When the City Moves Closer

A Rurban Development Framework for Säve

Master's Thesis 2023 • Chalmers School of Architecture • Rurban Transformations • Isak Larborn

About the Author

Isak Larborn

Bachelor's degree in Architecture And Engineering, Chalmers University of Technology, 2017-2020

Year in Industry Placement, Buro Happold Engineering, London, 2020-2021

M. Sc. Architecture and Planning Beyond Sustainability, Chalmers University of Technology, 2021-

- Architecture and Planning for Social Inclusion
- Social-Ecological Urbanism
- Sustainable Building: Competition

I first found Säve in the year 2018, when I drove the Swedish ice cream van during one of the hottest and driest summers on record. My tours took me all around the Gothenburg region, but Säve and Northern Hisingen struck me as an area that was previously off my radar, rural and out of the way despite being so close to the centre. The idea of Säve as an area with tons of unfulfilled potential has bounced around in my head ever since.

My studies at Chalmers have led me in the direction towards larger scale questions, in particular urban and spatial planning. My experience with computational design and GIS gives me the tools to tackle these large scale projects without getting bogged down in the details. My experience with participatory design from Architecture and Planning for Social Inclusion grants me the knowledge needed not to forget the social aspects of planning.

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Supervisor: Louise Didriksson
Examiner: Marco Adelfio
External supervision: Rådhuset Arkitekter

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Introduction

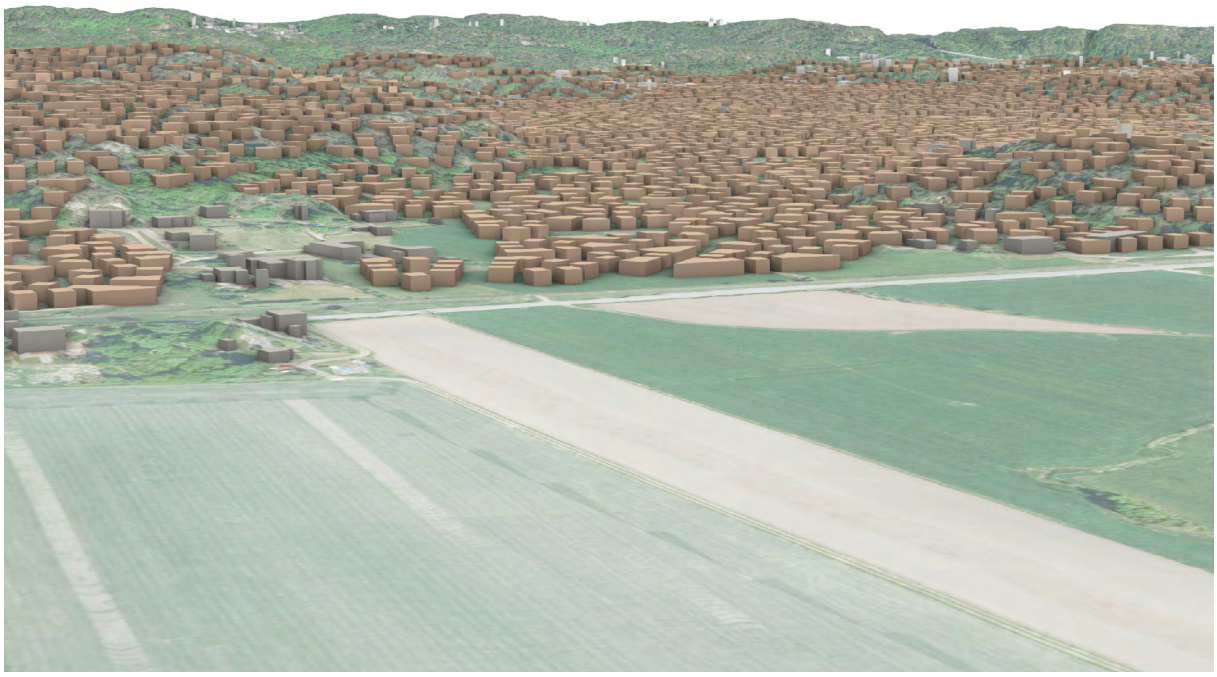
Abstract

Säve is a rural village of 700 people located within the municipality of Gothenburg, on the flat fertile plains of northern Hisingen. With farms and farmlands still located at the centre of the village, it still feels like it has not fully transitioned into a suburban area. This could change in the future, with the comprehensive plan of the City of Gothenburg proposing up to 12 000 new housing units in the Säve area, which would increase the population of Säve to over 30 000. A prerequisite for this is reopening the closed railway station, which would bring travel times to central Gothenburg down to 15 minutes.

Most of the land around Säve is agricultural clay plains, some of the best farmland available. Agricultural land is a limited resource, and it is one that is needed more and more with the world's growing population and increasing worries regarding the state of national security in Europe. Climate change could also mean that Sweden has to take on a greater role in the global food supply chain in the future.

Building on agricultural land is prohibited under the Swedish environmental code unless the development is a "significant public interest" that "cannot be accommodated elsewhere." While this law sounds strict, it is quite toothless in practice, as enforcement is minimal and it is generally left up to each individual municipality to interpret. Redevelopment of agricultural land for urban land uses is in fact increasing, not decreasing.

Säve is affected by various external and internal pressures. To find a balanced path forward for Säve, one which allows the community to develop into the future while still preserving its rural feel and its productive agriculture, the context and history of Säve as well as theory surrounding agricultural land redevelopment has been studied. In the history of Säve, a traditional type of agricultural village built with the intent to conserve useful agricultural land was found. These historical villages, their land use patterns and building typologies have been studied. The result is a framework that allows new villages to be constructed, taking minimal amounts of agricultural land, while still allowing Säve to develop into the future for decades to come.



Visualisation of what12 000 single-family homes constructed in the area highlighted by the comprehensive plan of the City of Gothenburg could look like. (Own work, generated using Grasshopper.)

Background

12 kilometres north of Central Gothenburg, in the rural heart of the island of Hisingen, lies the village of Säve. Home to just over 700 people, with 2500 living in the wider area, it has a rural character, and despite some suburban housing being built in the latter half of the 20th century Säve still retains much of its status as a farming village, having farms and pastures located within its built-up area to this day. Säve does also have industry and commercial activity, but it lacks basic amenities and services like a grocery store, making it very difficult to take care of your daily needs without owning a car.

One of the key factors that has allowed Säve to stay small and rural is its lack of good infrastructure. Despite being a part of the City of Gothenburg, its connections to the city centre are worse than those of many suburbs in neighbouring municipalities. To travel to Central Gothenburg today, your options are between a bus journey taking nearly 40 minutes with a minimum of one change, or a drive that takes 25 minutes with no traffic but can double to up to 50 minutes during peak hours, according to Google Maps. The traffic situation is described as 'severe' by frustrated residents. (Magnusson, 2022.)

There is however one piece of infrastructure that has the potential to massively change the situation of Säve - its railway. Tracks split the village in two, and every half hour a train runs straight through reaching Gothenburg Central in less than 15 minutes, and in the near future Haga and Korsvägen. The railway station in Säve closed in 1979, but in recent years discussions about reopening it have gained traction. Säve is stated to already meet the requirements for a new station, issues preventing its reopening are technical in nature but planned infrastructure upgrades are set to resolve these. (Trafikverket, 2021).

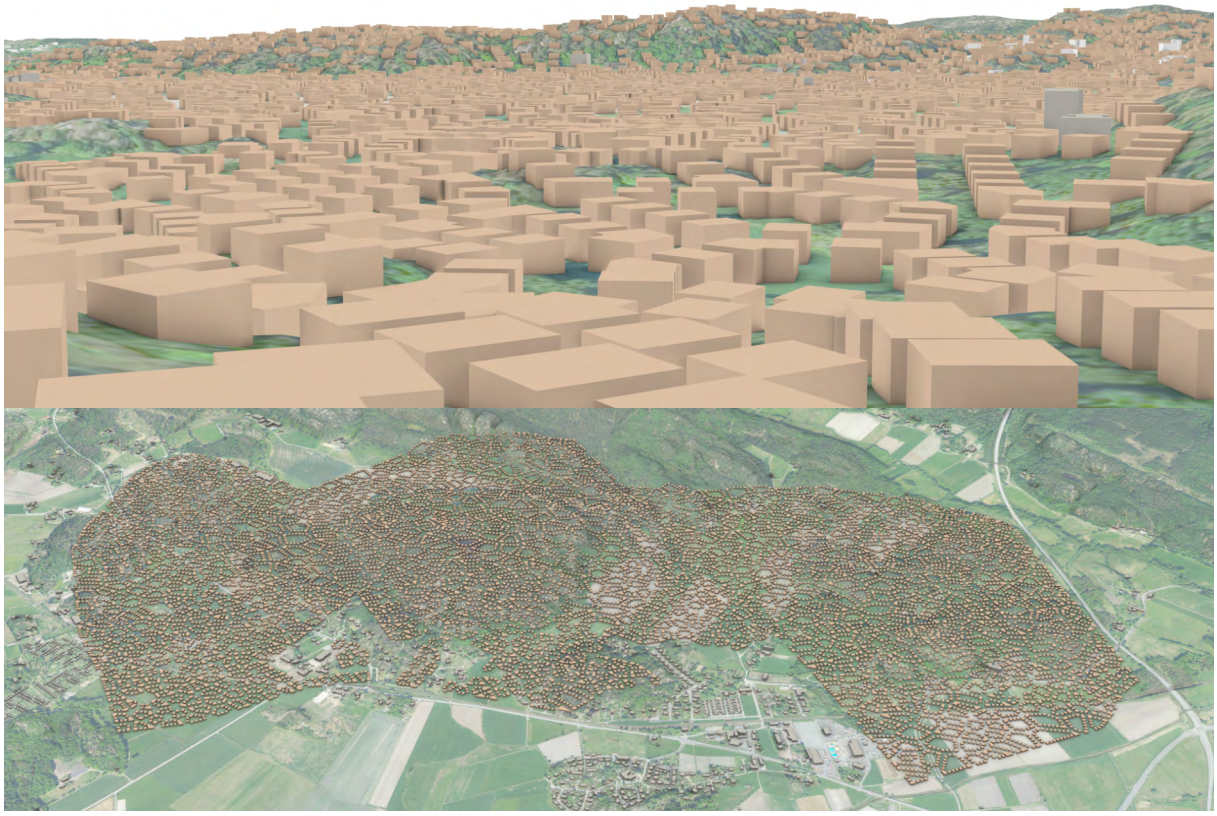
A reopened Säve railway station would not just mean quicker journeys into central Gothenburg. It represents a fundamental shift in the boundary conditions that have formed the Säve of today. The attractiveness of living in Säve would dramatically increase, as would its value to

Entering Säve village along the main road Kongahällavägen from the direction of Gothenburg to the south. The main industrial area is visible on the right hand side, while agricultural fields still continue on the left hand side.

property developers. For the City of Gothenburg this represents an opportunity. While the population of Gothenburg overall is growing, there is at least a common perception that middle-class families are moving out to suburbs, primarily those in neighbouring municipalities served by commuter rail, where they can afford to buy a house. (Cwejman, 2020.) As this demographic is a key taxpayer, this development threatens to erode the tax base of the City of Gothenburg. To the municipality, Säve represents an opportunity to create something within their borders that can compete with these commuter rail suburbs.

According to a report published by the City of Gothenburg (Göteborgs stad, 2021), there is potential for 10 000-12 000 new housing units in Säve. The station being reopened is a vital part of the new development, as the City of Gothenburg does not wish to do any expansions in its outer areas without being able to provide them with adequate public transport. (Göteborgs stad, 2022.) It is stated development around the station area should be relatively dense, with the present-day village of Säve becoming the central hub of a new urban district. Surrounding development would then be mostly single-family housing, with Ytterby just to the north in Kungälv municipality cited as a reference for the intended density and housing typology.

Most of the area surrounding Säve is agricultural, although the municipality has primarily studied the area extending east from the village, which is evenly split between agriculture and forested land. The agricultural landscape west of Säve, around the village of Öxnäs, is protected as a national interest (riksintresse) which explains the eastward focus. Regardless, new large-scale development in Säve would have to use greenfield land, and the land that is closest and easiest to develop is agricultural. Building on agricultural land is highly problematic, as it cannot be replaced and the need for it will only grow in the future. Still, agricultural land continues to be appropriated for urban development in Sweden, at a rate that is not slowing down. (Jordbruksverket, 2022.)



Visualisation of what 12 000 single-family homes constructed in the area highlighted by the comprehensive plan of the City of Gothenburg could look like. (Own work, generated using Grasshopper.)

Outline

This thesis starts off from the proposal for Säve that is outlined in the municipal comprehensive plan of Gothenburg. The final proposal reached by this thesis may be viewed, depending on point of view, as either a counterproposal or as a framework to execute the comprehensive plan. In order to develop this framework, the context and history of Säve have been studied, and historical, current and developing practices regarding the valuing of agricultural land have been analysed. The end goal is to reach a balanced compromise between the following three interests:

- The local interest to preserve the qualities of Säve, while improving perceived shortcomings.
- The regional interest for more housing, and in particular more housing near public transportation corridors.
- The national interest to preserve agricultural land, for preparedness in case of disaster and for future global needs.

The guiding thesis question is:

> How should Säve develop into the future, taking into account the unique characteristics of the local context, the needs and desires of local residents, and the justifiability of redeveloping agricultural land?

Methods used for this thesis include investigations into existing literature and research surrounding the valuing and treatment of agricultural land, as well as on-site analysis and conversations with residents, and analysing historical land use and building patterns of the area.

Tools used in this thesis include GIS software, used to analyse and visualise geodata to aid in the investigation into the context and land of Säve, and computational design software, used to generate visualisations of urban development at different scales and densities.

Supervisor for this thesis is Louise Didriksson of White Arkitekter and Chalmers University of Technology. External support has been provided by Johan Wahlström and Jakob Resare of Rådhuset Arkitekter.

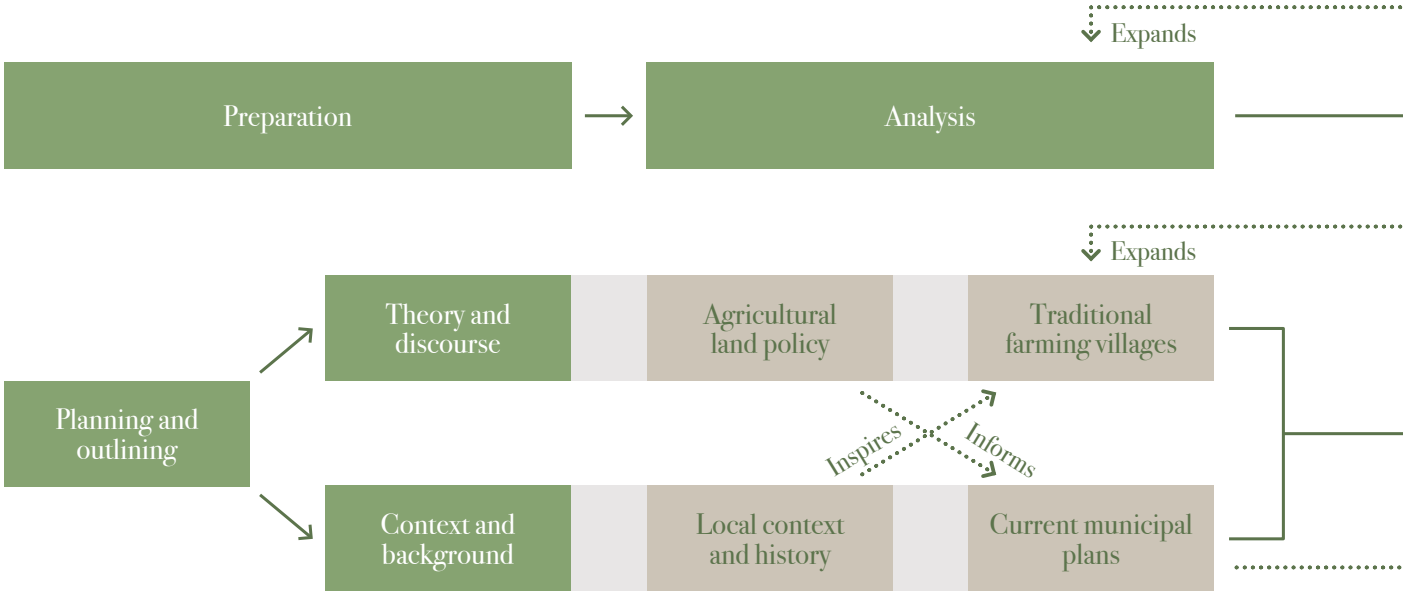
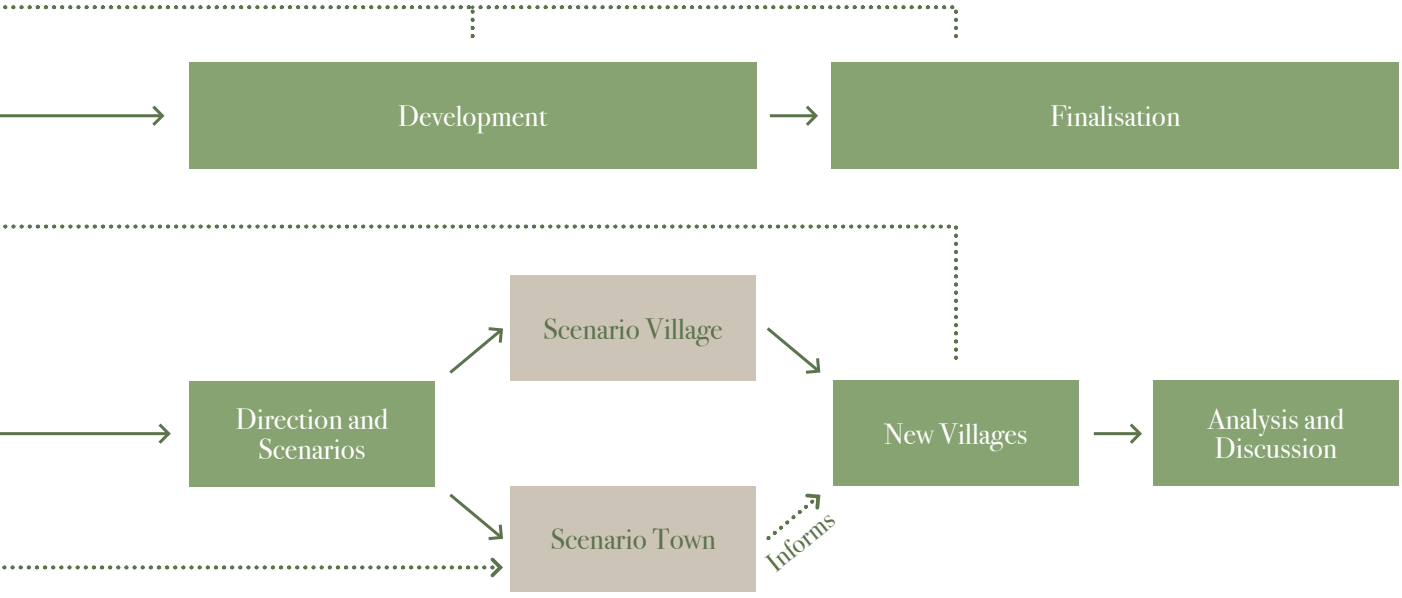


Diagram of process. The top shows the process as initially laid out during planning stage and the bottom shows how the process played out during production of the thesis.

The old Säve railway station, out of use since 1979.



The Local Context of Säve

Säve began as a collection of agricultural villages on the plains of northern Hisingen, centred around a church village. These villages were built on rocky hills raised above the fertile clay soil. The arrival of the railway caused the church village to begin to develop beyond agriculture, but the construction of the Säve air force base during World War II prevented the local authorities from fulfilling their plans of creating a local centre. When Gothenburg annexed Säve in 1967, the air base closed down and a plan to develop all of northern Hisingen by the year 2000 was created, but halted by the 1970s economic slowdown.

Today Säve is still a collection of rural villages, with few services but a vibrant industrial and enterprise sector. Poor connections to Gothenburg have kept interest in Säve low, but renewed plans to develop Säve into a sprawling urban area are brewing, and will be under serious consideration if the railway station reopens.

History of Säve

Early history

Säve is located on the northern tip of Hisingen and in the southernmost reaches of the historical province of Bohuslän, in a region that has been contested by Denmark, Norway and Sweden for as long as those countries have existed. Prior to 1658 Säve was located in the southern reaches of Norway, at the time itself ruled by Denmark. 1658 was the year in which Bohuslän and therefore Säve was conquered by Sweden, where it has remained ever since. (Scander, 1969.)

Säve itself is first mentioned in writing in a 1597 account of the travels of Oslo bishop Jens Nilsson. Its history stretches much farther back than this though. The church of today is known to date from around the 1200s, though with substantial remodelling occurring in the 1700s, although it likely replaced an earlier church on the same site. (Wildte, 1969a.) The landscape around Säve was then as now highly agricultural, consisting of a number of farming villages centred around a church village, known as kyrkeby. The name Säve itself comes from the same root as the modern day Swedish word for lake [*sjö*] and is said to be derived from a formerly flooded area near to the church. (Scander, 1969.)

Although Kyrkeby was an important centre in Säve, as the whole parish would have been expected to attend church each Sunday, the village of Bärby to the south was an important centre for all of medieval western Hisingen, being the gathering site for the traditional council known as a thing [*ting*], which primarily functioned as a court of law. (Wildte, 1969b.)

Säve Church. The central part is thought to date to the 1200s, while the rear and tower were added in the 1700s.

Successive agricultural land reforms were carried out across Sweden from the late 1700s onwards. These reforms intended to break apart the farming villages by moving each farm out onto its own separate plot of land, in order to improve the efficiency of the country's agricultural production. Most villages in Säve were affected by this although not all equally, with the village of Öxnäs being considered remarkably well-preserved.

Station community

In the early 1800s, Bärby overshadowed Kyrkeby as the most important centre of Säve parish. Due to its advantageous location at the crossroads between Kungälv, Torslanda and Gothenburg, Bärby had grown to house the school, trade house and administrative buildings. This changed with the arrival of the railway from Gothenburg to Uddevalla and the rest of Bohuslän. The railway passed through Säve parish north to south, but its station was placed in Kyrkeby, and when it opened in 1907 the balance was shifted. Around the station and church, a new station community begun forming that did not purely depend on agriculture, and the trade house moved to this community in 1917. (Rundberg, 1969).

Säve municipality was formed from the old parish in 1862, and with few exceptions kept the same borders for as long as it existed (Wikipedia, 2023). By 1934, the municipality was still highly rural, consisting only of farms and small villages, but the largest concentration of buildings could

The oldest remaining building of Bärby school, built in the 1920s.

be found around Säve station (Rikets allmänna kartverk, 1934.)

When the second world war broke out, the Swedish government found itself with an urgent need for more military air bases. In June of 1940, parliament approved the decision to establish a new air base in Säve and just a month later this base had begun operations, using various temporary facilities until a permanent air field was finished in June, 1941. The presence of this hastily developed air base became an issue when after the war, starting in 1948, jet aircraft began to be stationed at the airfield. (Hjorth, 1969). The noise from the military jets made half of the surface area of Hisingen unsuitable for development. Säve municipality began working on a plan for its new centre and station village in the immediate post-war years, with a first revision being produced in 1950 by Architect A. Lidvall. Subsequent revisions were made in 1952, 1953, 1955, and 1958. The 1958 revision was finally accepted by the county administration [*länsstyrelsen*] in 1962, although in a significantly reduced form consisting primarily of areas already built up (Johansson, 1969). This plan was small in scale, but featured a mixed use town centre next to the station, an industrial area to the south, a school immediately east of the station, and housing, both single-family and multi-family, limited to the east of the main road Kongahällavägen in the enacted plan but rising up on the hills of Brunstorp in the full proposal.

Incorporation

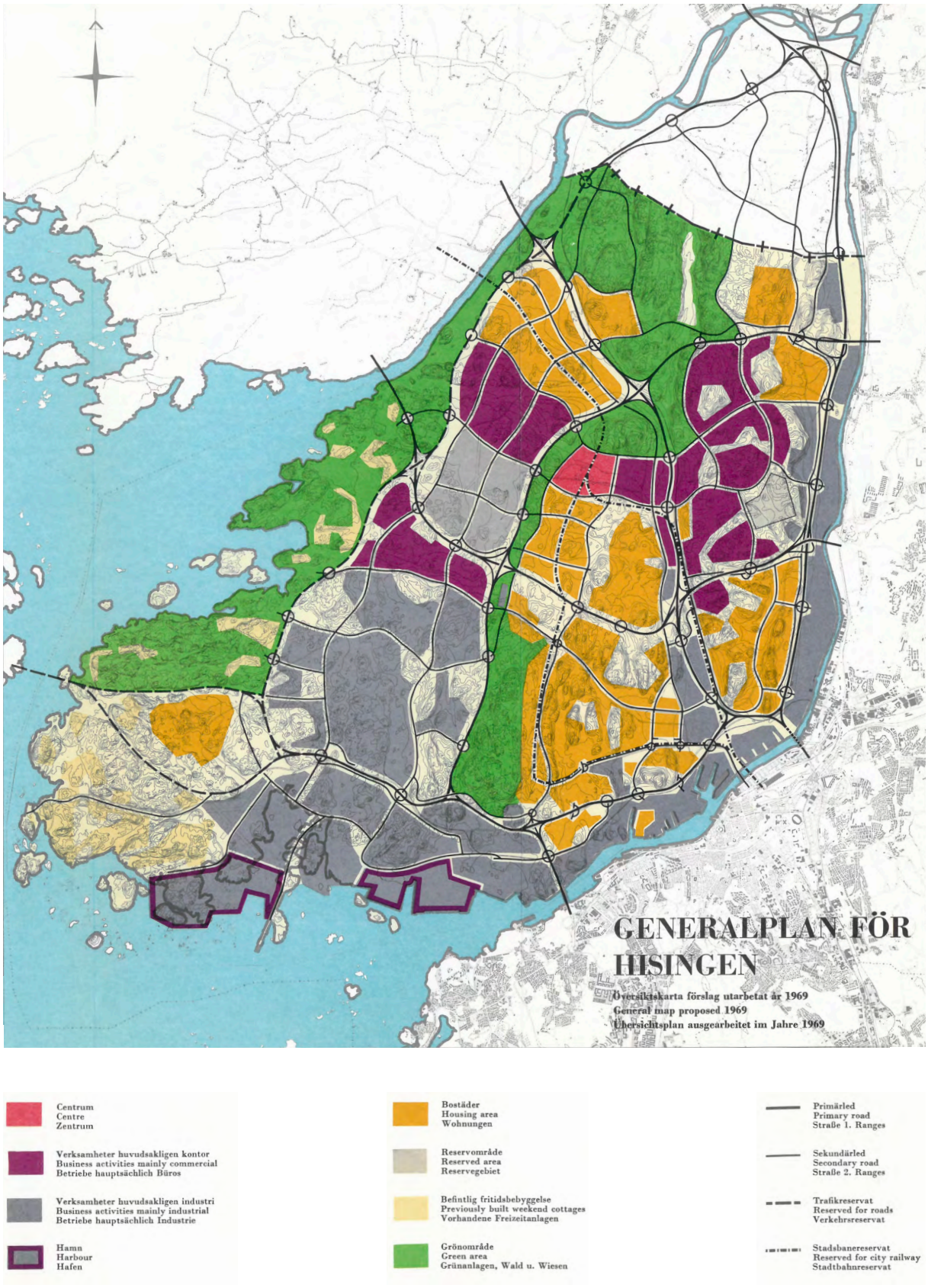
In the 1960s, at the peak of the period known in Sweden as the Record Years [*Rekordåren*], the city of Gothenburg and its industries were booming. As described by Wenander (2006) the rate of construction in Gothenburg was 5 000 to 6 000 units of housing per year, and acquiring land for the construction of Högsbo and Frölunda had been both time-consuming and costly. The municipalities to Gothenburg's north and northeast however were very rural and had plenty of available land. Led by City Secretary and local head of the Social Democrats, Torsten Henriksson, a process was launched whereby the city of Gothenburg would in secret buy up land from farmers in the northern municipalities. A law firm was hired to aid the process, and this law firm formed a new corporation under the name *Västsvenska Bygg och Bostads AB* (Western Swedish Construction and Housing, Ltd). Posing as a local property developers, in 1962-1963 the lawyers negotiated with the rural municipalities and local farmers to purchase as much land as they could get their hands on. So as this would not leak to the press, the Editor in Chief of the main local newspaper Göteborgs-Posten, Harry Hjörne, was made aware of the deal ahead of time.

When other newspapers became aware of the dealings, 102 million SEK had been spent on land in the municipalities of Angered and Stora Lundby to the northeast, and Tuve, Torslanda and Säve on Hisingen. Enough land had been bought that the City of Gothenburg was able to incorporate the territory of these municipalities on the 1st of January, 1967 ("Kupp gav Götet mark", 1963).

With the rural municipalities on Hisingen acquired, the City of Gothenburg drew up grand plans to develop this land. The 1969 Masterplan for Hisingen (Göteborgs stad, 1971.) would have meant the urbanisation of virtually the entire island by the year 2000. The plan featured large residential, industrial and office areas connected by highways and urban rail lines. Within the main village of Säve, a highway would have cut through right between Kyrkeby and Brunstorp, with large residential areas on either side. The entirety of the fields of Öxnäs, today highly protected as a State Interest, Natura 2000 area, and nature reserve, were marked for development, while land less suitable for agriculture (and thus with rougher terrain more difficult to develop) was marked for preservation. And with the Säve air base closed at Gothenburg's request, it appeared certain that the rural Säve would soon be replaced by an urban landscape (Johansson, 1969).

Rurbanity

With few exceptions, the grand plans would not come to pass. The economic crises occurring in the early 1970s dramatically slowed down housing construction in Gothenburg, and led to much of what did get built sitting empty (Kubu, 1979). Within just a few years the plans had been

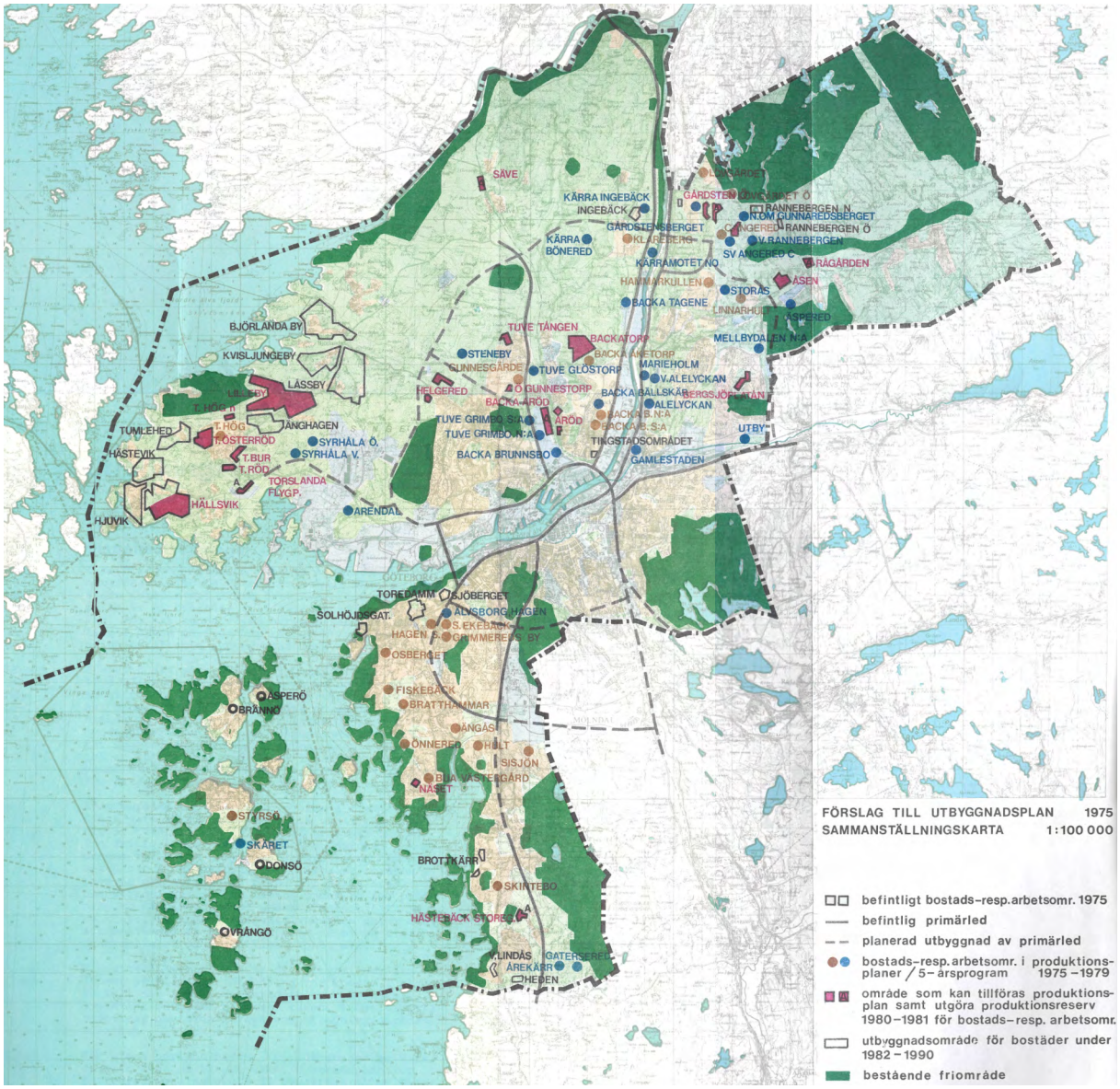


The 1969 masterplan for Hisingen, developed by Gothenburg after the annexation of Torslanda, Tuve and Säve. The plan uses mostly flat agricultural land while marking non-agricultural land in green as nature areas. When fully developed in the year 2000, the island of Hisingen would be home to 200 000 residents. (Göteborgs stad, 1971).

dramatically downscaled. The 1975 masterplan for Gothenburg (Göteborgs stad, 1976) had been redirected towards single family housing, mainly around Fiskebäck on the mainland and Torslanda on Hisingen. In Säve, only a small area was zoned for development, between today's main village and Gunnesby. This area has still not been built up to this day.

Säve has not changed much in the 50 years since the plans were dropped. The railway station closed in 1979 amidst dwindling passenger and freight numbers. Residential development has continued on a small scale, the largest being the redevelopment of Brunstorp in the early 1990s. Industries have also developed, both in Säve and the surroundings. The Lidvall plan has been used as recently as the early 2010s to enlarge the industrial area in the south of Säve village.

There has been a general shift in the view of the value of these lands. The well-preserved village of Öxnäs along with its surrounding lands, slated for complete redevelopment in the 1969 masterplan, are now under several layers of protection, starting with being made State Interest for Cultural Environment in 1987 (Riksantikvarieämbetet, 1987).



The 1975 masterplan for Gothenburg. Planned development on Hisingen has been completely redirected towards single-family homes in the coastal west compared to the 1969 plan. (Göteborgs stad, 1976),

Säve today

Säve and surrounding villages

The name Säve can, as it has in history, be applied in a number of ways. Firstly there is the urban area, which as defined by SCB (2020) includes the historical villages of Säve Kyrkeby and Brunstorp. The railway with its closed station splits this locality right down the middle. The population of this locality in 2020 was 715, according to SCB. Secondly there is the wider area, which includes surrounding villages with historical connections as part of the parish of Säve. As currently defined by the City of Gothenburg (2022), this area is home to 2 443 inhabitants. Within this area only one other locality meets the population requirement of 200 to qualify as an urban area according to SCB, and that is the combined villages of Skändla and Assmundtorp, located in the far south of the area, with a population of 217 (SCB, 2020).

A large number of other smaller villages are included in the wider Säve area. Focusing on the most important villages in the vicinity of Säve itself, we have Bärby, the historical administrative centre that houses the primary school, with a population of 66 (SCB, 2020).

A few hundred metres north of Säve there is Gunnesby, home to 134 people and a former school, now the meeting place of the Säve-Rödbo *hembygdsförening*, association of local heritage. Outside of it is Gunnesby Koloniträdgårdar, a large area of allotment gardens with holiday cottages. Farther north, there is Skålvisered, with a highly dispersed population of 138.

Brunstorp is today largely a 1990s residential area, but some older buildings and farm remains are sprinkled in.

West of Säve there is Öxnäs, a small village considered to have high cultural values due to having survived relatively intact through the era of agricultural land reform. It and its surrounding lands are protected under five different categories of state interests, a municipal area restriction and a recently enacted nature reserve.

Brunstorpsnäs was, as the name suggests, historically part of the lands of Brunstorp. 73 people reside here, and the village houses a port of a small cable ferry, Kornhalls färja, that connects Säve and the northwestern parts of the island of Hisingen to Kornhall and the western parts of the municipality of Kungälv on the mainland.

Retail

Within the village of Säve itself there is a convenience store and Café with postal services, Grönadals livs & café, located immediately off the main road Kongahällavägen. There is also a hair salon, Salong Babsan, right next to the railway tracks. The old station building was previously home to a restaurant, but now houses a catering business that also offers lunch, Matinspiration. Expanding the search to the wider area, Bärby features an unstaffed St1 petrol station. The farm shop Bärby självplock offers a wide variety of products including local and imported produce. Another farm shop, Hedens gård i Säve, is located in Skålvisered. And in Brunstorpsnäs, right next to the Kornhall ferry, a small kiosk can be found known as Kornhallskiosken.

Business

The business/industrial sector is stronger than the retail sector, and cannot be exhaustively listed. Much of this sector focuses on more specific retail to business as well as private customers, both physically and online. For example, just within Säve proper, there are used car and lorry retailers, companies dealing in specialised motor parts, construction and building material companies, and many other small businesses that cannot be neatly

categorised. Within the wider area, even more businesses can be found. In Öxnäs, a large plant nursery can be found, selling plants wholesale. Assmundtorp features a small industrial area, with businesses of a similar type to what can be found in Säve proper. And although it is a bit farther away from the areas mainly considered in this thesis, the strong business life of the Säve airport area cannot be ignored, including Heart Aerospace, a startup developing electric passenger airplanes which already has orders from major airlines and could be a major employer in the future.

Services

Within Säve proper, postal services can be accessed at Grönadals livs & café. A preschool, Humlelyckan, can also be found in Brunstorp. In Bärby there is another preschool, Bilyckan, and a primary school, Bärbyskolan. The nearest secondary schools are Glöstorpsskolan in Tuve and Klarebergsskolan in Kärra, both located approximately 5 km from Säve. Kärra and Tuve are also home to the nearest libraries, primary healthcare centres and pharmacies. When it comes to upper secondary schools [*gymnasieskolor*] the nearest are in Angered or all the way down in central Gothenburg.

Subjective impressions

Säve has always been a primarily rural area, and still is to this day. For an area so close to the city of Gothenburg, in fact within the municipal boundaries, it is not very urbanised or even suburbanised. Whereas many other rural villages and areas have transitioned into suburban towns serving Gothenburg, in particular those along important transport corridors, Säve still retains many of the characteristics of a primarily agricultural village. Farms and farmers' fields still exist within the boundaries of the village itself, right next to suburban developments of different eras. Säve appears to have begun a process of suburbanisation, but this has stalled or simply occurred so slowly that today's Säve is a hybrid between suburban and rural, simultaneously a suburban town and an agricultural village. From conversations with people in Säve it is clear that most like it that way. One farmer met on the roads east of Säve, when asked about the plans to build housing on the surrounding fields, replied instantly "us farmers absolutely do not want that." (B. Johansson, personal communication, March 28, 2023.)

Farm located right in the middle of the today's village of Säve, surrounded on all sides by suburban development. Piles of hay are stacked up front and the smell of manure can be felt when close.

The “main street” of Säve, Säve kyrkväg, looking east. Found along this street are a couple of local shops, some residential buildings including small apartment buildings, and many industrial sites and buildings.

View of the village of Säve from Tåfjäll, looking to the southwest. The church can be seen on the left hand side of the building, and the main industrial area towards the centre-right. Visible along the horizon is Karlatornet in the city centre.

The old Säve railway station, passed by one of the half-hourly Västtrafik trains. The railway station building until recently was used as a restaurant, but this restaurant closed down in early 2023.

The agricultural lands immediately to the east of Säve town. These are right in the middle of the development area outlined in the Municipal Comprehensive Plan.

Current municipal plans

Outline

The two key documents outlining future plans for Säve are the latest Municipal Comprehensive Plan (Göteborgs stad, 2022) and the Outer City Study, *Ytterstadsutredningen* (Göteborgs stad, 2021). However, Säve being included in the city's broad future plans is nothing new. The previous MCP (Göteborgs stad, 2009) also included Säve, highlighting an area with roughly the same delimitations as the latest MCP.

The defined area does vary slightly between the three planning documents. Between the Outer City Study and the latest MCP, which will be the main focus here, the only difference comes within the built-up village of Säve. Whereas the Outer City Study only includes the area east of Kongahällavägen, the MCP also includes all of Brunstorp and the fields west of Kongahällavägen between Brunstorp and the rest of Säve. This version of the studied area is shown on most maps within this section of the thesis as a black dashed line.

The planned area is roughly 630 hectares, and 35% of that is made up of currently used agricultural land, while 56% is clay soil, the soil type most suitable for agriculture out of those in the area. 35% of the area has bedrock as its main soil type. These are generally rocky forested hills, which vary in size. As a result of the previously detailed history, the City of Gothenburg owns roughly half the land in Säve, and most of this land is currently used for agricultural purposes.

Within this area the Outer City Investigation proposes 10 000-12 000 new housing units. The existing central village would become a new town centre, with denser, mixed-use developments. Outer areas could be built up more less and be more predominantly made up of housing. Ytterby in Kungälv municipality, on the other side of the river from Säve is considered "comparable to an imagined development of the studied areas" (Göteborgs stad, 2021). Ytterby itself consists of a small denser core around its station, with residential areas made up of mostly single-family housing scattered throughout its surroundings.

Stated challenges

The Outer City Study states an intent to connect the new outer areas with public transportation, to avoid a situation where all new traffic generated by these development is done by private cars, but this is said to be difficult due to a lack of capacity for public transportation in the city centre. For this reason, new developments should around existing public transport links and with local targets reachable on foot or by bike should be prioritised (Göteborgs stad, 2021). Säve has the railway already, and a reopened station would go a long way towards securing the required transportation infrastructure. Studies have shown that reopening the station would be viable, in terms of economy and passenger numbers (Trafikverket, 2021). In regards to cycling, the City of Gothenburg's cycling programme (Göteborgs stad, 2015) proposes several routes linking areas within and around Säve, and to the city centre, but currently all that exists is a section from Assmundtorp to Säve village via Bärby and its school.

Agricultural land

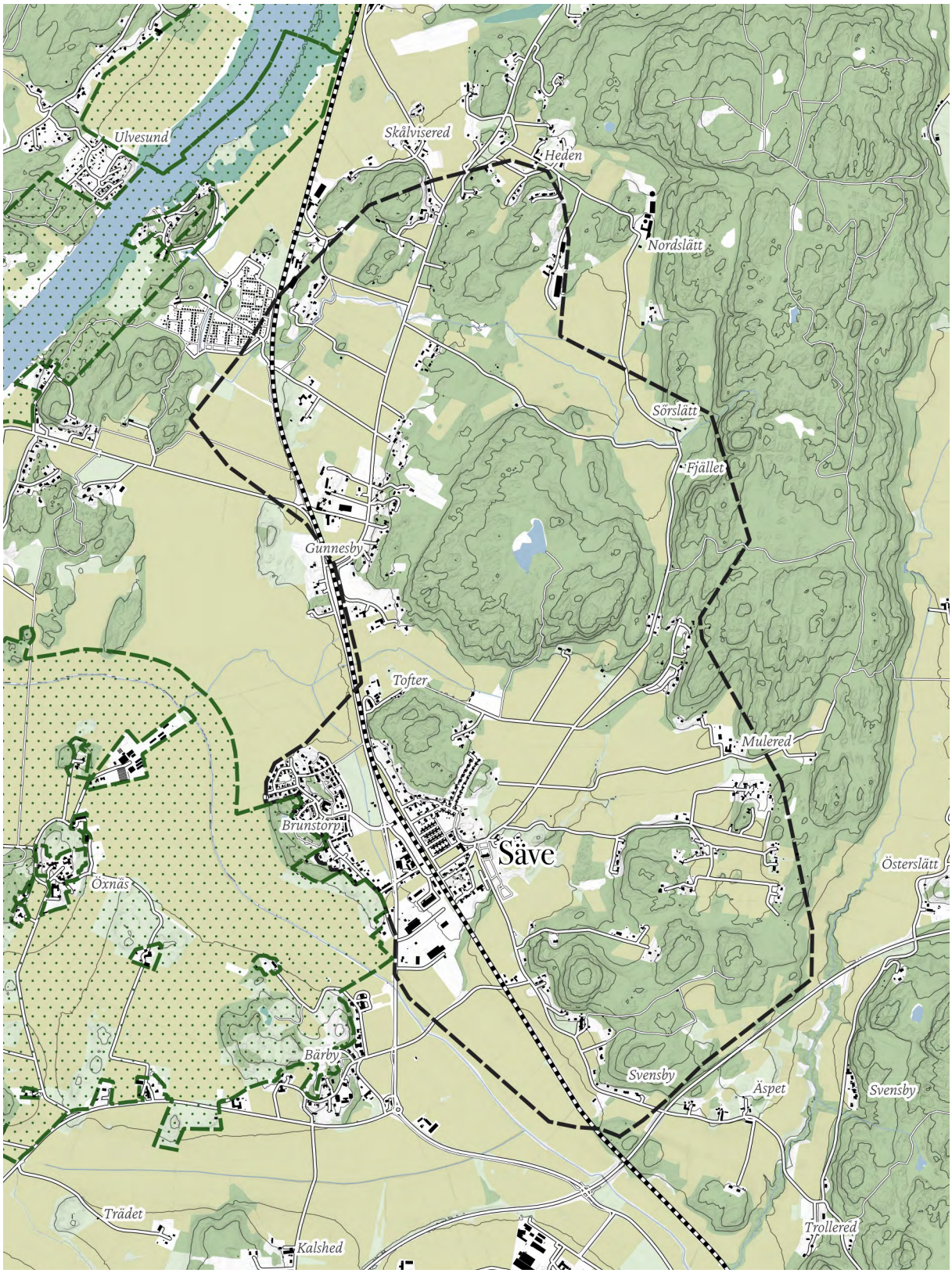
The Outer City Study refers to the environmental code, 3rd Chapter, 4th paragraph, which forbids the redevelopment of agricultural land for purposes other than "significant public interests" that "cannot be accommodated elsewhere". This law and its many interpretations are discussed in more detail in the later section *The Value Of Agricultural Land*. Relevant here is that the Outer City Study makes the interpretation that "buildout of outer city areas is a significant public interest that cannot be accommodated elsewhere". It lists many values of agricultural land, and states that redevelopment of agricultural land should be avoided as far as possible, but ultimately concludes that "Redeveloping the outer areas without appropriating agricultural land would bring about an unsuitable urban structure in these areas and significantly reduce the potential for new construction within them."

Geodata: Lantmäteriet (2021).

MCP study area
Nature reserves
Forest
Farmland
Built-up, industrial
Built-up, low density
Built-up, high density
Railway station

0 1 2 3 4 5 km

Gothenburg



Geodata: Lantmäteriet (2021), OpenStreetMap contributors (2022).

MCP study area
Nature reserves
Forest
Farmland
Meadow
Wetland
10 m contour

0 250 500 750 1 000 m

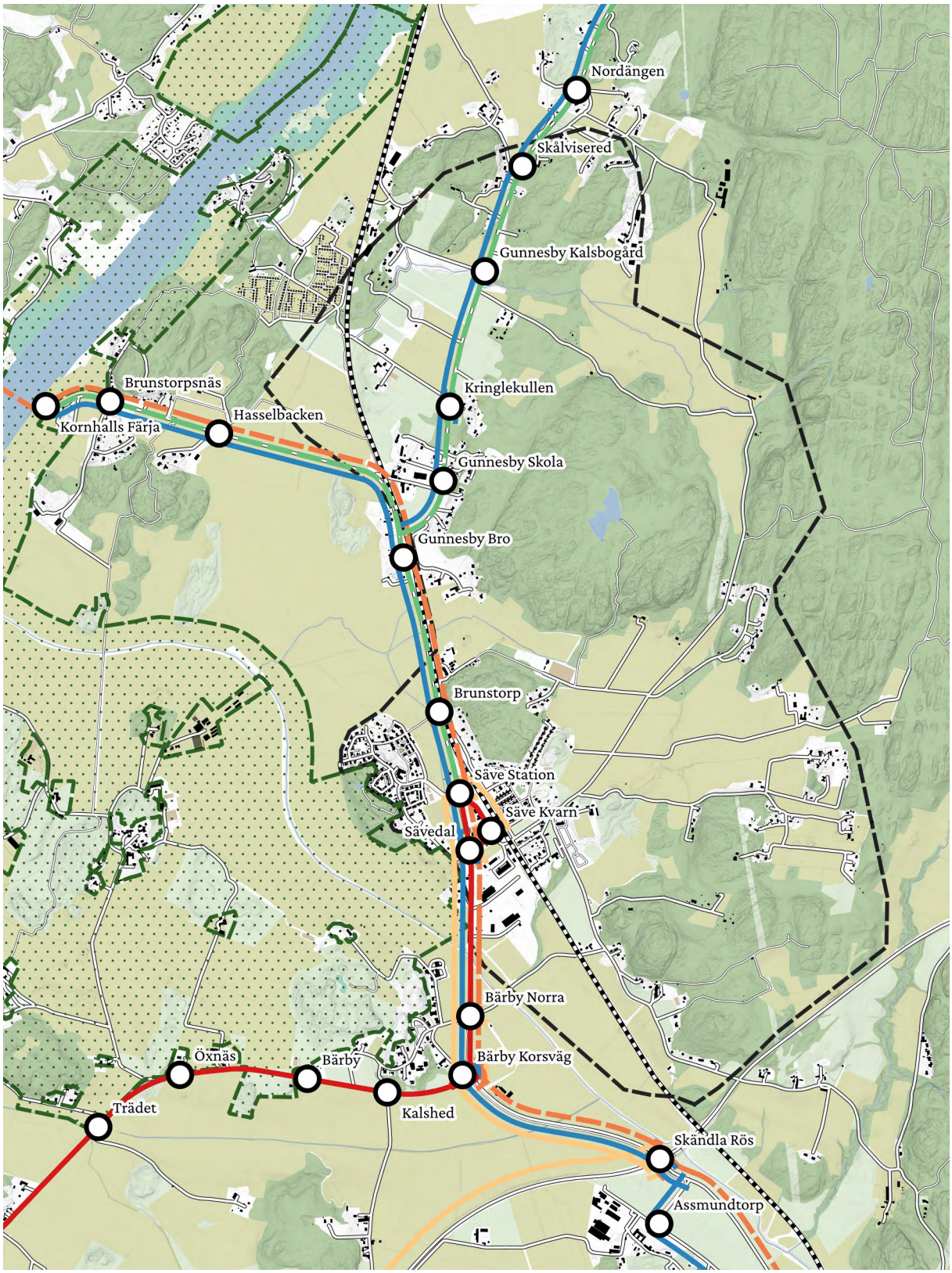
Overview

Geodata: Lantmäteriet (2021), OpenStreetMap contributors (2022).

Single-family housing
Multi-family housing
Community/culture
Preschool/school
Industry/business
Agriculture
Other
2/10 m contour

0 100 200 300 400 m

Village Overview

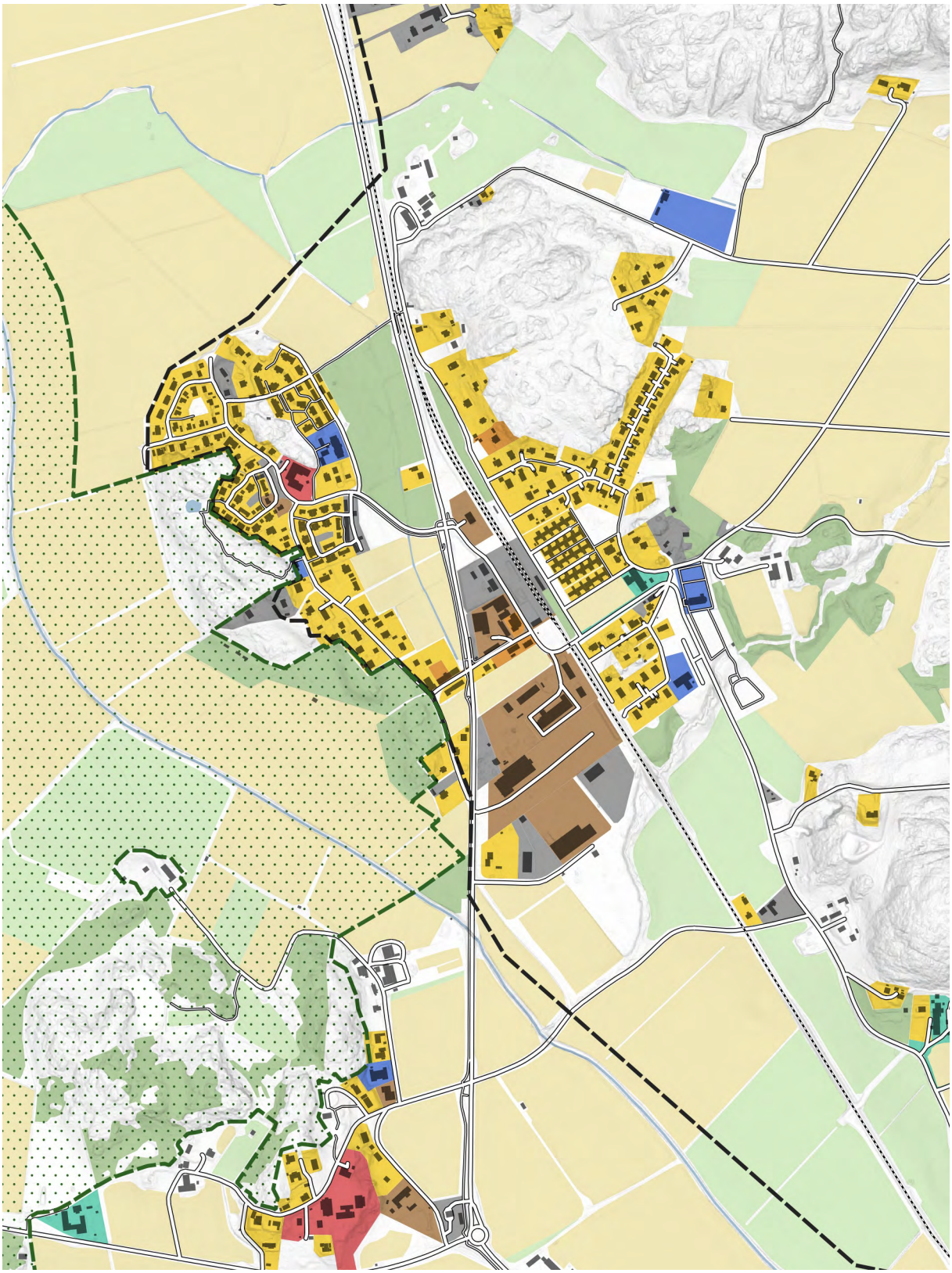


Geodata: Lantmäteriet (2021), OpenStreetMap contributors (2022).

320: Göteborg - Säve - Tjuvkil
36 Hj. Brantingspl. - Säve
39: Klareberg - Säve
35: Hj. Brantingspl. - Stora Holm - Säve
37: Hj. Brantingspl.- Kungälv
Limited service

Public Transport

0 250 500 750 1 000 m

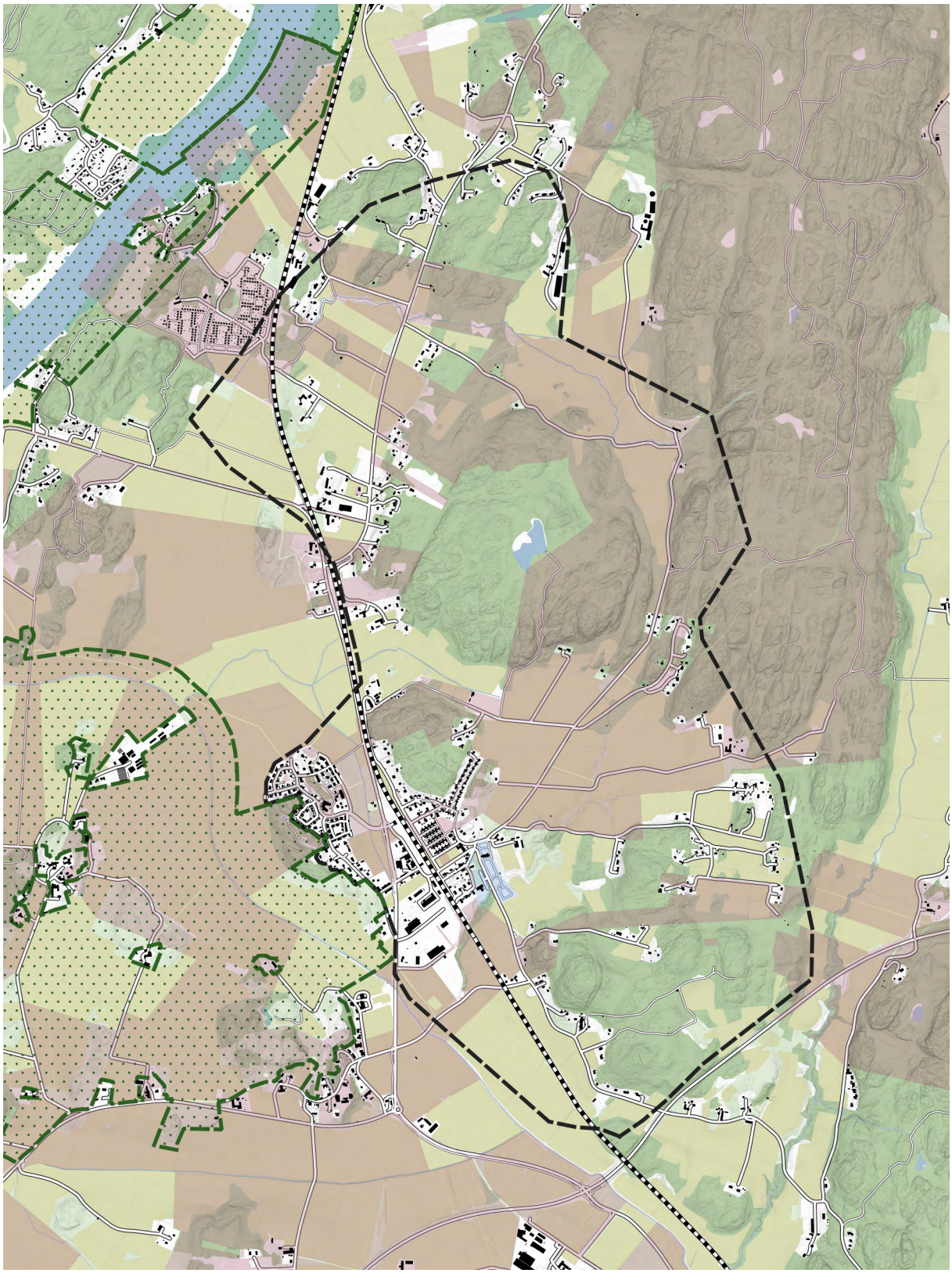


Geodata: Jordbruksverket (2023), Lantmäteriet (2021), OpenStreetMap contributors (2022).

Croplands
Grazelands
Single-family housing
Community/culture
Industry/business
Hayfields
Agricultural
Multi-family housing
Preschool/school
Other

Land Use

0 100 200 300 400 m

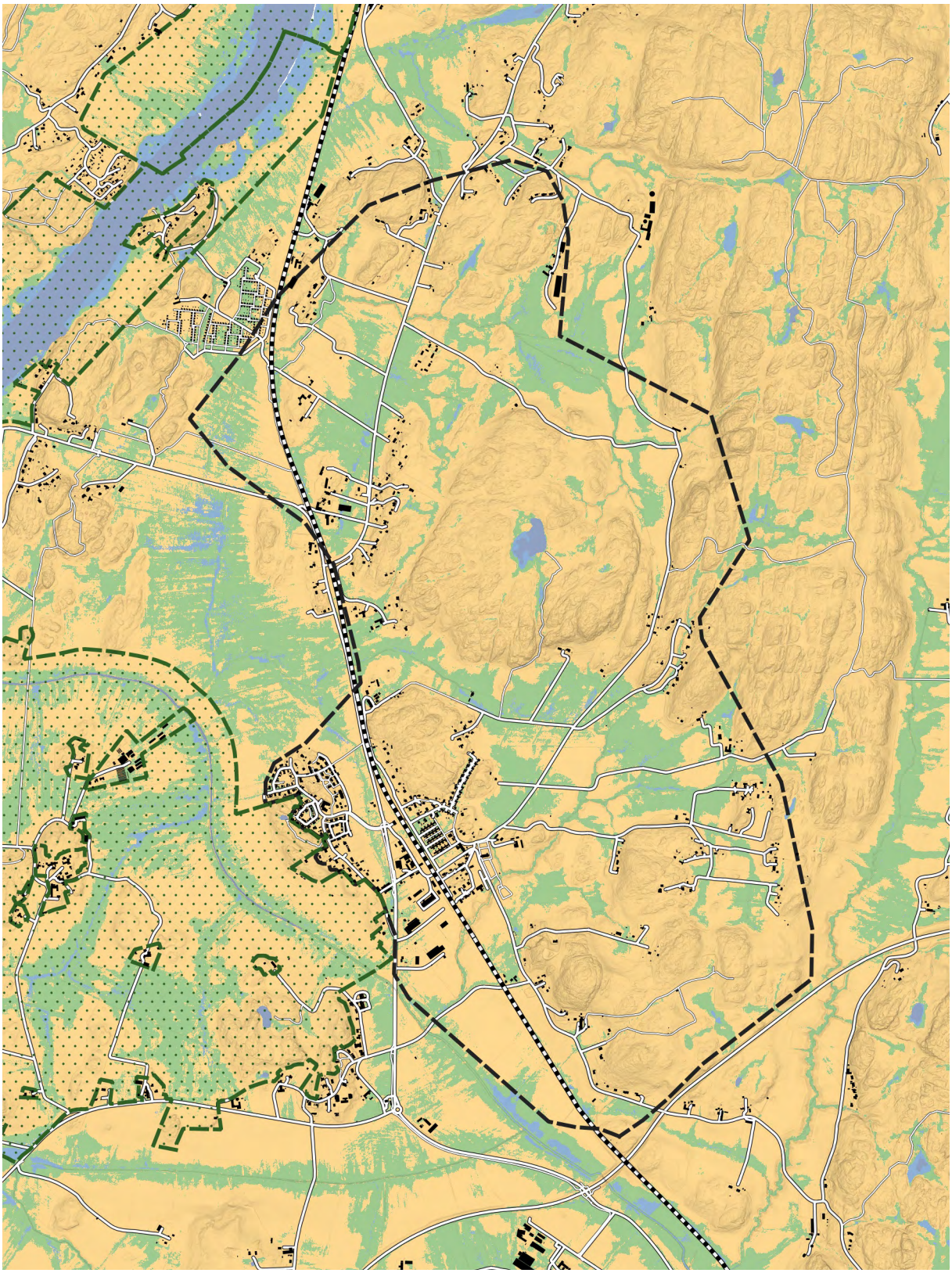


Geodata: Lantmäteriet (2021), Naturvårdsverket (2021), OpenStreetMap contributors (2022).

City of Gothenburg Church of Sweden Private/other

Land Ownership

0 250 500 750 1 000 m

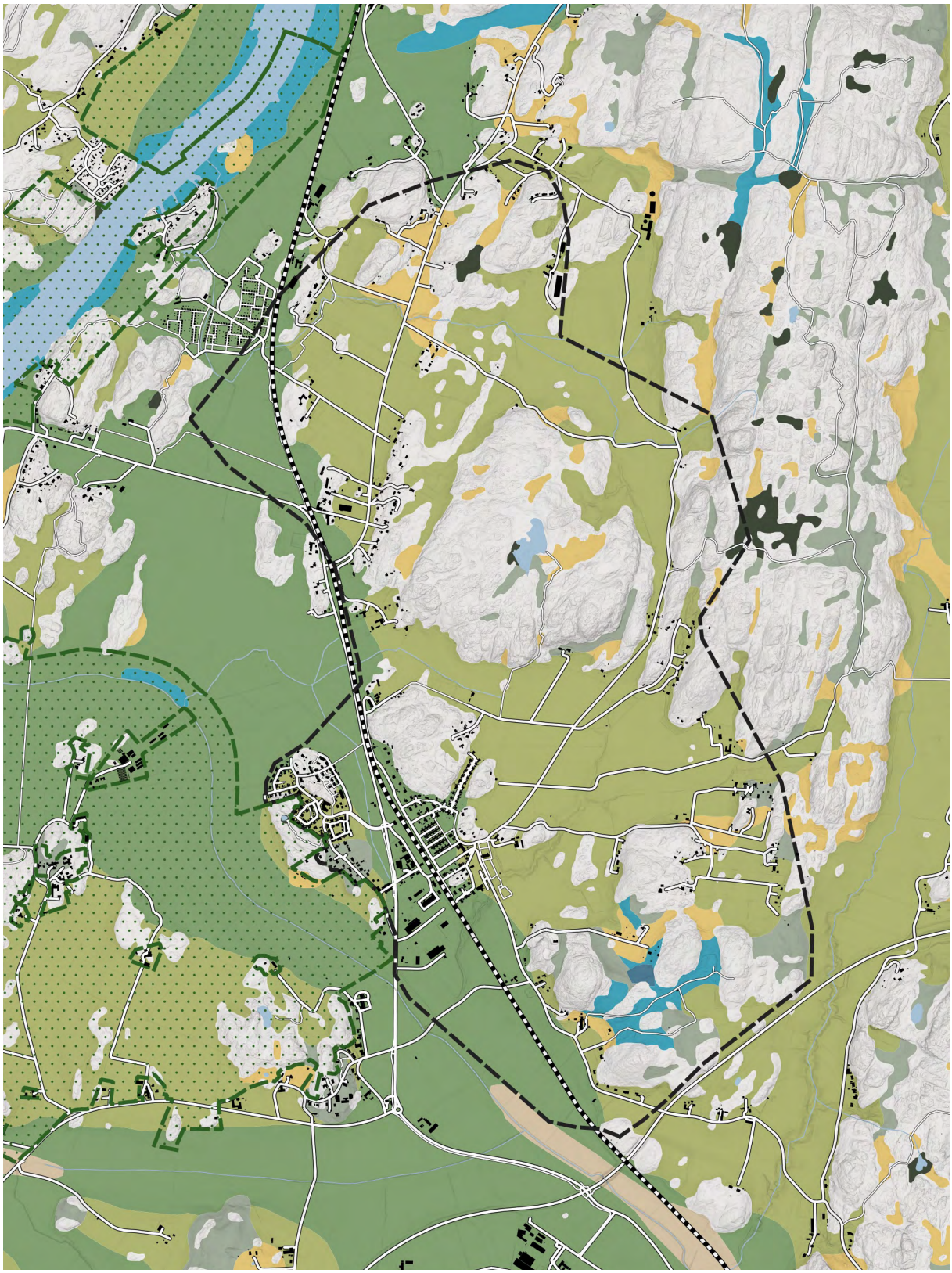


Geodata: Lantmäteriet (2021), OpenStreetMap contributors (2022), Sveriges lantbruksuniversitet (2020).

Dry Damp Wet Water

Soil Moisture

0 250 500 750 1 000 m

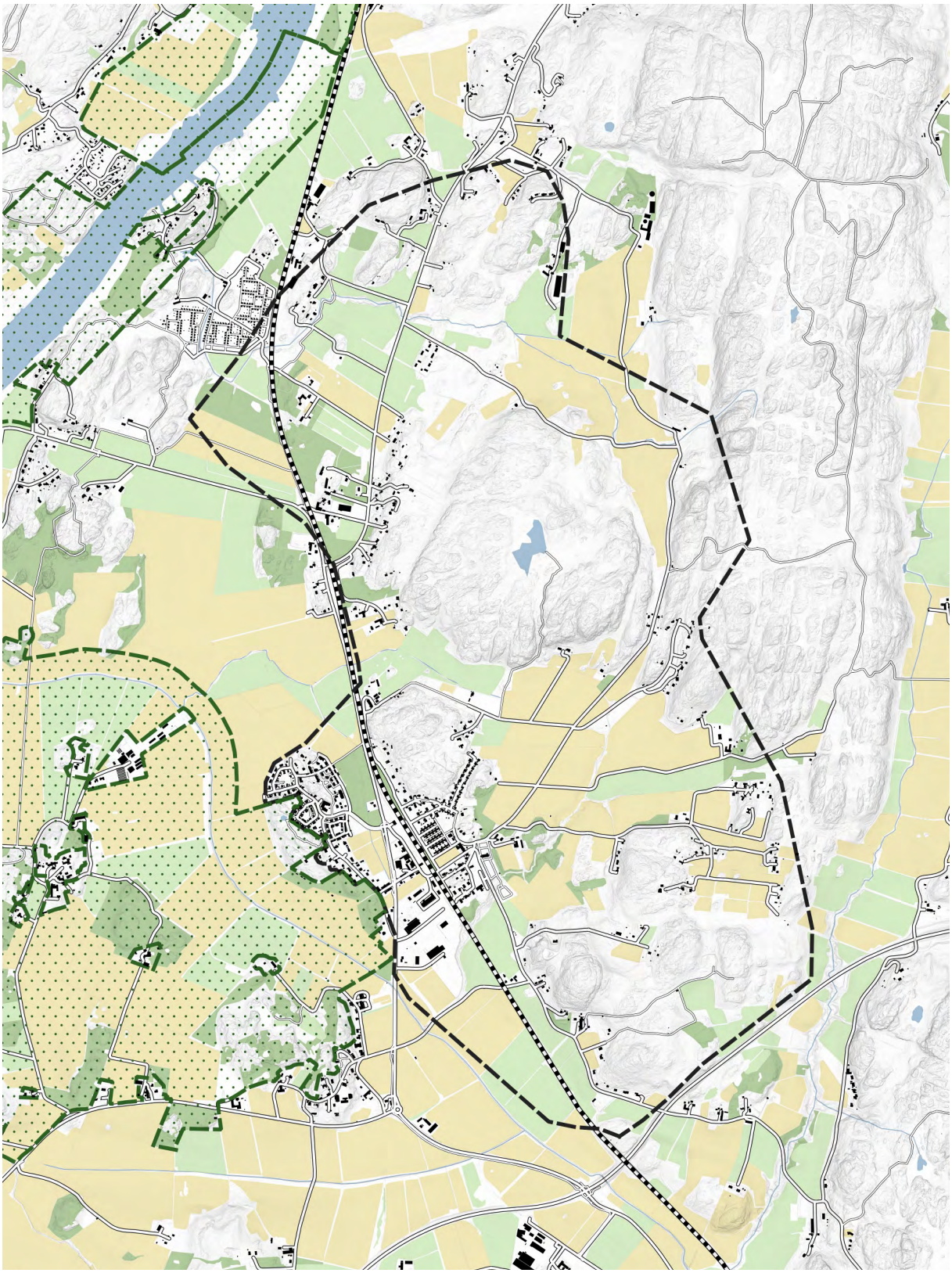


Geodata: Lantmäteriet (2021), OpenStreetMap contributors (2022), Sveriges geologiska undersökning (2014).

Postglacial clay
Glacial clay
Mud-clay
Postglacial sand
Peat
Moraine
Sediment
Landfill
Bedrock
Water

0 250 500 750 1 000 m

Soil Types

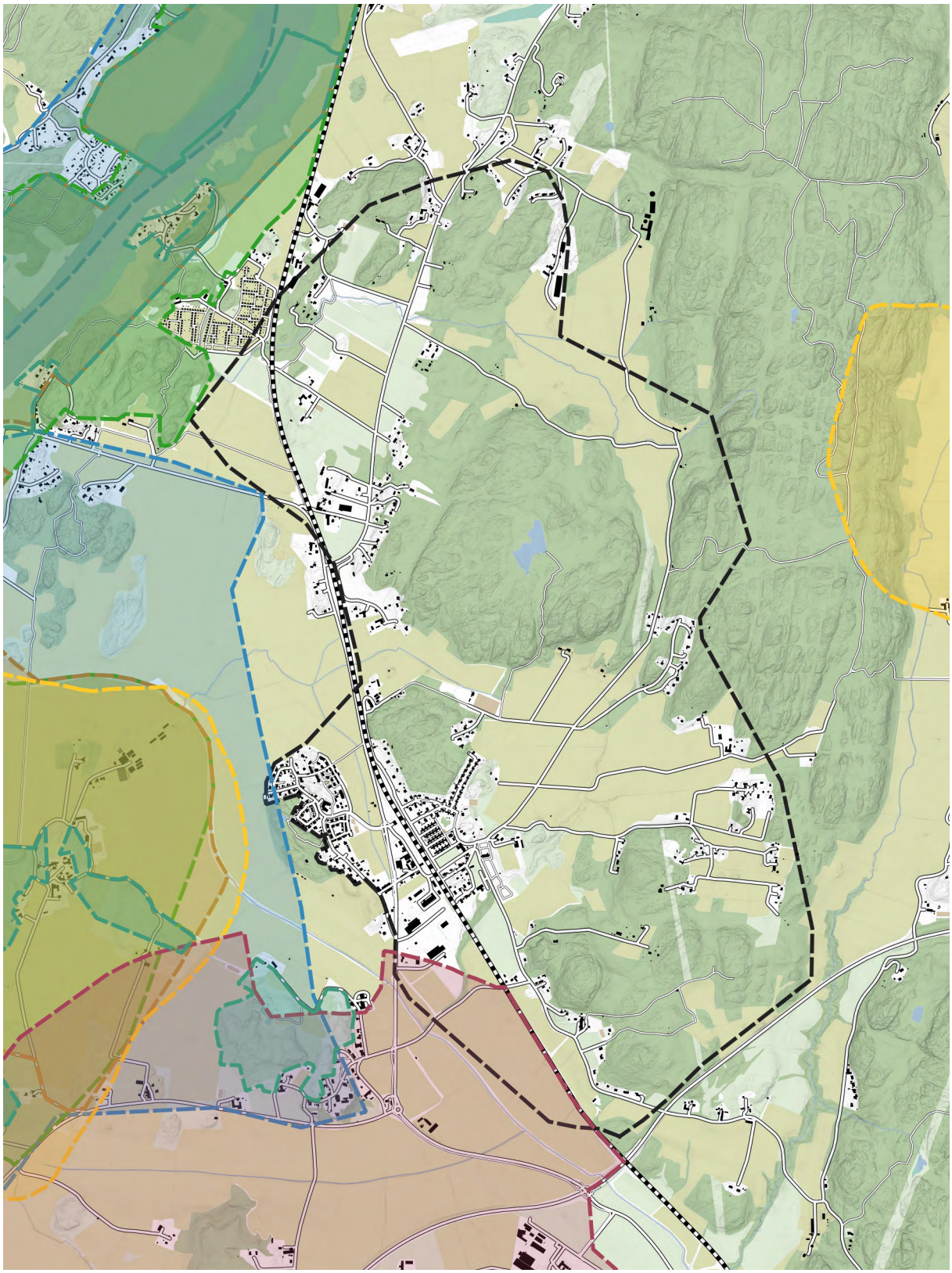


Geodata: Jordbruksverket (2023), Lantmäteriet (2021), OpenStreetMap contributors (2022).

Croplands Hayfields Grazelands

Agriculture

0 250 500 750 1 000 m

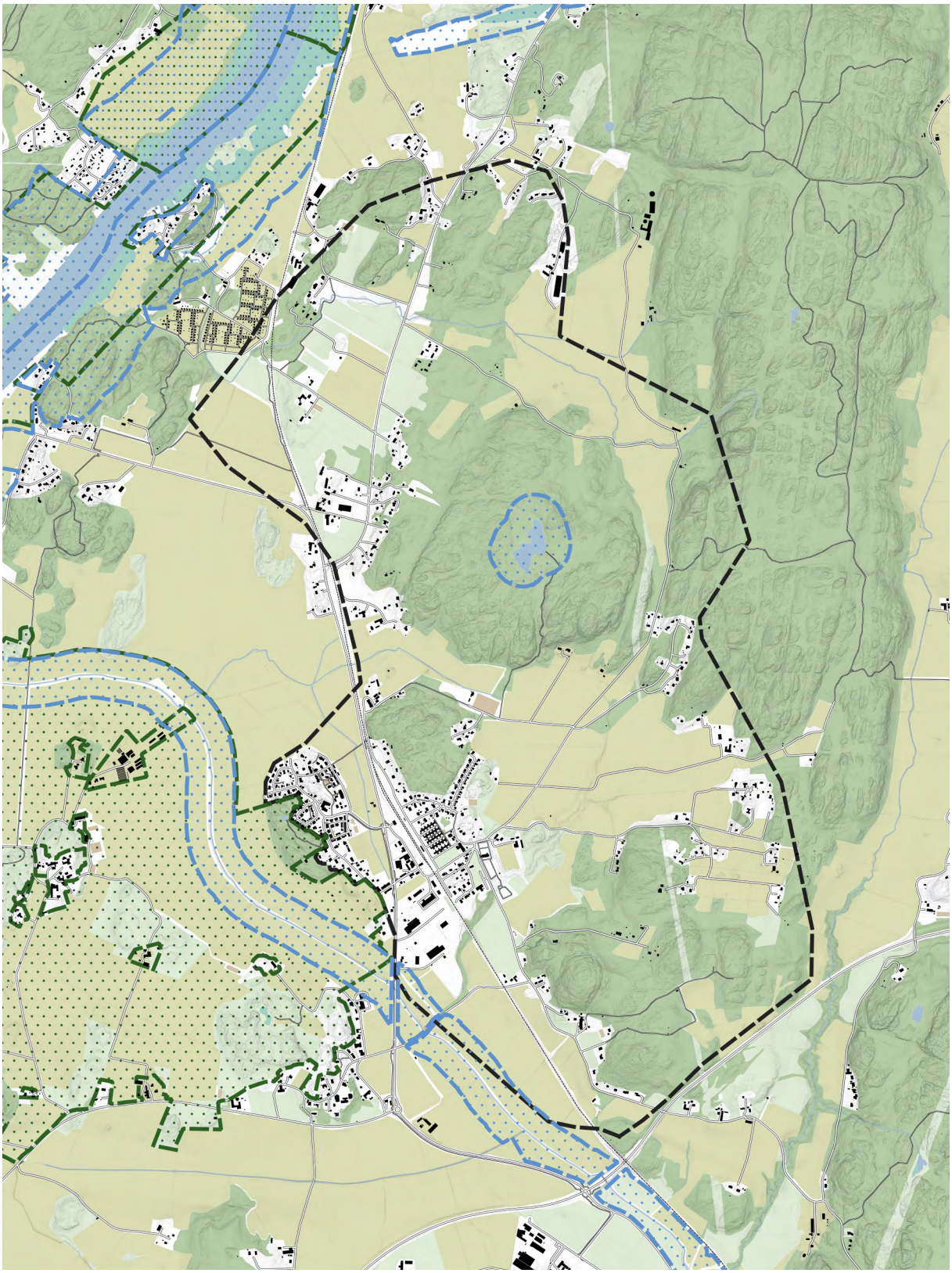


Geodata: Försvarsm. (2023), Lantm. (2021), Länsst. (n.d.) Naturv.(2023), OSM contrib. (2022), Riksantikv. (2023).

Natura 2000
Cultural heritage
Outdoor recreation
Natural environment
Highly exploited coastline
Military noise impact

0 250 500 750 1 000 m

State Interests

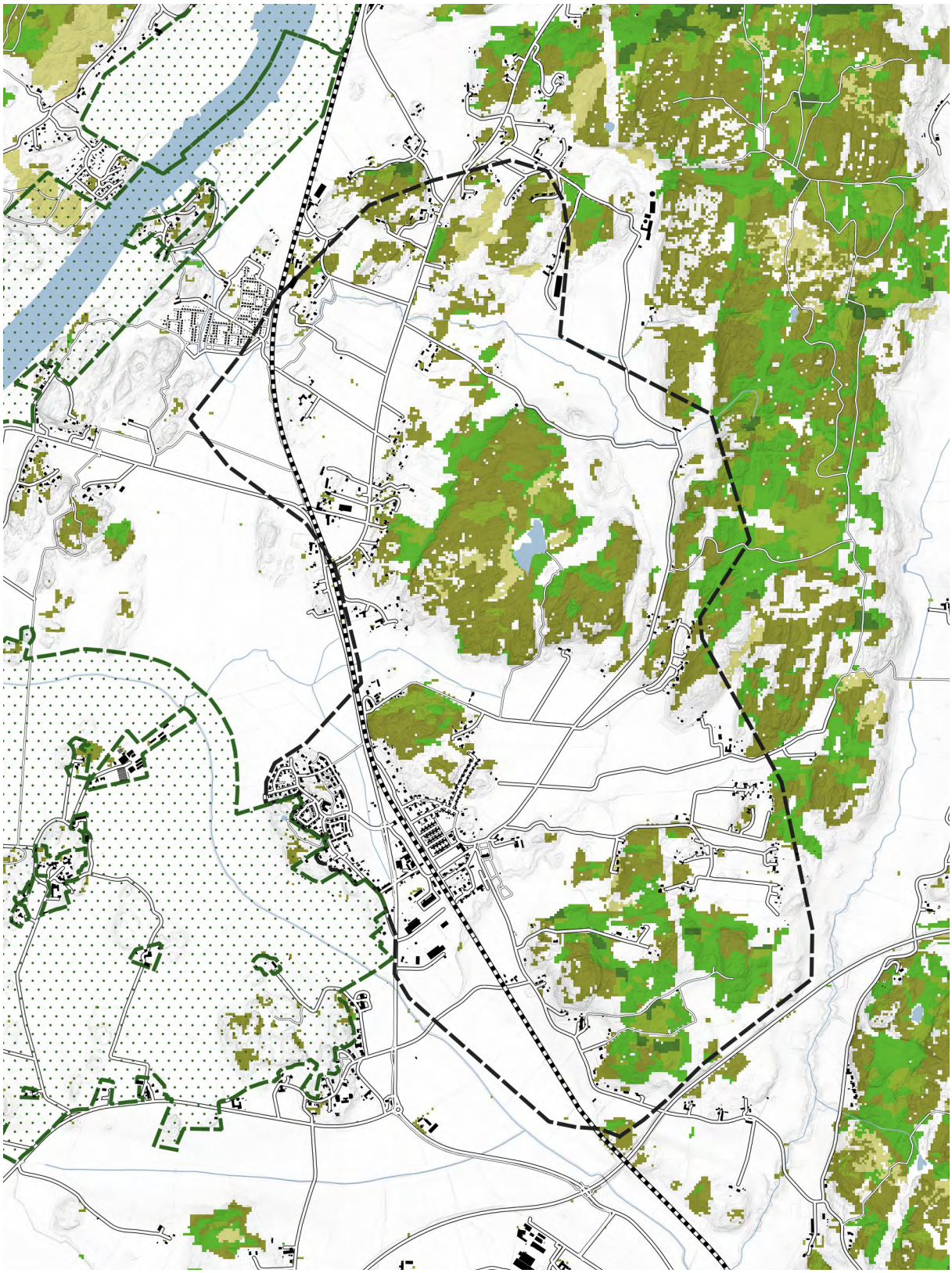


Geodata: Lantmäteriet (2021), Länsstyrelsen Västra götalands län (2023), OpenStreetMap contributors (2022).

Areas under shoreline protection

Shoreline protection

0 250 500 750 1 000 m

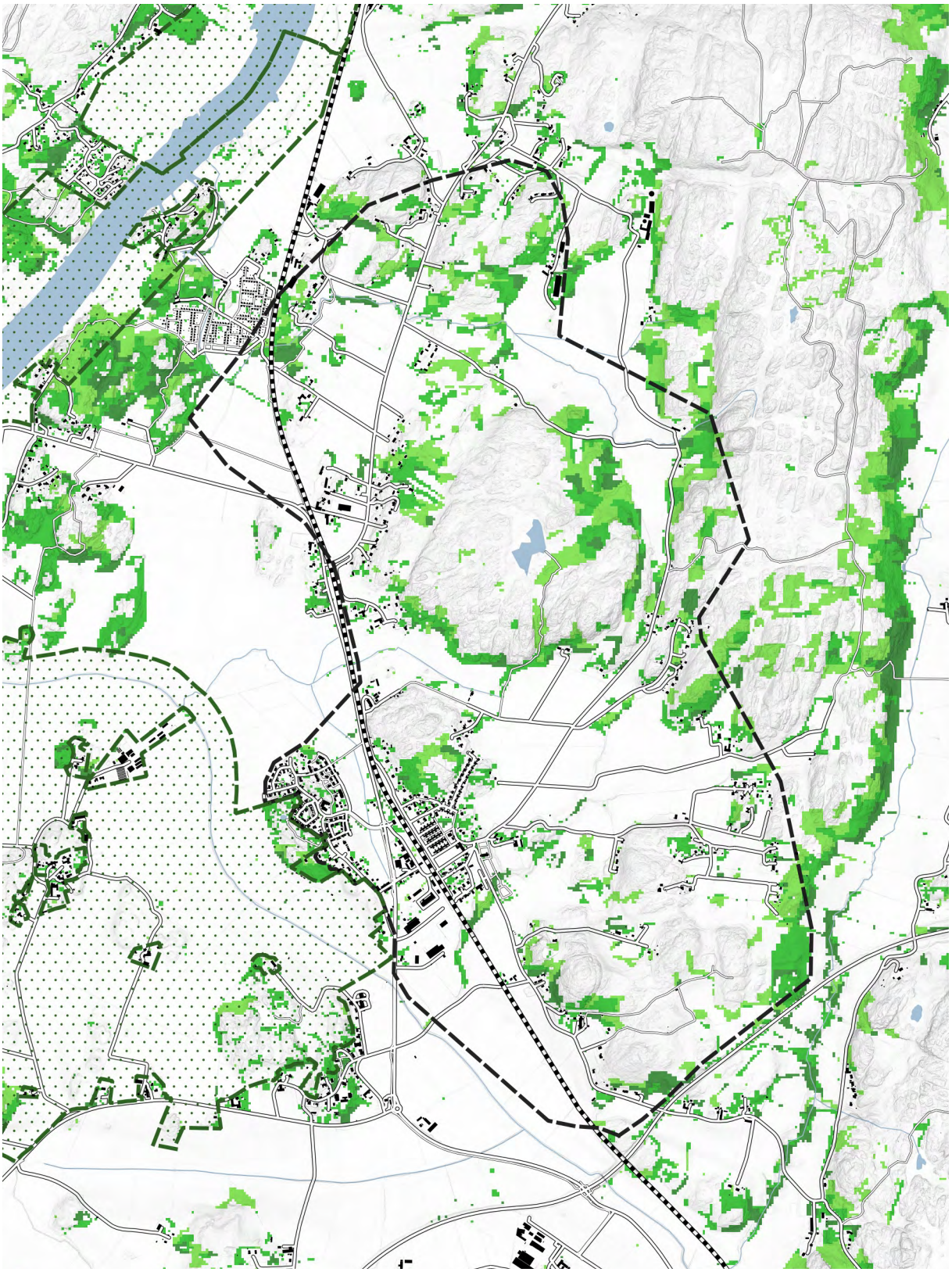


Geodata: Lantmäteriet (2021), Naturvårdsverket (2018), OpenStreetMap contributors (2022).

Pine forest
Spruce forest
Mixed coniferous forest
Coniferous/broadleaf mix
Temporarily unforested land

Coniferous Forests

0 250 500 750 1 000 m



Geodata: Lantmäteriet (2021), Naturvårdsverket (2018), OpenStreetMap contributors (2022).

Trivial broadleaf Hardwood broadleaf Mixed broadleaf

Broadleaf Forests

0 250 500 750 1 000 m

Historical Swedish Agricultural Villages

Traditionally, rural areas of Sweden were made up of villages, each owning a defined extent of surrounding lands. The villages in turn consisted of several farms, the lands being divided up between farms so that each owned proportional shares of the best and worst agricultural land available. The farms were grouped together on a central piece of non-farmable land, usually a rocky moraine. The spread of farmers' lands in small pieces across various fields meant that cooperation within the village was required for efficient farming. This system lasted until a series of land reforms from the early 1800s onwards consolidated each farm's land into one or a few large pieces, and compelled farmers to abandon the villages and move out on their new lands.

Each village consisted of several farms, which themselves could be divided into separate farming units. The farms generally followed a pattern of buildings surrounding a central farmyard, with a residential building taking up one side and long buildings housing various functions wall-to-wall covering the remaining sides. These farms would then be more or less densely clustered together, depending on the amount of space available to the village.

The traditional Swedish agricultural village

Background

Rural Sweden was traditionally organised into various small agricultural villages. As described in Nationalencyklopedin (2023a) the villages each owned a certain area of surrounding land on which they practiced farming, animal husbandry, forestry and more, depending on the location of the village. The land was broadly divided into inner lands, *inägor*, and outer lands, *utägor*. The inner lands were the most agriculturally productive, used primarily for crop farming. They were divided up into strips, *tegar,* that were spread out evenly so that each farm owned shares in both the best and worst lands of the village. The outer lands were located farther from the village and were generally unsuitable for crop farming. They were used for forestry and animal husbandry and were not divided up like the inner lands, but were common land for the whole village.

The location of the built up part of the village was carefully chosen based on a number of factors, which varied across Sweden. In the landscape of central Swedish fissure valleys which characterises Bohuslän and therefore Säve, villages tended to be located on high moraine pediments that rise above the surrounding clay plains (Nationalencyklopedin, 2023a). The analysis of the historical villages of Säve, detailed in the later in this section, shows a clear relationship between less fertile ground, in particular bedrock and moraine, and the location of the built-up centres of the villages. The historical villages of Säve can be clearly seen to have been located on non-fertile lands at the centres of the lands farmed by the village.

Land reform

From the late 1700s into the 1800s, a series of land reforms permanently altered the agricultural landscape of Sweden. The intent was to consolidate the old system of small, spread-out strips into a system of larger fields, enabling more rational and efficient farming practices. The first of these was *Storskifte*, (Nationalencyklopedin, 2023b), which was inspired by preceding land reforms in England. If a landowner in a village requested a storskifte, a government surveyor would redistribute the lands of the village such that this landowner's lands were organised into a set of larger, but fewer, strips of land. This reform was both disruptive - as reorganisations could come frequently as each landowner filed their request, affecting the whole village each time, and seen as too ineffective, as the fundamental issue of divided, spread out lands still remained after a storskifte. (Jonsson, 1997).

Storskifte was followed by a more radical reform, *enskifte* (Nationalencyklopedin, 2023c). Enskifte aimed to completely consolidate each landowner's lands into a single piece, and break up the farming villages, moving each farmer out onto their new piece of land. This included reforming the outer lands of the village from a commons to a divided piece of land with formal ownership structures. Most farmers were against enskifte, but only a single farmer in each village had to file a request for the reform to be carried out across the whole village lands (Jonsson, 1997).

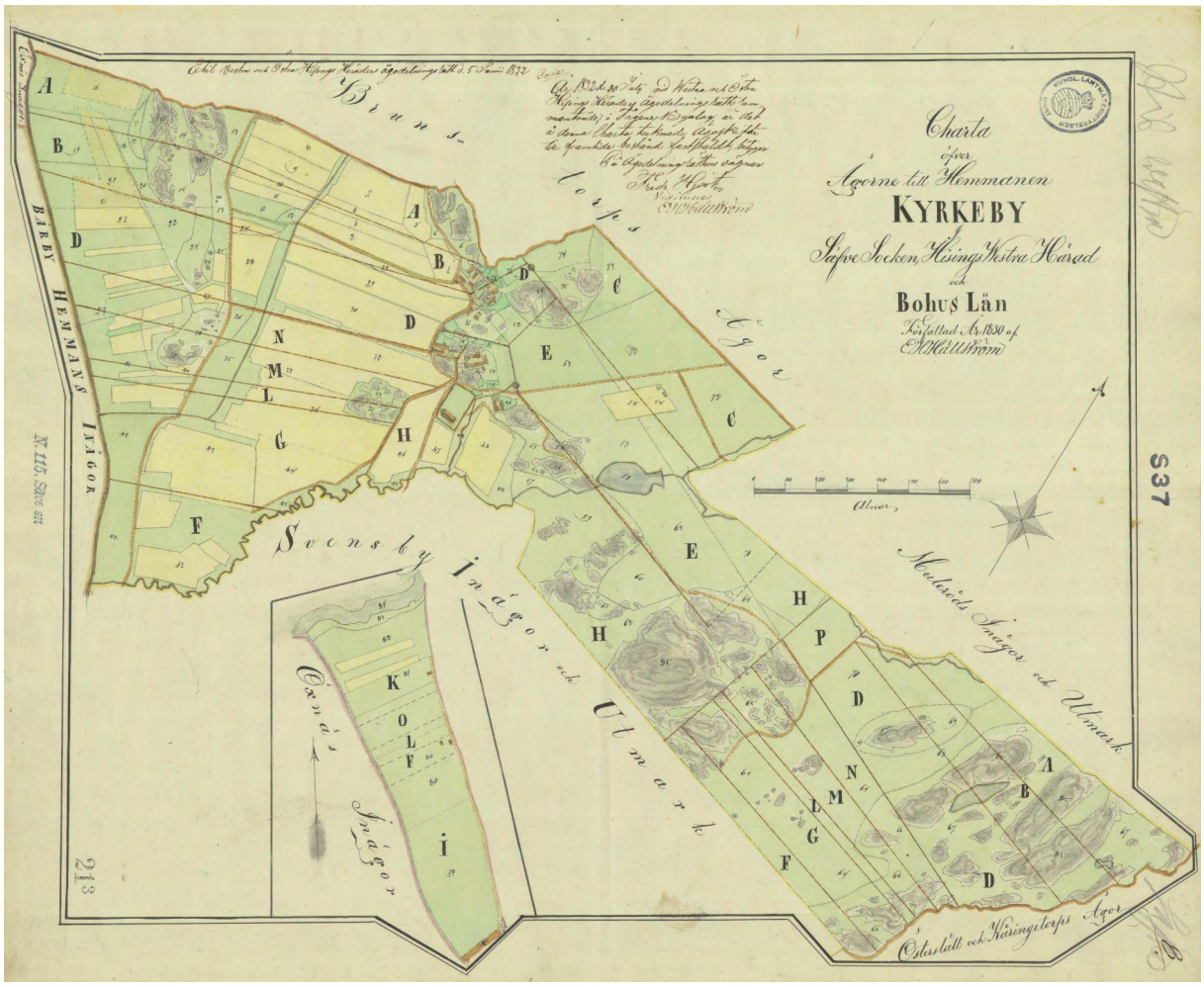
Enskifte did not replace Storskifte, and this caused issues and ambiguity when it came to the implementation of these reforms. For this reason, a new law was introduced, replacing both enskifte and storskifte with *laga skifte* (Nationalencyklopedin, 2023d). Laga skifte was not as far-reaching as enskifte as some splitting of lands was permitted, but crucially the requirement to abandon the village and move

The village of Öxnäs, located to the west of Säve, was uniquely left largely intact by the land reforms. Image: Averater, Wikimedia Commons

onto the lands one had been assigned remained. Laga skifte remained in force throughout the 1800s and 1900s, eventually being carried out in nearly all of Sweden, bar some regions like Dalarna where resistance was strong (Jonsson, 1997).

The land reforms did effectivise agricultural production and laid the groundwork for the coming mechanisation of agriculture starting in the 1800s. It did, however, have social effects resulting from the breaking up of the villages. Not only were farmers less dependent on each other due to the consolidation of their land, they were forced to be more independent due to their isolation (Jonsson, 1997).

The village of Öxnäs viewed from the northwest, 2023.



Map produced for the Laga skifte of Säve Kyrkeby. The village is shown in a pre-reform state. (Lantmäteriet, n.d.)

The historical villages of Säve

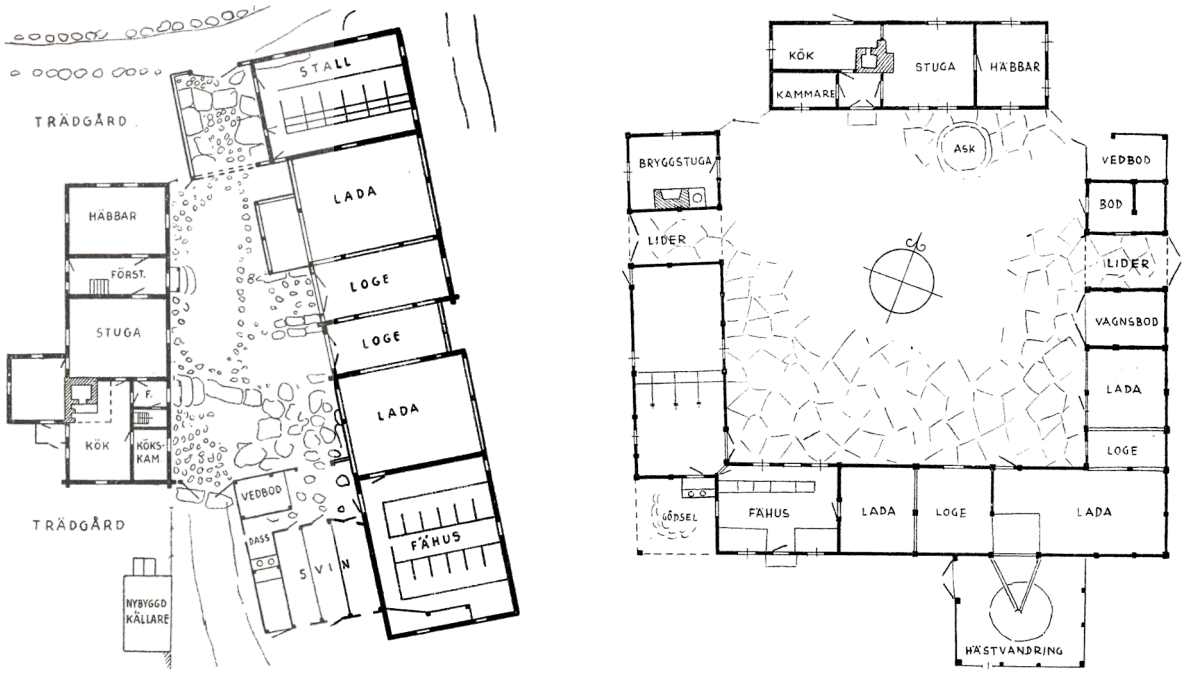
Study outline

The historical Säve parish consists of dozens of villages. This thesis focuses on a specific part of Säve, namely the area under study for development surrounding and including the existing locality of Säve. As such a subset concentrated around this area has been selected for study in order to learn more about how they were made up, functioned and what principles of land use governed their creation. The villages chosen are Kyrkeby and Brunstorp, which make up today's locality of Säve, Bärby and Svensby to the south, Öxnäs to the west, and Gunnesby to the north. Tofter is also included in the broad area studies, but due to its small size (one farm) and the lack of research material it has been left out of the more detailed studies.

The villages of Säve differ both in their design and the quality of data available on them Öxnäs and Gunnesby are two distinct villages which have been clearly mapped with both buildings and property being mapped in a pre-breakup state. For this reason, particular emphasis is placed on Öxnäs and Gunnesby in this study. Property mapping is also available for Brunstorp, but only in an earlier, smaller state compared to its final state before breakup. For Svensby and Kyrkeby, mapping exists showing its buildings pre-reform but not property, making it more difficult to discern what clusters and farms each building belongs to. And for Bärby, mapping is split and incomplete. The map of Bärby shown in this chapter has been compiled from an 1822 land reform map covering the southern half and a 1903 survey covering the northern half. This discrepancy makes it difficult to draw any conclusions regarding Bärby.

Village typologies of southern Sweden

The various agricultural villages that historically made up the parish of Säve share a number of features in common, but clear differences can be seen between them. Features in common include their basic makeup, consisting of a up to a dozen or so of farms more or less densely clustered together, with no visible hierarchy and little to no buildings not part of a farm. The locations of the villages are rocky areas roughly at the centre of their lands. As the farmland of the villages was split into small strips (*tegar*) with each farm being allocated its share of the best and worst farmlands, farms were not located on the lands they farmed, and farming tended to require



Farms of the Southern Swedish type from southern Bohuslän (left) and northern Halland (right). Circumstances have forced the left farm to be more tightly squeezed together, while the right farm is a more pure expression of the type. (Erixon, 1947)

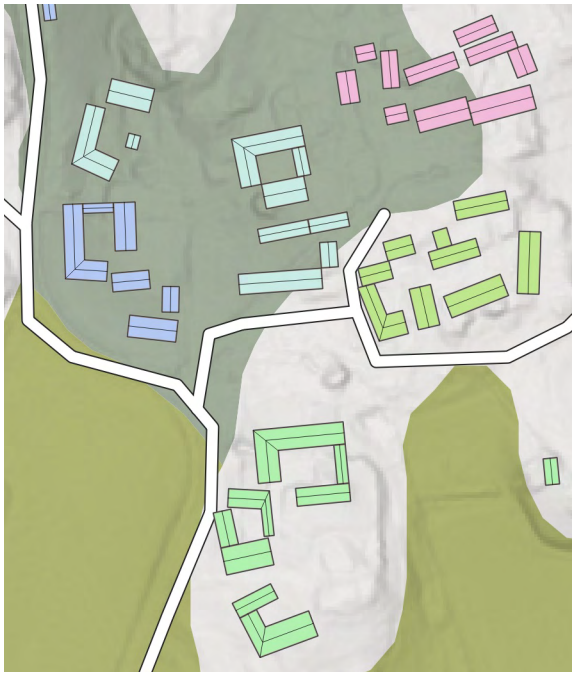
significant cooperation between the villagers (Nationalencyklopedin, 2023a).

Various different typologies of villages are found throughout Sweden. The typology that best matches the villages found in the Säve area is the cluster village [*klungby*]. These villages are characterised by an irregular, terrain-adapted layout with farms being grouped into one or several distinct clusters. In villages where distinctly separate clusters of farms can be found, these clusters are often organised by familial relations (Nationalencyklopedin, 2023a).

Swedish cultural historian Sigurd Erixon (1947) describes a number of different typologies of traditional Swedish farms. According to Erixon, the Southern Swedish farm (*sydsvenska gården*) was dominant from Skåne and Halland up to southern Bohuslän as far north as Orust. This type of farm is characterised by a simple rectangular arrangement of attached buildings surrounding a central farmyard, although the shapes can get more irregular towards the periphery of the area, which would include Säve. The farms include a residential cottage, occupying one side of the rectangle. The three remaining sides consist of barns, stables and other functional buildings. The height of the buildings is generally quite uniform. The buildings are close enough together that the central yard can be closed with gates, if not completely surrounding it. Farms of this type can be seen in many of the studied villages, in particular Öxnäs where some still survive to this day. However most farms that can be seen in the studied villages do not entirely map onto this typology, in particular the farms of Gunnesby, which follow a very irregular arrangement with more open farmyards.

Observed village typologies of Säve

Öxnäs as mentioned is home to several farms that fit neatly into the Southern Swedish farm type as described by Erixon (1947). Öxnäs is also a clear example of a cluster village, with distinct clusters of multiple farms within the village. Property mapping from an early land reform details these clusters, shown colour-coded on the map below. Text associated with the mapping identifies each cluster as one named farm, consisting of multiple farming units, 2-5 per cluster, for a total of eighteen. As the mapping focuses on land use, no details are given for how each building is used, however it is possible to make guesses especially in those cases where farms match the standard Southern Swedish farm typology.



Öxnäs in 1836. Five distinct clusters (colour coded) are shown in maps, each cluster containing multiple farms.

Gunnesby in 1801. All farms are in one cluster. Each farm is separately colour coded for clarity.

Öxnäs

Gunnesby

Brunstorp

Kyrkeby

Bärby

Svensby

Historical villages in the early 1800s

Scale 1:5000

Öxnäs

Gunnesby

Brunstorp

Kyrkeby

Bärby

Svensby

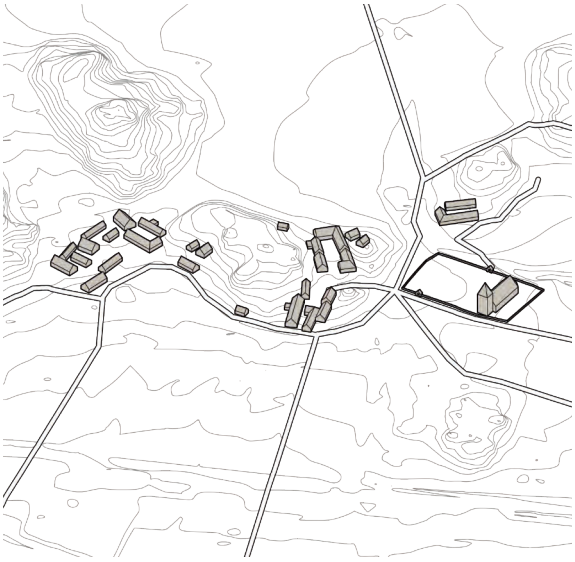
Historical village sites today

Scale 1:5000

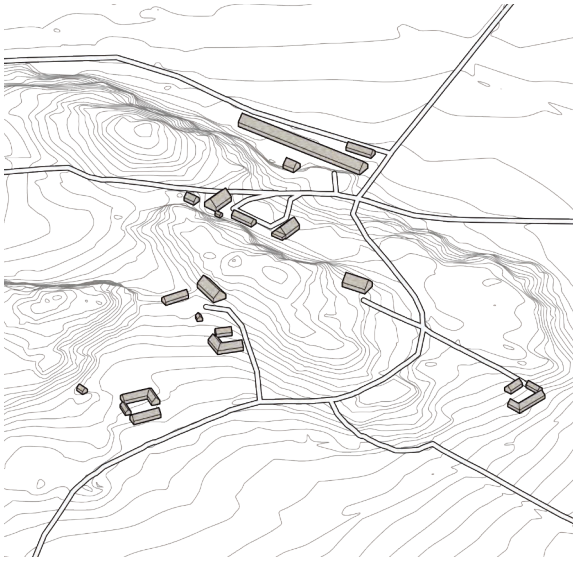
Öxnäs

Gunnesby

Brunstorp



Kyrkeby



Bärby

Svensby

Historical villages in the early 1800s

Southwest Isometric, Scale 1:5000

Gunnesby has no visually distinct clusters, but property mapping identifies 9 farms, shown with colour coding. No farm matches the Southern Swedish farm typology exactly, however we can clearly identify the basic characteristic of buildings surrounding a yard on the colour-coded map. Gunnesby's layout compared to Öxnäs could be a result of a comparative lack of space - Öxnäs has a large amount of non farmable land to spread out on, while the farms of Gunnesby are huddled together on a comparatively small rock, and actually do in some cases spread out onto farmable clay soil. An interesting feature of Gunnesby is the ring road which completely surrounds it. Such a feature is not seen in any of the other analysed villages.

Land use of traditional villages

The locations of the historical villages of Säve were chosen, at the very least, centuries ago. The oldest written account of Säve, that of Bishop Jens Nilsson in 1597, describes the villages encountered on his journey. This includes Kyrkeby and Öxnäs, along with several other villages in Säve not discussed here, namely Mulered, Kalshed, Kvillehed, Högstena, and Åseby. The descriptions of Kyrkeby and Öxnäs match up well with the mapping done in the early 1800s, indicating that not much changed in the over 200 years.

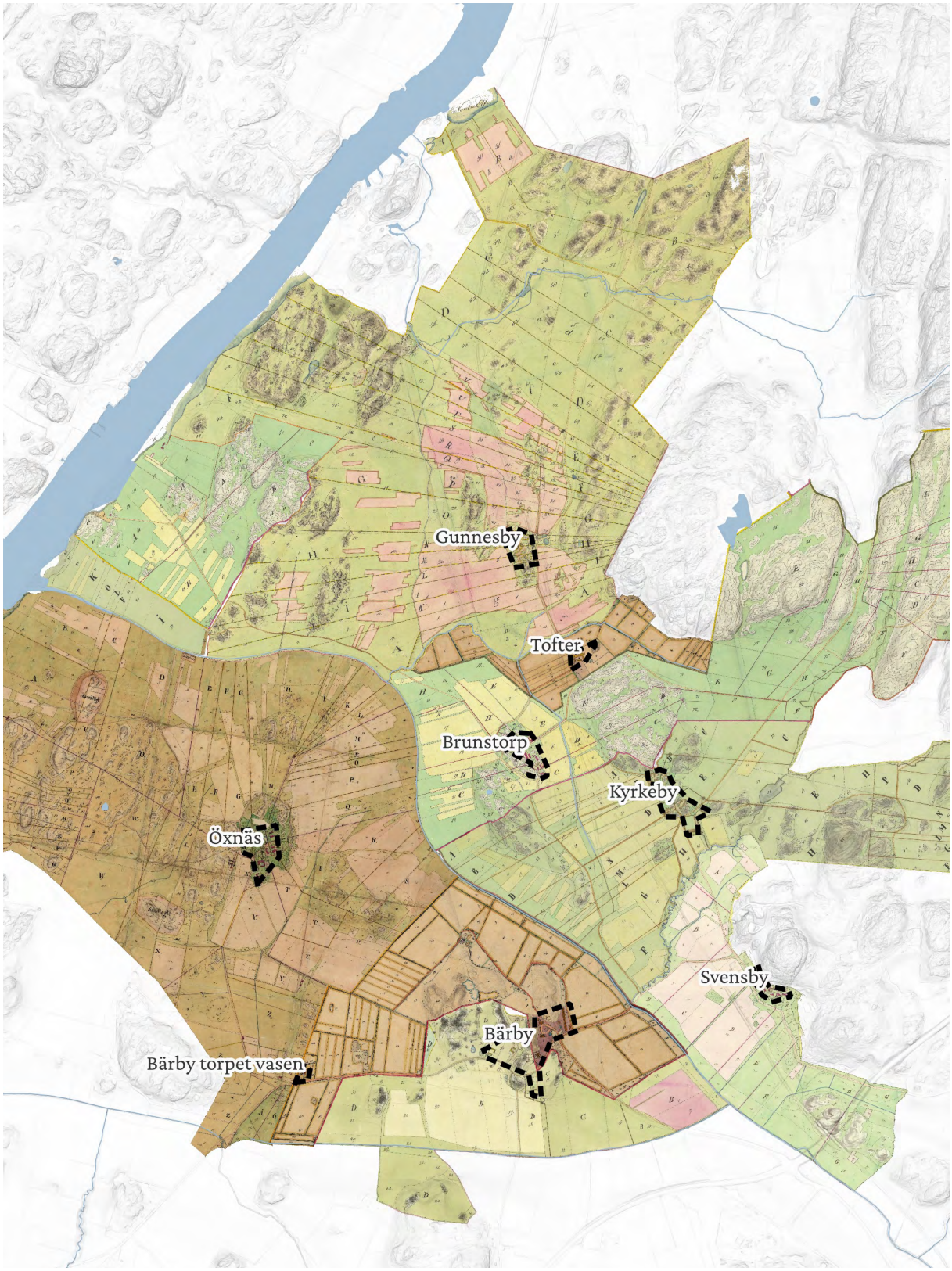
At the time the locations of the villages were chosen, agricultural land appears to have been a highly valued resource. This is indicated by the locations of the villages. As mentioned, the preferred location for villages were moraine pediments, hills that rise above the surrounding agricultural plains. This is clearly seen in all studied villages. Bärby and Svensby do differ slightly by being built on the slopes of much larger rocks, but the effect is the same - land suitable for agriculture is conserved.

An analysis of the soil types of the villages and their lands corroborates this observation. The total lands owned by each of the studied villages consist primarily of postglacial and glacial clay. Together these soils make up 66% of the village lands, and they are highly suitable for agriculture. Bedrock makes up 25% of the village lands. The remainder is made up of postglacial sand (3.0%), sandy moraine (2.6%), sedimentary soil (1.2%) and various other types each making up less than 1%.

The distribution is dramatically different when considering the areas where the buildings of the historical villages were located. Bedrock rises to become the most common soil type, making up 47% of the built-up village lands. Postglacial and glacial clay drop to just 26%. Sandy moraine sees the most dramatic difference, making up 17% of the built-up villages, a huge overrepresentation. Finally, postglacial sand makes up 8%, also an increase. We can therefore see a clear pattern where fertile clay soil was avoided in favour of less agriculturally productive soil types when choosing the locations for constructing villages.

This is not to say that finding less agriculturally valuable land was the only criteria for the village builders. Location is quite clearly important, as all villages are centrally located within their farmed lands - particularly the inner lands, (although we cannot know for sure if the lands farmed were chosen before the location of the village, or whether it is the other way around.) Locating buildings on higher ground also protects them from floods and allows for a clear view out over the fields from the farmhouses.

Well-preserved farms of the southern Swedish type in the village of Äskhult, Kungsbacka municipality.



Geodata: Lantmäteriet (n.d.), Lantmäteriet (2021).

Mosaic of historical maps of seven villages surrounding modern-day Säve. From this map the built-up centres of the villages have been identified. Historical maps obtained from the database of Lantmäteriet.

Historical Villages

Geodata: Lantmäteriet (2021), Sveriges geologiska undersökning (2014).

Analysis of soil types in the built-up villages and their lands. Villages are built on 47% bedrock, 27% clay, and 17% sandy moraine. Their total lands are 66% clay, 25% bedrock and 2.6% sandy moraine.

Village Soil Analysis

0 250 500 750 1 000 m

The Value of Agricultural Land

With a growing global population and expected reduction in the amount of agricultural land available, preserving what we have is important, and the European Union intends to reach no net land take by 2050. When measuring by short-term economic value, a proposed redevelopment is nearly always more profitable than preserving agricultural land uses. To make decisions for the long term, systems that value agricultural land from more perspectives are required.

Swedish law intends to protect agricultural land strongly, but by leaving interpretation up to the municipalities, the law ends up rather toothless. Municipalities realising the need to preserve agricultural land are however implementing and introducing new strategies and valuation systems to protect agricultural land, including Jönköping almost completely restricting any new developments on farmland.

Arguments for preserving agricultural land

International context

The necessity of agriculture is quite an obvious statement to make. Food is our most basic need, and agriculture is what feeds the world. And with an increasing global population expected to reach 10 billion by 2050, increasing pressure is put on the agricultural sector. The amount of global arable land has already decreased from 0.45 hectares per capita in 1960 to 0.25 hectares per capita in 2000, and is expected to decrease to 0.19 hectares per capita by 2050. Construction of infrastructure or buildings on agricultural land, known as soil sealing, is one of the leading causes of this decrease in the EU and globally. (Öhlund, et. al., 2020). Yet the global agricultural production must increase to provide for the growing population.

The loss of agricultural land in Sweden is not necessarily a problem on a global scale. Our economy today works with global supply chains, and a loss of agricultural land in one part of the world can be made up for by increases elsewhere. In fact, on a global scale, agricultural land area is increasing. This increase mainly comes from conversion of forests and wetlands, which has disastrous environmental effects, like a loss of biodiversity and carbon storage capacity (Slätmo, 2017). While climate change is likely to reduce the productivity of much of the world's agricultural land, it could have a beneficial effect on agricultural production in northern countries. Sweden may therefore find itself in the role of being a net exporter of food, providing for the world's growing population in the future (Jordbruksverket, 2015).

The European Commission (2021) has outlined a soil strategy for the year 2030. The key aim of this strategy is to ensure the health, biodiversity and resilience of the EU's soil ecosystems, through the protection, sustainable use, and restoration of soil, in order to secure the food chain and water filtration of the EU in the future. The report states that EU soils are in an alarming state, and a key reason behind this is the lack of legal protection for EU soils on the level of the protection already afforded to the natural environment, water, and air.

The vision laid out for the EU in the 2030 soil strategy includes reaching zero net land take by 2050, i.e. eliminating soil sealing. This means that in the years leading up to 2050, redevelopment of agricultural and greenfield land in the EU needs to wind down in order to finally cease completely.

Swedish context

From a Swedish point of view, the desire to preserve agricultural land arose primarily from a desire of self-reliance and war preparedness. This led to the introduction in 1987 of a paragraph in the Natural Resources Act protecting agricultural land, which was transferred to the Environmental code, Chapter 3 paragraph 4 when that law came into force in 1999 (Slätmo, 2017). The discussion regarding preparedness is still active today, and in an era of increasing global conflicts is cited more and more often as one of the key reasons to preserve agricultural land, for example by many of the plans and reports explored later on in this section. Other reasons commonly cited to preserve agricultural land are its natural, cultural and recreational values.

Sweden is currently at about 75% self-sufficiency in terms of agriculture. Sweden currently consumes agricultural products requiring about 0.4 hectares of land per person, and currently has 0.3 hectares per person. The shortfall is made up for through imports. (Jordbruksverket, 2015). As previously mentioned, this could change in the future, with the Swedish government having expressed a desire for Sweden to take on a larger role in the sustainable agricultural production of the future, becoming a net exporter (Rådhuset arkitekter, 2022.)

Cities in Sweden were often built up surrounding clay soils on plains, the highest quality agricultural lands available in Sweden (Jordbruksverket, 2015). This means that when cities expand out onto agricultural land, they often do so on the most productive, highest quality agricultural land we have. Site mapping shows that the agricultural land of the Säve area is exactly this type of clay plains.

Agricultural land in contemporary Swedish planning

The Environmental Code

The key tenet when it comes to protecting agricultural land in Sweden is the Environmental Code, *Miljöbalken*, chapter 3, section 4 (SFS 1998:808). It is, on a surface level, clear and strong in its language:

> Agriculture and forestry are of national interest [*nationellt intresse*].
>
> Serviceable [*brukningsvärd*] agricultural land may be appropriated [*tas i anspråk*] for development of buildings or facilities only if necessary to accommodate significant public interests and this need cannot be accommodated, in a from the public point of view satisfactory manner, through the appropriation of other land.
>
> Woodland which has significance for the industry of forestry shall as far as possible be protected from actions which may tangibly obstruct a rational usage for forestry.

Sweden delegates planning almost fully to the municipalities (Busck, et al., 2009) with few methods of intervention for higher authorities. The planning monopoly of Swedish local authorities is limited only by laws and by so-called 'state interests', *riksintressen**. Higher authorities may veto municipal planning decisions only if they stand in conflict with a state interest. (Öhlund, et al., 2020) A state interest is, however, not the same thing as a national interest. As agricultural land is merely a national interest, not a state interest, it is not afforded the same legal protections. It is thus left to the municipalities to interpret the environmental code and its policy regarding agricultural land, which they generally do not do in any concrete manner (Jordbruksverket, 2013).

Planning tools of the municipalities

Local authorities in Sweden have three planning tools at their disposal. The most important of these is the 'detailed development plan', *detaljplan*, which is the primary legally binding instrument of planning in Sweden. These are primarily created for in conjunction with urban development projects in urban areas (Busck, et al., 2009). On a higher level, each municipality is required to create a 'municipal comprehensive plan' (*översiktsplan*) which gives broad guidelines for land use on a municipal scale but is not legally binding (Boverket, 2023a). Between them there are 'area regulations' (*områdesbestämmelser*) which may be used in locations where there is not yet any detailed development plan and are intended for use in limited areas to regulate land use in a legally binding way and/or to safeguard the intent of the municipal comprehensive plan (Boverket, 2023b). In rural areas, there is often no detailed development plan and rarely any area regulation, which means that the municipal comprehensive plan is the only planning document guiding development decisions, and as it lacks legal force applications for building permits are decided on a case-by-case basis (Busck, et al., 2009).

Redevelopment of agricultural land

According to Jordbruksverket (2021a) the rate of redevelopment of agricultural land in Sweden increased between the 2011-2015 period and the 2016-2020 period, and in Västra Götaland alone 474 hectares were redeveloped between 2016 and 2020, which is a figure second only to Skåne. Nationwide over 3 000 hectares of agricultural land were redeveloped, and 81% of this land was used for new residential housing, with 10% being used for other buildings, 8% being paved for roads, and 1% becoming railways. It should however be noted that redevelopment only accounts for 10% of the total loss of agricultural land in this five-year period. The vast majority of agricultural land lost is simply abandoned, and

* Note that the legal term *riksintresse* is commonly rendered in English as 'national interest'. To distinguish between *riksintresse* and the wording in the environmental code *nationellt intresse* this report renders the former as 'state interest' and the latter as 'national interest'.

thereby lost to reforesting. The 10% that is redeveloped is of particular importance though as this process, generally referred to as "soil sealing", is considered irreversible (Slätmo, 2017).

From a market economic perspective, redevelopment of agricultural land makes sense, as it is most often more profitable to let a proposed redevelopment take place than to preserve agricultural land uses (Wenner Tångring, 2019). The economic perspective can even extend to municipal motivations of an increased population and tax base (Öhlund, et al., 2020).

The value of a commodity on the open market is not necessarily reflective of its usefulness and necessity. The diamond-water paradox is a common example used to illustrate this. The same principles can apply to food and land. It is not necessarily true that food prices properly indicate the benefit to society received from food, or that the economic value of land used for agriculture can be directly compared to the economic value of other land uses. For this reason, there are strong arguments for the need for valuation systems that take aspects other than pure economic profit into account (Öhlund, et al., 2020).

Valuation systems for agricultural land

Most municipal comprehensive plans (översiktsplaner) in Sweden include some form of language stating that agricultural land should as far as possible be preserved, but very rarely is there any method or procedure specified to determine whether agricultural land can be redeveloped (Öhlund, et al., 2020). In practice most municipalities let municipal ownership and/or external interests determine what land should be redeveloped (Jordbruksverket, 2013). Merely expressing a desire within the comprehensive plan to preserve agricultural land is no guarantee that land will be preserved, as when construction is planned on agricultural land, municipalities find justifications for why that piece of land in particular is not worth preserving (Öhlund, et. al., 2020).

A number of municipalities have however taken steps towards a more systematic approach to valuing agricultural land. This includes Jönköping, who since 2020 has adopted essentially zero-tolerance towards the redevelopment of agricultural land (Sveriges radio, 2020). Out of the municipalities surveyed by Öhlund, et. al., in 2020, which includes 30 municipalities evenly split between Skåne, Stockholm and Norrbotten counties, 3 municipalities expressed their intent to develop a systematic approach to solving land use conflicts, 2 of these focused on agricultural land, and one had been finished by the time of the publishing of the report - Sigtuna Municipality's *Jordbruksmark i den fysiska planeringen* (Agricultural land in spatial planning). Another municipality that has commissioned a report detailing a systematic approach to agricultural land is Vänersborg. From a state perspective, the Swedish Board of Agriculture [*Jordbruksverket*] published their own guidelines regarding the use of agricultural land in 2021. Finally, Gothenburg has no up-to date agricultural land policy, although an aborted attempt from the previous comprehensive plan exists (Göteborgs stad, 2013). The current comprehensive plan makes a short note about the development of agricultural land (Göteborgs stad, 2022).

Jönköping

Jönköping is a city of 100 000 people and a municipality of 150 000, located in northern Småland, and is the largest and most important city of its region. In 2020, Jönköping municipality released a new Programme Regarding the Value of Agricultural Land in the Planning of Communities (Jönköpings kommun, 2020). The programme was developed as part of the municipal strategy for a population increase to 200 000.

The programme outlines that a change in direction shall happen immediately whereby the starting point for any development in Jönköping municipality is that redevelopment of agricultural land shall not happen. Reasons for this are said to be to handle our future agricultural needs and positively affect the global transition to sustainability. This is stated to be possible even as construction of new housing, industrial areas, and social functions like schools is managed. The report considers this to be possible through pointing out "forested land and other land types"

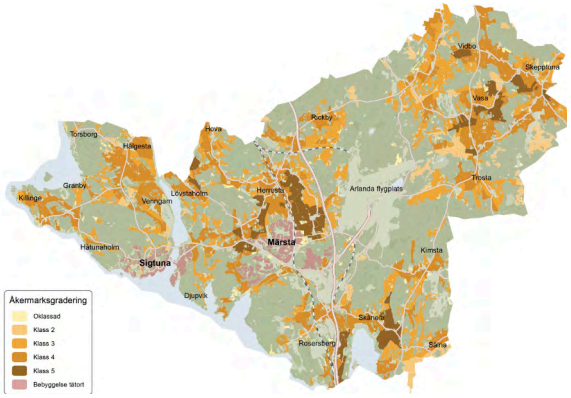
where development can happen, instead of the 16 % of the municipal land area that is made up of agricultural land. It reassures that consideration will still be taken towards valuable forested land as well forests close to urban areas, which have recreational value.

An exception is made for agricultural land that lies within the structure of an urban area or in other ways does not function as part of a farm unit [*brukningsenhet]* as well as grazelands of low quality that lay isolated on the fringes of the farm unit. New construction to enable generational transitions on farm units will also be possible. Finally the report states that a system for mitigation when agricultural land is redeveloped for a significant public interest will be developed.

Sigtuna

Sigtuna municipality is located in Stockholm's urban/rural fringes. It is home to the historic city of Sigtuna, one of the most important cities of medieval Sweden, but the municipality of today is based out of Märsta, a town of just under 30 000 that grew up around the railway to Stockholm. It is also home to Stockholm Arlanda Airport, the main airport of Stockholm and the largest in Sweden. Sigtuna municipality is growing with many commuting to Stockholm or to the airport for work. (Nationalencyklopedin, 2023e)

In their report on agricultural land, Sigtuna kommun (2018) begins by outlining reasons the background of a reduced need for local food



Map from the Sigtuna report showing the productivity of their agricultural land. Much of their most productive land is located in immediate proximity to the town of Märsta. (Sigtuna kommun, 2018).

production that has occurred as a result of globalisation. This is stated to have resulted in a situation where the value of agricultural land today is low, but in a long term perspective the preservation of agricultural land is important. Part of this is stated to be due to the worsening national security situation and the increased need for a preparedness in cases of disruption to international supply lines. Another part is increased global needs due to a global rise in population, with the government of Sweden stating that Sweden should contribute to a sustainable global rise in agricultural production and take an increased role on the global supply chain. The report states that currently, agricultural production in Sweden covers about 70% of our needs, but on a more local level in Stockholm county there is no feasible way for local production to cover all needs.

The strategy outlined by Sigtuna municipality includes a classification of agricultural land according to productive, natural and cultural values. It then outlines three questions to guide the planning process, based on the wording of the environmental code:

> 1. Is the agricultural land which is under consideration serviceable?
>
> 2. Does the development in question constitute a significant public interest?
>
> 3. Can the development in question be performed in a different location?

The definition of serviceable agricultural land is stated to be "land, which considering location, character and other properties is suitable for agricultural production" whether it is currently is in use or not. Significant public interest is stated to potentially include the need to provide housing, the interest in locating housing close to workplaces, infrastructure and recreational uses. In the question of localisation, the report states that to approve development on agricultural land, alternative locations must have been investigated but considered unsatisfactory. A satisfactory location is considered to be one that is "technically and functionally suitable plus economically reasonable". If all satisfactory alternatives are located on agricultural land, the

land with the best productive capacity should be exempted from redevelopment.

Vänersborg

Vänersborg is a city and municipality located on the southern tip of Lake Vänern, 75 km north of Gothenburg. It is a historically industrial town, and recently more and more a commuter town, after the Nordlänken project which upgraded the railway and the E45 highway in 2012, significantly reducing travel times to Gothenburg.

The Vänersborg report, commissioned from Rådhuset arkitekter in 2022, is more detailed and thorough in its analysis than the Sigtuna report. Principally, however, it follows similar lines. It makes the same connections between tensions in the surrounding world and the need to better preserve agricultural land. It also mentions the value of preserving the open character of landscapes and the natural and cultural values of long-used agricultural land. It brings up the Agricultural Board requesting municipalities to be very restrictive in allowing new construction to take over agricultural land, the difficulty of creating new agricultural land and the virtual impossibility of recreating it once development has happened. It therefore states that a good starting point is that the land currently under cultivation is the land we can expect to be cultivated in the future as well.

The Vänersborg report proposes a five-step methodology to considering development of agricultural land:

> 1. Quick pre-check of steps 2-4. Further studies will be required depending on the answers to these questions.
>
> 2. Is the land in question serviceable agricultural land? If the piece of land is in the Board of Agriculture block database, the answer is yes, if not that does not guarantee a no.
>
> 3. Is the development in question a significant public interest? Does the comprehensive plan state that it is a significant public interest?
>
> 4. Is there an alternative location? This should be tried on a municipal scale, with the comprehensive plan in mind.
>
> 5. What are the options to mitigate the negative impact of the development on agricultural land?

Jordbruksverket

The Swedish Board of Agriculture, in its 2021 report does not propose a methodology as much as it makes recommendations for the creation of a methodology. The report states that the following data should be used when evaluating agricultural land:

> The Board of Agriculture block database. This database is used to evaluate land for applications for agricultural support and broadly contains all currently active agricultural land.
>
> The meadow and grazeland inventory, a database of meadow and grazelands that have been evaluated based on natural and cultural values.
>
> Board of Agriculture statistics for the redevelopment of agricultural land, which are available per municipality.
>
> Historical agricultural land data, to provide a view of how the agricultural land use has shifted over time.
>
> Soil type, from the SGU database.
>
> Economical returns from the Board of Agriculture database, to provide a view of the productivity of agricultural land.
>
> Drainage conditions, soil drainage enterprises from the county administration.
>
> The regional green infrastructure plan, from the county administration.

The report recommends that municipalities use this data to create a report providing a basis for planning regarding agricultural land.

Gothenburg

The current comprehensive plan for the City of Gothenburg (2022) features only a short section regarding the treatment of agricultural land. The comprehensive plan states that agricultural land is one of the most important ecosystem services, and its values are derived from its productive capacity, its worth for the natural and cultural environment and its character and social values. Its opportunities for cultivation, recreation, education and rehabilitation has great importance for strengthening the attractiveness of the City of Gothenburg, the plan continues.

The plan mentions that 10% of the land area of Gothenburg is agricultural, and that most of this is found on northern Hisingen and along the Lärje river valley, and states a need to deepen the knowledge about its ecosystem services and importance to the character of the landscape. After referring to the Environmental code, chapter 3 paragraph 4, it states that some of city's agricultural land is protected under reserves or area restrictions.

Recommendations made in the comprehensive plan are to:

> Avoid redeveloping agricultural land as far as possible.
>
> If redevelopment is considered, it should primarily be done in such a way that the land can revert to agricultural in the future, for example by avoiding large hardened surfaces.
>
> When residential development is planned close to agricultural land, sufficient distance is required, to limit disruptions in the form of noise or smell and thereby avoid conflicts between residences and agricultural enterprises.

The highly protected agricultural landscape of Öxnäs, with the village in the background.

Scenarios for Säve

12 000 new housing units can only be considered a significant public on a scale as wide as the Gothenburg region. As there is other land than Säve's fertile agricultural plains, such as Gothenburg's vast reserves of brownfield land, this development cannot be allowed under the environmental code. A smaller scale development designed to benefit locals could possibly be allowed, as such a development would need to be located in Säve.

Two scenarios based on development patterns common today have been studied in order to determine a path forward. Scenario Town seeks to develop Säve into a suburban town, finishing the transition from agricultural village that has been slowly ongoing for the past century. While this would materially benefit suburban residents, it would eliminate Säve's rural character and simply turn it into yet another suburb. Scenario Village preserves Säve's status as a hybrid rural-suburban community, developing on the kind of locations where the agricultural villages of old could have been built. This would allow Säve to develop into the future without destroying what makes it unique, but needs significant rethinking if it is to affect any kind of positive change.

Development strategies for Säve

Baseline strategy

The Environmental Code is clear. The only redevelopment of agricultural land that may take place on serviceable agricultural land is one that fulfils a significant public interest that cannot be accommodated elsewhere.

Säve certainly has serviceable agricultural land. Its flat clay plains make it some of the best agricultural land in western Sweden. There is no question that the agricultural land in Säve fulfils this first criteria even under the strictest of definitions.

Housing can be a significant public interest according to most interpretations of the environmental code, although not according to the stricter interpretations such as that of Jönköping Municipality. With the Gothenburg region's housing shortage, let us for now assume that new housing in the Gothenburg region constitutes a significant public interest.

The final criteria of the Environmental Code is that of alternative localisation. Can new housing in the Gothenburg region be built elsewhere? The answer is yes. Few cities have as much underdeveloped industrial land, also known as brownfield land, as Gothenburg does. In Backaplan, 9 000 new housing units are planned, in Frihamnen 10 000, and those are just two examples out of many. Most of these areas are located close to Central Gothenburg, with already established transport links. Even if greenfield developments were to be necessary, for example in the long term, only 10% of the land area of the City of Gothenburg is agricultural. Other land should be considered first. Therefore, while 12 000 new housing units may be a significant public interest to the Gothenburg region, there are alternative locations, and thus the comprehensive plan's proposal cannot currently be argued for under the Environmental Code.

Local public interests are different, however. Säve currently lacks most basic services and amenities, requiring trips to Gothenburg. While such a massive expansion as 12 000 housing units could hardly be argued to be in the interest of the local public, smaller-scale development could be if it enables Säve to become a more self-sufficient village, with access to those services and amenities that it currently does not have. On a local scale, the question of alternative localisation becomes framed differently. While 12 000 housing units could be built anywhere in the Gothenburg region, local improvements of Säve can only be built in or near Säve. With this framing, it is possible that redevelopment of some agricultural land could be justifiable. Whether it is or not will depend on what actually is in the public interest of Säve locals, and whether it can be accomplished adequately without the use of agricultural land.

With this framing in mind, loose proposals for two scenarios for the future development of Säve have been developed for evaluation, in order to determine a path forward. Both focus exclusively on the existing urban area of Säve, within walking distance of the future railway station.

Scenario Town allows the use of some agricultural land where deemed appropriate, and is less conservative when it comes to redevelopment of other existing properties. The intent is to build Säve up into a small but more independent town.

Scenario Village has a zero-tolerance policy towards redeveloping agricultural lands, and is more conservative in its treatment of existing properties. This scenario will not significantly change the character of Säve, but has the potential to result in improvements with more creative thinking and local involvement.

Both scenarios keep densities fairly low compared to typical new construction in Gothenburg today, although on the high end of what can be found in Säve today. Zones are classified as low, medium, or high densities. High densities are found mainly in the centre of Scenario Town and are envisioned as free-standing apartment blocks of up to 4 storeys. Medium densities are terraced housing, while low densities are envisioned as duplexes similar to what is found in Brunstorp.

Both scenarios also make the explicit choice to keep the large industrial area in the south of Säve. Säve appears to have a thriving and vibrant industrial/enterprise sector, providing local jobs, and these proposals intend to avoid disrupting this sector, rather than treating this land as brownfield ripe for redevelopment.

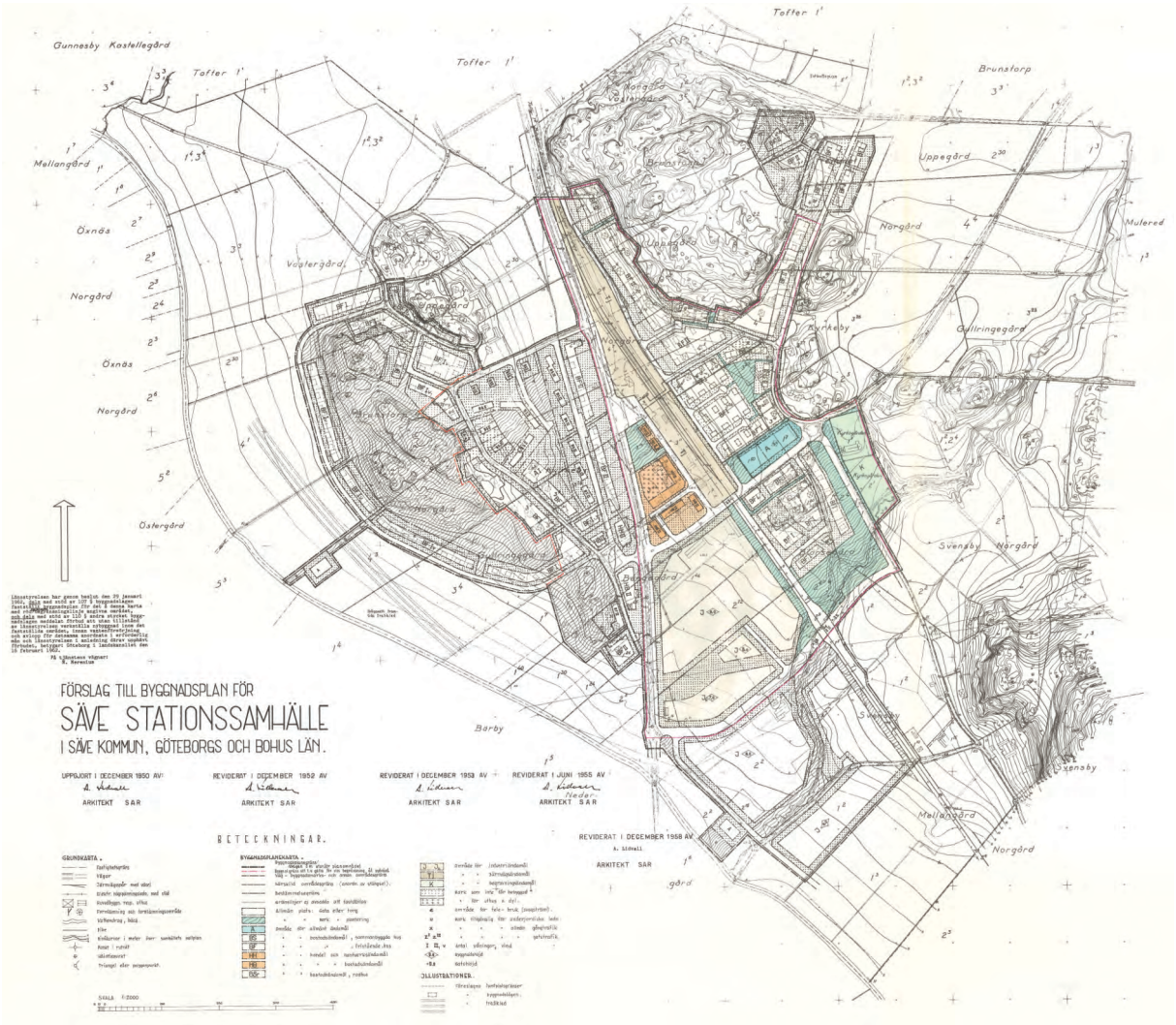
Scenario Town

Scenario Town is closely inspired by the *Plan for Säve station community* developed by architect A. Lidvall (1958). As discussed in the History of Säve section, this plan was developed while Säve was an independent municipality, but was only partially enacted and for the most part not built out as intended. It is however still the governing plan for most of the area it was enacted in.

In terms of land use, Scenario Town uses agricultural land that is already within the footprint of Säve, but does not expand out onto agricultural land outside the already built-up area.

The Lidvall plan lays out a mixed use town centre immediately west of the railway station, with commerce, handicraft, and housing in two storeys. This has been carried over to Scenario Town, albeit with a higher density than the Lidvall plan. This is the only highlighted area in any of the two proposals that already contains buildings. The intent is not to demolish every building in this zone, but to change the area's character from industrial into that of a town centre.

On the other side of the tracks the Lidvall plan proposes a school. Today this is still farmland, but as it is completely surrounded by the built-



The Lidvall plan for Säve station community. The solid red line shows the boundary in which it was enacted. (Lidvall, 1958)

Geodata: Jordbruksverket (2023), Lantmäteriet (2021), OpenStreetMap contributors (2022).

R: Residential
M: Mixed use
S: School
O: Other

Density - l/m/h:
low/medium/high

Total number of new residential units: 885
Area of agricultural land redeveloped: 7.6 Ha

Scenario Town

0 100 200 300 400 m

Geodata: Jordbruksverket (2023), Lantmäteriet (2021), OpenStreetMap contributors (2022).

R: Residential
S: School
M: Mixed use
O: Other

Density - l/m/h:
low/medium/high

Total number of new residential units: 233
Area of agricultural land redeveloped: 0 Ha

Scenario Village

0 100 200 300 400 m

up Säve village, Scenario Town carries this aspect over as well, and adds a preschool west of the church.

Housing is built out over the agricultural fields to the west of the main road, as proposed in the Lidvall plan, but with higher densities. Housing is also built out onto some of the rocky hills in the east, in particular the flatter parts of Tåfjäll, the main rocky hill to the northeast.

Scenario Town would add 885 housing units to Säve, bringing its population up from 700 to approximately 2 700 with the Swedish national average of 2.2 persons per household (SCB, 2018), and redevelops 7.6 hectares of agricultural land.

Scenario Village

Scenario Village selectively searches for small plots where development may be added, primarily according to the patterns observed from the analysis of the historical villages. Within the urban area of Säve, it proposes new commercial buildings on the west side of the tracks, but does not touch any of the existing buildings, industrial or residential. It adds a preschool west of the church, but leaves intact the plot of farmland where the Lidvall plan proposes a school.

Scenario Village goes farther away from the existing town than Scenario Town in its search for redevelopable land, but the developments in question are low density. The largest developments proposed under Scenario Village are on the rocky hill to the northeast known as Tåfjäll, although they are confined to a smaller part of this hill than what is proposed under Scenario Town.

Scenario Village would add 233 housing units to Säve, bringing its population up to approximately 1 200, while keeping all current agricultural land intact.

Farm in the centre of Säve. Farms such as this would no longer exist within the village under Scenario Town, but would be retained under Scenario Village.

Evaluation and comparison

Hybrid community

The Säve of today is truly rurban, in multiple senses of the word. It's located within the limits of the City of Gothenburg, but in a very rural and agricultural setting. It is also been affected by the suburbanisation of the region, but still retains much of its older, agricultural characteristic. Notably there is still agricultural land and even farm buildings right at the heart of Säve. The appearance of Säve today is that of an agricultural village that begun a transition to a suburban town, but stopped it halfway through. It's neither one nor the other, and at the same time a juxtaposition of both.

In the above sense, a clear distinction can be made between the two scenarios. Scenario Town completes Säve's transition into a suburban town, while Scenario Village reinforces the hybrid status quo.

Effects of Scenario Town

In Scenario Town, elements of agricultural functionality in Säve's interior would be eliminated, with any buildings preserved serving as little more than museum pieces, remnants of a past when agriculture was at the core of the identity of the town. The land formerly occupied by agricultural uses would be redeveloped for housing of various typologies, including typologies denser than what may currently be found in Säve. In the centre of Säve, the currently industrial land would be reallocated for mixed uses, restoring the intent of the Lidvall plan and creating a new service centre for Säve residents, reducing their reliance on Gothenburg for basic needs.

Transitions from rural villages to suburban towns have happened all around the Gothenburg region. As is self-evident simply by the scale of the population increase that may occur in such a transition, the vast majority of people moving into the new suburban housing will not be existing locals, but rather moving from nearby larger towns and cities. A diminished, if not lost, sense of local identity seems inevitable in such cases where new residents vastly outnumber the old. Depending on the size and strength of the existing community, the transition may be more along the lines of a new community being created, than an old one being changed.

The primary benefactors of an agricultural-suburban transition would be the new suburban residents, and not so much the farmers and other existing rural interests. As the 2022 comprehensive plan of Gothenburg states, agriculture in proximity to residential areas can results in conflicts, primarily due to for example noise, smells and other disturbances impacting non-farming residents. In favour of completing the transition is the fact that the population of Säve is already made up mostly of these suburban residents. However the transition being incomplete despite being begun over a century speaks against completing it, as it may still be possible to preserve and maintain Säve's existing local identity.

Effects of Scenario Village

Scenario Village retains all existing agricultural elements in Säve. It is also careful not to disturb existing buildings and activities. It seeks out the kind of locations that would have been chosen for villages historically, and develops them modestly. The result is a Säve whose character has not significantly changed compared to today, barring the addition of new housing and services. With such a small increase in population its hard to say whether improved services would even be possible.

While Scenario Village avoids any possible negative effects from completing Säve's suburban transition as Scenario Town would, the question is what positive effect it achieves. Scenario Village does present a path forward that can preserve many of Säve's existing qualities - its rural character, its status as a farming village that has survived years of suburbanisation, its more recent status as a hub of small business and industry. It is however a path forward mainly concerned with preservation, and does not try to create something new.

While Scenario Village follows traditional land use patterns it develops this land using typical suburban low-density housing typologies. This contradiction is the main reason why its population increase is so small. If Scenario Village took not just its land use practices from old tradition, but its urban design practices as well, it could have a greater impact.

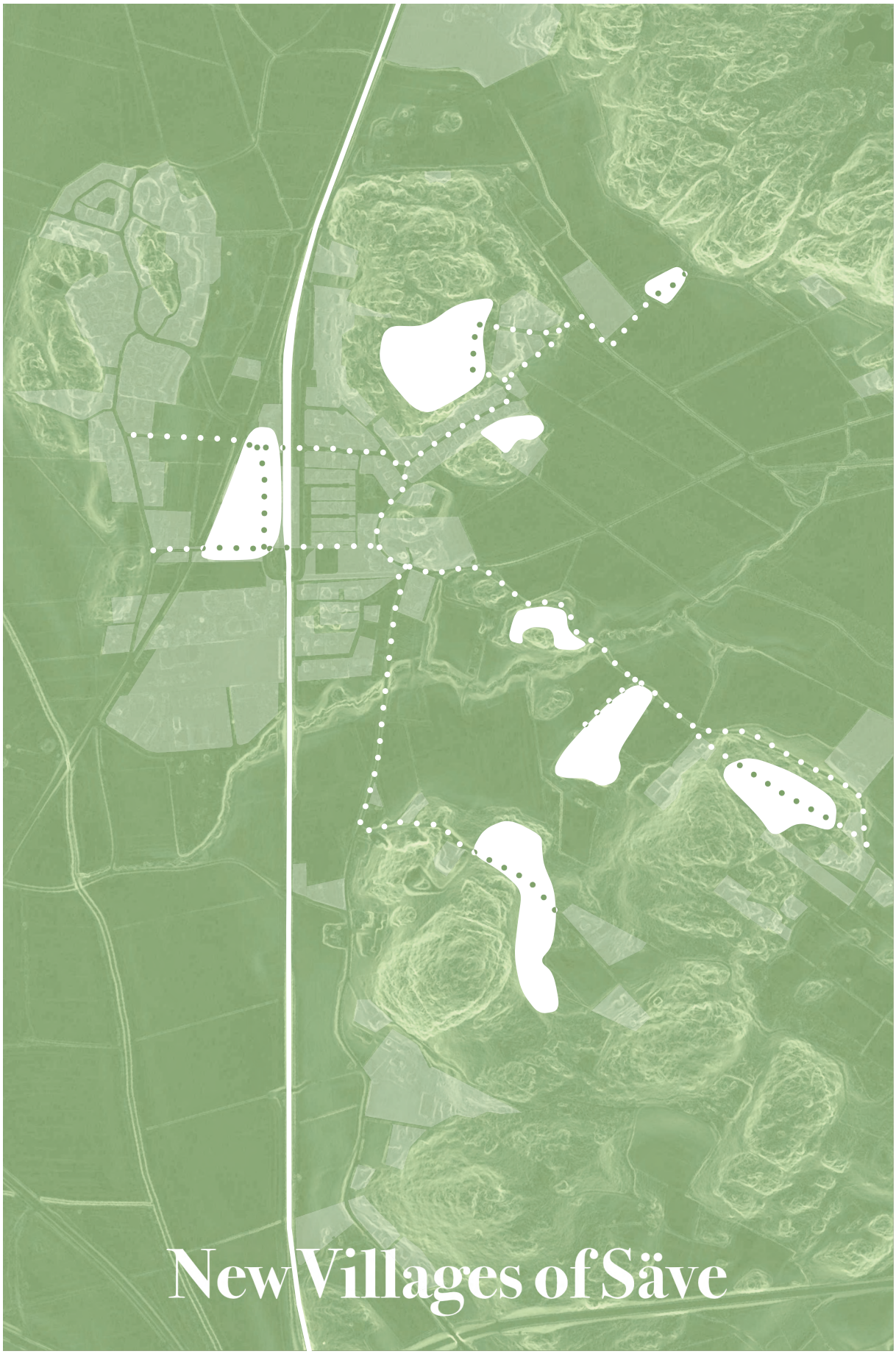
Conclusion

Out of the two studied scenarios, Scenario Town is the most thorough and consistent, and has the greatest possibility to effect positive change to the majority of the residents of Säve. This is not surprising given that both scenarios follow typical suburban development patterns, but only Scenario Town follows a typical suburban land use pattern. Scenario Town ends up being the scenario of change, while Scenario Village simply preserves the status quo.

Säve is in a unique position, being halfway between a suburban town and an agricultural village. The agricultural village represents its past, and the suburban town is by many thought to represent its future. There is however an opportunity to take a different path, one where Säve can continue to develop long-term and into the future without eliminating its rural character. Scenario Village as proposed exemplifies the land use characteristics of such a path, but to be effective it would need a new development patterns as well.

Scenario Town represents the established path forward. Although it is significantly downscaled from the city of Gothenburg proposal, there is still nothing out of the ordinary proposed within it. Scenario Village, with changes, is something new entirely. For this reason, Scenario Town does not need further studies, while Scenario Village could benefit greatly from them. The next chapter will delve deeper into Scenario Village.

The farmlands that separate Brunstorp from the rest of Säve, looking towards Brunstorp.



New Villages of Säve

A framework for new villages has been developed, with inspiration from the traditional farms and agricultural villages of the Säve area. This framework stretches from the characteristics of land to be used to the design of the villages themselves. Like those of old, these new villages are to be built on land not suitable for agriculture, and are made up of farmsteads each surrounding a yard, with housing as well as space for other functions, a dense, mostly low building typology, and an emphasis on the communal over the private.

Several sites have been identified for these new villages, and together they have a greater impact than Scenario Town, while using almost as little agricultural land as Scenario Village. The new villages are all within a short walk of the railway station, where a central village is to be built on currently industrial land, with housing as well as services for the surrounding villages. With all that Säve has to offer within a short walk, bike or bus ride, and central Gothenburg just a 15 minute train trip away, it is hoped that private cars will be eschewed in favour of more sustainable transportation options.

Scenario background

Lessons from Scenario Village

Scenario Village outlined a path for Säve whereby all existing development and agricultural land uses were preserved by identifying the kinds of locations where Säve's historical villages were built. However, rather than employing critical thinking regarding the kinds of development being built on these village sites, Scenario Village simply used typical suburban densities, resulting in a proposal with a low impact. This result was inevitable for a study focusing exclusively on land use. To properly evaluate the impact of Scenario Village, a holistic approach to land use and development patterns is needed. For a proposal influenced by the land use practices from the traditional villages, it makes sense to investigate the possibility of taking inspiration from their building practices as well.

Direction

The proposal put forward in this section is a scenario based on Scenario Village, but reconsidered in all aspects. The strict requirement to not disrupt any existing buildings or agricultural land is removed, in favour of a low-tolerance approach where exceptions are possible. This opens up the possibility of taking small amounts of agricultural land to aid the proposed development, and to change the industrial land uses in the village centre of Säve.

For this proposal, the following three steps have been completed:

- Location of suitable sites for development based on the land use practices identified in the historic villages.
- Development of a new housing typology based on the patterns of the historic villages and the farms within them.
- Exemplification of this village typology through the application of it on one of the proposed village sites.

Like the previous scenarios, this scenario focuses on the area within 500-1000 metres of the past/future Säve railway station. Within this distance the railway station is easily accessible, making it a natural part of the mobility of the residents. Beyond this distance, different mobility strategies would be required, and that is beyond the scope of this thesis.

The redevelopment of the centre of Säve from industrial use to a mixed use neighbourhood is still included within this scenario. It will require special treatment and adjustments to the proposed village typology in order to be an effective commercial and service centre making the most possible use of its location next to the future railway station. It is however still a village, and the same logic of making good use of available non-agricultural land still applies to the underutilised industrial land of the centre of Säve. Therefore, although the exact adjustments required are outside the scope of this study, the centre of Säve is to be treated like a new village, albeit one with a key role.

Entrance to the village of Bärby. Signs on the right point towards the *Bygdegård*, a type of rural community centre.

The new village typology

Land use

The historical villages of Säve were built on land unsuitable for agriculture. This can be clearly seen in the analysis of soil types on village lands, which show that bedrock and moraine are were the preferred soil types for village development. Meanwhile, most agricultural land in the Säve region is on clay soil. Therefore, one indicator of a suitable site to construct a village is the presence of bedrock and/or moraine and the absence of clay soil.

Such land makes up a large percentage of that available within the area studied by the municipal comprehensive plan, but much of this is very rough, rocky terrain that either requires significant use of explosives to get a level surface to build upon, or is simply too steep to practically build on using standard techniques and building typologies. Therefore, land that is not too steep or too rough is a requirement.

Finally, the sites should be close to existing roads and other infrastructure, so as not to require major new connecting roads and infrastructure to be built. Existing infrastructure may require upgrades to support a higher population, but this can be done along existing corridors, rather than disruptive, large-scale construction works. As we are only looking at sites within a 1 kilometre radius of central Säve for this study, this requirement is fulfilled most of the time. For any further development beyond the scope of this study, this requirement may come into play more often.

Farmsteads

The key building blocks of the historical villages were the farms. Each farm works as one unit, with mostly identical functions, coming together in a decentralised whole. The primary building block of our new villages will be new farmsteads, based on the principles identified in the traditional farm layouts of the region.

To recap, traditionally each farm was built in a more or less rectangular arrangement surrounding a central farmyard. One of the four sides around the farm yard would usually be occupied by a residential cottage, which would generally be separate or only loosely connected to the remaining buildings. The remaining sides would be occupied by functional buildings. These were built wall-to-wall, with little distinguishing them from each other.

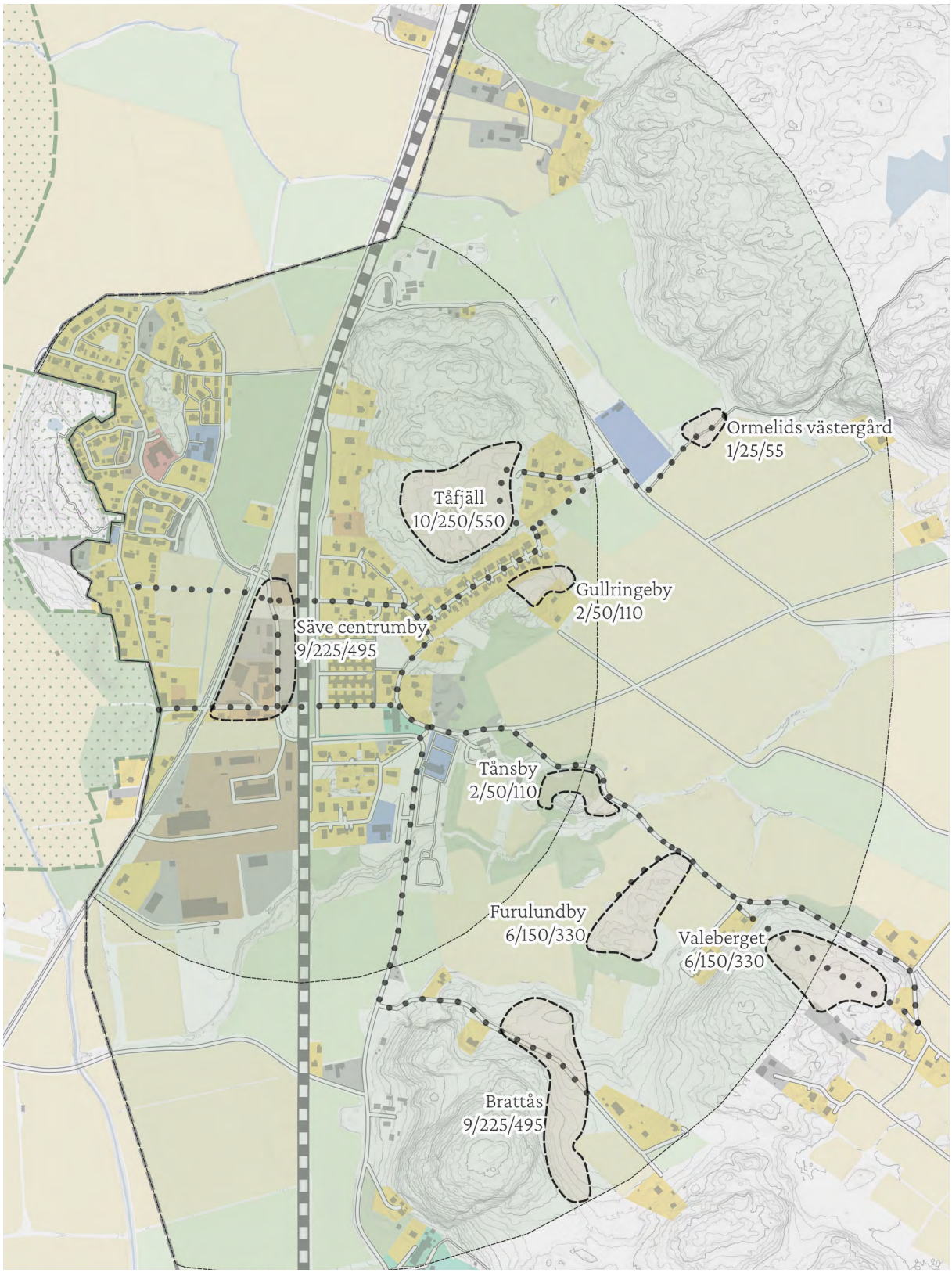
The primary purpose of these traditional farms was agriculture. The new farmsteads do not aim to replicate this, their primary purpose being to house people. As such, while the buildings of the traditional farms are mainly functional in nature with a small part dedicated to housing, the new farmsteads reverse this ratio, being mainly residential with some space for other functions.

Farmstead layout

Just like the traditional farms of the historical villages, the new farmsteads centre around an open courtyard. Whereas the farmyards of traditional farms was primarily a functional space to conduct farm work, the new courtyards serve mainly as recreational green space for the residents. On the following example plan, they feature playgrounds, benches, and spaces for communal gardening.

Analogous to the residential cottage in traditional farms, the new farmsteads feature a low-rise apartment block, occupying a footprint of 15 by 15 metres, and being four stories high including ground floor and loft. This apartment cottage may contain around 10-14 housing units depending on apartment size and ground floor use, making it home to approximately half of the around 25 households in each farmstead. The new cottage should generally occupy the most public side or corner of a farmstead, and placing it at the perimeter of a village is to be avoided.

The remaining sides around the courtyard are occupied by low-rise buildings that can adopt multiple functions. These buildings are made up of wall-to-wall units 7 metres in width and 8 metres in depth, with corners being special cases. Possible uses for these include as communal buildings, with the proposed plan showing some from each farmstead being used



Geodata: Jordbruksverket (2023), Lantmäteriet (2021), OpenStreetMap contributors (2022).

500 m from station

1 km from station

Village name

Farmsteads/homes/population

Total number of new homes: 1 125

Total population increase: 2 420

New Village Sites

0 100 200 300 400 m

as Felleshus in the spirit of Vallastaden, an urban development in Linköping where each block features a combined greenhouse and community space (Witte Sundell, 2023).

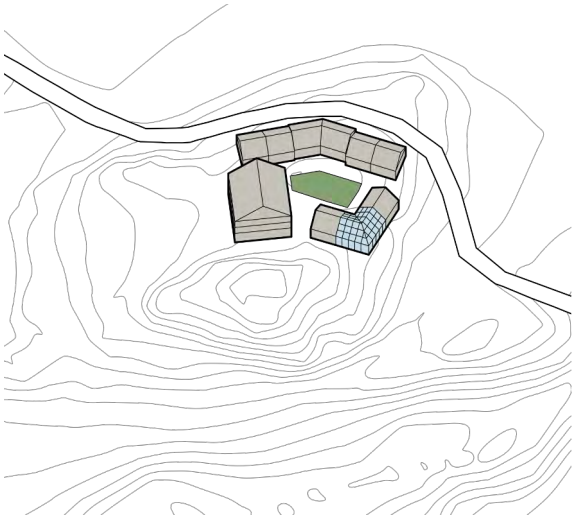
Most of these units will however be residential, and as residential buildings they function as 1 ½-storey terraced housing. In this mode, the units are entered from the courtyard side, with a private front yard extending 2 metres in front of the building and a back yard extending 3-5 metres behind. At the standard 7 metre width this makes the front yard 14 m² and the back yard 21-35 m². The larger backyards are used at the perimeters of villages, where space is less constrained. As a consequence of their longer rear facades, buildings on corner lots also get much larger backyards, in addition to their larger interior areas.

Village

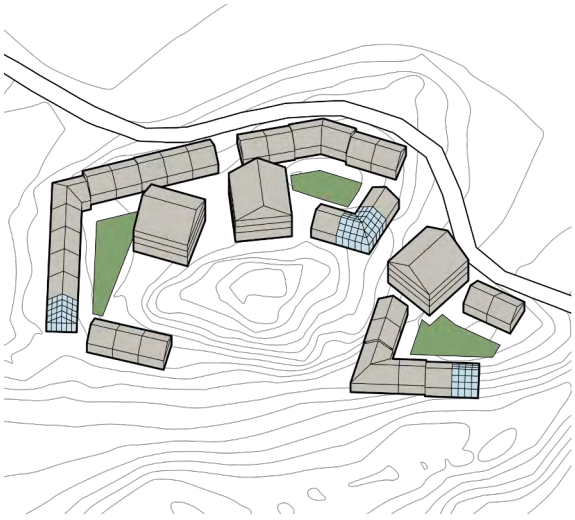
Villages are created by finding a suitable location and dividing it into approximate zones for each farmstead. The number of farmsteads will depend on the size of the site. 2 500-3 000 m² has been found through experimentation to be the approximate area required for a functional farmstead with a good balance of buildings and green space. Farmsteads can be plotted out keeping the public space formed between in mind. It is recommended to plot farmsteads out so that a central open space, or *bygata*, is formed connecting all or most farmsteads. However, one should not imagine farmsteads as city blocks separated by streets. Like the traditional villages, a freeform layout should be used instead, where green space is assumed to be the default and paths, streets and public spaces are placed within or along the perimeter where suitable.

While the building block of the village is the farmstead, with no hierarchy or additional buildings, it is possible to achieve synergies by varying functions within the farmsteads. Some farmsteads could for example have larger communal spaces than others, for use by people from the whole village if needed. Functions that only make sense on a village level, for example daycares, stores and other services, can be located in whichever farmstead is suitable, for example close to the public spaces.

An appropriate site for a village is of low agricultural use, not too rough terrain, and close to existing connections.

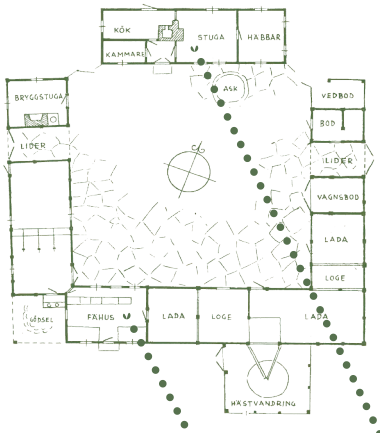


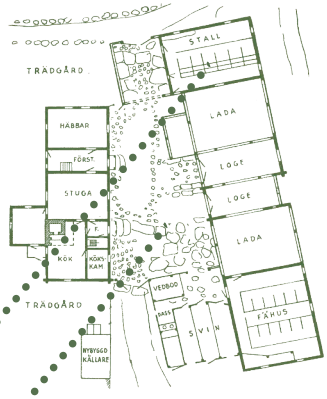
A farmstead is made up of residential and communal buildings tightly knit around a central yard.



A village is made up of several farmsteads surrounding a central open space.

Southern Swedish farm typology





Simple, straight volumes and angles

Distinct main residential part

Wall-to-wall functions

Enclosed farm yard which is main access

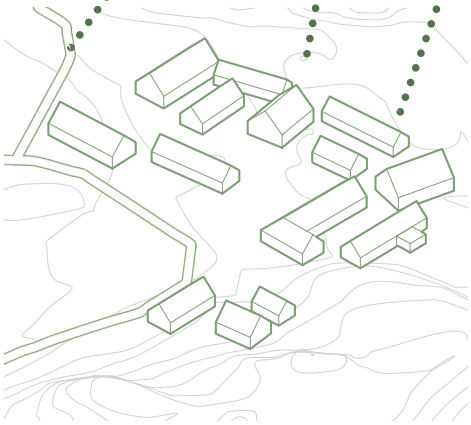
Roads on perimeter

Site not suitable for agriculture

Densely, non-hierarchically clustered farmsteads

Several villages form one community

Orbiting one central village



Historical villages of Säve

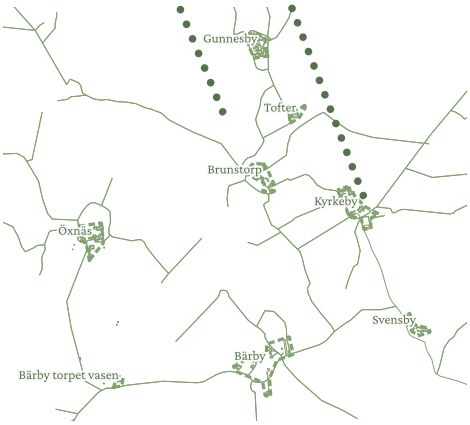


Diagram showing some of the elements from the research on historical villages that have gone into the new villages.

Exemplifying study of new village: Furulundby

Village outline

Furulundby is a new village located less than a 10 minute walk east of the future Säve railway station and central village, and west of the small existing residential area of Furulund for which it is named. The village sits on a long rocky bump in the landscape between crop fields to its north, west and east, and grazing lands to its south.

The village's six farmsteads, which collectively are home to 150 households or approximately 330 residents, each have shared courtyards for the residents to enjoy. Each also features a Vallastaden inspired Felleshus, combined greenhouse and communal space, with a larger all-village house by the main open space, the *bygata*. The apartment cottages surrounding the bygata could have, communal spaces, commercial premises, or services such as daycares on their bottom floors, although the main concentration of services would be in the central Säve village just a few minutes' walk away.

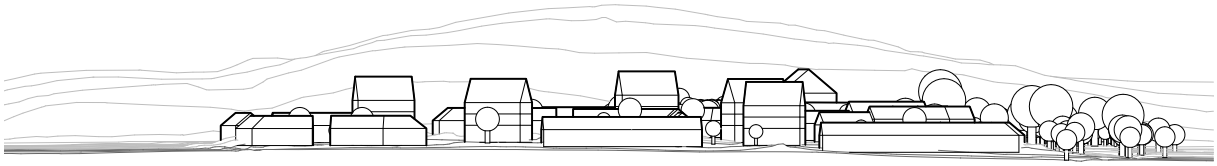
Apart from the green space within the village itself, and that within the central village of Säve, the forests and grazelands nearby could be used recreationally, under the Swedish principles of Right of Public Access best summed up as "do not disturb, do not destroy". This means that the agricultural surroundings although private property are not off limits to the residents, but can be enjoyed if treated with care.

Destinations and transportation

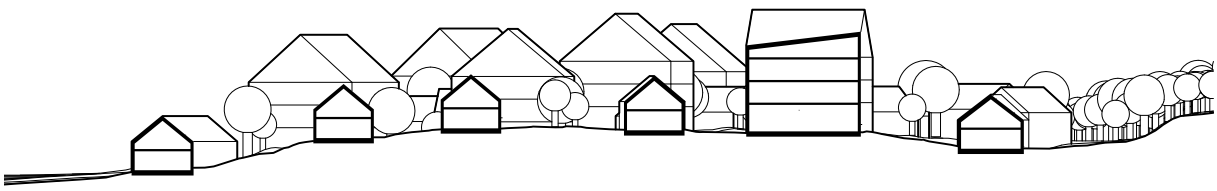
Like all of the proposed villages Furulundby is within convenient walking distance of the central village of Säve, which should allow residents to reach most of their daily destinations on foot. As this also includes the future railway station, trains are expected to be the main method of transportation to and from Gothenburg. With planned upgrades to the railway these trains would depart every 15 minutes and take not much more than that to reach railway stations in the city centre.

For local transportation at a longer distance, cycling can be a viable option. While many jobs in the Säve area are easily reachable on foot, even more, such as jobs in the growing Säve airport area could be reached within a 20 minute bike ride with planned improvements to bicycle infrastructure. Existing bus routes from central Säve, and potential new bus routes serving the villages would also play a key part in this range of travel.

Within the village itself, although inroads for deliveries and other necessary vehicle transports do exist, private motor vehicles are generally restricted to the access road running on its west side. Along this road, a number of parking spaces do exist for those residents who need to own a car. It is however hoped that with cars not needed for daily life, the few trips for most residents that do require cars can be done with shared mobility solutions such as carpooling.



Elevation [E] Scale 1:2000



Section [S] Scale 1:1000

Furulundby

0 10 20 30 40 m

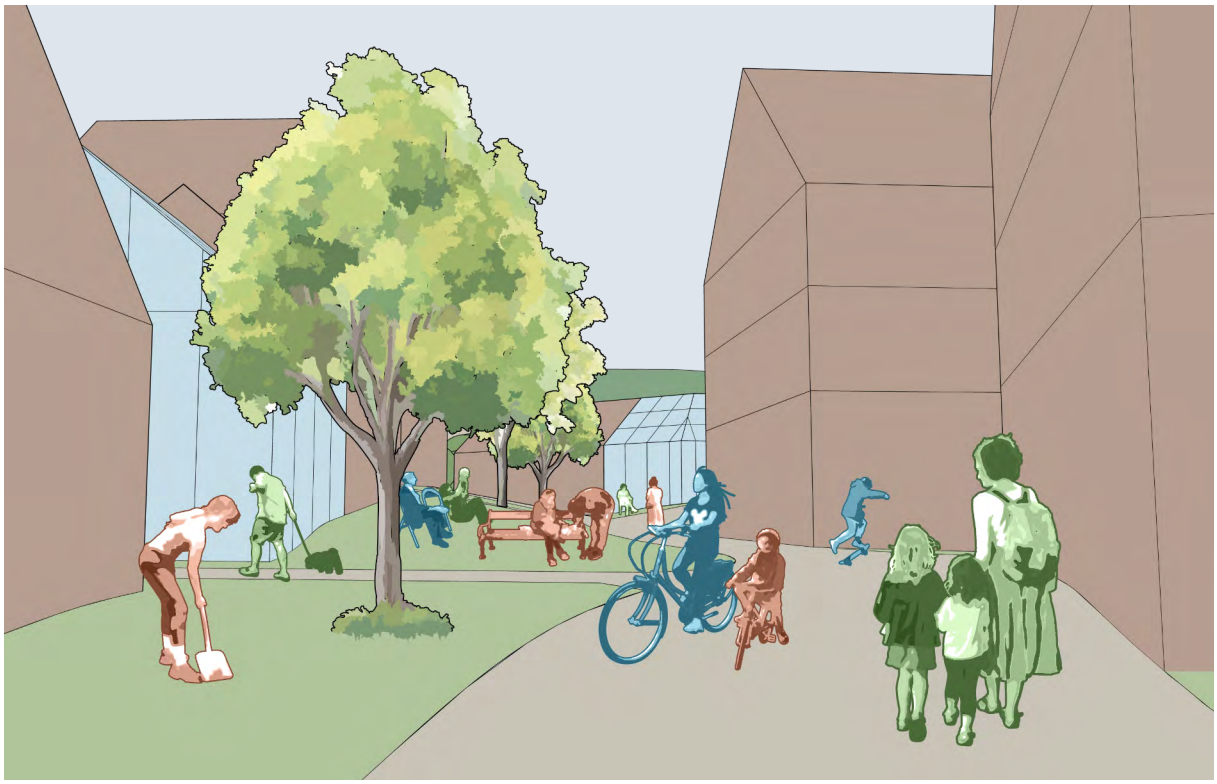
Evaluation

Furulundby and the other proposed villages differ from the standard suburban typology in several key aspects. While fundamentally terraced housing and apartment buildings are nothing new, the way in which they are assembled into a community here is, in particular the emphasis on communal buildings communal public space as more important than the private. These spaces come in many forms, from the central yards of each farmstead to the *bygata* to the vast surrounding fields and forests that we all may use with care under the right of public access.

This is not to say there is no private space - the terraced housing as commonly expected feature their own private yards. By the standards of Säve these are small. These sizes are however roughly in line with what's common for a newly built terraced house in denser urban areas of Sweden. Front yards are even being omitted completely in many new developments. With limited land available to develop these villages it is important to conserve what land is available, which holds true in urban areas as well, explaining the similarity.

Another aspect frequently seen in urban areas but rare in a suburban area is the car-light mobility strategy. With all villages within a short walk from the future central village of Säve and the railway station, residents of these villages should not need a car in their daily lives, which in turn should mean they do not need to own a car. Should more parking spaces be deemed necessary, perpendicular rather than parallel parking could be used, although this would eat into the adjacent crop fields. Reaching one parking space per household would however require a car park close to the size of one farmstead. It is unsure whether this would be a worthwhile investment in even the most car-centric vision of the future. With autonomous vehicles being intensely worked on by many companies, it is likely to eventually become commercially viable. With self-driving cars potentially being called to your door anytime from your phone, car ownership - and thus your own parking space - may become completely unnecessary even for those who do drive daily.

The villages do achieve their goal of providing a path for future development of Säve, with a greater population than even Scenario Town while using minimal amounts of current or

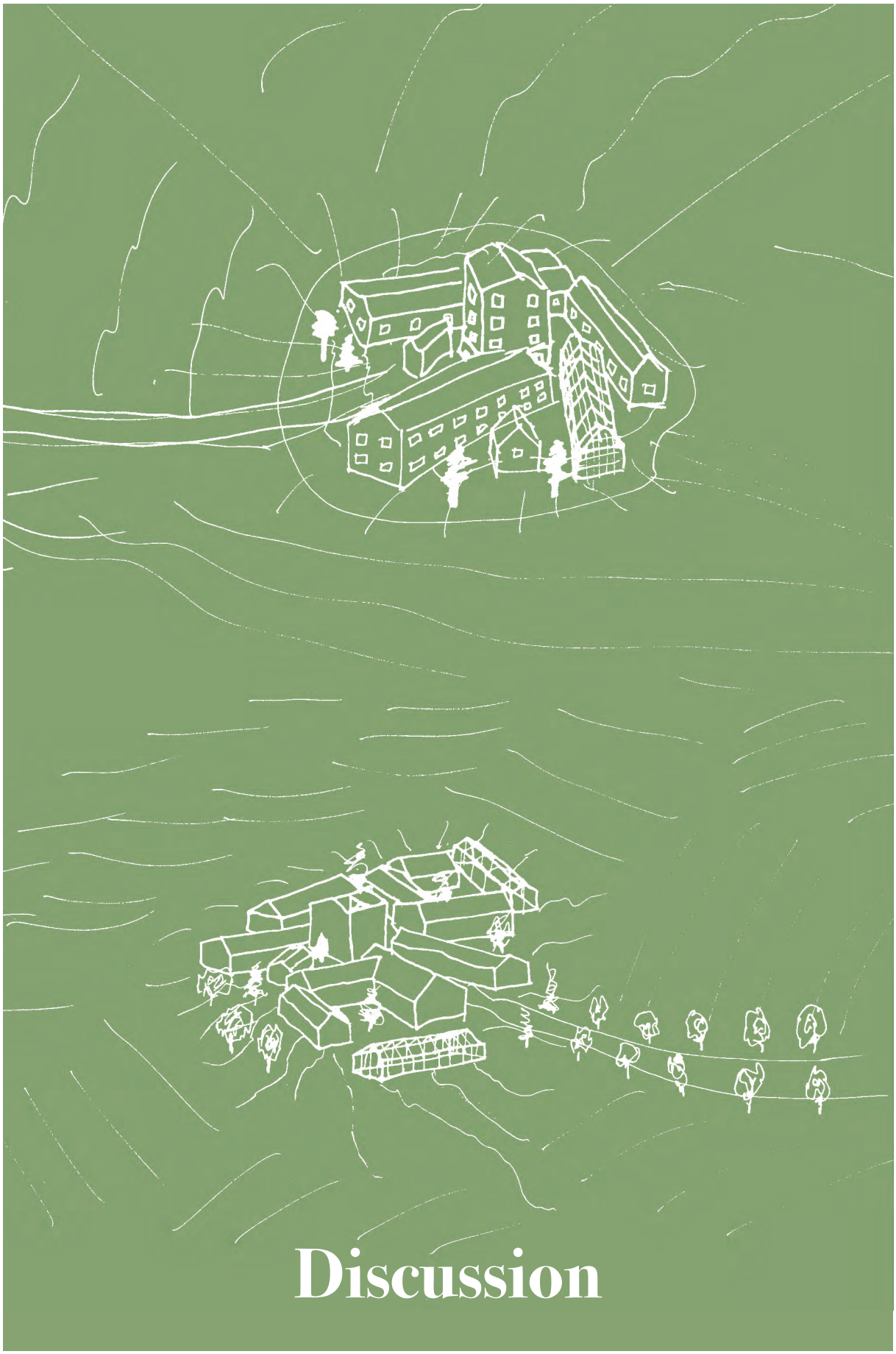


Perspective - *bygata*

potential agricultural land. Were this strategy to be applied to the whole of the area studied by the MCP and not just the area within a 1 km radius of the future railway station, it is possible that the MCP's 10 000-12 000 housing units or something close to it could be reached with minimal impact on agricultural land. There are many potential problems with this, however. Villages further than 1 km from the railway station and central village would likely be much more dependent on cars for transportation. Other centres could potentially be created to alleviate this, but it is unlikely that we would see another railway station in Säve. Developing villages on this scale would also consume vast amounts of forested land. While the impacts of this are out of scope for this thesis, it can safely be said that this would have a much more negative impact on biodiversity than the limited proposal laid out here.

Perspective - outside view

Axonometric view



Discussion

Säve and the Gothenburg region are under various pressures. There is a pressure on Säve to suburbanise, itself coming from a pressure on the Gothenburg region to build more housing. A reopened railway station would significantly intensify this pressure. There is also a pressure from a national level to preserve agricultural land, which in large lines up with the residents' will to preserve the character of the area they choose to live in. The goal of this thesis has been to find a path for future development of Säve that lies in equilibrium between these pressures.

The City of Gothenburg is ultimately the key stakeholder, as power rests with the city and its elected politicians to approve or deny development plans, and choose what to do with the huge amounts of city-owned land in Säve. The Swedish state is a high power stakeholder, but not one with high interest in the particulars of local planning unless state interests are affected. The people of Säve are not a homogeneous group, and they do not hold significant power, being not even a percent of the total population of Gothenburg. They do however hold some amount of power, through the possibility of legal challenges and the land still owned by farmers and other locals. Compromise could be required, and this thesis could end up being a satisfactory compromise.

Discussion

Pressures

On a fundamental level, this thesis deals with pressures. Säve is a region that for a long time, due to its proximity to Gothenburg, has been under pressure to suburbanise. This pressure has varied in strength over time, but it almost came to a close in the 1960s, when Gothenburg outright purchased Säve, ending its status as an independent municipality. Only the presence of military air base, and the economic crisis of the 1970s just years after its closure, prevented development at that time. After a few decades of lower pressure with only small developments, we are seeing signs that it is rising once again.

The pressure is not coming from nowhere. Gothenburg itself is under pressure. As the central city of a metropolitan area of over 1 million people, with a growing economy and population, the city is struggling to keep up with demand for housing. While the economic situation is less certain at the time of writing, the past decade has been one of intense growth and rapid changes for the city. It is not unreasonable to assume and to plan for continued growth into the future. No place but Säve within the City of Gothenburg has both an abundance of land to develop and the potential to create the necessary transportation infrastructure by simply reopening a closed railway station. It is therefore only natural that Säve is a part of the City's long-term planning for the future.

There are significant pressures in the reverse direction too. While the planning system in Sweden is highly decentralised, with local authorities holding a planning monopoly, the state has the power to intervene in when state interests are threatened, and several such state interests affect the Säve area. As we have seen, the village of Öxnäs and its surrounding lands are safeguarded by several different types of state interests, and are in the process of becoming a state level nature reserve. This makes urbanisation on the scale proposed in the 1969 masterplan impossible.

The other major central government interest affecting Säve is that regarding preservation of agricultural land. The government regulates this through the Environmental Code, which states that agricultural land is a national interest and shall not be redeveloped except for significant public interests that cannot be accommodated in other locations. A national interest is however not a state interest, so as discussed, this law is not being thoroughly enforced but is left to the municipalities to interpret. On the other hand with the worsening global security situation protecting the nation's food supply is once again higher on the agenda, which could mean that stronger national enforcement of the law is on the way, just as we are already seeing stricter interpretations of this law from many municipalities.

Lastly, we have the pressures coming from local residents. In many processes these pressures may in the end go ignored, and it's not necessarily a unified voice. In the case of Säve, we can make a few educated guesses. Whether they are descendants of farmers who have lived on their land for generations, or more recent residents living suburban lifestyles, it can be assumed that those who live in Säve live there by choice, because they enjoy living the life of a rural area with the benefits from being close to the city. A significant portion of the residents are still farmers, and those met on site expressed a strong aversion to redeveloping the agricultural lands surrounding Säve. In this regard, the interests of local residents may align well with the interest of the national government.

The complete urbanisation of Hisingen as proposed in the 1969 plan is at this point extremely unlikely. The developments proposed in the municipal comprehensive plan, in Säve and other areas of Hisingen, would nevertheless represent a drastic change should they come to pass. The framework developed within this thesis could be thought of as a criticism of the comprehensive plan and its proposals of urban sprawl, but it could also be seen as a method to implement the plan with minimal harm. Whichever way it is viewed, it is at the very least a compromise, an attempt to find the point of equilibrium between the various external and internal pressures acting upon Säve.

Stakeholders and power dynamics

If the framework outlined in this thesis is to be an effective compromise, we must critically analyse it from the perspective of the various stakeholders involved. How do each of them benefit from this proposal, and how do they not? What are the power dynamics?

The City of Gothenburg is undoubtedly the stakeholder with the greatest power. Not only are they the supreme authority on planning and urban development in the municipality, they also own the majority of the land in Säve, renting out much of the land that farmers use. Should they wish they may cease to renew contracts with local farmers and redevelop the land as they please, provided they do not tread on any state interests.

What the City of Gothenburg wants is difficult to clearly answer. Ultimately, it is simply a reflection of what a majority of elected city officials want, and this can change between election cycles, as it did in the 2022 elections when power shifted from a centre-right coalition to a centre-left one. The municipal comprehensive plan stretches much longer than an election cycle, and should not be seen as a wish list from politicians, but a planning document describing the overall long-term direction of the city. Development in Säve is at the moment not a particularly high priority for the politicians, but a reopened railway station would likely change this.

Should the railway station reopen, the City is quite clear in its goals from the comprehensive plan and preliminary studies that have been done for the area. This includes designing for sustainable mobility rather than car dependency, with key local targets reachable on foot or by bike, access to parks and nature, a higher degree of single-family housing than in more central areas of the city, and a stated goal to keep redevelopment of agricultural land low, although with a clear belief that it is required to some degree. And ultimately, the city does not with to lose money on these developments.

The proposal outlined here does address most of these questions well, and it arguably shows that development can happen without significant agricultural land take. The remaining issue is profitability. This has not been studied by the thesis, but fragmenting urban development into small villages may result in higher costs than building the same amount of housing in a collected manner. Ultimately though, there should not be anything out of the ordinary with this proposal cost-wise. This proposal appears to align well with the stated goals of the City.

From a state point of view, the particulars of local development are not of high interest. Their main goal is to safeguard their own interests, which they may do through various legal frameworks. The proposed framework does not conflict with any formal state interests, and seeks to minimise conflict with the national interest of agricultural land. From this point of view, the proposal is entirely in line with the ambitions of the state.

Finally, there are the people of Säve. They are not one homogeneous group, and defining what is in their interest is not a simple task. Their power is through the democratic process. They have a right to make their voices heard during consultations on new developments, and to challenge through the legal system. They do however not hold significant influence over elected officials, as the people of Säve make up less than a percent of the total voting population of Gothenburg.

Whether the proposed framework matches the desires of the residents of Säve is a difficult question to answer. To keep things simple, let us divide the population into 2 groups: Farmers and non-farmers. The proposed framework may not use any significant amount of agricultural land, but this does not mean that it will not cause any impact for farmers. An influx of new residents so close to their fields may not be what they want. The kind of conflicts that are discussed in the Gothenburg MCP risk occurring, conflicts of noise and other disturbance between new residents and farmers. The situations created here are however not too different from what already exists in Säve, where there are already farms next to and in between residential areas.

Where the City does not own the land, farmers also have to be willing to sell. This puts some power in their hands. As can be seen in the

mapping of land ownership, much of the agricultural land is in the hands of the city, while most of the land proposed for the villages is actually in private hands. The proposed framework may be a preferable alternative to farmers compared to building on city-owned farmland.

For non-farmers, it will depend on their view of Säve and its qualities. This proposal is a departure from previous suburban development styles in Säve, although not an enormous one. The main outward difference is the higher local density, and the inclusion of apartment buildings, something rare in Säve today. This may be perceived as not in line with their vision of the character of Säve. Again, the proposed framework may look better in relation to other development options for Säve than it does in isolation, as one that well preserves the rural character of today. If the proposed framework can deliver on solving some of the negatives of Säve, in particular the lack of services and shops, that may also be seen as a positive.

Conclusion

The success of a thesis must be judged on how well it answers its stated question:

> How should Säve develop into the future, taking into account the unique characteristics of the local context, the needs and desires of local residents, and the justifiability of redeveloping agricultural land?

The question can be divided into three parts. The first part is that of the local context. A large part of Säve's unique characteristics comes from its status as a rural-suburban hybrid, having never quite completed its transition from agricultural village to suburban community. The proposed framework preserves and reinforces this status, and sets the expectation that it is here to stay, rather than finishing the transition to suburbanity.

When it comes to the needs and desires of stakeholders, this thesis has not delved as deep as was intended from the outset. Here it is based mostly on assumptions, apart from a few informal conversations with local residents. This is a direct result of the evolving purpose throughout this thesis - itself a stated goal from the beginning. The thesis was originally intended to stick to land use, and not go into detailed design on a neighbourhood level. Any designs shown would have been simple examples, visual aids. When Scenario Village showed that simply working with a land use based on the traditional villages and populating that land with standard typologies was not enough to reach a satisfactory result, a much greater emphasis was placed on studying the building patterns of the villages as well. As a result, other aspects took a less prominent role. The social aspect of the thesis was scaled back perhaps the most, being less relevant when there was a clear end goal in mind that sprung out from a completely different basis. Instead, the thesis works with the general assumption that those who live in Säve do so out of their own choice, because they like the rural qualities of Säve today. The proposed framework aims to preserve these. As such it is hoped that it matches the needs and desires of the local residents.

The justifiability of redeveloping agricultural land is a heavy topic. Despite the thorough research performed, it is difficult to reach any definitive conclusions regarding what is acceptable or not. This thesis therefore aims to show that it is possible for Säve to develop without it coming at the cost of agricultural land. The impact of this can be disputed. Considering Säve in isolation, it could be little more than a drop in the bucket. Were this framework to serve as an inspiration for future development beyond Säve, the impact could be much greater. It may be a drop in the bucket, but the bucket is full of drops. If we can learn from the past, reevaluate our land use practices, and develop our cities in smarter ways, we may be able to significantly reduce or completely eliminate agricultural land take. That is what would have an impact.

Afterword

This thesis has changed continuously and dramatically from its inception. When I started work, I did not imagine what the final proposed solution would be, or even that it would have anything to do with traditional villages. In fact, when I first had the idea to write a thesis regarding Säve, the topics of preservation of agricultural land and rural qualities were not on my mind at all, and it was only during planning stages that I realised the significance of those topics. Had I begun with a clear goal in mind and worked towards that goal, the end result would have been completely different.

The five sections of this thesis can be viewed as five stages, which have been worked on almost linearly, each feeding into the next. In reality it is not quite that simple, as findings from the later stages have fed back into and enriched the earlier stages. The order in which the sections are presented does however represent the order in which they were started, and each section has had a roughly similar amount of time spent on it. For this reason it is important to view this thesis as a process not simply defined by the end result. The end result is a part of the process just like the rest, and has not had more time or effort put into it than any other part of the process.

This style of working has had its advantages and disadvantages. The primary advantage is that it allowed me to dedicate a significant amount of time to background research, and choose the direction of the final solution only after I had a solid foundation to build upon. The most significant disadvantage is that it means the final proposal may not be as developed as it would be had I spent and entire semester working on it. Another significant disadvantage is that the change of plans meant that some parts of the project plan could not be fulfilled. One of the original delimitations of the project plan was that this thesis should not develop new housing typologies. The intent was to mainly look at land use, and populate this land with standard typologies in standard arrangements. When developing the new villages became a part of the thesis, it was for good reason, and significantly enriched the final proposal. Delving deeper into details like this did come at the cost of some of the bigger picture. Whether this ultimately resulted in a better or worse thesis depends entirely on perspective, but it is clearly a different one.

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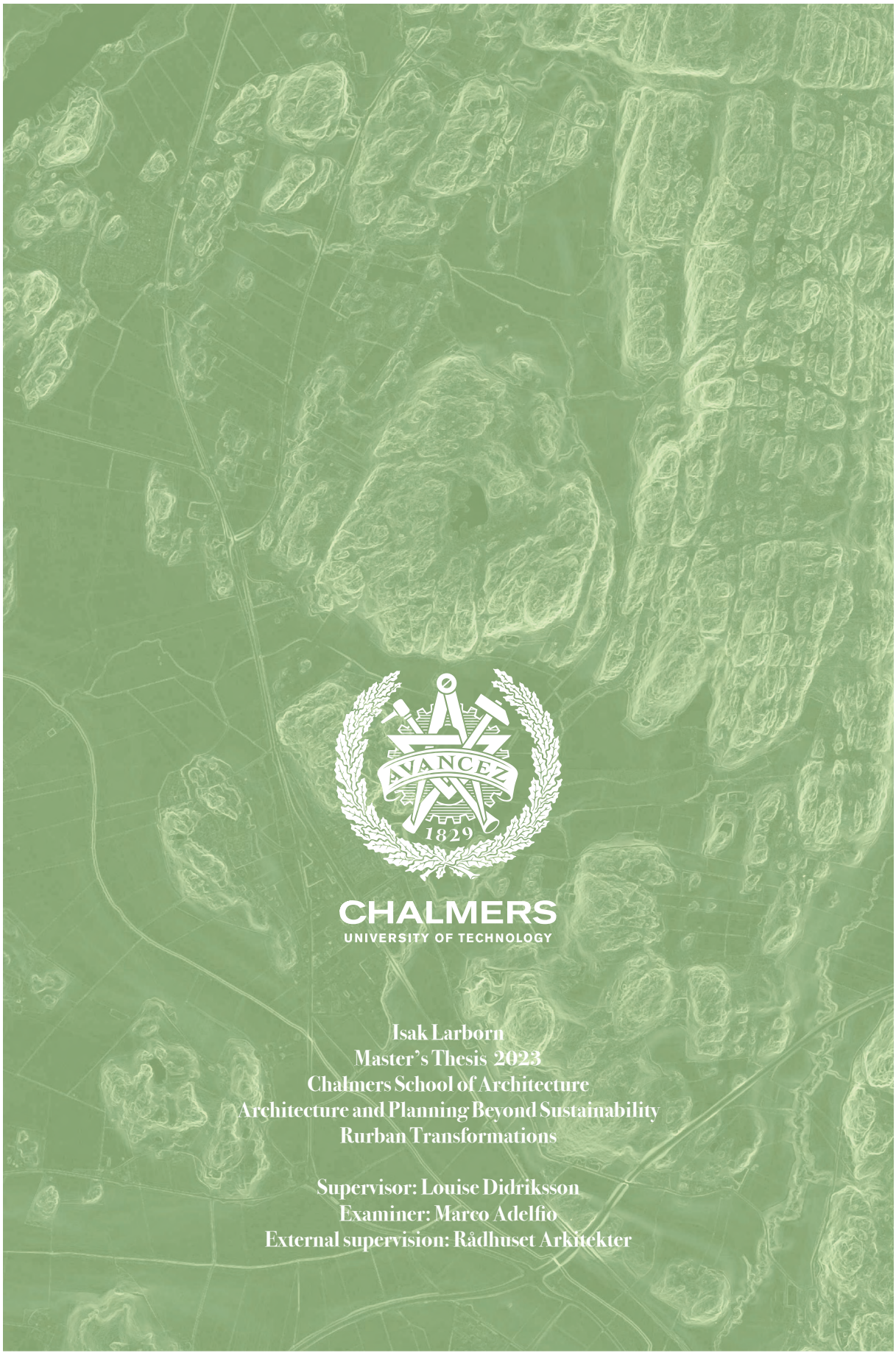

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