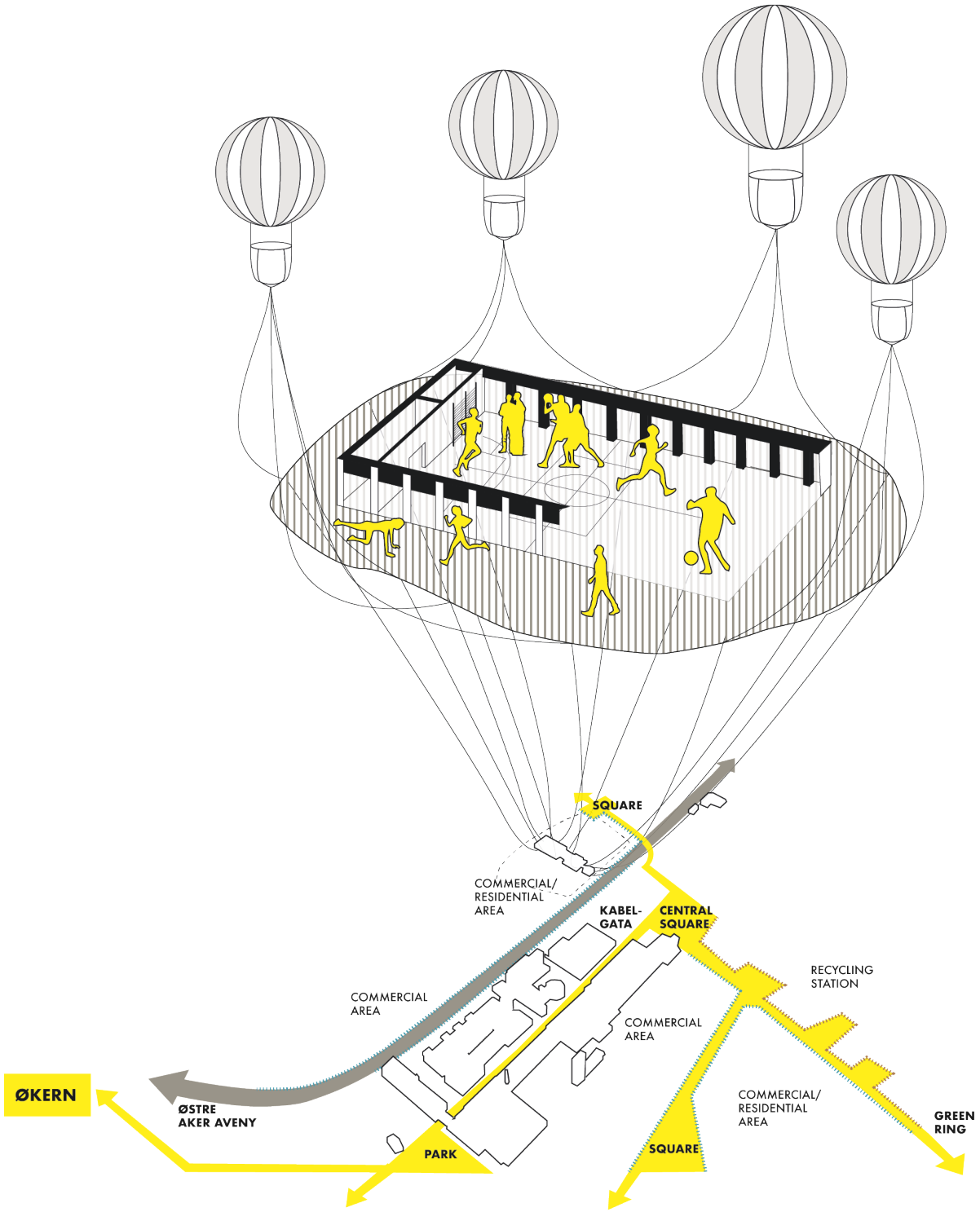
FROM INDUSTRIAL AREA TO VIABLE URBAN DISTRICT

A feasibility study of a plot at Oslo's outskirts with emphasis on vitalisation and retrofitting



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Astrid Solli

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ABSTRACT

How can one vitalise a homogeneous industrial area that exclusively promotes cars - where heavy and through traffic creates segregation, and moreover noise and air pollution?

Creating viable environments primarily concerns how to adapt the environment to the human scale and human interest. Partly, addressing potential catalysts for vitalisation - something which represents the interest and essential needs associated with the residents. Good accessibility and transparency are furthermore essential factors to generate life and minimise the segregation, especially when it comes to the case of this thesis.

As a sub-area within one of Europe's largest comprehensive redevelopment project, Hovinbyen, the industrial area at Haraldrud shall be transformed into a vital urban district. Concerning the future redevelopment of Haraldrud, this project report emphasise the space between the buildings and the genius loci of the area. The purpose of this study is to address site-specific attributes concerning how Haraldrud can be adapted to the human scale and soft mobility, and how the genius loci of the area can be safeguarded through retrofitting.

However, in this case, there are more interests involved - some of which possibly less worried about creating a liveable outdoor environment. Minimising the urban expansion at the conserved forest areas surrounding Oslo is the main motivation for this brownfield to be designated as a future potential residential and business district. Oslo's population increases drastically, which is why the authorities advocate increased vertical development, as opposed to urban expansion. This pretext implies that areas, which due to high levels of noise and air pollution are considered not liveable yet, shall be transformed into viable urban districts. Compact development moreover implies, in this context, that proximately central areas must provide smaller and denser dwellings in order to prevent increased housing prices and social segregation. To this extent, small interventions may improve the accessibility significantly if one starts by connecting critical missing links.

This project report consists of a case study, including a site-specific analysis and a feasibility study, and, moreover, a discussion regarding the challenges and conflicts of objectives associated with the vitalisation of the industrial area, Haraldrud.

PREFACE

In every project I have worked with, the intention has always been that the chapter of the project report should be uncovered in chronological order. However, this never happens. The parts of this report have therefore occasionally been studied in parallel, as new knowledge has been brought into the fold. And so I have rewritten the content of the report several times. This work process can be associated with the hermeneutic approach, where, as a researcher, you develop your perspective through the whole work process. Thus, the task is developed continuously - from start to the deadline. Time thus plays an essential role in the broad understanding of the subject. So for my part, my horizon regarding this topic ends here as a researcher.

The limitation has also been a challenge when it comes to this topic, and I quote one of my former supervisors: "*Had you only had more time, this report would have been shorter.*"

Nevertheless, I hope that this project report interestingly portrays compact urban development, as the purpose is to address dilemmas that are crucial when it comes to sustainably managing urban expansion.

Acknowledgements

I would like to thank some of the kind people who have offered me great help in the work process. These are:

Jorleif Jørgenvåg (Statsbygg), who has given me valuable guidance and advice in conjunction with the design process, thus contributing to raising the level of competence of the study.

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Moreover, my supervisor Lars Bodum (Aalborg University), for your professional advice, helpful guidance and constructive encouragement.

READING GUIDE

This report, hereafter called the project report, is the product of a master thesis, prepared according to the framework of the study program Land Management at Aalborg University (AAU), 4th semester. The 4th semester is not subject to one particular topic and the student is therefore responsible to identify the topic and problem statement the thesis will concentrate on. The subject of this project report is: vitalisation and densification of a former industrial area, focusing on the projecting redevelopment of a particular district in Oslo, Haraldrud.

The theme and scope of this thesis were designed in collaboration with the Strategy and Development Department within the Norwegian public sector administration company, Statsbygg. Statsbygg's Strategy and Development Department is responsible for executing governmental interests in large property development projects. The focus area of the projects report is to investigate potential development on Statsbygg's property at Haraldrud, which has great developing potential, in light of new established planning guidelines in conjunction with the revision of a new Municipal Master Plan.

The report consists of two parts: a pre-analysis and a feasibility study. The ambition behind the project structure is to combine discussion and problem-based research focused on a general topic (compact city development and vitalisation) with a site-specific design process.

The report uses the Harvard reference-method, executed as follows: (Last name, publication year, page numbers if it is relevant). As many Norwegian organisations and documents are referred to in the report with English titles, an overview of names used in this regard, is attached to the literature list at the end of the report. Sources of law referred to in the project report are also enclosed in the Appendix.

All illustrations in this project report are self-produced. Illustrations marked with source imply that the source has inspired it, and not directly copied. Photos including a reference, however, are retrieved from external sources. All sources are listed in the list of external illustrations at the end of the project report.

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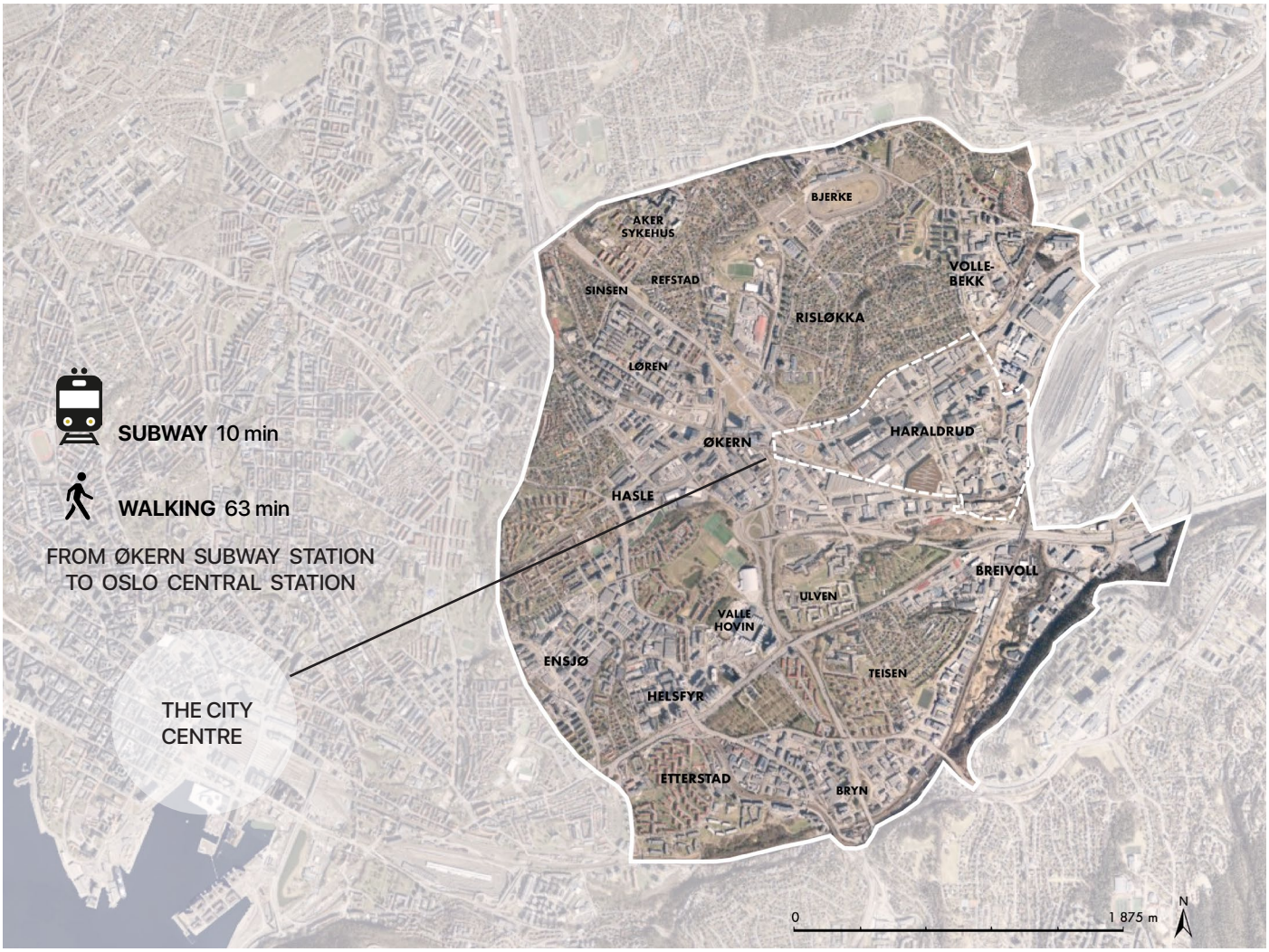


ILLUSTRATION 1: Map of Hovinbyen and its sub-areas

INTRODUCTION

CHAPTER 1

On the eastern outskirts of the city centre of Oslo, and the so-called inner city, one of Europe's most significant redevelopment projects is gradually taking shape. 'Hovinbyen' is the name of this area, which is subject to this ongoing densification and renewal project. The area is about as large as the inner city, covering approximately 11000 da. The Hovinbyen project represents, in this case, an ongoing strategic project which includes several sub-areas, as shown in illustration 1. One of these areas is Haraldrud, an area mainly known for its recycling station. However, now, efforts have been made to transform it into a liveable dense urban district. (Oslo kommune, 2016a p. 12)

The potential for transformation varies between the different sub-areas within Hovinbyen. The contemporary urban morphology depicts several significant physical contrasts: Industrialised areas and dense residential areas are intersected, often cut off by high-frequency highways, subways or big installations such as sports halls and transformer stations, providing a relatively low functional mix within Hovinbyen. Industrial facilities have created massive volumes of buildings, large parking spaces, to that end a considerable lack of pedestrian paths and vegetation in some of the sub-areas, as in Haraldrud.

Furthermore, the Strategic Plan for the Redevelopment of Hovinbyen encourages to maintain the local identity of each sub-area within Hovinbyen, meanwhile establishing a new functional mix. Haraldrud is moreover referred to as an industrial area, with some exciting features related to its former factories. The area has otherwise been characterised as inappropriate for a residential establishment in a short-term perspective. However, given the proximity to public transport, and the relatively short distance to the inner city, the area has arguably the potential to become a liveable urban district with a considerable transformation.

Behind the presumption that Hovinbyen has the potential to become a viable urban district, lies the compact urban development strategy in terms of a transit-oriented expansion principle (bane-basert fortettingsprinsipp). This principle has been advocated by the Municipal Master Plan (Oslo kommune, 2015a) since 2000 to minimise the urban expansion at the conserved forest surrounding the capital. Furthermore, in the expansion of Oslo, current demand indicators show a significant need for new housing and areas for commercial use, implying a forced higher land utilisation and smaller dwellings. In 2015, according to the adopted Municipal Master Plan, approximately 100 000 new dwellings, 6 million m^2 for commercial purposes and 2.5 million m^2 for social infrastructure were required by 2030 (Oslo kommune, 2016a, p. 14). Norwegian political discourses have in this conjunction addressed the transit-oriented expansion principle as a tactical and sustainable development tool, to accommodate the ongoing urbanisation and increased centralisation.

There are several explanations why compact urban development has become a guiding principle in national discourses during the last decades, whereas new scientific knowledge regarding sustainable development are one of the main reasons. This scientific knowledge refers respectively to the Brundtland Commission report from 1987 and the national research programme regarding sustainable urban development' from 1992, entitled 'Natur- og miljøvennlig tettstedsutvikling', and hereafter the NAMIT-project (Næss et al., 2018, pp. 37-44; Røe, 2018, p. 51).

The same concept of the transit-oriented expansion principle in Oslo, has its roots in the NAMIT-project. Through its recommendations, the NAMIT-project advocated densification, suggesting it to be the best solution to provide sustainable development, concerning environmental sustainability (reduction of CO2-emissions), economic sustainability (affordable and profitable expansion), and social sustainability (welfare). Over the last few years, more conditions have been associated with the three sustainability pillars; public participation, public health, universal design, and mutual opportunities for recreation, a.i. Also, aspects such as affordable housing and infrastructure and social inequalities have been put on the agenda for the last five to ten years, as part of determining what social sustainability implies in modern times and in Norway (Næss et al., 2018; Badland et al., 2014).

Several urban vitalisation projects have also aroused concerns regarding the social implications of compact urban development, due to social segregation tendencies. Due to these concerns, social and architectural diversity and local identity have been address in modern discourses as important attributes of social sustainability. Some scholars argue that these are essential means for counteracting commercial urban design, which arguably leads to social segregation (Hansen, Hofstad and Saglie, 2018).

Compact urban development has furthermore become subject to another essential purpose. According to modern planning theory, influenced by William Whyte, Jan Gehl, and Richard Florida a.i., denser areas arguably provide a more vibrant urban life (Sirowy, 2018, p. 197-198). As modern planning strategies describe the relationship between the compact city and the vital city as potentially symbiotic (provided certain conditions are met), life is given to new interpretations of the compact city that mainly focus on 'liveable' attributes. This facet under modern planning theory, which emphasis emotional experiences, diversity, and quality of life, is occasionally called liveable urbanism. Supporters of this vision imply that the social pillar of sustainable development should be further investigated, with the aim to determine urban form and features that make places more vital. (Aspen and Pløger, 2015)

Meanwhile, since the early twenty-first century, one interpretation of the compact city, in particular, has had a significant influence on Western urban development. Based on the popular book from 2005, Richard Florida proposed that the so-called 'creative class' has functioned as an international target group when it comes to urban renewal, aiming to attract those who are economically advantaged and interested in art, culture and rustique. Florida has later stated that his thesis was incorrect, as several important considerations had been ignored in his reasoning. Nevertheless, the hypothesis has been considered valuable in countless revitalisation projects. Some argue the thesis has led to the gentrification of many transformation areas, which is why compact urban development has been in recent years criticised for primarily accommodating specific groups, instead of improving the living conditions for the average inhabitant (Røe, 2018, p. 51).

This raises some crucial questions when addressing a possible urbanisation process and densification of an old industrial site in Oslo. With the aim of becoming a compact and vital urban district, the redevelopment of Haraldrud is challenged by several interests, concerning conditions of liveability and potentials of exploitation.

Considering the current conditions of the area, how can Haraldrud be transformed into a dense urban area, and also stimulate liveability? Also, which qualities should be protected in this process, with regard to the genius loci of the area?

The first part of this project report addresses these issues through a site-specific analysis and discussion regarding the redevelopment of Haraldrud. The following initial research question will be answered in this part:

What general densification principles may contribute to the vitalisation of Haraldrud?

TERM DESCRIPTION

Throughout the thesis there will be used some key terms. The following is a clarification of the definitions as understood by the writer, in order to create a comparative framework.

Annual average daily traffic (AADT): The total number of vehicles passing a point on the road, including both directions, for a year divided by 365 (days). The Norwegian term: Årsdøgntrafikk (ÅDT).

Densification: Densification may refer to both (1) demographic and (2) physical densification. When the term is used in this project report, this implies physical densification, based on compact urban policy.

GFA: Gross floor area, shorted GFA, refers to the total floor area, measured between exterior walls of the building, including all floors, the external walls and roof area.

GIA: Gross internal area, shorted GIA, refers to the total floor area, measured between internal walls of a building.

Guiding principle plan of public space: Refers to the Norwegian formal plan "Veiledende plan for offentlig rom (VPOR)", a master plan regarding public spaces within an area.

Design for universal accessibility: Refers to the Norwegian term "universell utforming", which is a legally required criterion in all new public spaces, according to the Planning and Building Act and the Anti-discrimination and Accessibility Act. The criterion is based on the vision of the Norwegian government, implying that all public areas in Norway will, by 2025, be designed for universal accessibility, because inclusive design invites as many people as possible to actively participate regardless of functional ability.

Metrozone: Metrozones are transit zones with major development potential. They are underutilised areas (often industrial areas) within the inner peripheries of the city that can be transformed into liveable and sustainable districts. (Dallas Prosser et al., 2017, p. 53; IBA Hamburg, 2018)

MFUA: The Norwegian standard and term 'minste felles uteareal', translated to 'minimum common outdoor area', applies to the outdoor area which is available to all residents within a residential area. The MFUA includes streets, but not private gardens, building areas, areas steeper than 3:1 and areas exposed to Ldn > 60 dB are.

Municipal Master Plan: The master plan regarding the development of the municipality. It is divided into two parts: the social element (part 1), and the land-use element (part 2). The latter includes the master zoning plan of the municipality, and is legally binding.

The number of vehicles in-use: Refers to the Norwegian term "personbiltrafikk", and to the total number of travels using passenger cars within a given network. In other words: the measured number of kilometres per person per vehicle.

Plan Programme: Refers to a planning tool, that is legally required prior to a formal large plan proposal, cf. the Planning and Building Act. It is prepared in early planning processes, and its guidelines are not legally binding. Its content provides a general framework for the new development, regarding land use, the further planning process, public participaton and relevant topics.

Retrofitting: The term retrofitting in this thesis refers to adding modern features to older (retro) built environment. The concept of retrofitting is to incorporate new functions, compensate for design gaps, or improve the environmental sustainability of built sites, for instance, in conjunction with water management. The concept is similar to intensification, but unlike intensification, retrofitting implies simultaneously protecting critical old features of historical value.

SFUA: The Norwegian standard and term 'samlet felles uteareal', translated to 'combined common outdoor area', applies to the outdoor area which is available to all residents. Furthermore the width of the SFUA must be is at least 12 meters, and the area-proportion is maximum 2:1. The purpose of the standard for SFUA is to ensure appropriate play and recreation areas in residential areas.

Social infrastructure: In the planning sector, social infrastructure refers to buildings and facilities that accommodate social services (for example schools and nursing homes). The broader understanding of the term also includes assets that contribute to optimisation of values associated with social needs in an area, for example, related to good living environments and upbringing conditions.

Sources of law: In the case of this thesis, sources of law refers to the Norwegian term 'rettskilder', that are binding and guiding legal materials regarding development in Norway.

Transit-oriented expansion strategy: Growing urban expansion (due to the increase in population) will develop from the inside of the city core and out through densification along subway lines.

Transformation: In the case of this thesis transformation will imply (a) a total physically renewal of entire areas, interchangeably with (b) reinvention, meaning a total renewal of functionality or identity, even though the physical framework remains.

Urban redevelopment: The term refers to all forms of incorporation of new features on a previously built (developed) site, often with the aim of facilitating new/mixed use, improving reputation, and stopping urban decay. It includes approaches to transformation, intensification, reinvention, retrofitting, et cetera.

Urban reinvention: the Functional transformation of previously built urban environments, which overall creates a new sense of place.

Vitalisation: Implies in this thesis urban renewal in order to fill the urban settlement with life.

SCIENTIFIC APPROACH

CHAPTER 2

This chapter describes the main elements of the scientific approach to this project report, including the philosophy of perception, which is critical realism, and the approach to the problem in terms of report structure and contents of the report. The general approach to the project can be associated with empirical research of the social field, as it uses empirical data by means of experiences and observations from the real world, generated by methods that are described in chapter 3. Many sorts of data that are both observable and unobservable can be relevant to investigate to construct a holistic image of the complex and social environment. This implies that empirical researchers can only assume something about the reality, based on specific amounts of evidence. It is therefore relevant to clarify the basis of this specific research, concerning its scientific approach, methods and theory. These elements are introduced in chapter 2, 3, and 4, and play an essential part in the research, considering its validity, reliability and comparability. Consequently, this report proposes solutions based on these presumptions.

2.1 CRITICAL REALISM

Daily phenomena in the urban space are considered results of several contexts that are always influenced by different (unobservable and observable) causal factors. Each factor can both enhance or counteract an action. This imply that an effort does not only result in observable phenomena. Cause factors are found in physical surroundings. These are affecting daily phenomena, such as travel habits within the city. However, individual preferences, social environmental, economics also matter in this calculation. Thus, location, proximity and access are not the only elements influencing individual human mobility. However, certain tendencies can be related to specific urban characteristics, indicating that urban structure has a significant role in the choice of for example means of mobility (Næss, 2018, p. 136).

The scientific approach of this thesis is in line with critical realism, in the sense that all impact factors cannot be observed. Contexts are regarded as large interconnected networks of different unobservable and observable forces. Therefore, urban planning, concerning physical surroundings and functions, cannot provide predetermined outcomes. The future is unpredictable. However, Nordic studies indicate that planning can affect travel habits, vitality, and quality of life in a specific direction. However, the effect can only be assumed (Buch-Hansen and Nielsen, 2012).

This way of thinking can be linked to holistic thinking - or problem-oriented rather than solution-oriented thinking - in contrasts with linear thinking (associated with positivism). The scientific 'turning' from linear to holistic understanding have been connected to the 1960s and the de-industrialisation, as the holistic understanding achieved increased credibility among professionals (Rittel and Webber, 1973; Webber, 1978, pp. 152-155).

An essential prerequisite of this thesis is that critical understanding implies that one's conclusions are formed by individual observations, own values, interview objects and a specific selection of existing empirical studies and sources of law. The literature and interviewed subjects that are included in this thesis, therefore, determine the degree of objectivity and validity of the project report.

2.2 APPROACH TO THE PROJECT

In line with the 'ABC-model' (Aunsborg et al., 2012), the project report is divided into two parts, according to illustration 2. The purpose of part 1 is to introduce the broad context of this thesis, which is Haraldrud, as shown in illustration 3 (p. 13), by answering the initial research question. In that regard, part 1 elaborate on the implications of the future plans regarding Haraldrud in order to address how one may vitalise the district. The initial question is designed to introduce necessary

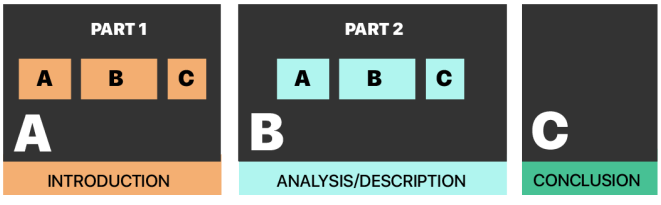


ILLUSTRATION 2: Illustration of the principle project structure elements, inspired by the ABC-model (Aunsborg et al., 2012, p. 14)

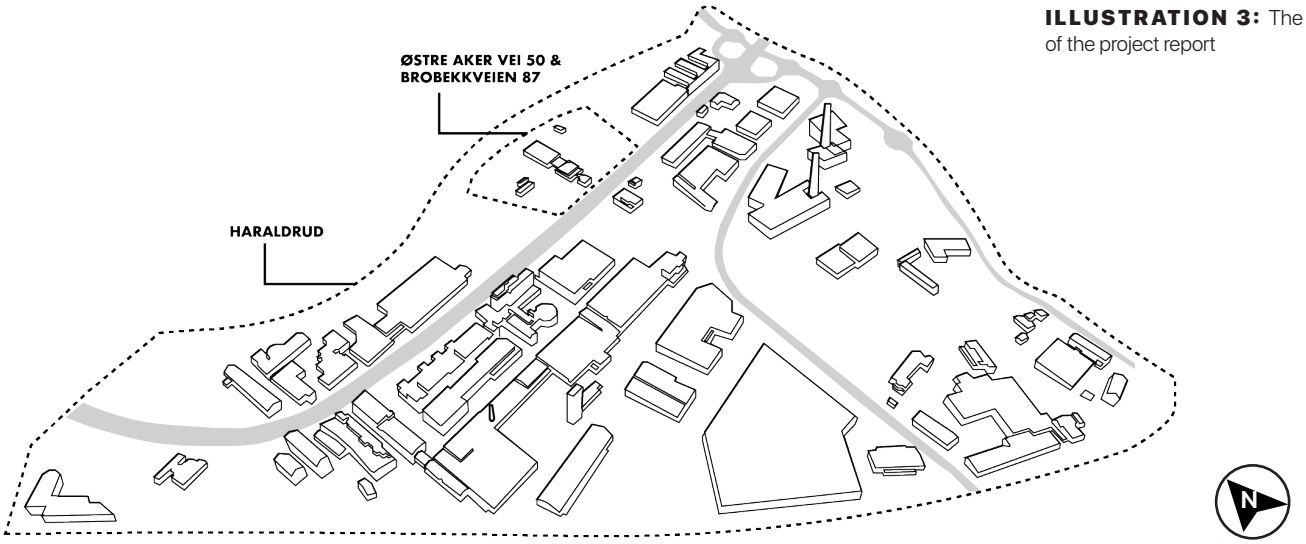


ILLUSTRATION 3: The focus area of the project report

THE PROJECT STRUCTURE

	FOCUS AREA:	APPROACH TO THE PROBLEM	
INTRODUCTION:	HOVINBYEN/OSLO	Chapter 1	Define the initial question
		Chapter 2	The scientific approach
		Chapter 3	Relevant methods to the case study
		Chapter 4	Relevant topics and conflicts of objectives
PRE-ANALYSIS PART 1:	HARALDRUD	Chapter 5	Site-specific analysis
			Discussion
			Conclusion
			Define the problem statement
ANALYSIS PART 2:	ØSTRE AKER VEI 50 AND BROBEKKVEIEN 87	Chapter 6	Site-specific analysis
		Chapter 7	Feasibility study
			Conclusion
CONCLUSION:	ØSTRE AKER VEI 50 AND BROBEKKVEIEN 87 AND A BROADER PERSPECTIVE	Reflections	Perspectivation

aspects regarding a specific context before the problem statement can be prepared and introduced, in line with the hermeneutic approach. In that sense, the conclusion of part 2 is not foreseen, as the whole project alter chronologically, based on the knowledge which is generated throughout the work process. The methods for retrieving data in both part 1 and part 2, are elaborated in chapter 3 (p. 14).

Part 1, thus, represents both (1) a complete study, as it includes the three steps cf. illustration 2 (an introduction, an analysis and a conclusion), and (2) the introduction or pre-analysis to part 2 of the project report. The conclusion of part 1 leads to the second part of the project report by introducing the problem statement.

Part 2 focuses on a smaller geographic area within Haraldrud - the plots Østre Aker vei 50 and parts of Brobekkveien 87. Thus, the development of the project is based on a top-down approach. To determine future site-specific amendments, based on a more detailed interpretation of the findings of part 2, the second part elaborate on the future purpose and design of the plots. In line with the ABC-model, the second part represents both a complete study and the main analysis of this project report.

Finally, in the case of this project report, a reflection represent the conclusion of the project report. The reflection emphasise in principle the most essential observations of this thesis.

The project structure above shows the complementary approach to the steps of the project report, including the introduction of the report.

METHODS

CHAPTER 3

The main purpose of this project is to examine and analyse an urban space, with the aim to comprehend its characteristics and potential to become a liveable urban district. The urban space, in this case, represents a multi-layered environment, consisting of a variety of features. What the area consists of, in terms of visible and invisible features, and how the built environment and aesthetics impacts our experience of the place, is relevant to interpret in this regard, to outline the future potential of this specific context.

The framework of the methodological approaches for surveying a specific place is called a site-specific analysis. Site-specific analysis can be practised in different ways, as it may include different methods. The methods described in this chapter are included in this analysis, according to illustration 5 (p. 15), in order to provide triangulation. Triangulation means in this context to portray a specific context by means of different methods. Each method provides an interpretation of the context. The purpose of triangulation is, therefore, to ensure that the analysis can be considered sufficiently valid and comprehensive, considering the resources at hand. The methods included in a site-specific analysis must also be feasible, considering the amount of time at one's disposal. Methods that contribute to triangulation in this case are described in the following sections.

3.1 CASE STUDY

A site-specific analysis is a case study where the case is geographically determined. Case studies are systematic surveys of a current phenomenon, concerning a particular geographical setting, theory or reality. It is a prerequisite that the researcher explores, without having any influence on the case itself. The researcher may interpret an environment based on his or her observation, or collect information through interviews, but he or she may not edit or experiment with the environment (Yin, 2009).

Conducting a case study starts with designing an overview of the required data, to answer the constructed research question, and accordingly how to feasibly collect these data. These data can be called analytical elements. The scope of the case study must also be specified, considering the purpose is to answer the research question adequately. In this case, the scope is limited as regards 1) the topic: densification and liveable urbanism, and 2) area: Haraldrud. Both part 1 and part 2 use single case studies as a methodological framework for the analysis, focusing on Haraldrud and the plots Østre Aker vei 50 and Brobekkveien 87, as shown in illustration 5 (p. 15). A single case study may be beneficial if the purpose is to go into depth in the individual case. The smaller the scope, the more one has the opportunity to go deeper into the material. However, a single case does not provide the same prerequisites for drawing generalisable conclusions.

In this case, triangulation is used to increase the validity of the case study. If the different methods show the same results or complement each other in an interesting way, triangulation is a significant advantage, as this increases the credibility of the results. If the methods, on the other hand, reveal entirely different interpretations of the reality, it may be necessary to reformulate the research question or rethink how the methods have been executed. The methods that are used in this case study are described in section 3.2-3.5 (pp. 14-18). The idea behind the selected methods was to determine the following analytical elements: status quo at Haraldrud, based on own experiences (through urban drifting) and the actors' experiences (generated through vox pop and literature study), and guidelines regarding future redevelopment of Haraldrud (generated through literature study).

3.2 LITERATURE STUDY

Literature study is a method for analysing published knowledge such as research studies, articles, books, political reports, or other sorts of papers. The process of literature study includes mainly two steps: 1) the literature searching process, and 2) the evaluation of the collected literature. In this regard, some general aspects should be considered when selecting relevant literature for the thesis.

Regarding the first step, one should, for instance, only use data that is relating to the topics of the research report. Literature that is considered not relevant to the subject should, therefore, be discarded. Using published literature as data is considered an advantage, provided that it is specific about the described subject. It is an advantage to avoids

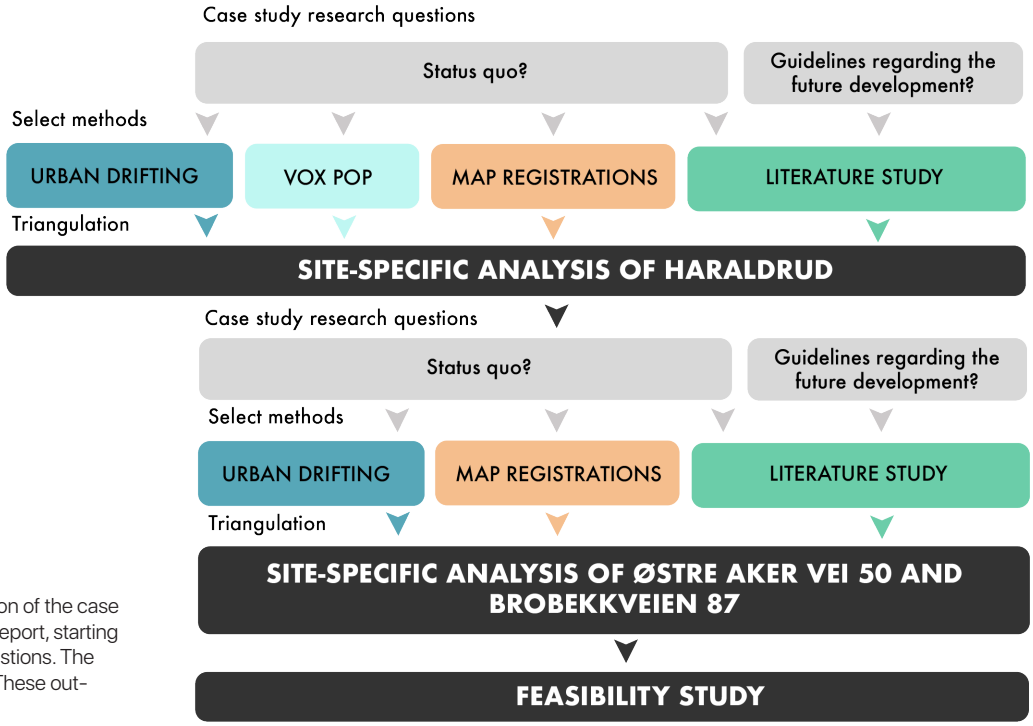


ILLUSTRATION 5: An illustration of the case study framework used in the project report, starting with the construction of research questions. The methods provide several outcomes. These outcomes contribute to triangulation.

duplication of research that already exists. However, sufficiently elaborated literature about Haraldrud does not exist, to cover all essential conditions. Therefore, triangulation has been introduced as parts of the case study.

Existing literature may also contain biases, considering the scientific approach, methods involved, and the purpose of the paper. Each paper is also bound to a specific period, meaning one should be critical about the actuality of each paper. Regarding step two of the process, one should be critical to the content, the author, the methods, date of publication and types of literature. Based on these general considerations, a selection of literature has been considered relevant and thus contributed to highlight the subject of this thesis. The following sections elaborate on the different types of literature that has been used in the project report, to clarify the purpose of each literature category in this regard (Andersen and Gamdrup, 2011, pp. 50-64; Yin, 2009, p. 106).

3.2.1 Scientific research and journals

This project report refers to some planning theories, most of which introduced in chapter 4 (p. 20). These research reports and scientific articles consist of publications related to scientific studies, which may contain the author's own opinions as well as relatively objective data collections, analyses and observations. Published knowledge, referred to in this project report, is usually generated from specific methods - often case studies - which does not necessarily mean that the publications are comprehensive or profound. Scientific research are indeed not objective, even though they are based on assessments of scholars, but they may highlight a particular topic thoroughly.

In this case, most of the scientific articles that are being referred to in chapter 4 (p. 20), focus on Norway and Oslo. Also, they have been chosen, based on their relevance related to the topics of this thesis, and time of publication (all that are considered relevant have been published within the last decade), with the aim of revealing a current and comprehensive image of the status quo.

3.2.2 Political and advisory documents

Political releases represent political goals, values and guidelines. These papers reflect specific views on public matters within the community, present-day topics and discourses. Furthermore, they are based on attitudes and socially designed rationalities, aiming for changing the society towards a particular goal. In this case, political reports overlap with sources of law, cf. section 3.2.4, as some political planning documents have a legitimate binding function, such as the Municipal Master Plan.

However, in terms of documents of governance, it is difficult to distinguish from those that are politically funded and funded on advisory expertise, as every document within this category is based on some political visions and priorities in the end. As the City Council must approve the Municipal Master Plan, the Plan Programme and the Guiding Principle Plan of Public Space, although they are prepared by advisory municipal agencies, these documents may be considered both political and advisory.

In this case, political releases are essential to address the conflicts of interests and objectives concerning the redevelopment of Haraldrud.

3.2.3 Encyclopaedias

Encyclopaedias are mainly used for conceptual clarification and description of historical development in this thesis. Internet-based encyclopaedias usually have an editorial that quality assures the individual articles, which can be used as an indicator of the article's applicability.

3.2.4 Sources of law

Sources of law are binding and guiding legal materials (Evald, 2011, p. 18). This project report refers only to Norwegian sources of law, including the Planning and Building Act and the second element of Oslo's Municipal Master Plan. The latter includes legal regulations on properties within the municipality. Attachment 3 includes an extract of legal materials regarding relevant matters, that have been referred to throughout the project report.

The selection and interpretation of legal sources are based on legal methodology, which includes the following three processes: 1) identification of the legal issue, 2) determining and emphasising relevant sources of law and legal principles, following the legal order, and 3) conclusion. Legal methodology implies that interpretation of legal questions is to some extent relative, depending on which source of law is being emphasised. Therefore, determining all relevant sources of law as well as normative forms of interpretation of laws is crucial when it comes to analysing legal issues (Evald, 2011).

The lex-principles are most essential tools from legal methodology that is taken into account in this context. In terms of prioritisation of sources, according to the lex superios principle, the highest ranked - and, thus, fundamental - sources of law are: laws, regulations and plans adopted by law. Guiding documents are second highest ranked. These are therefore considered not legally binding, but impose a specific determination in terms of criteria and permissible actions. The prioritisation of relevant future plans are, thus, specified in the pre-analysis regarding the future development of Haraldrud, cf. chapter 5.5 (p. 45) (PBE, 2014, p. 2).

In addition, according to the lex posterior principle and the lex specialis principle, the latest adopted and more specific sources of law are always emphasised (Evald, 2011).

3.3 VOX POP

Vox pop refers in this thesis to an informal and unstructured interview, much similar to an informal conversation (Cambridge dictionary, 2018). In this case, the purpose of the conversations is to ask random people, that are passing by in a specific public place at Haraldrud, about their opinion of the area. The interviews are elaborated in

chapter 5.4 (p.39), as part of the site-specific analysis in part 1.

Unlike formal, semi-structured interviews, one does not need to prepare an interview guide. The interviews may also vary, in terms of questions, subject, and participants. Also, the interviewees are not informed about the questions before the conversation, which means that the interviewees do not have much time to prepare their answers. This provides quick and relevant answers, considering the purpose of the conversation is to highlight affections related to an area. Talking face-to-face with respondents can be considered an advantage as it creates some confidentiality between the interviewer and the respondents. Furthermore, it allows for spontaneity and verbal language. The conversations will change naturally according to what is being said and how it is said. The answers can thus be interpreted more easily, considering the social context. However, if the purpose was to obtain solid facts, this interview method should be regarded as less relevant, given that the answers can be considered spontaneous, rather than thought-through or supported by facts (Metodeguiden, 2018; Elmholdt, 2006).

The purpose of the qualitative interview is to gather relevant data which complements existing data. Considering much data about Haraldrud already exist, one should clarify before the interviews, which complementary and qualitative information is considered appropriate, to analyse the area. Thus, some interview questions can be designed before the interviews, but the questions do not need to be semi-structured. Moreover, qualitative interviews should ask questions that are non-judgemental and open, compared to leading questions and "yes" and "no"-questions, considering the purpose is to reveal someone's honest opinions (Elmholdt, 2006; Kvale and Brinkmann, 2015, pp. 162-177).

One of the strengths of qualitative interviews is that they explicitly focus on a specific topic. Thus, they provide a deeper understanding of the topic. How people experience Haraldrud today, is considered most interesting to the pre-analysis, with the aim of revealing social-cultural contexts. This data will best be obtained through a conversation with those who reside at Haraldrud – those who hang around the school works there or possibly just passing by.

3.4 URBAN DRIFTING

Visiting any physical environment evokes feelings. These feelings are valuable information, as they reflect qualities of the urban structure in a way which cannot be determined by maps, photographies or other media. To concentrate these feelings, in a way which helps to memorise the distinctive associations related to the urban fabric, is therefore valuable to enhance the understanding of an area.
The method called urban drifting implies walking within urban environments to explore and experience the urban space, by interpreting visual and invisible elements that are present in the environment. There are different ways to explore the spirit of the place - also called the genius loci - which results in various defined ways to execute urban drifting. While some researchers prefer to concentrate on the psychological impact of urban design upon inhabitants, others, such as Kevin Lynch (1960), focus on ways to identify and measure urban visual structures. Drifting may as well involve observational sketching. To document one's observation, one may use both photographies, sketching, notes, audio records and films. In this case, photography, notes and sketching (cf. illustration 19, pp. 40-41) have been used as means of documentation. Also, it is important to point out that urban drifting only represents a subjective interpretation (Daniilidis, 2016, pp. 417-424).

3.4.1 The process of urban drifting

Alexandros Daniilidis divide the process of urban drifting into four steps. Firstly, one observes the specific place. It is essential to document these observations either simultaneously or afterwards. Regarding the survey of Haraldrud, a sum-up was written directly after each of the four inspections, to register the observations as correct as possible, considering poor memory may manipulate the registrations and cause biases (Daniilidis, 2016, p. 428).

Secondly, one sorts out and analyses the different types of discoveries, in terms of characteristics. It is important to distinguish between constant-independent conditions and varied-dependent conditions in this regard. Vitality and atmosphere associated with an outdoor area are, for example, varied-dependent conditions, as they depend

on the weather and time, while architecture associated with a building is considered a constant-independent condition. Considering that time and weather probably would have a significant impact on how the area was perceived during the drifting, in terms of how street life affects the atmosphere of the environment, the inspections cf. chapter 5.3 (p. 38) was organized on different days within the same time, between 11.00 – 13.00, including Tuesday (March 13), Thursday (March 15), Friday (January 25) and Sunday (January 21). The inspections were also conducted in January and March when the temperature was between minus 1 and minus 5 °C, and large areas within the place were covered with snow.

Thirdly, one evaluates the implications of the built environmental features. For instance: Is the urban settlement inviting, attractive and transparent? Although four surveys do not result in a complete picture of the area, the observations provide an adequate basis for concluding about the critical qualities of urban design cf. section 3.4.2 (Daniilidis, 2016, p. 428).

Finally, one concludes about the findings , according tot he fourth step (Daniilidis, 2016, p. 428). The evaluation, in the case of this thesis, is moreover inspired by Reid Ewing and Otto Clemente (2013), and their protocol for measuring urban design, which is mainly focusing on how friendly the environment in terms of walking. This protocol involves measuring the presence or absence of five key qualities associated with walkability. These key qualities are elaborated in section 3.4.2.

3.4.2 The five key qualities of urban design

1. Imageability relates to the sense of place - genius loci - in terms of attributes that makes the place recognisable and memorable, such as landmarks (here: orientation points). The term "high imageability" in this case, refers to an inviting sense of place, which encourage people to enter and stay.
2. Visual enclosure relates to the visual definite three-dimensional space and refers to the lines of sight relative to the arrangement of buildings and size of the outdoor space.
3. Human scale refers to proportions of the built environment, and how physical elements such as building volumes, pavement texture, and street furniture accommodate the human scale or human speed.
4. Transparency refers to visual clarity, relative to the degree to which one can spot the surroundings beyond the outdoor space or the end of the street/corner. The term 'low transparency' in this case, refers to the feeling of unpredictability, caused by limited visibility.
5. Complexity refers to the sense of excitement and depends on the number of various features to which a person is exposed. The quality relates to the diversity of architecture and landscape, the number of buildings, and other distinctive elements within the urban environment. (Ewing and Clemente, 2013, pp. 5-13)

Although each of the five qualities will not be evaluated individually in this case, they provide a list of fundamental considerations for the urban drifting. So, all qualities have been evaluated related to the context, while the most remarkable aspects have been outlined in chapter 5.3 (p. 38).

3.5 MAP REGISTRATIONS

Existing map registrations have been used as a source of information in conjunction with the preparation of the site-specific analysis in part 1 and part 2. When using map data, it is important to use reliable sources, as to how recently the map is updated and detail level relative to its relevance. The essential map data which is used in this regard, consist of a three-dimensional basemap provided by Statsbygg's map services, and satellite images, provided by the web map service of the Norwegian Map Services (Norgeibilder, Kommunekart, seeiendom), and Google Maps, respectively. Web maps provided by Oslo Municipality and the Cultural Heritage Authority, have provided additional information about aspects such as zoning, air and soil pollution, noise, and cultural heritage.

The original basemap has been modified in this regard, as relevant information has been selected based on a critical assessment, to limit the scope of the situation and thus make it more understandable. The satellite images and urban drifting, cf. chapter 5.3 (p. 38), have contributed in this process to ascertain physical details, materials, and sense of place within the relevant area.

"ONE FINE DAY, ALL THIS WILL BE YOURS"

ILLUSTRATION 6: The temporary art installation by Dellbrügge and de Moll, "one fine day, all this will be yours". The installation is referring to the theme of the exhibition called "common lands", arranged by Bjørvika Utvikling AS in 2008. The exhibition was based on the urban development on Oslo's harbour area, Bjørvika. (One fine day, all this will be yours, 2017)

PLANNING THEORY

CHAPTER 4

The installation "One fine day, all this will be yours," as shown in illustration 6, made a symbolic statement on behalf of the planning and building authorities regarding the ongoing transformation of Bjørvika, a former industrial harbour area in Oslo's inner city. The installation was part of the art exhibition "Common Lands" in 2008, where the aim was to achieve attention to the redevelopment of the harbour area, as it was transforming into a modern, cultural district. The visions of the plan, which was provided through the installation, served as a promise for the future revitalisation of Bjørvika. But, as with art, these types of interventions can be preserved ambiguously - leaving it up to the public to interpret such acts of 'branding'.

The installation by Dellbrügge and de Moll has later been referred to as an artistic expression of how promises regarding vitalisation projects can be seemingly broken, considering how the area has subsequently been primarily appropriated by a "cultural elite" (Aspen and Pløger, 2015, p. 176). It has been debated whether the transformation of Bjørvika was, in the end, in line with the ambition of creating accessible and diverse public spaces. Bjørvika has also been criticised for being subject to de-contextualised architecture (or conventional, transnational architecture), as the transformed area express little of the local identity of the original area (Røe, 2018, p. 54; Aspen and Pløger, 2015, pp. 138-146). Nevertheless, the art installation by Dellbrügge and de Moll is a good analogy to illustrate the aspect of branding and interpretation in redeveloping projects, and how debates emerge around comprehensive projects aiming to transform central brownfields into viable urban districts.

It is relevant to assume that some of the criticism about the transformation of Bjørvika touches upon a general challenge in connection with modern vitalisation projects: How can compact development also contribute to the vitalisation and the creation of good public spaces? First and foremost, one must regard these objectives associated with compact urban development and vitalisation as two different theories that do not automatically interrelate with each other. Compact development does not necessarily generate liveable urbanism, as I will elaborate in this chapter.

Vitalisation is, in this project report, associated with a theoretical concept called liveable urbanism, to establish precisely the implications behind the objective. This theory seeks mainly to address urban qualities that create satisfactory quality of life. There are however different theories about liveable urbanism, some of which see the concept as a legitimation of entrepreneurial compact development (Røe, 2018, pp. 48-51). Moreover, the concept is associated with social equality and public health (Badland et al., 2014, p. 65). This project report emphasises the latter.

Concerning compact urban development, the concept is associated with sustainable development strategies, after the NAMIT-project advocated this approach in the early 1990's (Næss et al., 2018). However, the social pillar of sustainable development is just recently being highlighted by scholars - due to a pattern of increased unequal social outcomes in terms of even more expensive square meters and social segregation (Røe, 2018, pp. 48-52). Concepts such as branding in redeveloping projects bring the dimension of ownership of public spaces into the fold when addressing transformation in dense urban settings, but what are the other social implications of the redevelopment of central industrial areas? The main purpose of this chapter is to address and elaborate some relevant dilemmas concerning vitalisation projects focused on industrial areas, and determine how different approaches to planning can be used in relation to these challenges.

4.1 THE COMPACT CITY

The compact city is a socially constructed concept, based on broad political interests in designing sustainable societies (Røe, 2018, p. 56). There is a widespread belief that compact cities provide sustainable development and liveable urban environments, which is why the concept is recognised as a hegemonic discourse. In Norway, this credibility evolved rapidly in the wake of the NAMIT-project in the early 1990s, as compact urban development was considered a necessary counter-reaction to environmental challenges caused by low-density housing, such as urban sprawl, and the subsequent over-reliance on fossil fuels (Næss et al., 2018, pp. 37-44).

Furthermore, mixed land use and walkable environments should

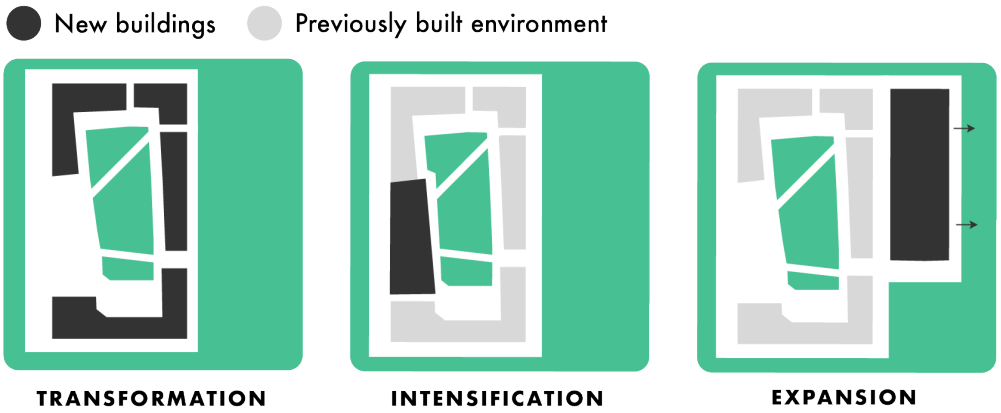


ILLUSTRATION 7:
The three principles of densification: urban transformation, intensification, and expansion. (Marjanovic, 2018)

provide socio-economic benefits in terms of inexpensive and proximate access to meaningful daily purposes and public transport, and hence more physical activity and frequent social interactions (Badland et al., 2014, p. 70). There are many indicators that compact urban development provides a more sustainable society. Energy consumption, water resilience, water conservation, and preservation of biodiversity, natural qualities and agricultural land are some of the environmental and economic sustainability outcomes associated with compact development. At the same time, there is a growing interest in studying the differentiated social outcomes, often addressed as liveability and social inequalities (Næss et al., 2018; Badland et al., 2014).

Needless to say, the compact city is a representation of a current complex reality - which is both dynamic and diverse. Hence, debates about areas that are subject to compact urban development strategies address; how does the compact city represent the society of diversity and who claims ownership to the general interpretation of sustainable development? In this case, it is furthermore interesting to examine the theoretical link between built environmental, densification and vitality, according to modern planning theory. In what way do specific concentration of buildings and public space stimulate social interactions? These questions are challenging to answer without referring to conventional indicators.

The intention with this chapter is to emphasise these questions while referring to a selection of modern planning theory. In the summary of this chapter, relevant issues regarding compact development today, and attributes to achieve liveable urbanism – as well as sustainable compact districts – will be sorted out by means of these theories (Thorén and Saglie, 2018).

In terms of liveable urbanism, creating viable urban districts has become an important purpose in relation to the compact city. Designing of public spaces that meet social diversity has been emphasised in current densification projects, with the aim of encouraging social benefits (in situ: high quality of life), economic benefits (in situ: affordable living) and environmental benefits (in situ: healthy environments). In that sense, compact urban development provides a foundation which should encourage liveable urbanism through 'ecomobility', in terms of accessible public spaces and urban facilities, and affordable participation within the city (Badland et al., 2014).

The link between liveability and the compact city is also supported in a wide array of planning theory. From Jan Gehl and others, scholars and planners have been taught that a certain degree of density is an essential prerequisite to make urban spaces vital, providing a critical mass of people - and because the sight of people attracts other people (Gehl, 2010). Human activities in urban spaces, such as play, leisure, movement, and transit use are attractive to watch, provided there be a possibilities to dwell (Norberg-Schultz, 2007). Nevertheless, density is by no means sufficient in itself. Density is also relative, influenced by both physical and social variables. Therefore,

the distinguishing between different forms of compact urban development and the social space, should consequently be examined in comparison to various forms with the implication of a social dimension (Sirowy, 2018, pp. 197-198).

Two approaches to compact urban development are described in the following sections, to illustrate some important theoretical implications of the compact city. These are (1) physical principles of densification, described in section 4.2, and (2) liveable principles in conjunction with redeveloping projects, described in section 4.3. Together these constitute the theoretical foundation for the project report's part 1 and part 2.

4.2 DENSIFICATION

Urban morphology, the study of spatial structures and urban patterns, with emphasis on dynamics between built environments and open spaces, defines three principles of densification. Variations on densification include transformation, intensification and expansion, as exemplified in illustration 7 (p. 21).

Transformation is generally understood to be physically renewal of entire areas. Hence, urban transformation in this project report refers to a total renovation of physical environments within urban districts, unlike intensification. A transformation may as well be understood as a total renewal of functionality or identity, even though the physical framework remains. In this project report, this type of transformation is instead called urban reinvention.

Intensification, on the other hand, means adding new volumes to already existing buildings, as shown in illustration 7 (p. 21). This may include, for instance, building extensions and infill buildings. It also applies to redeveloping projects in which certain buildings are conserved in the densification process.

Expansion implies that something is being built on undeveloped land. Over the last few years, Oslo has almost not expanded, due to the inside-out transit-oriented expansion principle, in accordance with the adopted Municipal Master Plan (2015). The NAMIT-project symbolises in this regard a national shift towards a compact and centralised development strategy (as opposed to urban sprawl and decentralised densification). However, as outlined in the introduction, Hovinbyen is called an *expansion* project (in line with the transit-oriented *expansion* principle). Figuratively speaking, this refers to an expansion of Oslo's inner city, not a physical expansion (Oslo kommune, 2015; Marjanovic, 2018, pp. 176-177; Næss et al., 2018, s. 46).

The perception of density varies. For instance, physical variables such as many visible windows, uniform buildings and façades without much details are perceived denser than the contrary (Bosselmann, 2008, p. 148)- implying that physical details can affect how we perceive density. By using elements on the exterior wall relatable in human dimensions, buildings should adapt to have a human scale and, thus, a human-friendly façades. The scale of the urban settlement

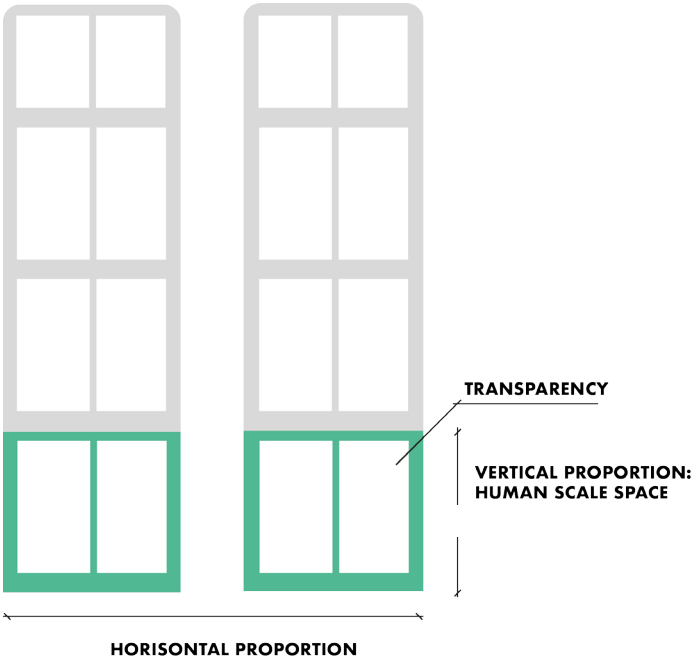


ILLUSTRATION 8: Human-friendly façades, in terms of physical variables in regard to human scale.

will relate more to the human dimension by for instance incorporating human-scaled patterns, such as large windows, gaps, or services on the ground floor. Likewise, the relationship between density and positive sense of space is also relative, with regard to privacy, noise, and fresh air. Whereas the sense of vitality stimulates positive emotions, overcrowding stimulates negative emotions (Røe, 2018; Bosselmann, 2008).

With regard to the impact on the social space, considerations should be given to the following conditions in densification projects: Accessibility in terms of proximity (ecomobility), access points, transparency, and with regard to the disabled pedestrians, and dynamics between built and open environment with regard to the human scale and lightning conditions (Marjanovic, 2018, pp. 176-177; Fiskaa, 2014).

It is furthermore relevant to stress how zoning (versus mixed-use) also manifests itself negatively in the cityscape. In the wake of the de-industrialisation during the 1970's and 1980's, segregation of functions into large mono-functional districts or zones within the city was no longer needed. Today, these de-industrialised districts are characterised by long distances, barriers, and consequently low accessibility for pedestrians, low attractiveness, poor harmony, and little social integrity. With the aim of developing a walkable mixed-use area, in line with compact city development and liveable urbanism, a division of volumes is a necessity to accommodate the human scale. Transit-oriented density implies in this regard that daily errands should be within walking distances (approximately 800 meters or 10 minutes walk) (Marjanovic, 2018).

Furthermore, any place has peculiarity or special sense of place - called genius loci (Norberg-Schultz, 2007) - at all times, created by appropriation and interpretation of its physical and cultural-historical qualities. This should not be underestimated in redeveloping projects, in regards to local identity and history associated with the area. This is a relevant concern in this case, as site-specific features often vanish in transformation projects, especially when it comes to transformation of stigmatised areas. Retrofitting is, in this regard, a relevant alternative to transformation. Retrofitting means redeveloping older (retro) built environment in terms of renovation or intensification, to make a place more sustainable and liveable, while interests regarding local identity and cultural heritage is being safeguarded (Designing Buildings Wiki, 2018; Aspen and Pløger, 2015; Norberg-Schultz, 2007).

4.3 LIVEABLE URBANISM IN RELATION TO COMPACT URBAN DEVELOPMENT

Compact urban development can be a fundamental contributor to vitality and liveability, but it may also bring challenges in relation to social equity and public health, as I will give an outline of in this section. The role of urban form in stimulating positive individual emotions, as well as impacting neighbourhood reputations and enhanced public health outcomes, has been studied by numerous. However, the term 'liveable urbanism' has no definitive definition. In this project report, liveable urbanism implies both vitality and socially inclusive, healthy and safe urban environments that stimulate public health (Badland et al., 2014, p. 65). The study of liveability in planning theory thus relates to the fields of social sciences, phenomenology, and social sustainability. By means of planning theories related to these fields, some essential attributes regarding liveable urbanism has been outlined in the box on page 24.

These attributes represent some guiding principles concerning liveable urbanism. Hence, liveable urbanism as a guiding concept included in compact development projects, contributes to a more sustainable development, in terms of improved quality of life, upbringing conditions, social inclusion and public health (Gehl, 2010, p. 119).

4.3.1 Social implications of compact urban development

The pillar of sustainable development is often under-emphasised in the discourse regarding compact development (Røe, 2018, p. 52). They are referring to segregation tendencies, gentrification tendencies, increasing degree of homogeneous urban spaces and conventional architecture, as examples of outcomes. This serves as an implication that the compact city pays too little attention to social diversity, inclusion and liveability. 'The stranglehold of zombie-urbanism' is a metaphor, introduced by Jonny Aspen and John Pløger, describing the conventional concept of the compact city's low ability to create liveable urban spaces (Aspen and Pløger, 2015, pp. 138-146).

Attributes of liveability
Qualities that are essential in liveable public spaces, include the following aspects:

- Comfortable degree of publicity and sociability, in terms of people, services, cultural features or entertaining. (Bosselmann, 2008, p. 141)
- Diversity and heterogeneity, with regard to both architecture, users, and opportunities for shopping, culture and recreation. (Sirowy, 2018, p. 205)(Bosselmann, 2008, p. 141)
- Jan Gehl (2010) uses the term 'optional use' as a qualification for addressing attractive urban spaces. In this case, optional use (contrary to necessary use) means urban functions that invite people to stay (e.g. seating facilities or distinctive architecture), and environments that respect the human scale. (Gehl, 2010, p. 144)
- Access to public spaces - physically and visually - is an important prerequisite, in regards to all soft mobility such as pedestrians and cyclists. Design for universal accessibility provide walkable conditions for all groups of people, both wheelchair users, visually impaired, children and adults, and thus encourages social inclusion.
- Proximate access to public spaces and public transport may encourage physical activity and frequent social interactions, and hence stimulate public health. Conversely, motor vehicle reliance more likely results in social isolation. (Badland et al., 2014, pp. 65)
- Public spaces must be seen in relation to the choice of being elsewhere. If there already exists better places to linger nearby, the degree of optional use decreases (Bosselmann, 2008, pp. 154-155).
- Jonny Aspen and John Pløger (2015) also include expectation and surprises as essential considerations in creating vital cities (Aspen and Pløger, 2015, 235).

The compact city strategy furthermore promotes an urban growth policy, associated with neo-liberal ideology, which emphasises competitiveness between cities, regarding relocation, tourism, business activity and investment willingness (Røe, 2018, p. 51). Compact development strategies - in conjunction with urbanisation and global competition between cities - stimulate market effects towards increased demand for a higher residential and business density. Although this, in turn, provides sustainable benefits such as proximate access to work and other daily errands through the transit-oriented intensification, there has been an increased interest in discussing the social and environmental consequences of the compact development strategy (Røe, 2018).

In terms of social implications, healthy living environments and public spaces are the most prominent concerns, associated with the compact urban development in Oslo. This is partly due to a certain negotiation room regarding qualitative requirements for dwellings and outdoor spaces in residential areas. The former refers to the increasing amount of - and acceptance for - smaller and denser dwellings, to provide affordable housing. The fact that many new dwellings do not meet the previous minimum requirement, recommended by the Norwegian National Housing Bank, Husbanken, (55 m^2, including minimum two occupancy units) is, for example, considered unfortunate (Schmidt, 2018, p. 170).

In regards to public spaces, a crucial challenge relates to safeguarding the criteria for common outdoor areas in Oslo, as well as social inclusion and liveability considering the relatively high levels of noise and air pollution. The latter is elaborated below, in section 4.3.2 (Schmidt, 2018, pp. 170-172).

There are, moreover, reasons for being concerned about how a growing interest in compact urban development may affect the incorporation of social infrastructure in redeveloping projects. Social infrastructure refers in this case to all assets associated with essential social needs that contribute to the optimisation of quality of life in neighbourhoods.

As private developers and landowners cannot be obliged to incorporate measures associated with social infrastructure, according to the regulations against terms in development agreement for private contributions towards social infrastructure (Lovdata, 2018d), the planning and building authorities are limited in terms of legal tools and literally space to facilitate social infrastructure. The question is how the ever-increasing interest in housing development manifest itself in primarily private-owned transformation areas, such as Haraldrud. A pressure is without a doubt put on current planning processes as

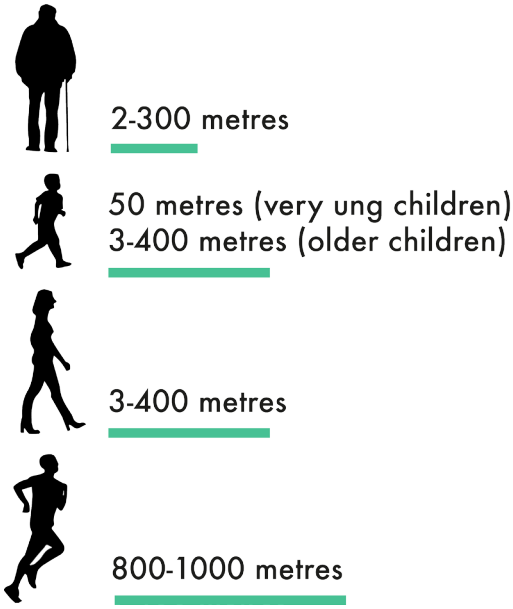


ILLUSTRATION 9: Differences of walking distance within 8-10 minutes in relation to age (Fiskaa, 2014, p. 128).

regards the implementation of new social infrastructure, which the municipality is obliged by law to provide (Lovdata, 2018a).

At the same time, there little research showing how the accessibility to social infrastructure and public space renewals affect property prices. These are potential enhancers in terms of private investments towards social infrastructure when it comes to transformation projects. The renovation of Bryant Park in New York in 1992, is a well-known example of how a park renewal can affect property prices and investment willingness immediately, based on the Ernst & Young study from 2002, "*How Park's Investment Pays Its Way*" (Kozloff, 2012). Due to the absence of studies that show the correlation between attractiveness and increased property prices, the importance of social infrastructure is often under-communicated in the hegemonic debate. So, when profits are primarily associated with vertical development, which actor will prioritise the implementation of measures that accommodate social needs and behaviour?

4.3.2 Noise issues in compact urban development

Noise pollution is an environmental problem which contributes to reduced quality of life and health problems in many residential areas. Road traffic is the most prominent noise source today, followed by aircraft, railways and industry. The World Health Organization has determined adverse public health effects - in terms of psychological stress and cardiovascular disease - due to exposure to the nighttime noise level (L_{night}) of more than 50 dB (World Health Organization, 2011, p. 58). About 1,9 million Norwegian residents were exposed to L_{night} of more than 55 dB in 2014 (Holz and Engelien, 2016), and it is estimated that living years lost each year due to noise pollution (sleep-disturbance), are approximately 10.000 (Miljødirektoratet, 2015, p. 1). The number is also expected to grow due to population growth, urbanisation and compact development in urban areas (Holz and Engelien, 2016).

Stortinget (The Norwegian parliament) has decided that the number of residents exposed to adverse noise levels shall be reduced by 10 % by 2020, compared to the year 1999, cf. St. meld. nr. 26 (2006-2007) (Det Kongelige Miljøverndepartement, 2007, p. 146). At the same time, there is a growing need for intensification in urban areas, as well as capacity improvements on the transport network within the Oslo region, due to urbanisation. Objective conflicts with regard to noise pollution and compact urban development thus create some complex dilemmas (Miljødirektoratet, 2015).

A number of guidelines provide a framework to guide the development in terms of how to prevent adverse health effects due to noise pollution, including the Norwegian guideline regarding noise pollution in planning processes (T-1442/2016). According to the guideline, noise-sensitive purposes, such as dwellings and offices, should be placed within areas measuring a maximum long-term noise level of L_{dn} < 55 dB. The municipality may, however, consider allowing noise-sensitive purposes to be located within the yellow zone (55-65 dB) or red zone (>65 dB) if this provides other important benefits (Klima- og miljøverndepartementet, 2016, pp. 5-9).

The area, to which this assessment opportunity applies, is called a deviation zone (avvikssone) (Miljøverndirektoratet, 2017b, p. 6). Deviation zones are respectively commercial urban areas and transit hubs where high density housing is considered most relevant to incorporate. Provided that the municipality has specified such an area in the adopted Municipal Master Plan, compromises regarding noise pollution and noise-sensitive purposes may be allowed in urban renewal projects. A considerable amount of areas in Oslo are designated as deviation zones in the adopted Municipal Master Plan, including Haraldrud (Oslo kommune, 2018; Miljøverndirektoratet, 2017b, p. 11).

4.5 COMMENT

The planner is in some way limited when it comes to his/her contribution in redeveloping projects aiming to create denser and viable urban places. It is apparent that the planning and building authorities cannot meet these types of objectives alone, as sustainable ways of living depends on preferences, attitudes, and social environment, and furthermore a number of contributing actors and developers who operate under a flexible legal framework (e.g. the Planning and Building Act and the Municipal Master Plan).

Concerning vitalisation, some attributes of liveability, introduced

by different planning theories, should be possible to identify through a site-specific analysis and feasibility study. The urban qualities, described in chapter 4.3, do not provide all prerequisites for vitalising industrial areas or making inhabitants choose a more sustainable life. However, they create an adequate framework for stimulating liveable urbanism in relation to compact urban development projects and transformation of urban brownfields. The theories referred to in this chapter also imply that the compact urban development strategy may produce vital places in terms of generating frequent meetings among inhabitants and more physical activity.

Furthermore, compact development promotes several economic and environmental benefits. Economic benefits, considering the possibility for higher utilisation of small building plot and price adjustments related to the value of the building plots in central areas, infrastructure benefits as public transport can be managed more efficiently and sharing economy in terms of proximate public services. Also, environmental benefits, considering the possibility to (I) minimise the carbon footprint, thus helping to protect green areas and biodiversity, and (II) reduce local pollution by minimising citizens reliance on the motor vehicle.

The social implications of compact urban development, could benefit public health through physical activity when put forward in conjunction with the idea of transit-oriented development, advocated by the planning and building authorities. Compact development promotes ecomobility (ecological mobility) in terms of the ten-minute city travel model, which imply that all daily errands should be within walking distances (ten minutes maximum).

At the same time, there are some evolving concerns regarding the social implications of densification projects. Social segregation, gentrification, exclusion within public spaces, de-contextualised architecture, lack of social infrastructure and compromises regarding essential qualities of life are mentioned as some current negative outcomes associated with the compact urban development strategy. These concerns imply that ongoing renewal projects must seek solutions that stimulate beneficial social outcomes (read: attributes of liveability), to reverse these tendencies.

Concerning de-contextualised urban design, the concept of retrofitting should be relevant to redeveloping projects of industrial areas such as Haraldrud, in order to continue the local identity and genius loci of the area. Buildings or other features of potential cultural-historical value are, therefore, relevant to address in the site-specific analysis. Segregation and gentrification will, on the other hand, not be discussed further in this project report in relation to the redevelopment of Haraldrud, as a broader perspective and larger scope are required to discuss these issues.

TRANSFORMATION VS RETROFITTING

ILLUSTRATION 10: The new skyline of Bjørvika, "Barcode", Oslo.

ILLUSTRATION 11: Retrofitting of Orangeriet, a former industrial factory at Storhaug, Stavanger.

ILLUSTRATION 12: Illustration fo the transformation of Bjørvika (in the back) and Bispevika (in the front), Oslo, expected finalized in 2024. (Oslo Metropolitan Area, 2018)

ILLUSTRATION 13: Retrofitting of an old office building (in the middle), and protection of the chimney of the former tobacco factory at Marienfryd, Oslo.

ILLUSTRATION 14: The Økern Portal project, which imply a transformation of Løren, Oslo. (Flere store nybygg på Løren, 2017)

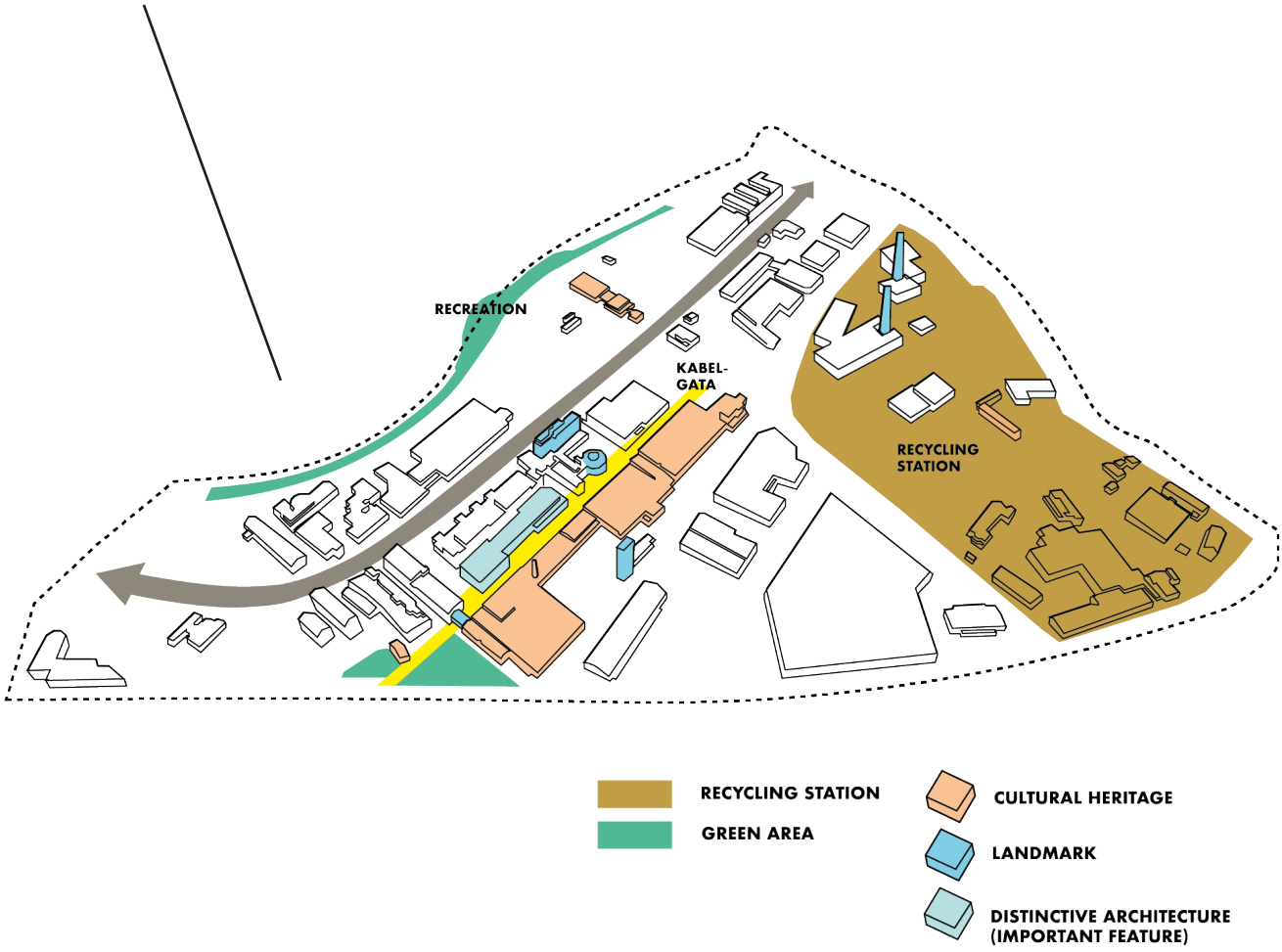
ILLUSTRATION 15: Retrofitting of Kanonhallen at Løren, Oslo, a former industrial workshop. (Kanonhallen, 2018)

PART 1

VITALISING HARALDRUD

"HARALDRUD WILL BECOME A LIVEABLE AND CREATIVE URBAN DISTRICT ON THE EDGE OF THE DENSE, INNER CITY. KABELGATA WILL BECOME AN ATTRACTION WITHIN HOVINBYEN."

(PBE, 2017, p. 21)



VITALISING HARALDRUD

CHAPTER 5

5.1 THE METROZONE: FROM INDUSTRIAL AREA TO VIBRANT URBAN HUB

Haraldrud is a former industrial area and an agricultural area within Hovinbyen. Probably, few of Haraldrud's attributes are familiar to the adjoining neighbours, due to its high degree of isolation and public inaccessibility and mono-functionality. The area is currently not optimally utilised nor liveable, considering the high level of pollution, noise, and heavy and through traffic. It is characterised as an industrialised area, consisting of local factories, stock halls, the local recycling station (Haraldrud gjenbruksstasjon), in addition to much parking space. Nonetheless, in conjunction with Oslo's transit-oriented expansion strategy, Haraldrud has been designated as a future 'metrozone' - a potentially densely mixed residential and business area. Efforts have subsequently been made to vitalise the industrial area, advocating significant interventions in the urban settlement (PBE 2015a; PBE, 2017a, p. 21).

There are three main reasons why Haraldrud is considered a potential liveable and densely built area:

1. The subway (T-bane) stations at Økern and Risløkka provide the basis for a sustainable transportation system, as it reduces the automobile dependency, considering the proximity to the inner city and the transport hubs at Økern and Breivoll.
2. The location between two of Hovinbyen's future large local centres, Økern and Breivoll imply proximity to work, commercial use, residential areas and various types of functions.
3. Considering Haraldrud's low utilisation and industrial environment today, in terms of a large parking space, and industrial use, Haraldrud gives a basis for vertical urbanism and a comprehensive development strategy, unlike residential and green areas.

The Agency for Planning and Building Services have prepared a site-specific analysis (the Plan Programme) and feasibility study (the Guiding Principle Plan of Public Space) that represent general guiding principles, concerning the future redevelopment of Haraldrud (PBE, 2015a; PBE, 2017a). The latter contains also suggestions regarding renewal of future public spaces within Haraldrud, as incorporated into illustration 29 (pp. 48-49).

Moreover, Haraldrud contains buildings of cultural-historical value, representing different historical layers associated with agricultural, industrial, and modern epochs. The former industrial area, with reference to Kabelgata, is still characterised by industrial features, in terms of red brick walls, large windows with iron jars, and one high chimney, as shown in illustration 18 (p. 37). Kabelgata has, moreover, been designated in the Guiding Principle Plan of Public Space as a potential catalyst for vitalisation. Because of the distinctive aesthetics, and proximity to mixed functions, such as Kuben Vocational Arena (upper secondary school), Hotel 33, and Eplehagen (public park), Kabelgata has been designated as the future catalyst of growth. Future projects must to some extent adapt to some of the determined cultural-historical structures, due to conservation measures, although the underlying vision of the plans implies that a considerable renewal process are needed in order to make Haraldrud a liveable area (PBE, 2017a).

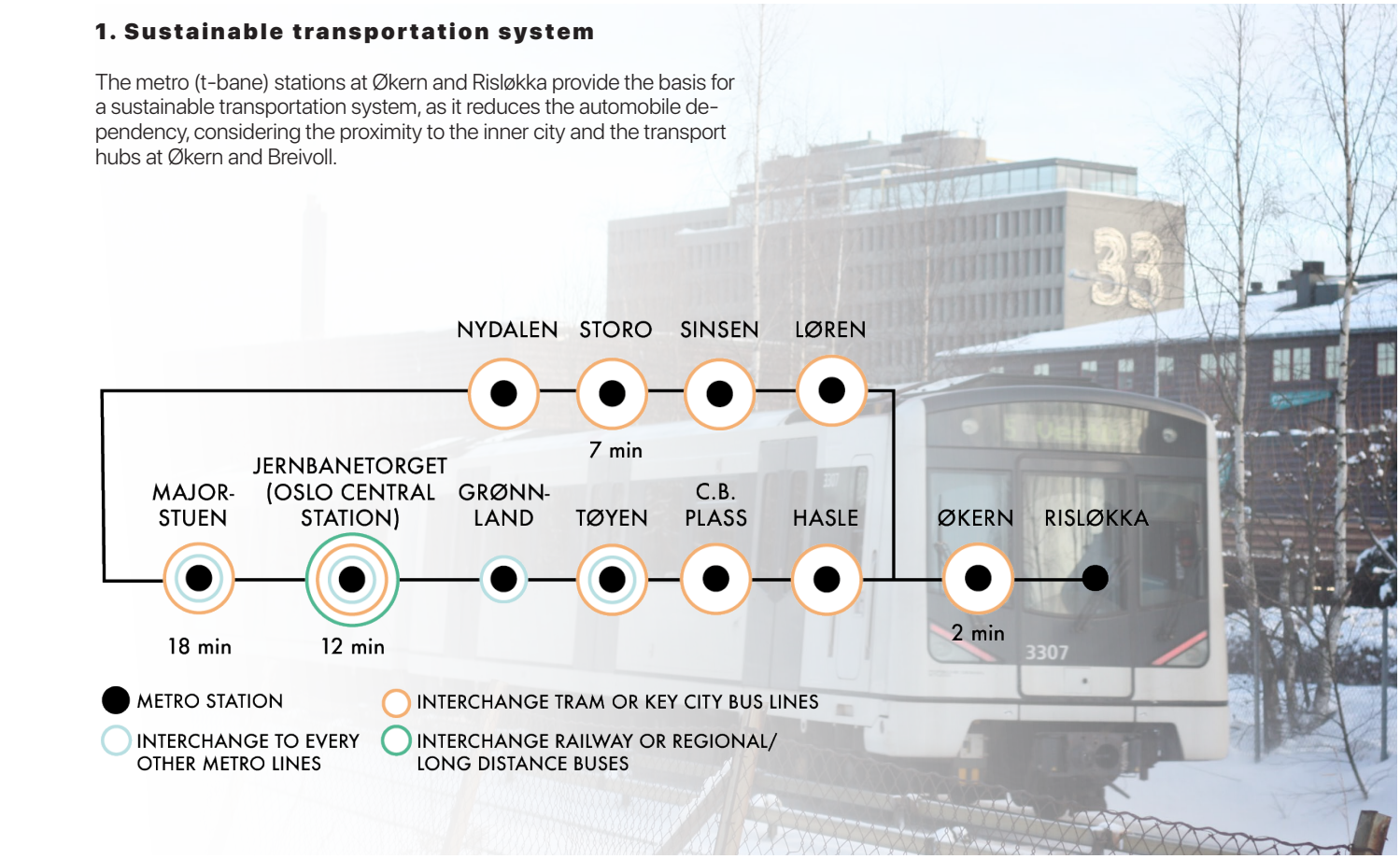
Currently, the responsibility to pursue these visions is transferred to the next phase of the redevelopment process, within which landowners, governmental entities, and private developers are engaged in interpreting the authorities' stance, and studying potential redeveloping opportunities for specific building plots within Haraldrud. Pursuing the plan is a challenge nonetheless, considering the entire area is currently considered not liveable. The main challenge in this regard is to determine how the redevelopment of Haraldrud should be programmed, in terms of prioritising measures and designing solutions to be implemented order-specificly within a long-term perspective.

A feasibility study of an individual plot may serve as a solution to these challenges. However, further knowledge about the current situation, should in this case be carried out prior to the main analysis and feasibility study, in accordance with the planning and building authorities' standards concerning plan proposals. Amendments were made to the procedure concerning the application for approval of planning proposals in Norway in 2014, with the intention of streamlining the consideration process. The amendments implied that an elaboration of some essential site-specific attributes was required in any formal planning proposals (PBE, 2015b, p. 5). These attributes, cf. table 1

THREE ESSENTIAL RENEWAL PREREQUISITES OF HARALDRUD

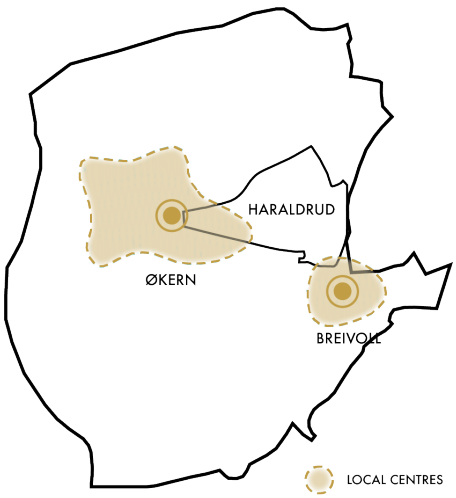
1. Sustainable transportation system

The metro (t-bane) stations at Økern and Risløkka provide the basis for a sustainable transportation system, as it reduces the automobile dependency, considering the proximity to the inner city and the transport hubs at Økern and Breivoll.



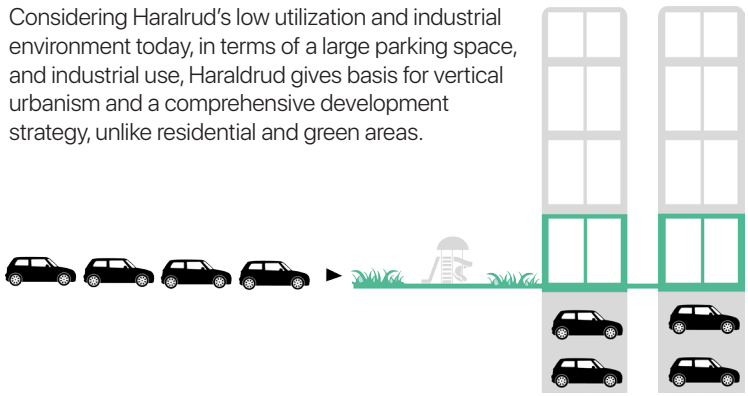
2. Økern and Breivoll within walking distance

The location between two of Hovinbyen's future large local centres, Økern and Breivoll means close proximity to work, commercial use, residential areas and various types of functions.



3. High utilization potential

Considering Haralrud's low utilization and industrial environment today, in terms of a large parking space, and industrial use, Haraldrud gives basis for vertical urbanism and a comprehensive development strategy, unlike residential and green areas.



(p. 33), are introduced in the Agency for Plan and Building Services' guiding notice regarding site-specific analysis. Hence, these aspects, cf. table 1 (p. 33), should be incorporated to this thesis, as they provide relevant analytical elements (PBE, 2015b).

The purpose of part 1 of this project report is to prepare a site-specific pre-analysis, following these attributes, which focus on the large structure (in situ: Haraldrud) and long-term development. The first part of the project report concentrates on the initial research question:

What general densification principles may contribute to the vitalisation of Haraldrud?

In the following sections, relevant aspects of the initial research question are sorted out by means of four methods, hereunder map registrations, literature study, urban drifting and vox pop. The structure of the site-specific analysis (and part one) reflects the research questions, cf. chapter 3.1: (1) What is status quo? and (2) what are the plans for the future? Firstly, chapter 5.2-5.4 will elaborate on the first research question. Then chapter 5.5-5.7 will elaborate on the second research question.

5.2 MAP REGISTRATIONS AND LITERATURE STUDY

Parts of the selected information regarding today's situation is based on existing map data and literature, cf. Chapter 3. Map registrations refer to quantitative information regarding basic geo-spatial conditions: topography, morphology, noise, sun path, public transport and green structure. These conditions are determined in illustration 26 (p. 44), based on the framework of the site-specific analysis, prepared by the Agency for Planning and Building (PBE, 2015b).

Existing literature has been used in this regard to collect qualitative information about the current situation, historical development and sources of law regarding the future development of Haraldrud. Laws and regulations referred to in this chapter are enclosed in the Appendix, in attachment 3. Relevant sources of law have been selected based on a critical assessment, cf. section 5.2.4 (p. 16). These sources of law include respectively the adopted Municipal Master Plan (2015), and guiding planning documents prepared by the Agency for Planning and Building, including: the Plan Programme (2015) and the Guiding Principle Plan of Public Space (2017) regarding Haraldrud. The documents, prepared by the Agency for Planning and Building, includes a site-specific analysis of Haraldrud, which provides a brief description of the current situation, challenges and opportunities related to the future development, and the municipal authorities principle recommendations regarding the future redevelopment and exploitation of the area (PBE, 2015a, pp. 19-31; PBE, 2017a).

Aspects that are considered to be sufficiently examined by other sources in this regard include: topography, noise, air and soil pollution, green structure, sun path, and historical development. These data have not been investigated further in this regard. Other aspects that relate to the sense of place, including accessibility, mental barriers, attractive and unattractive features, are further investigated and discussed in the case study. The interpretation of these aspects is based on subjective experiences from urban drifting, and the site description of the literature mentioned above.

As this project report aims to prepare a suggestion for densification of two plots (in part 2), it is considered relevant to meet the Agency for Planning and Building's criteria in this project report. The site-specific analysis of part 1 and part 2, therefore, determine the elements cf. table 1, as the comment imply.

Attachment 1, contains an extract from the thematic map of the adopted Municipal Master Plan, regarding future green structures and road connectors. The measures of the thematic maps are statutory, and not only recommended by the Guiding and Principle Plan of Public Space (2017), cf. illustration 29 (pp. 48-49). Apart from the historical development, the cadastral survey and altitude study, all aspects are implemented in the summary of the site-specific analysis, cf. illustration 20-26 (pp. 43-44).

Table 1: What site-specific analysis should comprise

Important site-specific aspects	Criteria	Comment
Historical development	*Important historical aspects and features of cultural-historical value*	*This is elaborated in section 5.2.1.*
Essential items	*Measure parks, squares, distinctive landscape formation, walkways and landmarks.*	*It is impossible to measure all items in detail, so the mapping should not be too extensive. Special considerations have been given to important features of todays situation, designated in illustration 20-26 (p. 37-38).*
Landscape	*Measure urban pattern, specific landforms, altitude, land use, density, street network, and built environment*	*Information about the altitude of the site is examined in the case study of part 2. Land use regulations, cf. the adopted Municipal Master Plan (2015) is shown in illustration 16.*
Property mapping	*A cadastral survey*	*This information is obtained from the Guiding Principle Plan of Public Space (PBE, 2017a, p. 17) and the Norwegian Cadastre and Land Registry (Kartverket), with reference to chapter 6.2. A cadastral survey of Haraldrud is also shown in attachment 6, in the appendix.*

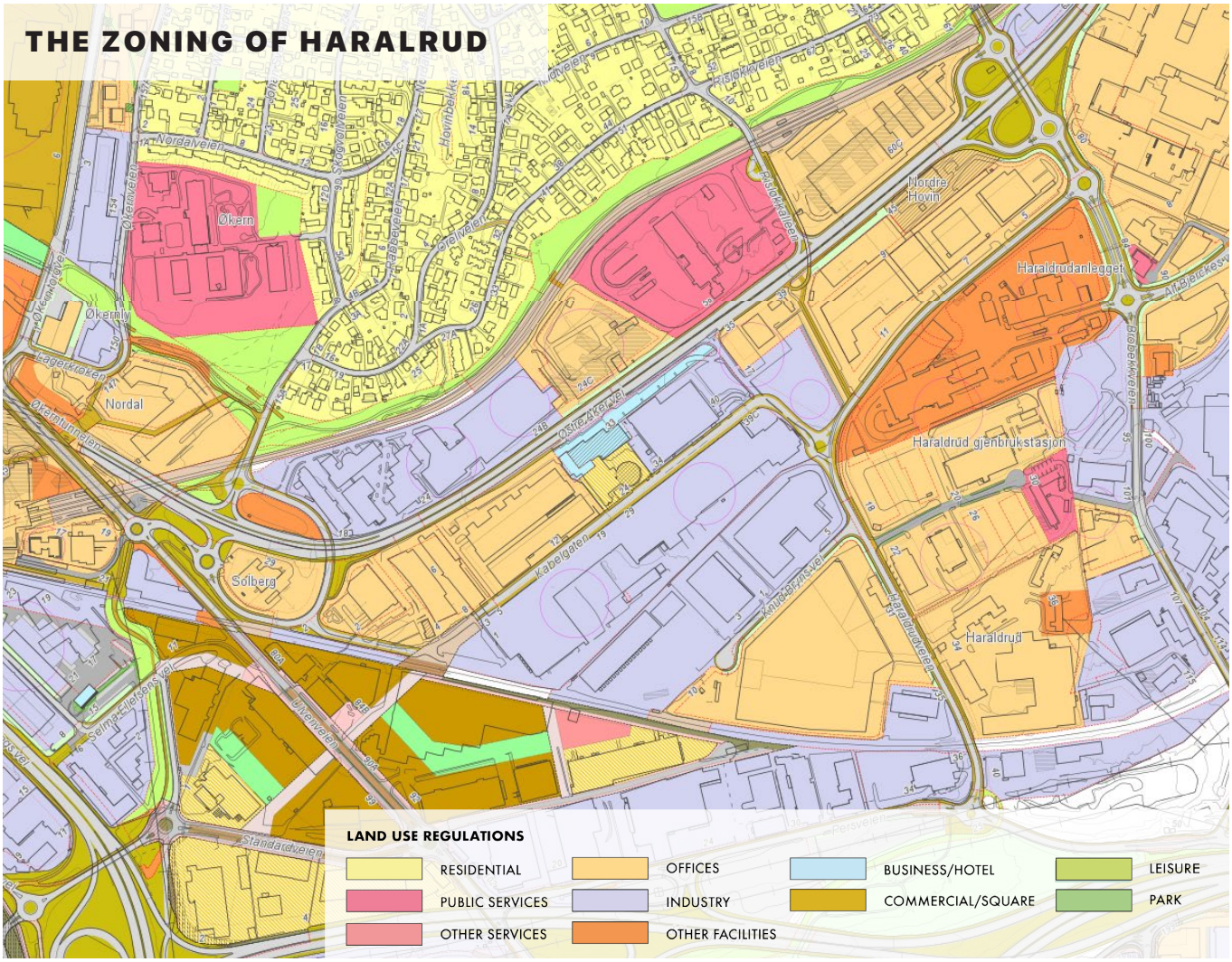
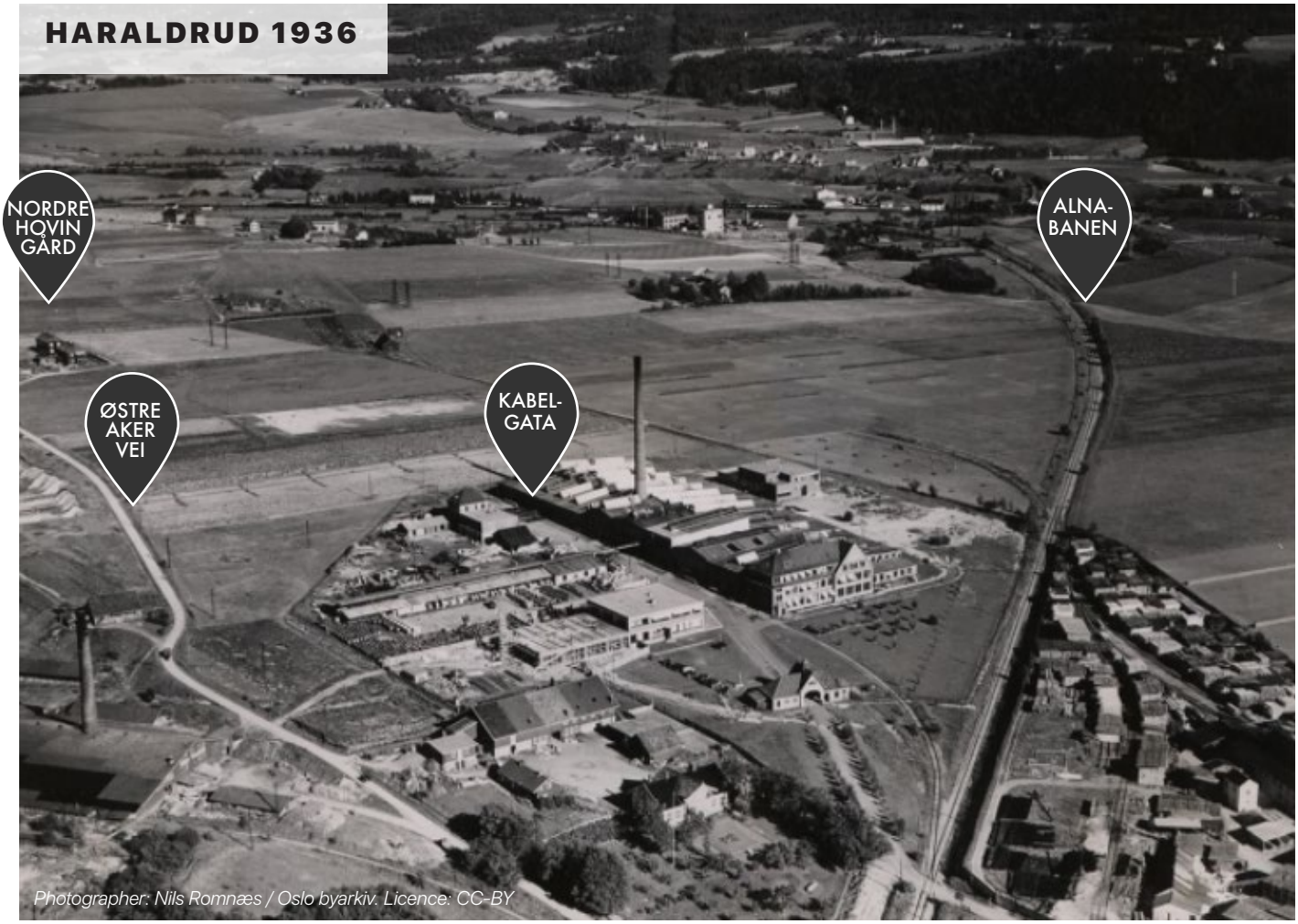
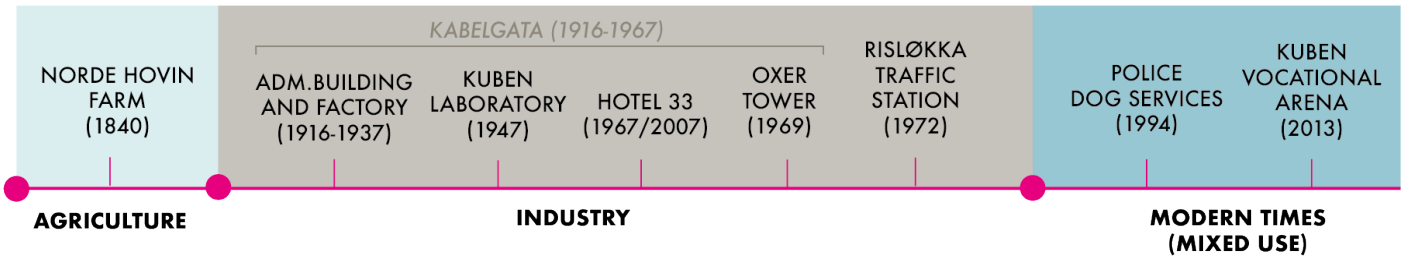


ILLUSTRATION 16: The zoning of Haraldrud (Oslo Kommune, 2018)

ILLUSTRATION 17: Haraldrud 1936, taken by Nils Romnæs (Digitalmuseum, 2018)



THE HISTORICAL DEVELOPMENT TIMELINE



5.2.1 Conservation of the historical development of Haraldrud

In light of increasing population growth and current compact development strategy of Oslo, densification projects of transformation areas must continuously adapt to essential sources of knowledge, existing qualities and identity features as well as creating denser and more attractive solutions for urban areas. Important physical features with historical value, some of which pointed out in illustration 18, must in this regard be conserved in the future development of Haraldrud to conserve historical qualities and the 'genius loci' of the area (PBE, 2017, p. 19).

Based on the National Director of Cultural Heritage's register of cultural heritage, some of the constructions and green features at Haraldrud are considered to have high cultural-historical value, as shown in illustration 24 (p. 43) and 26 (p. 44). These features include both buildings listed on the 'conservation and protection measures list' and the municipal yellow list, all interpreted as identifying qualities as they represent important associations to the past of Haraldrud. The features relate to the historical development, including three main phases: Firstly the agriculture at the 19th century, secondly the industrial epoch at the beginning of the 20th century, and modern times starting at the beginning of the 21st century. The Municipal Master Plan describe the features related to the first two epochs as representations of the following back curtain: (1) the nation building and the industrial city (the 19th century) and (2) the equality and modern city (the 20th century) (Oslo kommune, 20215b, p. 66). New elements shall in conjunction with the redevelopment process adapt to these old elements, while designated conserved buildings could be retrofitted into new functions and modern standards.

The conservation status varies between the specified buildings, as the status implies different legal terms and conditions of use. Conservation (vern) implies that the construction is part of a consideration zone (hensynssone), which provides requirements of restrictions and action terms to safeguard the interest of the municipality, specified by the land-use element of the Municipal Master Plan, cf. the Planning and Building Act § 11-8. In general, the conservation status does imply that the construction may be retrofitted, provided that the historical value is safeguarded, based on a critical assessment and approval by the municipal authorities.

The yellow list (kommunalt listeført) implies that the Cultural Heritage Authority designates the building as a proposal to the revision of the Municipal Master Plan. Construction on the yellow list is thus not assessed by the city council, and the protection is not statutory. The latter applies to the driver and vehicle licensing office at Risløkka (Risløkka trafikkstasjon) and the location of the police dog services (Politiets hundetjeneste).

5.2.2 Cultural-historical qualities at Haraldrud

Before the industry was established at Haraldrud in the early 20th century, the area was an agricultural area in Østre Aker, within the old Aker Municipality. A reminder from this time is Østre Aker vei and Nordre Hovin Gård (Nordre Hovin farm), as shown in illustration 17 (p. 35). Nordre Hovin Gård dates back to the third quarter of the 19th century (Riksantikvaren, 2017).

In 1916, the settlement of industrial factories expanded, under the auspice of the Standard Telefon og Kabelfabrikk (Standard telephone and cable factory) company. Some of the buildings along Kabelgata belong to this period, as shown in illustration 18.

The last building of historical importance within the area, according to the adopted Municipal Master Plan, is Hotel 33, formerly the administration building of Standard Telefon og Kabelfabrikk, and converted into a hotel in 2007.

Buildings on the yellow list include the driver and vehicle licensing station at Risløkka (Risløkka trafikkstasjon), built in 1972, and the police dog services, built in 1995. The Cultural Heritage Authority's motivation for the designation is that they represent special nutrition and architecture in relation to the variation of cultural-historical structures within Hovinbyen. Since the driver and vehicle licensing station at Risløkka is situated on the plot of the feasibility study of part 2, a more detailed assessment regarding the building, concerning conservation and retrofitting potential, is elaborated in chapter 6 (p. 63) (Byantikvaren i Oslo, 2018a; Byantikvaren i Oslo, 2018b).

ILLUSTRATION 18: Remaining parts of STK´s old factory at Kabelgata

5.3 URBAN DRIFTING

The urban drifting, as part of this case study, consisted of four inspections in total. Illustration 19 (pp. 40-41) shows the whole route combined, including three different entrance points. The entire route was divided into four inspections to measure all public spaces within the area. Also, it was relevant to examine the different perspectives and experiences related to the different entrance points leading into the area. In that conjunction, it was essentially interesting to examine the connectors between each entrance point to Kabelgata, to measure the most accessible ways to enter the site by walking.

The study aimed to measure essential features within the specific area that would supplement the information obtained from the map registration and the literature study, cf. chapter 5.2. This method mainly emphasises the emotional experience of the area, and how human-friendly the built environment is, in regards to soft mobility such as pedestrians and cyclists. Soft mobility also includes wheelchair users, people using prams or other vehicles devices, and people with disabilities. Essential elements to consider in this context are therefore: (1) access points, physical and mental barriers, and generally how well the physical environment is organised in regards to human scale, and (2) the absence or presence of qualities of urban design that stimulates positive associations, in terms of imaginability, transparency and complexity, cf. section 3.4.2 (p. 18).

These key attributes are measured and evaluated, as shown in illustration 19 (pp. 40-41), and further incorporated in illustration 21 (p. 43) and 26 (p. 44), which summarises the situation, based on the site-specific analysis. Below is a summary of the four inspections related to the survey of Haraldrud, as a comment to illustration 19 (pp. 40-43).

5.2.1 Summary of the survey

Firstly, in terms of accessibility, many barriers, both visible and invisible, were surveyed within the area, due to the over-dimensioned built environment, the heavy traffic, and many fences, as illustrated in illustration 19 (read: unreachable area). The area, except for Kabelgata, entirely promotes a car-based experience. As a result, there is little room for exploring the area by walking. The findings imply that several streets and outdoor spaces within the area are associated with poor imaginability and low complexity, and in that sense feels uninviting and homogeneous. The street network consists of few accessible roads for walking. Each road leads to mainly one direction through the area, as there are very few forks in the road. As shown in illustration 22 (p. 43), this creates mainly two long axes between the three access points. Also, the area is divided into three sub-areas: the north side of Østre Aker vei, the south side of Østre Aker vei, and the recycling station.

Secondly, transparency plays an important role in how to lead people into an area. In this case, several areas can be referred to as critical links between the different zones of Haraldrud, where - due to low transparency and lack of signages - unpredictability and confusion arise as to where one is are heading. The entrance points on each side of Kabelgata are examples of places where the built environment does not indicate that the pedestrian is heading to Kabelgata. Also, the passage from Kabelgata to the pedestrian bridge across Østre Aker vei is perceived as very inaccessible, as the pedestrian connectors between these points are perceived as a private area or a dead end.

Thirdly, Østre Aker vei is perceived as a clear physical barrier, where the pedestrian bridge by the subway station Risløkka T and the underpass for pedestrian beneath the subway station Økern T are the only options to cross the road. It is not likeable to walk along Østre Aker vei, even though there are pavements along parts of the road. Much traffic and narrow pavements create an unpleasant atmosphere, with regard to imaginability and human scale. South of the area, at the point of where Haraldrudveien and Persveien intersect, a steep footpath leads to a park area close to Østre Aker Cemetery. The path is relatively steep and narrow, and currently (March 15) just trodden in deep snow. The footpath is not an accessible path for wheelchair device users. Both Haraldrudsveien and Persveien are perceived as unattractive roads with regard to soft mobility, given the high traffic volume, which consists of heavy transport and the industry close to the road. Also, based on one of the inspections, a smell from the recycling station can drift into Haraldrudveien.

Fourthly, the industrial areas and large warehouses limit the public's access to several areas within Haraldrud. These areas represent the unreachable territory, as shown in illustration 19, due to physical and mental barriers. In this case, mental barriers imply that an area seems private or visually inaccessible, or a road seems like a dead end. It also implies that no inspections have been conducted in these areas. The 'observed environment' thus represents the opposite, called the public space within Haraldrud. The interpretation of these areas are solely based on urban drifting, cf. chapter 3.4.

As regards vitality, Kabelgata seems like the most vital place compared to other public spaces within the area, besides the subway stations (Risløkka T and Økern T). Most people are in this regard observed in the south area of Kabelgata. Within about 30 minutes, during the inspections (between 11.00 and 13.00), 10- 30 people were observed in Kabelgata Tuesday, Thursday and Friday, while only one person was observed on Sunday. Cars, vans and trailers are the dominant means of transportation at all roads at Haraldrud. The parking lots, both along Kabelgata and at the northern end of Kabelgata, are occupied during the daytime, and cars were driving to and from the area relatively often compared to soft mobility.

5.4 VOX POP

Vox pop was implemented as part of the case study, with the intention of collecting different users' impressions of Haraldrud - about the current situation and the future redevelopment. The main benefits of vox pop are the possibility to (1) meet the users face to face, and (2) to conduct the interview in the relevant environment. Thus, one can "feel the context" while speaking, as opposed to if you conduct the interview outside the actual environment. On the other hand, the spontaneous setting can be perceived as stressful to some interviewees. It is challenging to build confidentiality between the interviewer and the interviewees in such a short time and unpredictable setting. Also, the interviewees are relatively randomly selected in this case, as they happen to be on the site just as the vox pop took place.

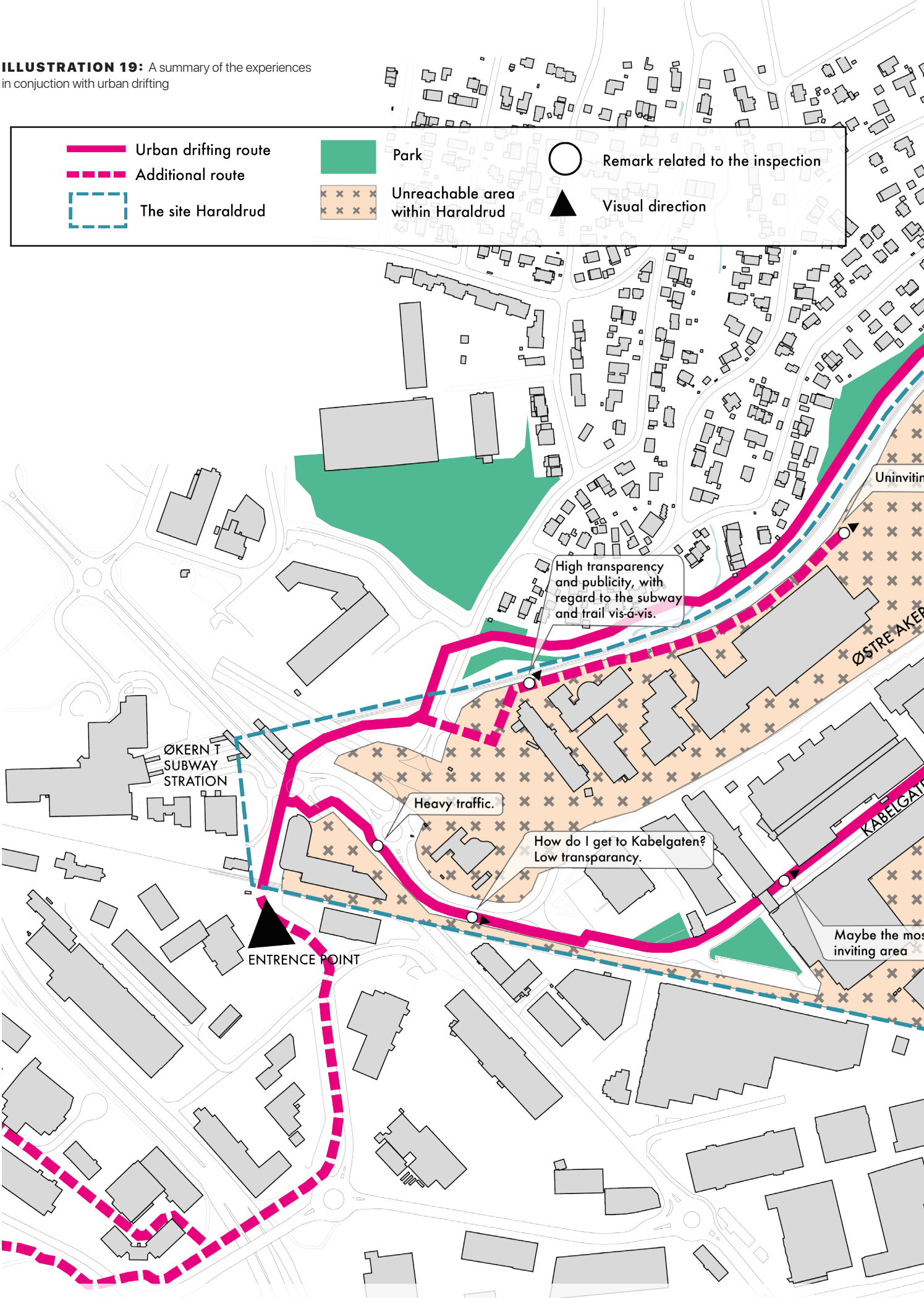
An essential prerequisite for the interviews conducted in this vox pop was to establish a sense of reciprocity between the respondents and myself, the interviewer, to begin with, to give the respondents the feeling that their attitude was important to me. Therefore, I started each conversation by introducing myself and the study, while I was emphasising that my interest was to understand what the users thought about the situation today and what they did there and thus making them interesting actors to this study. My experience was that the respondents became more positive and approachable after hearing this introduction. All respondents were further asked the following questions:

1) What did they call the area around Kabelgata? And where is Haraldrud according to their mental map?
2) What was their connection to the area? Did they work, study, or visit the place at the time?
3) Was there anything in the area that they liked in particular, which they thought should be conserved in a future transformation?
4) Was there anything they would wish to add to the area in a future redevelopment?

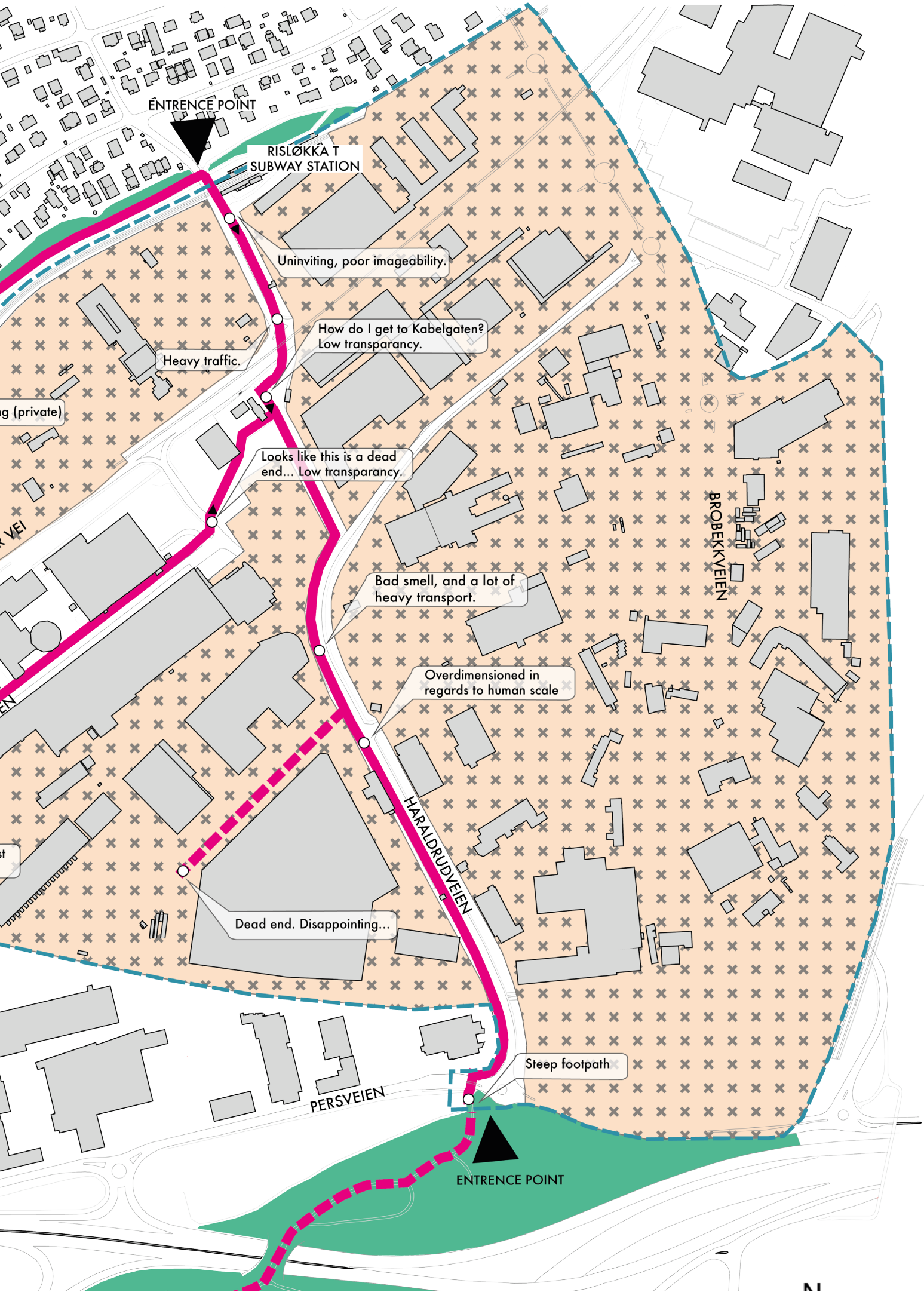
Each interviewee was unprepared. Also, most of the interviewees seemed generally little interested in the subject they were asked about, which I guess is partly due to the spontaneous framework of the interview. Most of the interviewees responded as follows: "I do not know" or "I have no opinion about the matter" (read: to question 3 and 4). I do not expect that these spontaneous reactions and answers reflect the whole attitude of the users of Haraldrud. It is essential to be aware that vox pop as a method cannot be regarded as a qualitative study, in regards to the comfort of the interviewees, their different connection to the area, and the time they had to reflect. At best, vox pop can give an indication of the users' associations to the specific site, and thus contribute to additional information which can support the site-specific analysis.

A total of ten people were interviewed within about half an hour. Age and personal connection to Haraldrud varied among the various interviewees. I will generalise the respondents into the following groups: Two older adults, four young people (16- to 19-year-olds), and five adults. Four of them were students at Kuben, two worked in the area, and four of them were there in conjunction with a one-time errand.

ILLUSTRATION 19: A summary of the experiences in conjuction with urban drifting



THE EXPERIENCE FROM URBAN DRIFTING


ENTRENCE POINT
RISLØKKA T
SUBWAY STATION
Uninviting, poor imageability.
How do I get to Kabelgaten?
Low transparancy.
Heavy traffic.
g (private)
Looks like this is a dead
end... Low transparancy.
BROBEKKVEIEN
Bad smell, and a lot of
heavy transport.
Overdimensioned in
regards to human scale
HARALDRUDVEIEN
Dead end. Disappointing...
Steep footpath
PERSVEIEN
ENTRENCE POINT

The number of respondents is a particularly critical variable to determine how representative the total respond is. The response from this vox pop is not a representation of the opinion of all users, given the low number of respondents relative to all users that visit the area on a daily basis. The answers, therefore, provide only an indication of what some users may think about the area.

The vox pop had to be conducted during week 11. A critical assessment was further made regarding time and place of the vox pop, compared with a selection of alternatives. The time and weather when the vox pop was conducted indicated that more people would probably be outside, relative to other alternatives. In particular, I wanted to meet those who worked and studied within the area. The place where the interviews were conducted, had been observed earlier during the urban drifting, cf. chapter 5.3, and seemed like the most "vital" place in the area. The vox pop was conducted on a Thursday, between 11.30 and 12.00. The date of the vox pop was March 15, 2018, which was a comparatively sunny and warm winter day, where the temperature was minus 1 °C.

I decided to quit the vox pop after finishing the tenth interview during 30 minutes because of the following reasons:
(I) Those who had been interviewed for the time being were representing a sufficiently diverse group, considering their age and connection to the area,
(II) I met very few people on the site during the 30 minutes (I counted 20 people in total), and
(III) I could interpret from the overall response that everyone had minimal positive feelings and minimal associations to the area, even those who worked and studied there daily.

The response from vox pop implied that Haraldrud has a low functionality and a low variety of optional use, considering every respondent was only involved with their own 'necessary task' in the area (here: school, work or errands). Few of the respondents had an opinion about qualities or positive/negative features in the area. The students at Kuben that I was talking to told me they did not use the outdoor area during the breaks, except for the roof of Kuben, but instead went to the city centre or the closest grocery store at Økern. The basketball court on the roof of Kuben was, according to all of the students I was talking to, the most popular outdoor place in the area, where most students stayed in the breaks. However, no one of the respondents stayed at Haraldrud any longer than necessary, he or she told me. Had I been able to interview them again, I would ask if the roof was open outside school hours and if it was enough space for everyone to hang there at the same time.

Their answers, however, confirms my own experience of an empty place, in particular when I explored Haraldrud in the weekend, on a Saturday and a Sunday. It indicates that the area is presumably associated with few particular or positive experiences associated with the existing environment. Only a couple of the interviewees mentioned the industrial impression along Kabelgata as a positive association.

Another interesting experience from vox pop was that everyone called the area Økern, not Haraldrud (read: to question 1). The name Haraldrud was only associated with the recycling station, cf. illustration 26 (p. 38). I decided that the study provide sufficient information to say something about the current situation. However, as emphasised above, vox pop is only a small contribution to the case study and refers only to some associations to the area.

5.5 CURRENT PLANS REGARDING THE FUTURE DEVELOPMENT OF HARALDRUD

A Plan Programme, prepared June 26th, 2015, and a Guiding Principle Plan of Public Space, prepared May 22nd, 2017, are the current plans that explicitly focus on the future development of Haraldrud. Prior to the preparation of these plans, Oslo's Municipal Master Plan, adopted September 29th, 2015, set out principle and legal guidelines explicitly regarding the future development of Hovinbyen, as introduced in chapter 1, including the district of Haraldrud. The Municipal Master Plan is also a further interpretation of national and regional guidelines, respectively the Government Planning Guidelines for coordinated housing, area and transport planning, adopted September 26th, 2014, cf. § 6-2 of the Planning and Building Act, and a Regional Master Plan concerning the area and transport planning of Oslo and Akershus, adopted December 2015, cf. § 8-2 of the Planning and Building Act

CASE STUDY

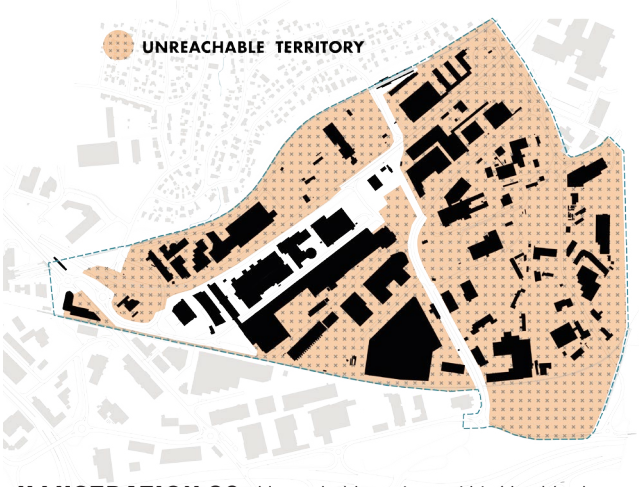


ILLUSTRATION 20: Unreachable territory within Haraldrud.

ILLUSTRATION 21: the experience from urban drifting. Each experience is average (relatively good) or lower (medium-poor).

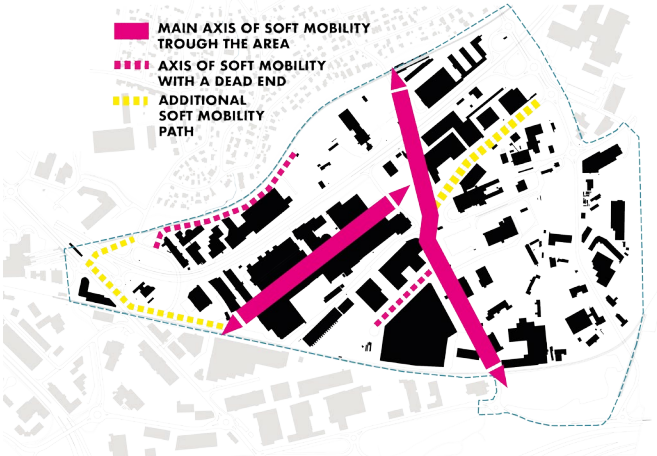


ILLUSTRATION 22: The axes of soft mobility

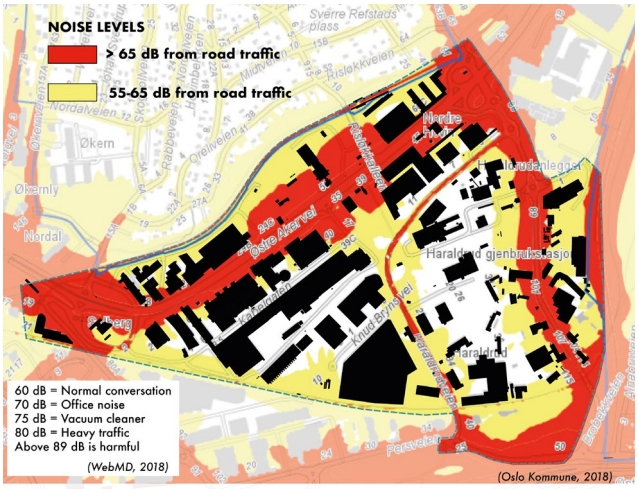


ILLUSTRATION 23: Noise from traffic. (Oslo Kommune, 2018)

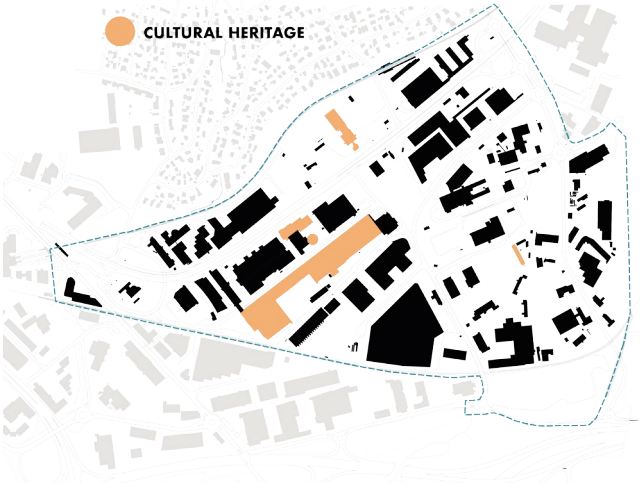


ILLUSTRATION 24: Buildings of cultural-historical value, according to cultural heritage authorities.

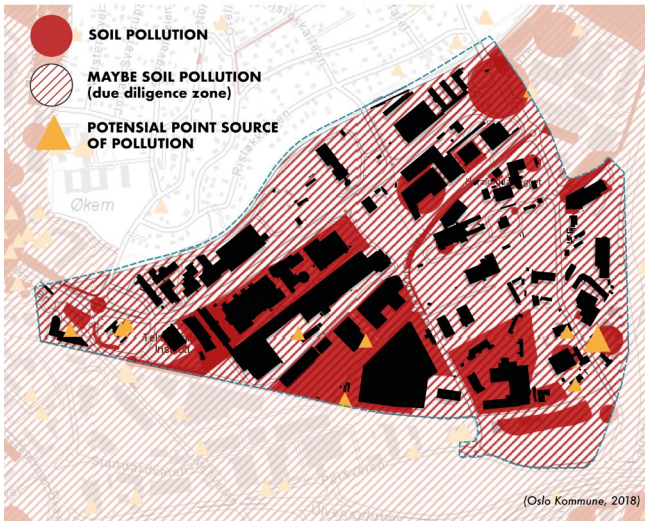


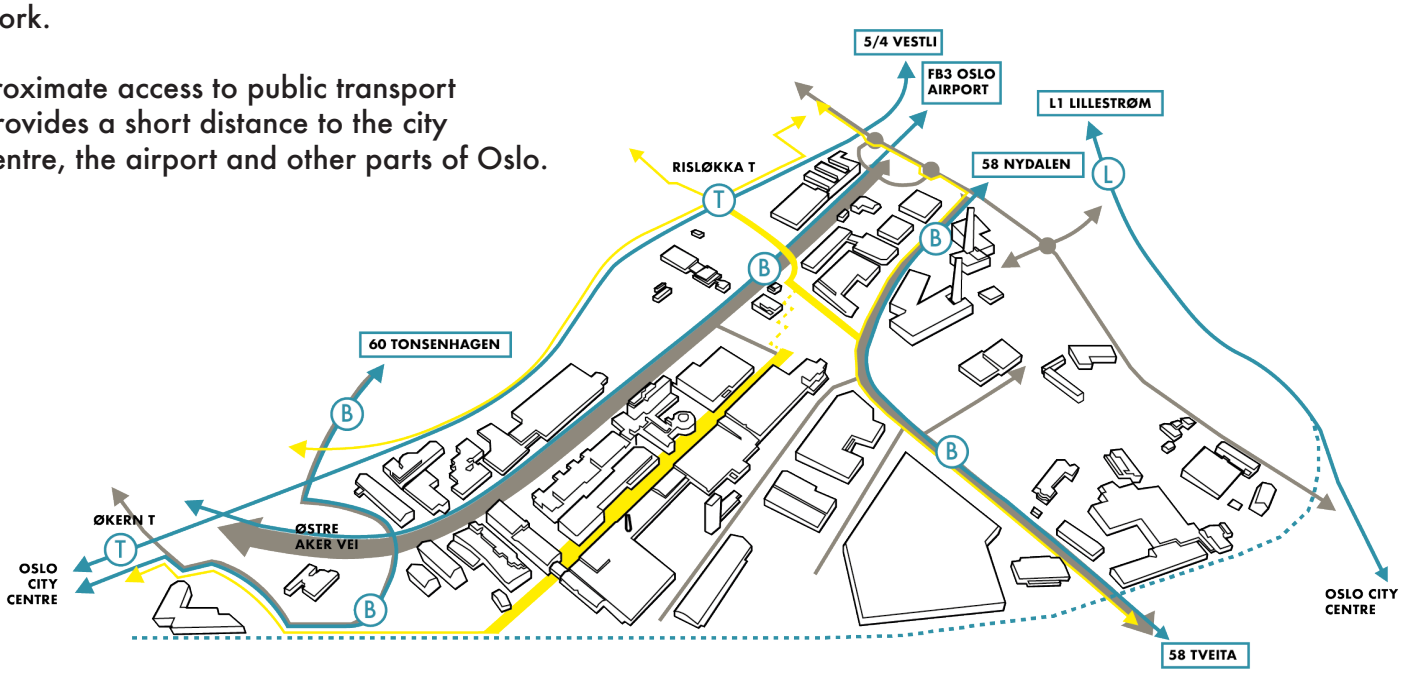
ILLUSTRATION 25: Soil pollution (Oslo Kommune, 2018)

SITE-SPECIFIC ANALYSIS OF THE CURRENT SITUATION

The area entirely promotes a car-based experience, except for Kabelgata, which is designated as the centre of Haraldrud.

The urban settlement is defined by low density building sprawl, and little pedestrian-friendly connectors. The area lacks a coherent and attractive pedestrian network.

Proximate access to public transport provides a short distance to the city centre, the airport and other parts of Oslo.



The urban landscape is segregated due to the street network, including Østre Aker vei.

Parts of the urban settlement along Kabelgata, bring a unique cultural-historical sense to the area - representing the 'genius loci'.

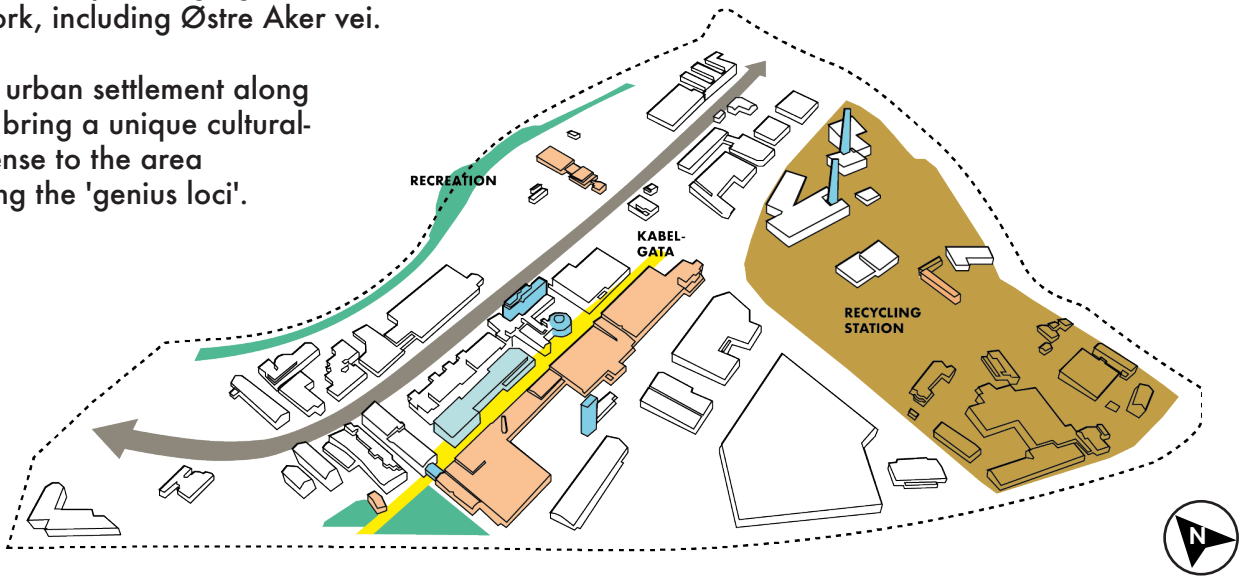


ILLUSTRATION 26: A site-specific analysis of the situation, determined by means of the case study of Haraldrud, cf. chapter 3 and 5.

(Lovdata, 2018a). The redevelopment of Haraldrud thus represents a top-down based and gradual process of governance, as shown in illustration 27.

The first initiative concerning the future development of Haraldrud is set out by the adopted Municipal Master Plan (2015) and the Strategic Development Plan of Hovinbyen, prepared June 30th, 2016. These two plans cover the relevant and superior municipal planning policies in this regard. Based on these guidelines, the Agency for Planning and Building Services of Oslo prepared the Plan Programme and the Guiding Principle Plan of Public Space, both focusing explicitly on Haraldrud. Part 1 of this project report focus on these three levels of governance, cf. illustration 27, while part 2 will focus on the next level of governance and phase of the process, as introduced in chapter 2.3. A summary of aspects relevant to part 1, is reproduced in chronological order in the following sections.

5.5.1 The municipal transit-oriented development principle

According to the Municipal Master Plan, titled "Oslo by 2030", Oslo Municipality wish to reduce 50 percent of the greenhouse gas emissions, compared to the 1991 level, by 2030 (Oslo kommune, 2015a, p. 31). This implies that the number of vehicle in-use must be restricted, while all growth in passenger transport must be taken by public transportation, cycling and walking. At the same time, a significant increase of Oslo's population is expected. According to the Norwegian Statistics' (SSB) projections, we should expect almost 200.000 more inhabitants in Oslo by 2040 (SSB, 2018). In addition, Greater Oslo, comprising 12 municipalities and about 1 million inhabitants, is expected to grow and thus expand in terms of more housing, working places and a more efficient transport system (SSB, 2017) (Oslo kommune og Akershus fylkeskommune, 2015). The annual growth of population in Greater Oslo has been about 17.000 people over the last few years (SSB, 2016). This implies that about 100.000 new housing units and 5-6 million m2 further area for trade and industry is needed in Oslo Municipality by 2030 (in 2015), according to the Municipal building and planning authorities (Oslo kommune, 2015a, pp. 34-35).

The stable forecasts of population growth and the aim to reduce the amount of polluting mobility have, since the year of 2000, legitimised the expansion strategy based on the principle of a compact "inside and out" and transit-oriented development. Specifically, the adopted Municipal Master Plan suggests densification and urban reinvention of primarily three large areas within Oslo, including the Inner City (Indre by), the West Corridor (Vestkorridoren) and Hovinbyen (the East Side of the Inner city). Also, it implies that new settlements should primarily take place around public transits. The Municipal Master Plan § 11.2, imposes in that connection 125 percent minimum built utilisation on the area around public transits in Oslo's so-called "outer city", referring to Hovinbyen (Oslo kommune, 2015b, pp. 26-27). The purpose of this strategy is that the redevelopment of Hovinbyen should provide a continuous expansion of the Inner City which follows the subway line, including the 4th and 5th subway line towards Vestli, cf. illustration 26 (p. 44) (Oslo kommune, 2015a, p. 48).

LEVELS OF GOVERNANCE	RELEVANT GUIDING PLAN DOCUMENTS
Norway (Country)	Central Government Planning Guidelines (2014)*
Oslo and Akershus (County)	Regional Master Plan (2015)*
Oslo (Municipality)	The adopted Municipal Master Plan (2015)*
Hovinbyen (District)	Strategic Development Plan (2016)**
Haraldrud (Smaller district)	Plan Programme (2015)** and Guiding Principle Plan of Public Space (2017)**
Østre Aker vei 50/ Brobekkveien 87 (Plot)	Combined feasibility study (2018)***

*) Highest ranked source of law, with the Planning and Building Act as legal basis,
**) Second highest ranked source of law,
***) Third highest ranked source of law, cf. section 3.2.4 (p. 14)

ILLUSTRATION 27: Top-down based planning documents regarding the redevelopment of Haraldrud (cf. part 1) and the site Østre Aker vei 50 and Brobekkveien 87 (cf. part 2)

5.5.2 The urban reinvention of Hovinbyen

The Municipal Master Plan is prescribing that any new development within Hovinbyen must implement a number of conditions, cf. § 11.2, with the aim of creating a positive urban reinvention of Hovinbyen (Oslo kommune, 2015b, p. 26). One of these regards implementation of specific urban qualities. These requirements include: High architectural quality of any newly built settlement, incorporation of a sufficient number of available public urban spaces exposed to the sun, and human-friendly ground floors that provide commercial services, while the remaining floors should provide office and residential purposes. In addition, good accessibility, which prioritises soft mobility, such as pedestrians and cyclists, and local traffic rather than through-traffic must be ensured through a dense street network which at the same time provides a safe, interconnected internal and external road network. Simultaneously, existing qualities, or any source of identity in each sub-area of Hovinbyen, should be conserved. An accessible public transport system with frequent departures will also be organised, and residential and work areas must be protected against noise and air pollution. There must also be considered areas sufficiently assigned for social, blue-green, technical and cultural activities, including public institutions (such as schools, nursery homes, and nursery schools), sports facilities, water resilience and more (Oslo kommune, 2015b, pp. 26-27).

5.5.3 The vitalisation of Haraldrud based on the Municipal Master Plan, including the implementation of a green ring

All of the seven different thematic maps (Temakart) attached to the adopted the Municipal Master Plan, regarding: noise, air pollution, natural environment, cultural heritage, accident estimates, and blue-green structures, must be implemented in the future development of Haraldrud. Relevant aspects are included in the site-specific analysis cf. illustration 23-26 (pp. 43-44). An extract of the seventh thematic map (T7) regarding blue-green structures at Haraldrud is enclosed in Attachment 1. This thematic map shows a planned green pedestrian path, connecting the existing green walkway routes on the north and south side of the area. In the Guiding Principle Plan of Public Space, this walkway is part of a 5.5 km long green ring, cf. illustration 29 (pp. 48-49). The green ring should appear as a soft mobility-friendly park as well as a pedestrian connector, which interconnects with the primary road network, and other park facilities, subway stations (Økern T and Risløkka T), the new central public square cf. number 3 in illustration 29, and a future tram line along Haraldrudveien. Recommended by the Guiding Principle Plan of Public Space, the green pedestrian ring should cover the width of 18 to 30 meters, and contribute as an attractive public space and recreational facility (Oslo kommune, 2018; PBE, 2016a, pp. 30-32).

The pavement along Haraldrudveien also intersect with another proposed lager recreational green ring, introduced in the Strategic Plan for Hovinbyen, with the purpose of linking the sub-areas around Økern together (PBE, 2016b, p. 46).

5.5.4 Østre Aker vei

In the thematic map T7, cf. attachment 1, Østre Aker vei, which today appears as a major barrier between the north and south side of Haraldrud, is regulated as an important mobility axis comprising green features. A reduction of both the road's effect as a barrier and its environmental impact on the area, are prerequisites for transforming Haraldrud into a more attractive and viable place, suitable for implementing residential and commercial areas, according to the Guiding Principle Plan of Public Space. This implies that facilitating new pavements, bicycle lanes and crossovers along Østre Aker vei is necessary, in order to make the area more accessible to soft mobility. Also, the Guiding Principle Plan of Public Space recommends lowering the driving speed limit to 50 km/h. This proposal aims to transform Østre Aker vei into an avenue. The avenue will also contain new green features, such as trees and bushes along the road. Alternatively, through-traffic can be placed in tunnels between Økern and Brobekkveien, to reduce more noise and air pollution, while also increasing the attractiveness of the area. However, during the consultation period of the Guiding Principle Plan of Public Space prepared in 2016 and 2017, objections have been raised to both alternatives regarding the reduction of traffic at Østre Aker vei. It is argued that the former option is working against a long-term strategy which tries to transfer traffic from Trondheimsveien to Østre Aker vei, as shown in illustration 28 (p. 41) (PBE, 2015, p. 58). Some stakeholders are therefore advocating a "no action alternative", which imply that Østre Aker vei maintains its function as a thoroughfare. Section 5.6 includes a summary of the objections raised by key stakeholders (PBE, 2017, p. 48).

ABOUT ØSTRE AKER VEI (RV. 163) AT HARALDRUD TODAY:

- AADT: approx. 24.000
- Speed limit: 70-80 km/h
- Heavy traffic: approx. 9-11 percent
- Does not have a collective transportation field, and no prominent role for local buses.
- There are no pedestrian nor bycycling fields along the road.

(Statens vegvesen, 2018b, p. 19)

The Norwegian Public Road Administration (Statens vegvesen) has subsequently prepared a system analysis (the draft is dated 02.02.2018), in order to clarify the future road system of Groruddalen in Oslo, including the central axes Østre Aker vei (Rv. 163) and Trondheimsveien (Rv. 4) and the connectors between them, shown in illustration 27. The analysis was focusing on solutions that:

(1) Prioritised soft mobility and public transport, in line with the national zero vehicle growth objective (zero growth of the number of cars and motorcycles, where the growth of transportation should happen in terms of walking, cycling and public transport),
(2) Ensured accessibility for heavy transport, and
(3) Improved the living environment along the roads, by reducing noise and local air pollution. The latter involved a study of looking at the possibility of lowering the speed limit from 70-80 km/h to 60 km/h or 50 km/h. The Norwegian Public Road Administration did not consider the tunnel alternative, as they were immediately negative to this suggested solution (PBE, 2017, p. 74; Statens vegvesen, 2018b).

The Norwegian Public Road Administration recommended, based on their analysis, a renewal of Østre Aker vei, including to lower the speed limit to 60 km/h in a short-term perspective, and to 50 km/h in a long-term perspective. New facilities along the road should establish a new priority order of traffic modes where soft mobility is prioritised, and include more crossings for pedestrians. The recommendation implies a gradual rebuilding process of Østre Aker vei, where the distance that goes through Haraldrud is included in the first prioritised rebuilding phase. The Norwegian Public Roads Administration recommends that Østre Aker vei should be transformed into a carriageway with four car lanes, according to the design class of H6 (adapted to 12 000-20 000 AADT) (Statens Vegvesen, 2014, p. 34). With rebuilding of Østre Aker vei, a more liveable environment consisting of commercial buildings and residential areas around Østre Aker vei may be possible to create, with regard to traffic safety, noise and air pollution (PBE, 2018; Statens vegvesen, 2018b, pp. 122-123).

Nevertheless, the renewal requires several years of planning before the amendments can be implemented. It also required funding through the revision of the National Transport Plan (NTP) or the Municipal Transport Plan (Oslopakke 3) (Statens vegvesen, 2018b, p. 133).

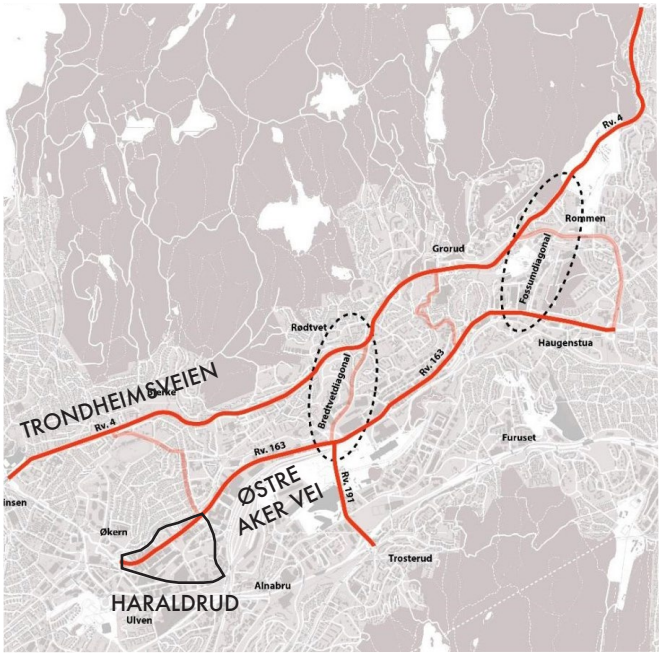


ILLUSTRATION 27: The road system of Groruddalen, including the main axes Østre Aker vei and Trondheimsveien (Statens vegvesen, 2018a).

5.5.5 Økern og Breivoll

Facilitating a better transition between Haraldrud and Økern is emphasised as an essential element of the redevelopment of Haraldrud, partly due to the new zoning and future transformation of Økern. According to adopted plans, including the Municipal Master Plan, Økern will become an important transport hub and centre of Hovinbyen. In few years, Økern will presumably contain new commercial areas measuring 45.000 m2 GFA (PBE, 2015, p. 14).

That being said, the connection between Økern and Haraldrud is currently considered poorly organised in regards to soft mobility. A new transition between these two areas is therefore needed, to establish a walkable connection between Haraldrud and other sub-areas within Hovinbyen. Two alternative proposals for new crossing are therefore promoted in the Guiding Principle Plan of Public Space at Haraldrud. Both proposals are based on the establishment of Østre Aker avenue (PBE, 2017, pp. 50-51).

On the other side of Haraldrud is Breivoll, another sub-area within Hovinbyen, which is described as a future urban transit hub of Hovinbyen. Thus, Haraldrud is interlinked to two key centres and transport hubs of Hovinbyen (PBE, 2016b, p. 42; Statens vegvesen, 2016).

The Municipal Master Plan also proposes a new subway station between Økern and Breivoll, as shown in illustration 29 (pp. 48-49), because the walking distance between existing subway stations and the south side of Haraldrud is too long. It is currently not

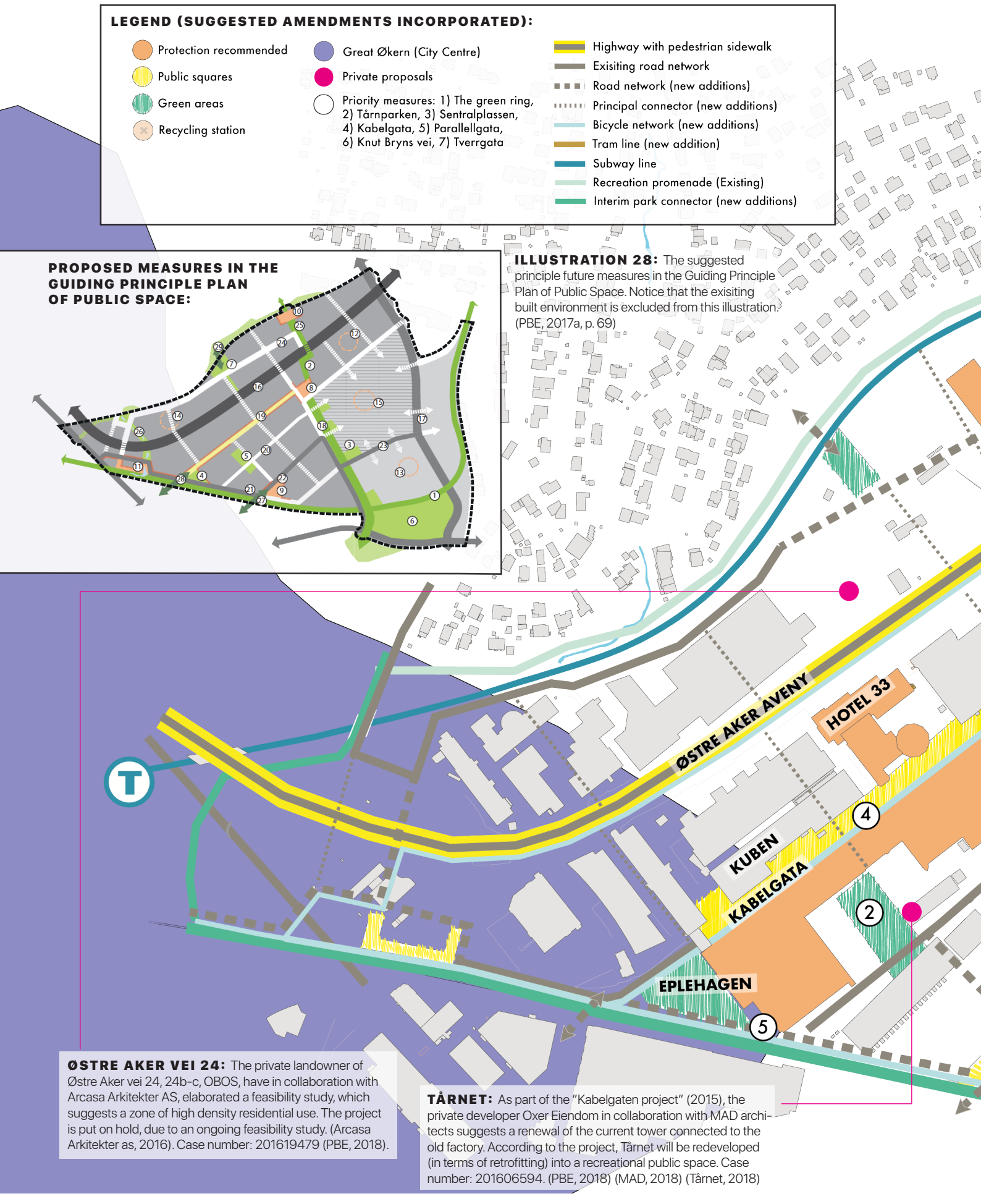
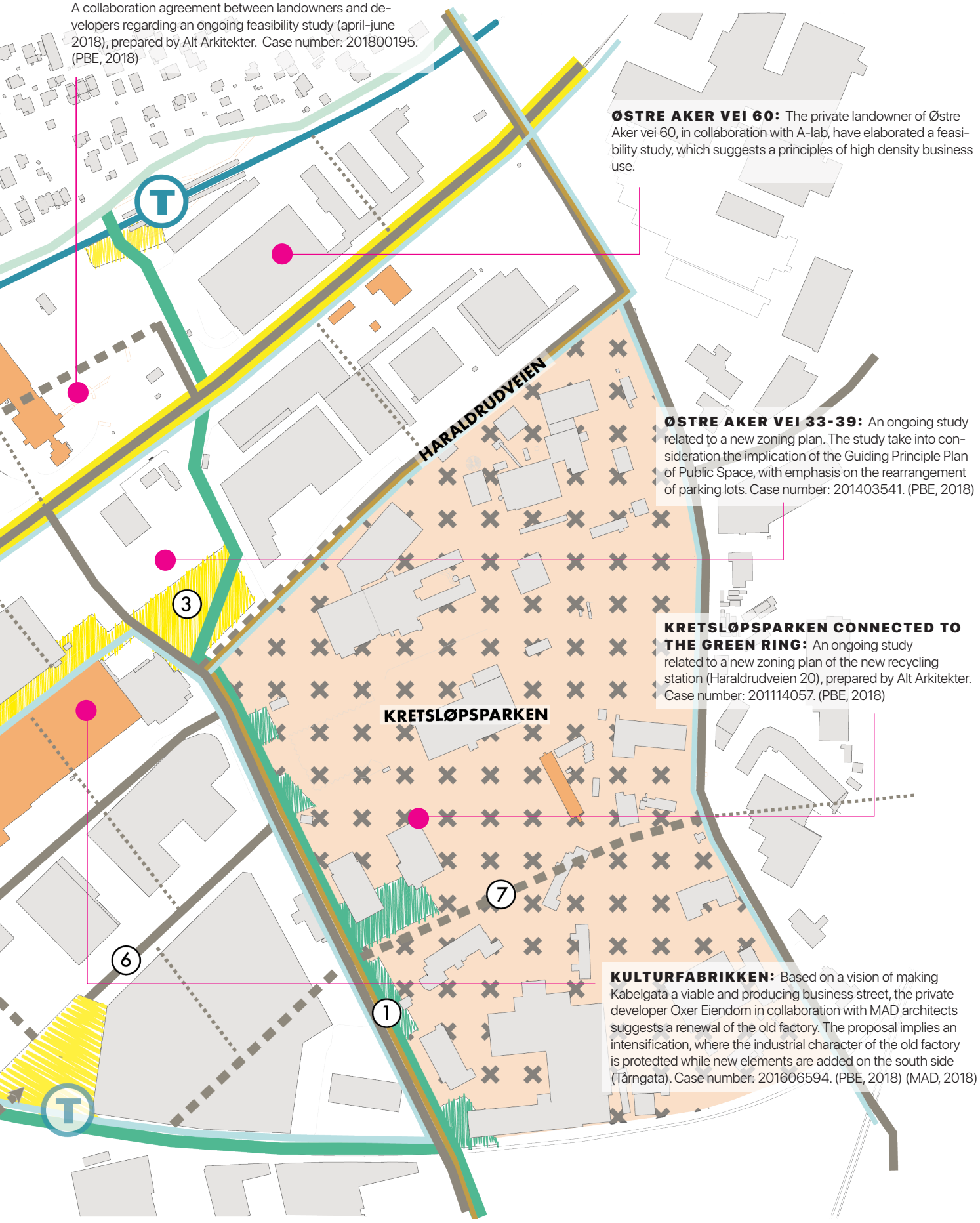


ILLUSTRATION 28: The suggested principle future measures in the Guiding Principle Plan of Public Space. Notice that the exisiting built environment is excluded from this illustration. (PBE, 2017a, p. 69)

ØSTRE AKER VEI 24: The private landowner of Østre Aker vei 24, 24b-c, OBOS, have in collaboration with Arcasa Arkitekter AS, elaborated a feasibility study, which suggests a zone of high density residential use. The project is put on hold, due to an ongoing feasibility study. (Arcasa Arkitekter as, 2016). Case number: 201619479 (PBE, 2018).

TÅRNET: As part of the "Kabelgaten project" (2015), the private developer Oxer Eiendom in collaboration with MAD architects suggests a renewal of the current tower connected to the old factory. According to the project, Tårnet will be redeveloped (in terms of retrofitting) into a recreational public space. Case number: 201606594. (PBE, 2018) (MAD, 2018) (Tårnet, 2018)

THE URBAN RENEWAL OF HARALDRUD



ØSTRE AKER VEI 16,20,22,24,50 AND 60: A collaboration agreement between landowners and developers regarding an ongoing feasibility study (april-june 2018), prepared by Alt Arkitekter. Case number: 201800195. (PBE, 2018)

ØSTRE AKER VEI 60: The private landowner of Østre Aker vei 60, in collaboration with A-lab, have elaborated a feasibility study, which suggests a principles of high density business use.

ØSTRE AKER VEI 33-39: An ongoing study related to a new zoning plan. The study take into consideration the implication of the Guiding Principle Plan of Public Space, with emphasis on the rearrangement of parking lots. Case number: 201403541. (PBE, 2018)

KRETSLØPSPARKEN CONNECTED TO THE GREEN RING: An ongoing study related to a new zoning plan of the new recycling station (Haraldrudveien 20), prepared by Alt Arkitekter. Case number: 201114057. (PBE, 2018)

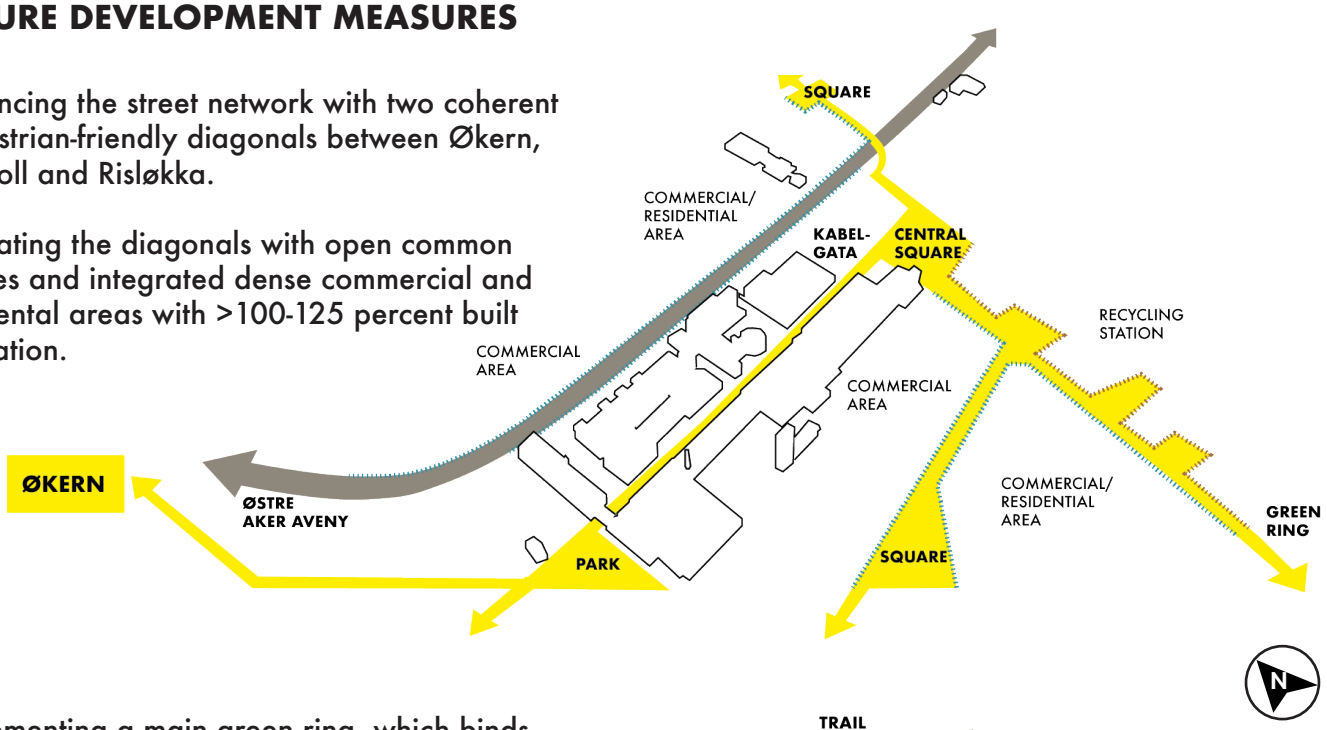
KULTURFABRIKKEN: Based on a vision of making Kabelgata a viable and producing business street, the private developer Oxer Eiendom in collaboration with MAD architects suggests a renewal of the old factory. The proposal implies an intensification, where the industrial character of the old factory is protedted while new elements are added on the south side (Tårngata). Case number: 201606594. (PBE, 2018) (MAD, 2018)

ILLUSTRATION 29: An interpretation of the suggested amendments by planning and building authorities and private developers.

CURRENT SITUATION WITH BUILDINGS TO BE CONSERVED AND FUTURE DEVELOPMENT MEASURES

Enhancing the street network with two coherent pedestrian-friendly diagonals between Økern, Breivoll and Risløkka.

Activating the diagonals with open common spaces and integrated dense commercial and residental areas with >100-125 percent built utilization.



Implementing a main green ring, which binds the district together. Alternative green pedestrian connectors could in addition support the variety of pedestrian movement.

Transformation of Østre Aker vei into a more pedestrian-friendly avenue.

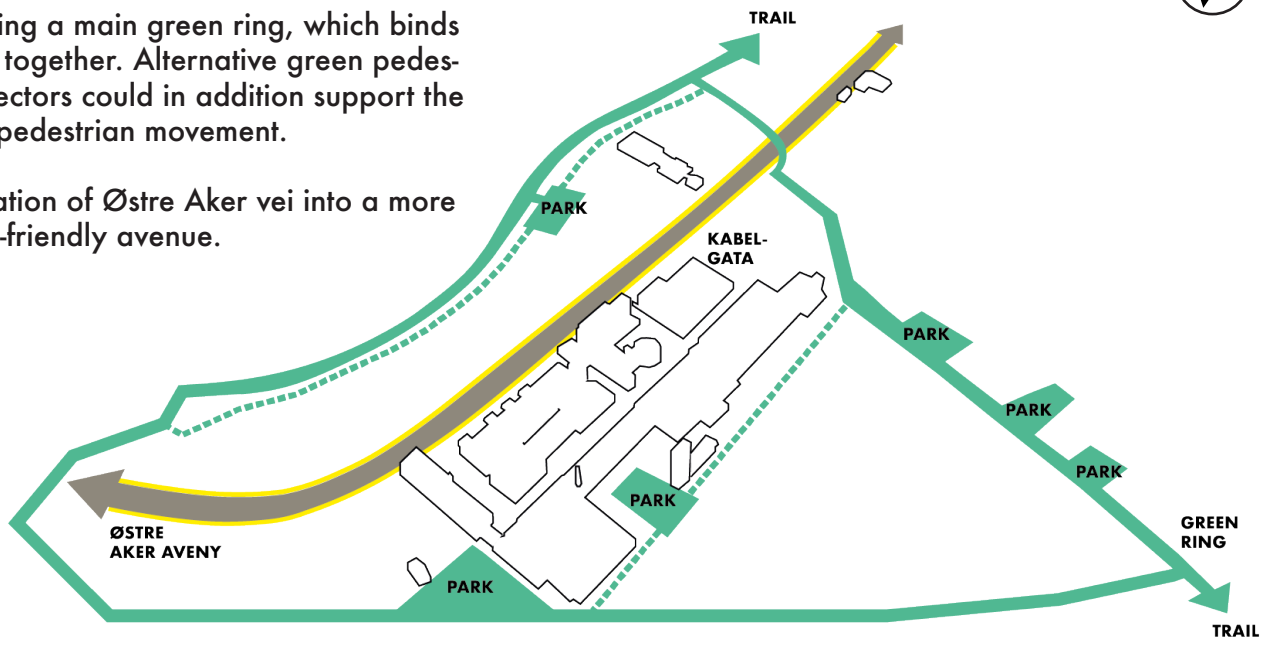


ILLUSTRATION 30: The redevelopment of Haraldrud, according to the Planning Programme (2015) and the Guiding Principle Plan of Public Space (2017)

ensured by any plan (PBE, 2015, p. 13). Moreover, a new tram line along Haraldrudveien is incorporated in the Norwegian Public Road Administration's principal recommendations regarding the collective traffic system of Groruddalen, as shown in illustration 20 (pp. 48-49) (Statens vegvesen, 2018b, p. 40).

5.5.6 Kretsløpsparken

Despite a number of objections regarding the recycling station at Haraldrud, as elaborated in chapter 5.6, it is currently suggested by the Guiding Principle Plan of Public Space that an integration of a new recycling station, called Kretsløpsparken, is a premise for the further development of Haraldrud. This suggestion implies that Kretsløpsparken should have public-oriented and transparent ground floors, although "not in an environmentally harmful way" (PBE, 2017a, p. 8). The aim is to develop Kretsløpsparken to an attraction and learning arena (PBE, 2017a, p. 12).

5.5.7 Five main development principles

To accommodate the aspects mentioned above, the vitalisation of Haraldrud shall develop in line with five main principle amendments, according to the Guiding Principle Plan of Public Space. These include solutions for (1) a dense street network, (2) green axes, (3) pedestrian crossovers at existing barriers, (4) develop Kabelgata as main street and catalyst for the redevelopment, and (5) new public parks and urban spaces (PBE, 2017, p. 23), all incorporated in illustration 29 (pp. 48-49).

According to the Guiding Principle Plan of Public Space, the area is currently not suitable for establishing a residential area, and therefore it recommends a long-term redevelopment process, in which offices, industry, and storehouses are established first of all, provided that a generally higher standard in terms of accessibility be incorporated, with regard to soft mobility.

The areas on the north side and south side of Haraldrud, cf. attachment 4, are, however, considered relevant for residential purposes in a short-term perspective, according to the Agency for Planning and Building Services (PBE, 2015a, p. 44). The recommended new residential area includes Østre Aker vei 50 and Brobekkveien 87 (PBE, 2017, pp. 8-9).

5.5.8 Summary and illustration of the future development

Haraldrud has major development potential, and thus designated as a future metrozone, in line with the transit-oriented development strategy. Illustration 29 (pp. 48-49) shows the necessary amendments recommended by the Guiding Plan of Public Space in order to vitalise Haraldrud based on a holistic approach. The amendments represent principle measures. In that sense, placement of the new street network and zoning are not exact, as this eventually must be considered during the next phase of the redevelopment process. Illustration 29 is thus an interpretation of the Guiding Plan of Public Space (PBE, 2017a), shown in illustration 27 (p. 48).

The plan proposal based on the recommendation of the Agency for Planning and Building Services, cf. illustration 29, is based on five main principle measures related to a site-specific sustainable and holistic approach to vitalise Haraldrud. The principle includes: (1) to establish a dense street network, (2) new green axes, (3) crossings over existing barriers, (4) new public parks and urban spaces, and (5) to make Kabelgata main street and catalyst for the future development and vitalisation of Haraldrud (PBE, 2017, p. 23).

Given the size of the district and the current conditions, the complete redevelopment of Haraldrud will probably take much time, according to the Agency for Planning and Building Services (PBE, 2017, p. 73). The Guiding Principle Plan of Public Space, therefore, suggests some priority amendments, which represent the necessary prerequisites for vitalising Haraldarud (PBE, 2017, pp. 68-69), as shown in illustration 29 (pp. 42-43) marked with the same number as below. This applies to the following measures: (1) The green ring (Green walkway), (2) Tårnparken (Tower park), (3) Sentralplassen (Central Square), (4) Kabelgata, (5) Parallelgata (the street parallel to the railway, Alnabanen), (6) Knut Bryn's vei, and (7) Tverrgata (the crossing street). The most relevant principle for future amendments is shown in illustration 30 (p. 44), including the new central public space, the green ring, and the renewal of Østre Aker vei.

Furthermore, ongoing private projects regarding the redevelopment, in terms of new facilities, are incorporated in illustration 29 (p. 48-49). The private initiatives represent plan proposals in relation to

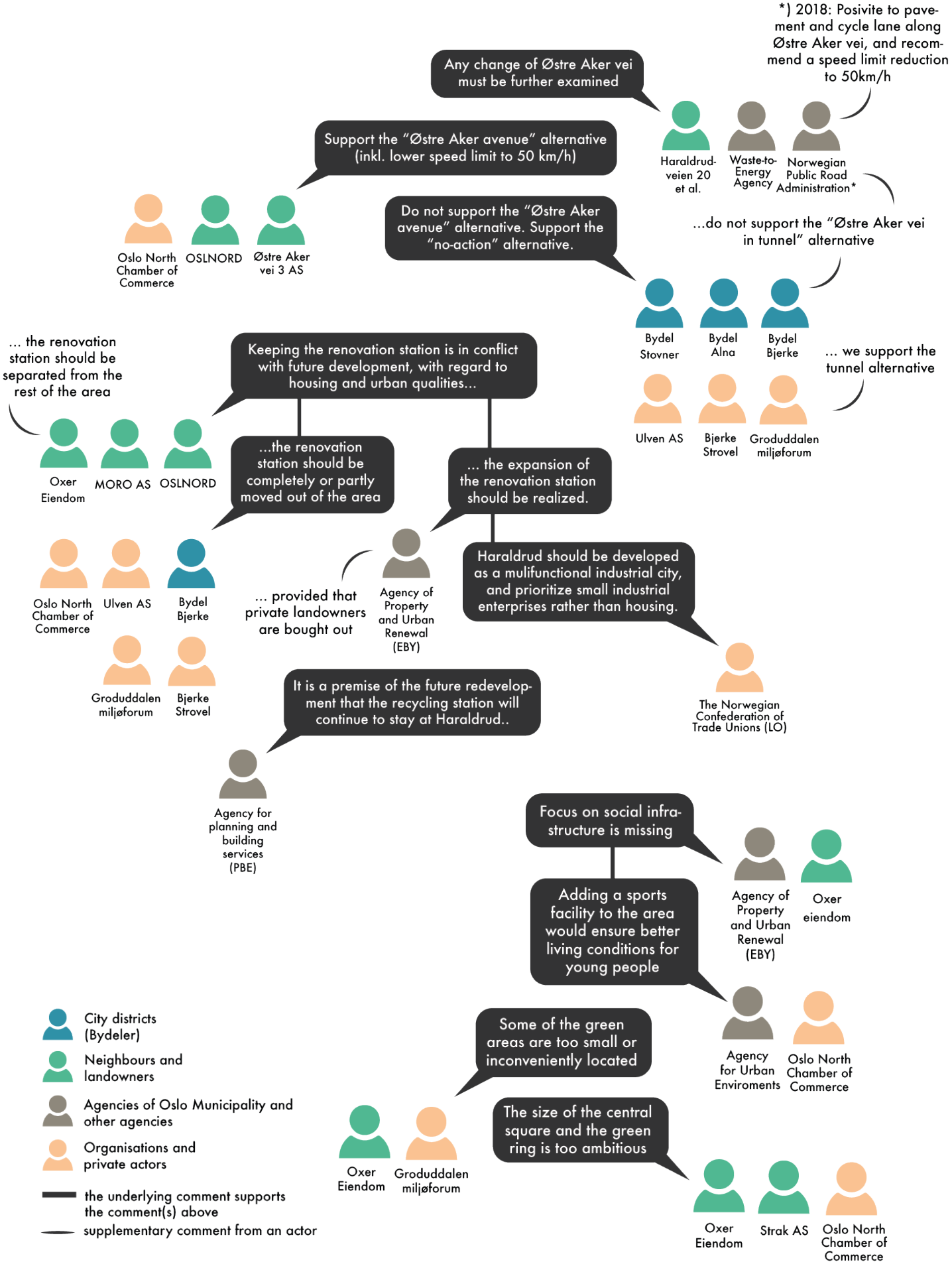


ILLUSTRATION 31: An extract from the inputs regarding the Plan Programme and the Guide Plan for Public Space, based on (PBE, 2017, pp. 74-76) (PBE, 2015a, pp. 58-66).

the new zoning of individual plots at Haraldrud. However, none of these is adopted at the moment.

In terms of the holistic approach proposed by the Guiding Principle Plan of Public Space, there are mainly two dilemmas that stand out: Firstly, the suggested new street network imply significant interventions within the current built environment, as shown in illustration 29 (pp. 48-49). The new connectors will, for instance, intersect with several plots and existing buildings, including buildings of cultural, historical value according to the City Director of Cultural Heritage, cf. section 5.2.2 (p. 36). Thus, will the suggested principle road connectors affect distinctive buildings at Haraldrud? The suggested street network must furthermore be interpreted by several landowners and developers, which requires collaboration between landowners and developers to provide continuity.

Secondly, in what way will the suggested renewal of Østre Aker vei affect the redevelopment along the road, with regard to noise and pollution? This will be discussed further in section 5.7.

5.6 STAKEHOLDER´S OBJECTIONS

Several objections from local stakeholders have been received regarding the future development of Haraldrud. Illustration 31 shows an extract from the inputs that was received in conjunction with the Plan Programme and the Guiding Principle Plan of Public Space, which is relevant to this case study. The inputs indicate that there is no consensus about essentially two challenges. It concerns (1) what function Østre Aker vei should have, and (2) whether it is possible to create a viable urban area near the recycling station at Haraldrud.

As regards the rebuilding of Østre Aker vei alternative (Østre Aker avenue), some of the neighbours are positive about the recommendation, while others, including the City Districts, are negative, because of its effect on the overall road network, with regard to traffic flow. (PBE, 2017, pp. 74-76). The Norwegian Public Roads Administration, who owns the road, had no specific statements regarding the different alternatives at that time. However, in 2008 they prepared a systematic analysis of the road network, where they recommend a speed limit of 80 km/h in Østre Aker vei, in order to reduce the speed limit on Trondheimsveien. (Statens vegvesen, 2008, p. 24). In February 2018, in connection with the revision of the Municipal Master Plan, the Norwegian Public Road Administration prepared a new system analysis, as elaborated in section 5.5.4.

Many of the stakeholders are moreover sceptical about developing a residential and commercial area close to the recycling station, as they consider it inappropriate in regards to the well-being of the residents and workers. Several believe that the recycling station must be removed in order to make Haraldrud become an attractive and liveable district. However, it is a prerequisite for the development that the recycling station will remain in Haraldrud. Thus, it is a question of where it is acceptable to establish new residential and commercial areas, given the recycling station remains in the area.

In summary, there is a conflict of interest regarding the reduction of traffic at Østre Aker vei. One side among the stakeholders (the Agency for Planning and Building Services and the Norwegian Public Road Administration) suggest that the through-traffic at Østre Aker vei should be reduced in order to prioritise the establishment of a residential and commercial area. The other side of the conflict (City districts) suggests that the traffic should not be reduced as this will cause spreading of traffic on the overall road network, and not solving the problem, hence.

Whether it is appropriate to establish a residential area at Haraldrud, as this requires significant infrastructure changes, depends on the prioritisation of different interests and objectives. A re-regulation of the Haraldrud is, according to the Municipal Master Plan and the Plan Programme, appropriate to prioritise in this regard, as this follows the transit-oriented expansion strategy as well as the national goal of reducing the number of vehicles in-use.

Some of the inputs concern public spaces, in addition, referring to the lack of specified green spaces, social infrastructure and especially offers for young people, in the plan proposal.

The different objections show that there are several conflicting

interests regarding the vision of transforming Haraldrud into a viable residential area. Interests that oppose the vision of establishing a residential area at Haraldrud concern primarily: Østre Aker vei, the absence of public spaces and social facilities, and the recycling station. Two of these dilemmas are especially crucial in this regard, hereunder lack of social infrastructure and Østre Aker vei, and are further elaborated in chapter 5.7.

5.7 DISCUSSION

In the wake of the adoption of the Guiding Principle Plan of Public Space, the redevelopment of Haraldrud may be continued under the auspice of the various landowners and developers. As the Guiding Principle Plan of Public Space provides only principle recommendations (exceptions from the proposal may be allowed), a relatively flexible framework has been established for the moment. This concerns in principle the redevelopment of the public space and the street network at Haraldrud. The new categories of zoning will furthermore be negotiated in the revision process of the Municipal Master Plan, based on the recommendations of the Agency for Planning and Building Services, cf. attachment 4. As regards the individual building plots at Haraldrud, a revision will most likely result in more developing potential as regards land use and land utilisation.

5.7.1 Social infrastructure vs. residential and commercial purposes

About 100 000 new dwellings, 6 million m2 for commercial purposes and 2.5 million m2 for social infrastructure are required within 2020, based on prognosis from 2015 (Oslo kommune, 2015a, p. 34). This prognosis imply that social infrastructure purposes correspond to approximately 5/12 of the required commercial area. Today's situation, however, with reference to the zoning plan, cf. illustration 16, (p. 34) shows a much more unbalanced proportion between commercial purposes and public services (social infrastructure), where Østre Aker vei 50 and Brobekkveien 87 currently is one of the few areas regulated for public services. Despite these considerations, the planning and building authorities mainly recommend new regulations of the plots, according to the consultation draft for Oslo's new Municipal Master Plan (Oslo kommune, 2017), as the plots are well suited for residential purposes with regard to noise and proximity to the subway station (Risløkka T).

There are reason to believe that a revision of the zoning plan concerning these plots will reduce the possibilities for implementing social infrastructure at Haraldrud, as both Østre Aker vei 50 and Brobekkveien 87 are owned and managed by public sector administrations (Statsbygg and the Agency for Property and Urban Renewal), as opposed to large parts of the rest of the area, see attachment 6. Given the aspect of ownership, the size of the plots, location and, moreover, the need for much more future social infrastructure at Haraldrud, there are several reasons why the area is better suited for social infrastructure.

On the other hand, while municipal guidelines advocate a need for more housing, there is a significant shortage of potential residential areas at Haraldrud, due to noise, air and soil pollution. Moreover, as regards areas proximate to subway stations, 80 % of the GFE should be dwellings, according to the Outdoor Area Standard for Oslo Municipality (Oslo kommune, 2012; Oslo kommune, 2015b). Hence, the planning and building authorities may prioritise that the area is to be regulated as a mixed residential and commercial area.

Nevertheless, this area reflects a potential conflict of interest and dilemma regarding the location and allocation of responsibilities associated with future social infrastructure within the area.

5.7.2 Municipal governance tools that may ensure continuity

Due to several current conditions, large areas at Haraldrud are currently not suitable for residential or commercial purposes. The Guiding Principle Plan of Public Space, therefore, suggests a relatively comprehensive and long-term renewal, implying that some short-term projects must go in front of the continuous redevelopment. Measures that should be prioritised in this regard are elaborated later in this chapter.

As regards the aspect of continuity, some essential plan tools may help to provide coherence between individual development projects and the major plan (the Guiding Principle Plan of Public Space,

Strategic Plan for Hovinbyen and the Municipal Master Plan). In this case, there are respectively two tools that may ensure this kind of continuity. The first relevant tool is the responsibility of the planning and building authorities in providing cohesive development in Oslo, including:

1. the Agency for Planning and Building Services (Plan- og bygningsetaten) who manage the processing of applications regarding zoning plan proposals,
2. the Agency for Urban Environments (Bymiljøetaten), whose responsibility is to develop properties owned by the municipality, and
3. the Agency of Property and Urban Renewal (Eiendom- og byfornyelsesetaten), whose responsibility is to be a negotiator in comprehensive development processes.

These responsibilities can, by representing the overall vision, provide continuity to some extent (PBE, 2017a, p. 70).

The second tool is the predictability decision (forutsigbarhetsvedtak) - or development agreement - according to the Building and planning Act § 17-3. Through a development agreement, the planning and building authorities can impose some measures on the developer. These measures must be considered necessary and economically proportionate relative to the extent of the project and the relative cost on the developer. Developers cannot, however, be obliged to incorporate measures, according to the regulations against terms of the development agreement (Lovdata, 2018d).

The Agency for Planning and Building Services proposes that a predictability decision should be adopted in conjunction with the processing of the Guiding Principle Plan of Public Space by the City Council. The predictability decision should in that regard consist of some 'order-terms' (rekkefølgebestemmelser) that will regulate the development of Haraldrud, in line with the recommendations in the Guiding Principle Plan of Public Space. Agreements between landowners/developers and the municipality will ensure that these terms will be continued. Order-specific terms imply that the adopted plan proposal cannot be carried out before all required prioritised measures under the predictability decision have been executed. It may also imply that developers must share the costs of technical and blue-green infrastructures. Predictability decisions are considered normal within large project areas (Bjørkholt, 2017; PBE, 2017a, p. 70).

With these tools, so-called 'free-labelled zoning' (frimerkeregulering), where developers are given the freedom to develop individual plots without having to take into account the broader context, is avoided, while some flexibility is provided, regarding building volumes, urban design, materials, and functions (Bjørkholdt, 2017). A predictability decision has, however, not yet been adopted, as the consideration of the Guiding Principle Plan of Public Space is still processing.

5.7.3 Østre Aker vei

Due to the environmental requirements related to noise in residential areas, cf. the Norwegian Standard (NS 8175), and currently poor pedestrian street network at Haralrdud, a transformation of Østre Aker vei is a prerequisite for transforming the area into a viable and cohesive district (PBE, 2015a). It is not possible to build dwellings or common outdoor areas close to the carriageway under today's conditions, considering the high level of AADT and noise pollution. The Agency for Planning and Building Services and the Norwegian Public Roads Administration, therefore, recommend a transformation of Østre Aker vei, where the speed is reduced to 50 km/h in a long perspective. The respective authorities furthermore recommend bicycle lanes and pavements, including several pedestrian crossovers, along the road. Such transformation may imply that 200 % of GFA utilisation along the road is acceptable (Statens vegvesen, 2018b; PBE, 2015a).

Stakeholders have different opinions regarding the transformation of Østre Aker vei, according to the objections from the consultation period, cf. section 5.6. Contrary objections claim that a transformation will have significant negative consequences for the rest of the road network of Groruddalen (Trondheimsveien and Persveien). Thus, the proposal was not supported by most of the stakeholders, including the city district of Haraldrud (Bjerke Bydel) and adjoining city districts. Despite the objections, an evaluation regarding the road network of Groruddalen was prepared in February 2018, suggesting otherwise. The Norwegian Public Roads Administration thus in principle support the avenue-alternative - for the time being.

Photographer: Küenholdt A/S, J.H. / Oslo byarkiv. Licence: CC-BY

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ILLUSTRATION 32 AND 33: Kirkeveien in Oslo's Inner city, which is similar to the Østre Aker avenue in terms of capacity and design (PBE, 2017a). (Oslo byarkiv, 2014) (Sandsberg, 2008)

A relevant aspects to discuss in this regard, is how differently the Østre Aker vei (current condition) versus Østre Aker avenue will affect the vitalisation of Haraldrud, given that the transformation will take place within a long term perspective. What does the short-term perspective (with a 70 km/h carriageway) versus the long-term perspective (with a 50 km/h avenue) imply when it comes to the redevelopment of the adjoining properties? To emphasise the importance of these different conditions, with emphasis on vitalisation, I have addressed some implications in the next sections.

5.7.4 Long-term development - Østre Aker avenue (50 km/h)

The long-term perspective is not time-specific. It refers to the realisation of the Øster Aker avenue alternative, which involves a reduction of the speed limit, cf. the Norwegian Public Roads Administration's recommendations (Statens vegvesen, 2018b). This alternative provides new opportunities, that may help to establish a public space along Østre Aker vei, as it becomes possible to incorporate human- friendly façades facing the road. Tall buildings may step back from the human scale space, or provide a density of activities and services on the ground floor, to improve walkability.

As regards traffic safety, this is influenced by both local and social conditions (number of users in relation to the road's capacity, the behaviour of the users as well as attitudes, driving culture) in addition to the technical conditions (the design of the road, signages) (Næss, 2018, pp. 134-135). However, based on the Norwegian Public Roads Administration system analysis (Statens Vegvesen, 2018b), the Østre Aker avenue is sufficiently safe with regard to soft mobility.

There are mainly two aspects that are important to the holistic redevelopment and the long-term perspective. The assessment regarding these aspects is, in addition to the planning theory, cf. chapter 4, partly based on evidence related to a comparable example, which is Kirkeveien (Ring 2) in Oslo, as shown in illustration 32-33. Kirkeveien is a carriageway consisting of four lanes, and a centralised field for the tram at some parts, and has approximately 21,000-23,000 AADT and a speed limit of 50 km/h (TOI, 2010, pp. 6-10; Vegdirektoratet, 2003).

1. Østre Aker avenue may and should have human-friendly façades and broader openings towards Østre Aker vei, to safeguard accessibility, sun, publicity and transparency from different angles. Human-friendly façades accommodate the human scale in terms of entrances and large windows for commercial use.

However, the width of the street, the noise level and the relatively large traffic volume imply that the outdoor space along the avenue will only serve as carriageway and soft mobility connector. Cafés with outdoor seating, parks or play facilities are not appropriate along the road. Besides, the avenue would still function as a barrier, although several pedestrian crossings will increase the connection between the northern and the southern areas.

2. Østre Aker avenue also improves the living conditions related to the residential and commercial area along the avenue. A mix of residential and commercial purposes provides a more diverse and liveable environment, considering the location is on the outskirts of the inner city. Furthermore, mixed functions generate people throughout the day: Work, education and commercial facilities (cafés, shops, stores) primarily generate life in the morning, while housing primarily generates life in the afternoons.

5.7.5 Short-term development - Østre aker vei (70 km/h)

How can a redevelopment of the plots along the Østre Aker vei in a short-term perspective (under current conditions) safeguard the measures of the major development plan? Provided that some of the landowners wish to develop their property before the rebuilding of Østre Aker vei, four main challenges are in that case potential threats to the cohesive redevelopment of Haraldrud.

1. As incorporating human-friendly and transparent façades (with gaps) towards Østre Aker vei under current conditions seems unnecessary, new urban settlements along Østre Aker vei will primarily provide a noise barrier. Instead of establishing human-friendly façades, the Østre Aker avenue may, in that case, become more segregated from the adjacent plots, and the sense of barrier increases.

2. With the aim of reducing noise and traffic effects, incorporating introverted quarterly building structures at the blots along Østre Aker

vei is possibly most appropriate in a short-term perspective. In principle, an enclosed quarter structure may improve the utilisation potential, as this structure may provide more space for lower buildings and outdoor areas in the middle, while also providing sunlight within the backyard (Marjanovic, 2018, 185-191). However, this may result in developing areas that seems very much private along Østre Aker vei. Moreover, this structure does not contribute to creating a transparent and accessible road network between the Østre Aker vei and the adjoining properties. The vitalisation potential reduces drastically.

3. The principal road network and public spaces, proposed in the Guiding Principle Plan of Public Space, cf. illustration 29 (pp. 48-49), can be interpreted differently, which complicates the planning process, as some measures involve several building plots. There is no allocation mechanism in the planning system regarding the responsibility of action and payment, except for the development agreement. This must, therefore, be distributed among the landowners through a voluntary agreement.

However, by establishing the most critical missing links, one may improve the accessibility within the area significantly. Seven critical pedestrian connectors have to be addressed in this regard, as shown in illustration 34 (p. 58). This project report recommends incorporation of the following connectors in a short-term perspective:

1. A crossover at the subway rails to Risløkkparken,
2. A connection between Østre Aker vei and Risløkkparken
3. Risløkkveien.
4. An extension of Kabelgaten and a cross-over at Alnabanen
5. Knud Bryn's vei,
6. Making Tårngata accessible to pedestrians, and
7. Upgrading the access to Kabelgaten at both ends.

4. The fourth challenge concerns social infrastructure. Social services also apply, in this regard, to assets that help to create better-living conditions within the area. As the need for social infrastructure follows the number of dwellings within the area, potentially there is a potential threat that the planning process will not provide adequate social services in a short-term perspective, as areas for this purpose are not specified in the preliminary plan proposal. However, through a development agreement, the municipality may impose requirements on the developer to ensure necessary social infrastructures or ensure that other necessary conditions are implemented new projects, according to PBL § 17-3 (Lovdata, 2018a).

In summary, potential threats are associated with the transformation of Østre Aker vei. Some necessary accessibility measures, cf. illustration 34 (p. 58), should therefore be established in conjunction with short-term projects, in order to create a time-dependent order-specific redevelopment towards the vitalisation of Haraldrud.

5.7.5 Noise issues in compact urban development

With the aim of creating a more viable residential environment along the highways of Groruddalen, reduction of the noise level along Østre Aker vei is emphasised in both the Norwegian Public Road Administration's system analysis (2018) and the Guiding Principle of Public Space (2017). This motivation is based on national objective to reduce the number of residents exposed to high noise levels by 10 % by 2020, as elaborated in chapter 4.3, (Det Kongelige Miljøverndepartement, 2007, p. 146). Objective conflicts with regard to noise pollution and compact urban development thus create some complex dilemmas. In this case, the deviation zone allows for compromises with regard to the high noise levels, and thus allows residential purposes. Provided this is a premise for further feasibility studies of the respective plots, other requirements concerning the residential area should, in turn, be emphasised, implying that any restriction of other quality requirements is not considered appropriate (Miljødirektoratet, 2015; Oslo kommune, 2018).

Different measures can also be incorporated to reduce noise pollution. Thus, a viable residential environment may almost be provided in the designated yellow and red zone, by means of these measures. Four of the measures that may help to reduce the sound spreading from the road (source of noise) are described below:

1. Absorbent elements such as air absorption, vegetation and "soft"

CHALLENGES TO BE SOLVED WITH REGARD TO THE VITALISATION

Enhancing the industrial area imply a comprehensive transformation, developed over a long period of time. Providing a cohesive development may be difficult, due to short-term projects.

Establishing transparent access to public spaces, considering the suggested common outdoor areas are spread over building plots owned by multiple private stakeholders.

Avoiding that new common outdoor spaces become private.

Ensuring accessible social services, given the few potential areas for establishing social infrastructure.

Transforming Østre Aker vei into a public space, which binds the area together in stead of segregating it, in regard to soft mobility.

Providing a liveable residential area, considering the high level of noise and air pollution. Also, proximity to the recycling station may contribute to a negative reputation.

Safeguarding the peculiarity of the area, with respect to specified cultural-historical features.

CRITICAL PEDESTRIAN CONNECTORS

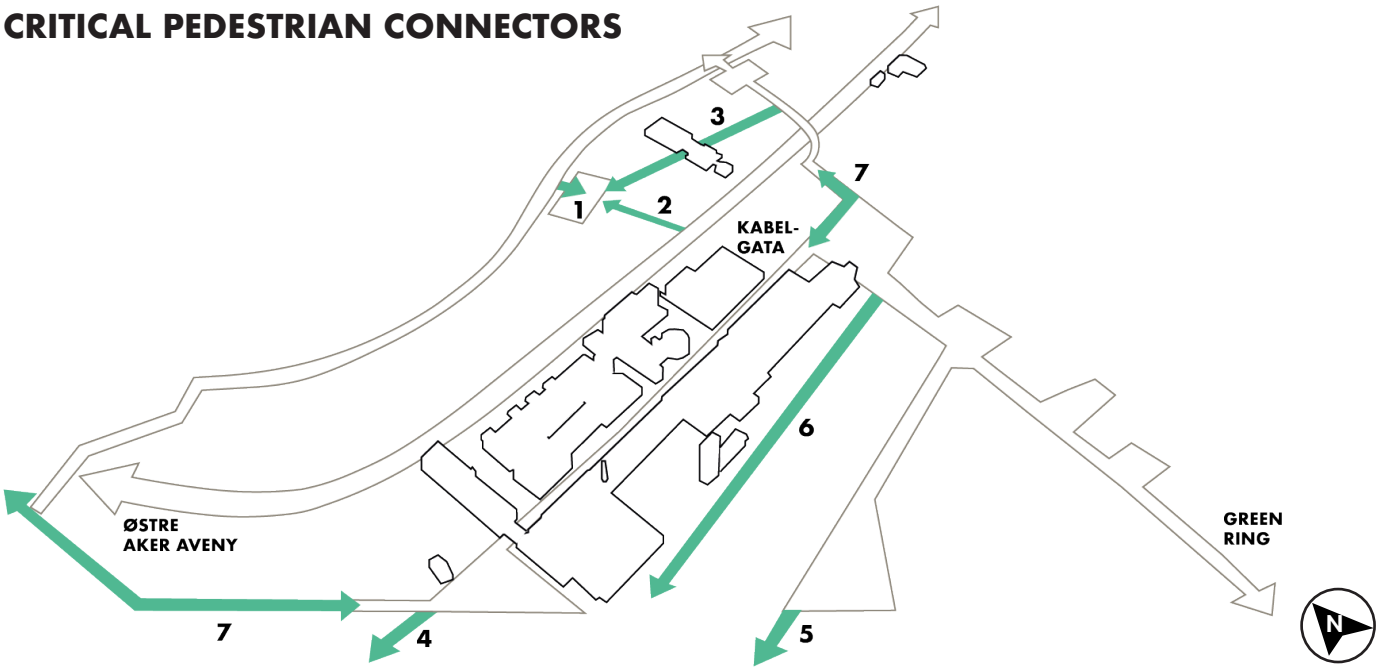


ILLUSTRATION 34: Short-term measures to improve accessibility, according to the Guiding Principle Plan of Public Space. (PBE, 2017a)

ground surfaces (fields, grass and snow) will contribute to a certain noise reduction, as opposed to "hard" surfaces (such as concrete, asphalt and water). However, a specific prevalence of vegetation is required to achieve significant noise reduction, considering about 100 meters of dense forest can reduce up to 10 dB (Miljøverndirektoratet, 2017a).

2. Noise barriers may contribute to noise reduction up to 10 dB. The effect depends on the sound source, local conditions (such as terrain and vegetation), the height and location of the barriers. (Miljøverndirektoratet, 2017a) However, the Norwegian Public Roads Administration wants to remove the existing noise barriers along the carriageways, and replace them with vegetation and terrain formations, concerning consistency and accessibility (Statens vegvesen, 2018, p. 61). Noise barriers can, however, be established in the form of buildings against the road.

3. Speed reduction can help minimise the noise pollution, as well as providing other environmental benefits, such as less air pollution, less road wear, better accessibility for soft mobility, and fewer accidents. On the other hand, it may increase time costs and causing queues. The effect on sound level, caused by speed reduction, is uncertain and depends on several factors, including the proportion of heavy transport. Generally, a reduction of 10 km/h is estimated to reduce approximately 2 dB. A reduction from 70 km/h to 50 km/h would in principle correspond to approximately (-) 4 dB. However, as regards noise-sensitive purposes, 30-40 km/h speed limit is recommended in residential and commercial areas (close to public spaces) (Miljøverndirektoratet, 2015, p. 12).

4. A reduction of traffic (AADT) may also reduce noise pollution. This can be realised through narrow lanes or specific urban structures. If a given amount of traffic is reduced by half, the sound level will in principle be reduced by approximately 3 dB (Vegdirektoratet, 2014; Miljøverndirektoratet, 2017a).

5.8 CONCLUSION

Haraldrud is pointed out by the planning and building authorities, as a potentially viable urban area, in line with the transit-oriented, compact development strategy. With the aim of vitalising Haraldrud, a principal redeveloping framework for the area has been prepared, and negotiations regarding new zoning initiated based on the Agency for Planning and Building Services' recommendations, cf. attachment 4. The vitalisation implies a comprehensive, punctual and long-term transformation of Haraldrud. In part 1 of the project report, challenges and measures related to the redevelopment strategy are determined concerning answering the initiative research question:

What general densification principles may contribute to the vitalisation of Haraldrud?

The site-specific analysis of Haraldrud, cf. chapter 5.2-5.4, determines the main challenging aspects at Haraldrud, which concern: poor accessibility for soft mobility, due to much traffic and the extensive industrial landscape, few attractive public spaces, and high level of noise and air pollution. Furthermore is some possible opportunities related to the vitalisation described in chapter 5.5. The most relevant proposed measures in this regard, are:

1. A transformation of Østre Aker vei, which imply that Østre Aker vei will be transformed into a pedestrian-friendly 4-lane carriageway, including a 60-50 km/h speed limit,
2. A walkable urban settlement, in terms of establishing 'the green ring', a new street network adapted to soft mobility, and more public spaces.
3. Retrofitting, in terms of merging the historical layers associated with Haraldrud (agriculture, industry, and business and residential district) in the new urban environment.

The proposal implies that the new street network will intersect with several plots and existing buildings, including buildings of cultural-historical value. This creates dilemmas concerning the visions of the redevelopment, because it may involve significant intervention. The principal road network must be interpreted by several landowners and

developers, which requires cooperation to provide continuity.

The central premise for vitalising Haraldrud, according to chapter 4, is to establish a human-friendly landscape, including prioritising soft mobility, design for universal accessibility, transparency and invitations, such as public-oriented façades, seating opportunities, activities, architectural qualities and recreation. Kabelgata is the designated new urban centre and catalyst for the vitalisation, due to its location and mixed facilities.

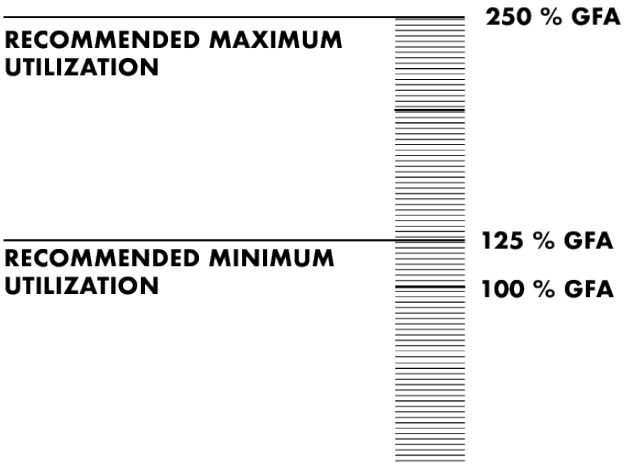
A general remark when it comes to compact urban development, as introduced in chapter 4, is that high demands for housing and commercial areas are systematically prioritised over living environmental qualities. This is legitimised even though large areas for social infrastructure are needed in the future (Oslo kommune, 2015a, p. 34). Smaller dwellings, lack of social services, and unpleasant outdoor environments are some of the adverse outcomes that create differences in the society concerning proximate social services, access to different recreational activities, and proper upbringing and living conditions.

While the Agency for Planning and Building Services' principle plan proposal regarding the redevelopment of Haraldrud, lacks a detailed specification of areas for future social infrastructure, a significant number of building plots are suggested regulated as high-density commercial and residential areas.

Because Haraldrud is designated as a deviation zone, according to the adopted Municipal Master Plan, compromises can be made with regard to noise limits under the principle guidelines regarding noise pollution in planning processes. This implies that implementation of noise-sensitive functions at Haraldrud may be accepted, even though the current noise level (L_{dn}) at the area is about 55-65 dB. Through particular measures, the noise level can, however, be reduced along Øster Aker vei, with the aim of making a more liveable district. Nevertheless, this compromise reflects that there are some conflicting objectives associated with the redevelopment of Haraldrud, respectively: the transit-oriented expansion strategy and objectives and recommendations regarding public health.

Some of these dilemmas are relevant in the next part of this project report, which focuses on a smaller site, comprising two plots, hereunder Østre Aker vei 50 and parts of Brobekkveien 87. The purpose of part 2 is to define and execute a site-specific analysis and feasibility study, with the aim of suggesting a principle densification solution in line with the transit-oriented development strategy. Furthermore, the analysis and feasibility study should take into consideration the existing conditions and conflicts of objectives, related to the broader context. The following problem statement will be answered in part 2, including chapter 6 and 7:

How can the plot consisting of Østre Aker vei 50 and part of Brobekkveien 87 be redeveloped into a denser area, with the aim of creating a more liveable urban place?



THE RECOMMENDED UTILISATION OF THE NEW URBAN SETTLEMENT, AND BUILDINGS TO BE CONSERVED (WHITE)

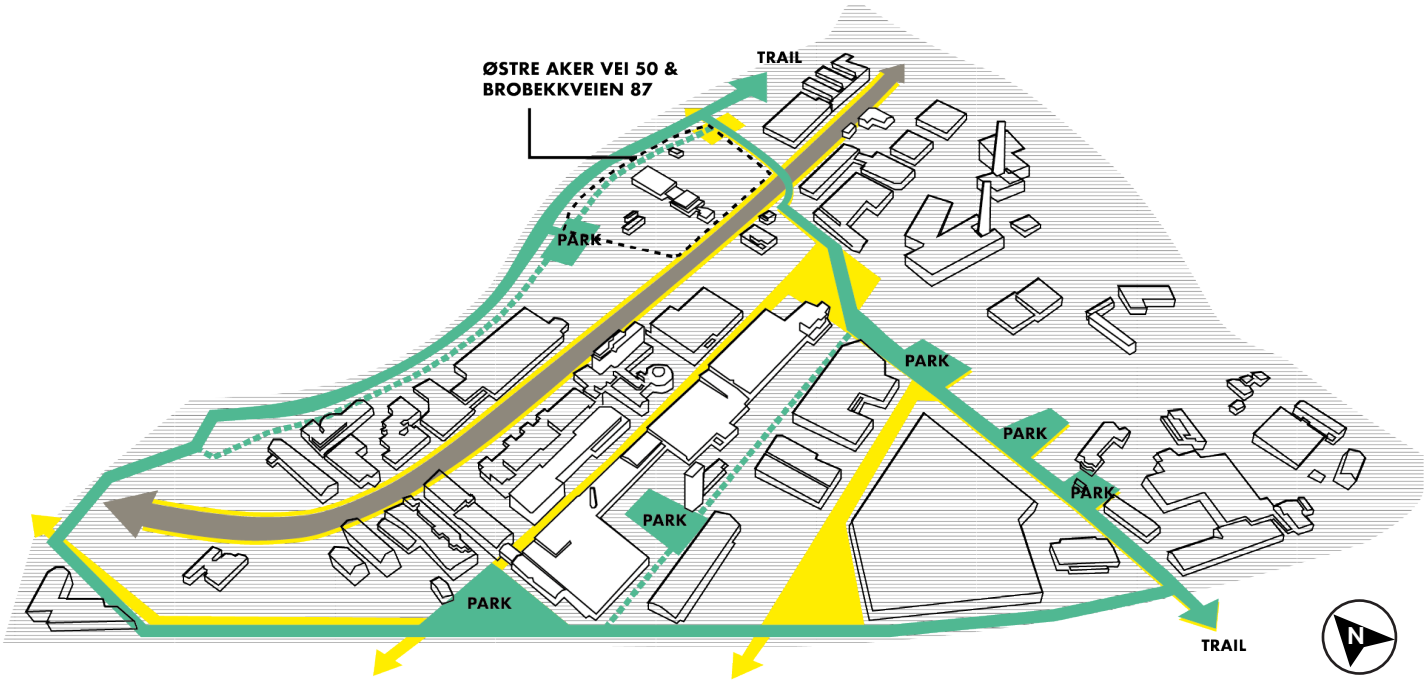


ILLUSTRATION 35: Future amendments according to overall plans, and recommended utilization (% GFA) of Haraldrud, according to the Outdoor area standard for Oslo municipality (2012). (PBE, 2012, p. 11)

PART 2

REDEVELOPMENT OF ØSTRE AKER VEI 50 AND BROBEKKVEIEN 87

" THE BUILDING HAS SIGNIFICANT ARCHITECTURAL QUALITIES, AND REPRESENTS PARTS OF THE HISTORICAL VARIETY OF HOVINBYEN."
(Byantikvaren i Oslo, 2018a)

The driver and vehicle licensing station at Risløkka

CASE STUDY OF ØSTRE AKER VEI 50 AND BROBEKKVEIEN 87

CHAPTER 6

6.1 INTRODUCTION TO PART 2

With a revision of Oslo's Municipal Master Plan, the ensuing transformation process of Haraldrud may begin, in terms of redeveloping its low-density industrial structures into a high density and mixed-use urban district. While consideration is given to the findings from part 1, the purpose of part 2 of this project report is to prepare a feasibility study focusing on potential renewal and densification of a smaller area at Haraldrud. The feasibility study of part 2 is thus a more detailed interpretation of the guiding documents addressed in part 1, chapter 5.5 (p. 42), concerning the processing of a new zoning plan.

The purpose of the feasibility study is more specifically to answer the following problem statement: How can the plot consisting of Østre Aker vei 50 and part of Brobekkveien 87 be redeveloped into a denser area, with the aim of creating a more liveable urban place?

The problem statement will be answered in two parts: Chapter 6 and Chapter 7. Chapter 6 deals with a site-specific analysis of Østre Aker vei 50 and Brobekkveien 87, which concludes with a situation description and a determination of essential renewal principles. Chapter 7 consist of an interpretation of the essential renewal principles, evaluated in relation to the objectives of the project report, and a redevelopment recommendation in the form of a plan proposal.

6.1.1 The scope of the feasibility study

The scope of part 2 covers two plots: Østre Aker vei 50, and a part of Brobekkveien 87, cf. illustration 36, hereafter called Brobekkveien 87. Both are situated on the north side of Haraldrud. Brobekkveien 87 covers a total of approximately 3100 m^2, and Østre Aker vei 50 covers a total of 36 567 m^2, which together constitute approximately 40 000 m^2 (40 da).

The scope of part 2 was initially defined based on a collaboration with Statsbygg, which owns Østre Aker vei 50, with the aim of examining the site's potential to be transformed into a vital place. Given the site's location in the landscape, including Brobekkveien 87 in the scope was later considered appropriate, as both plots are naturally linked to each other in terms of zoning and location next to the subway station (Risløkka T). Brobekkveien 87 is owned by Oslo municipality and managed by the Agency of Property and Urban Renewal (Eiendom- og byfornyelsesetaten).

Østre Aker vei 50 and Brobekkveien 87 are currently underutilised, considering most of the outdoor area serves as a parking lot and driving practice field. There is one main building at Østre Aker vei 50, which is the driver and vehicle licensing office at Risløkka (Risløkka Trafikkstasjon). The building is currently leased to the Norwegian Public Roads Administration (Statens vegvesen) until the lease expires December 31st, 2020. Since the market value is one of the factors that influence the level of the lease, negotiation of a new lease agreement as well as other alternatives of exploitation, are relevant to consider in light of the suggested amendments of the Plan Programme and Guiding Principle Plan of Public Space.

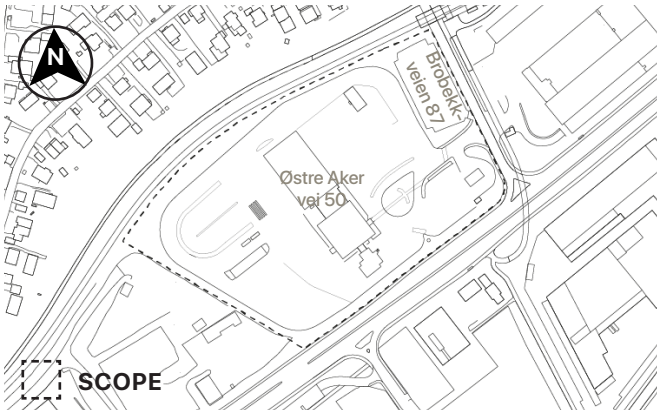


ILLUSTRATION 36: The scope of part 2, including two plots Østre Aker vei (gnr./bnr. 122/328) and Brobekkveien 87 (part of gnr./bnr. 122/6)

6.1.2 Statsbygg's alternatives regarding the redevelopment of Østre Aker vei 50

With the Plan Programme and the Guiding Principle Plan of Public Space, new alternatives for redeveloping Østre Aker vei 50 will become feasible, in conjunction with a revision of the zoning plan.

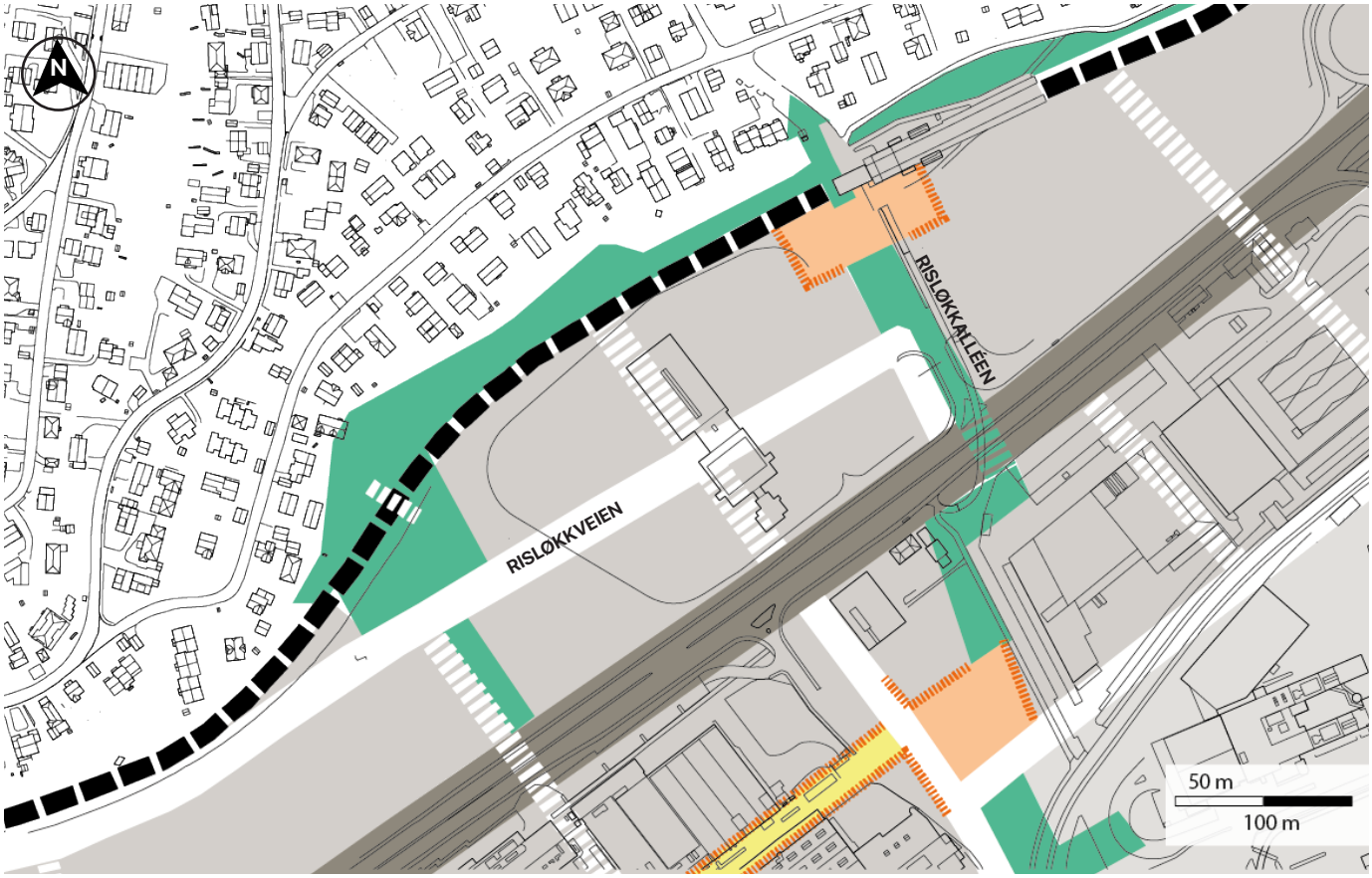


ILLUSTRATION 37: The suggested amendments regarding the public space, in accordance with the Guiding Princinple Plan of Public Space cf. illustration 28 (p. 48) merged together with today's settlement (PBE, 2017, p. 69).

As regards land use, the main recommendation of the Plan Programme suggests a residential zone on the north side of the plot, and commercial zone, which implies office purposes, on the south side of the plot, as shown in illustration 39 (p. 67). Statsbygg's alternatives, when it comes to this matter, are essential:

1. To extend the lease with the Norwegian Public Roads Administration to maintain the current use, although a higher rent is implied, due to the increased market value; or
2. Investigate whether other public sector entities need more space, new facilities or the like, and develop the area - or parts of the area - for this reason. If there is no such need within the public sector, Statsbygg can go for a 3rd alternative:
3. Sell the whole property - or parts of it - to let private developers exploit the opportunities of the property in accordance with the market value. Since Statsbygg only develops properties for reasons associated with public sector purposes, the third alternative gives the possibility for developing dwelling or other private facilities at the plot.

In this regard, I consider a re-regulation which promotes a mix of new purposes, including mainly a residential zone and a commercial zone, cf. illustration 39 (p. 67), most appropriate to achieve on-site vitalisation. This option implies a combination of the second and third alternatives, mentioned above. All premises of the feasibility study are summarised in section 6.1.5 (p. 68).

6.1.3 Proposed renewal of Østre Aker vei 50 in relation to the broader context

This project report emphasises coherence with regard to the broader context, with the aim of avoiding de-contextualised redevelopment and unsocial transformation. According to the case study of Haraldrud, cf. part 1, some challenges arise with the proposed amendments of the Plan Programme and Guiding Principle Plan of Public Space, some of which are relevant to stress in this regard.

The proposed amendments mainly challenge three essential aspects. The first challenge relates to the redefined street network. What are the implications of the new street network (especially Risløkkveien) with regard to the driver and vehicle licensing office? Moreover, how can the street network be re-defined in order to promote accessibility and vitality? The City Director of Cultural Heritage's proposal for conservation of the driver and vehicle licensing office at Risløkka, as to the aim of merging the historical layers related to Haraldrud's historical development, will be taken into consideration in this regard, as well as densification possibilities related to accessibility and liveability.

The second challenge concerns the location of the park (Risløkk-parken), with regard to the adjoining property (Østre Aker vei 24c), and accessibility. Interpretation of the proposal of the Guiding and Principle Plan of Public Space, as shown in illustration 37, where the proposal is to merge with the existing situation, imply that the park will be situated entirely within the adjoining property Østre Aker vei 24. As accessibility to the park will affect the level of attractiveness and publicity of the area, facilitating an inviting pedestrian access path that goes through Østre Aker vei 50 and Brobekkveien 87 would be beneficial, as the site will appear more inviting and thus liveable. This, however, presupposes that the desired target group of the park is the general public, and not exclusively residents. With the aim of vitalising the area, it is preferable in this context that the park is designated as a future public space, based on the recommendations in the Guiding Principle Plan of Public Space.

The redevelopment of Østre Aker vei 24c is furthermore interesting, considering how the different plot's functionalities will interact with each other. In light of the feasibility study prepared by Arcasa Arkitekter in collaboration with the landowner, OBOS (Arcasa Arkitekter AS, 2016) - and considering that the subway station (Risløkka T) and Risløkkalleén are large access generators for both soft mobility and cars - one must assume that a renewal of Østre Aker vei 24c will generate some traffic to the site, provided that the recommended connector (Risløkkveien) be established. One must additionally assume that minimal car-based traffic to Østre Aker vei 50 and Brobekkveien 87 is desired, in regard to the residential area. It would thus be beneficial if the through-traffic on Risløkkveien was somehow restricted. Risløkkveien should in that sense serve as a pedestrian-priority space.

The third challenge relates to noise and air pollution, and the barrier effect associated with Østre Aker vei (and future Østre Aker avenue). Considering that Østre Aker vei is the source of noise and air pollution, but also the sunny side of the plot, it is challenging to meet the requirements for both lighting conditions and noise. Future-oriented programming of new buildings in relation to the transformation of Østre Aker vei into Østre Aker avenue, cf. section 5.5.4, should be a premise of the feasibility study, with regard to noise and sun.

6.1.4 The combined feasibility study of Østre Aker vei 16, 18, 20, 22, 24, 50 and 60 (April - June 2018)

In conjunction with the processing of new zoning of Haraldrud, a collaboration agreement between the landowners north of Østre Aker vei, shown in illustration 38 (p. 67), and the Agency for Planning and Building Services (who represents Oslo municipality) was initiated in December 2017. The purpose of the collaboration, was to look at possible solutions that contributed to incorporate more residential areas at the north side of Østre Aker vei, compared to the building and planning authorities' recommendations, cf. the extract of the Plan Programme shown in attachment 4. The agreement furthermore implied that a combined and comprehensive feasibility study should be prepared, to establish some common developing principles, before any individual project related to the plots was initiated.

A consulting team, consisting of Alt Arkitekter, Efla, and Brekke & Strand, called team Alt Arkitekter, was subsequently engaged to prepare the combined feasibility study. The first meeting with each of the actors (the landowners, the Agency for Planning and Building Services, and team Alt Arkitekter) was held April 6th, 2018. The product of the combined feasibility study - consisting of team Alt Arkitekter's recommendations of principle densification solutions - was completed at the beginning of June 2018 (PBE, 2017b).

Because the preparation of the combined feasibility study was ongoing in parallel with the preparation of this project report, what is stated in this project report is independent of those conclusions which the combined feasibility study provides. However, the premises and challenges discussed at the start-up meeting have inspired this feasibility study, some of which are described below.

- Amendments of the urban structure suggested by the Guiding Principle Plan of Public Space, as well as the National Road Administration's system analysis regarding Østre Aker vei should be taken into account.
- The feasibility study should determine a solution that optimises utilisation in a long-term perspective - based on assessments of the challenging aspects related to Østre Aker vei and avenue. The plan

THE SCOPE OF THE COMBINED FEASIBILITY STUDY:

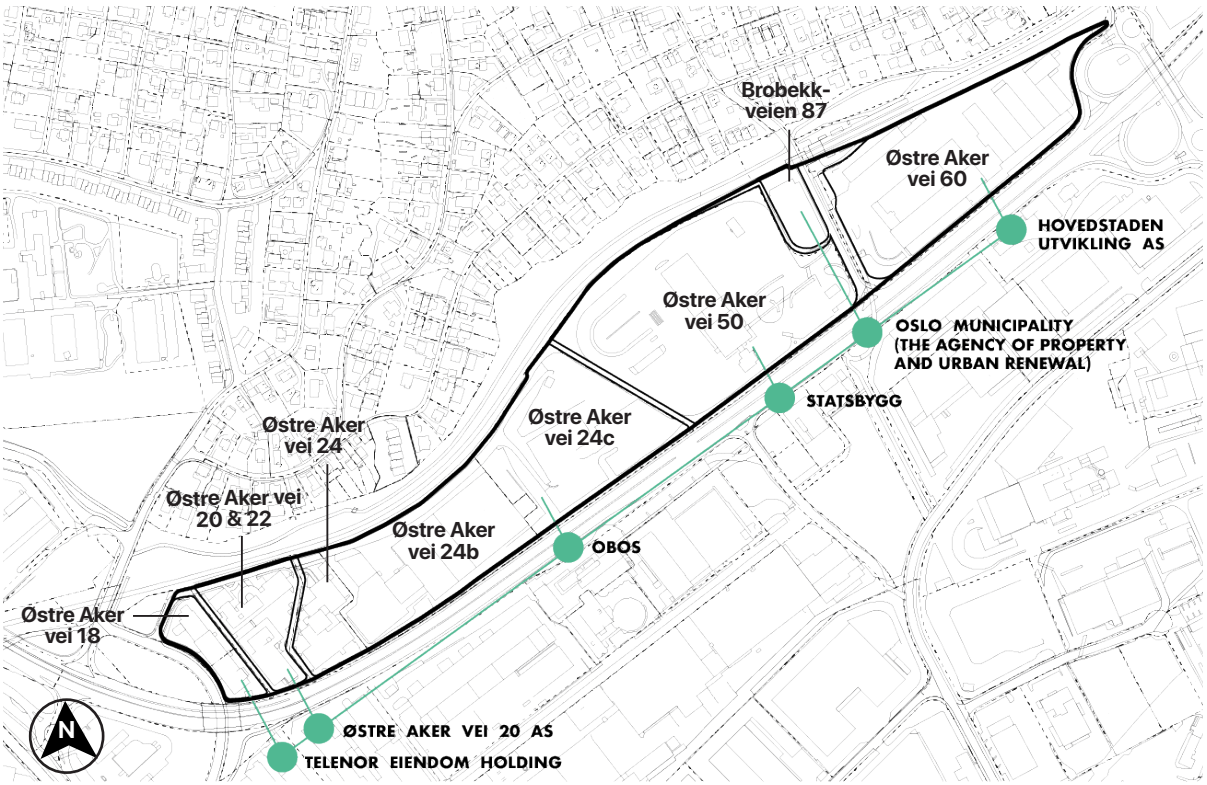


ILLUSTRATION 38: The scope of the ongoing feasability study of Østre Aker vei 16, 18, 20, 22, 24, 24b, 24c, 50 and 60, and the landowners associated with the different building plot areas.

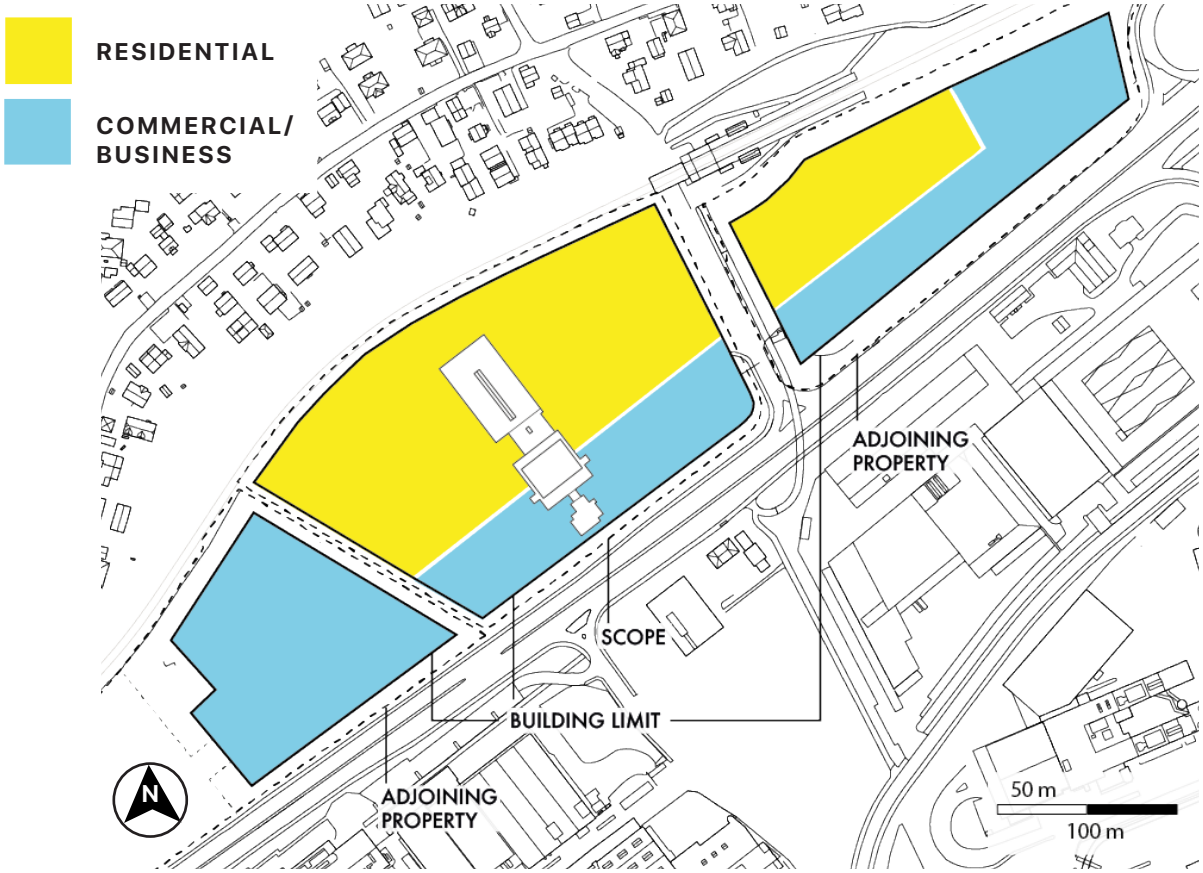


ILLUSTRATION 39: Suggested land use, in accodrance with the Plan Programme (PBE, 2015a, p. 44), building limit at the site, in accordance with the Municipal Master Plan (Oslo kommune, 2018), and adjoining properties

proposal should consist of a cohesive densification principle, focusing on potential for establishing residential areas, and the adjoining boundaries towards Østre Aker avenue.

- The cohesive redevelopment suggestion should not require an order-oriented implementation. Hence, every landowner should be able to develop each building plot without being dependent on the redevelopment of the adjoining properties in terms of access and outdoor space.
- The aspect of retrofitting potential would not be emphasised in the combined feasibility study.

This project report will consider these aspects, although this project report is independent of the outcome of the combined feasibility study. Determining retrofitting potential will, also, be emphasised in this feasibility study. As regards the future zoning and functionality of the adjoining properties (Østre Aker vei 24c and 50 respectively), the combined feasibility study implies that the future zoning of these properties has not been established yet. This aspect is therefore considered uncertain at the moment. The recommendation of the Plan Program, cf. attachment 4, as a basis for this feasibility study, therefore represents only an assumption regarding future land use regulations.

6.1.5 Premises of the feasibility study

Based on established knowledge about the future comprehensive development of Haraldrud, the following premises have been established for the feasibility study in chapter 7:

1. Implementation of the amendments of the Guiding Principle Plan of Public Space (2017) and Planning Programme (2015), which includes zoning for residential use and commercial use at the properties, as well as a redefined street network.
2. Implementation of Østre Aker avenue (50 km/h).
3. Densification solutions that provide a higher utilisation, at least 125 percent GFA, in line with the Municipal Master Plan (2015).
4. Redefine outdoor spaces and green areas, and incorporate at least one public space that can stimulate the vitalisation of Haraldrud.

Also, site-specific knowledge about the focus area and relevant design criteria and requirements must be examined in advance of the preparation of the feasibility study, to establish a complete design framework. The criteria of the site-specific analysis are elaborated under the next section.

6.2 SITE-SPECIFIC ANALYSIS

A site-specific pre-analysis of Østre Aker vei 50 and Brobekkveien 87 has been prepared to identify aspects of importance and discuss potential objective dilemmas before the preparation of the feasibility study. The site-specific analysis consists of five elements: 1) map registrations of the site, with the emphasis on relevant aspect in accordance with the Agency for Planning and Building guidance for site-specific analysis, cf. table 1 (p. 33), 2) a description of the driver and vehicle licensing office at Risløkka, based on a literature study and urban drifting, and 3) a summary of the site-specific analysis and conclusion regarding the current situation. Laws and regulations referred to in this chapter are enclosed in attachment 3.

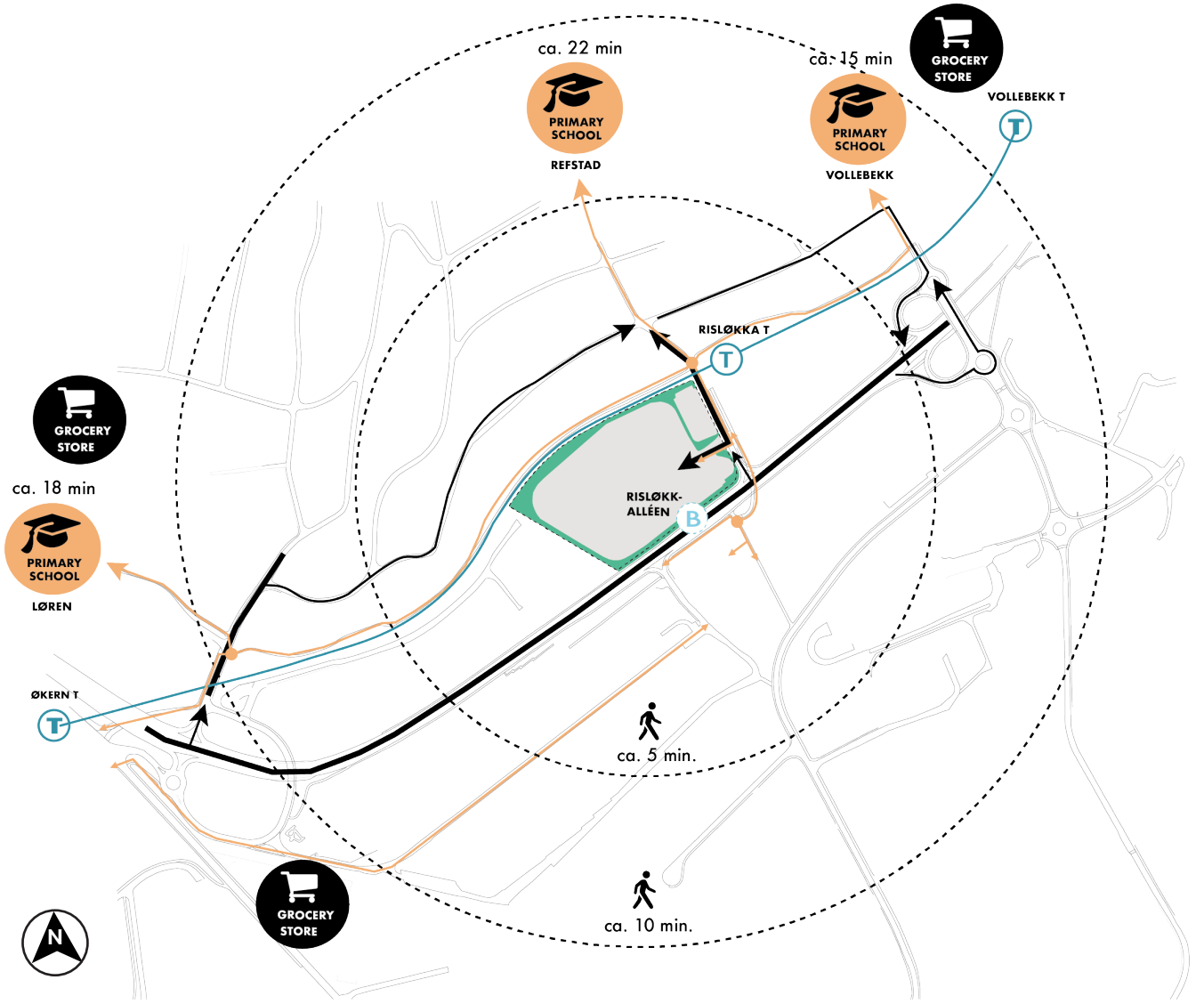
6.2.1 Map registrations and literature study

Section 6.2.2-6.2.7 are complementary comments to illustration 39-44 (p. 67-71), regarding the following conditions: land use and building limit, accessibility for soft mobility, terrain, noise and sound sources, sun path and green areas. Each illustration is based on both map registrations and literature study.

6.2.2 Predicted zoning and building limit

As regards the zoning in terms of land use, the amendments suggested by the Planning Programme (2015) is taken into account in this project report, and incorporated in illustration 39 (p. 67), representing the predicted altering of the zoning of the focus area. In light of the initiated combined feasibility study, cf. section 6.1.4, areas included in the feasibility study may be subject to other zoning decisions. A higher percentage of residential areas is preferably desired in this regard.

As stated in the land-use element of the Municipal Master Plan, cf. § 11.2, redeveloped areas close to the subway station (Risløkka T) should provide a total utilisation of 125 percent GFA. The outdoor



B **LOCAL BUS LINE (RUTER): N5 (NIGHT)**
REGIONAL BUS LINE: 153, 345, 435
AIRPORT BUS LINE: FB3

T **SUBWAY LINE: 5, 4**

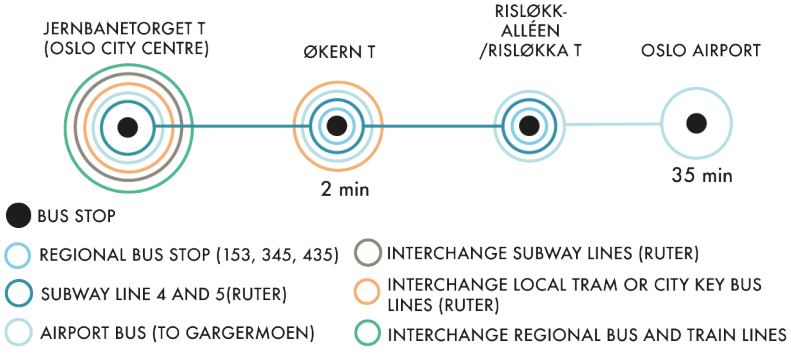


ILLUSTRATION 40: Accesibility (collective means of transportation, and soft mobility)

area standards of Oslo Municipality proposes a utilisation up to maximum 250 percent GFA, including a settlement comprising 80 percent housing, at transit hubs on the outskirts of the city centre (PBE, 2012, p. 11). Exceptions from the standard, in terms of land utilisation, apply in case of "clear protection interest" connected to building at the site (PBE, 2012, p. 14). Each floor shall have a minimum ceiling height of 2,4 metres, according to the Regulations on technical requirements for construction works (TEK17) § 12-7, and the cornice height of each building should be maximum 30 metres, cf. the Municipal Master Plan § 11.1 (Oslo kommune, 2015b; Direktoratet for byggekvalitet, 2017).

Building limits and predicted zoning description of the transformation areas next to Østre Aker vei 50 and Brovekveien 87 are therefore relevant to determine. The building limit must, in accordance with the Road Act § 29, initially begin at a 50 meters distance from any regional roads (here: Østre Aker vei) and 15 meters from any municipal roads (here: Risløkkalleen), unless otherwise is stated by the Municipal Master Plan or an adopted zoning plan (Lovdata, 2018c). The altered building limits related to Østre Aker vei 50, shown in illustration 39 (p. 65), is based on an older zoning plan (case S-1495), adopted 08.11.1968 (Oslo kommune, 2018).

Criteria for redeveloping the site:

(a) 125 to 250 percent GFA utilisation

(b) Building limit and land use cf. illustration 39

(c) The distance between houses/private outdoor spaces and common outdoor spaces must be at least 2 meters.

6.2.3 Accessibility

As regards the first aspect, accessibility of soft mobility, including proximate public transportation, and relevant services have been incorporated in illustration 40 (p. 69). Proximate access to the subway station (Risløkka T) provides a travel distance of approximately 15 minutes to Oslo's inner city from Østre Aker vei 50 and Brobekkveien 87. Since the adjoining property (Østre Aker vei 24c) is located closer to Risløkka T than Økern T, it would be appropriate to calculate a specific walking traffic between Østre Aker vei 24c and Risløkka T. This imply that the future connector Risløkkveien will probably serve as an access path for both Østre Aker vei 24c and 50. Given the location of the most proximate primary schools, there are several potential school routes on the north side of the area.

It shall furthermore be elaborated in any planning proposal, how the design for universal accessibility in the public space is provided, both within the scope of the plan proposal and in relation to adjacent properties, cf. the Municipality Master Plan § 6.1. With the aim of providing universal accessibility, the plan proposal must be according to the guiding principles of design for universal accessibility in Oslo municipality (Oslo kommune, 2014). Technical requirements include that access to common outdoor spaces shall: be step free, provide an increase not steeper than 1:15 (1:12 for distances under 5.0 m), a cross slope of a maximum of 1:50, provide a surface of low friction, have visually predictably delimitation (Lovdata, 2017).

About parking for cars and bicycles, the revised parking standard for Oslo (2017) proposes a reduction in parking requirements, as the aim of the revision is to facilitate future sustainable and little area-demanding traffic modes as part of the transit-oriented development strategy. The new standard will thus contribute to reduced car dependency and prioritise soft mobility (pedestrians and bicycles). Østre Aker vei 50 and Brobekkveien 87 are incorporated in 'the dense city zone', as the area is within 500 meters distance of a subway station (Risløkka T).

The new standard requirements imply maximum 0.2 parking spaces per 100 m2 of the office space and minimum 0.35/maximum 0.7 parking spaces, including the car park for visitor and services, per 100 m2 of the residential space. At least 50 percent of the parking spaces, in both residential and office areas, must, also, have a charging station for electric cars. 25 m^2 per number of parking spaces should be reserved in parking garages, 18 m^2 at street car parks, cf. TEK17 § 5-7 (KMD, 2014, p. 34). Requirements regarding the number of bicycle parking are 3.5 per 100 m2 of the residential space and 2.5 per 100 m2 of the office space. (PBE, 2017c)

Criteria for redeveloping the site:

(d) In cases of conversion or incorporation of outdoor public spaces, design for universal accessibility shall be provided, including: Step free accessibility, not steeper

ILLUSTRATION 41: Noise and air pollution (Oslo kommune, 2018)

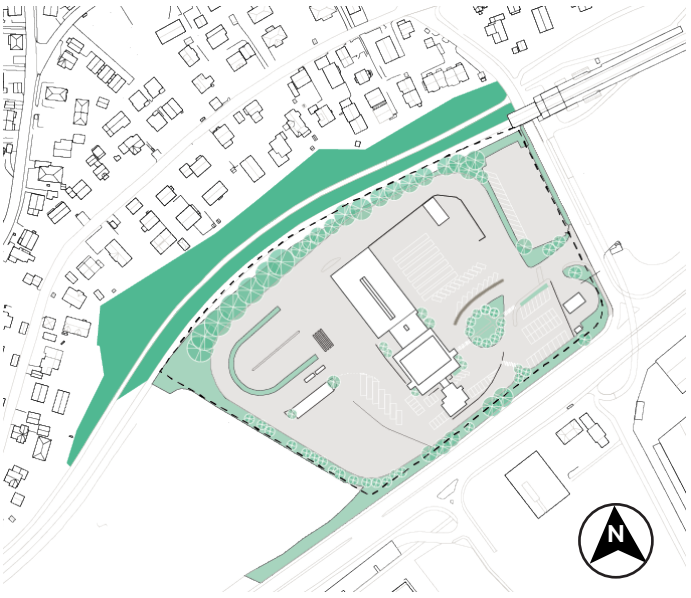


ILLUSTRATION 42: Green areas

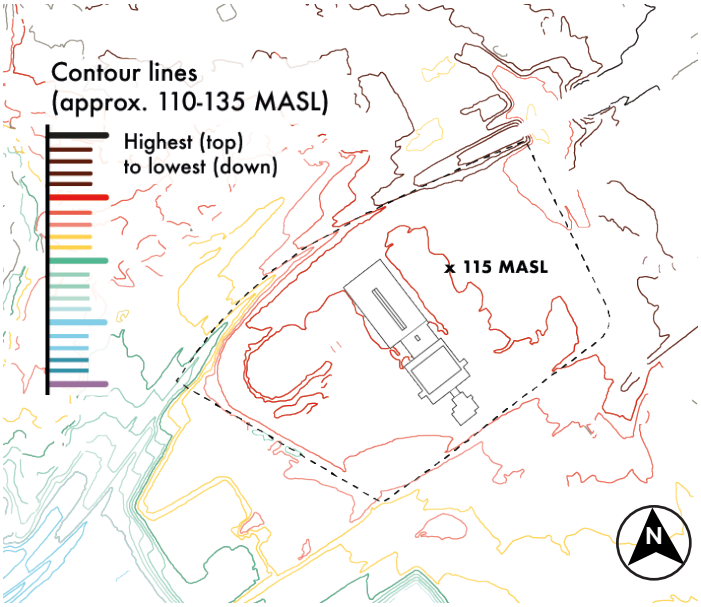
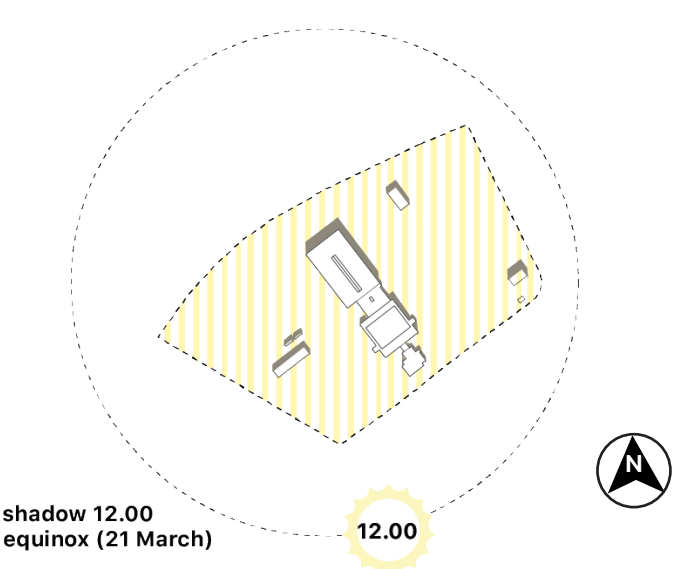


ILLUSTRATION 43: Terrain at the site.



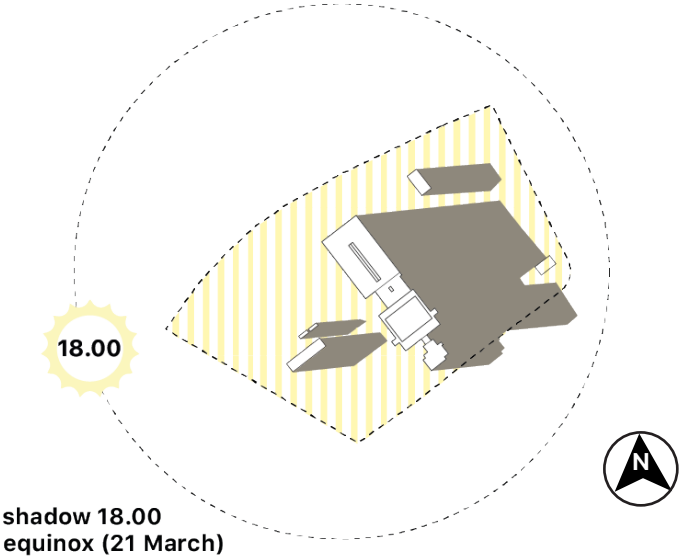


ILLUSTRATION 44: The position of the sun and shadows at 21 March, 12.00 (noon) and 18.00 (afternoon)

than 1:15, and cross slope of a maximum of 1:50.

(e) *0.2 parking spaces per 100 m² of the office area and 0.35-0.7 parking spaces per 100 m² of the GIA residential area, of which 10 percent must be HC parking.*

(f) 2.5 *bicycle parking per 100 m² of the GIA office area and 3.5 per 100 m² of the GIA residential area.*

6.2.4 Terrain

The terrain within the scope of the feasibility study, shown in illustration 43 (p. 71), has a relatively flat cross slope. The plots are located on a relatively high plateau, on counter line 115 metres above sea level (MASL). The sloping terrain between the plots Østre Aker vei 50 and 24c and the low settlement on the north side are aspects of relevance with regard to view, design of Risløkkparken and design for universal accessibility cf. section 6.2.3.

6.2.5 Noise

The relatively high noise level is a challenging aspect in relation to the redevelopment of the site, considering that the area is located within the designated yellow and red zone, cf. illustration 41 (p. 71). Because of the deviation zone, incorporated in the adopted Municipal Master Plan (Oslo Kommune, 2018), zoning of residential and commercial areas may, however, be incorporated, in line with the recommendation of the Planning Programme, provided that other requirements be met.

All residential units must, according to the Municipal Master Plan § 7.1, have at least one facade facing a quiet side, and suitable private or common outdoor areas provided with noise levels below the recommended limit of the Guideline regarding noise pollution in planning processes T-1442/2016 (L_{dn}<55 dB).

Criteria for redeveloping the site:

(g) All residential units within the deviation zone must have one quiet side (L_{dn}<55 dB).

(h) Common outdoor areas within the deviation zone should be exposed to less then the recommended noise level (L_{dn}<55 dB).

6.2.6 Sun

Illustration 44 (p. 71) gives a simple illustration of the shadow at equinox (21 March and 21 September), based on the extracts of a sun analysis in attachment 2, including the sun path at solstice (21 June) and equinox. The trees are excluded as vertical objects in the analysis. According to the Regulations on technical requirements for construction works (TEK17), § 8-10, and the outdoor area standards for Oslo, where the area is categorised as type two (which includes transit hubs on the outskirts of the city centre), at least 20 % of the outdoor space must be sunlit at least five hours at May 1st (PBE, 2012, p. 10). Distance to adjacent buildings should furthermore be three times longer than the height of the building (Direktoratet for byggekvalitet, 2017) .

The south-western side of the area is most exposed to the sun, and therefore most inviting for establishing outdoor areas. Exposure to afternoon sun is most important, with regard to the residential zone. Good afternoon lighting conditions may also increase security for the people using the areas, and thus promote vitality.

The negative terrain difference on the west side, cf. illustration 43 (p. 71) in addition to the building limit (about 10 meters within the boundary of the adjoining property), cf. illustration 39 (p. 67), may compensate for some blocking of sunlight on the plot, with regard to the redevelopment of Østre Aker vei 24c.

Criterion for redeveloping the site:

(I) Minimum 20% of the outdoor space must be sunlit at least five hours at May 1st

6.2.7 Green and common outdoor areas

Most of the area is covered with asphalt, as shown in illustration 42 (p. 71). At Østre Aker vei 50, there is essentially one small circular green area, surrounded by pine trees, in addition to the line of trees along the adjoining properties on the north, west and south side. The small green area before the main entrance of the driver and vehicle licensing office has, according to the City Director of Cultural Heritage, cultural-historic value (Byantikvaren i Oslo, 2018a). Considerations should, therefore, be given to this area, with regard to the protection of historical value.

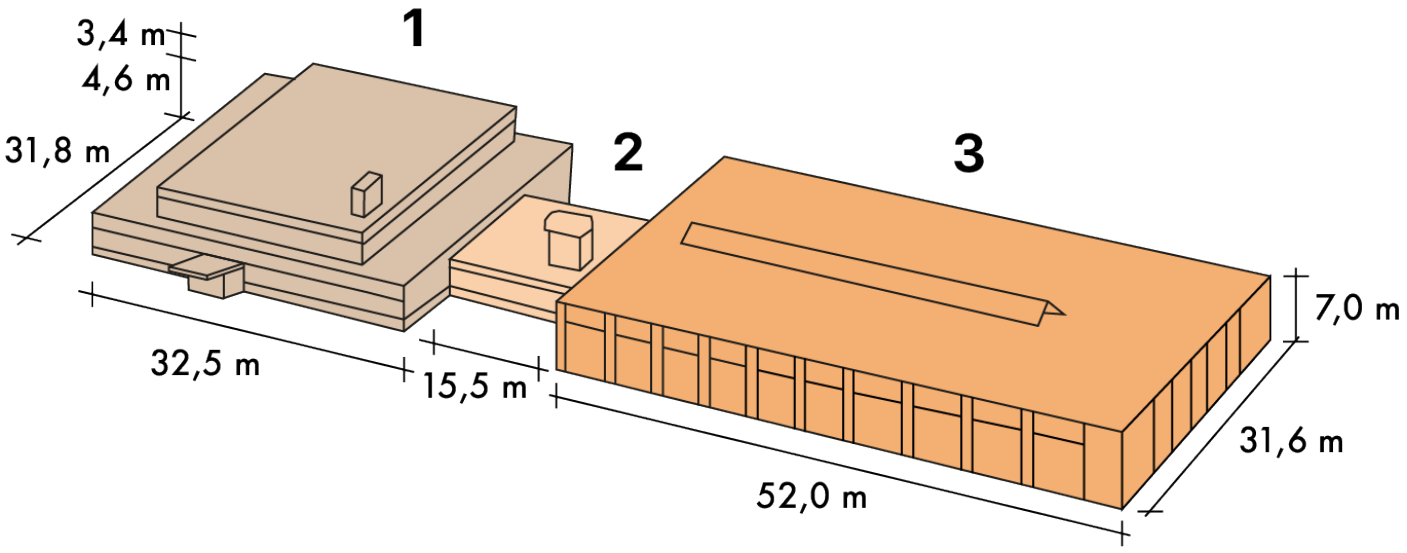


ILLUSTRATION 45: The three units of the driver and vehicle licensing office at Risløkka

According to the outdoor area standard of Oslo municipality, the minimum common outdoor area, shorted MFUA, shall comprise at least 20 % of the housing GFA. MFUA does not include private gardens or porches. Building properties larger than 1500 m^2 shall incorporate at least a 250 m^2 unified common outdoor area, shorted SFUA. At least 75 % of the area's MFUA must be according to the criteria for SFUA, with regard to appropriate use and play. The SFUA has a minimum width of 12 metres, and proportion in terms of length/width not larger than 2/1. All common areas must furthermore have some green features (including water and vertical and roof gardening) and 75 % must be situated on the ground level (PBE, 2012, p. 14-17).

Criteria for redeveloping the site:

(m) MFUA minimum 20 % of the housing GFA, and 75 % of the MFUA must be on ground level.

(n) SFUA equals >75 % of the area's MFUA.

(o) SFUA area minimum 250 m2, has minimum 12 metres width and maximum 2:1 area.

6.2.8 The driver and vehicle licensing office

The driver and vehicle licensing office at Risløkka, was designed by the architect Maurits Sundt-Hansen, and built-in 1972. The original construction consists of three units of different characteristics, cf. illustration 45, which reflect the red brick architecture of the 1970s. A horizontal window row characterises the office building, comprising the first (main building) and second units. Only the main building has 2 floors. There is also a basement below the main building. The third unit consists of an approximately 31 m x 52 m x 7 m workshop hall, as shown in illustration 45, which is associated with the vehicle service. It consists of several single workshops, connected with one or two of the distinctive vertical garage doors (Byantikvaren i Oslo, 2018a).

The whole building, including the green area outside the entrance of the main building, is considered to have a cultural-historical value in relation to the development of Haraldrud, according to the City Director of Cultural Heritage, and is therefore listed on the yellow list.

Objects which are listed on the yellow list represent the City Director of Cultural Heritage's input to the Municipal Master Plan, regarding potential protected objects. The proposal has not been processed, which means that the building nor the outdoor area do not have a protected status under the Planning and Building Act at the moment (Byantikvaren i Oslo, 2018a).

The reasoning behind the City Director of Cultural Heritage's request to protect the building is that: "*The driver and vehicle licensing office at Risløkka has filled an important function in the community since 1972, and is a well-known facility to many people in Oslo. The building is listed on the yellow list for the purpose of preserving the cultural-historical values associated with its function, and to preserve an identifiable landmark to which many people relate to. The building has in addition significant architectural qualities, and represents the variety of Hovinbyen*" (Byantikvaren i Oslo, 2018a).

Based on the City Director of Cultural Heritage assessment of the driver and vehicle licensing office at Risløkka, it is appropriate to consider protection, through retrofitting, in conjunction with the redevelopment of Østre Aker vei 50. As a dilemma arises with regard to the suggested redefined street network and zoning, as shown in illustration 37 (p. 63), it is relevant to discuss how appropriate retrofitting would be, considering the opposing considerations. Protection of the whole building would affect the land utilisation percentage. It is considered not relevant to built additional floors on the roof of the building in this regard, due to uncertainty as to whether the construction is sufficiently sustainable. This may imply that mixed-use solutions, including for example rooftop gardening or vertical gardening, may become a relevant proposal, to meet the recommendations for outdoor space and green areas, in terms of compensation for a possible high built utilisation of the area around the office. Considering the fact that the area is in the deviation zone, with regard to environmental challenges, other quality requirements should be stressed in the redevelopment of the plot. Hence any restriction of other quality requirements, such as the recommended requirements regarding common outdoor spaces, is considered not appropriate.

As the three different parts of the building have comparatively different retrofitting potentials, determining solutions that protect parts of the building, would also be appropriate in this regard. The workshop hall has, for example, some distinctive characteristics associated with multiple purposes, considering its high ceilings and vertical garage doors, unlike the other two units. There are many examples of retrofitting of similar industrial workshops, including Kanonhallen at Løren, as shown in illustration 15 (p. 27). Considering the reasons for protecting the construction are respectively related to (1) emotions with reference to the final driver test, all residents must take in order to obtain their driving licence, and (2) identity with regard to the cultural-historical associations, preservation of the entire building is possibly debatable, as the architecture in itself is considered less important.

According to the young people studying at Kuben Upper Secondary School at Haraldrud, cf. section 5.4 (p. 39), the basketball court on the roof of Kuben is the only attractive place at Haraldrud to hang out in your spare time. In light of the recommendation of the Agency for Urban Environments and others, cf. section 5.6 (p. 52), implying that the area needs more social services accommodating young people especially, it is relevant to determine opportunities for establishing new outdoor facilities and social services. Due to the compact urban development and expansion of small housing in Oslo, there is an increased need for attractive common areas and recreational facilities for children and young people. Future residences also imply a need of several proximate services, such as nursery schools and primary schools.

Outdoor sports grounds and common outdoor areas can also imply negative externalities on neighbours, in the form of noise, making it unpopular to establish a basketball court or other types of noisy activities close to a residential area. Indoor facilities adapted to activities for children and/or young people are thus a solution which excludes this negative externality. The main disadvantage of sports facilities, when costs are disregarded, is that it requires a large space. As the third part of the driver and vehicle licensing office building meets the area requirement for most sports facilities, which is minimum 25 m x 45 m for handball courts and gymnasiums, including basketball courts and seven-a-side football courts (Kulturdepartementet, 2016,

THE EXPERIENCE FROM URBAN DRIFTING

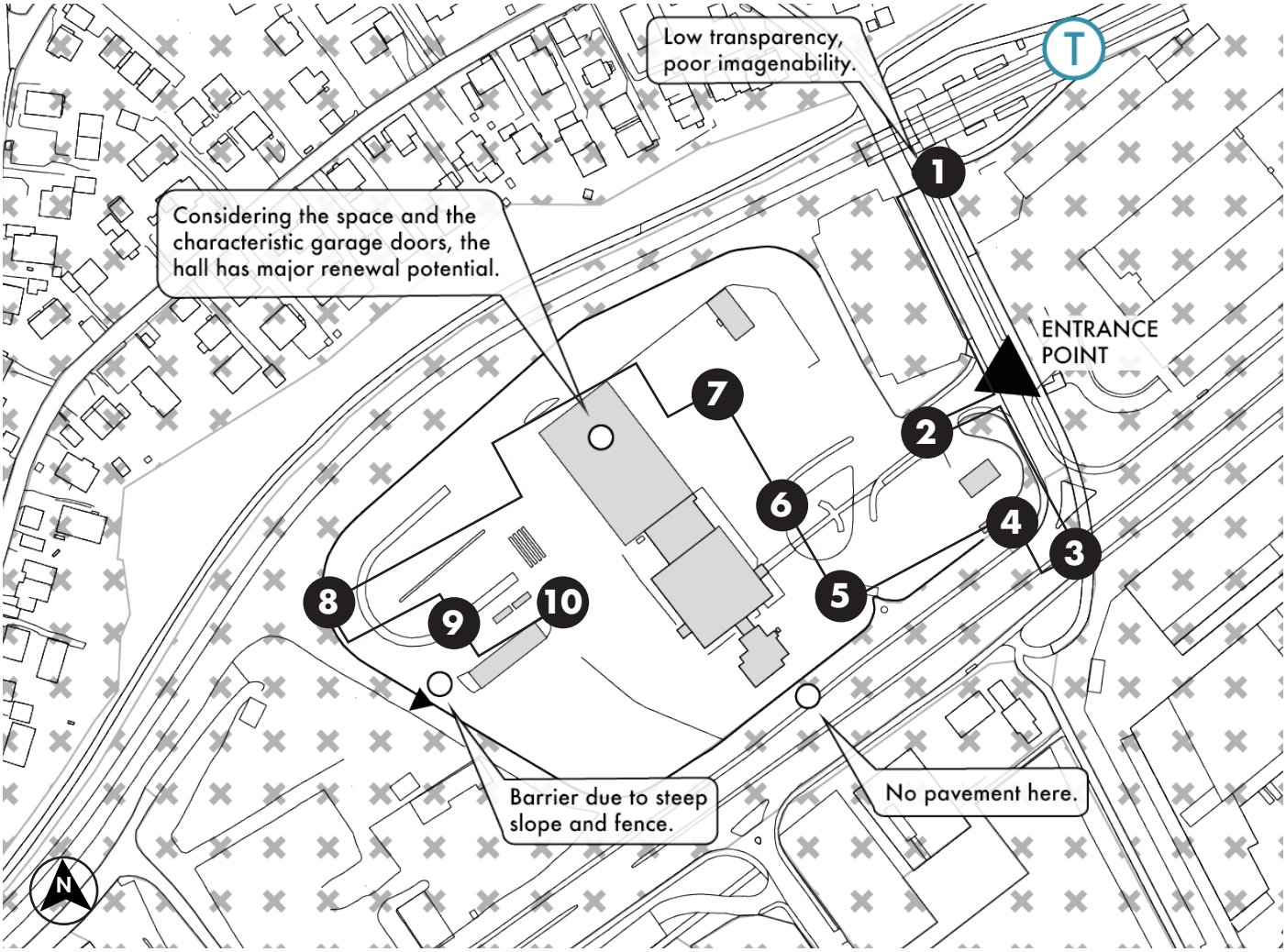


ILLUSTRATION 46: The route of the urban drifting at the plot

p. 39-41), this purpose should be assessed in regards to supply and demand. Sports are in addition an important cultural resource, and catalysts for vitality.

The evaluation regarding protection of the driver and vehicle licensing office at Risløkka must be based on a discretionary assessment, as this is, for the moment, not statutory protection. With regard to the emotional aspect, the cultural-historical value, and motivation behind the transit-oriented development, partial protection including protection of the third building, hereafter called the workshop hall, is recommended in this regard, as this is considered most appropriate. Different solutions of exploitation have been examined in detail, and evaluated in the feasibility study, cf. chapter 7 (p. 81).

6.2.9 Urban drifting at the site

To concentrate my own feelings and associations to the physical environment, I selected specific motives of the urban fabric that gave a distinctive association when I was visiting the site. These motives are depicted on pp. 76-77, in addition to my own comments on the experience cf. illustration 46.

The urban drifting was conducted on a Monday, April 5th, at 9.00-10.00, and a Tuesday, April 6th, at 12.30-12.45. The time indicates this to be a normal day, in terms of road traffic and activity associated with the driver and vehicle licensing office. Some of the associations are valuable in this context, as these cannot be determined by map registrations or literature study. Based on the urban drifting, three experiences are considered relevant information in this regard: the experience of noise, accessibility, and transparency.

The different experiences of noise within the indicated red and yellow zone, cf. illustration 41 (p. 71), are important, as they will function as subjective references in the assessment of different urban structures and the plan proposal, elaborated in chapter 7 (p. 81). The challenge here is to transform an area, which is much exposed to much traffic noise and air pollution, into a pedestrian-friendly and liveable area.

The feeling of accessibility, in terms of the lack of entrance points and barriers situated on all sides of the plot (including terrain), is the second important experience in this regard. Today the area entirely promotes a car-based experience with large parking space in front of the driver and vehicle licensing office, creating an uninviting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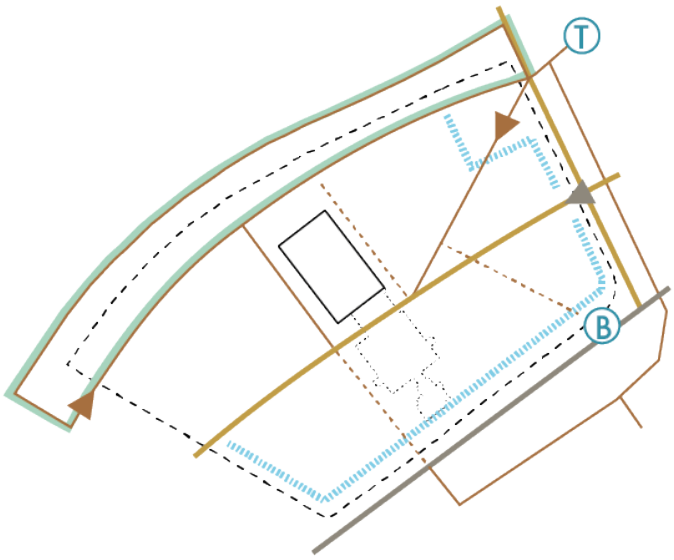
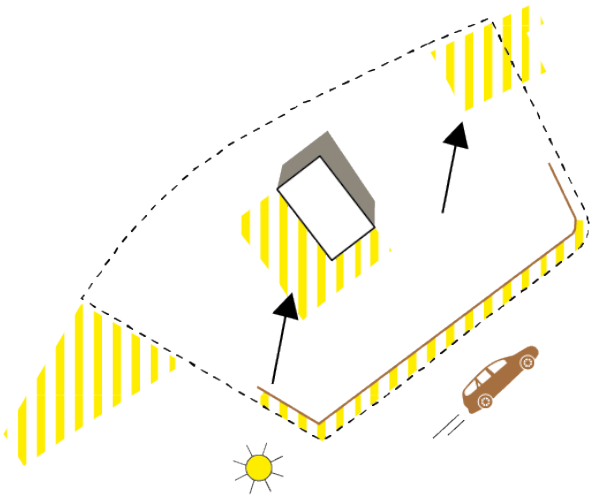
SITE-SPECIFIC ANALYSIS OF THE SITUATION WITH POTENTIAL RENEWAL



Green lane
Main pedestrian connectors
Alternative pedestrian connectors
Pedestrian-priority space
Car-priority space

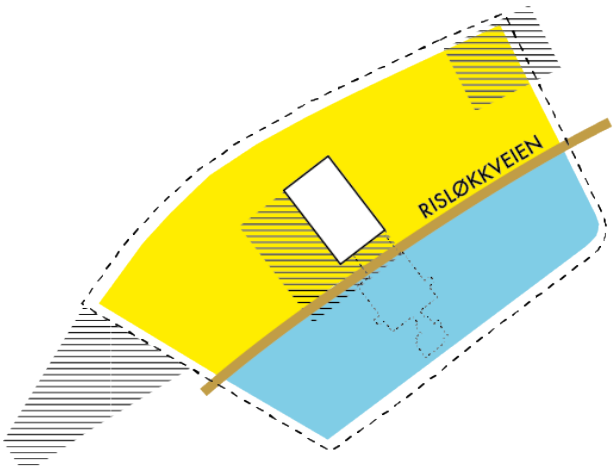
Soft mobilities main entrance points
Entrance points for cars
Conserved part of the current building
Human scale friendly façades

ILLUSTRATION 47: Site analysis with conceptual street network with regard to walkability.



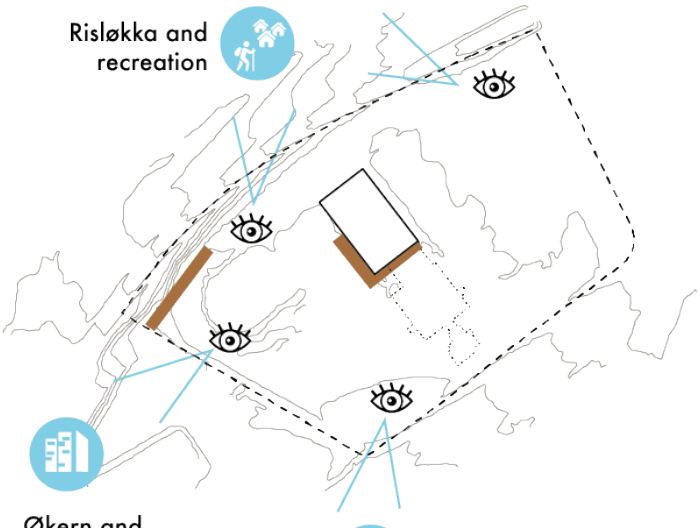
Outdoor areas that should be exposed to sun (>5 hours at May 1st)
Façades exposed to noise L_{dn}>55 dB (potential noise barrier)

ILLUSTRATION 48: Site analysis with conceptual areas exposed to sun, and noise barriers.



Residential area
Commercial/business area
>250 m² Unified outdoor areas

ILLUSTRATION 49: Site analysis with conceptual land use and common outdoor space.



View
Ramp (<1:15) needed with regard to universal accessibility

ILLUSTRATION 50: Site analysis with terrain and view.

PRINCIPLE FUTURE AMENDMENTS BASED ON THE SITE-SPECIFIC ANALYSIS

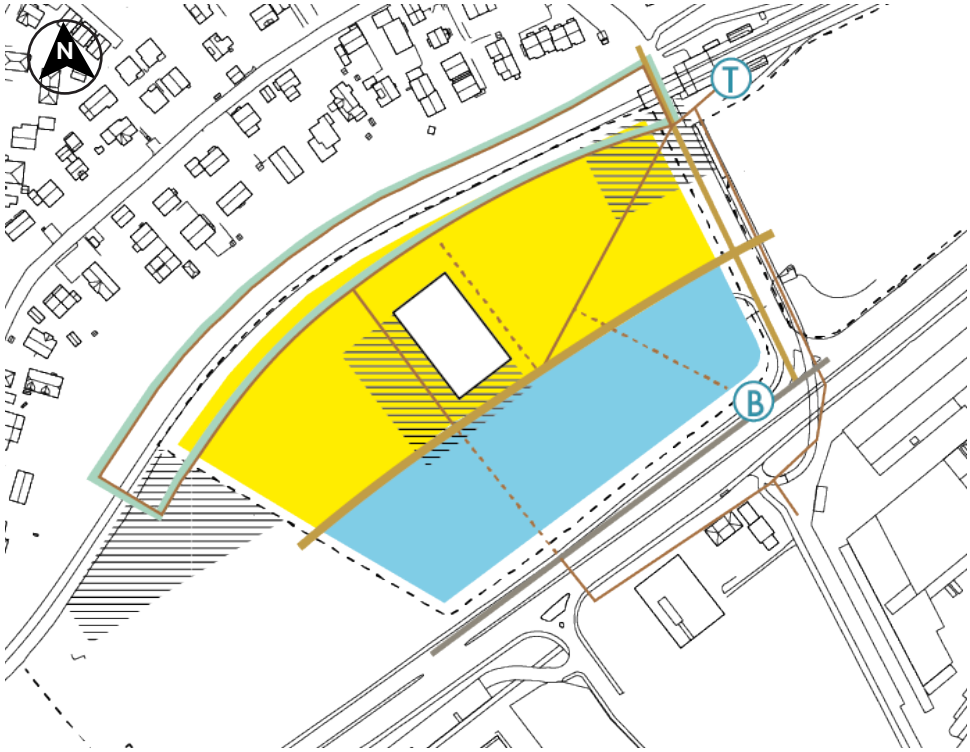


ILLUSTRATION 51: A site-specific analysis of the situation, based chapter 6.

environment. The height difference of about 2 meters between Østre Aker vei 24c and Østre Aker vei 50, is significant with regard to universal accessibility.

The third aspects regard the poor transparency associated with the access road connected to Østre Aker vei 50, due to the fence along Risløkkalléen, between the subway station (Risløkka T) and the entrance point. In regard to human scale, it would also be beneficial if the entrance was closer to the subway station. The row of trees along the north side of the site also blocks the view towards the adjoining area, across the subway line. Given the attractive view towards the north, with reference to the human activity associated with the trail and the park, I consider this part of the area potentially attractive, in terms of view.

Supplementary comments on the experience are illustrated in illustration 46 (p. 75).

6.2.10 Summary of the situation

This section is a comment to illustration 47-51 (pp. 78-79), which shows a summary of important aspects of today's situation, based on chapter 6.2.2-6.2.9. At the location of the driver and vehicle licensing office at Risløkka, where the redefined street network intersects, cf. illustration 37 (p. 65), contours of a spatial division and potentially central outdoor space materialise. The outdoor space around the building has the potential to become the prime space of the future much denser area. Pedestrian connectors between the park (Risløkkparken) and the square at the subway station (Risløkka torg) including the green ring (Risløkkalléen), would provide a transparent and inviting access to the prime space. A green pedestrian walkway should in that regard be situated on the north side of the area, cf. illustration 47 (p. 78), to make the area more inviting. With the subway and view toward Risløkka on the north side, the path could become an essential circular walkway, which binds the "vital elements" together, and thus gives the area more publicity.

The sun analysis, cf. section 6.2.6 (p. 72), implies that the west side of the area 's vertical settlements are most suitable for establishing outdoor spaces, including the prime space, although it would be a less beneficial location with regard to transparency at the Subway Square and Risløkkalleén, if the driver and vehicle licensing office is to be conserved. Based on previous assessments, cf. section 6.2.8 (p. 73), it is considered beneficial to retrofit the workshop hall of the building into an integrated identity carrier of the new settlement. The conserved building could, for instance, contain social services or noisy activities, considering the construction would function as sound isolation.

It is furthermore considered most beneficial to situate the tallest constructions on the north side and east side of the plot, to save

Table 2: Urban design criteria for the feasibility study

Important amendments	Criteria
Utilisation	*125 to 250 percent GFA utilisation. The distance between houses/private outdoor spaces and common outdoor spaces must be at least 2 meters. Each floor shall have a minimum ceiling height of 2,4 m.*
Residence and office areas	*Building limit and land use cf. illustration 37. All residential units within the deviation zone must have one quiet side (L_{dn}<55 dB).*
Accessibility	*Design for universal accessibility shall be provided, including a step free accessibility, pitch of maximum dimension of 1:15, and cross slope of maximum of 1:50. With regard to blind people, correct lines should be prioritized rather than curved lines. Shared space is not suitable for all pedestrian groups. Proximity and transparency should also be taken into account. Maximum 0.2 parking spaces per 100 m^2 of the office area and minimum 0.35 parking spaces per 100 m^2 of the residential area should also be provided.*
Lightning conditions	*Minimum 20% of the outdoor space must be sunlit at least five hours at May 1st. Good afternoon lightning conditions should be emphasised. The distance to adjacent buildings should be 3 times the height of the building.*
Green and common outdoor areas	*The area implying the least negative impact in terms of noise and air pollution must be chosen. MFUA must be at least 20 percent of the housing GFA, and 75 % of the MFUA must be on ground level. 80 % of the MFUA must be SFUA, which applies to the area having a minimum area of 250 m^2, width of 12 metres, and which is not more than 2:1 width/length. Common outdoor areas within the deviation zone should be exposed to less then the recommended noise level (L_{dn}<55 dB).*

common outdoor spaces from the shadow. The higher terrain also provides good view opportunities in terms of three directions: towards Kabelgata, Risløkka and Økern.

The noise source from Østre Aker vei implies that a form of noise barrier must be established to create a liveable environment. Higher constructions along Øster Aker vei imply greater soundproofing but also more shadow on the plot.

With the transformation of Østre Aker vei, the design of the façades against Østre Aker avenue should also be human-friendly, in terms of first floors. It may also be appropriate to situate an opening of a passage at the building row along Østre Aker vei if it connects to a crossover for pedestrians at Østre Aker vei. This alternative entrance point is however considered less critical with regard to soft mobility traffic. The adjoining park and the subway station (Risløkka T) would be the main entrances point used by soft mobilities, while Risøkkalléen would be the car entrance.

6.3 CONCLUSION

The site comprising Østre Aker vei 50 and Brobekkveien 87 has major development potential, in light of the transit-oriented development strategy, as well as the deviation zone, which provides the opportunity for implementing residential and commercial zones at some parts of the area. Based on the Planning Program and the Guiding Principle of Public Space, several principle amendments, including a redefined street network and new zoning, provide a general framework for the feasibility study. The relevant changes represent the essential renewal principles, cf. illustration 51 (p. 79), which will be taken into account in the feasibility study, in chapter 7.

It is considered appropriate to protect parts of the driver and vehicle licensing office at Risløkka, based on the argument of the City Director of Cultural Heritage. In this regard, the workshop hall is considered the most important element of the construction. It could be useful, if it is used as a vitalisation tool, implying a transformation of the workshop hall into a room of mixed purposes. These purposes could, for example, include: an event hall, a sports hall, a youth workshop, a cafe, housing, or offices. However, it has not yet been investigated whether the structure of the building is adaptable for these types of purposes - and thus the extent of a renovation. This matter will not be examined in the feasibility study either. Based on the urban drifting, cf. section 6.2.9, there is a need for a renovation of the roof construction in particular. In light of the objections related to the Guiding Principle Plan of Public Space, cf. section 5.6, social infrastructure is an element missing in the development of Haraldrud. In this connection, there is an opportunity to meet this need through a renewal of the workshop hall.

Overall guidelines related to the area (regulations, plans and principle municipal guidelines) also sets out some essential requirements, cf. table 2. These requirements also provide a framework for the feasibility study, cf. chapter 7.

FEASIBILITY STUDY OF ØSTRE AKER VEI 50 AND BROBEKKVEIEN 87

CHAPTER 7

7.1 INTRODUCTION

The feasibility study examined in this chapter is based on the principle renewal amendments described in chapter 6, as shown in illustration 51 (p. 79), regarding the recommended location of common outdoor spaces and redefined street network. Chapter 7 is thus a more detailed study of regarding densification opportunities, and retrofitting opportunities for the driver and vehicle licensing office at Risløkka. The suggested solutions should moreover be assessed against the legal criteria set out in chapter 6.2, cf. table 2 (p. 80), regarding the following aspects: utilisation opportunities (% GFA), design and situation of residential and office areas, accessibility with regard to all traffic users, and design of green and common outdoor areas with regard to lighting conditions and noise pollution.

The feasibility study consists of a volume study with regard to the criteria mentioned above, a discussion regarding how retrofitting of the driver and vehicle licensing station can be used as a catalyst for vitalisation, and a final recommended plan proposal in the form of a situation plan.

7.2 VOLUME STUDIES

There are several ways to attack a volume study, depending on the starting point of the study in terms of the vision and the imposed considerations to accommodate. The starting point for this feasibility study is to meet the premises cf. section 6.1.5 (p. 68) and the criteria cf. table 2 (p. 80). The main objective is to facilitate a residential and business area, where the space between the buildings provides good conditions for creating a viable area.

7.2.1 The design process

The process of developing a design starts with addressing the elementary spatial premises. The starting point in this regard is based on the principal future amendments described in section 6.2.10 (p. 79). It includes the establishment of: Two main connectors (one pedestrian connector and one connector which serve as a shared space), conservation of the northern part of the driver and vehicle licensing office, and the incorporation of three common outdoor areas, cf. illustration 49 (p. 78).

Shared space implies, in this case, a balanced design, in which all traffic users can move freely apart from the car, with the purpose of forcing drivers to show consideration for pedestrians and not the opposite. The design of the road's surface should in this regard imply that the area is a pedestrian-priority space, for example in the form of visual expansion of the pavement or vertical elements that provide velocity restriction or mental "edge friction" (which makes the driver slow down the speed). Step free access and tactile paving surfaces, to help disabled and visually impaired pedestrians easily interpret the environment, is also necessary to implement in design.

Other key features, concerning visually impaired pedestrians, may also be incorporated, including: the contrast in colour and road surface, properly lightning conditions, tactile signing, adequately visible information signs in terms of position, size and style of the text, use of colours and tones. Physical urban features lower than 50 metres should also be avoided, as well as curved lines (DETR, 1998, p. 11).

In the next phase of the design process, principal secondary axes for pedestrians are incorporated, as well as areas where universal access must be established due to differences in the terrain, as shown in illustration 53 (p. 84). In case the roof of the hall should be transformed into a common space, the entrance should include a universally designed ramp, cf. illustration 53 (p. 84), or a sufficiently large elevator. The ramp is dimensioned according to the requirement of maximum 1:15 pitch, cf. table 2 (p. 80).

As the standard for outdoor areas in Oslo requires that the residential area have at least one common combined outdoor area of minimum 225 m^2, this is implemented in the next part of the volume study, as shown in illustration 53 (p. 84). Principal areas of the new buildings were furthermore situated, as shown in illustration 54 (p. 84), based on the principal secondary axes for pedestrians, the recommended zoning and building limit. The principal areas occupy a total of just under 40% of the building area within the scope. According to table 2, the common outdoor area should corresponds to minimum 20 percent of the total area for residential purposes. Thus, a larger proportion of undeveloped outdoor space implies increased opportunity for vertical utilisation. As large areas are considered unsuitable to establish a common outdoor

area due to the subway line and new street network, it is necessary to limit the utilisation rate on the ground level area in order to increase the utilisation rate for housing. The sufficiently user-friendly outdoor area in terms of size, terrain and solar conditions, according to the shaded area in illustration 54 (p. 84), thus gives an indication of the exploitation possibilities when it comes to the vertical dimension. In total, this area covers approximately 10400 m^2.

As regards the residential area, outdoor areas for private gardens and verandas sufficiently exposed to the sun could also be included in the shaded area cf. illustration 54 (p. 84). As to the business area, two outdoor areas would also function as attractive features at the area and provide valuable space between the urban blocks, so that all settlements have close access and views towards a green area. Because the outdoor area and façades within the residential area should be adequately protected against noise from primarily Østre Aker vei, a line block is situated along Østre Aker vei in order to establish a noise barrier.

A study of cornice heights of the different buildings is furthermore examined in the nest phase, with the aim of achieving utilisation of at least 125 % GFA, cf. illustration 55 (p. 85). Sufficient exposure to sun and the recommended distance between buildings and private and public areas, cf. table 2 (p.80), has been taken into account in this part of the design process, to ensure a balanced combination of high utilisation and a suitable living environment. Table 3 (p. 88) shows the estimated basis values, used in the study. The values in table 3 are inexact, as the purpose of the study is to provide an approximate utilisation calculation based on principle volumes. Thus, the principal urban blocks can later be adjusted, relative to a general starting point.

The main alternative, as shown in illustration 55 (p. 85), represents the recommended explosion in terms of utilisation, which is about 139 % GFA. The different volumes of the suggested urban settlement create interesting dynamics in addition to good lighting conditions. Buildings of few floors can also be interpreted as human-friendly, with reference to the recommended cornice height of buildings along pedestrian-friendly commercial streets is seven metres (which corresponds to two-three floors), with respect to human scale. Ensuring a settlement of relatively low density, providing a neither too enclosed or too open sense of place, is considered necessary, in this case, to create attractive outdoor spaces. Even though buildings with cornice height of up to 30 meters (12 floors) might theoretically be approved, this is considered inappropriate at the site, considering the urban setting.

The main alternative, cf. illustration 55 (p. 85), requires that a parking coverage of at least 82 parking spaces for the residential area must be installed, alternatively in addition to a maximum of 61 parking spaces for the office area. 82 parking spaces constitute approximately 2050 m^2/1476 m^2 garage/street parking area, while 143 parking spaces constitute approximately 3575 m^2/2574 m^2 garage/street parking area. The volume study has not taken the exact situation of new parking spaces into account. However, underground parking might be possible to implement at the site, in this regard, to avoid street parking, considering 2050 m^2/3575 m^2 corresponds to only 5.2/9.0 percent of the total land area.

In addition to the main alternative, as shown in illustration 55 (p. 85), table 3 (p. 88) shows an estimation of three other possible alternatives, based on different combinations of a number of floors based on the same urban blocks. These alternatives provide other utilisation rates, including 131 %, 148 % and 170 % GFA. The latter alternative represents the maximum recommended utilisation in this feasibility study which is considered appropriate, based on the underlying criteria for creating an attractive, viable area. In essence, this alternative represents the maximum vertical utilisation which is in accordance with the minimum common outdoor area standard (20 % of the dwelling's GFA), based on the established blocks and common outdoor areas cf. illustration 57 (pp. 86-87) and table 3 (p. 88).

In the final phase of the volume study, the outdoor areas were categorised into three groups according to its functionality and location within the different zones, cf. illustration 56 (p. 85). The yellow areas initially imply private gardens (ground level) or verandas (2nd and higher floors) attached to individual apartments. Blue areas imply common outdoor areas primarily connected to the two office blocks on the south side, while the orange areas represent common outdoor spaces, including two public spaces: the Subway Square and the central

APPROACH TO THE VOLUME STUDIES

Pretext (Chapter 6) — Site-specific analysis, including the recommended principal amendments

Volume studies

Step one, cf. Illustration 52 — Implementing the essential connectors and common outdoor areas

Step two, cf. Illustration 53 — Implementing the secondary connectors

Step three, cf.Illustration 54-57 — Adapting new urban blocks in terms of ground area and height with regard to...

cornice

Criteria regarding the outdoor space

Criteria regarding land use and Utilisation

Step four, cf. Illustration 58 — Final recommendation.

VOLUME STUDIES

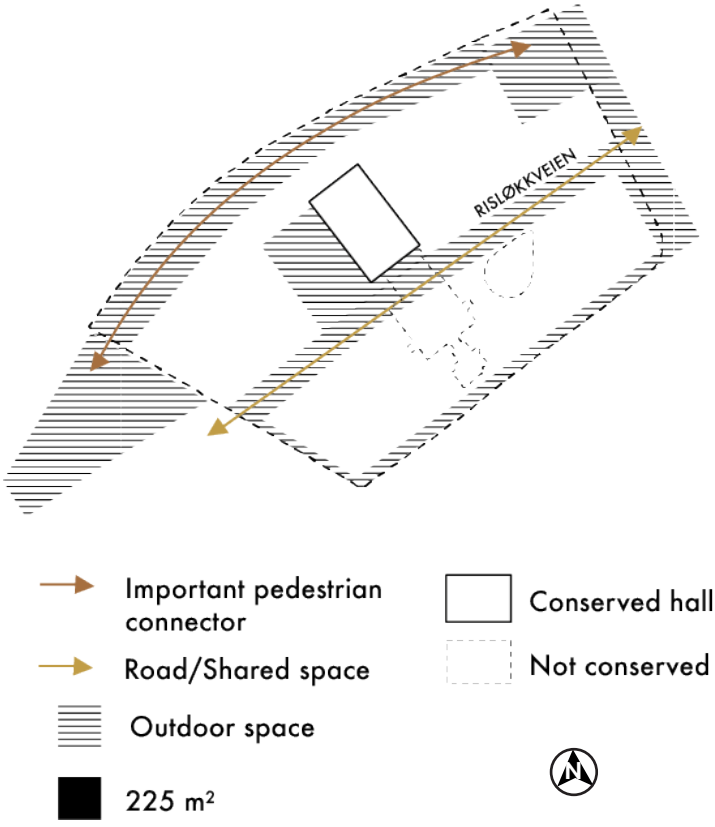


ILLUSTRATION 52: Incorporate main axis and common outdoor space, based on the recommended principle amendments cf. chapter 6 (p. 71).

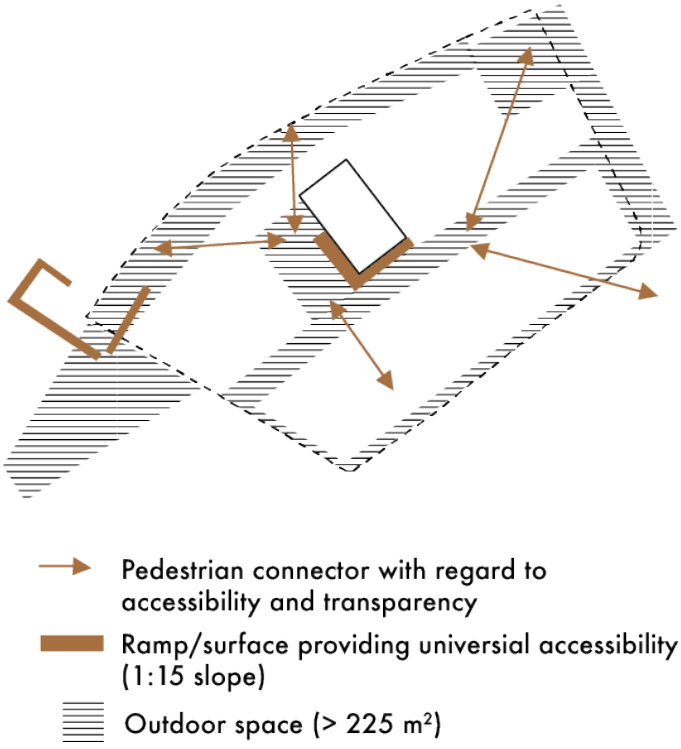


ILLUSTRATION 53: Add the secondary pedestrian connectors, with regard to accessibility.

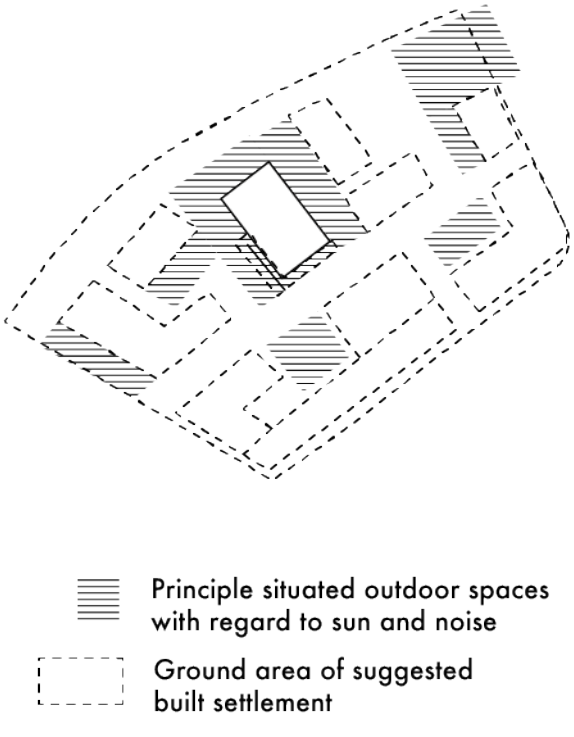
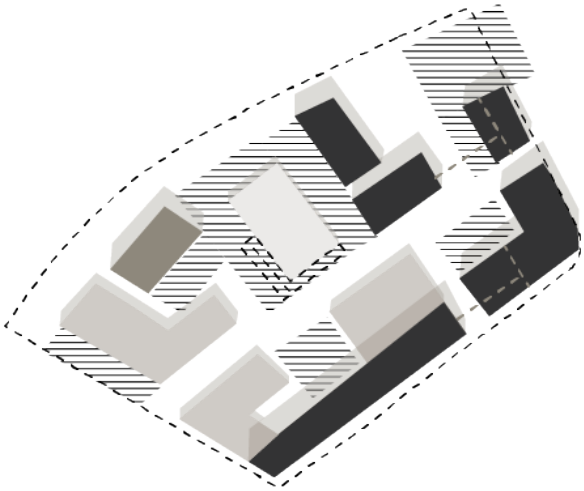
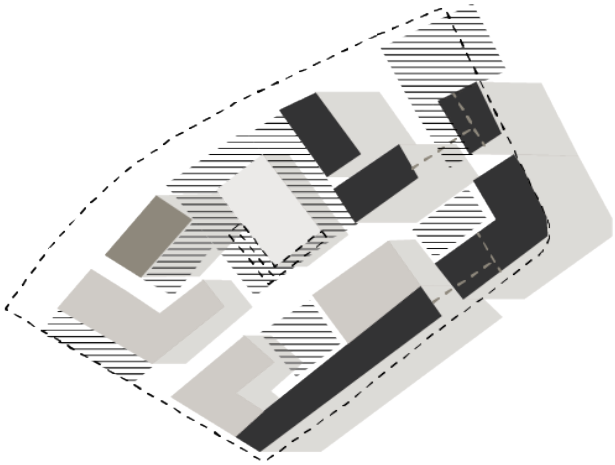


ILLUSTRATION 54: Adapt built settlement to the access connectors, with regard to sun and noise.



1 floor (3 m)
2 floors (6 m)
3 floors (9 m)
4 floors (12 m)
5 floors (15 m)
Recommended distance (3 times the height of the building)

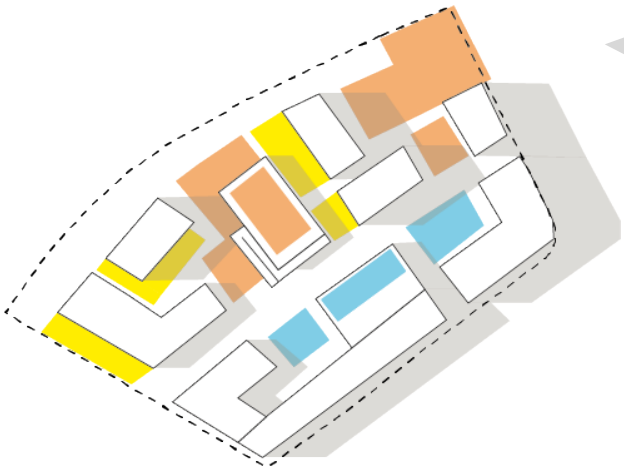
Shadow
Solstice 12.00



1 floor (3 m)
2 floors (6 m)
3 floors (9 m)
4 floors (12 m)
5 floors (15 m)
Recommended distance (3 times the height of the building)

Shadow
Solstice 18.00

ILLUSTRATION 55: Adjust cornice height relative to shadow and recommended utilisation (> 125 % GFA). This combination provide an utilisation of approximately 139 % GFA, cf. table 3.

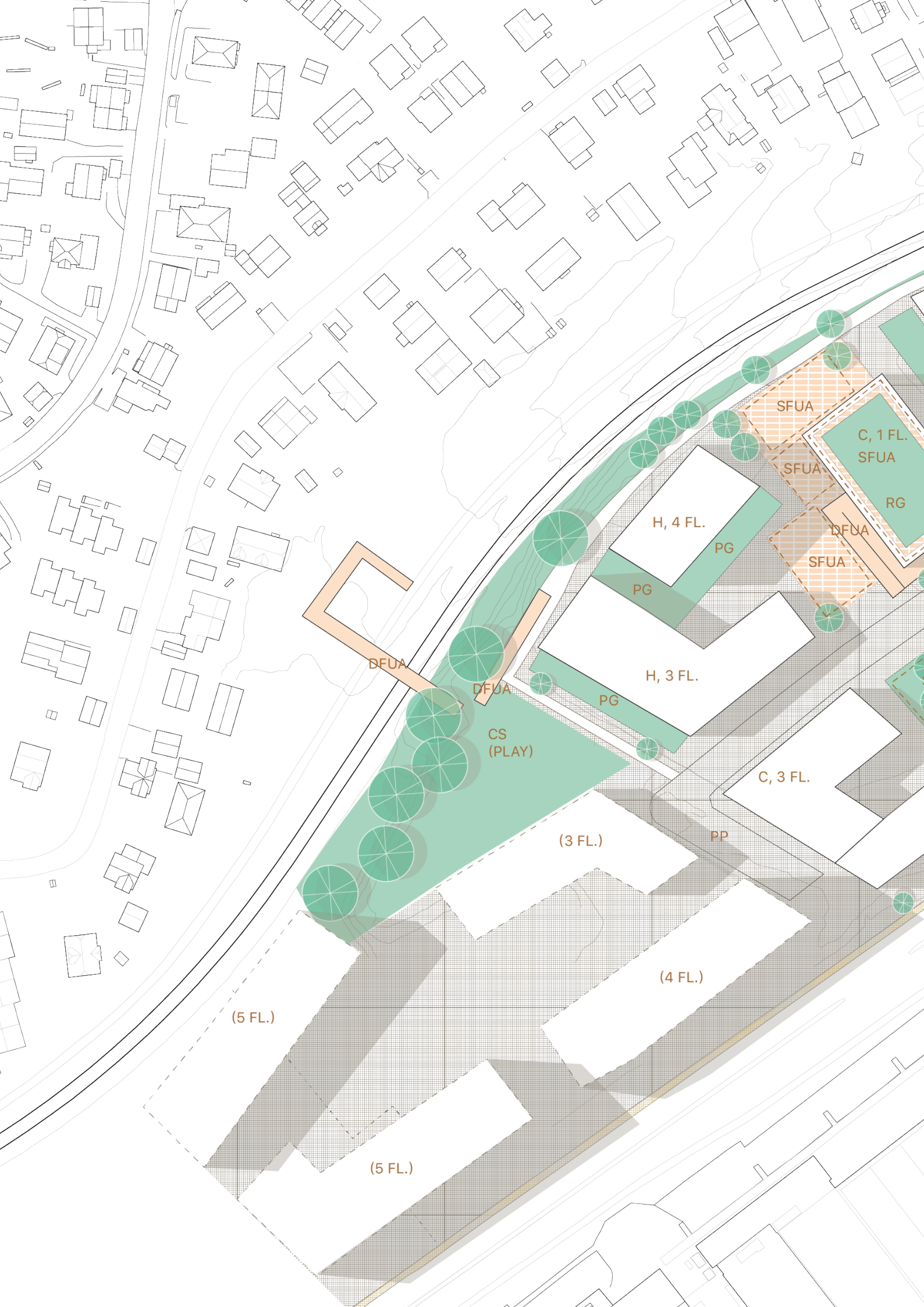


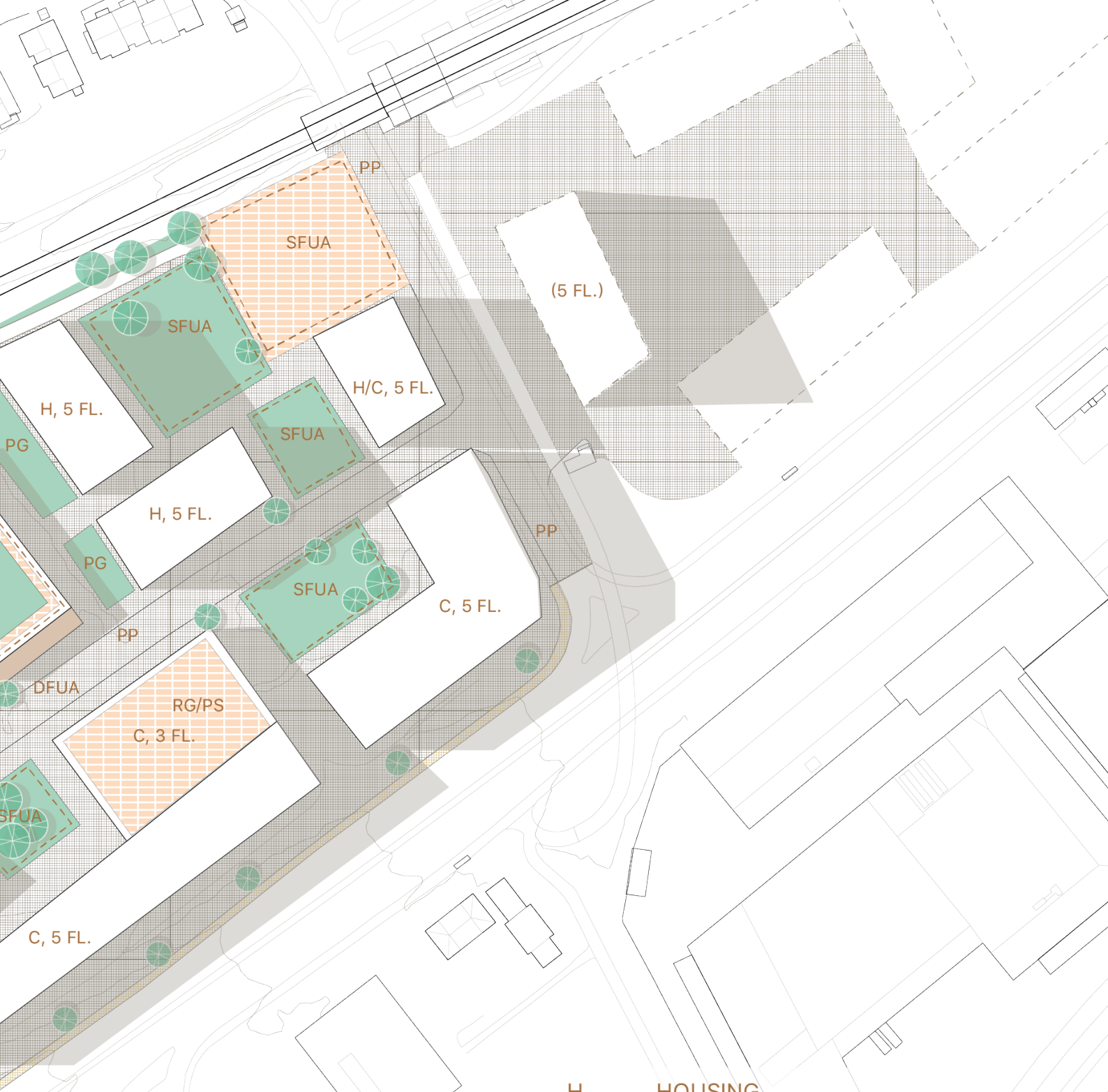
Common outdoor area
approx. 6500 m² total
Private outdoor space (Residental area),
approx. 3000 m² total
Private outdoor space (Office area),
approx. 2650 m² total

ILLUSTRATION 56: Segregation of outdoor space into three categories, in accordance with the new zoning, cf. chapter 6 (p. 71).

MFUA
approx. 18250 m² total
SFUA
approx. 5550 m² total
Private gardens

ILLUSTRATION 57: Calculation of outdoor spaces in terms of MFUA and SFUA and adjustment of the volumes and dwelling area with regard to the criteria for outdoor space.

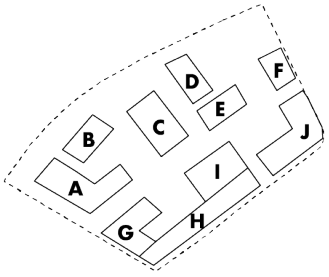

SFUA
C, 1 FL.
SFUA
SFUA
RG
H, 4 FL.
PG
DFUA
SFUA
PG
H, 3 FL.
DFUA
DFUA
PG
CS
(PLAY)
C, 3 FL.
(3 FL.)
PP
(4 FL.)
(5 FL.)
(5 FL.)



H	HOUSING
C	COMMERCIAL
FL.	FLOORS
PG	PRIVATE GARDENS
SFUA	UNIFIED COMMON OUTDOOR SPACE
PP	PEDESTRIAN-PRIORITY SPACE
RG	ROOF GARDEN
DFUA	DESIGN FOR UNIVERSIAL ACCESSIBILITY

ILLUSTRATION 58: Recommended plan proposal based on the feasibility study, with shadow at solstice 18.00.

Building areas	Ground floor (m^2)	Main alternative (floors)	Main alternative (m^2)	Minimum alternative (floors)	Medium alternative (floors)	Maximum alternative (floors)
Quarter Blocks						
A:	*2100*	*3*	*6300*	*3*	*3*	*3*
B:	*1000*	*4*	*4000*	*4*	*5*	*7*
C:	*1650*	*1*	*1650*	*1*	*1*	*1*
D:	*950*	*5*	*4750*	*5*	*5*	*7*
E:	*950*	*5*	*4750*	*5*	*5*	*7*
F:	*700*	*5*	*3500*	*4*	*6*	*7*
G:	*1400*	*3*	*4200*	*3*	*3*	*3*
H	*2350*	*5*	*11750*	*4*	*5*	*6*
I:	*1550*	*3*	*4650*	*3*	*3*	*3*
J:	*2000*	*5*	*10000*	*5*	*6*	*6*
Total settlement*:	*14650*	*55550*	*55550*	*52500*	*59250*	*68100*
Building Plot:	*40000*	*40000*	*40000*	*40000*	*40000*	*40000*
Utilisation (% GFA)*:	*37 %*	*139 %*	*139 %*	*131 %*	*148 %*	*170 %*
Outdoor space						
MFUA:**	*18250*	*18250*	*18250*	*18250*	*18250*	*18250*
SFUA:	*5550*	*5550*	*5550*	*5550*	*5550*	*5550*
Max MFUA*:**	*6900*	*6900*	*6900*	*6900*	*6900*	*6900*
Max RA allowed**:**	*34500*	*34500*	*34500*	*34500*	*34500*	*34500*
Land use						
DA:	-	*23300*	*23300*	*22600*	*25700*	*32900*
Dwellings***:**	-	*233 units*	*233 units*	*226 units*	*257 units*	*329 units*
CA:	-	*30600*	*30600*	*28250*	*31900*	*33550*
DA/Total settlement (%):	-	*42 %*	*42 %*	*43 %*	*43 %*	*48 %*



DA = Total dwelling area GFA
CA = Total commercial area GFA
*) The total m^2 does not include the roof area
**) Cf. illustration 57 and table 2, except for the criterion that 80% of MFUA must be SFUA.
***) When minimum 80% of MFUA must be SFUA, in accordance with table 2.
****) When MFUA equals minimum 20 % GFA of the residential area
(max RA allowed = max MFUA/0.2).
*****) When the average of the flat areas is 100 m^2.

Table 3: Estimated utilisation of building parts cf. illustration 57 (pp. 84-85)

square. If the roof of the workshop hall is included, these common areas can cover approximately 6000 m^2. Based on the shadows shown in illustration 55, representing solstice at 12.00 and 18.00, one may conclude that 20 % of each outdoor areas are sufficiently exposed to sun, according to the criteria cf. table 2 (p. 80).

The MFUA, cf. table 3, are furthermore calculated as follows.

Building plot:	40000 m^2
- Not accessible area	- 1800 m^2
- Building area	- 1450 m^2
- Private gardens	- 1800 m^2
- Areas exposed to Ldn >60 dB	- 3500 m^2
MFUA:	18250 m^2

However, the MFUA is greater than the municipal outdoor area standard recommends with regard to SFUA. Thus, large portions of the calculated MFUA are not applicable in terms of play and linger, and therefore cannot be used as the basis for the calculation of the total allowed dwelling area. The acceptable maximum dwelling area must therefore be based on the suggested SFUA.

The SFUA is, based on the proposal cf. illustration 58 (pp. 86-89), approximately 5550 m^2. As the SFUA must be at least 80 % of the MFUA, the maximum MFUA must be 6900 m^2, as shown in table 3. The allowed maximum area for residential purposes is thus 34500 m^2, given that the MFUA must be at least 20 % of the total dwelling area (DA).

SFUA:	5550 m^2
Max MFUA (0.8*SFUA)	6900 m^2

In summary, all criteria regarding the redevelopment of the plots are accommodated apart from the recommendation of 80% housing, according to the outdoor area standards of Oslo Municipality (PBE, 2012, p. 11). Nor does it provide a relatively high utilisation rate, as the maximum recommended solution, cf. table 3, is equivalent to approximately 170 % GFA utilisation. Furthermore, because sizeable areas within the regulated residential area are designated as common areas, according to the municipal outdoor area standards concerning residential areas, and the workshop hall is preserved, it is challenging to meet the requirements of 80 % apartments.

However, this can be accommodated by another established block structure, which includes a transformation of the hall and new zoning. The site-analysis cf. chapter 6 can in this regard still be used as a basis for other solutions, taking into account the same fundamental axes, noise and pollution sources and sun analysis. A solution which involves about 250 % utilisation including 73 % housing is exemplified in attachment 5. This solution does not, however, promote vitalisation to the same extent as the main recommendation cf. illustration 57, as it does not invite the public in, in terms of transparency. The solution also implies that the area loses a distinctive element (here the driver and vehicle licensing office). Thus parts of the area's genius loci will vanish. Moreover, it does not necessarily provide a pleasant outdoor environment, with regard to human scale, visual enclosure, and complexity, cf. section 3.4.2 (p.16). In other words, the principle solution cf. attachment 5 is an example of how a plot can be transformed into a conventional and non-vital residential area, even though it is in accordance with legal criteria and the compact development strategy. The solution illustrates a horrifying example, given the essential attributes described in chapter 4 (p. 24).

7.3 THE WORKSHOP HALL AS A CATALYST FOR VITALISATION

Based on the City Director of Cultural Heritage's recommendation and own discretionary assessment, cf. section 6.2.8 (p. 74), conservation of the workshop hall is considered appropriate. In terms of retrofitting, the hall could in this regard be transformed into a catalyst for vitalisation, if this means that the workshop hall will comprise some public service. This public service could, for example, include a sports hall for children and young people, which requires large indoor space, nursery school, or other commercial purposes such as cafés, stores, offices, as shown in illustration 59 and 60 (p. 90).

The advantage of implementing such purposes inside a building is the prevention of negative externalities in the form of noise. On the other hand, it can be challenging to generate life to the workshop hall

RETROFITTING THE WORKSHOP HALL INTO A CATALYST FOR VITALISATION

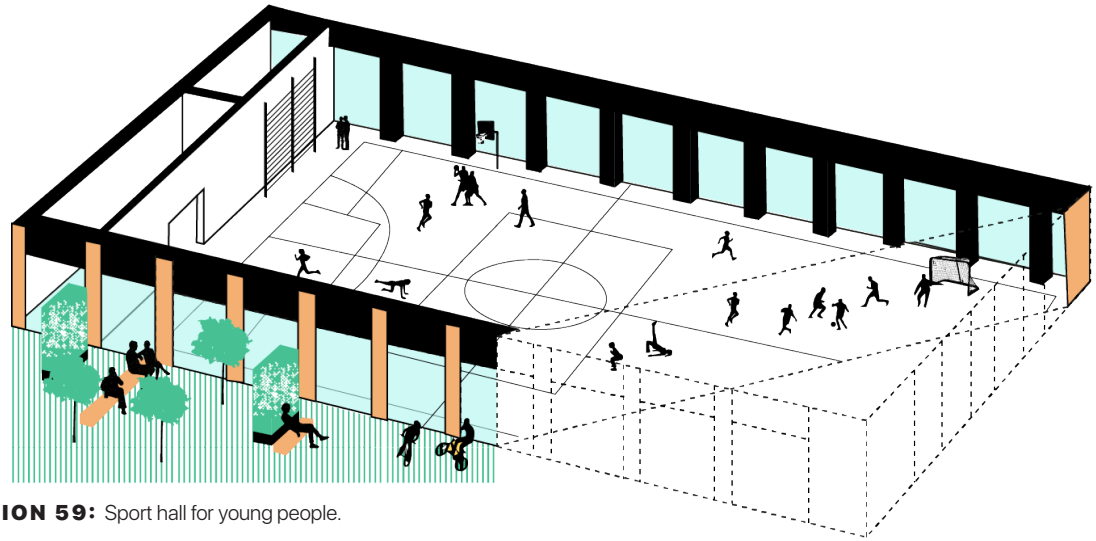


ILLUSTRATION 59: Sport hall for young people.

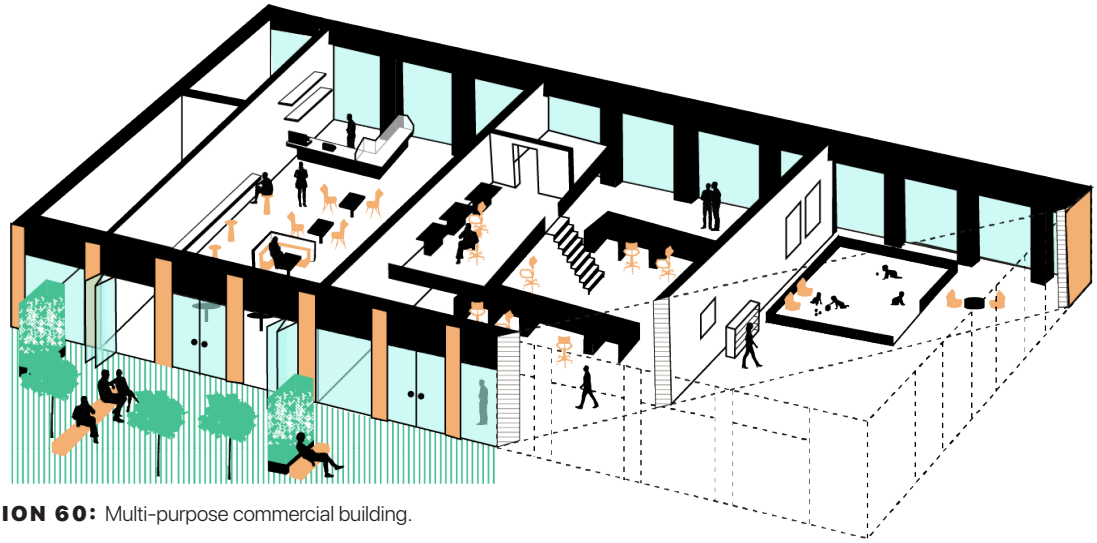


ILLUSTRATION 60: Multi-purpose commercial building.

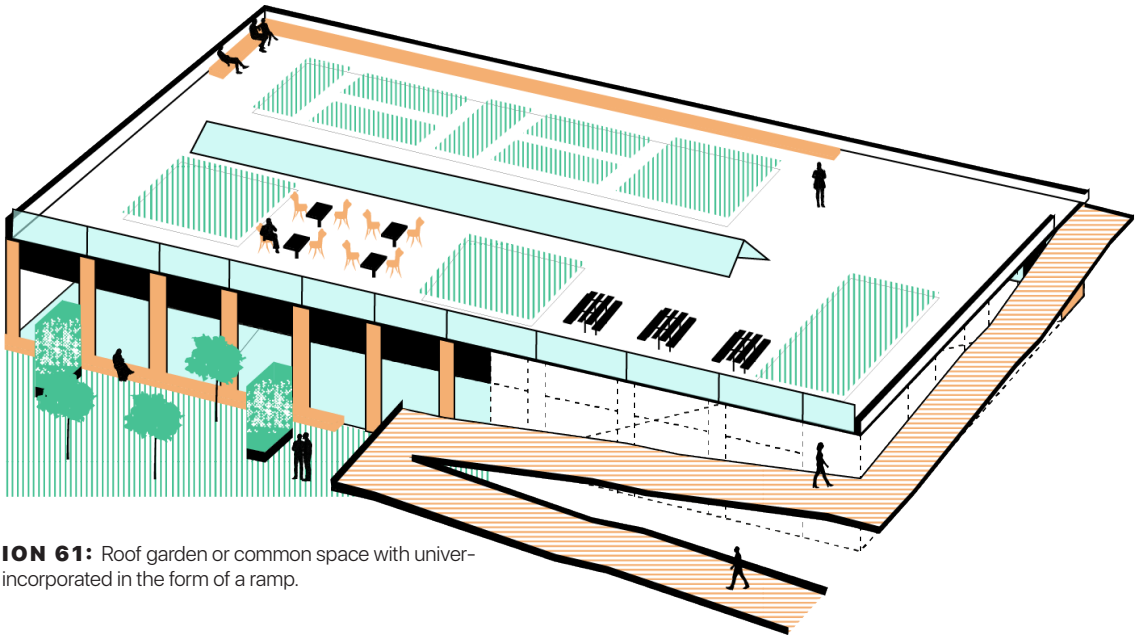


ILLUSTRATION 61: Roof garden or common space with universal accessibility incorporated in the form of a ramp.

with regard to transparency and accessibility, as it is situated within a relatively private area. However, proximity to the subway (Risløkka T) and public park (Risløkkparken) are factors that increase the sense of accessibility to the workshop hall. With the implementation of the green pedestrian connector along the subway lines, cf. illustration 51 (p. 79), and the green ring, cf. illustration 29 (pp. 48-49), insight and publicity will also increase.

Another possible issue, which may be relevant to discuss in this context as well, is whether this possible catalyst leads to much-increased vitality at the expense of privacy. Although the workshop hall is lowering the noise level, the adjacent common area will probably be affected by some outside noise. Although this aspect is partly unpredictable, too many visitors - ergo noise - will arguably not become a striking problem, as the area would seem relatively private and probably primarily residents will have the disposal of the area. This feasibility study does however not recommended to establish noisy activities such as basketball courts, skate ramps or the like at the suggested common outdoor spaces, including the roof of the hall, with regard to noise level and privacy.

Parts of the motivation for this proposal are the objectives of the Municipal Master Plan, including the following purposes: (I) ensure good childhood upbringing and opportunities for physical activity for all young people, (II) better the living conditions, and (III) provide access to attractive, varied and user-friendly urban spaces for all citizens of Oslo (Oslo kommune, 2015a, p. 21). Current plans regarding the future redevelopment of Haraldrud, cf. chapter 5.5 (p. 42) and chapter 5.6 (p. 51), draw a picture of Haraldrud which lacks public outdoor areas, especially with young people as a target group. It is thus relevant to address current additional outdoor areas in this regard, to make Haraldrud an attractive and liveable urban district. Due to the significant amount of small housing in Oslo, there is, also, an increased need for proximate and attractive public areas and facilities for children and young people (Schmidt, 2018, p. 171; Brattbakk and Andersen, 2017, pp. 44-45).

In regards to human scale, a step-free ramp has been incorporated following the requirements of design for universal accessibility, cf. table 2 (p. 80), as shown in illustration 61 (p. 90). The ramp is relevant only if a common garden or outdoor space is appropriate to establish on the roof of the workshop hall. Alternatively, the ramp can be replaced by a lift and thus spare parts of the ground area. In addition to being a common outdoor area, with good sun lighting conditions, the roof garden would provide an attractive view in several directions.

7.4 CONCLUSION

Plots nearby Risløkka subway station are designated as potential transformation areas, including Østre Aker vei 50 and Brobekkveien 87, in the consultation draft for Oslo's new Municipal Master Plan (Oslo kommune, 2017). Based on the municipality's current recommendation regarding new zoning potentials, according to the Guiding and Principle Plan of Public Space (PBE, 2017a), this project report has prepared a feasibility study to answer the following problem statement:

How can the plot consisting of Østre Aker vei 50 and part of Brobekkveien 87 be redeveloped into a denser area, with the aim of creating a more liveable urban place?

The question has been answered in two parts: Through a site-specific analysis, cf. chapter 6, and a feasibility study, cf. chapter 7. The feasibility study is an interpretation of the essential criteria regarding the redevelopment of the site as well as a personal recommendation to conserve the workshop hall at Østre Aker vei 50. The workshop hall can, in this regard, function as a catalyst for vitalisation if social infrastructure or means of optional use for the residents are integrated. Considering its architectural qualities also reflects the genius loci of the area, it could, moreover, function as a cultural-historical feature and landmark associated with the area. This project report thus recommends a retrofitting of the workshop hall.

As regards the future purpose of the hall, it could at best serve as a sports arena for children and young people, as a tool for ensuring a better upbringing environment. The workshop hall could also incorporate leisure options for the residents or assets towards social infrastructures, such as a nursery school. The need for nursery schools will most likely increase in conjunction with the future redevelopment of Haraldrud. Given that large parts of Haraldrud are transformed into

a residential area, cf. attachement 4, there are few plots at Haraldrud that are better suited for incorporating social infrastructure, considering the high degree of privatisation, noise and car traffic.

Through a volume study, crucial criteria addressed in chapter 6, are furthermore met at a principle level corresponding to the detail level of a simple situation plan, as shown in illustration 58 (p. 86-87). The volume of the buildings is approximate and therefore adjustable in terms of cornice height, ground floor area and situation. However, the plan proposal illustrates an urban settlement which provides a sufficient liveable outdoor environment with regard to sun, accessibility, transparency, complexity and human scale.

Nevertheless, some challenges have been addressed in the feasibility study regarding the exploitation of the land and residential area, partly due to high noise and pollution levels and conservation interest, respectively. However, the most challenging premise, in this case, have been the two leading - and partly conflicting - municipal interests that should be met in the best possible way. It concerns (1) the interest in increasing the utilisation of the site, while 80 % of the total GFA should be dwellings (Oslo kommune, 2017), and (2) the interest in meeting the criteria for creating viable urban outdoor areas (PBE, 2012). Objective conflicts imply that some consideration must be given priority over others.

In this case, for example, the deviation zone in the Municipal Master Plan implies that the interest in counteracting urban expansion and the interest in stimulating ecomobility must be prioritised in regards to environmental sustainability. The volume studies, cf. chapter 7.2 (p. 81), furthermore, prioritises interests concerning the outdoor area instead of solutions that provide maximum utilisation (225 %). This is done by calculating the total residential area based on established outdoor space reserved for streets and common use, and not the opposite. This weighing is subjective, with emphasis on human scale and social sustainability. Thus, this feasibility study proposes and argues for relatively low utilisation. Conversely, the feasibility study could advocate a denser vertical development in line with the national authorities' recommendation regarding intensification of areas along transit hubs.

Any plan proposal represents, nevertheless, an interpretation of the present and future (Norberg-Schultz, 2007). The weighing referred to above must, therefore, be based on a valid reflection and argumentation regarding what is most necessary in this case, concerning future requirements. Based on the previous discussion, in part 1 (p. 54), regarding the prognosis from 2015 (Oslo kommune, 2015a, p. 34), I suggest that there is a largely unbalanced relationship between residential areas and social infrastructure in the current plan proposal. Thus, it seems necessary to discuss the possibility for implementing social infrastructure or other social activities to some extent at Østre Aker vei 50 and Brobekkveien 87. As the plan proposal was one of the premises of this feasibility study - implying that only small parts of the settlement could incorporate social services - some assets (such as schools and nursery homes) were not taken into account.

Moreover, it seemed necessary to prioritise qualities associated with liveable urbanism, such as the human scale, accessibility and transparency, as a starting point in this case. Due to the lack of proximate social services, public spaces and recreational opportunities, the immediate common outdoor space should provide proper prerequisites for leisure.
The purpose of part 2 is primarily to address the most critical needs in this area, with regard to the living environments and, furthermore, vitalisation. The recommendation in this project report, thus, reflects a prioritisation of various interests, concerning the criteria cf. table 2 (p. 80). A compromise solution regarding lightning and noise conditions, accessibility and conservation of the workshop hall was not considered appropriate in this study, as a premise for creating a liveable and attractive environment.

Therefore, the level of detail is not the essence of this feasibility study - the essence of this feasibility study is to emphasise the prerequisites regarding the qualities of the space between the buildings. As sustainable development in terms of compact development often imply conflicts of political objectives, it should be necessary to take a step back to assess the dimension of densification, especially with regard to human scale and social needs.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REFLECTIONS

This project report emphasises the social dimension when it comes to sustainably managing expansion - in light of the significant growth of Oslo and its region. Appropriate densification solutions are complex and must reflect dimensions within the needs of the society. Given that Haraldrud is being transformed into a residential and commercial area, major infrastructure is needed primarily, which creates conflicts of interest between national, municipal and local actors. The prerequisites, in terms of criteria and objectives, to establish viable urban areas are almost universal, and therefore the conflicts of interest associated with the redevelopment of Haraldrud can be recognisable for other transformation and densification projects.

The portrayed example in this project report reflects, furthermore, how the social dimension is in conflict with environmental and economic objectives, as the national discourse advocates urban density and economic growth. At the same time, developers are allowed to interpret how outdoor spaces and housing units are to be designed, based on few standards, which to a small extent regulates the dimensioning of the sustainable pillars. When "everyone" wants increased profits, who takes responsibility for ensuring social equity in terms of social services and proximity to attractive urban space?

The municipality is legally responsible for ensuring adequate social infrastructure, while programming of projects is mainly managed by private developers. A question that is not discussed appropriately in this project report is: Is it sustainable to transform the plots Østre Aker vei 50 and Brobekkveien 87 into residential and commercial areas?

Due to this concern, regarding the social dimension, I consider it appropriate to incorporate social services at this site. Besides, the area is historically and affectionately a public space, managed by public administrations. To conserve the workshop hall - and maintain it as a landmark and an architectural quality, is in that regard most appropriate. I consider this proposal the most important reflection of this project report. Retrofitting and incorporation of assets that accommodate young people would be relevant in particular, considering this group of people is under-prioritised in this context of redevelopment. Furthermore, indoor activity halls for young people exclude negative externalities such as noise and vandalism. In addition, when the Municipal Master Plan (2015) advocates that assets to create good upbringing environments will be prioritised to a greater extent than before (Oslo kommune, 2015, p. 73), this should be an even more appropriate measure.

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Illustration 7: Marjanovic, G. (2018). *Kapittel 13: Bygningsform og bebyggelsesstrukturer i den fortettede byen*. Sandkjær Hanssen, G., Hofstad, H. and Saglie, I. L. (ed.), Kompakt byutvikling - Mulighe-

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Illustration 9: Fiskaa, H. (2014). *Fysisk detaljplanlegging*, (p. 128). Trondheim: Institutt for byforming og planlegging, NTNU.

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Illustration 23: Oslo kommune. (2018). *Planinnsyn* [Internet]. Obtained 15.03.2018, from: https://od2.pbe.oslo.kommune.no/kart/#598757,6643771,7

Illustration 25: Oslo kommune. (2018). *Planinnsyn* [Internet]. Obtained 15.03.2018, from: https://od2.pbe.oslo.kommune.no/kart/#598757,6643771,7

Illustration 31: Plan- og bygningsetaten (PBE). (2015a). *Planprogram for Haraldrud*. Oslo: Plan- og bygningsetaten.

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Illustration 35: Plan- og bygningsetaten (PBE). (2012). *Uteareal-normer - normer for felles leke- og uteoppholdsarealer for boligbygging i indre Oslo* (p. 11). Oslo: Plan- og bygningsetaten - avdeling for områdeutvikling.

Illustration 37: Plan- og bygningsetaten (PBE). (2017a). *Veiledende plan for offentlig rom for Haraldrud, forslag til politisk behandling* (p. 69). Oslo: Plan- og bygningsetaten.

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Oslo kommune. (2018). *Planinnsyn* [Internet]. Obtained 15.03.2018, from: https://od2.pbe.oslo.kommune.no/kart/#598757,6643771,7

Illustration 41: Oslo kommune. (2018). *Planinnsyn* [Internet]. Obtained 15.03.2018, from: https://od2.pbe.oslo.kommune.no/kart/#598757,6643771,7

Other photos and illustrations are self-produced.

English translations of Norwegian authorities and central documents:	The Norwegian translation:
Oslo Municipality	Oslo kommune
Agency for Planning and Building Services	Plan- og bygningsetaten (PBE)
Norwegian Environment Agency	Miljøverndirektoratet
Norwegian Public Road Administration	Statens vegvesen (SVV)
Agency for Urban Environments	Bymiljøetaten
Agency of Property and Urban Renewal	Eiendom- og byfornyelsesetaten (EBY)
Waste-to-Energy Agency	Energigjenvinningsetaten
Oslo North Chamber of Commerce	Næringsforeningen Oslo Nord
The Norwegian Confederation of Trade Unions	Landsorganisasjonen i Norge (LO)
Cultural Heritage Authority	Riksantikvaren
Norwegian Map Services	Statens Kartverk
City Director of Cultural Heritage	Byantikvaren i Oslo
Cadastre and Land Registry	Kartverket
The Planning and Building Act (Building part and planning part)	Plan- og bygningsloven
Municipal Master Plan	Kommuneplan
Plan Programme	Planprogram
Guiding Principle Plan of Public Space	Veiledende plan for offentlig rom (VPOR)
Guideline regarding noise pollution in planning processes (T-1442/2016)	Retningslinje T-1442/2016 for behandling av støy i areal-planlegging
Regulations on technical requirements for construction works (TEK17)	Byggteknisk forskrift (TEK 17)
Regulations relating to pollution control (Pollution regulations)	Forurensningsforskriften
Outdoor area standard for Oslo municipality	Utearealnorm for Oslo kommune
National Transport Plan	Nasjonal transportplan
Municipal Transport Plan	Oslopakke (1-3)
Government Planning Guidelines	Den statlige planretningslinjen for samordnet bolig-, areal- og transportplanlegging.
Regional Master Plan	Regional plan for areal og transport i Oslo og Akershus

ATTACHMENT 1: THEMATIC MAP

TEMAKART T7 - PRINCIPLE GREEN-BLUE SETTLEMENT

(Oslo kommune, 2018)

Tegnforklaring

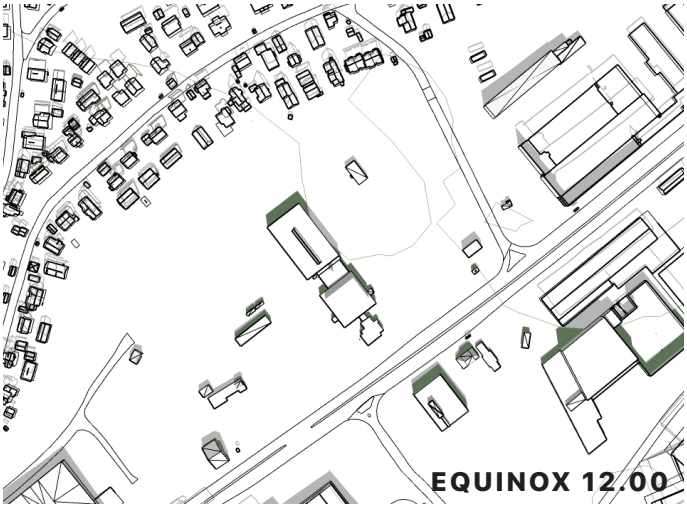
- Viktige kommunikasjonsårer med eksisterende og nye trær
- Elv, bekk, vann, dam

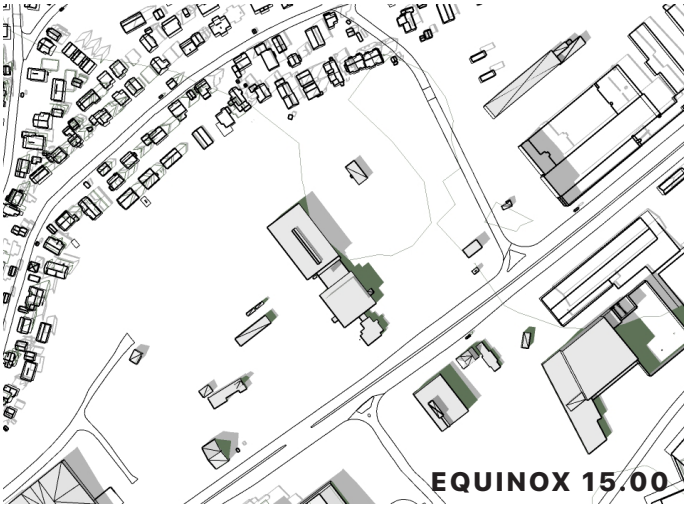
Ikke juridiske objekter

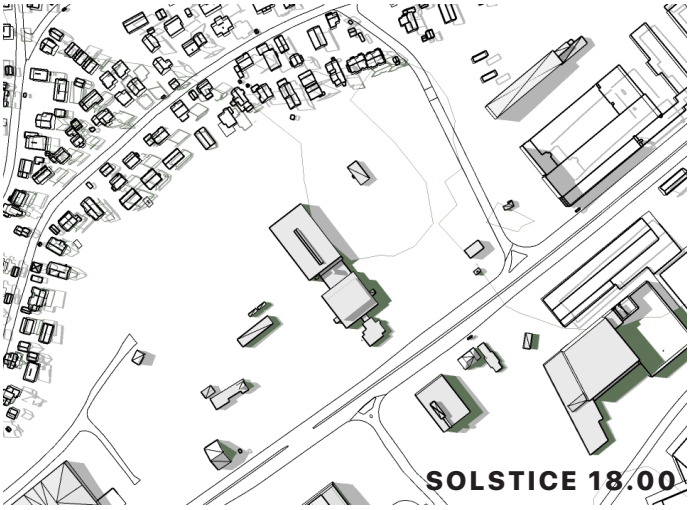
- Hovedturvei - eksisterende/planmessig sikret
- Hovedturvei - fremtidig
- Annen viktig gangforbindelse
- Fremtidig turdrag - prinsipptrasé
- Krysningspunkt som krever tiltak
- Fremtidig elv/bekk - prinsipplassering
- Område med behov for park på minimum 1 dekar ved byutvikling
- Område med behov for park på minimum 5 dekar ved byutvikling
- Framtidig park - prinsipplassering

ATTACHMENT 2: SUN PATH

SUN PATH AT SOLSTICE AND EQUINOX







ATTACHMENT 3: LEGISLATION

Kommuneplanen (the Municipal Master Plan)

§ 4.1
Ved regulering av nye gate- og veianlegg skal god og trafikksikker fremkommelighet for gående, syklende og kollektivtransport ivaretas i angitt prioritert rekkefølge.

§ 6.1
1. Ved utarbeidelse av reguleringsplaner skal det redegjøres for hvordan universell utforming sikres, både internt i planområdet og i forhold til tilstøtende eiendommer.

§ 6.4
1. Ved regulering og søknad om tiltak skal det sikres og dokumenteres tilstrekkelig, gode og solfylte leke- og oppholdsareal egnet for variert fysisk aktivitet for aktuelle alders- og brukergrupper. (...)

§ 7.1
b. I avvikssonen, område B, kan bebyggelse med støyfølsomt bruksformål etableres i gul og rød sone (...), dersom det kan dokumenteres at det er nødvendig for å oppnå gode utbyggingsløsninger, med hensiktsmessige planløsninger og god estetisk kvalitet. Boliger skal ha minimum en fasade som vender mot stille side. (...) Det skal tilbys bruksmessig egnede private eller felles private uteoppholdsareal med soner med støynivå under anbefalt grense, iht. tabell 3 i T-1442/12.

§ 11.1 Indre by: utviklingsområder og transformasjonsområder
Retningslinje:
- *Det kan vurderes tillatt inntil 30 meter gesimshøyde.*

§ 11.2 Ytre by: utviklingsområder, kollektivknutepunkter og stasjonsnære områder
b. Bymessig utforming av området, gjennom høy tetthet og arkitektonisk kvalitet, finmasket gate- og byromsstruktur, variert arealbruk, utadrettede funksjoner i 1. etasje i sentrale gater/byrom, gode solfylte byrom og integrering av viktige eksisterende stedskvaliteter.
c. Stasjonsområde for skinnegående trafikk skal gis en sentral rolle som sted, med offentlige byrom og sosiale/ kulturelle og andre publikumsrettede funksjoner.
d. God tilgjengelighet, med prioritering av gang- og sykkeltrafikk, sammenhengende grønnstruktur og gate og byromsstruktur, både internt og til tilstøtende områder skal sikres.
f. Vei- og gatesystemet skal prioritere lokalsamfunnet fremfor gjennomgangstrafikk.
g. Tilfredsstillende skjerming mot støy- og luftforurensning gjennom lokalisering og utforming av bebyggelse skal inngå.

Retningslinje:
- *For utviklingsområder i ytre by med kollektivknutepunkt bør det være en samlet områdeutnyttelse på 125 prosent, med høyest utnyttelse rundt kollektivknutepunktet.*
- *Innenfor områder der det er registrert særlig viktig kulturminneverdier, naturverdier eller andre funksjoner viktige for områdets identitet bør disse bevares og videreutvikles som kvaliteter for fremtidig byutvikling.*

§ 12.3
1. Temakart blågrønn struktur T7, datert 04.03.2015, skal legges til grunn for plan- og byggesaksbehandlingen.

Plan- og bygningsloven (the Planning and Building Act)

§ 12-7 Bestemmelser i reguleringsplan
I reguleringsplan kan det i nødvendig utstrekning gis bestemmelser til arealformål og hensynssoner om følgende forhold: (...)
4. funksjons- og kvalitetskrav til bygninger, anlegg og utearealer, herunder krav for å sikre hensynet til helse, miljø, sikkerhet, universell utforming og barns særlige behov for leke- og uteoppholdsareal,. (...)
7. trafikkregulerende tiltak og parkeringsbestemmelser for bil og sykkelparkering, herunder øvre og nedre grense for parkeringsdekning, (...)
10. krav om særskilt rekkefølge for gjennomføring av tiltak etter planen, og at utbygging av et område ikke kan finne sted før tekniske anlegg og samfunnstjenester som energiforsyning, transport og vegnett, sosiale tjenester, helse- og omsorgstjenester, barnehager, friområder, skoler mv. er tilstrekkelig etablert, (...)

§ 11-8.Hensynssoner
Kommuneplanens arealdel skal i nødvendig utstrekning vise hensyn og restriksjoner som har betydning for bruken av areal. (...)
Til hensynssone skal det i nødvendig utstrekning angis hvilke bestemmelser og retningslinjer som gjelder eller skal gjelde i medhold av loven eller andre lover for å ivareta det hensynet sonen viser.
Det kan fastsettes følgende hensynssoner: (...)
c) Sone med særlig hensyn til landbruk, reindrift, mineralressurser, friluftsliv, grønnstruktur, landskap eller bevaring av naturmiljø eller kulturmiljø, med angivelse av interesse.

§ 12-6.Hensynssoner i reguleringsplan
De hensyn og restriksjoner som er fastsatt gjennom hensynssoner til kommuneplanens arealdel, jf. §§ 11-8 og 11-10, skal legges til grunn for utarbeiding av reguleringsplan. Hensynssoner kan videreføres i reguleringsplan eller innarbeides i arealformål og bestemmelser som ivaretar formålet med hensynssonen.

§ 17-3.Avtalens innhold
En utbyggingsavtale kan gjelde forhold som kommunen har gitt bestemmelser om i arealdelen til kommuneplan eller reguleringsplan.
Avtalen kan også regulere antallet boliger i et område, største og minste boligstørrelse, og nærmere krav til bygningers utforming der det er hensiktsmessig. Avtalen kan også regulere at kommunen eller andre skal ha fortrinnsrett til å kjøpe en andel av boligene til markedspris.
Avtalen kan også gå ut på at grunneier eller utbygger skal besørge eller helt eller delvis bekoste tiltak som er nødvendige for gjennomføringen av planvedtak. Slike tiltak må stå i rimelig forhold til utbyggingens art og omfang og kommunens bidrag til gjennomføringen av planen og forpliktelser etter avtalen. Kostnadene som

belastes utbygger eller grunneier til tiltaket, må stå i forhold til den belastning den aktuelle utbygging påfører kommunen.

§ 28-7. Den ubebygde del av tomta. Fellesareal

Uteareal skal innenfor sin funksjon være universelt utformet i samsvar med forskrifter gitt av departementet. (...)
Uteareal på tomta skal gjennom størrelse, utforming og beliggenhet mv. sikre forsvarlig oppholdssted i det fri for beboerne og i nødvendig utstrekning muliggjøre lek, rekreasjon, avkjørsel og parkering av biler, motorsykler, sykler o.l. (...)
Det kan bestemmes i kommuneplanen at kommunen kan samtykke i at det i stedet for parkeringsplass på egen grunn eller på fellesareal blir innbetalt et beløp for hver manglende plass til kommunen for bygging av parkeringsanlegg.

Veglova (the Road Act)

§ 29
Langs offentleg veg skal det vere byggegrenser fastsette med heimel i denne lova, dersom ikkje anna følgjer av arealdel av kommuneplan eller reguleringsplan etter plan- og bygningsloven. (...)
Byggegrensene skal gå i ein avstand på 50 meter frå riksveg og fylkesveg og 15 meter frå kommunal veg. For gang- og sykkelveg er avstanden 15 meter. (...) Avstanden skal reknast frå midtlina i høvevis kjørebana, eller gang- og sykkelvegen. Har vegen åtskilde kjørebaner, eller er det tvil om kva som bør reknast for midtline, avgjer vegstyremakta kva line avstanden skal reknast frå. (...)
For fylkesveg kan fylkeskommunen for særskilt fastsett strekning sette byggegrensa til ein mindre avstand enn den som er nemnt i andre ledd, likevel ikkje mindre enn 15 meter.

Byggteknisk forskrift TEK17 (Regulations on technical requirements for construction works)

§ 8-7.
(1) Gangatkomster til uteoppholdsareal med krav om universell utforming skal
a) være trinnfrie
b) ha stigning som ikke er brattere enn 1:15, unntatt strekninger inntil 5,0 m som kan ha stigning som ikke er brattere enn 1:12
c) ha hvileplan på minimum 1,6 m x 1,6 m for hver 1,0 m høydeforskjell
d) ha fri bredde minimum 1,8 m, unntatt for strekninger inntil 5,0 m som kan ha fri bredde minimum 1,4 m
e) ha tverrfall på maksimum 1:50
f) ha fast og sklisikkert dekke
g) ha visuell og taktil avgrensing.

§ 8-10. Plassering av byggverk
(1) Byggverk skal ha god terrengmessig tilpasning ut fra hensyn til god arkitektonisk utforming, visuell kvalitet, naturgitte forutsetninger, sikkerhet, helse, miljø, tilgjengelighet, brukbarhet og energibehov.

(2) Byggverk skal plasseres slik at det tas hensyn til lys- og solforhold, samt lyd- og vibrasjonsforhold.

Veiledning: (...) Alle boenheter og felles uteareal bør være solbelyst minst fem timer hver dag ved vår- og høstjevndøgn. Avstand til tilstøtende bebyggelse bør være 3 ganger lenger enn gesimshøyden på det tilstøtende bygget. (...)

§ 12-7. Krav til utforming av rom og annet oppholdsareal
(2) For romhøyde i boenheter gjelder følgende:
a. Rom for varig opphold skal ha høyde minimum 2,4 m.
b. Rom som ikke er for varig opphold skal ha h.yde minimum 2,2 m.

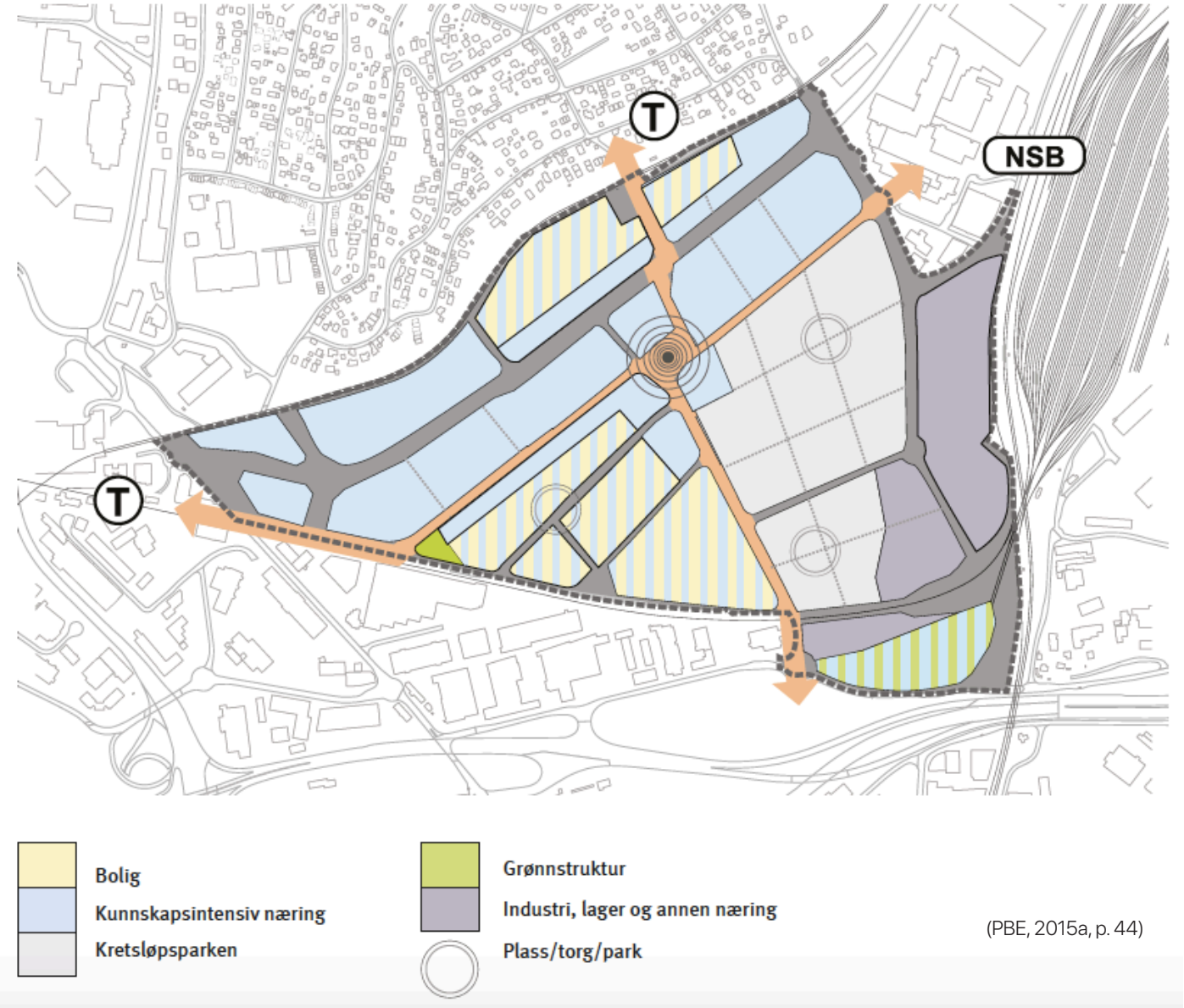
Forskrift om forbud mot vilkår om sosial infrastruktur i utbyggingsavtaler

I.
Det kan ikke avtales at grunneier eller utbygger helt eller delvis skal bekoste infrastruktur som skoler, barnehager, sykehjem eller tilsvarende tjenester som det offentlige i medhold av lov er forpliktet til å skaffe til veie.

ATTACHMENT 4: PLAN PROGRAMME EXTRACT

RECOMMENDED FUTURE ZONING OF HARALDRUD,

CF. THE PLAN PROGRAMME (2015)



(PBE, 2015a, p. 44)

ATTACHMENT 5: ALTERNATIVE VOLUME STUDIES

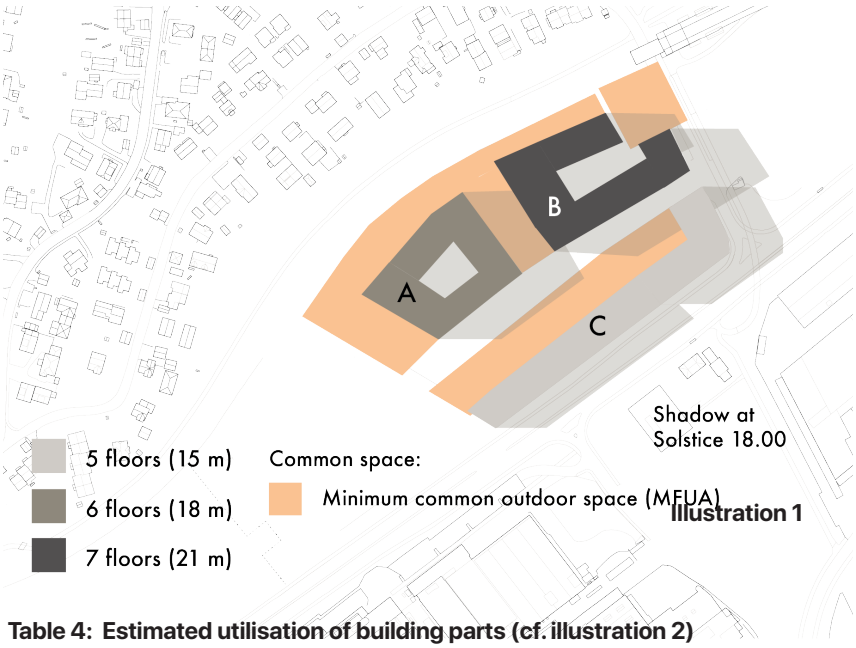


Illustration 1

Table 4: Estimated utilisation of building parts (cf. illustration 2)

Building areas	Ground floor (m²)	Floors	GFA (m²)
Quarter Blocks			
A:	*4600*	*6*	*27600*
B:	*5200*	*7*	*36400*
C:	*5400*	*5*	*27000*
DA:	*9800*		*64000*
Dwellings***:**	*98 units*		*640 units*
CA:	*5400*		*27000*
Total*:	*15200*		*91000*
Building plot:	*40000*		*40000*
Utilisation (% GFA)*:	*38 %*		***227,5 %***
RA/Total (%):	*-*		***70 %***
Outdoor Space			
MFUA:**	*20250*		*20250*
SFUA:	*8850*		*8850*
MAX MFUA*:**	*17700*		*17700*
Max DA**:**	*88500*		*88500*

DA = Total dwelling area GFA
CA = Total commercial/business area GFA
*) total m² does not include the roof area
**) cf. table 2, except for the criterion that 80% of MFUA must be SFUA.
***) When minimum 80% of MFUA must be SFUA, in accordance with table 2.
****) When MFUA equals minimum 20 % of the DA (max MFUA/0.2).
*****) The estimation is based on: the average of flat areas = 100 m².

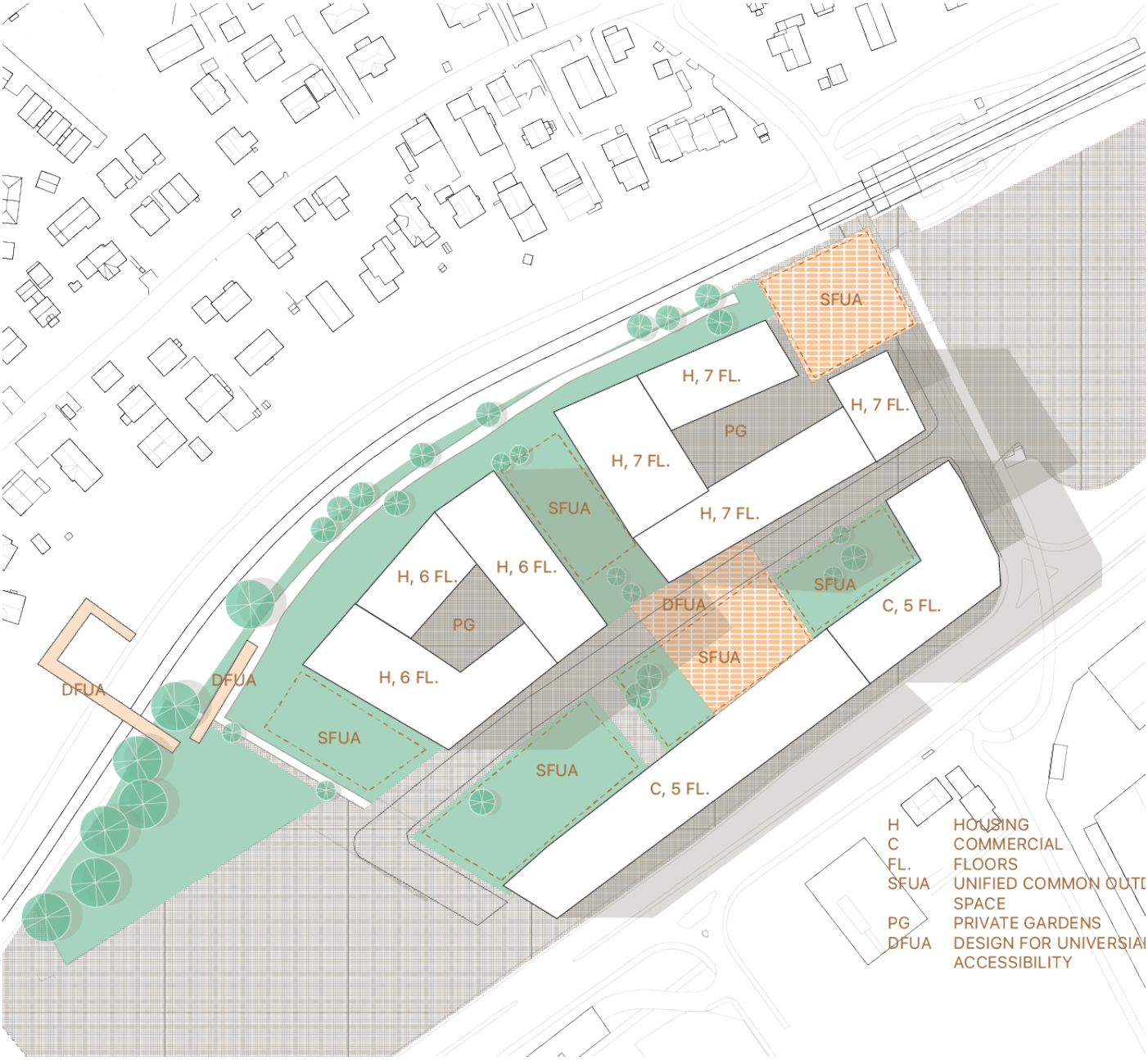
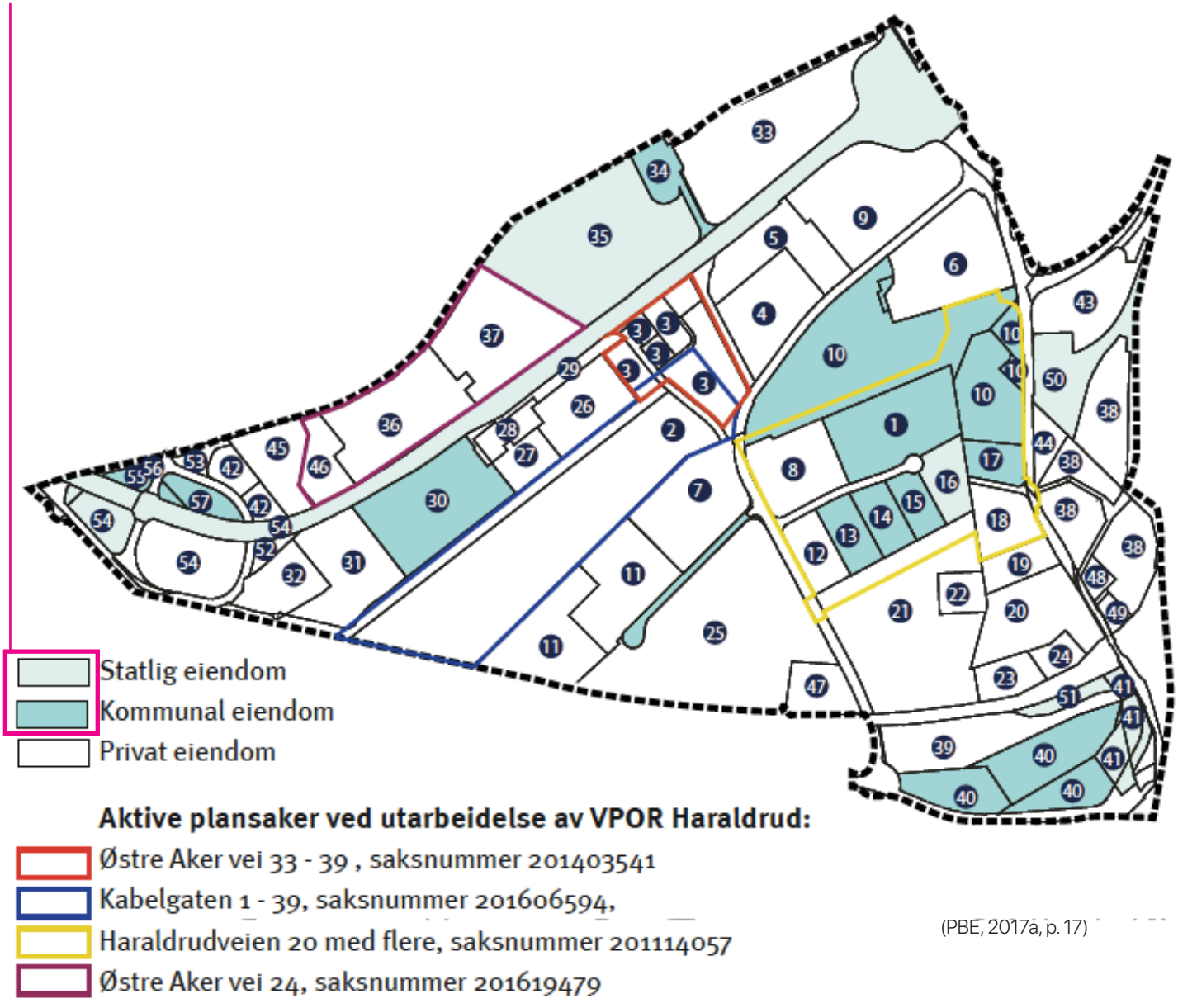


Illustration 2

ATTACHMENT 6: CADASTRAL SURVEY OF HARALDRUD

CADASTRIAL SURVEY, CF. THE GUIDING PRINCIPLE PLAN OF PUBLIC SPACE (2017)

Municipal / national public administrations



(PBE, 2017a, p. 17)