Shared Mobility for Innovative and Inclusive Green Cities (Sharming Cities)

1 Relevance relative to the call for proposals

The proposed project **'Shared Mobility for Innovative and Inclusive Green Cities (Sharming Cities)'** addresses the Transport 2025 call on research and innovations for sustainable transport by investigating the upscaling potential of shared mobility in Norwegian cities, across economic, social and environmental dimensions of sustainability. The project concretises this by addressing three groups of key players involved in the process: the shared mobility *users*, *suppliers*, and supporting *policy institutions*. With a sustainability perspective in general and a focus on key change agents for innovation in particular, the project corresponds with the call's claim to *"...promote an integrated understanding of the transport system",* and to "…*facilitate change in the transport system*".

By investigating the innovation and upscaling potential for shared, smart and sustainable mobility the project directly deals with the call's thematic priorities of *improved mobility, competitive businesses, sustainable urbanisation,* and *improved climate and environment.* Of the structural priorities, the project responds to the need for *innovation* and *radical change* facing the transport challenges by "*...stimulation untraditional solutions, new cooperation forms and technology visions"* (translated from 'foreløpig programplan'). Both car and bike sharing models will be studied and linked to use of other transport modes, thus *"...addressing challenges facing the individual modes of transport and the interaction between them".*

All dimensions of sustainable transport are covered. *Economic:* the project will study the organisations and business models that provide shared mobility, particularly focussing on the conditions for commercial success and economic viability. *Social:* we address the role of shared mobility users, their motivations, and how shared mobility impacts on social empowerment, inclusion and exclusion, accessibility and the distributional of welfare. *Environmental:* we provide calculable present and potential impacts of shared mobility drawing on findings on the how shared mobility adoption affects broader mobility practises. *Institutionally*, policies measures and the institutional support will be identified and evaluated in terms of goal-achievement, innovation and implementation. The project draws on *international interdisciplinary cooperation* and comparison by collaborating in close interaction with the Utrecht University during the whole project execution.

2 Aspects relating to the research project

2.1 Background and status of knowledge

Due to urbanisation and the growing concerns about global climate change and environmental degradation, worldwide, as well as in Norway, cities face challenges to reduce greenhouse gas emissions, air and noise pollution, while increasing the accessibility and liveability of residential, work and living environments to all citizens. In this context, various *smart city* concepts have been proposed that integrate grids and services across the ICT, energy and transport sectors. The smart city concept is particularly high on the European policy and research agendas: for instance in recent Horizon 2020 and JPI Urban Europe calls, where it is connected to energy efficiency and increased urban liveability. However, often, smart city initiatives are overly focused on technological fixes to existing systems, and fail to address the required deeper societal transformation encompassing social, cultural, political, economic, and institutional changes, as well as the economic, environmental and social implications.

This proposal suggests investigating the Norwegian upscaling potential for shared urban mobility. Mobility solutions based on the idea of sharing rather than owning vehicles are increasingly considered as a key element of smart cities, for its optimized use of vehicles, space, energy, financial and material resources, as well as for its potential benefits for social inclusion. This requires, however, not just a technological fix, but also changes in institutional arrangements and user practises. The timing of a Norwegian study into the globally-increasing

phenomenon of shared mobility is accurate. Until recently, Norwegian policy has not known any preoccupation or particular policy instruments regarding shared mobility, neither locally nor nationally. For instance, in 2010 the City of Oslo actively rejected car sharing *"…since there are existing arrangement without public support"*, (Nenseth *et al* 2012). But at this very moment, Norwegian policy regarding car sharing is shifting significantly. For instance the new proposal for an Energy and Climate strategy for Oslo (launched January 2015) explicitly suggests using the City's climate fund to support car-sharing schemes. Salient policy shifts are crucial for understanding the conditions for innovation and upscaling potentials.

Loosely expanding on a definition by Stillwater et al. (2009), we define shared mobility as services that allow citizens to hire locally available shared vehicles at any moment and for each possible period. We propose to define *vehicle* in a broad sense, including ordinary cars, electric cars, ordinary bicycles and electric bicycles. This is in line with policy goals to lower carbon emissions and to facilitate a shift from the car to alternative modes. As is common for emerging industries, shared mobility is characterised by a variety of business models (Shaheen and Cohen, 2013). These can be roughly subdivided into two categories: First are *traditional models* (Business to Consumer or Business to Business), where a profit or non-profit sharing operator owns a fleet of free-floating or locally stationed cars or bikes. Users (individuals or organisations) rent those vehicles short-term and are charged for distance and/or the duration of usage. Different variations exist in which users have to return vehicles to the pickup station (e.g. Vélib for bicycles, Car2Go or the Norwegian Bilkollektivet for cars); to another station (e.g. the Norwegian Bysykkel for bicycles); or to a random location within a designated operating area (e.g. DriveNow for cars). Second are *peer-to-peer models (P2P)*, where platforms facilitate contacts between users and owners, and organise payments and insurances (e.g. Spinlister for bicycles; SnappCar for cars). P2P models make efficient use of underutilized resources and require virtually no additional production or suppliers, and could be considered most innovative and environmentally friendly. None exist yet in Norway.

Shared mobility is not necessarily a new phenomenon (Shaheen and Cohen, 2007). One of the first car sharing initiatives started in Zurich, Switzerland, in 1948, to increase car mobility to those who could not afford a car. During the 1970s and 1980s various non-profit car-sharing programs started (and discontinued), such as the Witkar (1974-1988) in Amsterdam and Procotip in France (1971-1973). In Switzerland two successful car sharing organisations started by the late 1980s and merged into a nation-wide operator in 1997 (Truffer, 2003). Nevertheless, it was not until recently that – driven by environmental and economic crises and enabled by the advancements in communication technologies and online social networks – shared mobility has seen a large worldwide increase (Shaheen and Cohen, 2013). In 2007, 300,000 users shared 12,000 cars in 18 countries. In 2010, this increased to 1.2 million members sharing 31,000 cars in 26 countries (Shaheen and Cohen, 2013). These numbers are expected to raise rapidly to an estimated 20 to 26 million users by 2020 (Frost and Sullivan, 2013). Norway is no exception to these trends. Close to 5,000 users are attending Norwegian car sharing schemes today, representing a fast growth since car sharing was first formally established in 1995, with about 100 members in 1998 (Nenseth, et al. 2012). Nevertheless, the gap with front-runners like Switzerland (i.e. 100,000 members on a population of 7.5 million) is still relatively large. Regarding bike sharing, over the years four generations of systems can be identified (Shaheen et al., 2014). The first bike sharing system ("White Bikes") was introduced in 1965 in Amsterdam, the Netherlands, but failed due to misuse of the lockless bicycles. In 1991, Denmark introduced a second-generation coin deposit locked, bike sharing system. In the twentieth century third-generation programs have been introduced with distinguishable bicycles, docking stations for security, kiosks for user interface, and debit/credit payment solutions. The most recent, fourth generation bike sharing systems feature demand-responsive rebalancing, and are often integrated with other transport modes. Currently, more than 800,000

shared bicycles, of different generation systems, are available over 37,500 stations across 712 cities on five continents (Shaheen et al., 2014).

Following the present and prospected growth in shared mobility, scholars have started investigating the phenomenon, especially within transport sciences. Existing studies mainly focus on car sharing. Some studies find higher sharing rates amongst single households, lower income groups, higher educated, environmentally conscious people and/or those who live in urban environments, however overall user profiles appear rather diverse (e.g. Burkhardt and Millard-Ball, 2006; Zhou and Kockelman, 2011). When looked at motivations to share, overall saving money appears most important, followed by environmental reasons, the convenience of free and designated parking, and identity aspects – i.e. related to the lifestyle expressions enabled by the use of different types of shared cars, or the sense of belonging from being enrolled in a sharing community (Litman, 2000; Duncan, 2011; Kent, 2013). In response to findings indicating a 'peak car' phenomenon (Geels et al., 2012; Goodwin, 2012), studies have started looking at the relationships between car sharing, ownership and use, in relation to a *deprivatisation* of mobility (Dennis and Urry 2009; Conley and McLaren, 2012). Trips in shared cars require more individual planning in advance, which could reduce the number of impulse trips. Also, the fixed costs associated with vehicle ownership are replaced by variable costs, rendering people more conscious in their decision whether to make a trip and to better compare alternative transport modes (Duncan, 2011; Kent, 2013; Siou et al., 2013). Studies estimate that the introduction of one shared car, may lead to a reduction of four to over twenty owned cars (Shaneen and Cohen, 2007; Martin et al. 2010; Siou et al., 2013), as well as reductions in travelled distances by car (Cervero et al. 2007; Martin and Shaheen 2010; Kent, 2013) of up to 44% (Shaneen et al., 2009) and CO_2-emissions in the range of 142-312kg per person per year (Haefeli et al., 2006; Wilke et al., 2007; Martin, et al., 2010).

Although these studies provide essential insights on the use of shared mobility, four important shortcomings can be identified: *First*, some claims and figures above may be unfounded, incomplete or overly optimistic, as empirical insights are sparse and often based on data commissioned by car sharing firms, rather than publically funded data (Kent, 2013). *Second*, while impact studies focus mostly on the potential of CO_2-emission reductions, other environmental and societal implications are often overlooked. The use of shared mobility is largely analysed on the aggregated level of travelled distance by car. Less well documented is how shared mobility adoption affects interrelated travel behavioural choices, including trip scheduling, destinations, routing, transport mode and vehicle choices. Such knowledge is crucial to get a better understanding of how, when and where, shared mobility relieves or enhances local environmental stress and congestion in urban regions. Moreover, some interestingly claim that shared mobility gives disfavoured social groups the opportunity to use a car and enlarge their access to social networks, jobs and other resources (Litman, 2000; Kent, 2013), but lack the supporting empirical results to support these claims, even if this was precisely the main objective of the first car sharing schemes (Hald et al 2010). *Third*, while studies are mainly focussed on car sharing, user profiles and practises regarding bike sharing are often overlooked. Especially studies that cross-compare the sharing of cars and bicycles with a similar research design are lacking. *Fourth*, studies approach shared mobility mostly from a transport perspective. As such, most fail to provide an interdisciplinary view on how the upscaling of shared mobility involves deeper societal changes, for instance in market positions, (local) government policies and social norms regarding car ownership.

2.2 Approaches, hypotheses and choice of method

Our literature review shows that shared mobility is rapidly rising, but also that scientific research on this topic is still in its infancy. To address the literature shortcomings listed above, it is here proposed to view the upscaling potential of shared mobility as an innovative social practice (Shove and Walker 2010), involving changes in strategies, norms and behaviours at

the supply side (in the form of new business models and supportive technologies), the demand side (in the form of new mobility patterns and social norms associated with it) and the policy side (in the form of new policies and measures). This upscaling process will be assessed against its environmental, economic and societal impacts. Hereto we formulated the following primary objective: *To develop a comprehensive interdisciplinary understanding of the conditions that support the upscaling of shared urban mobility and define its environmental, social and economic sustainability, from supply, demand and institutional perspectives*.

As a theoretical basis, we draw on Nelson's (1995) co-evolutionary model of innovation, which understands the upscaling potential of innovations from the complex interplay between use, supply and institutions. Users drive the adoption of shared mobility services. Increasing demand triggers further investments at the supply side. Through economies of scale, costs and prices can go down and on the demand side the utility to adopt increases. With prices going down and mass markets opening up, and a dominant design in place, the emphasis in innovation shifts from product to process innovation (Abernathy and Utterback 1978). The average size of firms quickly goes up, and the number of firms active in the industry typically goes down. Though the initial innovation may come from startups, the large-scale provision may be realized by incumbent firms that were already active in related industries (e.g. rental companies, lease companies, car manufacturers). These can leverage their size, brand, managerial and financial resources, and potentially buy up startups (Den Hertog et al. 2010).

Although shared mobility is often market-led, there is an important role for public policy in regulating the institutional changes required for shared mobility. While conventional policy institutions strive for consensus and status-quo, policy innovation is triggered by external shocks or pressing problems. These in turn pave the way for new modes or (reflexive) governance characterised by informal strategies and new policy actors (Hajer, 2003; Heritier and Rhodes 2010; Voss et al., 2005). Recent insights from innovation sciences point out that no single policy, but rather a *policy mix* could improve the functioning and performance of innovation systems (Flanagan et al., 2011). In short, the notion of policy mix addresses how different and complementary policy instruments (i.e. communicative, regulative and fiscal – Vedung, 1998) address innovation system problems (Borras and Edquist, 2013), as well as the mix of different policy goals (environmental, economic and social), rationales and processes of policy making and implementation (Rogge and Reichardt, 2013).

The roles of demand, supply, and policy institutions are analysed by three secondary objectives in separate work packages, hereunder defined. All three work packages compare Norwegian shared mobility to that in the Netherlands. The rationale for this international comparison is fourfold: *First*, the data that we will below propose to acquire in Norwegian cities, have to some extent already been collected and preliminarily analysed in the Netherlands. These data are available for comparison via our Dutch research partner and will be used to guide our research design. *Second*, the Dutch and Norwegian cases of shared mobility are in similar stage where different shared mobility suppliers experiment with different types of business models, which allows for an interesting comparison, to explore to what extent and how business models, user practises and policy regarding shared mobility differ between cities in the two countries. For instance, peer-to-peer shared mobility is rapidly in the Dutch cities and countryside, while no examples of peer-to-peer shared mobility have started off in Norway yet, despite serious ambitions and attempts from large-scale internet service providers like finn.no. *Third*, it can be investigated whether some (features of) business models may diffuse between the Netherlands and Norway and whether Norwegian shared mobility suppliers and policy makers can learn something from Dutch experiences and vice versa. *Fourth*, the international comparison on the case of shared mobility may provide empirical insights that are relevant to how the diffusion of innovations in a more general sense, is linked to (dis)similarities in

demographic, geographic, social, cultural, political and/or institutional factors (Boschma, 2005).

WP1: Users (Lars Böcker (coordinator), Per Gunnar Røe, Aslak Fyhri)
Objective: *To understand the socio-demographic and geographic backgrounds, attitudes, motivations and mobility practises of current and prospective car and bike sharers.*
First WP1 will examine ***who*** adopt, or are willing to adopt, car and bike sharing. We explore whether it is the stereotypical early adopters (younger, highly educated, urban and environmentally conscious people) that use shared mobility, or whether it is a more diversified population. Results from our Dutch data suggest that in Amsterdam the latter is the case (Meelen et al., forthcoming). It will also be investigated whether user profiles differ between car and bike sharing and present current and prospective users. The anticipated empirical insights into shared mobility user profiles are important to understand the currently underexplored societal implications of shared mobility: whether shared mobility has indeed social equity benefits by empowering lower income or otherwise marginalised groups in society (Litman, 2000; Kent, 2013), or whether it is more likely to reproduce existing divides. Because firms or other organisations may be important 'users' to shared mobility suppliers (business-to-business models), attention will also be paid to the types of organisations that offer shared mobility to their employees. The following research question will be addressed:

1.1 What are the socio-demographic and geographic backgrounds and attitudes (social, environmental and transport-related) of current car and bike sharers?
1.2 What is the role of socio-demographic and geographic backgrounds and attitudes on the willingness to participate in (electric) car/bike sharing amongst the general population?
1.3 Which types of organisations (size, profit/non-profit, economic sector) offer shared mobility solutions to their employees?

Secondly, WP1 addresses ***why*** people or organisations adopt car and bike sharing. Following an existing Dutch study (Böcker and Meelen, forthcoming), it will be investigated whether those willing to adopt shared mobility are mostly economically, socially or environmentally motivated, and whether these motivations differ between socio-demographic groups or between different types of firms. Amongst individuals and organisations unwilling to adopt shared mobility, it will be investigated if they experience any specific barriers to do so. A better understanding of motivations and barriers to use shared mobility is crucial for shared mobility suppliers to fine-tune their business models, and for policy makers to formulate and implement effective policy measures. The following research question will be addressed:

1.4 What are the motivations/barriers for individuals to adopt (electric) car/bike sharing?
1.5 What are the motivations/barriers for organisations to adopt shared mobility solutions?

Thirdly, WP1 addresses ***how*** individuals adopt shared mobility. It will be investigated how and how often people make use of car and bike sharing, and how this changes their overall daily mobility patterns and longer-term attitudes and decisions regarding car ownership. The latter may give important insights into the whether shared mobility could be a driving or supporting factor in the identified peak car phenomenon. Along these lines, we will address three of the identified literature shortcomings: (1) the general lack of publically funded empirical studies on shared mobility user practises; (2) the lack of knowledge on the effects of shared mobility adoption on integrated mobility patterns; and (3) the specific lack on user practises of bike sharing in comparison to car sharing. These anticipated insights into shared mobility user practises will be used to assess the impacts on CO_2-emission reductions.

1.6 To what extent and how does (prospective) adoption to car and bike sharing affect attitudes and current/anticipated decisions regarding car ownership?
1.7 To what extent and how does (prospective) adoption to car and bike sharing affect daily frequencies and distances travelled by car, public transport, foot and bicycle?
1.8 To what extent do these car ownership and daily mobility changes as a result of shared

mobility adoption lead to overall CO_2-emission reductions?

Fourthly, the anticipated Norwegian insights on RQs 1.1 through 1.8 will be contrasted with similar analyses from the Netherlands, performed at Utrecht University. Drawing on the notions of similarity or proximity developed within studies on the diffusion of innovations (Boschma 2005), the following research question will be addressed:

1.9 To what extend do the socio-demographic profiles and practises of Dutch and Norwegian users differ, and how can this be explained from demographic, geographic, social, cultural, political and/or institutional (dis) similarities?

Data and methods**:** Triangulation of stated and revealed quantitative data will be used to investigate individual user profiles, motivations and practises. Qualitative interviews are used to explore organisational user profiles and motivations.

Stated preference survey amongst the general population. *Sampling*: Based on a geographically stratified sampling design 400 respondents will be sampled in Oslo, and 200 each in Bergen, Trondheim and Kristiansand. We focus on the four largest Norwegian cities, because shared mobility solutions in Norway are currently only offered in major cities, and because the shared mobility potential is highest here due to higher densities and subsequent economies of scale. After geographical stratification, respondents will be selected randomly, and approached by SMS (via the publically available Norwegian mobile phone register) to fill out an online survey. Non-western ethnicities and elderly people will be oversampled due to anticipated lower response rates. *Data*: Following an earlier Dutch stated preference survey (Meelen et al., forthcoming), data will be collected on respondents' willingness, motivations and barriers to participate in different business model scenarios for car and bike sharing, as well as on the socio-demographic backgrounds and attitudes towards the environment and car ownership. Data is analysed in multinomial/ordinal/tobit regressions and structural equation models to answer RQs 1.2, 1.4, 1.6, 1.7. The data will also be used to address WP2's RQ 2.3.

Survey amongst car sharing members of Bilkollektivet (Oslo, Stavanger, Tromsø, Kristiansand) and Hertz Bilpool (Oslo, Stavanger, Kristiansand, Bergen, Trondheim), and amongst Bysykkel bike sharing members (Oslo, Trondheim and Drammen). *Sampling*: The full population of members of these three Norwegian shared mobility suppliers will be contacted via the networks of our stakeholder partners to participate in an online survey. *Data*: Amongst these three groups of actual shared mobility users we collect data on socio-demographic and geographic backgrounds, reported shared mobility behaviours, and reported changes in daily mobility practises as a result of their adoption to shared mobility. Data is analysed in multinomial, ordinal and tobit regression models to answer RQs 1.1, 1.6, 1.7, 1.8.

Qualitative interviews with organisations that use shared mobility: Around 15 semi-structured qualitative interviews are planned with representatives from organisations that offer shared mobility solutions to their employees. These will be contacted via the networks of Bilkollektivet and Hertz Bilpool. Information is collected on organisational backgrounds, visions on shared mobility and motivations to use shared mobility to answer RQs 1.3 and 1.5.

WP2: Supply (Lars Böcker (coordinator), Koen Frenken, Vibeke Nenseth)

Objective: *To envisage which shared mobility organisations and business models are most likely to succeed in the sustainable upscaling of shared mobility*

Our literature review indicated two main categories of business models: traditional (B2C/B2B) and peer-to-peer. WP2, first examines into more detail what characterises the car and bike sharing business models currently operating in Norway, as well as which visions prevail amongst shared mobility suppliers on the development of shared mobility business models in the next decade. Second, we investigate how different types of present and prospective business models are adopted and valued by users. Part of this is also whether users are willing to provide peers with access to their own bike or car in P2P sharing systems. Third, we pay attention to the organisations behind these business models. The distinction between

start-ups and incumbents and between profit and non-profit is particularly interesting. Some non-profit organisations, such as the Norwegian Bilkollektivet, seem to re-organise themselves into a more commercial direction. Finally the present and envisioned developments in Norwegian shared mobility business models will be compared to the situation in the Netherlands and linked to demographic, geographic, organisational, institutional, social and cultural (dis) similarties (Boschma 2005). Particular attention will be paid to peer-to-peer business models that are currently successful in the Netherlands but do not yet exist in Norway – although there have been attempts. Why has it not succeeded yet in Norway? The following research questions will be addressed:

2.1 Which car and bike sharing business models are currently applied, including their mode of transport, charging, financing, risk allocation, success factors and upscaling potential?

2.2 Which business models can be envisaged in the next decade?

2.3 To what extent and how are different business models adopted, used and valued by users?

2.4 Which companies are both willing and able to provide shared mobility at a large scale, and for different users, given their experience, size, corporate structure and identity, and service innovation capabilities?

2.5 To what extent do present and envisaged shared mobility business models differ between Norway and the Netherlands and how can these differences be explained from cognitive, organisational, social, institutional, geographical and political (dis) similarities?

2.6 Which shared mobility business models applied in the Netherlands or other countries can be expected to be most relevant to the Norwegian context?

Data and methods: WP2 will be mainly based on qualitative case studies with suppliers, but will also draw on data in WP1. Around 15 semi-structured *informant interviews* are planned with car and bike sharing suppliers in Norway and the Netherlands. Some of these – e.g. Bilkollektivet, Hertz Bilpool, DriveNow (in a research stage for a Norwegian start-up) – are already supporting this project by participating as stakeholders (see the Letters of Intent). Thus they are willing to contribute to the research by sharing their knowledge and experiences on success factors and barriers in informant interviews and workshops. The Dutch organisations will be contacted via the Dutch connecting sharing platform ShareNL. We anticipate interviews with representatives of Snappcar (the Dutch P2P car sharing provider), Greenwheels (Dutch B2C car sharing provider linked to national railways) and OV-Fiets (Dutch bike sharing provider linked to national railways). The interview data will be used to answer RQ 2.1, 2.2 and 2.4-2.7. RQ 2.3 is answered through WP1's stated preference survey.

WP3 Policy institutions (Vibeke Nenseth (coordinator), Lars Böcker, Per Gunnar Røe)

Objective: *To assess which factors explain policy change and innovation, and which (mixes of) policy goals, rationales and instruments are most successful to the sustainable upscaling of car and bike sharing.*

This WP will explore the recent policy shift that has occurred towards shared mobility by comparing contrasting policy documents and learn from key policy actors the main arguments and reasons why. Particular attention will be put on their view on different business models for shared mobility and the kind and extent of policy intervention – whether economic, regulatory or communicative. This objective is analysed via the following research questions:

3.1 Which policies and regulations have currently been formulated or are being applied in support of car and bike sharing and at which administrative level?

3.2 What is the main political rationale that has paved the way for shared mobility policy support? To what extent has shared become mobility congruent or intertwined with other policy concepts/discourses (e.g. new modes of governance, private-public partnerships, local empowerment, market-led innovations, self-service society, low-carbon society)?

3.3 Which policies and regulations have proven, or are conceived, as most effective in supporting the sustainable upscaling of car and bike sharing services?

3.4 To what extent and how do the policies supporting shared mobility differ between the Netherlands and Norway, and how can these differences be explained from cognitive, organisational, social, political, institutional and/or geographical (dis) similarities?

3.5 Which shared mobility policies applied in the Netherlands or other countries can be expected to be most relevant to the Norwegian context?

Data and methods*: Discourse analysis* of Dutch and Norwegian *policy documents* and in-depth *informant interviews* with politicians and professionals in order to reveal the concepts, conditions and arguments in use to explain the policy shift and the upscaling potential for shared mobility. Some of the qualitative interviews will be in form of carefully selected and composited *focus groups* with key local (Oslo, Bergen, Stavanger, Kristiansand, Amsterdam and Utrecht) and national policy actors in the urban and mobility policy from Ministries, Directorates and urban professionals. As an innovative mobility solution, this topic is particularly appropriate to approach empirically by a group interview like a focus group to explore the argumentative dynamics - among the policymakers across different policy sectors (environmental, transport, urban) and levels. In addition, there will be supplementary *informant interviews*, e.g. among politicians having had shared mobility on their agenda. The *document analysis* will cover the most recent white papers, plans and strategies on urban, environment/climate and transport policy at the national and city level. This includes the Norwegian white paper on climate policy 2012, the National transport plan 2012, Oslo's proposed Climate and Energy Strategy, as well as equivalent documents in the Netherlands.

3. The project plan, project management, organisation and cooperation

The core research team consists of five experienced researchers (three Norwegian; two Dutch) across the social sciences (innovation science, political sociology, urban/transport geography, environmental psychology), and with previous internal bilateral collaborations: **Vibeke Nenseth** is a senior researcher (sociologist) at TØI and Head of CIENS Scientific Committee. She has long-standing experience in project management, interdisciplinary and cross-institutional research coordination on urban and mobility sustainability, policy and societal change, and innovative urban and mobility solutions.

There are following changes in the project team (from the proposal in May): We suggest to change the post-doc to a PhD-position. Lars Böcker, the proposed post-doc for the project, has got another post-doc-position, but he will still be a part of the project as a supervisor/mentor for the PhD-candidate. The change from hiring a post-doc to a PhD implies some released monetary resources, and the UiO team will be strengthened with professor Bjørnar Sæther, UiO/ISS, also an innovation expert, as Koen Frenken, our Dutch research partner. **Koen Frenken** is a full professor in innovation studies. He has a wide experience in scientific project management, both as co-applicant and coordinator. His main research areas include the evolution of science and technology, economic geography, innovation policy and the sharing economy. **Aslak Fyhri** is senior researcher (environmental psychologist) and TØI's leading bicycle researcher, with a solid methodological competence, in both planning and analysing larger surveys, with particular focus on multivariate analysis such as SEM. **Lars Böcker** is a postdoctoral researcher (urban and transport geographer) at University of Oslo with a recent PhD from Utrecht University. He has been involved in interdisciplinary projects on climate and daily mobility, smart cities, sustainable accessibility, the sharing economy, and urban metabolism. **Per Gunnar Røe** is a full professor at the Institute for sociology and human geography at the University of Oslo and is the University's member in CIENS Scientific Committee.

The work is subdivided into three work packages, each listing the coordinating and involved researchers. Strong cohesion between the WPs will be achieved through annual face-to-face meetings with all Dutch and Norwegian consortium members; quarterly meetings with researchers in Norway; joint publications and reports; and dedicated time for coordination activities by the main applicant Vibeke Nenseth.

A **user group** is set up as key informants and discussion partners for the project. The group will meet in interactive workshops, where they will be presenting their experiences and follow and comment upon the project' perspectives, progress and findings. The user partners cover various organisational and business models and all have agreed in contributing to the project by sharing their knowledge and experiences on shared mobility, success factors and barriers. The user partners will be Director Arne Lindelien, **Bilkollektivet** Oslo (non-profit member-based organisation, started 1995, Norway's largest carpool); manager Eivind Thorne, **Hertz carpool** (Norway's only and leading commercial carpool; started 2011); Senior designer Sondre Frost Urstad, Frost Produkt AS, key suppliers of **bike sharing system** (implemented in Oslo from 2003); Business Developer Manager Jashar **DriveNow** (a German-based, free-floating (not station-based) carsharing scheme); Director Mince Walnius, **Advier Mobiliseert** (Dutch consultancy agency active on shared mobility), Utrecht; and **Natuur & Milieu** (Dutch environmental NGO active on shared mobility). In addition to these project partners we will in the annual user-researcher workshops also approach more advisors and discussion partners on an ad-hoc basis, from public and city authorities and other mobility service providers not dealing with 'shared mobility'.

4. Key perspectives and compliance with strategic documents

Compliance with strategic documents: TØI has studied conventional car sharing in Norway within the field of sustainable transport, in two earlier research projects, based on conventional member based car sharing. The knowledge is lacking on new and commercial business models, and also on the user profiles on the (major) part of the population that is not into shared mobility schemes today. Except for a master thesis research on a seemingly popular and much used city-bike programmes ('bysykkelordninger') is lacking in Norway. Research on smart and sustainable mobility fits well into TØI's thematic strategies on sustainable transport and is in congruence with the European urban and transport research agenda, such as the 'smart cities' and 'smart, green and integrated transport' in Horizon 2020. Research on innovative and sustainable urban mobility is also of high relevance in the CIENS' (Oslo Centre of Interdisciplinary Environmental and Social research) strategic initiative, CIENS Urban, that coordinates the research for urban sustainability among the environmental research institutes in CIENS, recently launched as a larger research flagship. **4.2 Relevance and benefit to society:** As the call – and project – addresses sustainable urban transport as a key societal and political challenge the policy relevance will be immediate and demanded. The close interaction with stakeholders user-researcher workshops is an element in the project that further ensure the policy relevance. **4.3. Environmental impact:** The environmental concern is clearly manifest and inherent in the project as one of the basic research problem. However, the very project implementation and execution does not have any particular negative environmental impacts to reconsider. **4.4. Ethical perspectives:** The project does not imply any particular ethical challenges (no person identity problems for instance), and will in no respect violate common guidelines of research ethics - honest, accurate and thoroughly use of data. **4.5. Gender issues (Recruitment of women, gender balance and gender perspectives)** The research team consists of four men and one woman, where the latter will be the project manager. As a gender perspective might be relevant in analysing both the appeal and use of innovative and smart urban solutions like shared mobility, the research team will have a specific attention to the gender issues and gender variation in the empirical studies.

5. Dissemination and communication of results 5.1 Dissemination plan: Included in online form. **5.2 Communication with users:** The communication and interaction with the users is inherent in the project development and execution. The most relevant business partner have already been approached via existing professional networks of Vibeke Nenseth in Norway and Koen Frenken in the Netherlands. All users strongly confirm their interest, support and

contribution to such a project (cf. the 6 Letter of Intents) by making information and data available and exchange knowledge and experience in two national and one international interactive workshop (see dissemination plan).

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