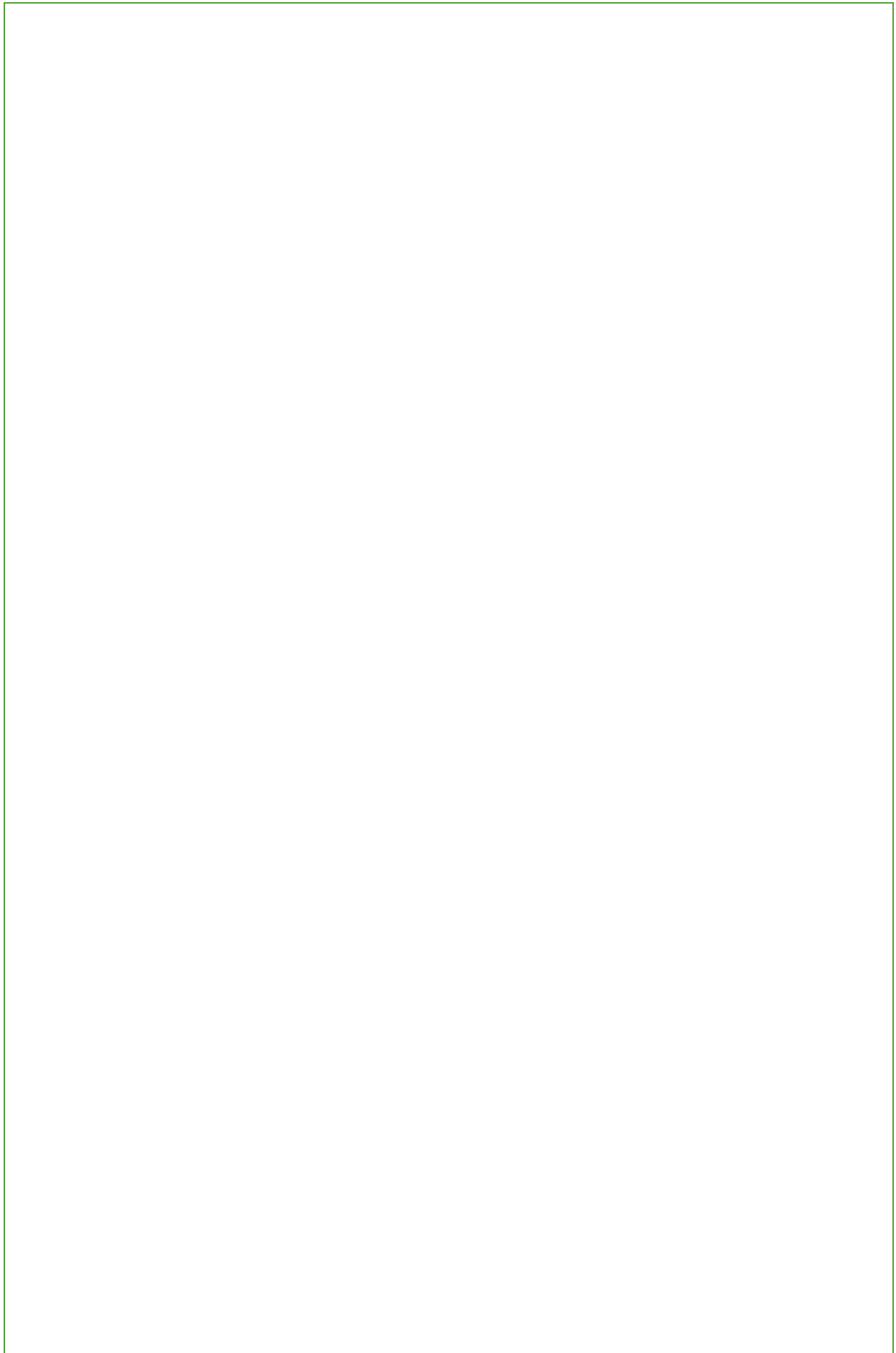


# UIDC 2017

Project area Hemlingby

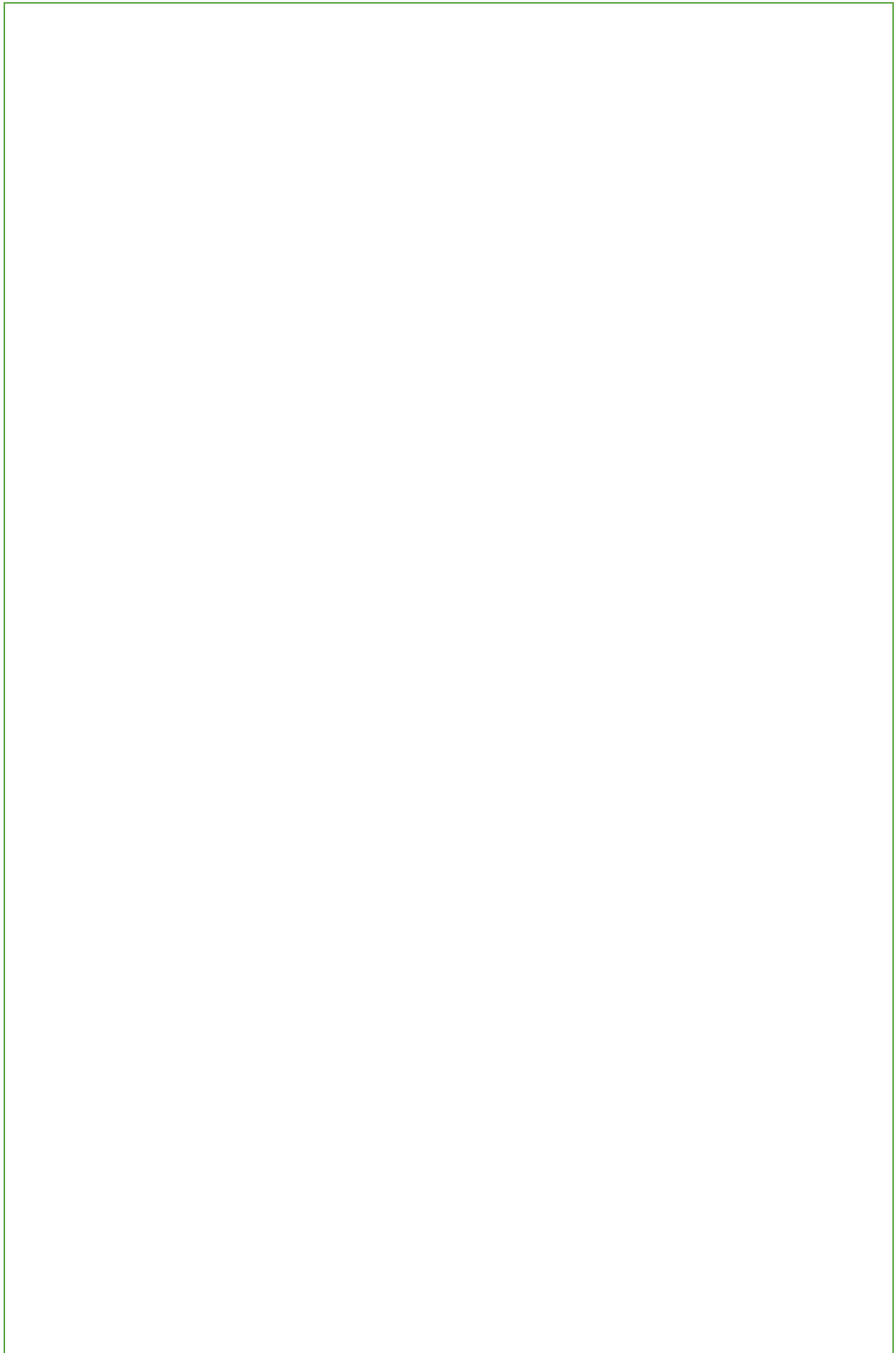
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## INTRODUCTION

In today's cities one of the biggest environmental challenges is the car use and the amount of land parking lots demands. Many developing countries in the world are on their way to a middle-class society which means the opportunity to acquire at least one car per household increases. With all the countries that are heading into higher class begin to drive as much car as developed countries do; carbon dioxide emissions will increase significantly and enhance the greenhouse effect even more than today. Even though there is a wide spread awareness about the greenhouse effect there does not seem to be an attitude change towards the car use and in a lot of today's development there is a big focus on the car. The world does not have the resources to take care of all the carbon dioxide leftovers. As cities continues to grow so does the pressure for a working public transit network and road network. Urban planning needs to focus less on car dependency and more on pedestrian and environmental friendly transit network solutions such as electric- or automatic vehicles.

## PURPOSE

The purpose of the project was to present a 4D model over an area in Gävle that we planned our self's. The mainly focus were on the transportation in the area and the importance to connect the newly-developed residential areas to the rest of the city. Throughout the project it was important to consider that the area should not be planned as a standalone area but as part of "the whole". To build sustainable, cities should be seen as a single living organism where the impact on one end can affect another. The transport in our area should be as sustainable and environmentally friendly as possible to promote a sustainable society for both the present and the future. Hopefully, the municipality can take this project with our ideas and thoughts as an inspiration for future plans when planning sustainable cities.



## HEMLINGBY- A LOCATION WITH POTENTIAL

The project area is approximately 400 000 m<sup>2</sup> and is located in south of Gävle next to a large retail area called Hemlingby Shopping center and a residential area consisting of villas. The area itself consist of forest today. The urban commune of Gävle has a local plan for the area and wants to develop with new residential but also commercials like supermarkets, school and healthcare.

After our retrospect and speculation about the plan, we found that it had many shortcomings in terms of sustainable development. For example, the local plan regulated different types of residential without mixing them. The residence was divided in separated districts around the area. The villas were divided by themselves and the high houses separately. This means that different types of family assemblies / households are not mixed and met. It counteracts socially sustainable development in the area. Our vision from the beginning was, in contrast to the plan, to increase the mixed-use planning. In addition, the planned road network was

not sustainable from an environmental point of view as the area contained loops and lollipops and deadlocks. Those type of network means detours and increased car traffic and greater emissions. However, what we liked with the plan was that the municipality would interfere with activities to create a rich street life.

The municipality plan made a great base for our thoughts and ideas that we wanted to apply in the area. The departure of the plan made it easier for us to take into account the existing water, Hemlingby Shopping center, existing roads, the villa area and the roads that the detailed plan has planned based on investigations. Because our goal that the municipality could take part in our work, we did not want to deviate from the plan too much.



## PROJECT VISION

### THE BUILDINGS IN THE AREA

Mixed land use creates vibrant environments since it creates different types of movement in different times of the day that can intercross. These setting creates spontaneous meetings among people and therefore make a place interesting to be in. In the planned area, there will be a school, daycare, care service mixed with different type of housing and different types of tenure. This will benefit all types of people and families with different needs to move into and within the area. It will also increase the rotation on people and will therefore most importantly create a prosperous residential area.





By placing several different types of activities such as food stores and cafés in the ground floor of the apartment houses, it helps people to shop where they live instead of having to go to a commercial area outside the residential area. Close access to the most important components in people's daily life will create a different kind of well-being and will make them feel comfortable in their residential area. This will also make it safer and more convenient for children and young people to shop and socialize in their home area.



This project area has put a lot of focus on creating many *public open spaces* to attract people who, in turn, contribute to life and movement in the area. This is very important for a prosperous residential area. Therefore, there has also been placed many playgrounds for children to stay on. These playgrounds will attract both children and parents. It will create a different kind of movement of people and bring life to the area which is the key to a healthy residential area.





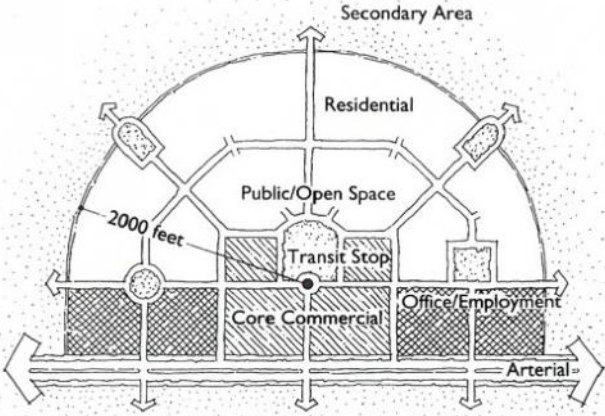


An important aspect from a planner perspective is to take the surrounding buildings and environment into consideration in order to create a cohesive settlement: there should be an interaction between existing buildings and new ones. However, that does not mean that you cannot break off and plan something brand new that stands out. In this project, we chose to plan the residential from a new perspective. The inner area has a varied architecture and the buildings are designed in different heights and configuration. The upper area has been attempted to be planned as an aesthetic link to the villa area adjacent to it. This is done by placing similar villas mixed with apartment buildings. The new building will fit into existing for the contrast to be as small as possible and to be accepted by the public. In addition, the new district can be linked to the existing city through road networks and transport systems. If it is easy to move through the city, the feeling of divisions is avoided. Therefore, the transport network of various self-polluted vehicles has been drawn throughout the project area.



**THE ROAD NETWORK IN THE AREA**

In order to achieve a well-functioning and flexible transport network in an urban area, bus stops need to be accessible to almost everyone living in the residential area. Close and easy access to the bus stops will increase the use of busses and reduce car driving. This concept is called transit oriented development (TOD). TOD is according to The Institute for Transportation and Development Policy an “integrated urban place designed to bring people, activities, buildings, and public space together, with easy walking and cycling connection between them and near-excellent transit service to the rest of the city. It means inclusive access for all to local and citywide opportunities and resources by the most efficient and healthful combination of mobility modes, at the lowest financial and environmental cost, and with the highest resilience to



disruptive events. Inclusive TOD is a necessary foundation for long-term sustainability, equity, shared prosperity, and civil peace in cities.”

In the project vision, the roadways will be added slightly to create a good flow and avoid detours. Several roundabouts have been planned to create a good throughput and avoid long stops and thus reduce emissions. There are walking and cycling routes on both side of the road. They should be easily accessible to encourage and provide many opportunities for cyclists and pedestrians to move forward smoothly. The idea is that it will help more people walk and cycle, and fewer to take the car, but also to give pedestrians and cyclists a safe way to get from point A to B. By using most sustainable self-driving cars that runs on electricity it can reduce carbon dioxide emissions and contribute to a more clean and healthier environment in the new area.



## TRANSPORTATION USING ATN'S AND SAV'S

The most important part in this project was to make sustainable transportation within the planned project area and focus has been on *Automated transport network* (ATN). One might first think that ATN and AV is for the future, but it is in fact very much for the present and it is a key element in producing sustainable cities. It is important to include and use the newest inventions in order to move forward in the development. A better future begins with less fossil fueled cars where people live.

One of the biggest problem in urban development in many cities is the increasing car use and with it the need for more parking lots. Urbanization is happening at the same time which enhance the demand further. This means that the area for new development in the city is being reduced. There is a competition between the space for residential and the space for parking. These two aspects cannot get equal attention in today's society because the need for everyone to have a resident is much more important than parking lots. This means that there have to be new transportation alternatives.

The process of making the society move to a more sustainable future with new transportation methods is not new. In fact, many countries have already begun this development. In the US for example, it is already common that millions of people are car sharing. In San Francisco, the

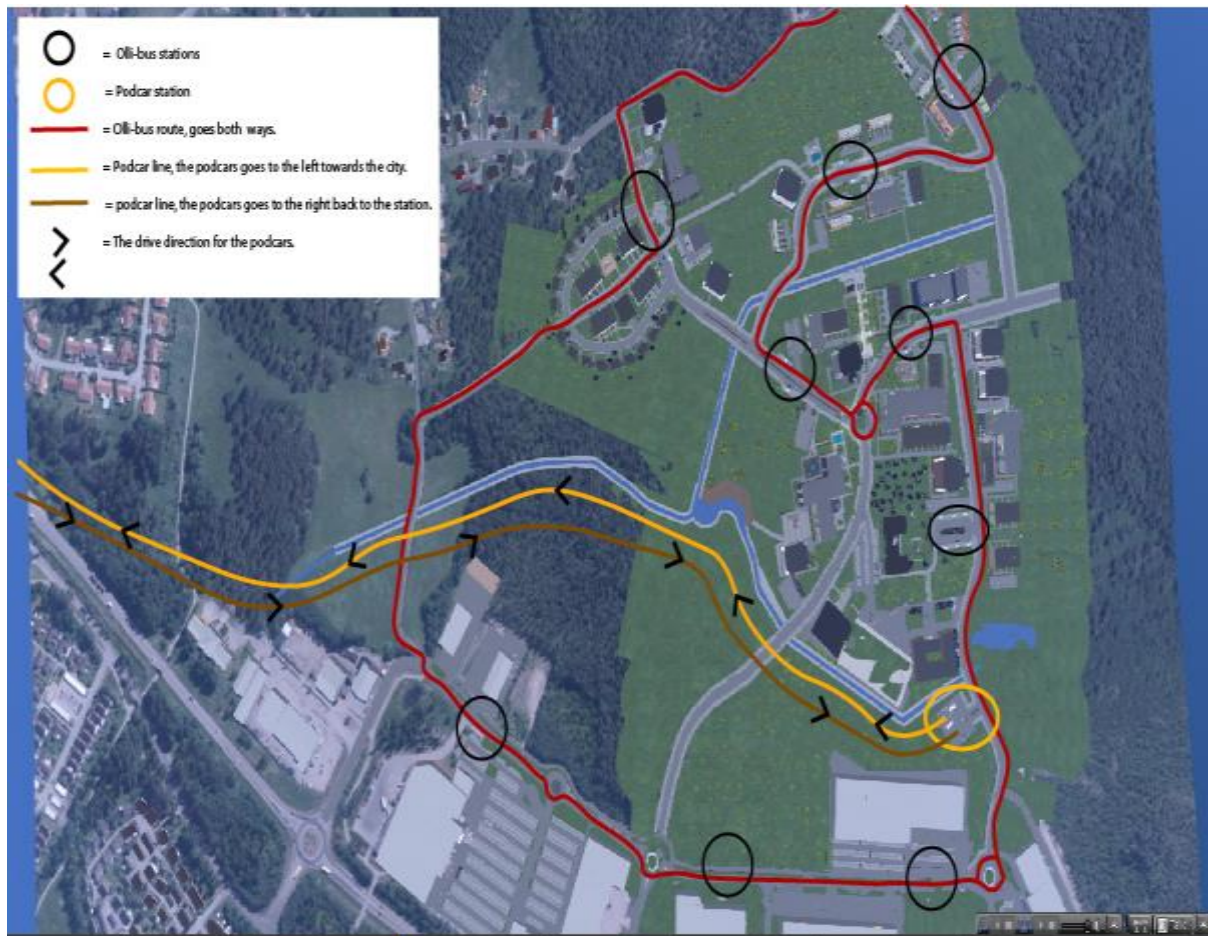
using of ride-hailing app is very popular where people are sharing transport space, so called *shared automatic vehicles* (SAV's) with unknown people. ATN's offers transportation from door to door at the speed of a private car but for the cost of a subway ticket. Not only that, ATN's will minimize the risk for accidents as it analyzes its surroundings and makes decisions thereafter. It will therefore drive at the specified speed and will adapt to the other private cars and AV cars and therefore will not deviate from its set mileage. Humans are not as reliable as a machine. Most traffic accidents are caused by excessive speed, inattention and distraction. An AV cannot be distracted or make mistakes and their will not be a problem with example drinking and driving. Also, the use of AV's will reduce the need for parking which is another positive consequence. This means that at the street parking and the parking garages will not be needed at the same extent and will instead make room for other land uses, such as residential or parks. The pavements can be broadened and provide pedestrians and cyclists a safer transport. Cities can become more attractive for pedestrians and cyclist by invest in a place's esthetics, e.g. planting more trees and making more public parks. Furthermore, the emission will be reduced as there is a switch from gas to electric power.



There is lots of good coming out from this evolution but the disadvantage that we will come from using AVs or ATN's is that many people working in the car and car driver industry such as car producers, taxi drivers and bus drivers will most probably lose their jobs. A large amount of tax revenues will be lost that finance the roads and infrastructure. Because the self-propelled buses and shared cars do not need to be parked, they can therefore not get parking tickets. This means that the maintenance of roads will be minimized, which in turn will cause them to expire. To avoid this, we have to find other job options. There will always be new jobs in line with developments. In addition, we must also consider the tax revenue lost, how, where and what we will pay the tax on. Even though this will be a longer and perhaps more demanding process, it will lead to a more prosperous and better society. Not only for our living generation but also for our next generations. We will build a more stable and secure foundation for our next generations to rely on. This will lead us to keep our world attached a little longer. This evolution can contribute to a healthier and environmentally friendly society. This idea includes not only our project area but it can also be applied to almost any urban environment in the world.

## CHOICE OF AUTOMATIC VEHICLES IN THE PROJECT AREA

The planned Podcar and Olli-bus route are evenly distributed to create easy-access.



### OLLI-BUS

As Jay Rogers (CEO and co-founder of local motors) discuss in one of his Olli release videos on YouTube, is that the buses are small and flexible and they do not take up much space on the roads. The bus can accommodate up to about 12 passengers. Although they take fewer people they can offer a more frequent time schedule, which means that the passengers do not have to wait for long for the next bus to arrive. Furthermore, one of the biggest success in the Olli production is the possibility for the passengers to communicate with Olli as if it were a real chauffeur. This can make them feel more comfortable and they can easily tell Olli where they want to go.

We chose to put the bus stops evenly spread around the area so that residential would have close access to them wherever they are. We had a goal that each station would have a radius of about 400 meters. This measure is common in a TOD, which is a planning ideal or a relationship to how to plan as sustainable as possible. In the radius, housing and other functions are included in the space. In general, A person is willing to walk no more than 400-600 meters to their target before they choose to take the car. If bus stops are too far apart or the time schedule is non-frequent, people will choose the car instead of the bus.



The project area is adjacent to the Hemlingby trading area. This area is large and well-visited. We want the project area to be linked to this area. We do this by letting all Olli buses pass the Hemlingby area so that everyone living in the area can take the bus to shop instead of taking the car the short way. The buses should be smooth and they should go continuously every hour of the day so that people feel comfortable taking the buses whenever they need to. Most importantly people should feel like the Olli-buses is a safe way to move around in and out of the area.

## PODCARS

Right from the beginning we wanted to make sure our project area was well connected with Gävle city because it is very important for a new residential area to have a connection to the existing inner city. The second automatic vehicle we chose to use in the project is the Podcar. This is because we want to have a transport alternative that not only moves around the project area but also can transport people to and from the Gävle city. The Podcar is a perfect alternative to transport people in the nearest and the fastest way, also called air distance. This is because the Podcar is driving on a railroad path that is located on pillars in the air. This means that the "railroad" can go over residential areas, roads etc. You will be traveling in a fast and straight line from point A to point B. Therefore, you will also be able to reach the city much faster and smoother than if you were to take the car which needs to take into account all traffic and all the winding roads.



The Podcars is quite similar to the Olli-buses with the size and form. By looking at pictures of the Podcar it looks like it can take up to five people. The Podcars cannot accommodate as many people as a regular bus. But because our vision is that both the Olli-buses and Podcars should go on a regular basis, people will not have to wait long for the next bus. This means that no queues will be created for the cars. Because there is no traffic that the Podcars need to adapt to, you can always rely on the cars to go and arrive on time. Because the Podcars will run up in the air, they will not be a disturbance for those living and staying below the rails. The Podcars are powered by electricity and therefore do not give unwanted sounds or greenhouse gasses.

That is also because we do not want the new area to be segregated from the rest of the city. By interconnecting two areas, people have the opportunity to take further transports in and out of the Gävle when they have arrived at Gävle Central. And if there is a large spread of ATN's and AV's within Gävle, maybe you can take an Olli-bus to your next destination when you arrive at Gävle Central. This will make the whole transportation environmentally friendly.

## CONCLUSION

Today there is a high demand for housing in the inner city. Introducing new smart ways that make it easier to get in and out of the city center can attract people elsewhere. Automatic vehicles can provide a long-term sustainable transit and make a good foundation for future cities. As less space is needed for cars, the left-over spaces can be used to other uses of public interest. In Hemlingby we were able to create a place for people with open places and lots of movement throughout the day. It is a new community where everything has easy access. It is a place for different types of households where you can live at any age in life.