

Eksperters syn på estetisk kvalitet for veier – kjennetegn, utfordringer og suksessfaktorer i norsk planlegging

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Roads are important spaces in our daily lives and they influence wellbeing. Despite theoretical and practical knowledge about road aesthetics, many road design issues that have been the subject of criticism may be traced back to challenges in the planning process. Semi-structured interviews were conducted to investigate the views of experts responsible for aesthetics in the planning process regarding the main characteristics of roads with high aesthetic quality. The informants mentioned: harmony between the road and the surroundings, good materials, functionality, coherent design, green atmosphere and variety. These characteristics were relevant for all kinds of roads and streets. Furthermore, this study aimed at identifying challenges and success factors when promoting these characteristics through the planning practice. Such factors include marginalization of aesthetics in the planning process and low prioritization in road aesthetics. The article concludes by proposing possible measures to strengthen the role of aesthetics in road planning processes.

Keywords: landscape architecture, aesthetic quality, characteristics, road planning process

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1. Introduction and aim

Roads and streets are more than just transportation infrastructure. They play an important role in the perception and appreciation of landscapes, and people explore their surroundings while travelling along them (Junta de Andalucia, 2009). Roads and streets are also public spaces where people interact in an urban, suburban or rural context, and their design influences road users' behavior (Gehl, 2011:11, Ewing et al., 2008, Handy et al., 2002).

In Norway, roads and streets (if not specified, the term «road» is used here for both roads and streets) cover around 15 % of the area in towns, which is equal to the area of both forest, agricultural land and other un-built areas put together (Statistics Norway, 2015). This makes roads the largest public space in urban areas.

The goal of the Norwegian Public Roads Administration (NPR) is to construct and maintain transportation environments that

are functional, environmentally friendly, universally designed, and that have good aesthetic quality. In Norway, the «Planning and Building Act» (Plan- og bygningsloven, 2008) requires good architectural design in projects (§ 29-1) and requires municipalities to assess the visual quality of projects (including roads), both inherently and with regard to their function, surroundings and location (§ 29-2).

The aim of planning, designing and constructing roads with good aesthetic quality is not new (Parsons et al., 1998, Amundsen, 1995). Many ideals and design guidelines have been developed in disciplines such as urban design, architecture and landscape architecture (Egebjerg, 2002, Wright and Curtis, 2002). These may be applied to various types of roads, such as motorways (Vejdirektoratet and Aalborg Universitet, 2005, Varming, 1970); in different locations (e.g. open landscapes (Junta de Andalucia, 2009, Statens Vegvesen, 1979) or urban areas

(Gehl, 2011, Carmona et al., 2010)); and for diverse modes of transportation (Appleyard et al., 1966, Forsyth and Krizek, 2011, Fleming, 2012, Crowe, 1960). On the basis of these ideals and design principles, as well as on the basis of empirical studies and more general aesthetic theory, Blumentrath and Tveit (2014) recently developed a framework for assessing the visual quality of roads. This framework includes twelve visual characteristics including naturalness, coherence, simplicity, imageability, variety or legibility. These characteristics describe features of the physical design of roads in a systematic generalized terminology, suitable for characterization of different roads in different contexts. Thus, some professional standards for road aesthetics can be identified in the literature.

Despite the existing regulations and theoretical knowledge about aesthetics and despite long traditions in constructing roads, road design has been criticized for being too grey, too monotone, lacking in individual character or for being designed with a view to satisfying the needs of motorized traffic alone (e.g. Hess, 2009, Junta de Andalucia, 2009, Carstean, 2015, NRK, 2010).

To identify the causes of inadequate aesthetic quality, researchers have already addressed the role of aesthetics in the road planning practice. For example, research has been done on the impact of the institutionalization and organization of the road planning process on road design (Hess, 2009, Brown, 2006) and the role of technical and safety-related engineering standards in road design (Southworth and Ben-Joseph, 1995, Hebbert, 2005). However, we could not find studies focusing on the experiences of those working with road aesthetics in practice. The people responsible for aesthetic concerns in road planning projects are most often aesthetically educated specialists from disciplines such as landscape architecture, architecture, urban planning or design. Here we refer to them as «experts in road aesthetics». These practitioners can be seen as key players in the implementation of professional standards regarding road aesthetics in the design process. Their knowledge and experience was therefore considered particularly useful to

gain insight into the role of such standards in the planning practice and to identify obstacles and success factors in this context. Aiming at improving the planning process to become more favorable towards aesthetic concerns, this study therefore set out to investigate the views of experts in road aesthetics, asking the following two questions:

1. What, in the opinion of experts in road aesthetics, are the main characteristics of roads with good aesthetic quality?
2. What are the challenges and success factors in the road planning practice when promoting these characteristics?

2. Method

To gain insight into experts' views on road aesthetics and the experiences and challenges in implementing aesthetics in the planning processes, semi-structured interviews were conducted with aesthetically educated informants working with road aesthetics in Norway.

The informants were recruited from the NPRA (Norwegian Public Roads Administration) as well as the planning offices of the municipalities, since these are the main responsible public authorities for road aesthetics in Norway. Ten potential informants working at one of the five NPRA regional offices were invited per email to participate. Additionally, emails were sent to the planning offices of all municipalities in one Norwegian county soliciting landscape architects or architects working with road planning to be part of the study. Participation in the study was voluntary and the answers were anonymized. Eleven experts (two men, nine women) answered the invitation and agreed to be interviewed; of these, seven worked in the NPRA and four in planning administrations of municipalities. One of the informants had a degree in architecture, while all the others had degrees in landscape architecture. All informants had worked with road planning for more than three years and thus had a significant amount of experience from road planning practice comprising a diverse portfolio of projects.

The interviews were conducted at the offices of the informants in February, March

and September 2013. The interviews took 30–60 minutes and were recorded using a digital voice recorder and later transcribed verbatim. The interview guide included questions about the informants and their education. They were also asked to describe their daily work in road planning projects and what – from their point of view – characterizes a beautiful road. The interviews started with questions about roads in towns, but the informants often chose to talk about other types of roads and streets (from bicycles lanes to motorways) in varied locations. The informants were also asked to give examples of roads or streets with good or poor aesthetic quality and to explain the reasons for their judgment. The participants were asked to give concrete examples of roads in order to facilitate the description of the abstract aesthetic characteristics. Due to restrictions from the Norwegian Social Science Data Services we were not allowed to use pictures of the discussed road projects, in order to ensure anonymity of the informants. However, sketches made by one of the authors are used in this paper to illustrate the identified characteristics.

Transcripts (in Norwegian) were analyzed manually in three main steps. First, the transcripts were read through to identify preliminary themes of relevance to the research questions. Second, quotes from the transcripts illustrating the different themes were marked and quotes not fitting into any of the themes were used to create additional ones. Finally, the themes were cross-checked to avoid overlap and renamed when necessary.

3. Results

First we will present the identified characteristics of roads with a good aesthetic quality from the experts' point of view. In section 3.2. we describe the main challenges and success factors brought up by the experts during the interviews with regard to promoting these characteristics.

3.1. Characteristics of roads with good aesthetic quality

The experts in road aesthetics described a great variety of projects, roads and locations

during the interviews, from the construction of new roads to the redesign of existing ones. However, six main characteristics could be derived from the experts' descriptions as particularly important for the aesthetic quality of a road independent of the type of project: harmony between the road and its surroundings, high quality of the materials and maintenance, good functionality, coherent design, «green» atmosphere and variety along the road. The terms chosen for the characteristics were based on words used by informants and the order in which they are presented reflect their importance in the interviews.

Harmony between the road and its surroundings

All of the informants mentioned that a very important element for good aesthetic quality of a road is that the road is well adapted or integrated into its surroundings. One informant described it as follows: «*It's about the harmony between the size of the road, the materials and the surrounding buildings*» (informant 3). In this context several experts mentioned the use of cobblestone pavement for streets in a historical environment (see Figure 1).



Figure 1. New pavement with a historical appearance in a historical environment, an example of «*Harmony between the road and its surroundings*»

Mismatch between the width of road and its surroundings was seen as particularly problematic in terms of aesthetic quality. In this context, nearly all informants stressed the importance of constructing streets in towns and larger roads outside of towns. They also underlined the necessity of choosing a design

concept that respects and harmonizes with the surroundings, including the built environment.

The informants regarded it as favorable for aesthetic quality outside urban areas that a road followed the landscape's structures and terrain as far as possible.

The experts also mentioned that the qualities of the surroundings that are visible from the road strongly influence how people assess the aesthetic quality of the road, both favorably and unfavorably. A road can be designed in a perfect manner, but will never be perceived as pleasant if the surroundings are not.

High quality of materials and maintenance

All informants mentioned that regular maintenance work and good quality of both workmanship and material are crucial for the aesthetic quality of a road. In particular the importance of using «*lasting materials that look good over time*» (informant 1), was stressed. Several experts gave the example of granite curb stones as a favorable choice, as these are more visually pleasing and at the same time more resistant to damage from snow plows than curbstones in concrete, for example.

Good functionality

The experts talked surprisingly often about the functionality of a road as an important characteristic of its aesthetic quality. This means they looked at whether the road design corresponds to the needs of both residents (those living along or close to a road) and road users (traveling along/using the road) with respect to qualities such as usability, accessibility and traffic flow. In this context, informants talked particularly often about safety aspects and the necessity of a design that minimalizes conflicts between different kinds of road users. They also mentioned the importance of an understandable, clear design which evokes correct expectations and driving behaviors. When asking for examples of roads which were perceived as aesthetically poor, the informants often cited roads through towns that were difficult for the residents to cross, and thus divided a place or town into two parts.

Coherent design of the road

All experts mentioned that a coherent «design concept», specifying for example a uniform layout of road furniture or a repeating pattern of forms, is favorable to high aesthetic quality. One informant described the effect of such a coherent design concept as follows: «*I like it when a road has its characteristic architectural expression. I believe that this creates more tranquility for the driver [...]*» (informant 8).

In this context some of the experts also stressed the importance of a common design for all roads in an area and mentioned that «design guidelines» created by the municipalities for street furniture, for example, could be a helpful tool. However, such documents are rather rare in small Norwegian municipalities.

A «green atmosphere»

Plantings and a «green atmosphere» were seen as favorable to the aesthetic quality of a road, not least since vegetation can be used to hide unattractive surroundings or to structure the roadscape (see Figure 2). According to the informants, roads with poor aesthetic quality were often those dominated by asphalt and concrete: «*There are facades, asphalt, facades. Without anything else. It's very sad. You will not get in a good mood when you walk there. It's just the hard, grey surfaces of three walls and just a little bit sky*» (informant 10).

Variety along the road

Variety in terms of attractions, landmarks or effects, especially for people moving along a road, was considered to be a positive contribution to the aesthetic quality, as the following quote illustrates: «*For road x they have managed to make a little deviation from the standard. On the top of the hill, they have preserved a small rock, and they have aligned the bicycle lane around it. So, there is a little experience on the road section that provides an additional effect*» (informant 10, see Figure 3).

The experts mentioned in addition that varied views from the road, a variety of uses and facilities along it, as well as seasonal changes are important features of an aesthe-



Figure 2. Example of a street with a «green atmosphere»

tically pleasing road. However, too many effects and variation in furniture were described as tiresome and chaotic, and thus not favorable for the aesthetic visual quality.

3.2. Challenges and success factors in the planning practice

In the following section we summarize information from the informants about the challenges and success factors they meet in the

road planning process when promoting the identified characteristics. Five main themes were identified: the role of aesthetics in the planning process, the perceived professionalism of roads aesthetics, the weak interest for road aesthetics among customers, the influence of individuals on aesthetic relevant decisions, and difficulties in influencing road plans.



Figure 3. The bicycle lane is led around a small hill, an example of «Variety of experiences along the road»

The role of aesthetics in the road planning process

Looking at the role of aesthetics in the planning process, experts stressed that it is important to involve aesthetically educated specialists from the beginning of a planning process. The reason for this is that most of the characteristics of a road with a good quality are strongly dependent on decisions made in early stages of a project (e.g. road alignment).

Furthermore, informants mentioned that projects with good aesthetic qualities are often those where aesthetics is deliberately chosen as an important aspect for the whole project. However, these kinds of projects seem to be exceptions, and all experts repeatedly mentioned that aesthetics strongly competes for spatial and financial resources with other interests such as traffic flow, safety and road capacity. Experts also felt that aesthetics is often considered the least important aspect and is therefore reduced to a minimum when resources are limited. It seems that regular maintenance work and the use of material with high quality, for example, are the main concerns in terms of prioritizing resources. The same applies to plantings, but here the available space (for trees, for example) and constraints due to management (e.g. salting of roads in winter) were mentioned as limiting factors.

The informants said that they often have to argue very hard for including aesthetic measures. They often have to argue that their ideas can also be favorable for other interests: *«I just wanted to have them [staggered roadbeds] since this is a good way to integrate the road into the landscape. But there was a lot of opposition since it had not been done before [...]. Thus, we had to demonstrate that it didn't take more agricultural land, and then we had to go through all the other subjects first, and, at the end, we could say we will do this, because it will be beautiful»* (informant 7).

Some experts felt that road aesthetics was often regarded as a «bonus» that could be added at the end of the planning process: *«What I suspect or have experienced is, that the landscape architects' job is like sprinkling parsley at the end: just decoration. They [landscape architects] are not involved in managing the project, the landscape adapta-*

tion or the alignment [...]. It is rather the case that landscape architects just add some trees in the end» (informant 8).

The professionalism of road aesthetics

The informants seem to struggle in some projects with their argumentation for aesthetic improvements. In this context informants experienced that their profession is not always taken seriously enough by colleagues of other disciplines. This was also evident when talking about the terminology used for road aesthetics among professionals and with laypeople. Several experts underlined the importance of not using «subjective» words like «beautiful»: *«You cannot use these kinds of words. You have to talk in a way, that people understand that you are talking about a discipline and not about your personal view»* (informant 1).

Some experts mentioned that aesthetics can be considered as a matter of individual taste and thus is not treated with the necessary seriousness. However, most of the informants thought that aesthetically educated experts and laypeople judge the overall aesthetic quality of roads in a quite similar way. Only a few of the experts mentioned different tastes or judgements between aesthetically educated experts and those who have other educational backgrounds and professions: *«Other people [not landscape architects] working in the municipalities would like to have many of these arrangements with summer flowers hanging at the lampposts. It's not like we [landscape architects] will have it, isn't it? Municipality emblems with marigold, stuff like that»* (informant 6).

Weak demand and interest for road aesthetics among customers

Experts believed that road users and residents only have a minor interest in the design of roads: *«Most people think about practicability, whether there are holes in the road, if there is traffic jam, if they have to pay road toll or if the road encroaches on parts of their garden. I believe that people do not really care about how the public space looks. Maybe they have an opinion about our square but not about roads»* (informant 9).

Some of the experts expressed that this lack of interest is quite normal, since roads

are mainly thought of as infrastructure. Others criticized this absence of interest and would like to get more feedback about the aesthetic quality of roads. However, in this context they also mentioned the difficulty for laypeople to read and thus to comment on road plans: «*The road administration has to deliver perspectives and sketches illustrating the position of the project in the surroundings... but [...] the illustrations the Norwegian Public Roads Administration made were extremely unreadable. It was hard to understand the impact [of the proposed road alignment] on the landscape. I found it difficult, so what can you expect from a layman? Here, I think that the Public Roads Administration has a job to do in terms of better communication*» (informant 8).

Dependent on individuals

The experts working in the NPRA often mentioned that the degree to which road aesthetics is taken into account strongly depends on individuals in the road planning administration. Expertise in road aesthetics is necessary, but interest in aesthetics can be equally important. The project leader of road planning projects seems to play a key role when it comes to aesthetic decisions, both in a negative and positive way. One expert described the following situation: «*There was a project leader who was not interested in design. He was just interested in building as much road as possible for the money [...]. Yes, there were many landscape architects involved in the project, but they gave up because it was impossible to be heard*» (informant 1).

Difficulties in influencing road plans

Some of the informants working at planning offices in the municipalities mentioned that the county roads (fylkesvei) and motorways are under the administration of the NPRA and that they experienced it as difficult to influence the plans made by the NPRA, even though the municipalities have to approve them. In this context, they especially criticized the inflexible application of road norms and standard solutions, which are apparently often used in projects lead by the NPRA: «*We have only limited possibilities to get things that do not match with the road norms. Being a little bit creative*

and innovative, getting the speed limit down and other measures – this can be difficult to implement for a county road» (informant 9).

4. Discussion

The results of the interviews with experts in the Norwegian road planning showed that there was a high level of agreement among the informants, both with regard to characteristics of roads that contribute to high aesthetic quality and with regard to the challenges and success factors in planning practice when working with road aesthetics.

Regarding aesthetically favorable road characteristics, all experts stressed that a road and its surroundings are strongly intertwined and they considered it their main responsibility in a planning project to create harmony between the road and its surroundings. Equally important for the informants was use of high quality materials and ensuring functionality for both motorized traffic and other road users.

The informants were asked about aesthetic characteristics of roads without delimitation, thus including both visual, auditory, olfactory and tactile senses (Wöbse, 2002, Carmona et al., 2010). Nevertheless, they related their responses regarding aesthetic quality to the visual and functional aspects. One reason for this might be that there are long traditions of road design focusing on planning for motorized traffic, such that the other senses are often seen to be of minor importance for the way the environment is perceived (Carmona et al., 2010, Appleyard et al., 1966).

When comparing the findings from these interviews with the theoretical and empirically based framework for assessing visual quality of roads developed by Blumentrath and Tveit (2014), there is a high level of agreement between the characteristics emphasized by the informants as important for road aesthetics and the concepts in the theoretical framework (see Table 1). However, the terminology used does not necessarily conform. For example, the informant's ideal of a «green atmosphere» can be considered synonymous with «naturalness,» and «harmony between the road and its surroundings» is related to «integration» in the framework. Furthermore, some aspects in this study summarized under «functionality»

match with the visual characteristic «legibility.» It should also be noted that characteristics for roads of good aesthetic quality which were mentioned in the interviews have also been

identified as important to laypeople’s preferences in landscape preference studies (see Tveit et al. (2006), Sevenant and Antrop (2009) and others).

Table 1: Comparison of findings from this interview study with the theoretical framework for assessing the visual quality of roads developed by Blumentrath and Tveit (2014)

Theoretical framework for assessing the visual quality of roads		Results of the expert interviews
Dimensions of road design	Characteristics (<i>short explanation</i>)	Characteristics of roads with a good aesthetic quality
I Roads seen as an independent structure	Coherence (<i>uniform, harmonious design</i>)	Coherent design of the road
	Imageability (<i>identity, character, uniqueness</i>)	–
	Simplicity (<i>ideal: «less is more»</i>)	Variety along the road (<i>too much variety is negatively perceived</i>)
	Visibility (<i>visual scale, openness</i>)	–
	High quality/ Maintenance	High quality of materials and maintenance
	Naturalness (<i>natural, green appearance</i>)	«Green atmosphere»
II Roads in relation to their surroundings	Integration	Harmony between the road and its surroundings
	Contrast	–
III Related to travelers’ movement along a road	Variety (<i>diversity and richness of elements</i>)	Variety along the road
	Aesthetics of flow (<i>rhythm, cinematic effects</i>)	–
	Legibility (<i>understandable design</i>)	Good functionality (partly)
	Orientation (<i>in space</i>)	–
		Good functionality

Beyond the visual aspects, functionality (including safety) was an important aspect of roads with high aesthetic quality. Functionality has also been identified as important for the evaluation of landscapes in both metropolitan (Tveit and Sang, 2014) and rural areas (Coeterier, 1996, Arntzen and Brady, 2008). In relation to road aesthetics it has not been discussed in the literature previously, however (Blumentrath and Tveit, 2014).

The challenges and success factors in the planning process mentioned by the informants provided interesting insights into how the road planning process could be improved

to be more favorable toward aesthetic concerns.

The experts stressed that the surroundings play an important role for the aesthetic quality of roads. It follows that good cooperation and communication between road planning authorities and local stakeholders such as landowners, residents or road users would be advantageous for a road project. Through a better and more regular communication process, particular local factors of importance and needs can be better integrated in the plans, and the design of a road and its surroundings can become more coherent.

According to the experts, the main challenge for creating aesthetically pleasing roads was the missing focus on aesthetic issues in the road planning process. This is not only the case in the Norwegian road planning practice. Myers (2004) made the point that the US State Departments of Transportation judge «safety, speed, and efficiency higher than design issues such as contextual sympathy, environmental sensitivity, and aesthetics» (ibid:121). In her paper about infrastructure and landscape, Carstean (2015) described how the German road administration does not want to spend financial resources to promote a more creative process in the planning practice. Given that road planning is primarily a technical and engineering-based discipline, this might not be surprising and reflects the general tendency for aesthetics to receive little attention in other contexts as well, such as landscape planning (Ewald, 2001).

Another challenge for aesthetics, according to the experts interviewed here, is that it is perceived as a matter of rather low importance. One reason for this is that aesthetics is often regarded as subjective, and that good aesthetics is a quality which is not possible to calculate with numbers as discussed by Fischer et al. (2000). In this context it is a disadvantage that there is still quite limited empirical evidence about how different road users perceive and assess roads (Blumentrath and Tveit, 2014), such as the studies of Appleyard et al. (1966), Vägverket (2004), and Drottenborg (1999) or Stefánsdóttir (2014).

The results of this interview study also indicate that attitudes and approaches towards aesthetics among other disciplines need to change. This becomes even more important since «safety claims» and corresponding design standards, are increasingly questioned (Noland, 2003, Jones, 2003, Hess, 2009). Nevertheless, these standards are apparently often used by road engineers as an argument against aesthetic improvements. In this context, research has also shown positive correlations between roads perceived as beautiful and safety (Drottenborg, 1999, Dumbaugh and Gattis, 2005), which underlines the importance and advantages of aesthetic improvements.

The road planning authorities should emphasize making politicians, road users and

residents sensitive to road aesthetics, since the aesthetic quality of our environment influences our well-being (Parsons and Daniel, 2002). If road plans are difficult for laypeople to access and understand and the processes of road planning and design are not set up to integrate people's road perception and preferences, it is not surprising that feedback from the public is limited. Improving the feedback system could be helpful to gain knowledge about how people perceive and assess road design. This, in turn, could strengthen the argumentation for aesthetic measures in the planning process.

The findings further indicate that the aesthetic quality of roads very often depends on the personal interest of individuals in key positions (e.g. project leader), a view also supported by Hess (2009). With regard to the regulations of the Norwegian Planning and Building Act, which aims at good architectural quality in all projects, this should be seen as a critical factor. Thus, measures are needed to delimit the influence of individuals in determining the aesthetic qualities in road planning and design. Here one could, for example, test whether integration of the road aesthetic profession in the early stage of a planning project is beneficial for the visual quality of the whole project, as the informants in this study reported. Related to this, Myers (2004) stressed in her paper about the design of the Blue Ridge Parkway that the «discussions among engineers and landscape architects in the early design stages helped to create a road that suits its context» (ibid:121).

Limitations of the study and need for further investigation

The findings of this interview study offer valuable insights into the daily work of experts responsible for road aesthetics in Norway.

To gain even broader perspectives on both the characteristics of roads with good aesthetic quality and success factors and challenges in the planning practice, it could be interesting for future studies to include representatives from other stakeholder groups and disciplines, such as politicians or engineers. Such studies could also give information about the perceived importance of road aesthetics in other disciplines. It could also

be interesting to conduct a systematic evaluation of road projects with good and poor aesthetic qualities, judged from both experts' and laypeople's point of view, in order to work in the direction of an evidence based design practice (Deming and Swaffield, 2011, Brown and Corry, 2011).

More empirical research about the needs and preferences of both road users and residents, about the benefits of good aesthetic quality and about positive side effects of aesthetic measures (e.g. towards improved safety) could be useful when trying to strengthen the aesthetic quality of roads as perceived by laypeople.

5. Conclusions

This study revealed six characteristics of roads which are seen by experts as being important for the aesthetic quality of roads and which are agreed with previous research in this field. The results suggest that the experts in road aesthetics are guided by a range of «aesthetic standards» which are adapted to specific local contexts.

The aesthetically educated informants also reported, however, that in their view road aesthetic issues are given rather low importance in the Norwegian road planning and design practice. This must be seen as a critical issue since research has shown that perception of our surroundings, including roads, influences our mental and physical well-being (e.g. Parsons and Daniel, 2002, Velarde et al., 2007) as well as our behavior (Gehl, 2011:11). The main reasons for the rather low importance of aesthetics in the planning practice might be the perceived subjectivity of aesthetics and the lack of evidence-based knowledge about the effects of aesthetic measures. Here, further research and better evaluation practice seem to be necessary.

Better information as well as increased participation in aesthetic decisions might be helpful to increase awareness of and knowledge about the importance of aesthetics among stakeholders and the public. Changes in the planning practice, for example including design disciplines in the early stages of road projects, might also be needed to enhance the aesthetic quality of roads.

The findings of this study can provide a starting point for reviewing and revising the road planning practice in Norway in a way that it becomes more favorable to aesthetically pleasing design of roads and streets.

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