

MOBILITY

The city of Trondheim has, as all other cities, the intention to reduce CO2 emissions caused by motorised traffic. 98% of all travels in Trondheim are done with the use of car. In the state-funded 'Miljøpakken' the city states as the main goal: "CO2 emissions from transport will be reduced by at least 20% in Trondheim in 2018 compared to 2008 levels." It also sets the goal of reducing the use of private car to 50% within 2018. To achieve this the city administration aims that future development of Trondheim, more specifically 40% of all work-intensive businesses are to be located along the 'Public Transportation Box' (kollektivbuen).

Sluppen is the southern endpoint of this corridor. It is also the geographical centre point of Trondheim and the most accessible area by the means of private transport. This fact has become both a fortune and a curse for Sluppen. The accessibility topic is very attractive for office-based businesses trying to attract employees. This has created very good conditions for a growing business park. However while the number of employees in Sluppen has increased, the public transportation service has remained poor, and the district has become an almost entirely car-dependant enclave.

Sluppen is currently home to many workplaces, and this number will only increase in the near future as real estate developers such as

Kjeldsberg are planning new office buildings in the area. The district is however greatly car-dependent, which causes a conflict of interest between the political right and left wing parties in the city council. Workplaces in Sluppen are mainly focused in the "new economy", meaning computer and mechanical engineering. These types of businesses are in lack of qualified personnel. Their best incentive to attract staff is offering free parking.

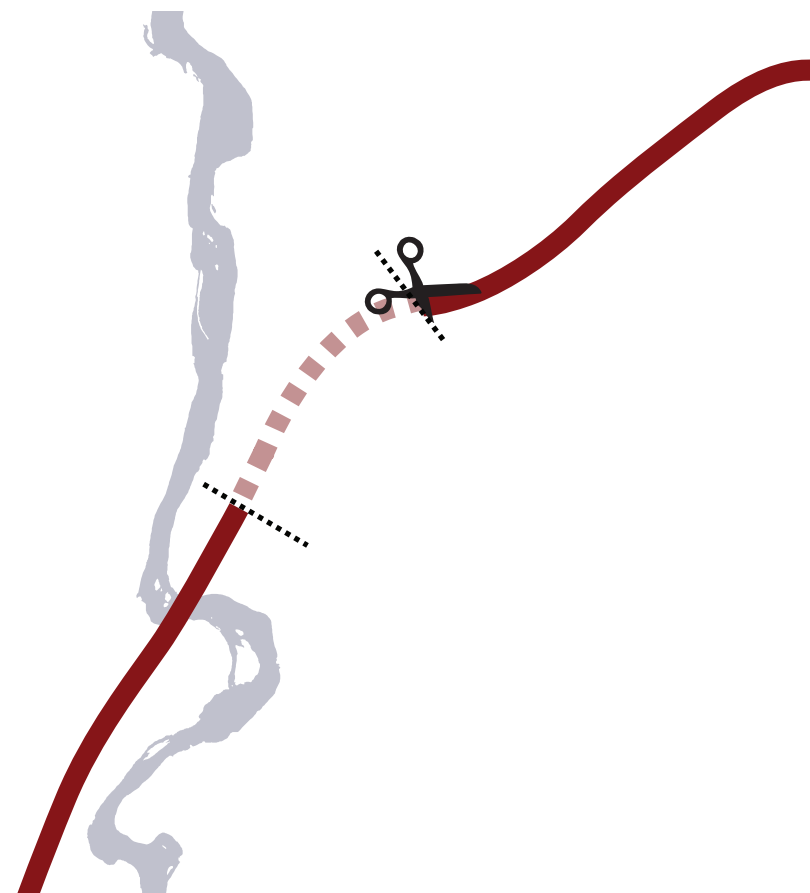
The design of a new masterplan for Sluppen will address this situation and aim to create a more sustainable community where the public transportation, bikes and pedestrians are given higher priority. An important premise for our project is our proposal for undertaking the E6. This is in our opinion a prerequisite for a successful development in Sluppen. Today the highway is separating the district from both the river and the urban tissue stretching from the city centre, and is supporting the car-dependency of the area by working as a barrier for pedestrian movement. The substantial noise and air pollution generated makes outdoor movement further unattractive. When the highway is put underground things can start happening on the surface. What this can look like, and what the qualities of this can be we will discuss further in this thesis.



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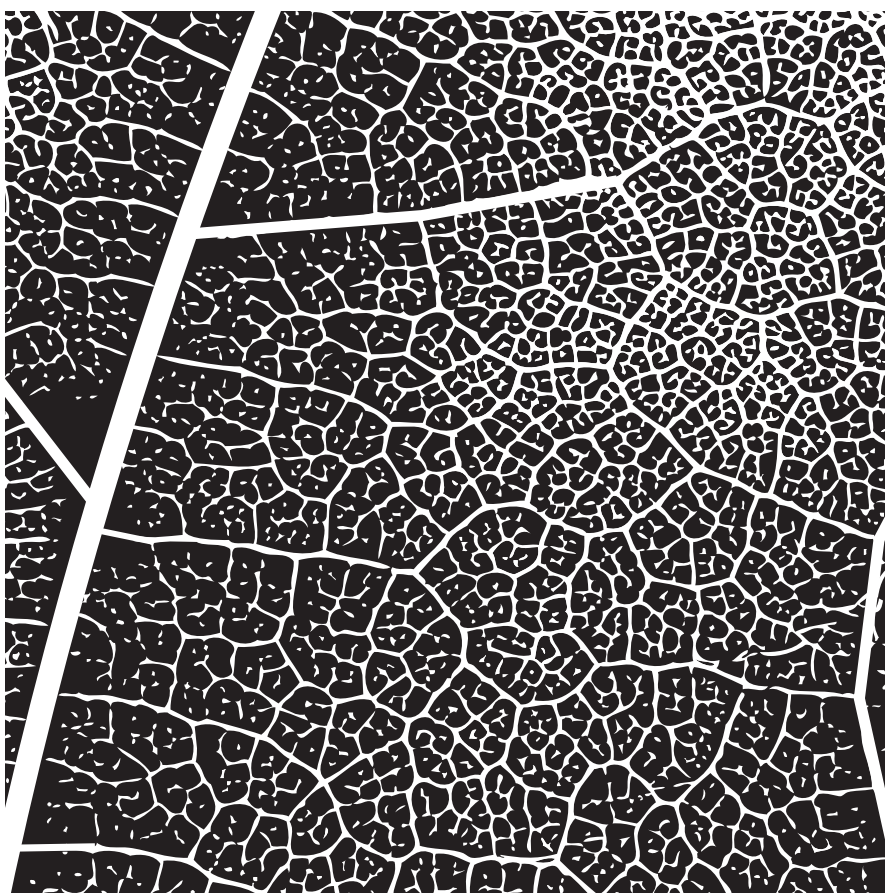
PRIORITIES:

The different groups of transportation are in constant conflict with each other. It is time that the private car loses its hegemony on the road, as it is obstructing the flow of more environmentally friendly means of transportation.



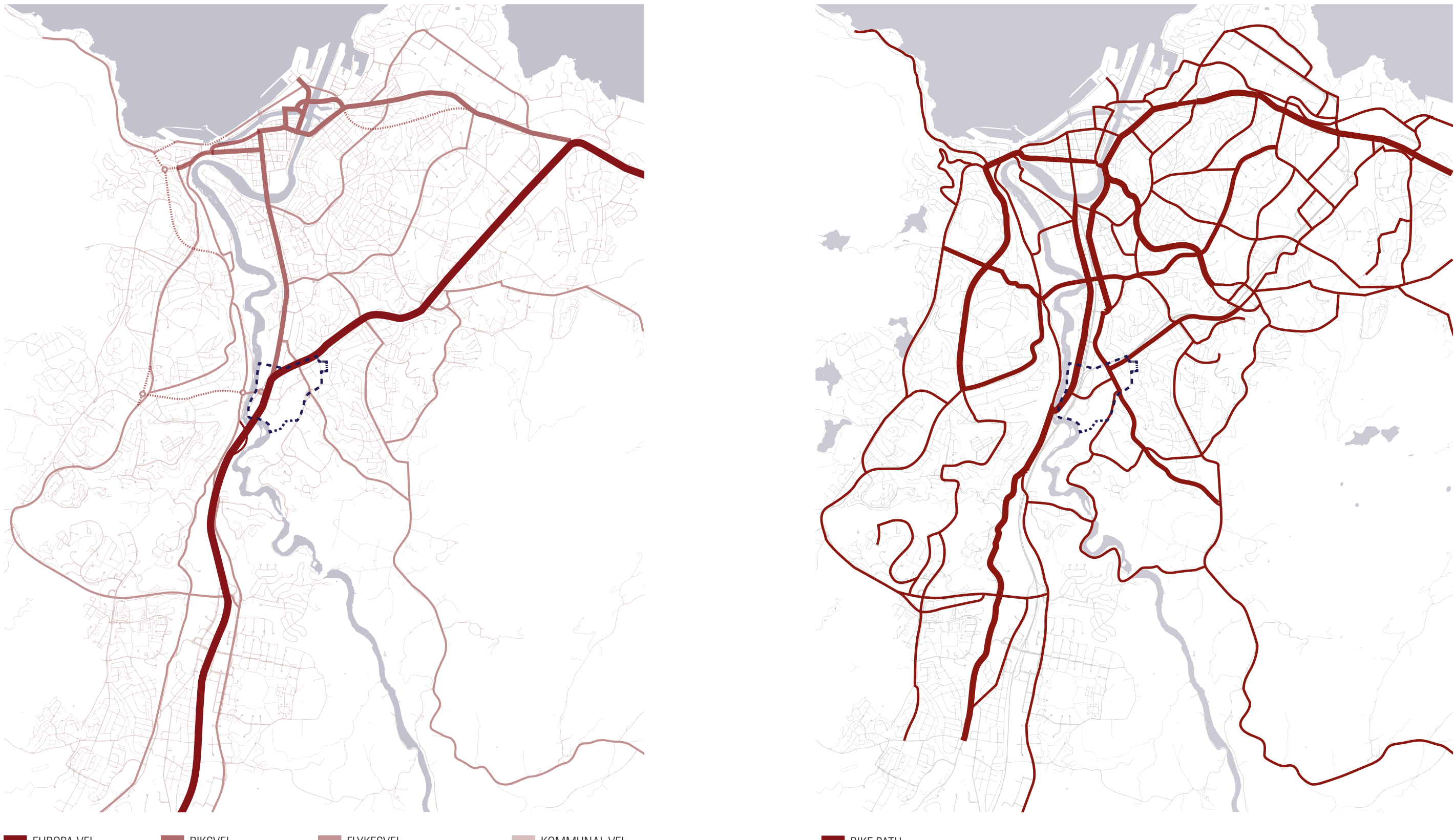
UNDERTUNNELING OF THE E6

We cut away a large part of the barrier that the highway represent. Now things can really start happening in Sluppen!



LIKE A LEAF

The street network have through modernistic traffic planning been designed as a tree, where "everybody" should drive their own car and have their own "cul-de-sac" at the tip of the outmost branch. If one wishes to maximise mobility without the use of car, the city structure should look more like a leaf. Many connections makes it easier to walk and bike around the city, while the public transportation follows the main arteries.



EXISTING ROAD NETWORK_CITY SCALE

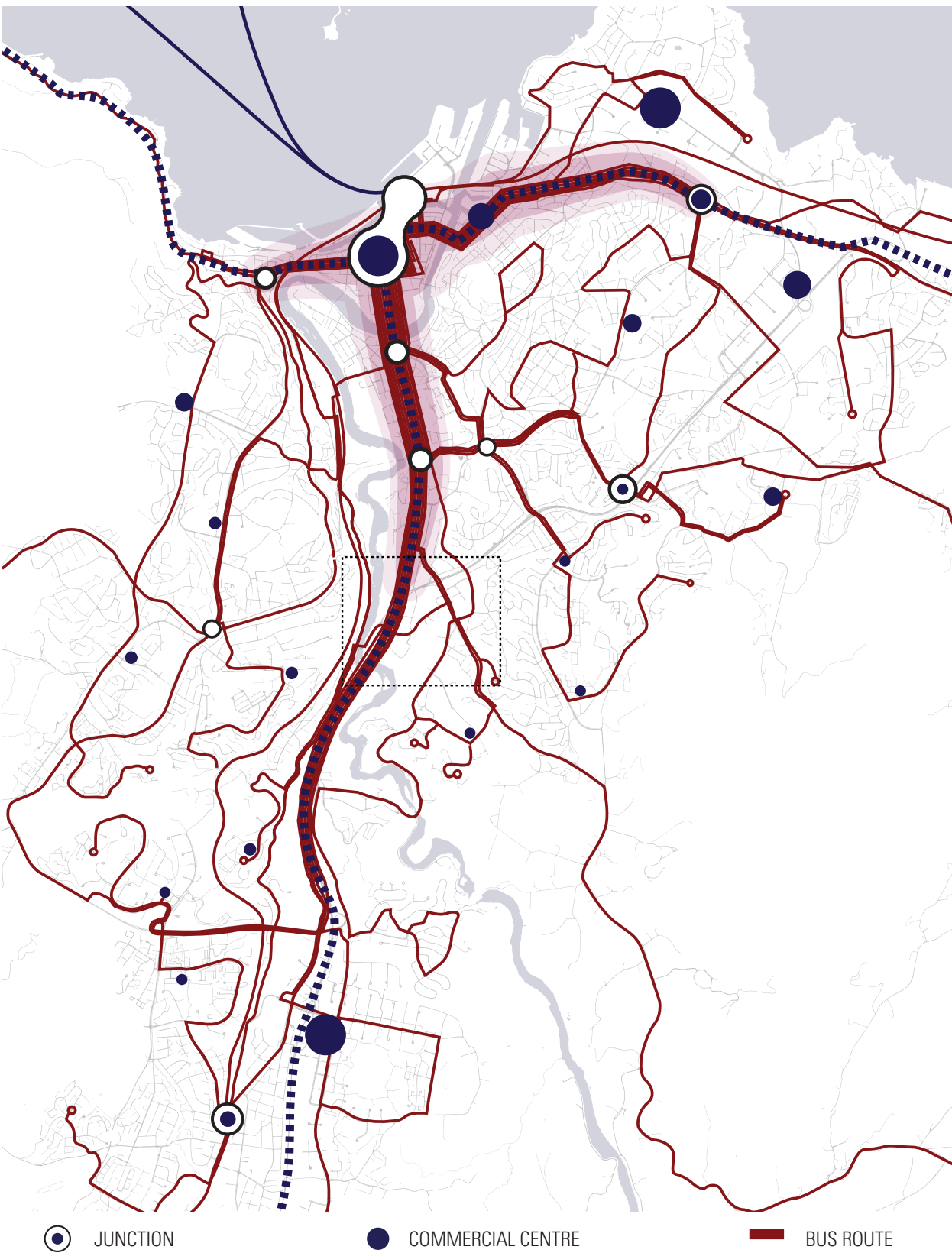
Sluppen is located along the E6, which is the main north-south route in Norway. The site lies onto of the junction where the road splits into two where one continues through the centre of Trondheim with reduced speed, while the other becomes a bypass-road that cuts through the city on the east side. A northern bypass-road have recently been constructed, while a western route is under construction, also this taking off from the mainroad at Sluppen.

The site is calculated to be the most accessible point in all of Trondheim by the use of private car. This is today a challenge, since most of the people working in Sluppen drives their car to work, and have parking spaces provided by their workplace. The reduction of car-dependency in Sluppen must be a careful process of improving the public transport while, treating the access to free/inexpensive parking.

EXISTING BIKE NETWORK_CITY SCALE

In a map, the bike network in Trondheim appears to be connecting the entire city in a network, but this network is only partially continuous as it does not provide the bikers a separate path for most of the routes. Mostly the network share the road with pedestrians, and sometimes also with cars. This is causing conflict between the different groups, as well as limiting the effectiveness of the bike as a mean of transportation.

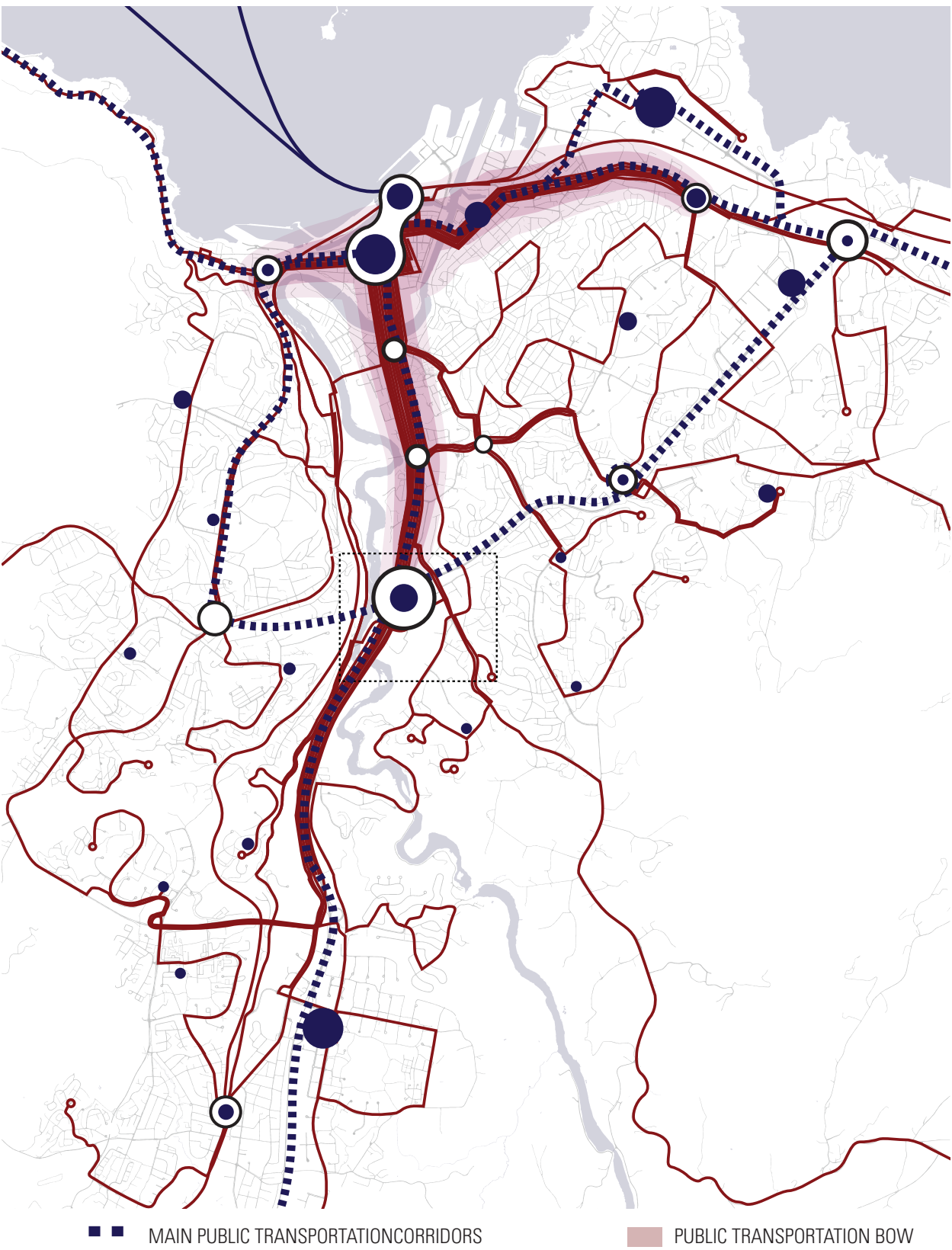
'Miljøpakken' have a goal to upgrade the bike-network for the amount of 800 mill. NOK, which should improve the conditions, however Trondheim has a long way to go to have a holistic and coherent bike network.



EXISTING PUBLIC TRANSPORT_CITY SCALE

The public transport system in Trondheim is very centre-oriented, meaning all bus routes lead to the centre. The network is in a way shaped like an octopus, where the centre is the head, and the buslines are linear arms stretching out to the suburbs. This is a result of a car-oriented development in the 60-70s, and today the public transport system is struggling to serve all the districts of the city in an effective way. Crossing the city from

for example east to west or east to south is very time consuming compared to using the private car. A paradox is that the location of the two large shopping areas is very poorly served. Sluppen however is very accessible from the north and the south, however coming from the east or west side one might need to change bus in the centre.



NEW PUBLIC TRANSPORT_CITY SCALE

To increase the efficiency of the public transport system we propose that one introduces ring-regular bus routes to complete the bus network. A circular bus route combined with strengthening of the junctions this generates would simplify the east-west, east-south, west-south journeys, thus increasing the competitiveness of the public transport against the private car.

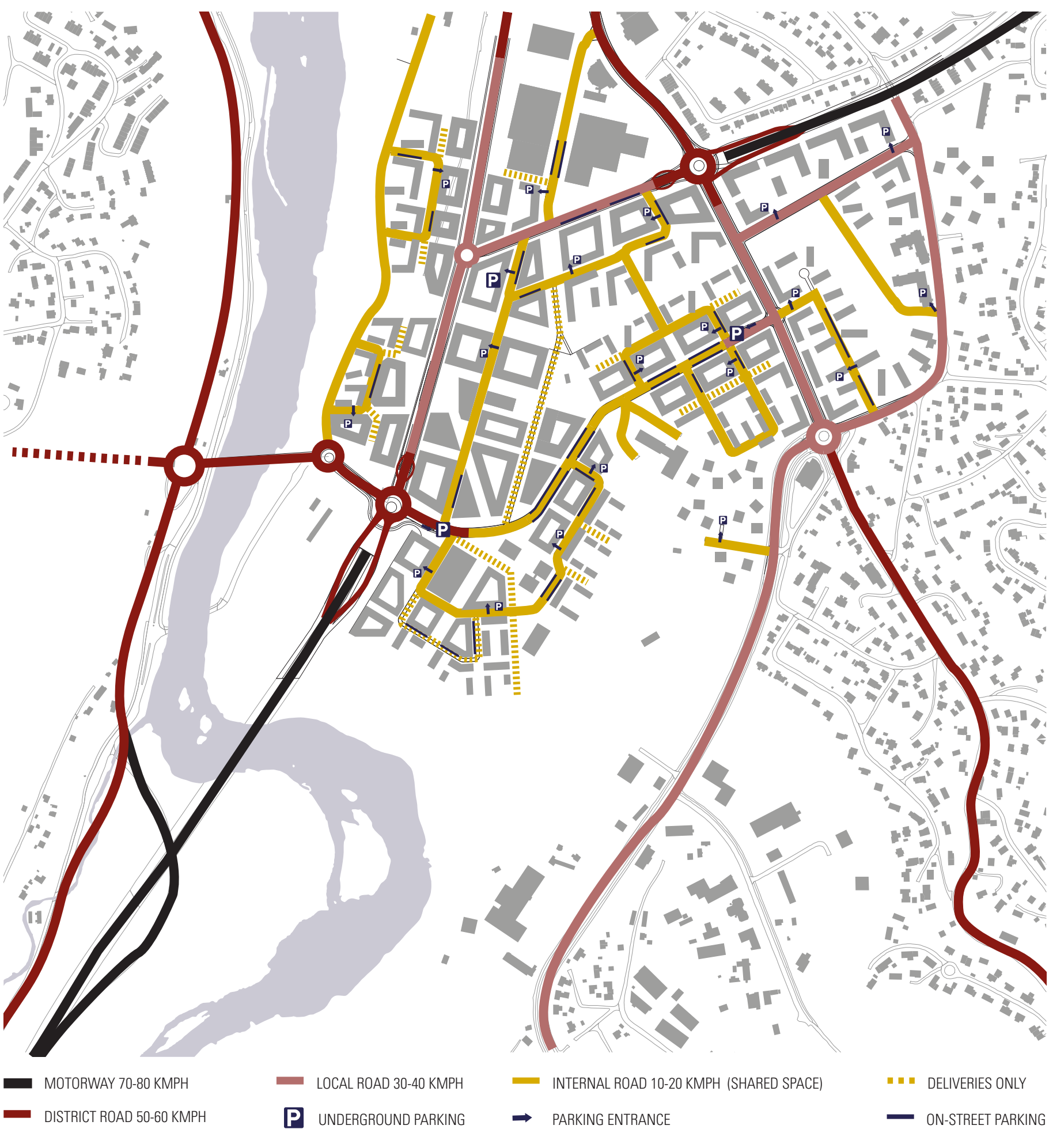
"Kollektivbuen" are already maximizing its capacity to run buses during rush hour, and will require different measures than increased departure frequency. Super-bus and light-rail studies have been conducted, and the possibility is there to invest in an efficient and attractive light-rail system. This will greatly boost the capacity in the area the city is aiming to densify, without carbon emission, and with the predictability that the businesses demand and need.



EXISTING ROAD NETWORK_

The traffic volume around the Sluppen area is one of the busiest, if not the busiest, in Trondheim. ADT-measureings show that 59 000 cars pass by on the E6 every day, on average. 48 000 of these use the E6 bypass road running along the north edge of the site. This traffic is relatively high speed, running in 70-80 kmph. Bratsbergveien (Fv 885) passes through the site from south to north. It carries also a high amount of traffic with 25 000 cars per day, while Sluppenveien, which is the only access road to the site, has a quite small traffic volume with only 5 000 cars per day. Sluppen is a low-traffacted island surrounded by important access routes. This makes the area on one hand a very accessible and well-connected district, but on the other hand, a remote and detached piece of land. The challenge when aiming to inhabit the site with a broader spectrum of urban functions will be to minimize the negative effects of the highway, such as traffic noise and pollution and reduced walkability. If the E6 should remain as it is today, it contexts an urban development in Sluppen both as barrier between Sluppen and the rest of the city, and as an unattractive and noise-generating element.

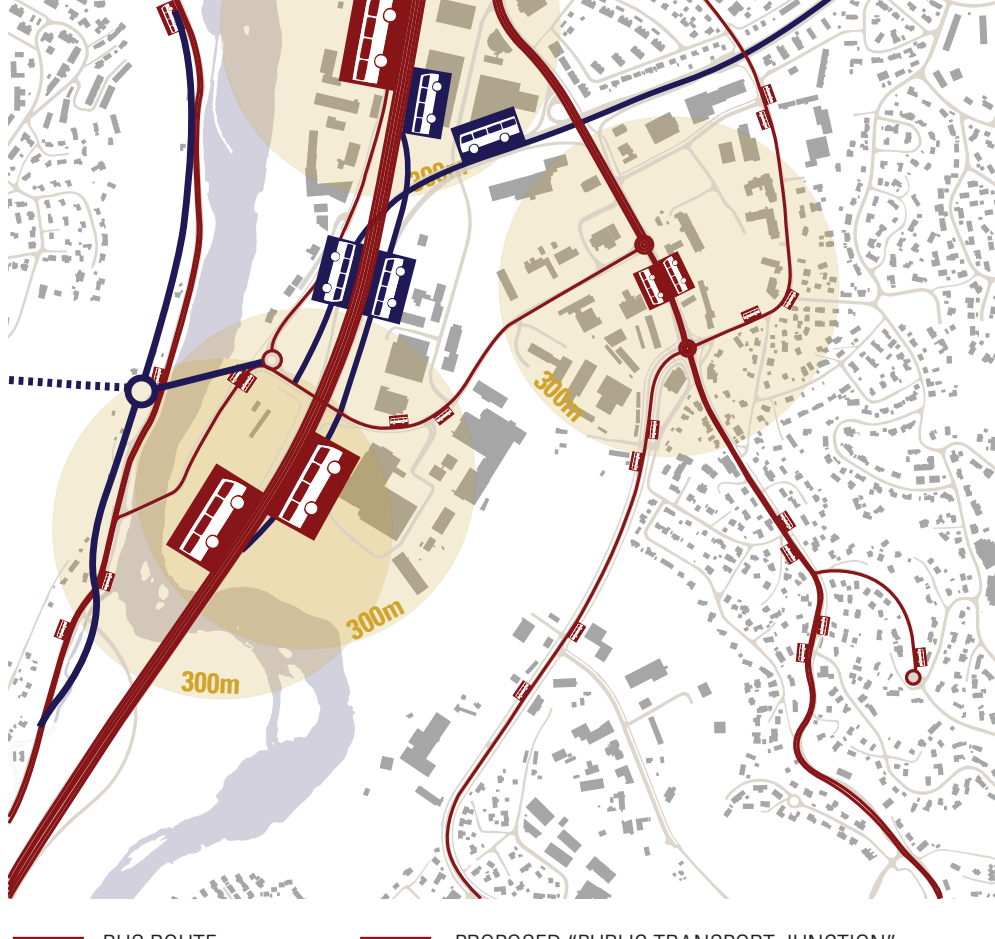
Our proposal to undertunnel the E6, would eliminate both the noise and the barrier between Sluppen and the city, and provide a much better environment for developing Sluppen as an urban quarter, as well as an attractive and efficient public transport junction.



EXISTING ROAD NETWORK_

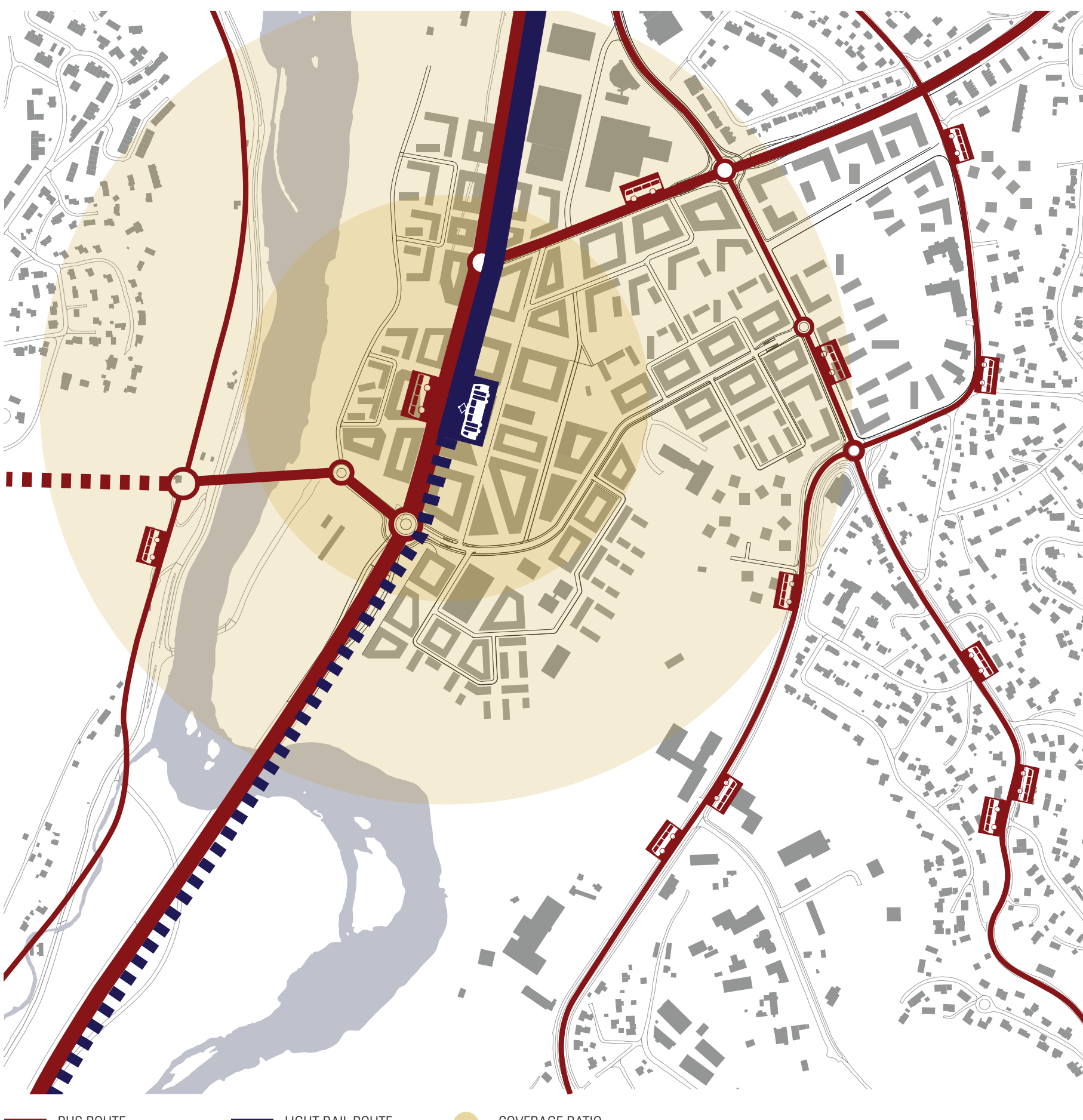
With the E6 underground, conditions are more suitable for designing city structures for people. Since the majority of traffic (48 000 ADT) continues onto the bypass-road, we say that the tunnel should channel this traffic. The traffic going towards the city centre (20 000 ADT) needs to get off after the Krokpan bridge before entering an urban boulevard. This transition sets a clear beginning of the 'city' of Trondheim. "This is where the city begins". The street network in Sluppen is made up of a clear hierarchy of road categories. The main traffic arteries passing through the site Holtemanns gt., Bratsbergveien designed for higher volumes and speeds, while conditions change as you enter the internal road network. These streets are designed as shared space, meaning the cars, bikes and pedestrians have to share the same street surface. The principle of shared space is that the concern for yourselves and others help you adapt your speed, and respect others, regardless of their mean of transportation. You no longer need complicated signposting or light control. Neither cars or pedestrians need to wait for the green light. The traffic flows in a slow moving interaction. The status of shared space must, however, be introduced in a later stage of the development, as it requires a certain balance in the amount of cars and pedestrians for it to work.

Parking is solved by having large underground parking on the outskirts of the site open for the public, while residents and businesses might access underground parking in certain building blocks throughout the cityscape. Some on-street parking should also be available. Both "private" and public parking should be subject to high fees/extra cost. The idea is, however, that Sluppen will be so well connected in terms of public transportation that one will not necessarily need to own a private car to work or live here.



EXISTING PUBLIC TRANSPORT_

The public transport service in Sluppen is not the worst. The bus stops on the highway have a very high frequency, and will take you very efficiently to any district south of Sluppen or towards the city centre. The problem is, however that the use of the bus stops requires quite long walking distances from most of the workplaces, due to the complex road system of the highway. The county-owned public transportation company AEB are addressing the problems in Sluppen by planning to establish a public transportation junction. These plans are however quite low-budget and are limited to establishing some new bus stops with access ramps on the highway 300 m north of their present location. The solution will give quite long walking distances between different stops. As urban planners we state that a public transportation junction is more than four busstops linked with a pedestrian bridge. We believe that for a public transportation junction to become an efficient and attractive location it needs to have space for the urban function that tend to cluster at such nodes.



NEW PUBLIC TRANSPORT_

The development of a whole new sustainable urban community needs to be supported by an efficient and accessible public transport. An urban development means: fragmenting the existing industrial parceling, densifying the land, designing for a variety of programme, shops in the windows, happenings in the squares, children in the park. When Sluppen no longer is an unorganised and enclaved district, and the public transportation junction give the residents ultimate accessibility to the entire city, conditions are perfect for developing a community for walking. The street network in Sluppen gives the pedestrians first priority and makes sure that the shortest route between two locations are safe, comfortable and with variations in rhythm and pace. Most of the car streets are "shared space", however an extensive path network makes it also possible to vary the choice of route. The pedestrian corridors have different character for different situations. The junction square will be an incredibly important location in Sluppen, being the point of arrival and departure for most of the workers and residents. Accessibility in pedestrian-scale is therefore important, so in Sluppen, "all roads lead to the junction square".



EXISTING BIKE-PATH NETWORK_

The area of Sluppen is busy in terms of bike traffic as well as cars. A bike count shows that 1500 daily passing bikes on the Sluppen bridge in the summer season. The main bike traffic move along Tempveien and Bratsbergveien towards the city centre and workplaces along the main axis Holtemannsveien/Eggesetgata. The bike network does however lack a separate pathway, and are in constant conflict with pedestrians on mixed pedestrian-and cycle pathways. The bike network is made up of certain "routes", for instance "The Moholt route" leading eventually to the district of Moholt. The different routes are signposted, however their pathway are of very varying quality, regularly drifting from sharing the road with cars, on a narrow sidewalk to mixed pedestrian-and cycle pathways.

A coherent and continuous bike network with a separate pathway would surely enhance the status of the bike as a mean of transportation.



NEW BIKE NETWORK_

In Sluppen the bike goes where the car goes - in a separate pathway. Along all major streets and boulevards the bike lane runs between the sidewalk and the car road. In the internal roads the bikes are free to travel, however this is on the condition of the pedestrians. The paths along the river and in the forest of Smidalen are excellent bike trails for an exhilarating workout.



BARRIERS

Surrounded by traffic infrastructure and nature, Sluppen has become an industrial enclave within the city structure. The highway E6 in the north and west define the area very clearly and restricts the connection to the river and the neighbouring areas. This physical barrier isolates Sluppen from the city structure extending from Midthvæn all the way to Sørgrønt. On the south Sluppen is bordered by the Smidalen forest, which due to its bad conditions works more like a barrier than a recreational and meeting area. There are no clear paths into the forest from neither the north nor the south side, and the industry and office buildings along it discourage pedestrians to use it. This highway also prevents the direct contact to the river and the pedestrian path running along. The only passage is a path along the traffacted highway E6 which leads down to the river. The overall situation is similar within the district. Due to the high number of warehouses, workshops and other industrial facilities in the area today, the area hard orientate and to move around. Roads and parking areas can also be taken as barriers. Considering the amount and size of the vehicles driving along Sluppenveien and the state of the few sidewalks, walking and cycling is an unpleasant sometimes dangerous experience. Most people even prefer to use private car when moving within the area. This situation has also consequences in the probability of people using public transport, since the access to bus stops is interrupted by diverse elements along the way.



PEDESTRIAN NETWORK_

Today the car reigns in Sluppen, but the pedestrians shall conquer the land. An urban development means: fragmenting the existing industrial parceling, densifying the land, designing for a variety of programme, shops in the windows, happenings in the squares, children in the park. When Sluppen no longer is an unorganised and enclaved district, and the public transportation junction give the residents ultimate accessibility to the entire city, conditions are perfect for developing a community for walking. The street network in Sluppen gives the pedestrians first priority and makes sure that the shortest route between two locations are safe, comfortable and with variations in rhythm and pace. Most of the car streets are "shared space", however an extensive path network makes it also possible to vary the choice of route. The pedestrian corridors have different character for different situations. The junction square will be an incredibly important location in Sluppen, being the point of arrival and departure for most of the workers and residents. Accessibility in pedestrian-scale is therefore important, so in Sluppen, "all roads lead to the junction square".