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Pamplona: Intelligent City Transformation Overview

ICC Final Deliverable

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Executive summary

Pamplona is the capital city of the Navarre Region in Northern Spain, characterized by 209.000 inhabitants and a growth rate of +8% (2000-2016).

Navarre approved in 2017 its Smart Specialisation Strategy (or S3). The S3 puts forward the use of smart policies that focus on these priorities to maximise the potential of regional development, to progress towards a knowledge-based economy based on Pamplona´s strengths: high rate of industrial activity (automotive and renewable energies), the presence of 3 universities a high density of innovation driven companies.

Pamplona has been a pioneer in fostering renewable energies during the last 20 years. Today the 60% of the total electricity consumption in the region comes from renewable sources. The National Center for Renewable Energies is located outside Pamplona, and the energy sector is the second most important industrial sector. Pamplona signed in 2009 the Covenant of Mayors and the CO2 emissions have been reduced a 22% between 2008 and 2017. Pamplona has renewed last March its commitment for 2030 (40% reduction) and it is developing an Energy Transition Strategy.

As a pending subject, Pamplona must face the challenge of the sustainable mobility. Pamplona is in the center position of a wider metropolitan where every working day there are about 1 million of trips, 42% of them are made walking, 41% in private transport, 13% in public transport (bus and taxi), and 4% by other means (mainly bicycle). The target of the recently approved Pamplona SUMP is to get 20% of public transport, 30% of private transport and 50% of non-motorized means (walking and bicycle).

Pamplona finished in 2021 its vision for 2030. After 2 years of work and the participation of more than 100 stakeholders, the strategy has been defined and it has 29 strategic objectives that will drive the city towards a new model based in energy efficiency and sustainable transportation underpinned by innovation and digitalization.

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Section

1

Pamplona: Preparation and assessment

ICC transformation

September 2020 to January 2021

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Introduction

Pamplona City Council has been developing a digital transformation policy for more than a decade. In 2012, for example, the Smart Pamplona Strategy was approved, and other actions and initiatives have also been carried out, such as the digitization of numerous procedures, the digitization of file management or the development of electric mobility. Because of these policies, in 2017 the European Commission approved the H2020 STARDUST project, where Pamplona is one of the 'lighthouse cities' in terms of digital development, receiving aid for the materialization of projects in this line.

The City Council is also immersed in the preparation of the Urban Agenda - 2030 Strategy; the dimensions and 29 strategic objectives on which to work have already been defined. Pamplona's participation in this initiative of the 100 Intelligent Cities Challenge (ICC) will contribute to the progress of the city towards the achievement of some of these objectives, such as the implementation of a new urban energy model, the commitment to a new, healthier and more sustainable mobility, adopt a sustainable tourism management model, the increase in innovative entrepreneurial initiatives or the consolidation of Pamplona as an attractive city for talent specialized in knowledge-intensive services.

The city of Pamplona 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 is going to mobilise make things happen

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

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

Measure success, and commit to keep connections and improvements going

The ICC local team of Pamplona worked to design and develop the city roadmap in collaboration with about 20 stakeholders. In this phase 6 initiatives were selected to move forward within the framework of ICC. The roadmap includes: objective, ambition, necessity, results, partners, synergies, costs, milestones, activities, risks and KPIs.

After this, the ICC local team defined one teamwork for each solution nominating one leader and 3 to 5 staff members of the stakeholder groups that were relevant for the solution development. Six teams have been created and they have been working to develop the roadmap of each of the 6 solutions. For this purpose we have used different tools as Miro Canvas charts.

The selected solutions were in line with the city strategy (energy-sustainable mobility-innovation): 1. Digital Twin of Mobility and Air Quality; 2. Smart Navarra Lab (living lab); 3. Pamplona Metropolitan Smart Strategy; 4. LORA Network; 5. Dron technology pilot in urban environment; 6. Energy Community pilot. Solutions 2, 3 and 5 have not progressed since the definition of the roadmap for different reasons. Solutions 1 and 4 have successfully progressed in time due to a subsidy approved in the context of Next Generation EU program. Solution 6 has progressed with 2 different pilots in Pamplona, one is self financed by the city, and the other one is in the framework of Horizon 2020 oPEN LAB project.

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 Pamplona today

Pamplona is the capital city of a small region (Navarre) that has been pioneer in fostering renewable energies during the last 20 years. Today the 60% of the total electricity consumption in the region comes from renewable sources (20% of the total energy consumption). The National Center for Renewable Energies is located outside Pamplona, and the energy sector is the second most important industrial sector. Pamplona signed in 2009 the Covenant of Mayors and the CO2 emissions have been reduced a 22% between 2008 and 2017. Pamplona has renewed in 2020 its commitment for 2030 (40% reduction) and it is developing an Energy Transition Strategy.

Pamplona is in the center position of a wider metropolitan area which has spread out in the last decades. In the metropolitan area every working day there are about 1 million of trips, 42% of them are on foot, 41% in private transport, 13% in public transport (bus and taxi), and 4% by other means (mainly bicycle). The target of the recently approved Pamplona SUMP is to get 20% of public transport, 30% of private transport and 50% of non-motorized means (walking and bicycle).

Key insights from city performance analysis

Higher performance observed

1. Advances in the implementation of sustainable urban mobility models
2. Citizen culture and urban design suitable for applying new paradigms
3. Quality of the urban environment, services and public action
4. Sense of belonging, conscience and citizen participation
5. Innovative business and academic ecosystem

Lower performance observed

1. City planned for private cars
2. Culture and legislation favorable to the use of private cars and fossil energy
3. Absence of comprehensive metropolitan management of mobility and budget constraints
4. Administrative fragmentation and deficits in mobility management
5. Unsustainable economic growth model

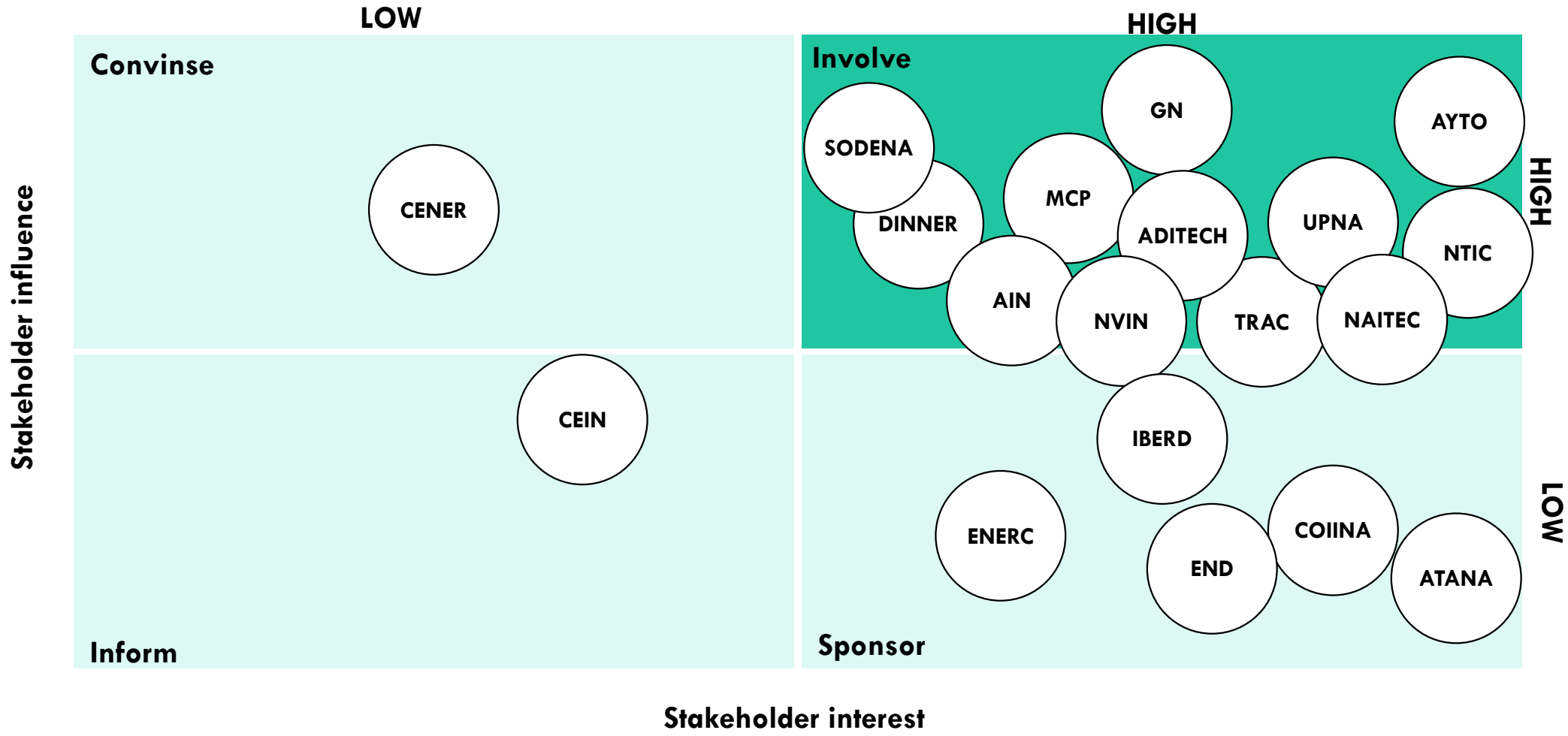
City Ecosystem

Pamplona´s stakeholder ecosystem in the ICC project is mainly composed of:

- Knowledge partners such as universities (UPNA) or the National Centre for Renewable Energy (CENER) who are key collaborators in current projects related to the city strategy (energy) and have significant experience in pilot projects related to ICC areas.
- Technology public companies such as Nasertic which is the regional company for TIC, and very relevant stakeholder to promote new technologies adoption and have relevant experience in innovation projects.
- Industry organizations such as AIN which is the regional industry association are key to incorporate private companies in the initiatives and to ensure alignment with their goals.
- Metropolitan partners (MCP): Pamplona is the centre of a wider metropolitan area that faces some challenges specially related to sustainable mobility or renewable energy integration. The metropolitan agency is a key stakeholder to enable mobility and facilities related aspects.
- Other public organizations relevant to the related ICC areas (TRACSA, NAITEC, COINA, ATACA, etc)

The following slide shows the stakeholder mapping performed by the ICC team.

City Ecosystem



ICC strategy: Vision and ambition statements

Overarching ICC city vision

To be a city that develops sustainably, inclusive in all local dimensions, culturally attractive, a bridge of knowledge and competitive in urban transformation processes through participatory, transparent and efficient governance.

This vision will become reality...

Ambition statement 1

- Developing in a sustainable way with environmental quality and in harmony with the environment, enhancing its green and ecological character

Ambition statement 2

- Enabling a socially responsible, entrepreneurial, diverse, dynamic and competitive local economy

Ambition statement 3

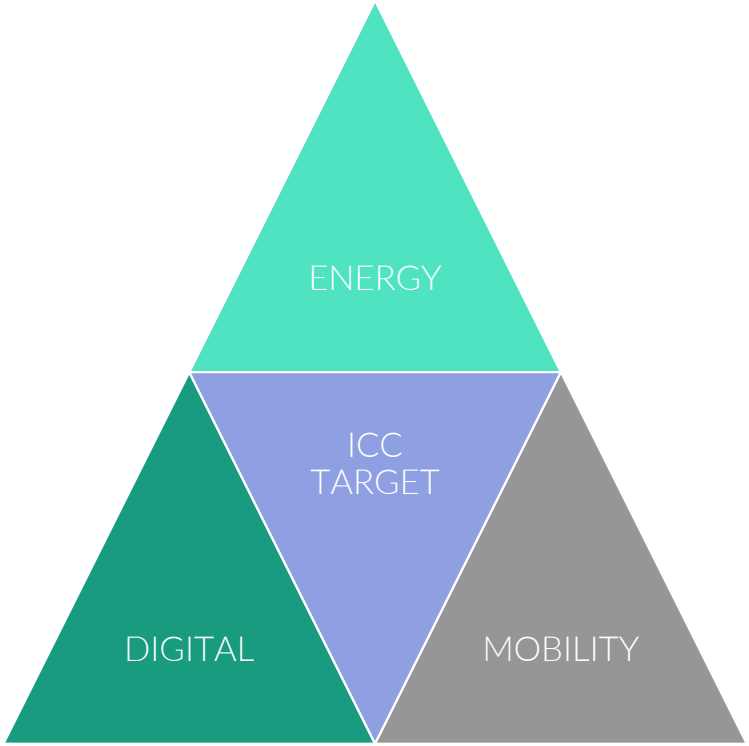
- Incorporating innovation in all processes and betting on knowledge as the engine of the city

City strategy: initiatives selection

In order to select relevant solutions aligned with the city strategy, the ICC team defined three the main areas/topics that solutions should be related to: Energy, Digital and Mobility.

By means of workshops, a long list of initiatives were identified and finally 6 solutions were prioritized by the stakeholders group based on 3 criteria: maturity, effort and impact.

The results of the stakeholder workshops about the analysis of the 6 solutions are shown in the next slides.

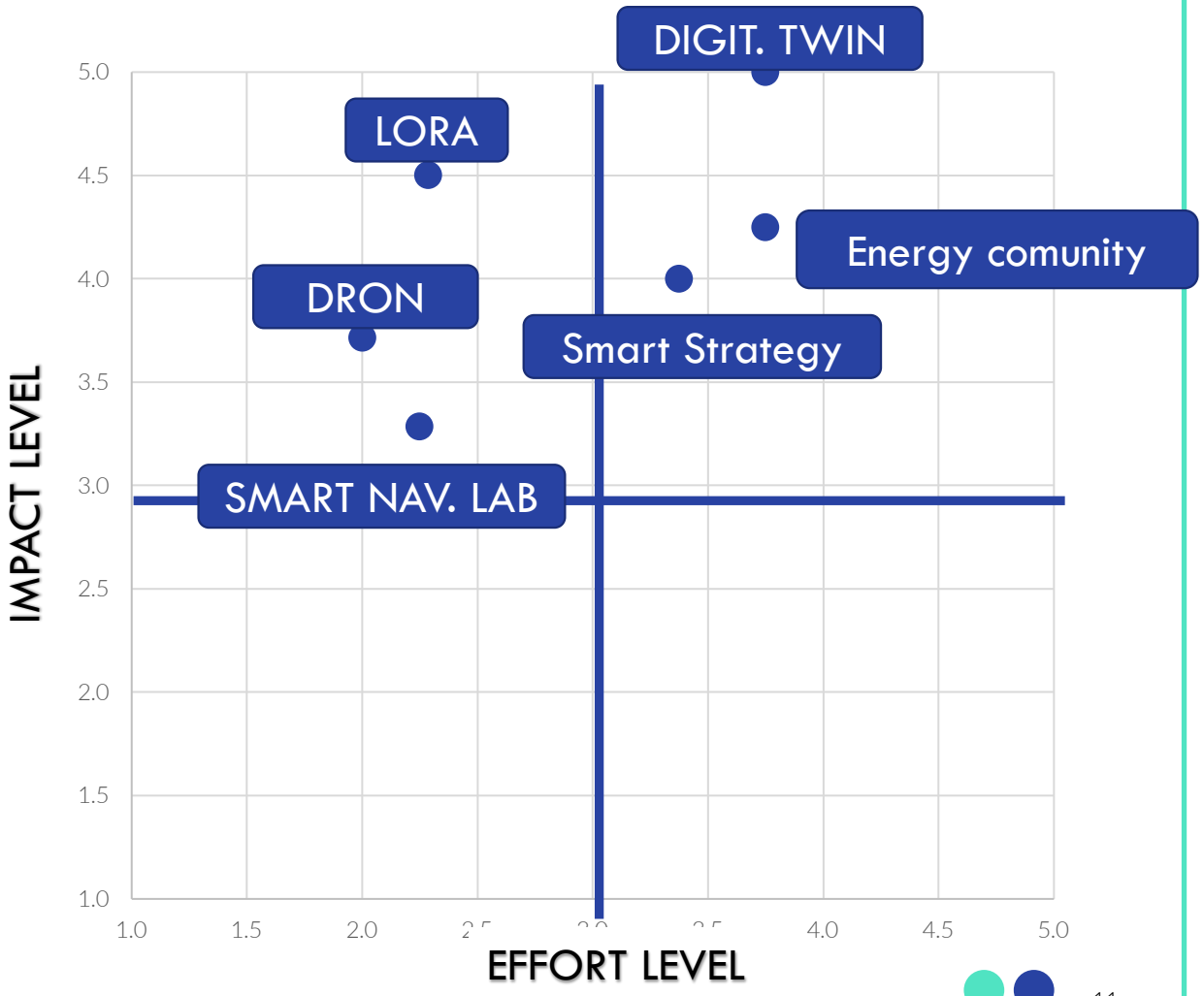


ICC initiatives

Prioritized initiatives to be part of ICC Project

1. Digital Twin of Mobility and Air Quality;
2. Smart Navarra Lab (living lab);
3. Pamplona Metropolitan Smart Strategy;
4. LORA Network;
5. Drone technology pilot in urban environment;
6. Energy Community pilot.

The following slides show details of the assessment of the different initiatives that was performed with the stakeholders.



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Section

2

Pamplona: Ambition and roadmap

ICC Transformation

February 2021 to May 2021

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High level implementation roadmap (“10000m plan”)

SOLUTION 1 – DIGITAL TWIN OF MOBILITY AND AIR QUALITY

	2021		2022		2023		2024	
Acciones	Sem1	Sem2	Sem1	Sem2	Sem1	Sem2	Sem1	Sem2
A1. Design & planning								
A2. Agreement								
A3. Budgeting & procurement								
A4. Pilot								
A5. Digital Twin								

High level implementation roadmap (“10000m plan”)

SOLUTION 2 – SMART NAVARRA LAB (LIVING LAB)

	2021		2022		2023		2024	
Planning	Sem1	Sem2	Sem1	Sem2	Sem1	Sem2	Sem1	Sem2
A1. Preparation								
A2. Agreement								
A3. Procurement prep.								
A4. Public Tender								
A5. Project selection/award								
A6. Pilot tests								
A7. Assessment								
A8. Monitoring & evaluation								

High level implementation roadmap (“10000m plan”)

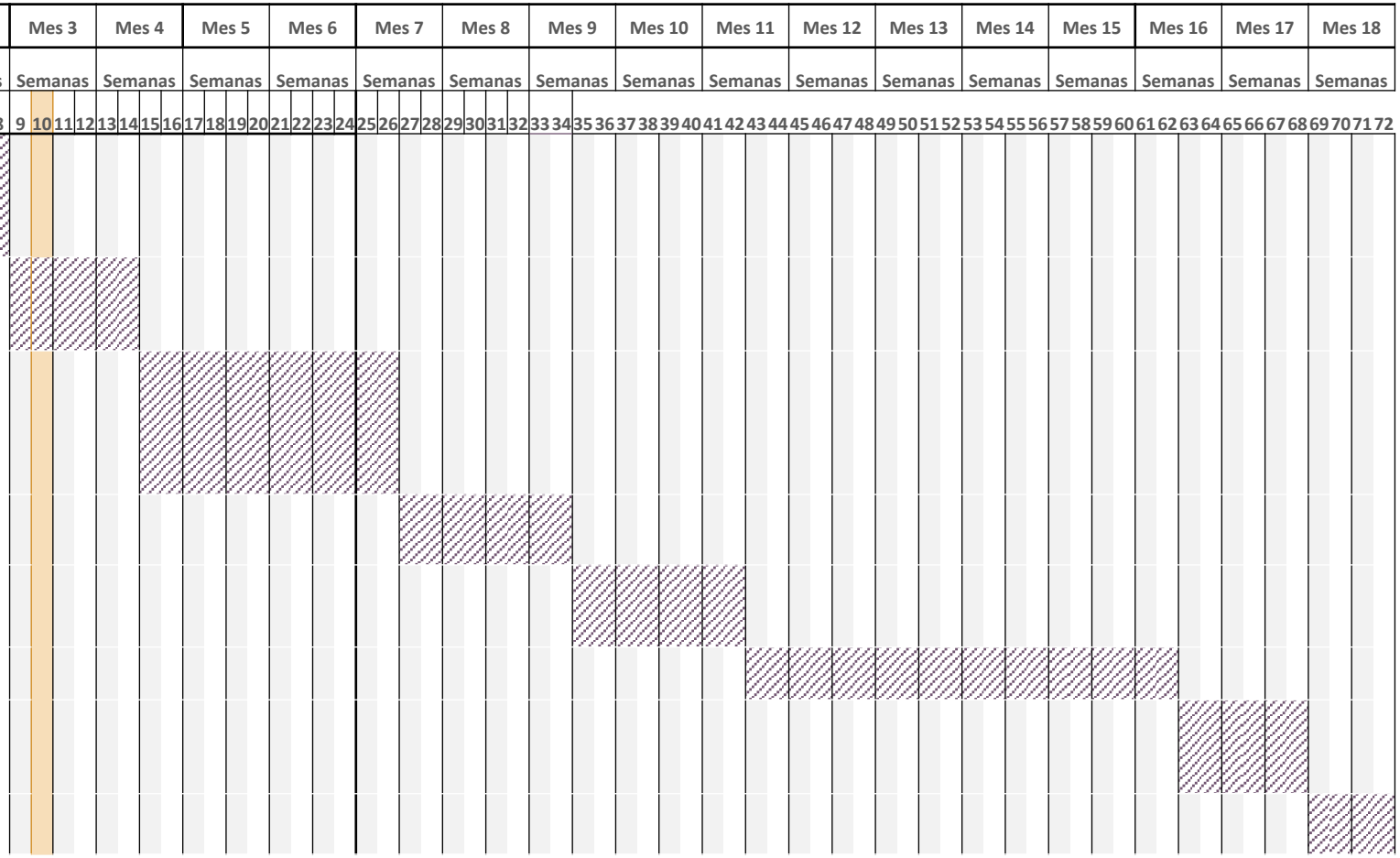
SOLUTION 3 – PAMPLONA METROPOLITAN SMART STRATEGY

	2021		2022		2023		2024	
Acciones	Sem1	Sem2	Sem1	Sem2	Sem1	Sem2	Sem1	Sem2
A1. Ideation								
A2. Agreement								
A3. Procurement								
A4. Diagnosis								
A5. Strategic framework								
A6. Pilot projects definition								
A7. Execution								
A8. Monitoring & evaluation								

High level implementation roadmap (“10000m plan”)

SOLUTION 4 – LORA NETWORK

ACTIVIDAD	Responsable	INICIO DEL PLAN	DURACIÓN DEL PLAN	INICIO REAL	DURACIÓN REAL	PORCENTAJE COMPLETADO
Definition of use cases, stakeholders and tests areas	Project manager	1	8			0%
Functional specification of use cases	Project Manager/Technology provider/UPNA	9	6			0%
Use cases: technology architecture and irastructures	Project Manager/Technology provider/UPNA	15	12			0%
Technology infrastructure enablement	Ayuntamiento Pamplona/NASERTIC/UPNA	27	8			0%
Solution deployment in real environment	UPNA/Technology provider	35	8			0%
Test in real environment	Technology company	43	20			0%
Results and conclusions	Project Manager/Technology provider/UPNA	63	6			0%
Final delivery	Project Mananger	69	4			



High level implementation roadmap (“10000m plan”)

SOLUTION 5 – DRON TECHNOLOGY PILOT IN URBAN ENVIRONMENT

	2021		2022		2023		2024	
Acciones	Sem1	Sem2	Sem1	Sem2	Sem1	Sem2	Sem1	Sem2
A1. Agreement								
A2. Stardards								
A3. Permits								
A4. Budget sourcing								
A5. Technology								
A6. Tests in rural areas								
A7. Tests in urban areas								
A8. Validation of use cases								
A9. Comunication								

Rationale to road map

The ICC local team of Pamplona has worked during last months in order to design and develop the city roadmap. In the previous phase we selected the 6 solutions that we want to implement in the framework of ICC in collaboration with about 20 stakeholders of the local ecosystem. The selected solutions are:

1. Digital Twin of Mobility and Air Quality;
2. Smart Navarra Lab (living lab);
3. Pamplona Metropolitan Smart Strategy;
4. LORA Network;
5. Drone technology pilot in urban environment;
6. Energy Community pilot.

For the definition of the roadmap one template sheet has been designed with the topics to be defined: objective, ambition, necessity, results, partners, synergies, costs, milestones, activities, risks and KPIs.

After this, the ICC local team defined one teamwork for each solution identifying one leader and from 3 to 5 staff members of the stakeholders that are interested in the solution development.

So, 6 teams have been created and they have been working during last weeks to develop the roadmap of everyone on the 6 solutions. For this purpose we have used different tools as Miro Canvas charts.

Unfortunately, the solution 6 (Energy Community) roadmap could not be finished on time for this Phase 2 deliverable.

1 Initiative charter: 1. Digital Twin

Strategy

Description

What: Home automation device with a screen and voice recognition that will be provided with features to especially help older people who live alone to undergo active ageing.

Why: To reduce physical, cognitive and social fragility of elderly people.

How: The system allows you to interact with the user, monitor their behavior, activate reminders and propose social, physical and mental activities.

Link to vision

Improve the social resilience and quality of life of citizens.

Link to ambition statement

Active ageing, promotion of healthy.

Expected impact and timing

Improvement of the physical conditions of the beneficiaries.
Decrease in attendance at primary medicine.
Increase in social activity in the city.
Generation of an economy dedicated to serving these groups and promoting their activity.
Reduce the risk of social exclusion of the beneficiary groups.

Timing: 12 months.

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Stakeholders involved

Solution lead:

Torrent City Hall & Alcoi City Hall

(the project will be developed by both cities jointly)

Solution working team:

ICC team.
Navarra Public University, Research and Technology Centers, Industry.

Contributors:

Navarra Public University, Research and Technology Centers, Industry.

Risks and mitigation

- **Risks**

1. High cost; 2. Technology in constant evolution; 3. Connection with other applications; 4. The digital gap.

- **Challenges**

Very ambitious project

Mitigating measures

To define properly the objectives of the digital twin. To phase the development and to start with one vertical in a pilot, then after extend.

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

Next Generation EU. Horizon Europe. RDEF.

he estimated cost of the project is 1-2M€.

Solution maturity outputs

Number of data insights and verticals built into the digital twin.

City performance outcomes and impacts

Reduction of private travels within the city, reduction of CO2 and air quality reduction

1 Initiative charter: 2. Smart Navarra Lab

Strategy

Description

What: Facilitate the testing in real conditions of new innovative technological solutions to startups by offering infrastructures and public services and advising on the business model. What is proposed with this project is to scale the Smart Pamplona Lab program to the Basin, or to all of Navarra, through an agreement between different administrations to draw up a joint call
Why: To foster innovation
How: Creating the ecosystem for start ups

Link to vision

Improve the innovation ecosystem in the city

Link to ambition statement

Sustainable and innovative city

Expected impact and timing

Improve the opportunities in Navarra for the development of technology startups by increasing Navarra's reputation as a territory that encourages innovative technological entrepreneurship.

Timing: 1 year

Stakeholders involved

Solution lead: Pamplona City Council

Solution working team: ICC team + Pamplona City Council.

.

Contributors: Regional Government, Metropolitan Authority, Public University, Research and Technology Centers

Risks and mitigation

- **Risks**

1. low engagement from stakeholders 2. Low number of propositions

- **Challenges**

Community support

Mitigating measures

Agility and openness in the open calls

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

The initiative will be financed by municipal funds and European funds.

The estimated cost of the pilot project is about 150-180k for 15 users.

Solution maturity outputs

Number of proposals evaluated

City performance outcomes and impacts

Increased number of companies associated to the innovation cluster and extended innovation ecosystem..

1 Initiative charter: 3. Pamplona Metropolitan Smart Strategy

Strategy

Description

What: Agree, design and execute a long-term digitization strategy, mainly focused on public services, at the level of the Pamplona Metropolitan Area.
Why: Need of collaborating and creating synergies between Pamplona and its metropolitan area.
How: Improve efficiency and the level of service of public services

Link to vision

Improve and digitalize the public services

Link to ambition statement

Sustainable and innovative city

Expected impact and timing

Significant progress is expected in the digitization of public services that will lead to a tangible improvement in terms of quality and efficiency in their provision.

Timing: 2-3 year

Stakeholders involved

Solution lead: Pamplona City Council

Solution working team: ICC team + Pamplona City Council.

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Contributors: Regional Government, Metropolitan Authority, Public University, Research and Technology Centers.

Risks and mitigation

- Risks

1. low engagement from stakeholders 2. complex governance

- Challenges

Complex governance

Mitigating measures

TBD

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

The initiative will be financed by municipal funds and European funds.

The estimated cost of the pilot project is about 100k€

Solution maturity outputs

Number of eligible projects.

City performance outcomes and impacts

Improvement of public services in terms of quality and efficiency in their provision

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1 Initiative charter: 4. LORA network

Strategy

Description

What: The objective is to implement a LORA Communication Network at city level open to different kind of users as City Council, Universities, Startups.... This network will support in the short term the installation of sensors in the street.
Why: Need of transitioning towards a smart city
How: Through different projects in the city

Link to vision

Improve and digitalize the public services

Link to ambition statement

Sustainable and smart city

Expected impact and timing

Set up the infrastructure for a smart city.

Timing: 1 year

Stakeholders involved

Solution lead: Nasertic

Solution working team: Nasertic + ICC team + Pamplona City Council.

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Contributors: Regional Government, Metropolitan Authority, Public University, Research and Technology Centers.

Risks and mitigation

- **Risks**

No risks identified

- **Challenges**

Be able to make use of the network

Mitigating measures

TBD

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

The initiative will be financed by municipal funds and European funds.

The estimated cost of the pilot project is about 100k€

Solution maturity outputs

Number of eligible projects based on use cases

City performance outcomes and impacts

Steps towards a digitalized and sensing city.
Increase in the % of LORA coverage within the city

1 Initiative charter: 5. Drone technology

Strategy

Description

What:
The objective is to run tests of drone technology applications in urban environment, specially in flood risks and emergency management .
Why: Need of transitioning towards a smart city
How: Drone case studies

Link to vision

Climate change mitigation strategies

Link to ambition statement

Sustainable and smart city

Expected impact and timing

Set up case studies for the use of drone in urban environment applied to flooding.

Timing: 1-2 year

Stakeholders involved

Solution lead: Pamplona City Council

Solution working team: ICC team + Pamplona City Council.

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Contributors: Regional Government, Metropolitan Authority, Public University, Research and Technology Centers.

Risks and mitigation

- **Risks**

Very innovative solution. Funding sources

- **Challenges**

How to set up and govern the case studies

Mitigating measures

Split the governance of the innititative into case studies identification and management. Each case study is managed independently.

Inputs, outputs, outcomes and impacts

Source of funding and estimated cost

The initiative will be financed by municipal funds and European funds.

The estimated cost of the pilot project is about 1-2M€

Solution maturity outputs

Number of eligible projects based on use cases for drone technology.

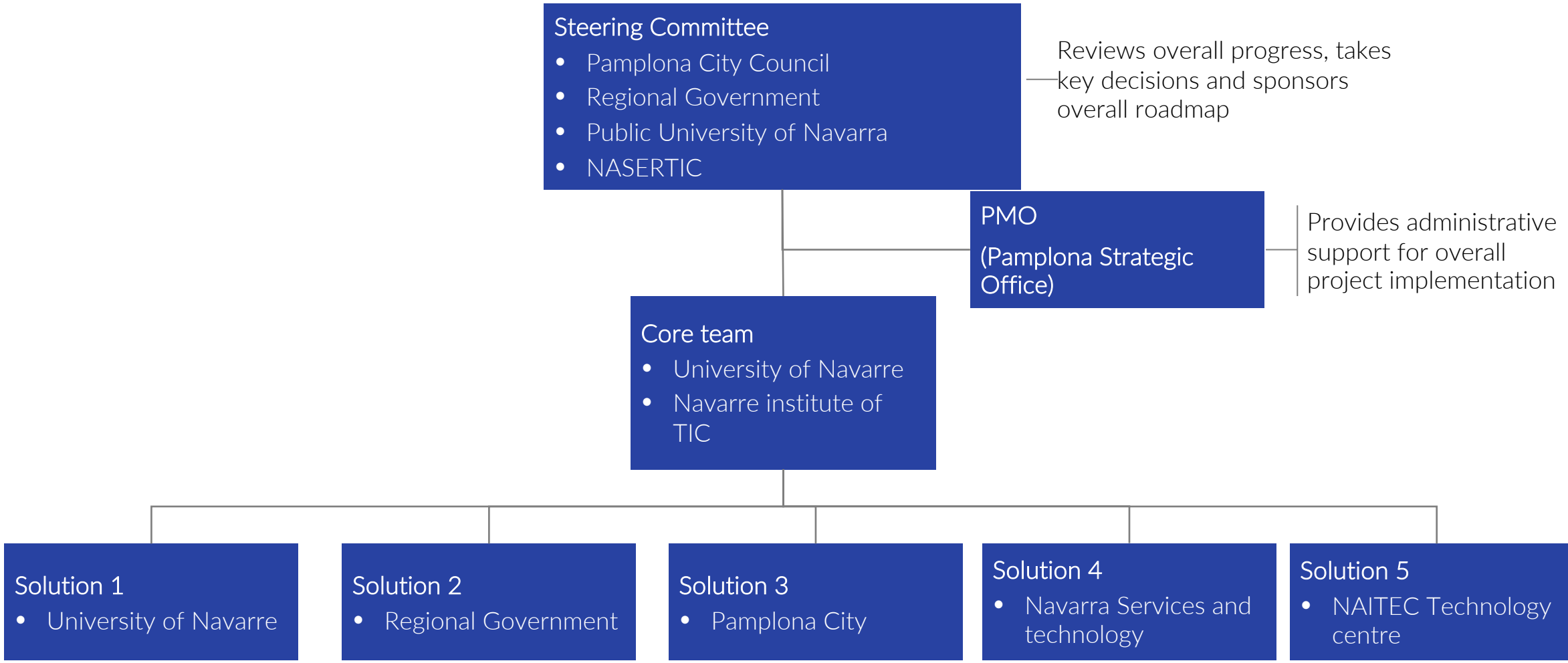
City performance outcomes and impacts

Improvement of alarm system in the city in the event of flooding. Better readiness for climate change events.

3 Key Performance indicators

Solution	Activities – Inputs and actions	Solution Maturity - outputs	City performance – outcomes and impacts
1. Digital Twin of Mobility and Air Quality	Number of data sources collected in the digital twin	Number of data insights and verticals built into the digital twin.	Reduction of private travels in the city. Inprovement on the air quality
2. Smart Navarra Lab (living lab)	Number of pilot tests	Number of proposals evaluated	Number of companies associated to the cluster and involved in the innitiative
3. Pamplona Metropolitan Smart Strategy	Number of meetings of the involved companies in Navarra	Number of elegible projects	Improvement of public services in terms of quality and efficiency in their provision
4. LORA Network	Number of new projects developed	Number of eligible projects based on use cases	Steps towards a digitalized and sensing city. Increase in the % of LORA coverage within the city
5. Drone technology pilot in urban environment	Number of new projects developed	Number of uses cases tested	Improvement of alarm system in the city in the event of flooding. Better readiness for climate change events.

4 Governance structure for roadmap implementation



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Section

3+4

Pamplona: Impact

ICC Transformation

February 2021 to May 2021

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Impact executive summary

As 3 solutions have not progressed in their implementation and other 3 have only achieved first steps, the impact of ICC in the city has been so far very limited. The KPIs have not moved from the baseline in general.

Since the solutions were selected and the roadmap was designed only one year ago the time is considered too short to see any relevant impact.

The mayor achievement has been the cooperation with 20 different stakeholders of the city ecosystem to select and define this solutions.

3 Year plan - targets

KPI		Category	What commitments will the city make to this end?
1	Number of initiatives in strategic alignment	Strategic alignment	All 6 initiatives are related to the city strategy and pivot between the three topics of energy, digital and transport, in strategic alignment with the City Strategy and the Regional Strategy.
2	Number of initiatives in mature state by 2025	Solution maturity or activities & ecosystem	The city of Pamplona commits to follow up on these initiatives, to progress them and to search for the necessary funding.
3	Number of initiatives in synergy and complemented by other city projects	Synergies with other existing initiatives in the city	The city of Pamplona commits to align the ICC initiatives with other initiatives (EU funded projects, Next Gen Projects, etc.)

5 key lessons

Lesson	Reflections
1	Cooperation is essential but a big challenge. All initiatives require cooperation between different stakeholders, and this means new ways of working and thus lower pace of progress.
2	Finance is always an issue. The pandemic and the lack of available budget within the ICC timeframe have slowed down implementation.
3	Showing interest does not mean having commitment. Transforming the interest of the main stakeholders into real commitment and effort is a big challenge.
4	Time is the most critical resource.
5	Importance of aligning strategies.