Smart Mobility Suburbs (SMS)

1 Relevance relative to the call for proposals

SMS is a multi- and trans-disciplinary project that addresses the conditions for transition towards energy-smart mobility in suburban centres. It focuses on two types of under-addressed innovations: i) *innovations in mobility practises* and ii) *innovations in collaborative and multi-scalar governance to enable low-energy smart cities/micro-cities*. Empirically, ***SMS*** studies the networks (cross-scale institutions) and markets and regulatory systems involved in the implementation of Oslo's climate and energy strategy "The Green Shift" and similar policies of neighbouring municipalities and suburban towns (with local micro-city cases in Lillestrøm, Ski, Fornebu/Bærum). We ask how regional, municipal and suburban governance and planning organise and regulate sustainable mobility practices within selected micro-cities areas of the city region through a combination of hierarchical, market and network measures. Very limited research has so far been done on smart city development focusing on collaborative governance, markets, networks and cross-scale institutional challenges between city regional and local scales. The proposal addresses ENERGIX ***priority areas*** on low energy transport and "energy policy, economy and society" by focusing on "smart cities and communities". The project will provide "new knowledge about which organisational, regulatory and market challenges can realize smart energy systems, cities and towns", as requested in the call. The project builds upon earlier and on-going research by each of the UiO/CIENS partners (NIBR, TØI) (see list in Application document), and long-standing institutional collaboration.

2 Aspects relating to the research project

Despite covering less than 2 per cent of the earth's surface, city regions are home to more than half the world's population (an expected 70% by 2050), generate more than 60% of all carbon dioxide and significant amounts of other greenhouse gasses, and use an estimated 78% of the world's energy (UN-Habitat, 2015). One sector of particular importance is the transport sector, which is the largest emitter of CO_2 and also generates a great deal of local stress (e.g. air/noise pollution, congestion, occupation of precious space) to city regions. (TØI, 2014). This hampers ambitions to increase the accessibility and liveability of residential, work and living environments to local citizens. Increasingly, however, cities are turning the tide and have taken the role as lighthouse frontrunners in a transition towards a low-energy, low-carbon society (Hollands, 2008, Bulkeley 2013). In this context, various *smart city*[1] strategies have rapidly developed as powerful and economically viable means to decarbonise cities (e.g. Caragliu et al., 2011), and feature prominently on European policy and research agendas.

Yet, many of today's smart city strategies are characterised by two major shortcomings. First, while being heavily focused on technological innovation, strategies often fall short to address the deep societal transformation encompassing not just technological, but also the required social, cultural, political, economic and institutional changes (e.g. Jackson, 2005; Van Nieuwaal et al., 2009). Moreover, potential unintended outcomes of such strategies in terms of social implications are little communicated (Caragliu et al., 2011). Second, in contrast to urban cores, suburban areas have been remarkably little studied from a smart energy/climate perspective, especially in Europe and the Nordic countries, which differ from

[1] Refers here to places where traditional networks and services are made more efficient with the use of information and communication technologies (ICTs), to the benefit of its inhabitants and businesses. This includes smarter energy, more efficient buildings / districts / transport networks, but also more interactive, collaborative and responsive city administration; safer / healthier / more attractive public spaces; and meeting the needs of cultural / demographic changes (Perboli, 2014).

[2] This includes the literature on interactive, reflexive and network governance, which is of particular focus in our study.

their U.S. counterparts. This is the case in the smart city debate, as well as in sustainable cities research in general. This is surprising given that substantial parts of western cities are suburban, both in respect to area and population. City regions span large tracts including peri-urban satellites and exurban areas (e.g. Keil et al., 2013). The form and structure of these diverse suburban areas in terms of housing, work place concentrations, commercial centres and transport infrastructures, have profound effects on travel patterns and energy use for the metropolitan region as a whole (e.g. Næss, 2006). Moreover the often-distinct demographic, economic and political situations of suburban areas (e.g. Schwanen, 2015) pose great coordination challenges to successful regional governance and planning.

In light of these shortcomings, the project studies ***innovations in mobility practises*** and ***innovations in governance*** in three suburban centres of the Greater Oslo region, each with their unique geographic, infrastructural, economic, and political situations, and their own trajectories towards low energy mobility. It will do so in connection to the developments in three suburban centres in the Greater Oslo region, each with their unique geographic, infrastructural, economic, and political situations, and their own trajectories towards low energy mobility (Lillestrøm, Ski, Fornebu). Fornebu (Bærum): a former airport green/brownfield development (Lingsom, 2008) into a mixed-land-use smart low-energy suburban centre, albeit with economic and transport challenges, but also innovative (often market-led and bottom-up) mobility solutions while awaiting a metro connection. Lillestrøm, a fast-growing, urbanising, railway node suburban centre with superb high-speed rail connections to both Oslo and Oslo's international airport. Ski: an important employment, commute and shopping centre with good public transport and road connections to Oslo and Sweden. Yet, all three are "areas in the making", and resemble the urbanisation (i.e. what Phelps et al. 2006 refer to as post-suburban development) of suburban centres.

The three case study areas play a crucial role in Oslo's climate plan "The Green Shift", which is now about to be officially approved. This strategy, which is intertwined institutionally and policy-wise with the "Regional Plan for Land Use and Transport for Oslo and Akershus" sets ambitious targets: a CO_2 emission reduction of 50% by 2030 and of 100% by 2050. This regional plan covers the municipality of Oslo, the county of Akershus as well as the 21 municipalities within the county. Hereto, the plan addresses a set of sectoral and cross-sectoral challenges across the city territory and mobilizes a set of actors at all scales: citizens, neighbourhood organisations, small and medium-sized enterprises, larger businesses, and an array of public and semi-public institutions. With regard to transport, the plan maps out a transition towards alternatively fuelled vehicles and a modal shift away from the car, to accommodate all urbanisation-induced passenger travel demand by bicycle (16% of all trips in 2050), foot and public transport. This involves increasing walkability and cycleability, establishment of environmental zones and other car reducing measures, and compact green transit-oriented development around public transport nodes. Oslo's climate targets are thus clearer and more ambitious than before, yet innovations in mobility practises and multilevel governance are required to meet and implement these ambitions.

Innovations in mobility-related practises

Throughout the western world (including in Norwegian cities – RVU, 2011), the private car is the dominant mode of transport (e.g. Pucher, 2004), and daily life in suburban areas is strongly linked to car use (e.g. Crane, 1996). However, recently, signs in many western cities indicate that the status and symbolic function of the car may be on the decline, and car use may have peaked (e.g. Goodwin, 2012). Transport policies in urban regions have traditionally been focused on facilitating the demand for car traffic, and minimising congestion and commute times. More recently such visions have increasingly been challenged, and a paradigm of *sustainable mobility* has been promoted, based on optimal rather than minimum congestion (Urry and Lyons, 2005; Banister, 2008). Four means are listed to achieve this:

fewer trips, modal shift, distance reduction and the phasing-in of more energy-efficient or alternatively fuelled personal and public transport vehicles.

For example, Norway has developed itself as a leading nation in the adoption of electric vehicles (Haugnaland and Kvisne, 2015). However, despite proving great effectiveness to reduce transport energy footprints, electric or alternatively fuelled vehicles do not reduce the occupation of valuable land by roads and parking spaces, or other negative aspects of associated with car travel (Haugnaland and Kvisne, 2015).

The other critical means to achieve low energy mobility, all involve *changes in individuals' mobility practises*. Modal shifts refer to the selection alternative modes to the car, such as public transport, walking, cycling, or various shared mobility alternatives, such as car, ride and bike sharing, but may also raise fundamental question about why we travel in the first place (Cohen and Kietzmann, 2014). Reduced distances are achieved when people select trip destinations (work, services, friends and leisure locations) closer to their trip origins.

Both modal shifts and reduced distances are often directly linked to compact urban designs. Reducing trip distances can be achieved through compact mixed land uses, where people live closer to work and have a wider range of services in the direct vicinity of their homes (e.g. Naess, 2006). Compact designs also increase the density of traffic flows. Different hypotheses exist on how compact designs affect daily and less-recurrent leisure trips, some arguing that leisure activities are located at closer distances, while others point at contrary compensatory mechanisms (Vilhelmson, 1990; Holden and Norland, 2005).

Many transport strategies listed in the Oslo Climate Plan refer to required shifts in travel behaviour (i.e. modal shift away from the car; accommodation of urbanisation-induced passenger travel demand by bicycle, foot and public transport) and mention that such shifts can be implemented via compact land uses, car reducing measures, and better infrastructures for alternative soft mobility modes. However, it is unclear if, in which ways, and via which regulatory or market mechanisms such measures will affect integrated individual travel behaviours (number of trips, modal choices, and distances) in suburbs. This requires a more comprehensive understanding of the interwoven practises (of working, commuting, doing groceries, chauffeuring children, participating in leisure etc.) that 'form a kind of infrastructure through which human activities coordinate and aggregate' (Schatzki, 2009: 35).

Echoing a recent debate to redefine the energy–society agenda from a resource-based thinking (e.g. conversion, supply, price of fuel) towards one that focuses on practises (Parkhill et al., 2013), an increasing number of studies have applied theories rooted in social practises (e.g. inspired by Bourdieu 1984; Giddens 1984; Latour 1992) on a wide range of topics in the context of climate change mitigation (Shove, 2014), ranging from changes in food consumption (e.g. Warde et al. 2007) to domestic energy and resource use (Strengers 2008; Taylor et al., 2009). These studies demonstrate that such practices depend on the interrelations of many material (e.g. technologies, devices, water, electricity) and non-material elements (e.g. bodily and mental activities, knowledge and competences, emotions, working cultures, dress-codes) (Reckwitz, 2002). Only few examples exist of studies that investigate practice changes in connection to low-energy mobility transitions (e.g. Watson, 2014; Aldred and Jungnickel, 2014), and none seems to have examined such transitions in the context of suburban areas.

Innovations in governance – scale and the governance of energy/climate policies

Hierarchies and markets continue to play an important role in regulating and developing urban society and economy and in delivering services to urban citizens. Yet, new forms of collaborative governance and networks are proliferating, spurred by institutional complexity, political fragmentation and an array of actors involved in urban planning and development. These transitions or innovations are driven by a recognition that no single actor has the knowledge or resources or is positioned in *scale* (functionally, geographically, or in time) to

solve complex social problems that cut across scales, sectors and public-private actors (Weber and Khademian 2008, Sørensen and Torfing 2012, Bulkeley 2013). Institutional transitions also evolve in relation to needs and demands for participatory governance and approaches connecting to citizens' concerns and social practices.

To this end, *scale* is a little debated issue in the urban governance literature.[2] Scale and scaling are defined as the "dynamic process through which collaborative forms of governance move from one scale to another" in response to a multiscalar issue" (Ansell and Torfing 2015:316). Even the extensive literature on multi-level governance does not really address the idea of scale. The governance literature does, however, suggest that network governance and interactive and reflexive governance are often used when calls for action are inadequately met by existing institutional jurisdictions. This may be either due to a mismatch in function (e.g. a cross-sectoral climate issue is not appropriately addressed by a sector agency); in geographic or society scale (e.g. a regional/county-level land use and transport plan is not appropriately adhered to by local municipalities); or between policies and citizens' social practices. Scale is, however, rarely an explicit concern in this literature, and it has not been much of a concern in the smart city research, which has focused much more on innovations in technology and infrastructures (Jackson, 2011; Hajer and Dassen, 2014; Sørensen and Torfing 2012, Hofstad 2012). This raises the need for more knowledge about innovative governance concepts and regulatory frameworks that address cross-scale institutional challenges for city regional development. Earlier research on public sector innovation has identified two key actors and two key tools in public innovation processes at the local level that will be at the centre of our attention (Sørensen and Torfing 2012, Hofstad 2012, Warren 2009). First, local politicians and administrative leaders are seen as core drivers or managers of innovation processes (key actors). Second, it is critical that these key actors; a) involve and coordinate between stakeholders at different scales in innovation processes and engage citizens, and b) utilize planning as a strategic governance instrument for mobilization and anchorage of smart city and micro-city goals with multiple actors including with citizens. *Micro-cities* are urban neighbourhoods or suburbs that encompass essential and mixed community activities and services that can be reached within walkable distances (Jafry and Seilvers, 2014) i.e. possibly smart, compact, and sustainable neighbourhoods. Micro-cities could be interconnected through a chain of transport hubs, infrastructure, communication technology (ICT), and energy efficient smart grids.

2.2 Approaches, hypotheses and choice of method

WP1: Energy-smart mobility practises in suburbs (coordinator Lars Böcker)
WP-Objective is to investigate how local and regional configurations of land uses and policies affect travel and energy use patterns, and configure energy-smart mobility practises. As our literature review indicates, many studies exist on land use and travel behaviour, including empirical evidence from Norwegian cities (Naess et al., 1995; Holden and Norland, 2005; Næss, 2006). Despite this extensive knowledge, five shortcomings can be identified that require urgent examination in order to provide policy makers with more detailed cues on how to spatially facilitate a transition towards energy-smart mobility in suburban areas. First, existing studies analyse the effects of residential environments on travel behaviour, but often overlook how destination environments affect mobility. Second, studies look mostly at spatial attributes of anthropogenic origin, but few examine natural spatial attributes, such as the

[2] This includes the literature on interactive, reflexive and network governance, which is of particular focus in our study. *Interactive governance* is here mainly about coordination and cooperation between actors/stakeholders, including aspects of citizen participation. *Reflexive governance* captures new public-private partnerships, informal interaction, knowledge exchange (in iterative manners), and self-organization as important factors for regulating societal development and also draws on participatory policy analysis (Voss&Bauknecht 2006, Hajer and Dassen 2014).

access to nature or green space. These are especially important to better understand both short and long-distance leisure trips (Sjitsma et al., 2012). Third, studies analyse mostly the effects of aggregated regional spatial attributes, such as distance to centre. Apart from address density, knowledge is lacking on the effects of land use and the availability and quality of transport infrastructures on neighbourhood levels. Fourth, existing studies mainly focus on the effects of land use on transport mode shares, but not on its simultaneous effects on a wider range of travel behaviours. This includes travel distances with specific modes required to establish environmental stress and energy footprints. Fifth, existing studies generally finish analyses with the effects of land use on travel behaviours. Only several studies (Norwegian examples are Naess et al., 1995, Holden and Norland, 2005) include a direct estimation of energy footprints, but make no distinction between peak and off-peak travel. The latter is important to provide policy makers a more comprehensive understanding of road congestion, fluctuations in public transport usage, and peaks in energy demand. We address these five shortcomings with the following two research questions:

1.1 How do local and regional configurations of land uses at the place of residence and destination simultaneously affect trip purpose, travel distance and transport mode choice?

1.2 How do local and regional configurations of land uses at the place of residence affect daily aggregated peak, off-peak and total travel distances with different transport modes, fuel and electricity consumption?

Although studies based on quantitative daily travel survey data give useful insights into the spatial patterns of travel behaviour, they leave fundamental questions unanswered, such as why it is that residents in different suburban areas travel the way they do, and by which factors their mobility is being shaped. Hereto, a deeper qualitative investigation is required of mobility–related social practises. For instance, Holden and Norland (2005) in a quantitative Norwegian household energy study, recognise in their agenda for research, that in order to better understand their findings on long distance travel by car or airplane, triangulation with qualitative data on such mobility practises would be necessary. As our literature review indicates, social practise based studies on suburban mobility, especially approaches that unite quantitative and qualitative methods, are currently lacking. To address these shortcomings, and deepen our understanding of the suburban centre travel patterns established with RQ1.1 and 1.2, we formulated the following research questions. These will be examined, in two separate articles, in connection to two different sets of mobility practises: the daily commute (and all social and mobility practises intertwined with it, such as running errands, chauffeuring children, etc.), and patterns of daily and less-recurrent leisure trips, including the Norwegian-famous weekly cabin trip.

1.3 How can both energy-intensive and energy-smart mobility practises in suburban centres be understood from interwoven social practises (of working, commuting, doing groceries, chauffeuring children, participating in leisure, etc.)?

1.4 How are these mobility practises spatially and temporally ordered, and with which implications for spatiotemporal concentrations of mobility and energy use?

1.5 Which material and non-material elements constitute mobility practises, and how and by which public, private or citizen actors are these elements currently circulated?

1.6 To what extent are different socio-demographic groups in suburban centres energy-aware in their mobility practises, and with which implications for the effectiveness of information-based policy instruments?

Methods: Use will be made of a mixed quantitative-qualitative approach. To tackle RQ 1.1 and 1.2 we draw on a Greater-Oslo subsample (n≈30.000) of the Norwegian Travel Survey (RVU, 2014), available via TØI. Following Fishman, Böcker and Helbich (2015), and with the assistance of Marco Helbich at Utrecht University (scientific advisor to the project), this will be merged, via GIS on the residential and destination postal code level, with local and

regional spatial register data from external public sources, such as Open Street Maps, Cadastral data, and local municipal data. Spatial variables to be extracted and linked include: distance to Oslo centre, distance to the nearest regional centre, address density, building usage diversity (Shannon entropy index), area percentage green space, distance to open nature, parking availability, parking prices, and indicators for the quality of walking, cycling and public transport (i.e. dedicated walking and cycling path length and travel time by public transport to the central station). Following Böcker (2014), the effects of land uses on mobility outcomes will be analysed alongside socio-demographic factors in multivariate Structural Equation Models (RQ1.1) and Tobit models (RQ1.2). Separate models are estimated for peak and off-peak trips and for different trip purposes. Energy and fuel footprints will be estimated based on total distances travelled by car, bus, tram, metro, boat or train and the most accurate available information on occupancy rates and vehicle efficiencies (model and make).

To address the other research questions, a qualitative fieldwork will be organised in the three designated case study areas, with assistance and feedback from the Centre for Mobilities Research and Mobilities.lab at Lancaster University, UK. First multi-sited ethnography (e.g. Larsen, 2008) will be used to grasp the mobility of people, objects, feelings, ideas and places (Sheller & Urry, 2006) in multiple sites of observation (Marcus, 1995). Second in-depth semi-structured interviews with inhabitants and employees will be used to reconstruct clusters of daily and less-recurrent mobility and social practises. Specific attention will be devoted to the circulation of material and non-material elements that constitute these practises (see paragraph 2.1).

WP2: Governance and scale for enabling soft mobility and low-energy micro-cities (Trond Vedeld (coordinator) and Vibeke Nenseth)

WP-Objective is to investigate the scale dimension of collaborative and reflexive governance for regulating and implementing climate and energy policies and effective land use in city regions and micro-city suburbs. The scaling of governance networks and forms of collaborative and reflexive problem-solving is critical in many situations to avoid policy or planning failure or disconnects between regional and city-level planning and local practices of concerned actors and citizens (e.g. related to knowledge-disconnects, policy/planning disconnects, participation-disconnects). This research explores the challenges of operating at a single scale and across scales or at multiple scales and moving between scales to enable sustainable mobility practices and low-energy micro-cities in sub-urban areas.

The main empirical focus is on governance and planning and the issues of scale in the coordination of climate/energy policies in the Oslo region. We propose to utilize a general framework developed by Ansell and Torfing (2015) for thinking about scale in the governance of a city region. Case studies are the micro-cities in the suburbs of Oslo: Ski, Lillestrom and Fornebu/Bærum. The study will include a focus on the organisation and implementation of the new innovative city development contracts (byutviklingsavtaler) and the city environment contracts (bymiljøavtaler) and conditions for their successful implementation. The two types of contracts are aimed to regulate land use, compact city development around transport hubs (in e.g. micro-cities), and transport development between societal actors at different scales (mainly state, counties, city/city regions). The contracts come along with financial support for public transport and soft mobility measures, including in the Oslo region (bymiljøpakker). The work package will provide new knowledge on how the planning system operates as a national and regional governance- and development-system at different scales, and facilitates coordination and interaction between public and private actors (vertically and horizontally) to addresses complex and cross sectoral challenges ("wicked problems"). The work package explores different combinations of modes of governance and how these are combined in practice to enable energy-efficient and low-carbon

solutions (hierarchies, markets, networks). More specifically, the following questions are addressed in four scientific articles (see dissemination plan):

2.1 To what extent is the planning and governance system positioned to coordinate actors, resolve complex and difficult interest conflicts, and enable institutional and public sector innovation and at what scales (through coordination, cooperation, collaboration, or reflexion)?What may be optimal "bundles" of hierarchical, market and network measures that nurture innovative practice at regional and micro-city scales?

2.2 How are the municipalities concerned with the three selected local micro-cities - and the counties (Akershus and Oslo) able to negotiate and cooperate at city region scale?

2.3 How do municipal authorities and private actors relate to national and regionally agreed planning directives, especially on land use and transport?

2.4 What is the (innovative) role of network managers and governing bodies (e.g. administrators and politicians) in scaling up (or scaling down) a network approach??

2.5 In what ways does the distinct municipal policy framing related to the suburban micro-cities vary? Does regional, municipal and suburban governance and planning reflect different needs and demands of local mobility practices within the three micro-cities?

2.6 What are some key tensions or disconnects in policy and governance between the regional level, the Oslo city level, the level of selected microcities (Lillestrøm, Ski, Forebu), and citizens and their social practices in each of these locations?

2.7 What implications do the empirical findings have for local social practices and mobility energy-footprints in sub-urban micro-cities?

2.8 How does interactive and reflexive governance scale up and scale down?

Methods: These questions will be studied at three levels and scales; regional, city and city district/micro-city and citizen level (social practices). The research will draw upon a mixture of research methods; multi-level governance/actor/institutional and policy analysis and process research/action research in close dialogue with key municipal stakeholders (Weber and Khademian 2008, Bulkeley 2013, Sørensen and Torfing 2012). The research will start by institutional mapping (including actor and network analysis) and policy and planning analyses at different scales and of the different sectors with relevance for local mobility and development of micro-cities (legal, institutional, financial). The analytical framework by Ansell and Torfing (2015) will help to sort of various scale factors in the governance and planning systems. Scale factors in this framework are, on the one hand, geographic or jurisdictional scale, functional scale, and temporal scale; on the other hand, the number or size/significance of stakeholders involved, types of interaction, and strategic horizon of the activity concerned. The framework allows us to study collaboration across scales, empirically related to the combined implementation of the Regional land use and transport plan for Oslo and Akershus and the municipal/micro-cities energy and climate strategies (including the Oslo Green shift strategy). We will analyse how such coordination and various modes of governance impact on the energy footprints of citizens' mobility practices, land use, and "compact" micro-city development – closely interlinked with WP1. A key aim is to understand the policy and planning guidelines and enforcement systems, governance and organizational structures, networks, markets and interactional relationships, including public and private-civic partnerships. We will study mandates, goals, types of services provided, coordination and translation mechanisms and interests and influences in relevant policy or political arenas. We will undertake focus groups and semi-structured interviews with selected stakeholders, and participate and observe interactions in meetings and arenas of deliberation. Theory and policy implications will be drawn in relation to conditions for governance, planning, policy or other institutional innovations.

WP3 Synthesis (Per Gunnar Røe (coordinator), all applicants)

WP-Objective is to unite the insights on suburban centre mobility practises and governance innovations, as well as to align this scientific knowledge with local stakeholder knowledge. To add reflexivity to the research project, we put strong emphasis on the continuous, interactive and iterative knowledge exchange with public, private and civic stakeholders in the three case study areas. Hereto, one of WP3's main tasks is coordinating seven local and one international interactive workshop (see dissemination plan). We will also inform policy makers through policy briefs. In the last year, WP3 will be in charge of a final paper synthesising findings from WP1 and WP2. This study is to unite knowledge on multi-scale issues in multilevel regional governance with knowledge on spatial and temporal rhythms of mobility practises in suburban centres. It is expected to lead to an agenda for research and policy on how to study and govern a societal transition towards low energy mobility in suburban centres. In this study it will address the following research questions.

3.1 To what extent, and how do disconnects (e.g. regulatory, organisational or market-related) arise between governance and mobility practises?

3.2 How, and via which modes of planning and governance, can such disconnects be bridged and innovations and sustainable and smart transitions enabled?

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

This is a joint UIO-CIENS collaboration with the strategic ambition to strengthen the ties between core Oslo research institutes on timely urban, energy, and sustainability related research issues. The core team consists of three experienced Norwegian researchers, all members of the CIENS Research Forum, and one early-career Dutch researcher, with backgrounds in diverse social science disciplines (political science, sociology, transportation, and urban geography). An important criterion for forming the core team has been that all four applicants have demonstrated throughout their careers the interest and experience in working interdisciplinary. The main applicant **Per Gunnar Røe** is a full professor in urban geography at the Institute for sociology and human geography at the University of Oslo and is the University's member in CIENS Scientific Committee. **Vibeke Nenseth** is a senior researcher (sociologist) at TØI and Head of CIENS Research Forum. 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. **Lars Böcker** is a postdoctoral researcher (urban and transport geographer) affiliated to both the University of Oslo and TØI 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. If this project will be granted, he will acquire a postdoc-position at the University of Oslo. **Trond Vedeld** is a senior researcher (Forsker 1), NIBR, PhD, development studies, public adm., societal planning. 32 years of international experience in leading international research/development programs on urban governance, institutions, climate change (e.g. (www.cluva.eu), and RCN projects GovClimServices and Climways).

The work is subdivided into three main work packages, each listing the coordinating and involved researchers. Strong cohesion between the WPs will be achieved through quarterly face-to-face meetings between the four applicants; joint publications and briefs; and thorough coordination and alignment of activities imbedded within WP3.

A **user group** is set up as key informants and discussion partners for the project. The group will meet in continuous dialogue in eight biannual interactive workshops, where they will be presenting their experiences and follow and comment upon the project' perspectives, progress and findings. The user partner group consists of both public and private stakeholders with relevant connections to the three defined case study areas. A pre-trajectory dialogue has started with the following user partners of whom letters of intent have been included: The user partners are SmartCity Bærum/Bærum municipality, Accenture consultancy, Ski municipality,

Skedsmo municipality, Oslo municipality and Akershus county. In addition to the listed names we will also approach more public, private and civic stakeholders to participate in the workshops, via the municipal networks.

An interdisciplinary, international **scientific advisory board** has been assembled (find included their letters of intent) to give state-of-the-art feedback on parts of the research design and analyses (see WP1), and to view insights into an international perspective, and in relation to research frontiers on spatial analyses and GIS (Marco Helbich), mobility practises (Monika Buscher), transport governance (Greg Marsden), and geographies of mobilities (Jon Shaw).

4. Key perspectives and compliance with strategic documents

4.1 Compliance with strategic documents: The project is of great strategic importance to each of the partners and strongly supports core strategies/strategy documents of each of the institutions (e.g. on cities and climate change, compact city development, energy efficient transport solutions. It builds upon on-going research programs in Norway/Europe by the Norwegian partners (see Application document for specifics). It will form the basis for further long-term Norwegian research collaboration, including with stakeholders in the Oslo region. Research on innovative and sustainable urban mobility is also of high relevance in the proposed 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. The project will reinforce ongoing strategic research and build upon e.g. CLIMWAYS, SUSPLAN, GovRisk, UrbKnow, CountyNode, Eva Plan, www.cluva.eu, and the Strategic Institute Program (SIS)).

4.2 Relevance and benefit to society: As the call, project, and recently-set climate targets indicate, a societal transition towards low energy mobility is a – if not *the* most – crucial component in the mitigation of climate change, and the vitalisation of metropolitan regions. With large impacts on the regional economy and transport system, suburban centres are key areas often overlooked. The systematic and well-timed knowledge on innovations in governance and social practises proposed in this research will strengthen local/regional and public/private governance capacities to meet ambitious climate challenges. By doing so, it will also increase the sustainable accessibility, attractiveness and inclusiveness of case study areas and the larger Oslo region, and boost the competitiveness of locally-based enterprises. Finally, a strong mutual knowledge dissemination process has already started in a pre-trajectory of knowledge exchange with the user group (confirmed by LOIs), and is further envisioned in a continuous dialogue in eight proposed interactive biannual workshops.

4.3. Environmental impact: Insights contribute directly to transport-related energy reductions. Communications with scientific advisors will be done face-to-face where necessary, but via Skype where possible to minimise energy (and economic) footprints. **4.4. Ethical perspectives:** No particular ethical challenges. Citizen respondents will be quoted anonymously. No common guidelines of research ethics will be violated – honest, accurate and thorough use of data. **4.5. Gender issues:** Well-balanced gender mixes in research team, scientific panel and user group, as well as in our institutes (see fact sheets). Attention for the role of gender among other socio-demographic factors for mobility practises in WP1.

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 public stakeholders have already been selected and have confirmed their interest, support and contribution to such a project by making information and data available and by exchanging knowledge and experience in the six biannual workshops (see dissemination plan in the online form).

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