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Improving the digital ecosystem in a border region

BROADEN – broadband across border Sweden-Norway

FOR YOU – countering digital exclusion among senior citizens



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Summary

As of today, rural and remote areas in the North Sea region face challenges in establishing a healthy digital environment, encompassing digital infrastructure, digital services and digital skills among inhabitants. Funded by the European Regional Development Fund, the CORA project (Connecting Remote Areas with digital infrastructure and services), evolved to address this and help bridge the digital divide.

With support from CORA, two pilots have been carried out in municipalities in the border region of Värmland County Administrative Board (Sweden) and Innlandet County Council (Norway).

BROADEN aimed to provide high speed Internet access on both sides of the border between Torsby municipality (Sweden) and Grue municipality (Norway), exploring an infrastructure-sharing model in a transnational context.

FOR YOU aimed to increase digital inclusion among the elderly population in the region, making use of a multi-generational approach where adolescents supported seniors to use digital tools.

The two pilots generated both direct outcomes and potential future values, including:

Direct outcomes

- Connecting a hotel on the Norwegian side of the border to the Swedish fibre broadband, enhancing their ability to operate successfully.
- Introducing seniors to digital tools, allowing them to get familiar with new digital services.
- Bridging the generational gap between adolescents and seniors in the municipalities by putting them in contact through digital training sessions.
- Highlighting the importance of digital inclusion, sparking a dialogue among both politicians and people working in the municipalities.

Potential future values

- The fibre expanded to the Norwegian side of the border could be used to connect more businesses and households, enhancing the attractiveness of the area by strengthening businesses, securing jobs and allowing inhabitants to make use of public services at a distance.
- Improved digital skills among senior citizens would allow them to make use of the digital infrastructure and public services provided at a distance, for example in the area of home care.

In addition to the above, the two pilots have contributed to the long-standing tradition of collaboration between Värmland and Innlandet. Both Swedish and Norwegian representatives emphasise the value

of this, especially as the pilots have been carried out at a time when collaboration across the border has been limited due to the Covid-19 pandemic. In this context, the pilots have an important symbolic value, illustrating that the collaboration between the two countries continues, despite the pandemic.

The two pilots also have the potential to be replicated in other geographical areas, further extending the potential value. Considering the infrastructure-sharing model explored through BROADEN, it constitutes a useful example both for other municipalities along the Swedish-Norwegian border, as well as for other neighbouring countries.

This report is produced by Analysys Mason on behalf of Torsby municipality. It is based on documentation from the two pilots, as well as interviews with the involved partners.

CORA – Connecting remote areas

For rural and remote areas to stay attractive for inhabitants and businesses, they need a healthy digital environment. However, rural and remote areas in the North Sea region often face challenges in regard to investments in digital infrastructure, as well as digital skills among the population. CORA evolved to address these issues, aiming to “*bridge the digital divide, improve public services delivery and create an environment stimulating digital innovation in rural areas*”.¹

Considering the digital ecosystem as a whole, CORA focuses on three dimensions:

- Digital infrastructure
- Digital services
- Digital skills

The CORA partnership involves 18 partners from seven European countries. Together, they work to empower rural areas towards digital transformation, connecting remote areas with digital infrastructure and services.

The CORA concept consists of three main steps; identifying common local challenges, testing solutions to overcome these, and enhance knowledge transfer. As part of the concept, nine pilots have been carried out by the CORA partners. The pilots have been aligned with the digital conditions and local priorities in each area, ranging from advancing telecommunication infrastructure to developing digital skills and new digital services.

Built on the findings, the CORA model has been developed, including guiding measures, good examples, and training materials targeted towards local communities, authorities and enterprises.



¹ CORA. About. <https://coraproject.eu/>
CORA. CORA model. <https://coraproject.eu/model/>
CORA. Digital transformation – Stories of connecting remote areas with digital infrastructure and services. https://coraproject.eu/wp-content/uploads/2021/02/210209_CORA_brochure-digital-trasformation_final_web.pdf

Bridging the digital divide in a border region

As a rural and sparsely populated area, the border region between Värmland County (Sweden) and Innlandet County (Norway) is facing challenges in regard to the digital divide. Broadband access could help make the region more attractive for businesses and inhabitants by improving the opportunity to work, learn and access public services at a distance. Also, in this rural areas physical bank offices, healthcare and other public services are less accessible than in urban areas, further increasing the need of residents to be able to access digital services.

In light of this, a pilot aiming to provide high speed Internet access to both sides of the border between Torsby municipality and Grue municipality has been realised with support from CORA. Also, both Swedish and Norwegian municipalities have worked to improve the digital skills among its senior citizens. In addition to Värmland County Administrative Board, Innlandet County Council, Torsby and Grue municipality, the initiatives involved Eidskog and Kongsvinger municipality on the Norwegian side of the border.

Värmland County Administrative Board (SE)
Torsby municipality (SE)
Innlandet County Council (NO)
Grue municipality (NO)
Eidskog municipality (NO)
Kongsvinger municipality (NO)



Illustration by Analysys Mason

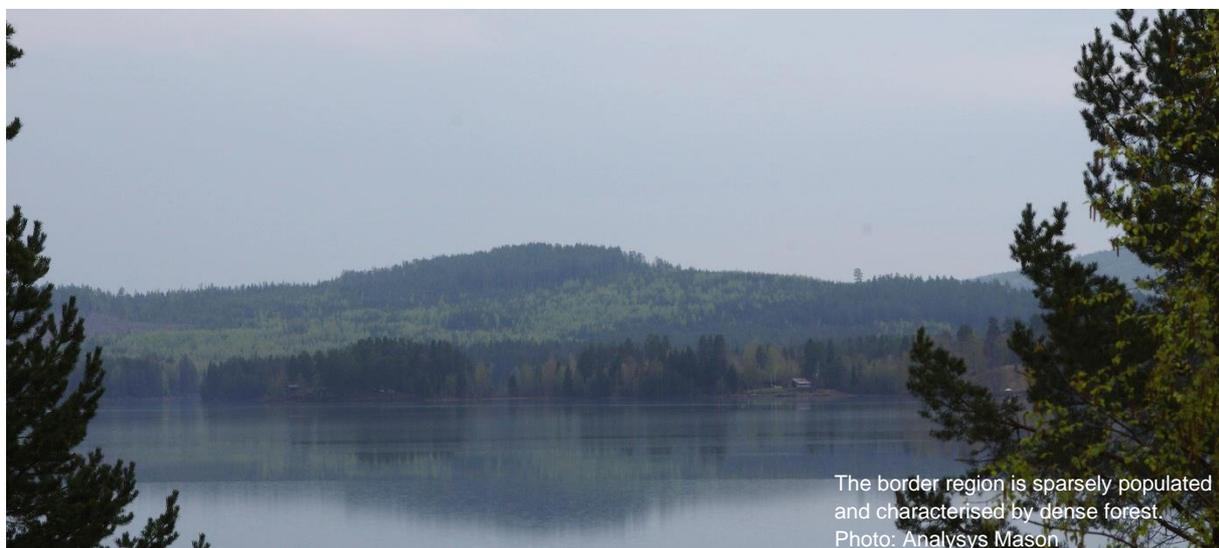
A remote and sparsely populated area

To understand why these initiatives were carried out here, one need to better understand the local context. The border between Torsby municipality and Grue municipality is characterised by dense forest, and as a remote area with few potential customers it has difficulties attracting investments in broadband infrastructure. Also, the municipalities share the same challenges in regard to depopulation and an elderly population. The elderly is a group that risks being excluded from the digital society if they do not have access to digital infrastructure, or the skills necessary to use it.

The table below gives an overview of the population and area of the four involved municipalities, as well as the area covered by buildings and forest respectively. Using the capital of Sweden as a reference point clearly illustrates the differences in geography and demography in these rural areas.

	Population 2020	Average age	Area in square km	Population in square km	Area covered by buildings	Area covered by forest
Grue	4 545	49	837	6	< 1%	79%
Eidskog	6 099	47	640	10	< 1%	82%
Kongsvinger	17 851	45	1 036	19	< 1%	80%
Torsby	11 549	47	4 162	3	1,7%	88%
Stockholm	975 551	39	215	5 211	55%	23%

Table 1: Comparison between municipalities. Source: Statistics Norway, Statistics Sweden.



The border region is sparsely populated and characterised by dense forest.
Photo: Analysys Mason

Historical collaboration across the border

Although there is an international border crossing this region, Swedish and Norwegian citizens live their lives across the border, with families, friends and jobs that are not constrained by a boarder on a map. Across the border, there is also an area called the Finn forest, named after the people from Finland coming here in the 17th century.² With a unique cultural environment, this area is shared between Sweden and Norway, further blurring the border between the two countries.

² Värmlands museum. *Finnskogen, vägen till världsarv*. <https://varmlandmuseum.se/mer-pa-museet/projekt/finnskogen-vagen-till-varldsarv/>

We who live here live our lives across the border, with families and jobs. (politician Torsby municipality)

For centuries, there has been an ongoing cooperation between Sweden and Norway in our region. The Finn forest is located across the border. It is natural that we cooperate with our Norwegian neighbours in different areas. (politician Torsby municipality)



The Finn forest is an area shared between Sweden and Norway. Photo: Analysys Mason

With this mentality and tradition of collaboration across the border in areas such as public transport, tourism and more, it came naturally to also cooperate around the digital ecosystem. While there are many similarities when it comes to the geography and demography across the border, Sweden and Norway have different models for broadband expansion in remote areas. As a member of the European Union, Sweden has received funding to deploy fibre broadband also in remote and sparsely populated areas, whereas Norway has not been able to roll out broadband in rural areas to the same extent. For Norwegian businesses and villages close to the border this entails that it would sometimes be more resource-efficient to connect to the fibre broadband deployed in Sweden.

This is the case in the border region between Torsby municipality and Grue municipality. Close to the border on the Swedish side, there are a few households with access to fibre broadband. Only a few kilometres from the border on the Norwegian side, Finnskogstoppen Hotel is situated. On the Norwegian side, there is also a small village, Svullrya with about 250 inhabitants. Before the pilot was carried out, there were no plans to offer broadband to these locations on the Norwegian side of the border.

Sweden has been good at expanding fibre broadband. In Norway, it has taken longer. Many telecom operators were clear that in areas such as the Finn forest, the digital development would decline. Then we had to think about what we could do to address this and it became very interesting to turn to Torsby municipality that was deploying broadband near the border in several areas. (business advisor Grue municipality)

Considering the blurred line between Sweden and Norway in this region, Swedish representatives highlight that broadband access on the Norwegian side of the border would not only benefit Norwegian businesses and citizens, but also Swedish inhabitants.

It is a lot about goodwill and good cross-border cooperation. At the moment it may feel like we are helping them [the Norwegians], but over time you do not know what it will look like, they may be able to help us. There are an incredible number of people in the border municipalities who commute and work in Norway. It is clear that it also benefits the people of Värmland when there is a good connection on the Norwegian side.
(project manager Värmland County Administrative Board)

Two pilots complementing each other

Considering digital infrastructure, skills and services to form a digital ecosystem, the two pilots carried out in the border region complemented each other. By focusing on establishing a model for infrastructure sharing across a national border, *BROADEN*, creates the physical conditions needed in a digital society. In turn, *FOR YOU* targeted digital exclusion among elderly in the border region, growing the skills necessary to benefit from the digital infrastructure.

On both sides of the border, we have a fairly similar demography. If you expand the technical infrastructure so that it has high capacity, the human capacity to use it might not follow along. The FOR YOU/More digital concept carried out in Sweden opened our eyes and we saw that it was a perfect fit to offer such sessions to our inhabitants. It was a huge success that we implemented in all three Norwegian municipalities [Grue, Eidskog and Kongsvinger]. (business advisor Grue municipality)

The figure below gives an overview of the timeline of the two pilots. *BROADEN* was initiated in July 2017 and the project is formally ending the last of June 2021. The first training session for seniors carried out with support from CORA was conducted in February in 2019, and the last one in October the same year.

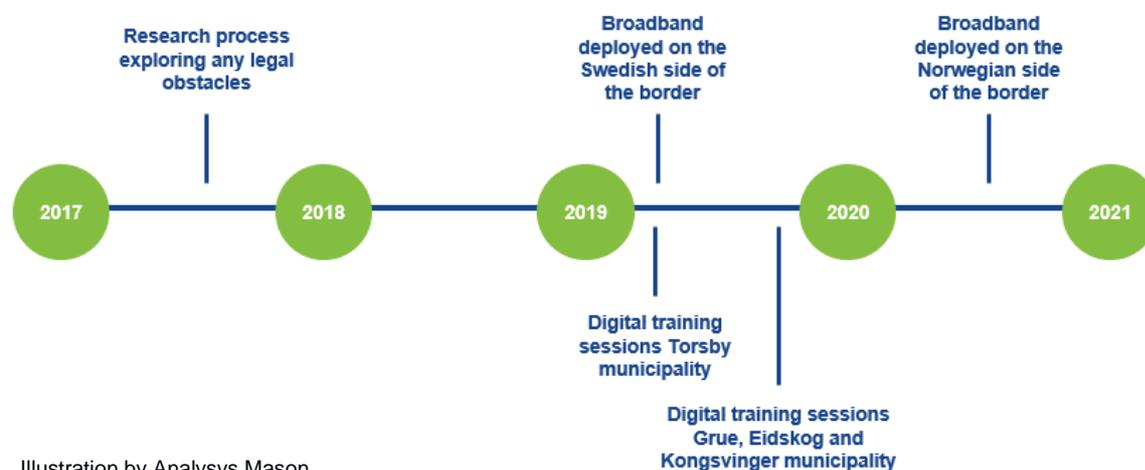


Illustration by Analysys Mason

BROADEN – Broadband across border Sweden-Norway

To develop a model for infrastructure sharing, partners from Sweden (Värmland County Administrative Board and Torsby municipality) and Norway (Innlandet County Council and Grue municipality) initiated a research process to examine the differences in models for broadband expansion between the two countries, and determine the technical requirements. They were further in dialogue with the Swedish

Post and Telecom Authority, the Swedish Civil Contingencies Agency and the Norwegian Communications Authority to investigate the regulatory frameworks and identify any obstacles to broadband expansion across the border.

As no legal or technical barriers were found, the partners could move on to the operational part of the pilot. Torsby municipality were responsible for the roll out of fibre from Rördåfors to the border. In collaboration with a procured fibre supplier, OneCo Networks, an underwater cable was placed in lake Røjden/Røgden, extending the fibre to the Norwegian border.

At the border, a cabinet was established from which Grue municipality was responsible for the further deployment. Also Grue municipality collaborated with OneCo, which facilitated the handover at the border. The fibre was taken from the border cabinet and extended through lake Røgden, to a fibre cabinet at the crossing direction of the village Svullrya. Here, Finnskogstoppen Hotel connected to the fibre cabinet.

No legal barriers were found

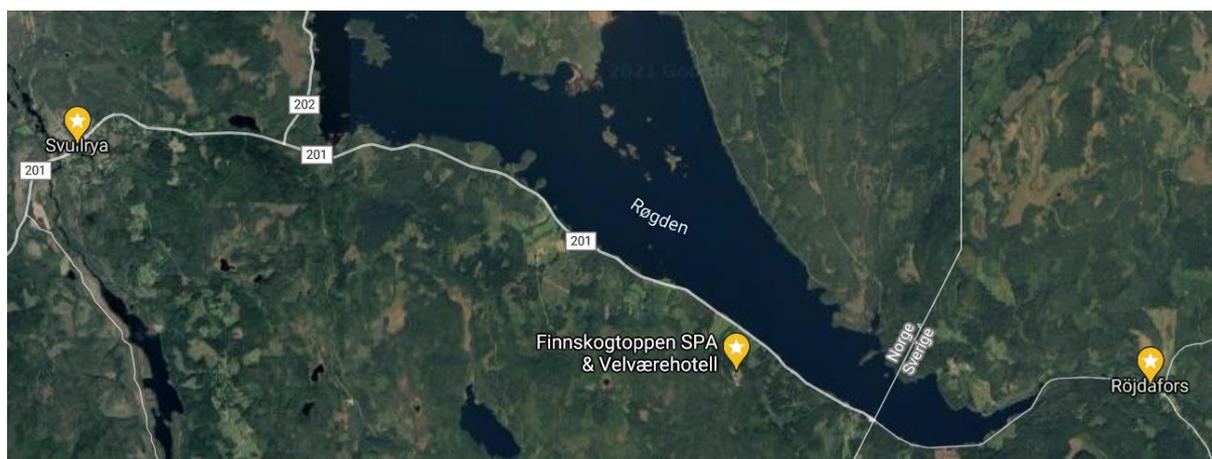
For previous broadband expansions across the Swedish-Norwegian border, the national authorities have provided the following information:

The Norwegian Communications Authority

"There are no formal barriers, but there is a duty of registration for the party building, operating and providing access to electronic communications networks used for the provision of public electronic communications services."

The Swedish Post and Telecom Authority

"There should not be an issue for a Norwegian broadband network to connect to a Swedish one as long as an agreement is signed. If the Norwegian company has operations or owns infrastructure in Sweden, they may be required to report according to LEK (Act 2003:389 on electronic communication)."



The total distance from Rördåfors (Sweden), to Finnskogstoppen Hotel (Norway) is about 7 kilometres.

Photo: Google Maps

As part of the pilot, Telia Company (Sweden) offered services to Finnskogstoppen Hotel exclusively. However, this brought challenges in regard to the services. As the broadband provider and the end-user are located in different countries, the end-user received an IP address from the country of the broadband provider, which initially affected the supply of TV services.



The fibre broadband is rolled out to the Norwegian side of the border through lake Røjden/Røgden using an underwater cable.

A short video documents the deployment:
<https://www.youtube.com/watch?v=p36hdkkHAVU>



Photo: Elisabeth Johansson, OneCo

FOR YOU – countering digital exclusion

To increase digital inclusion among the elderly, partners applied a concept developed by Telia Company (Sweden), called “*Mer digital*” (*More digital* or *Go digital* in English). The concept is based on a multi-generational approach, where adolescents support seniors to use digital tools.

The project called *Till Dig (FOR YOU)* was carried out in 15 of 16 municipalities in Värmland, with Värmland County Administrative Board and Region Värmland as the project owners. In three of these municipalities, the training courses were carried out in collaboration with CORA. Also the Norwegian municipalities Eidskog, Grue and Kongsvinger applied this concept with support from CORA.

In each municipality a number of training sessions were organised, targeting senior citizens. To inform the elderly about the possibility to participate, an invitation was sent by mail to all residents over the age of 65. The adolescents, aged 13–15, were recruited from the local schools. Ahead of the first session, they received a short briefing on how to best support the elderly.

We identified the target group in Grue municipality and sent an email to all citizens over the age of 65 living at home. We found out that we had several citizens over 100 years living at home. Then we arranged with adolescents from the local schools to be teachers and we had Telia providing the digital tools. We had three adolescents at each table, and as many seniors. (business advisor Grue municipality)

The training sessions were held in schools, conference centre or alike in each municipality. Telia Company (Sweden) provided digital tools, such as computers and tablets, and made sure the premisses had good internet connection. To make it easy for the elderly to participate, Torsby municipality and Eidskog municipality offered its citizens free transport by bus to and from the sessions.

We tried to make it an exciting experience to the elderly. We had a red carpet, marshals and cider as a welcome drink. We wanted them to feel very welcome. (digitalisation strategist Torsby municipality)

A short video from the Norwegian sessions:
<https://www.youtube.com/watch?v=tUCjp1kH2-M>



Photo: Värmland County Administrative Board

Each session lasted for about three hours, including a social coffee break. The adolescents and the seniors were placed together at tables, allowing the adolescents to support the elderly with their questions. Also some representatives from Telia Company (Sweden) and the municipality assisted the seniors. The seniors were the ones guiding the sessions, deciding what they wanted to explore and what questions they wanted help with. If the elderly run out of questions, there were small cards placed on each table, suggestion possible activities such as “*would you like to learn about...?*”. Moreover, some municipalities invited actors representing public transport, banks and alike that could showcase their digital applications to any senior participants interested.

Direct outcomes and potential future values

There are both direct outcomes generated by the pilots, as well as potential future values. In addition, as the pilots address different parts of the digital ecosystem (digital infrastructure and digital skills), there are positive synergies between them.

Creating conditions for a well-functioning business

Considering the direct effects of *BROADEN*, Finnskogstoppen Hotel has been connected to fibre broadband, allowing the hotel and its guest to benefit from fast and robust internet connection. Before the hotel was connected to fibre it made use of airborne internet that was not as fast nor reliable. Representatives of Finnskogstoppen Hotel describe that they had difficulties managing their online booking system, and that their guests complained about the poor connection.

A well-functioning internet connection is stressed to be a minimum requirement for a hotel to be able to operate today. Finnskogstoppen Hotel further highlights that with the fibre broadband connection their system works smoothly and their guests are satisfied with the internet connection.

Today, our systems work and our guests are happy. It is a minimum requirement that a hotel has internet today. (representatives of Finnskogstoppen Hotel)



Connecting more businesses and inhabitants

Looking at the potential future values that could follow from *BROADEN*, the fibre could be used to connect more businesses and households on the Norwegian side of the border. This would further expand the value generated by the pilot, allowing more people to benefit from next-generation access technologies and the opportunities they bring. To exemplify, a small grocery store in Svullrya, Joker Grue Finnskog, is currently exploring the possibility to keep the store open 24 hours a day by making use of digital solutions. To be able to fully reap the benefits of digitalisation, access to fast and robust internet connection is crucial.

Access to fibre broadband would be expected to further strengthen businesses and secure jobs in the area, as well as allowing inhabitants to make use of public services, such as e-health, at distance. As the border region between Torsby and Grue municipality is seen as a joint region, improved connectivity on the Norwegian side is emphasised to benefit also Swedish inhabitants and businesses.

Although it is the Norwegian side that is connected to fibre broadband through this pilot, residents and businesses in Sweden benefit from the Norwegian side being connected. Among other things due to jobs and benefits for Swedish business operations. (politician Torsby municipality)

Moreover, if the broadband from Sweden would be extended on the Norwegian side and connected to their national fibre infrastructure, it would enhance redundancy in both countries' broadband networks.

An opportunity for seniors to get familiar with digital tools and services

Looking at the direct effects following from the *FOR YOU/More digital* sessions, it allowed senior residents to become familiar with digital tools and services. Although regular training is needed to consolidate new knowledge, these sessions constituted an important starting point to build upon.

In Sweden, Värmland County Administrative Board conducted a survey among participants from seven different sessions, illustrating that many seniors felt more comfortable with digitalisation after taking part in the training sessions. This could in turn form an important basis from which senior residents could continue to learn and try on new digital services.

Looking at the potential future values, improved digital skills among seniors would allow them to make use of public services at a distance, for example in the area of home care.

Bridging the generational gap

An unexpected effect of the sessions emphasised by representatives from the municipalities is that it helped bridge the generational gap between young and senior citizens. In addition, not only the elderly benefited from the sessions, but also the adolescents are described to have grown by the experience. Many adolescents participated at more than one session, clearly showing their development and improved confidence.

Many seniors thought that it was very nice to meet the adolescents. They made new friends that they can send an email to, or say hi to when they meet at the city centre. It helped bridge the gap between generations, which we had not expected. (project manager FOR YOU Region Värmland)

The adolescents grew somewhat copious when they were allowed to help. The first day they were very nervous, the second day they sat there like professionals. (digitalisation strategist Torsby municipality)



Photos: Värmland County
Administrative Board



Highlighting the importance of digital inclusion

The initiative *FOR YOU* further sparked a dialogue in the municipalities about the importance of digital inclusion, involving both politicians and people working in the municipalities. To exemplify, some of the municipalities have started to work more actively through their libraries to support elderly in using digital tools and services. In Torsby municipality, the digital centres, Digidelcenter, at the libraries in Torsby and Sysseleback were promoted to seniors that wanted additional support after the training sessions. Moreover, at the time of the interviews, there are plans to advance the training for elderly further in Eidskog municipality.

Enhancing collaboration during the Covid-19 pandemic

Moreover, the pilots have contributed to the long-standing tradition of collaboration between Värmland and Innlandet. Both Swedish and Norwegian representatives emphasise the value of this, especially as the pilots have been carried out at a time when collaboration across the border has been limited due to the Covid-19 pandemic. In this context, the pilot projects have an important symbolic value, illustrating that the collaboration between the two countries continues, although the pandemic has made the border more prominent.

I am passionate about cooperation and getting cooperation across borders, allowing municipalities to get to know each other. It opens up for new collaborations. Especially now when the border has been closed, if we could present and show this project, it would be something positive for both countries – we have something that has worked well despite Corona. (broadband coordinator Torsby municipality)

We have always had a good collaboration with the Swedes. In the area of digital infrastructure it has become a closer collaboration through this project. Värmland and Torsby municipality have know-how that we have been able to learn from, both when it comes to fibre and the More digital sessions. (managing director business development Eidskog municipality)

Lessons learned

Looking at the lessons learned, the partners involved especially highlight that the pilots demonstrate that these initiatives are possible to realise, creating opportunities for replication. Also, the commitment, engagement and collaboration among members of the project groups are put forward as a crucial success factor in realising the two pilots.

Opportunities for replication

BROADEN has identified that there are no major legal restrictions to build fibre broadband across an EU border. As such it could work as a door opener for municipalities in Sweden and Norway, as well as for other neighbouring countries in Europe to establish similar initiatives. To exemplify, at the time of the interviews, Eidskog municipality is looking into the possibility to carry out a similar project, connecting two Norwegian villages close to the Swedish border with fibre from Sweden.

We are a forestry municipality, sparsely populated. There are two villages in Eidskog where fibre is deployed almost to the border on the Swedish side. If it is possible to realise this [infrastructure-sharing model], it has great potential for Eidskog. It is completely unrealistic that we would be able to roll out fibre from the Norwegian side to these villages. If we would manage, this would mean a lot to the people in these villages. They had never received fibre from Norway, it would have been too expensive. (managing director business development Eidskog municipality)

Representatives of the project group specifically highlight that the pilot brings value as it demonstrates that it is possible to realise an infrastructure-sharing model across country borders.

It works, be stubborn. That is what I would like to pass on, to not give up. (broadband coordinator Torsby Municipality)

The logic behind the model is to bring together stakeholders and find a business model. This is something that goes in line with the European target, a unique digital single market, cross sector, interoperability. There is basically no border when it comes to digital borders. It is paving the way for a borderless digital Europe. (project manager CORA)

Also the pilot *FOR YOU*, and the multi-generational approach used would be possible to replicate in other geographical areas. Swedish and Norwegian representatives highlight how it not only provided an opportunity for the elderly citizens to familiarise themselves with digital tools and services, but that it also helped bridge the generational gap in the municipalities and sparked a dialogue on how to further counter digital exclusion.

Challenges in regard to who should provide the services

While *BROADEN* has demonstrated that there are no legal or technical restrictions to build broadband across the border between Sweden and Norway, it has raised questions in regard to who should provide the services. As part of the pilot, Telia Company (Sweden) has offered services to Finnskogstoppen Hotel exclusively. Going forward, aiming to connect more businesses and household to the fibre infrastructure, Grue municipality is in dialogue with Telia Company (Norway) to try to find a solution. Replicating this concept in other areas, this aspect should be taken into account and addressed at an early stage.

One of the involved partners further stresses that this question would benefit from being discussed by politicians in an international context, considering how infrastructure sharing of fibre broadband in border regions could be facilitated.

Commitment, engagement and collaboration

The commitment and engagement among the members of the project group is put forward as a crucial success factor. Interviewees stress that the partners involved have been devoted to find solutions to any issues, big and small. Also the collaboration among partners is emphasised to have been crucial for the realisation of the two pilots. In this context, the different roles that partners have taken on is specifically put forward.

To illustrate, Värmland County Administrative Board and Innlandet County Council have coordinated *BROADEN*, organising the common meetings, managing the reporting to the CORA secretariat and explored the legal and technical aspects of the infrastructure-sharing model. This has allowed Torsby and Grue municipality to focus on the operational parts, procuring broadband suppliers and deploying the broadband on each side of the border.

Members of the project group further highlight that the structure provided by the CORA secretariat in regard to the goals they had to formulate was helpful for the successful implementation.

Turning to the pilot *FOR YOU*, Region Värmland and Värmland County Administrative Board coordinated the initiative on an overall level in Sweden, in close collaboration with the municipalities. The concept could then be transferred also to the Norwegian municipalities Eidskog, Grue and Kongsvinger, and picked up by Telia Company (Norway).



Part of the *BROADEN* project group at the border between Norway and Sweden. Photo: Värmland County Administrative Board

References

Interviews conducted

Organisation	Role of interviewee
Värmland County Administrative Board	Project manager <i>BROADEN</i> Project coordinator <i>BROADEN</i>
Innlandet County Council	Project manager <i>BROADEN</i> Adviser, Industry and international cooperation, Section for innovation and development
Torsby municipality	Broadband coordinator/administrative officer Digitalisation strategist Two local politicians from municipal council
Grue municipality	Business advisor, Section of plan and development Managing director, Business development
Eidskog municipality	Managing director, Business development
Region Värmland	Project manager <i>FOR YOU/Till DIG</i> on regional level
atene KOM GmbH	Project manager CORA
OneCo AB	Fibre planner and project leader installation
Telia Company, Norway	Business solutions manager
Finnskogstoppen Hotel	Chairman of the board General manager

Documentation from the pilots

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