INTEGRATED ACTION PLAN
IMPROVING LIFE THROUGH CONNECTIVITY

Ånge kommun
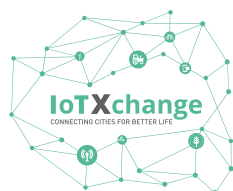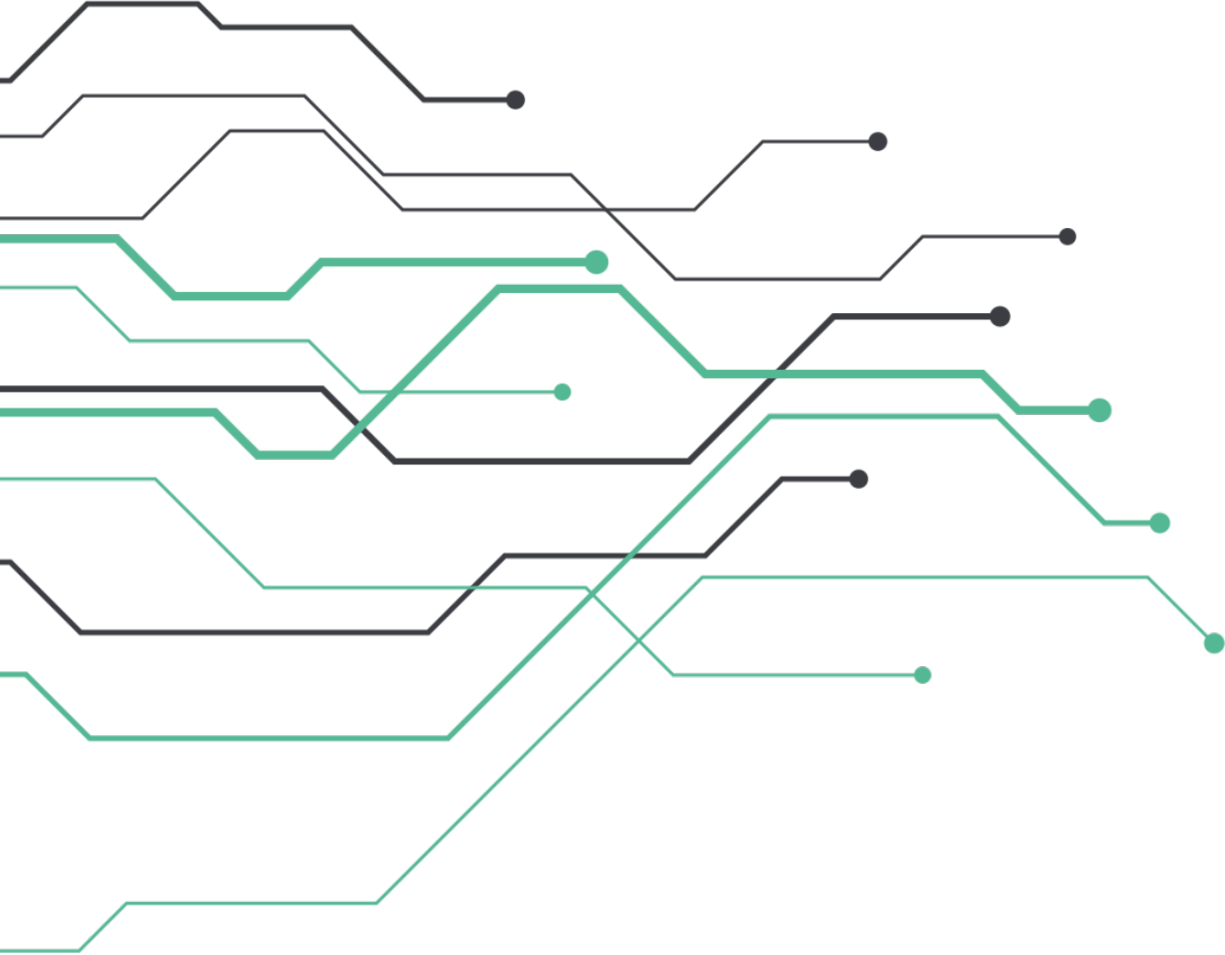
INTEGRATED ACTION PLAN
IMPROVING LIFE THROUGH CONNECTIVITY

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IoTXchange
CONNECTING CITIES FOR BETTER LIFE

URBACT
Driving change for better cities

EUROPEAN UNION
European Regional Development Fund

Ånge Municipality
Torggatan 10
841 33 Ånge

June 6th 2035

Dear Olivia,

I feel like it´s time for me to tell you how it all started!

You know how everything is now in our municipality, now that we have the hydrogen gas cluster on site in Eastern Alby fully operational, the hotel connected to campus Alby uses solar energy and stored hydrogen gas connected to an surveillance system. Bike lanes from our green campus is run using different IoT-based solutions during both winter and summer. We have hiking paths all along the Ljungan river with fishing spots and outdoor areas that are searchable through distributed QR-codes or through our digital channels.

In Ånge we have a rich environment for outdoor- and leisure activities in combination with a Supportive connected environment that makes Ånge an role model in Europe.

Digital services, places of work and citizens have turned our municipality into an attractive place to live, which has had a positive impact on the real estate prices in the municipality.

Everything started between 2020 – 2022 when the municipality joined an URBACT project called IoTXchange. We worked with an integrated approach to deliver an action plan for our prioritized areas for digitalization. It was a great success and became a road map for the development we created after!

Isn't it amazing that our vision and plans came true?

Now it´s your turn to take on the roll I took back then, as the new Municipal Council of Ånge Municipality. I hope that you feel that we have great opportunities to take the next step into the future together with our residents.

Kindest regards,
Erik

Erik Lövgren
Chairman of the Municipality Board
Ånge Municipality

CONTENTS

INTRODUCTION TO THE IAP

INTRODUCTION

Background

Ånge municipality is a rural area in center of Sweden. Ånge is a small municipality with about 9200 residents and a variety of both smaller urban centers such as Ånge and Fränsta as well as less dense rural villages such as Munkbysjön or Naggen. Despite being small, Ånge is futures oriented and holds many thriving communities.

We are on a digitalization journey and is currently exploring digital operations in projects like IoTXchange and IoT for Smart Snow Management.

Internet of Things

The Internet of Things is a name for a collection of technologies that enable communication between devices. Most often, the most powerful types of IoT is when communication technology is enabled for things that previously was not able to communicate. Such as IoT Sensors that can sense snow depth, measure water flow or control motors and cameras etc.

IoT has exploded within the home automation market with smart lights, smart refrigerators and smart heating and cooling solutions. However, the areas where IoT can improve operations most is within the public sector or more precisely, for municipalities that can use IoT to digitalize the geographical environment where they operate.

For data intensive applications, broad band connections such as 4G, 5G, Wifi and fiber connections can enable video streaming and data analysis in the cloud, whereas sensor based calculations with Edge Computing, or for less data intensive applications, narrow band connections such as LPWan can enable long range and cheap communication.

IoTXchange

During the years 2020-2022, Ånge municipality was part of IoTXchange[1], a project financed by the European Regional Development Fund and organized by URBACT. Ånge is one of 8 city partners that cooperated on their digitalization journeys.

The URBACT city partners are:

- Fundão, Portugal
- Jelgava, Latvia
- Dodoni, Greece
- Kezmarok, Slovakia
- Razlog, Bulgaria
- Nevers, France
- Ånge, Sweden
- Åbo Akademi & Nykarleby, Finland
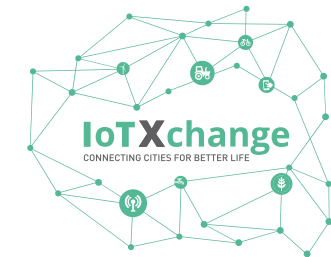
URBACT

URBACT III is an European Territorial Cooperation program that promotes and finances the thematic networks of cities working to develop common solutions to contemporary urban challenges.[2]

Projects financed under URBACT III is organized around four main objectives:

1. To improve the capacity of cities to manage sustainable urban policies and practices in an integrated and participative way

2. To improve the design of integrated urban and sustainable strategies/ action plans in cities

3. To improve the implementation of integrated urban and sustainable strategies/ action plans in cities

4. To ensure that practitioners and decision makers at all levels have access to knowledge and share know-how on all aspects of sustainable urban development

PART 2
CONTEXT OF Ånge kommun

Ånge is a town in the rural northern part of Sweden with 2500 inhabitants. The whole municipality of Ånge has about 9200 inhabitants and a population density of only 2,7 people per square kilometer. This puts a high pressure in services such as health, social care and on the availability of a suitable infrastructure for IoT services in the whole territory.

Geographically, Ånge is on quite some distance to major cities. And within the municipality the distances are very long. E.g., the closest hospital is 100Km away from the urban center of Ånge and the municipality social service workers that visit aging citizens at their home must travel for many kilometers and spent several hours to perform their visits. To visit just one health taker, can sometimes mean a one-hour drive for the nurse. Providing services in very rural areas is a very expensive and time-consuming assignment.

ÅNGE MUNICIPALITY

In 1947, Ånge was mostly a railway junction and a market town. Ånge municipality was formed in 1971 by the merger of the sockens, or counties, Borgsjö, Haverö and Torp that was formed in the municipality reform of 1862.

Ånge is known for being Sweden's geographical center with the mountain Flataklocken being regarded as the center point of Sweden. Although geographically Ånge in the center of Sweden it is regarded as being part of the north of Sweden as most of Sweden's population lives in the most southern part of the country.

The origin of the name Ånge is unknown, but it could be named by an earlier village in Borgsjö socken, that in turn was named by the river Ångan.

Region Västernorrland

Ånge municipality is one of 7 municipalities in the Västernorrland region. The others are:

- Sundsvall municipality
- Timrå municipality
- Härnösand municipality
- Kramfors municipality
- Sollefteå municipality
- Örnsköldsvik municipality

With a collaborative spirit the municipalities of Västernorrland work together to improve and digitalize their operations and public services.

Rural context

Ånge municipality is mostly rural with an average population density of 2,7 citizens per sq.km. Ånge covers a total area of 3 296 sq.km making it the 38th largest municipality in Sweden while only being the 262nd largest by population density, out of 290 municipalities in Sweden.

The rural context of Ånge implies a cultural dependence on personal transportation and a decentralized way of life, where local cultures are important, and the history of the villages are preserved.

Rural digitalization is a challenge as broadband and mobile connections such as 4G LTE and Fiber is limited in some areas. The municipality does not have any 5G connectivity today. However, for most communities along the Ljungan river there is a great access to high-speed internet.

Demography

As of 2020, Ånge municipality had a total of about 9 200 citizens, experiencing a population decline of roughly 1 000 people since 2008. During the Corona crisis the trend has turned, and a small population increase in seen as peoples relationships with urban and rural life is evolving.

Ånge, together with most of northern Sweden, has an aging population which puts an increasingly challenging demand of public services at the same time as tax revenue decreases. In 2017, 28% of Ånge's population was elderly (64 years and above), much larger than the national 20%.

According to the Statistics Central Bureau, SCB, in 2016 the average income in the municipality was 283 000 SEK per year, both lower than Västernorrland region and Sweden with 305 000 SEK and 314 000 SEK respectively.

Industry & Employment

In total, 8% of the municipal population between the ages 20-64 is unemployed, is close to the countries unemployment of 6%, however, youth unemployment is considerably larger with 15% of people between the ages 20-24 being unemployed whereas the national youth unemployment is 7%.

The biggest employers of the municipality is Ag-

riculture and Forestry, Manufacturing, Transportation and health and social care. The differences between male and female employment is great as the biggest employers of women is health and social care with 31% and education with 17%. Whereas the same industries for men is 5% and 3% respectively.

As Ånge municipality lies between two bigger cities, Sundsvall 96m to the east and Östersund 108 km to the west, commuting between to and from the municipality is very common. The railway is modern and highly functional, but the decentralized nature of the municipality means most commuters are heavily dependent on personal transportation.

Environment

The air quality in Ånge municipality is very good, with an annual average AQI score of 25 which is at the intersection of low and moderate pollution and is similar to the pollution levels of most of Sweden.

In 2019, according to SCB, the total CO2 emissions of Ånge, averaged 8.3 ton CO2 per capita, far above the what's required to reach the national goal of carbon neutrality in 2050. However, the region is heavily dependent industries which can lead to higher local emissions, without implications on the consumption-based emissions of the region, but as the population is dependent on personal transportation, the consumption based CO2 emissions must still be heavily reduced.

S:T OLAVSLEDEN

The northernmost pilgrim trail in the world, St. Olavsleden, is a 580km long trail from the Baltic sea in the East to the Atlantic Ocean in the West.

30km of the trail explores the beautiful nature of Ånge municipality, with mountains, forest and water.

VISION

We are a place for everyone, close to nature and community. Here, nourishment and commitment give strength to a thriving countryside

SUSTAINABLE COMMUNITY

The place exudes relaxed exclusivity - one where you want to be part of a community that stands firmly for security, inclusion, participation and democracy. We live with a sense of freedom AND feel joy in taking responsibility for our hosting. We warmly welcome new people, companies and ideas. It is the village feeling and the village mentality we are proud of

SUSTAINABLE EVERYDAY

We have a vibrant countryside with sustainable infrastructure for everyone. It is easy to live wherever you want in the municipality. Decentralization, digitalization and a stronger business community have created the conditions needed in the form of jobs and services. The landscape and society are well-kept and appealing.

SUSTAINABLE COMPETENCE

We drive steadily on the development of society through skills and business development. We have faith in the future and willpower, and always strive to be role models. We are curious, welcome change, and are looking for new trends and opportunities to explore and discover.

SUSTAINABLE HEALTH

There are plenty of meeting places, activities and a wide range of culture for everyone in the countryside and in the central towns that stimulates zest for life, creativity, movement and a healthy life for children, young people, adults and the elderly.

SUSTAINABLE NATURE

We use our strengths and refine our assets wisely, with reverence and in agreement to satisfy the need for resources today without jeopardizing the opportunities of future generations. We take care of what we have and dare to invest in what we are best at.

INSIGHTS FROM OUR CONTEXTUAL ENVIRONMENT

To learn from our surroundings, and to finds opportunities, we have conducted contextual environment analysis identifying factors that impact us. We have follow a tool known as IPESTLE, as recommended by the URBACT tool kit. This tool segments our environment in 7 perspectives in which we look for changes and factors that can affect us or uncertainties that might.

Additionally, we looked at which of these factors are external or contextual to our IAP, meaning they are long-term, often indirect and outside of our control, or operational meaning they are directly impacting us and can be, at least slightly, within our control.

The 7 perspectives of IPESTLE are:

1. Information
2. Politics
3. Economics
4. Social
5. Technological
6. Legal
7. Environmental

Planning from insights

These insights guide us in our digitalization journey by presenting the interconnectedness of our world, it shows both our greatest threats to implementing the IAP which guides our risk management, but it also shows us opportunities that we can use to ride the wave of digitalization and create more value to our residents.

Context provides a collaborative space

Many, if not all, of these insights are shared between both our neighbouring municipalities, our like-minded municipalities internationally or even for most geographical spaces globally.

Sharing part of our contextual environment provides opportunities for collaboration and tackling issues and creating value together. Therefore, we encourage you to keep searching for our shared context and to collaborate on improving life.

30 CONTEXTUAL FACTORS THAT AFFECT US

FACTOR	ENVIRONMENT
Increasing demand on data- and information quality	Contextual & Operational
Decreasing trust in information, Fake News & Misinformation	Contextual & Operational
Social Media is the most important platform for information	Contextual
Information demand is approaching 24/7	Contextual & Operational
Increasing complexity of problems facing society	Contextual & Operational
Increased instability in Europa	Contextual
Russian war in Ukraine	Contextual
Increased pressure on public funds	Contextual & Operational
Political Fragmentation	Contextual & Operational
Competence Shortage	Contextual & Operational
Public funds redirecting to Military expansion	Contextual
Increased use of Utility Calculations	Operational
Simultaneous Urbanization and Deurbanization	Contextual
Municipal Regrowth	Operational
Increasing tourism in Västernorrland	Operarional
Changing demands on the Municipal Organization	Operational
Increasing demand for systems that promote Digital and Physical Inclusion	Contextual & Operational
Aging population	Operational
Increased innovation power from Data Driven development	Contextual
Electrification of Transportation	Contextual
Increasing availability of connectivity networks	Contextual & Operational
Edge, Fog & Cloud Computing	Contextual
Increased feasibility of AI implementations in public services	Contextual & Operational
Changing relationships to transportation following Covid-19	Contextual & Operational
Increasing possibility in employing a distributed workforce	Contextual
Uncertainty in foreign owned Data Storage- and Cloud Service providers	Contextual
Strict regulation on procurement from Public Funds	Contextual
Increased regulation focusing on data integrity	Contextual & Operational
Increased energy intensity in digital processes (e.g. Blockchain)	Contextual
The Green Transition & The Energy Transition	Contextual & Operational

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INTEGRATED ACTION PLAN

An Integrated Action Plan, IAP, is a document defining actions to be implemented, covering timings, implementation responsibilities, costings, funding sources, monitoring indicators and risk assessments of the action. The IAP integrates the Action Plan in multiple levels of the organization, such as vertical integration between all levels of the government and local players, horizontal integration between different departments of the municipality as well as within the territory through cooperation with neighboring municipalities.

The IAP was developed to ensure and enable Ånge municipalities journey towards digitalization. The IAP is linked to the vision of the municipality as a future oriented municipality.

Following the IAP will be a priority of the municipality in the coming 5 years which is the duration of the action plan.

GLOSSARY

This page contains explanations of different important terms used in the Integrated Action Plan.

IAP Themes

Integrated Action Plan Themes are focus areas where the Action Plan will integrate and develop a digital ecosystem. These areas are defined to match the municipal organization and its areas of responsibility.

Actions

Actions are things to be done. All actions in the IAP are a part of an IAP theme and contains descriptions of what is to be done, by who and when.

Lead Organization

The Lead Organization for a theme or an action is the organization that will be responsible for the action/theme.

Key Partners

Key Partners for a theme or an action are those partners that is important for the action/theme to be implemented. These are not different departments of the municipality, but can be municipally owned organizations or other cooperation partners.

Resources & Assets

Resources and Assets are necessities for an action or theme to be done. They can be funds, staff, competence or anything else that can be needed.

Small Scaled Actions

Small Scaled Actions are tested implementations of actions in the IAP that were conducted during the IoTXchange project.

Risk Analysis

A risk analysis is an exploration on possible risk to implement the action plan such as risks that inhibit implementation or governance or risks that can happen as a result of its implementation.

Contingency Planning

Contingency Planning is when actions that can reduce or in other ways affect the risks of an action plan are explored. These contingencies are implement in order to manage risks.

Stakeholders

Stakeholders are those with an interest in the implementation of the action plan, those that are affected by the action plan and those that are important to implement the action plan.

Governance

Governance is the system that will ensure the implementation of the action plan. The governance system consists of organization such as the Lead Organization, Key Partners and Stakeholders.

ACTION PLANNING

Ånge municipality aspires to become a thriving community where residents can live wherever and however they want. With digital tools and services that empower citizens whether they are elderly, disabled or have other needs that can make rural life more difficult.

The integrated action plan focuses on establishing the foundation of a digital ecosystem, with digital public services, digital organizations and companies and digitally enhanced lives of our residents.

1. IoT for Health

2. IoT for Public Services

3. IoT for Tourism and Cultural Heritage

IoT for Health

As Ånge Municipality have a large elderly population healthcare is a large employer and a great focus for improving health. Healthcare can be greatly enhanced through digital tools and services.

IoT for Public Services

Public services such as Snow Plowing, Water Treatment and Garbage Disposal can through new sensors and operations development improve services and reduce costs.

IoT for Tourism and Cultural Heritage

Tourism in Ånge municipality is highly decentralized and using digitalization for tourism is thus challenging in a different way than in centralized areas such as larger cities. Using new technology can enable tourism through Wifi-working spots, cultural heritage QR-codes and ice and snow depth sensing.

Future Actions

This Action Plan focuses on the three areas above, however we see a large need for digitalization within both Education and Agri-Tech which will be a focus in the future as responsibilities and resources are managed.

Horizontal Action Plan

As many actions that needs to be taken are shared between the different IAP themes an horizontal action plan is developed.

MOTIVATION & PROCESS

The strategic vision of the IAP is to:

"Improve the lives in Ånge municipality through digitalization that empowers Ånge in its journey towards the future"

Ånge municipality aspires to become a thriving community where residents can live wherever and however they want. With digital tools and services that empower citizens whether they are elderly, disabled or have other needs that can make rural life more difficult. But Ånge also aspires to be a place where all residents can through better information improve their lives and receive smarter and more individualized services.

The integrated action plan focuses on establishing the foundation of a digital ecosystem, with digital public services, digital organizations and companies and digitally enhanced lives of our residents.

URBACT Method

This Integrated Action Plan was developed using the guidance of the URBACT Action Planning Network, IoTXChange, and URBACT E-University.

The process followed the three URBACT principles:

1. Integration
2. Participation
3. Action Learning

These principles underpin capacity building of urban practitioners to drive change. The Integrated Action Plan captures and frames this change to improve local level policy development.

URBACT Local Group

The Ånge URBACT Local Group is a group of individuals and organization that cooperate to evaluate and test the Small Scaled Actions and develop the Integrated Action Plan.

The ULG has regular digital meetings and exchange competence, knowledge and experience.

The group consists of 28 members with different roles and from different organizations.

The core of the ULG is the municipal digitalization team. Using a Triple Helix perspective, the ULG also contains politicians, private sector and university.

Within the project several meetings and workshops have been held to explore the development of an IAP, the focus and themes of it and the actions to be done.

This has been a very successful project that has developed the municipality's knowledge on both digitalization and action planning.

Transnational Exchange

The 8 URBACT City Partners share experience through transnational exchange meetings.

The challenges faces by the different municipalities in the different countries are , but the focused IAP themes are different.

The transnational exchange contains discussions on the IAPs, peer review feedback sessions and learning and inspirational lectures and seminars.

Servanet

Servanet is one of Ånge municipality's key partners for digitalization and connectivity.

Servanet is a metropolitan area network, i.e. a broadband network available locally in one or more municipalities. Servanet, like most other urban networks, is mostly built with fiber optics and is a so-called open net. It supplies fiber networks in the municipalities: Sundsvall, Härnösand, Timrå, Ånge, Strömsund and Ragunda, and is owned by the municipalities, or in some cases by utilities in the municipalities, providing its inhabitants with access to the sharpest options in the Internet, television and smart services for the connected home, and ensuring the coordination of the offer across a vast region.

With over 33,000 connected households and businesses in the concerned municipalities this is Sweden's largest municipal urban networks.

In addition to internet access, Servanet is currently expanding its IoT-network with distributed LP-gateways This allow the development of a sensor network to service the smart society, collecting data and enabling smart services on areas such as: Connected waste bins, Moisture alarms, Water flow, Water levels, Carbon dioxide and Snow depth for all the 6 municipalities.

External consultant

During the final stretch of IoTXchange, Ånge Municipality chose to work together with an external consultant from Pro&Pro to finalize the IAP.

Pro&Pro is a management consultancy firm based in Sundsvall. Pro&Pro aims to be an innovative partner that helps you solve the complex challenges of the future.

Daniel Adelander is a management consultant at Pro&Pro that specializes in strategic development, innovation management and futures exploration. Daniel strives to create understanding in complexity.

SMALL SCALE ACTIONS

To enable learning and development within the IAP a Small Scale Action, SSA, is tested and evaluated. Ånge municipality had an initial goal of exploring different available IoT-platforms to learn more about them before potential procurement.

In combination with platform evaluation, new data was collected through IoT sensors to explore how new data can be used in conjunction with existing data within the IoT platforms.

The SSA process in Ånge was divided into 4 steps:

1. Presentation and exploration of several IoT platforms.

2. Procurement of 2 temperature sensors.

3. Installation of sensors in lakes and publishing data on Ånge's homepage.

4. Evaluation.

Exploring IoT Platforms

An IoT platform is a shared space for storing and building IoT-based products and services. In the public sector, an IoT platform can be crucial in allowing digitalization across different public operations and organizations.

However, running an IoT platform requires the resources and competences to maintain and operate it. Therefore, Ånge municipality explored several IoT platform to understand how they would relate to Ånge municipality.

Several IoT platforms were explored, but quickly it was realized that the organization is too small to operate an IoT platform themselves. Instead, other solutions had to be found.
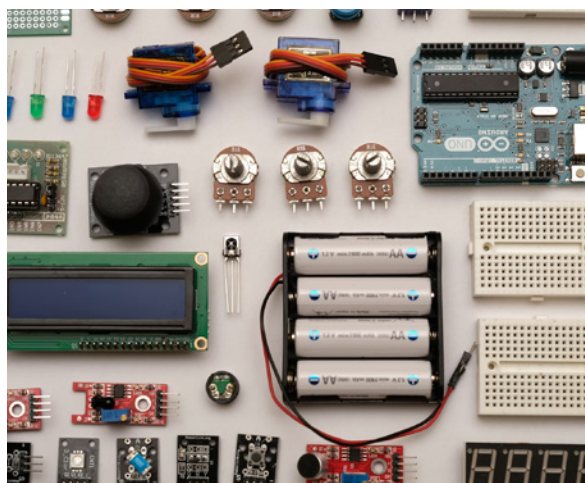
Therefore, Servanet, the fiber and LPWan operator in the municipality, provided access to their platform for testing of the SSA.

Ånge envisions a future with full access to an IoT and digitalizations platform, but with outsourced platform operations to work within the restrictions of a smaller municipality.

> Torpshammar, in the eastern part of the municipality, is often the warmest place in Sweden.
>
> Temperatures range from +33°C in the summer to-20°C in the winter.

Exploring sensor technology

We explored using new sensor technology by implementing a temperature sensing and visualization system installed in two lakes in the municipality, Backetjärn and Vojen. These lakes are two of the municipalities most used swimming lakes and is a common spot for summer and outdoor activities. During 2022 the test will be scaled up with a new swimming lake, Borgsjö Strand.

As most citizens of Ånge lives far enough from these lakes to use cars and other modes of personal transportation, informing them of the temperature in the lakes could be used to influence their willingness to swim.

In cooperation with Servanet, two temperature sensors were installed with great success. The sensors was connected to the LPWan communications network covering a large part of the municipality. The results was visualized and published on the municipality's website and has been greatly appreciated by the communities in Ånge during the summer of 2021.

This action invoked many ideas on how to work with digitalization and sensing technologies to improve the lives of citizens of the municipality. Such as snow depth sensing which Ånge is developing in a project together with Örnsköldsvik.

Key Takeaways

! Operating an IoT platform requires too many resources to manage for a small municipality.

! Outsourcing IoT platform management could enable more efficient digitalization of the municipality.

! Cooperation with Servanet can accelerated the rate of adoption of IoT technology in the region.

! Sensor technology could enable more information that can have an impact on the lives of citizens.

! Temperature sensing in Backetjärn and Vojen was a successful and appreciated implementation of IoT technology.

Article about the temperature sensors in Sundsvalls Tidning

Newsarticle   https://tinyurl.com/AngeNyhet

Sundsvalls Tidning   https://tinyurl.com/ST-Badtemp

KEY OBJECTIVES

The Integrated Actions Plan proposes actions and activities that promotes digitalization of Ånge municipality. The Action Plan was produces within the URBACT Local Group, during the fall 2021 until spring 2022, through a series of strategy and action planning workshops within the IoTXChange project.

The vision that the IAP targets is the digitalized rural environment and operations of the municipality, both as a geography and as a public organization.

Key Objectives

The key objectives of the IAP is the most pressing priorities for the organization to enable adoption of digitalization and IoT. On the table to the right, the key objectives are defined together with indicators for their achievement.

From the identified objectives, actions and activities are identified and planned for the IAP themes on pages 28-33.

Digital Ecosystem

Establishing a digital ecosystem within the geographical municipality to improve quality of life or residents of Ånge municipality is the most prioritized key objective of the action plan. However, the journey towards a digital ecosystem is long and challenging. Thus, the municipality must work hard at improving competence, fund innovation, develop demonstrators and implement solutions within the themes of the IAP, collaborate with neighboring municipalities and raise the technological awareness within the geographical region.

Competence & Knowledge

Competence and experience on digitalization of municipal responsibilities are hard to come by. As Ånge is a small municipality, the most important action for enabling digitalization must be the competence development and digital maturity of the employees of the organization and the residents of Ånge. Thus, competence and experience will be developed through prototype development, education and participation and management of innovation projects.

Funding Innovation

As will be discussed more in the Resourcing section, funding innovation projects is important to allow for the pursuit of digital innovation. The action plan will secure funding for innovation projects that enables the adoption of digital technologies within the municipality.

Prototype Implementation

A key part of competence development is gathering the experience of digital innovation for the municipal organization. Thus, several small scale prototypes will be developed that can raise the awareness of the technology of the stakeholders, deliver useful experiences to the employees and initialize the digital transformation journey.

Digital Maturity

As the municipality learns from digitalization experience, so must key stakeholders as well. The action plan includes activities that raise digital maturity, awareness of the technology and the understanding of the possibilities of digitalization.

Additionally, the digital maturity will accelerate technological adopting outside of the municipal organization.

Collaboration

Collaboration is key to achieve large scale improvement in the rural environment. Most, if not all, rural municipalities in the north of Sweden share common challenges related to digitalization, competence and funding.

KEY OBJECTIVES	INDICATORS	ACHIEVED
Establishing the foundations for a functioning digital ecosystem within the geographical municipality	-	-
Funding research and innovation projects that promote the adoption of digitalization in industries relevant to the geographical area	Secured 5MSEK funding	31/12 - 2027
Implementing a set of prototypes for learning purposes	10 implemented prototypes	31/12 - 2025
Expand the awareness of the technological solutions for municipal employees, key stakeholders and citizens	15 published articles on the municipal digitalization	31/12 - 2026
Increasing the municipality´s digital maturity	30% increase on digital maturity index surveys between 2022-2025	31/12 - 2025
Improving collaborations efforts with neighboring municipalities	4 co-partnered innovation projects	31/12 - 2027
THEME 1 — Improve quality of life through digitalization of health-care	3 implemented prototypes	31/12 - 2025
THEME 2 — Using digitalization to optimize and simplify public services.	5 implemented prototypes	31/12 - 2025
THEME 3 — Initiating systems that digitalize decentralized tourism, leisure and cultural activities	2 implemented prototypes	31/12 - 2025

Action Plans

These key objectives will ensure progress in the desirable direction according to Ånge vision.

On following pages, how these key objectives will be achieved is described. The Action Plan is divided into the three IAP Themes and the Horizontal theme.

IOT FOR HEALTH

Main Objective	Through digitalization of health care, the quality of life for residents receiving care as well as relatives to those receiving care will increase. Installing sensors enables more individualized care options that can enable a more independent lifestyle for those who desire it.
Vision	To allow independency for our residents for as long as possible, with safety, closeness and a sustainable everyday.
Background	New technology is empowering health care. People desire independence and technology can enable independence. Ånge municipality has an aging population and the need for smart health care increases. *The needs of our residents is changing, and we need to meet people where they are now.*
Lead Organization	Ånge Municipality – Social Services
Key Partners	• Servanet • Tunstall
Timescale / Budget	2021-2027 • *Within the operations budget and eventual external funding*
Inspiration	We are inspired by the opportunity that surrounds us, our networks and environmental scanning. We see smarter health care in Kramfors Municipality that we learn from. We learn from SKRs Digitalization Guide, and we learn from our people.

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Action	Intended Result	Lead Organization & Key Partners	Timescale
Needs analysis Understanding the needs of municipal caretakers and digitalization opportunities	Needs analysis and connectivity plan for Smart Home Care users.	**Social Services** • Servanet	2022-2024
Operations analysis Mapping, identification and evaluation of current operations processes	Evaluation of which processes that can be enhanced or digitalized.	**Social Services**	
Smart Home Care Medical robots are tested with the purpose of evaluating the possibility of increased independence for medical recipients.	Increased quality of life and possibility to remain at home for longer	**Social Services** • Servanet	*Test and evaluation during 2022*
Smart LSS-care Installing sensors and cameras for LSS-care monitoring	Increased quality of life and independence of recipients' of LSS-care	**Social Services** • Servanet • Tunstall	*Large-scale implementation 2022-2023*
Elderly Care Sensors Installing sensors in the elderly care	Increased quality of life and care quality.	**Social Services** • Servanet	

SWEDEN'S MIDPOINT

Sweden's Geographical Midpoint is the mountain Flataklocken in Ånge municipality.

1947 the center of Sweden was calculated by balancing a stiff map of Sweden on a needle.

IOT PUBLIC SERVICES

Action	Intended Result	Lead Organization & Key Partners	Timescale
Smart Snow Management Using Snow Depth sensing to improve efficiency of Snow Management.	Plowing at the right time. Increasing accessibility and safety on the roads.	**Technical Services** • Bron Innovation • Mid Sweden University • Servanet	2021-2024 Financed by Vinnova
Remote Water sensors Connecting 400 remote Water sensors.	Connected to the billing system to enable billing according to actual use	**Technical Services** • Servanet • Dahl • Ambiductor • Netmore	2021 - 2027 350 000 SEK for sensors
Production Kitchen Climate Using sensors to measure climate and environment in production kitchens.	Data can show property owners desired actions	**Technical Services** • Servanet	In progress
Presence Indication Sensors Installing sensors for presence to indicate burglaries or unauthorized access	Installed sensors	**Technical Services** • Servanet	Within 3 years
Garbage Bin Sensors Installing sensors on garbage bins to optimize garbage disposal routes	Installed sensors	**Technical Services** • Servanet	2022 - 2026

Main Objective

Using digitalization to optimize and simplify public services within the municipality, such as Snow Management, Water sensors and Garbage disposal to reduce environmental impact, improve reliability and improve are use of resources.

Vision

IoT for Public Services is part of Ånge Municipalities vision of a **Sustainable "everyday"**
By simplifying life for our citizens, employees and organizations, we can improve quality of life and reduce our resource consumption allowing for more environmentally sustainable public services.

Background

We need to use our resources differently. Digitalization of Public Services allows for a redistribution of resources that can improve quality of life in other areas.

We have witnessed a growth in available products and solutions that now are becoming both economically, and socially viable. Through the expansion of Servanet LPWan-network we can deliver more digital services.

Lead Organization

Ånge Municipality – Technical Services

Key Partners

• Servanet
• Mid Sweden University

Timescale / Budget

2021-2027

• *Within the operations budget and eventual external funding*

Inspiration

We are inspired by our innovative citizens that experiment with smart solutions that improve their quality of life through new opportunities with digital technology and connectivity.

Through our collaboration with ServaNet, we have been inspired to follow through with a digital approach to Public Services.

ALWAYS GREEN FORESTS

Ånge municipality is mostly covered by coniferous forests with Pines and Spruces dominating the landscape.

As the coniferous species keep their needles year-round, the forest and green all year round.

IoTXchange
CONNECTING CITIES FOR BETTER LIFE

★URBACT
Driving change for better cities

EUROPEAN UNION
European Regional Development Fund

IAP THEME 3
IOT FOR TOURISM AND CULTURAL HERITAGE

Main Objective	Using digital technologies to elevate outdoor activities and cultural heritage in the geographic Ånge municipality. Ånge contains a very decentralized way of life, and thus digitalization within the area must also be decentralized.
Vision	A digitally enhanced tourism and nature experience with connected devices that help navigate and take smart decisions to promote outdoor life and cultural experiences for people of all ages.
Background	Ånge municipality has a strong cultural heritage and a nature centered lifestyle. Engines and vehicles is a big interest for the youths in the municipality.
Lead Organization	Ånge Municipality – The unit for tourism and culture
Key Partners	• Servanet • Naturum • StarBit
Timescale / Budget	2021-2027 • *Within the operations budget and eventual external funding*
Inspiration	We are inspired by the tourism solutions in the High Coast of Sweden. They have similar challenges and beautiful solutions.

Action	Intended Result	Lead Organization & Key Partners	Timescale
Digital Mechanics Garage Using IoT, mechanics garages for interested youths can serve as a knowledge platform and teach mechanics to users.	Enabling youth participation and competence development	**The unit for tourism and culture** • Servanet	2022-2025
St:Olofsleden Counting visitors along the St:Olof pilgrimage trail.	Accessible statistics that visualizes St:Olofsleden	**The unit for tourism and culture** • Servanet	2022-2025
Naturum Improving Naturum visitors center with new technology.	Visualized information for Naturum visitors	**The unit for tourism and culture** • Servanet	2022-2025
Outdoor Working spots Distributing Wi-Fi hotspots to enable spots for working close to outdoor activities.	Installed Wi-Fi hotspots throughout the municipality	**IT** • Servanet	2022-2025
QR codes for cultural heritage Building a cultural heritage service with distributed QR codes in the geography containing information on history, snow scooter trails etc.	Increasing accessibility to cultural heritage and outdoor activities	**The unit for tourism and culture** • Servanet	2022-2025
Weather based sensing Developing and installing sensors for ice-depth, snow depth and water temperature.	Making useful information available that can help people plan the outdoor activities.	**The unit for tourism and culture** • Servanet • StarBit	2022-2025

SWEDEN LOVES ALLEMANSRÄTTEN

The right of public access is an important part of Swedish life. Allemansrätten means that everyone is welcome to enjoy the Swedish nature as long as you follow the rule, **don't disturb, don't destroy.**

So come over and enjoy the forest, pick blue berries and explore nature.

IoTXchange   URBACT Driving change for better cities   EUROPEAN UNION European Regional Development Fund

HORIZONTAL ACTION PLAN

As the IAP themes have overlapping areas, a horizontal action plan was developed. There are five focus areas in the horizontal action plan:

1. New digitalization Strategy

2. Competence development

3. IoT Communication Networks

4. One Ånge Municipality

5. Ensuring responsibilities

New Digitalization Strategy

Ånge Municipalities Digitalization Strategy from 2019 is nearing its end. The Strategy covered the years 2019-2022 and a new Digitalization Strategy towards 2030 is necessary to further out digitalization journey.

Competence development

Competence, experience and education within public sector digitalization, IoT and AI can and will enable implementation of digital services for the municipality.

IoT Communication Networks

The geography of Ånge municipality has an insufficient communication network coverage. How and where to build and improve communication networks is very important to enable digital inclusion.

One Ånge Municipality

Ånge Municipality aims to only have one access point. One place for all services and questions. This must relate to the digital services and using digitalization the access point can become smarter.
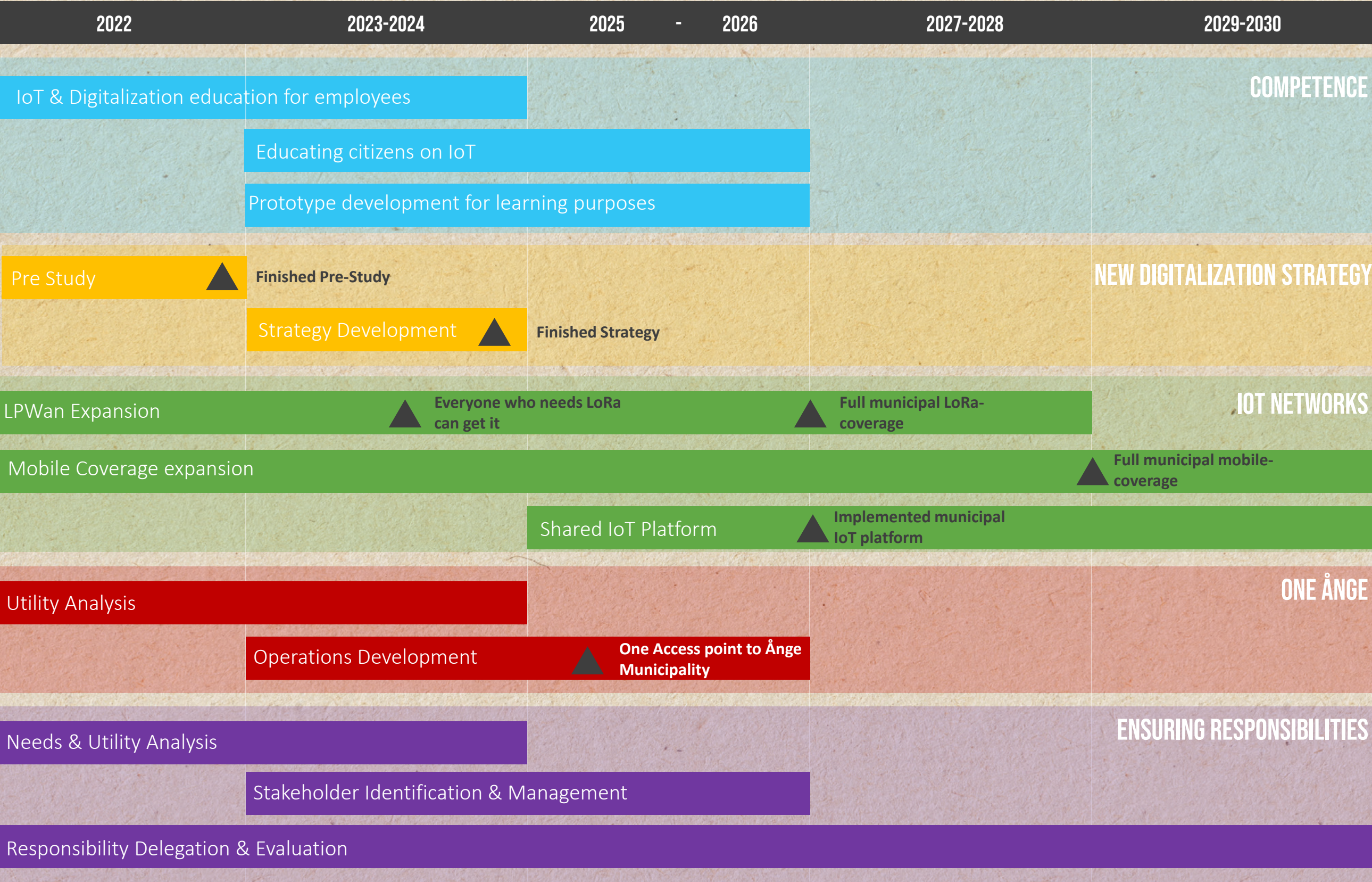
Ensuring responsibilities

One of the major risks of the IAP is not being able to ensure responsibilities for the actions. Thus a contingency plan for responsibilities is part of the horizontal action plan.

Gantt-chart

The horizontal action plan is presented in a Gantt-chart that shows actions in the five focus areas over the time period 2022-2030.

THE BIG 5 CARNIVORES

All of Swedens big 5 carnivores can be found wild in Ånge municipality. They are:
- Bears
- Wolves
- Lynxes
- Wolverines
- Golden Eagles

GANTT-CHART
HORIZONTAL ACTION PLAN

Ånge kommun

2022	2023-2024	2025 - 2026	2027-2028	2029-2030

COMPETENCE

- IoT & Digitalization education for employees
- Educating citizens on IoT
- Prototype development for learning purposes

NEW DIGITALIZATION STRATEGY

- Pre Study ▲ **Finished Pre-Study**
- Strategy Development ▲ **Finished Strategy**

IOT NETWORKS

- LPWan Expansion ▲ **Everyone who needs LoRa can get it** ▲ **Full municipal LoRa-coverage**
- Mobile Coverage expansion ▲ **Full municipal mobile-coverage**
- Shared IoT Platform ▲ **Implemented municipal IoT platform**

ONE ÅNGE

- Utility Analysis
- Operations Development ▲ **One Access point to Ånge Municipality**

ENSURING RESPONSIBILITIES

- Needs & Utility Analysis
- Stakeholder Identification & Management
- Responsibility Delegation & Evaluation

▲ Important Milestone

■ Activity

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RESOURCING & FUNDING

Digitalizing Ånge municipality through the IAP is resource intensive, but as the municipality is a slimmed organization, securing resources can be difficult.

The most important resource is staff, or more precisely, time for the current staff to focus on following the IAP. This requires a high level of commitment from the participating operations within Ånge municipality and thus,clear benefits from implementations must exist.

Implementing sensor solutions can be costly, but most costs are from time, not procurement of sensor. Our priority will be developing collaborations with private sector organizations in projects funding by the ERDF or IoT Sweden to develop the technology needed for the IAP.

Digitalization implies change, and Ånge has a clear vision of being a futures oriented municipality with management prepared for change. But structural change is challenging, and it is important that people within the organization is prepared for it. Thus, the organization will educate and develop the competences needed to achieve change. This

again is mostly not an issue with funding, but with finding time and the personnel ready for it.

Staffing

As will be discussed in the Risk Analysis on page 40, staffing and delegating responsibilities is a major challenge for smaller organizations on a digitalization journey.

Most digitalization projects will be run alongside other priorities and responsibilities. Thus finding sufficient staff and staff with sufficient interest and competence will be a continuous challenge.

Funding

Securing funding for the IAP activities can be a challenge. There are several available sources for project funding, such as the European Regional Development Fund and the European Social Fund. Additionally, there are Swedish funding agencies such as Tillväxtverket and Vinnova, where Vinnova funds IoT development projects through IoT Sweden.

Funding is also available through Region Västernorrland, but most commonly when combined with other sources of funding.

Prioritized Funding Sources

! Tillväxtverket

! Vinnova

! IoT Sweden

! European Regional Development Fund

! EU Urban Initiatives

! Region Västernorrland

! European Social Fund

! AI Sweden

! Horizon Europe

! Interreg Europe

Tillväxtverket

Tillväxtverket (Swedish Agency For Economic and Regional Growth) is a Swedish government agency tasked to promote entrepreneurship and regional growth.

Tillväxtverket also manages and distributes funds from the European Regional Development Fund and European Social Fund.

Vinnova

Vinnova is a Swedish government agency that funds research and development of innovation systems. Vinnova funds many projects focused on digitalization, IoT and AI.

Vinnova holds 17 strategic innovation programs, the most relevant to this IAP being Internet of Things Sweden.

IoT Sweden

Internet of Things Sweden is a strategic innovation program funded by Vinnova, Energimyndigheten and Formas. IoT Sweden has a yearly budget of 80 million SEK whereof 50% is funded by external parties.

IoT Sweden funds both preparation projects and implementation projects. Currently, Ånge municipality together with Örnsköldsvik's municipality is cooperating in an IoT Sweden funded innovation project called IoT for Smart Snowplowing.

European Regional Development Fund

The European Regional Development Fund (ERDF) is fund allocated by the European Union with the purpose of transferring money from richer regions and invest it in infrastructure and services of underdeveloped regions.

For the program period 2021-2027, 200.36 billion Euros have been allocated to the ERDF.

Region Västernorrland

Region Västernorrland is politically run organization that can finance projects from the ERDF, ESF and Interreg Europe.

Collaborative Funding

Ånge municipality will sign a collaboration agreement with the regional university, Mid Sweden University, in 2022. The collaboration agreement

funds research and innovation projects.

Mid Sweden University has through its department STC - Sensible Things that Communicate, a focus on sensor technology and digitalization.

Additionally, cooperation projects with other municipalities can be seen as collaborative funding as costs reduce through collaboration. Collaboration with other municipalities is not only a goal for Ånge municipality, it is also a high priority of all municipalities in Västernorrland.

Operations budget

The different departments of Ånge municipality will use their operations budgets to fund digitalization of their operations.

Shared Digitalization Budget

Ånge Municipality have allocated funds for Digitalization that is shared between all municipal departments. The total budget is 250 000 SEK per year, roughly equivalent to 24 000 Euros.

The shared digitalization budget has the purpose to enable digitalization when the operations budgets are insufficient or for situations when the operations wish to become more innovative.

SWEDEN'S LOOOONGEST FLEA MARKET

For the last seven years, Sweden's longest, and perhaps most beautiful flea market has been arranged in Ånge.

For 47 km, along the Ljungan River, about 70 flea markets are held at the same time.

FRAMEWORK FOR DELIVERY

The Integrated Action Plan is a shared strategic document for Ånge Municipality and its partners.

Ånge Municipality will lead the digitalization of the municipality but as cooperation is key to success responsibilities must also be delegated to stakeholders as well.

Stakeholders

The key stakeholders of the municipality and this IAP is:

- **The residents of the municipality**

- Organizations, companies and service providers located in Västernorrland.

- The public service providers in the municipality.

- Cooperation partners such as Servanet.

The residents of the municipality is seen as the highest priority stakeholders as this IAP is mostly focused on digitalization that improves the lives of residents. Although the residents is the most important key stakeholder, no responsibilities for digitalization is delegated to them.

Responsibilities

Most responsibilities lies on the municipal organization such as following the IAP, governing the digitalization journey, establishing partnerships and educating stakeholders.

Servanet is one of the key stakeholders and they are responsible for building and maintaining communication networks such as LPWan and Fiber.

Companies and Service providers are responsible for their digitalization journeys but must also be responsible for their cooperation with residents and the municipal organization to provide digital services that are aligned with the strategic vision of the municipality.

Governance after URBACT

After the URBACT project IoTXchange is over the IAP will be governed by the municipality, Servanet and the employees within the respective responsibilities of the municipality.

In other words, the URBACT Local Group (ULG) that was initiated in the project with live on by their responsibilities to the goals and actions within the IAP.

Ånge kommun
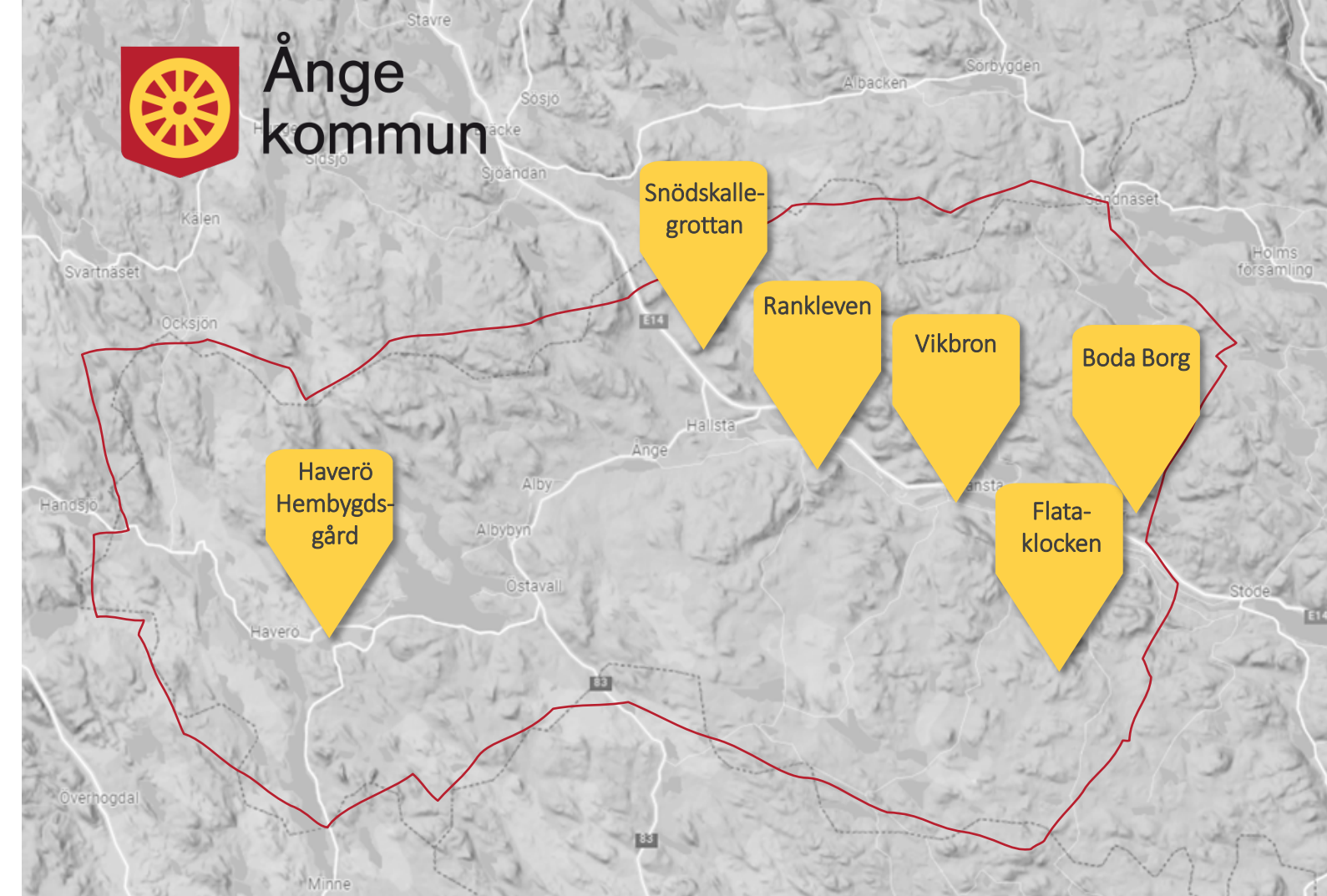
Rankleven

Rankleven is a nature reserve purposed to preserve the special vegetation in it. It is protected as a Natura 2000 area.

Flataklocken

South of the Ljungan river lies Flataklocken, the geographical center of Sweden.

Vikbron

Vikbron in Fränsta is Sweden's longest wood bridge of its kind. It spans 133 meters of the Ljungan river.
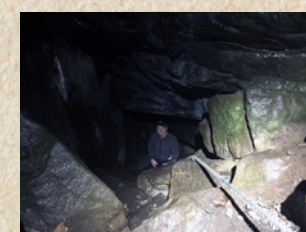
Haverö Hembygdsgård

Haverö Hembygdsgård holds 17 old buildings, a museum and a wonderful view of Ljungan.

Snödskallegrottan

The tales tell of the Kerstin who was taken by the Snödskallepeople one summer long ago. Be careful because it is said that she will pull the feet of the visitors of the cave.

Boda Borg

Boda Borg is a unique experience of Quests. Experience rooms will with challenges that you and your team must clear.

Source: www.upplevange.nu

RISK ANALYSIS

Ånge municipality have identified 13 risks that have an impact on our ability to follow the integrated action plan. These risks are presented in the risk table on page 39 and are classified by their probability to occur, their impact if they occur and their priority calculated by multiplying the probability with the impact.

The risk analysis was used to understand adverse effects of following the action plan or to foresee external and internal challenges to following the action plan. For the highest priorities risks, a contingency plan was developed, which in turn was included in the action plan by adding risk reducing actions.

Contingency Plan For High Priority Risks

Through this methodology five high priority risks were identified. For these five risks, a contingency plan was developed that identifies risks to be mitigated by either:

• Accepting the risk

• Avoiding the risk

• Transferring the risk

• Reducing the risk

HPR1 - No Network Coverage

Both the geographical network coverage and the amount of fiber connected households in the area is limited. Thus, the municipality cannot guarantee LPWan, 4G or any other type of network coverage for all areas of the municipality.

Unfortunately, this implies large risk for unavailable connection where any type of IoT technology is implemented, whether it is in the nature or at home in rural areas.

Ånge municipality is continuously working to delivered fiber to more households and to ensure mobile connection coverage. In the long term, this reduces this risk however in the short term this risk must be accepted.

HPR2 - Unable to secure responsibilities

It has proven difficult to ensure a person responsible for all planned actions in the IAP. There is thus a large risk for any action that no one is able to take responsibility for it. This will have a large impact on the IAP as it can slow down or event halt progress.

Through education and showing the potential benefits of implementing new technologies, the municipality hopes it can reduce this risk by encouraging taking responsibilities for them.

HPR3 - Responsible leaves the organization

A common risk for smaller organizations such as Ånge municipality is the risk of the responsible person leaving the organization or taking on new responsibilities, leaving the old responsibilities unattended for. To avoid this risk, any action in the IAP is lead by a group or organization instead of a single person. However, this increases the risk of HPR2.

HPR4 - New budget priorities

Another high impact risk for small organizations is new budget priorities. This can come from changing political views following an election or any other political change. As the municipal organization is small, shifting budget priorities can heavily impact the ability to follow the action plan.

Thus, to reduce the risk, any action must ensure it is signed on as being prioritized to shield it from shifting budgets. However, the risk will still remain.

HPR5 - New methods not adopted

New technology is not sufficient to bring digitalization to the municipal organization and the popula-tion. The technology also includes change to how work is performed. There is a risk that workers are unable to see or understand the benefits of the new methods, which can slow down progress. To reduce this risk, the workers will be educated, included and responsible for their actions in the IAP.

HPR6 - Networks are down

Increasing demands for uptime for communication networks is a given as more devices are connected and more of our lives are digitalized. However, network uptime cannot be guaranteed. Power outages are common in rural areas, cyber attacks are becoming more prevalent and climate changes are challenging networks.

This is a risk that can only be reduced by having redundant and secure networks, which cannot be guaranteed for all areas of the municipality. Thus this risk can only be accepted.

Continuous Risk Management

Although these five high priority risks mitigates the most likely or impactful foreseeable events, the future remains uncertain. Therefore, Ånge municipality will work continuously with updating and evaluating the risk analysis as time progresses.

Not only does this ensure mitigation opportunities for newly identified risks, but it ensures the risk analysis is a working document and risk management becomes a continuous practice.

	RISK	PROBABILITY [0-5]	IMPACT [0-5]	PRIORITY [P*I]
HIGH PRIORITY RISKS	No network coverage where the technology is implemented	5	5	25
	Unable to secure and delegate responsibilities	4	5	20
	Responsible leaves the organization	4	4	16
	Change in budget prioritization	3	5	15
	New work methods are not adopted	4	3	12
	Networks are down (Power outages, Cyberattacks etc.)	3	4	12
MEDIUM PRIORITY RISKS	Users are opposed to new technology	3	3	9
	Staff unable to understand the value of the technology	3	3	9
	Technology raises integrity and surveillance concerns	3	3	9
	Insufficient competence and knowledge to implement tech.	3	3	9
LOW PRIORITY RISKS	Unable to secure external funding	3	2	6
	Insufficient resources for urgent problems	3	2	6
	Change in communication network technology	1	3	3

CONCLUSION

CONCLUSION

The URBACT Network and the IoTXchange project has elevated Ånge municipalities competence on digitalization and IoT greatly.

Through the transnational exchange meetings and the URBACT Local Group Action Planning Process, a clear Integrated Action Plan has been developed.

Ånge Municipality has a clear vision that:

"We are a place for all, close to nature and community. Here, employment and engagement power a thriving community"

And although digitalization is not part of the vision digitalization is a powerful tool to achieve and enable the vision.

The IAP will continue to be a strategic document that orientates Ånge municipality's digital journey.

We want to thank URBACT for their enthusiastic involvement in our development and all URBACT Local Group that have inspired us during our journey. And we want to wish you all good luck on your digitalization journey.

Petra Malmberg

Elin Rapp

Daniel Adelander

Ånge
kommun

ÅNGE MUNICIPALITY ULG TEAM

Ånge Municipality

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Erik Lövgren, Chairman of the Municipality Board

Anders Mjärdsjö, Head of Opposition

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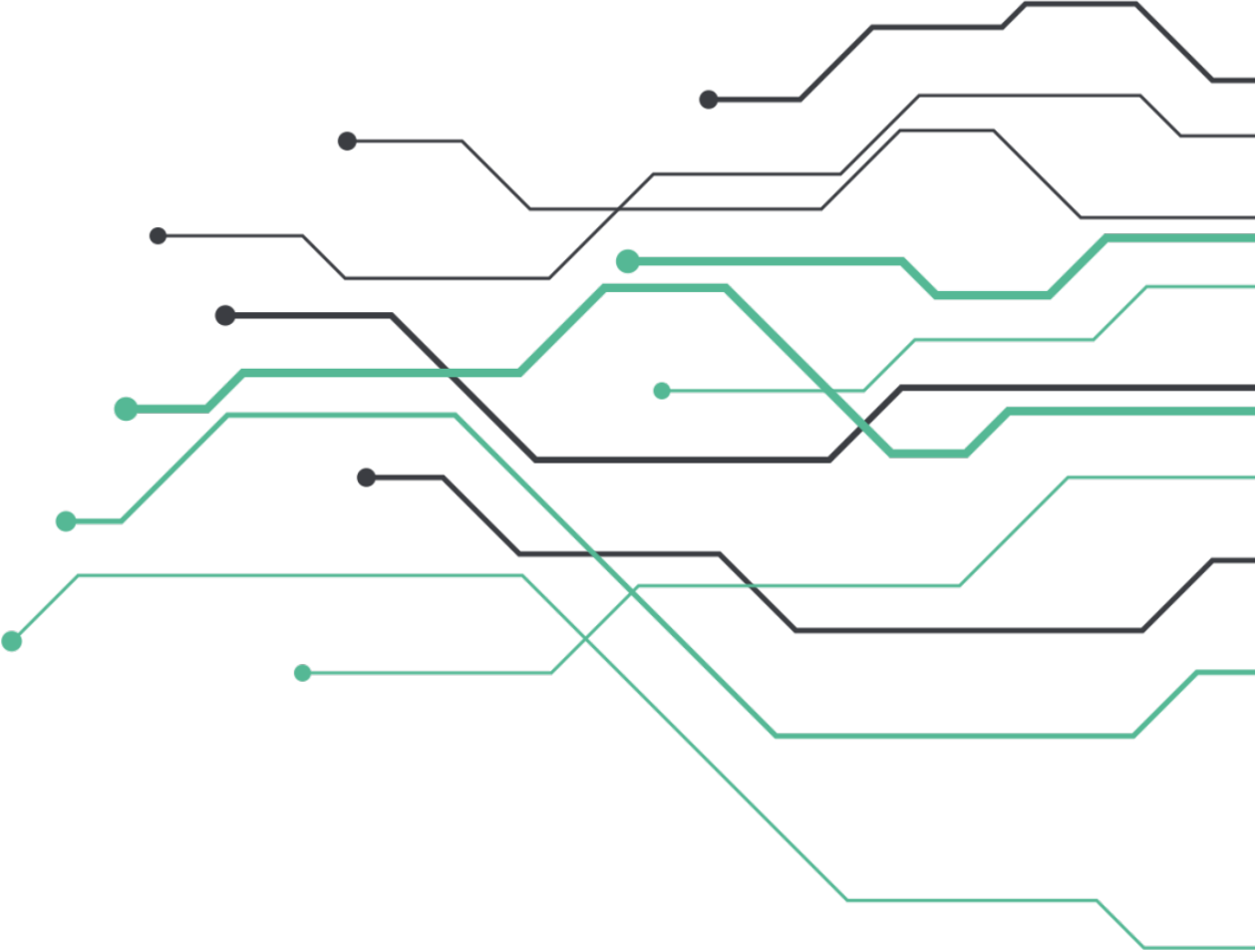
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Our team in September 2020

IMPROVING LIFE THROUGH CONNECTIVITY
INTEGRATED ACTION PLAN

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