Integrated Action Plan

URBACT III- DIGIPLACE

Municipality of Messina

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Index

Index of Figures

1. Executive Summary

This document describes the impact that the ***DigiPlace*** project has had on the city of ***Messina,*** and in particular on the **Local Working Group** *(URBACT Local Group, ULG*) and the staff of the Municipality of Messina.

The document contains a brief overview of the city of Messina describing the city context as necessary to better understand the actions undertaken. Based on the city context, it was decided to focus the digital innovation actions of the *DigiPlace* project in the field of urban mobility. The choice also derived from the possibilities of collaboration with projects currently underway in the municipal area. A relevant part of the document describes the *DigiPlace* focus also starting from objective considerations based on statistical surveys processed by entities outside the municipality. Therefore, based on the current situation, some of the most important projects underway in the municipality which reflect the focus of the project are detailed. The projects mentioned were all supportive of the activities carried out and fundamental for the achievement of the objectives.

Part of the ***Integrated Action Plan*** (***IAP***) is also dedicated to the relevant personalities in the municipality who have and will contribute to the DigiPlace focus and to the financing actions that can help carry out the actions undertaken. The ***Small Scale Actions*** (***SSA***) carried out were detailed, describing the various phases of the actions and the impact they had on the actors involved.

Finally, the document describes the ***URBACT Local Group*** and the impact that the project activities have had on it as well as the risks they have and can negatively influence the results obtained by the project and their continuation.

The document closes with comments on the results obtained and considerations on future opportunities that have been opened thanks to DigiPlace.

2. City context and definition of the initial problem/ policy challenge

Messina ("Missina" in Sicilian; Μεσσήνη / Μεσσήνα in Greek) is an Italian town of **220,094** inhabitants, the capital of the homonymous metropolitan city in Sicily. It rises near the extreme northeastern tip of Sicily (Capo Peloro) on the narrow street that bears its name. The port is the first in Italy for the number of passengers in transit. Messina has an important and historic university seat, the local Studiorum Universitas was founded in 1548 by Saint Ignatius of Loyola.

Messina was originally founded by settlers and Chalcidians in 757 BC. (First Greek colony in Sicily) with the name of **Zancle** (from the Greek Ζάγκλης, which takes up a Sicilian term meaning "sickle", because the peninsula of San Raineri, the natural port of the city, resembles a scythe). It assumed the name of Messene when Anassilao di Reggio, around 491 BC, conquest the Milesii, the Samii, and the army of Hippocrates of Gela, and repopulated it with, among others, elements from Messenia. The Romans conquered it in 264 BC. and in 241 BC they renamed it, **Messana**, after the victory in the First Punic War and after the fall of the Western Roman Empire, it was first in the possession of the Byzantines who renamed it, Messina, from the Arabs who conquered it in 843 AD. In 1061 it was conquered by the Normans, with the help of Ruggero d' Altavilla.

Under the Swabian-Angevin-Aragonese dominions, Messina achieved great prosperity, becoming the capital of the Kingdom of Sicily together with Palermo. The city, with its flourishing port, was also linked to the Hanseatic league. In 1674 it rebelled against Spain, in the repression that followed the city lost all forms of autonomy, including the senate.

Messina was hit by a serious earthquake in 1783. It became part of the Kingdom of Italy after the expedition of the Thousand Garibaldians of 1860.

In 1908 it was severely damaged again by a terrible earthquake lasting 37 seconds, followed by a devastating tsunami.

The coat of arms of the city of Messina (Figure 1) is heraldically described as follows: "a horse-head shield, in red on the golden cross, surrounded by two vine shoots at the natural fruity gold, stamped by the crown of the city "while the banner is a" cloth of red on the cross of yellow, supported by a halberd-trimmed pole ".

Figure 1 – Coat of Arms Municipality of Messina

Source: Municipality of Messina

The coat of arms of Messina was, in the very early days, a sickle (symbolizing the shape of the port), which at the occupation of the Messenians, became an M.

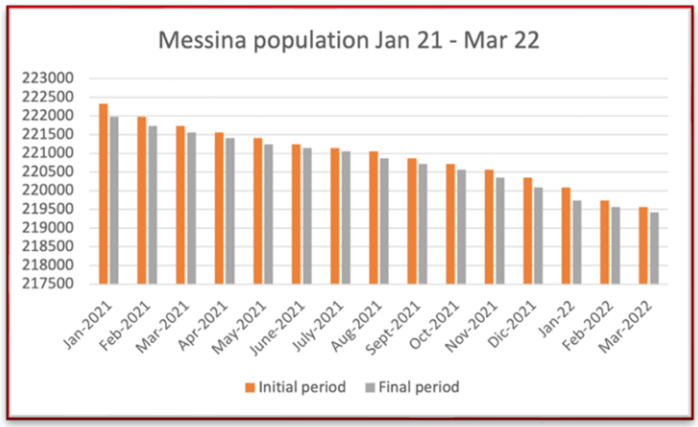
Later, the Mamertines replaced the city coat of arms with one depicting a castle (or according to other traditions, three towers in a green field). According to legend, the current coat of arms of the city, a gold cross on a red background, with the addition of four B (beta) dates to the emperors of the East, the Palaeologus, of the 5th century AD ... In 407, in fact, the Eastern emperor Arcadius, son of Theodosius I, after being expelled from Constantinople, the capital of the Empire, found himself besieged by the Bulgarians within the walls of the Greek city of Thessaloniki.

2.1. Population Statistics and Demography

The city of Messina has a resident population of about **220,094** inhabitants of the most recent ISTAT (National Institute of Statistics) analyzes. From the ISTAT analyzes it was learned that at the end of 2021 the population of the province of Messina fell for the first time below **600,000** inhabitants. This means that the metropolitan city of Messina has fewer and fewer residents.

Specifically, for the city of Messina, the year began with 222,329 inhabitants and ended with a resident population of 220,094 people, **2,998** fewer.

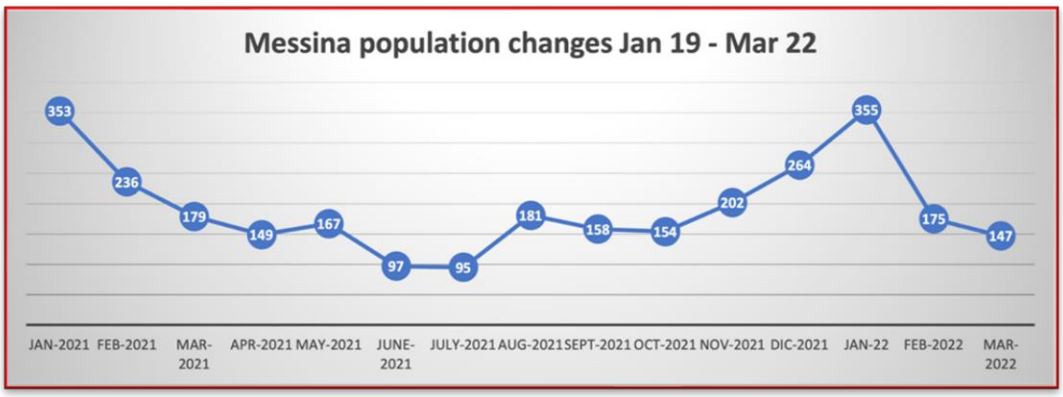
Figure 2 – Messina population Jan 2021 – Mar 2022



Source: Municipality of Messina – ISTAT Data

This trend is shown in Figure 2, where the population of the city of Messina decreases monthly. From Figure 3 the monthly population losses for the period January 2021 to March 2022 are evident. The peaks in the first months of the year are to be observed, which suggest that the phenomenon of dispossession is not only due to a problem of shortage of birth of children but to an abandonment of the city.

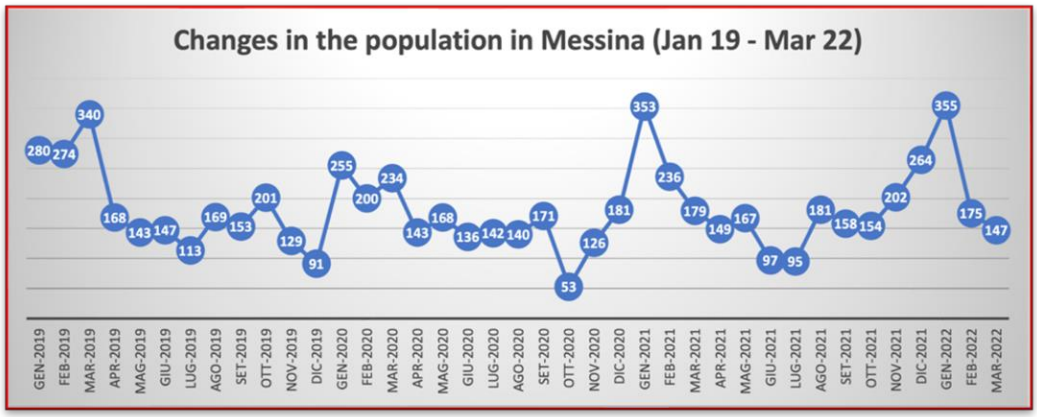
Figure 3 – Messina population changes Jan 2021 – Mar 2022



Source: Municipality of Messina – ISTAT Data

Going back over the years this trend is confirmed as can be seen from Figure 4.

Figure 4 – Messina population changes Jan 2019 – Mar 2022



Source: Municipality of Messina – ISTAT Data

Figure 4 shows the decrease in the population from January 2019 to March 2022. It is observed that the COVID-19 pandemic period has reduced the numbers relating to the decrease in the population, but the trend does not it has however changed. This factor demonstrates that the problem linked to the decrease in the population is not to be found only in the lack of births (a problem known throughout Italy) but also in the emigration of the population due to the lack of adequate job prospects in the area.

2.2. Geographic Location of the city

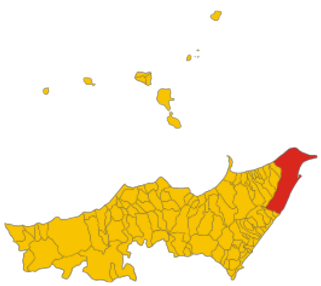
The city of Messina is the third-largest city in Sicily (IT) and Messina metropolitan area is the 13th in Italy. The Messina city area is a vital service center not only for the surrounding municipalities of the province (metropolitan area) but also for the Calabria and Straits area. Its geographical position (Figure 5) makes Messina the gateway to Sicily from the mainland. As a matter of fact, it has always served as a crossroads for Sicily.

Figure 5 - Messina Metropolitan Area in Sicily

Source: Municipality of Messina

Messina city (red area in Figure 5) is the first stop for those who come from the strait. Therefore, the flow of commuters comes from the surrounding area municipalities and the sea. The port of Messina is one of the first Italian ports that appear in the top ten of European ports for passengers according to the recently published Eurostat survey. The port area is a center for logistics and contains both civil and military shipyards. Peculiar to the city of Messina is the local public transport consisting mainly of buses, tramways, and rail transports network, and hydrofoil and ferry boat fleets.

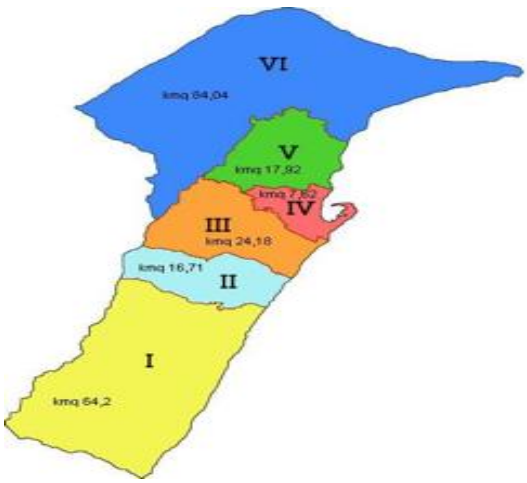
Figure 6 - City of Messina in the Metropolitan Area



Source: Municipality of Messina

The city develops mainly in a longitudinal direction along the coast of the strait without interruption from Giampilieri Marina to Capo Peloro for 32 km in the Ionian belt (red area in Figure 6). The Tyrrhenian belt, of 24 km, extends from Capo Peloro to Ponte Gallo. The central urban area, which can be enclosed between the Annunziata and San Filippo streams, now covered by the road level, is about 12 km long, with little inclination towards the west due to the hill buttresses of the Peloritani, which prevent the development of a large network geometric urban in that direction. The extreme proximity of the mountains gives the western part of the city a certain slope, overcome by steps and crossed by the panoramic ring road located upstream. Inland there are numerous "urban intrusions", corresponding to the short plains of the streams, which tend to incorporate as neighborhoods some of the oldest farmhouses in the city, the so-called "Villages", currently 48. The neighborhoods are 6 and their subdivision is reported in Figure 7.

Figure 7 - Municipality of Messina - Neighborhoods



Source: Municipality of Messina

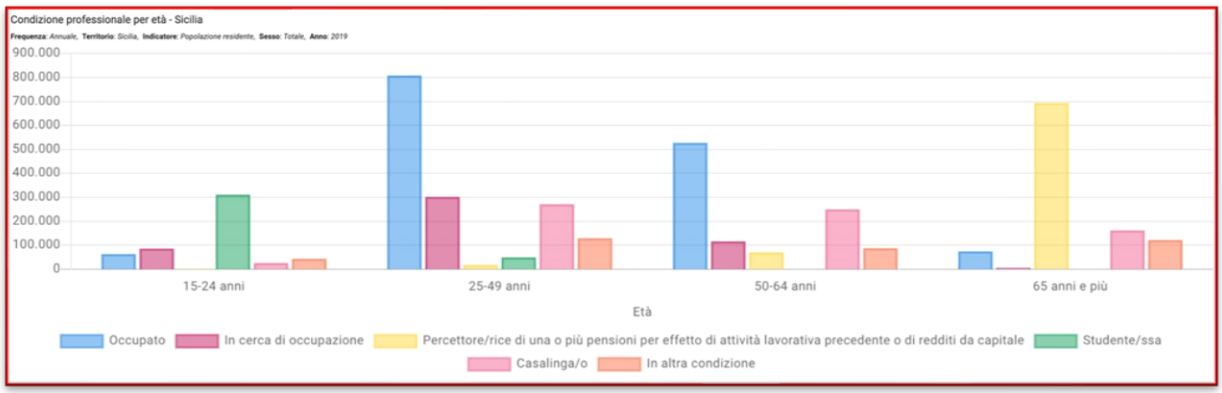
The city of Messina is crossed by the state roads n. 113 Northern Sicilian branch and n. 114 Orientale Sicula, is served by the A20 Messina-Palermo - Messina-Boccetta motorway, just 3 km from the town - and by its railway station, the terminus of the Messina-Catania-Syracuse and Messina-Palermo lines. The reference airport is 107 km away, but the closest airport, in Reggio di Calabria, is the Strait Airport ", 28 km away.

2.3. Employment and educational statistics

According to the latest ISTAT census (https://esploradati.censimentopopolazione.istat.it/databrowser/#/it/censtest/ITG1) in 2019, the professional condition by age in Messina sees retirees (65 years or more) decrease by about 800 units compared to 2018, while the number of employees increased among all age groups except for the 25–49 year-old, the most numerous.

In 2020, in the municipality of Messina, 29.462 people aged between 25 and 49 years had a secondary school diploma or professional qualification (3–4-year course). The most relevant demographic group together with the age group 50-64 years (18.875), 65+ (13.310) and 9-24 years (9.821).

Figure 8 – Messina professional condition



Source: Municipality of Messina – ISTAT Data

From the ISTAT analysis, the data show a reduction in subjects without educational qualifications representing 3,4% of the total population.

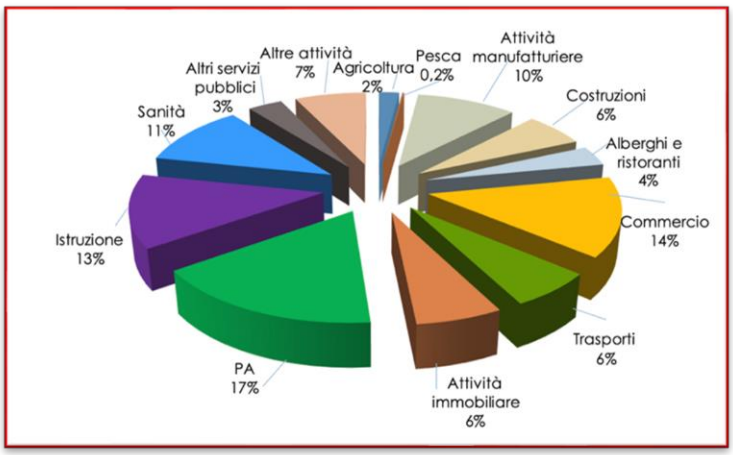
2.4. Industrial / employment composition

The city of Messina bases its economy mainly on tertiary activities. In Messina, there is an articulated accommodation system, a vast distribution network, and numerous services. However, there is no lack of traditional rural activities, typical products: oil, fruit, vegetables, cheeses, meats, bread, accompanied by fishing: from April to October, it is the scene of an extraordinary millenary

tradition giving life to swordfish fishing trips (still today the boats used are the ancient feluccas, characteristic and unique of these places).

The industry, in turn, is represented by numerous companies, operating in various sectors, primarily construction and shipbuilding. Headquarters of USL, school districts, major state offices, hospitals, and television stations, it has schools of all types and levels, as well as universities. It is also home to a good number of libraries, museums, and art galleries.

Figure 9 – Distribution by sector of activity of employed residents of working age



Source: Municipality of Messina – ISTAT Data

Figure 9 shows the distribution by sector of activity of residents of working age in the municipality of Messina.

To date, the activities linked to the Public Administration are among the predominant activities in the economic system of the Messina area, with a percentage of 17%. With a slightly lower percentage, there is commerce (14%), followed by education with 13% and health with 11%. With lower percentages, however, there are real estate, transport, and construction activities (6%) and agriculture and fishing with percentages of 2% and 0.2% respectively.

3. Focus and objectives

3.1. Information from baseline research / expanded SWOT analysis

To support the proposed project idea and its feasibility below (Figure 10) is a diagram with the **SWOT** analysis (Strengths, Weaknesses, Opportunities, Threats) with any corrective actions and strategies relating to weaknesses and threats.

Figure 10 – SWOT Analysis

	HELPFUL	HARMFUL
INTERNAL ORIGIN	**STRENGTHS** • Resources • Skills • Network and partnership • City of Messina synergies • Knowledge of the Territory	**WEAKNESSES** • Lack of skills • Unavailability of innovative technologies (e.g: non-deployment of 5G, low level of workability of the proposed innovations)
EXTERNAL ORIGIN	**OPPORTUNITIES** • Economic repercussions • Development of the territory • Paris goals / sustainability environmental • Tourist attraction • Engineering Gold Standard • Prestige / Visibility	**THREATS** • Costs too high • "Loss of interest" by partners • Difficulty finding suitable partners

Source: Municipality of Messina

Concerning possible weaknesses and threats, possible corrective actions are envisaged:

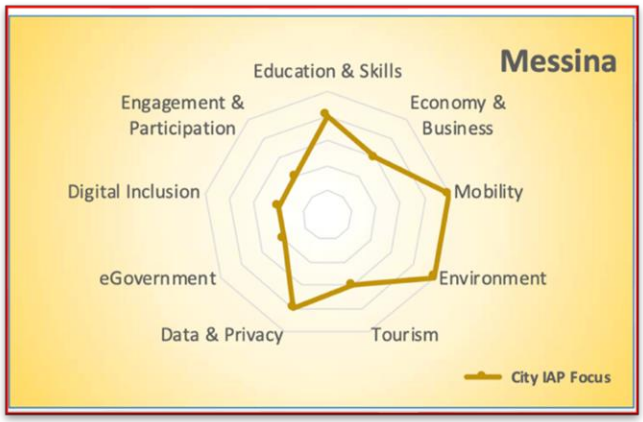
- **Lack of skills:** very rarely there were difficulties in finding the skills necessary for its realization within the DigiPlace project. The same would be identified among the numerous academic and non-academic partners, thanks to the extensive network of collaborations existing between the Municipality of Messina and other national and international research institutes and centers.
- **Unavailability of innovative technologies:** in the eventuality the unavailability of some innovative technologies proposed must be verified (for example delays in 5G or low can be developed at the laboratory technologies level), temporarily we will opt for existing ones, preparing the structures for installation new ones as soon as they become available.

- **Too high costs:** if the construction costs are far above the expected budget, the missing resources could be easily available through participation in competitive tenders of national and international importance.
- **"Loss of interest" of the partners and Difficulty in finding suitable partners**: as in the case of the "lack of skills", among the numerous collaborations and agreements between the Municipality of Messina and small, medium, and large enterprises, new important partners will be identified national and international, who notes the importance of the project will be easily "attracted" and encouraged to collaborate.

3.2. Presentation and analysis of problems and options for solutions

The city of Messina is working hard on digitalization both at the level of technological advancement of the systems and from the point of view of staff training. Messina wish to get better coordination of all the various smart/digital projects. Many of these currently happen in isolation. They wish to bring these together via a coherent and integrated strategy.

Figure 11 – Messina IAP Focus



Source: Municipality of Messina

The municipality is looking to combine the technology side of digital innovation with the human side - getting people and technology working together. They see a "*smart city*" as one which uses digital innovation and technology in a prioritized and coordinated way. In terms of specific areas, the city

will focus on environmental monitoring, management of the water pipe system, and cameras for security. The full development and delivery of the MeSm@rt program are one of the key parts of the city strategy in terms of digital innovation, and the long-term sustainability of these changes is a priority.

Mobility is another area that the city will have to tackle, with the study of new intelligent transport systems. The developed capacities of the city must now find different forms useful for providing services to the citizen in the long term. Areas of interest for contributing to the development of the city are the environment and mobility (Figure 11). The city of Messina is very busy and pollution levels can be considerably lowered. Interoperability between the various stakeholder projects, therefore, becomes a necessity to face the challenges of the future. Looking at mobility, the data that the municipality acquires on the various projects can be used to develop traffic forecasting systems and systems for decision support and continuous monitoring. Some projects already launched in the municipality are already looking in this direction. However, there has not yet been a service that citizens can see also to understand the enormous work done by the municipality. Another option that emerged during *DigiPlace's* activities concerned the use of mobility to create a priority system at traffic lights (*Smart Traffic Light*) for emergency vehicles and law enforcement agencies. This service can be implemented starting from the systems installed in the city and can be monitored thanks to the data acquisition systems available which can also constitute support in the event of disasters or particularly dangerous situations.

3.3. Description of the focus of the Integrated Action Plan and analysis of the motivations for its definition.

The Integrated Action Plan focused on the theme of mobility; ***Small Scale Actions (SSA)*** have been defined in this specific field. In particular, the use case of *intelligent traffic lights* (**SSA _1**) and *data collection of accidents in the city area* (**SSA_2**) was discussed:

SSA_1: Smart traffic lights are a vehicular traffic control system that combines traditional traffic lights with a series of artificial intelligence sensors and algorithms to intelligently control vehicular and pedestrian traffic. They can be part of a larger intelligent transportation system. The city of Messina intends to experiment with a *Small Scale Action (SSA)* with intelligent traffic lights in some of the main streets of the city center, those with the greatest risk of congestion, to allow emergency vehicles not to find obstacles and interruptions in their path. This case study was selected because

the theme of traffic management is one of the pillars for the development of the city and because there are systems and projects in the city that go in this direction but are unable to merge into a single application that offers a service to citizens. This action aims to bring together projects concerning the physical infrastructure of the city in the field of mobility and the software that wants to study the flow of traffic. In fact, the purpose of this action is also, and above all to stimulate interoperability both within the municipal departments and between the various stakeholders.

SSA_2: the collection of data in the PA and their sharing on open databases is an aspect of constant attention in Italy. The data on road accidents are currently collected at the crash site by the competent services that perform this task with a sense of duty and precision. The entire data collection process must be carried out around the city, and this currently takes place with surveys whose results are manually transcribed on paper reports. Only when the staff arrives at the office do they enter the data on software and make them available digitally. The SSA, therefore, wants to stimulate the creation of a paperless software system that facilitates data collection by eliminating the use of paper and making the data available to the open database of the municipality of Messina. The purpose of the SSA is to stimulate interoperability between the functions involved as well as to stimulate the propensity to use digital technologies by the operating units involved in the investigations. The service will be joined to the existing one, but the operators will use a mobile device to collect the data that they will then insert into the official software. On the other hand, the process of manual data sharing with the data processing center and their availability in an open manner will be automated.

During the different phases of the project, it was discovered that the distinct departments do not share information that is often necessary for the progress of the projects. The defined SSAs were therefore also created with the aim of stimulating inter-departmental cooperation aimed at sharing data and information. The objective of the PA is in fact to create datasets to be shared both inside and outside the single institution. This policy is involved in the objectives of the three-year IT plan defined by the *Agency for Digital Italy* (**AgID**) to promote the digital transformation of the country and that of the Italian Public Administration.

3.4. Summary of main aspirations for the Integrated Action Plan

The ***Integrated Action Plan*** was conceived as a reference from the point of view of the analysis of the current situation regarding the digital transformation of the City of Messina. Furthermore, the

plan proposes planning of actions according to the principle of interoperability between local PAs and other parties interested in the digital development of the territory. The municipality of Messina aspires to:

- collect a series of data on the municipality of Messina.
- collect information on the population of the city and the surrounding area.
- describe the governance of the city and the main references for the areas of intervention considered.
- describe the projects in progress or just completed in the context of digital transformation.
- propose an intervention validated from a technical-economic point of view in the context of urban mobility.
- stimulate interoperability both within the municipality of Messina and between the various stakeholders both at a technical level and from the point of view of the working groups.
- consolidate the focus on the implementation of the planned actions and on the monitoring of the results of the actions implemented.
- introduce some new elements related to the implementation of the PNRR and the supervision of the PA's digital transformation obligations.

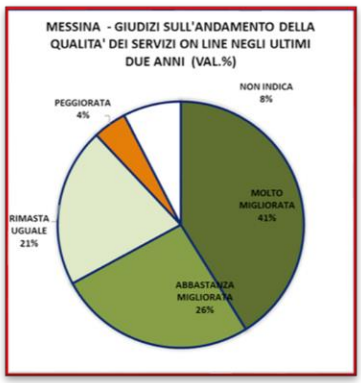
3.5. Presentation of strategic vision

The municipality of Messina has a clear vision concerning the issue of the digital transformation of the institution and the territory. The Municipality is making considerable efforts to speed up the digital transformation of its services and encourage the digital transformation of companies operating in the different sectors of the economy. Digital transformation is above all a governance strategy. It is therefore important to have clear the objectives that it must achieve to intervene in the event of failure to achieve the predetermined results. Each action must be thought out and evaluated in the short and long term, based on the results and not on technology that changes quickly and whose choices must be entrusted to specialized technicians.

The first index of the goodness of the actions implemented comes from the iCityClub survey carried out by the PA forum on public administration services. The survey concerned the services offered by the municipality of Messina. The results of the survey showed that the judgments of merit are

predominantly positive, about the improvements that the Municipality of Messina has made in the last two years as shown in Figure 12.

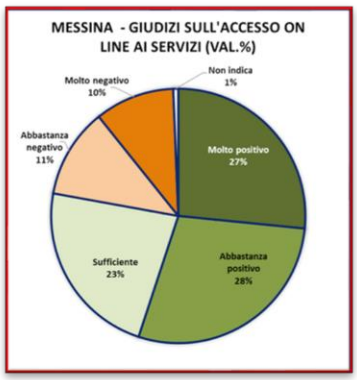
Figure 12 – Messina goodness PA online service



Source: Municipality of Messina

Figure 13 shows that 55% of the users who participated in the survey are satisfied with the services offered online by the Municipality of Messina.

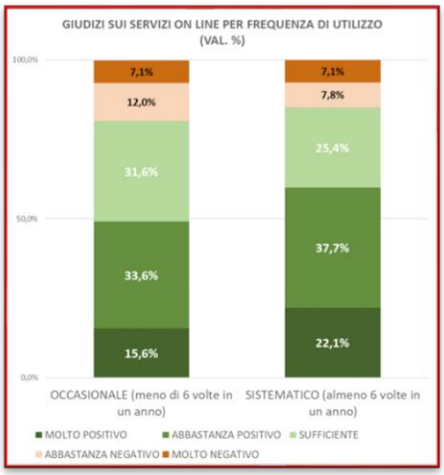
Figure 13 – Messina goodness PA online service



Source: Municipality of Messina

This data takes on greater value if, as shown in Figure 14, it is observed that the opinions are mostly positive among users who use the site with greater continuity.

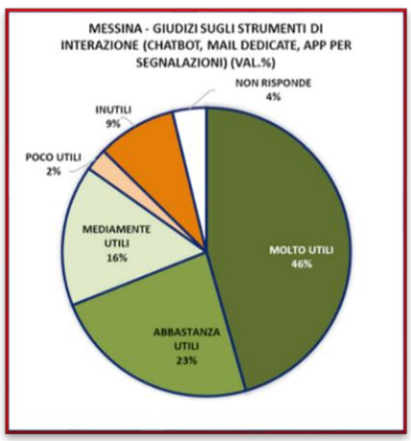
Figure 14 – Judgments by frequency of use of online services



Source: Municipality of Messina

The survey also shows that with the growth of digital skills, the very positive percentage of judgments grows and that the use by the PA of tools such as chatbots, mailing lists and informative apps are rated positively by users (Figure 15).

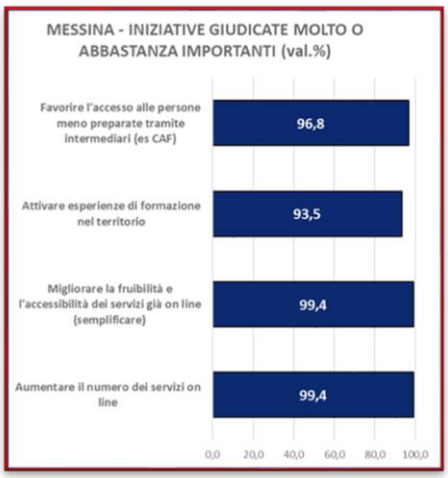
Figure 15 – Percentage use of digital tools such as chatbot, mailing list, informative app



Source: Municipality of Messina

Particularly relevant in the context of the IAP is the result shown in Figure 16 where users are particularly interested in digital initiatives and their use.

Figure 16 – Request of Digital Initiative in the Municipality of Messina



Source: Municipality of Messina

These results motivate the city administration to periodically review the digital transformation strategy and vision, ensuring an incisive, measurable, and shared commitment to the achievement of the main objectives. Of fundamental importance is the principle linked to coordinated, interdisciplinary, and strategic planning that must guide the strategy adopted.

Starting from these reflections, the strategic vision for digital transformation adopted by the municipality of Messina can be described in the following steps:

- **Definition of the reasons for the digital transformation:** often managers and staff of public administrations and companies, but also freelancers and entrepreneurs believe that digital transformation is a bureaucratic requirement linked to new technologies. Furthermore, it is commonplace to think that the reason behind its implementation has no solid foundation and can be overshadowed. This approach is a failure. The implementation of the IAP provides that digital transformation must be based on identifying the needs and objectives of the public administration and the territory. Starting from these needs, it is necessary to build a strategy for individual actions. An

excellent starting point is the strategic objectives of the administration and the three-year plan for information technology. This approach is more pragmatic than a three-technology approach. Furthermore, it is necessary to consider a plan of results that defines objectives and times. This approach facilitates interdisciplinarity and dissemination at different levels of both government and department;

- **Awareness of a cultural change:** public administration governance and executives must lead the digital transformation process. The "digital change" is driven by the great market leaders. These companies develop technologies that are introduced on the market and reach the users who are induced to use them. This approach puts technologies and not people at the center of digital transformation, but it is easier to disseminate and is the most common approach. This implies a certain resistance to change in work applications e skepticism towards the "new" and the consequent refusal to use the new systems. To remedy this situation a team of grassroots "supporters" is needed, who understands the prospects for the administration and whose work will bear fruit in the long term. Any change will bring challenges, such a group will need to be made up of leaders who foster a culture where one learns from mistakes and builds on successes. The transformation initiatives digital will affect the work employees do daily basis. It is, therefore, necessary to identify the actions that truly improve the efficiency, effectiveness, and productivity of workers (any level);
- **Definition of small but strategic steps:** digital transformation is a path, not a project to be carried out. To complete this ever-growing path, it is necessary to work on "proof-of-concept" to be developed over time. It is essential to prepare the ground for the future of the initiatives by obtaining approval from the prominent figures of the municipality but also from other public administrations as well as from the various categories that make up the population. The "digital transformation" does not apply in one day and missteps and failures will be experienced. It is necessary to be aware that the best initiatives are those based on "small successes", which can be up and running and show tangible results rather than long and complex actions that do not ultimately lead to concrete results. A successful small-scale action can be immediately replicated in other PAs or departments, demonstrating the value that digital transformation also has in the PA;
- **Technology design and implementation:** the experience gained in the *DigiPlace* project but also the other digital transformation projects have allowed the Municipality of

Messina to reach the awareness that projects based only on technology tend to fail. In practice, this implies that if you innovate technologies and not processes, your staff will only use new and expensive things. Technology must represent an indispensable tool, a lever, to help the PA achieve the required results. A common set of fundamental technologies for achieving digital transformation can be:

- Broadband connectivity
- IoT
- Digital Twin
- Cloud
- Artificial intelligence and Machine Learning
- Augmented reality, virtual reality, and mixed reality
- Automatic workflows

To build use cases on digital transformation, it is necessary to combine these technologies. Some are already present and widely used in the Municipality of Messina, but in some cases, they lack the elements that favor the creation of true value. For most technological interventions it is necessary to rely on external suppliers with the right combination of products and skills to accelerate the time-to-value. In addition, the internal staff must be adequately trained and adequately increased numerically;

- **Research of partners and skills:** the evaluation of technologies and technological partners in a digital transformation process must always consider future developments. It is necessary that consultants and partners, in addition to being prepared, have experience gained in the field in the field of application of the technology. Furthermore, to waste resources, it is good to avoid "sporadic" solutions. A technology that solves the problem of a department must be applied, at most with small changes, to others as well. This applies to solutions to common and non-specific problems. Engaging departmental leaders in digital transformation technology decision-making helps ensure that the strategic vision of the institution should not be forgotten. The sought-after partners must complete, enhance, and make possible the idea that the digital transformation entity is. The strategic partnerships, such as those with universities and/or research centers and/or schools, must bring a decisive advantage to strategic governance choices and support staff in cultural growth and, when possible, in technical improvement.

- **Collection of tips:** digital transformation processes need KPIs that identify their objectives and give indications of the goodness of the process that is developing. All the stakeholders need to be aware of what they owe be carried out to consider the project completed successfully. It is important to consider an effective and concrete way to exchange ideas and to ensure that all stakeholders are learning from experience as the digital transformation strategy develops. Digital transformation is a journey. Creating "*milestones*" is a way to check progress, and correct and improve things during the stages of the transformation process. Furthermore, it is normal for the progress of the process to be continuously under review. Technological advancement is very fast, this can create new situations and new goals to be achieved. The technologies chosen must therefore always be flexible and agile to adapt to new situations. The municipality must being "*agile*" or developing digital processes that can easily be modified when unexpected situations arise due to new situations or technological progress;
- **Scalability of operations and transformation of processes:** progress and positive results will be visible as the digital transformation strategy unfolds. These successes can be used to build momentum and foster collaboration in later stages, as well as the strategy in a long term. Additionally, as digital transformation initiatives progress, new ways will emerge for digital to transform the world of physicists. Scale-out opportunities must also be considered in this process - applying similar strategies across multiple departments/processes - and vertically, connecting additional technologies that enhance processes that have already had a digital transformation. Each public administration must have its own digital transformation process that will be different from the others. This happens not due to errors of evaluation, but because you are facing a personalized path that indicates where the change is more effective for the administration of processes and the territory;

In its vision of digital transformation, the Municipality of Messina is clear that digital transformation has no point of arrival. Once you have reached step "a" or completed the "b" process, you will need to make other evaluations and work on new processes and new challenges. As society and the world of work evolve, digital transformation will continue to be a crucial part of governance strategy. This awareness is necessary so that the City of Messina and the entire metropolitan area are competitive, can promote efficiency, and can always offer better services to their citizens and businesses operating in the area.

3.6. List of overall priorities of the Action Plan

The IAP aims to summarize the strategy for the digital transition of the Municipality of Messina by describing some ongoing actions. Furthermore, the IAP describes the *Small Scale Actions (SSA)* that the ***DigiPlace*** project has developed and implemented in order to effectively demonstrate the goodness of the strategy. The priorities of the IAP can be summarized in the following points:

- **Dissemination of the digital culture to the stakeholders:** organization of dissemination events on digital and innovation issues. The meetings will serve to make known the projects underway in the Municipality of Messina and to stimulate dialogue with associations, public administrations, and citizens. The meetings must be open not only to technicians but to the entire population and must also serve to create networks with neighboring territories;
- **Stimulate interoperability between municipal departments and between local public administrations:** the Municipality of Messina wants to promote internal interoperability with other PAs. Meetings will be promoted to disseminate the various activities within the municipal departments. Some actions have already been undertaken to feed the open data portal of the Municipality of Messina. This prerogative is part of the actions that the Italian *Code for Digital Administration* (**CAD**) through the "Triennial Plan for Informatics" imposes on PAs. Furthermore, the portal will be available to public and private companies in the area, but also to citizens, who will then be able to draw data or feed the open database. For this reason, the Municipality of Messina, also through European and national projects, will organize events that will involve executives, public and private companies, universities, and research centers. The purpose will be twofold: to stimulate data sharing and the use of opendata;
- **Designing an SSA for urban mobility:** smart traffic lights are a vehicular traffic control system that combines traditional traffic lights with a range of sensors and artificial intelligence to intelligently route vehicular and pedestrian traffic. They can be part of a larger intelligent transportation system. The city of Messina intends to experiment with intelligent traffic lights in some of the main streets of the city center, those at the greatest risk of congestion, to allow emergency vehicles to find no obstacles and interruptions in their path. During the activities of the *DigiPlace* project, the location of the traffic light systems was investigated with the collaboration of the Urbact Local Group. During the works, the impetus was given to the acceleration of procedures

already in progress, and studies and inspections were made to plan the action. The work carried out has produced a preliminary feasibility design with the estimates acquired that will serve as a basis for the continuation of the activity;

- **Develop an SSA that demonstrates the concrete possibility of interoperability between departments operating in different fields:** the IAP wants to promote good practices that use digital as a flywheel for inclusiveness and collaboration between municipal departments. In this perspective, the goal is to develop an SSA that involves different departments in the development of a demonstrative action of dematerialization of internal procedures. In this sense, considering the national regulations and the needs that emerged from the Urbact Local Group, a software system was created for the dematerialization of the process of accidents data collection by the urban police. The system provides for the dynamic enrichment of the municipality's open data database. In addition to the "Personal and Business Services" Department, this action also involved the local police and the Data Processing Center.

3.7. List of expected results and indicators

Below is a list of expected results and result indicators divided by specific objectives:

Specific objective	Result indicator	Output indicator
Participation/organization of dissemination events on the issues of digital transformation	Participation in meetings as speakers. Participation in meetings as listeners.	• 5 event organizations. • 10 participations in events as a speaker; • 15 participations in events as a listener;
Contribution to interoperability between public administrations	Participation in local and international working groups on specific topics	• Participation in 4 Social Policy Labs meetings on decision support digital tools about mobility; • Participation in 2 meetings of working groups meetings on the digitalization of the PA;

		• Participation in 2 meetings of working groups on the usefulness of digital in environmental monitoring; • Enrichment of 10 databases on the open data portal of the municipality of Messina;
Support for the implementation of an intelligent traffic light system in the city of Messina	Technical meeting and work estimate request	• 10 technical meetings with the relevant departments; • 2 demo work estimate;
Design and development of a software for the cataloging of paperless incidents and the enrichment of the open data database	• Technical meetings; • Search for solutions on the market; • Search for a company for the development of customized software;	• 10 technical meetings with the relevant departments; • Analysis of 5 solutions on the market; • 1 work estimate for the creation of a customized solution; • 1 software system demo; • 1 mobile application for accident cataloging; • 1 backend system for interfacing between the mobile application and the open data portal; • 1 dynamic database on the open data portal;
Digitalization of internal work procedures	Dissemination of digital "best practices" in daily work procedures	• 25 staff units using cloud computing for storage; • 25 staff units using digital planning tools;

		• 20 staff units using SAAS-type cloud services; • 50 units of staff who use conference call services daily;

4. Summary of relevant project concerning the same area of interest

DigiPlace project was born to affect the digital revolution that is sweeping the city of Messina. However, in the city of Messina, there are already several projects in the field of digital transformation in different areas. ***DigiPlace*** cannot, therefore, ignore the knowledge of these projects to better define the IAP. Below is an overview of the most relevant projects concerning digital transformation which involved the Municipality of Messina.

4.1. Agorà

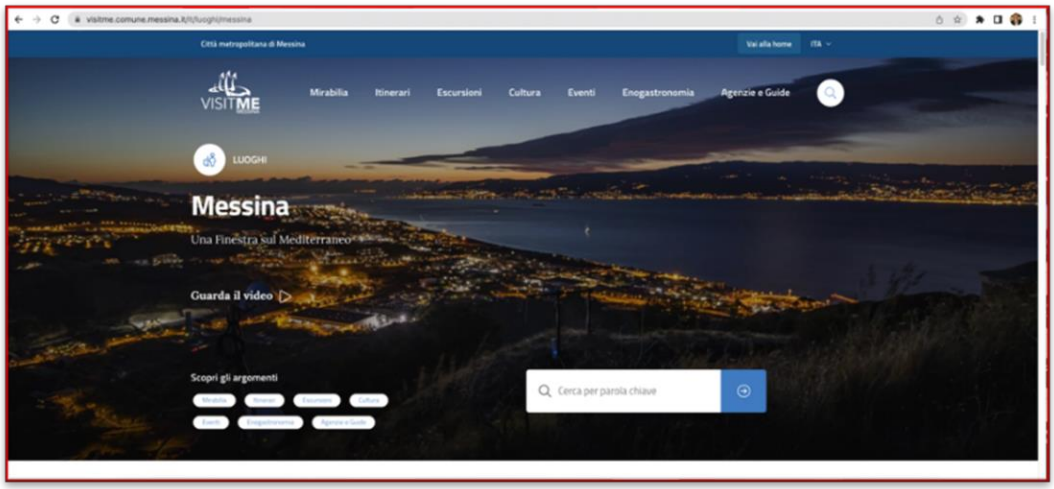
The ***Agorà*** project is divided into three innovative areas, which are synergistic and complementary to each other:

1. Design of the **Digital Identity** of the Municipality of Messina, which consists of the redesign of the Digital Identity on the entire ecosystem of digital touchpoints, in the consequent optimization of the Municipality portal in terms of User Experience, User Interface, production, and content management. The aim is to achieve the complete transformation from a "mainly informative" site to a "channel" (not the only one, in perspective) for the use of valuation services for citizens, City Users, and tourists of the City of Messina. This project area will take care of the creation of digital aspects and graphic elements that are consistent with the aspects that characterize the physical identity of the city of Messina. The contents must be preparatory and functional for the use and possible redesign of the various digital touchpoints. The set of digital assets, components, and templates will initially be focused on the desktop (responsive) aspects to facilitate the start of prototyping and development activities.
2. Digitalization of the commercial and artisan offer typical of the Messina area: the project aims to create and support a stable strategy of rules and services summarized in a Brand ***I'm Messina***. Agora will allow the network of artisans, entrepreneurs, and small traders to make the food and wine, and artisan heritage more accessible and easily accessible to both citizens and the hundreds of thousands of tourists who annually visit the territories of the metropolitan area. The project is aimed at encouraging the creation of a network of artisans and commercial operators who, using "smart" solutions for the analysis of brand reputation. and market intelligence provides services and products for a policy of territorial promotion and recognition

by citizens and tourists. This action aims to allow integrated use of the artisanal and food and wine resources of our city. In general, the activities have as their purpose the development of various interoperable modules that allow the clustering of interests and potential users also for better managing content and management opportunities.

3. Digitalization of the tourist-cultural and leisure offer of the metropolitan area of the City of Messina. The purpose of this action is to facilitate the use, dialogue, and interaction between the public administration, its citizens, and the numerous City Users on issues of culture and leisure. In addition, we want to ensure access to the services provided and available by the Public Administration and by other players in the area. The specific objectives of this area of activity are to spread knowledge about the historical and artistic heritage and the vast cultural offer of the area to all the citizens of Messina and the entire metropolitan belt. The project saw its implementation phase between April 2018 and December 2021. From this phase, the ***VisitMe*** platform was born (https://visitme.comune.messina.it/it/luoghi/messina)

Figure 17 – visitMe Home poge



Source: Municipality of Messina

Currently, *VisiteMe* is the official tourist portal of the City of Messina and the Metropolitan area. It contains all the actions described above.

4.2. MESMART

The ***MESMART*** project represents the infrastructure for the applications foreseen and already in use by the PA. The project actions aim to develop integration and aggregation models for the processing of data coming from heterogeneous sources connected. To this end, a fundamental objective is to provide decision support and process optimization systems. The development of the MESMART Project made it possible to know the state of health and safety of the territory, favoring access to services and information through data analytics tools.

Furthermore, processing systems developed were used starting from the cartographic data of the information on waste, erosion, and hydrogeological instability. These actions are needed to optimize the planning and control systems of the territory. The development of the ***MESMART*** platform made it possible to know the state of health and safety of the territory of the City of Messina in the following aspects:

- hydrogeological structure.
- seismic safety.
- water network monitoring.
- use of natural resources and energy consumption.
- waste.
- urban security by monitoring sensitive points with real-time analysis systems.
- energy efficiency and re-lamping.

Through the **MESMART** platform, the data are displayed on the user side, and through *APIs*, they are shared with other project interventions of the Municipality of Messina. One of the main results of the **MESMART** project was the creation of a Control Room that allows the use of information coming from the network of sensors distributed over the city. On the other hand, the Control Room provides real-time multi-channel info mobility services to users, also concerning events and emergencies, in coordination with *Civil Protection*. One of the main advantages of having such a system within the City of Messina is to improve the efficiency and timeliness of the management of services to citizens, businesses, and tourists and at the same time, optimize public services by monitoring the territory.

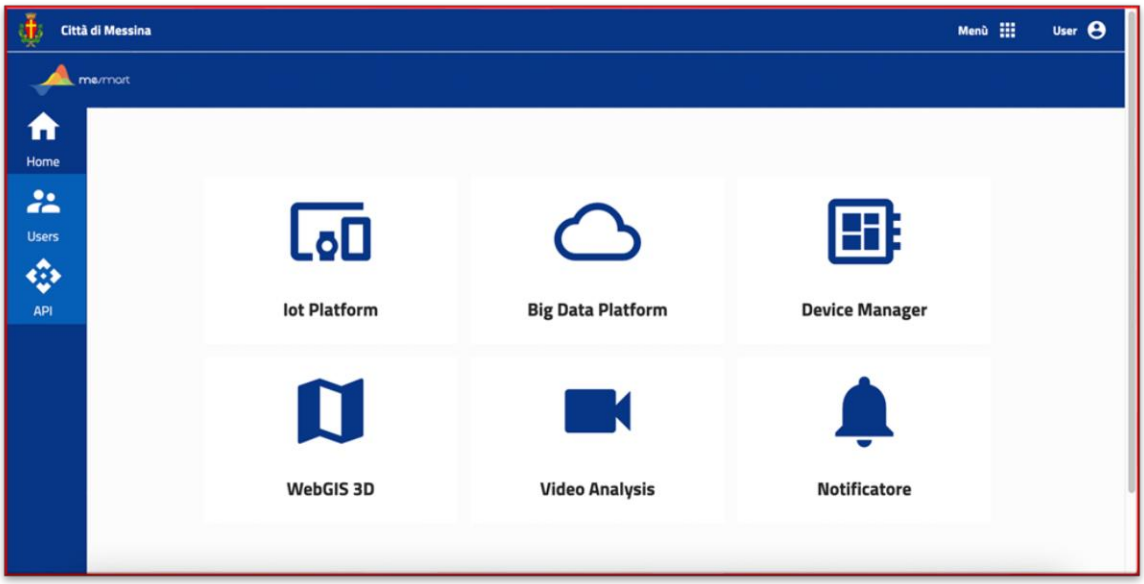
The development of the ***MESMART*** system involved the implementation of the following activities:

1. Recognition of existing databases (public and private), information collection and remediation, digitalization.
2. Recognition of existing databases integrated with information collection and digitalization processes.
3. Realization of a sensor network, video surveillance, and hardware for data acquisition, processing, and management. In this context, sensors, and wireless communication systems (LoRa, Zigbee, Bluetooth) are used.
4. Implementation of a platform for dialogue with the sensor network and subsequent storage of BigData through Open-Source software.
5. Development of data analysis functions in the backend and integration of the SIT system for the detection of criticalities and alerts in real-time.
6. Development of functions for environmental authorizations of territorial competence.
7. Development of interfaces capable of acquiring and analyzing the data processed by different monitoring systems.

Through the ***MESMART*** platform, it is possible to carry out an analysis of related data belonging to different domains. All the information processed is shared with municipal companies and municipalities in the metropolitan area of the City of Messina. With the MESMART project, it was possible to create a procedural standard and protocols for the secure exchange of data to create an interoperable system at the metropolitan level. Furthermore, Open-Source platforms were used which guaranteed the publication of data according to the "Open Data" paradigm and the creation of an "***API Economy***" for the development of smart applications.

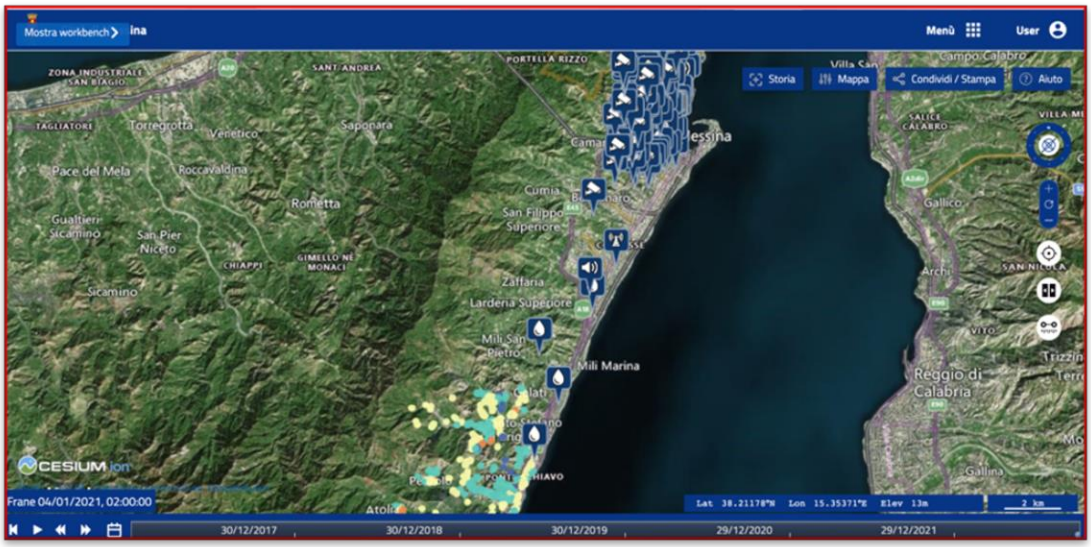
The MESMART project has made possible the development of a public/private community and the construction of a single database that can be consulted by citizens. Through MESMART it is possible to provide information on traffic, energy consumption, emissions, and lighting. The acquired data are processed in such a way as to provide support for decision-making processes on traffic, public transport, waste, noise pollution, seismic risks, and control of water waste.

Figure 18 – MeSmart Platforms general



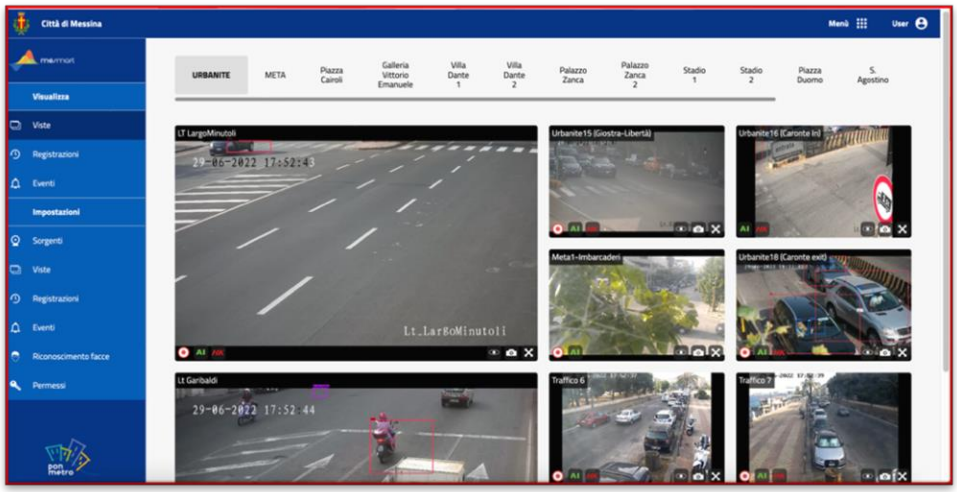
Source: Municipality of Messina

Figure 19 – MeSmart Platforms WebGIS 3D



Source: Municipality of Messina

Figure 20 – MeSmart Platforms Video Surveillance and Traffic Monitoring



Source: Municipality of Messina

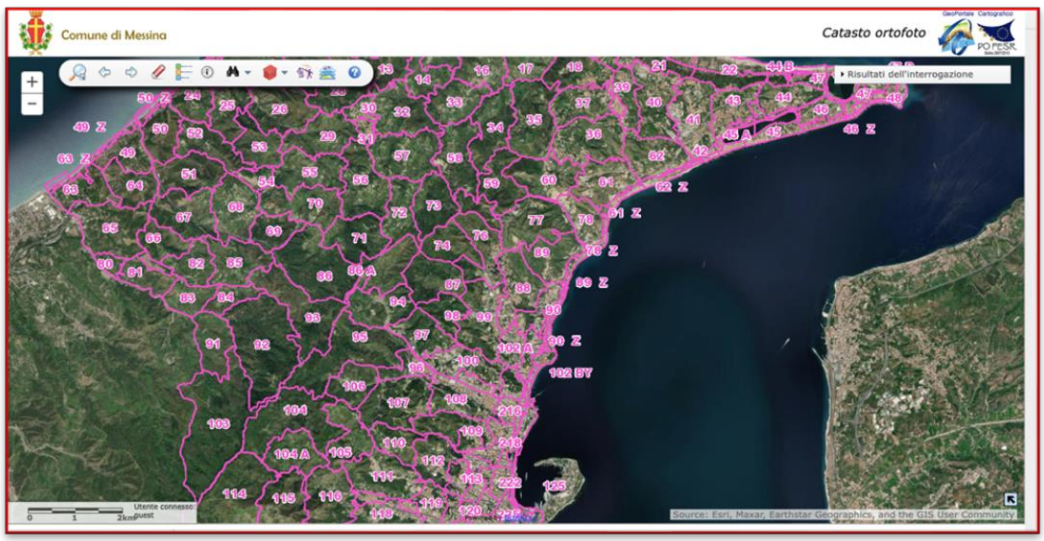
4.3. Urbamid Plus

The ***Urbamid Plus*** project aimed to define a management system for the procedures concerning urban planning and construction, integrating new modules implemented for the management of public works and the web-gis module. With ***Urbamid Plus*** it was possible to develop a dedicated portal that allows users to consult the archives and facilitates project management. Within the ***Urbamid Plus*** project, it was necessary to develop scalable back-end functions and front-end applications with independent layers capable of providing a detailed overview of the information of the municipalities belonging to the Metropolitan City of Messina.

URBAmid /DAERAnet is the digital management system for practices in the field of construction and urban planning and consists of modules that allow the sending of files, their registration, and the management of the entire process. The present system can be optimized to improve the services provided to technicians, citizens, and businesses, to have greater interoperability of data. The management software of the Municipality of Messina has been integrated with applications that have allowed the dematerialization of the documents of the practices. Furthermore, through the systems implemented in ***Urbamid Plus***, it was possible to guarantee accessibility to citizens for the consultation of data, of the planning, programming, and testing phases of public works.

Through the *Urbamid Plus* project, it was possible to enhance the performance of the ***SIT system*** - ***Real Estate Registry***. Through the information systems implemented it was possible to provide web services to citizens and technical professionals as a decision support tool for monitoring the territory, urban planning, and network services. By accessing the link, http://www.comune.messina.sitr.it/, it is possible to access the services of the ***Urbamid+*** Project.

Figure 21 – Urbaid+ Platform



Source: Municipality of Messina

It was possible to develop the municipal real estate registry (buildings and land) directly connected to the tax systems with the aim of having an optimized system for the fair and correct management of taxes.

URBAMid+ starting from the consolidated experience for the dematerialized management of building and urban planning practices, and thanks to the implementation of the GIS systems in use and the new Public Works module, significantly contributes to the creation of a system for the government and monitoring of the territory and expenditure public, thus guaranteeing the principles of transparency and equal treatment for all citizens.

Finally, the project envisages the following as enabling elements for the correct provision of the service:

- the acquisition of historical data and their digitalization in standard format as an enabling activity for the correct provision and management of services;
- local enhancement of structured cabling and hardware;
- training and information events for stakeholders. In this sense, even the design of a real brand appears essential to promote the use of online services according to a recognizable visual identity;

4.4. CloudMe

The ***CLOUD@ME*** project provides for the hardware modernization of the physical spaces necessary to guarantee efficient services to the entire Metropolitan Area of the City of Messina. The modernization process involved systemic, network, and physical security aspects of the premises of the Data Processing Center of the Municipality of Messina CED, to host and manage many IT equipment for secure management of the infrastructures.

The services are exposed in the following ways:

- **PaaS (Platform as a Service):** the infrastructures that allow the development, testing, and distribution of applications are exposed;
- **SaaS (Software as a Service):** in this model, software services are offered to users, such as e-mail and office;
- **IaaS (Infrastructure as a Service):** The Municipality of Messina has at its disposal its own virtualized environment, computing power, and network services to be able to autonomously deliver its services and applications;

Three different approaches have been applied to manage the Cloud infrastructure:

- **Public Cloud:** Offers scalable services and greater flexibility. These features make it possible to vary costs and simplify the management of activities;
- **Private Cloud:** an approach is applied aimed at creating the enabling conditions for the Cloud;
- **Hybrid Cloud:** maintaining the core of the Cloud on Premise infrastructure and leaving open the possibility of benefiting from external Cloud service;

Within the project, actions have been launched which include:

- **Infrastructure Assessment** for the definition of current systems and applications to converge on the Cloud.
- **Technology scouting**: Hardware and Software selection to identify the most suitable solution for the project requirements.
- **Training for operators**: acquisition of the know-how necessary for the management of the virtual infrastructure.
- **Standardization and integration of Hypervisioning** tools and implementation of tools for advanced resource management.
- **Virtual environment setup** and resource virtualization: to simplify the management of Hardware components.
- **Activation and monitoring of the system**.
- Evaluation of external platforms for **Disaster Recovery** solutions.

The Municipality of Messina will have to provide services that guarantee citizens a high degree of security of sensitive data. The municipality will have to process a considerable amount of personal data, having to ensure the free circulation and security of data. In particular, the public administration's information systems manager must take care of the systems managed and implement all the security measures aimed at reducing the risk. In this perspective, the Municipality of Messina wants to undertake logical and organizational security measures to standardize the systems concerning the regulations about:

1. Legislative Decree 30 June 2003, n. 196: "*Code regarding the protection of personal data*" and subsequent amendments;
2. Applicable Privacy Guarantor Measures;

The objective of the CLOUD@ME project is to provide the following services:

- Services for the management of digital identities for the identification, authentication, and authorization of external users who request access to the Administration services.
- Services for checking the security status of the infrastructure and the state of exposure to vulnerabilities of the Municipality of Messina concerning external attacks.

- Services that allow to carry out periodic checks on the network security status and for database protection to guarantee the Confidentiality, Integrity, and Accessibility of data.
- Services for the protection of web applications from cyber-attacks.

Furthermore, with Cloud@ME, it was possible to create a CLOUD infrastructure with reliable and safe environments, reducing the maintenance and management costs of both the hardware and energy components, with the adoption of the Green Computing paradigm.

With the implementation of the Cloud@ME project, it will be possible to:

- Simplify access to digital services without penalizing security and privacy.
- Maintain a complete and updated view of their vulnerabilities and related risks.
- Protect one's information assets by extending this protection to the data and information of citizens and businesses.

4.5. Messina Connected City

With the ***Messina Connected City*** project, it was possible to integrate and extend smart connections with self-consistent but connected interventions. The design strength was the creation of a software infrastructure on which it was possible to develop vertical, heterogeneous, and interoperable applications in terms of data flows and interactions. In the City of Messina, with the implementation of numerous digitalization projects, it was necessary to implement intelligent solutions to transform the Administration's processes and provide citizens with optimized services. Employing the project, it was possible to create simple and always accessible services for the citizen, guaranteeing at the same time an ever-stronger relationship with the city administration.

Lastly, there was a need, also dictated by the COVID-19 emergency condition, to have tools that allow effective, direct, multi-channel, and safe communication with citizens and city users.

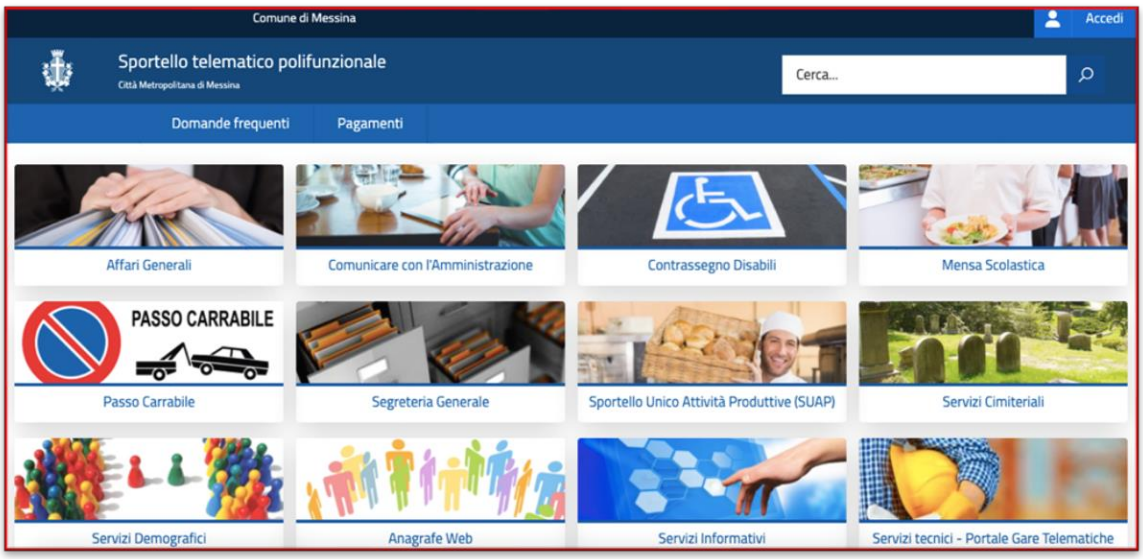
With the Messina Connected City project, it was possible to activate the ***Single Virtual Desk*** (Sportello Virtuale Unico SVU). The **SVU** is a telematics platform that allows easy access to users who apply for the digital services of the Municipality of Messina. Through the SVU, citizens are guided in the completion processes of any online application. To access the SVU it is necessary to use an authentication system such as SPID, CIE, and CNS. The ***PagoPA*** service has been activated for payments.

The SVC of the Municipality of Messina provides the following services:

- Tributes
- Demographic services
- Disabled badge
- Cemetery Services
- School canteen
- Request for a driveway
- Personal and Business Service
- Urban planning and tourism
- IT and Technical Services
- Communication with the Administration

Through the link: https://sportellotelematico.comune.messina.it/ it is possible to access the services of the Single Virtual Desk.

Figure 22 – "Sportello Telematico Polifunzionale" Homepage



Source: Municipality of Messina

4.6. Administra

With the ***AdMINISTRA*** Project (*Management Actions, Integration and Reengineering of Administrative Processes*) the city of Messina will become efficient from the point of view of energy policies, ecological transition, and digital transformation.

The design objective is to regenerate the bureaucratic machine to streamline and accelerate the change process by involving the whole community. To this end, it is necessary to use destructive policies deriving from the strategic guidelines provided by the EU for a substantial change in the urban eco-environment, to change its DNA, and regenerate the urban eco-environment and bureaucratic processes.

The strength of this project is the green and digital revolution that will make the city of Messina more livable and sustainable also in terms of quality of life. The "*Vision*" that the City of Messina must have been to implement valid policies for the completion of the processes of digitalization and optimization of the services offered to citizens, simplifying the processes, and streamlining the procedures for relating to citizens. and businesses. For this reason, it is necessary to develop "*data-driven*" policies for the sustainability of the city with a view to digital transformation, and energy efficiency policies for the implementation of the *Energy Transition* in the city of Messina.

Within the ***AdMINISTRA*** project, actions for decarbonization and the reduction of atmospheric pollution are implemented to restore and strengthen green areas and biodiversity, to favor the transition to a circular economy with a view to *Ecological Transition*.

All these actions will be possible following an analysis of the Big Data collected in the area. The City of Messina will move towards ecological measures using new software for monitoring and optimization of processes for the management of the operating machine.

A fundamental action is to enhance areas and skills through the dynamic programming of technical-economic policies that will allow the evolution of the services and departments responsible for public investment programs.

4.7. I-Hub dello Stretto

The ***I-HUB project*** stems from the need to implement actions within the Metropolitan area of the city of Messina, characterized by massive use of technologies and digital tools in the logic of reuse

and replicability of the solutions put in place. The I-HUB of the Strait must be built following a quadruple helix approach, therefore involve in its exercise:

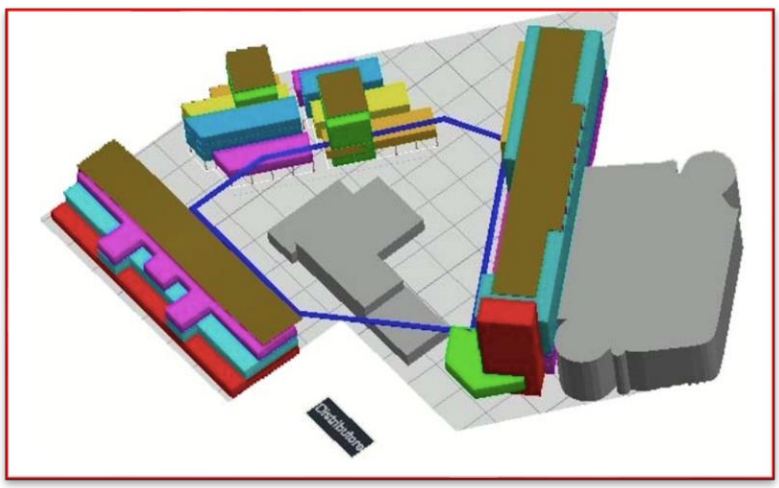
- Local PA Administrations, which will be called to participate, according to different roles (for example, pioneer and follower Administrations present in the territory can be identified as Metropolitan).
- The University and research centers will be able to test digital solutions and in the field of IoT, Cloud Computing, Fog Computing, Edge Computing, AI, innovative Cybersecurity for the city.
- City Users, who will be able to use the sharing spaces to present their ideas and requests for the improvement of the city.
- Companies, which will be able to exhibit and test their solutions within the i-HUB and which will be able to meet the needs of the Administrations adhering to the i-HUB.

Within the i-HUB of the Strait, therefore, activities can be carried out on multiple domains, relating to the PA and the territory, the environment, safety management, citizen participation and digital inclusion, mobility and transport, management waste collection, and more. The realization of a common quality planning is also capable of attracting new financial resources from a programmatic point of view. The activities of the i-HUB of the Strait will therefore concern:

- Thematic workshops for sharing issues, critical state of the art of individual cities.
- Co-Design of needs and requirements for the implementation of solutions.
- Market scouting to identify stakeholders interested in proposing innovative or non-innovative solutions.
- Research and definition of economic sustainability models applicable to the creation of new services.
- Definition of procurement tools.
- Test and pilot the solutions of private companies or universities, evaluation, and validation of the solutions.
- Definition of research areas connected to city services, development of research streams.
- Research and attraction of funds and financing, public, for the realization of services, but also private ones aimed at Research & Innovation, which Universities and start-ups and funds can use privately.

The ***i-HUB project*** provides for the possibility of including the co-participation of private companies, and funds, which may be involved through public-private partnership (PPP) mechanisms and which, therefore, will have areas and tools available to create and implement the solutions and on the other hand, will share the risk in the realization of new services. The CORE, linked to digital technologies, becomes the basis of the activities to be conducted for the Public Administration and the Company where the training component (Education) in both cases becomes essential to facilitate its use. In the *i-HUB of the Strait*, it is expected that the Digital aspect is the enabling to all the actions that are implemented both in the start-up phase of the initiative also when fully operational. Here we are talking about equipping PAs and companies with important Digital Skills to face the revolution underway in Digital Transformation. As reported by the achievable objective POC in which it is important to determine the digitalization of administrative processes and the diffusion of fully interoperable digital services, the i-HUB project aims to build the ICT Core action on different levels: a) to equip the PA with innovative tools Digital, b) to enable companies to face the challenges within the Industry 4.0 context, c) to build Agile training courses (i.e. capable of taking into account the needs of PA and companies) on-demand necessary to bridge the gaps in DT and Industry 4.0 of the operators involved.

Figure 23 - I-HUB project prospectus



Source: Municipality of Messina

4.8. Messina - A scuola e al lavoro con il Trasporto Pubblico Locale. Iniziative per promuovere la mobilità sostenibile

Better known in the city with the ***MuoviMe*** brand (www.muovime.it), it was founded as part of the national experimental program of home-school and home-work mobility of the Ministry of the Environment and Protection of the Territory and the Sea. The project was drawn up by the Municipality of Messina in partnership with the University of Messina and the *A.T.I. Euromobility-CRAS s.r.l.* provides for the involvement of stakeholders identified in public bodies, companies, professional associations, trade associations, and schools in the city starting from 2016. The project aims to raise awareness among users who are formally linked to stakeholders in the use of local public transport and sustainable mobility and at birth, it was based on 4 fundamental actions:

- **Incentives for Local Public Transport: 50**% reduction of the monthly/quarterly pass, on all lines of Local Public Transport managed by the Messina Transport Company.
- **Car Pooling Incentives**: creating a carpooling platform helps workers and students get in touch to share a private car along a common path.
- **Bike to Work Incentives:** the action aims to encourage people to leave their cars and use their bicycles to travel home-work and home-school. The project includes both actions of pure awareness towards workers and students and initiatives that can encourage the use of bicycles by granting an e-bike free of charge for a limited period and providing bonuses in the face of the use of the bicycle for systematic travel.
- **Traffic Calming:** interventions aimed at discouraging the use of private cars through a better offer of walking and cycling achieved by creating greater safety conditions near schools.

The project was supposed to end in 2021 but given the pandemic situation from COVID-19 that hit the world in 2020, it was extended until the end of 2023. Furthermore, the carpooling action was suppressed due to the related risks pandemic and further actions have been introduced in the project:

- **Bike to Work**: addition of mobility vouchers for the purchase of vehicles for sustainable mobility (bicycles and scooters). Users will be able to freely purchase a vehicle on which a GPS device must be installed to track its actual systematic use.

- **On-demand services for LPT:** it is planned to create an experimental app for on-demand services for local public transport. Users who use the service will receive prizes which will be discounts on tickets and/or season tickets.

At present, a web platform has been developed for the management of the services provided (Figure 24), 20 stakeholders have an agreement with the Municipality of Messina whose staff can take advantage of the project actions in progress, and the mobile app is being released for on-demand services on local public transport.

Figure 24 – Muovime project platform

Source: Municipality of Messina

4.9. URBANITE

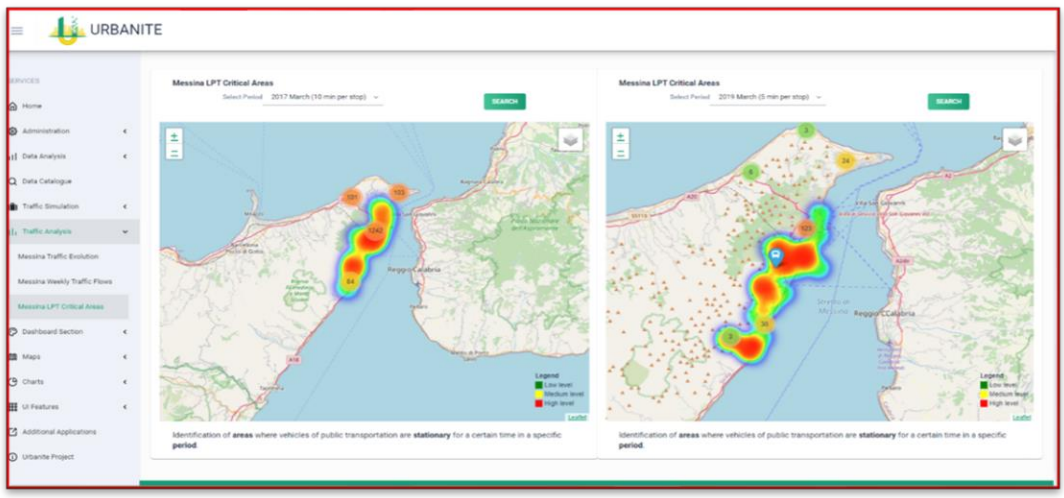
URBANITE is an H2020 project and Messina is a pilot of the project. The objectives of URBANITE are to promote the use of disruptive technologies in the nascent Smart Cities in technological terms through the use and analysis of Big Data, AI algorithms, etc. An innovative element, however, is related to the promotion of innovative tools for participatory decision-making processes such as the *Social Polic Laboratory* (***SoPoLab***). The project aims to provide the Stakeholders of the project with a series of innovative technological tools to support the decision-making processes of managers of public administrations and companies. Within the project, there are four pilot cities: Amsterdam, Bilbao, **Messina**, and Helsinki. In each of the pilots, the needs are studied, and analysis tools are developed which will then be applied to each of them. As regards the city of Messina, analyses were conducted on traffic and its effects on local public transport.

To help the city of Messina the ***URBANITE*** project is going to provide a platform to collect and make accessible data coming from different sources (also from different departments of the same organization) to the decision-makers. To this aim, the platform will offer tools to facilitate the connection to data sources (also owned by third parties) and provide capabilities to share information among the decision-makers that could be involved and/or interested in the same decision-making process. The platform will also offer the possibility to:

- perform simulations and analysis over collected data (e.g., to estimate traffic, identify multimodal paths, the available vehicle for the public transportation in each moment),
- define custom dashboards (to allow each decision-maker to briefly access the information he/she needs)
- visualize on maps, charts, and graphs mobility-related information (e.g., to identify roads in which the busses were stopped (Figure 25).

This set of capabilities would support decision-makers in their day-by-day activities such as identifying problems afflicting public transportation, streets, and roads needing maintenance interventions and intervention for public safety to be realized.

Figure 25 – URBANITE Messina Use Case platform: Messina Critical Areas for bus transport



Source: Municipality of Messina

5. The current state of the institutions that play regarding the theme tackled by the Integrated Action Plan

This paragraph collects the main institutional components that refer to *DigiPlace's* area of action. In particular, the main institutions will be mentioned also according to the possible peer collaboration and the project actions that will be indicated. The list of institutions and actions is not restricted but constantly updated.

5.1. Summary of institutional context – roles and responsibilities of different agencies

The institutions involved in the digitalization process faced by the ***DigiPlace*** project are public administrations operating in the metropolitan area. Below is a brief description of the institutions and personalities involved:

- ***Municipality of Messina:*** the municipality of Messina is the highest democratic expression of the city. It deals with the government of the city under the guidance of *Mayor Federico Basile* elected in June 2022 and belonging to the same political area as the previous government with *Mayor Cateno De Luca* under which *DigiPlace* began. Government personalities interested in the topics of the *DigiPlace* project are:
    - *Carlotta Previti*: commissioner with responsibility for the Smart City and strategic planning for European funds 21-27.
    - *Francesco Caminiti:* commissioner with responsibility for the digitalization of the public administration and the data processing center.
    - *Salvatore Mondello:* commissioner with responsibility for mobility. He is relevant for the DigiPlace project given the use case considered.

  Furthermore, in addition to the members of the city government, specific services of departments of the municipality are relevant from the point of view of the DigiPlace project:

    - **Personal and business services**: it coordinates the DigiPlace project, and the project coordinator *Dino Alessi* works on it. The department is coordinated by *Salvatore De Francesco* and reports directly to the councilor *Carlotta Previti*.

- **Data processing center:** deals with the management of the IT services of the municipality. It is coordinated by *Placido Accolla* and reports directly to councilor *Francesco Caminiti*.
- **Mobility (TERRITORIAL AND URBAN SERVICES):** deals with urban mobility services under the coordination of *Domenico Cerniglia* and *Bruno Bringheli*. The department reports directly to councilor *Salvatore Mondello*.

- ***Metropolitan City of Messina***: it is a territorial government body that includes 108 Sicilian municipalities in the Messina district. The municipality of Messina is also one of the 108 municipalities. The metropolitan city is administered by the mayor of the metropolitan capital and therefore by the mayor of the city of Messina Federico Basile. The metropolitan mayor coordinates the employees of the metropolitan city by guiding tall the territorial action policies.
- **University of Messina:** University of Messina, founded in 1548, is an international research institution hosting many foreign students. It is currently led by the *Magnificent Rector Salvatore Cuzzocrea* who makes use of the collaboration of the *General Director Francesco Bonanno* for the administrative management of the institution and a group of pro-rectors and delegates of the rector who advise him with specific skills in different areas of interest for the government of the University. In recent years the University of Messina, in addition to increasing the number of foreign students, has climbed the rankings of world universities thanks to the quality of the research and teaching offered. As regards the *DigiPlace* project, the collaboration of *Massimo Villari*, delegate to the ICT services of the Rector for the University of Messina and Full Professor in Computer Science, is of particular importance. Together with the research group coordinated by him, it contributes in terms of vision and innovation to various actions of the city public administrations as regards the digital transformation activity at different levels and in different use cases.
- **ATM SpA:** was born on June 1, 2020 and manages local public transport within the city of Messina: surface vehicles, trams, car parks, and ZTL. ATM SpA is a fully publicly owned company and deals with the local public transport service in the city of Messina. The sole shareholder is the Municipality of Messina. The governing groups of the company are:
  - Shareholders' Meeting

- Board of Directors and the President
- Board of Statutory Auditors
- Auditor

ATM SpA is currently increasing its fleet of machines trying to adapt to the disruptive impact of digital transformation on the mobility sector.

5.2. Summary of existing strategies and policies relevant to this field (local, regional, and national)

Digital transformation is currently at the heart of most funding plans both at regional, national and European levels. In Sicily, the **PO-FERS 21-27** program foresees a budget of 5.8 billion euros and will focus on the environment, research, and digital. To these are added the two 2021-27 territorial cooperation programs managed by the Sicilian Region, namely the Interreg Next Italy-Tunisia and Italy-Malta, which together provide 93 million euros in funding. These two have a focus on green, digital, and the environment. As regards national funds under the ***Next Generation EU*** initiative, Italy has received resources relating to the ***Recovery and Resilience Device (PNRR)*** for a total amount of € 191.5 billion to be used in the period 2021-2026 through the implementation of the PNRR. 21% of these funds concern the digital transition, while about 40% concern the green transition and mobility. 40% of PNRR funds must be spent in the regions of southern Italy. To what has been described is added approximately 13 billion euros from the React EU fund and around 30 billion euros from the complementary national fund.

Furthermore, the Horizon Europe program foresees project lienees at the European level for several billion euros both in terms of digital transformation and in terms of mobility.

6. Remark on the Small-Scale Actions

As described in the previous chapters, during the ***DigiPlace*** project two Small Scale Actions have been identified and carried out. The first one which is identified as ***SSA_1*** concerns the management of traffic using intelligent traffic lights, and the second identified as ***SSA***_2 concerns the process of digitizing the detection of accidents by the municipal police and the processing of data in real time both for statistical purposes and enrichment of open databases.

6.1. SSA_1: Activities and results

The development of a system of intelligent traffic lights is an interdisciplinary process that involves various representatives of the PA and not. The experience gained by the representatives of the Municipality of Messina in comparison with Oulu colleagues has generated interest in this traffic management solution. ***ULG*** had to carry out preliminary studies on the partners of the ***URBANITE*** project in collaboration with the Mobility Department and the Data Processing Center, the state of the art, and possible developments about the SSA were clarified. The study and development activities of the SSA were carried out with several meetings both ULG and with the technicians of the mobility department. During the meetings, the implications that the SSA could have on city traffic were clarified as well as the technical functions. It emerged that the action requires several authorizations as it directly impacts daily traffic. Furthermore, the choice of an area of the city to carry out the SSA had to be made in function not only of the traffic but also of the situation of the traffic lights adjacent to the one used for the SSA. From discussions with specialized technicians, it emerged that the existing systems, even if functional to the planned action, require a technological upgrade, both hardware, and software. Based on the various considerations, the working group took action to request authorizations and to carry out a market survey that would identify companies available for a technological upgrade of the system. As this was a small-scale action, it was not possible to acquire the necessary authorizations to carry out a trial. Furthermore, the market investigation revealed that the cost of the technological adaptation far exceeded the budget available to SSA.

However, the actions carried out made it possible to clearly define the steps necessary for the implementation of the system. In collaboration with other projects, the technical problems hindering the start of the action have been overcome, and the municipality of Messina now has sufficient studies and knowledge to be able to seek funds to create a system of intelligent traffic

lights. For these reasons, even if experimentation was not carried out, the SSA_1 was concluded with positive results overall.

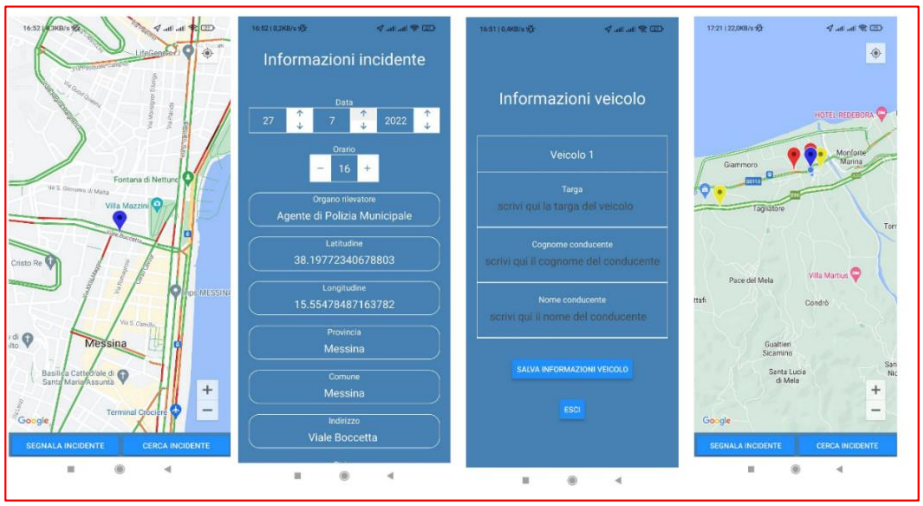
6.2. SSA_2: Activities and results

The activities carried out within the SSA_1 have allowed the URBACT Local Group to address various problems concerning the use of digital technology within the public administration, but also problems concerning innovative areas and strategic vision for the city. Among these issues are. pay particular attention:

- the absence of an open database for mobility data, and for accidents.
- the absence of real-time data on accidents in the city.
- data collection methods for incidents that still use paper and involve further work to digitize them without ensuring interoperability.

Also considering the Italian legislation in terms of open data, the URBACT Local Group has decided to create a software system for the digital management of accidents. Technically it is a mobile app to be given to the brigade where they can geolocalize automatically (at the accident site) and enter the data necessary for the reporting on site.

Figure 26 – Mobile Application for accidents data collection



Source: Municipality of Messina

These data will be sent automatically to the cloud of the municipality of Messina where they will be processed and will go on the one hand to feed the open data portal in a dynamic environment, on the other hand, to feed a database at the base of decision support tools with dashboards that aggregate the data for statistical purposes. The mobile app also allows you to view colloected incidents to be functional to a transition period that allows the municipal police to delete the paper and then collected the incidents in the software currently in use.

In carrying out the various activities, a fundamental contribution was made to the creation of an open database for the open data portal of the municipality of Messina which includes data on mobility and obviously on accidents in past years.

Figure 26 shows some screens of the application created. It is shown how the operator is located and can enter data (the requested data includes different screens to be filled in) while subsequently, the incidents are visible in the app. The user experience and functionalities are evolving under the advice of the operators to whom it is intended.

Figure 27 – Software for accidents data collection, Dashboard data visualization

Source: Municipality of Messina

Figure 27 shows an example of the Dashboard that displays data in real-time. This tool is useful both in the context of strategic planning and in the context of decision support. The system is equipped with an API to ensure interoperability not only for the open database of the municipality of Messina but also in case of the need to share data with other entities. The system is GDPR compliant and guarantees the anonymization of the data shared openly.

The SSA has had a very positive effect in terms of both appreciation and innovation. The system devised made it possible to introduce digital tools among municipal police operators, helping to spread the digital culture. Furthermore, the actions implemented will allow a more efficient service by enriching the open data portal of the municipality of Messina and making the work of the operators easier. Of particular importance was the result of the interdepartmental collaboration which, by exploiting digital technologies, allowed all the actors involved to proceed easily with the implementation of the SSA. The results obtained by SSA_2 were therefore highly positive and appreciated and a strong contribution was made to the achievement of the IAP objectives.

The actions carried out by the URBACT Local Group have made it possible to increase the ability to operate with digital technologies both for its participants and for part of the staff of the municipality of Messina. Particularly relevant was the ability to think in an innovative way that allowed the difficulties of the SSA initially identified to produce a new SSA that was solving real problems. Furthermore, SSAs have addressed current issues and demonstrated how the PA can efficiently address the challenges that digital transformation will also present soon. A particularly positive note was the awareness of the actors involved in carrying out the actions defined by the SSA. From the meetings, it emerged not only the full achievement of the objectives defined in the IAP but also the desire of the municipality to improve itself based on the experiences lived in the SSAs.

7. Description of the process

7.1. Composition and role of URBACT Local Group and its role in the process of implementation

The project team within the municipality's European office will lead the **DigiPlace** project, being also responsible for many of the city's smart and digital projects. This team created the ***URBACT Local Group (ULG)*** which includes stakeholders with different skills:

- University of Messina
- Startup Messina – SME & Startup support organization
- FabLab Messina
- Verona-Trento Technical School
- Local Digital Company
- URBANITE local and international partners

The ***ULG coordinator*** is part of the same team as the project coordinator and has experience working on National and European projects. The ULG is a new group who are not familiar with working together. This presents both challenge and opportunity, as the city is using the ***DigiPlace*** project to build on nascent relationships and catalyze this new cross-city working group around Digital Innovation. The inclusion of the local technical school in the group is a welcome addition, with some students already being involved in the baseline visit.

Political Support is provided by the municipality and in addition different departments of the municipality work in collaboration with the ULG. The collaboration of the mobility department and the local public transport company (ATM S.P.A.) is fundamental.

7.2. Role / impact of transnational exchange and learning

The exchange of views with the stakeholders was very important during all phases of the project. The University of Messina played a fundamental role in support and vision, especially in the initial phases of the project. The ***fablab***, associations, and schools have given a different view of the state of the art. The points of view of the younger generations were important and they certainly innovated the overall vision of the partners. Furthermore, local companies have made it possible to

focus attention on real problems and on the most imminent activities to be carried out in terms of digitalization to support the production sector.

Finally, the exchange of views and participation in the activities of the *URBANITE* project in collaboration with Alma Digit srl was particularly useful. The URBANITE project, among its activities, intends to create a sustainable ecosystem model for the long-time term for the development of new mobility policies based on co-creation strategies Social Policy Lab (*SopoLab*). The co-creation shared by Alma Digit has allowed a form of participation and democratization that has stimulated all stakeholders, creating a transparent and open flow of social communication. Through the activities of the SoPoLab, it is possible to investigate the use of innovative digital technologies to support new urban mobility policies and evaluate their economic and social impact. From the various meetings, new project proposals and innovative solutions were born in mobility management. The URBANIE SoPoLab was only the first approach toward the co-creation model of strategic solutions for the city, but the ambition of the Municipality of Messina and the parties involved must be that of making this working model a concrete tool for dealing with the needs of the city reconciling them with those of the various interested parties and satisfying the expectations of the latter.

The realization of the URBANITE SoPoLab in which ULG actively participates in Messina will see further activities through some initiatives related:

1. thematic working groups, in which the various interested parties can discuss issues of common interest to support mobility and identify possible decision-making paths.
2. training meetings relating to technological innovations to support urban mobility.
3. project activities to benefit from specific funding opportunities.

ULG intends to be an active stakeholder in these initiatives even after the end of the *DigiPlace* project.

8. Risk analysis

8.1. Description of type of risk

For the definition of detailed risk analysis, it is necessary to identify the **mission that determines the priority of the use of resources, sets the objectives to be achieved in the short and medium term, certifies a "strategic" level, and starts from elements of "Governance". Through the risk assessment activities, it is possible to carry out the preliminary risk assessment, which precedes two fundamental processes: "risk treatment" and the "statement of applicability".**

The risk treatment makes it possible to define the set of responses concretely implemented, while the statement of applicability guides the DigiPlace Project towards the implementation of security measures deriving from standards or "best practices" applied in different ecosystems.

In general, the risk categories can be classified into five macro areas:

1. **Impact Mitigation:** consists in the implementation of countermeasures aimed at reducing the impact in the event of adverse events.
2. **Prevention:** involves the process of implementing actions that aim to reduce the possibility of an adverse event occurring. Software security controls fall into this category.
3. **Sharing:** consists of the transfer of the risk to a third party who takes charge of it in exchange for a counterpart. The most widespread implementation consists of the stipulation of an insurance policy that guarantees a refund in the event of the occurrence of the risk.
4. **Acceptance:** implies the decision not to put in place any countermeasure concerning a given risk, accepting the impacts that would derive from its actualization.
5. **Cancellation:** represents the determination to renounce an activity because the risks may have an impact that cannot be adequately mitigated and, in any case, not acceptable.

It is of fundamental importance to evaluate the sphere of the impact of information security, and to identify the boundaries that divide competencies and responsibilities of a political, technical, and bureaucratic nature from those that are pure "IT".

It is appropriate to introduce two concepts related to the definition of risk, and in particular:

- **threat**: it can be identified in an external entity that can be human or digital, capable of causing damage in a casual, accidental, or deliberate way;

- **vulnerability**: represents the weakness, intrinsic or caused by carelessness and little attention to the system to be defended;

Cyber-security is a fundamental and essential prerequisite to guarantee the correctness, impartiality, equity, and effectiveness of infrastructures. Furthermore, it is necessary to understand that the actions taken are aimed at safeguarding and serving users.

Once the fundamental principles of Risk Assessment have been defined, it is necessary to describe a risk management methodology that can be customized to the local application context.

8.1.1. *Risk for SSA_1*

The implementation of a smart traffic light system has both technical and economic risks. From the technical point of view, it is in fact necessary to verify that the traffic light system is all (or in part) connected to systems for data exchange. Subsequently you need a data collection center governed by software that manages traffic lights. Even if the presence of this system has been verified in the city, the use case in question requires a technical adjustment with a not negligible economic value. Furthermore, traffic light systems are fundamental infrastructures for which various authorizations are required even in the case of testing or demonstration interventions. From the analysis conducted, therefore, the implementation of the actions envisaged in the IAP is put at risk mainly by 3 factors:

- **technical feasibility**: the traffic lights must be networked and managed by specific software.
- **economic:** interventions to adapt the plants require higher economic coverage than those currently available.
- **bureaucratic:** for the adaptation of the systems, authorization and technical opinions are required. This requires the intervention of specialized technicians and competent authorities/departments.

8.1.2. *Risk for SSA_2*

Implementing a software system for collecting accident data and publishing them on an open database presents both technical and economic risks. From a technical point of view, it is in fact necessary to verify the interoperability of the systems currently in use in the municipality. Subsequently, storage and processing systems for the collected data will be required. Even if the

presence of such systems has been verified within the municipality, the use case in question requires technical interventions to protect users' privacy. From the analysis conducted, therefore, the implementation of the planned action identified as SSA_2 is put at risk mainly by 3 factors:

- **technical feasibility:** storage capacity is required by the municipality of Messina and the systems must be interoperable.
- **economic:** hardware adaptation interventions require economic efforts by the entity, moreover a service to be used over time requires high levels of security in the systems to guarantee the privacy of users.
- **bureaucratic:** the use of a new system requires the change of the software currently in use and is therefore linked to the reference regulations.

8.2. Categorizations into low, medium, or high risk

To define an efficient risk analysis digital transformation staff, it is necessary to identify all the activities that can affect the confidentiality, integrity, and availability of information in the organization:

- Nature and type of data and categorization of interested parties
- Methods and classification of treatments
- Tools used
- Databases in which information is stored
- Place of custody of the storage media
- Type of devices used
- Types of interconnections with which access is made

The resources collected may contain paper and/or electronic documentation, applications, databases, electronic tools, infrastructures, and external services / outsourced processes.

An important step is to identify all the threats and vulnerabilities associated with assets deriving from the *ISO / IEC 27005* standard. This standard is the main reference for risk management in terms of IT security, based on what is written in the document of the ***US Government Agency NIST***

(*National Institute of Standards and Technology)* known as "***SP 800-30***" and aimed at providing information useful for the quantitative determination of IT risks.

After completing the information "acquisition" phase, and having identified all the fundamental elements, it is necessary to associate each resource with the various threats that can put them at risk and at the same time connect each threat to potentially exploitable vulnerabilities.

Figure 28– Assets Analysis

Assets	Vulnerability
Infrastructure	Lack of access control
	IoT not calibrated
	Unstable network infrastructure
	Lease susceptible to flooding
	Applications subject to attacks

Source: Municipality of Messina

As previously described and considering that risk is characterized by two fundamental components, impact, and probability, it is necessary to define assessments that will be represented in the following tables. In a first phase it is necessary to evaluate each combination of threat and vulnerability for each individual case under analysis:

Figure 29 – Impact Analysis

Low Impact	*The loss of confidentiality, availability, or integrity does not involve economic-financial damage and does not affect legal or contractual obligations or its reputation.*
Medium Impact	*The loss of confidentiality, availability, or integrity involves costs and has a low or moderate impact on the legal or contractual obligations or on the reputation of the organization.*
High Impact	*The loss of confidentiality, availability, or integrity has a considerable and/or immediate impact on an economic-financial level, on operations, on legal or contractual obligations, or on its reputation.*

Source: Municipality of Messina

After assessing the consequences, it is necessary to assess the likelihood of such a risk occurring, i.e. how likely it is that a threat could exploit a given vulnerability:

Figure 30 – Probability Analysis

Low Probability	*The existing security controls are strong and have so far provided an adequate level of protection. No new incidents are expected in the future.*
Medium Probability	*Existing security controls are moderate and have mostly provided an adequate level of protection. New accidents are possible, but not highly probable.*
High Probability	*Existing security checks are low or ineffective. Such accidents have a high probability of occurring in the future.*

Source: Municipality of Messina

Once the threats and vulnerabilities have been determined, it is possible to evaluate the level of risk starting from a synthesis of the two original values.

The table summarizes the relative meanings of the various risk values:

Risk Level	
1- Low	It applies to at least one of the following cases: • the threat may occur less frequently than reported by the most well-known researchers. • in the event of a deliberate attack, the data is unattractive, and the image of the organization is not compromised therefore the attack attempts either have not started or are carried out by bad guys who are poorly prepared from a technical point of view with few resources to layout. • in the event of an unintentional attack, the area is not very complex, and therefore it is difficult to make mistakes.

	• in the case of natural events, studies show that the threat can occur very rarely. • In the case of limited economic resources, the probability of threat is low. • In the presence of bureaucratic problems, related to the modification and updating of the software, the resulting damages are limited and solvable. • In the case of untrained personnel, the damage that can affect the organization is very limited.
2- Medium	It applies to at least one of the following cases: • the threat can occur as reported by the most well-known researchers. • in the event of a deliberate attack, the data is unappetizing, and the image of the organization is not compromised and therefore can be conducted by criminals who are not particularly motivated, on average trained from a technical point of view, and with scarce resources available; alternatively, studies confirm that attempted attacks are still rare. • in the event of an unauthorized attack, the area is on average complex and therefore errors can be made. • in the case of natural events, studies show that the threat can occur in the average of the cases studied. • in the case of limited economic resources, the probability of threat is average, and can be countered. • in the presence of bureaucratic problems, related to the modification and updating of the software, the resulting damages are solvable. • in the case of untrained personnel, the damage that can affect the organization is limited, but it is necessary to act with training to address the gaps.

3-High	It applies to at least one of the following cases: • the threat may occur more frequently than reported by the most well-known research. • in the event of a deliberate attack, the data is desirable, or the image organization is compromised, and therefore can be conducted by highly motivated, technically trained, and highly resourceful criminals; alternatively, studies confirm that attempted attacks are still carried out very frequently. • in the event of an unauthorized attack, the scope is highly complex (for example for multiple locations, types of IT systems, internal and/or external users), and therefore it is easy to make mistakes. • in the event of natural events, studies show that the threat almost certainly occurs. • in the presence of untrained personnel, the probability that the systems are under threat, and can suffer irreversible damage is very high. In these cases, it is necessary to define training policies for individual members of the organization. • in the event of business problems, the use of software that is not optimized and aligned with current regulations can lead to significant risks both in terms of security and management of the applications. • lack of funds and personnel for the implementation of SSAs.

8 . 3 . Outline of steps which could be taken to mitigate probability and impact

Risk mitigation can be done by following some steps:

- raise awareness among the population and the authorities on the importance of the intervention required.

- carry out a technical feasibility study of the proposed solution that considers the situation of traffic light systems in the city.
- create a schedule for the request for authorizations that indicates the personalities involved and the times for issuing the authorizations.
- carry out a market survey also abroad to look for a solution that is innovative and economically and technically sustainable.

9. Proposed Actions

The work carried out with the various departments of the Municipality of Messina has stimulated the URBACT Local Group to discuss specific issues. Thanks to the interdisciplinarity of the components of the ULG, improvement proposals have been identified which, thanks to digital technologies but not only, can make the city more liveable for citizens and more attractive for companies. These proposals, summarized in the following paragraphs, aim to propose solutions that can be of continuity with the work done with DigiPlace and inspiration for new projects to make the city of Messina better.

9.1. Staff training and reduction of the digital divide

DigiPlace's activities have in some cases brought out the digital limits of the municipality's staff. The digital skills of the staff on duty are limited to a few general-purpose software. The concepts of cloud, sharing, or shared work on a single document are not clear. It is not clear the possibility of controlled entry on documents and folders or the possibility of having a digital agenda perhaps shared at different levels. These problems in addition to slowing down the bureaucratic machine often create inconvenience to the people. Employees sometimes feel inadequate about the interlocutor, causing their performance to drop and slow down project activities. URBACT Local Group has faced these problems, trying to solve them in some cases. It emerged that a basic training activity would be needed for staff to increase digital skills and innovate the way they work. In particular, it is considered necessary to address the following macro topics:

- **Fundamentals of IT:** terminology, computer structure, the latest generation of hardware devices, basic IT tools (office package, video conferencing software);
- **Cloud Computing:** description of cloud services, cloud for public administration, access to cloud documents, sharing of files and folders;
- **Organizational tools:** use of shared calendars, scheduling of meetings with shared tools;
- **Innovative work methods:** teamwork, optimization of activities, learning on the job;
- **Project management software:** project management concepts, software for project management in public administration.

To address these issues, the contribution of specialized personnel from both universities and companies could be essential. It is important that staff understand the importance that digital skills

also have in interacting with companies that collaborate with the municipality of Messina. A virtuous path in this sense would improve not only the performance of the municipality but also the quality of the employees' work.

9.2. Interoperability of databases for public services

The URBACT Local Group faced various problems including the difficulty in finding information on activities and projects underway in the municipality. This problem is known as "silos logic" where each department works in isolation without strategies for storing documents and data. The digitalization process of the PA wants to eliminate the "silos logic" through the maximum application of the concept of interoperability. As a demonstration of this trend, the AGID guidelines for the drafting of the “IT Triennial Plan” specify targets for interoperability. The Municipality of Messina has already started a good activity in this sense thanks to the work of the CED, but the procedures for enriching the database are still slow and require manual processes. Improving this process, and therefore making the Municipality of Messina become a virtuous administration also from this point of view, means implementing actions as well as personnel training, including the introduction of interoperable software for the management of internal procedures. The action that must be taken must obviously be gradual and this necessitates the use of private cloud technologies that the municipality of Messina has at its disposal. The problem of data management also focuses on the issue of privacy and therefore certainly the data cannot be used without anonymization procedures. These problems are easily resolved by implementing policies to replace the software in use with modern software that anonymizes the data and then makes them available also in an open data perspective or through technologies for interoperability (for example API REST). The enhancement of data and therefore their use in an interoperable way includes, however, the past heritage that the municipality has available and that it is necessary to know for future planning. It is, therefore, necessary to implement historical data collection procedures and establish standard digitalization processes to be used in different departments. The standardization of procedures would then make it possible to create software for internal use that process the data available, possibly anonymizing them, and creating databases. The databases can then be made "interoperable" and therefore the municipality could have an internal service to support decisions and design as well as provide data to other PAs and companies that want to invest in the territory. Implementing these processes would also facilitate the monitoring and reporting procedures that funding programs, including the PNRR, make mandatory. The municipality of Messina has professional skills that can begin to

implement these actions, but it could refer to professional skills that support these activities also on the territory, finding valid support, especially in the University of Messina.

9.3. Encouragement of sharing activities for means of transport: urban furniture and energy efficiency

More and more cities in Italy and Europe are implementing policies to reduce cars in the city center. These policies provide for the introduction of shared electric vehicles such as small cars, motorcycles, bicycles, and scooters. These policies have been tested in the municipality of Messina with good results in terms of requests for the service, but there are no such services in the city. From the activities of the DigiPlace project, it emerged that the Municipality of Messina is issuing licenses for this type of activity with the free fleet mode. However, the studies carried out by the URBACT Local Group have found that this type of modality mainly generates 2 critical issues:

- urban furnishing problems: due to the presence of hundreds of vehicles often left in an inappropriate way, the sidewalks are occupied by vehicles causing difficulties for pedestrians;
- energy problems: the presence of electric vehicles that must be continuously recharged with high consumption of energy not deriving from renewable sources effectively cancels the environmental benefits that these practices are thought to bring;

The solutions to these problems certainly require the dissemination of the culture of sharing mobility and respect for common spaces, but also an activity of the municipality of Messina that will set specific stakes for sharing activities. In this sense, the Municipality of Messina can act for example by fixing areas to take and release the vehicles. In this case, suitable structures for the storage of vehicles with recharging columns that exploit renewable energy such as sun or wind could be installed by the municipality or in partnership with proven companies. This possibility would allow:

- to reduce costs for companies operating in this field because they should not collect the unloaded vehicles to take them to recharge points;
- to prevent vehicles from being abandoned everywhere in the city;
- real environmental benefits thanks to the use of alternative energy sources that would contribute to the reduction of harmful emissions

- reduction in the prices of the service for citizens;

The energy efficiency action is closely linked to these activities. The municipality of Messina is already implementing energy efficiency activities for its structures. With consumption monitoring actions, as well as having clear data on building management, it could use excess energy to power the charging stations of the vehicles used for sharing but more generally for charging electric vehicles. Such an action, in addition to improving emissions reduction activities, would allow further facilitations on sharing for PA employees. Agreements could be made by companies that would allow discounts for staff who would be incentivized not to use their car in commuting from home to work. In addition, the staff could use the vehicles also in service trips, freeing the municipality from further costs. This action therefore would make the municipality of Messina virtuous not only from the point of view of reducing traffic but also from the point of view of respect for the environment.

9.4. Interoperability of transports: mobility digital hub

Messina is the capital of the Metropolitan city. The main services for the 108 municipalities that make up the metropolitan area are in the city. Furthermore, the geographical position of Messina makes it the gateway to Sicily. From Messina, ferries depart and arrive for Calabria and then for Italy. In addition to passengers, they are also pass-through Messina cars, trucks for the transport of goods, buses for national and international routes, and trains. URBACT Local Group has encountered many difficulties of citizens moving due to the need to change means of transport to make their journey. To solve this problem, the solution has been identified as that of realizing, or stimulating the realization of, of a mobility digital hub. It is a digital platform where a citizen can plan his trip that passes through Messina. This means that it is necessary to collect the timetables of urban and extra-urban buses, trains, and ferries according to specific digital standards to give citizens the possibility to "create" their journey through a platform or a mobile app. The creation of the trip may also involve the issue of a ticket with its online payment and a seat reservation on the vehicle. This practice would simplify the life of the citizens, also allowing them to optimize the trips or in any case to program the transport services in an optimized way.

Furthermore, a digitization action of this type would open the doors to on-demand services for mobility already being tested in the Municipality of Messina. By also introducing devices on board the means of transport to monitor the number of passengers on board, it would also be possible to verify the efficiency of the journeys in progress, allowing better company policies to transport

companies. Positive implications from this action will be for the city of Messina and for the villages. The ability to monitor the number of passengers on the buses would make it possible to understand which trips are well planned and which are not. Furthermore, the possibility of having an on-demand service would allow activating trips in specific situations as well as understanding when a service is necessary and therefore having data to evaluate the actual need for activation even permanently.

The realization of these interventions necessarily passes from the collaboration of public and private transport companies operating in the area. The Municipality of Messina can certainly be a promoter and incentivize these interventions with technological tools that bring evident improvements in services for citizens and greater revenues for companies. A large amount of funding for the mobility sector currently available on various programs can certainly be an incentive to implement this action. This aspect is fundamental because even companies to participate in this type of action must make investments and technological adaptations which, however, find a valid basis in the case of a global vision of the territory that has the Municipality of Messina as a leader.

9.5. Assets Mobility

The policies to reduce city traffic cannot only pass from the optimization of the movement of citizens but must also concern the optimization of the movement of assets. Nowadays, in addition to the suppliers of small and large shops, couriers also arrive in the city to transport goods bought from online stores. Couriers use medium-sized means of transport for their journeys, often violating traffic regulations. Even with a view to the broader policy of "pedestrianizing" the urban centers of European cities, the municipality of Messina could implement restrictions on the entry of suppliers and couriers into the city. For this purpose, spaces could be used in the peripheral areas of the city of Messina, where storage centers for logistics companies can be created and where fleets of small electric vans or electric cargo bikes can be housed. The structures to be built should be powered with energies deriving from renewable sources (sun, wind) and, through appropriate monitoring of consumption, supply energy to the charging stations of electric vehicles. Once stored, the goods would be transported to the city with small vans or cargo bikes. This process would further reduce the number of polluting vehicles in the city by improving the quality of life of citizens. Furthermore, also in this case with appropriate energy policies that include digital technologies for energy monitoring, it could be possible to structure excess energy from public buildings, but also private ones, to recharge fleets and therefore reduce polluting gas emissions and delivery prices. for end

users. Actions of this type are being carried out in large Italian and European cities. Logistics companies are already organizing themselves in this logic and therefore this suggests that they would welcome action of this type which must be harmonized with the policies of the Municipality.

9.6. Smart Waste Management

Waste management in a city is a complex aspect that often causes a lot of inconvenience to citizens due to non-collection or poor management often due to a lack of means and personnel. The Municipality of Messina has solved several critical issues by implementing good practices of door-to-door separate waste collection for both citizens and commercial activities. However, a still critical aspect in the city is the management of waste in the collection bins located in the squares or more generally in places of the public domain such as parks or sea areas. This aspect of waste management is critical because sometimes the garbage cans, differentiated or not, are full and the waste falls, polluting the neighboring areas, other times the bins are empty, and sending personnel to empty them translates into a waste of means and resources. A possible solution to this problem, already adopted by the Oulu partners, and to be extended to other aspects of waste management, can be to use sensors to detect the filling level of the bins. The data transmitted to a central system can be viewed on a dashboard and the system can send alerts on the bins to be emptied. Furthermore, with such a policy, fleet management policies can be adopted that collect waste based on shortening the route or on the basis of bins to be emptied first. A solution of this type would reduce the pollution deriving from the dispersion of waste, but also the emissions of polluting gases from the 9 vehicles that would move in optimized mode, allowing among other things the improvement of other services for which more vehicles and more people would be available. To carry out this type of intervention, the availability of the company that manages the waste is certainly necessary. The company must be available to implement this type of innovative policy for the sector and to train or hire people who can work with this new management system. There are several solutions on the market, but also local companies can provide the expertise necessary for the implementation of these systems.

10. Conclusions

This document summarizes the results of the *DigiPlace* project both in terms of the actions carried out and their impact on the municipality. The actions carried out have made it possible to increase the digital skills of the entire URBACT Local Group, and of the staff involved in the Small-Scale Actions. Starting from the problems of the municipality of Messina, which reflect those of the territory and local public administrations, the difficulties that the digital transformation is introducing among the staff were addressed.

The URBACT Local Group has been the promoter of innovative actions that have contaminated the personnel involved in the SSA, giving a fundamental input to the reduction of the digital divide. The meetings and public events made it possible to effectively disseminate the concepts related to the change of approach in work through digital tools, giving enthusiasm to all the actors involved in the project. The definition of SSA has shown how synergistic work and innovative actions allow real and concrete improvements to be made.

The first SSA allowed to solving specific problems on the considered use case, unlocking projects and allowing real processes to move forward. This will allow the city of Messina to be equipped with a new smart service in the coming years. The second SSA was derived from the difficulties encountered in carrying out the first.

The work carried out made it possible to face and give input to the resolution of a real problem by bringing important innovations within the municipality. In addition to the positive results from a technical point of view, the impacts on people were also significant.

The people involved saw their skills grow by applying them daily at work. The working groups involved will carry out their work more easily thanks to the digital skills acquired and will spread the digital culture within the municipality.

As prospects for the future, the municipality of Messina certainly has an important staff improvement at its disposal that will allow them to work more effectively in future projects. Furthermore, Small-Scale Actions have paved the way for two major innovations. In the first case, the municipality of Messina can proceed smoothly to the conclusion of the intelligent traffic lights project. In the second case, it will have the skills and results to carry out the introduction of a new digital tool that makes the administrative process and services for citizens more efficient. Finally, it should be noted that the actions implemented will contribute to achieving the objectives of the

digitalization of Public Administrations that the Italian Government particularly requires of the Municipalities. A part of the document was dedicated to actions considered to be improving for the Municipality of Messina based on the problems facing during the project.

URBACT Local Group will conclude the project with dissemination actions. The results obtained will be presented to the city, and events will be organized with the high schools of the city of Messina. The purpose of this dissemination phase will be to demonstrate how good practices applied to the digital transformation process can bring positive results in the development of society.