Collective learning in the multilevel governance project Civitas Dyn@mo

A case of knowledge management

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ABSTRACT
Reflexive approaches to (multilevel) governance are currently discussed as essential for sustainable outcomes of decision-making. A key element of reflexive governance has been called collective learning. Collective learning has been argued to be a necessary tool or safeguard against the misuse of power in the context of sustainable decision-making. Though being named a key element, the effects of collective learning processes on power and conflict dynamics have been defined very vaguely in reflexive governance approaches. If at all, collective learning is described as an excursive debate that - given the choice of experienced actors and a set of rules – will automatically lead to balanced power distribution. This work contributes to the scientific discourse on reflexive governance by conceptualizing the process of collective learning in two steps. The first involves a conceptual claim whereby it is shown that collective learning, in addition to a discursive debate, consists of three ‘aspects’, communication, participation, knowledge implementation. This claim is exemplified via the investigation of a case of knowledge management in the sustainable governance project Civitas Dyn@mo, as it reflects the suggested aspects of collective learning.

Keywords: collective learning; power dynamics; reflexive governance; knowledge management; sustainable development; CIVITAS
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List of abbreviations

CIVITAS = City-Vitality-Sustainability, “or” Cleaner and Better Transport in Cities
EC = European Commission
EFSW = European Future Search Workshop
IP = intellectual property
IT = information technology
ITS = intelligent transport systems
NGO = non-governmental organization
PSRO = public sector research organization
SUMP = Sustainable Urban Mobility Plan
TM = Transition management
UBC = Union of the Baltic Cities
VIP = Verkehrsentwicklungsplan (traffic development plan)
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1. Introduction

The sustainability paradigm confronts us with a new level of complexity, resulting in rapidly changing power and conflict dynamics. Not only science but media as well is becoming aware of new variables that have to be considered in all parts of our daily life. The more encompassing the topic, the more variables and opinions have to be considered. Some scholars believe that this increasing complexity leads to a public disenchantment with politics and, further, to destabilizing Western societies (Schon, 1995; Rip, A., 2006; Loorbach, 2007; Frame, 2008; Meadowcroft, 2009; Loorbach, 2010; Holl and Wielgus, 2013). In order for governments to accomplish public projects (e.g. public-private partnerships, political initiatives, etc.) especially where several levels of government are involved, it has become necessary to establish more effective means of encouraging participation and communication, and to facilitate the application of existing knowledge to solving problems collectively.

Theories of reflexive governance (e.g. Transition or Adaptive management) confront decision-makers with this new level of complexity, and hence the associated power dynamics. Moreover, reflexive approaches to governance suggest that decision-makers have to consider their own role in creating the issues that can be derived from multilevel governance. The argument goes that if governance wants to achieve real sustainability (no matter which level or domain) it has to consider its own flaws, i.e. imbalanced power and conflict dynamics.

Collective learning is a ‘key element’ of reflexive governance approaches. Voß and Bornemann (2011) describe it as a safeguard against the misuse of power. In their recently publicized paper on reflexive governance Crona and Parker (2012) have identified three major concepts (Bridging/boundary organizations, Knowledge utilization studies and Stakeholder theory) according to which specific aspects of (collective) learning can be measured, hence how collective learning affects social interaction. Furthermore, Voß and Bornemann (2011) have been talking about a discursive debate, that has been proven supportive to communicate complex projects throughout the boundaries of different political levels and stakeholder domains.

This work contributes to the previous literature on reflexive approaches to governance by synthesizing theories of collective learning with the analytical concepts of knowledge management and visioning stemming from organizational theory and knowledge utilization studies. That is, this case study links the process of collective learning to three core aspects: communication, participation, and the generation and implementation of knowledge. By the
example of knowledge management in Civitas Dyn@mo this work explains how knowledge management relates to the stated above principles, albeit contributes to the suggested concept of collective learning.

1.1 Background and the empirical case

1.1.1 The CIVITAS Initiative
The CIVITAS Initiative (European Commission, 2002) was launched in 2002 in order to support cities to improve their transport systems. The ultimate goal of CIVITAS was to achieve sustainable urban mobility ‘via the modal split towards sustainable transport’ (European Commission, 2002). This goal was to be reached via both the development and support of new technologies, such as a vision-based policy and polity framework.

Since its start in 2002, CIVITAS has undergone three phases: CIVITAS I (2002–2006), CIVITAS II (2005–2009), and CIVITAS PLUS (2008–2012). Every phase consisted of four to five sub projects with 17 to 25 collaborating cities over a period of 48 months. Currently CIVITAS is entering its fourth phase, CIVITAS PLUS II. In total, the CIVITAS consists of 60 European cities that are co-funded by the EU with over 300 million Euros for the implementation of measures to foster sustainable transport in cities. In turn, the EU develops the framework for sustainable urban transport through the feedback and experience gained from these projects.

According to the EU’s strategy on sustainability, clean urban transport is one goal on the policy roadmap towards a good quality of life for citizens (European Commission, 2010a). Urban transport as it exists is seen as a cause of such problems as poor air quality, noise pollution and global climate change (European Commission, 2012a). Therefore, CIVITAS is driven by a set of European policies that share the common goal of fostering sustainable transport. A milestone in this permanently progressing framework is the Action Plan on Urban Mobility (European Commission, 2009a) that above all the other European policies helps to organize the co-funding process of CIVITAS. Besides the Action Plan, the White Paper on Transport highlights the possibilities of urban areas to contribute to the EC’s strategy on sustainability by a range of actions and targets that push the development of technological innovations.

“The European Commission (EC) adopted a roadmap of 40 concrete initiatives for the next decade to build a competitive transport system that will increase mobility, remove major barriers in key areas and fuel growth and employment. At the same time, the
proposals will dramatically reduce Europe's dependence on imported oil and cut carbon emissions in transport by 60% by 2050.” (European Commission, 2012b)

Summed up, the European policy framework strives towards a cleaner and better transport system.

1.1.2 The CIVITAS Community

The CIVITAS Community is grounded in the ideas of good practice, low communication barriers and participation. By signing the CIVITAS Declaration (a voluntary agreement), member cities agree to these ideas. To make participation and the successful transfer of knowledge possible, the CIVITAS cities are all connected via the CIVITAS Forum Network that is subdivided into the CIVINET City Networks and Thematic Groups, comprising more than 200 cities, representing 68 million citizens in 31 countries. The network has the sole purpose to foster the generation and transfer of knowledge about sustainable urban mobility generated out of expert knowledge from past projects and case studies and stored in a central database. The annual CIVITAS Forum Conference is an extension of the Forum in order to transfer knowledge between the different domains (public, politics, and business) and actors involved in the initiative and the sub-projects.

As displayed by Figure 1, the CIVITAS Forum Network is supported by national networks called CIVINET. These CIVINETs usually share the common language of the participating countries and are as well intended to lower communication barriers. On the other hand, all CIVINET networks are connected with politics at the EU level in order to lower the communication barriers between the involved authorities. Each CIVINET City Network
works independently, with the cooperation through CIVINET to share learning and experiences, and to spread the city network approach to other countries.

The second institution within the CIVITAS Forum Network are the Thematic Groups. Thematic Groups act as learning collectives which are called community of practice (European Commission, 2002). They commonly consist of peers that, like the CIVITAS Forum and the CIVINET Network, have the purpose of knowledge exchange. The peers usually consist of well-experienced CIVITAS cities called demonstration cities, or forerunners, to serve as inspiration for other cities. The peering system indicates that, unlike the CIVITAS Forum and CIVINET, the Thematic Groups are also supposed to generate new knowledge on the topic of sustainable transport. The Thematic Groups are designed to connect the project partners (cities) of the sub-projects. Their structure consists of a main contact point and links to the project partners of the specific sub-projects, hence are connected with a so-called measure category. These measure categories (clean fuels and vehicles; collective passenger transport; demand management strategies; mobility management; safety and security; car-independent lifestyles; urban freight logistics and transport telematics) are the thematic fundament of the CIVITAS Initiative (European Commission, 2012c). If a city wants to take part in one of the sub-projects, it has to choose and implement a variety of these measures in its policy framework as a roadmap towards sustainability in urban transport. The application process for these groups is straightforward: Once a CIVITAS member or non-member wishes access to these groups, they simply have to write an email to the administrator of the particular thematic group. The only criterion for exclusion is a commercial interest that is not associated with local CIVITAS partnerships (European Commission, 2012d).

1.2 Previous research on collective learning

1.2.1 Collective learning: a discursive debate to balanced power distribution
Scholars of reflexive governance approaches have suggested collective learning to be a discursive debate that based on the ‘two-communities assumption’ and so called ‘search strategies’ will automatically lead to a balanced power distribution.

It is further suggested that governance no longer has a neutral position in the process of social change. Furthermore, if sustainability is the declared goal, it has to be reflected on how governance practices impact society. ‘Power struggles’ and ‘tactical games’ (Voß and Bornemann, 2011, p. 11) that commonly occur on all levels of governance, hamper a good flow of information and ideas. Crona and Parker have described these phenomena as ‘power
and conflict dynamics’ (Crona and Parker, 2012, p. 1), hence suggested the management of knowledge and communication with stakeholders to support reflexive governance.

In order to establish a more reflexive approach to governance, three ‘search strategies’ (Voß and Bornemann, 2011, p. 9) for a successful learning process to foster sustainability. These strategies have been discussed repeatedly in order to support a successful collective learning process (i.e. the successful adaptation and implementation of knowledge in reflexive governance projects in combination with the establishment of trans-domain cooperation and communication).

1.2.2 Picking the right actors is the key
In order to empower local initiatives and actors, one first has to identify and bring together a set of technical experienced actors relevant for the project. The next step is to make a successful collaboration between these actors happen. While reviewing the standardized academic measures to support sustainable urban transport, P. J. Vergragt and H. S. Brown (2007) realized the problem of varying efficiency of these measures in different settings. They pleaded instead for in-depth scrutiny of the reasons for the unequal efficiency of the measures under changing conditions. In order to do so, they stipulated the ‘engagement of key stakeholders’ (Vergragt and Brown, 2007, p. 1110) in complex multilevel governance projects. According to their approach, this engagement would foster a collective learning process to understand the reasoning behind diverging policies, and thus foster knowledge dissemination between the collective involved in, and outside, the project. In other words, the promotion of the policy initiative by a more diverse set of actors would push the communication of complex political issues. It would furthermore raise the level of acceptance of the concerned population as the concentrated flow of information would foster transparency.

1.2.3 Rules to procedure
The second strategy, which emphasizes rules of procedure, comes from organizational and management studies but have been adopted by scholars of the reflexive approach to governance. The so-called ‘rules to procedure’ aim to understand the diverging concepts and ambitions rather than suppressing or keeping them out of the process; hence they seek to reflect on the stakes that are involved in the process, which solves the problem of representativeness.

The downside of this approach is that it doesn’t foster unified decisions; hence it demands the establishment of a mechanism that can be used as a means to merge incommensurable visions. A further problem is that even though this approach provides for a basic means of
representativeness on the base of the involved stakes, it further needs criteria to include and guarantee equality amongst the stakeholders and the creation of a neutral environment that allows for open communication and participation (Voß and Bornemann, 2011).

1.2.4 Cooperative reflection
The third strategy has the purpose to open up the political debate. Cooperative reflection is the formulated strategy to stimulate the public discourse in order to find alternative pathways, i.e. ideas and solutions. In the context of this public debate, social learning would not need the consultation of experts. Instead the character of this debate would foster social learning by mutual adaptation. In such a discursive environment, actors would rather pick up certain thoughts of each other instead of putting through their own interests and ideas, if it was to their own advantage (e.g. maintenance of credibility (Voß and Bornemann, 2011).

The ‘cooperative reflection strategy’ is – opposed to the previous strategies (1.2.2; 1.2.3) – not only a design concept for multilevel decision-making but also highlights a common problem in sustainable governance projects. The challenge to establish a process of collective learning creating transparency, hence fostering the exchange of information via dialogue and the willingness of all actors to contribute, is to name the characteristics that would allow for a reflexive dialogue. These characteristics would allow to include a wide range of actors, perspectives and political groups (especially marginalized groups) to participate in a pluralistic debate.

1.3 Research Problem: A lack of concept
When talking about marginalized groups, Voß and Bornemann already name the problem of the discursive debate. Collective learning has been named a key element and a safe guard against the misuse of power in reflexive governance. Having said that, the concept is lacking a clear set of aspects up to present. The discursive debate associated with collective learning has been named, and hence a set of rules have been stipulated to foster the process itself. Yet no aspects have been defined that would link collective learning with the management of power and conflict dynamics in specific (Voß and Bornemann, 2011). In return nobody has established a direct link on how power and conflict dynamics inform collective learning in specific. If at all, collective learning is described as an excursive debate that - given the choice of experienced actors and a set of rules – will automatically lead to balanced power distribution.

What is missing are core aspects of collective learning that would help to outline the discursive debate in a more balanced way. In detail, the stipulated diversification of actors is a
nice idea that reflects the idea of sustainability from a biocentristic\(^1\) point of view. From a management point of view, the mere stipulation to diversify a debate doesn’t say anything about how to make the process of learning more collective.

1.4 Research Aim

The aim of this study is to examine a case of knowledge management in a sustainable multilevel governance project, in order to contribute to the current debate on collective learning by two steps.

1.5 Research objectives

1. The first involves a conceptual claim whereby it is shown that collective learning in addition to its discursive debate character consists of three ‘aspects’, communication, participation, knowledge implementation.

2. The second is to relate the theoretical assumptions, i.e. the three aspects to the empirical case of knowledge management in Civitas Dyn@mo.

1.5.1 Research questions

1. What are the key aspects of a collective learning process and how are they related to knowledge management in the project Civitas Dyn@mo?

2. How can knowledge management in Civitas Dyn@mo help to foster collective learning, thus help to facilitate power and conflict dynamics that naturally occur in a multilevel governance project?

\(^1\) The biocentristic point of view extends inherent value to all living things. The term has been employed by political, philosophers and politicians, who seek to promote the preservation of biodiversity, animal rights, and environmental protection.
2. Methods

This case aims to make an analytical generalization as defined by Yin (2009). In order to do so we have to distinguish between two different methods based on the study objectives.

The two objectives of this study (Expanding the theory on reflexive governance and the empirical case of knowledge management in Civitas Dyn@mo), require the analysis of two different types of materials.

**Studying the theory on collective learning**

The first part of the theory section is a contextual analysis concerned with the (1.) question, what the essential aspects of a collective learning process in Civitas Dyn@mo and according to the literature are. There are already three elements, i.e. collective learning, knowledge management and power and conflict dynamics that are of interest for the theory section. According to the analytical aim of this study, the theory section, as well as the analytical framework is established on content, and hence contextual analysis.

In this first part it is attempted to expand the theory of the concept on the ‘key element’ collective learning such as its role in the management of power and conflict dynamics. Therefore, the analytical approach of this study is on collective learning in Civitas Dyn@mo. The generalization that follows is to derive aspects (communication, participation and knowledge implementation) that are paramount for a successful knowledge management to collective learning in this specific case.

The material studied for the contextual analysis are peer-reviewed articles and books on organizational theory, knowledge management, as well as reflexive governance with a special focus on collective learning and power and conflict dynamics.

**The empirical case of knowledge management**

The empirical case subsequently is designed to answer the (2.) question. It is an intensive within-case analysis, to underpin the theoretical assumptions made in the theory section. In other words, the consecutive step was to establish an analytical framework based on the core aspects of collective learning to cast a light on the meso- and micro-management of everyday politics, thus to reveal the benefits of knowledge management for a sustainable outcome of Civitas Dyn@mo.

To get a better understanding on how the process of visioning was perceive in Civitas Dyn@mo I had to scale out to EU Level (macro level) of decision-making. In front, the
studied primary sources on sustainable mobility and transportation (European Commission, 2007, 2009a, 2009b, 2012e) were not only seen as a starting point to down track the visioning process (from macro to micro level). Together with Polity: Directive 2010/40EU their content was likewise used to analyze the aspect of communication. Moreover, reflections of these policy frameworks (and directive) could be found in the later on studied SUMP and programs displayed on the web page of the CIVITAS Initiative (www.civitas.eu).

The content analysis of the political frameworks, the role of a central entity (Rupprecht Consult) - acting as a bridging organization and knowledge broker – is first described. The description of this entity was important because Rupprecht Consult is the physical entity in Civitas Dyn@mo taking responsibility to establish links of communication between all actors that are used to transfer and implement knowledge.

To develop a deeper understanding of the micro management processes in CIVITAS Dyn@mo, semi structured in-depth interviews with the project coordinators (city correspondents; Aachen, Gdynia, Koprivinica, Palma de Mallorca) were planned as a means to double check the information gathered by the first interview with Rupprecht Consult.

2.1 Why this empirical case on knowledge management?

The project Civitas Dyn@mo, is used as a case to test the theoretical assumptions on collective learning, the awareness of the project management for power and conflict dynamics. The case also explores how management contributes to sustainability.

In its work to develop sustainable transport in European cities, CIVITAS has promoted knowledge implementation (i.e. good practice, learning collaborations, support for bottom up projects), lowering communication barriers and increasing participation. CIVITAS is also keen to embrace new concepts to foster sustainability.

This work is presenting collective learning as a means to assess and analyze potential participation and communication intersects. To this end, CIVITAS cities are all connected via the CIVITAS Forum Network, which is subdivided into the CIVINET City Networks and Thematic Groups. The purpose of these networks is to foster the generation and transfer of knowledge about sustainable urban mobility. Civitas Dyn@mo is further interested in the implementation of existing knowledge, relying on expert knowledge from past projects, such as case studies stored in a central database and the consultation of external and science experts. The implementation of frameworks and regulations, such as the adaptation of these policies on a regional and local scale (Sustainable Urban Mobility Plans) help to communicate
this knowledge from the level of European politics to all kinds of political levels and actor domains involved in this project.

2.1.1 Source critique: Validity and reliability

Reflexive governance is a theory which scrutinizes the hindrances of governance itself for sustainable decision-making. The general problem with the theoretical material and the contextual analysis was to get scientific reliable (peer reviewed) material reflecting on both, collective learning and its importance for power and conflict dynamics. It was therefore necessary to reflect on collective learning processes as they were described in various study approaches, theories and conceptual frameworks prior to the emergence of reflexive governance.

Studying the empirical case I tried to analyze biases and problems associated with single method approaches, single-observer and single-theory studies by making use of a triangulation method combining multiple observers, methods, and empirical materials. Interviews with local managers of the Civitas Dyn@mo (micro management) could not be established. This was simply because some of the local managers did not respond or had not been appointed by the deadline for the collection of data. Instead, the data for the local micro-management were partially retrieved from the interviews made and content analyses of project reports published online by CIVITAS (www.civitas.eu). Local Sustainable Urban Mobility Plans (SUMP’s) and suggestions for spatial planning programs were studied to determine the consistency of the process of communication and knowledge implementation from the macro level (EU) to the micro level (local).

During the analysis of this first interview it became clear that the case Civitas Dyn@mo could only be understand taking into consideration the historical development of the CIVITAS Initiative. An unstructured interview was carried out to get a better understanding of the overall CIVITAS Initiative. The project coordinator of the first round of CIVITAS in the City Council of Stockholm gave hence an insight on the trial and error character of the early days of CIVITAS. In this context this interview was only used indirectly (not cited) to get a better understanding of how the aspect of knowledge generation and implementation played a role in CIVITAS.
3. Theory: collective learning and its origins

To understand the foundations of collective learning as described in reflexive governance approaches one has to understand where this concept stems from, thus how it relates to the suggested principles of participation, communication and knowledge implementation. The following paragraphs (3.1 - 3.3) contextualize collective learning from different theories and scientific disciplines.

Reflexive governance and collective learning (3.4) is then going to summarize what overall aspects of collective learning can be generalized from the broader theory.

The analytical framework (3.5) finally narrows the theory section down to an applicable framework that allows for the analysis of the empirical case, albeit reflecting on the links between the knowledge management and the generalized aspects of collective learning.

3.1 Higher-order learning for a positive project outcome

Higher-order learning is a fundamental change in the interpretation of reality and facts. It can be traced back to such theories as ‘double loop’ (Argyris, 1977, 1995), ‘generative’ (Senge, 1990), and ‘conceptual’ learning (Glasbergen and Groenenberg, 2001) and contains a set of assumptions that changed the way science looked at the decision-making process. It triggered a shift in the perception of the causes of individuals, communities or organizations in the common policy debate in order to identify societal problems that could be corrected by a shift in policy making according to the abovementioned theories. In detail, ‘double loop’, ‘collective’ and ‘generative’ learning describe the process of learning as a ‘feedback stimulus mechanism’ that occurs when well-tested and accepted frames receive feedback on their ability to solve problems or advance in a special topic. The validation of this feedback depends on whether the results of the performance deliver useful outcomes. If there are no outcomes that contribute to problem solving or advancing, this would result in changing the direction of the entire framework. The urgency of a problem has been identified as a central criterion for learning, as it leads to repeated trial and error tests that in return might lead to a solution (Vergragt and Brown, 2007).

3.2 Policy sciences: communicating a vision in multilevel governance

One approach to achieve collective learning in complex multilevel environments is the communication of a vision. According to (Marya Axner, 2013) a vision is an idealized picture of reality. One can use it as a roadmap to plan a journey from a given ‘point a’ towards your final destination. The vision of CIVITAS is to achieve sustainable transport, partially via
policy-based strategies. They are reliant on existing expertise and experience, standing for the EU’s constant striving towards sustainability. According to Vergragt and Brown (2007), there are several research disciplines, including policy science, organizational science and sociology, that have individually accumulated knowledge about how learning occurs among individuals, groups, organizations and the society.

Similar to organizational and cognitive science, in policy science learning has been associated with feedback loops of existing belief systems and the dynamics that occur with the arrival of new events. The difference between these systems (organizational and cognitive science, in policy science learning) lies in the scale and the terminology. While organizational and cognitive science talks about feedback-stimuli, this term is addressed as social or collective learning in policy science. Policy science discusses two different concepts of what to study to make sense of learning, just as in organizational science a (good) crisis, the urgency of problems and hence the possibility to interact are core features of collective learning (Schon, 1995).

3.2.1 The two communities assumption

The ‘two-communities assumption’ differentiates two groups of actors in political decision-making (academics and policy-makers), that have different concepts about the quality of knowledge and its transfer. Where academics only regard peer-reviewed journals as valid means of knowledge dissemination, decision-makers often focus on the outcome of knowledge utilization, saying that knowledge is only valuable if it meets the needs of their target group. For that reason, decision-makers employ different techniques they consider valid for the creation of knowledge (e.g. face-to-face meetings) (Oh and Rich, 1996 in Crona and Parker, 2012). On the other hand the term ‘organizational interests’ describes the assumption that it is solely the interest of the stakeholders (organizations) that defines what kind of knowledge is utilized, and to what extent. Finally, there is the assumption of “social interactions,” which claims that knowledge is extended and transferred only when stakeholders interact in a meaningful way. The phenomenon of ‘organizational interests’ is as well described by scholars of reflexive governance (Rip, A., 2006; Voß et al., 2006; Loorbach et al., 2007; Voß and Bornemann, 2011) where it is used to underpin the idea of the government contributing to the power and conflict dynamics.
3.2.2 Sustainable urban planning and learning
There are a variety of opportunities to apply the concepts of collective learning in complex multilevel governance projects, especially when it comes to sustainable and urban mobility planning. (Vergragt and Brown, 2007) name the example of individual mobility solutions within sustainable mobility systems that might lead to advantages for the actors. Moreover, the authors of this study stress the importance of a more integrated and holistic design of urban public transport to make sustainable urban mobility more attractive to larger parts of the urban society. This would come with the necessity to completely shift the focus on public transportation, including a new framing of its problems, thus to imagine new alternatives and solutions. (Vergragt and Brown, 2007) consider higher order learning as a solution to the problem, which, as described above is nothing but social learning and can be used as a synonym for the term collective learning as coined by (Voß and Bornemann, 2011)). Additionally, higher order learning offers a variety of new tools, which could greatly benefit sustainability projects like Civitas Dyn@mo if embedded consistently throughout the whole program (e.g. initiatives visioning exercises, backcasting, scenario building, and small-scale experimentation).

In their paper on social learning, Vergragt and Brown (2007) suggest that ‘learning takes place when [there are] key actors representing a range of interpretive frames’ (p.1109). Consecutively, problem definitions and core competences are defined by these actors who engage in intense interactions around an issue, a problem, or an idea. In other words, a profound part of a multilevel governance project has to focus on the management of communication if sustainability is the desired goal. As in big organizations, embedding macro-level policy vision into regional measures is comparable with the transfer of knowledge from one group to another, which do not necessarily share common viewpoints or even the same language. This is a common problem in all multilevel decision making projects and described in detail under the next paragraph.

3.3 Organizational theory and collective learning
In order to get a better understanding of how learning in collectives (e.g. enterprises, organizations, companies) functions in detail, one has to track this concept back to its origins in organizational theory and knowledge utilization studies. Just as higher order learning, the utilization of knowledge has been assessed and further described by a wide range of actors, disciplines and scholars (Knott and Wildavsky, 1980; Brown and Duguid, 1991; Nonaka, 1994; Nonaka and Takeuchi, 1995; Argote and Ingram, 2000; Harman and Brelade, 2003; Landry et al., 2003; Gano et al., 2007).
3.3.1 Knowledge management and power dynamics

One pathway in this discipline is knowledge utilization studies. Knowledge utilization scrutinizes the power dynamics between the creators and receivers of knowledge, hence how it is used to affect the well-being of our society (Gano et al., 2007). Though criticized in its limitation to assess only one aspect of the learning process (the utilization of knowledge), the positive aspect of this approach lies in the ability to use it to focus on the outcome of greatest interest. This becomes obvious when referring to bridging organizations. Knowledge created by social interactions within these organizations helps to inform governance and policy interactions. The extent to which policies are informed can consecutively be measured, as a well-established scale for knowledge utilization is already applicable amongst these organizations (Crona and Parker, 2012). In reflexive governance, the purpose of collective learning is:

“to function as a safeguard against the domination and instrumentalization of powerful actors that tend to inform a governance project according to their will.”

(Voß and Bornemann, 2011, p. 8).

This is commonly reflected (or not, depending on whether a policy framework is reflective or not) in opposing opinions within a governance project (politics) and the discursive interaction following in order to achieve a productive political outcome (polity). However, the term collective learning hasn’t been described as a pragmatic concept to combat the complexity issue of the sustainable paradigm. Especially on the meso- and micro-levels of political management, new designs have to be found that allow for the equal access and exchange of knowledge and information, as well as ways to lower the communication barriers between the stakeholders of different domains (economy, politics, and public).

On the other hand it has been successfully argument that Knowledge management can be a powerful instrument when it comes to governance and decision-making on all political levels and in interdisciplinary joint ventures. To make sense of this rather theoretical description, collective learning has to be split up into more feasible concepts and aspects, allowing for a more detailed assessment of this term.

3.3.2 Knowledge management as a means to inform and control

From an entrepreneurial point of view, knowledge management is a simple means to manage the knowledge that is embodied in employees (Argote and Ingram, 2000). Furthermore, it is related to how and to which extent information technology (IT) informs and creates more
information, thus how knowledge is generated and distributed. (Levine and Gilbert, 1999) stated that the method of knowledge management is only valuable when it is shaped into policies, no matter which domain (e.g. policy, business).

### 3.3.3 Knowledge management to foster the process of learning

(Paulus and Yang, 2000) have claimed that knowledge and idea exchange in groups is an important but oftentimes inefficient process, so they suggested ways to foster conditions or environments in which the creation of ideas can be more productive. According to their findings, it is above all important to form groups that collaborate by using brainstorming techniques, as compared to ‘nominal groups’ where eventually every individual is working on their own ideas and then sharing them in a second step (Nonaka, 1994). Hence the performance of all groups could be improved by ‘reflection’ and ‘incubation’ according to which group members had to reflect on the ideas after each session and then reunite in a second meeting. This was finally seen as a vital means to improve creativity and innovation in the overall topic of knowledge transfer in companies.

#### Idea sharing

The second step in sharing the merits of the first stages oftentimes entails the discussion and evaluation of these ideas. In detail this means that the ideas are exposed to externals of the group after a so called ‘minimum evaluation’. Furthermore, two vital conditions have to be fulfilled in order for ideas to be distributed successfully. First, the ideas have to be translated into a feasible form for the receivers (e.g. coded knowledge or tacit knowledge\(^3\) (informal)) (Nonaka, 1994; Szulanski, 2000, 1996). The second condition is the willingness of the creator of an idea to share it. This willingness is dependent on various concerns and levels and entities (e.g. workgroup to workgroup; between workgroups, between departments). The relationship (trust, issues, distance) between the entities plays an important role in this process.

#### Idea evaluation

According to many scholars, organizations have to evaluate new ideas (Cummings, 1965; Bacharach, 1989; Nonaka, 1994). It has also been suggested that the outcome of an evaluation is strongly dependent on the employees’ capacities, hence the working environment. As for

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\(^3\) According to Argote and Ingram in (2000) knowledge resides in organizational members, tools, tasks, and their sub networks. The problem with this special kind of knowledge however is that it often times is not acknowledge as such, as the holders of this knowledge are not aware of its value.
European projects, it is common that projects featuring new and efficient ideas are put together in a database (European Commission, 2009c, 2001a) to make gathered knowledge available for evaluation by other enterprises.

In the case of the CIVITAS initiative, best practice is a core concern that is supposed to foster a constant flow of knowledge between the cities to push and exchange new ideas. To emphasize the exchange of ideas in the different networks of CIVITAS, such as the Forum Network and the National Networks, the thematic groups are obliged to gather in annual and quarterly conferences in different locations to exchange best practice experience, i.e. the evaluation of ideas is an external process not conducted in the knowledge manage structures and tools directly related to the project Civitas Dyn@mo. Nevertheless are these conferences, tools and for a vital source of knowledge – frequently used by all actors associated with CIVITAS – to assess and improve the quality of their local measures towards sustainable urban mobility and transport.

**Knowledge generation and transfer**

Information doesn’t automatically equal knowledge. It is a common understanding in science, though, that what you’ve gathered you’ve got (though the usefulness will have to be determined in a second step). Levine and Gilbert (1999) used the example of the endless river of information that is known is known by us as the World Wide Web. They noted that though we tap it daily, it is impossible to get more than a fraction of the whole, even if we would spend a lifetime studying it. For a sufficient idea dissemination concept, this means that information within an organization can only turn into knowledge if people who can use it, receive it (Nonaka, 1994). Thus there are several solutions, both technological and organizational, that can be used to foster this concept.

According to (Bate and Robert, 2002; Hartley et al., 2002), knowledge is transferred between individuals and teams or organizations; tacit and explicit knowledge are corresponding dimensions that are often present at the same time but different rules underlie them. For example explicit knowledge can be ‘codified and transmitted using formal language’ (Hartley and Benington, 2006 p.103) (e.g. databases, mathematical formulas, linguistics), or it can simply be passed on in conversation. On the other hand, tacit knowledge, which is by definition ‘embodied’, would be difficult to pass on orally. According to (Bate and Robert, 2002) this type of knowledge is more difficult to disseminate as it is distinguished by ‘mental models’ and ‘metaphors, intuitions and know-how’ (Hartley and Benington, 2006
p.103). On the other hand it is stated that tacit knowledge is a key determinant for the success of idea dissemination and therefore of knowledge generation.

**Knowledge adoption**

The last step, according to (Levine and Gilbert, 1999), is the adoption of the initially shared and evaluated idea as knowledge in the project or organization. In reality, this often doesn’t happen due to limited absorptive capacity and poor management or ‘rigid structures’ which are simply not open to changes (Knott and Wildavsky, 1980; Landry et al., 2003). The criteria usually vary from whether ideas have worked in the past or are considered efficient working in new environments.

3.3.4 **Bridging organizations to guarantee collective learning**

Per definition, bridging organizations are third parties that despite of other mediation institutions (round tables, task forces and joint ventures) are historically and economically independent of the participants. They have been framed as being capable of bringing down hindrances to communicate and participate (Brown, 1991; Olsson et al., 2004 in Crona and Parker, 2012). Moreover they have been described as facilitators of knowledge implementation.

In the reflexive governance context, the concept of bridging organizations feeds into the idea of knowledge transfer management, hence the mediation of conflicts which is often closely intertwined. Bridging organizations are commonly designed in a way that it envelopes a specific set of actors to bridge the boundaries of their respective knowledge and promote collective learning as an outcome (Olsson et al., 2004, 2007; Schultz et al., 2007; Berkes, 2009). It was a first attempt to solve complex problems that only could be tackled by multi-actor approaches (e.g. cross-sectoral partnerships by non-governmental organizations (NGO’s), business and stakeholders) (Brown and Korten, 1989; Brown, 1991). Academia addressed bridging organizations as the places to moderate and to conceptualize new strategies.

While the early philosophy of bridging organizations was an attempt to develop goal-oriented coordination strategies in an entrepreneurial or organizational project context, the overall goal is nowadays to promote learning in a governance environment on the basis of trust building, conflict mitigation and transparency between government and non-government stakeholders (Olsson et al., 2004, 2007; Schultz et al., 2007; Berkes, 2009). This is the analytical point to access the case of knowledge management of Civitas Dyn@mo.
Finally bridging organizations are a means to mediate conflicts (Brown, 1991 in Crona and Parker, 2012). As their purpose is to deal with complexity problems, thus create knowledge out of this process, bridging organizations have a diverse set of structure and appearance (Crona and Parker, 2012).

**Summed up**

Learning as it occurs in collectives, hence sustainable planning share a common ground. In the 1970s, rational choice theory and bounded rationality were not able to fully understand decision-making process no matter in which domain (private, business, and politics). Due to rapidly changing social environments there were too many uncertain factors that couldn’t be understood clearly enough to make full sense of the complex socio-economic systems scientific scholars wished to understand in the past. As a reaction, theories of political, cognitive and organizational learning emerged, thus lead to the development of concepts describing the process of higher order learning.

Starting with higher-order learning, collective approaches to learning were mainly seen as the attempt to gather broader knowledge in order to explain the uncertain and unexplainable, thus to achieve a ‘positive’ outcome in decision-making projects (Argyris, 1977, 1995; Senge, 1990; Glasbergen and Groenenberg, 2001).

In a next step policy and social sciences developed a concept of learning in collectives that was directly linked to the idea of the communication of an image of reality as a vision. Starting with the ‘two communities assumption’ this paragraph goes over the implications that as soon as there are more than one domain (politics and science) is involved in a decision-making project, there is a need for knowledge management.

Additionally, social science made the term collective learning scalable as it was used to describe phenomena in multilevel governance, thus connected collective learning with complex issues in spatial planning processes. Outgoing from the application in spatial planning it has been argued that in order to achieve sustainability that it is necessary to portray visions ideas of all actors associated problem. By this definition we receive a first indication on why it is so important to expand learning via a large set of actors in order to handle complexity issues (Vergragt and Brown, 2007).

Organizational theory developed the concept of the feedback stimulus assuming that learning in collectives (organizations) would only occur to combat threads. This model was then enhanced by ‘a community of practice’ and shifted towards the idea of knowledge
transfer. This transboundary process of knowledge transfer was seen as vital as it was suggest to ‘produce learning’ in collectives.

Finally the theoretical assumptions are linked back to reflexive governance via a concept called bridging organizations first link to collective learning in this field by Crona and Parker (2012). Initially developed by Brown and Duguid in the late 1980’s to describe a mechanism for power distribution in multilevel sustainable governance, bridging or boundary organizations are still seen as an effective means to push the introduced principles of participation, communication and knowledge implementation via knowledge management in the presented case.

3.4 Reflexive governance and collective learning
As mentioned before, communication and participation have been discussed as a possibility to foster sustainable development not only in reflexive governance. The debate on the implementation of existing political knowledge is directly related to the process of collective learning and thus sustainable governance. The three aspects knowledge implementation,

3.4.1 The aspect of knowledge implementation
Learning described in the context of reflexive governance, mainly consists of search strategies to look for actors that might contribute to the project. This approach leaves a lot of space for interpretation and ambiguity. Though offering management approaches (Loorbach, 2007), reflexive governance has been dismissed already as too unspecified to deal sufficiently with the issues that arise on the micro- and meso-level of politics when it comes to the management of conflict and power dynamics (Meadowcroft, 2009). Organizational and management theory already offer useful concepts to steer complex multilevel governance projects. Moreover, with knowledge management, organizational theory offers a tools that shows how to manage the hindrances that are connected to knowledge implementation, thus connect this process. For example Nonaka (1994) wrote that tacit and explicit knowledge are complementary, thus that they both can be extended via social interaction. (Knott and Wildavsky, 1980), talk about six discrete steps that have to be accomplished sequentially to embed scientific knowledge in political organizations.

Universities and public sector research organizations (PSROs) have tried to professionalize this knowledge implementation between the public entities (universities) and the business domain. The developed strategies to assure a correct transfer of intellectual property (IP) between the two domains, hence to generate value out of IP, vary between a range of different process and policies (e.g. joint ventures, and royalty based systems)
To make the final outcome of policy implementation sustainable, it has been concluded that one needs to reflect on the conflicting interests that are displayed in ambiguity and uncertainty naturally occur in every governance project like the mentioned above.

3.4.2 The aspect of participation
The possibility to participate is crucial for the conduct of sustainable governance projects in which experimentation and learning are seen as main focus. Especially in the fields of knowledge utilization studies and in organizational theory it has been repeatedly stated that a participation of all actors involved in a certain project is key if a vision is supposed to be translated from a theoretical concept in to the physical world (e.g. measures, local projects, actions). Interestingly the most feasible means to identify or establish the aspect of participation as a cross-link between collective learning and knowledge management comes from social studies. By establishing tools like back casting and visioning (Lippmann, 1997; Vergragt and Brown, 2007; Frame, 2008) empower actors of all domains and political levels to communicate ideas horizontally and vertically very easily as long as associated with a specific governance project.

In the context of multilevel governance projects like the one described in this study, participation can on the other hand simply mean to participate in the offered education incentives. Other opportunities to participate or interact can be identified in scientific assessment and monitoring in order to evaluation process to implement and maintain local projects and measures related to the project. Last but not least it is important to collaborate with local movements or individual experts. In order to make a participation of these groups or individuals possible it has been argued again that interfaces (e.g. local managers, meetings, round tables, etc.) have to be created which would guarantee the meaningful exchange of knowledge between actors on a horizontal and vertical axis.

3.4.3 The aspect of communication
Communication for the sake of this study may be with the concept ‘meaningful interaction’ between at least two actors. It is described by Crona and Parker (2012) as the actual willingness and ability to exchange useful knowledge, as opposed to the exchange of data or information that is around but cannot be made sense of. Though the process of communication has been framed as mentioned above in knowledge utilization studies, communication has been conceptualized and named differently by diverse scholars.

One of these conceptualizations is more detailed and identifies knowledge as more than the simple existence of information. It extends the definition by the term tacit knowledge and the process through which the transfer of knowledge changes the performance of the
recipients of knowledge (Argote and Ingram, 2000). This concept of communication is extended and summed up then under the term ‘knowledge transfer’, which is naturally as well concerned with power relationships as it has to deal with imbalances and the manipulation of learning processes and the question for the need of knowledge as a valuable (economic, scientific or political) resource (e.g. employer and employee, industrialized and threshold countries) (Harman and Brelade, 2003; Crona and Parker, 2012).

Having said that, in their briefing paper (Levine and Gilbert, 1999) have broken knowledge transfer into five distinct steps (1. idea creation, 2. sharing, 3. evaluation, 4. dissemination and 5. adoption) that seem more suitable for the scrutiny of the specific case of Civitas Dyn@mo. Though presented as discrete units, these five steps anticipate the inherent process of a managed project instead of the external knowledge transfer between the project itself and not. It is stated further that these five steps share common characteristics, thus can be combined or skipped occasionally.

There is a scale developed by (Knott and Wildavsky, 1980), hence further developed by (Landry et al., 2003; Crona and Parker, 2012) which describes the transfer of meaningful knowledge as a sequence of six stages (reception, cognition, discussion, reference, effort, and influence). It is hence a consecutive chain, meaning that each stage within the scale is more important than the previous in the process of achieving knowledge utilization, thus is accorded progressively more weight. In summary the scale describes to which degree information is process cognitively, hence how the initial information will affect the later policy process (Webber, 1991) in (Crona and Parker, 2012, pp. 2–3).

It is further argued (Crona and Parker, 2012) that this scale is relevant because the decision-making process in reflexive governance is usually not based on a single event but rather on a series of interactions and discoveries that can be described by the concept of knowledge utilization. However (Landry et al., 2003) suggest that there is also a co-relation between social relationships and learning. Additionally (Voß and Bornemann, 2011) have postulated two strategies that have the potential to explain how knowledge transmission is affected by social interaction. Finally, (Crona and Parker, 2012) have summarized some very important aspects that influence the potential outcomes of collective learning not only in multilevel governance projects, as they involve the collaboration of various domains (politics, science, economics).
3.5 Analytical framework: Knowledge management

Knowledge management summarizes how knowledge transfer and implementation has been successfully conducted in organizations; thus it suggests that the same is possible for governance projects. The literature on management and organizational studies suggests the use of trainings, incentives, structures or technical means (e.g. internet, databases) to lower communication barriers (Nonaka, 1994; Nonaka and Takeuchi, 1995; Szulanski, 1996, 2000). Crona and Parker (2012) argued that the same is possible for joint ventures in governance projects if management is properly implemented via independent actors (e.g. bridging organizations, interorganizational mediation) (Berger and Neuhaus, 1977; Brown and Korten, 1989; Brown, 1991; Hartley et al., 2002; Hartley and Benington, 2006).

As repeatedly mentioned under (Error! Reference source not found.; 3.) it is important to combine diverging concepts and ambitions of diverging actors rather than keeping them out of the process. A bridging organizations main task therefore is to identify all relevant knowledge, hence make it accessible (Olsson et al., 2004; Hahn et al., 2006; Olsson et al., 2007; Crona and Parker, 2012). This is especially important if a collective process of learning is desired. Based on the presented research under (3.2.; 3.3.) a knowledge management framework is established that likewise represent the key aspects of collective learning as it displays how power balance is managed in the case of Civitas Dyn@mo.

3.5.1 Trainings

To successfully produce new ideas, employees of an enterprise as well as actors of governance projects (no matter which kind) need to be trained to solve problems. This is seen as a necessity if people are supposed to think ‘outside the box’ (Levine and Gilbert, 1999). A classic problem-solving program (Nonaka and Takeuchi, 1995; Levine and Gilbert, 1999; Hartley and Benington, 2006) would contain strategies to facilitate proper implementation of knowledge. In their brief on knowledge transfer, Levine and Gilbert (1999) specifically state the need for training to ‘identify and prioritize problems’. Once found, the root causes of the issues have to be identified and tackled accordingly by establishing countermeasures that would allow for implementing new solutions. These new solutions would of course have to be checked on a further instance. It is crucial to mention in this context that enterprises have to provide for information on the working environment and the actual project to focalize the employees. In 2013, it is also obligatory that employees are proficient team workers (Levine, 1995).

An issue that must not be underestimated when it comes to sharing ideas/knowledge is the language barrier. (Levine and Gilbert, 1999) suggest that workers have to be well educated on
the language of the working environment, such as the technical languages (e.g. IT-modeling, statistics) in order to make proper contributions to the enterprise.

When it comes to the evaluation of ideas, it is seen as important that both managers and employees are trained to grasp and systematically approach complex systems; this is especially true for solving issues of environmental character and peaks in the development of sustainable solutions. Levin (1995) mentioned that high-quality workers and employers have a comprehensive understanding in correlations and a basic understanding of science-based approaches to decision-making processes. He elaborates further on the problem to paste simple statistical models on real problems, and states the importance of this explicit knowledge for the creation of new ideas.

Trainings focusing on how to produce and promote new ideas are a way to make sure that knowledge is easily accessible (meaning both easy to disseminate, hence easy to adopt). Additionally they are a means to ensure a well-balanced social space that each stakeholder can access with or without using the same amount of resources. It would put all participants of the project on one level. This is partially due to the actor’s ability to understand ideas, which can be a barrier at the same time. It is suggested, therefore, that in order to lower these barriers by ongoing education of the participant, hence to push this education by actively understriking its importance or offering opportunities for the participants to enhance their own knowledge base including trainings on validation and dissemination of new ideas (Levine and Gilbert, 1999).

3.5.2 Structures
Building up sufficient management structures is an essential requirement for low communication barriers. It has been argued that management structures have to be flat instead of hierarchical to provide for good communication equaling a good transfer of knowledge, especially if it is the declared goal of a project to foster democratic processes or sustainability (Musso et al., 2000). Levine (1995) named time as the most important ingredient for shaping a creative working atmosphere, and also argued that in order to foster a social environment for sustainable decision-making it is important to create structures that allow for brainstorming (e.g. suggestion programs, self-directing teams). In sum this means that actors are supposed to be given the authority and the accountability to make improvements (no matter if that would be inside or outside the organization).

To promote the evaluation process within organizations, several scholars have noted that it is of chief importance to create mechanisms that automatically monitor failure and success of past experience, like accessible databases to recorded projects. In other words, knowledge
has to be translated from tacit to explicit knowledge. This process needs tools like databases with free access to best practice examples. On the other hand, tacit knowledge can be as valuable if there are trained sources that provide for the knowledge in an accessible form. Links to experts with already existing knowledge are seen as the silver bullet to avoid mistakes from the past and empower actors not only in sustainable decision-making (Brown and Duguid, 1991; Garvin, 1993; Levine, 1995; Crona and Parker, 2012).

Having said that, experts remain the best way for the successful dissemination of knowledge (Knott and Wildavsky, 1980; Hartley et al., 2002; Hartley and Benington, 2006). Regardless of all advances in information technology (IT), there is and will be (at least in the near future) a lot of tacit knowledge that is best transmitted in personal meetings or for a like. On a bigger level there are even whole organizations, as described above which can act as mentors or trainers.

3.5.3 Technology and knowledge transfer
We do have some experience in the implementation and use of IT as a means to support knowledge transfer. Advances have been made not only in the sharing of knowledge via intranets, social platforms, and the whole Internet as a dissemination platform by itself; the Internet has even revolutionized our whole concept of communication. Collaborative software (e.g. Microsoft Groove), and as a successor cloud computing, have enabled us to tap and exchange information in real time.

      Nowadays whole surveys can be carried out via social platforms like Facebook or Google+. Technology helps us to evaluate knowledge; one doesn't even need access to a computer to arrange and analyze statistics to measure causes and effects of certain patterns. The evaluation of actions according their effectiveness can be supported by technology to a degree that it is highly accessible even to lay people.

      Finally, social networks and online platforms have lowered the barriers for the dissemination of knowledge dramatically. It is easier than ever before to target and inform people in both desirable and rather undesirable ways. For example groups can tap and discuss new ideas via mailing lists and even manage the membership. Modern algorithms can even identify and spread valuable information on an independent basis. Skype and chat programs that are free of charge make the adoption of new knowledge easy. News groups pod casts and push services offer new possibilities to connect with the citizen as a valuable source, and help to create acceptance and transparency.
3.5.4 Visioning
In the last 10–15 years, many new approaches have been developed to induce learning for sustainable development and sustainability. According to (Vergragt and Brown, 2007) visioning (in creative processes), scenario building, backcasting, and small-scale socio-technical experiments are the most prominent examples.

Drawing on several authors, P. J. Vergragt and H. S. Brown (2007) present visioning as ‘pseudo-facts that guide behavior’ or even more distinct Vergragt cites Lippman (1997) that: ‘visions can create structures that even would guide behavior and help to define roles’. By summing up several methods of visioning (e.g. technological visioning, mapping possibility spaces, back casting,), Vergragt points out that visioning itself can be used as a heuristic tool for problem defining and solving, that supports the idea of sustainable development, hence by building up actor-networks, it would foster the collective aspect of learning in a most direct sense, as actors would envision future plans and strategies group wise.

Summed up, there are two reasons that make visioning appealing for both sustainable development and learning if performed at a continuous base. The first one is directly associated with the intrinsic value of a vision as being valid because of the ‘constitutive power’ behind it. It is simply described here that this ‘power’ makes a vision appealing to the actors that have created it and therefore creates this sense of validity even if there are no hard facts behind the vision. Moreover, there is a tendency of visions to be disseminated more easily as they leave space for interpretation, which is participation as one core aspect of collective learning in the first place.

In this context Vergragt describes the method of mapping possibility spaces in greater detail as a tool to inspire and attract actors to participate, on one hand, and as a means to test and validate certain scenarios on the other. Additionally, the contribution of ‘mapping possibility space’ to balance power and influence as a direct outcome of diversified participation is mentioned.

Backcasting is described here as a consecutive step, providing for the balanced participation of multi-actor approaches altogether with scenario building. It aims for the creation of multiple scenarios and ‘alternative futures’ that are scientifically based on the method of trend exploration but enhanced by the attempt to anticipate dominant drivers to achieve a scenario via the experience of actors. Similarly, backcasting pursues the idea of tracking back the created scenarios from scenario building and creating an action plan (e.g. action plan on sustainable urban transport) for a desirable future. Scenario building and backcasting have both been successfully applied as participatory planning tools to identify
ideas for sustainable development (Vergragt and Brown, 2007 p.1113), thus would provide for collective learning.
4. The Empirical case: Civitas Dyn@mo

Civitas Dyn@mo is part of the fourth phase of the CIVITAS Initiative (2012-2016). It consists of four main actors: Aachen (Germany) and Gdynia (Poland) as demonstration cities, and Palma de Mallorca (Spain) and Koprivinica (Croatia) as learning cities. Furthermore, there is a consortium consisting of 28 partners that is managed by the Union of the Baltic Cities’ (UBC) Environmental Commission (EnvCom) Rupprecht Consult and Lund University.

The project Civitas Dyn@mo has defined four pillars (strategic level, technical level, service level and the European level) that equally serve as a more detailed roadmap and correspond with the CIVITAS Initiative’s sustainability measures, such as the Thematic Groups. The ultimate goal of Civitas Dyn@mo is: “to strengthen sustainable mobility through the promotion of non-polluting lifestyles” (European Commission, 2013a). To contribute to the goal of a non-polluting lifestyle, Civitas Dyn@mo has developed two strategies that combine the implementation of innovative transport services, such as social interaction, with so-called “active citizens” on the basis of the new media (e.g. Twitter and Facebook). Additionally the two strategies mentioned above are carried out and verifiable by the following strategic aims:

1. *The Development of ‘Mobility 2.0’ systems and services by ‘web 2.0’ technologies.*
   (European Commission, 2013a)

This strategic aim describes the creation of a space or platform from which the city planners envision the establishment an interactive planning culture that includes direct and permanent interaction with citizens via web 2.0 applications. Furthermore, the management of Civitas Dyn@mo clearly pleads for the implementation of intelligent transport systems (ITS) throughout all levels of CIVITAS. Within Civitas Dyn@mo, ITS will be used to improve, maintain, support and update the service and the communication (within and outside) of the project. ITS are seen as a vivid means to involve the citizens and other stakeholders in the project coordination and management.

2. *Implementation of city- and citizen-friendly electric mobility solutions (e.g. electric bicycles, car’s, etc.)* (European Commission, 2013a)
The technical aim describes the use of advanced intelligent transport systems managed by software to cut down on energy emissions, thus to improve the transport experience of the citizen. Civitas Dyn@mo holds to the philosophy that clean public transport is always based on the idea of cutting down on energy emissions. Therefore, Civitas Dyn@mo tries to improve its public car fleet emissions by using alternative fuels, new technologies and social projects (e.g. alternative fuels, hybrid buses, car sharing schemes).

3. *The establishment of a new dialogue between citizens and local authorities to improve the planning and service quality.* (European Commission, 2013a)

The dialogue described under the third aim doesn’t end at the regional level but is intended to underscore the significance of the Civitas Dyn@mo for Europe as a whole. It is intended to foster the European identity of CIVITAS, while at the same time displaying the multilevel character of Civitas Dyn@mo. Additionally, the project cities want to implement 30 innovative measures in all to strengthen sustainable mobility in their cities. By public-private partnerships in the sector of new technologies, or by subsidization of “green” mobility solutions, Civitas Dyn@mo selectively promotes a new lifestyle with the goal to increase public acceptance for a sustainable public transport system free of privately owned cars.

Civitas Dyn@mo is a multilevel governance project, touching multiple political levels and dimensions. Just as the CIVITAS Initiative, it stands for sustainability and a holistic approach that seek to raise participation of and acceptance by the public. To give it a sound base for planning, Civitas Dyn@mo is based on the policy mentioned earlier, called Sustainable Urban Mobility Plan (SUMP). The SUMPs are the backbone of the urban planning in the four partner cities. The two demonstration cities, Aachen and Gdynia, have already implemented a version of individual SUMPs in their urban mobility concept. Koprivinica and Palma de Mallorca, on the other hand, are in the pre-development stage of their individual SUMPs. All SUMPs have in common that they include citizen and Stakeholder feedback via web-based applications (European Commission, 2013a).

4.1 Empirical findings

The project management (Rupprecht Consult) of Civitas Dyn@mo is intertwined with all political levels of this project, reaching from the EU level to local actors of all societal domains (political, economic, scientific, etc.). The challenges that occur from this case are as manifold as there are actors involved. For the purpose of this work, the empirical section
concentrates only on the five main actors, which comprises the two demonstration cities (Aachen, Gdynia), two learning cities (Koprivinica and Palma the Mallorca), and the consulting company Rupprecht Consult, which can be characterized as a bridging organization that works as knowledge pool and facilitator of the project Civitas Dyn@mo on all political levels and domains.

Presenting the empirical findings with the scrutiny of the management structures of Civitas Dyn@mo based on the statements of Interviewee I and II. We then start presenting the European transport policy (4.2), such as the White (4.3.1) and Green Papers (4.3.2) on European transport and urban mobility, such as “The Action plan on Sustainable urban transport (4.3.3). Though not directly related to the project Civitas Dyn@mo those three European policy guidelines give a first abstract impression on a collective approach to what learning means in the context of sustainable urban transport and mobility. The focus of these policies clearly describe the three aspects of collective learning, i.e. knowledge implementation, participation and communication already on a rather abstract level. The focus of this section is clearly set on the goals and visions described in these policy guidelines and how they are implemented as knowledge in the local SUMP (4.4), thus how these visions influence the participation, i.e. the implementation of local measures in the four cities. Here the Interviewees where used to complement the data on the project page (www.civitas.eu), thus to get a more detailed impression on the context of how the EU-level vision on sustainable transport is communicated to local actors.

4.2 Rupprecht Consult: Managing multilevel politics

For the project structure CIVITAS Dyn@mo consists of four cities; Aachen, Gdynia, Koprivinica and Palma de Mallorca are the key actors on the horizontal axis, hence at regional scale. According to Interviewees I and II there is a vertical axis that provides for higher level services which can’t be performed solely on the micro and meso scales of Civitas Dyn@mo, thus involve responsibilities at the European macro scale (e.g. the feedback and project evaluation such as the general framing of the SUMP). According to Interviewee I Rupprecht Consult is the ‘knowledge pool’ that is frequently tapped by all actors from local city administrations to the European macro level of politics. Furthermore, by setting up and moderating meetings between private innovators and the sphere of politics, Rupprecht Consult tries to initiate a social space for barrier-free communication.
4.2.1 Building bridges for the transfer of knowledge
The knowledge transfer is mainly dependent on Rupprecht Consult to sponsor initial ideas, from the macro to the micro level of Civitas Dyn@mo. The ideas for Civitas Dyn@mo are created in the application phase of the project itself, which means that they are created prior to the actual project.

“The ideas are usually developed in the application phase of the project. So we have signed a contract, which entails a very detailed technical annex. This annex describes all the subprojects which are going to be conducted in the various cities (...). So for these subprojects it was a very important step in our work to ask: "What are the possible actions that can be successfully conducted in the cities." So we concentrated on three parts, one of which is sustainable urban mobility planning.” (Interviewee I)

Additionally, the ideas need to be structured and fitted according to the CIVITAS measures. In the case of Civitas Dyn@mo there are three overall themes that are pursued by the cities (technology, the SUMP’s and public transportation, and information technologies). According to the interviewee there are 30 subprojects that need then to be coordinated.

“They are very diverse. For example the city of Aachen is going to introduce new measures on the use of fuels and hopes to reach lower emission levels concerning noxious substance. But they are supposed to be more economic as well. Because they run in urban areas. Aachen has as well a traffic development plan (Ger: Verkehrsentwicklungsplan (VIP)).” (Interviewee I)

Furthermore, the assessment and the monitoring of these subprojects has to be planned, as they are supposed to progress and develop, thus including the surrounding regions of the actor cities.

The sharing of knowledge through dissemination is another important part of the work of Rupprecht Consult in Civitas Dyn@mo. The simple dialogue in meetings with executive directors or middlemen is seen as a vivid means not only to set the agenda on the European macro level of politics to steer the outcome of Civitas Dyn@mo but for the whole CIVITAS Initiative. By this approach Rupprecht Consult wants to make sure that Civitas Dyn@mo
stays on the political agenda on all political levels for a longer period of time that lasts even after political changes have occurred.

“For example the actions suggested in Palma (de Mallorca), have been suggested under a rather ecologically oriented government. And after the government was reelected it shifted to a conservative party. (...) It has then been very ambitious to implement the actions, and of course some have directly been cancelled. But we made sure that other innovations could be realized. And we really talk to these decision-makers.” (Interviewee I)

4.2.2 Knowledge management in a multilevel environment
At the European level Rupprecht Consult is responsible for organizing and conducting technical workshops to brief the city agents and for deciding who is invited to participate. Furthermore, on the regional (meso) level Rupprecht Consult helps to steer the project communication between the different cities, and thus helps to organize the exchange of ideas on the micro scale of Civitas. Here Rupprecht Consult organizes and focalizes meetings and workshops such as round tables to get ideas translated into available knowledge for the participants that can in turn develop this knowledge to make site projects out of it. In addition to this process of generating and sponsoring ideas, Rupprecht Consult is as well monitoring the knowledge transfer within Civitas Dyn@mo.

In the case of Civitas Dyn@mo, the term project management stands for the management of knowledge. Rupprecht Consult is the bridging organization in the project, thus is ultimately responsible for the management on all meta levels (micro, meso, macro) and domains (politics, public, private actors). Moreover, it is the responsibility of Rupprecht Consult to keep up and build the structures that are necessary for the successful exchange of knowledge.

Civitas Dyn@mo has a rather hierarchical management structure. Commonly, there is direct communication between the agents of the cities (site managers, evaluation managers dissemination managers), which are in turn directly connected to local agents (measure leaders, site evaluation managers, and site dissemination mangers). These local agents are directly responsible for the translation of CIVITAS measures into real projects; in other words they monitor the progress of local actions. It is worth mentioning that Rupprecht Consult is also responsible for the construction of these structures and is partially responsible for the choice of the local agents.
“We (Rupprecht Consult) have during the announcement phase, made recommendations about who (of the local actors) is supposed be included and who (of the local actors) is supposed to be excluded, but the choice was primarily made by the cities.” (Interviewee I)

According to the CIVITAS criteria, there is a broad range of actors due to the measures that need to be implemented on a regional and local level. Moreover, there are seven policy fields (access restriction, public transportation, car sharing, cycling, walking, etc.). These fields are supposed to be further developed and then implemented by the cities on a local level. It is the responsibility of Rupprecht consult as the bridging organization to act as a knowledge broker and identify the possibilities for the translation of the measures that have been framed on the EU level policies on a local micro level of politics. In terms of the communication, Rupprecht Consult gathers these actors together and discusses how the actions in this project would look and which kinds of actions are supposed to be integrated and which not. This round table event is especially important to connect to actors that are not connected to Civitas Dyn@mo directly, hence solely act on the micro or local level. It gives those local participants a tool to manage and synchronize their ideas and progress.

There are constant meetings on the management levels concerning Civitas Dyn@mo directly (meso and micro). Moreover, there is a management core group consisting of the four participating city agents (Aachen, Gdynia, Koprivinica, Palma de Mallorca), UBC and Lund University, which is called the 'close and far group'. Additionally, there are monthly standardized telephone conferences. They take place in a fixed time (2 hours) and according to fixed patterns. Topics have to do with the micro management of the local participators, such as general feedback on measure implementation progress and issues. There are three physical meetings per year of this core group, with single actors that are relevant for special events, if special topics were brought up that need a broader range of actors to discuss. Once a year all actors meet to share experience and progress throughout the borders of Civitas Dyn@mo (CIVITAS Forum Conference). The various cities have, in turn, round table meetings on a constant basis. These meetings are commonly used to discuss the technical details of the projects in the various regions. Rupprecht Consult watches over the process to keep it inside the frame, and if things start running outside of the frame of the project, to report to the EC to get a higher level feedback about how to solve issues with projects to make them suitable for the Civitas Dyn@mo (Interviewees I, II).

Technology is another important point in the knowledge management process of Civitas Dyn@mo, which is partially managed by Rupprecht Consult (partially the CIVITAS fora are
a consistent part of the whole initiative. Civitas Dyn@mo has an electronic exchange platform (Microsoft SharePoint™) to which all associates have access. There is a calendar and a forum, which is only remotely accessed, where all documents are stored and updated. All 30 subprojects have access to this intern collaboration space. In this intranet documentations are also maintained; these include as well information about how to develop sustainability plans. And this offer is used by all cities. There are further European framework directives which we have helped to develop (SUMPs) and we offer trainings for the shaping of these SUMPs on a regional basis.

Technical actions can be found as well on the local micro level, such as how to get the user of public transportation systems involved in decisions concerning the quality of those systems (e.g. push services). These push services are supposed to provide information about traffic as well as provide a way for people to comment or offer complaints and suggestions to establish communication between the commuters and the providers of public transportation services.

Just as any multilevel governance project is reliant on following policy guidelines and framework directions, Rupprecht Consult offers a variety of training incentives. This management action is supposed to sensitize the local administration to the overall strategic goals of CIVITAS, hence how to identify local projects to support the outcome of Civitas Dyn@mo.

“This is in the process of coming into being. By the end of June we’ll have a summer university in Palme which is going to explain in detail the SUMP. This is going to happen at the university. There are going to be lectures ad exercises which are going to be held by experts.” (Interviewee I)

Eventually these training incentives are used as a means to bring scientific knowledge to the project. The university setting is not only for the educational purpose of the training but is used for the direct evaluation of the program, and to externally monitor the management of the program.

“Lund University plays an important role here in this process. They are involved in the development of these guidelines. And with the work in CIVITAS they have a direct contact
to urban politics and to the implementation process of actions. This is a constant process from science about how to evaluate.” (Interviewee I)

4.3 The policy Context of the EU

According to the European Commission (EC), information will be the key to influencing future consumer behavior. For the transportation sector this means that in order to facilitate a sustainable mobility process, future projects have to be communicated not only via conservative media but in ways that a more interactive connection between the public and the authorities can evolve. In this process education and learning will play a big role in order to raise awareness, hence to create acceptance. Consequently, information management as described above is supposed to implement a bottom-up approach to European transportation management via surveys and open consultations. Thus, this new bottom-up strategy needs to be implemented on all levels (local, regional, national) including a sectoral level involving private associates to this system (European Commission, 2009a, 2009b).

The development of new technologies, hence the growing possibilities outgoing from this process, will need new regulatory frameworks and practices. Outgoing from this demand, new practices and institutions have to be established on top of existing practices to meet and settle the challenges brought up by these demands (European Commission, 2009b). Furthermore, this development will result in the need for coordination to ensure a reliable interoperability of the institutions and norms already in place (e.g. tolling, intelligent transport systems (ITS)), and thus prevent the occurrence of inhomogeneous national systems. A further issue is the limited role of the EU as a moderator of this new approach towards a sustainable urban mobility due to the subsidiary principle. It is a fact that most transport is on an intra-city level, whereas the demands for standards exceeds this limitation. The EU argues, however, for a meta-level coordination of this project to guarantee a sustainable outcome. The major tasks, according to the EC, are the management and distribution of knowledge, which is formalized in the setup of the CIVITAS initiative (European Commission, 2007, 2009a, 2009b, 2012e).

Urban mobility has been already identified as an issue in other network initiatives (e.g. the ‘Regions for Economic Change initiative’4). In this sense the EU strives for the strengthening of cross-linked initiatives, that in return are supposed to be managed and steered by the EC, thus further promoting the urban mobility policy to actively influence the

4 “The ‘Regions for Economic Change initiative’ is an initiative of the European Commission that aims to highlight good practice in urban and regional development, with a particular focus on innovation, and to speed up the transfer of good practices to enhance the quality and impact of the EU’s regional development programs and their implementation by the EU’s Member States and regions. It supports the EU policy objectives of smart, sustainable and inclusive growth...” (European Commission, 2010a).
public mobility behavior of so called ‘specific target groups’ (European Commission, 2007, p. 17). Hence, it is proposed to create a conference on the issue of steering urban mobility that is supposed to be led by the CIVITAS Forum on behalf of the EU.

Directly concerned with the generation of knowledge is the White Paper on European transport and the Green Paper on sustainability. In these papers the EC talks about the consultation and implementation of the knowledge of earlier initiatives to fill knowledge gaps in statistics on urban mobility. Additionally, the EC argues for a homogenization of knowledge via a single provider and an exchange platform for all levels of practitioners and decision-makers as this was asked for by stakeholders and practitioners in this very field (European Commission, 2007, p. 18).

4.3.1 The White Paper on European transport
In 2001, the EC adopted a White Paper on European transport (European Commission, 2001b) to keep up with the sustainable development strategy adopted by the European Council in Gothenburg in June 2001. It was an attempt to shift the balance between the modes of transport (railway, air, sea) of the European transport system by implementing 60 measures to control growth. Out of these 60 proposed measures, the EC has finally adopted a roadmap of 40 concrete initiatives to build a ‘competitive transport system’ that is supposed to remove barriers in sustainable transport regarding specific areas, hence increasing the overall mobility while lowering the EU’s dependency on fossil fuels and lowering carbon emissions by 60% by 2050.

Like most of the EU’s programs on sustainable development, the White Paper is based on a vision and set of (key) goals to achieve this vision, including the total elimination of fossil fueled cars in cities and a reduction of carbon fuels and emissions in shipping and aviation. Via developments such as the implementation of new technologies and the more progressive policy strategies, the White Paper describes the essence of the CIVITAS initiative and Civitas Dyn@mo in their strivings for the implementation of sustainability measures in urban areas. Just as the action plan on sustainable urban transport that was introduced later, the White Paper names a set of initiatives to foster sustainability via the pillars of technological innovations and social equity in the transport sector that are based on the principles of participation and knowledge transfer.

4.3.2 The Green Paper on urban mobility
The European Commission adopted the Green Paper "Towards a new culture for urban mobility" on 25 September 2007 (European Commission, 2007). This Green Paper was intended to set up a new agenda for European mobility with a special focus on urban areas.
Because this paper was set up for promoting change in the whole of Europe, it follows the European idea of a bottom-up approach, respecting local, regional and national responsibilities, while aiding those political levels by sharing knowledge (e.g. best practice). Since the stakeholder consultation period ended on March the 15\textsuperscript{th} in 2008 (European Commission, 2012e), the debate was intended to identify obstacles and find possible solutions to them (e.g. quality control, increased use of clean and efficient energy, promotion of walking and cycling, protection of human rights).

A more concise description concerning knowledge transfer, as well as the implementation and creation of knowledge, is described under point (The improvement of knowledge) in the Green Paper (European Commission, 2007, p. 17). Here the paper focuses on establishing and fostering new partnerships in order to foster what is called a ‘new urban mobility culture’ (European Commission, 2007, p. 17), which is supposed to include new planning methods and tools. Additionally, the generation of knowledge is linked to the terms \textit{education, training} and \textit{awareness raising}.

A further point is the strengthening of the competencies of professionals associated with tasks in the field of urban mobility. Here the EU ought to play a role in the organization of knowledge exchange via such activities as the organization of systematic exchange actions and staff trainings). Furthermore, the Green Paper proposes the strengthening of existing networks and initiatives in the sector of urban mobility in order for leading stakeholders and experts to have more decision power in their respective sectors of expertise and interest.

\subsection*{4.3.3 The Action Plan on Sustainable Urban Transport}
Based on the Green Paper on urban mobility (European Commission, 2007), the European Commission (EC) planned to implement six themes: 1. Promoting integrated policies, 2. Focusing on citizens, 3. Green urban transport, 4. Strengthening funding, 5. Sharing experience and knowledge, and 6. Optimizing urban mobility. These themes would be implemented under the name ‘Action Plan on Sustainable Urban Transport’ across all existing EU programs and instruments concerning sustainable urban transport (European Commission, 2009a). As part of a steady learning process, the actions outgoing from these themes are supposed to complement each other and already existing EU initiatives as a means of best practice. In the following this section lists all actions and themes closely related to sustainable urban mobility and transport, thus promote knowledge implementation and transfer, such as participation and the process of communication.

Theme 1 describes the promotion of mutual learning platforms, such as integrated policies, which is paramount for the EC, hence for a sustainable transportation system in
Europe (Action 1). Action 3 points out the potential of sustainable urban transport in fostering a healthy sustainable environment by establishing cross-sectoral partnerships with the public health body.

Theme 2 focuses on the citizen, and questions how to integrate the collective knowledge of the public into the further development of the transportation sector. The EC gets more specific, pointing out the implementation and promotion of already existing, so-called transparent contracts fostering human rights (e.g. passengers with mobility issues). Here the EC strives for an implementation of those contracts that so far are only integrated into the rail system and on coach and bus services (European Parliament, 2007). Action 4 describes the knowledge transfer between the citizens and local authorities as a bottom-up process in which the EU will operate as a moderator to facilitate the dialogue in order to push and monitor voluntary commitments to the local public transport systems. Linked back to the idea of best practices is also the generation of knowledge. Action 7, therefore, proposes a study of the exchange of knowledge on the access rules for “Green Zones” (European Commission, 2009a, 2007). Educational campaigns as described under Actions 8 and 9, hence the cross-reference to the European Road Safety Program, are supposed to foster transparency, and consequently acceptance.

Theme 3 is a market-oriented proposal to foster and push the development of new and clean vehicle technologies; hence the European economy by the consequent implementation of policy-based fees on the generation of climate tradeoffs. Action 10 points directly at the CIVITAS initiative, fostering alternative fuels and transportation. This development ought to be the starting point for the CIVITAS FUTURA initiative that will consequently push the global knowledge exchange Action 10. Action 11 ought to push the development of projects for lower- and zero-emission vehicles, and thus start the development of a public database on clean and energy-efficient vehicles. Action 12 is concerned with the generation of knowledge about the pricing system of future public transport. In detail this action focuses on a study on

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5 "In the Green Paper consultations, many stakeholders called for guidance and for the development of harmonized rules for urban Green Zones at the EU level in order to enable a wide use of such measures without creating disproportionate barriers to mobility for citizens and goods... Therefore, the European Commission commissioned a study on urban access restrictions (green zones), which was finalized in December 2010. This can help cities to identify solutions that suit their needs and strengthen environmental protection while ensuring freedom of movement in a non-discriminatory way for all citizens in the European Union. An increasing number of cities in Europe have established 'green zones' to reduce pollutant and noise emissions." (European Commission, 2009a.)

6 "The Commission has adopted a Road Safety Program which aims to cut road deaths in Europe in half in the next decade. The program sets out a mix of initiatives, at European and national level, focusing on improving vehicle safety, the safety of infrastructure and road users' behavior." (European Commission, 2010b)
urban aspects of the internalization of external cost points, emphasizing the causes and effects of cost recovery in regards to social acceptance and urban pricing systems.

Action 13 directly points to the exchange of information on urban pricing schemes using the input of already existing initiatives, including information and consultation processes. The conclusion of the whole process is then used to further develop the internalization of external costs\(^7\) (European Commission, 2008b, 2009a).

Under theme 4, the EC talks about strengthening existing and future funding (Action 14). Here the EC argues with the need for a proper economic base as a guarantee for a most beneficial sustainable outcome. Though local, regional and national sources are seen as the major financial bearers, funding new technical innovations is seen as to be the domain of European investment banks and private stakeholders. Action 15 aims for the analysis of the needs for further funding to support future CIVITAS initiatives (e.g. CIVITAS FUTURA).

Theme 5 of the communication on the action plan on urban mobility the European Commission describes how stakeholders are supposed to make proper use of existing knowledge and how the EC will support this process of “capitalizing on knowledge” by the development of community programs that are supported by the European Union through data collection and assessment. The communication states the importance of the collection and integration of data gathered by existing measures to develop further policies (Action16). It is clearly stated that this pool of data based on standardized measures is supposed to aid cities with less experience in the field of sustainable transport to advance in this sector (e.g. pedestrian and cyclist safety).

Action 17 describes the setting-up process of a virtual “urban mobility observatory” that is supposed to enhance the process of data exchange and availability. Furthermore the database is supposed to maintain training and educational material.

The last point (Action 18) mentioned under theme 5 is the international dialogue and information exchange by which the EU is planning to open the CIVITAS Platform for neighboring countries of the European Union, such as global partners (European Commission, 2009a, para. 18).

Theme 6 focuses on the optimization of urban mobility itself by the generation and distribution of knowledge via conferences and surveys on cargo, ticketing and payment systems (Actions 19, 20). Action 20 is specifically concerned with the complementation of the

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\(^7\) “The internalization of external costs forms part of a package of initiatives aimed at making transport more sustainable. It consists of including external transport costs (pollution, noise, congestion, etc.) in the price paid by the user, so as to encourage them to change their behavior.” (European Commission, 2008a)

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### 4.4 The SUMP

The Sustainable Urban Mobility Plan(s) (SUMPs) ‘define(s) a set of interrelated measures designed to satisfy the mobility needs of people and businesses today and tomorrow’ (Rupprecht Consult and Edinburgh Napier University, 2011). They are the outcome of transdisciplinary and multilevel approaches to address the needs of sustainable transport in an urban environment, such as those found throughout Europe. At this institutional level - the level of the SUMPs - the concept of forerunners has already been introduced through cities that have already successfully implemented CIVITAS measures on the regional level. Therefore, these cities are described as demonstration cities, that have in part the knowledge (embedded and tacit in the form of experts) to give guidance for cities that are new in the CIVITAS Initiative. Additionally, the network that results from the SUMP concept is seen to enhance the traditional planning process to give new impulses the development of future policies.

A SUMP is based on a so-called ‘integrated planning approach’ (Rupprecht Consult and Edinburgh Napier University, 2011 p.17) that describes the holistic way of addressing and implementing measures to fulfill the demands of all possible forms of transport (public, private, industrial) in the urban and suburban areas of a city. For the sake of achieving sustainability, this means that a SUMP has to guarantee the accessibility of public transport to all citizens, whilst improving the safety of the users. Additionally, there are environmental concerns like the mitigation of pollution, including the emissions of greenhouse gases, that would also result in lower energy consumption. There is always the concern for economic efficiency in order to enhance the attractiveness, thus the quality, of urban environments.

Eventually to be approved, a SUMP has to fulfill a set of rules that are called ‘characteristics’. Above all there is the strict rule to engage in the classic bottom-up ‘participatory approach’ to involve the citizens, or customers, in the decision-making process from the very beginning and throughout the whole process. In the project of Civitas Dyn@mo this is achieved via so-called push services, hence the establishment of virtual interactive planning scenarios and the use of Web 2.0 (Facebook, Twitter, Google) (Interviewees I,II,III).

An additional characteristic is called social equity. This social equity characteristic plays a special role in CIVITAS, such as Civitas Dyn@mo as the characteristic addresses gender equity and accessibility, hence the environmental pillar and economic development. Social
equity plays a very important role in the transdisciplinary context of multilevel, sustainable governance. As transdisciplinary is a necessity sustainable governance and collective learning, social equity describes the free communication and collaboration between different kinds of policy sectors, private actors and authority levels, which likewise have to be implemented by a concise description of their communication and the mechanisms through which their work is steered.

Visioning is a central topic mentioned in the report on SUMP (Rupprecht Consult and Edinburgh Napier University, 2011 p.11). It describes future goals and measures, and establishes measurable targets that can be derived from short-term objectives. Visioning is furthermore seen to be the key to integrated urban planning that considers the importance of embedding of a meta-level strategy to achieve sustainable development for urban mobility and transport in general.

From the methodological point of view, SUMPs are supposed to contain a cost benefits analysis, taking into account so-called wider societal costs across all policy sectors. In order to back up the visioning, there is a set of methods (e.g. status analysis, baseline scenario, assignment of responsibilities and resources) that are not further described but are important as they build the interface for the participation of science as an actor involved in the evaluation and assessment of the collective learning.

As stated by an interviewee, the most common reason to work together at an international level is to reflect on the past and future perspective of their own city. This becomes an even more important issue where the distribution of urban functions (e.g. education, transport, land use) are not centralized but still have to be implemented in an holistic way comprising the issues of a whole region, while interacting with multiple political levels and actors. Here the SUMP takes a central role of managing this process, as it is an interactive tool that is developed and maintained via the ‘European Future Search Workshop’ (EFSW). The EFSW is a special workshop for holistic planning that uses transdisciplinary insights to create future visions of sustainable mobility (Rupprecht Consult and Edinburgh Napier University, 2011). It is also mentioned in this context that constant education – for all actors taking part in the project – is seen as vital, since education is considered the core element pushing forward and distributing visions and knowledge embedded in Civitas Dyn@mo and the whole CIVITAS Initiative.

4.4.1 The example of Aachen
The development of SUMPs differs from country to country, and it still is a new concept in many contexts. The European Commission is engaged in spreading the adoption of SUMPs
widely in European cities and regions through a variety of projects and initiatives. In the case of Aachen, the SUMP is a collaboration of Baltic Urban Sustainable Transport Implementation and Planning (BUSTRIP) that is similar to CIVITAS in that it seeks to support European cities to achieve the vision of a sustainable public transport system. In the special case of Aachen, the city plans to promote cycling. The city has been engaged in the promotion of sustainability since 1995. A concrete outcome of this promotion is the “Urban Traffic Plan” (UBC) that embodies the SUMP on a regional level. A specific goal formulated in the UTP is to raise cycling traffic from 10 to 15% of the whole urban traffic in the city. Within the arrival of the CIVITAS initiative, Aachen has continuously enhanced and promoted the aims and goals from the initial UBC in 1995 (e.g. sustainable urban mobility planning, clean and energy-efficient vehicles, ITS and Information and communications technologies) (Interviewee I).

The start of Civitas Dyn@mo is going to bring the initial vision of the UBC to the next level, implementing a regional SUMP. The regional approach described by the core vision of the new SUMP will include the feedback and participation of citizens as well as regional actors. Actors and citizens will thus act as promoters of CIVITAS measures themselves on a regional and national level. In specific Aachen has several social projects that aim to implement sustainability projects with various backgrounds. There is an intermodal mobility alliance that strives to establish an information platform on public transport. Furthermore, there are projects that are supposed to work in combination with the public transport, such as individual transport. All social projects are facilitated by the evaluation team of Civitas Dyn@mo, hence Lund University.

Another core measure for Civitas Dyn@mo, together with the implantation of a SUMP in Aachen, will be an active dialogue with the local citizens and the stakeholders. Ultimately the city pursues the goal to focalize the local actors, such as the citizens, to find a common position that can be promoted nationwide. The SUMP is thus the regional solution for the modal split, as it is both the successor of regional policies UBC, such as the outcome of the close long-time collaboration with the CIVITAS Network promoting the development of sustainable technologies (i.e. The promotion of environmentally friendly vehicles for public and individual transport).

4.4.2 The example of Gdynia
Just as Aachen, Gdynia has been further developing European recommendations, hence the SUMP developed by the EU and the CIVITAS Initiative to local project. The overall aim of the city is to become the showcase for sustainable urban mobility planning in Poland.
Therefore, Gdynia aims to eliminate its communication barriers in urban transport. When it comes to its own transport policies, Gdynia strives to achieve real sustainability by ‘multimodality’ (European Commission, 2013b) and the improvement of its public transport services.

For Civitas Dyn@mo, Gdynia has three main themes, which will be further described as strategies in the local SUMP: ‘sustainable urban mobility planning, clean and energy-efficient vehicles, intelligent transport systems and ICT‘ (European Commission, 2013b). The main action of Gdynia within Civitas Dyn@mo is the development and implementation of a SUMP into local policies. Therefore, the city needs and actively seeks the participation of the local stakeholders. Furthermore, the SUMP itself will be the outcome of the international and multilevel cooperation with other CIVITAS partners that were developed in the second phase of CIVITAS in 2008. Alongside the establishment of the SUMP, Gdynia will foster coordinated project studies to identify action areas. These areas will then be the basis for further measures that will be summarized in a local mobility concept. This concept will be supported by a mobility 2.0 platform, which is designed to deliver feedback and further expertise from the citizens as actors and other local experts (European Commission, 2013b).

The SUMP will implement stronger community involvement, including local stakeholders. Specifically, Gdynia is going to introduce a community project based on case studies that aims to identify hot spots for future measures, like the creation of new pedestrian areas. Additionally, Gdynia plans for the installation and development of a digital feedback platform between citizens and authorities (e.g. Facebook, Twitter). In a second step these digital platforms will be facilitated by experts to extract in-depth consultations that exceed feedback (Interviewee III). For the evaluation of this management project Gdynia will create a competence center in cooperation with the UBC, Lund University and the University of Gdynia.

The competence center is not only for collecting data and dispersing information about the sustainable transport in Gdynia. To achieve the strategic goal of sustainability, Gdynia relies on gathered expertise and information of past projects and the CIVITAS network. Gdynia has been frequently consulting, for instance with experienced counseling by the CIVITAS network, since the first phase of CIVITAS (CIVITAS I) between 2002 and 2006. During this first phase of CIVITAS, Gdynia installed a more reliable trolleybus traction that helped to improve the pedestrian area of the city by increasing safety, thus the life quality of the citizens.
Alongside the social management, Gdynia has been pushing green technologies, like the hybrid trolleybuses in areas without public transport. A second measure is the implementation of the so-called super capacitor technology to decrease the overall energy consumption of the public transport system. Outgoing from the recommendation on ITS (European Parliament, 2010) there are several digital models that will be implemented into the overall SUMP in order to steer public and individual transport in a more economical way. Furthermore, there will be a system that will determine and reduce the road damage, increase road safety, and a digital and interactive model to reduce traffic jams. This, in addition to the above-mentioned mobility 2.0 platform, will be used as a means to further support the implementation of the local SUMP.

4.4.3 The example of Koprivinica

Koprivinica is a learning city within the project of Civitas Dyn@mo but has gathered experience in sustainable transport since Second World War. The city has since then been a bicycle city, actively promoting cycling for urban mobility. In 2001, Koprivinica introduced its sustainable urban transport plan and officially included sustainability. The main strategy is to push sustainability as a policy strategy further. As a learning city within Civitas Dyn@mo, Koprivinica has no SUMP for the development of its mobility and transport system. Instead, the city relies on a national policy in Croatia called Local Agenda 21. The Local Agenda 21 was adopted in by Koprivinica in 2008 and has since then been a means to raise awareness about the topic of sustainability. Moreover, the Agenda has been a first tool to teach and improve the understanding among the planning authorities of Koprivinica.

Pushing the rearrangement of the infrastructure for walking and cycling has to date brought the city the expert role in Croatia when it comes to sustainable urban transport. In numbers, Koprivinica had a total amount of 48% sustainable public and individual transportation, according to a survey in 2007. Furthermore, with the help of the Civitas Forum Network, such as experts from the EU, the city improved the existing measures on sustainable transport and implemented new actions (e.g. progressive development of the infrastructure after 2007 achievements, enlargement of the cycling tracks, promotional campaigns, improvement of walking tracks and the public transport, lowering street light energy consumption) finally involving the participation of over 50 stakeholders in the NGO sector. Just like the two demonstration cities, Koprivinica has pushed the development of alternative fuels in order to decrease the carbon footprint of the city. Therefore, the city has introduced a gas-driven school bus fleet into its public transportation system (European Commission, 2010c).
Within Civitas Dyn@mo, Koprivinica aims to develop its first individual SUMP. Based on the topics of sustainable urban mobility, such as energy efficient vehicles, Koprivinica seeks to further develop its sustainable public transport.

To underscore the importance of the citizens as actors in Civitas Dyn@mo, hence to foster regional participation and transparency, Koprivinica wants to involve regional and national stakeholders. Regional stakeholders are actively invited to take part in the preparation process and discussions concerning the implementation of the SUMP, such as the regional SUMP competence center. This process is further defined as an ‘important learning experience’, thus a part of the bigger plan of creating a SUMP competence center (European Commission, 2013c). By the inclusion of the local university areas into Civitas Dyn@mo, the local campuses of Koprivinica’s university will be used as a showcase scenario for sustainable mobility solutions or zero emission zones. The city also plans to install a citywide ‘innovation corridor’ that is divided into north and south by a local sharing point, connecting the university, the industrial zone and the local railway. The promotion of car sharing schemes is also included in the plans for Civitas Dyn@mo.

Unlike Aachen and Gdynia, Koprivinica sets its main emphasis on the progressive learning process on social measures to increase sustainable urban mobility. Koprivinica relies heavily on the participation of the citizens to actively spread the word and enact the suggestions made by the local government.

“Our own citizens are being our best promoters and multipliers of our activities. So now we have come to the point where if citizens of Koprivinica are asked about the quality of life the first thing they will mention is the kilometers of cycle tracks, which I think is great. And in the meantime we became a member of the EU’s 'Covenant of Majors' network and we concluded our sustainable action plan, so we are quite advanced and we have constructed several buildings, several passive houses, in which we are also the first in Croatia for which we were recognized by the association of Croatian cities. We just got the award for best cases for energy efficiency and we also applied for the European energy week award and as far as I know we have been short listed in this in this process.” (Interviewee II)

Within Civitas Dyn@mo it is planned to further promote social activism in accordance with a ‘less car-intensive lifestyle’. Especially cutting down emissions in the everyday life of the
citizens (e.g. way to school, work and recreation facilities) are part of the strategy to cut down energy consumption.

4.4.4 The example Palma de Mallorca

Unlike the other three cities, Palma de Mallorca hasn’t structured a sustainable mobility concept, nor did it have any experience in the recent past. According to a summary from 2010, Palma de Mallorca still relies heavily on individual transport (900 vehicles per 1000 inhabitants) that made 58% of the total trips in the city (European Commission, 2010d). The public fleet with its 201 buses consisted of 150 fossil-fuel-driven engines according to the old Euro 2 standard and no hybrid system was installed. The local fleet management is outsourced to a private company which holds 11 Euro 4 and 40 Euro 5 buses that are all managed by a centralized ITS with the special focus on road safety, accomplished by lowering traffic congestion, pollution and accidents. Besides the management, the company is in charge of promoting the public service of the urban mobility system in Mallorca that especially provides service for disabled people.

In the recent past there has been a change, at least in the policy domain on urban mobility of Palma de Mallorca. Since 2010, the local strategy on transport focused on ‘accessibility, attractiveness, environment and health’ (European Commission, 2010d). These key words have had an impact on the different levels of local governance structures, which are up to date promoting the vision of sustainable mobility. Moreover, the number of total individual transport trips has dropped to 50% (European Commission, 2013d) and the city plans to introduce hybrid buses to its public transport fleet. This is, however, only the theoretical part of the modal split only concerning the political agenda. Additionally, there are certain bottom-up projects in progress, which seek to foster participation. The city summary from 2010 names entertainment events in which local activist groups, in collaboration with the municipal transport company, arrange group transport to lower the carbon footprint of the city.

Public transport in Palma the Mallorca is for the most part based on the bus lines in the city. By this means, sustainability in urban mobility is constantly promoted and improved according to the city as the bus lines are under constant technological development and aim for the installment of hybrid or fossil fuel free engines. More important in the context of this work however is how this fact is communicated and shared with the public and project partners. A lot of work has been done promoting the connection between public transport and individual transport (e.g. cars and cycling). Furthermore there have been management advances, especially in promoting walking and cycling, by the local planning authorities and actors which have already been translated into some physical outcomes. The city has created
additional pedestrian areas in the city center and has increased the cycling track network to a total amount of 43.5 km since 2011. Furthermore, a public bicycle system was launched to connect with the citizens and better communicate the measures in the bicycle initiative.

The described mobility policies of the city didn’t even specifically include the topic of sustainability. This has changed since the start of Civitas Dyn@mo, as Palma de Mallorca has changed the focus of its sustainability plans once more. The new vision for the local planning policy is based on ‘Sustainable urban mobility planning, clean and energy-efficient vehicles and intelligent transport systems and ICT’ (European Commission, 2013d). Moreover, for their new SUMP the city has formulated five pillars on their way to sustainable urban transport:

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- Increase the attractiveness and user-friendliness of sustainable urban transport services, public charging points.
- Increase the use of sustainable transport modes (public transport, walking and cycling).
- Encourage a more rational use of motorized vehicles, including the introduction of clean technologies.
- Reduce emissions (NOx and CO2) and improve air quality (NO2).
- Increase the attractiveness of public space.
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(European Commission, 2013d)

The new measures, according to these vision statements, are centered on the development of an additional SUMP, which is seen as an addition to the ‘General Urban Master Plan’. The major aim described by the city is participation. This aim is connected via the implementation of existing policies that are supposed to be translated into direct local strategies enacted by local stakeholders. As an additional support, Palma is going to install a new ‘mobility 2.0’ platform in order to provide citizens with information on local public transport. Push services for direct feedback or other feedback systems are not mentioned in this context.

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8 Stations that can be used to recharge the batteries of electric driven cars or bikes.
A direct goal related to the new sustainability initiative is a continuation of the city’s policy on walking and bicycling by further enhancing and connecting walking and cycling routes. As an outcome of this action, the city hopes to increase the attractiveness of its public spaces and to increase the road safety. Additionally, these measures are seen to contribute to the overall health of the citizens and cut down vehicle emissions, and thus on carbon. It is important to mention that this specific measure actively involves the collaboration of local businesses as stakeholders in Civitas Dyn@mo.

To support these measures, there will be a study on where to place new bicycle stands and a market study of the needed capacity. Additionally, there will be a combination of different management strategies, such as an Internet blog and the organization of local events to inform and involve different local actors in the development of health tracks. The expertise gained from these events and the collaboration will then be summed up and implemented in the new SUMP of the city. The design of these health tracks will be accomplished through a series of public planning events by which local citizens can vote for a final route online (European Commission, 2013d).

Technological progress will continue through the renewal of the public transport vehicles. In line with the emphasis on health within Civitas Dyn@mo, Palma de Mallorca will push collaboration between local stakeholders to substitute electric vehicles for fossil-fuel-driven vehicles. This action is fostered by promoting the installation of public charging points to increase the dispersion of electric vehicles over a larger area and a wider public.


According to the EC, Intelligent Transport Systems (ITS) are ‘an ideal tool to make transport more efficient’. According to CIVITAS, such as the persons interviewed for this case study, technology is an important pillar to realize sustainable transport. The EU adopted a framework on 7 July 2010 (European Parliament, 2010) in order to speed up the installation of a range of pioneering transport technologies all over Europe. Though this directive is an important instrument for the coordination and implementation of ITS, as well as any other directive made by the EU, the Action Plan on intelligent transport underlies the subsidiary principle, meaning that it is up to the member states which system to choose (European Parliament, 2010)⁷.

To address interoperability and compatibility amongst all the different systems, the EU plans to adopt and implement this directive within the next seven years. Furthermore, it is stated that Directive 2010/40EU is a descendant of the initial Action Plan adopted 16
December 2008, which suggested a number of target measures, hence the directive itself and the promotion of mature ITS applications and services in Europe.
5. Analysis

5.1 The knowledge management process

The knowledge management process fostering collective learning in Civitas Dyn@mo is the topic of this analysis. Straight away, analyzing the data retrieved exposed two things. First due to the early stage of the project itself at the moment of data collection, some of the knowledge managing stages (training, incentives and structures) were harder to describe than others (technology, knowledge transfer, and visioning). While some of the knowledge management stages had been described prior to Civitas Dyn@mo - either by the EU or by the CIVITAS Community – the exact training schemes concerning meso and micro management were still under development.

Secondly it the possibility to craft thing like the structure hence the content direction of the training on the micro and meso level can be interpreted in a way that much space is given by the political top level to the local actors. One certainly might argue a lack of pre formulated norms on the regional and local level problematic, as the absence of norms usually means absence of control. The absence of normative control mechanisms can as well be a chance for local actors to identify with the project, thus develop a sense of responsibility. Experience made in past time projects of CIVITAS suggest that at least the public (social initiatives, clubs, etc.) commonly react positively on the given space to shape and co-create local projects (Intervieweess I, II).

5.1.1 Trainings, incentives and structures

Educational courses, like lectures and exercises for better understanding of the SUMP concept, might be a further help to break down the issues of communication between the different levels and dimensions of actors involved. Letting the local responsible clerks and accountants of the cities take part in the process of framing the SUMPs might help to lower the boundaries for communication within and outside the project, as active participation increases with experience. Though the summer university is a pilot project, the concept appears to be well organized as it contains provisions for training and for monitoring the whole project at the same time. There are likewise politicians, administration officers, and scientists (Lund University) involved in this event, which makes it also a transboundary platform for the exchange of concepts. It might be a tool for the different “communities” (Error! Reference source not found.) (politicians, scientists, public, private actors) to xchange knowledge in a rather neutral social space that helps to cross bridges between the different communities collaborating in this project.
The round tables on the micro- and meso-scales of the project are valuable means for local participants and the cities as local actors to connect, share and participate in a vision that is co-created on different political levels. These round tables are, moreover, a tool to synchronizes, manage and share. The direct linkages to the European macro level of politics and to the micro level of local project sites, which are established and maintained via Rupprecht Consult, have the potential to guarantee a stable communication flow between envisioning and implementing measures. If a knowledge pool and bridging organization keep these links alive, the primary condition for a knowledge transfer, communication and participation are secured. The close contacts between Rupprecht Consult, the city agents and those responsible for transport policies on the European level are a further indication of low communication barriers.

5.1.2 Technology and knowledge transfer
The use of IT systems to support the management of governance projects is nothing new. Within CIVITAS, such as CIVITAS Dyn@mo, the use of the Web with all its possibilities to communicate is a backbone that supports, hence facilitates, the transfer of embedded and tacit knowledge available throughout the whole CIVITAS Initiative. The various fora, such as the intranet, installed solely for Civitas Dyn@mo are a valuable means for the direct transfer of written knowledge; thus they promote group participation. Within CIVITAS there is even a subproject called CIVITAS WIKI with the sole purpose of keeping the progress of knowledge dissemination in CIVITAS up-to-date.

In Civitas Dyn@mo, web-based technologies are not only used for knowledge management inside the project, but for also dissemination of knowledge outside. ‘Mobility 2.0’ is a means of communication that reaches out to the citizen in a relatively novel way. Rupprecht Consult follows the strategy of targeting citizens that are willing to participate in Civitas Dyn@mo, hence are interested in the use of web-based communication platforms (Facebook, Twitter, etc.). It is a declared aim of the company to use Mobility 2.0 in a most reasonable way, meaning that it will have an actual impact on the project outcome. The idea is good but has been proven difficult to manage. Aachen and Gdynia have both started to integrate push services into their SUMP concepts with the hope of getting a closer contact with their citizens. Palma and Koprivinica haven’t approached this possibility yet. On the other hand, there is the HEALTHtracs project in Palma de Mallorca, which has an interactive

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9 Hiking routes that are planned in collaboration with local volunteers, social activists and the municipal spatial planers and use the support of web 2.0 techniques.
design phase planned. Stakeholders will then play a key role in the design and the planning of the local hiking, cycling, and health routes. In a second step, these routes will then be added to the SUMP as a measure to support the sustainable development of the public transport system. The development of these tracks by local stakeholders is done to enhance the capacity of the local commuter trains and the underground. In the best-case scenario, the hiking and cycling tracks are supposed to work as an alternative for the individual traffic (European Commission, 2013d).

Knowledge transfer is a topic named specifically by the EU within the legislation on sustainable transport (European Commission, 2001b, 2007, 2009a). Moreover, the generation of knowledge is of chief interest when it comes to sustainable urban transport (European Commission, 2009a). Under Action 12, 13, 15, 19 and 20 in the Action Plan on Sustainable Transport, the Council of the European Union has given more specific details on what they mean by knowledge transfer. They have issued studies on the economic aspects that are associated with sustainable urban transport, such as the internalization of external costs it causes. This is done to achieve a better understanding of the environmental impact of urban transport. Furthermore, detailed suggestions are made on the future funding for projects that monitor this footprint and on educational initiatives on the relation between pricing schemes and the environmental impact. The communication of these schemes is seen as crucial, not only by the EU, in order to create transparency and acceptance, thus foster participation on all political levels for the support of the sustainable transport vision of the EU.

The sharing of knowledge, such as its dissemination, is another important part of the work of Rupprecht Consult in Civitas Dyn@mo. The simple dialogue in meetings with executive directors or middlemen is seen as a vivid means not only to set the agenda on the European macro level of politics to steer the outcome of Civitas Dyn@mo, but for the whole CIVITAS initiative. By this approach Rupprecht Consult wants to make sure that Civitas Dyn@mo stays on the political agenda on all political levels for a longer period of time that continues even after political changes have occurred. The active sharing of knowledge and the close contact of the team of Rupprecht Consult to regional politics is also an advantage when it comes to implementing and sustaining knowledge. Having said that, securing the expertise and the tacit knowledge of politicians, is one of the biggest hindrances in governance projects in general. The experience of Rupprecht Consult with a changing government illustrates this issue in a very detailed way. When the government changed in Palma de Mallorca, Rupprecht Consult had a rather difficult time trying to stick to the pro-sustainability agenda made by the previous government. A lack of information about how important the combined
implementation of CIVITAS measures are has caused severe trouble in the past, solely because of a shift in local politics.

The information dissemination of the project is mainly focused on the Internet. This is especially noticeable examining the external communication (between the project and the citizen), while for disseminating internal information one will find a balance between real-life physical meetings, workshops and conferences, and their counterparts (web-based fora, workgroups, etc.). There are exceptions, as the example of Koprivinica shows. Most of the cities’ knowledge dissemination is based on public events and trust in the abilities of the citizens to participate in these events. There are also single measures, like the trolleybuses in Gdynia, which are actively used to promote CIVITAS and the idea of sustainable urban mobility. It can be criticized, though, that this form of knowledge dissemination is a rather conservative one-way form of one-sided communication. The promoted push services, like the ones that are going to be installed for example in Aachen and Palma de Mallorca, are systems that are able to submit a direct feedback on the quality of the service from the actual user to the project evaluation. These systems have the potential to change the relation between the citizens and the city substantially. Time will show the outcome of this experiment. A big part in the knowledge dissemination process might also be played by the planned local competence centers for sustainable mobility, like the one in Gdynia. This center might help to both establish a cross-link to the local actors (citizens, initiatives, entrepreneurs) and foster a dialog between all participants that then results in collective learning. It depends, though, on how open the design concept for this center is interpreted by the responsible management to involve local actors. If there the city administration and local activists are really interested in each other and their already existing projects, and if there is openness and rather low bureaucratic boundaries from the project management, then a competence center can help to foster knowledge generation in manifold ways. There might not only be the possibility to generate knowledge on sustainable urban mobility but also a way to gather and foster experience that in turn can be distributed in the future.

5.1.3 Visioning

Visioning is another tool that can facilitate the process of knowledge generation and distribution as it is described in the SUMP's. Though the finalized vision statement is a container for the complex pathways that lead towards this idealized picture, it is usually easy to communicate, as it contains the idea of this complexity wrapped in a simple statement. The strength of Sustainable Urban Mobility Plans is that they are based on existing planning activities and on the vision statements of existing European policies.
The examples of Aachen and Gdynia show very clearly how the cities try to enact the vision parameters of integrated sustainable planning of EU policies. Moreover, the statements of their SUMPs are focused on how to combine these efforts with the ideas and existing structures of local networks, communities and organizations.

In particular, Aachen has based its SUMP on the creation of a shared vision of all stakeholders involved in the projects. The city has furthermore stated that the SUMP is supposed to support the local population to implement existing visions that haven’t been implemented due to a lack of collaboration between the both local actors (city and citizen). This statement furthermore indicates an easy to evaluate project goal, as a clear statement like the statement above can give a clear indication whether CIVITAS measures and SUMP goals and visions are feasible strategies or just another neatly illustrated design trick to fool the local community. Time will show here also if this statement will be helpful in creating structures that really enact urban mobility solutions in a sustainable way (e.g. local education projects on sustainable mobility, technical innovations fostered by local companies).

Moreover, the event above displays the attempt to transport the visions of EU policies that there is a real willingness to communicate between the top level structures of Civitas Dyn@mo and the local management in a serious way. This willingness is also reflected in the strategic themes or visions of the cities (besides Koprivinica). Though they are sometimes not directly correlated to the SUMP (Gdynia), they share the common understanding of the EU and therefore CIVITAS’ idea of sustainable transport, albeit leaving enough space for the interpretation on how to participate in this project for local actors that might want to bring in their own expertise. Palma de Mallorca, on the other hand, has formulated very ambitious and detailed project goals. As part of the CIVITAS Initiative the city has announced five overall goals by which it wants to define its own interpretation of sustainable urban transport. At this very early stage of the project, the communication of these vision statements to the citizens appears to be vague as there is no direct connection between the vision and the implementation of the measures described on the official project page.

In accordance with the fourth round of the CIVITAS Initiative, Gdynia aims to solve ‘communication problems of the city’. Like Aachen, Gdynia consults the CIVITAS network to use the inherent knowledge of the initiative to solve its transport issues in a sustainable way (Interviewee III). Achieving the strategic goals of the city is supported by its involvement in the CIVITAS network since CIVITAS I (2002-2006). Within CIVITAS I, Gdynia participated in a modernization of Swietojanska Street and the installation of a new, more reliable
trolleybus track, making it a pedestrian-friendly area and increasing the quality of life for the street’s inhabitants (European Commission, 2013b).

In the implementation of CIVITAS measures, such as for the development of a SUMP, all cities are using the expert knowledge of the CIVITAS network and Rupprecht Consult. As the knowledge pool of the project (Interviewee II), Ruprecht Consult has the central task to monitor and moderate the use and embedding of existing knowledge. It is then up to the cities how to use this embedded knowledge. The crucial point for Civitas Dyn@mo, as it is for most other multi governance projects, is to identify and bring together the different knowledge units (experts, databases, policies). The mechanisms that promote sharing existing knowledge are installed. There are expert workgroups on the European macro level that exceed the level of politics by far. The communicative structure within CIVITAS and Civitas Dyn@mo seems by and large accessible at least to the local management. However, it was rather difficult to reach the heads of these management units; the staff was in single cases not yet experienced enough to know the bigger picture of the communication structures, leading to the embedded and tacit knowledge for Civitas Dyn@mo. For example, during the investigative time no responsible person was reachable for Palma de Mallorca. It has to be kept in mind, though, that Civitas Dyn@mo was in a very early project stage when the investigation of this study was taking place.

The implementation of existing knowledge is a key to collective learning. A lot of the knowledge used to shape Civitas Dyn@mo has been already embedded in the European policy and polity framework mentioned under (4.3). For example The Action Plan on Sustainable Urban Transport (European Commission, 2009a) can be seen as a direct descendant of the White Paper on European Transport and the Green Paper towards a new culture on urban mobility. It is the first document to study for analyzing the process of collective learning in Civitas Dyn@mo because it was partially prepared with the consultation of stakeholders. Given its title and purpose to frame sustainable transportation and the European focus on lifelong learning, it is quite unsurprising that the first paragraph in the Action Plan names the strong connection between sustainability good governance and learning. Moreover, Themes 1, 3 and 4, such as Action 9 specifically, point at the maintenance and the improvement of the legislation (e.g. legislation on bus services, clean vehicle technologies, the specific support of existing CIVITAS projects). Furthermore, the paper underscores the European Commission’s holistic approach to sustainable transport by pointing to the cross-links of sustainable transport, nutrition, sports and their positive effect on
diseases. It is this specific point that can be found in the local measures of the cities (e.g. HEALTHtracks, Mobility Week, promotion of cycling and pedestrian areas).

Theme 2 Action 4 focus on the role of the EU as a knowledge pool. In principle the EC describes its role as a bridging organization in the education process or the knowledge transfer under the topic of sustainable urban transport. This is then followed by a detailed description in Actions 7 and 8 naming acceptance and transparency as the key values for the EU’s initiative on sustainable transport. These values are not only key values for good governance but also foster participation and communication substantially (Rooy, 2004).

5.2 Knowledge management and the collective learning in Civitas Dyn@mo

Knowledge management and communication
Focusing on the process of collective learning in the case of knowledge management in Civitas Dyn@mo it can be stated, that the principle of communication is – at least in theory – well established. This fact is supported by the management structure of Civitas Dyn@mo. The management tools i.e. trainings, incentives, such as the extensive use of technology are omnipresent, not only in the proposals that were written to start Civitas Dyn@mo but also in the SUMP and the regional SUMPs. Workshops like the summer university in collaboration with Lund University and Rupprecht Consult have been successfully conducted and foster the impression of a willingness to approach the issue sustainable urban transport with all its merits and challenges collectively. It can be recorded as well that the process of communication - as described in the sense of knowledge dissemination - is not only top down (from inside the project towards the local citizens) but also has a real bottom up dimension that tries work with the feedback given by citizens. Of course, the strength of this process varies from city to city. For example the willingness to incorporate external knowledge from the local citizens is much more pronounced in the city of Koprivinica that hardly leaves out an opportunity to interact with external actors. On the other side we might place Palma de Mallorca that in theory has already established visions to implement local measures involving local and social projects, but still haven’t implemented to date.

Knowledge management and participation
This leads to the next principle of collective learning, participation. There are many suggestions about how to interact and lower the barriers for the active participation and communication in Civitas Dyn@mo. Some of them have been made prior to the actual kick
off to Civitas Dyn@mo. The implementation of these suggestions display how important a strong collaborative learning network is. There are local incentives taking place that inform and try to catch the attention of the local population. For example, the Trolley busses in Gdynia and Aachen are not only effective when it comes to the reduction of CO2 but are also informing the citizens about Civitas Dyn@mo and sustainable transport via imprinted stickers or informational material handed out in the sustainability center in Gdynia. It is nevertheless, hard to measure this principle of participation.

In this sense one could argue that this is just another example of rigid top-down governance, completely ignoring feedback from outside, but there are also projects like the push systems directly installed in the public transportation system that offer the possibility to participate directly in the design process of certain projects. Such is the case in Palma de Mallorca, where there are planned online polls to directly decide about new health paths via social media and simulation programs. In Koprivinica there are even planned round tables with local social initiatives to decide about how to design local measures. This is a vivid example of a direct connection between the local micro level and the European macro level. It would exemplify the direct translation of EU policy made into local action that is only focalized by city agents. It might be to bold to say that collective learning is a significant means to tackle the disenchantment with politics at the present stage. However, the recent findings on knowledge management in combination with the conducted measures in Civitas Dyn@mo suggest that fostering of participation and communication are of paramount importance to support the empowerment of actors of all social, science, public and political actors likewise.

**Knowledge management and knowledge implementation**

The last principle, knowledge implementation is at the current stage of the project hard to measure. Regarding the EU-level framework and polity that are associated with sustainable transport and mobility, it is somewhat surprising that the CIVITAS Initiative and the knowledge that is associated with it hasn’t gained more presence in the media and public. The ambitions framed in the only partially finalized SUMPs of the various cities are an indicator of the future road map of the project. Only the two demonstration cities Aachen and Gdynia are actively pursuing the implementation of a SUMP in its pristine sense, following the rational and design structure proposed by the project management. On the other sustainability and diversity are strongly related. They both require a lot of free space, hence a great deal of creativity to adapt to the regional and as the example of Koprivinica shows the national
requirements, laws and norms. It is quite something noticeable being able to contribute to the national framing from the institutional bottom line of politics. Furthermore it implies –since the regional governance of Koprivinica adapts the knowledge gathered by CIVITAS – that transnational and multilevel, collective learning is, to a certain degree possible. The channel by which knowledge is communicated and anticipated might be hard to track but it is definitely an act of collective learning incorporating by far more then only two actors and domains.
6. Discussion

Knowledge management as a means to foster sustainable mobility paradigm in the EU.

‘Project management is en vogue in the EU’ (Interviewee I) and there is a reason for it. Two desired features of management style governance projects are acceptance and transparency. In order to promote these key features there is a strong tendency to enlarge the public discourse from the government side. The key words here are empowerment and participation. P. J. Vergragt and H. S. Brown (2007) argued that participation and empowerment foster the sustainable mobility paradigm. The EU – at least according to its polity and policy framework on sustainable urban transport – is actively promoting this vision.

According to Vergragt and Brown (2007), a more encompassing involvement of all stakeholders in one governance project would mean a more effective form of persuasion than one-sided communication. I therefore argue that a more encompassing approach to project management would foster a more collective sense of learning in governance projects like Civitas Dyn@mo. A more encompassing approach in multilevel governance projects would lead to a much more detailed debate on the subject at hand. From a social science point of view, including researchers, academics, policy makers, public health, public transport, ecology and engineering in a debate would be the only reasonable way to solve the issues in a project like Civitas Dyn@mo. Knowledge management as an approach to collective learning would do exactly that. The critique, on the other hand, might be that developing an understanding for each other involves more than sitting together and talking. There are, however, moderation techniques that could deal with this problem.

This observation is also congruent with the earlier findings on visioning (Brown et al., 2003). In their small-scale experimentation with new technologies and services, Brown et al. have found a cross-link between higher order learning in small-scale mobile sustainability projects that used visioning as a tool. The argument for visioning as a tool to foster collective learning was that it would ultimately support the dissemination of ideas. Idea dissemination is one crucial piece in the chain of knowledge transfer, thus management. Looking at the past development of sustainability projects in the EU 10 years later, it can be stated that there is a trend to use visioning as an essential means to communicate on multilevel scales with various actors. Likewise, there has been an increasing trend that incorporates visioning as a means to communicate business projects and multilevel governance projects (Brown et al., 2003; Cash et al., 2006; Vergragt and Brown, 2007). Although the direct efficiency of visioning to promote participation and communication in multilevel governance has yet to be established,
the benefits of this method to design future images and create a common ground for diverging actors is that it creates a common sense of responsibility. This effect is most likely to support steering traditional processes into new directions – an ability needed very much, when it comes to the institution of a progressive idea like entirely sustainable transportation. Hence, responsibility is a clear sign for the development of accountability (Rooy, 2004).

The SUMP might be a proper answer to this problem. At least for Civitas Dyn@mo the SUMPs are a reason for the project partners to work together on an international level. A multilevel governance project like Civitas Dyn@mo requires all actors to look beyond the borders of their traditional competencies, especially in urban areas with diverging settings that have mixed requirements for holistic, multilevel governance approaches. The collaborative work of all actors to create a common base (e.g. SUMP), hence the overall aim to connect local with regional issues, is an integrative approach that involves the enhancement of linear planning techniques. Visioning, as a part of the development process of the SUMP, would offer these advanced techniques to create a common base of collaboration. What makes this visioning approach to communication and participation even more valuable is its connection to the vision of the European Action Plan on transport. In organizational theory it has been discussed that given a hierarchical structure, a vision had to be transported from the top to the bottom layer of decision-making. The workshops on the SUMP do exactly that, thus adding more individual features to the European vision. The SUMPs are supposed to help create local sustainability. The international dimension of CIVITAS as a whole will foster that idea. The SUMP in connection with the international dimension of the CIVITAS Networks, will offer the actors involved in Civitas Dyn@mo to make a vision for new innovative ways of thinking and of actions.

**Bridging the knowledge gap to collective learning**

The case of knowledge management in Civitas Dyn@mo shows that collective learning has an impact on the communication of the projects, such as informing people about the thresholds to participate, and thus contributes to the EU’s strategy of implementing management structures in governance projects. The analysis of the European Initiative on Civil transportation in comparison with the essential key points of the general vision of the SUMP shows that there actually is a willingness to communicate and interact from all societal domains and actors involved in Civitas Dyn@mo. If the project Civitas Dyn@mo wants to be successful to contribute to sustainable urban mobility, a dialog has to be established not only inside the project but also as a bridge to the public. If Civitas Dyn@mo
wants to establish sustainable transport, then the most important part to focus on is the dialogue with the regional public, such as amongst its stakeholders. This is best done by the means of education.

This goal is not done overnight and arguably exceeds the possibilities of a four year project like Civitas Dyn@mo. On the other there is a formulated aim in reflexive governance theories to consolidate short term objectives with long term goals. An aim that is well reflected in the social sustainability claims of the CIVITAS Initiative, such as the commitment to involve the public and hence to learn from past time mistakes. This becomes clear as one follows the constant endeavors of single cities to make an impact on the local spatial planning in cooperation with local acting volunteers. Given the fact that the knowledge generated by these endeavors is now upscaled and implemented in national norms and directives by governments (Koprivinica Croatia) might be astounding to skeptics of bottom up approaches (Interviewee II).
7. Conclusion

Civitas Dyn@mo is a multilevel governance project which aims to foster sustainability. The more interesting part for this work however is how the sustainability claim is reflected in terms of balanced power dynamics and collective learning. Taking the presented empirical case of knowledge management of Civitas Dyn@mo as an indicator for this statement, there are certain striking aspects that come to mind.

The diversification of power in the described knowledge management process is the first characteristic to start with. Frameworks and norms communicate the vision of sustainability (socially, ecologically, technologically and economically) vertically from the EU level to the very local norms and project plans. Taken alone, this may seem to approve the sufficiency of collective learning as a discursive debate. Knowledge management and collective learning in the case under scrutiny didn’t end at this stage. The possibility that of active participation in the creation of project plans and normative frameworks already on the EU level is reflected throughout the whole CIVITAS Initiative for the public and local administration. Workshops organized and communicated by the project management, and consequent educational trainings help the exchange and implementation of knowledge throughout all involved domains and levels. This approach to collective learning exceeds common rules to procedure and hence the rule to pick the right actors based on technical experience.

To sum up and answer the first research question; “What are the key aspects of a collective learning process and how are they related to knowledge management in the project Civitas Dyn@mo?” has been addressed in the contextual analysis in the theory section of the three general core aspects (communication, participation and knowledge implementation) of the Civitas Dyn@mo. All referenced study and research disciplines commonly name communication, participation and knowledge implementation, when referring to a collective learning approach not only in reflexive governance. One might argue that these three core aspects might be defined and described in a way that is oversimplified and deserve a more detailed research to define. No matter what, when it comes to a collective approach to learning, it is important that these aspects are embedded in the project from the very top vision of a project to the local micro management. This structure will, if not overly complicated, and managed sufficiently, provide for a balanced power dynamic on the base of easy accessible platforms to exchange knowledge, thus foster participation.

To answer the second research question, the empirical part of this work has shown that aspects of collective learning can be directly applied via knowledge management. The
analysis clearly shows that communication, participation and knowledge implementation are present throughout the knowledge management process. It can be argued that some of the knowledge management aspects are stronger developed than others. For example the Trainings and incentives could be communicated in more detail, and incorporate the public domain. On the other hand, it can be argued that a four year project like Civitas Dyn@mo does incorporate the public through the establishment of local incentives, feedback systems (web 2.0) and public outreach projects. Moreover, the mechanisms to generate and foster the implementation of useful knowledge (databases, language networks, free accessible expert networks) indicate the strong will to foster collective learning. The success of CIVITAS over the past ten years also suggests the importance of collective learning.

The empirical analysis of this case raises the question of whether a collective learning approach is applicable on a larger scale of cases within the CIVITAS Community. Reconciling evidence from a larger set of cases with the single outcome of this study would certainly help to support the promising findings made so far.
REFERENCES


APPENDICES

QUESTIONNAIRES

- INTERVIEWEE I
- INTERVIEWEE II
- INTERVIEWEE III
1. How is knowledge treated/facilitated within Civitas Dyn@mo (generation of ideas, knowledge dissemination, knowledge implementation)?

2. How is knowledge managed inside Civitas Dyn@mo (Trainings, supervisions, steering of actors)?

3. Are there any official strategies/mechanisms to achieve a neutral social communication space?

4. How are the vertical and horizontal linkages in the multilevel governance project Civitas Dyn@mo described and managed?

5. The evaluation and implementation of ideas is often a critical point for the generation of knowledge. How is the process of knowledge implementation fostered?
1. What are Koprivnica’s measures for the development of sustainable urban Transportation?

2. How and with whom do you share generated data/knowledge

3. How do you integrate the Citizen as an actor into local Civitas measures?

4. How do you access the stored knowledge of the CIVITAS Initiative?

5. How do you relate/link your regional (CIVITAS) measures to the level of national governance?
1. How did Gdynia become a demonstration city? How does the process of becoming a demonstration city look like in the CIVITAS Community?

2. What are the criteria for good practice in Gdynia?

3. How does knowledge evaluation help to achieve “good practice”