Restart mAI* City

(*Artificial Intelligence)

Integrated Action Plan (IAP)

City of Trikala

May 2022

e-trikala

URBACT
Driving change for better cities

EUROPEAN UNION
European Structural and Investment Fund

DigiPlace
digital innovation for cities

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The Pindus range, the Clock Tower, the Asclepius pedestrian bridge and the Mill of Elves

Live information streams displayed in the municipal control center

Context and Background

Trikala is a medium-sized city of 81,000 residents, located in the center of interior Greece. The urban area is a compact, nuclear conurbation with a vibrant city center, separate old town and a thriving tourist/hospitality offer.

- ➔ City is bisected by a small river, a core focal point.
- ➔ Very walkable city; strong cycling culture
- ➔ Clear connection to nature - trees and green spaces within the city.
- ➔ Municipality comprises main urban center and many outlying villages
- ➔ Area of approximately a 30km radius.
- ➔ Slightly isolated geographical position
- ➔ Good connections to both major urban areas / airports of Athens (325km) and Thessaloniki (213km) by rail and road, including regular bus services.
- ➔ Population growth of 10,000 (~20%) in urban center from 1991 - 2011

In 2015, the Municipality conducted the "Trikala 2025 Strategic Plan: A Smart, Sufficient and Resilient City". It was **a strategic document with a 10-year planning for the city of Trikala**, Greece, with priorities and measures that secure city's future against challenges like urbanism and climate change.All city's stakeholders (local and regional government; city service and utility providers; companies; Non-Government Organizations (NGOs); industry associations; academia; citizens and communities) -as well as the national government and international, regional and multilateral organizations (i.e., United Nations, standardization bodies etc.) that develop corresponding initiatives and policies- since the strategy affects the entire local community.

Trikala centrally located on the mainland

The city of Trikala doubled its size and population in 2010 due to the national municipal reorganization (Kallikratis), while a new Municipality that incorporated the smaller ones in the area was structured. However, this extension was not accompanied with the appropriate change preparation and management. The same

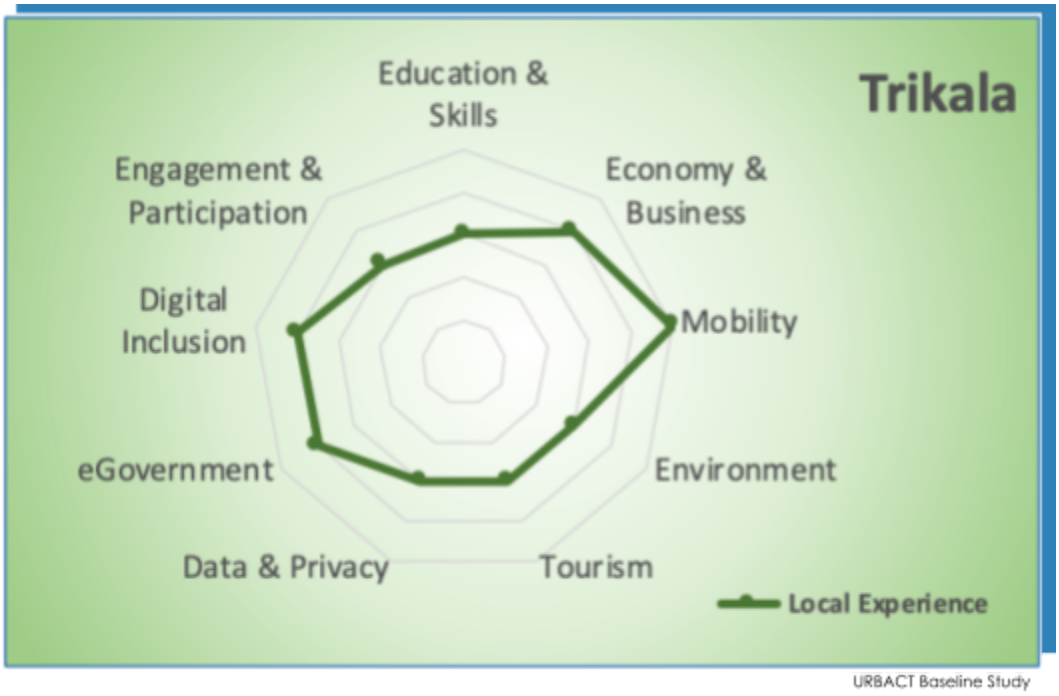
period the entire country experienced an extensive recession and austerity, which resulted in large unemployment rates that test social cohesion.

On the other hand, several challenges appear that the local community has to recognize and prepare a corresponding reaction. Urbanism is an international phenomenon that generates significant problems for the cities, against which the emerging smart city industry is expected to provide solutions. Climate change on the other hand affects local environmental conditions and lives. Additionally, city resources are being decreased progressively while municipal authorizations increase. At the same time, an increasing competition is being observed at an international level in an attempt for cities to attract visitors, inhabitants and investments.

The Municipality of Trikala realized the above challenges and defined a 10-year strategic plan with corresponding measures. This is the first historical attempt for the city of Trikala to engage the entire local forces on the achievement of a mix of targets, in a timeframe that exceeds a single mayor's service. The municipality has invited all the stakeholders to deliberate on and consulate the definition of this strategy and its corresponding projects. In this regard, all local competitive advantages (demographical, historical, cultural, intelligent etc.) will be utilized for the purposes of this strategy.

The new municipal organization is being compromised with this strategic plan, as a mid-term commitment to develop an attractive, sustainable, resilient, sufficient and smart city.

Strategic Vision: the development of an operationally smart, sufficient against crises (political, financial and nutritional), resilient, agile and sustainable city, which will be attractive and efficient for its inhabitants, visitors and enterprises.



Recognized Challenges

1. Urbanism: more than 50% of the international population live in cities, a proportion that is expected to exceed the 70% by 2050 according to UN-HABITAT reports. This phenomenon obliges the cities to enhance their resource management and to focus on sustainability.

2. Climate Change: several environmental disasters (floods, droughts and pandemics) are being observed, with an incremental size and effect πλημμυρών. Local governments have to be able to deal with these disasters.

3. Urban Competition: cities traditionally compete regarding the attraction of inhabitants, visitors and investments. This competition has moved from a national to an international arena and in this respect every city has to utilize its competitive advantages in its attempt to participate in this rivalry and to enhance its human capital.

4. Economy: Greece and especially the region of Thessaly has experienced a long fiscal and political crisis that tested social cohesion, sufficiency and efficiency, while it multiplied the size of potential disasters. City response against such a crisis highlights the need for Municipal agility and organizational flexibility.

Back to 2021, we all recognise that digital innovation has been a cornerstone of the city's development strategy over the last decade. It has styled itself as the first digital

city in Greece, having participated in or led a large number of pilots and projects in this domain. For a Greek city of its size and location, it has achieved a surprising amount in smart city testing, much of this through using the city as a living lab, where solutions are

Trikala Smart City Initiative

developed and piloted in real life situations within the city.

The city has a municipal company, e-Trikala, which leads their digital innovation work, in close partnership with the city council. This is seen as a crucial part of the city's ability to implement pilot projects in the city. Some background on identified problems and the processes involved to reposition the city and engagement with the community.

Like many, Trikala has rolled out free WiFi across the city. However, this started in 2004 and they have gone further by enabling and offering this service to be used by residents in their own home. For low income or vulnerable residents, e-Trikala installed the receiver/router in their home for free, allowing them free access to the internet. So far, over 1000 homes have been supported by e-Trikala in this way.

Municipal Control Center

Trikala has also partnered with Cisco, using their software to integrate all the various data, monitoring and control systems deployed across the city, all controlled from a central "Smart Trikala" control room in the city hall. There are 18 digital applications implemented in total, mostly managed through the Cisco Kinetic integration platform. Several of these applications developed "in-house" with the rest in partnership with third party tech

companies. The city also has a LoRaWA Network installed across the city which supports communication across its various IoT devices and systems. Building on partnerships with the likes of Cisco, the city is now working with Vodafone using Trikala as one of their 5G testbeds, the only one in Greece. Trikala is also starting a pilot project to look at using drones to deliver medication to remote areas of the municipality.

Plan & Development Areas

- Increasing the longer-term uptake, embedding and sustainability of digital solutions.
- Linking free WiFi to the outlying villages.
- Increased use of the 5G testbed
- Extension of the car free zone in the city and corresponding green transport implementations
- Increased co-creation and citizen participation in projects

Autonomous bus network that was piloted in the city

Identified Challenges

Adaptation and integration is the major challenge as there is a natural tendency to prefer older methods. Change needs to come in a multitude of roll out strategies as well as the visible need to make changes. Convincing citizens and employees that these things will benefit them in the long-run is sometimes more difficult than the actual act of developing and implementing new systems. Additionally some change can only happen through policy change and enforcement. Public outreach is a critical part to bridging the people to the new systems and helping them understand how it will help them and ultimately serve them. With the current state of the environment it has become a more urgent need to deploy and make changes to stabilize and offer more resilience. Modern day rate of change is already very rapid, however with the aging population and the continuous roll out of new technologies it can be overwhelming not just to the public but to the municipal personnel as well. Onboarding and updating users is an equally challenging aspect that needs consideration and a strategy. This rate of change needs to happen even faster due to the environment to better alleviate and identify stress points. Identified areas that need more immediate change are also the ones that are and will be harder to reposition.

Longevity of tools and hardware. As we digitalize our infrastructure and interconnect the systems, we gain great ability to manage and foresee potential opportunities and troubles. We also need to address the means of data capturing, formats and outputs. European and Greek guidelines put privacy at the forefront and this often requires creative thinking and solution building. Building in flexibility and solid base foundation can extend the life cycle as well as the utility and functionality of all tool sets. The ongoing updating and replacement of infrastructure is a costly undertaking. Over time this requires a healthy sized budget. Meaning selections of deployed hardwares need to be well researched and complement the existing infrastructure. A master plan is only as strong as its components.

Vision

"***Create a smart Municipality in terms of its operation, self-sufficient against crises (political, economic, food), resilient and sustainable for its citizens, enterprises, and more attractive for investment, visitors and young citizens".***

The following concepts are gathered in the above vision:

Smart City: the city that incorporates innovative solutions, which upgrade the following six (6) dimensions of a city:

- Citizens
- Governance
- Economy
- Transport
- Environment
- Quality of life

Efficient City: the city that has the necessary resources to respond against recorded and recognized risks. The dangers identified in the context of this strategy are the following

- Political crises: political instability, uncertainty, upheavals in structures and in operation of the state
- Economic crises: unemployment is above national levels and it is even more at the ages 25-35 years.
- Food crises: lack of food and water resulting from degradation of the primary sector, the concentration of the population in the urban fabric, but also the ever-increasing environmental catastrophes.

Resilient City: refers to the ability of the Municipality getting back to its pre-crisis status after a variable period.

Agile City: concerns the preparation of the organizational structure of the Municipality to respond to changes.

Sustainable City: concerns the implementation of existing and future plans aimed at ensuring the sustainable development of the Municipality.

The above characteristics of the vision have the capacity to improve the internal structure of the Municipality, and to strengthen its comparative advantages (cultural heritage, natural environment, human resources, geographical location, demographics).

Main IAP Focus for DigiPlace

- Mobility, Education and Skills (particularly amongst children and young people), Digital Inclusion, Environment (particularly agriculture).
- More specifically it wishes to develop more in its smart mobility work, building on plans to remodel their city center square to be car-free and extend the use of green transport options.
- Education Tech is an area that the city wishes to explore further, building on a few pilot projects that have explored digital learning platforms. This is a newer area where the city has less experience but can see opportunities and benefits.
- Another aspect is to put more focus on primary school age children, engaging digital natives and future city "users" in their digital innovation processes.
- Agriculture and Environmental monitoring / automation is another area where the city is running some small pilots (e.g. on smart watering systems) but wishes to develop further.
- Trikala also wishes to explore in more depth the question of how to ensure impact and achieve the right results from Digital Innovation – how to ensure changes benefit citizens and the city as a whole. This development of systems and integration / visualization of multiple data sources is also an area where the Trikala could support and add value to other DigiPlace Project Partners
- To continue to expand upon the living lab through means of becoming a platform to develop and expand

IAP Focus Areas

Mission

"To implement systems and networks to better serve the community while optimizing it and making it more resilient and adaptive to change."

To expand upon the open governance network and establish stronger connection with its citizens through services and accessibility initiatives. While creating opportunities for the public to participate in innovation and the future of Trikala. The core values and thus the core pillars of the Municipal infrastructure are to continue to develop a sustainable movement, reduce energy consumption and optimize operations, improve citizen and business services, and overall quality of life improvements. All pillars are interconnected and support each other as more improvements and additions are made.

Robotics kits to engage children in schools about innovation and technology

Objectives

Develop supporting infrastructure to meet the benchmarks put into place to pave the path towards the long term goals.

A. e-Governance and Digital Inclusion
- a. Government services and documents
- b. Awareness and interaction with communities
- c. Streamline procedures and accessibility

B. Mobility
- a. Electrification of fleet
- b. Atomization and data driven networks
- c. Accessibility
- d. Multimodal
- e. Reduction of cars in center

C. Energy & Environment
- a. Smart grid
- b. Renewable energy
- c. Green spaces
- d. Green corridors and agriculture

D. Entrepreneurship
- a. Support structure for startups
- b. Grants and loans programs
- c. Partnerships with large to small businesses

E. Digital Infrastructure
- a. IoT networks and connectivity
- b. Accessibility tools and hardware deployment
- c. in-house , corporate, university, etc. partnerships and development
- d. National, regional, and local government services
- e. Central control center and oversight

F. Education
- a. State of the art tools and integrated learning
- b. Awareness and training
- c. Inspiring the next generation of innovators

G. e-health
- a. Accessibility and outreach
- b. Mobility
- c. Education & Information

The objective categories are interconnected on various levels with the total aim to offer a seamless and inclusive experience to all users. Support and dialogue happens in all categories to engage and identify needs and foresight. Each branch hosts its independent projects, however they are all designed to tie into one another and strengthen the main network. Each objective category continues to develop as new technologies become available or are developed. Most commonly a need will be identified through dialogue, best practices, and data collection. Programming and designing of such will take target the needs

Strategies & Implementation

Based on the goals and position of the municipality now and in the near future, identified objectives within the mission statement are observed, designed, and then implemented. Some, such as the greening of the city and securing biodiversity and ecosystems, are part of the greater picture and play a major role when considering options. In many cases projects and various small scale actions are implemented in sections of the city and continue to expand as funding, needs, etc. allow for it or prioritize it. Larger budgetary investments, mostly infrastructure, require support from the national government, private and corporate partners, Initiatives from the EU, or budgeting strategies with a roll out plan. These are presented and formulised in the long-term and mid-term strategies that benchmark the timelines. Quality of life improvements alongside systems upgrades tend to offer themselves up in tandem. When smaller and equally sufficient solutions present themselves, they are preferred.

Long/Mid-Term Goals

The digital infrastructure and expansion thereof is the baseline foundation for enabling projects to either be initiated and executed swiftly. The objectives being the core anchor points that encompass a multitude of project categories, will guide the overall process and design planning.

The long-term goal is to have a complete package of services that can dynamically adapt to the needs of the community and policies put in place. A core underlying value is the environmental impact as well as the wellbeing and overall quality of life of the citizens.

This includes but not limited to:

Open government and digital services. Being transparent and engaging with the public has been a long term effort and will continue to be on the forefront of city building. Helping to understand what the public needs and engaging in dialogue is always a challenge. Alongside open door policies, telephone centers and digital interfaces where the public can engage with the municipality is an ongoing effort to optimize and make more accessible.

Partners & Stakeholders

ULGs are considered to be a vital part of the project design and implementation until its end. Therefore, our intention was to organize as many as possible ULG meetings in which the participants will have the opportunity to discuss the project's progress, define the local context, identify good practices, design the strategy, monitor its implementation and make suggestions, where applicable.

Community engagement and information services

The URBACT Local Group of Trikala consists of a core group (steering committee) and a wider group of stakeholders, who are involved via an open procedure. The core group is responsible for the project delivery, while the wider group supports the core ULG on specific issues and activities.

Core ULG & Stakeholders

- The Municipality of Trikala through its Mayor and his special advisors
- GiSeMi HUB
- The Technical Services Directorate of the Municipality,
- The Municipal Smart City Department,

Best represented ULG members

- Institute of Communication and Computer Systems (National Technical University of Athens)
- Department of Electrical and Computer Engineering of the University of Thessaly
- Vodafone s.a.
- Cisco
- Chamber of Commerce of Trikala
- Technical Chamber of Commerce-Branch of Thessaly
- Institute of Entrepreneurship Development
- Protergia s.a.

The list above is not restricted but several changes/replacements may occur. In any case, a "campaign" will take place so E-Trikala will inform and consequently engage the identified stakeholders by explaining efficiently the project in general, its scope and aims, the potential results and the expected overall outcome.

Since the project extends in two years' time and a large number of stakeholders has been identified in order to become part of e-Trikala's ULG, we assume that there will be changes in the group's synthesis throughout these 24 months period. There may be a lack of interest on their behalf, or different priorities in their activities with regards the project's scope and timeframe. Another obstacle may be political or personal issues within ULG members and in some cases a conflict of interest. For policy makers and practitioners, increased awareness of and involvement of stakeholders can be a double-edged sword. It can help bring new perspectives to an intractable issue or problem, but it can also bring to the surface new issues and new expectations which challenge existing practices, institutions, and policies. These challenges, nonetheless, can have positive outcomes and should be seen as part of a continuing process of evolution in policy and practice. Used inappropriately stakeholder consultation processes can also be a way of bypassing or challenging established democratic structures and governance processes.

Therefore, we have decided to work on two types of groups (core and wider) in order to avoid any possible obstacles that may jeopardize the ULG operation and be able to distinguish the stakeholders, based on the level of commitment and interest, by allowing the stakeholders to be able to move from core to wider group and vice versa.

e-Trikala's ULG meetings were designed to be carried out before or mainly after Transnational's Meetings, in order to transfer and share knowledge, inspire its members by good practices and new ideas and finally link transnational and local activities of the Network. Furthermore, and in order to efficiently monitor the progress the core ULG meetings are be carried out before and after significant milestones of the Project (SSA, IAP Draft, Final IAP) in order to share and discuss ideas, define and plan actions, prioritize and define next steps of the Action Plan and the SSA process.

So far, the vast majority of ULG meetings have been conducted virtually, due to covid 19 restrictions, a fact that has caused a low number of meetings so far (four of them), which we intend to increase in the forthcoming period and meet our target by the project's end.

It's worth noticing that our participation in the Transnational Meetings have been very helpful from the very beginning, firstly because we get the chance to identify good practices from fellow European cities, but also we can discuss and have our ideas reviewed by experts who can safely guide us throughout this journey. The use of online tools like Miro and Menti have helped to minimize the distance among us and bring us together, even if it is a virtual environment.

Small Scale Action - Street Lighting Remote Control Management System

There are a diverse number of small scale actions that are transforming the experience of citizens. From eHealth and access to doctors, specialists and pharmacists from a distance to transforming the mobility network through the city. Open government and establishing direct lines to the municipality are additional feats of various scales. On the digital front Trikala is developing a homogeneous vertical and horizontal platform to unify and standardize its growing digital operations. Internet of things (IoT) is playing a major role in the data streams and digital twinning for the long term strategy.

Streetlights are a major source of revenue drain for all cities and if not properly maintained, can result in a lot of inconvenience to the citizens. Also streetlights, if left ON for long times, can adversely impact also the environment.

Smart street lighting is the small-scale action that is taking place with our partner Vodafone Greece. The 5G network ties in the deployed conversion units so they can communicate to the central hub. Initial functionality will allow for better metering, functionality, and flexibility. Additionally this will now also serve as a platform to further expand upon. With Trikala's initiative to support, promote, and attract new invitation, individuals and partners can now plug into the platform and develop sensor systems, monitoring, relay points, etc. that directly interact and live within the infrastructure. Such tech has been deployed along the river network to monitor water levels, developed by small local startups. Smart street lighting will allow the municipality to expand and promote more opportunities that can be tested and developed alongside the city.

Description

Bringing the street lighting system online and automating it, is part of integrating the city's infrastructure into a centralized system. The network of lights is connected through the 5G network provided by our partner Vodafone. Each node installed offers a multitude of opportunities to expand upon. With Ai running in the background optimizing lighting not only to times of days but weather conditions and output levels. Better usage data can be collected as well as optimized even further. Energy savings are naturally built into this design. Expanding onto the platform with air quality monitoring, noise, weather, etc. As data types are needed they can be expanded upon these nodes. As the network grows it will offer a more detailed, local level of information that can give decision makers quality information to design around. Localized monitoring allows identification of foreseeable issues and scheduling of maintenance routines.

Key Benefits

It is a centralized streetlight management solution that is powerful yet economical enough to provide quick ROI based on the following:

- Reduce energy costs
- Reduce maintenance costs
- Low-cost wireless control
- Energy Monitoring
- Increased lamp lifespan
- Sun-set/Sun-rise based ON/OFF schedule
- Powerful web-based software with GPS-GIS mapping
- Powerful Asset Management with complete and accurate streetlight inventory
- Extensive reporting on the performance and energy savings and more

The system offers several products to address the specific needs and budgets of different agencies. These products range from extremely low cost controllers that can replace digital timers on individual poles to complete streetlight systems that control power to a large group of streetlights.

Main features

➔ **Wireless Technology**

The system utilizes the latest developments in wireless technology and employs GSM/GPRS/NBIoT technology to program; monitor and control geographically distributed remote streetlights.

➔ **Simple and Easy Remote Monitoring**

Streetlights power distributors (junction box) are equipped with controllers that contain communication and monitoring modules that provide regular streetlight status updates to the Cloud platform.

➔ **Local and Remote Control**

The streetlight control system provides as many as five control modes for controlling the light bulbs that can be remotely programmed from a web based software. Lamps can be remotely controlled based on a user configurable ON and OFF schedule that can be programmed on daily / monthly / yearly basis or can be controlled locally based on an astro-clock that accurately calculates sunset and sunrise times using location and time zone data throughout the year. Thus the street lights continue to be operated even when the communication link fails.

➔ **Faulty Monitoring**

Extensive fault monitoring is provided based on intelligent correlation of data to report lamp status, communication failure and more. All faults are sent to the Cloud platform that generates alarms for visualization and fault rectification.

➔ **Burn Hours**

The system can track lamp burn hours that can be used for predictive maintenance allowing lamp replacement to be planned in advance.

➔ **Flexible for Expansion**

The system can easily be expanded to include new locations and streetlights. The only demand is the GPRS coverage. There is no need to set any infrastructure (as for LoRa or WiFi solutions).

➔ **Report Generation**

The Master Control Station generates various detailed real-time reports. It also helps to maintain history of events.

Advantages of Streetlight Automation

- **Power Saving**

The ON/OFF switching of the streetlights can be remotely programmed and re-programmed as per requirement so as to save valuable power. Intelligent interface devices can optimize the energy requirements by recording the changes in nightfall in different seasons.

- **Reduce Operating Cost**

The system utilizes wireless communication techniques and offers real time surveillance of individual groups of junction boxes and lamps.

- **Low Annual Maintenance Cost**

The unmatched precise and accurate information on electricity consumption helps to plan preventive maintenance and reduces maintenance cost per pole by a significant level.

- **Future Addition Made Easy**

The system utilizes wireless mode of data communication and saves the cost and labor of cable lying throughout the busy roads. This improves the scalability of the system to a new height. Any number of new streetlights can be added to the existing network with simple and easy modifications.

- **Low Initial Cost**

Absence of cable lying brings down the execution cost and saves initial installation cost.

Methodology & Implementation

Baseline study of digital presence and services. Identified needs and weaknesses. Establishment of long term positioning and strategies to get there. Continuing monitoring and adjusting of deployed tech, policies, and programs. Open government and outreach to the public to establish a clearer understanding of the needs and wants of the public. Alongside nudging and incentivising programing to help educate and motivate the public towards positive change.

Baseline Study and progress reporting

- Digital assessment and snapshot of trikala
- User needs and infrastructure weaknesses
- Understanding the network and deployed technologies and its potential
- Identify weaknesses in the systems and missed opportunities

Future expansions and programs to build towards

Parallel to the digital transformation, Trikala is providing the building blocks for homegrown startups to test drive new technologies within the city network. Pilot, adjust and mature into competitive businesses that provide valuable tools and services on the global market. Trikala benefits from this as it is able to meet its needs and that of its citizens. The incorporation of the Horizon and Carbon Neutral European initiatives, the digital strategy plays a critical role in terms of identifying and responding to weak points and opportunities within efficiency and opportunities. The vision of being an inclusive and opportunistic green living lab brings many aspects together. The digital frontier will help the municipality navigate and steer into successful benchmarks.

Possibilities and call for collaboration & opportunities

As systems come online and become more unified, Partners and stakeholders will be able to take on a more central role. With nodes being deployed and connected, opportunities arise for ideas to step in and take part in the change.

Implementation

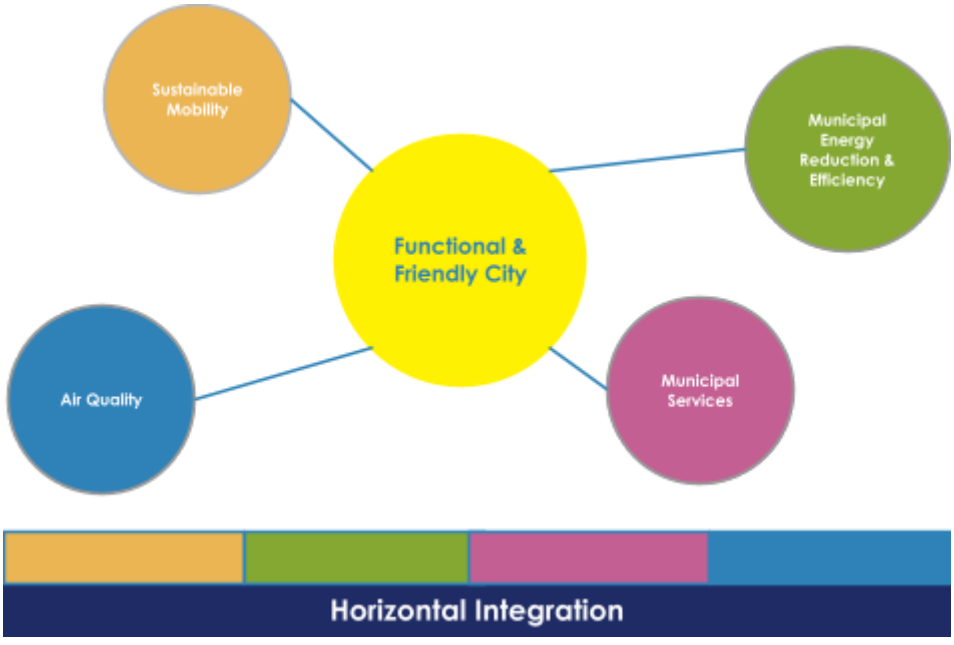
Action Plan

The Covid 19 pandemic along with the launch of NextGenEU, has given European cities the opportunity and tools to get "digital" in a very short time. However, since efficiency is also an issue, we believe that a coherent and concrete DIgital Strategy must be designed in order to analyze the current status, spot the needs and suggest solutions, based on technological trends and worldwide good practices.

Towards this direction and as part of the DigiPlace project, we have proposed **"Trikala's Digital Transformation Strategy"** as our main Action, which contains various sub-actions and interventions, to be funded by Greek National Recovery and Resilience Plan-Greece 2.0.

This Digital Transformation Strategy is based on four Axes

- Sustainable mobility
- Energy Saving - Reducing the Energy Footprint of Municipal Buildings
- Improving the services provided to citizens and entreprises
- Improving the quality of life



Each axis has prioritized actions with different levels of maturity, budget, timeline and requirements of any kind, while its primary goals are:

- Strengthening an interactive city-citizen relationship
- Improving the sense of trust between municipality - citizen
- Targeted intervention to upgrade city living conditions
- Creating a suitable environment for attracting dynamic investments e.g. innovation parks, start-ups
- Creating infrastructure for the development of participatory and social actions
- Establishing a sense of security among citizens

As noticed these four axes are fully in line with the Objectives as identified through various TNM and ULG meetings and have been analyzed via Miro board. The Strategy and its Actions as illustrated below, have been presented to the relevant Ministry of Finance and are expected to be prioritized and granted within the next three months. As a result the following table will be filled out with data as soon as the sub-actions are prioritized and become more focused and analytical.

ACTION Title Smart City Strategic Plan		ACTION Owner Municipality of Trikala	
Short Description A complete and concrete plan that aims to the city's digital transformation through various axes	Stakeholders City of Trikala, ETrikala SA, Institute of Communication and Computer Systems, Department of Electrical and Computer Engineering of the University of Thessaly, Vodafone, Chamber of Commerce of Trikala, Institute of Entrepreneurship Development	Links to Strategy A set of activities and interventions that aim to digitally change Trikala within next years Finance & Resources The activities are expected to be financed by funded by the National Recovery and Resilience Plan, Greece 2.0 ACTION Readiness As soon as funding is granted, all the activities could be carried out from 2022	Risks In case some activities are not funded by the Recovery and Resilience Plan, Greece 2.0, new means of funding must be found, which would cause great delays
ACTION Summary			

Sustainable mobility	Estimated date of beginning: Sept 22 Estimated date of end: May 23	1.1 Installation of smart signaling and traffic control infrastructure 1.2 Creation of a control and information system for smart parking 1.3 Creation of a DRT (Demand - Responsive Transport) application on low passenger traffic routes	Not applicable	The Strategic Plan consists of several activities that require resources (financial, human, administrative etc). Therefore, in case any of these are missing or not enough, there might be problems with ist implementation
Energy Saving	Estimated date of beginning: Sept 22 Estimated date of end: Sept 24	2.1 Installation of infrastructure for remote management, remote control and telemetry of distribution tables (pillars) of municipal infrastructure of public space (street lighting 2.2 Installation of energy saving infrastructure in municipal building infrastructure. 2.3 Development of an application for the recording and updating of an energy balance city 2.4 Installation of energy storage systems in fuel cells of hydrogen. 2.5 Smart interactive electric lighting of emblematic points of the city.	Not applicable	Same applies as above

Improving the services provided to citizens and entreprises	Estimated date of beginning: Sept 22 Estimated date of end: Sept 24	3.1 Creation of a platform for information and participation of the Citizen in local governance. 3.2 Development of a single infrastructure for interconnection through wireless/ wired tumble networks and wireless short-band networks. 3.3 Acquisition of smart portable field equipment (e.g. smart mobile devices, tracking devices) to support the operational management of personnel and vehicles of the Municipality.	Not applicable	Same applies as above
Improving quality of life	Estimated date of beginning: Sept 22 Estimated date of end: May 23	4.1 Creation of infrastructure to support the provision of care, telecare, telemedicine and strengthening the independence of the beneficiaries of the program "Help at home". 4.2 Development of "Social GIS" support infrastructure 4.3 Creation of an infrastructure for the smart support of citizens' well-being 4.4 Creation of an application for the management/ disposal/ utilization of municipal buildings and common use areas. 4.5 Creation of infrastructure for data collection and presentation, commercial and tourist activity	Not applicable	Same applies as above

Framework for delivery

The Municipal departments, as core ULG members as well, are responsible for the design and implementation of the actions mentioned above. There is close collaboration at any level that lead to the actions' sustainability since they will continue existing and after the project's end

Resourcing

ACTION	RESOURCES
1.1 Installation of smart signaling and traffic control infrastructure	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 471.000,00
1.2 Creation of a control and information system for smart parking	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 248.000,00
1.3 Creation of a DRT (Demand - Responsive Transport) application on low passenger traffic routes	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 74.000,00
2.1 Installation of infrastructure for remote management, remote control and telemetry of distribution tables (pillars) of municipal infrastructure of public space (street lighting).	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 620.000,00

2.2 Installation of energy saving infrastructure in municipal building infrastructure.	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 669.000,00
2.3 Development of an application for the recording and updating of an energy balance city.	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 161.000,00
2.4 Installation of energy storage systems in fuel cells of hydrogen.	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 301.000,00
2.5 Smart interactive electric lighting of emblematic points of the city.	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 235.000,00
3.1 Creation of a platform for information and participation of the citizens in local governance.	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 86.000,00
3.2 Development of a single infrastructure for interconnection through wireless/ wired tumble networks and wireless short-band networks.	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 830.000,00

3.3 Acquisition of smart portable field equipment (e.g. smart mobile devices, tracking devices) to support the operational management of personnel and vehicles of the Municipality.	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 124.000,00
4.1 Creation of infrastructure to support the provision of care, telecare, telemedicine and strengthening the independence of the beneficiaries of the program "Help at home".	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 248.000,00
4.2 Development of "Social GIS" support infrastructure	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 62.000,00
4.3 Creation of an infrastructure for the smart support of citizens' well-being	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 74.000,00
4.4 Creation of an application for the management/ disposal/ utilization of municipal buildings and common use areas.	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 62.000,00
4.5 Creation of infrastructure for data collection and presentation, commercial and tourist activity.	The project is expected to be funded by the National Recovery and Resilience Plan, Greece 2.0 Total Budget: 62.000,00

Risk analysis table

Description of risk	Type of risk (e.g. operational, financial, legal, staffing, technical, behavioral)	Categorisation (low, medium or high risk with regard to the successful implementation of your IAP)	Outline of steps which could be taken to mitigate the risk
The actions may not be accepted by local community	operational, financial, behavioral	low	Informing local community about the potential impact of the digital transformation
The actions may fail to be fully integrated and in collaboration between them	operational	medium	Investment on technology, infrastructure improvement
The actions may fail to have a positive effect on the issue of digital transformation (keep up with the technological trends)	opeational	medium	Investment on technology, infrastructure improvement

Delays due to uncertain circumstances (covid 19, lack of efficient supply of equipment, war etc)	operational, financial, staffing, technical	medium	Increase the level of safety and stability
Lack of efficient funding	financial	medium	Identification and search of other financial resources

Sections of Integration

All actions are designed to interweave into the network of existing and future developments. The idea is to strengthen and support existing infrastructure while pooling resources to develop or enhance services. Quality of life improvements also means for the team overseeing and making decisions to better serve the community.
The categories are the following

Governance

Open government is taken seriously and is present in all designs and policy structures that the municipality conducts. It is of importance to the citizens to understand where energy is focused on and how public funding and administration is put to work. Citizen trust and cooperation is at the core of Trikala.

e-Health

With an aging population living in rural and remote places, deploying technology where it can make a difference is the foundation of eHealth. From tele clinics to pharmaceutical deliveries build out the services and define accessibility and response times.

Universal integration and functionality

Energy and Environment

Greener solutions and various scales of technological deployment of clean energy systems alongside energy reductions and savings is where deployed technologies are shining. For mobility EV charging stations are increasing in numbers, privately hosted photovoltaics, SMART grids and battery stations are building out a network of clean efficiency and future expansion. The shift away from expensive energy sources is also part of the goal to enable better economic stability for families.

Mobility

Electrification of the municipal fleet, reduction of vehicular traffic throughout the city, increase in cycling and walking, better connectivity with better optimized bus networks and systems to bridge connectivity gaps. The goal is to provide a clean, quiet, and efficient network of mobility options that is inclusive and dynamic to users needs. Alleviating the city of cars is a long term goal within the center and communities.

Education

Is the most important ingredient as it is the key for citizens to understand how all this technology serves them. Educating the public as well as the personnel within the municipality is an ongoing initiative to make sure everyone is comfortable and up to date. This continues down to the school levels with the future generations that can bring new ideas to fruition. Making this dialogue and information accessible is critical for all the other actions to succeed.

Entrepreneurship

Promoting a startup culture and enhancing small businesses with support structures to get them off to a good start is beneficial for the community. The long term goal is providing a space for dialogue to take place between small startups and medium to large corporations. The skilled talent pool is huge and eager. The municipality as a testing bed has helped test, prompt and refine a multitude of projects and innovation that local startups have launched.

Digital Infrastructure

The spine of the entire infrastructure and its dynamics are what brings all the programs and actions together and possible. Monitoring and identifying problem areas or potential ones is keeling the municipality one step ahead and saving resources. Swift integration of new policies and technologies from a national, regional, and local level are part of this framework.

Environmental monitoring (left) & Fleet management and optimization (right)

Summary

The municipality of Trikala has been in an ongoing transformation for the past years. At this stage it has gained some considerable momentum and changes are happening at a shorter turnover rate. The national government is pushing for a nationwide digitalization and infrastructure upgrade. Many of these initiatives are supportive and inline with the municipalities and have increased the services. The COVID-19 pandemic has helped expedite this process as well as make additional resources available to all municipalities.

(Although the private and municipal infrastructures are still a local responsibility and need to support those of the national government. Most of the digital services that have come from the top down are part of the day to day framework of life such as taxes, healthcare, etc. The municipality is able to utilize this in addition to)

Innovation and change around the city