URBACT IoTXChange

Integrated Action Plan for the city of Nykarleby

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Åbo Akademi University
Experience Lab
June 2022

PHOTO: Sofie Kåll

IoTXchange
CONNECTING CITIES FOR BETTER LIFE

URBACT
Driving change for better cities

NYKARLEBY
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European Regional Development Fund

Åbo Akademi

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Åbo Akademi University/Experience Lab

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Part 1.

Context and process

1.1

City Context and Initial Challenges

Statement of intent

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The city of Nykarleby needs to cope with the changes that are taking place in Finnish society. Especially for cities and municipalities in rural areas the age structure is challenging as younger people move to larger cities while the state subsidies for the municipal sector have decreased. This means that cities like Nykarleby need to find new methods to meet the future challenges.

The city needs to find factors that attract people to move in as well as new business establishments and at the same time maintain a modern and progressive approach. New technology and new innovations put to concrete and tangible use are Nykarleby's opportunity.

For example, a demonstration of a larger number of cyclists in traffic could be an argument for state support for the construction of cycle paths and the construction that promotes bicycle traffic. The city of Nykarleby could actively participate by encouraging staff and residents to use bicycles more frequently in everyday life. By being able to follow up on the use of bicycles, in a modern way, the city could use sustainable energy solutions and new innovations to raise civic interest for an active lifestyle. The statistics need to make Nykarleby's residents aware of the consequences of their choice in the end. By raising general awareness, the whole city can benefit.

Another alternative could be to demonstrate the amount of sustainable energy that is produced every day in Nykarleby, a city where more and more wind farms are planned and where hydropower is already of crucial importance. Increased awareness of climate choices, where the city's employees are encouraged to more everyday exercise and movement, would probably also result in better occupational health – and the city of Nykarleby is happy to participate with the staff as subjects for the campaign.

Various surveys and measurements would contribute to a statistical basis for future government project funding and enable the city to establish new collaborations with universities, the business community and the third sector.

Martin Norrgård

Mayor, the city of Nykarleby

1.1.2 General context

The making of an Integrated Action Plan for the city of Nykarleby within the frame of the URBACT programme and its IoTXChange network fits into a development need and moment in time in a national context, while addressing development needs raised by some of the megatrends of our time – namely digital transformation and civic inclusion, aimed at a more sustainable future based on smart services created together with the users.

The Finnish public sector underwent a large administrative reform at the beginning of 2022, as the health and social care sectors were transferred to a new regional level of authority. Thus, it's time to re-appraise the activities left for the municipalities, including education, planning, technical services and the cultural sector, which renders the time right for looking at digitalization strategies and smart services. Another reason to reappraise service production is the possibility to enhance the city brand, its image and attractivity to old and new inhabitants, especially since work becomes more independent of place in the wake of the pandemic.

An important step towards testing the possibilities of new technologies to create smart services has been taken by joining the IoTXchange project (https://urbact.eu/iotxchange) in the URBACT programme (https://urbact.eu) as an associate to Åbo Akademi University. Through this collaboration, co-creation methods and working through a local action group have been introduced to the municipality and its employees.

1.1.3 Nykarleby in brief

The City[1] of Nykarleby – Uusikaarlepyy (LAU 2), with 7500 inhabitants, is located in the region of Ostrobothnia (NUTS 3) in Finland. The municipality is bilingual, with the majority (87%) speaking Swedish and the minority (7%) Finnish, while other languages amount to 6 %. Nykarleby consists of the town centre and three former rural municipalities with a number of small villages, with a land area of 732 km2. Thus, physical distances are a factor to be weighed in when considering the digital infrastructure.

Today's Nykarleby hosts a large number of industries. The largest employers in the City are both members of KWH Group, Prevex in the City and KWH Mirka, a coated abrasives manufacturer, in the village of Jeppo. Unemployment is at a historically low, around 3 %, and there is in fact a labour shortage.

[1] *Note that "city" and "municipality" are interchangeable concepts and refer to the same governance unit and territory; depending on the source, both may be used in this document*

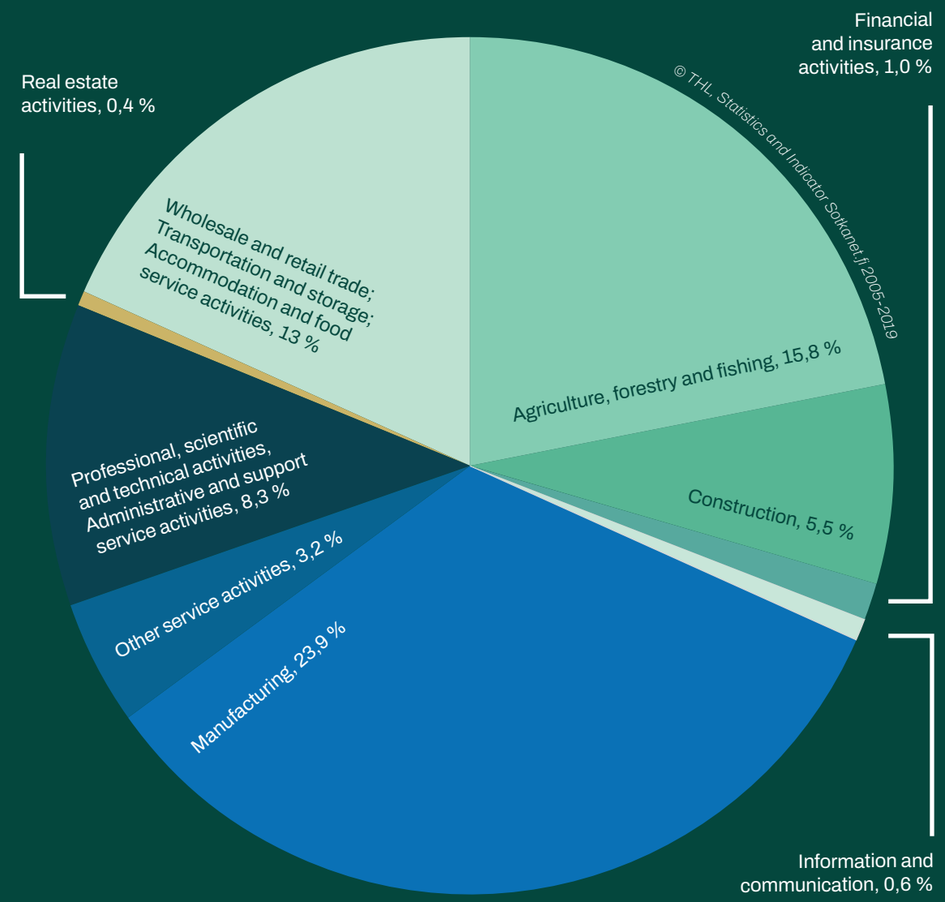
Business demography:

SIZE

Micro *(<10 employees)*	1190
Small *(10-49)*	57
Medium Sized *(50-249)*	5
Large *(250+)*	1
No data	116
TOTAL	**1369**

Source: Business register at the regional development company Concordia.

Employment profile (% of total active labour force), 2017:



IoT / Digital SWOT of the City © Municipality of Nykarleby 2020

STRENGTHS	WEAKNESESS
Very high availability of fixed network (download >100 Mbit/s 89 % of households; Finland 58 % 31.12.2018) IoT ambitions in primary production, industry and services. High international exposure and exports, several internationally competitive companies in all branches of industry, most importantly Mirka, which is a world leader in surface finishing technology and which hosts an innovative research and development program. Mobile networks (4G and 3G) cover the whole municipality, and in the center of Nykarlaby there is 5G enabling high speed IoT solutions. Other technologies in the municipaplity is available in selected areas like LoRa networks.	Uncoordinated efforts and misallocation of resources. Lack of strategy and general guidelines. Unclear responsibility for digital transformation and its implementation.
OPPORTUNITIES	**THREATS**
Climate change and competitiveness drivers of development. Research and development Åbo Akademi University, Novia and Centria Universities of Applied sciences	Losing competitive edge. Dependence on competencies of single individuals.

1.1.4 Definitions of the Challenges

At present, many forces of change are at work – which also is an opportunity to find new solutions. New technologies like IoT will have an important part in this change and may support and/or solve upcoming challenges. Municipalities are approaching a more technology driven future where new technology can help to solve challenges, but at the same time they are also facing economical challenges.

The rationale for this project lies in the current state of strategies and plans for digital transformation in Nykarleby. Digital transformation is both a challenge and an opportunity for the municipality, its stakeholders and citizens. Smart use of digital solutions could lead to raised awareness, greater civic engagement and satisfaction, as well as greater effectivity.

"Smart use of digital solutions could lead to raised awareness, greater civic engagement and satisfaction, as well as greater effectivity".

Examples of local challenges are the rising mean age of the population, already hard and worsening conditions for agriculture and especially the fur farming sector which is especially important for Nykarleby, the depopulation of the villages and discontinuation of almost all traditional services like local bank offices and stores. But there are also global threats like climate change that effect the local community.

In the local business community there is a strong commitment to an entrepreneurial culture, which is open to change and to innovation. Local businesses have started to collaborate to establish structures for supporting the evolution of the entrepreneurial culture and the society. The third sector is traditionally strong, with development projects in place to help local actors take the digital plunge.

There is also a need to update and broaden the municipal governance culture, to embrace both new openings towards civic interaction, the use of open data, and the idea of pilotization and development projects to introduce new services, tools, processes and governance. As an example, there is as yet no overall co-creation mechanism or routine to engage citizens and society in the development of public services.

Another challenge to be addressed is the collaboration between neighbouring municipalities and between these and regional levels of government; in some sectors, reforms are underway but in others there are gains to be made from involving users and creating joint operations.

The main local challenges to be addressed, summarized in the focus of the Integrated Action Plan, are to raise awareness, enhance efficiency, promote citizen participation and create smart demand-driven services with the help of new technology such as the Internet of Things and open data-based services, and thereby update municipal service production and governance. Devising smart services to combat climate

change and sudden weather phenomena, with road maintenance as pilot case, were chosen because they are an area where the ability of the technical department of the city and its entrepreneurs to use the data available, react in time, allocate resources right and communicate and interact with the citizens are crucial for a good quality of life. As road conditions are also a standard topic for conversation and source of opinions, they make a good case for introducing new solutions to show the potential of new technology. The small scale action is presented in section 1.2.3 below.

The citizen participation challenge lies in connecting the shared knowledge and interests of the citizens to a systematical dialogue; this requires establishing better real-time information channels between the city and the citizens both in specific matters such as road conditions, and generally in testing and developing ways of engaging citizens in the planning and design of smart public services. This is a theme that will be lifted onto agendas on a broader scale in the near future.

As the municipalities also face the pressure of higher-level governance reform, as well as political shifts from one election to another, this plan will act as a pilot for implementation of the Digital Road Map in Nykarleby, both regarding the actual implementation of service pilots and the use of new interaction modes towards the citizens.

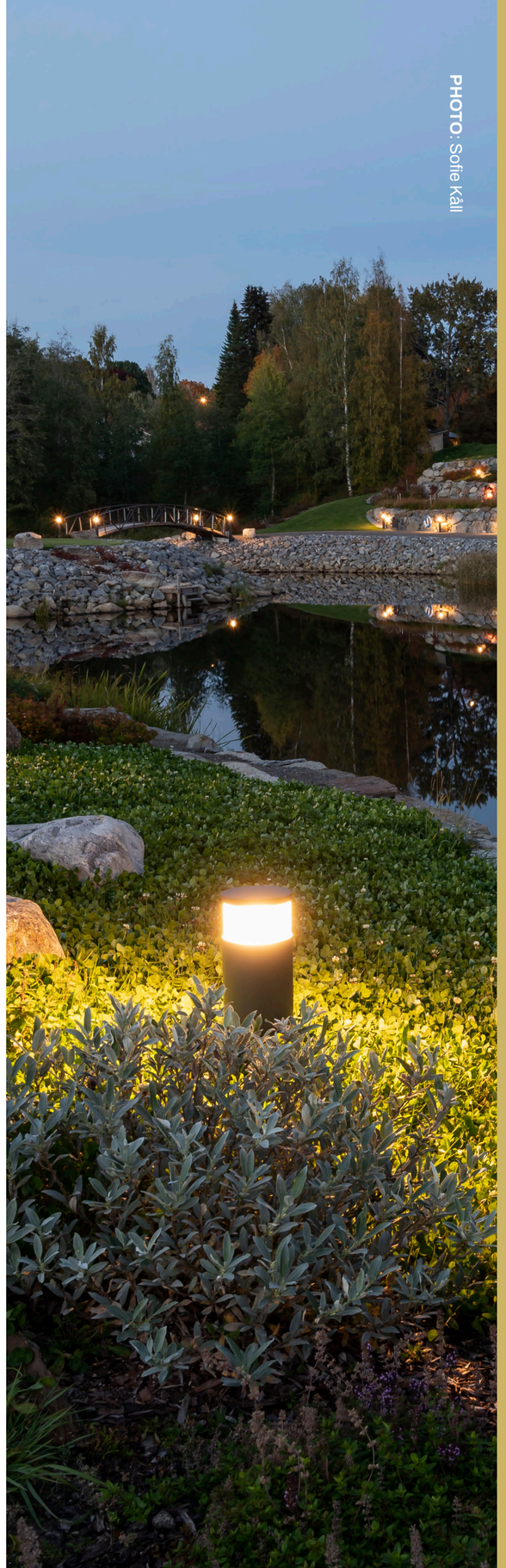


PHOTO: Sofie Kåll

1.2. Focus

1.2.1 Aims of the plan

The IAP will build on the following themes, all critical for creating smart services and forming parts of the digital roadmap to be developed:

- **Identifying** needs for smart solutions and matching them with IoT and other technologies.
- **Defining** the parameters for the first actions: feasibility, time scale, potential for driving change and promoting sustainability.
- **Creating** mechanisms and channels for residents' awareness and engagement in the development.
- **Establishing** the regional level of collaboration between municipalities and regional actors.

Firstly, the focus is on finding smart IoT-based solutions to challenges related to municipal service production. An IoT infrastructure can collect and process data and deliver it in real time to the end users, and the aim is to combine the potential of using available data for designing services with establishing easy communication channels between all parties. A common problem among small municipalities is the small organizations with few employees and many tasks to handle. New technology like IoT gives new opportunities to support these challenges.

Secondly, a mechanism will be developed for rapid assessment and implementation of ideas based on the identified challenges. It is an important feature of digital transformation and the path to sustainable development to be able to present tangible results quite soon, but the importance of covering all bases in assessment as well as the scarce resources for implementation are reasons to make sure that the decisions taken are based on all relevant aspects of the cases.

Thirdly, a model will be devised for constructive citizen input and co-creation, aiming to adopting the practice for co-design of public services. This includes tools for presenting visualized data to citizens and visitors – to raise awareness and to build on the brand of the municipality – as well as using surveys to the citizens as a tool for shaping the agenda. The aim is to identify the need and demands for information flow and interaction channels between citizens and the municipality and its contractors, in order to establish procedures with a wide applicability. Also, smart services require that the challenge and the potential of the technology are assessed from the user/customer viewpoint and the design builds on that assessment. This also builds for a greater use of open data and digital design resources in service design.

Finally, actions at the regional level of collaboration will be developed – thereby addressing a governance challenge as well as optimising the use of resources between municipal and regional/national levels, especially in areas where responsibilities are shared between actors and levels. Beside actual service production, collaboration in applying for projects and resources will be developed.

PHOTO: Sofie Kåll

The aim is to identify the need and demands for information flow and interaction channels between citizens and the municipality and its contractors, in order to establish procedures with a wide applicability.

Proof of concept from piloting, vertical and horizontal integration and the introduction of co-creation measures with residents form building blocks for the municipal Digital Road map, operationalized through establishing connections and activities that enhance the municipal service production and design through engaging with other societal actors in solving shared challenges. Thus, the ultimate aims of the plan are to convince and engage relevant stakeholders, secure funding for the actions and raise the awareness on the topics for both all parties engaged in the process and the general public. In parallel with the creation of a mechanism, as described above, some of the ideas discussed during the planning process will be implemented in pilot versions, to further enhance the city's capacity for smart service production, create examples and showcases, and build further on the evidence base for further, bigger and/or more continuous operations.

1.2.2 The Planning Process

The plan has been developed by a local action group with members from the city of Nykarleby (Mayor's office, technical department), Åbo Akademi University (project partner in the IoTXChange network), Nykarleby Innovation Center (representing local entrepreneurs), and Centria and Novia Universities of Applied Sciences (representing R&D and educational institutions with a mandate for regional development and collaboration).

Through a sequence of 8 or 9 meetings the group have set the agenda, identified the challenges and focus, planned small scale actions and drafted an integrated action plan and an implementation process includWing funding opportunities and collaborations that will commence after the IoTXchange project period. In a parallel process, members of the ULG together with colleagues from their respective organisations have planned and applied for projects aimed at implementing or supporting actions outlined in the planning process.

The work of the local group has been combined with the progress of the IoTXchange network through participation in network meetings, case studies and Urbact University sessions as well as using some of the tools and methods presented. Due to the pandemic conditions, most of the work has been undertaken online – which itself has been an orientation in different aspects of digital co-creation within networks of stakeholders.

1.2.3 Small Scale Action

To demonstrate the potential of IoT technology and clarify its preconditions, a SSA (Small Scale Action) was undertaken, since there was no earlier knowledge or implementation of IoT in the municipality. Winter road maintenance was chosen as topic together with the infrastructure department in Nykarleby, since it is both demanding and important; a good result is dependent on detailed and timely data.

Mobile sensors were fitted to vehicles, in order to cover the wide road network, and the data was presented through an interface provided by the tech provider Roadcloud. The SSA gave us good insight in how the municipality could use IoT to get useful data and information to make better decisions and improve the service for residents.

The process was performed by Åbo Akademi University in four steps:

- **Identify** needs: talk to end users, define the problem we are trying to solve.
- **Find** a technology that can solve the problem – and a provider and possible other partners.
- **Pilotize** the technology before.
- **Evaluate** the SSA to assess the potential for full scale implementation.

The results of the SSA were positive and gave good insight in the current road states around the municipality. This information allowed the infrastructure department to see the road state in real time. But the pilot also showed problems that need to be solved – from the concrete and specific to the general and abstract:

- The mobile sensors must be combined with stationary sensors to cover all aspects
- Vechicles that cover all relevant roads must be chosen to generate the right data
- Affordable technology is needed for a small municipality with limited resources.
- Cooperation is needed to successfully implement digitalization projects

The model of testing new service concepts through piloting and co-creation will also be benchmarked for implementation in new areas within municipal service production; while there are always context- and case-specific questions to be addressed, there are also elements of the process than can be used as a template to start the development work from.

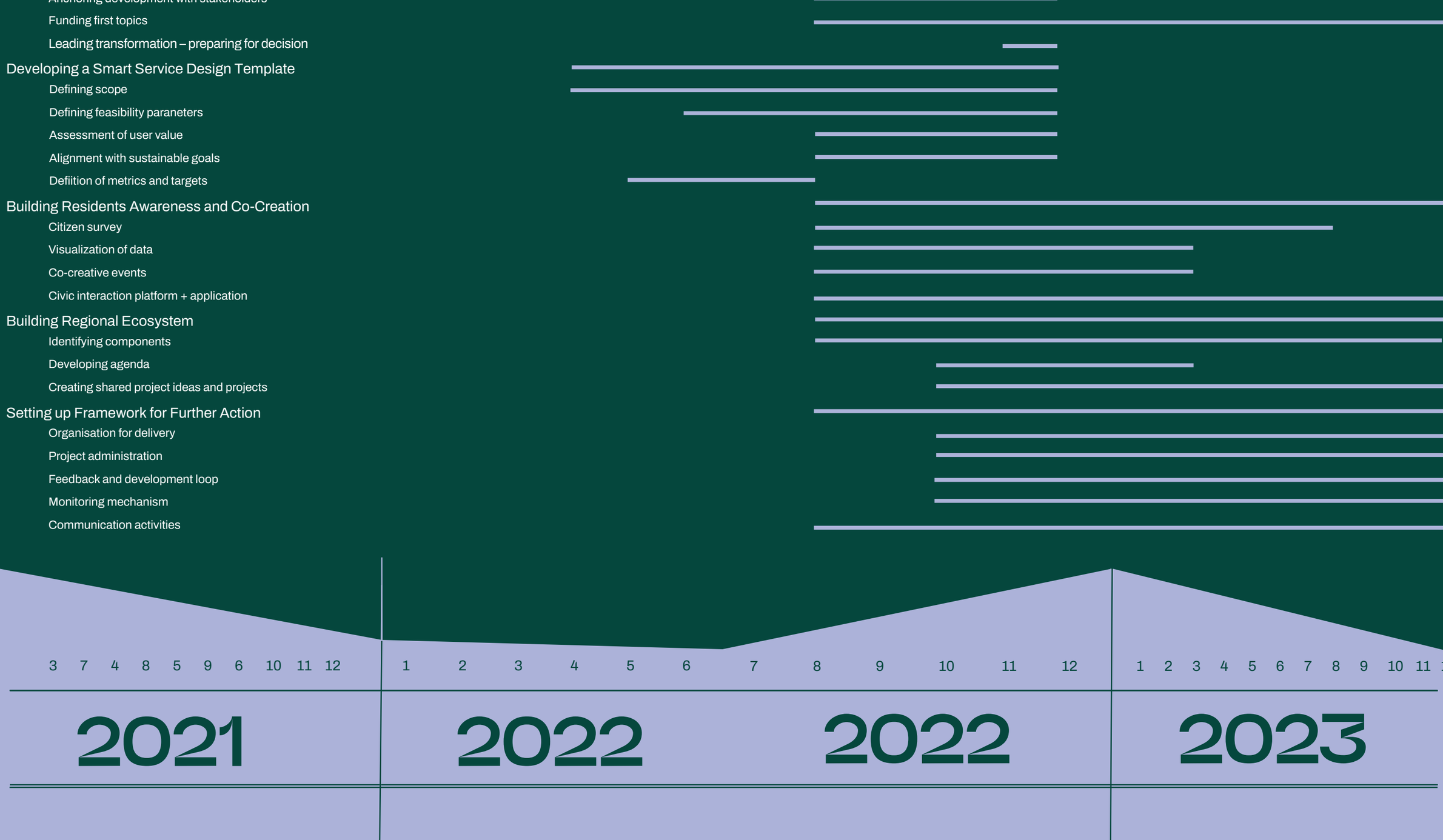
PHOTO: Sofie Kåll

Part 2.

Action Plan

Timeline

- Creating Integrated Action Plan
- Winter Road Maintenance SSA
- Digital Road Map
  - Identifying Topics
  - Projectifying Pilot Action
  - Anchoring development with stakeholders
  - Funding first topics
  - Leading transformation – preparing for decision
- Developing a Smart Service Design Template
  - Defining scope
  - Defining feasibility paraneters
  - Assessment of user value
  - Alignment with sustainable goals
  - Defiition of metrics and targets
- Building Residents Awareness and Co-Creation
  - Citizen survey
  - Visualization of data
  - Co-creative events
  - Civic interaction platform + application
- Building Regional Ecosystem
  - Identifying components
  - Developing agenda
  - Creating shared project ideas and projects
- Setting up Framework for Further Action
  - Organisation for delivery
  - Project administration
  - Feedback and development loop
  - Monitoring mechanism
  - Communication activities



Actions:

Road Maintenance Model – Snow depth measurement

- Benchmarking technologies
- Pilotization
- Evaluation + design of solution

Visualization of Energy Production Through IoT Technology

- Background research
- Planning visualization

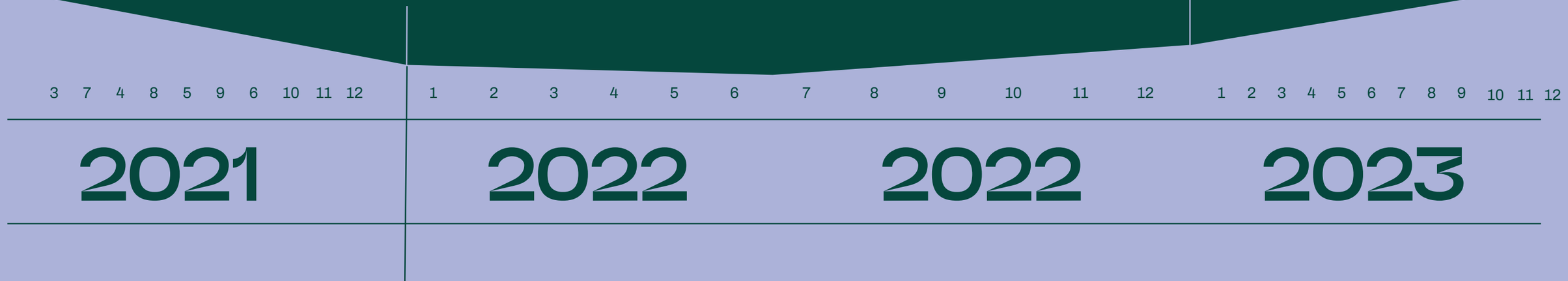
Healthy Commuting – monitoring bicycle use via IoT

- Citizen survey
- Planning
- Pilot test
- Evaluation
- Design of solution

Using IoT in infrastructure

- Monitoring of water reservoirs
- Monitoring of beach water temperature

1/2024-6/2024



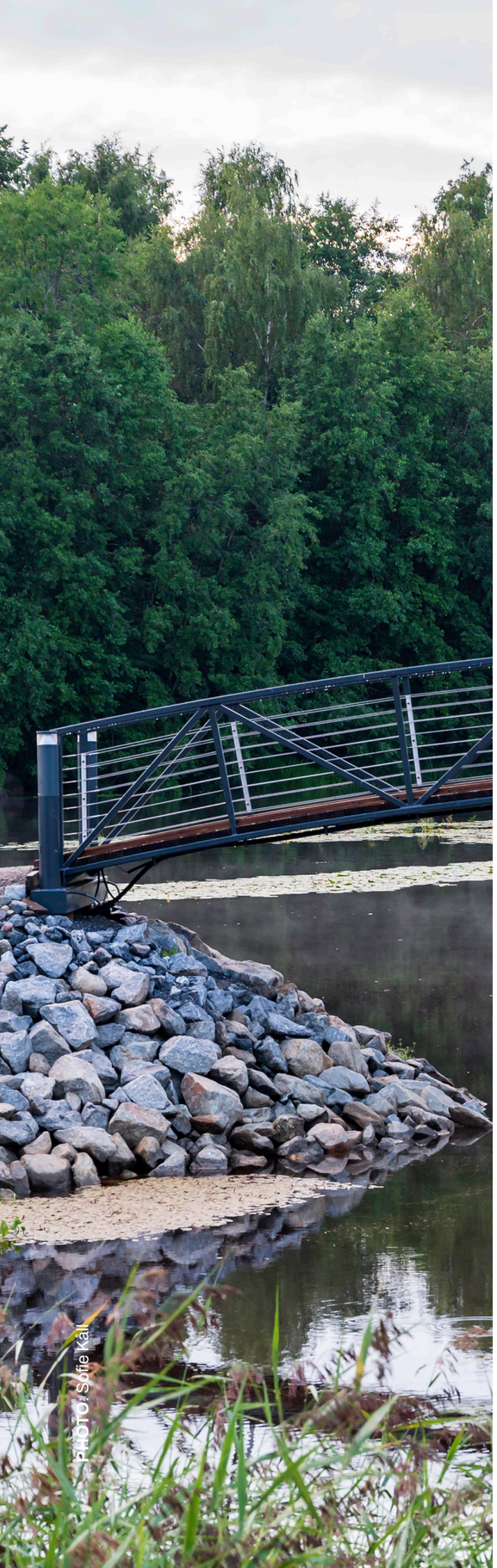


PHOTO: Sofie Kåll

2.1 Objectives, actions and schedule

The Integrated Action Plan will form the backbone and structure for project plans and applications aimed at operationalizing the municipal Digital Road map and establishing connections and activities that enhance the municipal service production and design. This comes through engaging with other societal actors in solving shared challenges with the help of new technologies such as IoT and new methods such as engaging citizens and stakeholders in co-creation of services that answer to the needs and wishes of the engaged parties.

Thus, the ultimate aims of the plan are to convince and engage relevant stakeholders, secure funding for the actions and raise the awareness on the topics for both all parties engaged in the process and the general public. This is achieved by the right sequence of actions and provision of data backing the strategy to provide evidence of the benefits of employing new technology and co-creation methods in service design and implementation.

The detailed schedules as well as some budget figures and the final choices of indicators are still open at the time of writing. However, the details will be finalized as the roadmap is prepared for presentation for the town council in November, 2022.

2.2 Planned Actions

Specific Objective		**Preparation of Municipal Strategy and Digital Road Map**			
Action	**Intended outcome**	**Resources/ assets**	**Lead agency**	**Key partners**	**Time scale**
Identifying topics for the digital road map	Identifying topics for the digital road map. A plan for the first actions and the steps towards the roadmap. Including funding and Implementation.	The IAP + SSA	City of Nykarleby	ULG members' organisations	3-12/2022
Projectifying pilot actions	Implementation of first actions intended to kick off the roadmap.	The IAP + SSA	City of Nykarleby	ULG members' organisations Local stakeholders	5/2022-
Developing a template for smart service design through pilot actions	Checklist covering scope, aspects of sustainability, short-term feasibility, value, measureability. Guidelines for process design.Set of indicators for success.	The IAP + SSA + co-creation survey	City of Nykarleby	ULG members' organisations	4-12/2022
Developing a template for smart service design through pilot actions	Checklist covering scope, aspects of sustainability, short-term feasibility, value, measureability. Guidelines for process design.Set of indicators for success.	The IAP + SSA + co-creation survey	City of Nykarleby	ULG members' organisations	4-12/2022
Building residents awareness and co-creation	Building residents awareness and co-creation. Raised awareness among residents and inclusion, participation. Tools and channels for visualization, residents' feedback and co-creation. Higher user satisfaction.	The smart service template The residents survey	City of Nykarleby	NIC, Åbo Akademi University, other partners (private/civic)	8/2022-3/2023 + ongoing
Building Regional Ecosystem	Greater efficiency through coordination. Greater resource pool. Higher user satisfaction. Reduced cost.	The smart service template. Data collected. The municipal strategy.	Other municipalities + entrepreneurs	Other municipalities + entrepreneurs	8/2022-3/2023 + ongoing
Setting up framework for further action	A framework for ensuring the pickup and development of spinoffs and future needs into actions	The municipal strategy.	City of Nykarleby	All relevant stakeholder	Starting 8/2022, ongoing

2.3 Detailed Action Sheets:

2.3.1 Identifying of Topics and Steps towards the Digital Road Map

Action		**Identification of Topics for the Digital Road Map**		
Lead Agency		City of Nykarleby		
Sub-action	**Intended result**	**Resources/ assets**	**Key partners**	**Time scale**
Defining and projectifying the first topics	Identifying topics for the digital road map. A plan for the first actions and the steps towards the roadmap. Including funding and Implementation.	IAP, SSA + feedback Benchmarking of tools and processes developed by other parties	ÅA ExpLab, UAS Novia	3-8/2022
Anchoring the development with stakeholders	Support for the overall development and the specific actions. Governance alignment. Commitment to participation.	IAP, SSA + feedback Compliance checks	Elected representatives, public officials, external stakeholders	8-12/ 2022
Funding the first topics	Allocations in the municipal budget for 2023.Project applications for implementation.	IAP, SSA + feedback	ULG partners + other local stakeholders	Starting mid-2022, ongoing
Leading the transformation	Leading the transformation. The road map and clear responsibility for advancing it.	Governance resources of the city	Elected city council representatives	Preparation for decision 10-11/2022

The digital road map will serve as a building block in the new municipal strategy

The digital road map will serve as a building block in the new municipal strategy. The aim of the mapping process is to gather and develop ideas that form the base for smart services, while at the same time building the mechanism and gaining experience on how the development process should be designed to ensure that all relevant stakeholders are engaged and all aspects of the designed services taken into account.

This requires both an adequate resourcing within the city organisation and anchoring of the development with decisionmakers as well as stakeholders to ensure that there is an uptake of the reasoning leading to decisions on the implementation.

2.3.2 Projectifying Pilot Actions

The general rationale of employing a small scale action lies in learning the process and getting proof of concept; the aim is to benchmark the winter road maintenance action for a model to implement in other topics in service development:

Both the use of sensor and other data and the flow of communication and interaction between the city, the entrepreneurs and the citizens is interesting both specifically and generally.

Critical questions:

- Will the technology/system give relevant information to the municipality and support the service provision?
- Will it save money and increase citizen satisfaction with the services?
- Generally, a tested and documented process that is adopted for scalability between sectors of municipal governance should be possible to replicate in other cities as well.

Overview of Planned Objectives

Objective	Timetable	Budget
Road Maintenance Model • Snow depth measurement	Autumn 2022	20 000 euro
Visualization of Energy Production Through IoT Technology	2023	80 000 euro
Healthy Commuting – monitoring bicycle use via IoT	2023	80 000 euro
Using IoT in infrastructure	2024	50 000 euro

Specific Objective		Road Maintenance Model			
Action	**Intended result**	**Resources/ assets**	**Lead agency**	**Key partners**	**Time scale**
Identifying and benchmarking fixed technologies for measuring snow depth	Shortlist of tech solutions with specifications	The smart service template. The residents survey.	City of Nykarleby	Åbo Akademi University, UAS Novia, UAS Centria, Municipaiity of Ånge.	5-9/2022
Pilotization of snow depth measurement	Proof of concept	IAP, SSA, shortlist	City of Nykarleby	ÅAU	11 /2022-04/2023
Pilot evaluation and design of solution	Proof of concept and specifications for operationalizable solution	Pilot	City of Nykarleby	ÅAU	05/2023

Specific Objective		Visualization of information from IoT-generated data			
Action	**Intended result**	**Resources/ assets**	**Lead agency**	**Key partners**	**Time scale**
Background research on visualization of information	Benchmarked possible solutions	Web information resources	City of Nykarleby	TBD	8-12/2022
Planning IoT data visualization for the topics identified by the city: Energy production, healthy commuting, weather data and other local information	Proof of concept	IAP, SSA, shortlist	City of Nykarleby	ÅAU	11 /2022-04/2023

Specific Objective		Healthy Commuting – monitoring bicycle use via IoT			
Action	**Intended result**	**Resources/ assets**	**Lead agency**	**Key partners**	**Time scale**
Citizen survey	Gathering information on how residents commute to work.	The IAP	City of Nykarleby	Åbo Akademi University	5-12/2022
Planning	Developing a plan for a pilot	The IAP, survey results	City of Nykarleby	ÅAU Experience Lab	10-12/2022
Pilot test	Test of concept and technology	Pilot test	City of Nykarleby	?	4-9/ 2023
Evaluation of pilot test	Evaluation of pilot test, identifying path forward	Pilot results, citizen survey	City of Nykarleby	?	10-11/ 2023
Design of solution	A final design, integration into the Nykarleby App, Visualzation on different platforms	All of the above	City of Nykarleby	?	1-6/ 2024

Specific Objective		IoT Solutions in Infrastructure			
Action	**Intended result**	**Resources/ assets**	**Lead agency**	**Key partners**	**Time scale**
Monitoring of water reservoirs	Pilot and possible implementation	SSA results, tech benchmarks	City of Nykarleby	ULG members' organisations	1-12/2023
Planning	Developing a plan for a pilot	The IAP, survey results	City of Nykarleby	ÅAU Experience Lab	10-12/2022

2.3.3 Developing a Template for Smart Service Design

Action		Developing a Template for Smart Service Design through Pilot Actions		
Lead Agency		City of Nykarleby		
Sub-action	**Intended result**	**Resources/ assets**	**Key partners**	**Time scale**
Defining feasibility parameters	Defining feasibility parameters.Checklist for itemized aims and milestones on time scale.	City strategy and budget	ÅA ExpLab, UAS Novia	6-12/2022
Defining scope	Alignment with city strategies and resources. Alignment with partners and stakeholders.	City strategy and budget. Available financial instruments. Regional co-operation mechanisms.	Local businesses and other stakeholders ÅA ExpLab, UAS Novia	4-12/2022
Assessment of user/ citizen value	Documented proof of demand of service Inclusion and participation	Survey to residents. National and regional inclusivity measures.	ÅA ExpLab, UAS Novia	8-12/2022
Alignment with sustainable goals	Assessment tool of all aspects of sustainability of actions	Sustainable development goals and their operationalization	Kommunförbundet, Concordia	8-12/2022
Definition of metrics and targets for progress	Documented proof of target fulfilment and progress of actions	City strategy and budget	ULG members Data providers	5-8/2022

Thus, projectifying identified needs into pilot actions serves both as a testbed for ideas developed to meet those needs and as an opportunity to demonstrate both technologies and methods as well as to collect information on their uptake.

The template is a tool for the starting digital transformation process, aiming at streamlining the planning process and ensuring that all relevant aspects – scope, sustainability, feasibility, efficiency, user satisfaction – are taken into account in the plan, assessing also possible externalities.

- The surveys to residents are a tool for both agenda-forming and following up on decisions taken

- Metrics – data to be collected and interpreted – are an important tool for checking whether the actions have the intended effect.

- But covering all bases for a comprehensive interpretation of results requires a qualitative approach alongside the measurements.

- Gradual development of the city strategy on a general level can be expected as a consequence of pilot actions addressing different topics in public service production combined with assessing the overall performance.

2.3.4 Building Residents' Awareness and Co-Creation

Action		**Building Residents' Awareness and Co-Creation**		
Lead Agency		City of Nykarleby		
Sub-action	**Intended result**	**Resources/ assets**	**Key partners**	**Time scale**
Survey to residents	Verified information of needs as well as experience and satisfaction	Existing survey mechanism	Åbo Akademi University	8-9/2022
Visualization of data	Raising awareness, supporting learning and participation Branding of city	City's web pages The Nykarleby app Public display(s)	Tech provider	8/2022- 3/2023
Co-creative events	Creating a culture of participation. Channels for input on matters of interest.	NIC track record Community college courses	NIC Local NGOs, societies	8/2022- 3/2023
Civic interaction platform and applications	Enabling interaction and participation regardless of time or place	The Nykarleby app	NIC + network	8/2022- 3/2023

The main point is to introduce the concept of systematical co-creation and ideation of services to the municipality

The idea of residents' co-creation of public services based on new technology and open data is an important part of the Integrated Action Plan and the engagement mechanism envisaged for the further implementation; the sequence of smart services should be to first identify and validate a need, then identify a technology that can solve the need.

- The main point is to introduce the concept of systematical co-creation and ideation of services to the municipality, its citizens and other stakeholders, and demonstrate the power and benefits of crowdsourcing as a means to improve smart service design.
- Thereafter to demonstrate IoT technology and open data-based services to the citizens and businesses of the municipality.
- The mechanism of ideating and designing in a process between the city, the entrepreneurs and the citizens can be applied on other service provision and design as well.

Critical questions:

- The substance – what needs and demands are there for smart services provided by the municipality and/or local businesses, based on open data and new technologies such as IoT?
- The mechanism – is there interest for participating in systematical co-creation in lieu with the municipality, and what processes and tools are preferred?
- Co-creation of services is a concept already employed in many municipalities; thus there should be examples to benchmark and practices to exchange and learn from each other.

2.3.5 Regional and Other External Collaboration: Building an Ecosystem

Action		**Building Regional Ecosystem**		
Lead Agency		City of Nykarleby		
Sub-action	**Intended result**	**Resources/ assets**	**Key partners**	**Time scale**
Identifying components of the ecosystem	Identifying partners and shared interests	The municipal strategies of partners. Regional development strategies .	Other municipalities, Concordia, RCO	8-12/2022
Developing an agenda	A shared agenda with specified targets and plans for achieving them	See above	Identified stakeholders in ecosystem	10/2022- 3/2023
Shared projects	Development of projects depending on the targets identified. Applications for funding.	Development agenda Regional and national funding programmes	Identified stakeholders in ecosystem	Starting late 2022, Ongoing

The rationale for including this aspect of local/ regional government lies in the present ad-hoc character of such collaboration between autonomous bodies such as municipalities that isn't formalized in structures, which may lead to missing out on new funding opportunities aimed at regional clusters or consortia rather than single actors.

- This will be addressed through leveraging the concept of systematical co-creation and ideation of services based on IoT technology and open data-based services to the regional level, with neighbouring municipalities, regional government agencies, private companies and R&D institutions as primary partners, to explore the possibilities of enhancing regional collaboration by engaging with international partners with similar characteristics.
- Adoption of new technology may require broader shoulders due to the scale of initial investment, which is a reason for pooling resources for new endeavours.
- Networking with actors from other territories may widen the perspective on solving challenges on a local level
- Especially in development projects, networks and collaborations are often a prerequisite for funding
- Regional partnerships bring together actors who face similar challenges but may have adopted different approaches, which gives possibilities for exchange and learning
- The critical questions mirror those of co-creation with residents
- What additional questions need to be asked when the collaboration is on a regional level?
- As these actions are common in co-creation procedures, both up-scaling and replicating shoud be easy to realise given that the city is willing to allocate the resourced needed for the actions.

As the digital road map evolves, an aspect of the process will be to establish a continuous dialogue with actors on different levels tasked with development and facilitation to ensure that identified needs are met.

"An aspect of the process will be to establish a continuous dialogue with actors on different levels tasked with development and facilitation to ensure that identified needs are met"

These actors include the regional universities of applied sciences (Novia and Centria) and Åbo Akademi University, with competencies and mandates to work with regional and technology development, from research to implementation regional and local authorities and business development companies (Regional Council of Ostrobothnia, Concordia, the Ostrobothnian Chamber of Commerce), national authorities and their regional branches as well as international project and network partners.

PHOTO: Sofie Kåll

"Networking with actors from other territories may widen the perspective on solving challenges on a local level"

2.4. Framework for delivery

The city of Nykarleby will answer for the integration of IAP and SSA inputs into the Digital Road Map development, and for decisions on how the results are integrated into the governance. The theme of introducing smart service co-creation with citizens is applicable to all fields of public service. Due to the scarcity of resources and the need to show tangible results along the way, the template and scorecard for project design will be crucial for building a culture of sustainability and inclusion that is resilient to possible disruptions. The evidence from the first actions will be important for preparing further decisions, funding applications and actions.

Especially smaller municipalities will need collaboration and partnerships to enable service production of an acceptable quality. This calls for developing the already existing collaborations and partnerships and establishing new ones, especially if the themes covered require large development resources and/or initial investments, as in the deployment of new technologies for smart services. Also, the proper monitoring mechanism should be put in place. As the development of digital smart services is one of the foremost trends in governance in years to come, the progress should be overseen by elected representatives as well as experts.

Communication and dissemination of activities and plans will be carried out continuously on the channels of all partners, seeking to create avenues for dialogue and exchange of information. The target groups include the citizens, local businesses, authorities and NGOs, as well as regional actors in the area and national and international networks and interested parties. for smart services. Also, the mec engagement requires a continuous effort from the municipality even though private actors and citizens will be encouraged to take on bigger roles.

In order to ensure a continuous digital transformation process, the municipality should ensure sufficient resources for leading the process in the shape of appointing a dedicated process leader with the responsibility to engage and liaise with different sectors of governance as well as stakeholder groups in society. Within the municipal organization, the digital transformation should be a common concern.

Also, the proper monitoring mechanism should be put in place. As the development of digital smart services is one of the foremost trends in governance in years to come, the progress should be overseen by elected representatives as well as experts.

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"As the development of digital smart services is one of the foremost trends in governance in years to come, the progress should be overseen by elected representatives as well as experts".

Action		**Setting up Framework for Delivery of Actions**		
Lead Agency		City of Nykarleby		
Sub-action	**Intended result**	**Resources/ assets**	**Key partners**	**Time scale**
Setting up organization for delivery	Municipal mechanism for implementing the development agenda Process leadership (position + resources)	Work hours: City staff Development agenda		Starting 10/2022, ongoing
Project administration	Streamlined project administration within municipality	Work hours: City staff Development agenda		Starting early 2023, ongoing
Feedback and development loop	An ongoing iteration of needs into project applications into actions Picking up spinoffs	Municipal strategy Digital roadmap Customer/resident feedback channel	Identified stakeholders in ecosystem	Starting early 2023, ongoing
Monitoring mechanism	A monitoring mechanism for substance as well as governance	Work hours: City staff Development agenda	Identified stakeholders in ecosystem	Starting early 2023, ongoing
Communication activities	Awareness among partners, stakeholders and citizens about the goals and the mechanism to reach them	Communications depts of municipality and pf partners Web resources, the Nykarleby app	Identified stakeholders in ecosystem	Starting ASAP, ongoing

2.5 Resourcing

Action		**Resourcing the activities – applying for external funding**		
Lead Agency		City of Nykarleby		
Sub-action	**Intended result**	**Resources/ assets**	**Key partners**	**Time scale**
Regional development funding	Small-scale regional projects	RCO regional dev funds ESF programs Leadet Private funds	RCO, ELY Other municipalities	TBD in digital roadmap/ strategy
National funding supplied by different ministries and national government	Large-scale regional projects	RCO and ministries ESF and similar programs	National government, other municipalities	
Innovation and business development funding	National and international funding for business development	Business Finland ELY	Concordia Business Finland Enterprises	
Research funding with an angle towards implementation	Research funding with an angle towards implementation Research and development projects with an angle of implementation	EU, national research programs Private funds	Universities and UAS	
International funding opportunities	Cross-border Nordic and European projects	EU programs (Interreg, others)	International partners networks	

2.4.1. Indicators

The development of new tools and processes will require broader shoulders

The indicators for success and/or decisions on implementation of pilot results will be developed and decided during the autumn of 2022 in lieu with the roadmap development.

On the implementation level, possible indicators include:

- The number and character of co-creation processes and co-created services
- The technologies involved and their effects,
- The resources generated and
- The results achieved
- The number and character of regional collaborations and their budgets

For individual actions, the indicators must be specified according to need, but may include:

- The number of participants and/or actions by participants.
- The technology involved, its use and the effect caused/change induced.
- The cost and possible saving generated by the action.

Also, a category of qualitative indicators of change is critical, especially if the effect of a new technology is to induce a change that occurs over multiple sectors/factors.

The basic resources for the delivery come from the municipality: work efforts, infrastructure and funding for service production and procurement. However, one of the cornerstones of a digital roadmap is to create a sound economic basis for the work, utilizing available project funding through different channels. Sustainability has an economic aspect as well; actions undertaken should demonstrate both effectivity in the short term and benefits in the long run.

The involvement of citizens and civic society may result in additional work efforts, but a basic principle must be that public service of a continuous nature should be supplied by parties who are adequately compensated for tasks that are not voluntary.

The development of new tools and processes will however require broader shoulders; firstly, new consortia must be built for collaboration. The partners may include other municipalities, regional government organisations, private companies, R&D institutions and civic society organisations. Therefore, the networks behind any new

collaborations will form a base for resources as well. Ultimately most development funding available to municipalities requires some commitment from the project partners; therefore, the resourcing question falls back on municipal capacity to dedicate seed money and prioritize the challenges and subsequent initiatives at hand.

Permanent operations cannot rely on continuous project funding. This may be addressed through partnerships with private businesses in cases which allow for commercial operations, but will also require guidelines and decisions from the municipality and other public participants on which activities are regulated as mandatory.

Finally, the municipality should allocate adequate resources for leading the process; ideally, digital transformation and actions forwarding it should be led by a dedicated person with a clear mandate.

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2.6 Risk analysis

Action	Risk analysis	
Lead Agency	City of Nykarleby	
Risk	**Worst-case scenario**	**Mitigation strategy**
Lack of resources for planning and implementation	Business as usual or stagnation due to lagging behind	Ensure appointment of key persons to lead the process.Make sure all involved partners have resources to participate .Set up clear targets and timelines for projects and funding.
Lacking experience of project work	Failure to deliver and follow ruled of the funding	Hire or train staff to know and meet project demands. Use checklists and similar.
Lack of channels and means for civic input and co-creation	Failure to meet smartness criterion through insufficient information of civic needs	Establish forums for continuous discussions on shared challenges
Disruption through personnel changes	Processes delayed or halted due to loss of tacit knowledge, opportunities missed due to lack of monitoring of development	Ensure that core tasks are documented and followed-up, create a culture of sharing
Reluctance to try new, inclusive procedures	Business as usual or stagnation due to lagging behind, residents find other places to live	Staff training, highlighting progress through flexible processes
Indifference to the theme among stakeholders	Only the loudest are present; dictatorship of the few	Map and use all kinds of communication that support the cause
Difficulties to follow technological development	Business as usual or stagnation due to lagging behind, missed chances to develop and build compentencies	Identify key sectors and developments to follow, task someone with following them. Consider expert facilitation.

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2.7 Summary and concluding reflections

The exercise of drafting an integrated action plan has highlighted both the novelty of working this way in the municipality and the potential and promises identified by both the city executive, the technical department as host for the pilot case, and the stakeholders represented in the local action group, who represent actors more used to working in project settings.

The use of technology in itself is nothing new, but the service providers and the governance have not been able to keep up with all aspects of the rapid development of technologies; this is something that will need more attention in the future – but it is a challenge shared by many, and should therefore not be attempted alone.
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The co-creation of ideas and perhaps even shared decision making are topics that have gotten less attention, and that go against the grain of traditional public service production planned by experts in the municipal organization based on decisions made by elected representatives. The idea of sharing power and becoming more demand-driven and user/customer oriented may take a while to actually be adopted.

The steps forward that have been identified, both in terms of concrete actions and on a general strategic level, are perceived as realistic, and the support the city needs for implementation have been identified. As always, funding and other resources are a challenge when new activities or modes of operation are considered; since external funding most likely will be needed, the city should have a plan, and tap into existing networks and build new ones to enable successful projects

However, as the role of municipalities in Finland and the allocation of their resources is undergoing a thorough reform at the moment, this is the time window for looking at all aspects of municipal services and the role of the public sector anew – and in this sense both the digital transformation as well as the many aspects of sustainable development and the co-creative action planning mechanism as a tool for inclusive, effective and wise governance are present at the right point in time.

PHOTO: Sofie Kåll

URBACT IoTXChange
Integrated Action Plan for Nykarleby

Åbo Akademi University/Experience Lab

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