MARA
Mobility and Accessibility in Rural Areas

Interreg
Baltic Sea Region

EUROPEAN UNION
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EU STRATEGY FOR THE BALTIC SEA REGION
FLAGSHIP

Regional Action Plan

Piloting an integrated system for e-bikes + car sharing to increase mobility in Setesdal (Norway)

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Content

Introduction

MARA – Mobility and Accessibility in Rural Areas – aims to improve the accessibility and mobility in touristic remote areas of the BSR by increasing the capacity of transport actors. The project is funded by the Interreg Baltic Sea Region Programme 2014–2020. The project is gathering 12 full partners and 13 associated partners from nine countries surrounding the Baltic Sea. The partnership is made up of regional and national public administrations as well as universities.

Several common challenges are faced by rural areas of the Baltic Sea Region:

- Population decline/demographic change
- Seasonal fluctuation of population/tourists
- Expensive public transport
- Car dependent lifestyle
- Many stakeholders involved
- Lack of using digital solution

MARA aims to crosscheck the actual mobility demand of residents and tourists with current mobility offers. The project aims to increase the capacity of regional and local transport actors to address multifaceted mobility needs by:

- improving existing services
- developing and testing innovative sustainable mobility solutions for remote areas.

Finally, the project will integrate its improved or new mobility approaches in remote areas into regional spatial and mobility development plans. This will increase the long-term impact of the main outputs and help to share the project results with other BSR regions.

Setesdal and Åseral make up one region in Southern Norway. The region is inland area, and is distinguished by beautiful and pristine nature. The municipalities that constitute this region are:

- Evje and Hornnes
- Åseral
- Bygland
- Valle
- Bykle

The total population of the five municipalities is 7.857, and Evje and Hornnes is the municipality with the highest inhabitant number.

Figure 1. Maps on Setesdal location, from Open Street map

Despite the proximity of the region to the large towns, Arendal and Kristiansand, the region battles challenges related to population stagnation and demographic changes. Tourism is a growing industry within the region, particularly nature and culture based tourism.

Setesdal inter-municipal political council is a partner of a EU project aiming to shed light upon and improve mobility and accessibility in sparsely populated areas. The project is financed by the

Interreg Baltic Sea Region Program. The project was commenced in January 2019, and is ongoing until September 2021. The project involves 12 partners of nine countries.

The project aims to elucidate challenges related to mobility and passableness in sparsely populated areas, and enquire into what extent changes to these factors will affect settlement patterns and attractiveness for tourists.

The challenges confronting the region in terms of mobility and passableness are:

- Inhabitants and tourists depend on private cars
- The road standards are generally poor
- Transport to and fro, and within the villages, are not up to par with the sustainable development which is sought-after

In this report we will analyse and report the status-quo of the mobility situation in our region as of today. We will take into view what kind of provision exists today, how the inhabitants and tourists use transport within our municipalities. And we will review the plans that are laid out beneath the existing mobility situation, and what the future plans are. Interested parties will be described accordingly to the role they possess in relation to the mobility situation of Setesdal and Åseral. These are inhabitants, the municipal politicians and their administration, the transportation offerer, regional and national authorities and businesses.

As part of the MARA Project, a survey was conducted among the inhabitants of the region, and, also a mapping of existing plans that concern mobility and transport.

A separate project on el-bikes is described in pursuit of establishing a system of el-bikes in Setesdal. Other projects that are carried through by MARA partners may be included in this report when they are ready.

The report describes first of all the existing, current mobility situation in Setesdal and Åseral, and subsequently points on what needs are related to this. Following that, there is a description of possible disparities between the current situation and newly revealed needs. These disparities form a base on which to form suggestions of innovative solutions that may reduce these disparities. The report will provide some recommendations on how to progress with work on mobility in Setesdal and Åseral, added with a brief conclusion at the end.

Transport planning – national and regional level regulations

The Setesdal and Åseral municipalities are defined as district municipalities in Norway. There are various programs and projects that works specifically to improve mobility and transport in the districts, and which affects our region also. These are national, regional, inter-municipal and municipal.

The outset of most of the programs and projects lie in the challenges that also our project has defined as challenges in rural areas:

- Vacating and demographic changes
- Exceedingly season-based variations in terms of number of people who live in/visit the region
- Expensive public transport
- Car-dependent lifestyle
- Lack of involvement and engagement from interested parties
- Lacking in use of digital solutions

In this chapter we would like to describe disclosed needs in rural areas on national, regional and local levels by using existing planning works as a starting point. The plans describe needs that result in goals which are to prioritised within the time scope of the plans.

Then we will walk you through the results from the survey among the inhabitants and the answers that were returned in relation to what may improve mobility and accessibility in Setesdal and Åseral. We also intend to briefly comment results from the answers on mobility from the inhabitant surveys in Bykle and Bygland, i.e. their opinion.

No separate survey on mobility and tourism was carried out in the region. During spring 2019, a survey on tourists visiting the region on the background of Setesdal being a sustainable destination was conducted, and some of the results from this survey will be commented.

With regards to mobility needs, we also quickly want to describe the general needs that follow demographic changes, and needs that are clarified by the commitments to reduce carbon emissions.

National Regulations

The overriding terms of reference for mobility development in Norway, is National Transport Plan 2018-2019 (NTP) (source: the government, national transport plan). It is a plan that rotates every fourth year. The plan represents the transport policies of the presiding government, and describes what goals and principles will make up the foundation for the development of the assembled system for roads, rails, air traffic and naval transport. The plan outlines the wishes and needs as proximate goals that the government will work with (NTP, p. 105). Particularly for rural areas, the following points from the plan are important:

- Improve passableness for persons and goods in all the country.
- Connect regions and various parts of the country by prioritising measures that reduces travelling time.
- Continue the attempt to contain the maintenance lagging.
- Accommodate for larger living and labour market regions by developing infrastructure and improvement of public transport.
- Continue the contribution of upgrading and renovating the county roads.

Important changes to the mobility need that are described in the plan, are measures that will prompt more people to walk or cycle (NTP, p. 106), among them improve maintenance of walk and cycle paths during winter season. The government has also in its report to the Storting (Meld.ST.5) emphasised the importance of an infrastructure that connects the country together, including focusing on novel solutions that induce mobility and access to services.

Regionally (Agder County Municipal og Setesdal Regionråd)

Regional Transport Plan Agder 2015-27

The main administrative document for transport and mobility is Regional Transport Plan Agder 2015-27 (TRPA), which was agreed upon by the two county councils in Aust- and Vest-Agder, and was Agder's main contribution to National Transport Plan 2018-27. Regarding the municipalities of our region, one need in particular is described as important, and it is the common theme «Agder

- one mutual work and living area» (TRPA, p. 13), and where the build out of RV9 in particular is mentioned as the very life nerve of Setesdal, and a central road that binds the municipalities and the region together with other regions. The need for reparations of the roads network is described in chapter 13, p. 27-31 of the plan. Both RV9 and the county roads are mentioned, and the latter is deemed to be in the need of considerable investment. Below the paragraph on county roads, the mending needs of County Road 42 is described in detail. It is a common county road that binds the region together. A contribution to this build out is argued for by pointing to the fact that «Agder is sparsely populated with many district municipalities and local communities that depend on a well-functioning roads network that reduce the disadvantages of long distances.» (RTPA, p. 30).

Region Plan Agder 2030

It is the principal strategy document for Agder county municipal (source: Agder fylkeskommune, Regionplan Agder 2030). The has a separate chapter on transport and communication, and the future visualisation is based on these prerequisites:

- The transport needs in Agder are reduced.
- Mobility solutions that are environmental friendly, efficient, secure and with universal design are available.
- Necessary infrastructure designed for a low-carbon society is built out.
- The share of people who travel on foot, bike or with public transport has increased.
- Infrastructure for transport and communication is adapted to climate changes and extreme situations.
- Digital infrastructure is robust, with good capacity and internationally well connected.
- The planning of land use and transport system will facilitate a sustainable social development.
- Agder is still prepared for future transport solutions.

Agder county municipal has passed a bill to create their own mobility strategy in order to meet needs of the future. This work was commenced autumn 2020, and Setesdal and Åseral will be part of this plan. The plan will aim to elaborate the main goals described in Region Plan Agder 2030 by adding tangible specifications that show the overall responsibility and efforts of the county municipal on mobility.

Setesdal Inter-Municipal Political Council

Setesdal inter-municipal political council (IPR) is an inter-municipal collaboration between the municipalities Evje og Hornnes, Bygland, Valle, Bykle and Åseral. The council work with three main areas – infrastructure, inter-municipal collaboration and development of the private sector. The strategy plan of the council, Regional Development Plan for Setesdal 2020, also treats mobility and infrastructure with strategies that describe an adequate physical and digital infrastructure as prerequisite to the development of businesses and tourism. More specifically, it suggests to build out RV9 and to develop a district friendly public-transport facilities. The work on a new strategy plan for the council was commenced in 2020.

Municipal Plans

All of the Setesdal and Åseral municipalities has their own municipal plan, containing one community part and one land part. The plans make up the groundwork for municipal doings and aim to describe the future development that is called for within the municipalities.

The community part of the municipal plans grapple with the possibilities of i.e. establishing transport services internally in the municipalities, requests to strengthen public-transport facilities in general, expansion of roads on al levels and the development of walk and cycle paths. In the land part of the municipal plans, the municipal councils decide what use of land is to be permitted, and what limitations are applicable in land areas by determining land-use objectives, zone requiring special considerations and general and purpose related plan regulations and administrative arrangements. This may mean that regulations direct that new residential areas are placed near existing public-transport facilities, that walk and cycle paths must be accommodated for, or require considerations to be made into how new residential areas might reduce carbon emissions in connection to transport.

In the land part of the municipal plan of Evje and Hornnes, p. 7, the regulations that are laid down in the traffic security plan are described. They will secure the development of school roads and modern housing which ought to be situated close to the main roads in the region (source: Evje og Hornnes kommune, kommuneplan). On p. 9, it also lay out the regulations that mandate residential areas are to be planned in connection to public services in the municipality, and that the future use of land must contribute to reduce carbon emissions from road traffic (p. 19). Descriptions of the need for a well-built infrastructure for pedestrians and cyclists is also included.

In the municipal plan of Åseral, the need to concentrate public health services within shorter distances between medical practitioners and physiotherapists is emphasised (source: Åseral kommune, kommuneplan). It is also defined in the plan that all public roads are required to have asphalt coating within 2024, and the municipal plan has a strategy on the establishment of

charging stations for el-cars. In similar manner future effects of the climate changes on municipal roads mentioned, and it is pointed out that it may aggravate maintenance lagging some places.

Valle municipal has in its own municipal plan several strategies which point to how one visualises a further expansion of the roads network, which among other things contributes to secure «an efficient, future-oriented and safe roads network» (Valle kommuneplan 2016-2028, samfunnsdelen, p. 33). The plan also emphasises that improved communication means a lot to settlement, business and tourism. In the very same plan, it is also written that a renovation of the main roads network will provide the municipal with a more varied and flexible labour market.

Figure 2. Map: Roads network out of and into Valle ; from Valle municipal plan

Bygland municipal depicts in their municipal plan a future vision in which the transport sector in 2032 largely has become electrified. The aforementioned future vision also describes «new, flexible public transport solutions have contributed to curb the growth of the passenger car traffic» (Bygland kommuneplan 2020-2032, samfunnsdel, p. 22), and they envision that walking and cycling paths are well constructed, allowing people to easily walk or cycle to work, nursery, school and shops. The municipal wishes to be a driving force behind an improved public transport facilities in the municipality. One measure that is referred to, is that environmental transport and access to

walking and cycling paths will be accommodated when new expansions and regulations are formed.

The municipal plan of Bykle describes specific intermediate aims related to its work with transport and mobility, amongst them active influence on building roads, prioritise pedestrians and cyclists while doing the planning, accommodate for public transport and work to get a hamlet bus operating, in addition to taxi (source: Bykle kommune, kommuneplanen).

Description of the region and existing mobility models/offers

The five municipalities, Evje and Hornnes, Åseral, Bygland, Valle and Bykle, make up the region Setesdal and Åseral. All together 7.857 inhabitants reside in the five municipalities. 44 per cent of the inhabitants live in Evje and Hornnes municipality, which decidedly is the largest municipality of the region. All the municipalities are situated within the ambit of district-targeted investment support. This field of application is valid for several areas of the country that struggle with certain challenges that can be met with district political measures. The characteristics of such municipalities within these areas, are (source: Ministry of Local Government and Modernisation (KMD)):

- Reduction of or no increase of the population
- Vast distances
- Challenges in employment, labour market and living conditions
- A growing portion of the population is ageing

Measures put to use are reduced employers' National Insurance contributions, investment support to businesses and concentrating on transport, ample health care services, education, research and innovation pursuing a well-functioning regional development and regional balance (source: KMD).

Setesdal and Åseral maintain an extensive road network, and the use of cars is prevalent. The road standard is adequate along the newly renovated Classified Road 9, which runs through all of Setesdal. The condition of the remaining roads in Setesdal and Åseral vary greatly.

Public Transport

The only available public means of transport in Setesdal and Åseral is bus. The public owned transport company Agder Kollektivtrafikk (AKT) (www.akt.no) runs the bus lines in Setesdal and Åseral. AKT is owned by Agder county municipality and Kristiansand municipality, and retains the

responsibility of all public transport in Agder, including school buses and schedule information. School pupils make up around half of the passengers on the buses in Setesdal, and remains an important factor in the ability to maintain the public bus transport (Agder Kollektivtrafikk årsmelding, p. 40).

In Setesdal and Åseral AKT runs the lines internally in Setesdal and Åseral, and those traverse the borders of the region. These lines are:

170: Haukeli- Hovden – Evje – Kristiansand

178 Åseral – Evje

172 Eiken –Evje

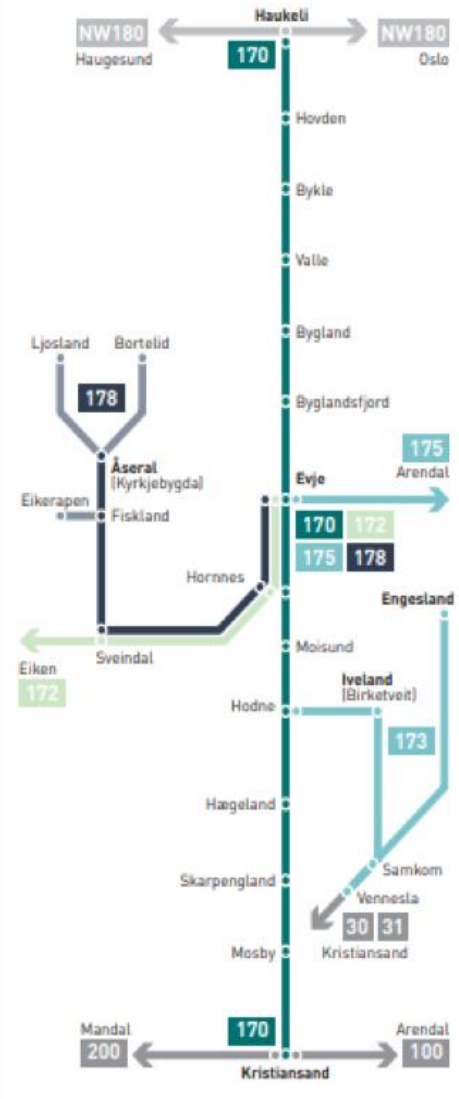
175 Evje – Arendal

During 2019, there were 207.105 boardings all together on these lines. More than half of them are schoolchildren and high school students. Line 170 is the most frequently used, and carries out half of all the bus transport within the region (source: all numbers; AKT)

Line 178 is a «bus on request» line, and the passenger is required to book the departure on the day prior to the journey, before 6 PM.

Setesdal Bilruter, which operates the bus lines in Setesdal and Åseral, has in recent years invested in Euro IV buses that emits significantly less than the buses previously used.

Figure 3. Map over bus lines Setesdal and Åseral; source AKT 2020



The Norwegian Public Roads Administration (NPRA), too, has invested in new bus shelters, a measure that will make it more appealing to take the bus.

At the ski resort, Hovden i Bykle municipality, there is a local bus that transports skiers to and fro the ski arenas and overnight accommodations, in addition to other selected bus stops. The Ski Bus is offered by Bykle municipality.

Results from the Inhabitant Survey on Public Transport

In the inhabitant survey on transport and accessibility carried out in Setesdal and Åseral during the summer of 2020, 7,9 per cent of the respondents answer that they avail themselves of bus daily or several times a week (Table 1).

Table 1. «Use of bus», from the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd

	Uses bus daily or sometimes during the week	Don`t use bus or use bus less than once a month
Åseral	8,8 %	84,6 %
E & H	11 %	73 %
Bygland	7,5 %	82,8 %
Valle	5,1 %	83,8 %
Bykle	3,1 %	85 %
Total	**7,9 %**	**79,6 %**

The age group 15-17 sticks out by that 56,3 per cent of them respond that they use bus daily or several times a week (table 2). No exceptions or specifications regarding school bus driving were made, and we must therefore assume that the high response rate is in accordance with this. The next group using bus most often, is the age group 18-24 (16,3%), and, subsequently the rate is declining with higher age. In reply to the question if they never or rarely use bus, those from the age 25 and upwards confirm most frequently.

Table 2. «Use of bus and age» from the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd.

		Age								
	Total	**Under 15**	**15 - 17**	**18 - 24**	**25 - 34**	**35 -44**	**45 - 54**	**55 - 64**	**65 - 74**	**Over 75**
Daily	3.3%	0.0%	18.8%	9.8%	4.2%	0.5%	3.0%	1.5%	1.7%	0.0%
A few times a week	4.6%	100.0 %	37.5%	6.5%	2.8%	4.0%	3.0%	3.6%	2.8%	2.9%
Several time a month	6.7%	0.0%	15.6%	17.4%	4.2%	2.5%	7.0%	3.6%	6.8%	20.0%
Once a month	5.8%	0.0%	3.1%	9.8%	4.9%	4.5%	2.2%	7.2%	8.5%	11.4%
Less than once a month	42.1%	0.0%	18.8%	27.2%	38.0%	41.9%	43.0%	49.2%	46.9%	54.3%
Do not use	37.5%	0.0%	6.3%	29.3%	45.8%	46.5%	41.7%	34.9%	33.3%	11.4%
Number of responses	1106	1	32	92	142	198	230	195	177	35

Evje og Hornnes is the municipality with the highest rates of bussing, where 11 per cent reply that they use bus daily or several times a week, while the municipality with the lowest use of bus is Bykle, with 3,1 per cent of the inhabitants using bus daily or several times a week. To the degree that bus is used, it is usually reserved for extended tours, and family visits is the most quoted purpose.

Tourists and Use of Bus

During the winter of 2019, a survey targeting tourists were conducted in Setesdal, on Setesdal as a sustainable destination. The respondents were asked, among other questions, which means of transport they had used to get to and from the destination. 6 percent of those who replied used bus. When the same group were questioned about what means of transport they used to get around on the point of destination, 3,5 per cent answered bus. Most likely they referred to the Ski Bus at the ski resort Hovden in Bykle municipality.

Use of Car

In a survey among inhabitants in Setesdal and Åseral on mobility and passableness, car appeared to be the most prevalent means of transport.

59,3 per cent of the inhabitants say they avail themselves of car on a daily basis, and, further 28.2 per cent use car several times a week (table 3). All together 87,5 per cent use car either daily or several times a week. Those who reply that they never use a car, or do so less than once a month, make up 4,5 per cent of the population. If we look at car use in terms of status on the labour market, age and sex, a male employee in Åseral appears to be the most frequent car driver. Car is most frequently used for all travel purposes, both regarding time spent and purpose.

Table 3. «Use of car» from the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd

	Use car daily or sometimes during the week	Don`t use car or use car less than once a month
Åseral	91,8 %	1,8 %
E & H	85,1 %	5,7 %
Bygland	89,8 %	3,5 %
Valle	90,2 %	3 %
Bykle	84,4 %	5,8 %
Total	**87,5 %**	**4,5 %**

Only 2,8 per cent of the respondents say they do not use car at all, and the majority of those are found in densely populated areas. The use of car is widespread in comparison to all other types of travel modes, and time spent. Over the last ten years the number of passenger cars in Setesdal has increased with 13 per cent (source: SSB.no/bilparken) (table 4). The growth was most notable in Åseral (26 per cent), and lesser in Bykle (1 per cent). Setesdal and Åseral have a car population density per inhabitant equivalent to 0,56, while it is 0,5 for the rest of the country. The fleet of cars in Setesdal and Åseral distinguishes itself from the rest of the country by containing significantly fewer electric cars in our region, 2,7 per cent of the fleet of cars is made up of electric cars, while the national average is 9 per cent.

Table 4. Number of cars in Setesdal and Åseral 2010.209; source Statistisk Sentralbyrå 2020

				2010	2019	Total No of cars 2010	Total No of cars 2019	Increase 2010-2019
K-4219 Evje og Hornnes	Private transportation	Petrol	Private cars	1 077	695			
		Diesel	Private cars	581	1 153			
		Electric	Private cars	0	65	1 658	1 913	15 %
K-4220 Bygland	Private transportation	Petrol	Private cars	440	252			
		Diesel	Private cars	212	442			
		Electric	Private cars	0	22	652	716	10 %
K-4221 Valle	Private transportation	Petrol	Private cars	404	268			
		Diesel	Private cars	253	445			
		Electric	Private cars	0	11	657	724	10 %
K-4222 Bykle	Private transportation	Petrol	Private cars	292	154			
		Diesel	Private cars	180	312			
		Electric	Private cars	0	9	472	475	1 %
K-4224 Åseral	Private transportation	Petrol	Private cars	244	171			
		Diesel	Private cars	203	381			
		Electric	Private cars	0	11	447	563	26 %
			Total			3886	4391	13 %
								%of increase that is electric cars
			Electric cars	0	118			23 %

The extensive car use is connected to settlement and access to public transport. They who live most scattered, use the car the most and have the narrowest access to a slim public transport provision.

Tourists and the Use of Car

During the winter of 2019, a survey targeting tourists were conducted in Setesdal, on Setesdal as a sustainable destination. The respondents were asked, among other questions, which means of transport they had used to get to and from the destination. 92,9 per cent of those who responded used a car (87,9 per cent private cars, 4 per cent el-cars and 1 per cent camper). When asked about transport within the point of destination, 76,9 per cent replied that they used a car as means of transport.

In Setesdal a significant increase of car traffic has taken place in recent years. In the traffic census station of Norwegian Public Road Administration (NPRA) by Classified Road 9 (RV9 S11D1 m5105) (source: Statens Vegvesen, car census) an increase of 32 per cent was registered from 2014 to 2019. The increase is caused by several factors, among them:

- More leisure homes in Setesdal (increase by 7 per cent in 2014-2019); (source: SSB, housing statistics) and a general increase in the use of leisure homes, from 54 to 77 nights spent annually; (source: Norsk Turistutvikling)

- Increased amount of driving among the inhabitants.
- Road conditions are improved.
- Decline in bus transport.

The increased use of cars in Setesdal causes elevated levels of greenhouse emissions, and runs counter to the climate and environmental politics that were agreed upon by the various municipal councils. Transport extending over larger areas is likely to increase, though the effort to reduce shorter car rides and replace it with alternative opportunities of transport are present. A local «bus on request» service is an alternative that many of the respondents view as a definite improvement of means of transport within the region.

Taxis

6 taxi permissions were issued in Setesdal and Åseral. The taxi permissions are administrated by Agder county municipality and is issued at application.

Taxi is a lesser used means of transport compared to the answers of the respondents from the survey of summer 2020. This may be related to very few taxis available in Setesdal, 6 permissions in the whole valley (source: transportløyve.no), and that an outstretched valley makes it expensive to use a cab. There is a higher density of cars in Setesdal and Åseral compared to the average in Norway, and it may also preserve the taxi market small. On the 1st of November 2020 the rules of taxi permission were altered, allowing for an easier move into the taxi business. In Setesdal and Åseral it is still uncertain how the effects of such change will unfold, since small municipals with few taxi companies still maintain the right to offer monopoly, due to contracts that involve emergency transport.

Other Means of Transport

In all of the Setesdal municipalities and Åseral volunteer centres were established. They offer among other things, transport to healthcare premises and home again, or transportation of foods and medicines.

All of the municipalities have mandated ambulance services and emergency health care.

Some of the municipalities maintain their own transport services for i.e. elderly who need to go to health care premises.

Road Network

The roads network in Setesdal consist of classified roads, county roads, municipal roads, private roads and forest truck roads. All together the roads in Setesdal count 1.748 kilometres (table 5).

Table 5. Roads network in Setesdal and Åseral, source: Statistisk Sentralbyrå

Road type	Responsibility	Kilometres
Classified roads	NPRA	175
County roads	Agder County Municipality	450
Municipal roads	Municipalities	188
Private roads	Private/shared with municiaplities	935
	Total kilometres of road	**1 748**

Classified road 9 (RV9) is the main route through Setesdal. It starts off in Kristiansand and ends in Haukeli. Its total length is 253,6 kilometres, and within Setesdal it is 174,9 kilometres (source: Statens Vegvesen). RV9 connects Setesdal with E18 and E39 to the south (Kristiansand) and E134 (Haukeli) to the north.

NPRA is responsible for the operating and maintenance of the classified roads in Norway.

RV9 has during recent years gone through a substantial upgrade. Regional Transport Plan Agder 2015-27 defends the upgrading of RV9 with the preservation of a «steady and predictable standard important to traffic security, and will contribute to a positive enlargement of the region in the inner Agder», quote: (Regional Transportplan Agder 2015-27). The aim of the upgrade is a «yellow parting strip to Hovden» within 2023. On the 20th of October 23 kilometres is left before the goal is reached.

There exists around 450 kilometres of county roads in Setesdal, and they are operated and maintained by Agder county municipality. The municipalities of Setesdal and Åseral bear the responsibility to operate and maintain 188 kilometres of municipal roads. 80 per cent of the municipal roads have paved surface (source: SSB, Kommunale veier). Within the same municipalities exist 935 kilometres of private roads, 91 kilometres of which the municipalities contribute subsidies to operating and maintenance.

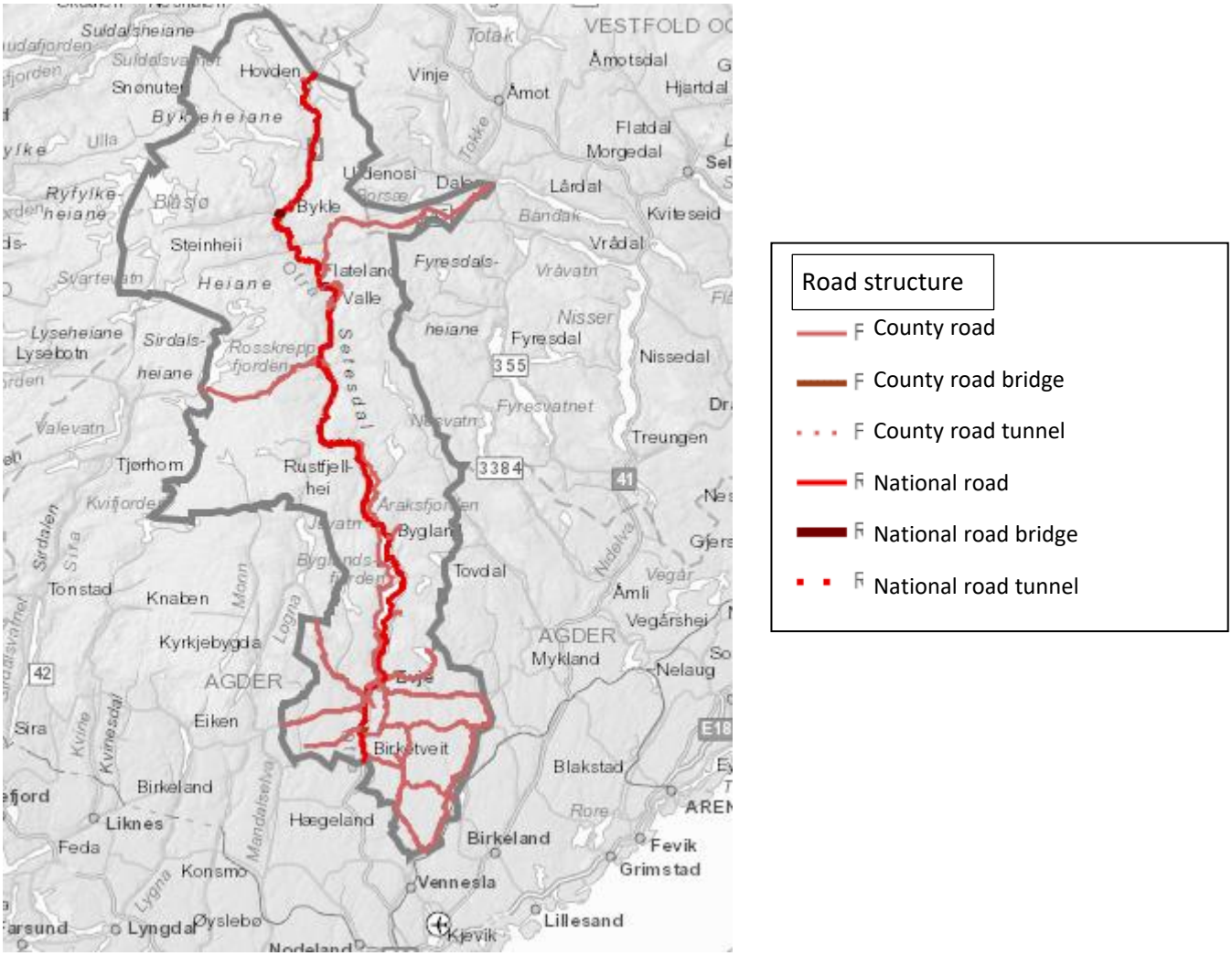


Figure 4. Map roads network structure in Setesdal and Åseral, source Statens Vegvesen

Like all other places in Norway, there are needs to upgrade and renovate county and municipality roads. 63,9 per cent of the respondents in the survey of this summer on mobility and accessibility in Setesdal and Åseral, answered that the need to upgrade the roads is absolute or somewhat necessary.

Setesdal has in recent years developed an extensive recharging network for el-cars. In 2019 there were 14 charging stations in Setesdal, compared to 11 in 2016. Tesla keeps two charging stations in Setesdal (Bygland and Hovden in Bykle). In Hovden in Bykle municipality there is a charging station with 21 sockets all together.

Walk and Cycle Paths

In Setesdal and there are 38 kilometres of walking and cycling paths. In the survey which was carried out during the summer of 2020, in relation to the MARA project, there was a clear tendency towards more walk og cycle paths (Evje and Hornnes and Bykle) (table 6) resulting in increased use of bicycle and feet compared to the other municipals.

Table 6. Kilometres of walking and cycling paths in the municipals; Source statistikknett.no

Cycling and Walking Paths in the Municipals	Kilometres of walk and cycle paths	Metres per inhabitant	Metres per km public road
Evje og Hornnes	11	3,03	55
Åseral	1	1,06	7
Bygland	2	1,66	13
Valle	4	3,27	28
Bykle	20	20,88	204
Totalt	**38**	**5,98**	**61,4**

30,5 per cent of the respondents in the survey answer that they cycle daily or several times a week. There is a tendency towards most cyclists being female, while there are more women who say they never bike (never bike: 23,1 per cent men, 32 per cent women). Evje and Hornnes is the municipality in which most people respond that they cycle daily or several times a week (34.5 per cent), and Åseral is where fewest people cycle daily or several times a week (19 per cent) (table 7).

Table 7. «Use of bike» from the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd

	Use bike daily or sometimes during the week	Don`t use bike or less than once a month
Åseral	19 %	55 %
E & H	34,5 %	44,2 %
Bygland	24,2 %	53,6 %
Valle	32,7 %	43 %
Bykle	31,8 %	49 %
Total	**30,5 %**	**48,7 %**

38,9 per cent of the respondents say they make avail of their feet as daily means of transport, and that it occurs most frequently on travels that last less than half an hour, and when visiting family and doing their shopping. There are relatively great differences between the municipalities, represented by the disparities of Åseral and Bykle. In Bykle 74,2 per cent of the inhabitants say they travel on foot daily or several times a week, while 56,6 per cent of the inhabitants of Åseral give a similar reply. The youngest spend most time traveling on foot (53,1 per cent in the age group 15-17) while the retired spend the least (28,6 per cent).

Table 8. «Transport on foot» from the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd

	Walks daily or sometimes during the week	Never walks or walks less than once a month
Åseral	56,6 %	31,3 %
E & H	60,4 %	23,2 %
Bygland	67,2 %	24,1 %
Valle	60,6 %	20,2 %
Bykle	74,2 %	13,6 %
Total	**63,4 %**	**22,1 %**

Cycle Route 3 runs from Kristiansand to Kristiansund, and through all of Setesdal. It is one of the ten national cycling routes (www.sykkelveg.no). The route is marked and is administered by NPRA in collaboration with municipalities and county municipalities.

During the winter 2019 a survey among tourists in Setesdal was conducted, on Setesdal as sustainable destination. 55,8 per cent answered that they used their feet to get around while on the destination, while 5 per cent used bike, and 2 per cent a kicksled.

Demography

Inhabitants, Sex and Age

Counting them all, Setesdal and Åseral had 7.857 inhabitants by 1.1.2020 (table 9). The last ten years there was a population increase of 1 per cent. Evje and Hornnes and Åseral have increased their populations, while the municipalities Bygland, Valle og Bykle had theirs reduced.

Table 9. Changes to the population in Setesdal and Åseral 2010-2020, source SSB; Statistikkbanken, befolkning

Population change in municipalities	2010	2020	Change
E&H	3397	3634	7 %
Åseral	917	932	2 %
Bygland	1223	1162	-5 %
Valle	1289	1164	-10 %
Bykle	970	965	-1 %
Totalt	7796	7857	1 %

Extrapolation of the population size until 2050, suggests that the municipalities of Setesdal will see their population grow with an additional 3 per cent, meaning that the number will be ca. 8.100 in 2050. (source: SSB, befolkningsframskrivinger)

Regarding the distribution of sex and age, there were major changes in recent years (table 10). In 2020, 48,38 per cent of the inhabitants are women, while in 2010 the female inhabitants made up

49,46 per cent of the population. Age distribution within the municipalities has also changed in Setesdal and Åseral during the last decade. In 2020, 14 per cent of the population is older than 70 years, and 23,2 per cent of the population is younger than 20. Correspondingly were 11,93 per cent of the population older than 70 in 2010, while 25,77 per cent were younger than 20 in 2010.

Table 10. Population distribution in Setesdal and Åseral 2010-2020, source: SSB; Statistikkbanken, befolkning

Change in sex and age 2010 - 2020	**2010**	**2020**
Population	7796	7857
Women	49,46 %	48,38 %
Population above 70 years	11,93 %	14,03 %
Population below 20 years	25,77 %	23,20 %

During the last decade, women are fewer in Setesdal and Åseral, and a larger portion of the inhabitants are older while fewer are younger. This is emphasised by the increase of 6 per cent in households in the five municipals, and the number of persons within each private household have been reduced from 2,33 persons to 2,22 in the last decade.

Domicile

Disparities between settlement patterns in the municipalities are relatively great. SSB statistics define a village (densely populated area) as an area in which minimum 200 persons live, and where the distance between each household is less than 50 metres (source: SSB, type bosted). According to their statistics, 45 per cent of the inhabitants in Setesdal and Åseral live in densely populated areas. In the municipalities Åseral and Valle, 100 per cent of the inhabitants live in sparsely populated areas, as these municipalities lack villages that meet the requirements of the definition of villages outlined by SSB. In a citizen survey carried out last summer (2020), in connection to the MARA project (figure 5), 39,4 per cent of the respondents answered that they lived in densely populated areas, while 36,45 answered that they lived in a hamlet, and 24,3 per cent said that they lived in a sparsely populated area.

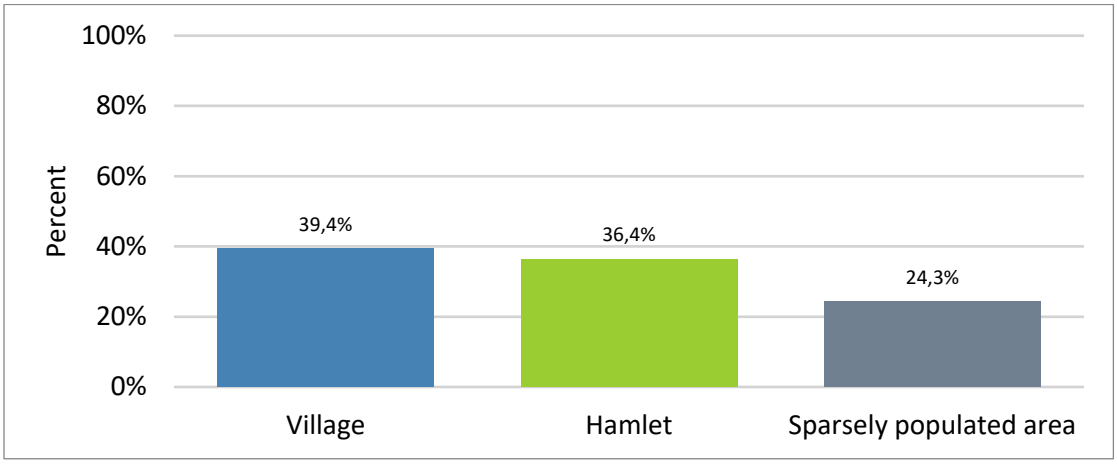


Figure 5. From the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd. Questions on type of settlement.

Statistics from SSB and answers in aforementioned survey, confirm that more than half of the Setesdal and Åseral inhabitants live in sparsely populated areas.

Table 11. Basic information about population

Region	Total population	Population		Population change per 1,000 inhabitants (2014-2019)	Population		
		city	village		0-19 years	20 – 65 years	over 65 years
Setesdal	7857	45 %	55	0,45	1823	4419	1615

Table 12. Basic information about region

Region	Area of the region (km2)	Number of inhabitants	Density of population (number of inhabitants per km2)	Hard paved public roads per 100 km² in km	Cars registered per 1000 inhabitants	Bicycle paths (km)	Geographical location/local border traffic/ connectivity to transport hubs (airports, ports)	Access to railway/buses/waterways	Number of holiday and other short-stay accommodation (with more than 10 beds)
Setesdal	5 519	7857	1,42	11,77	0,56	38	Airport: 61-188 km Port: 63-190 km	Railway: 32-174 km Buses: < 3 km	Approx 20

Table 13. Touristic attractiveness about region

Region	Touristic attractiveness
Setesdal	210 kilometers attraction with several hotels and other accommodation, restaurants, museums, cultural sights, UNESCO listing for song and dance culture, hydroelectric power sights(dams), several hiking routes, fishing and biking acticities
Evje & Hornnes	Mineralparken, Troll Aktiv, Troll Aktiv Bike Park, High Wire Adventure, Gocart, Several hiking routes, canoing and river rafting, Evje And Hornnes Geomuseum, Evjemoen Defence Museum, Climbing Forest, festivals, fishing
Åseral	Hiking routes, canoing, boat rental, minigolf, culture centre, fishing, winter sports, festivals
Bygland	Bygland Museum, old steam cruiser, hiking routes, old logs, moose park, fishing
Valle	The traditional Setesdal culture, the Setesdal museum, Rygnestad Museum, silver smith shops, via ferrata routes, hiking routes, mountain climbing, wintersports
Bykle	Golf course, old paths, open air museum, fishing, river pool jumping, waterpark, wintersports, museum of iron production (Iron Age)

Table 14. Main problems of mobility and accessibility of region

Region	The main problems of mobility
Setesdal	▪ High use of car ▪ Lack of public transportation offer ▪ Increasing number of elderly

Challenges of transportation models and recommendations for improving mobility offers in policy and planning documents

There exists a well-functioning hierarchy for the plan work related to transport and mobility. Agder county municipality intend to, in the advent of Region Plan Agder 2030, initiate the work on a regional mobility strategy. It is highly important that the municipalities of Setesdal and Åseral actively contribute in this process, and clarify the needs specific for Setesdal and Åseral, and at the same time participate in pointing to possible solutions that address the challenges. Setesdal inter-municipal political council (Setesdal Regionråd) is due to commence on its new strategic steering document, and in connection to this, it is recommended that a separate «Transport Plan for Setesdal» to be made, which juxtaposes the challenges each municipality has and those the whole region has. This may strengthen the chances of more influence and impact on the future work on mobility.

In the municipal plans, mobility and communication are described in various planning documents. It is essential to round up the measures and plans concerning mobility issues. In the municipal plans of the individual municipality there ought to be present a chapter on mobility that connects the challenges of the municipalities, and which summarise the preferred measures. It should discuss, among other things, road construction, public transport, emergency transport municipal services.

Mobility needs in the region

In the survey conducted among the inhabitants of Setesdal and Åseral in the summer of 2020, they were asked what improvements they desired in terms of mobility and passableness.

Question 5 concerned itself with what degree the respondents were content or not with six different factors within public transport. Possible answers were content, somewhat content, neither, somewhat discontent and very discontent.

Table 15 indicates with the colour red the factors that drew the most discontentedness, and the factors that received most positive answers are marked with green.

Table 15. «Ranking of content (discontent with public transport» from the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd.

Question	Very or somewhat content	Somewhat or very discontent
Access to public transport	26,9 %	44,7 %
Number of departures	22,7 %	53 %
Fares on public transport	30,6 %	26,6 %
Information on public transport	37,3 %	22,6 %
Safety on public transport	59,3 %	4 %
Accessibility for the disabled on public transport	19,1 %	15,6 %

The survey shows that respondents from Evje and Hornnes were predominantly more satisfied than in the other municipalities with accessibility and departures on public transport. If the respondents from Evje and Hornnes were to be excluded, are 56,3 per cent somewhat or very discontent with

access to public transport, while 66,8 per cent are somewhat or very discontent with the number of departures on public transport.

Question 6 requested of the respondents to rank possible improvements within the existing mobility provision on a scale from Absolutely necessary, Somewhat necessary, Neither, Somewhat unnecessary and Absolutely unnecessary.

There were three areas in which more than 60 per cent of the answers claimed it was absolutely or somewhat necessary (table 16). The most frequent answer regarding improvement potential was to increase the number of departures (busses). Fewest also said it was unnecessary to do something about this.

Table 16. «Necessary/unnecessary with improvements» from the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd.

Question	Absolutely or somewhat necessary	Somewhat or absolutely unnecessary
Road improvements	63,9 %	12,6 %
Safety improvements	43 %	14,3 %
Reduction of fares on public transport	43,2 %	12,1 %
Increase of departures	66,9 %	5,5 %
Quality improvement of bus stops	30,1 %	23,6 %
Improvement of bus quality	36,9 %	13,6 %
Increase the number of bus stops	19,8 %	30,2 %
Improvement of information on bus transport	42,9 %	17,4 %
Improvement of punctuality on bus transport	14 %	29,5 %
Improvement of accessibility for the disabled	29,6 %	7,2 %
Increase the number of cycle paths	60,3 %	14,9 %
Increase the number of bicycle parking lots	31,7 %	26,9 %
Increase the number of car parking lots	29 %	32,7 %

Improvement of roads and cycle paths were the to next items that the respondents believed were the most important items to improve. The item which most clearly did not need improvement, was public transport punctuality.

Question 5 enquired into how content the respondents were with public transport fares. The answers to this, were that the respondents neither were content or discontent. Question 6 ventured into the necessity of reducing public transport fares, and here the answers predominantly inclined towards somewhat or absolutely necessary. The call for reduced fares is most expressed in municipalities with the most frequent use of bus.

There is a relatively large difference from municipality to municipality in the want of increased number of cycle paths. In Åseral municipality the share of the respondents who view this as absolutely or somewhat necessary is 48,6 per cent, while in Bykle municipality the correspondent share is 67,1 per cent, and in Valle municipality it is 66,5 per cent. It is those use bicycle most frequently who think that there is a strong need to increase the number of cycle paths (table 17).

Table 17. «Use of cycle and the necessity to increase cycle paths» from the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd

		Bicycle					
	Total	Daily	A few times a week.	Several time a month.	Once a month	Less than once a month	Do not use
Absolutely necessary	29.7%	42.7%	36.3%	32.2%	20.3%	29.3%	23.9%
Somewhat necessary	30.6%	27.0%	32.1%	34.2%	36.7%	27.5%	29.4%
Neither nor	24.8%	21.3%	18.4%	24.8%	30.4%	27.9%	26.0%
Somewhat unnecessary	9.3%	6.7%	9.4%	6.7%	11.4%	8.7%	10.4%
Absolutely unnecessary	5.6%	2.2%	3.8%	2.0%	1.3%	6.6%	10.4%
Number of responses	**1178**	**89**	**234**	**149**	**79**	**229**	**289**

To the question on the necessity of road renovation, Åseral sticks out from the other municipalities in the survey. 81,6 per cent answer that it is absolutely or somewhat necessary to improve roads, while the other municipalities deviate no more than 2,9 points compared to the average answer for all the respondents, which was 63,9 per cent.

The question of necessity in improving punctuality on bus transport is the question to which the respondents declare it the least necessary to improve, and 29,5 per cent say it is somewhat or absolutely unnecessary.

Needs Induced by Demographic Changes

The elderly population in Setesdal and Åseral increases, and a large share of the inhabitants liv in sparsely populated areas. If this population segment still is to live at home, it will give rise to new needs in terms of mobility. In a car dependent area it is important to define the needs in elderly who no longer dispose of a driver's license. If this segment is to take part in the local community and their own vicinity, vital tasks and retain access to public services, it requires an offer of mobility and accessibility that makes such opportunities possible.

Tourism Related Needs

In the winter of 2019 a survey was conducted targeting tourists who journeyed in Setesdal with reference to Setesdal as a sustainable destination. Some of these questions were dedicated to communication and passableness, and are described in chapter «Description of the region and existing mobility models/offers" in this report. The tourists were asked about road standards on RV9 through Setesdal, and 53,7 per cent completely agreed or agreed to the statement that «Road standard on RV9 is good», while 21,1 per cent completely disagreed og disagreed.

They were also asked to what degree they were satisfied with the transport provision on destination, and 25,6 per cent responded little or unsatisfied with this, while 52,3 per cent answered don't know or neutral.

Setesdal is the recipient of the national banner for sustainable destinations, and is clearly in want of reducing the effects on nature and environment from tourism (source: Innovasjon Norge, merket for bærekraftig reisemål).

Summary of Needs

Based on aforementioned documentation, the mobility needs in Setesdal may be recapitulated as such:

- Renovation of the roads network, including to aim for «yellow parting strip to Hovden» and renovation of county roads network.
- Increasing the number of kilometres of walk and cycle paths.
- Improved public transport facilities, including more departures and reduced fares.
- Solutions that address demographic changes (ageing population).
- Solutions that reduce carbon gas emissions.

Short description of research methodology

The survey was conducted in spring 2020 from the 20th of May to the 18th of June. All told, it consisted of 11 main questions accompanied by 43 secondary questions and assessment choices. The survey had three main parts:

- What means of transportation are in use as of today.
- What are the areas of improvement within the current provision.
- What new solutions may work in Setesdal and Åseral.

The survey was translated and adapted based on a survey produced by Bialystok University of Technology in Poland. Some questions and response alternatives concerning means of transport that are non-existent in Setesdal and Åseral were removed, i.e. questions regarding boats, aeroplanes and rail.

The survey was compiled by the project management of Setesdal inter-municipal political council, then worked out by the software QuestBack (questback.com) with resource help from Visit Setesdal, which also owns access to this internet based tool.

The survey consisted solely of pre-set reply alternatives.

The invitation to participate in the survey was communicated via SMS to all citizens above the age of 15 within the municipalities in Setesdal and Åseral. The SMS invitation contained a link to the survey. Three manual surveys were sent on request. No private or personal information were collected during the survey, and all replies remain anonymous in accordance with the GDPR. Information about the ongoing survey was published on the websites of the five municipalities and via other municipal communication channels. Furthermore, information about the survey was conveyed in a press announcement and broadcasted in an interview with the project manager on NRK Sørlandet Radio.

All together 1220 replies were obtained, which is equivalent to 15,5 per cent of the total population of the five municipalities that were able to participate in the survey.

The results from the survey were analysed with assistance opportunities that lie within the web based tool, among them cross references and groupings. Preliminary results and analyses were

relayed to Setesdal inter-municipal political council, and were also included in a project description of an el-bike system in Setesdal.

Table 18. Research methods used to assess and analyze the needs of tourists and residents

Partner (Institution)	Methods applied																					
	Quantitative						Qualitative									Other						
	PAPI			CAWI			IDI			Case study			Desk research			Delphi method			Spatial information/ dynamic maps development and processing (including PPGIS)			
	T*	I*	A*	T	I	A	T	I	A	T	I	A	T	I	A	T	I	A	T	I	A	
Setesdal	x	x		x	x					x		x			x	x	x				x	

*"T" – tourists; "I"- inhabitants; "A" - authorities/tourists entities (e.g. tourist agencies), (other?)

Table 19. The mobility needs of tourists – main results

Region	Measure (% or other indicator)	Mobility needs (in points)
Setesdal	In % of 320 respondents	▪ Road Improvements (21,1 %) ▪ Improvements on transportation at the destination (25,6%)
Setesdal	Comments from qualitative research	▪ Several comments on lack of public transportation

Table 20. The main mobility needs of inhabitants – main results

Region	Measure (% or other indicator)	Mobility needs (in points)
Setesdal	In % of 1220 respondents	• Improved quality of road network (63,9%) • Increased numbers of walk and cycle paths (60,3%) • Improved public transport facilities, including more departures and reduced fares (43,2% - 66,9%)
Setesdal	From planning documents	• Solutions that address demographic changes (ageing population) • Solutions that reduce carbon gas emissions.

Disparities between the current mobility needs and the existing mobility solutions

In this chapter we aim to describe the differences related to the existing mobility provision which are described in chapter 3, and the needs described in chapter 5.

We will focus on the five most obvious elements of the mobility structure in Setesdal and Åseral:

- Renovation of the roads network, including to aim for «yellow parting strip to Hovden» and renovation of county roads network.
- Improved public transport facilities, including more departures and reduced fares.
- Increasing the number of kilometres of walk and cycle paths.
- Solutions that address demographic changes (ageing population).
- Solutions that reduce carbon gas emissions.

Renovation of the Roads Network

Setesdal and Åseral have a large roads network, totalling in 1.748 kilometres which consist of national, regional, local and private roads. The use of the roads network in Setesdal is substantially increased, an increment resulting from, among other things, more tourists and expanded transportation needs among the inhabitants. RV9, which is the main road through Setesdal, has been subjected to significant upgrades in recent years, and the goal to implement a «yellow parting strip to Hovden» is soon met. Yet, municipal plans, regional plans and national plans, point out maintenance lags along the rest of the roads network.

63,9 per cent of the inhabitants that partook in the survey on transport and accessibility in the summer of 2020, say that «renovation of roads» is absolutely or somewhat necessary.

Passenger car is the predominant means of transport in Setesdal and Åseral, and an adequate og secure roads network is prerequisite that allows cars to use in order to fulfil needs related to increased population, the opportunity to commute and business establishment.

Improved Public Transport Facilities, including more bus departures and reduced fares

Over the last years in Norway, the use of public transport facilities have increased considerably. The increase occurs mostly in urbane and urbane fringe areas.

In Setesdal and Åseral the use of bus (the only available public transport facility) is very low. In the survey that was carried out in the summer of 2020, 2,8 per cent of the respondents said that they used bus on a daily basis. The national average in Norway for using public transport as the main means of transport is 11 per cent (Statens Vegvesen, Reisevaneundersøkelsen 2018).

The provision in Setesdal and Åseral is based on school bus driving, and the schedules are largely dependent on school bus driving. Most bus stops in Setesdal and Åseral have one to two departures a day, and in Åseral they have arrangements for «bus on request», which requires the passengers to book within 6 PM on the preceding day if they wish to use the bus.

In regional and municipal plans is improved public transport facilities defined as a need, and this one must assume is based on the fact that the current provision is dissatisfactory. It is also clear that the inhabitants desire improved public transport facilities, since increased departures (on public transport) is the one factor that the inhabitants demonstrably rank as a measure that is absolutely or somewhat necessary to do something about (66,9 per cent of the respondents).

It is also evident that there exists a discrepancy between the information presented on public transport and how well it is perceived by the inhabitants, since 42,9 per cent view this as an area with improvement potential.

A survey conducted by Institute of Transport Economics in 2013 (Hjorthol, Engebretsen and Uteng 2013, p. 8) shows that those who enjoy good services, travel the most, and a good service is defined as having less distance than one kilometre to the bus stop and minimum four departures each hour. In the same survey very poor public transport facilities as having less than one departure every other hour. Any survey on what the Setesdal and Åseral inhabitants deem good public transport facilities to be has not been done.

In public plans where improved public transport facilities is listed as a point of priority, they barely specify how this need is to be fulfilled.

Still it may be concluded that there exists a large gap between needs and existing provision in public transport facilities in Setesdal and Åseral.

Increase of Number of Kilometres of Walk and Cycle Paths

In the public plan work extensions of walking and cycling paths are described as a need. The need is described with reference to desires of improving mobility offer and improvement of public health.

60,3 per cent of the respondents in the survey from the summer 2020 answer that there is a need to increase the number of cycling roads.

In the same survey, the inhabitants respond that transport on foot or bike are the primary means of transport after car. Walking and cycling are popular occurrences already in Setesdal and Åseral. There is a tendency towards the more access to walking and cycling paths (Bykle and Evje and Hornnes), the more frequently feet and bikes are availed of.

In the Setesdal and Åseral municipalities, there exists in total 38 kilometres of walking and cycling paths, and this is a small part of the total roads network measuring 1.748 kilometres.

Needs Induced by Demographic Changes (ageing population)

The population of Setesdal and Åseral is ageing. It induces needs that result from physical movability, expanded needs for health care services, and reduced opportunities to drive one's own car. The needs are exacerbated by the settlement pattern in Setesdal and Åseral, meaning that

The needs are to some extent described in the municipal plans, yet there is an obligation to explore it more closely. The current offer in terms of vicinity transport, i.e. with public transport or taxis most likely fails to meet the existing requirements and those that emerge in the future.

The difference between offer and need in a population that is continuously ageing must be prioritised, particularly considering the desire to let people be able to live at home.

Needs Related to Reduction of Carbon Emissions

Emission of carbon gas is a challenge comprehensively described in national, regional and municipal plans. Setesdal and Åseral have to a high degree facilitated a well-functioning infrastructure with charging stations for el-cars. This in spite of only 2,8 per cent of the fleet of cars in Setesdal and Åseral being electric, meaning that the disparity between the desire to reduce emissions and the actual fleet of cars is pronounced. The measure is also part of the increased request for such charging stations from tourists who drive el-cars.

The development of walking and cycling paths is pointed to in several public plans, referred to as measures that will reduce greenhouse emissions. There remains a contrast between this particular want, and the real number of such existing roads.

Setesdal earned the banner of Sustainable Destination (source: Innovation Norway), and this banner entails duties to work for a reduction of carbon emissions, both in terms of transport to the destination and on destination while the tourist are here. Both road extension, charging network and environmental friendly modes of transport to/from/on destinations are circumstances that are affected by these duties.

Innovative solutions to improve mobility in the region

Chapter "Disparities between the current mobility needs and the existing mobility solutions" pinpoints several areas in which gaps exist between the current mobility provision and the needs of the inhabitants and the municipalities.

In this chapter we wish to describe some future solutions which may improve the provision, allowing the needs to be met.

We will describe these solutions:

- El-bike system
- System for «bus on demand»
- Carpooling via app
- Self-driving busses og cars

In the survey on transport and accessibility in Setesdal and Åseral, which was conducted in the summer of 2020, the respondents were asked about various aspects of the current mobility solutions, possible improvements of these, and future innovative solutions.

Question 7 in this survey requested of the respondents to consider if possible innovative solutions would improve the opportunities to transfer within their own localities. As already mentioned in the paragraph on possible error sources, the various solutions were explained to them in relatively simple terms. This may have been the cause as to why a large share of the responses (37,7 per cent) was «Hard to say». A majority answered that the suggested solutions would in total not provide an improvement (35,1 per cent), compared to the number who said that the suggested solutions would provide improvements (27,6 per cent).

The suggestion among possible solutions in the future that the respondents most clearly say will cause an improvement, is corresponding transport services with a single ticket (45,2 per cent say

significant or very great improvement, and 23 per cent say none or insignificant improvement) (table 21).

Table 21. «Improvement/non-improvement by possible future solutions» from the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd.

Question	None or insignificant improvement	Significant or great improvement
A local system for bike-sharing handled via a cell phone app (and improved cycle paths/roads)	41,4 %	20,3 %
A local system to share el-cars (bases with charging stations) operated with the cell phone	40,9 %	20,8 %
A local system for el-bike sharing operated with the mobile phone (pick-up stations and improved cycle paths)	39,1 %	23,9 %
A local system for carpooling operated with the cell phone	39,6 %	21,9 %
A local system that connects the sharing process of individual means of transport (bike, el-bike, el-car, carpooling) to public transport	34,5 %	23,3 %
A «bus on request» service	27,1 %	38 %
Corresponding transport services (single ticket/fare	23 %	45,2 %

To the question on the solution «bus on request», say 38 per cent that this will provide a clear or very great improvement, while 27,1 per cent say it will give none or insignificant improvement. It is those who use the bus least frequently who respond «Hard to say» most frequently (table 22)

Table 22. «Improvement with bus on request compared to use of bus» from the survey on transport and accessibility in Setesdal and Åseral, summer of 2020; Setesdal Regionråd.

		Bus					
	Total	Daily	A few times a week.	Several time a month.	Once a month	Less than once a month	Do not use
No improvement	12.6%	31.3%	17.0%	9.2%	8.3%	9.2%	14.3%
Little imrpovement	14.5%	18.8%	14.9%	16.9%	8.3%	16.6%	14.1%
Significant improvement	21.9%	28.1%	19.1%	21.5%	18.3%	23.8%	19.8%
Very great improvement	16.1%	6.3%	23.4%	26.2%	13.3%	17.0%	13.8%
Hard to say	34.9%	15.6%	25.5%	26.2%	51.7%	33.4%	37.9%
Number of responses	**1142**	**32**	**47**	**65**	**60**	**446**	**398**

The third highest ranked solutions that is expected to deliver improvement, is an el-bike system handled via the cell phone. 23,9 per cent say it will give a significant or very great improvement. Correspondingly there are 39,1 per cent who answer that it will give non or insignificant improvement.

System for «Bus on Request»

A system for bus on request is a system where the user books the opportunity to board, and if no boarding requests appears, the bus does not run this line. Traditionally such request lines were established at places where there was a need for bus provision, but not to the extension that an ordinary bus line was needed. One such line exist today in Åseral municipality, line 178. The lines are run on a regular schedule and with regular equipment.

An extension of this system could be copied from one that Agder Kollektivtrafikk (AKT) has initiated in Vågsbygd i Kristiansand municipality, which is a pilot project named AKT SVIPP (source: akt.no).

The system is based on a digital booking technology where the user can book transport from home within a time frame, and be transported to a preferred destination within a certain geographic area or to a public transport hub.

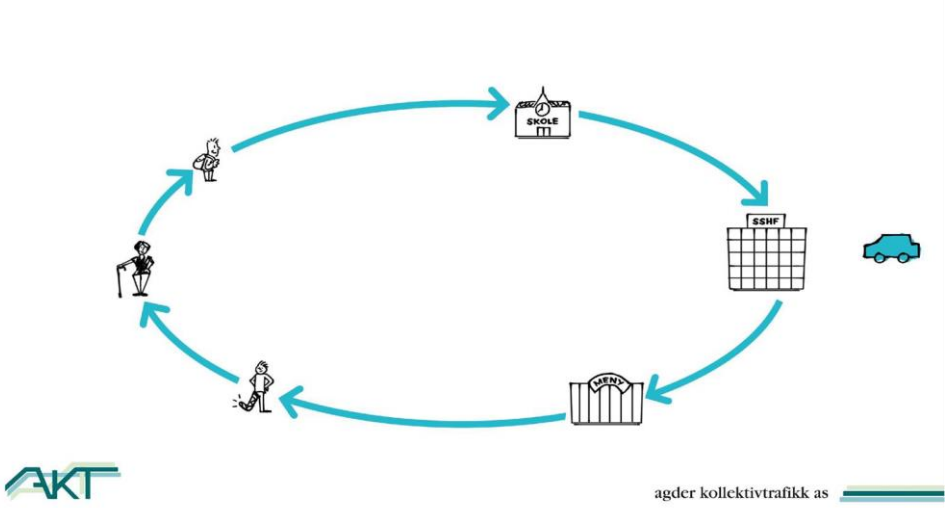


Figure 6. Agder Kollektivtrafikk as, pilot project AKT SVIPP.

In the project, electrical minibuses are utilized, and the pilot is situated in a relatively densely populated area in order to draw sufficient volumes to put the service to the test.

The project is ongoing until 2022.

In Setesdal and Åseral could such a system meet several of the needs of the municipality and its inhabitants.

It would provide opportunity for transport internally in the municipalities, but also to the public transport hubs where from extended journeys with ordinary public transport may be initiated. For those who do not possess a driver's license, it would grant them the possibility to still live in sparsely populated areas. It would afford a simpler and more reasonably priced school transport, and the system would also be possible to escalate in terms of capacity in the case of more demand, i.e. frequent use or in busy tourist seasons.

With reference to carbon emissions, such a service would reduce the emissions by reducing car traffic and by the use of electric buses.

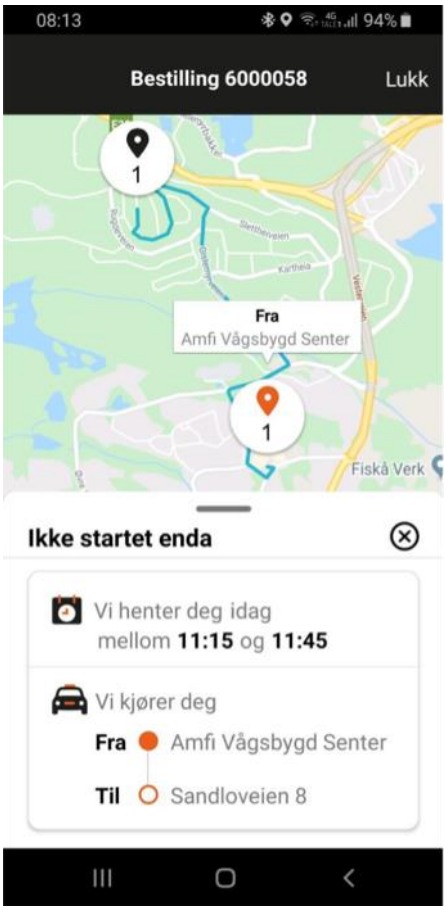


Figure 7. Agder Kollektivtrafikk

A system like this one could unfold in collaboration between municipalities, volunteer centres, taxi companies and public transport companies.

A similar system that may also be used as a reference of experience, is the system «HentMeg» («FetchMe»), whicih the public transport company in Rogaland, Kolumbus, runs (source: Kolumbus, HentMeg).

A system for «bus on request» should also be viewed in connection to possibilities that autonomous buses may provide.

El-Bike System

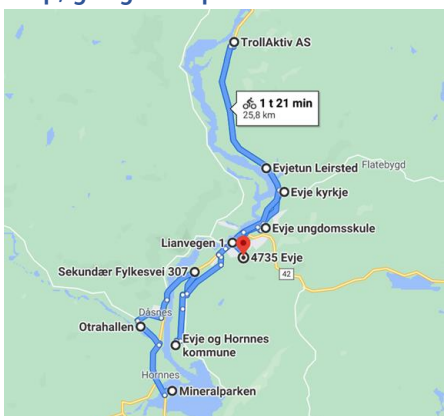
As part of the MARA project, a system of el-bikes in Setesdal was outlined which will be able to meet several of the mobility needs that inhabitants and tourists have. The system is envisaged as a lending/rental offer to the inhabitants and tourists in Setesdal and Åseral, and it will cover several needs in terms of mobility and accessibility.

- Transport on destination
- Transport from bus stops to homes
- Transport from bus stops and the centre to public offices and folk university college
- Transport from the centre to tourist attractions
- Transport between tourist attractions
- Leisure and recreational use

Foto: Kolumbus

The longterm goal is to create a system providing access to el-bikes in all the villages in the five municipalities, and that it forms a continuous network of el-bikes throughout all of Setesdal and also up to Åseral. The long established Cycle Route 3 will make up a starting point for this system.

Map, google maps



A pilot project is planned for this system, with starting date in April 2021. For the time being the pilot project is thought to be situated in Evje and Hornnes municipality. The municipality has the largest village in our region, and has the most inhabitants. Further, Evje and Hornnes remains the municipality with the highest use frequency and most departures within the existing public transport facilities. These elements will provide the quickest possible response as to whether the system functions in covering the defined needs.

Advantages generated by such a system, are expected to be:

Social, by improving the mobility for inhabitants and tourists

Sustainable, by increasing the use of environmental transport

Improved public health by use for recreation and transport

New offers within tourist industry

The project is largely based on a similar system that the public transport company Kolumbus in Rogaland has established. In first half this is a system that is part of ordinary public transport facilities, but it preserves all the functions that are wanted in a system like the that we wish to establish in Setesdal and Åseral (source: kolumbus.no, bysykkel). Kolumbus offers a completely developed app, they have laid down a thorough effort to narrow down the right bicycle type and are vastly experienced in running and maintaining the system on a technical and operational level.

Ride-sharing with Car

It is a solution that expands on the idea of carpooling, and involves a more organised type of ride-sharing from meeting places that were pre-arranged, and extends into a more dynamic and spontaneous ride-sharing with assistance from networks (Amundsen and Ryeng, 2019).

A system of the kind is based on digital solutions in which travellers are connected via their departure and destination points. The advantages with such solutions are that only one passenger in the car is avoided, it becomes easier for those without a car to move about, and one will most likely get more options in departure times. By having more people using the same car, carbon emissions are reduced too, and it will reduce wear and tear on the roads network. For many people, the social aspect will be a boon too. Also, it would benefit passengers and driver economically compared to traveling on their own.

The disadvantages are that the private experience of the ride is lost, and the itinerary may become less flexible. A certain degree of unsafeness may also be a disadvantage, since one may not always know those who are given a ride or the person driving the car.

An already established product called Sammevei («Sameway», sammevei.no), and is a ride-sharing app developed to connect various users and offerer within the transport sector. Sammevei has more projects under construction, among them ride-sharing to work, to trains or as a replacement for ordinary bus transport.

A system involving ride-sharing in Setesdal and Åseral might offer good transport provision, in addition to existing public transport.

Autonomous Vehicles

Autonomous vehicles are self-driving and unmanned means of transport which may cover the most important transport functions of a vehicle. An autonomous vehicle should, with assistance from sensors, in-built computers and network-based navigation tools and connection, be able to drive and navigate along the roads network without human intervention.

In January 2018 a bill was passed in Norway on the testing of self-driving vehicles (source: lovdata). During the legislative work, traffic security and privacy protection formed the core in relation to interests that need safeguarding.

In a report from the Institute of Transport Economics (Nenseth, Ciscone ad Buus Kristensen 2019), five different scenarios with self-driving vehicles are described. Two of the scenarios that are described, concern themselves with shared use of self-driving vehicles, more specifically (1) in relation to ride-sharing with minibuses and (2) self-driving public transport. The report points to the potential in low-priced fares, minor strain on the environment, and, increased traffic security, resulting in «self-driving and driver-less vehicles may change our transport system fundamentally over the next decades» (quote: Nenseth, et.al. 2019).

Autonom buss på Svalbard

Foto: Applied Autonomy

In several Norwegian towns (Kongsberg, Oslo, Bærum, Forus, Gjøvik and Svalbard) in recent years, pilot projects with autonomous buses were carried out. NPRA (source: Statens Vegvesen) has collected experiences from these pilots following a green signal from the Directorate of Public Roads to test such vehicles on public roads on the condition that traffic security, vehicle control and emergency procedures were attended to. For every pilot project, limitations on speed, passenger number and the routes they could drive, were enforced. The buses were required to keep a host or operator onboard, maximum speed was 18 km/h, and the maximum passenger limit was 11.

The experiences are varied and point to the necessity of having an operator onboard, that low speed is able to generate traffic hazards, i.e. overtaking, pedestrians and cyclists «disturb» propulsion and cause unexpected sudden stops, and that the sensors in the bus were highly sensitive for

weeds and gravel on the roadway. Self-driving buses were attempted on Svalbard, as the world's most northern autonomous bus line in snow and harsh conditions.

Despite that the projects with self-driving vehicles still are in a premature phase, it remains a mode of transport that is interesting for the districts, and for Setesdal and Åseral.

Recommendations and operation plan for improved mobility offers

A well-built infrastructure for transport and mobility is a prerequisite for the inhabitants of Setesdal and Åseral to continue living and residing in the region. The challenges of the region that are connected to sparsely populated areas, small population, demographic changes and tendencies towards urbanisation, force the municipalities in Setesdal and Åseral to prioritise the work on future-oriented public transport facilities. The private sector (tourism included) depends on a transport system that works in order to be able to deliver their goods and services.

In previous chapters the existing mobility system is explained, it is pointed out what improvements are needed in the region, and some innovative solutions that may cover these needs are described. Based on this, we wish to make a few suggestions with regards to the further work on mobility.

Mobility in the Plan Work

There exists a well-functioning hierarchy for the plan work related to transport and mobility. Agder county municipality intend to, in the advent of Region Plan Agder 2030, initiate the work on a regional mobility strategy. It is highly important that the municipalities of Setesdal and Åseral actively contribute in this process, and clarify the needs specific for Setesdal and Åseral, and at the same time participate in pointing to possible solutions that address the challenges. Setesdal inter-municipal political council (Setesdal Regionråd) is due to commence on its new strategic steering document, and in connection to this, it is recommended that a separate «Transport Plan for Setesdal» to be made, which juxtaposes the challenges each municipality has and those the whole region has. This may strengthen the chances of more influence and impact on the future work on mobility.

In the municipal plans, mobility and communication are described in various planning documents. It is essential to round up the measures and plans concerning mobility issues. In the municipal plans of the individual municipality there ought to be present a chapter on mobility that connects

the challenges of the municipalities, and which summarise the preferred measures. It should discuss, among other things, road construction, public transport, emergency transport municipal services.

Measures

Setesdal and Åseral ought to seek to become host municipality for future pilot projects that set off in connection to new transport solutions for inhabitants. A project based on the ongoing AKTSVIPP project should be launched in our region. The low-frequent use of buses in our municipalities ought to be analysed more closely. The expenses connected to current bus traffic are immense, and more work with local, less expensive measures is requested. This is particularly valid for an accommodated bus on request offer, and autonomous vehicles must be considered connected to this, too.

The suggested e-bike project ought to be given priority in view of the advantages it may produce for the inhabitants and the tourism industry. The inhabitants of our municipalities already walk and cycle to a large extent, thus accommodating more people to choose the same. This will also give an opportunity to perform a general assessment of the needs for walking and cycling paths in the municipalities, a measure that the inhabitants say must be prioritised.

Improvement of roads is the item that the largest share of the inhabitants viewed as important. To a larger degree than today, the inhabitants ought to be invited into dialogue on what parts of the roads network need mending, and a general plan for this improvement process for all the municipalities of Setesdal and Åseral should be made. This plan needs to be adjusted to the other plans that exist or are made on a regional or national level.

Setesdal and Åseral have a very low share of electric cars compared to the rest of the country. At the same time the municipalities offer a extensive charging network. To allow the municipalities to reach their goals in reducing greenhouse emissions, work should be laid down to increase the share of electric vehicles, and incentives ought to be considered.

New solutions that can improve mobility must be rendered visible and explained to the inhabitants. In the survey that was carried out on mobility in Setesdal and Åseral, a significant share of the responses concerning new solutions were neutral. This indicates that the topic mobility and what opportunities of improvement that exist in this area, have not been clarified well enough or discussed to any extent. The municipalities ought to promote this information and discussion.

The municipalities ought to initiate ride-sharing to a much further degree than what is the case today, by using already developed tools and have the inhabitants use them.

The municipalities should systematically collect the opinions of the citizens, on mobility. In the survey from the summer of 2020 and in the latest citizen surveys from Bykle og Bygland, there is a clear tendency towards dissatisfaction with the current situation in transport and accessibility. The inhabitants must be involved to a greater extent, and a broader arena to investigate new solutions together as a community.

Summary

There are many aspects that concern the mobility system in Setesdal and Åseral. The area is sparsely populated and the area is vast.

Setesdal and Åseral has a mobility system based on the use of passenger cars, and the inhabitants frequently use feet and cycle for transfer. There is an extensive network of roads in the municipalities, but few walking and cycling paths. The inhabitants are in need of improved mobility, and call for, among other things, more departures and better roads network. Specific work to increase the number of kilometres of walking and cycling roads should be initiated.

The current public transport offer is in a poor state, and is used infrequently.

It is not obvious how the mobility may or should be improved, and neither is it clear what results a change can produce.

The work with a communal mobility strategy for Setesdal and Åseral ought to be co-ordinated in order to make the region appear gathered in terms of goals, and is viewed as one unit when planning and implementation of prospective changes may be realised. This is important, too, considering influence and impact on the preparation of a mobility plan for Agder, which will be based on the directives given in Region Plan Agder.

There exist future solutions which Setesdal and Åseral ought to consider availing themselves of.

References

Agder Fylkeskommune, *Regional Transport Plan Agder 2015-27*, Lastet ned 9. november 2020 fra: https://agderfk.no/_f/p1/i125230c5-7b62-4498-9c20-a3f0db4b036e/regional-transportplan-agder-2015-27.pdf

Agder Fylkeskommune, *Regionplan Agder 2030*, Sist lastet ned 13. november 2020 fra: https://agderfk.no/vare-tjenester/regional-planlegging-og-utvikling/gjeldende-planer-og-strategier/regionplan-agder-2030/

Agder Kollektivtrafikk, *Årsmelding 2019*, Sist lastet ned 15. november 2020 fra: https://akt.no/media/549869/akt_a-rsrapport-2019_lavopploest.pdf

Agder Kolletktivtrafikk, *AKT SVIPP*, Sist lastet ned 14. november 2020 fra: https://akt.no/info/reise/akt-svipp-ta-deg-en-svipptur/

Amundsen og Ryeng (2019), *Samkjøring med bil*, Tiltakskatalog for transport og miljø, Sist lastet ned 14. november 2020 fra: https://www.tiltak.no/b-endre-transportmiddelfordeling/b-5-mobilitetsplanlegging-og-kampanjer/b-5-3/

Bygland Kommune, *Kommuneplan 2020-2032, Samfunnsdel,* Sist lastet ned 13. november 2020 fra: https://www.bygland.kommune.no/getfile.php/4709310.2244.wslltuuwsijwsj/KP+samfunnsdel+2020_2032.pdf

Bykle Kommune, *Kommuneplan 2016-2026 Samfunnsdel*, Sist lastet ned 13. november 2020 fra: https://www.bykle.kommune.no/kommuneplan-for-bykle-2016-2026-samfunnsdelen.6034163-424361.html

Evje og Hornnes Kommune, *Planbeskrivelse Kommuneplanens arealdel*, Sist lastet ned 13.11.2020 fra: https://www.e-h.kommune.no/getfile.php/4657671.1622.7kzlwbztbnnjwt/200227_Planbeskrivelse_kommuneplanens-arealdel-2020-2030.pdf

Hjorthol, Engebretsen og Uteng (2013). *Den nasjonale reisevaneundersøkelsen 2013/14 – nøkkelrapport,* Transportøkonomisk Institutt, ISBN 978-82-480-1598-7 Elektronisk versjon

Innovasjon Norge, *Merket for bærekraftige reisemål,* Sist lastet ned 14. november 2020 fra: https://www.innovasjonnorge.no/no/tjenester/reiseliv/merket-for-barekraftig-reiseliv/

Kolumbus, *Bysykkelen*, Sist lastet ned 14. november 2020 fra: https://www.kolumbus.no/reise/sykkel-oversikt/bysykkelen/

Kolumbus, *HentMeg,* Sist lastet ned 14. november 2020 fra: https://www.kolumbus.no/aktuelt/hentmeg-i-sauda/

Kommunal og moderniseringsdepartementet, *Regionalpolitikk og distriktspolitikk.* Lastet ned 11. november 2020 fra: https://www.regjeringen.no/no/tema/kommuner-og-regioner/regional--og-distriktspolitikk/om-regionalpolitikken/id2345452/

Lovdata, *Lov om utprøving av selvkjørende kjøretøy,* Sist lastet ned 15. november 2020 fra: https://lovdata.no/dokument/NL/lov/2017-12-15-112

Nenseth, Ciscone og Buus Kristensen (2019) *Samfunnsmessige konsekvenser av automatiserte kjøretøy – norske scenarioer*, Transportøkonomisk Institutt, ISBN (elektronisk versjon): 978-82-480-2237-4

Regjeringen, *Levende lokalsamfunn for fremtiden- distrikstmeldingen, Meld. St 5(2019-2020)* Sist lastet ned 14. november 2020 fra: https://www.regjeringen.no/contentassets/935d2cc0d4924184810f4bf336662c80/no/pdfs/stm201920200005000dddpdfs.pdf

Regjeringen, *Mobilitetsbehov beskrevet i regjeringens proposisjon,* Sist lastet ned 12. november fra: https://www.regjeringen.no/no/tema/kommuner-og-regioner/regional--og-distriktspolitikk/aktuelt-na/laringsnettverk-smart-mobilitet/id2766068/

Regjeringen, *Nasjonal Transportplan 2018-2029*, Sist lastet ned 12. november fra: https://www.regjeringen.no/no/tema/transport-og-kommunikasjon/nasjonal-transportplan/id2475111/

Setesdal interkommunalt politisk råd, *Regional utviklingsplan for Setesdal 2020*, Sist lastet ned 13. november 2020 fra: https://www.setesdal.no/?cat=484493

SINTEF, *Smart transport i distriktene*, Lastet ned 12. november 2020 fra: https://www.sintef.no/projectweb/smart-transport-i-distriktene/

Statens Vegvesen, *Busser uten hender på rattet*, Sist lastet ned 15. november fra: https://www.vegvesen.no/fag/fokusomrader/miljovennlig-transport/smart-mobilitet/forerlose-minibusser

Statens Vegvesen, *Lengde på RV9* : Lastet ned 8. november 2020 fra: https://www.vegvesen.no/_attachment/2664073/binary/1323060?fast_title=Rute+4c+-+Rv+9+Kristiansand+-+Haukeligrend+og+Rv+13%2FRv+55+J%C3%B8sendal+-+Voss+-+Hella+-+Sogndal.pdf

Statens Vegvesen; *Reisevaneundersøkelsen 2018*, Sist lastet ned 14. november 2020 fra: https://www.vegvesen.no/_attachment/2674990/binary/1361215?fast_title=N%C3%B8kkelrapport+Reisevaneunders%C3%B8kelsen+2018+-+november+2019.PDF

Statistisk Sentralbyrå, *Befolkningsframskrivinger*, Sist lastet ned 15. november 2020 fra: https://www.ssb.no/statbank/table/12882/

Statistisk Sentralbyrå; *Alderssammensetning og fordeling kjønn i kommunene i Setesdal og Åseral* Lastet ned 28. oktober 2020 fra: https://www.ssb.no/statbank/table/07459/tableViewLayout1/

Statistisk Sentralbyrå; *Bilparken i Norge* Lastet ned 30. oktober 2020 fra: https://www.ssb.no/bilreg

Statistisk Sentralbyrå, *Kilde kommunale veger og vegdekke,* Lastet ned 10. november 2020 fra: https://www.ssb.no/statbank/table/11845/tableViewLayout1/

Statistisk Sentralbyrå, *Kilde private veger, og tilskudd til drift og vedlikehold av private veger*: Lastet ned 8. november 2020 fra : https://www.ssb.no/statbank/table/11845/tableViewLayout1/

Statistisk Sentralbyrå; *Økning i antall fritidsboliger i Setesdal*, Lastet ned 2. november fra: https://www.ssb.no/statbank/table/05467/tableViewLayout1/

Statistisk Sentralbyrå; *Type bosted* Lastet ned 28. oktober 2020 fra: https://www.ssb.no/befolkning/statistikker/beftett/aar/2015-12-11?fane=tabell&sort=nummer&tabell=248664

Transportløyve.no, *Oversikt drosjeløyver i Norge,* Sist lastet ned 8. november 2020 fra: http://www.transportloyve.no/

Valle Kommune, *Kommuneplan 2016 – 2028, Samfunnsdelen,* Sist lastet ned 13. november 2020 fra: https://www.valle.kommune.no/kommuneplan.523897.nn.html

Åseral Kommune, *Kommuneplan 2015-2025 Samfunnsdelen,* Sist lastet ned 13. november 2020 fra: https://www.aseral.kommune.no/kommuneplan.540114.nn.html

Appendix

Appendix 1: Survey Inhabitants Report PP4 Setesdal

Appendix 2: Stakeholder involvement Setesdal

Appendix 3: Planning documents Setesdal

Appendix 4: Script of inhabitant's survey on mobility in Setesdal and Åseral