Lower performance observed

1. The lack of indicators and quantitative information on the circular economy and risk management and prevention enables policy decisions based on data and quantitative conclusions.
2. Although digital communication is available for most of the procedures in the catalog of citizen services, it is not available to raise awareness and provide information in the intended work areas.
3. A battery of solutions and projects to move toward the circular economy and improve risk management are available but stalled due to a lack of municipal funding. This has been further intensified with COVID.
4. We must raise awareness among citizens and local businesses in these new work areas.

City Ecosystem (Slide 1)

Consortium

Ajuntament de Gavà

Ajuntament de Castelldefels

Partners

CETAQUA WATER TECHNOLOGY CENTRE

- ✓ Aigües de Barcelona and CETAQUA with their experience in RESCCUE project (Resilient cities facing climate change), iON Beach system and BINGO project.

Aigües de Barcelona

UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

- ✓ UPC Campus Baix Llobregat develop projects and solutions participating in many European calls.

FAB LAB TINKERERS

- ✓ HATom platform developed by Tinkerers, a 3D immersive and interactive geospatial data visualization platform that analyze and visualize complex graphics and data.

Stakeholders

AMB Àrea Metropolitana de Barcelona

Pla Estratègic Metropolità de Barcelona

UC GAVÀ UNIÓ DE COOPERADORS

CIMNE EXCELENCIA SEVERO OCHOA

Consell Comarcal del Baix Llobregat

Federació d'Associacions de Veïns de Castelldefels

10 ANYS INNOBAIX Connectant l'ecosistema de la innovació

gfi NEW CHALLENGES, NEW IDEAS

Institut de Ciències del Mar

CSIC

GREMI D'HOSTALERIA DE CASTELLDEFELS I BAIX LLOBREGAT

Ai

Diputació Barcelona xarxa de municipis

- ✓ AEBALL, PIMEC Baix Llobregat, Innobaix and Placte Industrial de AMB are business associations promoting innovation and co-creation in our territory.
- ✓ Unió de Cooperadors, ON Innovem, ON StartUp, Made in Gavà and Castelldefels are public initiatives and facilities that will host entrepreneurs and startups to promote innovative solutions.
- ✓ "Parc Mediterrani de la Tecnologia" (PMT), a scientific park promoted by the Catalan Government, the Consell Comarcal del Baix Llobregat, the Castelldefels City Council and the Universitat Politècnica de Catalunya (UPC). The park is home to the UPC's Baix Llobregat Campus, a centre of innovation and excellence in teaching and technology transfer in the fields of Telecommunications Engineering, Aeronautics, Agrifood, and Biotechnology.
- ✓ Innovation HUB and InnoDELTA PECT a new project to promote innovation in circular and social economy in Delta municipalities.

City Ecosystem

Key topics for discussion

Shared aspirations and vision – In the framework of the different meetings held with more than 30 stakeholders, it has been possible to confirm that they are aligned with the strategy proposed by the City Consortium. Both social and structured economic entities are moving along the same lines. Many of them have already carried out a strategic analysis and have identified projects and lines of work that coincide with those proposed by both city councils. It is, however, more challenging to align the interests of individual companies, given that there is still a little culture of digitalization or of implementing circularity measures or minimizing environmental and natural risks. On the other hand, a group of technology companies, providers of ad hoc services and products, interested in municipal approaches can be identified. It is not easy at the individual level.

What we bring and how we work together – The public administrations promoting participation in the ICC are pushing technology companies in the ecosystem to participate in developing some of the proposed strategies. At the same time, the project advisors are transferring all their knowledge and practice, especially in the definition of solutions. So, we are working with interest and collaboratively at the moment with top-down inertia that we hope will be bottom-up in the subsequent phases of work. On the other hand, new stakeholders not identified in the first phase of work at the supra-municipal level are joining the project with interest in collaborating in the development of the project.

Urban resources for transformation – Our cities have critical thinking and a set of highly innovation-oriented start-ups with a skilled labor force. They are willing to take risks to test and implement innovative solutions as principal assets for significant transformation. Likewise, the territorial and morphological structures of both cities in which urban areas, coast, agricultural park, and natural parks coexist become an ideal space for testing and a laboratory for innovative solutions.

ICC strategy: Vision and ambition statements

ICC Cities Vision

Promote the articulation of municipal policies to boost the **circular economy** and improve the **resilience** of our cities based on the analysis of data and predictive models generated with digital tools and solutions.

Ambition Statement 1
Circular Data Driven cities

Establish actions in the field of energy efficiency, waste generation and management and water reuse in urban areas based on data and predictive models.

Ambition Statement 2
Resilient Data Driven cities

Promote improvements for the integrated management and resilience of sensitive areas (coast, agricultural park, natural parks, ...) based on data and predictive models.

What we want to do

Ambition Statement 3
Innovative co-creation with local ecosystem

Promote a local ecosystem network of quadruple helix actors for innovative co-creation and structuring of public-private projects.

Ambition Statement 4
Digital environment with business and citizens

Creation of a circular economy and risk management information system to promote Data-Driven organisations and generate virtual environments for citizens and businesses.

How we want to do it

City solutions and delivery strategy

Solution 1 – Circular & Resilient Data Driven Cities

Description

Analyze the circularity level and resilient capacity of urban and natural areas of our cities. This analysis is based on extensive data collection, implementation of circular economy actions, and climate change adaption methods: long-term monitorization and performance assessment of the implanted activities and strategies.

Relevant to which city ambition statement

- Ambition Statement 1: Circular data driven cities.
- Ambition Statement 2: Resilient data driven cities.

Benefit to city

- Increase the capacity of natural and urban resilience to climate change.
- Efficient waste, energy and water systems management.

Business model

Public-private collaborations for activating social, economic and environmental synergies.

Parties interacting

- Municipalities and regional administration.
- Business: Digital services, natural resources companies, local business…
- Research centres
- Civil and environmental associations.

Blockers and risks

- Lack of funding for implementing actions and demonstrate the benefits of circularity to local business.
- Public administrative terms for proceeding and procurement.

Pending uncertainties

Partnership management to access to EU funding through public-private initiatives.

City solutions and delivery strategy

Solution 2 – Innovative co-creation system

Description

Promote public-private initiatives for implementing circular economy and resilience solutions based on digitalization methods and framed into the EU strategies and funding programs. We are enhancing the capacities of existing local co-creation clusters and other innovation hubs.

Relevant to which city ambition statement

- Specifically, relevant for Ambition statement 3: Innovative co-creation with local ecosystem, but this solution contributes directly to the other ambitions statements as well.

Benefit to city

- Enhanced socio-economic resilience;
- Growth of win-win solutions in the local ecosystem;
- Growth of startups, SMEs and social economy.

Business model

Public-private collaborations for activating social, economic and environmental synergies.

Parties interacting

- Municipalities and regional administration.
- Business: Digital services, natural resources companies, local business…
- Research centres
- Civil and environmental associations.

Blockers and risks

- Lack of funding for implementing actions and demonstrate the benefits of circularity to local business.
- Public administrative terms for proceeding and procurement.
- Risk management of non-tested innovative business opportunities.

Pending uncertainties

Partnership management to access to EU funding through public-private initiatives.

City solutions and delivery strategy

Solution 3 – Stakeholders digital platforms

Description

Creation of a circular economy and risk management information system to create a Data Driven organization and generate a virtual network for the public administration, citizens, and local businesses.

Relevant to which city ambition statement

- Specifically, relevant for Ambition statement 4: Digital environment with business and citizens, but this solution contributes directly to the other ambitions statements as well.

Benefit to city

- Enhancing citizen and business participation, connectivity and community.
- eGoverment administration and digitization of public services.

Business model

Public-private collaborations for activating social, economic and environmental synergies.

Parties interacting

- Municipalities and regional administration.
- Business: Digital services, natural resources companies, local business…
- Research centres
- Civil and environmental associations.

Blockers and risks

- Lack of funding for implementing actions and demonstrate the benefits of circularity to local business.
- Public administrative terms for proceeding and procurement.
- Resources for maintaining a long-term management system of the digital platform.

Pending uncertainties

Partnership management to access to EU funding through public-private initiatives.

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Section

2

Gavà - Castelldefels Consortium: Ambition and roadmap

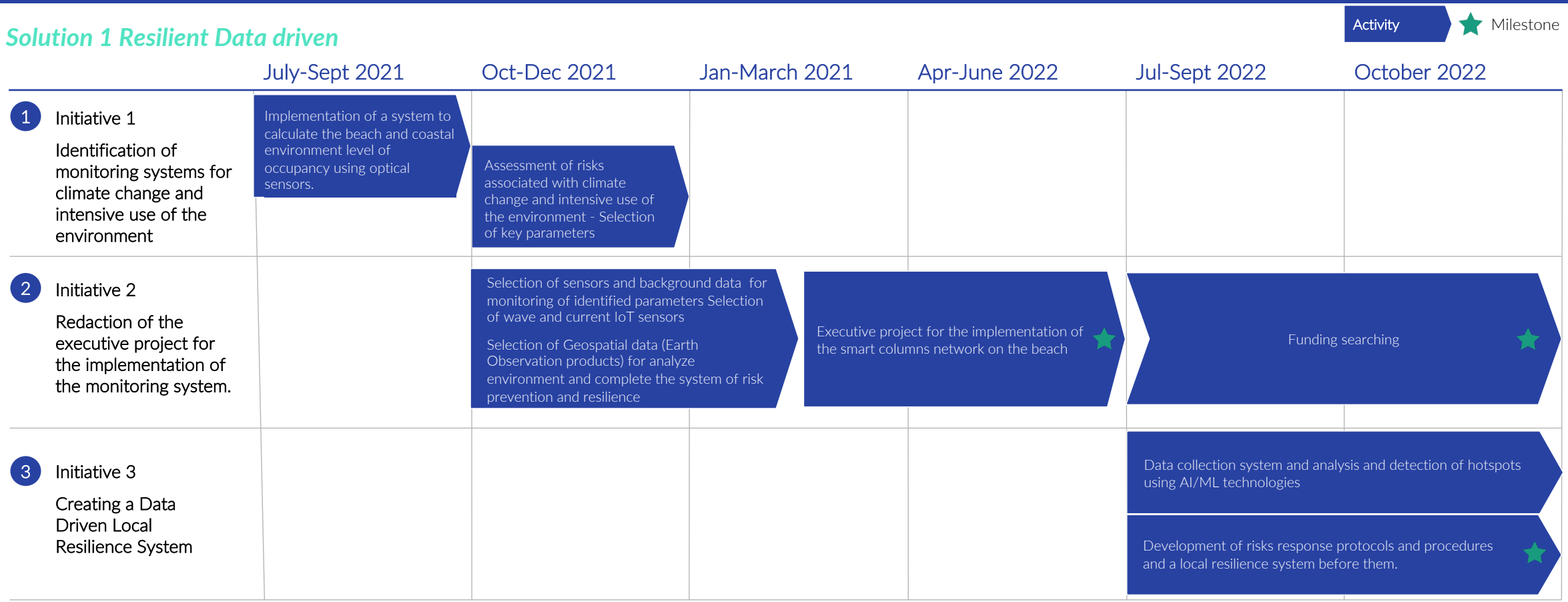
ICC Transformation

February 2021 to May 2021

European Commission | The Intelligent Cities Challenge is funded by COSME, the EU programme for Competitiveness of Enterprises and SMEs

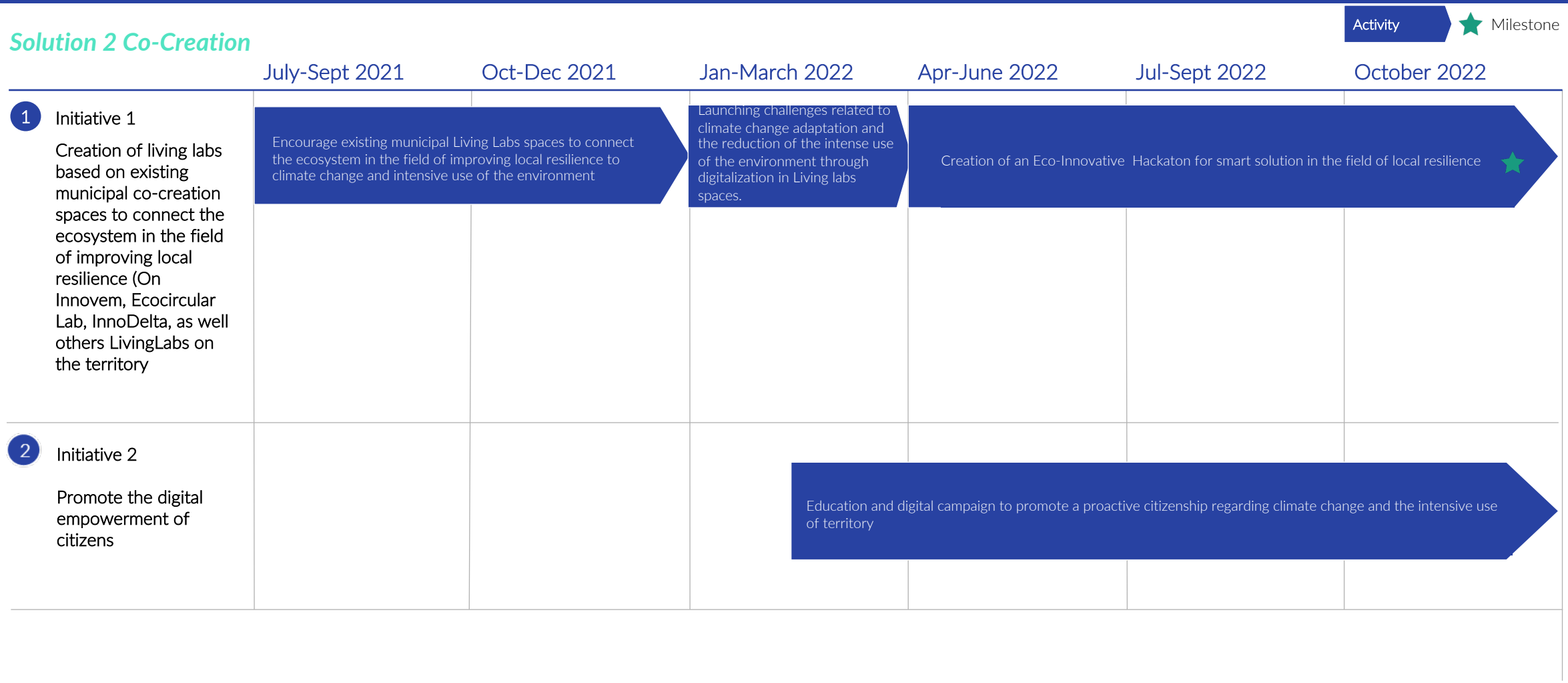
High level implementation roadmap for solution

Solution 1 Resilient Data driven



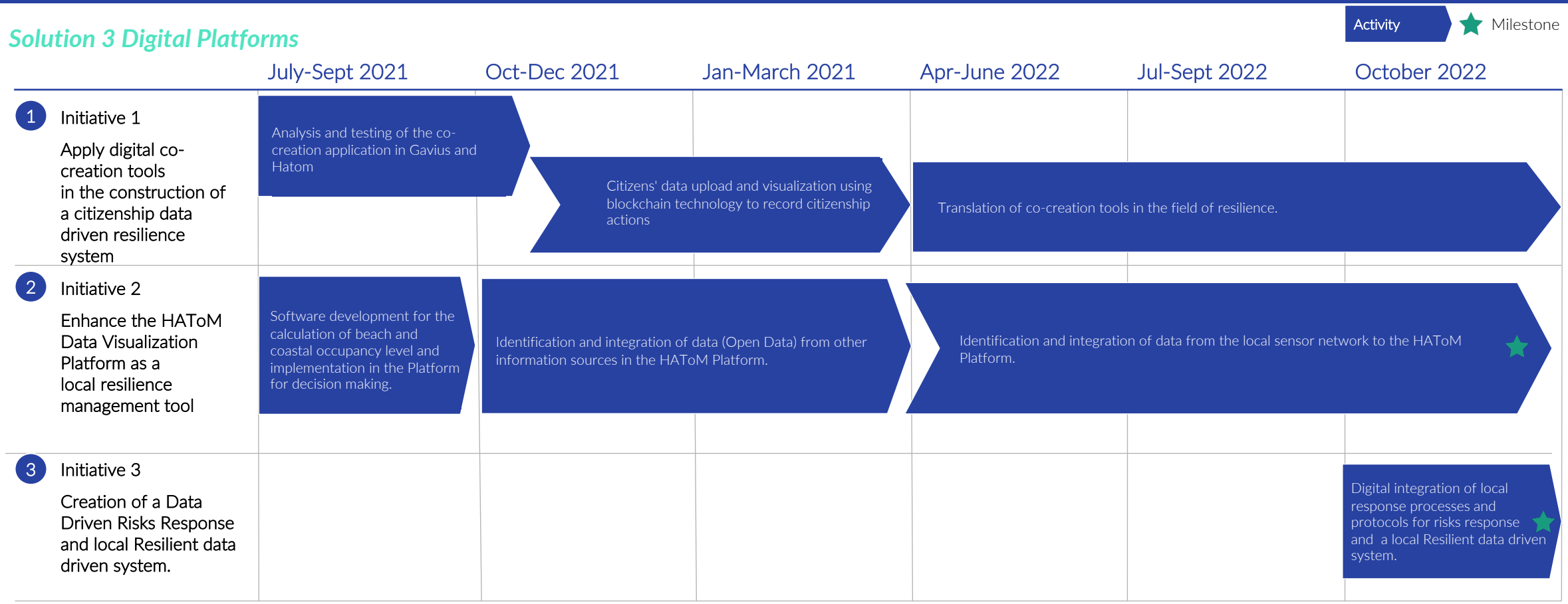
High level implementation roadmap for solution

Solution 2 Co-Creation



High level implementation roadmap for solution

Solution 3 Digital Platforms



Rationale to road map

The roadmap was planned during several consortium working sessions, allowing all partners to develop solutions in their expertise. All the solutions defined were integrated and distributed in the roadmap timetable taking into account the order and time of development needed to implement each solution.

The investment by the municipalities of Gavà and Castelldefels in the first stages of the ICC made it possible to partially evaluate some of the solutions proposed through pilot tests. However, the first step was to write the executive project for the deployment of the necessary infrastructure of the sensors for monitoring the different defined parameters.

Thus, we have the visualization and data exchange platforms (HAToM and Gavius) where we can integrate information already available from our territory. However, for the deployment of the sensor network and, therefore, the creation of the protocols, we need an essential investment that we do not have.

In this sense, we are focusing on obtaining financing from European funds to implement the data collection system and develop the rest of the solutions proposed in the roadmap.

Initiative charter Solution 1: Resilient Data Driven

Strategy

Resilient Data Driven

Description

Due to climate change and sudden changes in weather, changes are planned in the delta line where the cities of Gavà and Castelldefels are located. As well as sudden changes in the streams and the sewer of the City. Also an increase in pollution.

We anticipate the installation of sensors and 360º cameras that collect data on a platform that, thanks to the definition of forecasting models, AI and IoT, neurological models can improve in real time the public management of natural spaces and urban areas of more risk.

Link to vision

The vision the solution links to

Improve the resilience of our cities

Link to ambition statement

The ambition statement the solution links to

Ambition Statement 2
Promote improvements for the integrated management and resilience of sensitive areas (coast, agricultural park, natural parks, ...) based on data and predictive models.

Expected impact and timing

Expected impact & when will the solution begin to create impact? We want to improve the management of public services and natural areas, as well as quickly assess and anticipate risk situations for the population

The Impact on the city will be in 24 months

Stakeholders involved

Solution lead: And Solution working team:

www.Tinkerers.tech (geospatial intelligence and urban computing)

www.Cetaqua.com (water technology center)
?
https://www.icm.csic.es/en (Institute of Marine Sciences)

https://lim.upc.edu/en Maritime Engineering Laboratory.

https://www.aiguesdebarcelona.cat/es/home

Risks and mitigation

Personal identity protection measures

It is a factor that we consider but that we have not worked on yet

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

2 Million Euros

Solution maturity outputs

Both Castelldefels and Gavà have broadband networks in most of their territory. They are innovative cities in the establishment of digital service management systems.

https://www.upc.edu/parcupc/ca/noticies/tinkerers-fab-lab-desenvolupa-una-tecnologia-interactiva-de-visualitzacio-de-dades-per-controlar-lafluencia-a-la-platja-de-castelldefels

https://www.uia-initiative.eu/en/uia-cities/gava

City performance outcomes and impacts

It has been applied as a pilot project in the evaluation of the occupation of the beaches through the installation of IoT sensors and the visualization of AI-ML computed data in the HAToM platform. That allowed the city to manage the risk of contagion to COVID19 for possible agglomerations of people and to inform the visitors of the level of occupancy for better territorial distribution to avoid them. Drafted a risk management executive project for rapid decision-making and response.

Initiative charter Solution 2:Innovative co-creation system

Strategy

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Description

Promote public-private initiatives for implementing resilience solutions based on digitalization methods and framed into the EU strategies and funding programs. Enhancing the capacities of existing local co-creation clusters, as well as other innovation Hubs.

Link to vision

The vision the solution links to

Enhancing the capacities of existing local co-creation clusters, as well as other innovation hubs.

Link to ambition statement

The ambition statement the solution links to

.Ambition Statement 3
Promote a local ecosystem network of quadruple helix actors for innovative co-creation and structuring of public-private projects

Expected impact and timing

Expected impact & when will the solution begin to create impact? We want to improve the management of public services and natural areas, as well as quickly assess and anticipate risk situations for the population

The Impact on the city will be in 24-36 months

Stakeholders involved

Solution lead: City Council Gavà and City Council Castelldefels.

And Solution working team:

Others stakeholders: - AEBALL, PIMEC Baix Llobregat, Innobaix and Pacte Industrial de la Regió Metropolitana de Barcelona are business associations promoting innovation and co-creation in our territory. All of them support the consortium ICC project and are developing similar initiatives to stimulate innovation.

- Unió de Cooperadors, ON Innovem, ON StartUp, Made in Gavà and Castelldefels are public initiatives and facilities that will host entrepreneurs and startups to promote innovative solutions.

- UPC Campus Baix Llobregat and TINKERERS (assessing partners of the project) are used to promote innovative projects and solutions participating in many European calls.

- "Parc Mediterrani de la Tecnologia" (PMT), a scientific park promoted by the Catalan Government, the Consell Comarcal del Baix Llobregat, the Castelldefels City Council and the Universitat Politècnica de Catalunya (UPC). The park is home to the UPC's Baix Llobregat Campus, a center of innovation and excellence in teaching and technology transfer in the fields of Telecommunications Engineering, Aeronautics, Agrifood, and Biotechnology. The Campus is occupied by 7 research centres and its incubators, and 40 start-ups - Innovation HUB and InnoDELTA PECT a new project to promote innovation in circular and social economy in Delta municipalities.

Risks and mitigation

the difficulty of working together sharing common goals large work teams.

Great efforts in communication such as newsletters and digital work forums

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

1 Million Euros

Solution maturity outputs

Castelldefels and Gavà have research and development laboratories in their municipalities

Gavà is the leader of the HUB ECCUS circular https://hubeccus.com/ economy and has a new EcoCircular Lab center. Castelldefels has a technology park to promote spin-offs On stard UP

City performance outcomes and impacts

There are no outcomes and impact yet.

Initiative charter Solution 3:Business and citizens digital platforms

Strategy

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Description

Creation of an information system on climate change risk management, based on AI, to reduce the gap between the 20th century systems used by the local administration and the 4.0 environment enjoyed by citizens, moving from a reactive local administration to a proactive one.

Link to vision

The vision the solution links to

Analysis of data and predictive models generated with digital tools and solutions.

Link to ambition statement

Ambition Statement 4

Creation of a risk management information system to promote Data-Driven organizations and generate virtual environments for citizens and businesses

Expected impact and timing

Expected impact & when will the solution begin to create impact?

The Impact on the city will be in 24-36 months

Stakeholders involved

Solution lead: ICC Gavà- Castelldefels Consortium

And Solution working team:

Gavius project led by Gavà City Council will promote the creation of an AI system to provide virtual technical assistance to municipal workers and the public in managing and applying for social aid.

HATom platform developed by Tinkerers Fab Lab for Castelldefels City Council, a 3D immersive and interactive geospatial data visualization platform that analyze and visualize complex graphics and data in a more understandable and universal language: visual.

UPC Campus Baix Llobregat, Tinkerers Fab Lab and Alteraid are developing similar projects. Mediterranean Technology Park (PTM)

Gavà City Council, Aigües de Barcelona and CETAQUA are developing an indicator system based in City Blueprint Index.

Risks and mitigation

the difficulty of working together sharing common goals large work teams.

Great efforts in communication such as newsletters and digital work forums

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

1 Million Euros

Solution maturity outputs

Both Castelldefels and Gavà have broadband networks in most of their territory. They are innovative cities in the establishment of digital service management systems.

https://www.upc.edu/parcupc/ca/noticies/tinkerers-fab-lab-desenvolupa-una-tecnologia-interactiva-de-visualitzacio-de-dades-per-controlar-lafluencia-a-la-platja-de-castelldefels

https://www.uia-initiative.eu/en/uia-cities/gava

City performance outcomes and impacts

There are no major outcomes and impacts yet. However, it has been test the digital platforms through a pilot project in the evaluation of the occupation of the beaches through the installation of IoT sensors and the visualization of AI-ML computed data in the HAToM platform that allowed the consortium to draft a risk management executive project for rapid decision-making and response.

Key Performance indicators - Activities (inputs and actions)

Solution	Initiative	Activities – Inputs and actions
1.Resilient Data driven	1.1 Identification of monitoring systems for climate change and intensive use of the environment	1.1.1 Implementation of a system to calculate the beach and coastal environment level of occupancy using optical sensors. 1.1.2 Assessment of risks associated with climate change (Natural Disaster Risk Management) and intensive use of the environment - Selection of key parameters
	1.2 Implementation of the monitoring system for the identified parameters	1.2.1 Selection of IoT sensors and background data for monitoring of identified parameters 1.2.2 Implementation of the smart columns network on the beach 1.2.3 Provision of IoT sensors on the beach and coastal environment and on infrastructures of the territory.
	1.3 Creating a Data Driven Local Resilience System	1.3.1 Data collection system and analysis and detection of hotspots 1.3.2 Development of risks response protocols and procedures and a local resilience system before them.
2.Co-Creation	2.1 Promotion of existing municipal co-creation spaces to connect the ecosystem in the field of improving local resilience (On Innovem, Ecocircular Lab, as well as other innovation laboratories). 2.2 Promote the digital empowerment of citizens	2.1.1 Encourage existing municipal living labs spaces to connect the ecosystem in the field of improving local resilience to climate change and intensive use of the environment 2.1.2 Launching challenges related to climate change adaptation and the reduction of the intense use of the environment through digitalization in living labs spaces. 2.1.3 Creation of an Eco-Innovative Hackaton for smart solution in the field of local resilience 2.2.1 Education and digital campaign to promote a proactive citizenship regarding climate change and the intensive use of territory
3.Digital Platforms	3.1 Apply digital co-creation tools in the construction of a citizenship data driven resilience system	3.1.1 Analysis and testing of the co-creation application Gavius 3.1.2 Citizens' data upload and visualization using blockchain technology to record citizenship actions 3.1.3 Translation of co-creation tools in the field of resilience.
	3.2 Enhance the HAToM Data Visualization Platform as a local resilience management tool and DRR & CCM	3.2.1 Software development for the calculation of beach and coastal occupancy level and implementation in the Platform for decision making. 3.2.2 Identification and integration of data (Open Data) from other information sources in the HAToM Platform. 3.2.3 Identification and integration of data from the local IoT sensor network to the HAToM Platform 3.3.4 Integration of AI & ML cloud computing platforms to process the data from different IoT sensors and platforms
	3.3 Creation of a Data Driven Risks Response and local Resilient data driven system	3.3.1 Digital integration of local response processes and protocols for risks response and a local Resilient data driven system.

Key Performance indicators – solution maturity (outputs)

Solution	Initiative	Solution Maturity - outputs	Targets
1.Resilient Data driven	1.1 Identification of monitoring systems for climate change and intensive use of the environment	Document 1. Risks assessment and main monitoring systems in climate change and intensive use of the territory.	Local scientific and innovative research ecosystem
	1.2 Implementation of the monitoring system for the identified parameters	Document 2. Type of sensors, number and location in the territory	Local scientific and innovative research ecosystem
	1.3 Creating a Data Driven Local Resilience System	Document 3. Description of critical areas in the intensive use of the territory Document 4. Main local response systems to climate change Document 5. Local response protocol to climatic risk episodes	Decision makers Local government managers
2.Co-Creation	2.1 Promotion of existing municipal co-creation spaces to connect the ecosystem in the field of improving local resilience (On Innovem, Ecocircular Lab, as well as other innovation laboratories).	Document 6. Map of actors for innovative co-creation in the field of local resilience Document 7. Results of the Session of innovative co-creation in the field of local resilience	Citizens Local co-creation labs
3.Digital Platforms	3.1 Apply digital co-creation tools in the construction of a local data driven resilience system	Measuring citizen satisfaction in the use of the Gavius platform Measuring citizen satisfaction with the use of Blockchain technology	Citizens
	3.2 Enhance the HAToM Data Visualization Platform as a local resilience management tool (DRR & CCM)	Integration in HAToM of the software of calculation of beach and coastal occupancy, data of other sources of information and data of the network of IoT sensors sensor in the field of the local resilience Integration of AI/ML Cloud Computing platform for the Earth Observation/Geospatial data and IoT sensors network	Local government managers
	3.3 Creation of a Data Driven Risks Response and local Resilient data driven system	Document 3. Description of critical areas in the intensive use of the territory Document 4. Main local response systems to climate change Document 5. Local response protocol to climatic risk episodes	Decision makers Local government managers

Key Performance indicators

Solution	Initiative	City performance – outcomes and impacts	Targets
1.Resilient Data driven	1.1 Identification of monitoring systems for climate change and intensive use of the environment	1. Data collection system and analysis and detection of hotspots using AI/ML technologies 2. Development of risks response protocols and procedures and a local resilience system before them.	Citizenship, Scientific and Technological Research Community, decision makers, Local government managers
	1.2 Implementation of the monitoring system for the identified parameters		
	1.3 Creating a Data Driven Local Resilience System		
2.Co-Creation	2.1 Promotion of existing municipal co-creation spaces to connect the ecosystem in the field of improving local resilience (On Innovem, Ecocircular Lab, as well as other innovation laboratories).	1. Creation of an Eco-Innovative Network for local smart solutions in the field of local resilience	Innovative local ecosystem
3.Digital Platforms	3.1 Apply digital co-creation tools in the construction of a local data driven resilience system	1. Digital integration of local response processes and protocols for risks response and a local Resilient data driven system. 2. Citizen construction system of data related to climate change in real time 3. System of response and local action in front of the effects of some parameters detected in the climatic change	Citizenship, Scientific and Technological Research Community, decision makers, Local government managers
	3.2 Enhance the Hatom Data Visualization Platform as a local resilience management tool		
	3.3 Creation of a Data Driven Risks Response and local Resilient data driven system		

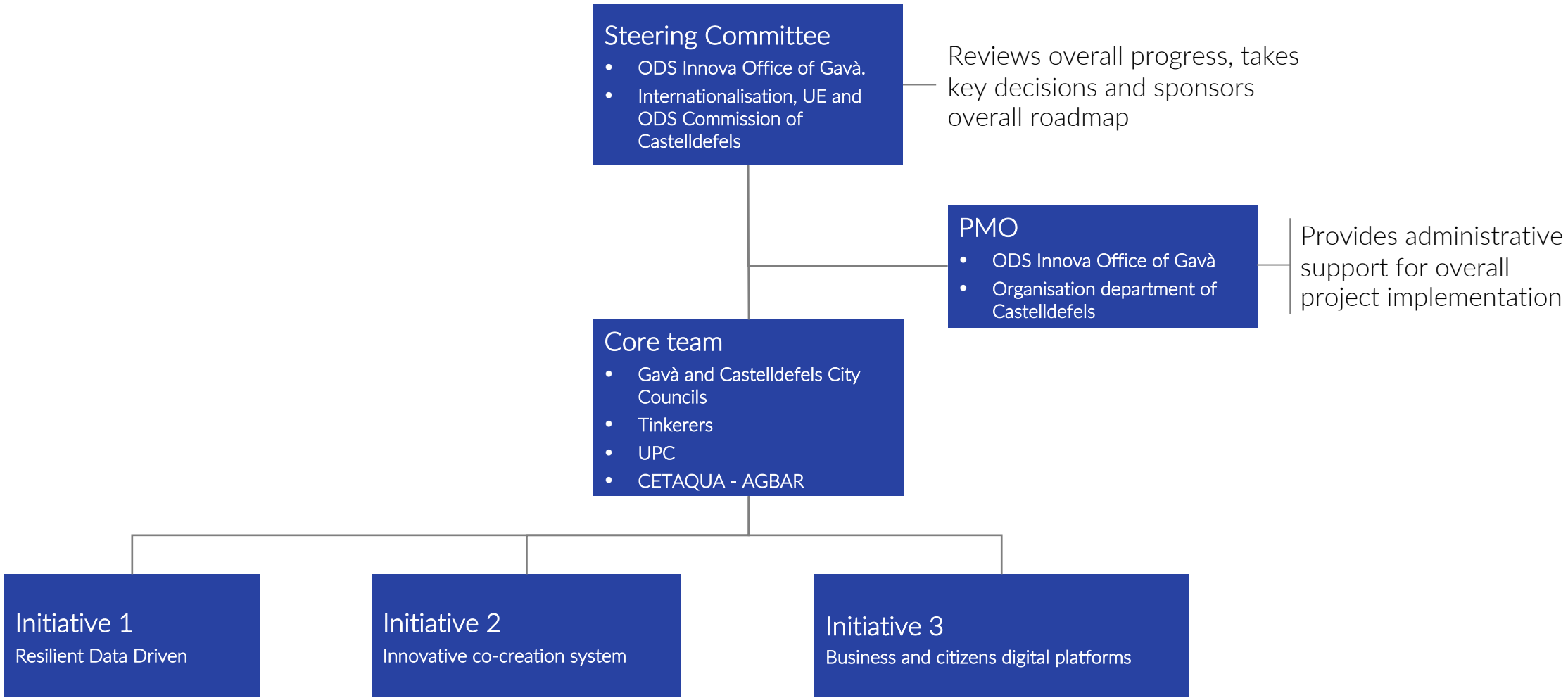
Key Performance indicators - Cross cutting indicators

Cross cutting indicators
Genre: Composition of the project management team in relation to gender and age Composition of the project's driving team (partners) in relation to gender and age Composition of the teams of other actors of the project (Innovative Co-Creation Ecosystem) in relation to gender Composition of citizens who use the Gavius application in relation to gender and age in the field of climate resilience
Innovation: Number of financial resources dedicated to the innovation project Number of human resources dedicated to innovation Alliances with technology centers Alliances with technology research and development companies Alliances with other research institutions Alliances between Co-creation Centers, Innovation Laboratories
Research and Technology: Number of people with technological qualifications in relation to gender and age Equipment and facilities used in relation to research and development New lines of technological action created from the development of the project and generated by the project teams
Sustainability: Calculation of total CO2 emissions in the technology applied to the project Calculation of CO2 emissions per inhabitant in the technology applied to the project Renewable energies used in the development and outcome of the project Energy consumption used in the technology applied to the project Waterfoot print, Coeficiency

Rationale to KPI approach

We cannot yet assess city performance, solution maturity, ecosystem, and activities. The proposed solutions still do not have KPIs, so we have not started to act. We are in the process of seeking financing to execute the project, and we cannot measure the results of something that has not been implemented yet.

Governance structure for roadmap implementation



The European Commission's
INTELLIGENT CITIES
CHALLENGE

Section

3+4

Gavà - Castelldefels Consortium: Impact

ICC Transformation

May 2021 to June 2022

European Commission | The Intelligent Cities Challenge is funded by COSME, the EU programme for Competitiveness of Enterprises and SMEs

Impact executive summary

Our ICC consortium has promoted improvements for the integrated management and resilience of sensitive areas of our cities (coast, agricultural park, natural parks, ...) based on data and predictive models and defined through a newly formed local ecosystem network of quadruple helix actors for innovative co-creation (Startups, universities, research centers, entities...).

Due to climate change and sudden weather changes, changes will happen in the Llobregat river delta line, where the cities of Gavà and Castelldefels are located. As well as sudden changes in the streams and the increase in pollution as we are part of the metropolitan area of Barcelona, a zone of a high density of people and critical infrastructures but with important natural spaces.

The ICC program allowed us to form a highly trained working team that, through other cities' experiences seen during the ICC city labs, allowed us to anticipate a public management system of natural spaces and urban areas of more risk during the COVID19 pandemic. The management system consisted of the installation of sensors and 360º cameras. These cameras collected data on a platform that, thanks to the definition of forecasting models, AI and IoT, neurological models improved in real time the calculation of the capacity of the beaches and the publication of this data for the users, and thus be able to distribute the public better and guarantee safety in the use of this spaces, among other measures.

This first test allowed us to analyze the implemented system and define the bases for developing a risk management project that has been drawn up by all the members of the ICC Gavà - Castelldefels consortium. This project takes into account the collection and analysis of data on the occupation of sensitive areas of our cities, the weather conditions and pollution episodes that occur, the monitoring of changes in coastal dynamic, etc., to visualize them through a management platform and publish them in a public information app.

The final product is a risk monitoring and management system for rapid decision-making and response to improve the resilience of the city to eventual impacts related to climate change hazards.

Assessment of city performance - discussion

The consortium solutions assessment in terms of KPIs is not ready to be performed as the solution maturity, and activities are still in process. The solutions that we proposed still do not have KPIs. We are in the process of seeking financing to execute the project. See the following slides for qualitative assessment.

Assessment of solution maturity - discussion

The management system tested during the ICC program consisted of the installation of sensors and 360º cameras that collected data on a platform that, thanks to the definition of forecasting models, AI and IoT, neurological models improved in real time the calculation of the capacity of the beaches and the publication of this data for the users, and thus be able to distribute the public better and guarantee safety in the use of this spaces, among other measures.

This first test allowed us to analyze the implemented system and define the bases for developing a risk management project that has been drawn up by all the members of the ICC Gavà - Castelldefels consortium. This project considers the collection and analysis of data on the occupation of sensitive areas of our cities, the weather conditions and pollution episodes that occur, the monitoring of changes in coastal dynamics,... to visualize them through a management platform and publish them in a public information app.

The final product is a risk monitoring and management system for rapid decision-making and response. It is an excellent and susceptible project to be presented to the different calls for the NextGenerationEU funds, which will allow us to obtain economic resources and program support strategies to develop it. Personal and organizational resources are ready, and the project is defined and drafted to be implemented once the funding is secured.

Assessment of city ecosystem and activities - discussion

During this time, we have worked with administrations, start-ups, and research centers. We have created a dynamic and decisive working group with high capacities.
Also, our councilors presented the ICC strategy at the Smart City World Congress in November 2021.
The political approval and the incorporation of new vital partners have been decisive in developing such a potential project.

5 key lessons

Lesson	Reflections
1	Knowledge of innovative ways to manage problems related to climate change and the intensive use of the environment.
2	Technological development at the service of citizens.
3	Local administration innovation may become decisive in the future.
4	Public-private collaborations is fundamental for activating social, economic and environmental synergies.
5	The lack of funding can block the implementation of actions and the demonstration of the benefits of circularity and resilience to local business.

Reflections on city collaborations

The collaborations have been limited to the ICC city labs and other online sessions, which made it difficult to prosper in the future. However, we have seen that many cities in the ICC program have and share similar problems and difficulties in deploying innovative projects. And we also want to achieve similar goals to ensure the resilience of our cities and beyond.

Commitments

Commitments to on-going resources	Commitments to on-going collaboration	Commitments to on-going KPIs
Persist in the search for funding by presenting proposals for funding calls. Political commitment to implement actions. Availability of different politically approved sectoral municipal Plans and Programs that advocate strategy and action plans	Continue collaborating with the partners of the consortium Find other interested partners. Presentation of proposals with current and potential partners. Promoting participation of technology companies in the ecosystem to participate in the development of some of the strategies proposed.	Develop an efficient system to evaluate the KPIs defined in the ICC program. Achieve the expected results for the planned solutions but also for the defined cross-cutting indicators. Maintain the schedule of the action plan in the terms that we defined once we have the financing to develop it.

3 Year plan - ambitions

Building on the ICC, what would will the city aim to achieve in 3 years time?	Dispose of a circular economy and risk management information system to promote Data-Driven organizations and generate virtual environments for citizens and businesses. Consolidate the local ecosystem network of quadruple helix actors for the innovative co-creation and structuring of public-private projects.
What steps will you take over the next 3 years to achieve these goals?	Preparing and presenting proposals for funding calls. Implementation of the monitoring system defined in the executive project for the deployment of the necessary infrastructure of the sensors for the monitoring of the different defined parameters. Collect and analyze the strategic data using AI/ML technologies with strategic and expert partners. Education and digital campaign to promote a proactive citizenship regarding climate change and the intensive use of territory.

3 Year plan - targets

KPI	Category	What commitments will the city make to this end?
1	Key Performance indicators – Activities and solutions maturity (inputs and actions): Resilient Data driven.	Implementation of the monitoring system for the identified parameters Creating a Data Driven Local Resilience System
2	Key Performance indicators – Activities and solutions maturity (inputs and actions: Co-Creation	Promotion of existing municipal co-creation spaces to connect the ecosystem in the field of improving local resilience (On Innovem, Ecocircular Lab, as well as other innovation laboratories). Promote the digital empowerment of citizens.
3	Key Performance indicators – Activities and solutions maturity (inputs and actions: Digital Platforms	Apply digital co-creation tools in the construction of a citizenship data driven resilience system. Enhance the HAToM Data Visualization Platform as a local resilience management tool and DRR & CCM Creation of a Data Driven Risks Response and local Resilient data driven system
4	Key Performance indicators - Cross cutting indicators: Genre	Composition of the project's driving team (partners) in relation to gender and age Composition of the teams of other actors of the project (Innovative Co-Creation Ecosystem) in relation to gender Composition of citizens who use the Gavius application in relation to gender and age in the field of climate resilience
5	Key Performance indicators - Cross cutting indicators: Innovation	Number of financial resources dedicated to the innovation project and number of human resources dedicated to innovation Alliances with technology centers, technology research and development companies. Alliances between Co-creation Centers, Innovation Laboratories
6	Key Performance indicators - Cross cutting indicators: Research and Technology	Number of people with technological qualifications in relation to gender and age Equipment and facilities used in relation to research and development New lines of technological action created from the development of the project and generated by the project teams
7	Key Performance indicators - Cross cutting indicators: Sustainability	Calculation of total CO2 emissions in the technology applied to the project Calculation of CO2 emissions per inhabitant in the technology applied to the project Renewable energies used in the development and outcome of the project Energy consumption used in the technology applied to the project Waterfoot print, Coeficiency